# PlumeStop<sup>™</sup> Demonstration Study Report

NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT (NIROP) FRIDLEY, MINNESOTA

Revision: 0

Prepared For:



Department of the Navy Naval Facilities Engineering Command Mid-Atlantic 9324 Virginia Avenue Norfolk, Virginia 23511

Prepared By:

Resolution Consultants A Joint Venture of AECOM & EnSafe

> Address: 1500 Wells Fargo Center 440 Monticello Avenue Norfolk, Virginia 23510

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Nanjun Shetty Environmental Engineer Christina M. Boehm Carlson, PG

Chi hel Com

CTO Project Manager

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#### **List of Acronyms**

ACP Anoka County Park

BDI Bio-Dechlor INOCULUM®

bgs below ground surface

CAI Contributing Area Investigation

COD Chemical Oxygen Demand

CSIA compound specific isotope analysis

CVOC chlorinated volatile organic compound

DCE dichloroethene
Dhb dehalobacter
Dhc dehalococcoide

EPA United States Environmental Protection Agency

ERD enhanced reductive dechlorination

HRC® Hydrogen Release Compound

IC Institutional control

IDW investigative derived waste

MDH Minnesota Department of Health

mg/L milligrams per liter
MI Microbial Insights

MPCA Minnesota Pollution Control Agency

MSDS Material Safety Data Sheet

NIROP Naval Industrial Reserve Ordnance Plant

OU Operable Unit
PVC polyvinyl chloride

RI Remedial Investigation

RL reporting limit

ROD Record of Decision

sVOC semi-volatile organic compounds

TCE trichloroethene

TCLP Toxicity Characteristic Leaching Procedure

TOC total organic carbon VFA volatile fatty acid

VOC Volatile organic compound

μg/L microgram per liter

#### 1.0 INTRODUCTION

#### 1.1 Demonstration Scope and Purpose

This report describes the implementation of a demonstration study at the United States Navy (Navy) Naval Industrial Reserve Ordnance Plant (NIROP) in Fridley, MN (Site) to evaluate a new commercial product that has the potential for *in situ* remediation of chlorinated volatile organic compounds (CVOCs) in subsurface soil and groundwater. The product, termed PlumeStop™, is a colloidal groundwater remediation agent manufactured by Regenesis, Inc. (Regenesis), which couples degradation of contaminants with rapid contaminant sorption. The intended result of a PlumeStop™ application is to enhance biodegradation of Site contaminants and to sorb contaminants from groundwater in a treatment zone, thus controlling the plume migration and accelerating CVOC degradation. PlumeStop™ was injected in two demonstration areas within an existing trichloroethene (TCE) plume underlying the Site; one area is of moderate TCE concentration (Demonstration Area One) with a second area downgradient of the first and of lower TCE concentration (Demonstration Area Two). A Site Location Map is included as Figure 1-1 and Figure 1-2 illustrates the Site Layout.

This demonstration study was managed for the Navy by Resolution Consultants in cooperation with Regenesis, the manufacturer of PlumeStop<sup>TM</sup>. The Navy executed this project in a cost-sharing approach with Regenesis; however, by this arrangement the Navy does not endorse or intend directly or incidentally to promote the use of PlumeStop<sup>TM</sup>.

#### 1.2 Performance Goals

The intended result of the NIROP PlumeStop™ demonstration was to evaluate if the product will yield measurable results as indicated by a decline in CVOC concentrations over the planned monitoring period, specifically TCE and its degradation products [cis-1,2-dichloroethene (DCE), trans-1,2-DCE, and vinyl chloride]. As described, the demonstration areas are small and the performance monitoring is limited to a few wells over a relatively short time period. As proposed in the PlumeStop Demonstration Study Work Plan (Work Plan) (Resolution Consultant, 2015), the Navy envisions the short-term performance goal to be a reduction in the concentrations of CVOCs in groundwater within the vicinity of injections by approximately one order of magnitude (from baseline sample concentration).

#### 1.3 Site Background

The NIROP site is 83-acres located approximately 700 feet east of the Mississippi River in Fridley, Minnesota (Figure 1-1). Various contractors have operated NIROP for the Navy producing advanced weapons systems since 1940. The Navy, United States Environmental Protection Agency

(EPA), Region 5, and Minnesota Pollution Control Agency (MPCA) have worked together to complete environmental investigations and remedial efforts at the Site. Figure 1-2 presents a detailed map of the Site including the extensive network of groundwater monitoring and extraction wells and PlumeStop™ Demonstration Areas One and Two.

The NIROP site is divided into three separate operable units (OUs):

- OU1 is the groundwater plume as shown on Figure 4 of the NIROP Record of Decision (1990).
- OU2 is the unsaturated soils outside of the Plating Room on the NIROP property.
- OU3 is the unsaturated soils beneath the Plating Room within the NIROP building.

The NIROP Record of Decision (ROD) for groundwater remediation (OU1) was signed in September 1990 (USEPA, 1990) by the Navy, the EPA Region 5, and the MPCA. Remedial action in the ROD specified "...hydraulic containment and recovery of all future migration of contaminated ground water from the NIROP and recovery, to the extent feasible, of contamination downgradient of the NIROP." The selected remedy included the installation and operation of groundwater extraction wells. Contaminated groundwater downgradient of NIROP in Anoka County Riverfront Park (ACP) is allowed to dissipate naturally. In September 1992, the groundwater extraction well system came on-line and the system is currently in operation. Through the end of 2014, the system had treated approximately 5.1 billion gallons of groundwater and extracted approximately 39,713 pounds of TCE and other volatile organic compounds (VOCs) (Resolution Consultants, 2016).

In 2003, the EPA issued a ROD for OU2 and OU3, which uses institutional controls (IC) to restrict the property to industrial and limited commercial use until and unless EPA and MPCA determine that concentrations in soil have been reduced to levels allowing less restrictive uses.

In 1997, an investigation of OU3 (since re-defined) was completed as part of the Remedial Investigation (RI) study to locate contributing areas beneath the building, included analysis of approximately 500 soil and 46 groundwater samples (TetraTech NUS, Inc. [Tetra Tech], 2002). In July 2013, the Navy commenced a Contributing Area Investigation (CAI) (performed by Resolution Consultants) to evaluate potential TCE contributing areas. The CAI determined that the East Plating Shop, 8th Avenue Area south of the East Plating Shop, and 7th and Broadway area are the primary areas contributing TCE to groundwater. The maximum concentration of TCE detected was 1,200,000 micrograms per liter ( $\mu$ g/L) in a groundwater sample collected from the 7th and Broadway area from 76 to 79 feet below ground surface (bgs). The CAI Report has been submitted in draft version with a final version expected to be completed in early 2017.

TCE and its degradation products are present in groundwater at concentrations above regulatory levels, thus requiring continued operation of an onsite groundwater extraction and treatment system. Although the groundwater treatment system is operating in accordance with the ROD, under current conditions, it will take significant time to reach cleanup goals. Therefore the Navy periodically evaluates new cleanup options in order to identify actions that optimize the cleanup process and that may allow the Site to reach cleanup goals faster and at a lower cost.

The NIROP property was purchased by Fridley Land, LLC and they have begun redeveloping the NIROP property for commercial office and distribution space. The redevelopment activities began in 2014 and building demolition, grading and construction activities are currently ongoing.

#### 2.0 DEMONSTRATION AREAS ONE AND TWO GROUNDWATER CONTAMINATION

The three primary TCE source areas are the East Plating Room, the  $7^{th}$  and Broadway area, and the  $8^{th}$  Avenue area. Figure 2-1 is an isoconcentration map from the draft CAI report (Resolution 2015) that depicts TCE variation in Site groundwater in these areas. As indicated on Figure 2-1, Demonstration Area One is located in the vicinity of a former pit near the  $7^{th}$  and Broadway TCE source area. This area is within the 100,000  $\mu$ g/L TCE contour as determined in the CAI vertical profile sampling. Demonstration Area Two is located to the north and west in an area of lower TCE groundwater concentration (within 10,000  $\mu$ g/L contour of vertical profile sampling). A brief description of the TCE concentration in each Demonstration Area is provided below.

The  $7^{th}$  and Broadway area is characterized by elevated TCE concentrations at intermediate zone depths in finer grained soils. Soil samples containing the highest concentration of TCE were collected in the 7th and Broadway Area from boring VP-32, located just east of a pit (see Figure 2-1). The sample interval depth with the highest TCE concentrations was from 71 to 84 feet bgs in alternating silty sand, silt, and clay layers. The maximum concentration of TCE in groundwater measured during the CAI was 1,200,000  $\mu$ g/L, in the boring VP-32 (76 to 79 feet bgs). Demonstration Area One is located downgradient of VP-32 and near of boring VP-17. The maximum concentration of TCE in groundwater in boring VP-17 was 100,000  $\mu$ g/L (61 to 64 feet bgs) within silty sand soil. Based on the groundwater elevations contours from the 2014 Annual Monitoring Report, the intermediate depth groundwater gradient in this area is relatively flat with flow towards the southwest (Resolution Consultants, 2016).

Demonstration Area Two is located hydrogeological downgradient of the source areas near groundwater extraction well AT-12. Boring VP-25 is located near Demonstration Area Two and the soil type encountered in the area is fine to medium sand. The maximum TCE concentration measured in VP-25 was 12,000  $\mu$ g/L from 77 to 80 feet bgs. Based on the groundwater elevation contours from the 2014 Annual Monitoring Report, the intermediate depth groundwater gradient in this area is influenced by the nearby groundwater extraction wells with a steeper gradient than found in Demonstration Area One (Resolution Consultants, 2016).

### 3.0 PlumeStop<sup>™</sup> DESCRIPTION

PlumeStop™ is a colloidal groundwater remediation agent, manufactured by Regenesis, Inc. (Regenesis), which couples enhanced biodegradation of contaminants with rapid contaminant sorption. The combined effects of PlumeStop™ degradation and sorption actions is expected to result in a sustained decline of groundwater CVOC concentrations. The formulation is designed to distribute through soil and groundwater upon application, and is based on micron-sized activated carbon, enhanced with a proprietary mixture of polymeric and molecular active ingredients. PlumeStop™ has been shown to be effective on most chlorinated organic groundwater contaminants, including CVOCs, by first sorbing mobile contaminants followed by biodegradation as the sorptive material provides a favorable matrix for microbial colonization and growth (Birnstingl, et al, 2014). The Material Safety Data Sheets (MSDS) for PlumeStop™ and the other injectants are provided in Appendix A.

#### The function of Plume-Stop™ is to:

- Adsorb contaminants and rapidly reduce their concentration in groundwater;
- · Inhibit transport of contaminants; and,
- Provide a "bio-matrix" for bacteria and contaminants to enhance contaminant biodegradation, resulting in contaminant destruction and remediation of the site.

To facilitate anaerobic biodegradation on the PlumeStop™ biomatrix, Hydrogen Release Compound (HRC®) was co-injected with PlumeStop™. HRC® is a poly-lactate ester material that, when hydrated, is subject to microbial breakdown producing a controlled release of hydrogen to enhance anaerobic bioremediation. The Demonstration Areas were also bioaugmented using Bio-Dechlor INOCULUM® Plus (BDI), a consortium of bacteria that have been shown to be effective in the dechlorination of chlorinated ethenes and ethanes. The purpose of the bioaugmentation step is to allow complete breakdown of chlorinated solvents to non-toxic byproducts such as water and carbon dioxide and prevent build-up of degradation products (Regenesis, 2015).

#### 4.0 PLUMESTOP™ INJECTION ACTIVITIES

The implementation of this demonstration study required the installation of direct push injection points, installation of injection wells, installation of four new groundwater monitoring wells, and direct push post-injection borings to evaluate the injectant area of influence. Pre-injection and post-injection groundwater sampling was completed to evaluate baseline conditions and to monitor Plume-Stop™ effectiveness. The following sections address each of these activities in detail. Figure 4-1 illustrates the boring and monitoring well configuration in Demonstration Area One. Figure 4-2 illustrates the boring, injection well and monitoring well configuration in Demonstration Area Two.

#### 4.1 Demonstration Areas

The demonstration study was implemented on a relatively small foot print (approximately 20 by 16 feet) in the two areas. The higher TCE concentration test area was Demonstration Area One and was located near the 7<sup>th</sup> and Broadway TCE source and proximal to CAI direct push locations VP-17 and VP-32 (see Figure 2-1). Demonstration Area Two was placed in a lower TCE groundwater concentration area and was proximal to CAI direct push location VP-25 (see Figure 2-1). Site-wide generalized cross sections were updated with the PlumeStop™ Demonstration Area injection plan. A cross-section location map is included as Figure 4-3. Generalized site-wide geologic cross sections A-A' and B-B' are included on Figure 4-4. Geologic cross sections focused on Demonstration Areas One and Two are shown on Figure 4-5 and Figure 4-6, respectively. As shown on the cross sections, the performance well screens were placed in the same depth interval as the PlumeStop™ injection depths. The Demonstration Areas are located in fairly homogeneous geologic materials, which assisted with the distribution of PlumeStop™ in the soil matrix.

#### 4.2 Pre-Injection Activities

Pre-injection activities included permitting, utility clearance, monitoring well installation and baseline groundwater monitoring. These activities are discussed below.

#### 4.2.1 Permitting

Variances were required to be submitted to and approved by the Minnesota Department of Health (MDH) prior to completing injections of remedial agents associated with PlumeStop™. The first variance permit (TN 5265) was obtained to inject chemical agents at the Site. The variance approved the injection of up to 9,000 pounds of PlumeStop™ (25% concentration), 400 pounds of HRC®, and five pounds of Dehalococcoides spp. (Dhc) microbial consortium mixed with approximately 4,500 gallons of potable water. The variance included injection of these materials into up to 28 direct push soil borings (14 borings at each demonstration area). A second variance permit (TN 5265A) approved the injection of an additional 2,000 pounds of PlumeStop™ (25% concentration) mixed with approximately 3,500 gallons of water into three injection wells (MN

unique numbers 818601, 818602, and 818603) at the Site. The MDH Variance Permits are included as Appendix B.

#### 4.2.2 Utility Clearance Procedures

Resolution Consultants coordinated utility clearance with the Gopher State One Call public utility locating service prior to completing the subsurface activities. The Gopher State One Call was notified and marked public utilities prior to drilling. Hance Utility Services, Inc. (a private utility location subcontractor) was also contracted to locate private utilities prior to commencing subsurface activities.

#### 4.2.3 Performance Monitoring Well Installation

Four soil borings (PMW-1 through PMW-4) were drilled on September 2 and 3, 2015 in the Demonstration Areas using a sonic drilling rig. Monitoring wells were installed in each boring prior to the Plume-Stop™ injections. Drilling and well construction services were provided by Mark J. Traut Wells, Inc. Performance monitoring wells PMW-1 and PMW-2 were installed in Demonstration Area One and PMW-3 and PMW-4 were installed in Demonstration Area Two. The performance monitoring wells were installed to allow collection of groundwater samples to assess the performance of PlumeStop™.

Wells PMW-1 and PMW-3 were installed in the central portion of the Demonstration Area One and Demonstration Area Two, respectively. Wells PMW-2 and PMW-4 were installed downgradient of Area One and Area Two, respectively, as shown on Figure 4-1 and Figure 4-2. The downgradient wells were installed less than a presumed 30-day time-of-travel distance from each injection area to assess application methods and CVOC concentration decline.

Continuous soil samples were collected during the advancement of each soil boring and the drill cores were logged by a field geologist. Boring logs created from soil borings are included as Appendix C. Performance monitoring wells were constructed of 2-inch diameter stainless steel well screen and poly-vinyl chloride (PVC) riser pipe. Well screens are 5-feet in length and have slot size of 0.010 inches with a bottom caps fitted to the bottom of each well. Pipe sections, screens and bottom caps are flush-jointed. Demonstration Area One monitoring wells (PMW-1 and 2) screens were installed at approximately 61 to 66 feet bgs. Demonstration Area Two monitoring wells (PMW-3 and 4) screens were installed at approximately 70 to 75-feet bgs. The filter packs consists of 20/30 clean silica sand that was installed using a tremie pipe from the base of screen extending to 4-feet above the top of the screen. The remaining annular space from above the sand pack to ground surface was sealed with high-solids bentonite grout installed using a tremie pipe. The wells were completed with a flush mount manhole. Well construction details, including total and screened depth, are summarized on monitoring well construction forms included as Appendix D.

Monitoring wells were developed using a surge and purge method. Between 90 and 100 gallons of groundwater was purged from each monitoring well.

#### 4.2.4 Baseline Groundwater Monitoring

Baseline, or pre-injection, groundwater sampling was completed on September 15 and 16, 2015, approximately twelve days after the performance monitoring wells were installed. The sampling event included measuring the depth to groundwater and sampling the four newly installed monitoring wells (PMW-1 through PMW-4). Groundwater samples were collected from each well with a bladder pump using low-flow purging and sampling techniques. The pump intake was placed approximately at the midpoint of the well screen during purging and sampling. The pumping rates (i.e. purge and vent cycle of the pump) for the bladder pump was controlled via a controller box and compressed air was utilized as the gas source. The respective pumping rates were set below the approximate rate of recharge for each well to minimize drawdown during sampling. Between sampling locations, the pump was decontaminated with a distilled water and Alconox® solution and rinsed with distilled water. New disposable tubing and bladders were used at each sampling location.

Water quality parameters were collected with a YSI water quality meter equipped with a flow-through cell during purging. Readings were recorded at approximately five minute intervals and the wells were purged until water quality parameters stabilized. When water quality parameters stabilized, samples were collected from each monitoring well and placed directly into laboratory supplied containers with the appropriate preservative (if required). Samples were stored on ice in coolers and were delivered under chain-of-custody to the laboratory. Groundwater Sample Collection Record forms for the baseline groundwater monitoring are included as Appendix E.

#### 4.3 Surveying

The location, ground surface elevation, and top of casing elevation at wells PMW-01, PMW-02, PMW-03 and PMW-04 were surveyed by a surveyor licensed in State of Minnesota (Harry S. Johnson Land Surveyors) on September 15, 2015. The survey information for each well is included on the boring logs (Appendix C).

## 4.4 Field Assessment of PlumeStop<sup>™</sup> Injections

PlumeStop<sup>™</sup> and BDI were pressure injected via direct push technology into approximately 20 points (10 points at each Demonstration Area) within the intermediate zones of the aquifer. In addition, the electron donor HRC<sup>®</sup> was injected in four separate points in each demonstration area. In Demonstration Area One, the interval from 60 to 67 feet bgs was targeted and in Demonstration Area Two, the interval from 70 to 77 feet bgs was targeted for injections. The injection depths

were selected based upon the soil types and TCE concentrations from borings advanced during the CAI.

#### 4.4.1 Initial PlumeStop™ Injections

The initial injection event in Area 1 was completed September 30, 2015 through October 5, 2015, with Matrix Environmental, LLC providing Geoprobe drilling services and Regenesis providing injection services. PlumeStop and BDI were injected from 60 to 67 feet bgs in direct push points IP-1 through IP-10 in Demonstration Area One around performance monitoring well PMW-1. The boring and well configuration of Demonstration Area One is illustrated on Figure 4-1. At each injection location in Demonstration Area One, the injection tooling was advanced to 67 feet bgs and a 2-foot long injection screen was exposed. Approximately 82 gallons of PlumeStop™ was injected at each 2-foot interval and then the injection tooling was retracted to the adjacent shallower 2-foot interval. For the last interval, 60 to 61 feet bgs, the screen was further retracted so that only one foot of screen was exposed and half the amount of product was injected. In boring IP-3, high injection pressures were encountered leading to more or less product injected at each depth intervals. A total of 290-gallons of PlumeStop<sup>™</sup> were injected at each location. Approximately 0.26 liters of BDI was added to the PlumeStop<sup>™</sup> for each 2-foot interval. Four additional borings, HRC-1 through HRC-4, were advanced in Demonstration Area One to inject HRC®. At each injection location, the injection tooling was advanced to 67-feet bgs and a 2-foot long injection screen was exposed. Approximately 0.69 gallons of HRC® solution (7.5 pounds [lbs.] per foot) was injected at each 2-foot interval and then injection tooling was retracted to the adjacent shallower 2-foot interval. A total of 4.84-gallons of HRC® were injected at each location. Appendix F includes injection logs completed by Regenesis summarizing the injection borings.

The initial injection event in Area 2 was completed October 6, 2015 through October 8, 2015. PlumeStop and BDI were injected through points IP-1 through IP-10 in Demonstration Area Two around performance monitoring well PMW-3. Injection point IP-1A was installed adjacent to IP-1 in order to complete injections after fine sands plugged the screen in the initial attempt. The boring and well configuration of Demonstration Area Two is illustrated on Figure 4-2. In Demonstration Area Two, during the first injection attempts at IP-1, the fine grained sand was heaving into the injection screen preventing the screen from opening. The Regenesis field crew decided to change the injection tooling used in Area Two due to the high pressure and heaving sands. The new injection tooling included an expandable tip which released from the end of the drilling string when high pressure is applied and then the tooling is drawn up a foot during injections. This method injects the PlumeStop™ in a downward direction out the bottom of the tooling versus laterally as with the screen in Area One. At each injection location, the injection tooling was advanced to 77-feet bgs and high pressure was applied during pumping of PlumeStop™ which released the expandable tip. Approximately 34-gallons of PlumeStop™ were injected at each 1-foot interval

(slightly more or less was injected at some locations due to high injection pressures) and then injection tooling was retracted to the adjacent shallower 1-foot interval. A total of 240-gallons of PlumeStop™ were injected at each location. Approximately 0.13 liters of BDI was added to the PlumeStop™ for each 1-foot interval. Four borings (HRC-1 through HRC-4) were advanced in Demonstration Area Two to inject HRC® using the same technique as the PlumeStop™ injections. Approximately 0.69-gallons of HRC® were injected at each 1-foot interval and then injection tooling was retracted to the adjacent shallower 1-foot interval. A total of 4.84-gallons of HRC® were injected at each location.

Following injections, radius of injection influence was assessed by advancing soil borings radially outward from the injection area. Borings RD-1, RD-2, and RD-3 were advanced at Demonstration Area One. Boring RD-4 was advanced at Demonstration Area Two. The radius of influence boring locations are illustrated on Figure 4-1 and Figure 4-2, respectively, for Demonstration Areas One and Two. Soil cores were collected with the direct push drill rig using dual-tube tooling as summarized below.

- Borings RD-1 and RD-2 were blind-drilled to 60-feet bgs and soil cores were collected from 60 to 70-feet bgs.
- Boring RD-3 was blind-drilled to 55-feet bgs and soil cores were collected from 55 to 70-feet bgs.
- Boring RD-4 was blind-drilled to 65-feet bgs and soil cores were collected from 65 to 80-feet bgs.

Cores from borings RD-1 and RD-2 were cut into 1-foot long sections, secured with foil and rubber caps, secured with tape and shipped to the Regenesis laboratory. The soil cores from borings RD-3 (Area One) and RD-4 (Area Two) were opened and visually examined by the Regenesis field geologist on-Site. PlumeStop™ is readily identifiable by visual observation of the soil cores due to its distinct black coloration (in contrast to the native brown sand / silty sand). Dark grey to black was noted in the silty sand from 60 to 68-feet bgs at boring RD-3 indicating the presence of PlumeStop™. Slightly grey sand were noted from 75 to 77.5-feet bgs at boring RD-4 and grayish water was also in the drilling liner, indicating the presence of PlumeStop™.

#### 4.4.2 Injection Well Installation and Follow-Up PlumeStop™ Injections

The Regenesis project team recommended the completion of an additional follow-up injection of PlumeStop™ at Demonstration Area Two based on the initial field assessment and post injection performance monitoring results (discussed below). Follow-up PlumeStop™ injection activities in Area Two included injection well installation and PlumeStop™ injections in the newly installed wells.

#### 4.4.2.1 Injection Wells Installation

Injection wells IW-1, IW-2, and IW-3 were installed on December 17 through 21, 2015 by Mateco Drilling, Inc. to perform additional PlumeStop injection in Demonstration Area Two. Wells were constructed of 2-inch diameter stainless steel well screen and steel riser pipe. Injection wells screens were installed from approximately 71 to 76-feet bgs and have slot size of 0.010 inches. The filter packs consists of 20/30 clean silica sand that was installed using a tremie pipe from the base of screen extending to 4-feet above the top of the screen. The remaining annular space from above the sand pack to ground surface was sealed with high-solids bentonite grout installed using a tremie pipe. The wells were completed with above grade locking well protection. Well construction details are summarized on monitoring well construction forms included as Appendix D.

Injection wells were developed using a surge and purge method. Approximately 76 gallons of groundwater was purged from each injection well.

#### 4.4.2.2 PlumeStop™ Injections into Injection Wells

A total of 1,066-gallons of PlumeStop<sup>™</sup> (667 lbs of PlumeStop<sup>™</sup> plus water) was injected at each injection well (IW-1, IW-2, and IW-3) on January 8, 2016. Regenesis performed the injections by attaching the injection piping directly to the injection well top of casing and pumping the PlumeStop<sup>™</sup> through the well screen into the formation. The goal of pumping PlumeStop<sup>™</sup> through the injection wells was to obtain better horizontal distribution and radius of influence compared to the direct push method previously used in Demonstration Area Two. No BDI or HRC were injected in during this event. Appendix F includes an injection log completed by Regenesis of the follow-up PlumeStop<sup>™</sup> injections.

#### 4.5 Investigative Derived Waste

Soil cuttings generated during monitoring well installation and soil sampling were containerized in 55-gallon drums. Groundwater generated during well development, purging and sampling activities was stored in a water-tight roll-off dumpster. A soil sample representative of the investigative-derived waste (IDW) was collected and submitted to Trimatrix Laboratories in Grand Rapids, Michigan for analysis of toxicity characteristic leaching procedure (TCLP) VOCs, TCLP semi-volatile organic compounds (sVOCs), TCLP metals, flashpoint, ignitability, corrosively, pH, TCLP pesticides, and polychlorinated biphenyls. Soil IDW analytical results were used to generate a waste profile. Soil drums were removed from the Site by Capitol Environmental for disposal on March 24, 2016. The waste disposal documentation is included in Appendix G.

A water sample representative of the IDW waste was submitted to Trimatrix Laboratories in Grand Rapids, MI for analysis of metals (cadmium, copper, chromium, lead, nickel, zinc, and mercury), VOCs, total suspended solids, pH, cyanide, and chemical oxygen demand. Water IDW analytical results indicated that the analyzed compounds were below the Metropolitan Council Environmental Services permit limits. The water IDW was discharged to the sanitary sewer on November 10, 2015.

#### 5.0 PERFORMANCE GROUNDWATER MONITORING

Groundwater monitoring was performed in Demonstration Area One and Demonstration Area Two prior to injection activities and during a time period of approximately one-month through approximately six-months after the initial injections. The groundwater monitoring results are discussed below.

#### 5.1 Monitoring Program

The monitoring program varied slightly over the study. Tests performed included field stabilization parameters and laboratory analysis of VOCs (including CVOCs), ethane, ethane, methane, total iron, dissolved iron, sulfate, carbon dioxide, total alkalinity, sulfide, nitrogen, chemical oxygen demand (COD), total organic carbon (TOC), compound specific isotope analysis (CSIA), and volatile fatty acids (VFAs) at Pace Analytical Services in Minneapolis, MN (Pace). Additionally, samples for microorganism testing were performed by Microbial Insights (MI) in Knoxville, Tennessee.

Results for CVOC and inorganic groundwater analytical results are presented in Table 5-1. VFA groundwater analytical results are presented in Table 5-2. Carbon isotope forensics groundwater analytical results are presented in Table 5-3. Water quality parameters collected during well purging are summarized on Table 5-4. Laboratory analytical reports for the baseline groundwater monitoring event are included in Appendix H.

A brief description of the field and analytical parameters used to evaluate results for reductive dechlorination is provided in Appendix I.

#### 5.2 Baseline Monitoring Results

Baseline monitoring was performed prior to injection activities on September 15 and 16, 2015. Analyses included all those specified in Section 5.1.

Baseline field sampling parameters indicate that groundwater pH (see Table 5-4) is favorable for Dehalococcoides spp (Dhc) to survive and that groundwater is slight to moderately anaerobic. Electron acceptors include low to moderate concentrations of total iron (likely including both ferrous and ferric) and high sulfate concentrations in both demonstration areas.

The TCE results of the baseline sampling were significantly lower than expected, based on results from the CAI, most notably in Demonstration Area One. Baseline TCE groundwater sample results from wells PMW-1 and PMW-2 were 156  $\mu$ g/L and 35.4  $\mu$ g/L, respectively, versus an anticipated concentration of up to 100,000  $\mu$ g/L. Similarly, but to a lesser degree, baseline TCE groundwater sample results from wells PMW-3 and PMW-4 were 519  $\mu$ g/L and 13.7  $\mu$ g/L, respectively, versus anticipated concentrations of up to 12,000  $\mu$ g/L. An additional round of groundwater samples for

VOCs analysis were collected from wells PMW-1 and PMW-2 on September 25, 2015 to confirm the initial baseline results. The analytical results from the confirmation groundwater samples collected on September 25, 2015 were similar to the baseline results collected September 15 and 16, 2015, with TCE detected at wells PMW-1 and PMW-2 at concentrations of 332 and 30.2  $\mu$ g/L, respectively.

The microorganisms typically responsible for the biodegradation of TCE are Dehalobacter (Dhb) (TCE to cis-1,2-DCE) and *Dehalococcoides* (*Dhc*) (TCE to ethene). The following table provides guidelines to interpret the density of *Dhc* (ESTCP, 2011).

Dehalococcoides 16S rRNA	
gene copies per Liter	Interpretation
<104	Low Dhc, efficient dechlorination and ethene production unlikely
<10 <sup>5</sup>	Moderate Dhc, which may or may not be associated with ethene formation.  Observable dechlorination
<10 <sup>6</sup>	High Dhc, which is often associated with high rates of dechlorination and ethene production

Baseline results for Dhc range from 7.74 X  $10^2$  to 8.9 x  $10^3$  cells/mL Dhc population was below the critical mass required for reductive dechlorination (see Appendix H). Some biodegradation activity may have been occurring prior to injection activities. In addition, other halorespiring microorganisms ( $Dehalobacter\ spp$  and  $Dehaloginimonas\ spp$ ), methanogens and sulfate reducers were present in groundwater from both demonstration areas. However, TCE and vinyl chloride reductase genes were below reporting limits in all pilot monitoring wells.

#### 5.3 Demonstration Area One Performance Monitoring

Groundwater monitoring was performed at Demonstration Area One on October 26, November 6, and December 4, 2015 and January 6, and March 31, 2016 at performance monitoring wells PMW-1 and PMW-2. Groundwater sampling methodology was the same as the pre-injection baseline sampling as described in Section 4.2.4. Groundwater samples were submitted to Pace for analysis of VOCs, ethane, ethane, methane, dissolved iron, sulfate, carbon dioxide, total alkalinity, sulfate, nitrogen, COD, TOC, and VFAs. Additionally, groundwater samples collected on November 6, 2015 and March 31, 2016 were submitted to Pace for CSIA and the samples collected on November 6, 2015 were submitted to MI for analysis of *Dhc*.

An immediate decrease in concentrations of CVOCs to below reporting limits (RLs) was observed in key performance monitoring well PMW-1 within one month of injecting PlumeStop<sup>™</sup> in Demonstration Area 1. The contaminant reductions are interpreted to be a direct result of the placement of PlumeStop<sup>™</sup> via six injection point locations within eight feet of well PMW-1 (Figure 5-1). The presence of PlumeStop material was visually confirmed in the RD-3 soil core and in groundwater in well PMW-1 (as observed black-to-gray color of groundwater samples obtained from this well, Table 5-4). As shown on the graphs in Appendix J, the CVOC contaminant reductions in PMW-1 persisted for the six month monitoring period until performance monitoring was formally concluded. The TOC concentrations in well PMW-1 increased from the baseline concentration of 2.8 milligram per liter (mg/L) to a high of 91.9 mg/L in January 2016. Evidence of VFAs was observed two months after the PlumeStop injection in well PMW-1 (see Table 5-2). Very low concentrations of VFAs were observed in the downgradient well PMW-2 five months after the PlumeStop injection. The lack of discernable CVOC or biogeochemical changes in well PMW-2 suggests that groundwater in this area was not influenced by the upgradient injections during the performance monitoring period. The hydraulic gradient was flat between PMW-1 and PMW-2, which may account for the slow travel time between the wells and/or local flow variations (see Table 5-1 for groundwater elevations). Dissolved iron concentrations significantly increased within one month and sulfate concentrations began reducing within two months after injection in well PMW-1 indicating that iron and sulfate were being used as electron acceptors. However, sulfate concentration remained high at the end of the study (102 mg/L) indicating that sulfate competing for electron donor.

Most of the data collected from Demonstration Area One suggests that sorption was the primary process for removal of CVOCs from groundwater. The timing of concentration decreases (i.e. immediate decrease in CVOC concentrations) is one of the key indicators of sorption. In addition, dehalorespiring bacterial colonies were below critical mass required for effective reductive dechlorination, functional genes were below RLs, and no hydrogenolysis daughter products were present. *Dhc* population increased slightly in well PMW-1 from 8.9 x 10<sup>3</sup> to 1.74 x10<sup>4</sup>, while that in well PMW-2 had a slight decrease, from 7.47 x 10<sup>3</sup> to 6.3 x 10<sup>2</sup> (see Microbial Insights QuantArray® Microbial Study results in Appendix H). Since it appears that CVOCs (TCE and degradation products) were adsorbed to the activated carbon in PlumeStop, reductive dechlorination that may have occurred within the carbon matrix could not be directly measured.

The eventual presence of methane (low concentrations) in well PMW-1 suggests that hydrogen generated by the oxidation of the injected HRC® was being used by methanogenic bacteria, although the field parameter trends showing moderately low oxidation-reduction potential suggest transition metal reduction was a more dominant redox position within the aquifer. Similarly, low concentrations of sulfide were observed in well PMW-1 after six months after injection, indicating

that pockets of strongly reducing conditions may have existed within the aquifer despite measuring bulk oxidation-reductions potentials that were moderately reducing. Sulfate concentrations in both wells PMW1- and PMW-2 were decreasing, but still remaining at high concentrations and likely competing for the electron donor. The relatively small volumetric addition of HRC® (4 gallons per location) may be one reason why sufficient distribution of carbon substrate in the treatment area was likely not observed. Low hydraulic gradient in the area may have also influenced poor distribution of the injected carbon substrate and VFAs.

Baseline CSIA results in well PMW-1 (significant fractionation) suggest that sorptive processes were primarily responsible for changes in observed CVOC concentrations rather than enhanced reductive dechlorination (ERD) (no hydrogenolysis daughter products observed).

Neither PlumeStop material or TOC was observed in well PMW-2. CVOC concentrations gradually increased during the study period and there was no evidence of hydrogenolysis (i.e., increases in daughter products). There were no evidences that PlumeStop or HRC influenced this well which is located approximately 25 feet downgradient of well PMW-1. However, CSIA data indicates some enrichment in TCE and vinyl chloride was observed which could be due to natural attenuation processes.

#### 5.4 Demonstration Area Two Performance Monitoring

Results of the initial PlumeStop injections performed on October 6 through 8, 2016, via direct push points, had poor distribution and did not reach monitoring wells PMW-3 and PMW-4 (screened from 71 feet to 76 feet below ground surface). A second round of PlumeStop injections was performed on January 8, 2016 using injection wells IW-1, IW-2 and IW-3 which were screened from 71 feet to 76 feet below ground surface (see Figure 5-2). It is likely that that the majority of the PlumeStop material and HRC may have migrated into more permeable zones (gravel) which may resulted in poor distribution of the injected material. Groundwater monitoring was performed at Demonstration Area Two on October 26, November 11, and December 4, 2015 and January 6, 2016 at performance monitoring wells PMW-3 and PMW-4 following the initial PlumeStop™ injections. Groundwater monitoring was performed on January 25, February 8, and March 31, 2016 in Demonstration Area Two following the second round of PlumeStop™ application utilizing in injection wells IW-1, IW-2, and IW-3. Groundwater samples were collected, handled and analyzed as described in Sections 4.2.4 and 5.1.

In well PMW-3, after a significant initial decrease in TCE concentration after the first PlumeStop application, the TCE concentration stabilized and exhibited a slightly decreasing trend. TCE decreased from 519  $\mu$ g/L to 20.8  $\mu$ g/L one month after the initial PlumeStop<sup>TM</sup> injections. As the TCE concentrations decreased, both cis-1,2-dichloroethene (cis-1,2-DCE) and trans-1,2-

dichloroethene (trans-1,2-DCE) increased in this PMW-3. A slight increase in vinyl chloride concentration was observed in this well after the initial application, which later decreased. As indicated in Section 4.4.1, slightly grey sand were noted in boring RD-4 and grayish water was also in the drilling liner, indicating the likely presence of PlumeStop. Based on this information, it is possible that some adsorption of VOCs may have occurred in this area. However, no increases in TOC or VFAs concentrations was observed in wells PMW-3 and PMW-4 which indicates that HRC did not reach these wells which is required to supported ERD. Therefore, no evidence of complete dechlorination was observed in either of these wells.

CSIA data indicate enrichment in carbon<sup>13</sup> isotope ( $d^{13}C$ ) in TCE in well PMW-3, while  $d^{13}C$  isotopes in both cis-1,2-DCE and trans-1,2-DCE sampled from well PMW-3 were enriched during the first month of the study and subsequently stabilized. These trends suggest sequential dechlorination of TCE to cis-1,2-DCE and trans-1,2-DCE, which is a typical for biologically-mediated reductive dechlorination. A slight enrichment of  $d^{13}C$  in TCE was initially observed in well PMW-4 (e.g. intrinsic biodegradation) without obvious short-term effects from the injected PlumeStop<sup>TM</sup>.

TOC and VFA concentration increases were not observed in either well PMW-3 or well PMW-4, but minor increases in total and dissolved iron concentrations were observed and supported by pH and oxidation-reduction potentials that could indicate redox poising at iron-reducing conditions. In contrast, increases in methane evolution were not observed either in well PMW-3 or well PMW-4 and sulfate concentrations did not decrease. Traces of VFAs detections were observed in well PMW-3 at the end of the monitoring period. Discernable changes in CVOC concentrations were not observed in key performance monitoring well PMW-4, suggesting that this well was not influenced by the PlumeStop injection. The incomplete concentration reductions of CVOCs in Demonstration Area Two may have resulted from uneven distribution of injected material in the study area or low volume of HRC® injected or from high dissolution rate of the injected HRC® due to high groundwater velocity in the vicinity of the study area. Further, injected material may have migrated into the gravelly layer located below well PMW-3.

#### 5.5 Well Abandonment

On May 18, 2016, the performance monitoring wells PMW-1 through 4 and injection wells IW-1 through 3 were abandoned by Mark J. Traut Wells, Inc. The wells were abandoned at the request of the property owner due to ongoing redevelopment activities (concrete slab removal and grading) in Demonstration Area One and Two. The wells were sealed and abandoned by pumping neat cement into the well using a tremie pipe from the bottom of the well to ground surface. Locking steel above grade protops were removed from the wells. The MDH well abandonment approval letter is included in Appendix B.

#### 6.0 SUMMARY

The following is summary of the results of the PlumeStop<sup>™</sup> Demonstration Study:

- The baseline concentrations of CVOCs were orders of magnitude lower than those expected for the PlumeStop study.
- Injection of PlumeStop<sup>™</sup> resulted in complete removal of CVOCs in well PMW-1 in Demonstration Area One and order-of-magnitude concentration reductions of CVOCs in well PMW-3 within Demonstration Area Two.
- CVOC and CSIA data suggest that sorption of CVOC to the PlumeStop<sup>™</sup> material is the major process in the CVOC reduction in well PMW-1.
- CSIA data indicate some level of sorption in well PMW-3 in Demonstration Area Two but not as rapid as that observed in well PMW-1.
- No significant increase in TOC and very low concentrations of VFAs were observed in well PMW-4 in Demonstration Area Two indicating ineffective distribution of HRC® with minimal dechlorination of CVOCs. CSIA data for this area indicate minimal enrichment of TCE and vinyl chloride. Data indicates initial enrichment of d¹³C isotopes for cis-1,2-DCE and trans-1,2-DCE which later stabilized.
- Sharp stratigraphic contacts, perhaps in combination with flow paths created by the nearby groundwater recovery system, may have affected the delivery and distribution of PlumeStop<sup>TM</sup> including HRC<sup>®</sup> in Demonstration Area Two, and would need to be accounted for as part of a future injection design.
- Probing was successfully conducted at depths deeper than 50 feet, and injection rates approached 10 gallons per minute with less than 10 pounds per square inch of formation backpressure at the ground surface, indicating that injection work is relatively feasible at the Site.

Although the overall contaminant reductions observed as part of the Demonstration Study were moderately encouraging, the following limitations of the study are noted:

 Baseline concentrations of CVOCs in new performance monitoring wells did not facilitate the evaluation of PlumeStop<sup>™</sup> performance for high-concentration groundwater hot-spots. These locations are more challenging implementation spots for using a product like PlumeStop successfully, and the establishment of robust non-sorptive degradation/dechlorination processes would be important to achieve.

- The effectiveness of PlumeStop<sup>™</sup> delivered in grid patterns that are more feasible for scale up than those used for the Demonstration Study was not evaluated.
- Due to local geological and hydrogeological features, larger amounts of HRC® and bioaugmentation culture are likely required to get better distribution within the targeted treatment areas.

#### 7.0 REFERENCES

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# Tables

# Table 5-1 PlumeStop Demonstration CVOCs and Inorganics Groundwater Analytical Results

## PlumeStop Demonstration Study Report NIROP Fridley, Minnesota

Well ID	Date	TCE	cis-1,2- DCE	trans-1,2- DCE	1,1- DCA	1,1-DCE	VC	Ethane	Ethene	Methane	Iron	Dissolved Iron	Sulfide	Carbon Dioxide	Total Alkalinity	Sulfate	Nitrogen	COD	тос	GW Elevation	Notes
U	nit	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ft amsl	
PMW-1	09/16/15	156	141	154	7.1	2.3	0.66	ND	ND	ND	10,200	135	ND	34.8	383	157	ND	ND	2.8	819.07	Pre-injection
	09/25/15	332	229	438	17.3	10.1	ND	-		ı	-	-	-	-	-	-	-	•	-	819.19	Pre-injection re-sampling
	10/26/15	ND	ND	ND	ND	ND	ND	ND	ND	ND	21,400	2,580	ND	ND	599	172	ND	1,240	35.1	818.58	1st Post-injection
	11/06/15	ND	ND	ND	ND	ND	ND	ND	ND	ND	10,500	833	ND	ND	521	172	2.6	995	ND	818.62	2nd Post-injection
	12/04/15	ND	ND	ND	ND	ND	ND	ND	ND	ND	13,300	2,190	ND	ND	575	117	ND	342	36.7	818.96	3rd Post-injection
	01/06/16	ND	ND	ND	ND	ND	ND	ND	ND	31.7	17,600	11,600	ND	103	605	104	ND	278	91.9	818.64	4th Post-injection
	03/31/16	ND	ND	ND	ND	ND	ND	ND	ND	1,710	12,100	7,240	0.25	100	519	102	ND	ND	14.5	818.50	5th Post-injection
PMW-2	09/16/15	35.4	192	230	27.2	16.9	2.7	ND	ND	ND	10,800	1,620	ND	35.3	318	108	ND	ND	3.1	819.07	Pre-injection
	09/25/15	30.2	224	276	31.7	21.6	3.6	-	-	-	-	-	-	-	-	-	-	-	-	819.19	Pre-injection re-sampling
	10/26/15	39.7	248	303	46.5	32.1	4.5	ND	ND	14.4	3,430	2,600	ND	63.6	427	156	ND	ND	2.3	818.61	1st Post-injection
	11/06/15	36.6	264	318	34.3	20.5	4.8	ND	ND	16.0	3,860	3,420	ND	34.8	426	149	ND	ND	2.5	818.59	2nd Post-injection
	12/04/15	54.4	257	284	50.5	30.7	4.1	ND	ND	13.2	7,070	5,480	ND	51.9	425	147	ND	ND	2.5	818.96	3rd Post-injection
	01/06/16	51.2	282	320	37.8	22.2	ND	ND	ND	13.0	8,910	6,320	ND	54.0	421	157	ND	ND	2.4	818.62	4th Post-injection
	03/31/16	93.8	361	309	35.2	23.6	3.7	ND	ND	18.6	9,170	6,320	0.13	60.7	499	128	ND	ND	5.3	818.48	5th Post-injection
PMW-3	09/15/15	519	20.5	42.3	ND	ND	0.65	ND	ND	72.4	5,250	1,370	ND	36.7	315	98.2	ND	ND	2.6	810.22	Pre-injection
	10/26/15	20.8	15.6	35.3	ND	ND	0.92	ND	ND	26.7	10,500	4,540	ND	36.1	300	152	ND	ND	2.5	803.73	1st Post-injection
	11/06/15	21.0	19.4	45.0	1.4	ND	2.4	ND	ND	51.3	7,270	5,180	ND	28.0	369	121	ND	ND	2.6	806.54	2nd Post-injection
	12/04/15	19.5	34.5	70.5	3.1	ND	1.7	ND	ND	36.9	8,360	7,260	ND	48.0	370	136	ND	ND	3.0	805.12	3rd Post-injection
	01/06/16	13.0	37.7	67.7	2.6	ND	ND	ND	ND	24.6	10,800	7,410	ND	35.9	328	130	ND	ND	2.8	804.06	4th Post-injection
	01/25/16	10.8	42.3	65.9	2.8	ND	0.72	ND	ND	23.1	10,700	5,880	ND	40.6	341	141	ND	ND	3.1	804.95	1st Post Injection Well Injections
	02/08/16	12.9	57.6	97.6	3.7	1.5	1.2	ND	ND	37.0	8,300	6,350	ND	55.8	343	150	ND	ND	2.8	804.16	2nd Post Injection Well Injections
	03/31/16	13.9	53.6	91.0	2.7	1.6	ND	ND	ND	27.3	8,680	7,600	ND	41.3	356	151	ND	ND	3.1	805.67	3rd Post Injection Well Injections
PMW-4	09/15/15	13.7	11.0	31.8	ND	ND	ND	ND	ND	20.6	5,020	1,090	ND	31.6	264	85.4	ND	ND	2.2	810.16	Pre-injection
Ī	10/26/15	17.8	19.9	55.3	ND	ND	ND	ND	ND	17.7	3,880	2,580	ND	32.6	274	118	ND	ND	2.3	803.39	1st Post-injection
Ī	11/06/15	15.4	18.2	50.5	ND	ND	ND	ND	ND	21.0	4,970	2,580	ND	24.5	281	115	ND	ND	2.6	806.50	2nd Post-injection
Ī	12/04/15	16.5	23.2	69.0	1.4	ND	ND	ND	ND	ND	8,940	3,370	ND	36.0	273	97.1	ND	ND	2.9	804.99	3rd Post-injection
Ī	01/06/16	14.4	16.4	47.1	ND	ND	ND	ND	ND	ND	5,920	3,330	ND	35.9	267	101	0.46	ND	3.2	803.92	4th Post-injection
Ī	01/25/16	19.3	19.3	49.9	1.1	ND	ND	ND	ND	ND	4,860	3,420	ND	32.4	251	80.5	ND	ND	3.2	804.84	1st Post Injection Well Injections
ľ	02/08/16	21.6	23.8	60.4	1.2	< 1.0	0.4	ND	ND	ND	3,980	3,070	ND	30.6	241	84.2	ND	ND	3.3	804.05	2nd Post Injection Well Injections
	03/31/16	28.4	23.8	57.5	ND	1.2	ND	ND	ND	ND	6,310	3,350	ND	22.7	231	90.5	ND	ND	3.6	805.57	3rd Post Injection Well Injections

- = not analyzed

cis-1,2-DCE = cis-1,2-dichloroethene

COD = chemical oxygen demand

CVOCs = chlorinated volatile organic compounds

1,1,-DCA = 1,1-dichloroethane

1,1,-DCE = 1,1-dichloroethene

ft amsl = feet above mean sea level

GW = groundwater

mg/L = milligrams per liter

ND = not detected

TCE = Trichloroethene

TOC = total organic carbon

trans-1,2-DCE = trans-1,2-dichloroethene

μg/L = micrograms per liter

# Table 5-2 PlumeStop Demonstration Volatile Fatty Acids Groundwater Analytical Results PlumeStop Demonstration Study Report NIROP Fridley, Minnesota

!!	<b>.</b> .	Lactic Acid	Acetic Acid	Propionic Acid	Formic Acid	Butyric	Pyruvic Acid	i-Pentanoic Acid	Pentanoic Acid	i-Hexanoic Acid	Hexanoic Acid	
Well ID	Date	mg/L	mg/L	mg/L	mg/L	Acid mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Notes
Unit		•		•		_	<u> </u>	<u> </u>	<u> </u>			
PMW-1	09/16/15	ND	ND	ND	NA	ND	ND	NA	NA	NA	NA	Pre-injection
	10/26/15	ND	ND	1.5		ND	ND	ND	ND	ND	ND	1st Post-injection
	11/06/15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2nd Post-injection
	12/04/15	ND	30	15	ND	ND	ND	ND	ND	ND	ND	3rd Post-injection
	01/06/16	ND	120	86	ND	1.8	ND	ND	ND	ND	ND	4th Post-injection
	03/31/16	0.10 J	17	10	0.044 J	1.4	0.066 J	0.054 J	ND	ND	ND	5th Post-injection
PMW-2	00/16/15	ND	1.7 J	ND	NIA	ND	ND	NIA	NIA	NIA	NIA	Due injection
PIVIW-Z	09/16/15	ND	ND	ND	NA	ND ND	ND ND	NA	NA	NA	NA	Pre-injection
	10/26/15	ND		ND	ND			ND ND	ND	ND	ND	1st Post-injection
	11/06/15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2nd Post-injection
	12/04/15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3rd Post-injection
	01/06/16	ND 0.043.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	4th Post-injection
	03/31/16	0.043 J	2.7	2.2	ND	ND	ND	ND	ND	ND	ND	5th Post-injection
PMW-3	09/15/15	ND	4.6 J	ND	NA	ND	ND	NA	NA	NA	NA	Pre-injection
	10/26/15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1st Post-injection
	11/06/15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2nd Post-injection
	12/04/15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3rd Post-injection
	01/06/16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4th Post-injection
	01/25/16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1st Post Injection Well Injections
	02/08/16	ND	0.016 J	ND	0.014 J	ND	ND	ND	ND	ND	ND	2nd Post Injection Well Injections
	03/31/16	ND	0.035 J	ND	0.028 J	ND	ND	ND	ND	ND	ND	3rd Post Injection Well Injections
												, ,
PMW-4	09/15/15	ND	1.1 J	ND	NA	ND	ND	NA	NA	NA	NA	Pre-injection
	10/26/15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1st Post-injection
	11/06/15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2nd Post-injection
	12/04/15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3rd Post-injection
	01/06/16	ND	0.14	ND	ND	ND	ND	ND	ND	ND	ND	4th Post-injection
	01/25/16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1st Post Injection Well Injections
	02/08/16	ND	0.036 J	ND	0.016 J	ND	ND	ND	ND	ND	ND	2nd Post Injection Well Injections
	03/31/16	ND	0.049 J	ND	0.016 J	ND	ND	ND	ND	ND	ND	3rd Post Injection Well Injections

J = estimated value mg/L = milligrams per liter ND = not detected NA = not analyzed

# Table 5-3 PlumeStop Demonstration Carbon Isotope Forensics Groundwater Analytical Results PlumeStop Demonstration Study Report NIROP Fridley, Minnesota

			Stable Ca	rbon Isotop	e Forensics	of Chlorina	ted Solven	ts
		Vinyl	cis-1,2-	trans-1,2-				
Well ID	Date	Chloride	DCE	DCE	1,1-DCE	1,1-DCA	TCE	Notes
PMW-1	09/16/15	-31.62	-29.87	-33.97 J	-13.89	-26.26	-6.24	Pre-injection
	11/06/15	U	U	U	U	U	U	2nd Post-injection
	01/06/16	NA	NA	NA	NA	NA	NA	4th Post-injection
	03/31/16	U	U	U	U	U	U	5th Post-injection
PMW-2	09/16/15	-29.05	-26.20	-35.25	-16.80	-27.41	-0.63	Pre-injection
	11/06/15	-23.97	-27.03	-37.54	-20.23	-29.16	12.09	2nd Post-injection
	01/06/16	NA	NA	NA	NA	NA	NA	4th Post-injection
	03/31/16	-23.79	-19.24	-37.86	-18.67	-26.40	6.28	5th Post-injection
PMW-3	09/15/15	-29.94	-28.09	-28.07	U	U	-21.82	Pre-injection
	11/06/15	-20.39	-20.10	-20.97	U	U	-8.52	2nd Post-injection
	01/06/16	U	-19.78	-22.58	U	-23.48	-3.77	4th Post-injection
	03/31/16	U	-19.77	-23.1	U	-23.01	-0.26	3rd Post Injection Well Injections
PMW-4	09/15/15	U	-13.30	-17.99	U	U	5.56	Pre-injection
	11/06/15	U	-17.46	-20.12	U	U	7.39	2nd Post-injection
	01/06/16	NA	NA	NA	NA	NA	NA	4th Post-injection
	03/31/16	U	-25.88	-29.16	U	U	4.39	3rd Post Injection Well Injections

Results reported in % VPDB

Method: Compound Specific Isotope Analysis (CSIA) for 13C and 2H by GC-IRMS and for 37CL by GC-qMS

 $J = Low peak signal prduced which is considered usable to the <math>\pm 2\%$  but not the standard  $\pm 5\%$ 

U = Either there was no peak corresponding to the target analyte or that such a peak did not produce a reliable CSIA result due to sample matrix effect or dilutions applied to prevent instrument contamination

NA = not analyzed

DCE = dichloroethene

TCE = trichloroethene

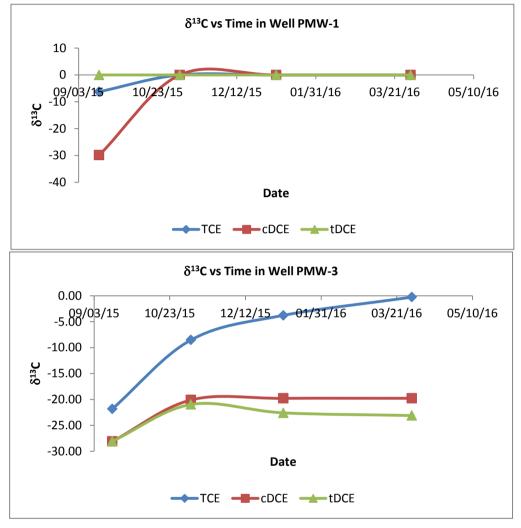


Table 5-4
Summary of Field Water Quality Parameters
PlumeStop Demonstration Study Report
Nirop Fridley, Minnesota

Well Number (Unique Number)	Date	Volume Removed (gallons)	Temperature (°C)	рН	Specific Conductance (µs/cm)	ORP (mV)	Dissolved Oxygen (ppm)	Color
PMW-1	9/16/2015	5.0	17.36	7.24	1,402	52.2	5.78	Clear
	9/25/2015	2.5	17.98	7.17	1,571	-47.9	0.69	Clear
	10/26/2015	3.75	17.26	8.16	1,814	-159.7	0.71	Black
	11/6/2015	2.25	16.00	7.67	2,051	-189.6	0.15	Black
	12/4/2015	2.0	15.21	7.29	1,649	-185.4	0.52	Black
	1/6/2016	2.0	14.02	6.95	1,603	-150.6	1.13	Light gray
	3/31/2016	2.0	15.07	7.08	1,383	-135.7	0.37	Gray
PMW-2	9/16/2015	2.5	16.62	7.11	1,384	-117.2	0.39	Clear
	9/25/2015	3.25	17.97	7.15	1,497	-25.9	0.72	Clear
	10/26/2015	4.5	16.87	7.17	1,426	-80.9	1.75	Clear
	11/6/2015	2.0	16.02	7.11	1,698	-110.2	0.81	Clear
	12/4/2015	2.5	14.56	7.15	1,425	-105.5	1.02	Clear
	1/6/2016	2.5	14.65	7.22	1,415	-106.3	1.29	Clear
	3/31/2016	2.0	14.75	7.26	1,353	-105.8	0.25	Gray
PMW-3	9/15/2015	2.5	16.45	7.05	1,062	-92.8	0.59	Clear
	10/26/2015	3.0	15.90	7.27	1,029	-90.6	3.10	Clear
	11/6/2015	2.5	15.55	7.07	1,410	-104.3	0.82	Clear
	12/4/2015	2.0	12.65	7.14	1,152	-117.6	1.29	Clear
	1/6/2016	2.5	13.40	7.27	1,099	-98.5	2.99	Clear
	1/25/2016	2.5	13.51	7.25	1,017	-110.4	3.95	Clear
	2/8/2016	2.0	10.88	7.16	1,058	-78.4	1.83	Clear
	3/31/2016	2.0	14.31	7.27	1,103	-100.5	0.31	Light Gray
PMW-4	9/15/2015	3.5	16.22	7.12	828	-173.9	0.60	Clear
	10/26/2015	3.25	16.28	7.19	898	-50.2	1.09	Clear
	11/6/2015	2.5	15.52	7.00	1,137	-91.2	0.90	Clear
	12/4/2015	2.0	12.33	7.06	1,164	-100.6	1.43	Clear
	1/6/2016	3.0	13.00	7.23	889	-62.6	2.17	Clear
	1/25/2016	2.0	13.71	7.22	785	-57.7	0.85	Very Light Gray to Clear
	2/8/2016	2.0	12.35	7.11	788	-69.0	1.01	Clear
	3/31/2016	2.5	14.38	7.28	781	-60.0	1.17	Light Gray

### <u>Notes</u>

°C = degrees Celsius μs/cm = microsiemens per centimeter mV = millivolts ppm = parts per million

# Figures

Naval Industrial Reserve Ordnance Plant (NIROP) Plumestop Demonstration Report

**Site Location Map** Date: 10/25/2016

Last saved by: KLAUSB(2016-10-25)

Figure 1-1

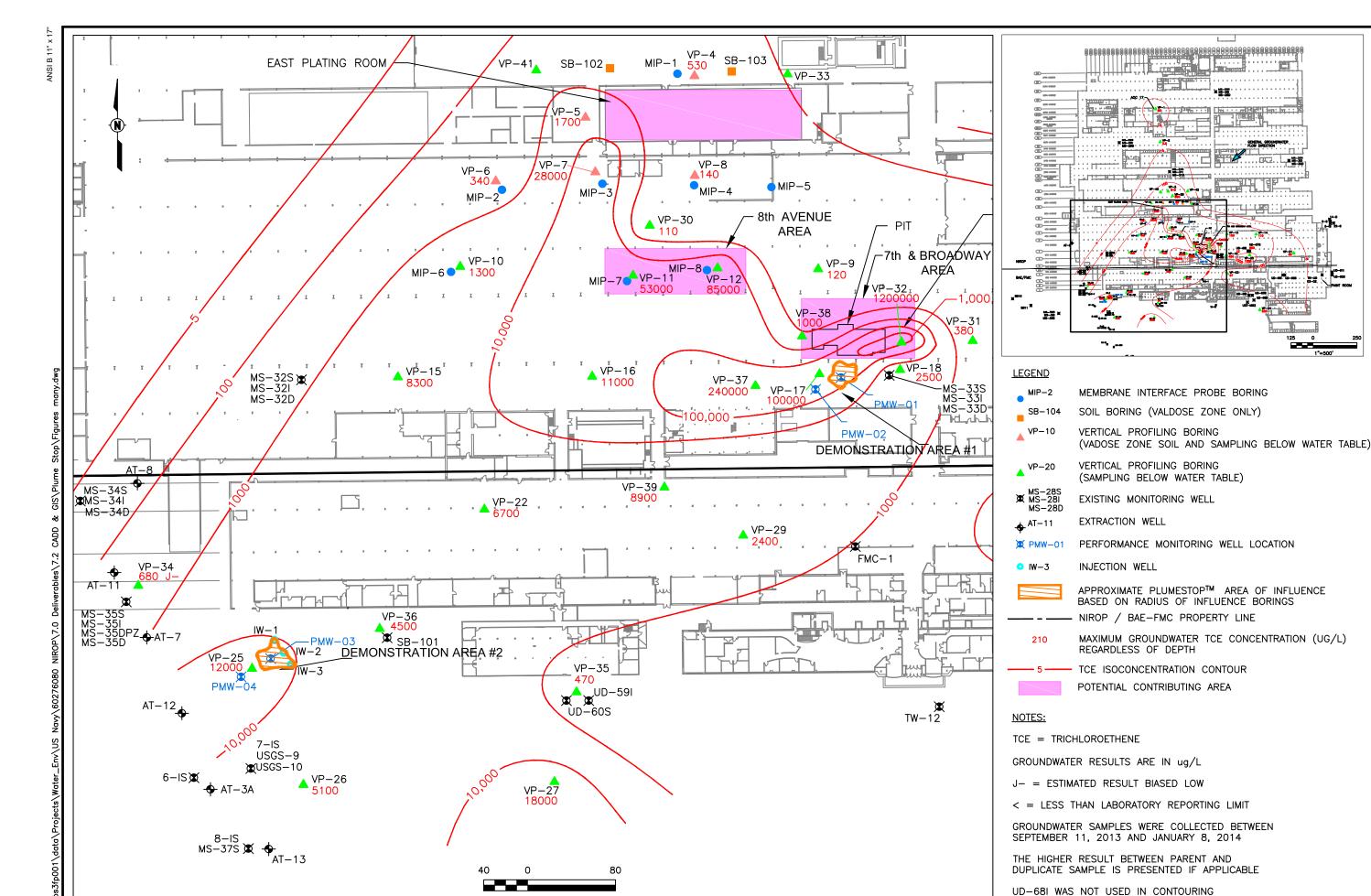
Feet

later used for plant processes.



Site Layout

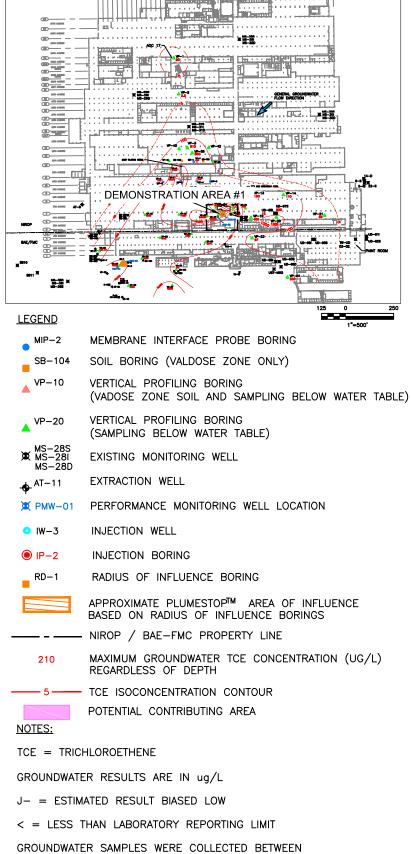
Naval Industrial Reserve Ordnance Plant (NIROP)
Plumestop Demonstration Report
Fridley, Minnesota
Project No.: 60276080 Date: 10/25/2016



1"=80'

Plume Stop Demonstration Report Fridley, Minnesota Project No.: 60276080 10/26/2016

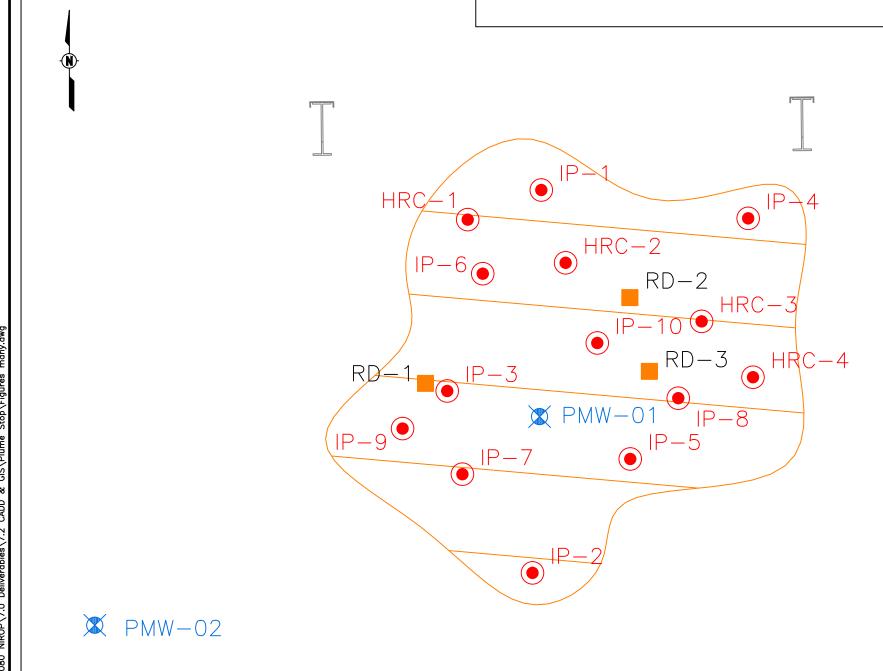
Ordnance Plant (NIROP)



SEPTEMBER 11, 2013 AND JANUARY 8, 2014 THE HIGHER RESULT BETWEEN PARENT AND DUPLICATE SAMPLE IS PRESENTED IF APPLICABLE

BORING LOCATIONS BASED ON FIELD MEASUREMENTS

UD-68I WAS NOT USED IN CONTOURING

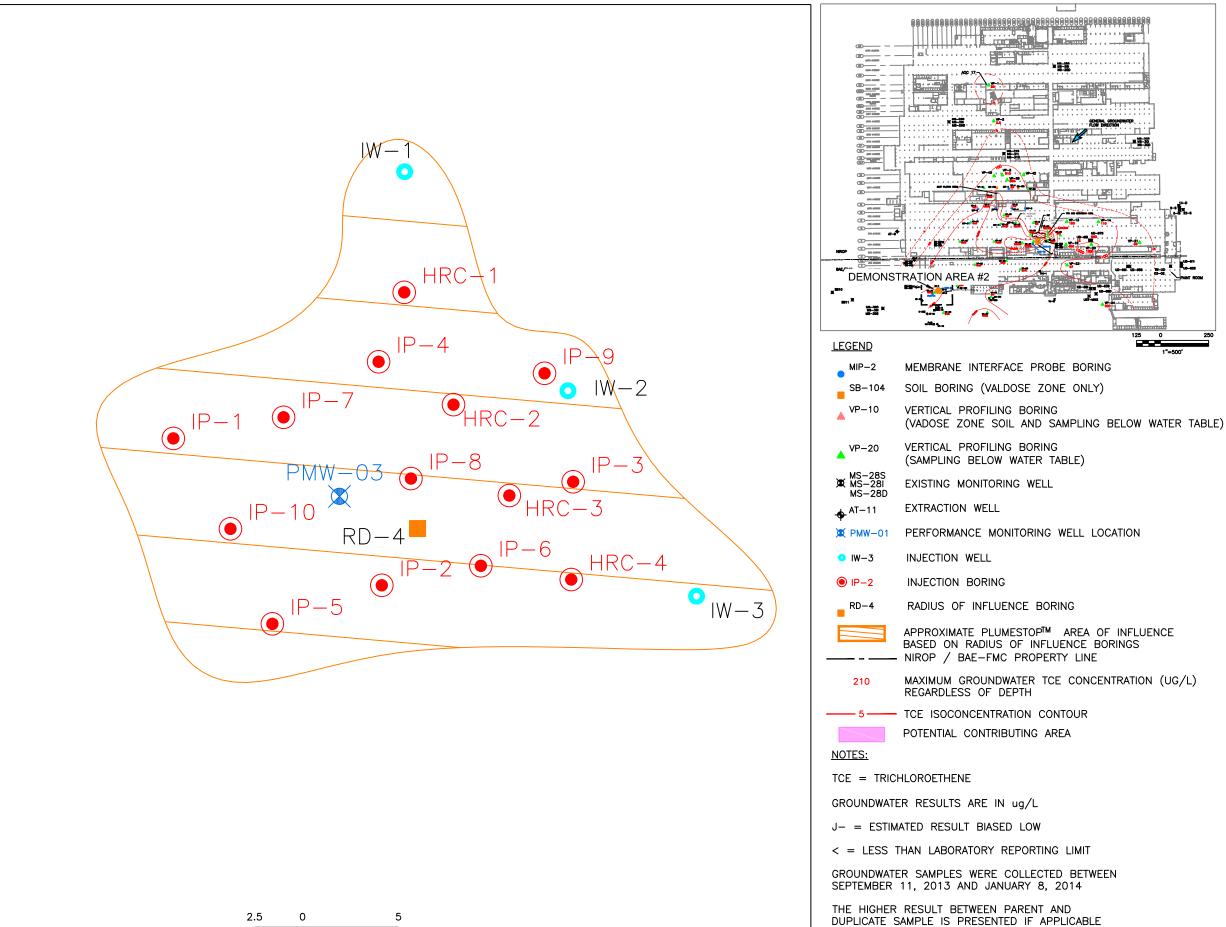


1"=5"

Ordnance Plant (NIROP) Naval Industrial Reserve Ordnance F Plume Stop Demonstration Report Fridley, Minnesota Project No.: 60276080 10/25/16

UD-68I WAS NOT USED IN CONTOURING

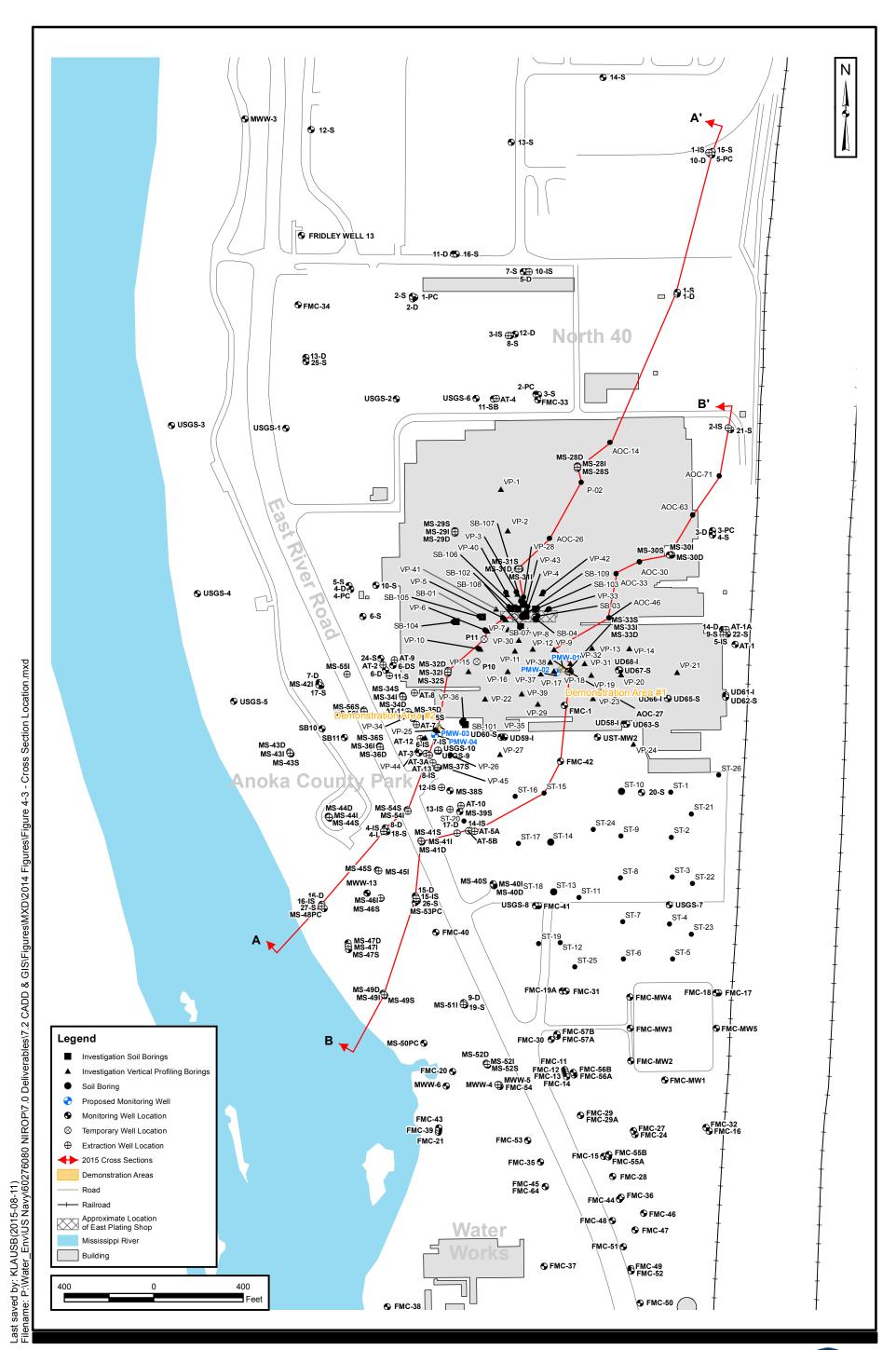
BORING LOCATIONS BASED ON FIELD MEASUREMENTS



1"=5'



PMW-04



**Cross Section Location Map** 

Naval Industrial Reserve Ordnance Plant (NIROP) Plumestop Demonstration Report

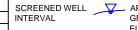
Fridley, Minnesota

Project No.: 60276080 Date: 10/25/2016

**AECOM** 

FIGURE 4-5







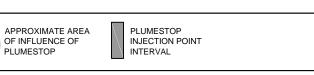




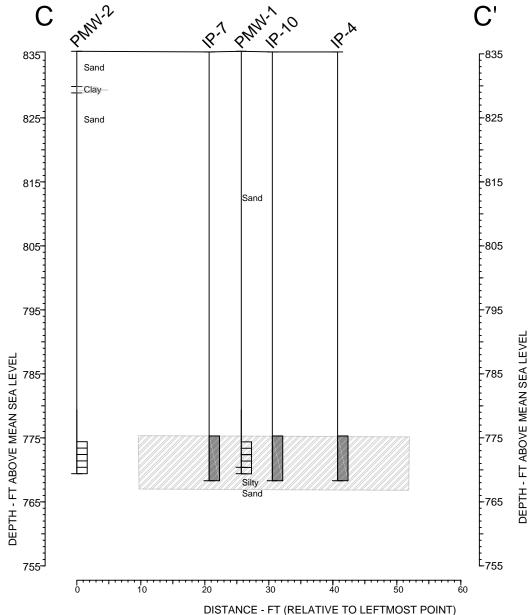


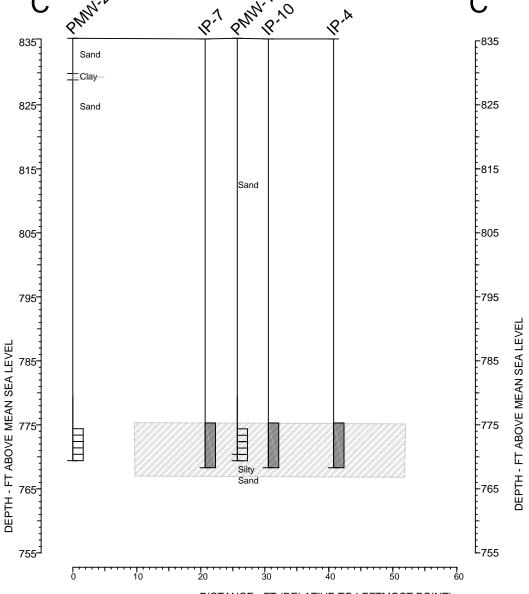




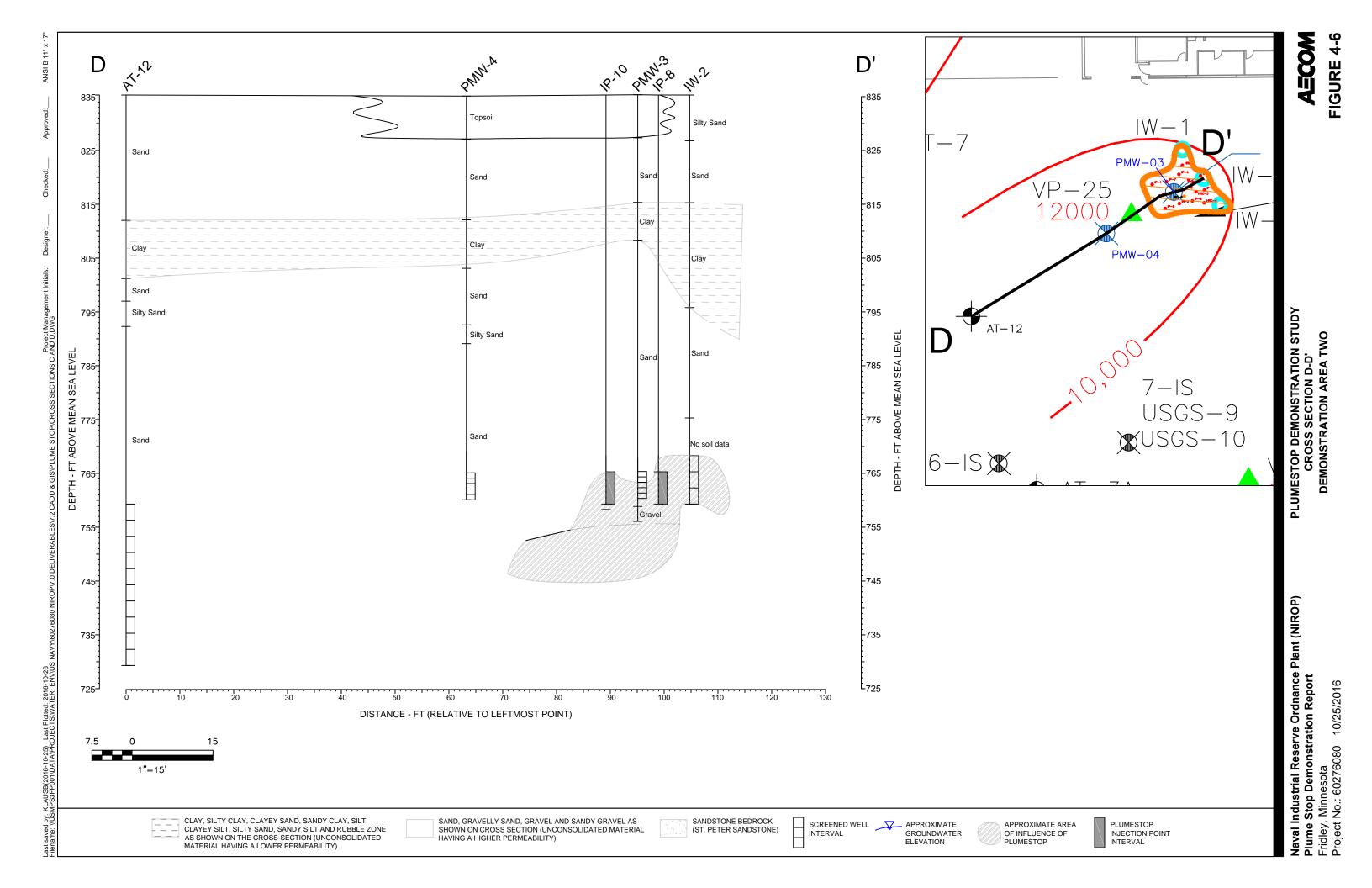


PMW





7.5



**WUSGS-**

MS-37S 🕱 →

VP-26

10/26/2015

tran-1,2-DCE (μg/L) 55.3

11/6/2015

cis-1,2-DCE (μg/L) 23.2 ran-1,2-DCE (μg/L) 69.0

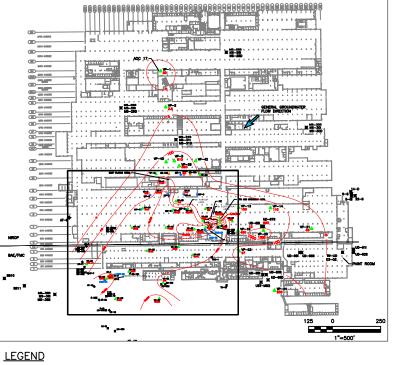
TCE (μg/L)

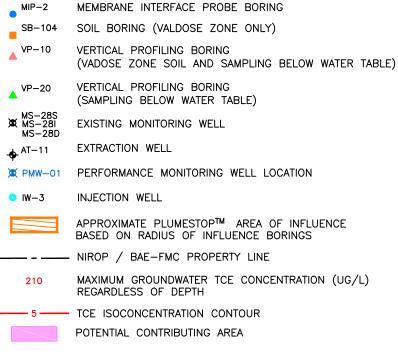
cis-1,2-DCE (μg/L)











J- = ESTIMATED RESULT BIASED LOW

< = LESS THAN LABORATORY REPORTING LIMIT

SEPTEMBER 11, 2013 AND JANUARY 8, 2014

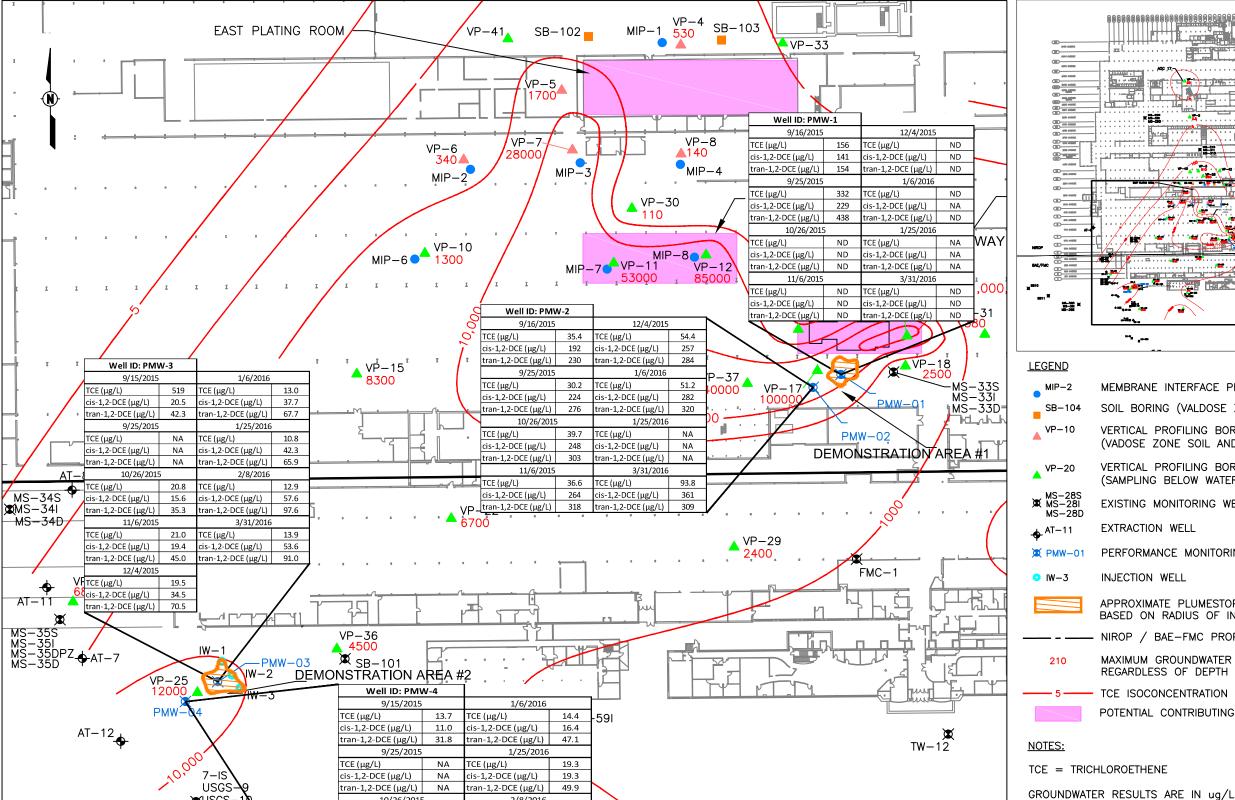
DUPLICATE SAMPLE IS PRESENTED IF APPLICABLE

THE HIGHER RESULT BETWEEN PARENT AND

UD-68I WAS NOT USED IN CONTOURING

1"=80'

GROUNDWATER SAMPLES WERE COLLECTED BETWEEN



2/8/2016

tran-1,2-DCE (μg/L) 60.4

3/31/2016

21.6

23.8

28.4

23.8

TCE (µg/L)

TCE (µg/L)

cis-1,2-DCE (μg/L)

17.8

19.9

cis-1,2-DCE (μg/L) 18.2 cis-1,2-DCE (μg/L)

16.5

tran-1,2-DCE (μg/L) 50.5 tran-1,2-DCE (μg/L) 57.5

Appendix A
Material Safety
Data Sheets

## PlumeStop™ Material Safety Data Sheet (MSDS)

Last Revised: July, 1 2014

#### Section 1 – Supplier Information and Material Identification

#### Supplier:



1011 Calle Sombra San Clemente, CA 92673 Telephone: 949.366.8000

Fax: 949.366.8090

E-mail: info@regenesis.com

Chemical Description: An aqueous mixture of activated carbon and other food grade additives

Trade Name: PlumeStop™

Product Use: Used to remediate contaminated soil and groundwater (environmental

applications)

#### Section 2 – Chemical Information/Other Designations

CAS No.	<u>Chemical</u>	Weight %
7440-44-0	Colloidal activated carbon ≤2.5 µm	< 25
7732-18-5	Water	> 75
	Proprietary additives	≤ 2

#### Section 3 – Physical Data

Form: Aqueous suspension

**Color:** Black Odor: Odorless 0°C **Melting Point: Boiling Point:** NA Flammability/Flash Point: NA **Vapor Pressure:** NA **Bulk Density:** NA **Solubility:** NA Viscosity: NA pH (1% solution) 8-10

**Decomposition Temperature: NA** 

Section 4 - Reactivity Data

Stability: Stable under recommended storage conditions.

**Conditions to** Avoid contact with alkali metals and strong oxidizing

Avoid/Incompatibility: agents.

**Possibility of Hazardous** 

Reactions:

Hazardous polymerization will not occur.

**Hazardous Decomposition** 

**Products:** 

Hazardous decomposition products formed under fire conditions.

Carbon oxides.

#### Section 5 – Regulations

**TSCA Inventory:** Listed (activated carbon)

Not regulated **OSHA Hazards:** 

**CERCLA Reportable Quantity:** NA

Canadian Domestic Substance Listed (activated carbon)

List:

WHMIS Classification: Listed (activated carbon)

**SARA 302 Components:** No chemicals in this material are subject to the reporting requirements

of SARA Title III, Section 302.

SARA 313 Components: This material does not contain any chemical components with known

CAS numbers that exceed the threshold reporting limits established by

SARA Title III, Section 313.

#### Section 6 – Protective Measures, Storage and Handling

#### **Technical Protective Measures**

Storage: Keep container tightly closed in the original container. Do not allow

product to freeze.

As with any chemical product, use good laboratory/workplace Handling:

procedures. Avoid contact with skin and eyes. Wash thoroughly after

handling this product.

Personal Protective Equipment (PPE)

**Exposure Limits** Contains no substances with occupational exposure limit values.

**Engineering Controls:** Local exhaust ventilation is recommended.

**Respiratory Controls:** Not required for routine handling. A NIOSH approved respirator should

be used if handling dust that results in the event that water evaporates

from product.

**Eye Protection:** Wear chemical safety goggles. A full face shield may be worn in lieu of

safety goggles.

Section 6 – Protective Measures, Storage and Handling, continued

**Hand Protection:** Wear chemical resistant gloves (neoprene, rubber or PVC). Dispose of

used gloves in accordance with good laboratory practices. Wash and dry

hands after handling.

**Skin Protection:** Try to avoid skin contact with this product. Chemical resistant gloves

and protective clothing should be worn during use.

**Protection Against Fire &** 

**Explosion:** 

Product is non-explosive and non-flammable. In the unlikely event that

all water is evaporated, residual dust is flammable.

#### Section 7 - Hazards Identification

**Potential Health Effects** 

**Inhalation:** Not applicable.

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

**Ingestion:** May be harmful if swallowed.

#### Section 8 - Measures in Case of Accidents and Fire

**After Spillage/Leakage:** Contain spill with absorbent material. Vacuum or sweep into suitable,

closed container for disposal. Do not return spilled or contaminated

material to the inventory.

**Extinguishing Media:** Water, alcohol-resistant foam, dry chemical or carbon dioxide.

**Eye Contact:** Rinse thoroughly with plenty of water for at least 15 minutes and

consult a physician.

**Inhalation:** If affected, move person to fresh air. Get medical attention if symptoms

occur.

**Ingestion:** Rinse mouth with water. Get medical aid if symptoms occur.

**Skin Contact:** Wash off with soap and water to remove the activated carbon.

#### Section 9 – Accidental Release Measures

**Cleanup Methods:** Contain spill with absorbent material. Vacuum or sweep into suitable,

closed container for disposal.

#### Section 10 – Information on Toxicology

Oral LD50: No data available.

Dermal LD50: No data available.

**Carcinogenicity:** No component of this product is identified as a probable, possible or

confirmed human carcinogen by IARC, ACGIH, NTP, OSHA or CA Prop 65.

	Section 11	<ul> <li>Information on Ecolo</li> </ul>	gy			
No data available.						
	Section 12	- Disposal Consideratio	ons			
Waste Treatment: Dispose of in an approved waste facility operated by an authorized contractor in compliance with local regulations.						
Package (Pail) Treatment:	The empty and clean containers are to be recycled or disposed of in conformity with local regulations.					
	Section 13 – Sh	ipping/Transport Inform	mation			
D.O.T. Shipping Name:	Not dangero	us goods.				
IMDG, IATA	Not dangero	us goods				
	Section 2	14 – Other Information				
NFPA Rating:	Health – 0	Flammability – 0	Reactivity Hazards – 0			
	Section 1	5 – Further Information	1			

The information contained in this document is the best available to the supplier at the time of writing, but is provided without warranty of any kind. Some possible hazards have been determined by analogy to similar classes of material. The items in this document are subject to change and clarification as more information become available. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person. Individuals receiving this information must exercise their independent judgment in determining its appropriateness for a particular purpose.

# Hydrogen Release Compound (HRC®) MATERIAL SAFETY DATA SHEET (MSDS)

Last Revised: February 10, 2004

#### **Section 1 - Material Identification**

#### **Supplier:**



## **REGENESIS**

1011 Calle Sombra

San Clemente, CA 92673

Phone: 949.366.8000 Fax: 949.366.8090

E-mail: <a href="mailto:info@regenesis.com">info@regenesis.com</a>

Chemical Name: Propanoic acid, 2-[2-[2-(2-hydroxy-1-oxopropoxy)-1-

oxopropoxy]-1-oxopropoxy]-1,2,3-propanetriyl ester

Chemical Family: Organic Chemical

**Hydrogen Release Compound® (HRC®)** 

Trade Name: Glycerol tripolylactate and Glycerol

Product Use: Used to remediate contaminated soil and groundwater

(environmental applications)

#### **Section 2 – Chemical Identification**

CAS# Chemical

201167-72-8 Glycerol Tripolylactate

**56-81-5** Glycerol

50-21-5 Lactic Acid

#### **Section 3 - Physical Data**

Melting Point: Not Available (NA)

**Boiling Point:** Not Determined (ND)

Flash Point: ND

Density: 1.3 g/cc

Section 3 – Physical Data (cont)

Solubility: Acetone and DMSO

Appearance: Viscous amber gel/liquid

Odor: Not detectable

Vapor Pressure: None

#### **Section 4 - Fire and Explosion Hazard Data**

**Extinguishing Media:** Carbon Dioxide, Dry Chemical Powder or Appropriate Foam.

Water may be used to keep exposed containers cool.

For large quantities involved in a fire, one should wear full protective clothing and a NIOSH approved self contained breathing apparatus with full face piece operated in the pressure demand or positive pressure mode as for a situation where lack of oxygen and excess heat are present.

Section	5 - '	Toxicol	hoical	Inform	nation
DECLIOIT	_, =	I UXILUI	wenai		IALIVII

May be harmful by inhalation, ingestion, or skin absorption.

May cause irritation. To the best of our knowledge, the

chemical, physical, and toxicological properties of the glycerol tripolylactate have not been investigated. Listed below are the

toxicological information for glycerol and lactic acid.

MA8050000

RTECS#: Glycerol

**Acute Effects:** 

SKN-RBT 500 MG/24H MLD BIOFX\* 9-4/1970

85JCAE-,207,1986 85JCAE-,207,1986

Irritation data: EYE-RBT 126 MG MLD 85JCAE -,656,86

EYE-RBT 500 MG/24H MLD AJOPAA 29,1363,46

SKN-RBT 5MG/24H SEV EYE-RBT 750 UG SEV

#### **Section 5 – Toxicological Information (cont)**

**ORL-MUS LD50:4090 MG/KG** NIIRDN 6,215,1982 FEPRA7 4,142,1945 FRZKAP (6),56,1977 SCU-RBT LD50:100 MG/KG RCOCB8 56,125,1987 **ORL-RAT LD50:12600 MG/KG** ARZNAD 26,1581,1976 IHL-**ARZNAD 26,1579,1978** RATLC50:>570MG/M3/1HBIO NIIRDN 6,215,1982 FX\*9-4/1970 IPR-RAT LD50: JAPMA8 39,583,1950 4420 MG/KG DMDJAP 31,276,1959 **IVN-RAT LD50: 5566 MG/KG** BIOFX\* 9-4/1970 **IPR-MUS LD50: 8700 MG/KG** NIIRDN 6,215,1982 SCU-MUS LD50: 91 MG/KG FMCHA2-,C252,91 FMCHA2-,C252,91 IVN-MUS LD50: 4250 MG/KG ORL-RBT LD50: 27 GM/KG FAONAU 40,144,67 SKN-RBT LD50:>10GM/KG JIHTAB 23,259,41 IVN-RBT LD50: 53 GM/KG FMCHA2-,C252,91 **ORL-GPG LD50: 7750 MG/KG** JIHTAB 23,259,1941 ORL-RAT LD50:3543 MG/KG SKN-RBT LD50:>2 GM/KG **ORL-MUS LD50: 4875 MG/KG ORL-GPG LD50: 1810 MG/KG ORL-QAL LD50: >2250 MG/KG** 

Target Organ data:

**Toxicity data:** 

Behavioral (headache), gastrointestinal (nausea or vomiting), Paternal effects (spermatogenesis, testes, epididymis, sperm duct), effects of fertility (male fertility index, post-implantation

mortality).

RTECS#: OD2800000

Lactic acid

Only selected registry of toxic effects of chemical substances (RTECS) data is presented here. See actual entry in RTECS for complete information on lactic acid and glycerol.

#### **Section 6 - Health Hazard Data**

**Handling:** Avoid continued contact with skin. Avoid contact with eyes.

In any case of any exposure which elicits a response, a physician should be consulted immediately.

**First Aid Procedures** 

Remove to fresh air. If not breathing give artificial respiration. **Inhalation:** 

In case of labored breathing give oxygen. Call a physician.

No effects expected. Do not give anything to an unconscious **Ingestion:** 

person. Call a physician immediately.

Flush with plenty of water. Contaminated clothing may be **Skin Contact:** 

washed or dry cleaned normally.

Wash eyes with plenty of water for at least 15 minutes lifting **Eye contact:** 

both upper and lower lids. Call a physician.

**Section 7 - Reactivity Data** 

**Conditions to Avoid:** Strong oxidizing agents, bases and acids

Hazardous

**Polymerization:** 

None known

**Further Information:** Hydrolyses in water to form Lactic Acid and Glycerol.

Section 8 - Spill, Leak or Accident Procedures

After Spillage or

Leakage:

**Disposal:** 

Neutralization is not required. This material may be burned in a

chemical incinerator equipped with an afterburner and scrubber.

Laws and regulations for disposal vary widely by locality.

Observe all applicable regulations and laws. This material, may

be disposed of in solid waste. Material is readily degradable and

hydrolyses in several hours.

No requirement for a reportable quantity (CERCLA) of a spill is known.

#### **Section 9 - Special Protection or Handling**

Should be stored in plastic lined, steel, plastic, glass, aluminum, stainless steel, or reinforced fiberglass containers.

**Protective Gloves:** Vinyl or Rubber

**Eves:** Splash Goggles or Full Face Shield

Area should have approved means of washing eyes.

**Ventilation:** General exhaust.

Storage: Store in cool, dry, ventilated area. Protect from incompatible

materials.

#### **Section 10 - Other Information**

This material will degrade in the environment by hydrolysis to lactic acid and glycerol. Materials containing reactive chemicals should be used only by personnel with appropriate chemical training.

The information contained in this document is the best available to the supplier as of the time of writing. Some possible hazards have been determined by analogy to similar classes of material. No separate tests have been performed on the toxicity of this material. The items in this document are subject to change and clarification as more information becomes available.



## Material Safety Data Sheet (MSDS)

## Bio-Dechlor INOCULUM PLUS (BDI PLUS™)

#### **SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION**

Material Name: DHC microbial consortium (SDC-9) MSDS #: ENV 1033

Date Prepared: 1/05/2006 CAS #: N/A (Not Applicable)

Prepared By: Simon Vainberg Formula #: N/A

Material Description: Non-hazardous, naturally occurring non-altered anaerobic

microbes and enzymes in a water-based medium.

#### **SECTION 2 - INGREDIENTS**

Components	%	OSHA PEL	ACGIH TLV	OTHER LIMITS
Non-Hazardous Ingredients	100	N/A	N/A	N/A

#### **SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS**

Boiling Point:  $100^{\circ}$ C (water) Specific Gravity ( $H_2$ O = 1): 0.9 - 1.1

Vapor Pressure @ 25°C: 24 mm Hg (water) Melting Point: 0°C (water)

Vapor Density: N/A Evaporation Rate ( $H_2O = 1$ ): 0.9 - 1.1

Solubility in Water: Soluble Water Reactive: No

pH: 6.0 - 8.0

Appearance and Odor: Murky, yellow to grey water. Musty odor.

#### **SECTION 4 - FIRE AND EXPLOSION HAZARD DATA**

Flash Point: N/A

Flammable Limits: N/A

Extinguishing Media: Foam, carbon dioxide, water

Special Fire Fighting Procedures: None

Unusual Fire and Explosion Hazards: None

#### **SECTION 5 - REACTIVITY DATA**

Stability: Stable

Conditions to Avoid: None

Incompatibility (Materials to Avoid): Water-reactive materials

Hazardous Decomposition Byproducts: None

#### **SECTION 6 - HEALTH HAZARD DATA**

#### **HEALTH EFFECTS**

The effects of exposure to this material have not been determined. Safe handling of this material on a long-term basis will avoid any possible effect from repetitive acute exposures. Below are possible health effects based on information from similar materials. Individuals hyper allergic to enzymes or other related proteins should not handle.

Ingestion: Ingestion of large quantities may result in abdominal discomfort including

nausea, vomiting, cramps, diarrhea, and fever.

Inhalation: Hypersensitive individuals may experience breathing difficulties after

inhalation of aerosols.

Skin Absorption: N/A

Skin Contact: May cause skin irritation. Hypersensitive individuals may experience

allergic reactions to enzymes.

Eye Contact: May cause eye irritation.

#### FIRST AID

Ingestion: Get medical attention if allergic symptoms develop (observe for 48 hours).

Never give anything by mouth to an unconscious or convulsing person.

Inhalation: Get medical attention if allergic symptoms develop.

Skin Absorption: N/A

Skin Contact: Wash affected area with soap and water. Get medical attention if

allergic symptoms develop.

Eye Contact: Flush eyes with plenty of water for at least 15 minutes using an eyewash

fountain, if available. Get medical attention if irritation occurs.

**NOTE TO PHYSICIANS:** All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this material may have occurred.

#### **SECTION 7 - SPILL AND LEAK PROCEDURES**

Reportable quantities (in lbs of EPA Hazardous Substances): N/A

Steps to be taken in case of spill or release: No emergency results from spillage. However, spills should be cleaned up promptly. All personnel involved in the cleanup must wear protective clothing and avoid skin contact. Absorb spilled material or vacuum into a container. After clean-up, disinfect all cleaning materials and storage containers that come in contact with the spilled liquid.

Waste Disposal Method: No special disposal methods are required. The material may be sewered, and is compatible with all known biological treatment methods. To reduce odors and permanently inactivate microorganisms, mix 100 parts (by volume) of SDC-9 consortium with 1 part (by volume) of bleach. Dispose of in accordance with local, state and federal regulations.

#### **SECTION 8 - HANDLING AND STORAGE**

Hand Protection: Rubber gloves.

Eye Protection: Safety goggles with side splash shields.

Protective Clothing: Use adequate clothing to prevent skin contact.

Respiratory Protection: Surgical mask.

Ventilation: Provide adequate ventilation to remove odors.

Storage & Handling:

Material may be stored for up to 3 weeks at 2-4°C without aeration.

Other Precautions: An eyewash station in the work area is recommended.

## Appendix B MDH Variance Permits



#### Protecting, maintaining and improving the health of all Minnesotans

December 28, 2015

Refer to: TN 5265A

Mr. Brian Murray Department of the Navy NAVFAC Mid-Atlantic Building Z-144 9324 Virginia Avenue Norfolk, Virginia 23511 Ms. Chris Boehm Carlson AECOM Suite 500 800 Lasalle Avenue Minneapolis, Minnesota 55402

Dear Mr. Murray and Ms. Boehm Carlson:

Subject: Amendment to a Variance from Minnesota Rules, Chapter 4725, to Inject Activated Carbon into Groundwater at the Naval Industrial Reserve Ordnance Plant located at 4800 East River Road, Fridley, located in the NE ¼ of the SW ¼ of Section 27,

This letter is in response to your request submitted on December 22, 2015, to the Minnesota Department of Health (MDH) for an amendment to variance TN5265, described in an MDH letter dated September 30, 2015. The original letter issued a variance from Minnesota Rules, chapter 4725, to inject activated carbon, Hydrogen Release Compound®, and a Dehalococcoides microbial consortium into groundwater at the subject property through approximately 28 environmental bore holes. Approval of additional injection of activated carbon through three monitoring wells, Minnesota Unique Numbers 818601, 818602, and 818603 is requested. Minnesota Rules, part 4725.2050 requires that a well or a boring must not be used for disposal of surface water, groundwater, or any other liquid, gas, or chemical. This rule part prohibits the injection of dye tracing chemicals, nutrients, organisms, or other remediation materials in a well or boring.

The proposed injection is intended to facilitate in-situ enhanced reductive dechlorination (ERD) for remediation of trichloroethylene (TCE), and daughter products, contamination at the source. The original injection activities, approved by TN5265 and conducted in October 2015, did not result in the desired extent or orientation of the injection chemicals due to geology and equipment difficulties. To supplement the original injection, activated carbon will be injected through three 2-inch diameter monitoring wells installed with 5 feet of screen between approximately 71 and 76 feet below-grade.

The proposed injection chemical is PlumeStop<sup>TM</sup>, a mixture of approximately 25 percent activated carbon, and 75 percent water with less than 2 percent food grade additives, manufactured by Regenesis, Inc. of San Clemente, California. Injection activities are expected to take approximately 2 days, during which a total of approximately 2,000 pounds of PlumeStop<sup>TM</sup> combined with 3,500 gallons of water would be injected. The volume of fluid injected into an individual well would range from 1,000 to 1,500 gallons.

Mr. Brian Murray Ms. Chris Boehm Carlson Page 2 December 28, 2015 TN 5265A

Groundwater monitoring will continue in monitoring wells PMW-1 through PMW-4. No groundwater samples will be collected from the injection wells.

On December 23, 2015, Ms. Shanna Schmitt with the Minnesota Pollution Control Agency (MPCA) indicated that the MPCA requires no additional approval for this injection request because it is within the scope of the original work plan.

In accordance with Minnesota Rules, chapter 4725, your request for a variance to inject activated carbon through wells Minnesota Unique Numbers 818601, 818602 and 818603 into groundwater at the subject site is granted. The variance is granted because of the need to remediate contaminated groundwater at the site. The variance is granted with the following conditions:

- 1. The variance is granted for the proposed injection of approximately 2,000 pounds of a 25 percent solution of activated carbon mixed with approximately 3,500 gallons of potable water through Minnesota Unique Well Numbers 818601, 818602, and 818603. Solution make-up water must be from a potable source. No other injection may take place in these wells or in any other regulated well or boring at the subject site unless and until a variance request for the intended injection has been submitted to and approved by the MDH.
- 2. The variance allows the injection of Regenesis, Inc. PlumeStop™ and potable water. No other material may be injected into the borings.
- 3. AECOM must notify MDH staff Mr. Steven Bennett at 651-201-3963 or Mr. Ronald Thompson at 651-201-3658 at least 24 hours prior to beginning injection to schedule an inspection.
- 4. Monitoring must take place as described in the variance application and the work plan from AECOM, dated September 2015. Analytical methods must have detection and reporting limits below the federal Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs), where applicable.
- 5. A copy of a report summarizing the results of the ERD pilot test must be submitted to Mr. Alex Martell within 90 days after completion of the test.
- 6. The applicants are responsible for the safe handling, storage, and use of the injection chemicals.
- 7. All other conditions from variance TN 5265 remain in effect.
- 8. All other requirements of Minnesota Rules, chapter 4725, are in effect.

Mr. Brian Murray Ms. Chris Boehm Carlson Page 3 December 28, 2015 TN 5265A

This variance should not be construed as an endorsement of the proposed injection, nor is it an assessment of the efficacy of the proposed injection.

Alternative measures or conditions attached to a variance have the force of law and effect of applicable rule. If a party violates the alternative measures or conditions attached to the variance, the party is subject to enforcement actions and penalties provided in the applicable law or rule.

This variance is conditioned upon the applicable acceptance of and compliance with the conditions of the variance. Failure by the applicant to comply with the conditions prescribed in the variance will result in the immediate expiration of the variance.

If you have any questions, please contact Mr. Alex Martell at 651-201-4595.

Sincerely,

Christopher D. Elvrum, Manager Well Management Section Environmental Health Division P.O. Box 64975

St. Paul, Minnesota 55164-0975

CDE:ECS:dg

cc: Shanna Schmitt, MPCA



Protecting, maintaining and improving the health of all Minnesotans

September 30, 2015

Refer to: TN 5265

Mr. Brian Murray Department of the Navy NAVFAC Mid-Atlantic Building Z-144 9324 Virginia Avenue Norfolk, VA 23511 Ms. Chris Boehm Carlson AECOM Suite 500 800 Lasalle Avenue Minneapolis, Minnesota 55402

Dear Mr. Murray and Ms. Boehm Carlson:

Subject: Request for a Variance from Minnesota Rules, Chapter 4725, to Inject Activated Carbon, Hydrogen Release Compound®, and a Dehalococcoides Microbial Consortium into Groundwater at the Naval Industrial Reserve Ordnance Plant located at 4800 East River Road, Fridley, located in the NE ¼ of the SW ¼ of Section 27, Township 24 North, Range 24 West, Anoka County, Minnesota

This letter is in response to your request submitted to the Minnesota Department of Health (MDH) for a variance from Minnesota Rules, chapter 4725,to inject activated carbon, Hydrogen Release Compound® (HRC®), and a Dehalococcoides microbial consortium into groundwater at the subject property through approximately 28 environmental bore holes (EBHs). Minnesota Rules, part 4725.2050 requires that a well or a boring must not be used for disposal of surface water, groundwater, or any other liquid, gas, or chemical. This rule part prohibits the injection of dye tracing chemicals, nutrients, organisms, or other remediation materials in a well or boring.

The proposed injection is intended to facilitate in-situ enhanced reductive dechlorination (ERD) for remediation of trichloroethylene (TCE), and daughter products, contamination at the source. The ISCO treatment chemicals would be injected through a total of approximately 28 EBHs, split across two demonstration areas (Area 1 and Area2), with approximately 14 borings advanced in a grid at each area. Direct push drilling equipment will be used to advance the borings to approximately 60 to 67 feet in Area 1 and 71 to 78 feet in Area 2. The potentiometric water level at the injection sites are anticipated to be approximately 16 to 20 feet, and 30 to 35 feet in Area 1 and Area 2, respectively.

The chemicals proposed for injection are all manufactured by Regenesis, Inc. of San Clemente, California. The proposed injection chemicals include, PlumStop<sup>TM</sup>, HRC®, and Bio-Dechlor INOCULUM PLUS. PlumStop<sup>TM</sup> is a mixture of approximately 25 percent activated carbon, and 75 percent water with less than 2 percent food grade additives. HRC® contains glycerol tripolylactate, glycerol and lactic acid, and serves as nutrients. Bio-Dechlor INOCULUM PLUS contains an aqueous solution of a Dehalococcoides microbial consortium.

Mr. Brian Murray Ms. Chris Boehm Carlson Page 2 September 30, 2015 TN 5265

Bioaugmentation is proposed, using Bio-Dechlor INOCULUM. Documentation provided in the variance request and obtained from other sources indicates that the Bio-Dechlor INOCULUM PLUS is a natural, non-pathogenic, anaerobic microbial consortium. Bio-Dechlor INOCULUM PLUS is composed of *Dehalococcoides sp.*, which is a naturally occurring dechlorinating organism, and naturally occurring iron reducing and methanogenic anaerobic bacteria. These bacteria have been shown to be naturally present at sites throughout North America and Europe where groundwater is contaminated with chlorinated solvents such as trichloroethene (TCE), and their presence has been identified or inferred at the subject site. The supporting documentation also indicates that Dehalococcoides bacteria have been shown to completely dechlorinate chlorinated ethenes in-situ to ethene gas. The dechlorinating bacteria do not persist in the absence of chlorinated solvents, or in aerobic or even mildly reducing conditions.

Injection activities are expected to take approximately 1 week, during which a total of approximately 9,000 pounds of PlumStop<sup>TM</sup>, 400 pounds of HRC®, and 5 gallons of a Bio-Dechlor INOCULUM PLUS would be injected. The volume of fluid injected into an individual EBH would range from 900 to 3,500 gallons.

Samples will be collected from two downgradient wells, PMW-02 for Area 1 and PMW-04 for Area 2, at two weeks, one month, two months, three months, and six months after injection. The sample analysis will include chlorinated volatile organic compounds (CVOCs), nitrate/nitrite, total and dissolved iron, sulfate/sulfide, carbon dioxide, ethene, ethane, methane, alkalinity, chemical oxygen demand, volatile fatty acids/metabolic acids, total organic carbon, and CENSUS Dehalococcoides. Two additional monitoring wells, PMW-01 (Area 1) and PMW-03 (Area 2), will be installed within the injection area, sampled on the same schedule and for the same list of analytes.

On September 29, 2015, Mr. Alex Martell, MDH hydrologist, discussed the proposed injection with Ms. Shanna Schmitt, Minnesota Pollution Control Agency (MPCA) geologist, who confirmed that the MPCA has approved the work plan for the proposed ERD.

In accordance with Minnesota Rules, chapter 4725, your request for a variance to inject activated carbon, HRC®, and a Dehalococcoides microbial consortium into groundwater at the subject site is granted. The variance is granted because of the need to remediate contaminated groundwater at the site. The variance is granted with the following conditions:

1. The variance is granted for the proposed injection of approximately 9,000 gallons of a 25 percent solution of activated carbon, approximately 400 pounds of HRC®, and approximately 5 pounds of a Dehalococcoides microbial consortium mixed with approximately 4,500 gallons of potable water, and to utilize up to 28 EBHs for the injection. Solution make-up water must be from a potable source. No other injection may take place in these borings or in any other regulated well or boring at the subject site unless and until a variance request for the intended injection has been submitted to and approved by the MDH.

Mr. Brian Murray Ms. Chris Boehm Carlson Page 3 September 30, 2015 TN 5265

- 2. The variance allows the injection of Regenesis, Inc. PlumStop™, HRC®, Bio-Dechlor INOCULUM PLUS, and potable water. No other material may be injected into the borings.
- 3. Construction and sealing of the direct push borings must be done by or under the direct supervision of a licensed well contractor or registered monitoring well contractor. Ms. Chris Boehm Carlson of AECOM has indicated that Matrix Environmental, LLC would be employed for the EBH work.
- 4. After injection is complete, each boring must be sealed by pumping approved neat-cement grout through the injection point from within 10 feet of the original bottom of the boring up to the ground surface. Borings used to determine the radius of influence of the injection chemicals must be sealed in the same manner.
- 5. AECOM must notify MDH staff Mr. Steven Bennett at 651-201-3963 or Mr. Ronald Thompson at 651-201-3658 prior to beginning injection to schedule an inspection.
- 6. Monitoring must take place as described in the variance application and the work plan from AECOM, dated September, 2015. Analytical methods must have detection and reporting limits below the federal Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs), where applicable.
- 7. A copy of a report summarizing the results of the ERD pilot test must be submitted to Mr. Martell within 90 days after completion of the test.
- 8. The applicants are responsible for the safe handling, storage, and use of the injection chemicals.
- 9. All other requirements of Minnesota Rules, chapter 4725, are in effect.

This variance should not be construed as an endorsement of the proposed injection, nor is it an assessment of the efficacy of the proposed injection.

Alternative measures or conditions attached to a variance have the force of law and effect of applicable rule. If a party violates the alternative measures or conditions attached to the variance, the party is subject to enforcement actions and penalties provided in the applicable law or rule.

Mr. Brian Murray Ms. Chris Boehm Carlson Page 4 September 30, 2015 TN 5265

This variance is conditioned upon the applicable acceptance of and compliance with the conditions of the variance. Failure by the applicant to comply with the conditions prescribed in the variance will result in the immediate expiration of the variance.

If you have any questions, please contact Mr. Martell at 651-201-4595.

Sincerely,

Christopher D. Elvrum, Manager Well Management Section Environmental Health Division P.O. Box 64975

St. Paul, Minnesota 55164-0975

CDE:ECS:dg

cc: Matrix Environmental, LLC



PROTECTING, MAINTAINING & IMPROVING THE HEALTH OF ALL MINNESOTANS

May 12, 2016

Mr. Rob Vix Mark J. Traut Wells, Inc. 141 28th Avenue South Waite Park, Minnesota 56387

Dear Mr. Vix:

Subject: Response to a Request to Seal Three Injection Wells, Minnesota Unique Well Numbers 818601, 818602 and 818603; and Four Monitoring Wells, Minnesota Unique Well Numbers 814759, 814760, 814761, and 814766; Within the Southwestern Fridley and Southwestern Columbia Heights Special Well and Boring Construction Area, Anoka County, Minnesota

This letter is in response to your request submitted to the Minnesota Department of Health (MDH) to seal three injection wells, Minnesota Unique Well Numbers 818601 (H339285), 818602 (H339286) and 818603 (H339287); and four Monitoring Wells, Minnesota Unique Well Numbers 814759 (H339281), 814760 (H339282), 814761 (H339283), and 814766 (H339284) located at the Naval Industrial Reserve Ordinance Plant (NIROP), 4800 East River Road, Fridley, within the Southwestern Fridley and Southwestern Columbia Heights Special Well and Boring Construction Area. The request was provided to MDH in two letters from Mark J. Traut Wells, Inc., dated May 10, 2016, and May 11, 2016.

Minnesota Unique Well Numbers 818601, 818602, and 818603 were the subject of a variance, TN5265A, granted in a letter from MDH dated December 28, 2015. The variance was issued to allow the injection of remediation chemicals into groundwater at the site.

Each well requested to be sealed is constructed with 2-inch steel casing and a 5-foot section of stainless steel screen. The depths of the wells range from 66 to 75 feet. Proposed sealing will be completed by pumping neat-cement grout through a tremie pipe from the bottom of each well to within 2 feet of the ground surface.

MDH has reviewed the sealing proposal and approves the work with the following conditions:

- 1. Contact MDH staff, Mr. Patrick Sarafolean at 651-201-3962 or Mr. Steven Bennett at 651-201-3963, at least 24 hours prior to beginning well sealing so that an inspector may be present during this work.
- 2. The tremie pipe must be placed within 10 feet of the bottom of each well, and neat-cement grout must be emplaced in one continuous operation for each well.

Mr. Rob Vix Page 2 May 12, 2016

If you have any questions, please contact Mr. Sarafolean at 651-201-3962, Mr. Bennett at 651-201-3963, or me at 651-201-4595.

Sincerely,

Alex Martell

Well Management Section Environmental Health Division

P.O. Box 64975

St. Paul, Minnesota 55164-0975

AMM:mj

cc: Chris Boehm Carlson, AECOM

## Appendix C Soil Boring Logs

## Resolution Consultants

# Boring and Well Construction Log

BORING #: **PMW-1**Sheet 1 of 3

	nsulta Department						Logged By: MM			
.ocatio	n: NIROP, F	ridley MN		Northing: 1078402 Easting: 2811703 Drilling Company: Traut Inc						
	#: 6027608			Ground Elevation (msl): 835.10 Hole Size (in): 2 IN						
	ate: 9/2/201			Drilling Meth			Water Level (ft): 17			
	Date: 9/2/20			Drill Rig Typ			Total Depth (ft): 66.0			
				3 71				2		
O Depth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic		Classif	Soil Description ication Scheme: USCS	Soil Lab Sample		
			CNCR		0.8	Concrete				
2 4		0.0	SW			well graded SAND; very fine to coa rounded; moist; loose; 10YR 4/2 de @5-6' bgs: wet	rse sand; some fine to coarse gravel; subrounded to rk grayish brown			
6		0.0			6.0					
		0.0				well graded SAND; very fine to coa angular; trace silt; dry; loose; 10YR	rse sand; some fine to coarse gravel; subangular to 6/2 light brownish gray			
1		0.0		, , , , , , , , , , , , , , , , , , ,	1					
8		0.0	SW	<u> </u>	1					
-		0.0		<i>//////</i>	9.0	noorly graded SAND; very fine to co	parse (mostly fine) sand; little fine to coarse gravel (up to			
10						2" in size); round to subround; trace	e silt; moist to wet; loose; 10YR 6/2 light brownish gray			
		0.0								
12		0.0								
14		0.0 0.0 0.0	SP							
-		0.0		•/•/•/•/•/	15.0	well graded SAND; very fine to coa	rse sand; some fine to coarse gravel; little silt; trace			
16		0.0				cobble (up to 3" in size); wet; 10YR	. <del>17.5</del> DIOW(I			
-				**************************************						
18		0.0		<u> </u>	-					
		0.0	SW	<u> </u>	1					
20		0.0			1					
20		0.0		<u>/////</u>						
+		0.0			21.5					
22		Ţ	SW		22.0	well graded SAND; some fine to co	earse gravel (up to 49%); subround to subangular; little			
		0.0					parse (mostly fine) sand; little fine gravel; subround to IYR 4/2 dark grayish brown			
24		0.0	SP		;	•				
		0.0	J.		) ) ) )					
			<b>D</b> · -		25.0	-	I bear			
Pos	olution Cons	Remarks:	Boring T	erminated (ft):	66.0	Hand augered down to 5	ngs			
800 Minr Pho	LaSalle Ave, neapolis, MN ne: (612) 376 : (612) 376-22	Suite 500 55402 -2000	Cloudy,	70's, humid						

## Resolution Consultants

## Boring and Well Construction Log

BORING #: **PMW-1**Sheet 2 of 3

Client: Department of the Navy		Logged By: MM
Location: NIROP, Fridley MN	<b>Northing:</b> 1078402 <b>Easting:</b> 2811703	Drilling Company: Traut Inc
Project #: 60276080	Ground Elevation (msl): 835.10	Hole Size (in): 2 IN
Start Date: 9/2/2015	Drilling Method: Sonic	Water Level (ft): 17
Finish Date: 9/2/2015	Drill Rig Type: Versa-Sonic	Total Depth (ft): 66.0

Depth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic	Soil Description Classification Scheme: USCS	Soil Lab Sample Collection Depth
26		0.0			poorly graded SAND; very fine to coarse (mostly fine) sand; little silt and fine gravel; subround to subangular; wet; loose; 10YR 4/2 dark grayish brown @26.5-26.6' bgs: coarse sand lense with fine gravel	
		0.0			©20.0 20.0 Ogg. codace sam tonce with this grave.	
28		0.0				
		0.0				
30		0.0				
		0.0				
32		0.0	SP			
		0.0	0.			
34		0.0				
		0.0				
36		0.0				
- 55		0.0				
38		0.0			38.0_	
- 30		0.0			poorly graded SAND; very fine to fine sand; some silt; trace clay; no plasticity; wet; 10YR 4/2 dark grayish brown @44-44.1' bgs: very fine to medium sand lense	
40		0.0			@44-44.1' bgs: very fine to medium sand lense	
40		0.0				
12		0.0				
42		0.0				
<b> </b>		0.0				
44		0.0	SP			
<u> </u>		0.0				
46		1.4				
<u> </u>		0.0				
48		0.0				
 50		1.7			50.0	
30		1	<u> </u>		00.0	

Remarks:

Boring Terminated (ft): 66.0

Hand augered down to 5' bgs

Resolution Consultants 800 LaSalle Ave, Suite 500 Minneapolis, MN 55402 Phone: (612) 376-2000 Fax: (612) 376-2271

Cloudy, 70's, humid

# Resolution Consultants

## Boring and Well Construction Log

BORING #: PMW-1 Sheet 3 of 3

Client: Department of the Navy		Logged By: MM
Location: NIROP, Fridley MN	<b>Northing:</b> 1078402 <b>Easting:</b> 2811703	Drilling Company: Traut Inc
Project #: 60276080	Ground Elevation (msl): 835.10	Hole Size (in): 2 IN
Start Date: 9/2/2015	Drilling Method: Sonic	Water Level (ft): 17
Finish Date: 9/2/2015	Drill Rig Type: Versa-Sonic	Total Depth (ft): 66.0

Depth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic	Soil Description Classification Scheme: USCS	
		0.0	SP		poorly graded SAND; very fine to fine sand; some silt; trace clay; no plasticity; wet; 10YR 4/2 dark grayish brown 6,44-44.1 bgs: very fine to medium sand lense	
52		0.0			poorly graded SAND; very fine to fine (mostly fine) sand; wet; 10YR 4/2 dark grayish brown	
- 02		0.0				
54		0.0				
		0.0				
56		0.7				
		0.9	SP			
58		2.8				
		7.1				
60		6.8				
		0.0			61.0	
62		1.2			poorly graded SAND; very fine to medium (mostly fine) sand; some silt; cohesive; wet; 10YR 4/2 dark grayish brown	
		0.5				
64		1.3	SP			
		2.5			65.0_	
66		2.6	SM		SILTY SAND; very fine to fine; wet @65.8-65.9' bgs: silt lense with very fine sand; 10YR 5/1 gray	
		1.6			End of boring at 66 0 ft, bos	

End of boring at 66.0 ft. bgs. 1.6

Remarks:

Boring Terminated (ft): 66.0

Hand augered down to 5' bgs

**Resolution Consultants** 800 LaSalle Ave, Suite 500 Minneapolis, MN 55402 Phone: (612) 376-2000 Fax: (612) 376-2271

Cloudy, 70's, humid

Resolu	ution
Consu	Itants

# Boring and Well Construction Log

BORING #: **PMW-2**Sheet 1 of 3

<u> </u>	<u>nsulta</u>	ints						neet 1 of 3	
Client:	Department	of the Navy					Logged By: MM		
Location	on: NIROP, F	Fridley MN		Northing: 1078394 Easting: 2811680 Drilling Company: Traut Inc					
Projec	t#: 6027608	0		Ground Elevation (msl): 835.11 Hole Size (in): 2 IN					
Start D	Date: 9/2/201	5		Drilling Meth	Drilling Method: Sonic Water Level (ft): 17				
<b>Finish Date:</b> 9/2/2015				Drill Rig Type	e: Vei	rsa-Sonic	Total Depth (ft): 66.0		
Oepth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic		Classif	Soil Description ication Scheme: USCS	Soil Lab Sample Collection Depth	
			CNCR		0.8	Concrete	o cilti mojot: loogo: 10VP 4/2 dark gravich brown		
2 4		0.0	SW		5.5	well graded SAND, with graver, ittl	e silt; moist; loose; 10YR 4/2 dark grayish brown		
6		0.0	CL		6.5	SANDY CLAY; cohesive; low to me moist, 10YR 3/1 very dark gray	edium plasticity; very fine to fine sand; trace fine gravel;		
L 4			<u> </u>		0.5	well graded SAND; some gravel (u brown	p to 49%); little silt; moist; loose; 10YR 4/4 dark yellowish		
8		0.0	SW	//////		@7.5' bgs: 10YR 5/3 brown @8' bgs: large cobble			
		0.0	SVV	/ / / / /	9.0				
		0.0		*****	0.0	poorly graded SAND; very fine to c subround to subangular; little silt; n	oarse (mostly fine) sand; some fine to coarse gravel; noist; loose; 10YR 4/3 brown		
10		0.0				@15' bgs: some silt @19' bgs: trace cobble			
<b>-</b>		0.0				@19.5 bgs: 1" of silty clay lense @21' bgs: moist @24' bgs: cobble (4.5" in size) sub	round		
12		0.0							
14		0.0							
		0.0							
16		0.0							
10		0.0	0.5						
<b>├</b> ┤		0.0	SP						
18		0.0							
<u> </u>		0.0							
20									
		0.0							
22		0.0							
		0.0							
<b>├</b> ┤		0.0							
24		0.0		•/•/•/•/•/•	24.0	well graded SAND; with gravel: rou	and to subround; little silt; wet; loose; 10YR 4/3 brown		
		0.0	SW	**************************************	25.0		, , ,		
		Remarks:	Boring Te	erminated (ft):	66.0	Hand augered down to 5	' bgs		
800 Min Pho	solution Cons LaSalle Ave, neapolis, MN one: (612) 376-22 :: (612) 376-22	Suite 500 55402 -2000							

Reso	ut	tio	n
Consi	ılt	ar	nts

# Boring and Well Construction Log

BORING #: **PMW-2**Sheet 2 of 3

Client: Department of the Navy	Logged By: MM		
Location: NIROP, Fridley MN	<b>Northing:</b> 1078394 <b>Easting:</b> 2811680	Drilling Company: Traut Inc	
Project #: 60276080	Ground Elevation (msl): 835.11	Hole Size (in): 2 IN	
<b>Start Date:</b> 9/2/2015	Drilling Method: Sonic	Water Level (ft): 17	
Finish Date: 9/2/2015	Drill Rig Type: Versa-Sonic	Total Depth (ft): 66.0	
		_	

Depth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic	Soil Description Classification Scheme: USCS	Soil Lab Sample Collection Depth
26		0.0			well graded SAND; very fine to coarse sand; little fine to coarse gravel; little silt; wet; 10YR 4/2 dark grayish brown	
20		0.0		/////		
-		0.0		//////		
28		0.0		/ / / / /		
-		0.0	SW			
30		0.0				
-		0.0				
32		0.0		1, 1,	32.0 poorly graded SAND; very fine to coarse (mostly fine) sand; little silt; wet; loose; 10YR 4/2	
-		0.0			poorly graded SAND; very fine to coarse (mostly fine) sand; little silt; wet; loose; 10YR 4/2 dark grayish brown @38.5' bgs: some silt @42.5' bgs: mostly medium sand	
34		0.0				
-		0.0				
36		0.0				
		0.0				
38						
-		0.0				
40		0.0				
		0.0	SP			
42		0.0				
		0.0				
44		0.0				
		0.0				
46		0.0				
		0.0				
40		0.0				
48		0.0			48.5	
		0.0	SP		poorly graded SAND; very fine to coarse (mostly medium) sand; little silt; trace fine gravel; round to subround; wet; 10YR 4/2 dark grayish brown	
50		D	Davis at T		50.0	

Remarks:

Boring Terminated (ft): 66.0

Hand augered down to 5' bgs

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Resolu	ution
Consu	Itants

# Boring and Well Construction Log

BORING #: PMW-2 Sheet 3 of 3

Client: Department of the Navy	Logged By: MM	
Location: NIROP, Fridley MN	<b>Northing:</b> 1078394 <b>Easting:</b> 2811680	Drilling Company: Traut Inc
Project #: 60276080	Hole Size (in): 2 IN	
<b>Start Date:</b> 9/2/2015	Drilling Method: Sonic	Water Level (ft): 17
Finish Date: 9/2/2015	Drill Rig Type: Versa-Sonic	Total Denth (ft): 66.0

Depth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic	Soil Description Classification Scheme: USCS	Soil Lab Sample Collection Depth
		0.0			poorly graded SAND; very fine to coarse (mostly medium) sand; little silt; trace fine gravel; round to subround; wet; 10YR 4/2 dark grayish brown	
<u> </u>		0.0				
52		0.0				
54		0.0				
- 54		0.0				
		0.0				
56		0.0	SP			
58		0.0				
		0.0				
60		0.0				
- 00		0.0				
62		0.0			62.0	
02		0.0			poorly graded SAND; very fine to coarse (mostly fine) sand; some silt; trace fine to coarse gravel; subround; wet; 10YR 4/2 dark grayish brown @64-64.5' bgs: mostly medium sand @65.5' bgs: 1" mostly medium	
64		0.0			@64-64.5' bgs: mostly medium sand @65.5' bgs: 1" mostly medium	
- 04		0.0	SP			
66		0.5			66.0	
<b>⊢</b> —		1	1		00.0	

End of boring at 66.0 ft. bgs. 0.0

Remarks:

Boring Terminated (ft): 66.0

Hand augered down to 5' bgs

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Resol	ution
Consu	ultants

BORING #: PMW-3

Client:	Department	of the Navy				Logged By: MM	
Locatio	on: NIROP, I	Fridley MN		Northing: 10	078145 <b>Easting:</b> 2811181	Drilling Company: Traut Inc	
Project	#: 6027608	30		Ground Eleva	tion (msl): 835.05	Hole Size (in): 2 IN	
Start D	ate: 9/2/201	5		Drilling Metho	od: Sonic	Water Level (ft): 26	
Finish	<b>Date:</b> 9/2/20	)15		Drill Rig Type	: Versa-Sonic	Total Depth (ft): 77.0	
Depth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic	Classi	Soil Description fication Scheme: USCS	Soil Lab Sample Collection Depth
2 4 4 6		0.0 0.0 0.0	SM		Top soil; SILTY SAND; little clay;	10YR 2/1 black	
10		0.0	SW	/*/	well graded SAND; very fine to co 10YR 4/3 brown; some mottling 9.0		-
12		0.0					
		0.0					
14		0.0					
-		0.0	SW	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
16		0.2					
18		0.0		/ · / · / · / · / · / · / · / · / · / ·			
20		0.0			20.0		
		Remarks:	Boring T	erminated (ft): 7		5' bas	
800 Minr	olution Cons LaSalle Ave, neapolis, MN ne: (612) 376	sultants Suite 500 I 55402	Boiling 1	Giriinateu (II). T	7.0 Hand augeteu dowff to :	o ugo	

Reso	lu <sup>-</sup>	tio	n
Consi	uŀ	tar	nts

BORING #: **PMW-3**Sheet 2 of 4

Client: Department of the Navy	Logged By: MM	
Location: NIROP, Fridley MN	<b>Northing:</b> 1078145 <b>Easting:</b> 2811181	Drilling Company: Traut Inc
Project #: 60276080	Ground Elevation (msl): 835.05	Hole Size (in): 2 IN
Start Date: 9/2/2015	Drilling Method: Sonic	Water Level (ft): 26
Finish Date: 9/2/2015	Drill Rig Type: Versa-Sonic	Total Depth (ft): 77.0

	Date. 3/2/20	710		Dilli Nig Type.	versa-some rotal beptin (it).	
Depth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic	Soil Description Classification Scheme: USCS	Soil Lab Sample Collection Depth
20		0.0			LEAN CLAY; medium plasticity; some silt; little fine to coarse gravel; round to subangular; trace very fine to coarse sand; moist; 10YR 4/1 dark gray	
		0.0			trace very line to coarse sand, moist, 10 fk 4/1 dark gray	l
22		0.0				l
		0.0				ı
24		0.0	CL			ı
		0.0				ı
_ 26		0.0		200	7.0	i
-		0.0		(/////////	7.0 poorly graded SAND; very fine to coarse (mostly medium) sand; some fine to coarse gravel; round to subround; trace small cobble; subround; trace silt; wet; loose; 10YR 4/2 dark	ı
28		0.0			grayish brown @39.8-40' bgs: some silt	l
30		0.0				l
		0.0				İ
		0.0				İ
32		0.0				l
		0.0				ı
34		0.0	SP			İ
		0.0				ı
36		0.0				ı
		0.0				ı
38		0.0				İ
40		0.0		40	0.0	
		D	D		I Company of the second development of the s	

Remarks:

Boring Terminated (ft): 77.0

Hand augered down to 5' bgs

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Reso	lu	tic	n	)
Consi	Ш·	ta	nt	5

BORING #: PMW-3

	nsulta		t	Boring	and Well Const	ruction Log	#: <b>PMW-3</b> neet 3 of 4
	Department					Logged By: MM	
	on: NIROP, F			Northing: 1	078145 <b>Easting</b> : 2811181	Drilling Company: Traut Inc	
Project	#: 6027608	0		Ground Eleva	ation (msl): 835.05	Hole Size (in): 2 IN	
Start D	ate: 9/2/201	5		Drilling Metho	od: Sonic	Water Level (ft): 26	
Finish	<b>Date</b> : 9/2/20	)15		Drill Rig Type	e: Versa-Sonic	Total Depth (ft): 77.0	
Depth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic	Classif	Soil Description fication Scheme: USCS	Soil Lab Sample Collection Depth
40		0.0			poorly graded SAND; very fine to c round to subround; trace small cob grayish brown	oarse (mostly medium) sand; some fine to coarse gravel; oble; subround; trace silt; wet; loose; 10YR 4/2 dark	
42		0.0					
72		0.0					
44		0.0					
		0.0					
46		0.0					
40		0.0					
48		0.0					
40		0.0	SP				
50		0.0					
		0.0					
52		0.0					
		0.0					
54		0.0					
		0.0					
56		0.0			56.0		
		0.0				nedium sand; trace silt; wet; loose; 10YR 4/3 brown	
		0.0					
58		0.0	SP				
		0.0					
60		Remarks:	Boring Te	rminated (ft): 7	60.0 Hand augered down to 5	5' bgs	
800 Mini Pho	olution Cons LaSalle Ave, neapolis, MN ne: (612) 376-22	Sultants Suite 500 55402 5-2000				-	

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BORING #: **PMW-3**Sheet 4 of 4

Client: Department of the Navy	Logged By: MM	
Location: NIROP, Fridley MN	Northing: 1078145 Easting: 2811181 Drilling Company: T	raut Inc
Project #: 60276080	Ground Elevation (msl): 835.05 Hole Size (in): 2 IN	
<b>Start Date:</b> 9/2/2015	Drilling Method: Sonic Water Level (ft): 26	
Finish Date: 0/2/2015	Drill Pig Type: Versa-Sonic Total Denth /ft): 77	0

Depth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic	Soil Description Classification Scheme: USCS	Soil Lab Sample Collection Depth
		0.0			poorly graded SAND; very fine to medium sand; trace silt; wet; loose; 10YR 4/3 brown	
62		0.0				
- 62		0.0	SP			
-		0.0	O.			
64		0.0			65.0	
-		0.0	SW		well graded SAND; some gravel (up to 49%); wet; loose; 10YR 4/3 brown	
66		0.0			poorly graded SAND; very fine to coarse (mostly fine) sand; little fine gravel; trace silt; wet; 10YR 4/3 brown @68.5-70' bgs: mostly coarse sand	
68		0.0				
		0.0				
70		0.0				
		0.0				
72		0.0	SP			
		0.0				
74		0.0				
		0.0				
76		0.0				
		0.0		2/2/2/2/2	76.5 well graded SAND; with gravel; subround to subangular; trace small cobble; wet; 10YR 4/3	
-		0.0	\SW	<u>/. · · · · /. · · · · /.</u>	77.0 well gladed SAND, with glaver, subtourio to subangular, flace sitial cobbie, wel, 101k 4/3 brown  End of boring at 77.0 ft. bgs.	

End of boring at 77.0 ft. bgs.

Boring Terminated (ft): 77.0

Hand augered down to 5' bgs

Resolution Consultants 800 LaSalle Ave, Suite 500 Minneapolis, MN 55402 Phone: (612) 376-2000 Fax: (612) 376-2271 Tiana augerea down to 5 bgs

Reso	ut	io	n
Consi	ılt	ar	nts

BORING #: PMW-4

	nsult <i>a</i>		t	soring	and Well Const	ruction Log sr	meet 1 of 3
	Department					Logged By: MM	
Location	on: NIROP, F	ridley MN		Northing: 1	1078131 <b>Easting</b> : 2811152	Drilling Company: Traut Inc	
Projec	t#: 6027608	0		Ground Elev	ation (msl): 834.79	Hole Size (in): 2 IN	
Start D	ate: 9/3/201	5		Drilling Meth	od: Sonic	Water Level (ft): 26	
Finish	<b>Date:</b> 9/3/20	15		Drill Rig Typ	e: Versa-Sonic	Total Depth (ft): 75.0	
Oepth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic	Classif	Soil Description ication Scheme: USCS	Soil Lab Sample Collection Depth
2 4		0.5	SM		Top soil; SILTY SAND; very fine to	coarse sand; little clay; moist; 10YR 2/1 black	
		0.6 1.1					
8		0.6			8.0 poorly graded SAND; very fine to co cohesive; moist; 10YR 4/2 dark gra	parse (mostly fine) sand; little fine gravel; little silt; slightly lyish brown	
10		0.9	SP		10.0		
10		0.0			No recovery; two large concrete co	bbles (up to 4" in size)	
12		0.9					
16							
18							
20		0.0	SW		20.0 well graded SAND; some gravel (ul 10YR 4/2 dark grayish brown	p to 49%); large concrete boulder (>4" in size); wet; loose;	
		0.9	ΟVV			parse (mostly fine) sand; trace silt; 10YR 5/2 grayish	
22		0.9	SP		@22.9' bgs: coarse sand and fine of	gravel; large cobble >4" in size	
24		0.8 1.3	CL			me silt; little fine to coarse gravel; subround to se sand; moist; 10YR 4/1 dark gray	
				<u> </u>	25.0		
800 Min Pho	colution Cons LaSalle Ave, neapolis, MN one: (612) 376 : (612) 376-22	Suite 500 55402 -2000	Boring Te	rminated (ft):	75.0 Hand augered down to 5	' bgs	

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Consi	ult	ar	nts

BORING #: PMW-4

Sheet 2 of 3 Department of the Navy Logged By: MM 1078131 Location: NIROP, Fridley MN Easting: 2811152 **Drilling Company:** Northing: Traut Inc Project #: 60276080 Ground Elevation (msl): 834.79 Hole Size (in): 2 IN Start Date: 9/3/2015 Drilling Method: Sonic Water Level (ft): Finish Date: 9/3/2015 Drill Rig Type: Versa-Sonic Total Depth (ft): Soil Lab Sample Collection Depth USCS Code Recovery (percent) (mdd) Graphic Soil Description Classification Scheme: USCS <u>ĕ</u> LEAN CLAY; medium plasticity; some silt; little fine to coarse gravel; subround to subangular; trace very fine to coarse sand; moist; 10YR 4/1 dark gray 1.1 26 1.0 1.1 28 1.1 CL 1.3 30 1.2 1.2 32 poorly graded SAND; very fne to coarse (mostly fine) sand; little silt; trace fine to coarse gravel; subround to subangular; moist to wet; 10YR 4/3 brown @35.5' bgs: 1" silty clay with sand 1.1 1.1 @38.0' bgs: mostly coarse sand 34 0.9 1.1 36 1.2 SP 1.3 38 1.1 1.1 40 0.9 0.9 poorly graded SAND, very fine to coarse (mostly fine) sand, little silt; 10YR 4/3 brown 42 SP SILTY SAND; very fine to fine (mostly very fine) sand; cohesive; wet; 10YR 4/3 brown 1.0 0.9 SM 0.6 46 poorly graded SAND; very fine to coarse (mostly fine) sand; little silt; trace fine gravel; 0.6 subround to subangular; moist; 10YR 4/3 brown 0.7 48 SP 0.6 50

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Remarks:

Boring Terminated (ft): 75.0 Hand augered down to 5' bgs

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BORING #: PMW-4 Sheet 3 of 3

Client: Department of the Navy	Logged By: MM	
Location: NIROP, Fridley MN	<b>Northing:</b> 1078131 <b>Easting:</b> 2811152	Drilling Company: Traut Inc
Project #: 60276080	Hole Size (in): 2 IN	
Start Date: 9/3/2015	Drilling Method: Sonic	Water Level (ft): 26
Finish Date: 9/3/2015	Total Depth (ft): 75.0	

				1		
Depth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic	Soil Description Classification Scheme: USCS	Soil Lab Sample Collection Depth
		0.6	SP		poorly graded SAND; very fine to fine (mostly fine) sand; some silt; slightly cohesive; moist; 10YR 4/2 dark grayish brown (continued)	
		0.8	01	•/•/•/•/•	51.0	1
52		0.0			well graded SAND; very fine to coarse sand; little silt; 10YR 4/2; dark grayish brown @57-57.5' bgs: mostly medium sand	1
		0.8				1
-		0.8		•/•/•/•/•/		1
54		0.0		<u>/• -• -/• -• -/•</u>		ı
		0.8	SW	××		1
-		0.9		//////		ı
56				* / * / * / * ·		ı
		0.9		<u> </u>		1
-		0.8		1. 1. 1. 1. 1. 1.	57.5	,
58		0.0			poorly graded SAND; very fine to coarse (mostly fine) sand; trace silt; 10YR 4/2 dark grayish brown	,
		0.9				,
		1.0				,
60		0.7				1
		0.7				,
		0.7				,
62		0.6				,
						,
64		0.6				,
- 04		0.6				,
-						1
66		0.4				,
		0.5	SP			,
-		0.6	] 3.			,
68						,
		0.7				,
-		0.5				,
70						,
		0.6				,
		0.6				,
72		0.7				,
		0.7				,
		0.7				,
74		0.7				,
		0.6			75.0	
1			-		End of boring at 75.0 ft. bgs.	<u> </u>

Remarks:

Boring Terminated (ft): 75.0

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Hand augered down to 5' bgs

Resol	u <sup>-</sup>	tio	n
Consi	ıŀ	tar	\ts

BORING #: IW-1

	nsulta		t	Boring	and V	Well Co	onsti	ruction Log	Sheet 1 of 1	1
	Department							Logged By: MM		=
	on: NIROP, F	-		Northing:		Easting:		Drilling Company: Mateco Well Drilling		_
Projec	t #: 6027608	30		Ground Elev	vation (msl):			Hole Size (in): 2 IN		_
Start D	Date: 12/19/2	015		Drilling Meth				Water Level (ft): 33		_
Finish	Date: 12/21	/2015				ic Mini Geoprob	ре	Total Depth (ft): 76.0		_
						·			£	_
o Depth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic			S Classifi	Soil Description cation Scheme: USCS	Soil Lab Sample Collection Depth	
- 2 -					Blin	d drill to 65' bgs				_
- 4 -										
- 6 -										
- 8 -										
_ 10 _										
12										
14 -										
18										
- 20 -										
- 22 -										
- 24 -										
26										
- 28 - - 30 -										
- 32 -										
- 34 -										
- 36 -										
- 38 -										
40										
- 42 - - 44 -										
- 46										
- 48 -										
- 50 -										
- 52 -										
54										
56 - 58										
- 60 -										
- 62 -										
_ 64 _					65.0					
66					<1 ii	nch of recovery	eny fine to fin	ne; wet; loose; 10YR 4/2 dark grayish brown		
68					:	ny gradou oz 1112, vi	cry mic to mi	10, Wot, 10000, 10111 4/2 daily grayion brown		
70 - 72 -			SP		;					
- 74 -										
76					76.0			1. (1. )		
							End	d of boring at 76.0 ft. bgs.		
		Remarks:	Boring Te	erminated (ft):	76.0					
800	colution Cons LaSalle Ave,	Suite 500								

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Reso	ut	tio	n
Consi	ılt	ar	nts

BORING #: IW-2
Sheet 1 of 4

Client: Department of the Navy		Logged By: MM
Location: NIROP, Fridley MN	Northing: Easting:	Drilling Company: Mateco Well Drilling
Project #: 60276080	Ground Elevation (msl):	Hole Size (in): 2 IN
<b>Start Date:</b> 12/17/2015	Drilling Method: Sonic	Water Level (ft): 33
Finish Date: 12/21/2015	Drill Rig Type: Roto Sonic Mini Geoprobe	Total Depth (ft): 76.0

Oepth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic	Soil Description Classification Scheme: USCS	Soil Lab Sample Collection Depth
Ü					SILTY SAND; very fine to coarse sand; little clay; cohesive; little fine gravel; subround to subangular; moist; medium dense; 2.5Y 2.5/1 black	
-						
2						
	20	132.2				
4			SM			
		76.7	Sivi			
6						
		28.5				
		19.0				
8	100	7.5			3.5	
		4.4		9/9/9/9/9	well graded SAND; very fine to coarse; trace fine gravel; subround to subangular; moist; loose; 2.5Y 5/2 grayish brown @15' bgs: trace cobble (up to 3.5" in size); round	
10		1.4			e 15 bgs. trace couble (up to 3.5 in size); round	
				/*/*/*/*/*/*/*/*/*/*/*/*/*/*/*/*/*/*/*		
12		1.3		<i></i>		
	40		O	/_/_/		
14			SW			
		1.3				
h -		0.3		<i>y</i> . <i>y y</i> . <i>y</i>		
16		0.0				
				<b>7. 1. 1. 1. 1. 1. 1. 1. 1</b>		
18	100	0.0		///1	well graded SAND; very fine to coarse sand; trace silt; trace cobble (up to 3.5" in size); round; moist; loose; 2.5Y 5/3 light olive brown	
10	. 30	0.0			round; moist; loose; 2.5Y 5/3 light olive brown	
<b> </b>		0.0	SW	/ / / / / / / / / / / / / / / / / / /		
20				2	20.0	

Remarks:

Boring Terminated (ft): 76.0

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20's, windy, cloudy

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BORING #: IW-2

Co	<u>nsulta</u>	<u>ants</u>				struction Log	Sheet 2 of 4
Client	Department	t of the Navy		_		Logged By: MM	
Locati	on: NIROP,	Fridley MN		Northing:	Easting:	Drilling Company: Mateco Well D	rilling
Projec	t #: 6027608	30		Ground Elevat	ion (msl):	Hole Size (in): 2 IN	
Start D	Date: 12/17/2	2015		Drilling Method	d: Sonic	Water Level (ft): 33	
Finish	<b>Date:</b> 12/21	/2015		Drill Rig Type:	Roto Sonic Mini Geoprobe	Total Depth (ft): 76.0	
Depth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic	Cla	Soil Description ssification Scheme: USCS	Soil Lab Sample Collection Depth
20		0.0			LEAN CLAY; medium plastici	ty; some silt; little fine to coarse sand; trace fine grave st; 2.5Y 4/1 dark gray	
		0.1			Subfound to Subangular, mois	s, 2.31 4/1 dain gray	
22		0.2					
	100	0.0					
		0.1					
24							
		0.0					
		0.0					
26		0.0					
	100	0.0					
28	100	0.0					
		0.0					
30		0.0	CL				
-		0.0					
32	100	0.0					
⊦		0.0					

Remarks:

0.0

0.0

0.0

0.0

0.0

0.0

Boring Terminated (ft): 76.0

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100

36

38

40

20's, windy, cloudy

well graded SAND; very fine to coarse sand; with fine to coarse gravel; subround to

Reso	lut	ior	)
Consi	ılt	an	ts

BORING #: IW-2

Co	nsulta	ants	ı	buring	ann	u wen const	ruction Log	Sheet 3 of 4
	Department						Logged By: MM	
Location	on: NIROP, I	Fridley MN		Northing:		Easting:	Drilling Company: Mateco Well Drilling	g
	t #: 6027608			Ground Elev	ation (r		Hole Size (in): 2 IN	
	)ate: 12/17/2			Drilling Meth			Water Level (ft): 33	
	Date: 12/21					o Sonic Mini Geoprobe	Total Depth (ft): 76.0	_
	Dato: 12,21,	,2010		Dimiting Typ	1. 1101	o como mini ocoproso	Total Dopul (i.y. 10.0	ء
Oepth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic		Classif	Soil Description ication Scheme: USCS	Soil Lab Sample Collection Depth
40		0.0	SW	•/•/•/•/•/•/		subangular; some silt; wet; loose; 2		
			SW		41.0	well graded SAND; very fine to coa subangular; some silt; wet; loose; 2	rse sand; with fine to coarse gravel; subround to 2.5Y 3/2 very dark grayish brown	
42		0.0		**************************************			rse sand; some fine to coarse gravel (up to 2" in size); t; loose; 2.5Y 3/2 very dark grayish brown	;
	100	0.0						
l		0.0						
44		0.0		<u>/////</u>				
		0.0		<u> </u>				
46		0.0		<u> </u>				
	100	0.0						
48	100	0.0						
		0.0						
50				**************************************				
			sw	/• <u>•</u> /•/•/•/•/				
				<u> </u>				
52		0.0		<u> </u>				
	40	0.0			1			
⊦	10			7777				
54				<u> </u>				
		0.0		<u> </u>	1			
				//////	1			
				7777				
56		0.0		<u> </u>				
		0.0		<i>/</i> /				
<b>├</b> ┤				<b>/</b>	-			
58	60	1.0		/ / / / /	]			
				/ · · / · / · / · /				
[		1.1		1/1/1/1/1/	1			
60				7.0	60.0			
		Remarks:	Borina Te	erminated (ft):	76.0			
Res	solution Cons		]		•			

Resolution Consultants 800 LaSalle Ave, Suite 500 Minneapolis, MN 55402 Phone: (612) 376-2000 Fax: (612) 376-2271

20's, windy, cloudy

Resol	u <sup>-</sup>	tio	n
Consi	ıl·	tar	nts

BORING #: IW-2
Sheet 4 of 4

Client: Department of the Navy		Logged By: MM		
Location: NIROP, Fridley MN	Northing: Easting:	Drilling Company: Mateco Well Drilling		
Project #: 60276080	Ground Elevation (msl):	Hole Size (in): 2 IN		
<b>Start Date:</b> 12/17/2015	Drilling Method: Sonic	Water Level (ft): 33		
Finish Date: 12/21/2015	Drill Rig Type: Roto Sonic Mini Geoprobe	Total Depth (ft): 76.0		

Depth (ft bgs)	Recovery (percent)	PID (ppm)	USCS Code	Graphic	Soil Description Classification Scheme: USCS	Soil Lab Sample Collection Depth
					No recovery	
-						
62						
	0					
-	0					
64						
-						
66						
-						
68	0					
70						
72						
	0					
74						
,-						
-						
76					76.0_	
	0				End of boring at 76.0 ft. bgs.	

Remarks:

Boring Terminated (ft): 76.0

Resolution Consultants 800 LaSalle Ave, Suite 500 Minneapolis, MN 55402 Phone: (612) 376-2000 Fax: (612) 376-2271 20's, windy, cloudy

Resol	ution
Consi	iltants

BORING # IW-3

Consultants	Boring	and Well Const	ruction Log	eet 1 of 1
Client: Department of the Navy			Logged By: MM	
Location: NIROP, Fridley MN	Northing:	Easting:	Drilling Company: Mateco Well Drilling	
Project #: 60276080	Ground Eleva	ation (msl):	Hole Size (in): 2 IN	
Start Date: 12/18/2015	Drilling Meth	od: Sonic	Water Level (ft): 33	
Finish Date: 12/21/2015	Drill Rig Type	e: Roto Sonic Mini Geoprobe	Total Depth (ft): 76.0	
Depth (ft bgs) Recovery (percent) PID (ppm)	Graphic	S Classifi	Soil Description Collection Depth	
0 - 2 -		Blind drill to 60' bgs		
- 4 - 6 - 6 - 8 - 10 - 12 - 14 - 16 - 18 - 20 - 22 - 24 - 26 - 28 - 30 - 32 - 34 - 36 - 38 - 40 - 42 - 44 - 46 - 48 - 50 - 55 - 55 - 54 - 56 - 58 - 60 - 62 - 64 - 66 - 68 - 70 - 70 - 70 - 70 - 70 - 70 - 70 - 7		60.0 No recovery		
- 72 - - 74 -				
76		76.0	Lathering 170 0 to b	
		End	d of boring at 76.0 ft. bgs.	
Resolution Consultants 800 LaSalle Ave, Suite 500 Minneapolis, MN 55402 Phone: (612) 376-2000	erminated (ft): 7	76.0		

Fax: (612) 376-2271

WELL OR BORING LOC County Name Anoka		. AND E	OR	EPARTMENT OF HEALTH  RING SEALING RECORD  Statules, Chapter 1031  Minnesota Well and Boring Sealing No. Ninnesota Unique Well No. Or Westerlas No. Chew Blank Inclinement	
Township Name Towns Fridley 30	hip No. Range No. 24	Section No. E	Fraction (sm. NW NW		Date Sealed Date Well or Boring Constructed 5-18-16
	degrees	minutes_	seco		Depth Before Sealing Low It Original Depth Low It.  AQUIFER(S)  Single Aquifer Multiaquifer  Static Water Level
Numerical Street Address or 4800 E River Rd, F	ridley MN 55	421			WELL/BORING  Measured  Estimated Date Measure.  Discrete Date Measure.
Show exact location of well in section grid with "X."	or boring	location, si	p of well or l howing prop is, and buildi	erty	□ Env. Bore Hole □ Other □ Ab t. □ below □ above land surface  CASING TYPE(S)
W S I Mile	A Mile (1)	875'	15twa   181   8		Steel   Plastic   Tile   Other
PROPERTY OWNER'S NAM NAVFAC - Midlan Property owner's mailing addres 9324 Virgina Ave Norfolk, VA 23511	t		indicaled abov	е	CASING(S) Diameter  Depth Set in oversize hole? Annular space initially grouted?  In from  Lo  Fit.  Yes No  Yes No  Unknown  Unknown
WELL OWNER'S NAME/CON					SCREEN/OPEN HOLE Screen from 6 to 66 ft. Open Hole from tott.
Well owner's mailing address if	different than property	owner's address i	indicated abov	е	OBSTRUCTIONS  Rods/Drop Pipe Check Valve(s) Debris Fill No Obstruction  Type of Obstructions (Describe)
GEOLOGICAL MATERIA	COLOR	HARDNESS OF	R FROM	то	Obstructions removed?
II not known, indicate estima	Gray	rom nearby well	or boring.	ī	Type
SandEgrave	. D	14		IU	Removed Not Present Other  METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:
Sand	1	5	14	06	No Annular Space Exists Annular Space Grouted with Tremie Pipe Casing Perforation/Removal in, from the Company of the Casing Perforated Removed In, from the Company of the Casing Perforated Removed Removed
					Type of Perforator
					GROUTING MATERIAL(S) (One bag of cement = 94 lbs., one bag of bentonite = 50 lbs.)
		-	+	_	Grouting Material New Center Iron to 66 It yards bags
					from to ft bags
					from to ft bags
REMARKS, SOURCE OF D	ATA DIFFICULTIF	S IN SEALING			OTHER WELLS AND BORINGS  Other unsealed and unused well or boring on property?  Tyes  No How many?
ALMANIA, SOUNCE OF D	AIA, DII FICOLITE	S IN SEMENTS			LICENSED OR REGISTERED CONTRACTOR CERTIFICATION This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.
					License or Registration No.  License or Registration No.  Certified Representative Signature  Cartified Rep. No.  Date
MININ, DEPT OF HEAL	TH COPY				Name of Person Sealing Well or Boring

WELL OR BORIN County Name Anoka	NG LOCATIO	N		AND	BOR	PARTMENT OF HEALTH ING SEALING RECORD Statutes, Chapter 1031  Minnesota Well and Boring Sealing No. Minnesota Unique Well No. or W-series No. (Laws blackfill and worm)  814339282  814760				
Township Name	Township No	Range No.	Section No. Fra							
Fridley	30	24		IW NW		16 S-18-16 9-2-15				
GPS	alilude	degrees		sec		Depth Before Sealing (a) It. Original Depth (a) IL.  AQUIFER(S) STATIC WATER LEVEL				
Numerical Street Add				Location		Single Aquiller Multiaquiller WELL/BORING Measured Estimated Date Measure				
4800 E River	. 0000000	-/	77.75.	of well as	Sea de a	Water-Supply Well Monit, Well 18				
Show exact location in section grid with "	or well or born X."	ua K	Sketch map location, sho lines, roads,	or well or wing prop and build	perty lings.	□ Env. Bore Hole □ Other □ tt. □ below □ above land surface  CASING TYPE(S)				
		25,	/ 51st	wa	У	Steel Plastic Tile Other WELLHEAD COMPLETION				
w iii		ET	- 11-12-1		Τ,	Outside: Well House At Grade Inside: Basement Offset				
-	+++	1 (00)		118	501	☐ Pitless Adapter/Unit ☐ Buried ☐ Well Pit				
	i i i i i	1 ,/		$\sqrt{}$		□ Well Pit				
	Mile —		\865 >	0		Other				
PROPERTY OWNER	'S NAME/CON	MPANY NAME	1			CASING(S)				
NAVFAC - N Property owner's mailin		erent than well le	ocation address inc	dicated abo	ive	Diameter Depth Set in oversize hole? Apprular space initially grouted?  To Yes No Yes No Unknown				
9324 Virgina Norfolk, VA 2						in, from loft.				
itoriom, vit z						in, from toft.				
WELL OWNER'S NA	ME/COMPANY	NAME				SCREEN/OPEN HOLE				
Same Well owner's mailing ad	ddress if differen	t than property o	owner's address inc	dicated abo	ove	Screen from to to Color to Open Hole from to ft.				
						OBSTRUCTIONS				
						Rods/Drop Pipe Check Valve(s) Debris Fill I No Obstruction				
				1		Type of Obstructions (Describe)				
GEOLOGICAL MA		COLOR	HARDNESS OR FORMATION	FROM	то	Obstructions removed?				
If not known, indicat	L. T	0.	m nearby well o	r boring.	ī	Туре				
Concre		Oray	IT.	10		Removed Not Present Other				
Sanazu	(rave)	Brn	5_	1/_	13	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:				
Sound		<u> </u>	5	13	66	□ No Annular Space Exists □ Annular Space Grouted with Tremie Pipe □ Casing Perforation/Removal  in, from □ to □ Perforated □ Removed				
						in, from VVIII 96 VVIII II. Perforated Removed				
						Type of Perforator				
						Other				
						GROUTING MATERIAL(S) (One bag of cement = 94 lbs., one bag of bentonite = 50 lbs.)				
						Grouting Material Neut Cementrom 0 to 66 h yards / bags				
						from to ft yards bags				
						from to ft yards bags				
						OTHER WELLS AND BORINGS				
REMARKS, SOURC	E OF DATA, I	DIFFICULTIES	IN SEALING			Other unsealed and unused well or boring on property? 🗖 Yes 🔯 No How many?				
						LICENSED OR REGISTERED CONTRACTOR CERTIFICATION This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.				
						License or Registration No.				
						Certified Representative Signature Certified Rep. No. Date				
MINN, DEFT OF	F HEALTH C	OPY				Name of Person Sealing Well or Boring				

County Name WELL AND BORI					ING SEALING RECORD Sealing No. Minnesota Well and Boring Sealing No. Minnesota Unique Well No. or W-series No. Cleave blink in not known.
Township Name Township II Fridley 30	No. Range No.	Section No. Fra	ction (sm		Date Sealed 5-18-16 Date Well or Boring Constructed 9-2-15
uro	degrees				Depth Before Sealing 75 n. Original Depth 75 n.  AQUIFER(S) STATIC WATER LEVEL
Numerical Street Address or Fire 4800 E River Rd, Frid			Location		Single Aquifer ☐ Multiaquifer  WELL/BORING ☐ Estimated Date Measure
Show exact location of well or bo		Sketch map of	of well or	boring	□ Water-Supply Well ■ Monit, Well □ Env. Bore Hole □ Other □ Other □ above land surface
in section grid with "X,"	30	location, show lines, roads,	wing prop	erty	Env. Bore Hole CASING TYPE(S)
3 / 5/stway					WELL GEAD COMPLETION Outside: Well House At Grade Inside: Basement Offset Pitless Adapter/Unit Buried Well Pit Well Pit
\$	<b>-</b> , 	( /	0		Other
PROPERTY OWNER'S NAME/CC NAVFAC - Midlant Property owner's mailing address if d 9324 Virgina Ave Norfolk, VA 23511		ocation address indi	icaled abo	ve	CASING(s)         Depth         Set in oversize hole?         Annular space initially grouted?           Diameter         Depth         Set in oversize hole?         Annular space initially grouted?           in. from         to         Tt         Yes         No         Yes         No         Unknown           in. from         to         ft         Yes         No         Yes         No         Unknown
WELL OWNER'S NAME/COMPAR Same Well owner's mailing address if differ		aumor's addrage ind	inated abo	1/0	SCREEN/OPEN HOLE           Screen from         to
well owner's maining address if differ	ent man property i	ywners audiess ind	icated auc	ve	OBSTRUCTIONS  ☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☑ No Obstruction  Type of Obstructions (Describe)
GEOLOGICAL MATERIAL	COLOR	HARDNESS OR FORMATION	FROM	то	Obstructions removed?  Yes No Describe
If not known, indicate estimated	formation log fro		boring		PUMP
topsoil	BIR	5	0	4	Type Removed Not Present Other
Sand garevel	Bon		4	10	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:
Sand			10	20	□ No Annular Space Exists □ Annular Space Grouted with Tremie Pipe □ Casing Perforation/Removal
Clay us Sand			20	26	in from WN (SIOV) Perforated Removed
Sand	$-\psi$	V	26	77	Type of Perforator
					□ Other
					GROUTING MATERIAL(S) (One bag of cement = 94 lbs., one bag of bentonite = 50 lbs.)
					Grouting Material NEAT CEMED from to tr
					fromtobags
					from to ft yards bags
					OTHER WELLS AND BORINGS
REMARKS, SOURCE OF DATA	, DIFFICULTIES	IN SEALING			Other unsealed and unused well or boring on property?
					License or Registration No.  License or Registration No.  Certified Representative Signature  Certified Rep. No. Date
MINN, DEPT OF HEALTH	COPY				Name of Palson Sealing Well or Bering

### BANN FORMS TECHNOLOGY • 651-224-5135

WELL OR BORING LOCATION MELL AND						PARTMENT OF HEALTH Minn Seal Minn Seal Minn	esota Well and Boring ing No.	# 339284
o surry marrie							esola Unique Well No. -series No. blank il nol known)	814746
Township Name Township No. Range No. Section No. Fraction (sm. → Ig.)   Fridley   30   24   27   NW NW SE						Date Sealed 5-18-16	Date Well or Boring Constructed	9-3-15
JGPS	ıtitude	degrees	minutes_	sec	onds	70	Original Depth 75	
	ongitude		minutes_				STATIC WATER LEVEL	
Numerical Street Add 4800 E River				ng Location	,	Single Aquiter  Multiaquifer  WELL/BORING	Measured  Estimated	Date Measure
Show exact location in section grid with ".	of well or borin		Sketch may location, sh lines, loads	p of well o	boring	Water-Supply Well Monit Well  Env. Bore Hole Other	28.5 n. d below	■ above land surface
	N		lines foads	s, and build	lings.	CASING TYPE(S)		
		6	/ 51	Stul	211	Steel Plastic Tile Other		
l		2	-	1	-	WELLHEAD COMPLETION		
w		T Ø	\	101	251	Outside: Well House	e Inside: Base	ement Offset
		½ Miley	1	120		☐ Pitless Adapter/Unit	<b>□</b> Well	
	l I I I I	TN	2001	V		☐ Well Pit	☐ Burie	
1 A			1000	→ (X)		☐ Other		
PROPERTY OWNER		IPANY NAME				CASING(S)		
Property owner's mailin		erent than well f	ocalion address in	ndicated ab	ove	Diameter Depth ZCAL	Set in oversize hole	? Annular space initially grouted?  Or Yes No Unknown
9324 Virgina	Ave						/	
Norfolk, VA 2	23511					in. fromloft_	Yes No	☐ Yes ☐ No ☐ Unknown
						in, fromloft,	Yes No	Yes No Unknown
WELL OWNER'S NA	ME/COMPANY	NAME				SCREEN/OPEN HOLE		
Well owner's mailing ac	ddress if dilferent	t than property	owner's address i	ndicated ab	ove	Screen from / / to / tt.	Open Hole from	toft.
						OBSTRUCTIONS  Rods/Drop Pipe Check Valve(s)	☐ Debris ☐ Fill 🗸 i	No Obstruction
						W. J. A. C. C. C. C. C. C. C. C. C. C. C. C. C.	Deblis Hill Mi	NO ODSIFICATION
						Type of Obstructions (Describe)		
GEOLOGICAL MA	ATERIAL	COLOR	HARDNESS OF FORMATION	FROM	то	Obstructions removed?  Yes No Descr	ribe	
If not known, indicat	e estimated for	rmation log fro	om nearby well	1 4	1	Type	9	
Concier	e Le	oray	1	10	(	☐ Removed	Other	
Sandfar	avel	Brn	5	11	10	METHOD USED TO SEAL ANNULAR SPACE BET	WEEN 2 CASINGS, OR CASIN	
Sand		1		10	20		ce Grouted with Tremie Pipe	Casing Perforation/Removal
Clay wis	and			120	26	in from	n min	Perforated Removed
Samo	1	1		26	75	in, from CFC C	6 10 00 // it.	Perforated Removed
- Cerus		Ψ	-	100		Type of Perforator		
	-					Other		
	-			-		GROUTING MATERIAL(S) (One bag of	cement = 94 lbs., one bag of	bentonite = 50 lbs.)
	_		-	1-		Grouting Material NEW Cemens	t 0.75	ft. vards bags
				-		Ground Waterial Political Confee 77	107.7	, , , , , , , , , , , , , , , , , , , ,
						÷	from to	It yards bags
						f	irom to	ft yards bags
						OTHER WELLS AND BORINGS		
REMARKS, SOURC	E OF DATA, D	IFFICULTIES	IN SEALING			Other unsealed and unused well or boring on prop		many?
						LICENSED OR REGISTERED CONTRACTOR CER This well or boring was sealed in accordance with is true to the best of my knowledge.		5. The information contained in this report
						Ligensee Business Name		License or Registration No.
						4) 1/	1	
						Corlified Representative Signature	Centified Re	en No. Date
						To de la company	) Commod He	pervo. Dato
MINN, DEPT OF	F HEALTR OC	YAC				Name of Person Sealing Well or Goring	andy	

### MINNESOTA DEPARTMENT OF HEALTH Minnesota Well and Boring WELL OR BORING LOCATION Sealing No. Minnesota Unique Well No. or W-series No. (Leave blank if not known) WELL AND BORING SEALING RECORD County Name Minnesota Statutes, Chapter 1031 Township Name Township No. Range No. Section No. Fraction (sm. → Jg.) Date Sealed Date Well or Boring Constructed 5-18-16 alma) by Sen 24 12-20-15 GPS LOCATION - decimal degrees (to four decimal places) 76 Depth Before Sealing Original Depth Latitude Longitude\_ AQUIFER(S) STATIC WATER LEVEL Single Aquifer Multiaquifer Numerical Street Address or Fire Number and City of Well or Boring Location Measured Estimated Date Measured 5-18-16 WELL/BORING Water-Supply Well Monit. Well Sketch map of well or boring location, showing property lines, roads, and buildings. Show exact location of well or boring in section grid with "X." ( Other in jedioni Xbelow above land surface Env. Bore Hole CASING TYPE(S) 🕍 Steel 🗌 Plastic 🔲 Tile 🔲 Other WELLHEAD COMPLETION Outside: Well House At Grade Inside: Basement Offset Well Pit ½ Mile Buried Pitless Adapter/Unit Buried Other 6" protop Other PROPERTY OWNER'S NAME/COMPANY NAME CASING(S) NAVFAC - Middlerd Property owner's mailing address if different than w Diameter Set in oversize hole? Annular space initially grouted? 2 to 11 \_in. from\_ 💋 Yes Yes Yes ☐ No ☐ No Unknown 9324 Virginia Ave Yes ☐ No No Yes Unknown Nortalk, VA 23511 in. from Yes No Yes ☐ No Unknown WELL OWNER'S NAME/COMPANY NAME SCREEN/OPEN HOLE to 76 ft. Open Hole from Screen from Well owner's mailing address if different than property owner's address indicated above OBSTRUCTIONS Rods/Drop Pipe Check Valve(s) Debris Fill No Obstruction Type of Obstructions (Describe)\_ HARDNESS OR FORMATION GEOLOGICAL MATERIAL COLOR FROM то PUMP If not known, indicate estimated formation log from nearby well or boring. Type\_ 4 Removed X Not Present Other\_ S 4 10 METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE: No Annular Space Exists Annular Space Grouted with Tremie Pipe Casing Perforation/Removal 3 20 10 Perforated Removed S 20 26 Removed 5 240 Type of Perforator VARIANCE Was a variance granted from the MDH for this well? Yes No TN# GROUTING MATERIAL(S) (One bag of cement = 94 lbs., one bag of bentonite = 50 lbs.) exect from 0 to 76 ft. \_\_ yards\_ bags OTHER WELLS AND BORINGS REMARKS, SOURCE OF DATA, DIFFICULTIES IN SEALING Other unsealed and unused well or boring on property? Yes No How many? LICENSED OR REGISTERED CONTRACTOR CERTIFICATION This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report IW-1 Trant Wells, Inc. 1404 License or Registration No. Name of Person Sealing Well or Boring 339285 LOCAL COPY

### MINNESOTA DEPARTMENT OF HEALTH Minnesota Well and Boring WELL OR BORING LOCATION Sealing No. WELL AND BORING SEALING RECORD Minnesota Unique Well No. or W-series No. (Leave blank if not known) County Name 818602 Minnesota Statutes, Chapter 103I Range No. Section No. Fraction (sm. → lg.) Date Sealed Date Well or Boring Constructed Township Name NW NV 4 GE 4 5-18-16 12-18-15 GPS LOCATION - decimal degrees (to four decimal places) 710 ft. Original Depth Depth Before Sealing\_ \_\_ Longitude\_ AQUIFER(S) STATIC WATER LEVEL Single Aquifer Multiaquifer Numerical Street Address or Fire Number and City of Well or Boring Location Measured Estimated Date Measured WELL/BORING 4800 E. River Rd. Water-Supply Well Monit. Well Sketch map of well or boring location, showing property lines, roads, and buildings. Show exact location of well or boring in section grid with "X." 38.5 ft. Skbelow above land surface Other In Local Env. Bore Hole CASING TYPE(S) Steel Plastic Tile Other WELLHEAD COMPLETION Outside: Well House At Grade Inside: Basement Offset ☐ Well Pit Buried Pitless Adapter/Unit Buried Other 6" protop Other PROPERTY OWNER'S NAME/COMPANY NAME CASING(S) MAVFAC - Midlant Property owner's mailing address if different than well location address indicated above Diameter Set in oversize hole? Annular space initially grouted? a\_\_ in. from\_\_ O to 7/ ft. X Yes ☐ No X Yes ☐ No Unknown 9324 Virginia Ave. Yes No Yes □No Unknown Norfilk, VA 23511 \_\_\_ to\_\_\_\_ in. from\_\_ Yes Yes ☐ No ☐ No Unknown WELL OWNER'S NAME/COMPANY NAME SCREEN/OPEN HOLE Sance to 76 ft. Open Hole from\_ Screen from Well owner's mailing address if different than property owner's address indicated above OBSTRUCTIONS Rods/Drop Pipe Check Valve(s) Debris ☐ Fill No Obstruction Type of Obstructions (Describe) HARDNESS OR Obstructions removed? Yes No Describe GEOLOGICAL MATERIAL COLOR FROM то PUMP If not known, indicate estimated formation log from nearby well or boring ▼ Not Present Removed Other\_ 4 10 Sand Lexavel METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE: Annular Space Grouted with Tremie Pipe Casing Perforation/Removal 26 10 Perforated Removed 20 26 Perforated Removed 26 76 Type of Perforator Was a variance granted from the MDH for this well? Yes No TN#\_ (One bag of cement = 94 lbs., one bag of bentonite = 50 lbs.) Grouting Material Mat Coment from 0 to 76 ft. yards OTHER WELLS AND BORINGS REMARKS, SOURCE OF DATA, DIFFICULTIES IN SEALING LICENSED OR REGISTERED CONTRACTOR CERTIFICATION This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge. Mark 5 Trant Wells, Inc. 1404 License or Registration No. IW-2 339286 Name of Person Sealing Well or Boring

LOCAL COPY

### MINNESOTA DEPARTMENT OF HEALTH Minnesota Well and Boring 339287 WELL OR BORING LOCATION Sealing No. **WELL AND BORING SEALING RECORD** Minnesota Unique Well No. or W-series No. (Leave blank if not known) County Name 818603 Minnesota Statutes, Chapter 1031 Township Name Range No. Section No. Fraction (sm. → Ig.) Date Sealed Date Well or Boring Constructed JP1/10/2012 1/2 5-18-16 12-19-15 GPS LOCATION - decimal degrees (to four decimal places) 16 76 Original Depth\_\_\_ Depth Before Sealing Latitude \_\_\_ Longitude\_ AQUIFER(S) STATIC WATER LEVEL Single Aquifer Multiaquifer Numerical Street Address or Fire Number and City of Well or Boring Location 4800 E. River Rd. Fridley Measured Estimated Date Measured\_ WELL/BORING Water-Supply Well Monit. Well Show exact location of well or boring in section grid with "X." Other in webs Sketch map of well or boring location, showing property lines, roads, and buildings. 28.5 ft. ⊠ below □ above land surface Env. Bore Hole CASING TYPE(S) X Steel Plastic Tile Other WELLHEAD COMPLETION Outside: Well House At Grade Inside: Basement Offset Well Pit Buried Pitless Adapter/Unit Buried Other 6" protop Other\_ PROPERTY OWNER'S NAME/COMPANY NAME NAVFAC - Midlant Property owner's mailing address if different than well location address indicated above Diameter Set in oversize hole? Annular space initially grouted? X Yes ☐ No X Yes ☐ No Unknown 9324 Virginia Ave Yes Yes Yes No No Unknown Norfolk, VA 23511 \_\_\_ to\_\_\_\_\_ft. Yes Yes ☐ No Yes Yes ☐ No Unknown WELL OWNER'S NAME/COMPANY NAME SCREEN/OPEN HOLE 11 to 16 ft. Open Hole from Screen from\_ Well owner's mailing address if different than property owner's address indicated above OBSTRUCTIONS Rods/Drop Pipe Debris Fill Type of Obstructions (Describe) HARDNESS OR FORMATION Obstructions removed? Yes No Describe **GEOLOGICAL MATERIAL** COLOR FROM то If not known, indicate estimated formation log from nearby well or boring. Removed X Not Present Other\_ S 4 METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE: No Annular Space Exists Annular Space Grouted with Tremie Pipe Casing Perforation/Removal 20 10 Perforated Removed Clay/Sand 20 Removed 26 Type of Perforator VARIANCE Was a variance granted from the MDH for this well? Yes No TN# (One bag of cement = 94 lbs., one bag of bentonite = 50 lbs.) Grouting Material Neat Centert from 0 to 76 ft. yards OTHER WELLS AND BORINGS REMARKS, SOURCE OF DATA, DIFFICULTIES IN SEALING Other unsealed and unused well or boring on property? Yes X No How many? LICENSED OR REGISTERED CONTRACTOR CERTIFICATION This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge. Mark Trant Wells, Inc. 14/04 Consea Business Name License or Registration No. 589 1-7-16 TW-3 Name of Person Sealing Well or Boring 339287 LOCAL COPY

Appendix D

Monitoring and Injection Well

Construction Forms

Ñ	WELL OR BORING LOCATION					DEPARTMENT OF HEALTH	MINNESOTA UNIQUE WELL AND BORING NO.			
L	County Name		WELL A		G CONSTRUCTION RECORD 818601					
ļ	Anoka	No.   Dance No.	Costing No.   Gra			WORK COMPLETED				
	Frdicy Township I	3.	Section No. Fra	ction NW	SE	76 n. 1	I - 20-15			
Ì	GPS LOCATION —decimal degrees (to	four decimal places).	100		DRILLING METHOD  Cable Tool  Driven					
	Latitude 45 3 19 Lo	ngitude <u>93 14 +</u>	3	(in	Auger Rotary					
١	E TOTAL PROPERTY.				DRILLING FLUID WELLH	YDROFRACTURED? ☐ Yes M No				
ŀ	Not Assigned to Show exact location of well/boring in se	ction and with "X."		well/boring	WATER From_	ft. Toft.				
ı	STOP BABLI ISCALIO V	cuon gaig with 74.	Sketch map of Sh roads, bui	owing prope Idings, and	rty lines, direction.	USE Domestic Monitoring	☐ Heating/Cooling			
ı		V E E			Noncommunity PWS Environ. Born					
1	- X	/ 5	4		Community PWS Irrigation	Remedial				
١	- W	-/ 51	1		☐ Elevator ☐ Dewatering  CASING MATERIAL ☐ Drive Shoe? ☐	Ves TNO HOLE DIAM.				
		P. C.				Steel Threaded	Welded			
	12.8	dile 💆	2080	1		Plastic				
1		06	ö				pecifications			
ı	1 Mile	235				2 in. To 7/ tt. 3.65 lbs./ft.	SCH 40 6 in. To 76 tt.			
	PROPERTY OWNER'S NAME/COMPA	NY NAME	3 3 3	TENNO S		in. Toftlbs./ft.	in. Toft.			
	NAVFAC-MI					in. To tt. lbs./tt.				
	Property owner's mailing address if diffe		address Indicated	above.	v	SCREEN	We will see a second			
Č.	9324 Virgin	is Ave				Type 304 Strinks	m tt. To tt.			
6	Norfolk VA,					Slot/Gauze 10	Length 5			
	MOI HOIK ALL	23311					FITTINGS NAT (ACK COURT			
Į,						STATIC WATER LEVEL	Measured from ToC			
ĺ	WELL OWNER'S NAME/COMPANY NA	AME		4						
	NAVFAC-MID					NA It. after	hrs. pumping g.p.m.			
	Well/boring owner's mailing address if		owner's address ind	licated abov	9.	WELLHEAD COMPLETION				
	Service of the last of X					Pitiess/adapter manufacturer  Casing protection 6 Stc 3 9b~	Model			
	J. 15.1					At-grade  Well House  Hand Pump GROUT INFORMATION (specify bentonite, cement-sand, neat-cement, concrete, cuttings, or other) Material West - Comparison To  tt. Yds. Regs				
-		= 1 Vasti 10		1						
N.						Material From To	tt. Yds. Bags			
			HARDNESS OF			Material From To	tt. Yds. Bags			
	GEOLOGICAL MATERIALS	COLOR	MATERIAL	FROM	то	Driven casing seal From To	Bags			
		0	S		.,	NEAREST KNOWN SOURCE OF CONTAMINATION				
	lopsoil	Black	>	0	4		type			
	Soud Gravel	Q.	5	4	10	Well disinfected upon completion? Yes No				
	-and staves	Brown			10	Not installed Date installed				
	Sand	Brown	5	10	20	Manufacturer's name				
						Model NumberHF				
11	Clar W/ Sand	Brown	5	20	26	Length of drop pipef				
		0	5	76	77	Type: Submersible L.S. Turbine Reciprocating				
i.	Sand	Brown		20	1 /	ABANDONED WELLS				
					12	Does property have any not in use and not sealed well(s	s)? Yes No			
				T		Was a variance granted from the MDH for this well?	Vec No TN#			
						WELL CONTRACTOR CERTIFICATION				
						This well was drilled under my supervision and in according the information contained in this report is true to the be-	dance with Minnesota Rules, Chapter 4725. est of my knowledge.			
	Use a sec REMARKS, ELEVATION, SOURCE OF	cond sheet, if needed. F DATA, etc.				and the second s				
						MATECO Dilling Co.	1586m			
					Licensee Business Name	Lic. or Reg. No.				
	IW-					SDS ITH	1045 M 12-24-15			
	LW					Certilled Representative Signature	Certified Rep. No. Date			
		- 7				2.0				
	IMPORTANT - FILE WITH PROPERT	TY PAPERS WELL O	WNER COPY	100	01	John Pitsch				
	ID #52603	- 3	8	186	OT	Name of Driller	HE-01205-15 (Rev. 8/13)			

WELL OR BORING LOCATI	ON	1			DEPARTMENT OF HEALTH MINNESOTA UNIQUE WELL AND BORING NO.
County Name	er tu man er e	WELL A			G CONSTRUCTION RECORD 818602
Anoka		David At 1		mmesot	
Township Name Tow	70 Range No.	177 N	Section No.	J SE	WELL/BORING DEPTH (completed)  DATE WORK COMPLETED  1.   2 -   8 - / 5
GPS LOCATION — decimal degr	rees (to four decimal places).		A 76	н	DRILLING METHOD
Latitude 45.0553	Longitude 93	1783			Cable Tool Driven Auger Rotary
House Number, Street Name, Cli	The second second		E-11		DRILLING FLUID   WELL HYDROFRACTURED?   Yes AND
Show exact location of well-both		Sketch map o	well/boring	location.	water From the To the
N	* * * * * * * * * * * * * * * * * * * *	roads, bu	lowing propi ildings, and	direction.	USE Domestic Monitoring Heating/Cooling
					Noncommunity PWS Environ. Bore Hole Industry/Commercial
		51st Way			Community PWS Irrigation Remedial  Elevator Dewatering
W	ET 2 -	10 mars	nyah		CASING MATERIAL Drive Shoe? Yes No HOLE DIAM.
		2095			Steel Threaded Welded
	's Mile	-> Ø			Plastic CASING
S S	ij 33	4			Diameter Weight Specifications
1 Mile	٦				2 in To 71 ft. 3.65 lbs/ft. SCH YO 6 in To 76 ft
PROPERTY OWNER'S NAME/O	OMPANY NAME	-1-90-1		-	in. To ft. lbs./ft. in. To ft
	MIDLANT				in. To t. ibs./ft. in. To ft  SCREEN Var OPEN HOLE
Property owner's mailing address	SE E A	n address indicated	above.		Make From ft. To ft
9324 Vin					Type 304 Structess Diam. 3"
Nor Folk V	A, 23511				Slot/Gauze 1() Length 5' Set between 71 tt. and 76 tt. FITTINGS NPT (sccssed Guel
Tee Till Avente	Richard Rec				STATIC WATER I EVEL
					33 tt. Below Above land surface Date measured 12 2015
WELL OWNER'S NAME/COMP/	ANY NAME	S. (2) (2)	3:30	10 10 10 10 10 10 10 10 10 10 10 10 10 1	PUMPING LEVEL (below land surface)
NAVFAC- W	MIDLANT		Total Vision	- 2	N/A tt. after hrs. pumping g.p.m
Well/boring owner's mailing addr	ess if different than property	owner's address inc	dicated above	е.	WELLHEAD COMPLETION
THE "HILL HER F			COM C		☐ Pitless/adapter manufacturer Model ☐ Casing protection ☐ 51col 3 should grade ☐ 12 In. above grade
					At-grade Well House Hand Pump
1					GROUT INFORMATION (specify bentonite, cement-sand, neat-cement, concrete, cuttings, or other)  Material On A Concent From 1 To 67 ft. G Yds. X Bags
					Material From To th. Yds. Bags
		HARDNESS OF			Material From To tt. Yds. Bags
GEOLOGICAL MATERIAL	S COLOR	MATERIAL	FROM	то	Oriven casing seal From To Bags
T	Black	5	0	4	NEAREST KNOWN SOURCE OF CONTAMINATION  // A- feel direction type
lopsoil	Olgan	2			Well disinfected upon completion? Yes NO No
Sand Gravel	Brown	S	4	10	PUMP
- WIN BIRDET			1 3	9	Not installed Date installed
Sand	Brown	5	10	20	Manufacturer's name
	. 0	1342		0.1	Model Number HP Volts
Clay W/ Sand	Brown	5	90	96	Length of drop pipe tt. Capacity g.p.m
6 1	Brown	5	21	76	Type: Submersible L.S. Turbine Reciprocating Jet
Sand	01000	3	26	10	ABANDONED WELLS
	2500.00				
The state of the s	7				Does property have any not in use and not sealed well(s)?   Yes  No
	Z L	-			VARIANCE
					Was a variance granted from the MDH for this well? Yes TN#
		4			Was a variance granted from the MDH for this well? Wes TN#
	e a second sheet, if needed.	•	2		Was a variance granted from the MDH for this well? Yes TN#
Us.		•			Was a variance granted from the MDH for this well?  WELL CONTRACTOR CERTIFICATION This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.
					Was a variance granted from the MDH for this well?  WELL CONTRACTOR CERTIFICATION This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.  MATE CO 0:11:03 Co. 1586 M
REMARKS, ELEVATION, SOUR	ICE OF DATA, etc.				Was a variance granted from the MDH for this well?  WELL CONTRACTOR CERTIFICATION This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.
REMARKS, ELEVATION, SOUR					Was a variance granted from the MDH for this well?  WELL CONTRACTOR CERTIFICATION This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.  MATE CO 0:11:0 Co. 1586 M Licensee Business Name Lic. or Reg. No.
REMARKS, ELEVATION, SOUR	ICE OF DATA, etc.				Was a variance granted from the MDH for this well?  WELL CONTRACTOR CERTIFICATION This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.  MATE CO 0,111,2 Co 1586 M  Licensee Business Name Lic. or Reg. No.
REMARKS, ELEVATION, SOUR	ICE OF DATA, etc.				Was a variance granted from the MDH for this well?  WELL CONTRACTOR CERTIFICATION This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.  MATE CO 0,111,9 Co 1586 M  Licensee Business Name Lic. or Reg. No.  Certified Representative Signature Certified Rep. No. Date
REMARKS, ELEVATION, SOUR	CE OF DATA, etc.  W - Z	WILL GODY	186	:02	Was a variance granted from the MDH for this well?  West a variance granted from the MDH for this well?  West Contractor Certification This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.  MATE CO 0, 11, 1, 2, 6, 1586 M  Licensee Business Name  Lic. or Reg. No.

MINNESOTA UNIQUE WELL AND BORING NO. MINNESOTA DEPARTMENT OF HEALTH WELL OR BORING LOCATION WELL AND BORING CONSTRUCTION RECORD County Name 818603 Minnesota Statutes, Chapter 1031 Anoka DATE WORK COMPLETED WELL/BORING DEPTH (completed) Township Name Township No. Section No. Fraction Валов No. NW DE NV 2-19-1 27 Fridley 30 DRILLING METHOD GPS LOCATION decimal degrees (to four decimal places). Cable Tool
Auger
Other Driven Latitude 45 3 19 \_ Longitude \_93 House Number, Street Name, City, and ZIP Code of Well Location WELL HYDROFRACTURED? Yes W No DRILLING FLUID RNer Fridle 1.
Sketch map of well-boring location. Not Assigned Show exact location of well/boring In section grid with "X." WATER Showing property lines, roads, buildings, and direction. ☐ Heating/Cooling Monitoring Domestic Environ. Bore Hole Industry/Commercial Noncommunity PWS Community PWS ☐ Irrigation Remedial & Injection Elevator ☐ Dewatering HOLE DIAM. CASING MATERIAL Drive Shoe? Yes No Steel
Plastic 2110 ☐ Threaded ☐ Welded CASING Specifications Weight 240 in. To 71 ft. 3.65 lbs./ft. SCH 40 6 in. To 76 to - 1 Mile lbs./tt. PROPERTY OWNER'S NAME/COMPANY NAME NAV FAC - MIDLANT OPEN HOLE Nes Property owner's mailing address il different than well location address indicated above. Johnson From Virginia Ave. Type 304 5+417455 IO Length Slot/Gauze \_\_ Nor folk Mussed Corps 71\_ft. and\_ FITTINGS NOT Sal hetween STATIC WATER LEVEL TOC ft. ☐ Below Above land surface Date measured 12 - 20 - 15 WELL OWNER'S NAME/COMPANY NAME PUMPING LEVEL (below land surface) NAVFAC - MIDLANT hrs. pumping WELLHEAD COMPLETION Well/boring owner's mailing address if different than property owner's address indicated above. Model Pitless/adapter manufacturer Yds. Bags Yds. Bags HARDNESS OF FROM m **GEOLOGICAL MATERIALS** COLOR Driven casing seal NEAREST KNOWN SOURCE OF CONTAMINATION direction Well disinfected upon completion? 
Yes 
No PUMP 0 Not installed Date installed 20 Manufacturer's name Model Number \_ ft. Capacity Length of drop pipe Type: Submersible L.S. Turbine Reciprocating Jet 26 ABANDONED WELLS Does property have any not in use and not sealed well(s)? 

Yes > No VARIANCE Was a variance granted from the MDH for this well? Yes You TN#\_ WELL CONTRACTOR CERTIFICATION This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge. Use a second sheet, if needed. REMARKS, ELEVATION, SOURCE OF DATA, etc. 1586M Lic. or Reg. No. MATECO Drilling TW-3 Licensee Business Name 1045M 12-24-15 Certified Representative Signature Pitsch John IMPORTANT - FILE WITH PROPERTY PAPERS WELL OWNER COPY 818603 Name of Drille HE-01205-15 (Rev

ID #52603

MINNESOTA UNIQUE WELL AND BORING NO. MINNESOTA DEPARTMENT OF HEALTH WELL OR BORING LOCATION WELL AND BORING CONSTRUCTION RECORD County Name 759 Minnesota Statutes, Chapter 1031 WELL/BORING DEPTH (completed) Range No. Fraction DATE WORK COMPLETED Township Name Township No. Section No. ft. DRILLING METHOD GPS LOCATION - decimal degrees (to four decimal places) Cable Tool Latitude 45 Driven \_ Longitude \_ Auger Rotary House Number, Street Name, City, and ZIP Code of Well Location Other WELL HYDROFRACTURED? Yes No MAN DRILLING FLUID Sketch map of well/boring location. Showing property lines, roads, buildings, and direction. Show exact location of well/boring in section grid with "X." ft. To USE Domestic Monitoring Heating/Cooling Noncommunity PWS Environ. Bore Hole ☐ Industry/Commercial Community PWS Irrigation Remedial Elevator Dewatering CASING MATERIAL HOLE DIAM. Drive Shoe? Yes No Steel Threaded Welded Mile Plastic 1 1-11 CASING Diameter Weight Specifications 875 - 1 Mile PROPERTY OWNER'S NAME/COMPANY NAME in. To lbs./ft. in. To Manhi OPEN HOLE Property owner's mailing address if different than well location address indicated above. SCREEN Make From 6506 Namy ton Blud. Туре Diam. Slot/Gauze Length NOCO NA 23508 Set between ft. and ft. FITTINGS F STATIC WATER LEVEL Measured from ft. Below Above land surface Date measured WELL OWNER'S NAME/COMPANY NAME PUMPING LEVEL (below land surface) 606 ft after hrs. pumping g.p.m. Well/boring owner's mailing address if different than property owner's address indicated above. WELLHEAD COMPLETION Pitless/adapter manufacturer Model Casing protection\_ 12 in. above grade At-grade Well House Hand Pump GROUT INFORMATION (specify bentonite, cement-sand, neat-cement, concrete, cuttings, or other) Cm From Material | Material Bags Yds. Material From Yds. Bags HARDNESS OF GEOLOGICAL MATERIALS COLOR FROM TO MATERIAL Driven casing seal From Bags NEAREST KNOWN SOURCE OF CONTAMINATION feet direction Well disinfected upon completion? ☐ Yes 👿 No 16 PLIMP Not installed Date installed Manufacturer's name Model Number HP Length of drop pipe ft. Capacity g.p.m. Type: Submersible L.S. Turbine Reciprocating Jet ABANDONED WELLS Was a variance granted from the MDH for this well? Yes V No TN# WELL CONTRACTOR CERTIFICATION This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge. Use a second sheet, if needed. REMARKS, ELEVATION, SOURCE OF DATA, etc. Licensee Business Name Certified Representative Signature

WELL CONTRACTOR COPY

IC 140-0020

814759

MINNESOTA UNIQUE WELL AND BORING NO. MINNESOTA DEPARTMENT OF HEALTH WELL OR BORING LOCATION WELL AND BORING CONSTRUCTION RECORD County Name 814760 Minnesota Statutes, Chapter 1031 WELL/BORING DEPTH (completed) DATE WORK COMPLETED Township No. Range No. Section No. Fraction Township Name 66 30 DRILLING METHOD GPS LOCATION — decimal degrees (to four decimal places) Driven
Rotary Cable Tool \_ Longitude Auger Other House Number, Street Name, City, and ZIP Code of Well Location DRILLING FLUID WELL HYDROFRACTURED? Yes X No Sketch map of well/boring location. Showing property lines, roads, buildings, and direction. Show exact location of well/boring in section grid with "X." ft. To USE Domestic Monitoring Heating/Cooling Noncommunity PWS Environ. Bore Hole ☐ Industry/Commercial Remedial Community PWS Irrigation Elevator Dewatering CASING MATERIAL Yes No HOLE DIAM. Drive Shoe? Threaded Steel Mile Plastic CASING Diameter Specifications Weight in. To -1 Mile lbs./ft. PROPERTY OWNER'S NAME/COMPANY NAME in. To lbs./ft. Property owner's mailing address if different than well location address indicated above. OPEN HOLE SCREEN 6506 Hampton Blud Make From Type 🔰 Diam Slot/Gauze Length Norfolk, UM 23508 Set between 61 ft. FITTINGS ft and STATIC WATER LEVEL Measured from \_ft. 📈 Below 🗌 Above land surface Date measured\_ WELL OWNER'S NAME/COMPANY NAME PUMPING LEVEL (below land surface) 66 ft. after hrs. pumping Well/boring owner's mailing address if different than property owner's address indicated above. WELLHEAD COMPLETION Pitless/adapter manufacturer Model Casing protection 12 in. above grade At-grade Well House Hand Pump
GROUT INFORMATION (specify bentonite, cement-sand, neat-cement, concrete, cuttings, or other) Material Yds. Bags Material From Yds. Bags HARDNESS OF GEOLOGICAL MATERIALS COLOR FROM TO MATERIAL Driven casing seal From To Bags NEAREST KNOWN SOURCE OF CONTAMINATION Well disinfected upon completion? Yes No PUMP Not installed Date installed Manufacturer's name Model Number HP Length of drop pipe ft. Capacity g.p.m Type: Submersible L.S. Turbine Reciprocating Jet ABANDONED WELLS Does property have any not in use and not sealed well(s)? Yes K No Was a variance granted from the MDH for this well? ☐ Yes ☑ No TN# WELL CONTRACTOR CERTIFICATION This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge. Use a second sheet, if needed. REMARKS, ELEVATION, SOURCE OF DATA, etc. Licensee Business Name Lic. or Rea. No

WELL CONTRACTOR COPY

IC 140-0020

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Nome of Dellar

Certified Representative Signature

Karasch

MINNESOTA UNIQUE WELL AND BORING NO. MINNESOTA DEPARTMENT OF HEALTH WELL OR BORING LOCATION WELL AND BORING CONSTRUCTION RECORD County Name Minnesota Statutes, Chapter 103I Township Name WELL/BORING DEPTH (completed) DATE WORK COMPLETED Township No. Range No. Section No. Fraction NW DE DRILLING METHOD GPS LOCATION decimal degrees (to four decimal places). Cable Tool Driven Longitude Auger Rotary House Number, Street Name, City, and ZIP Code of Well Location y Other DRILLING FLUID WELL HYDROFRACTURED? Yes No Sketch map of well/boring location. Showing property lines, roads, buildings, and direction. Show exact location of well/boring in section grid with "X." From ft. To Domestic Monitoring Heating/Cooling Industry/Commercial Environ. Bore Hole Noncommunity PWS Irrigation Remedial Community PWS Elevator Dewatering HOLE DIAM. CASING MATERIAL Yes No Drive Shoe? Steel Threaded CASING Diameter Weight Specifications lbs./ft. PROPERTY OWNER'S NAME/COMPANY NAME in. To AC 11+1 OPEN HOLE SCREEN Property owner's mailing address if different than well location address indicated above. Make 1506 Namy to Blud Туре Slot/Gauze Norlalk UN 23508 Set between ft. and ft. FITTINGS (1456) STATIC WATER LEVEL Measured from \_ft. 🗓 Below 🗌 Above land surface Date measured\_ WELL OWNER'S NAME/COMPANY NAME PUMPING LEVEL (below land surface) ft after hrs. pumping\_ Well/boring owner's mailing address if different than property owner's address indicated above WELLHEAD COMPLETION Pitless/adapter manufacturer Model Casing protection 12 in. above grade At-grade Well House Hand Pump
GROUT INFORMATION (specify bentonite, cement-sand, neat-cement, concrete, cuttings, or other) Material Yds. Bags Material From Yds. Bags HARDNESS OF GEOLOGICAL MATERIALS COLOR FROM TO MATERIAL Driven casing seal From NEAREST KNOWN SOURCE OF CONTAMINATION Well disinfected upon completion? Yes No 10 PUMP Not installed Date installed 10 Manufacturer's name Model Number Length of drop pipe ft. Capacity g.p.m. 26 Type: Submersible L.S. Turbine Reciprocating Jet ABANDONED WELLS Does property have any not in use and not sealed well(s)? Yes X No Was a variance granted from the MDH for this well? Yes TN#\_ WELL CONTRACTOR CERTIFICATION This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge. Use a second sheet, if needed.

WELL CONTRACTOR COPY

REMARKS, ELEVATION, SOURCE OF DATA, etc.

IC 140-0020

814761

Dovyl Karasch

Licensee Business Name

MINNESOTA UNIQUE WELL AND BORING NO. MINNESOTA DEPARTMENT OF HEALTH WELL OR BORING LOCATION WELL AND BORING CONSTRUCTION RECORD County Name 814766 Minnesota Statutes, Chapter 103I WELL/BORING DEPTH (completed) DATE WORK COMPLETED Township Name Township No. Range No. Section No. Fraction NB DRILLING METHOD GPS LOCATION — decimal degrees (to four decimal places). Cable Tool Driven \_\_\_\_ Longitude \_\_\_\_\_ Rotary Auger House Number, Street Name, City, and ZIP Code of Well Location Other DRILLING FLUID WELL HYDROFRACTURED? Yes No Sketch map of well/boring location. Showing property lines, roads, buildings, and direction. Show exact location of well/boring in section grid with "X." Latel From ft. To\_ USE Monitoring Heating/Cooling Domestic Noncommunity PWS Environ. Bore Hole Industry/Commercial Community PWS Remedial Irrigation Elevator Dewatering CASING MATERIAL Yes No HOLE DIAM Drive Shoe? ☐ Welded Steel Threaded Mile N Plastic CASING Diameter Weight Specifications / lbs./ft. - 1 Mile lbs./ft. PROPERTY OWNER'S NAME/COMPANY NAME lbs./ft. in. To ft. NAVENC AHO OPEN HOLE SCREEN Property owner's mailing address if different than well location address indicated above. Make Nample Blad Blill From Type \_\ Diam Slot/Gauze Length Set between 10 ft. FITTINGS ft and STATIC WATER LEVEL Measured from \_ft. \_ Below \_ Above land surface Date measured WELL OWNER'S NAME/COMPANY NAME PUMPING LEVEL (below land surface) ft, after hrs. pumping g.p.m Well/boring owner's mailing address if different than property owner's address indicated above. WELLHEAD COMPLETION Pitless/adapter manufacturer Model Casing protection 12 in. above grade Hand Pump At-grade Well House GROUT INFORMATION (specify bentonite, cement-sand, neat-cement, concrete, cuttings, or other) Material Yds. Bags Material From To Yds. Bags HARDNESS OF GEOLOGICAL MATERIALS COLOR FROM TO MATERIAL Driven casing seal From To Bags NEAREST KNOWN SOURCE OF CONTAMINATION direction Well disinfected upon completion? Yes 📝 No PUMP Not installed Date installed Manufacturer's name Model Number HP Length of drop pipe ft. Capacity g.p.m Type: Submersible L.S. Turbine Reciprocating Jet ABANDONED WELLS Does property have any not in use and not sealed well(s)? Yes X No VARIANCE Was a variance granted from the MDH for this well? Yes No TN# WELL CONTRACTOR CERTIFICATION This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge. Use a second sheet, if needed. REMARKS, ELEVATION, SOURCE OF DATA, etc. Licensee Business Name Lic. or Reg. No.

WELL CONTRACTOR COPY

IC 140-0020

814766

Name of Driller

Certified Representative Signature

Certified Rep. No.

Appendix E
Groundwater Sample Collection
Record Forms

### A=COM

Well/Piezo ID:	
WEINT ICZU ID.	<b>^</b>
	raciii - (ii

## **Ground Water Sample Collection Record**

2057

Site Location:	1,00 02 7 608 210 Ley,	MN	ctor(s)	M.M.	-	Time: Star Finish	Date: 9 t 12 41 1 5 00	16/16	
WATER LEVEL DATA: (measured from Top of Casing)  a. Total Well Length  (5.15' c. Casing Material STEEL  b. Water Table Depth  15.78' d. Casing Diameter 2'  f. Calculated Well Volume 8.14696									
b. Acceptance Criteria defined (from workplan) - Minimum Required Purge Volume (@									
d. Field Testin  Volume Removed (gal)  1405 2.0  1410 2.5  1415 3.0  1425 4.0  1430 4.5  1430 4.5	Т	QED Spec pH (µ: 7.38   12 7.39   12 7.36   12 7.25   13 7.25   13	BLADEA C. Cond (s/cm) (03 (93 (6) (85)	ORP 9.5 15.7 29.7 40.0 485	115K MP DO mg/L 8.52 8.52 8.02 6.90 7.20 5.78	IIS79 ID 24t Turbidity (NTU)	Color CUEAR CUEAR CUEAR CUEAR CUEAR CUEAR CUEAR	Other	
e. Acceptance criteria pass/fail  Has required volume been removed  Has required turbidity been reached  Have parameters stabilized  If no or N/A - Explain below.  TURSIDITY WAS NOT MEASURED, WORK PLAN DIO NOT WILLIAGE  VOLUME REMOVED									
Sample ID Conta	niner Type	Method:		Preservation		Analysis		Time	
Comments Signature									

### A=COM

Well/Piezo ID: PMW-0

### **Ground Water Sample Collection Record**

Client: Time: Start /24/ Project No: Finish 1500 Site Location: #0's Lenay Collector(s) Weather Conds: المرافق Piezometer 🖅 WATER LEVEL DATA: (measured from Top of Casing) Well □ e. Length of Water Column <u>49.37</u> c. Casing Material a. Total Well Length d. Casing Diameter 0" f. Calculated Well Volume 8. 146 gol b. Water Table Depth **WELL PURGING DATA** a. Purge Method RLADO GR b. Acceptance Criteria defined (from workplan) - Minimum Required Purge Volume (@ \_ well volumes) - Maximum Allowable Turbidity **NTUs** - Stabilization of parameters 407Serial Number 12J 100963 c. Field Testing Equipment Used: SI 536 FIELD CABLUE d. Field Testing Equipment Calibration Documentation Found: 11579 2405 QED BLODGE BUMP Spec. Cond DO Turbidity Volume Other Time Removed (gal) T° (C) pΗ (µs/cm) mg/l (NTU) Color 20.40 2.4 t Beaut 1352 1405 1419 1409 1340 1388 1370 oreINP ON Found e. Acceptance criteria pass/fail N/A No 64 STACTED SING. Has required volume been removed W Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. WORK PLAN DID NOT INCLUDE TURBIDITY WAS NOT MEASUREP; MEASUREMENTS/ Comovia BLADD ER Method: **SAMPLE COLLECTION:** Time No. of Containers Preservation **Analysis** Sample ID Container Type SEE AFTACHED COC PMW-OL Comments

Client:	NIROP				Date: 9/10/15					
Project No:	6027608	30 .		Time: Star	1/25					
Site Location:	TRIALEZ.	ien			1210					
Weather Conds:	WINDY, 7041	Collector(s)	Millean	USEN						
	1175	()								
WATER LEVEL DATA: (measured from Top of Casing)  a. Total Well Length  C. Casing Material  (Control of Water Column 1999)  Well Piezometer Piez										
a. Total Well Leng	th <u>עסיסן</u>	c. Casing Material	1(tel	e. Length of Water C	Jolumn					
b. Water Table Depth 5.89 d. Casing Diameter 211 f. Calculated Well Volume 8.245 gal										
	WELL PURGING DATA a. Purge Method Beards Pump									
h Accer	tance Criteria defi	ned (from workplan)	•							
		ge Volume (@	_ well volumes)							
	mum Allowable Tu		NTUs							
- Stabi	lization of paramet	ers /	_%	20000 407	200295					
c. Field	Testing Equipment	Used: Make	LOOKE Fump (or Model	Serial Num						
	, <u>-</u>	45F 5560 H	UPS 556-4M	PS 125100						
		45I 556 F	TELD LABLE	12654						
d Field	Tosting Equipmen	t Calibration Document	EARD 1.75 BLA	DOER purp 1157	9 _ /					
u. Fleiu	resting Equipmen	RED BLADO	BR Pump Con	TROUGH MP10	2405					
Volu	l l	Spec. Cond	T '	DO Turbidity						
Time Remove	d (gal) T° (C)	pH (μs/cm)	ORP	mg/L (NTU)	Color Other					
1100 0.	5 16.85°	7.24 1339	-147. +	0.57 -	LT. Blan -					
1/20	16.62	7.19 1364	-142-7 -132.7	0.32 -	CLEAR -					
1175 211		7.12 1384	-125.5	0.39 -	CLEAR					
130 2.3	6.62	7.11 1384	-117.2	0.39 -	CLEAR					
·										
		<u> </u>		<u></u>						
Has ı	ptance criteria pas required volume be required turbidity be	een removed	No 	N/A ⊠ Æ						
	parameters stabili									
11	no or N/A - Explai	n below.		_	,					
	WORK PLAN	WAS NOT MEA		LIMOTOON /A	UC CLESTO IN					
SAMPLE COLLI		Method: BLAGOIS	4							
Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time					
PMW-02_		SEE ATTACHE	coc.		1/55					
			-							
51	1									
Comments				ê.						
	1 1/2	7	<del></del>		115					
Signature				Date 9/16/	13					

Well/Piezo ID: Puw 73

Client: Project No		100	1. ROP 27608	<u>م</u>			· •	Time: Star		slis	
Site Locat		IR	DLGY.	ma	<u> </u>			Finish	1610		
Weather 0	Conds: 6	uns	4 805,	Jean	Collector(s)	M. MEESU	SEN	De pto	ELPS		-
		•									1
		_			of Casing)	the 1	Well		Piezometer		
a. Total W	'ell Leng	th .	75.09	c. Ca	sing Material		e. Length	of Water (	Column 5	2.07	
b. Water	Table De	epth .	25.02	d. Ca	sing Diameter	2"	f. Calcula	ated Well V	olume <u>41</u>	.91	
WELL PU	<b>RGING</b> I a. Purge	DATA Method	d	BLADO	DER.	pup			<u> </u>		
ł	<ul><li>Minim</li><li>Maxir</li></ul>	num Re num Al	Criteria definequired Purg lowable Tur of paramet	ge Volume rbidity	(@	well volumes) NTUs %	10				
	c. Field T	esting	Equipment	Used:	SOUNST BU Make 4ST 556	Model Mps 556-	Compe 4 Mps E	Serial Num 12 J 1 12654	(07 2 <i>0</i> 1 nber <u>00963</u> t	0295	
(	d. Field	Testing	Equipmen	t Calibrati	DED Samp on Documenta EA BLADOC	ation Found:	BLADDER TROLLER	Runp	11579	5	
Time	Volu		T° (C)		Spec. Cond	ORP	DO	Turbidity	Color	Other	]
Time	Remove	u (gai)	17.47	7.46	(μs/cm) F60	-173.0	mg/L 1. 74	(NTU)	H. Brown	Other	1
1525	1.0	)	16.80	7.11	940	-132.5	0,64		clear		1
1530	1.5	,	16:70	7.06	1007	-714.3	0.60	Para.	Cher		]
1535	2	_	16.51	7.05	1044	~100.7	0.59	_	Clear		-
1540	2 - !	<u> </u>	176.45	7.05	1062-	-92.8	0.59	-	Clark		-
											1
	e. Acceptance criteria pass/fail Yes No N/A  Has required volume been removed									Romove	
SAMPLE COLLECTION: Method: Bladder Pung											
Samp	-	Conta	iner Type		Containers	Preservation		Analysis		Time	-
PMW-	3			Sec	utached	( cac				1545	4
<b>-</b>		<u> </u>				,		-			1
											1
											]
											J
Comment	s		. 17	<del>.</del>							_
Signature	a	11	14	2			Date	9/15/	7/5	Ð	-

Well/Piezo ID:	PMW-04

Client:	NIROP			_	Date: 7//5//	<u>)</u>
Project No:	6027600	6		Time: Sta	art 1344	
Site Location:	PIPLEY N	N	,,	Finis	h 1445	
Weather Conds:	way, 805	Collector(s)	4. Mariens	6/		
	<i>O</i> . ,					
WATER LEVEL D	ATA: (measured t	from Top of Casing)		Well	Piezometer K	
a. Total Well Leng	711 77		Steel	e. Length of Water	Column 50.	12
u. Total Well Long		_	. И	•		
b. Water Table D	epth <u>24.61</u>	d. Casing Diameter	7	f. Calculated Well	Volume _ 6 . / 1	<u>r</u>
WELL PURGING	DATA	1111				
a. Purge	Method	Bladder Pur	7		it	
		(for one or one of one large)				
		ned (from workplan) ge Volume (@	well volumes)			
	mum Allowable Tu		NTUs			
	ilization of paramet		%	0	1/	a -
		SOCINST BU	DOGE Pun	p Complessor Serial Nul ups 12 J 10	407 2002	73
c. Field	Testing Equipment	Used: Make	Model	Serial Nui	nber mala	
		11CT 55/2 F	ELD CARLE	12654	1	
		427 276 11	BUD GIFTUE	7900		
d. Field	Testing Equipmen	t Calibration Documents	ation Found:			
		t Calibration Documents  QED BLADDER	pump con:	ROUTER MPIO	2405	
Volu Time Remove	me	Spec. Cond pH (μs/c <u>m</u> )	ORP	DO Turbidity mg/L (NTU)		ther
1350 0.5	13/	7.17 755	-1105.5	0.79 -	Llear	II ICI
1355 10		7.11 807	-179.7	0.62	clear	
1400 1.9	16.23	7.12 818	-179.1	0.65	cler	
1405 2.	0 11,24	7-11 824	-173.7	0.60 -	Clear	
1110 2	5 14.24	7.12 827	-102-7	0.68	Clear	
1415 3.	0 16.20	7.11 827	-169.7	0.60 -	clew	
1420 3	16.22	7.12 828	-175.7	0.60 -	ileur	
e. Acce	ptance criteria pas	s/fail Y <u>es</u>	<u>No</u>	N/A		
	required volume be			<u>四</u>		
	required turbidity be parameters stabili			四		
	f no or N/A - Explai					
	TUEBIDITY W	AS NOT MEASUR	ed Work	PLAN DID NOT	INCLUDED	
		REMOULL				
SAMPLE COLL	ECTION:	Method: Bladd	1. Pump			
SAMPLE COLL	ECTION.	Welliou.	<i>y</i>			
Sample ID	Container Type	No. of Containers	Preservation	Analysis	3 Ti	ime
PMW-04		See Att.	school CO		14	125
		<u> </u>				
				-		
		1		<u> </u>		
Comments						
	1/1				,	
	. 11/2			Date 9/16	115	
Signature				Date	<del>/ ' </del>	
	$\mathcal{A}$					

Well/Piezo ID:		
TAACIMI ICZO ID.	17 44 4	
l	$\nu_{IIM}$	-01
l	r /W W	

Client: Project No: Site Location: Weather Conds: (	NOP / 60 7600 FRIOLEY LOUDS +		_Collector(s)	MELESSA 1	- Utean	Finish	Date: 9/2 rt <u>/339</u> r 1931	25/15	
WATER LEVEL DATA: (measured from Top of Casing)  a. Total Well Length  b. Water Table Depth  Well Piezometer  e. Length of Water Column 49.45  f. Calculated Well Volume 8.16									
a. Purge	well Purging DATA  a. Purge Method BLACO & Durp  b. Acceptance Criteria defined (from workplan)								
- Minir - Maxi	- Minimum Required Purge Volume (@ well volumes)  - Maximum Allowable Turbidity NTUs  - Stabilization of parameters %								
	c. Field Testing Equipment Used: Make Model Serial Number 10852  OFD SAMPLE NED 1-75" BLOOSE PLUD SIN: 471852X  OFD MISD CWTEXILE CONFIRME SIN: 471852X  d. Field Testing Equipment Calibration Documentation Found:								
d. Field	Testing Equ	ipment Calibrat	ion Document ISE 556 F	ation Found: ' IELD (ABLE	4m	14610			
Volu Time Remove			Spec. Cond		DO DO	Turbidity		Other	
Time Remove		(C) pH 32 7.185	(μs/cm) / 539	ORP -89. Z	mg/L 0.83	(NTU)	Color Ct Recui	Other	
(400) 1.0		15 7.17	1558	-73.9	2.82	_	CLEAR		
1405 1.5		02 7.17	1571	-62-5	0.75	-	CLEAR		
1410 2.0		97 7.16	1572	-52.0	0.73		CLERE		
1415 2.5	17.	98 7.17	1571	-47.9	0.109		CLEAR		
Has i Has i Have If	e. Acceptance criteria pass/fail Yes No N/A  Has required volume been removed								
	VOLUME	REMOUSE	). ′		/				
SAMPLE COLL		Method:		' '					
Sample ID	Container T		Containers	Preservation HC-L		Analysis LOC		Time / 420	
T. TOW VI	70ml VV	//	,	TILL	- 1	700		1920	
			_						
<u> </u>						<u> </u>			
Comments								1.0	
Signature									

Well/Piezo ID:	PMW-02

	Client: Project No: Site Location:	FRIDLEY,	MS NAVY  Collector(s)	Mc and	Date: 9 Time: Start <u>12:72</u> Finish <u>13:36</u> MEEUW SEN				
(		th 15.72°	from Top of Casing)  c. Casing Material d. Casing Diamete	Size	Well Piezomet e. Length of Water Column _ f. Calculated Well Volume 2.	50.1			
	b. Acceptance Criteria defined (from workplan)  - Minimum Required Purge Volume (@ well volumes)								
	- Maxi - Stabi c. Field <sup>-</sup>	mum Allowable Tur lization of paramet Festing Equipment QED Saw	Used: Make  ### ### ############################	_NTUs _% 	GED M SO WIRDUR COMPRESS Serial Number BLADGE PUTP ISN 4718	PS2K;			
	d. Field  Volu  Time Remove	DO Turbidity mg/L (NTU) Color	Other						
	1245 0 S 1250 1.75 1300 1.75 1300 1.75 1305 2.26 1310 2.75	18.09 5 17.70 17.78 17.86 18.02 48.17.93	pH (μs/cm)  7.25 /433  7.21 /459  7.19 /488  7.18 /490  7.16 /496  7.16 /496  7.17 /491	-84-6 -78-5 -57-2 -45-8 -90-6 -32-7 -25-9	1.32 - H BON 1.40 - LIEAR 1.06 - LIEAR 0.96 - CLEAR 0.93 - LIEAR 0.83 - LIEAR 0.82 - LIEAR				
	e. Acce Has r Has r Have	ptance criteria pass equired volume be equired turbidity be parameters stabili no or N/A - Explair	en removed  een reached  zed  below.	No	N/A  K  C  C  C  C  C  C  C  C  C  C  C  C				
	SAMPLE COLL	Vocume	REMOVED.  Method: BLACK		)				
PMW-02-	Sample ID	Container Type	No. of Containers	Preservation + CP	Analysis VOC	Time /320			
	Comments								
	Signature 2	4			Date 9/25/15				

Well/Piezo	ID:	PMW-01	

Client: Project No: Site Location: Weather Conds:	US WAVY	MN Collector(s)	MEUSSA		FIRISN	Date: <u>/0/</u> 1352 15/2 J	12c/15	
WATER LEVEL DA a. Total Well Lengt b. Water Table De	th 65-29	rom Top of Casing)  c. Casing Material  d. Casing Diameter	STEEL		of Water (	Piezometer Column <u>9</u> Dlume <u>8</u>	9.02	
WELL PURGING DATA  a. Purge Method  BLAGDER  Aurp — QED BLADDER Purp Controller SNF 2738  b. Acceptance Criteria defined (from workplan)  - Minimum Required Purge Volume (@ well volumes)  - Maximum Allowable Turbidity NTUs  - Stabilization of parameters %								
	esting Equipment  Testing Equipment	Used: Make <u>La Mome</u> <u>YST</u> Calibration Document	Model 2020 W.E. To SSo M.₽S ation Found:		Serial Num 471 RFW 22	1-3514	DHELD, 4' FLOWTHER	FIELDCARI U CELL
Volume Time Remove 1415 0.25 1,420 1.25 1,430 3.00 1,435 3.35	d (gal) T° (C) 17.47 17.31 17.37 11.33	Spec. Cond (μs/cm) 8·40 (761 8·34 /809 8·28 (8/4 8.21 /8/6 8·16 /8/4	ORP - 249.5 - 253.2 - 223.8 - 100.4 - 159.7	DO mg/L 1.55 0.95 0.85 0.76	Turbidity (NTU) 73 - 73 - 73 - 73 - 73	Color BLACK BLACK BLACK BLACK BLACK	Other	
Has r Has r Have If		en removed  een reached  zed  below.  DID VOT INCLU E REMOVED	No D D D D D TURBID	N/A EL EA □	FACE REM	BUT R	Eouveen	NEUTS
SAMPLE COLLE	Container Type	No. of Containers  SEE ATTAC	Preservation		Analysis		Time (440	
Comments	P1 K	9			0/26/	// (-	- 10	
Signature				Date _/	102/	<u>/</u>		

Client: Project No: Site Location: Weather Conds		27608 10154 7 (402 7 (1647	0 , M 04	Collector(s)	MEUSSA		Einich	Date: <u>/0</u> t <u>/2: /8</u> * /3:5]	126/15	
water Level a. Total Well Le b. Water Table	ength Depth	65-78′ 16-30′	c. Cas	sing Material s	Steel 2"	f. Calcula	of Water (	Piezometer Column $\underline{49}$ olume $\underline{8}$	3.4g1 3.1b	
b. Acc - Mi - Ma	ceptance t nimum Re aximum Al	Criteria defin	nea (trom ge Volume bidity	workplan) e (@	- RED BLAD - RED WELL well volumes) NTUs %			OCLER 2 DC Comp	50# 738 XESSUR ZI	SU# 2937
		Equipment		Make LA MOITE VST QED on Documenta	Model 2020 W.E. 556 M.P.S Sample peo ation Found:	TUEBLDI	1-0	nber 711-351 w zzoqu 534	HANDHE FLUNTH	en cer
Time Remo	00	T° (C) 16.84 16.74 16.84 16.85 16.85 16.85	pH 7.31 7.24 7.20 7.18 7.17 7.17	Spec. Cond (µs/cm) / ½5 / ½3 6 / ½3 1 / ½29 / ½25 / ½26	ORP -140.0 -110.2 -101.4 -75.8 -90.6 -80.9	DO mg/L 3.78 2.32 2.26 2.54 3.01 1.65	Turbidity (NTU) 16.3 7.32 5.20 3.36 2.31 1.75	COLOR LT. GRAH V. LT. GRAH CLEAR CLEAR CLEAR CLEAR	Other	
H: H:	as required as required ave param If no or I WOR De	blune	een removeen reach ized n below.	ed	NO D D DE TUBIPI DER PL	N/A N/A N/A N/A N/A N/A N/A N/A	ASUCEM	ENT RE	auwem	ENTS
Sample ID	Conta	n: iiner Type		Containers	Preservation	0,-	Analysis		Time 13: 20	
Comments	)ei	10,-				Date	10/26	115		

Well/Piezo ID:		1100
VVEIN 1620 ID.	0	~
	VNJ IN	-15
1	1000	رر

	Client: Project No: Site Location: Weather Conds:	US A41 60276080 FRIDLEY	Ollector(s)	MEUSSI	Time: Star Finish A Hetiuw	1738	
	WATER LEVEL D. a. Total Well Lengt b. Water Table De	75.06		2 STEEL	e. Length of Water of Calculated Well V		
	b. Accep - Minim - Maxir	Methodtance Criteria defi	rbidity	well volumes) NTUs	RED BLACOSER PU LED WELL WIZA LED SAMPLE PRO	1.75" BLADE	Compressed SUF Compressed SUF ZZC13. Prump SUF 1153
,		Testing Equipment	Used: Make  LA MOTTE  YSE  tt Calibration Documenta	556 MB		711-3514	ELD, Y'FIELD (ABI
1650 1655 1705	Polu Time Remove  1170 Volu Re	me od (gal) T° (C) S (S-91 DO 15-92 PO 15-90  ptance criteria pase required volume be required turbidity be parameters stabiling or N/A - Expla	Spec. Cond pH (µs/cm) 7-30 /019 7-27 /029 7-27 /029 7-27 /029 8s/fail Yes een removed een reached lized	ORP -105.80 -97.5 -96.2 -90.6	DO Turbidity mg/L (NTU) 2.21 20.8 2.37 13.5 2.49 11.15 3.10 11.4  N/A  N/A  D  D  N/A  D  D  D  D  Turbidity M74.8	CUEAR -	Other
	Sample ID PWW - 0 3	Container Type	No. of Containers	Preservation	Analysis		Fime 7/0
	Comments	110-			Date [0] ZG	15	

Well/Piezo ID: PMW -04

Client: Project No: Site Location: Weather Conds:	US NAV WZ7608 FRIPLEY	MN Collector(s)	MECESSA		Finish	Date: <u>/0/.</u> t <u>/5/8</u> _/630	26/15	
water Level D. a. Total Well Leng b. Water Table De	th <u>74.72</u>	rom Top of Casing) c. Casing Material d. Casing Diameter		f. Calcula	of Water (	Piezometer Column <u>7</u>	3.34 .15 gol	
b. Accep - Minim - Maxir - Stabil c. Field T	Method tance Criteria definum Required Purg mum Allowable Tur lization of parameto Festing Equipment	bidity ers	Model  ADDOWE  SCHOOLS	TURRID	Serial Num	ber 711-3514	5	504 2738 Ser 90# 22937 104 11534 FELD CAB
Volume Time Remove 15 40 0 25 15 45 1 00 15 50 1 7 5 1600 3, 25  e. Acceptas remove Acceptage remove Acceptage	me d (gal) T° (C) l 6.24 l 6.23 l 6.27 l 6.27 l 6.27 l 6.27 ptance criteria passequired volume be	Spec. Cond (μs/cm)  7.39 (μ9/0)  7.72 802  7.19 705 301  7.19 892  s/fail Yes en removed	ORP - 90.6 - 80.2 - 49.6	DO mg/L 2.25 1.73 1.55 1.24 1.09	Turbidity (NTU) 20 · 1 1.5 · 7 13 · 1 (0.07 7-86	Color CLEAR CLEAR CLEAR	Other	
Have	parameters stabili no or N/A - Explain	n below.  Method:  No. of Containers	Preservation ACNES CO		Analysis		Time /60S	
Comments					12/21	1,5		
Has r Have If SAMPLE COLLE Sample ID PMW-04	required turbidity be parameters stabili no or N/A - Explair	een reached			Analysis	1/15		

Well/Piezo ID:	0
	PMW-01
	77000

Client: Project No Site Loca Weather	tion: 5e	NAVY - 76080 10LEY, 10, W, NA	uN		MEUSSA M		Time: Star Finish	Date: <u>   </u> t		
a. Total W		65.77	c. Cas	of Casing) sing Material @ sing Diameter	TECL	Well 2000 e. Lengti f. Calcula	n of Water (	Piezomete Column $\underline{\mathcal{G}}$	9.04	
	JRGING DATA  a. Purge Metho  b. Acceptance (  - Minimum Re  - Maximum Al  - Stabilization	Criteria defir equired Purg llowable Tur	je Volume bidity	workplan)	well volumes) NTUs %					
	c. Field Testing d. Field Testing		1	1	556 mps		Serial Num 1711-35 3.5 (006)	nber 14 74 3	KSi Dity -	rМ.
Time 1429 1434 1434	Volume Removed (gal)  c.5  1.25  1.75  2.25	T° (C) 15,95 15,98 15,98 16,06	pH 7,97 7,78 7,76 7,76	Spec. Cond (μs/cm) 29/3 } 20/5 ς 20/5 z 20/5 z	ORP -217.8 -208.8 -199-1	DO mg/L 0-30 0-16 0.15	Turbidity (NTU) -73 -73 -73 -73	Color black black black black	Other	
	e. Acceptance Has require Has require Have param If no or	d volume be d turbidity be neters stabili	en removeen reachized	ed 🔲	No 	N/A  N/A  N/A  Meas	UREME	WTS AR	ENDT	
SAMPL	E COLLECTIO	WIIKK	Method:			ρ				- ,
	ple ID Conta	ainer Type		Containers	Preservation		Analysis		Time	
Commer		10					11/6/1			- -
Signatur	$eQ_1$	145				Date	111611	7		

Well/Piezo ID:	PMW -02

Client: Project No Site Locati Weather C	ion·	US GO.	NAVY 276080 10LEY, 02, WIN	MA		Meussa M		Time: Star Finish	7720	I .
a. Total W	'ell Lengt	h (	05,79	c. Ca	of Casing) sing Material of sing Diameter		e. Lengt	L h of Water ( ated Well V	_	19.47
	a. Purge b. Accept - Minim - Maxin	Method tance ( num Re num Al	Oriteria defir	ned (from ge Volume bidity	workplan) e (@	well volumes) _ NTUs %				
			Equipment		Make  La Monte  VSE  on Documenta		ps	Serial Num 4711-35 13 J 10	ber 514 Tu 701063	ies on then
Time 1314 1319 1329 1329	Volur Removed 0.5 1.0 1.5		T° (C) 16-16 16-14 16-04 16-62	pH 7.31 7,19 7,13	Spec. Cond (µs/cm) 1723 1712 1706 1698	ORP -1(c-2 -135.0 -118.7 -110.2	DO mg/L C-81 0-75 0-76 0-81	Turbidity (NTU) (1,5 6,50 4.00 2.83	Color claw chew Clans	Other
	Has ro Has ro Have If	equired equired param no or N Voca	WOR	een removeen reachized n below.	o Aup y	No	N/A R D MEA	ASU <i>RE</i> ME	EUTS A	RE NOT
SAMPLE Samp PMW	le ID		iner Type		Containers COC	Preservation		Analysis		Time
Comment	$\overline{}$	VOC	CSIA	= 20	VIAL; 1	BROKE	Date	11/6/	15	

Well/Piezo	ID.
1 4 CH/1 1020	D. D
	PNA 11) - 14
l	17000-01

Client: Project N Site Loca Weather	o: <u>(v.).</u> tion: Fr Conds: <u>(iv.)</u>	NAVY 27 60 80 OLET, A OY, WWS,	NIRO 1N 40'S	Collector(s)	MELISSA MEEL	· · · · · · · · · · · · · · · · · · ·	Time: Star Finish	Date: /// t 930 / 1/05	6/15
a. Total V		74.70'	c. Ca	sing Material	STEEL		h of Water (		6.43
b. Water	Table Depth	28,29	d. Ca	sing Diameter	· <u>~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~</u>	f. Calcul	ated Well V	olume7	· 66°
WELL PI	JRGING DATA a. Purge Metho	od Bc.	WER.	Pump	- SN:	11128			x.
	<ul> <li>b. Acceptance</li> <li>- Minimum R</li> <li>- Maximum A</li> <li>- Stabilization</li> </ul>	lequired Purq Allowable Tui	ge Volume bidity	workplan) e (@	well volumes) NTUs %			***************************************	
	c. Field Testin	g Equipment	Used:	Make La MOTTE YST	Model 2020 WE 556 M	g o	Serial Num   <u>  711 - 3</u> 5   <u>3                                   </u>	iber 14 704 663	BIDITY ME
	d. Field Testin	ng Equipmen	t Calibrati	on Document	ation Found:				
Time	Volume Removed (gal	15.30	pH (.9]	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	Other
1011	2.0	S. 29	6.97	1172	-90.4	0.99	9.67	Clear	_
1021	2,5	15.52	7.00	1137	-91.2	0-70	8-80	Claur	
							. =		
	Has require Have parar If no or	ed volume be ed turbidity b meters stabil N/A - Explai XUME	en removeen reachized n below.	ed □ ⊠	No 	N/A 図 図 口	1 Car & EM	ENTS	ARE NOT
SAMPL	E COLLECTIO	N:	Method:	BLADE	or Rung				
	ple ID Cont	ainer Type		Containers	Preservation		Analysis		Time
Pruu	1-04		_ S@	Z ATTALI	(E1) (OC -				1025
		) i							
			X		-		,		
Commer	nts								
Signature	all	105	_			Date	11/1/18		-

Well/Piezo ID: PMW-03

Client:  Project No: Site Location:  Weather Conds:  US NAUY   NIRC  LOZ 7 LOB 0  FRIDLEY, MN  PHETEL JUNY, 40'S  WIND	0	Teussa Me		Finish	Date: [1] (1 t <u>[1 08</u> 1 <u>1 2 10</u> 0 FXTUA	•
	sing Material	real		n of Water (	Piezometer Column <u>40</u>	33
b. Water Table Depth 28.70 d. Ca	sing Diameter	<u> </u>	f. Calcula	ated Well V	olume <u>7</u>	69
WELL PURGING DATA  a. Purge Method BLAGOISE  b. Acceptance Criteria defined (from	•	SN:	11128		<del> </del>	
<ul> <li>Minimum Required Purge Volume</li> <li>Maximum Allowable Turbidity</li> <li>Stabilization of parameters</li> </ul>	e (@ v 1	vell volumes) NTUs %			45	
c. Field Testing Equipment Used:	Make LAMONE YST	Model 2020 WE 556 MD		Serial Num 47/1 - 3 /35/0	nber 35/4 Tu 10/6/63	REIDITY M.
d. Field Testing Equipment Calibrat	ion Documenta	tion Found:				
Volume Time Removed (gal) T° (C) pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	Other
1140 0.75 15-22 7.06	1408	~!lʊ.i	0.77	35.7	clear/light	
1175 1,25 15.47 7.07	1413	-107.7 -104.7	10.73	17.5	clear/1.3h+b	
1150 2.0 15.39 2.06	1412	-104.3	0.18	13.5	clear	-
(3)			77.0			17
				1 2 1		
		0 0			<u> </u>	
e. Acceptance criteria pass/fail Has required volume been remo Has required turbidity been reach Have parameters stabilized If no or N/A - Explain below.  Volume Remove	hed □	No 	N/A ☑ ☑ ☐	n.Seveer.	nevis	ACE NOT
	BLADOZA	Rup				
	f Containers	Preservation		Analysis	3	Time
Prin-03 - SEE	ATTACHEC	COC				1200
		<u> </u>	-			
			-			
		10111 11 -				
Comments						
Signature MO		2	Data /	11/6/1	<u> </u>	

Well/Piezo ID:	PMW	-/

Client:		N	ROD -	NAVY					Date: 12/	4/15	
Project N		600	776080	)		10		Time: Star	1 /300	·	
Site Loca	-	FR.	INIA,	MN	O-lineter/s	A leases	661	Finish	Meily		
Weather	Conas:	un.	, WIND	, 303	Collector(s)	M. MELLIN	34V	K DA	MOINT-		
			13		7,44		14/all [7]		Dianamata	. 🗀 🌣	•
				rom Top	of Casing)	STEW	Well 🔀	•	Piezometer	,	
a. Total V	Vell Lengt	h.	(nb.39'		sing Material		_		Column <u>57</u>		
b. Water	Table De	pth .	15.89	d. Ca	sing Diamete	r <u>d''</u>	f. Calcula	ated Well V	olume $g_{\cdot}$		
WELL P	<ul><li>a. Purge</li><li>b. Accept</li><li>Minim</li><li>Maxin</li></ul>	Method ance ( um Re num Al	Criteria defir equired Purg lowable Tur	ge Volume bidity	Workplan)	QED WELL WHE BED BLAGOOD  WELL WELL WELL WELL VOLUMES)  NTUS	2420 3 5R Pho P20 1.	620 DC () 40 COUTH 75" BLA	mplesse 20USR 2004 Pm	SALTE	23085 U28
			of paramet Equipment		Make Hawa Ys.I	Model Tursidity Mo	IGA PS	Serial Num <u>&amp; Ooo   ,</u>   14 h   a :			
	d. Field	Testing	j Equipmen	t Calibrati	on Document	ation Found:					
	Volur				Spec. Cond		DO	Turbidity			]
Time	Remove	d (gal)		pH O this	(μs/cm)	ORP 2	mg/L	(NTU)	Color	Other	16.02
326	9:7		15, 16 15, 0h	344	1652	192 5	1 310	F 10	ZI ACK	BLACK	15.9
33	1.8		15.13	731	1647	-190.2	1.58	LID	BLACK	BLACK	15.95
1336	2.0		15.21	7.29	1649	1854	0 52	60	BLACK	BLUL	15.45
<u> </u>							-				'-' '
	- ,-					1000	1				
	Has r Has r Have	equired equired param no or l	criteria pas d volume be d turbidity b leters stabil N/A - Explai	een removeen reachized n below.	ned 🔲	No 	N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A	BOR VOLLU	me lem	oved,	-
SAMPL	E COLLE		,		BLADDE		ρ	48		W	-
Sam	ple ID	Conta	iner Type	No. of	Containers	Preservation		Analysis	-	Time	]
	10-1	<u> </u>			JEE CHA	IN OF COTE	TODY			1340	-
<u> </u>	born		67	-		. 201	- 11				1
											1
						111					-
		ا را د	. س س	0.	11	1 (	T-0-	Co	-1	<u> </u>	7
Commer		HANI	UA TUR	BIDIT	y MEDE	R CALMOT	1454	Hampl	ē. <u>S</u>		<b>-</b>
Signatur	e Cy	L	ull	9-			Date	12/4/	15		-

Well/Piezo ID:	7.	66
	D	
	1 MW-2	

Client:  Project No: Site Location: Weather Conds:  Weather Conds:		M. Mee uwse	_	Time: Star Finish	Date: 12 t 1135 /245 SIAK	14/15	
water Level DATA: (measured a. Total Well Length	c. Casing Material			of Water (	Piezometer Column <u>5</u>	0.67	
b. Water Table Depth 15.95 d. Casing Diameter 2" f. Calculated Well Volume 8.36 gsl  WELL PURGING DATA  a. Purge Method BLAGGE Purp - RED BLAGGE Purp Controller SU12817  - RED SAMPLE PRO 1-75" BLAGGER Purp SW: 11128  b. Acceptance Criteria defined (from workplan)  - Minimum Required Purge Volume (@ well volumes)  - Maximum Allowable Turbidity NTUs  - Stabilization of parameters %							3
c. Field Testing Equipment Used:  Make  Model  Serial Number  HANNA TURBUDITY METER & 0001 38 4  VSF 556 M PS 14 N 103 83 4  d. Field Testing Equipment Calibration Documentation Found:							
Volume         Volume         To (C)         pH         Spec. Cond (μs/cm)         ORP         DO mg/L (NTU)         Turbidity (NTU)         Color Other           12/0         0.5         /4.75         7.34         /454         -154.3         /.41         -         CLSAL 17 Gen. 15.           12/5         1.0         14.72         3.24         /447         -135.6         0.42         5.85         CLSAL 17 Gen. 15.           1220         1.5         /4.68         7.16         /438         -121.2         1.37         9.48         CLSAL -           1230         2.5         14.65         7.16         /433         -12.6         /.08         3.48         CLSAL -           1230         2.5         14.56         7-15         1425         -105.5         102         2.44         CLSAL -							
e. Acceptance criteria pass/fail  Has required volume been removed  Has required turbidity been reached  Have parameters stabilized  If no or N/A - Explain below.  WORK PLAN DID ANT INCLUDED PARAMETERS FOR VOLUME LEMONED.  TURBIPITY AND STABIZATION							
SAMPLE COLLECTION:	Method:BLAOOS			<u> </u>			
Sample ID Container Type	No. of Containers	Preservation	ру —	Analysis		Time 1235	
Comments		774		12/4/1	<u> </u>	()	•

Well/Piezo	ID.	
AACINLICTO	10.50 III	
	MM41-3	133
	17000-	17.1

Client: Project No:	N.	200 · N.	4 <i>V</i> Y			- :	Time: Star	Date: <u>12</u>	14/15	Ŧ.
Site Location:	501	DLEV. A	(A)			-		1125	•	
Weather Cond		2015 W		Collector(s)	M. MEERWS	EN . SC				
	Н.									
WATER LEVE	EL DATA: (				Sen.	Well 📮	-	Piezomete		
a. Total Well l	Length	76.43	c. Ca	sing Material	dier_		h of Water (			
b. Water Tab	le Depth	30.12	d. Ca	sing Diameter	2"_	f. Calcu	lated Well V	olume <u>7.</u>	64 gal	
b. A - h - h	urge Metho cceptance ( Minimum Re Maximum Al	Stitetia delli	je Volume bidity	Puup workplan)	-QED WELL <u>QED BLADO</u> QED SANDL well volumes) _ NTUS %	WIZAR SR ALLO E ALLO	a 3020 p. Course 1.75" BL	DC COMP DUER EN DODER P	essor SI 1: 2817 hup SV	v: 2308 : 11) 28
c. Fi	ield Testing	Equipment	Used:	Make HANNA TI YST on Documenta	Model  ARBIDITY N  556 mps	FIER	Serial Nurr <i>e 0</i> 00 / 4 h /			
	Volume			Spec. Cond		DO	Turbidity			1
Time Ren	noved (gal)	T° (C)	pH	(µs/cm)	ORP	mg/L	(NTU)	Color	Other	30.15
1030	0.5	12.62 12.66	7.16	1-498114	-125.0 -126.3	1.43	8.76	LIMBO	IT GRA	1 in
T	:5	17.64	3.15	1151	-120.5	1.38	5.57.	11500	LT GOLD	30,13
1045 2	0	12.65	7.14	h 52	-117-6	11.29	5.57	Liese	6-0	30.14
							13.71	-		
	× 1	1								
h H	Has required Has required Have param If no or I	criteria pas d volume be d turbidity b leters stabili N/A - Explai	en removen reach zed n below.	ed 🛄	No 	N/A IDI IDI ETERS	KOE VOLI	une Ré	EMOUZD,	
SAMPLE CO		,	Method:	_						
Sample II		iner Type		Containers	Preservation		Analysis		Time	]
PMW-	3   -			EE CHA	ID OF CAST	Dyg .			1050	
9						30)	W I			1
W							, ii			1
					181					]
Comments										-
Signature _C	Ull	1/10	)		v	Date	17/4	/15		-

Well/Piezo	ID: _		10.7
	Dun	- 6	1
	PMW	7	,

Client: Project No Site Local Weather	tion:	NIRU LOUZ! FRII 203,	17 - N 7 6080 DLEY, M WIND,	My Sun	Collector(s)	M. Meé unse		Finish	6955	14/15	\$3
<b>WATER L</b> a. Total W b. Water	/ell Lengi	th .	measured f 74 .69' 29.78'	c. Ca	of Casing) sing Material	STEEL		n of Water C		,	
	a. Purge b. Accep - Minim - Maxin - Stabil c. Field T	Method tance C turn Re num Al ization esting	equired Purg lowable Tur of paramet	ge Volume bidity ers Used:	Make HANNA VSI	WELL IN THE PROPERTY OF THE PR	WIZARD R PILL E PRO	Serial Num		OESSOR S SW: ZB17 Julp SW	W:2308 L : 11178
Time 907 913 967 923	Volument Remove	ne d (gal)	T° (C) 12.48 12.28 12.36	pH 7.09 7.05 7.05 7.05	Spec. Cond (µs/cm) 1.(27 1.156 1.160	ORP -87.5 - 499 - 10.6	DO mg/L 2.25 1.67 1.48 1.43	Turbidity (NTU) 1 4 11 9-76 5.88	Color (LELL (LELL (LELL (LELL)	Other	Cel W 29.80 29.81 29.76 29.80
	Has r Has r Have If	equired equired param no or I Work Twe	BIDITY,	een removeen reach ized n below. DOD	ed □ ☑ ☑ <i>NoT INC</i> ☐ <i>AKILI ZATIL</i>	No D D D CUPE PLEAM	N/A  N/A  D  D  D  D  D  D  D  D  D  D  D  D  D	FOR	lbeune	<u>Bemove</u>	3
	E COLLE		iner Type		Containers CU上い Gデ	Preservation CustVDY		Analysis		Time 0925	
Commer			le_	^		1	Date _/	2/4/15			-

Well/Piezo D: W-01	
170111 10-1701	
PINCO J.	

Client:	_us	NAVY-		Date: 1666 Time: Start /345 Finish 1430 THE BANDSAK							
Project No:	60	27608	Time: Start /393								
Weather Conds:	Site Location: FRIPLEY, MN							UNSEN R. BANDAAK			
weather Conds:	Cross	04, 203 P	1	Collector(s)	M. MEEN	wsew	K. I.	PANAMA			
	>6	GHT W	WO						on the training		
WATER LEVEL	DATA: (	measured	from Top	of Casing)		Well 🔼		Piezometer			
a. Total Well Len		66.35		sing Material	57851	o Lenati	of Water (	Column 5	0.14		
	-				JACEC	e. Lengu	TOI Water	0	17		
b. Water Table [	3.2	16.21		ısing Diametei				olume $oldsymbol{\mathcal{B}}$			
WELL PURGING a. Purg	S DATA le Metho	d BLAGE	er Pu	-060 U	NPID BLADOCI TAMPIE PRO 1-7	3020 D	Contract	1500 5N 21 11771	1. 23085 BI 7		
- Max	imum A	Criteria defi equired Pur llowable Tu of paramet	ge Volum rbidity	workplan) e (@	well volumes) NTUs %	S. DING	pac 30.				
c Field	Testina	Equipment	Head:	Make	Model		Serial Num	her			
0.11010	reating	Equipment	Oseu.	VSI	556 Haush		1351006				
	(4)			VSI	SS6 PIELC	CABLE					
d. Field	d Testing	g Equipmen	t Calibrati	CAMOTE on Documenta	2010 WE 41.	LBIONY	Merar:Sa 1099AU	5214-0	115		
acrosses a second of the St	ume			Spec. Cond		DO /	Turbidity				
	ed (gal)	T° (C)	pH	(µs/cm)	ORP	mg/L	(NTU)	Color	Other		
1400 0.		14.05	6.84	1803	-158.9	1-247	THE		_ ~		
14/0 /		14.05	6.17	1655	-163.3 -154.3	1,14	-50074	LT GRAY	<u> </u>		
1415 2.		14.02	6.77 6.55	1603	-154.3 -150.6	1.13	-47 -UG	LT COLD	7 -		
7113 21		17.0	W73	16.2	130.6	1010	77	U GAL	-		
e. Acceptance criteria pass/fail Yes No N/A  Has required volume been removed											
SAMPLE COLL		18/		BLADOE	^						
Sample ID	Contai	ner Type		Containers	Preservation		Analysis		Time		
PMW-01	_			et co					-1420		
	-										
omments					-				1		
ignature	W	16	_			Date	1/6	116			

Well/Piezo ID:	
	PMW-02

Client: Project No: Site Location: Weather Conds:	US NAVY - 00274080 PUDLEY, 1	NN Col	Date: 16/15 Time: Start 1230 Finish 1335 1330							
WATER LEVEL DAT a. Total Well Length b. Water Table Dept	66.95 th 16.29'	c. Casing	Material S	2"	f. Calcula	n of Water ( ated Well Vo	Piezometer Column			
- Minimur - Maximu - Stabiliza	ethod BLACE  nce Criteria defin  m Required Purg  Im Allowable Tur  ation of paramete  sting Equipment	ed (norm wone Volume (@bidity ers	TKPIAN)    I	well volumes) NTUs % Model	tero	Serial Num	ber 662			
d. Field Tell  Volume Removed  (256 0.5  1301 /.0  1306 /.5  1311 2.7  1316 2.5		Calibration Sp pH	MOTTE	2020 WE 7	DO mg/L 1.84 1.70 1.47 1.38 1.29	Turbidity (NTU) 209 1198	Color (T GA) V. L. GA V. C. C. GA V. C. C. GA V. C. C. GA V. C. C. C. GA V. C. C. C. C. GA V. C. C. C. C. C. C. C. C. C. C. C. C. C.	Other	CUELL CLEAR CLEAR	
e. Acceptance criteria pass/fail  Yes  No  N/A  Has required volume been removed  Has required turbidity been reached  Have parameters stabilized  If no or N/A - Explain below.  WWA PLAN DID NOT INCLUDE PARAMETERS FOR Volume Removed,  THE BLORY, AND STABILIZATION.										
Sample ID C	Container Type	No. of Co	ontainers	Preservation		Analysis		Time 1325	- - - -	
Comments	D00				Date	116/	15	1		

	$\overline{}$
Well/Piezo ID:	- 1
	- 1
PMW-03	
TINU	

Client: Project N Site Loca Weather	ition:	40,1	MAY - 1 76080 754 , M	(A)	Collector(s)	M. MEEUM	- - - - - - - -	Time: Sta Finis R. BA	Date:     art	6[]6
WATER I		_	measured	c. Ca	of Casing) sing Material		Well <b>k</b> e. Lengt	th of Water	Piezomete Column <u>4</u>	14.71
b. Water	Table D	epth	31.18	d. Ca	sing Diamete	r_ <b>2</b> "_	f. Calcul	lated Well \	/olume	7.28 gal
WELL PI	<ul><li>a. Purge</li><li>b. Acce</li><li>Mining</li><li>Max</li></ul>	e Metho ptance ( mum Re imum Al	d Base Criteria defi equired Pur llowable Tu of paramet	ge Volume rbidity	Purp - 0 -Q workplan) e (@	REB WELL WIZ RED MP (D BL ED Sample P well volumes) _ NTUS %		020 DC Pup Con BLADE	Confessor Nicousa ER SN:	оR, SN: 2: SN: 2817 1177)
			Equipment g Equipmen		Make  VST  VST  VST  Compare  On Document	Model 556 Hangle 550 FIELD ( 2020 WE The ation Found:	CADIN	Serial Nun 13J 1000 154 22 Merca	62	- 7-0115
	Volu				Spec. Cond		DO ma/l	Turbidity (NTU)	Color	Other
Time 1034	Remov	ed (gal)	T° (C)	PH 7-30	(μs/cm)	-104.2	2.93	7.80	CUESA	-
039	115		13.18	7.28	1087	- 99.3	3.04	-56	CIFAR	_
044	2.5		13.40	7.27	1099	70.5	A.77	6.73	CLEAL	
										* * * * * * * * * * * * * * * * * * * *
										N (8)
	Has Has Have If	required required parame f no or N Work Turk	BIPIST	een removeen reach zed n below.	IN INCLU	^	N/A EX D Exces	Fax VI	stuns ,	Renoved,
SAMPL	E COLLI	ECTION	l <b>:</b>	Method:	BLADDE	<u>rup</u>				
Samp		Contai	ner Type		Containers	Preservation	1560 1	Analysis		Time
mw.	03	-			EE CO					1055
			- : - :						u Tali	
omment										
anature	d	e /	10				Date	العال	6	

Well/Piezo ID: PMW-04

Client: US NAVY - N Project No: 60276080 Site Location: FRIDEY MA Weather Conds: PARTY (LOUGH S	V Collector(s)	4 MEEUWS	- - '&v , R.	Fini	Date: 1 art <u>0815</u> sh <u>0935</u> siAK	_
water Table Depth 30.85	om Top of Casing)  c. Casing Material  d. Casing Diameter	STEEL 2"	e. Lengt		Piezome r Column <u>-</u> 5 Volume <u>-</u> 7	14.90'
well purging data  a. Purge Method BLADD of  b. Acceptance Criteria define  - Minimum Required Purge  - Maximum Allowable Turb  - Stabilization of paramete	ed (from workplan) e Volume (@ oidity					3085
<ul><li>c. Field Testing Equipment \( \)</li><li>d. Field Testing Equipment</li></ul>	YSI VOT	Model  SSL FANDIKE  SSL FIELD  2020 WE  ation Found:	CARE	Serial Num 1351ecd 15422-2 1 NETER :	02	- - -DIIS
Volume Time Removed (gal) T° (C)  QU) (.50   12.52  (05   1.25   12.74  Q10 2.00   12.82  915 3.00   13.00	pH Spec. Cond (µs/cm) 7.16 & fo 7.24 & B 1 7.23 & B 84 7.23 & B 84	ORP - 63.7 - 61.9 - 62.8 -62.6	DO mg/L 3.13 2.45 2.63 2.17	Turbidity (NTU) 3.97 2.27 3.26 -57	Color CLEAR CLEAR CLEAR	Other
Tueadiry,	en removed  en reached  zed  below.  MAN MT INC MA  AND STABILIZAD	700.	N/A KI III IIII	Bog Vol	une R	SMOVED,
Sample ID Container Type  Sample ID Container Type	Method: <u>BLACOSA</u> No. of Containers  SEE COC	Preservation		Analysis		Time 0925
Comments Signature			Date	1/6/16	9	

Well/Piezo ID:		
THEIR ICEO ID.	- C	
	MANAS	-02
	11400	-45

Client: Project No Site Local Weather (	tion:	602	US NA 200 246080 DEEY, M	-	Collector(s)	M. MEE		Finist	Date: <u>1/3</u> 5 1 <u>1/35</u>	:5/16
a. Total W	/ell Lengt	h =	75a3	c. Cas	of Casing) sing Material			of Water	Piezometer Column <u>4</u>	14.74
b. Water	Table De	يد pth	30.29	d. Ca	sing Diamete		f. Calcula	ted Well V	olume <u>7.</u>	27 gal
	b. Accept - Minim - Maxim	Method ance C um Re um Al	d Criteria defir quired Purg lowable Tur of parameto	ed (trom je Volume bidity	workplan)	well volumes) NTUs	o WELL W O BLACO O SAMPU	BE PULLD E PRO 1-	sozo DC ( <u>C</u> C <u>DNTEPU</u> B 75" BLACK	nupressor e sn: 281 se puup SN
3			Equipment		Make VSI VSI	Model SS6 HAND! SS6 Fig.	HELD D CABLE	Serial Num OSHZ IOL	nber 35249 15-2	
	d. Field 1	Γesting	Equipment	Calibration	on Document	ation Found:				
Time	Volun Removed		T° (C)	рН 7.31	Spec. Cond (μs/cm) 0.981	ORP	DO mg/L	Turbidity (NTU)	Color	Other
1206	1.5		13.62	7.27	1.012	-117.5 -113.3 -112-2	2.80 3.40 3.78		CLEAR	12
1216	<u> </u>	III //	13.51	7-25	[1017	7110.4	395	1	CLEAR V.U. GOV TOCK	AR.
	Has re Has re	equired equired param	criteria pass I volume be I turbidity be eters stabili N/A - Explair PAN I	en remov een reach zed	ed 🔲	NO	N/A III III III	bume	REMOVED	
SAMPL	E COLLE					e tung		VIII .		
Samı PMw~		Conta	iner Type		Containers	Preservation		Analysis		Time
		1		3 1						
Commer	nts			8	8			Þ		
	921	1	9	,		- 10	Date	1/25	16	101 ×

Well/Piezo	ID.
1446101 1620	" O
	Mus-04
	11000 01

Client: Project No: Site Location: Weather Conds:	US NAW - 60276080 FRIDLEY, CLOUDY, DRIZZI	MA/		M. MEGUW		Time: Star Finish	Date: 1/2/ 1 /0/5 1/32	5/16
a. Total Well Leng		c. Ca	of Casing) sing Material	STEEL	e. Length	of Water 0	Piezometer Column <u>#</u>	4.74'
- Minir - Maxi		ned (from ge Volume	Yeurp workplan)		PRO 1.	DEO DE C DE CONTRI PENA	supressi ouse sump	
c. Field	Testing Equipment	Used:	Make YSI YST	Model SSG HANDHE	4D	Serial Num 05H 23 3 10L45	ZAQ	
d. Field  Volume Time Remove (a43 0.5 /a48 1.0 /053 1.5 (058 2.0	ed (gal) T° (C) 13.55 /3.68 /3.72	pH 7.31 7.26 7.23	Spec. Cond (µs/cm) 0.744	ORP -103-4 -85-6 -69-3 -57-7	DO mg/L 0.80 0.83 0.85	Turbidity (NTU)	Color  V. IT Co.  V. IT Co.  V. LT Co.	Other  Sucart
Has Has Hav	eptance criteria pas required volume b required turbidity b e parameters stabi if no or N/A - Expla WOLK PLAN TURBIOLTY	een removeen reachized in below.	TASILLZ	TIOU.	N/A IXI IXI IXI	TOR VOLL	ime Re	FMoVED,
Sample ID	Container Type		Containers CHAIN OF	Preservation		Analysis		Time (105
Comments						100	60 200 200 200 200 200 200 200 200 200 20	
Comments	18/1105	34 X			Date	1/25/16		Y A

Well/Piezo ID:	2.3
//000	70

Client: Project N	-	113	MAVV -	- NIE		Date: <u>2/8//6</u> Time: Start <u>0950</u>				
Site Loca	_		IDLEY .	MA				Finish		İ
		7 AL	OL LOVE	110 €	Collector(s)	M. MEQUOS	.cN	0 -	NASIAK	
	UNTER		ATHER	ADVIS		10/18/01/2000				2.
				_						
WATER I	LEVEL DA		measured f				Well 🔀		Piezometer	
a. Total V	Vell Lengt	h .	75.94		sing Material				Column <u>4</u>	- 4 4
b. Water	Table De	pth .	31.081	d. Ca	sing Diameter	<u> 2"</u>	f. Calcula	ited Well Vo	olume <u>7.</u>	51 gol
WELL P	J <b>RGING [</b> a. Purge l		d	BLAD	PER P	- 060 C	MP 10 Sample	BLADOGE PED 1.75'	Pump Colored	MAKEBOR SN
	- Minim	um Re	Criteria defin equired Purg llowable Tur	je Volume	(@	well volumes)		- 4		•
			of paramete			%				
	c. Field T	esting	Equipment	Used:	Make <b>VS</b> I	Model 556 HANDH		Serial Num	ber 101339	
					VSE	556 FIELD	CABLE	13 KL	4	
	d Ciold	Focting	. Couinmon	Calibrati	on Documenta	BIDITY METER 2	20 WE	3754-4	13.5W	
	a. riela	າ ອວເກເຊ	) Ednihmem	Calibrati	on Documenta	ation Found.		-	13.5	
	Volur				Spec, Cond	055	DO	Turbidity/	Color	Other
Time	Remove	d (gai)		pH	1,020	ORP	mg/L	(NTU)	Color	Other
10013	(1.0		10.31	7-05	1.035	- 82 6	1.50	11. 2	Clear	
1000	7.5		10.109	7.15	11044	- 57.5	2.210	11.1-	CLEAR	
1023	2.0		10.88	7.16	1.058	-78.4	1.83	9.29	CLEAR	
										<del></del>
	-		- 1	11		<u> </u>				
	Has re	equire	criteria pas: d volume be d turbidity be	en remov		No.	N/A   <b>M</b>			
	Have	param	eters stabili	zed	<b>K</b>					
			N/A - Explai L <i>DLA</i> N		OT INCLUD	E PARAMETE	X FOR	burns	- PEMAN	VED.
	•		RELOLTY	AND	STABILIZATI	DW.	<u> </u>	/ocuarit	<u> </u>	
SAMPL	E COLLE	CTIO	N:	Method:	BLADO	of Purp				<u> </u>
Sam	ple ID	Conta	iner Type	No. of	Containers	Preservation		Analysis		Time
	2.03	_	- SEE	- CHA	IN DR	CUSTODY			•	1030
	7		A so				52			
	<del></del>	THE STATE OF		10			<del>                                     </del>			
				O.						
1/4										W
Commer	nts				2					
	·-		1					, 1		<u> </u>
Signatur	· Cu	Kil	lu		<del></del>		Date	2/8	6	

Well/Piezo	ID:	Priw	
	_	PNU	-07

Client:		u.	S-NAYY	Nil	200	e.			Date: 2	0/16	177.
Project N		602	76086	, , ,		17.5		Time: Star			- 11
Site Loca		FRIC	DLEY IN	1N	O-II1(-)	11 1/200 20			0915	-	
weather	Conds: 1	NW PH	CLOUDY	1100	Collector(s)	M. MEELLUS	EN K	SANA	SIAK		
		30			7						1
					of Casing)		Well 🔼	~	Piezometer	-	
a. Total V	Veli Lengi	th .	+6.03	c. Ca	sing Material	STEEL	e. Length	of Water 0	Column <u>4</u>	5.51	
b. Water	Table De	epth	35 30	.72 Ca	sing Diameter	<u>2"</u>	f. Calcula	ated Well Vo	olume _ <del>7</del> .	38 gcl	
WELL P	JRGING I a. Purge	DATA Metho	BLA	OOER	Purp - as	DMP10 BLADO DED SAMPLE F NED WELL WIZAG	es Pung 201-75"	BLACOER	LER SN.	2817 11771	
	Accep     Minim     Maxin	tance ( num Re num Al	Jriteria defii	nea (trom ge Volume rbidity	workplan) e (@	well volumes) NTUs %	20 5020	DE COMP	ee <b>sor</b> sn	1: 23085	
	c. Field Testing Equipment Used:  Make  Model  Serial Number  SSL HANDHELD  OF J 101339  VEG  SSG FILLD (ABLE: 13K14										
	d. Field	Testing	j Equipmen	t Calibrati	on Documenta	Tueriony Mercation Found:	R 700	we 37	54-4013		
Time	Volui		To (C)	-LI	Spec. Cond	ORP	DO ma/l	Turbidity (NTU)	Color	Other	
7 Time	Remove	o (gai)	T° (C)	7.01	12-758	- b6.1	mg/L /92	6.83		CE	
0845	1.0	_0	12.10	7-15	0.776	-69.8	1.36	5.49	( UEIK		
0850	1.5		12-04	7-09	0781	-68.6	1.12	4.15	CLEAR	(aPto 17E	-700
DBSS	2.0		(2.35	F-11_	0.788	-67.0	1.01	-103.53	CLEAR		200
		331			X 33%	** 68	×	7			j
	- U	10		100 To 100				:	==		55 0.
	Has r Has r Have	equired equired param	criteria pas d volume be d turbidity b eters stabil N/A - Explai	een remov een reach ized		No	N/A EA				
		WOR		DID N	OT INCLUS STABILIZA	PARAMETE	es Foe	bun	E REMO	OVED,	•
SAMPL	E COLLE		,			Punp				: 5a	- 1
Sam	ple ID	Conta	iner Type	No. of	Containers	Preservation		Analysis		Time	1
PMU	)-04			EE G		LUSTODY	- "	10	121	0900	]
<u>'</u>	111		12 1			0	7 =77			23 99	1
-	5310	70	Si B	-			11/	11 13			1
	1		(±)	34 []	- 11	_ 11 _	1 ,		ă (		]
		<u> </u>		<u> </u>	- 3	TH 0 Y				- X2	J.
Commer	nts	- N.	l ism	W.	100			- 1	ce c		<u>.</u>
Signatur	eM	ll	110	_			Date	2/8/16			

Well/Piezo	ID: Price	-01	
	, we	01	

Client:	US NAVY - 1		Date:3/31/16 Time: Start 13/4					
	PIDLEY, M	40°F C	ollector(s) _	Maussa H	EELLUS	Finish	Ider	
WATER LEVEL DA	65.26	c. Casir	f Casing)  ng Material _  ng Diameter	STEEL		of Water C	Piezometer olumn <u>48</u> olume <i>B. C</i>	3.91'
- Minimu - Maxim		ed (from we Volume (	- QED - QED - QED rorkplan)	MP10 BLACE Sample PR WELL WIZE	D 1.75 MRD 30			
	esting Equipment l		Make  VST  VSE  MOTTE To  n Documenta	556 FIELD	CABLE	Serial Num 05F13 13519 06 52	42AI	
Volum Removed (326) 0.5 (333) (1033) (1333)		pH 7.35 7.13 7.12 7.08	Spec. Cond Mps/cm) 1.357 1.380 1.387	ORP -144.7 -151.8 -142.6	DO mg/L O. 45 D. 39 6.43 0.37	Turbidity (NTU)   5.3   12.3   1.3	Color CAM CAM COLOR COLOR COLOR CAMP	Other
Has ro Has ro Have		en remove een reache zed n below. \( \int \) \( \int \)	ed 🔲	NO 	N/A  R  U  VETGAS	FOR 1	locume	REMOVE
Sample ID	Container Type	200 at 1	Containers	Preservation		Analysis		Time
Jum- 01	P	LEASE	SEE G	an of a	2700	7 -		1350
Comments Signature	el lo				Date	3 31	6	

Client: Project No:	LCS NAVY -	NIRO	<u> </u>			Time: Star	Date: 3(	31 16
Site Location:	FRIDLEY P. Claudy, ab.	ND, YOK	ollector(s)	MEUSS		Finish	1309	-
VATER LEVEL D	ATA: (measured f				Well 🛱		Piezomete	
. Total Well Leng	th <u>65.79</u>	c. Casin	g Material	STEEL	e. Length	of Water	Column <u>4</u>	4.36
. Water Table De							olume 8	•
VELL PURGING a. Purge b. Accen	DATA Method RACO	ER Pue	- QE - QE orkolan)	D MP10 BCA FD Sample T FD WELL LOIZA	006R PM PRO 1-7 RD 3021	S' BLACE	DUER SW DOGR Pum NPCESSOR	1:1839 p SN:116 SN:231
- Minin - Maxii	num Required Purg num Allowable Tur lization of paramete	je Volume ( bidity	@	well volumes) NTUs %			Ť	
	Testing Equipment Testing Equipment		Make   SI   SI   SI   Documenta	Model  556 HAND  556 FIELD  BIDITY METER  ation Found:	HELD	137	1542A	_
Volu Time Remove	me	18	pec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	Other
211 0.	5 14.84	7.48	1.345	-151.2	0.37	27.5	GRAY	
1214 [. [	19.79	243	. 359	-135.1	0.27	22.2	Carr	-
1226 2	6 14.32	7.26	353	-110.	6.25	11.63	GEOR	
1000	1177	43.5		143.0	0.23			
								<u> </u>
Has Has Have	ptance criteria passe required volume be required turbidity be parameters stabili ino or N/A - Explai Work PLAN TURBLALTY;	en removed een reached zed n below.			N/A  IZ  IZ  IZ  IZ  IZ  IZ  IZ  IZ  IZ  I	e ibeum	E REMOV	<b>150</b> ,
SAMPLE COLL	ECTION:	Method: 🙎	APPORT &	urp				
Sample ID	Container Type	No. of C	ontainers	Preservation		Analysis		Time
1230 PMW-02		PLEA	se see	CHAIN OF C	MADE	<b>5</b> -		1230
Comments								
		11-21				-6.11		
Signatur C	119				Date	3/31/1	0	

	-7
Well/Piezo ID:	П
Well/ Caezo ID.	- 1
V11. \ - >	- 1
PMW)-03	٠ŧ
1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	_

Client: Project No	o:	US	NAVY -	Date: 3/31/16 Time: Start /021 Finish 1/15						
Site Loca Weather	tion: / Conds: C	LOW	of mic	N D, 46F	Collector(s)	MELLSSA M	Etuns	Finish	1115	
					of Casing) sing Material	_			Piezometer Column <u>43</u>	
	Vell Length									
	Table Dep	_	29.57			_2"				•
WELL PL	- Minimu	ım Re um Ali		je Volume bidity	(@	MPIO BLAO Sample PR WELL WIZAA Well volumes) NTUs %			ROUTH S TR Pump MPRESSOR	W: 1839 SN: 11695 SN: 2308
			Equipment  Equipment		Make VST VST Lamorte Toon Documenta	Model  556 HANDH  556 HANDH  LUBBIDITY METER  ation Found:	ELD	13 T19	542AI	5
Time	Volum		T° (C)	рН	Spec. Cond	ORP	DO mg/L	Turbidity (NTU)_	Color	Other
1040	1.5	(yai)	14.21	7 29	1,059 -79.3 0.55 9-25 la Gasay					
1045	10		14,18	7.77	1.103	-87.4	2.34	5.16	IT CON	
1055	2.0		14.3	7.27	1.103	-100.5	0.31	3.05	1+ cery	
									0	
-									-	
	Has re Has re Have   If	equired equired param no or N	criteria passi volume be turbidity be eters stabili V/A - Explai	een removeen reachized n below.	ed 🗌	No	N/A  IZI  IZI  IZI  IZI  IZI  IZI  IZI  I	Foe Vol	um5 Pi	EMOVED,
SAMPL	E COLLE	CTION	N:	Method:	BLADOGR	Pens				
		Conta	iner Type	No. of	Containers	Preservation		Analysis		Time
X0 4	gu-									
105	0									
Prin	0-03	-		PLEAS	E SEE (	HAND OF CO	STODE			1100
Commer	nts						1	<u> </u>		
Signatur	e (1)	l	10-				Date	131 1	Ь	

Well/Piezo	ID·	1000
TT CINT TOLO	17 (2)	
	PALLAZ - X 4	1.0
	10000	1 5.71

Client:	US NAVY -	NIROP				Time: Star	Date: 3/2	3//16
	FRIDLEY , M	1. FL					1016	
7	LOLLDY, 407, W	0 11	ector(s) _	MZUSCA	MEE			
WATER LEVEL DA	ATA: (measured fi			,	Well 🗷		Piezometer	
a. Total Well Lengt	74.65	c. Casing I	Material _	TEEL	e. Length	of Water (	Column <u>4 S</u>	.46
o. Water Table De	pth <u>29.20</u>	d. Casing	Diameter .	2"	f. Calcula	ated Well V	olume 7.	50
WELL PURGING D a. Purge	Method BLADOS	a Pump	- QED	MPID BLADOS SAMPLE PO	2020	COUTE BLACK	OUER SN	\$ 1839 \$N:116
- Minim	ance Criteria defin um Required Purg num Allowable Tur	e Volume (@	\		3020	oc qin	Presset s	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	zation of paramete			%		-		
	esting Equipment Festing Equipment	LAM	Make  SI  SI  OTHE TWO  ocumenta	Model  SSL HANDH  SSL FIELD  RBIDITY METER  tion Found:	CABLE	52H	154 ZA	
Volur	nicke production	edito el Esta	ec. Cond	- 44	DO	Turbidity		
Time Remove			us/cm)	ORP	mg/L	(NTU)	Color	Other
0972 1.0	14.31	737 0	78/	70.0	0.50	7 64	George Cong.	
0927 50	14.31	7 19 0	784	11.6	125	6-16	15-600	
6937 2.5	14.38	7-28 0.	781	-600	1.17	4-73	IT GREE	
					24 1 1 1 1 1		U	
	1				3.11	15		
Has r Has r Have If	otance criteria passequired volume be equired turbidity be parameters stabili no or N/A - Explain	en removed een reached zed n below.	Yes	NO 	N/A II II CAMETE	es For	Volume	REMOVI
SAMPLE COLLE	ECTION:	Method:	SLADDE	se Pump				1
Sample ID	Container Type	No. of Con	tainers	Preservation		Analysis		Time
PMW-04		- PLEASE	SEE	CHAIN OF	Cersto	04 -		1942
	ira ray							
Comments								
Signature <u>U</u>	llo		_	t.	Date	3/31/16	6	

Appendix F Regenesis Technical Memorandums and Injection Summary Logs





			Injection	Injection	Flow	Volume	of PlumeStop	Injected	Total	BDI Plus	HRC	
Injection Point	Date	Time	Depth (feet)	Pressure (psi)	Rate (gpm)	Beginning Flow Meter (gal)	Ending Flow Meter (gal)	Gallons Injected per Interval	gallons per Location	application (liters)	Application (pounds)	Comments
		2:40	67-65	80	3.60	0	82	82.00		0.26		First and second attempt resulted in heaving up into the rods.
1	9/30/2015	2:54	65-63	78	4.01	82	164	82.00	290.0	0.26	-	
	3/30/2013	3:09	63-61	70	4.37	164	246	82.00	250.0	0.26		
		3:50	61-60	90	4.25	246	290	44.00		0.12	-	Flushed with 25 gallons of water.
		12:35	67-65	90	1.85	0	82	82.00		0.26	1	
2	10/1/2015	12:35	65-63	70	3.45	82	164	82.00	290.0	0.26	1	
2	10/1/2015	12:35	63-61	72	3.89	164	246	82.00	290.0	0.26		
		11:35	61-60	72	3.99	246	290	44.00		0.12		Flushed with 25 gallons of water.
		12:12	67-65	110	1.08	0	56	56.00		0.26		Pulled up early due to high pressure. Screen likely didn't open on initial pull.
3	10/1/2015	12:59	66-64	65	3.09	56	97	41.00	290.0	0.26		
		1:23	64-62	70	3.25	97	193	96.00		0.26		
		1:49	62-60	68	4.25	193	290	97.00		0.12		Flushed with 25 gallons of water.
		1:58	67-65	70	2.25	0	82	82.00		0.26		
4	10/1/2015	2:23	65-63	70	3.56	82	164	82.00	290.0	0.26		
-	10/1/2013	2:46	63-61	64	3.79	164	246	82.00	290.0	0.26		
		2:59	61-60	64	3.67	246	290	44.00		0.12	1	Flushed with 25 gallons of water.
		3:13	67-65	70	4.25	0	82	82.00		0.26	-	
5	10/1/2015	3:30	65-63	64	5.34	82	164	82.00	290.0	0.26		Surfacing through rods at IP-3 at 126 gallons. Placed cap on rods and continued to pump. Slowed flow rate down.
		3:48	63-61	60	2.50	164	246	82.00		0.26		Surfacing through rods at IP-2 at 195 gallons.
		4:09	61-60	55	3.08	246	290	44.00		0.12		Flushed with 25 gallons of water.
		9:37	67-65	55	2.85	0	82	82.00		0.26		
6	10/2/2015	9:52	65-63	60	3.85	82	164	82.00	290.0	0.26		
-		10:04	63-61	64	3.20	164	246	82.00		0.26		
		10:25	61-60	60	3.56	246	290	44.00		0.12		Flushed with 20 gallons of water.





			Injection	Injection	Flow	Volume	of PlumeStop	Injected	Total	BDI Plus	HRC	
Injection Point	Date	Time	Depth (feet)	Pressure (psi)	Rate (gpm)	Beginning Flow Meter (gal)	Ending Flow Meter (gal)	Gallons Injected per Interval	gallons per Location	application (liters)	Application (pounds)	Comments
		10:54	67-65	64	3.13	0	82	82.00		0.26		
7	10/2/2015	11:18	65-63	54	3.10	82	164	82.00	290.0	0.26		
,	10/2/2013	11:42	63-61	54	3.32	164	246	82.00	290.0	0.26		
		12:09	61-60	52	3.25	246	290	44.00		0.12		Flushed with 15 gallons of water.
		12:35	67-65	78	3.46	0	82	82.00		0.26		
8	10/2/2015	1:08	65-63	74	3.04	82	164	82.00	290.0	0.26		
	10/2/2010	1:31	63-61	70	3.11	164	246	82.00	200.0	0.26		
		1:54	61-60	60	3.21	246	290	44.00		0.12		Flushed with 20 gallons of water.
		9:45	67-65	34	3.64	0	82	82.00		0.26		
9	10/5/2015	10:10	65-63	24	3.51	82	164	82.00	290.0	0.26		
	ļ	10:30	63-61	18	3.75	164	246	82.00		0.26		
		10:53	61-60	18	3.56	246	290	44.00		0.12		Flushed with 20 gallons of water.
		11:25	67-65	96	2.68	0	82	82.00		0.26		Pressure dropped to 64 psi at 50 gallons. Flow rate increased to 4.09 gpm. Slowed pump to 3.58 gpm.
10	10/5/2015	11:52	65-63	46	3.58	82	164	82.00	290.0	0.26		Pressure continues to drop. 34 psi at 162 gallons.
		12:15	63-61	24	3.66	164	246	82.00		0.26		
		12:35	61-60	24	3.72	246	290	44.00		0.12		Flushed with 20 gallons of water.
			67-66			0.00	0.69	0.69			7.50	
			66-65			0.69	1.38	0.69			7.50	
			65-64			1.38	2.07	0.69			7.50	
HRC-1	10/5/2015	2:15	64-53			2.07	2.76	0.69	4.84		7.50	
			63-62			2.76	3.46	0.69			7.50	
			62-61			3.46	4.15	0.69			7.50	
			61-60			4.15	4.84	0.69			7.50	Flushed with 3 gallons of water.
			67-66			0.00	0.69	0.69			7.50	
			66-65			0.69	1.38	0.69			7.50	
			65-64			1.38	2.07	0.69			7.50	
HRC-2	10/5/2015	2:45	64-53			2.07	2.76	0.69	4.84		7.50	
			63-62			2.76	3.46	0.69			7.50	
			62-61			3.46	4.15	0.69			7.50	
			61-60			4.15	4.84	0.69			7.50	Flushed with 3 gallons of water.
			67-66			0.00	0.69	0.69			7.50	
			66-65			0.69	1.38	0.69			7.50	
	40/5/004-	0.00	65-64			1.38	2.07	0.69			7.50	
HRC-3	10/5/2015	3:28	64-53			2.07	2.76	0.69	4.84		7.50	
			63-62			2.76	3.46	0.69			7.50	
			62-61			3.46	4.15	0.69			7.50	
			61-60			4.15	4.84	0.69			7.50	Flushed with 3 gallons of water.
			67-66			0.00	0.69	0.69			7.50	
			66-65			0.69	1.38	0.69			7.50	
			65-64			1.38	2.07	0.69			7.50	
HRC-4	10/5/2014	3:56	64-53			2.07	2.76	0.69	4.84		7.50	
			63-62			2.76	3.46	0.69			7.50	
			62-61			3.46	4.15	0.69			7.50	
			61-60			4.15	4.84	0.69			7.50	Flushed with 3 gallons of water.





			Injection	Injection	Flow	Volume	of PlumeStop	Injected	Total	BDI Plus	HRC	
Injection Point	Date	Time	Depth (feet)	Pressure (psi)	Rate (gpm)	Beginning Flow Meter	Ending Flow	Gallons	gallons per Location	application (liters)	Application (pounds)	
			( )	u - 7	(51 )	(gal)	Meter (gal)	Interval		()	u	Comments
		11:10	77-75	190	1.14	0	9	9.00				
		11:25	75-73	190	0.98	9	28	19.00				Pulled early to determine if screen was open.
		11:36	73-71	180	1.06	28	40	12.00				Pulled early to determine if screen was open or related to back pressure from aquifer. Turned pump down.
1	10/6/2015	11:50	71-70	90	0.68	40	45	5.00	45.0			Abandoned point due to high pressures. Pulled rods to look at screen, which didn't open resulting in the high pressures. Appears fine sands penetrated the screen causing it to not open. Readvanded rods with screen, but couldn't initiate flow. Abandoned point.
		8:43	77-76	30	3.38	0	34	34.00		0.13		3rd attempt with expendable point tip.
		8:52	76-75	6	3.92	34	68	34.00		0.13		Slowed flow rate down to 3.53 gpm at 54 gallons.
		9:00	75-74	2	3.49	68	102	34.00		0.13		g <sub>p</sub>
1A	10/7/2015	9:10	74-73	2	3.56	102	136	34.00	195.0	0.13		
	-	9:20	73-72	2	3.54	136	155	19.00		0.13		
		9:26	72-71	2	3.51	155	174	19.00		0.13		
		9:32	71-70	2	3.50	174	195	21.00		0.12		240 gallons total with the 45 gallons applied on 10/6/15.
		1:23	77-76	170	0.00	0	0	0.00				Couldn't initiate flow. Abandoned point and re-advanced rods with expendable point.
		2:28	77-76	74	2.21	0	34	34.00		0.13		Second attempt with expendable point tip.
		2:36	76-75	58	2.68	34	68	34.00		0.13		occord accompt with experiousle point up.
_		2:49	75-74	66	2.86	68	102	34.00		0.13		
2	10/6/2015	3:01	74-73	66	2.84	102	136	34.00	240.0	0.13		
		3:13	73-72	62	2.75	136	170	34.00		0.13		
		3:26	72-71	62	2.80	170	204	34.00		0.13		Flushed with 12 gallons of water.
		3:39	71-70	62	2.76	204	240	36.00		0.12		1st attempt screen didn't open initiallybent screen due to subsurface conditions.
		10:32	77-75	12	3.20	0	68	68.00		0.26		Point didn't dropped. Used inner rods to clear point. 2 foot pull to get flow initiated.
		10:50	75-74	12	3.25	68	102	34.00		0.13		
3	10/7/2015	11:03	74-73	6	3.38	102	136	34.00	240.0	0.13		
3	10/7/2015	11:13	73-72	6	3.43	136	170	34.00	240.0	0.13		
		11:23	72-71	4	3.42	170	204	34.00		0.13		
		11:36	71-70	4	3.46	204	240	36.00		0.12		
								0.00				
		1:15	77-76	64	3.25	0	34	34.00		0.13		Pressure dropping as we injection more volume60 to 18 psi.
		1:25	76-75	4	3.53	34	68	34.00		0.13		
	40/7/0047	1:34	75-74	0	3.74	68	102	34.00	0.40.0	0.13		
4	10/7/2015	1:43 1:52	74-73 73-72	0	3.78	102 136	136 170	34.00 34.00	240.0	0.13		
		2:02	72-71	0	3.82	170	204	34.00		0.13		
		2:10	71-70	0	3.67	204	240	36.00		0.13		Flushed with 10 gallons of water.
		12:33	71-70	12	3.67	0	34	36.00		0.12		Tradica with 10 gailons of water.
		12:33	76-75	12 4	3.33	34	68	34.00		0.13		Heave when breaking rods. Had abandoned an re-advance rods.
		2:40	75-74	0	3.64	68	99	31.00		0.13		Trouve when breaking rous. That abandoned an re-advance rous.
5	10/7/2015	2:53	74-73	0	3.74	99	136	37.00	240.0	0.13		
		3:04	73-72	0	3.74	136	170	34.00		0.13		
		3:13	72-71	0	3.78	170	204	34.00		0.13		
		3:22	71-70	0	3.71	204	240	36.00		0.12		
		4:26	77-76	6	3.74	0	34	34.00		0.13		Heave up in rods on first attempt. Had abandoned an re-advanced rods.
		4:33	76-75	6	3.91	34	68	34.00		0.13		
6	10/7/2015	4:41	75-74	4	3.86	68	102	34.00	240.0	0.13		





		Injection Injection Flow Volume of PlumeStop Injected Total		Total	BDI Plus	HRC						
ection Point	Date	Time	Depth (feet)	Pressure (psi)	Rate	Beginning Flow Meter	Ending Flow	Gallons Injected per	gallons per			
						(gal)	Meter (gal)	Interval				Comments
C	10/1/2010	4:50	74-73	4	3.86	102	136	34.00	240.0	0.13		
		4:58	73-72	4	3.82	136	170	34.00		0.13		
		5:08	72-71	4	3.80	170	204	34.00		0.13		
		5:17	71-70	4	3.84	204	240	36.00		0.12		Flushed with 12 gallons of water.





Injection Date Ti			Injection	Depth		Depth	Depth	Depth	Depth	Injection	Flow	Volume	of PlumeStop	Injected	Total	BDI Plus	HRC	
Point	Date		Depth (feet)	Pressure (psi)	Rate (gpm)	(gal)	Ending Flow Meter (gal)	Interval	gallons per Location	application (liters)	Application (pounds)	Comments						
1	ļ	5:36	77-76	38	2.71	0	34	34.00		0.13								
	-	5:48	76-75	4	3.82	34	68	34.00		0.13								
7 1	10/7/2015	5:57	75-74	4	3.78	68	102	34.00	240.0	0.13								
,	10/7/2015	6:06	74-73 73-72	4	3.81	102	136 170	34.00	240.0	0.13								
1	-	6:15 6:25	73-72 72-71	4 6	3.76 3.74	136 170	170 204	34.00 34.00		0.13 0.13								
	-	6:34	71-70	4	3.74	204	240	36.00		0.13		Flushed with 25 gallons of water.						
		9:42	77-76	4	3.96	0	34	34.00		0.13		Points 8 & 9 done at the same time.						
	-	9:49	76-75	4	3.80	34	68	34.00		0.13		Tomas o a o done at the same time.						
		9:59	75-74	2	3.36	68	102	34.00		0.13								
8 1	10/8/2015	10:10	74-73	2	3.45	102	136	34.00	240.0	0.13								
		19-Oct	73-72	2	3.30	136	174	38.00		0.13								
		10:31	72-71	2	3.58	174	204	30.00		0.13								
		10:39	71-70	2	3.54	204	240	36.00		0.12								
		9:57	77-76	32	3.07	0	34	34.00		0.13								
	ļ	10:03	76-75	2	3.89	34	68	34.00		0.13								
	Ī	10:12	75-74	2	3.36	68	102	34.00		0.13								
9 1	10/8/2015	10:20	74-73	2	3.30	102	134	32.00	240.0	0.13								
		10:30	73-72	2	3.32	134	170	36.00		0.13								
		10:41	72-71	2	3.34	170	208	38.00		0.13								
		10:52	71-70	2	3.99	208	240	32.00		0.12		Flushed with 25 gallons of water.						
	_	2:50	77-76	18	3.34	0	34	34.00		0.13								
		2:59	76-75	4	3.78	34	68	34.00		0.13								
		3:08	75-74	6	3.83	68	102	34.00		0.13								
10 1	10/8/2015	3:17	74-73	6	3.89	102	136	34.00	240.0	0.13								
	_	3:27	73-72	8	3.94	136	170	34.00		0.13								
	_	3:33 3:41	72-71	6	4.25 4.24	170 204	204 240	34.00		0.13								
		3:41	71-70			_	_	36.00		0.12	7.50							
			77-76			0.00	0.69	0.69			7.50							
			76-75			0.69	1.38	0.69			7.50							
HRC-1 1	10/9/2015	8:30	75-74			1.38	2.07	0.69	4.84									
HKC-1 I	10/9/2013	0.30	74-73 73-72			2.07 2.76	2.76	0.69	4.04		7.50 7.50							
			73-72			3.46	3.46 4.15	0.69			7.50							
			71-70			4.15	4.15	0.69			7.50	Flushed with 5 gallons of water.						
			77-76			0.00	0.69	0.69			7.50	Flustied with 5 gallons of water.						
			76-75			0.69	1.38	0.69			7.50							
			75-75 75-74			1.38	2.07	0.69			7.50							
HRC-2 1	10/9/2015	9:15	74-73			2.07	2.07	0.69	4.84		7.50							
2	10/0/2010	3.10	73-72			2.07	3.46	0.69	4.04		7.50							
			72-71			3.46	4.15	0.69			7.50							
			71-70			4.15	4.15	0.69			7.50	Flushed with 5 gallons of water.						
			77-76			0.00	0.69	0.69			7.50	. name and o gamens of mater.						
ı l		ŀ	76-75			0.69	1.38	0.69			7.50							
ı l		ŀ	75-75			1.38	2.07	0.69			7.50							
HRC-3 1	10/9/2015	10:00	74-73			2.07	2.76	0.69	4.84		7.50							
	. 5/5/2010	10.00	73-72			2.76	3.46	0.69	4.04		7.50							
ı l		ŀ	72-71			3.46	4.15	0.69			7.50							
			71-70			4.15	4.15	0.69			7.50	Flushed with 5 gallons of water.						
	_		77-76			0.00	0.69	0.69			7.50	2 ganono or matori						
			11-10			0.69	1.38	0.69			7.50							





Injection Point		Time	Injection Depth (feet)	Injection Pressure (psi)		Volume of PlumeStop Injected			Total	BDI Plus	HRC	
	Date					Beginning Flow Meter (gal)	Ending Flow Meter (gal)		gallons per		Application (pounds)	Comments
			75-74			1.38	2.07	0.69			7.50	
HRC-4	10/9/2015	10:40	74-73			2.07	2.76	0.69	4.84		7.50	
			73-72		-	2.76	3.46	0.69			7.50	
			72-71	-	1	3.46	4.15	0.69			7.50	
			71-70		1	4.15	4.84	0.69			7.50	Flushed with 5 gallons of water.

| PlumeStop | BDI+ (pounds) | Totals: | 2400.0 | 9.00 | 210.0



### **AECOM - NIROP**

### Plumestop Injection Summary Log Injection Area Description Table 1



Injection Point	Date	Time	Injection Depth (feet)	Avg. Injection Pressure (psi)	Avg. Flow Rate (gpm)	Volume of PlumeStop Injected					Pounds of	
						Beginning Flow Meter (gal)			Per Location	Batches Injected Per Location	PlumeStop Injected Per Location	Comments
IW-1	1/8/2016	13:40	69-76	0.0	10.5	0	1066	1066	1066	1.00	666.95	
IW-2	1/8/2016	10:05	69-76	6.0	10.4	0	1066	1066	1066	1.00	666.95	
IW-3	1/8/2016	11:45	69-76	7.0	10.8	0	1066	1066	1066	1.00	666.95	



October 21, 2015

**To:** Chris Boehm Carlson – AECOM, Brian Murray–NAVFAC

From: Craig Sandefur, Steve Barnes, and Kristen Thoreson–REGENESIS

**Cc:** Ryan Moore–REGENESIS

RE: Early Field Observations related to PlumeStop® Liquid Activated Carbon™ Field Test at the Naval Industrial Reserve Ordinance Plan (NIROP), Fridley, MN

Dear Team,

REGENESIS recently completed an *in-situ* application of PlumeStop® Liquid Activated Carbon™ (PlumeStop), HRC®, and Bio-Dechlor INOCULUM® Plus (BDI Plus) at the NIROP site located in Fridley MN. The application consisted of two (2) separate test locations within the facility and have been identified as Test Area 1 and Test Area 2. The scope of work for this effort is outlined in the AECOM Work-plan dated August 2015. Below are a few key observations that we wanted to share with the team as we move into the post application monitoring program.

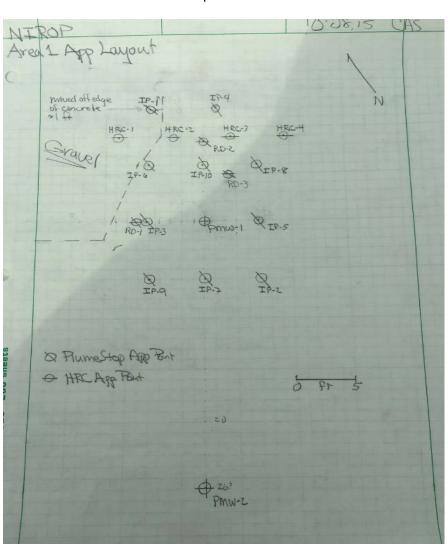
Previous assessments of groundwater (GW) in the two (2) test areas indicated elevated GW chlorinated volatile organic compounds (cVOCs) present. As part of the pre-application program REGENESIS and AECOM mobilized to the site and installed two (2) GW monitoring wells in each of the test area locations (total of four (4) newly installed monitoring wells). At that time the AECOM/REGENESIS team assumed that GW concentrations would likely be within the same order of magnitude for each of the test areas. Based on the information provided, it was presumed the total cVOCs concentrations in Test Area 1 would be in the range of 100 mg/L and in the range of 10 mg/L in Test Area 2.

#### Test Area 1:

This area is considered a source area at the NIROP site and is adjacent to the sites former plating room. In this area no GW elevation change was present between the newly installed monitoring wells. These wells were installed with 5 feet (ft) of screen (61-66 ft below ground surface (bgs)). This section is within the vertical section of elevated cVOCs concentrations reported in previous site wide GW assessment programs. GW analytical results in these wells, collected during the pre-application program (September 15<sup>th</sup> and 25<sup>th</sup>, 2015), indicated significantly lower total cVOC concentrations present, approximately 0.4 to 0.5 mg/L.



In Test Area 1, the application of PlumeStop went without significant difficulties beyond the elevated aquifer pressure present. The injection activities were initiated with greater than typical pressure but stabilized over the course of the application to more typical pressures and flowrates. The injection pressure ranged from 18 to 110 pounds per square inch (psi) with an average injection pressure of 62 psi. The PlumeStop solution flowrates ranged from 1.08 to 5.34 gallons per minute (gpm) with an average of 3.42 gpm. Pressure and flowrates were conversely related throughout the injection application. Due to this, the injection pump was adjusted to maintain a flowrate in the range of 3.50 gpm. Below is a field map of the injection point array.



Field Map of Test Area 1



Upon completion of the PlumeStop application a bailer was lowered into the well; PlumeStop water was observed upon removal of about 4.0 gallons of pre-application GW from the unscreened section of the well. A picture of PlumeStop in groundwater from PMW-1 is provided below (jar on the left).



Photo of Bailed GW from TTZ in Area 1 and Area 2, Post-application

A soil cores were also collected from within the Target Treatment Zones (TTZ) of both test areas after the injection activities were completed. The soil cores from the test areas were then sent to the REGENESIS lab in San Clemente, CA for a detailed logging. Below is a photograph taken by AECOM that shows the bottom most section of the soil core collected from Test Area 1 with a total depth of 67 ft bgs. It shows the presence of PlumeStop (black soil) within the TTZ saturated soil column at approximately 64-66 ft bgs. The lighter section of soil present at the core base is below the TTZ (left side of picture). The screened interval of the adjacent performance well is 61-66 ft bgs.



Photo of Soil Core from Area 1, Post-application



#### Test Area 2:

Test Area 2 is positioned in a downgradient "hot spot" and does not appear to be directly associated to a known source at the site. This area is within approximately 150 ft of the nearest site GW extraction well, AT-12. During the injection applications, the extraction well network was not operating. The two (2) GW monitoring wells were installed with 5 ft of screen (71 to 76 ft bgs) during the pre-application program. This section is within the vertical section of elevated cVOCs reported in the previous site wide GW assessment programs. GW analytical results from these newly installed wells indicate a significantly lower cVOCs concentration than presumed. Total cVOCs GW concentrations in these wells ranged from approximately 0.05 to 0.6 mg/L. Below are photographs of Area 2.







Application of PlumeStop was a bit more complicated in this area. Starting at approximately 40 to 45 ft bgs, a fine grained stratigraphy was encountered that resulted in "heaving" of the soils into the injection screens, which ultimately locked the screens closed. In one instance these tighter soils bent the injection screen tooling, which also locked the screen closed. For either case, the injection screen tooling malfunction resulted in no PlumeStop delivery. After four unsuccessful attempts using the injection screen tooling to reach the TTZ depths and inject PlumeStop, the application team elected to use an expendable tip rod for the PlumeStop injection. This method does not require opening of the tool, it merely uses the elevated pressure generated by the pump to "drop" the expendable tip out the



end of the rod's tip holder and thus PlumeStop is applied continuously and minimizes sand heave into the rods. This method along with an elevated pressure, >50 psi, allowed the initiation of PlumeStop without the significant sand heave experienced when using the injection retractable screen tools. Although effective in preventing the clogging of injection rods this method has a disadvantage in that it directs the reagent directly downward and not outward (laterally) as does the retractable injection tool.

In this aquifer setting (coarsening downward/fining upward) the pressure of initiation (e.g., "popping" the tip) was higher than typical, however, the application pressures after that initial phase was very low. The injection pressures ranged from 0.0 to 74 psi with an average pressure of 15 psi. The flowrates ranged from 2.21 to 4.25 gpm with an average rate of 3.48 gpm. Pressures typically were in the low to moderate range (12 to 74 psi) from approximately 76 to 77 ft bgs and decreased to a lower range (4.0 to 58 psi) as the injection tooling was pulled upward. Pressure and flowrates were conversely related throughout the injection application. Similar to Test Area 1, the injection pump would be adjusted to maintain a ideal flowrate in the range of 3.50 gpm.

Upon completion of the PlumeStop application a bailer was lowered into well PMW-3. No PlumeStop (black water) was observed from the bailed water. REGENESIS then hand bailed approximately 12 gallons of GW from the well without a significant change in the GW color. PlumeStop water was not observed in PMW-3 during the bailing activities. Below is a picture of the water from PMW-3 (Jar on the right).







#### **Working Model**

Based on the post application soil cores it may be that the coarse gravel layer present (approx. 3 ft below the total depth of wells PMW-3 and PMW-4) was contacted by PlumeStop during application. The "expendable tip" method may have emphasized a downward direction rather than lateral application of PlumeStop. At most sites the downward force of injection is more than off-set by much greater horizontal hydraulic conductivities (Kh) in unconsolidated sediments/soil. Most sediment/soils have a lateral Kh that are 10x those of the same soil's vertical Kh. However, at this site a very high Kh layer of well sorted gravel present near the base of the TTZ interval may have skewed the application dimensions. Given the application method required in this area it may be that the more typical lateral movement of PlumeStop was effectively short-circuited downward by direct contact with the highly transmissive gravel section below the TTZ. Below is a photograph of the contact between the upper medium grained sand and the underlying gravel layer. Wells PMW-3 and PMW-4 were completed approximately 3 ft above the gravel layer and is within the medium-coarse grained sand zone shown on the right side of the photo.







As part of the soil logging process Regenesis staff use field settling tubes to assess the relative quantities of fine grained particles (clay and silt) and coarse grained particles in soil samples. This is a technique that is simple in that it requires only addition of soil + water to a unpreserved 40 ml VOA, the VOA is shaken to separate the fines and then set aside to allow settling of the coarse to fine grain soil particles. A relative visual percentage based on volume can be estimated using a ruler/tape measure. This method is beneficial in that it allows better visual observation of more detailed soil texture. These include grain size distribution, sand particle angularity or roundness etc. Finally, the presence of PlumeStop becomes somewhat more discernable (compared to dark colored soil). This is because upon agitation of the VOA pre-stabilized PlumeStop present in the soil matrix is transferred back into the water phase and can be observed separately from the soil matrix. See the settling tube picture below for more detail.

Photo: settling tubes with PlumeStop present in water at 78 to 79 ft bgs (3 ft. below the TTZ)



Based on the delivery method required (expendable tip) and soil core observations, including those from soil settling tubes shown above, it seems likely that the application of PlumeStop in Test Area 2 was delivered below the TTZ. It may be that PlumeStop contacted the coarse gravel layer underlying the TTZ and consequently little of PlumeStop was distributed above this gravel zone and within the actual TTZ (PMW-3 well screened interval). Based on field observations of the available soil from post-application soil cores (limited soil returns from within the TTZ), it appears that a minor amount of PlumeStop *may* be present at the base of the screened interval 71-76 bgs. The strong presence of PlumeStop was noted below 74.8 ft bgs in the soil core samples from 78-79 ft bgs. PlumeStop was not apparent in the soil sample from 80 ft bgs.

# REGENESIS

# TECHNICAL MEMORANDUM

#### **Possible PlumeStop CVOC Responses:**

#### Area 1

Based on the presence of Plumestop in the soil column and in GW from the TTZ in this test area, it is likely that a significant and sustained reduction in CVOC GW concentrations will be achieved.

#### Area 2

PlumeStop was not obviously present in the soil core samples collected within the TTZ nor was it readily identifiable in the GW removed from well PMW-3. Given the possibility that the "as designed" quantity of PlumeStop may not be present in the planned TTZ, we might expect one or more of the following:

- an immediate yet diminished contaminant capture efficiency as evidence by a lesser initial sorption effect; might be evidenced by a less than the typical robust decline in CVOC concentration, and/or
- a shortened duration of capture (lifespan); this is evidence by a rebound in contaminant concentration

#### **Next Steps**

REGENESIS recommends that we monitor the GW in both Area 1 and 2 per the Work Plan and proceed based on the interim results in each test area. REGENESIS believes that within 2-3 months of the application, some more clear trends will become evident. REGENESIS will continue to provide technical assistance and review of all data sets associated with the upcoming GW monitoring events. REGENESIS will confer directly with AECOM on all data and the appropriate next steps throughout the study.

In order to assess if some PlumeStop may remain in the Area 2 TTZ, GW chemistry changes should be tracked (field parameters and laboratory based) and the field visual observation of GW should be recorded (dark GW coloration). Additionally, Volatile Fatty Acid results will help us track HRC related metabolites (bioremediation).

Finally AECOM has agreed to perform a one time over purge (remove 75 gallons) from well MWP-3 in Area 2 prior to the  $1^{st}$  post-application GW sampling event. This GW sampling event is scheduled for Friday October  $23^{rd}$ , 2015.



May 9, 2016

To: Chris Boehm Carlson – AECOM, Brian Murray–NAVFAC

From: Craig Sandefur, Ryan Moore, Kristen Thoreson–REGENESIS

RE: Summary Report of a PlumeStop® Liquid Activated Carbon™ Field Test at the Naval Industrial Reserve Ordinance Plant (NIROP), Fridley, MN

Dear Team,

REGENESIS recently completed a Pilot Scale study of a new *in-situ* technology called PlumeStop® Liquid Activated Carbon™ (PlumeStop) at the NIROP site located in Fridley MN. The study consisted of an initial application of PlumeStop, Hydrogen Release Compound (HRC) and Bio-Dechlor Inoculum Plus (BDI) in two (2) test locations within the facility. The two Pilot Test areas are referred to as Test Area 1 and Test Area 2, shown in Figure 1. A second application of PlumeStop only was applied in Area 2 as a follow up to the initial application. The scope of work for the above efforts are outlined in and AECOM Work-Plan dated August 2015, a REGENESIS Reapplication Technical Memo dated November 6, 2016, and an AECOM memo to the Minnesotan Department of Health (MDH) dated December 2, 2015. Below is a summary of activities performed and key observations that we want to share with the team as we conclude the Pilot Test Study.

Previous assessments of groundwater (GW) in the two (2) test areas indicated elevated GW chlorinated volatile organic compounds (CVOCs) present. As part of the pre-application program REGENESIS and AECOM mobilized to the site and installed two (2) GW monitoring wells in each of the test area locations (total of four (4) newly installed monitoring wells). At that time the AECOM/REGENESIS team assumed that GW concentrations would likely be within the same order of magnitude for each of the test areas. Based on the information provided, it was presumed the total cVOCs concentrations in Test Area 1 would be in the range of 100 mg/L and in the range of 10 mg/L in Test Area 2.

#### **TEST AREA 1:**

This area is considered a source area at the NIROP site and is adjacent to the sites former plating room. In this area of the site GW elevation/gradient was zero. That is no change in GW elevation was present between the newly installed monitoring wells installed as part of this study. These wells were installed with 5 feet (ft) of screen extending from 61-66 ft below ground surface (bgs). This screened section of the aquifer is within the same vertical section that contained elevated cVOC concentrations as reported in the previous site wide GW assessment program. Groundwater analytical results in these wells, collected during the pre-application program (September 15<sup>th</sup> and 25<sup>th</sup>, 2015), indicated significantly lower total cVOC concentrations were present. The total CVOC concentration present ranged from approximately 0.4 to >1 mg/L.



#### **Test Area 1 Application Program**

PlumeStop and a bioaugmentation culture Bio-Dechlor Inoculum (BDI) were applied via a series of 10 Direct Push Injection (DPI) points using typical DPI methods. In addition, the electron donor Hydrogen Release Compound (HRC) was applied via 4 separate DPI points. In Test Area 1 REGENESIS used a 3 foot long retractable screen injection tool to apply the remedial reagents across a 7 foot thick target treatment zone (TTZ) extending from 60-67 feet BGS. The application delivered 4,400 pounds of PlumeStop, 9 Liters of BDI and 210 pounds of HRC. See the attached map (below) for application point locations and orientation.

Application of remedial reagents in Test Area 1 was without significant difficulties beyond overcoming the unanticipated high (native) aquifer pressure present. Although injection activities were initiated with higher than typical pressures stabilized application pressures were generally typical for the flowrates used. Injection pressures ranged from 18 to 110 pounds per square inch (psi) with an average injection pressure of 62 psi. PlumeStop application rate ranged from 1.08 to 5.34 gallons per minute (gpm) and averaged about 3.42 gpm. Pressure and flowrates were conversely related throughout the injection application. As a result, the injection pumping rate was adjusted to maintain an application rate in the range of 3.50 gpm. Below is a map of Pilot Test Injection array.

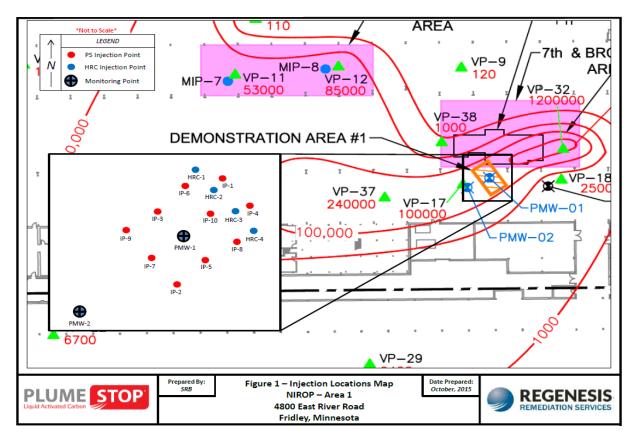


Figure 1: Field Map of Test Area 1



Photo 1: Test Area 1 Application Array



Upon completion of the PlumeStop application a bailer was lowered into PMW-1; PlumeStop water was observed upon removal of about 4.0 gallons of GW from the screened section of the well. A picture of PlumeStop in groundwater from PMW-1 is provided in Photo 2 below.

Photo 2: Bailed GW from TTZ in Area 1, Post-application



A soil core was collected from within the TTZ of both test areas after the injection activities were completed. The soil cores from the test areas were then sent to the REGENESIS lab in San Clemente, CA



for a detailed logging. Below is a photograph taken by AECOM that shows the bottom most section of the soil core collected from Test Area 1 with a total depth of 67 ft bgs. This photo shows the presence of PlumeStop (black soil) within the TTZ saturated soil column at approximately 64-66 ft bgs. The lighter section of soil present at the core base is below the TTZ (left side of picture). The screened interval of the adjacent performance well is 61-66 ft bgs.



Photo 3: Soil Core from Area 1, Post-application

#### **Test Area 1 Application Results**

Application of PlumeStop in this section of the aquifer resulted in an almost immediate and complete removal of CVOC from GW in Well PMW-1. This well is positioned with in the PlumeStop application area. The baseline concentration 1,026 ug/L CVOC were removed to Below Detection Limits (BDL) within 2 weeks of application and remained BDL for the duration of the Pilot Test Program (6 months). Results of PMW-2 GW analysis indicate a gradual increase over the past 6 months from a baseline total CVOC concentration of approximately 550 ug/L to approximately 825 ug/L. The majority of the increases in CVOC species in PMW-2 were in TCE and cDCE. A table of analytical results is provided as an attachment.

Results in well PMW-2 do not appear to be consistent with a well that is positioned downgradient of the PlumeStop application. Based on depth to groundwater data, and the previous GW potentiometric surface maps it appears that this well pair (PMW-1/PMW-2) may be located in a section of the aquifer that has a flat or zero gradient. This may explain the unanticipated disconnect between results in PMW-1 and PMW-2. Without a gradient to adjectively move PlumeStop the dose response is essentially limited to the area of application. This notion is supported by the lack of typical TEA shifts associated with the presence and advection of the HRC electron donor present in Area 1.

# REGENESIS

## TECHNICAL MEMORANDUM

#### **Area 1 Results Discussion**

Infield well PMW-1 present within Area 1 exhibited an immediate and sustained decrease of CVOC's in GW. In this well total CVOC's were reduced from baseline concentrations of approximately 450 ug/L to below detection limits for a period of 6 months (end point of the pilot test).

The downgradient control Well PMW-2 (approximately 30 feet downgradient of the PlumeStop injection area) exhibited an overall increase over the same time period. Given the flat GW gradient in this section of the Plume and the short time frame wells PMW-01 and PMW-02 were present prior to PlumeStop application it is REGENESIS is opinion that GW conditions in this area were likely stabilizing and had not reached a steady state concentration in this area prior to application of PlumeStop. It is likely that given the GW conditions and the proximity of PMW-1 to the former source area that total CVOC's would have likely increased in this well to near or above PMW-2 over the same timeframe.

Essentially we think that Well PMW-2 is control well that provides representative CVOC levels for this section of the aquifer.

#### **Test Area 1 Conclusion**

Based on the PlumeStop dose response as well as performance over the course of this study. REGENESIS recommends a full scale PlumeStop program in this section of the site.

#### **TEST AREA 2:**

This area is positioned within a downgradient "hot spot" that does not appear to be directly associated with a known source. This area is positioned within 150 ft of GW extraction well, AT-12. This well is part of a network of GW extraction wells that have been used to control the sites CVOC GW plume since the 1980's. This network has extracted over a billion gallons of water over the course of the last 30 years. During the PlumeStop application, the extraction well network was shut down for a few days.

#### **Test Area 2 Application Program**

PlumeStop and BDI were applied via a series of 10 DPI points using typical methods. In addition, the electron donor HRC was applied via 4 separate DPI points. In Test Area 2 REGENESIS attempted to use a 3 foot long retractable screen injection tool to apply the remedial reagents across a 7 foot thick TTZ extending from 70-77 feet BGS. The application delivered 2,000 pounds of PlumeStop, 9 Liters of BDI and 210 pounds of HRC. See the map below for application point locations and orientation.

Prior to the PlumeStop application, two (2) Pilot Test GW monitoring wells (PMW-3 and PMW-4) were installed within the test area. These wells were installed with a 5 ft of screen that extend from 71 to 76 ft bgs. The screened intervals of these wells are within the vertical section of elevated cVOC reported in the previous site wide GW assessment program. GW analytical results from these newly installed wells indicate a significantly lower cVOC concentration than was previously presumed. Total cVOC GW



concentrations in these wells ranged from approximately 0.05 to 0.6 mg/L. Below is a map of the PlumeStop Pilot Test Area.

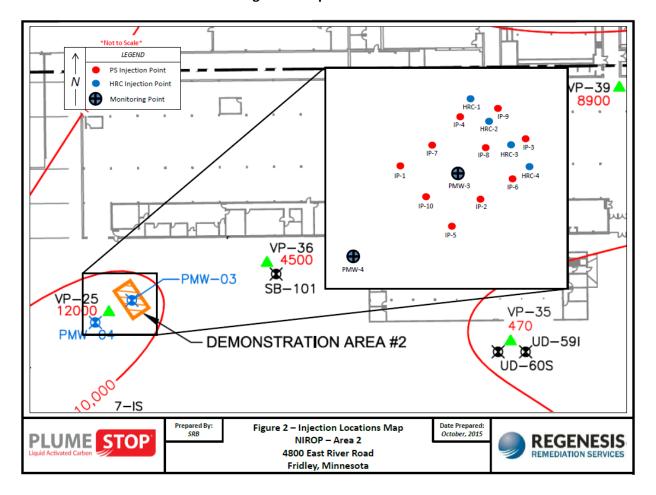


Figure 2: Map of Test Area 2





**Photo 4: Area 2 Injection Array and Monitoring Wells** 

Application of PlumeStop in Area 2 was more challenging than in Area 1. At approximately 40 to 45 ft bgs, a fine grained soil horizon is present that resulted in "heaving" soil into the injection tool screen. This influx of fine sand into the tool screen cause the tool to become "locked" in the closed position. Further, advancing the injection tool through the soil present in this section of the aquifer resulted in a bent injection tool. The bent tool resulted in the screen section of the tool to remain (locked) in the closed position. In both cases, the injection tool malfunction resulted in no PlumeStop being delivered to the TTZ. After four unsuccessful attempts to reach the TTZ using the screened injection tool the application team elected to switch to an expendable point rod set. This method does not require opening a tool. This method uses the pressure generated by the pump to "expel or drop" the expendable point/tip from a tip holder positioned at the end of the rod set. This allows PlumeStop to be applied continuously and so minimizes the sand heave into the rode. This method along with an elevated application pressure (>50 psi) allowed delivery of PlumeStop without problems associated with sand heave experienced during the previous attempts at application of PlumeStop using the retractable screen injection tool. It should be noted that although this method is effective in preventing the clogging of injection rods this method has a disadvantage in that it directs the PlumeStop directly downward rather than outward (laterally) from the tool. This lateral application of PlumeStop is one of the main benefits of using a retractable screen injection tool.

In this aquifer setting (coarsening downward/fining upward) the initiation pressure (e.g., "dropping" the tip) was higher than typical, however, application pressures upon initiation were low. Injection



pressures in this section of the aquifer ranged from 0.0 to 74 psi with an average pressure of 15 psi. The application rates ranged from 2.21 to 4.25 gpm with an average rate of 3.48 gpm. Overall application pressures were low to moderate range. In the deep section of the aquifer application pressures ranged from 12 to 74 psi at 76 to 77 ft bgs and decreased into the range of 4.0 to 58 psi as the injection interval was raised (shallower zones). Pressure and flowrate were conversely related throughout the injection application. Similar to Test Area 1, the injection pump was adjusted to maintain an optimal flowrate of approximatley 3.50 gpm.

Upon completion of the PlumeStop application a bailer was lowered into well PMW-3. No PlumeStop (black water) was observed from the bailed water. REGENESIS then hand bailed approximately 12 gallons of GW from the well without a significant change in the GW color. PlumeStop water was not observed in PMW-3 during the bailing activities. Below is a picture of the water from PMW-3.



Photo 5: Bailed GW from TTZ in Area 2, Post-application

## **Test Area 2 Application Results**

Application of PlumeStop in this section of the aquifer resulted in an almost immediate removal of a significant 88% of the total CVOC's from GW in the infield Well PMW-3. Two weeks after application CVOC concentrations in PMW-3 were reduce from 581 to 72 ug/L. Over the next 2-3 months CVOC levels stabilized between 120-130 ug/L. A reapplication program was proposed and implemented in this area. See the discussion below for details.

Results in PMW-4 did not appear to be consistent with a well that is positioned downgradient of the PlumeStop application area. Baseline concentrations in PMW-4 (56 ug/L) are 1 OOM lower than baseline concentrations of the upgradient well PMW-3. Results of CVOC analysis from well PMW-4 indicate an



initial increase from baseline levels to concentrations ranging from 85 to 110 ug/L. Results in this well have been fairly consistent since application of PlumeStop. See the attached table for details.

#### Test Area 2 Results Discussion

Based on Area 2 soil cores, it may be that the coarse gravel layer present (approx. 3 ft below the total depth of wells PMW-3 and PMW-4) was contacted by PlumeStop during application. The "expendable tip" method may have emphasized a downward direction rather than lateral application of PlumeStop. At most sites the downward force of injection is more than off-set by much greater horizontal hydraulic conductivities (Kh) in unconsolidated sediments/soil. Most sediment/soils have a lateral Kh that are 10x those of the same soil's vertical Kh. However, at this site a very high Kh layer of well sorted gravel present near the base of the TTZ interval may have skewed the application dimensions. Given the application method required in this area it may be that the more typical lateral movement of PlumeStop was effectively short-circuited downward by direct contact with the highly transmissive gravel section below the TTZ. Below is a photograph of the contact between the upper medium grained sand and the underlying gravel layer. Wells PMW-3 and PMW-4 were completed approximately 3 ft above the gravel layer and is within the medium-coarse grained sand zone shown on the right side of the photo.



Photo 6: Contact between the Lower Gravel and the Upper Sand (Test Area 2)

As part of the soil logging process REGENESIS staff use field settling tubes to assess the relative quantities of fine grained particles (clay and silt) and coarse grained particles in soil samples. Using this technique a relative visual percentage of fine grained vs coarse grained soil can be estimated. This method is beneficial in that it allows better visual observation of soil texture. The presence of PlumeStop becomes somewhat more discernable (compared to dark colored soil). This is because upon agitation of the VOA pre-stabilized PlumeStop present in the soil matrix is transferred back into the water phase and can be observed separately from the soil matrix. See the settling tube picture below for more detail.





Photo 7: Settling tubes at 78 to 79 ft bgs from Test Area 2 (3 ft. below the TTZ)



Based on the delivery method required (expendable tip) and soil core observations, including those from soil settling tubes shown above, it seems likely that at least some of the applied PlumeStop in Test Area 2 was delivered below the TTZ. It may be that PlumeStop contacted the coarse gravel layer underlying the TTZ and consequently little of PlumeStop was distributed above this gravel zone and within the actual TTZ (PMW-3 well screened interval). Based on field observations of the available soil from post-application soil cores (limited soil returns from within the TTZ), it appears that a minor amount of PlumeStop *may* be present at the base of the screened interval 71-76 bgs. The strong presence of PlumeStop was noted below 74.8 ft bgs in the soil core samples from 78-79 ft bgs. PlumeStop was not apparent in the soil sample from 80 ft bgs.

At 3 months post application REGENESIS elected to reapply PlumeStop via a set of newly installed dedicated injection wells. A discussion of this follows.

#### **Test Area 2 Reapplication**

Upon electing to reapply PlumeStop in Area 2, REGENESIS designed another round of PlumeStop application using injection wells rather than direct push methods. The thinking was to install the injection wells without contacting the gravel layer thought to be present below 77 feet BGS. In December 2015 REGENESIS + AECOM staff installed 3 injection wells with 5 feet of stainless steel screen (71-76 ft bgs) using sonic drilling techniques. These 3 injection wells were oriented on a line oriented perpendicular to GW flow direction at a distance of approximately 13.5 feet upgradient of PMW-3. The wells were installed at a center spacing of 15 feet. Upon wells installation each well was developed in preparation for PlumeStop application. In January 2016 REGENESIS + AECOM + REGENESIS Remediation Services remobilized to the site and applied 2,000 pounds of PlumeStop only.

The application of PlumeStop in this area via injection wells was without issues. The injection of PlumeStop was performed at an average pressure of 10.8 psi at a rate of 10.5 gpm.

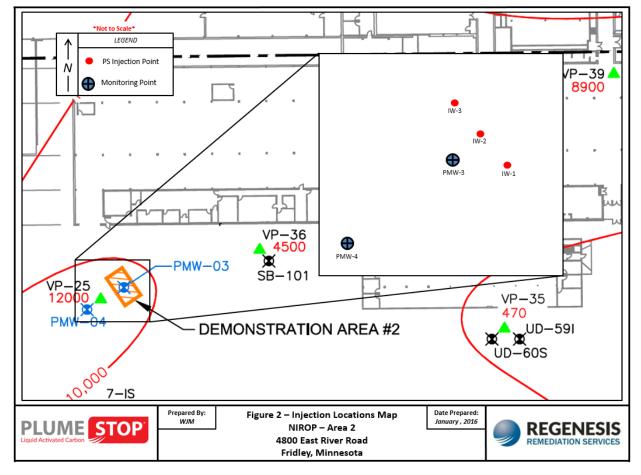


Figure 3: Map of Injection Well Positioning in Test Area 2

#### **Test Area 2 Reapplication Results Discussion**

Reapplication of PlumeStop in this section of the aquifer appears to have had no discernable dose response effect in either of the Pilot Test controls wells.

Total CVOC's in PMW-3 have remained at the concentrations that are the same or greater through the final 3 months of the Pilot Test Program. See Table 2 for details of CVOC results over time.

CVOC levels in PMW-4 did not appear to exhibit a dose response. CVOC concentrations remained relatively flat to modestly increase. See Table 2 (separate attachment) for details on CVOC concentration changes in these wells.



#### Test Area 2 Initial Application

Post Application Assessment of the Test Area indicates that PlumeStop was not obviously present in the soil core samples collected within the TTZ except for the base of the screen interval and below the TTZ. Further, PlumeStop was not readily identifiable in the GW removed from well PMW-3.

TECHNICAL NOTE: collection of soil core using typical methods in Test Area 2 was not generally successful due to the aquifer soil and GW conditions present in this section of the aquifer. Soil recovery rates were routinely less than 50%. During installation of the 3 injection wells, soil core recovery rates with "sand catcher" subassemblies were unsuccessful in the recovery of soil core.

#### Test Area 2 Reapplication

Upon re-application of PlumeStop via the 3 injection well array PlumeStop was present in GW from that application.

Given the presence of PlumeStop in Well PMW-3 and the presence of PlumeStop in soil collected from the TTZ it is unclear why the dose response in PMW-3 was not more robust.

- The most likely reason for the lack of CVOC removal from GW is that the PlumeStop applied was rapidly swept from the application field of the existing extraction system present at the property boundary. The closest extraction wells AT-11 and AT-12 are within 150 feet of the PlumeStop work area.
- Based on communication with AECOM, REGENESIS understands that the GW extraction system
  was restarted within 3 days after installation of PlumeStop. Given the high Kh present in this
  section of the aquifer REGENESIS believes the majority of the PlumeStop applied in this section
  of the aquifer as a stabile colloid was swept into the extraction system before it time to
  destabilize and deposit onto the soil matrix. The on-going extraction system is accelerating GW
  flow in this area reducing the expected number of collisions between CVOC and PlumeStop as
  well as accelerating the flux rate of CVOC's in this section.

Given the possibility that the "as designed" quantity of PlumeStop may not be present in the Area 2 TTZ, we might expect one or more of the following:

- an immediate yet diminished contaminant capture efficiency as evidence by a lesser initial sorption effect; might be evidenced by a less than the typical robust decline in CVOC concentration, and/or
- a shortened duration of capture (lifespan); this is evidence by a rebound in contaminant concentration

Based on the data sets for Area 2 we believe the above relatively predicted outcome is very likely what occurred in this section of the aguifer.



#### **Test Area 2 Conclusion**

PlumeStop achieved a cVOC reduction of between 70-80% with an operating P&T system in place.

It is reasonable to assume that PlumeStop performance results were affected by the operating P&T system. REGENESIS believes upon shut down the P&T system that native GW velocity will be much slower. The slower GW velocity will result in a longer residence time of CVOC within the PlumeStop reactive zone. This will result in more complete sorption and ultimately a higher CVOC removal rates. REGENESIS believes that under native GW gradient and flow conditions that Test Area 2 will be conducive to success with PlumeStop at full scale given PlumeStop's reasonably good performance under the current GW flow and velocity conditions.

#### **Conceptual Full Scale Project Approach**

Given the positive dose response in both Test Areas of the site the conceptual approach for PlumeStop in full-scale is as follows.

PlumeStop would be implemented as a series of reactive zones positioned perpendicular to GW flow in strategically selected areas along the CVOC plumes long axis. Upon implementation the systematic removal of CVOC's along the plume center line will result in a dramatic reductions in CVOC mass flux along the DG property boundary. The lowered CVOC present will require a less robust system to manage the mass flux. REGENESIS proposes using an iterative design program combined with a phased implementation approach that provides the Navy+AECOM+REGENESIS Remediation Team with maximum flexibility in managing the design and application based on system performance. This will allow the NIROP Remediation Team to optimize the program so minimizing the chance of over- or under- design. Using this approach REGENESIS is very confident in PlumeStop's ability to achieve high efficiency removal of CVOC's to NIROP cleanup requirements under a full scale scenario.

# Summary Results - Area 1 PlumeStop Demonstration Study Report NIROP Fridley, Minnesota

Well ID						PMW-01							PMW-02			
Sample ID			PWM-01	PMW-01	PMW-01	PMW-01	PMW-01	PMW-01	PMW-01	PWM-02	PMW-02	PMW-02	PMW-02	PMW-02	PMW-02	PMW-02
Date Sampled			9/16/2015	9/25/2015	10/26/2015	11/6/2015	12/4/2015	1/6/2015	3/31/2016	9/16/2015	9/25/2015	10/26/2015	11/6/2015	12/4/2015	1/6/2016	3/31/2016
Date Sampled			9/10/2013	0	10/20/2013	11/6/2015	12/4/2015	1/6/2015	3/31/2016	9/10/2015	0	10/26/2015	11/6/2013	12/4/2013	1/6/2016	3/31/2010
Monitoring Event			Baseline	Baseline	2 weeks	1 month	2 month	3 months	6 months	Baseline	Baseline	2 weeks	1 month	2 month	3 months	6 months
Field Parameters	Units	PQL														
Temperature	°C	Ţ	17.36	17.98	17.26	16	15.21	14.02	15.07	16.62	17.97	16.87	16.02	14.56	14.65	14.75
На			7.24	7.17	8.16	7.67	7.29	6.95	7.08	7.11	7.15	7.17	7.11	7.15	7.22	7.26
Conductivity	uS/cm		1402	1571	1814	2051	1649	1603	1383	1384	1497	1429	1698	1425	1415	1353
D.O.	mg/L		5.78	0.69	0.71	0.15	0.52	1.13	0.37	0.59	0.92	1.65	0.81	1.02	1.29	0.25
ORP	mV		52.2	-47.9	-159.7	-189.6	-185.4	-150.6	-135.7	-117.2	-25.9	-80.9	-110.2	-105.5	-106.3	-105.8
Turbidity	NTU				-73	-73	no read	-49	8.99			1.75	2.83	2.44		
Depth to Water (DTW)	ft		15.78	15.66	16.27	16.23	15.89	16.21	16.35	15.84	15.72	16.3	16.32	15.95	16.29	16.43
Total well Depth (TD)	ft		65.15	65.11	65.29	65.27	66.39	66.35	65.26	65.81	65.82	65.78	65.79	66.62	66.95	65.79
General Chemistry																
Nitrate+Nitrite	mg/L		< 0.020		< 0.020	2.6	< 0.20	< 0.020	< 0.020	< 0.020		< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Chemical Oxygen Demand	mg/L		< 50.0		1240	995	342	278	< 50	< 50.0		< 50	< 50	< 50	< 50	< 50
Total Organic Carbon	mg/L		2.8		35.1	< 100	36.7	91.9	14.5	3.1		2.3	2.5	2.5	2.4	5.3
Sulfide	mg/L		< 0.10		< 50	< 20	< 5.0	32.3	0.25	< 0.10		< 0.10	< 0.10	< 0.10		0.13
Sulfate	mg/L		157		172	172	117	104	102	108		156	149	147	157	128
Alkalinity, total as CaCO3	mg/L		373		603	519	611	605	519	305		409	409	413	421	499
Alkalinity, bicarbonate CaCO3	mg/L		383		595	521	575	605	519	318		427	426	425	421	499
Carbon Dioxide, free	mg/L		34.8		333	< 25	< 100	103	100	35.3		127	34.8	51.9	54	60.7
Volatile Fatty Acids	1118/ -		3 1.0			123	1100	103	100	33.3			31.0	31.3	31	00.7
Acetic acid	mg/L		5.0 U		< 1.0	< 1.0	30	120	17	1.7 J		< 1.0	< 1.0	< 0.10	< 0.10	2.7
Propionic Acid	mg/L		5.0 U		1.5	< 1.0	15	86	10	5.0 U		< 1.0	< 1.0	< 0.10	< 0.10	2.2
Pyruvic Acid	mg/L		5.0 U		< 1.0	< 1.0	< 0.10	< 1.0	0.066	5.0 U		< 1.0	< 1.0	< 0.10	< 0.10	< 0.10
Butyric Acid	mg/L		5.0 U		< 1.0	< 1.0	< 0.10	1.8	1.4	5.0 U		< 1.0	< 1.0	< 0.10	< 0.10	< 0.10
Lactic Acid	mg/L		10 U		< 2.0	< 2.0	< 2.0	< 2.0	0.1	10 U		< 2.0	< 2.0	< 0.20	< 0.20	0.043
Formic Acid	1118/ -		n/m		< 1.0	< 1.0	< 0.10	< 1.0	0.044	n/m		< 1.0	< 1.0	< 0.10	< 0.10	< 0.10
i-Pentanoic Acid			n/m		< 1.0	< 1.0	< 0.10	< 1.0	0.054	n/m		< 1.0	< 1.0	< 0.10	< 0.10	< 0.10
Pentanoic Acid			n/m		< 1.0	< 1.0	< 0.10	< 1.0	< 0.10	n/m		< 1.0	< 1.0	< 0.10	< 0.10	< 0.10
i-Hexanoic Acid			n/m		< 2.0	< 2.0	< 0.20	< 1.0	< 0.20	n/m		< 2.0	< 2.0	< 0.20	< 0.20	< 0.20
Hexanoic Acid			n/m		< 2.0	< 2.0	< 0.20	< 1.0	< 0.20	n/m		< 2.0	< 2.0	< 0.20	< 0.20	< 0.20
Dissolved Gases			,		` 2.0	12.0	10.20	1.0	10.20	11,111		12.0	12.0	10.20	10.20	10.20
Ethane	ug/L		< 10.0		< 10	< 10	< 10	< 10	< 10	< 10.0		< 10	< 10	< 10	< 10	< 10
Ethylene	ug/L		< 10.0		< 10	< 10	< 10	< 10	< 10	< 10.0		< 10	< 10	< 10	< 10	< 10
Methane (TCD)	ug/L		< 10.0		< 10	< 10	< 10	31.7	1710	< 10.0		14.4	16	13.2	13	18.6
Total Metals	νδ/ L		` 10.0		` 10	` 10	` 10	51.7	1,10	` 10.0		±7.7	10	15.2	13	10.0
Iron	ug/L		10200		21400	10500	13300	17600	12100	10800		3430	3860	7070	8910	9170
Dissolved Metals	~6/ <u>-</u>		10200		21 100	10300	13300	1,000	12100	10000		3.30	3000	, , , ,	0310	3170
Iron	ug/L		135		2580	833	2190	11600	7240	1620		2600	3420	5480	6320	6320
8260 VOCs	~o, -		133						,	1020			3.20	3 .53	3323	3323
1,1,1-Trichloroethane	ug/L		< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10.0	< 10	< 1.0	< 1.0	< 2.0
1,1 - Dichloroethane	ug/L		7.1	17.3	< 10.0	< 1.0	< 1.0	< 1.0	< 1.0	27.2	31.7	46.5	34.3	50.5	37.8	35.2
1,1-Dichloroethene	ug/L		2.3	10.1	< 10.0	< 1.0	< 1.0	< 1.0	< 1.0	16.9	21.6	32.1	20.5	30.7	22.2	23.6
Chloroethane	ug/L		< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10.0	< 10	< 1.0	< 1.0	< 2.0
cis-1,2- Dichloroethene	ug/L		141	229	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	192	224	248	264	257	282	361
trans-1,2-dichloroethene	ug/L		154	438	< 10.0	< 1.0	< 1.0	< 1.0	< 1.0	230	276	303	318	284	320	309
Ethylbenzene	ug/L		< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10.0	< 10	< 1.0	< 1.0	< 2.0
Tetrachloroethene	ug/L		< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10.0	< 10	< 1.0	< 1.0	< 2.0
Trichloroethene	ug/L		156	332	< 4.0	< 1.0	< 1.0	< 1.0	< 0.40	35.4	30.2	39.7	36.6	54.4	51.2	93.8
Toluene	νδ/ L		< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10.0	< 10	< 1.0	< 1.0	< 2.0
Total xylene			< 1.0	< 1.0	< 30.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 30.0	< 30	< 30	< 1.0	< 6.0
Vinyl chloride	ug/L		0.66	< 5.0	< 4.0	< 0.40	< 0.40	< 0.40	< 1.0	<b>2.7</b>	<b>3.6</b>	<b>4.5</b>	4.8	4.1	< 0.80	3.7
Total VOCs	ug/L ug/L		461.06	1026.4	BDL	BDL	BDL	BDL	BDL	504.2	587.1	673.8	678.2	680.7	<b>713.2</b>	826.3
% VOC Removed	ug/L		701.00		99.9+%	99.9+%	99.9+%	99.9+%	99.9%	304.2		-15%	-16%	-16%	-21%	-41%
70 VOC Removed				_ <b></b>	JJ.J⊤/0	JJ.JT/0	J∃.∃⊤/0	JJ.JT/0	33.370			-13/0	-10/0	-10/0	- <b>∠1</b> /0	- <b>-1</b> /0

# Summary Results - Area 2 PlumeStop Demonstration Study Report NIROP Fridley, Minnesota

Well ID						PMW-0	13								PMW-04			
Sample ID			PMW-03	PMW-03	PMW-03	PMW-03	PMW-03	PMW-03	PMW-03	PMW-03	PMW-04	PMW-04	PMW-04	PMW-04	PMW-04	PMW-04	PMW-04	PMW-04
Date Sampled			9/15/2015	10/26/2015	11/6/2015	12/4/2015	1/6/2016	1/25/2016	2/8/2016	3/31/2016	9/15/2015	10/26/2015	11/6/2015	12/4/2015	1/6/2016	1/25/2016	2/8/2016	3/31/2016
Date Sampled			9/13/2013	10/20/2013	11/0/2013	12/4/2013	1/0/2010	2 weeks post 2nd	1 month post 2nd	2 months post	9/13/2013	10/20/2013	11/0/2013	12/4/2013	1/0/2010	2 weeks post 2nd		2 months post 2nd
Monitoring Event			Baseline	2 weeks	1 month	2 month	3 months	injection	injection	2 months post	Baseline	2 weeks	1 month	2 month	3 months	injection	injection	inj
Field Parameters	Units	DOI	Daseille	2 WEEKS	Tillolitii	2 111011111	3 1110111113	injection	injection	ZIIU	Daseille	2 WEEKS	Tillolitii	2 111011111	3 1110111113	injection	injection	IIIJ
Temperature	°C	FQL	16.45	15.9	15.55	12.65	13.4	13.51	10.88	7.26	16.22	16.28	15.52	12.33	13	13.71	12.35	14.38
pH	C		7.05	7.27	7.07	7.14	7.27	7.25	7.16	7.27	7.12	7.19	7	7.06	7.23	7.22	7.11	7.28
Conductivity	uS/cm		1062	1029	1410	1152	1099	1017	1058	1103	828	898	1137	1164	889	7.22	7.11	781
D.O.	mg/L		0.59	3.1	0.82	1.29	2.99	3.95	1.83	0.31	0.6	1.09	0.9	1.43	2.17	0.85	1.01	1.17
ORP	mV		-92	-90.6	104.3	-117.6	-98.5	-110.4	-78.4	-100.5	-173.9	-50.2	-91.2	-100.3	-62.6	-57.7	-69	-60
Turbidity	NTU		-52	11.4	13.5	3.71	6.73	-110.4	9.29	3.05	-173.5	7.86	8.8	5.88	-57	-57.7	3.53	4.93
Depth to Water (DTW)	ft		25.02	31.51	28.7	30.12	31.18	30.29	31.08	29.57	24.61	31.38	28.27	29.78	30.85	29.93	30.72	29.2
Total well Depth (TD)	ft ft		75.09	75.06	75.03	76.43	75.89	75.03	75.94	75.04	74.73	74.72	74.7	74.69	75.75	74.67	76.03	74.66
General Chemistry	10		73.03	75.00	75.05	70.43	73.63	73.03	73.34	75.04	74.73	74.72	74.7	74.03	75.75	74.07	70.03	74.00
Nitrate+Nitrite	mg/L		< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.46	< 0.20	< 0.020	< 0.020
Chemical Oxygen Demand	mg/L		< 50.0	< 50	< 50	< 50	< 50	< 50	< 50.0	< 50	< 50.020	< 50	< 50	< 50	< 50	< 50	50	< 50
Total Organic Carbon	mg/L		2.6	2.5	2.6	3	2.8	3.1	2.8	3.1	2.2	2.3	2.6	2.9	3.2	3.2	3.3	3.6
Sulfide	mg/L		< 0.10	< 0.10	< 0.10	< 0.10	2.0	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	3.2	< 0.10	< 0.10	< 0.10
Sulfate	mg/L		98.2	152	121	136	130	141	150	151	85.4	118	115	97.1	101	80.5	84.2	90.5
Alkalinity, total as CaCO3	mg/L		309	285	357	364	328	341	343	356	261	266	275	268	267	251	241	231
Alkalinity, bicarbonate CaCO3	mg/L		315	300	369	370	328	341	343	356	264	274	281	273	267	251	241	231
Carbon Dioxide, free	mg/L		36.7	36.1	28	48	35.9	40.6	55.8	41.3	31.6	32.6	24.5	36	35.9	32.4	30.6	22.7
Volatile Fatty Acids	IIIg/L		30.7	30.1	20	40	33.3	40.0	33.6	41.5	31.0	32.0	24.3	30	33.9	32.4	30.0	22.1
Acetic acid	mg/L		4.6 J	< 1.0	< 1.0	< 0.10	< 0.10	< 0.10	0.016	0.035	1.1 J	< 1.0	< 1.0	< 0.10	0.14	< 0.10	0.036	0.049
Propionic Acid	mg/L		5.50 U	< 1.0	< 1.0	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	5.50 U	< 1.0	< 1.0	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyruvic Acid	mg/L		5.50 U	< 1.0	< 1.0	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	5.50 U	< 1.0	< 1.0	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Butyric Acid	mg/L		5.50 U	< 1.0	< 1.0	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	5.50 U	< 1.0	< 1.0	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Lactic Acid	mg/L		3.30 U	< 2.0	< 2.0	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	10 U	< 2.0	< 2.0	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Formic Acid	IIIg/L		n/m	< 1.0	< 1.0	< 0.10	< 0.10	< 0.10	0.014	0.028	n/m	< 1.0	< 1.0	< 0.20	< 0.10	< 0.10	0.016	0.016
i-Pentanoic Acid			n/m	< 1.0	< 1.0	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	· ,	< 1.0	< 1.0	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pentanoic Acid			n/m	< 1.0	< 1.0	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	n/m n/m	< 1.0	< 1.0	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
i-Hexanoic Acid			n/m	< 2.0	< 2.0	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	n/m	< 2.0	< 2.0	< 0.10	< 0.10	< 0.20	< 0.20	< 0.20
Hexanoic Acid			n/m	< 2.0	< 2.0	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	n/m	< 2.0	< 2.0	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Dissolved Gases			11/111	₹ 2.0	₹ 2.0	₹ 0.20	₹ 0.20	₹ 0.20	₹ 0.20	< 0.20	11/111	\ 2.0	₹ 2.0	₹ 0.20	₹0.20	₹ 0.20	₹ 0.20	₹ 0.20
Ethane	ug/L		< 10.0	< 10	< 10	< 10	< 10	< 10	< 10.0	< 10	< 10.0	< 10.0	< 10.0	< 10	< 10	< 10	< 10.0	< 10
Ethylene	ug/L		< 10.0	< 10	< 10	< 10	< 10	< 10	< 10.0	< 10	< 10.0	< 10.0	< 10.0	< 10	< 10	< 10	< 10.0	< 10
Methane (TCD)	ug/L		72.4	26.7	51.3	36.9	24.6	23.1	37	27.3	20.6	17.7	21	< 10	< 10	< 10	< 10.0	< 10
Total Metals	ug/ L		72.4	20.7	31.3	30.9	24.0	25.1	37	27.3	20.0	17.7	21	\ 10	<b>\ 10</b>	<b>\10</b>	V 10.0	V 10
Iron	ug/L		5250	10500	7270	8360	10800	10700	8300	8680	5020	3880	4970	8940	5920	4860	3980	6310
Dissolved Metals	46/ L		3230	10300	7270	3300	10000	10700	0300	3000	3020	3000	7370	3340	3320	7000	3300	0310
Iron	ug/L		1370	4540	5180	7260	7410	5880	6350	7600	1090	2580	2580	3370	3330	3420	3070	3350
8260 VOCs	~6/ L		1370	1540	3100	, 200	, 110	3300	5550	, 500	1000	2300	2300	3370	3330	3 720	3370	3330
1,1,1-Trichloroethane	ug/L		< 1.0	< 10.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1 - Dichloroethane	ug/L		< 1.0	< 10.0	1.4	3.1	2.6	2.8	3.7	2.7	< 1.0	< 1.0	< 1.0	1.4	< 1.0	1.1	1.2	< 1.0
1,1-Dichloroethene	ug/L		< 1.0	< 10.0	< 1.0	< 1.0	< 1.0	< 1.0	1.5	1.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.2
Chloroethane	ug/L		< 1.0	< 10.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2- Dichloroethene	ug/L		20.5	15.6	19.4	34.5	37.7	42.3	57.6	53.6	11	19.9	18.2	23.2	16.4	19.3	23.8	23.8
trans-1,2-dichloroethene	ug/L		42.3	35.3	45.0	70.5	67.7	65.9	97.6	91	31.8	55.3	50.5	69	47.1	49.9	60.4	57.5
Ethylbenzene	ug/L		< 1.0	< 10.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	ug/L		< 1.0	< 10.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	ug/L		519	20.8	21.0	19.5	13	10.8	12.9	13.9	13.7	17.8	15.4	16.5	14.4	19.3	21.6	28.4
Toluene	~9/ <b>-</b>		< 1.0	< 10.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total xylene			< 1.0	< 30.0	< 3.0	< 3.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 3.0	< 3.0	< 3.0	< 3.0	< 1.0	< 1.0	< 3.0
Vinyl chloride	ug/L		0.65	0.92	2.4	1.7	< 0.40	0.72	1.2	< 1.0	< 1.0	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	0.4	< 1.0
Total VOCs	ug/L		581.8	71.7	89.2	129.3	121	122.52	174.5	162.8	56.5	93	84.1	110.1	77.9	89.6	107.4	110.9
% VOC Removed	46/ L			88%	85%	78%	79%	79%	70%	72%	30.3	-65%	-49%	-95%	-38%	-59%	-90%	-96%
70 VOC Nellioved				00/0	03/0	10/0	13/0	13/0	/ U /0	14/0		-03/0	<b>-≒</b> J/0	-33/0	-30/0	-33/0	-50/0	-30/0

Appendix G
Investigative Derived Waste
Disposal Document

245880

	The state of the s				1	*	(C.75)	
1	NON-HAZARDOUS WASTE MANIFEST  1. Generator ID Number NOT REQUIRED	2. Page 1 of	3. Emergency Response	Phone	4. Waste T	racking Nun	nber	
	5. Generator's Name and Mailing Address		Generator's Site Address	(if different th	nan mailing addr	ess)	1 7 17 1	Tie .
-	Department of the Nevy, NAVFAC MW							1
	201 Decelur Ave., Bldg. 1A, Greet Leliers, IL 00088		4800 (	East River	Rd., Fridley	y, MN 554	121	
	Generator's Phone: (847) 638-2600 Aftin: Hervey Polkorny							1.3
	6. Transporter 1 Company Name			2	U.S. EPA ID	Number		Jes. 7
					1			
	7. Transporter 2 Company Name				U.S. EPA ID	Number		
					and the same			
	Designated Facility Name and Site Address				U.S. EPA ID	Number		
	WRR Environmental Services Co, Inc.							
	5200 Ryder Rd., Eau Claire, WI 54701						NOT REQU	ocn
	Facility's Phone: (715) 834-9624			,	1		1401 Palled	INCL
			10. Contai	ners	11. Total	12. Unit		84
	Waste Shipping Name and Description		No.	Туре	Quantity	Wt./Vol.		
_	1.			1				
TOF	Non DOT, Non RCRA Regulated Material		1		00			
RA	(Empty Drums)		Accordance	DM	20	P		
GENERATOR	2.							
2	Non DOT, Non RCRA Regulated Material		8 6		1 1			
			11	DW	6.600	P		
1	(Soil Quitings)				7 100.0	1 14		
						-7-		
	4.							- P
						0	1	
						10/3/	1	
	13. Special Handling Instructions and Additional Information				11.	1		The Court of the C
					IU.	(0	10011	
	1: App# 2014080068-1F0000					112	18214	
	2: Appli 2014060069-4WD304				1	1601	00 1 (	
	E. PARIN EU PURANTRI-TVILISAPI					Intellige	DAN COCK	
							JAN-SSCH-	
П	14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of the marked and labeled/placarded, and are in all respects in proper condition for transport a	his consignment are	fully and accurately desc	ribed above b	by the proper shi	ipping name,	and are classified,	packaged,
1	Generator's/Offeror's Printed/Typed Name		iture	nai governine	mai regulations.		Month	Day Year
1		l ( )	5 1/	11/1	1521.1		0310	3 C/ 2011
7	15. International Shipments		Just	efic	my		000	120/6
INT	L_J Import to U.S.	Export from U.S			//			
	Transporter Signature (for exports only):  16. Transporter Acknowledgment of Receipt of Materials		Date leaving	ig U.S.:	11			
TRANSPORTER	Transporter 1 Printed/Typed Name	Signa	ture		/_		Month I	Day Year
OF	Digit I Vallage	Jigita	1	20	8		2   -	Alli
NSI	Transporter 2 Printed/Typed Name	Signa	ture	" \ _ C	8		Month I	Day Year
LA	The state of the s	Joigila						-wy rear
-	17. Discrepancy Roy La missional Accordance							
1	17. Discrepancy Indication Space 17. Discrepancy Indication Space	12 11 TAV	no hun.					
	Quantity Type		Residue		Partial Rej	ection	L Full	Rejection
				8 5 y 1 1 1 1				
<u>'</u>	17b. Alternate Facility (or Generator)		Manifest Reference Nu	ımber:	U.S. EPA ID I	Vumber		
5	The michale Facility (or denerally)				U.S. EFA ID I	TUITIDE!		
FACILITY	E-1711 Build							
	Facility's Phone:  17c. Signature of Alternate Facility (or Generator)						Month	Doy Vee
ESIGNATED	176. Signature of Atternate Facility (of Generator)	4.1					Month [	Day Year
SN -					Serger and Comment			
ES								
1								
1 -	18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the			2 11 1			22 11	<b>N</b>
	Printed/Typed Name	Signa					the state of the s	Day Year
¥	Boardy Videosy ACSK FOI	m	and and a	The same of the sa	mathem time of the Control of the Co	1 1 1 1	32	4/6

## WASTE PROCESSING CERTIFICATION OF DISPOSAL

Department of the Navy NAVFAC MW
4800 East River Road
Document Number
Company Number
207156
Arrival Date
3/24/2016

Manifest Number	NON HAZ	Waste Pr	ofile	Treatment Code	Qty	y	WEIGHT
		2014060068	1F0000	H141	1	DM	45
		2014060069	1HE804	H141	1	DM	202
		2014060069	1ME304	H141	5	DM	2585
		2014060069	4WD304	H141	5	DM	3327
	Total Quantity for	this Manifest/Docu	ument		12		6159

This document certifies that the material listed on the referenced manifest will be beneficially recycled or reused by WRR Environmental Services Co., Inc., located in Eau Claire, WI (EPA# WID990829475). The waste residue from our operations will be utilized in a secondary fuel stream and thermally destroyed in a RCRA permitted cement kiln.

Any material which cannot be treated as indicated above, will be thermally destroyed at a licensed incinerator or treated at a licensed waste water treatment facility.

Containers used to transfer material to WRR Environmental Services Co., Inc. will be recycled for further use at an approved drum reconditioner/recycler.

**VP/PLANT OPERATIONS** 

WRR Environmental Services Co., Inc.

Brian Schnide

Eau Claire, WI54701

# Appendix H Laboratory Analytical Reports





October 15, 2015

Melinda Pham Regenesis 1011 Calle Sombra San Clemente, CA 92673

RE: Project: PS BETA NIROP

Pace Project No.: 10322358

#### Dear Melinda Pham:

Enclosed are the analytical results for sample(s) received by the laboratory on September 16, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

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

Sincerely,

Jennifer Anderson jennifer.anderson@pacelabs.com Project Manager

JAndera

Enclosures

cc: Ryan Moore, Regenesis







#### **CERTIFICATIONS**

Project: PS BETA NIROP Pace Project No.: 10322358

**Minnesota Certification IDs** 

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770 Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA Colorado Certification #Pace Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L Florida/NELAP Certification #: E87605

Guam Certification #:14-008r Georgia Certification #: 959 Georgia EPD #: Pace

Idaho Certification #: MN00064 Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01 Iowa Certification #: 368

Kansas Certification #: E-10167 Kentucky Dept of Envi. Protection - DW #90062 Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001 Maine Certification #: 2013011

Maryland Certification #: 322 Michigan DEPH Certification #: 9909 Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace Montana Certification #: MT0092 Nevada Certification #: MN\_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002 New York Certification #: 11647 North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150 Ohio VAP Certification #: CL101 Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563

Puerto Rico Certification Saipan (CNMI) #:MP0003 South Carolina #:74003001 Texas Certification #: T104704192 Tennessee Certification #: 02818 Utah Certification #: MN000642013-4 Virginia DGS Certification #: 251 Washington Certification #: C486 West Virginia Certification #: 382 West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970

## **Montana Certification IDs**

150 N. 9th Street, Billings, MT 59101 Colorado Asbestos #: 17119 A2LA Certification #: 3590.01 EPA Region 8 Certification #: 8TMS-L

Idaho Certification #: MT00012

Minnesota Dept of Health Certification #: 030-999-442 Montana Certification #: MT CERT0040

North Dakota Dept. Of Health #: R-209 NVLAP Certification #: 101292-0

Washington Department of Ecology #: C993

## Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792 Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785 Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470 WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

#### **Ormond Beach Certification IDs**

8 East Tower Circle, Ormond Beach, FL 32174

Alabama Certification #: 41320 Connecticut Certification #: PH-0216

Delaware Certification: FL NELAC Reciprocity

Florida Certification #: E83079 Georgia Certification #: 955

Guam Certification: FL NELAC Reciprocity Hawaii Certification: FL NELAC Reciprocity

Illinois Certification #: 200068

Indiana Certification: FL NELAC Reciprocity

Kansas Certification #: E-10383 Kentucky Certification #: 90050

Louisiana Certification #: FL NELAC Reciprocity Louisiana Environmental Certificate #: 05007

Maryland Certification: #346 Michigan Certification #: 9911

Mississippi Certification: FL NELAC Reciprocity

Missouri Certification #: 236 Montana Certification #: Cert 0074 Nebraska Certification: NE-OS-28-14 Nevada Certification: FL NELAC Reciprocity

New Hampshire Certification #: 2958 New York Certification #: 11608 North Carolina Environmental Certificate #: 667

North Carolina Certification #: 12710 North Dakota Certification #: R-216 Pennsylvania Certification #: 68-00547 Puerto Rico Certification #: FL01264 South Carolina Certification: #96042001

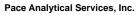
Tennessee Certification #: TN02974 Texas Certification: FL NELAC Reciprocity US Virgin Islands Certification: FL NELAC Reciprocity

Virginia Environmental Certification #: 460165

West Virginia Certification #: 9962C

#### REPORT OF LABORATORY ANALYSIS

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



Pace Analytical www.pacelabs.com

1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700

#### **CERTIFICATIONS**

Project: PS BETA NIROP

Pace Project No.: 10322358

**Ormond Beach Certification IDs** 

Wisconsin Certification #: 399079670

Wyoming (EPA Region 8): FL NELAC Reciprocity

#### **REPORT OF LABORATORY ANALYSIS**





#### **SAMPLE SUMMARY**

Project: PS BETA NIROP

Pace Project No.: 10322358

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10322358001	PMW-04	Water	09/15/15 14:25	09/16/15 17:04
10322358002	PMW-03	Water	09/15/15 15:45	09/16/15 17:04
10322358003	PMW-02	Water	09/16/15 11:35	09/16/15 17:04
10322358004	PMW-01	Water	09/16/15 14:25	09/16/15 17:04
10322358005	Trip Blank	Water	09/16/15 00:00	09/16/15 17:04

#### **REPORT OF LABORATORY ANALYSIS**

(612)607-1700



**SAMPLE ANALYTE COUNT** 

Project: PS BETA NIROP

Pace Project No.: 10322358

_ab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10322358001	PMW-04	RSK 175	DR1	3	PASI-M
		EPA 6010C	IP	1	PASI-M
		6010C Met	BD1	1	PASI-M
		EPA 8260B	DJB	70	PASI-M
		SM 4500-S2-D	JME	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	NMT	1	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	KEO	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V
0322358002	PMW-03	RSK 175	DR1	3	PASI-M
		EPA 6010C	IP	1	PASI-M
		6010C Met	BD1	1	PASI-M
		EPA 8260B	DJB	70	PASI-M
		SM 4500-S2-D	JME	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	NMT	1	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	KEO	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V
0322358003	PMW-02	RSK 175	DR1	3	PASI-M
		EPA 6010C	IP	1	PASI-M
		6010C Met	BD1	1	PASI-M
		EPA 8260B	LPM	70	PASI-M
		SM 4500-S2-D	JME	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	NMT	1	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	KEO	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V
0322358004	PMW-01	RSK 175	DR1	3	PASI-M
		EPA 6010C	IP	1	PASI-M
		6010C Met	BD1	1	PASI-M
		EPA 8260B	DJB	70	PASI-M

#### **REPORT OF LABORATORY ANALYSIS**

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## **SAMPLE ANALYTE COUNT**

Project: PS BETA NIROP

Pace Project No.: 10322358

Lab ID	Sample ID	Analytes Method Analysts Reported	Laboratory
		SM 4500-S2-D JME 1	PASI-MT
		SM 2320B MW 3	PASI-M
		SM 2320B NMT 1	PASI-O
		EPA 300.0 KEO 1	PASI-M
		EPA 353.2 KEO 1	PASI-M
		SM 5220D KEO 1	PASI-M
		SM 5310C KRV 1	PASI-V
10322358005	Trip Blank	EPA 8260B DJB 70	PASI-M

#### **REPORT OF LABORATORY ANALYSIS**



Project: PS BETA NIROP

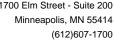
Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

Sample: PMW-04	Lab ID: 1032	22358001	Collected: 09/15/1	5 14:25	Received: 09	)/16/15 17:04	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
RSK 175 AIR Headspace	Analytical Meth	od: RSK 1	75					
Ethane	ND	ug/L	10.0	1		09/20/15 06:03	74-84-0	
Ethene	ND	ug/L	10.0	1		09/20/15 06:03	74-85-1	
Methane	20.6	ug/L	10.0	1		09/20/15 06:03	74-82-8	
6010C MET ICP	Analytical Meth	od: EPA 60	010C Preparation Me	thod: E	PA 3010			
Iron	5020	ug/L	50.0	1	09/18/15 14:52	09/22/15 09:36	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	od: 6010C	Met Preparation Me	thod: EF	PA 3010			
Iron, Dissolved	1090	ug/L	50.0	1	09/21/15 18:02	09/22/15 00:10	7439-89-6	
8260B VOC	Analytical Meth	od: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		09/19/15 01:37	67-64-1	
Allyl chloride	ND	ug/L	4.0	1		09/19/15 01:37	107-05-1	
Benzene	ND	ug/L	1.0	1		09/19/15 01:37	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		09/19/15 01:37	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		09/19/15 01:37	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		09/19/15 01:37		
Bromoform	ND	ug/L	4.0	1		09/19/15 01:37		
Bromomethane	ND	ug/L	4.0	1		09/19/15 01:37		
2-Butanone (MEK)	ND	ug/L	5.0	1		09/19/15 01:37		
n-Butylbenzene	ND	ug/L	1.0	1		09/19/15 01:37		
sec-Butylbenzene	ND ND	ug/L	1.0	1		09/19/15 01:37		
ert-Butylbenzene	ND ND	ug/L	1.0	1		09/19/15 01:37		
Carbon tetrachloride	ND ND		1.0	1		09/19/15 01:37		
		ug/L		1				
Chlorobenzene	ND	ug/L	1.0			09/19/15 01:37		
Chloroethane	ND	ug/L	1.0	1		09/19/15 01:37		
Chloroform	ND	ug/L	1.0	1		09/19/15 01:37		
Chloromethane	ND	ug/L	4.0	1		09/19/15 01:37		
2-Chlorotoluene	ND	ug/L	1.0	1		09/19/15 01:37		
1-Chlorotoluene	ND	ug/L	1.0	1		09/19/15 01:37		
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		09/19/15 01:37		
Dibromochloromethane	ND	ug/L	1.0	1		09/19/15 01:37	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		09/19/15 01:37	106-93-4	
Dibromomethane	ND	ug/L	4.0	1		09/19/15 01:37	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		09/19/15 01:37	95-50-1	
,3-Dichlorobenzene	ND	ug/L	1.0	1		09/19/15 01:37	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		09/19/15 01:37	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		09/19/15 01:37	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		09/19/15 01:37	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		09/19/15 01:37	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		09/19/15 01:37		
cis-1,2-Dichloroethene	11.0	ug/L	1.0	1		09/19/15 01:37		
rans-1,2-Dichloroethene	31.8	ug/L	1.0	1		09/19/15 01:37		
Dichlorofluoromethane	ND	ug/L	1.0	1		09/19/15 01:37		
1,2-Dichloropropane	ND ND	ug/L	4.0	1		09/19/15 01:37		
1,2 Dioinoropropario	IND	ug/L	₹.0			00/10/10 01.0/	10-01-0	

## **REPORT OF LABORATORY ANALYSIS**

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Date: 10/15/2015 10:20 AM

#### **ANALYTICAL RESULTS**

Project: PS BETA NIROP

Sample: PMW-04	Lab ID: 1032	22358001	Collected: 09/15/1	5 14:25	Received: 09/16/15 17:04 M	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	od: EPA 82	260B				
2,2-Dichloropropane	ND	ug/L	4.0	1	09/19/15 01:37	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1	09/19/15 01:37	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1	09/19/15 01:37	10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1	09/19/15 01:37	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1	09/19/15 01:37	60-29-7	
Ethylbenzene	ND	ug/L	1.0	1	09/19/15 01:37	100-41-4	L2
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1	09/19/15 01:37	87-68-3	
sopropylbenzene (Cumene)	ND	ug/L	1.0	1	09/19/15 01:37	98-82-8	
o-Isopropyltoluene	ND	ug/L	1.0	1	09/19/15 01:37	99-87-6	
Methylene Chloride	ND	ug/L	4.0	1	09/19/15 01:37	75-09-2	
I-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1	09/19/15 01:37	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1	09/19/15 01:37	1634-04-4	
Naphthalene	ND	ug/L	4.0	1	09/19/15 01:37	91-20-3	
r-Propylbenzene	ND	ug/L	1.0	1	09/19/15 01:37	103-65-1	
Styrene	ND	ug/L	1.0	1	09/19/15 01:37	100-42-5	
,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1	09/19/15 01:37		
,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1	09/19/15 01:37		
etrachloroethene	ND	ug/L	1.0	1	09/19/15 01:37		
etrahydrofuran	ND	ug/L	10.0	1	09/19/15 01:37		
oluene	ND	ug/L	1.0	1	09/19/15 01:37		
,2,3-Trichlorobenzene	ND	ug/L	1.0	1	09/19/15 01:37		
,2,4-Trichlorobenzene	ND	ug/L	1.0	1	09/19/15 01:37		
,1,1-Trichloroethane	ND	ug/L	1.0	1	09/19/15 01:37		
,1,2-Trichloroethane	ND	ug/L	1.0	1	09/19/15 01:37		
richloroethene	13.7	ug/L	0.40	1	09/19/15 01:37		
Trichlorofluoromethane	ND	ug/L ug/L	1.0	1	09/19/15 01:37		
,2,3-Trichloropropane	ND ND	ug/L ug/L	4.0	1	09/19/15 01:37		
,1,2-Trichlorotrifluoroethane	ND ND	-	1.0	1	09/19/15 01:37		
		ug/L					
I,2,4-Trimethylbenzene	ND	ug/L	1.0	1	09/19/15 01:37		
,3,5-Trimethylbenzene	ND	ug/L	1.0	1	09/19/15 01:37		
/inyl chloride	ND	ug/L	0.40	1	09/19/15 01:37		
(ylene (Total)	ND	ug/L	3.0	1	09/19/15 01:37	1330-20-7	
Surrogates	റാ	0/	75 105	1	09/19/15 01:37	17060 07 0	
,2-Dichloroethane-d4 (S)	93	%.	75-125	1 1			
Toluene-d8 (S)	92	%.	75-125	-	09/19/15 01:37		
-Bromofluorobenzene (S)	97	%.	75-125	1	09/19/15 01:37	400-00-4	
I500S2D Sulfide Water	Analytical Meth						
Sulfide	ND	mg/L	0.10	1	09/21/15 15:52		
2320B Alkalinity	Analytical Meth	od: SM 23	20B				
Carbon Dioxide (SM4500CO2D)	31.6	mg/L	5.0	1	09/22/15 10:46	124-38-9	
Alkalinity, Total as CaCO3	264	mg/L	5.0	1	09/21/15 10:50		
Alkalinity,Bicarbonate (CaCO3)	264	mg/L	5.0	1	09/21/15 10:50		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1	09/21/15 10:50		

#### **REPORT OF LABORATORY ANALYSIS**





Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

Sample: PMW-04	Lab ID: 1032	<b>2358001</b> C	collected: 09/15/1	15 14:25	Received: 09	9/16/15 17:04	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions	Analytical Meth	od: EPA 300.0	)					
Sulfate	85.4	mg/L	1.2	1		09/21/15 18:09	14808-79-8	
353.2 Nitrate + Nitrite	Analytical Meth	od: EPA 353.2	2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		09/23/15 10:03	3	M1
5220D COD	Analytical Meth	od: SM 5220D	Preparation Me	thod: SM	1 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	09/21/15 10:11	09/21/15 13:27	7	
5310C TOC	Analytical Meth	od: SM 5310C	;					
Total Organic Carbon	2.2	mg/L	1.0	1		09/24/15 02:13	3 7440-44-0	



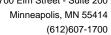
Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

Sample: PMW-03	Lab ID: 103	22358002	Collected: 09/15/1	5 15:45	Received: 09	9/16/15 17:04	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
RSK 175 AIR Headspace	Analytical Meth	nod: RSK 17	75					
Ethane	ND	ug/L	10.0	1		09/20/15 06:11	1 74-84-0	
Ethene	ND	ug/L	10.0	1		09/20/15 06:11	1 74-85-1	
Methane	72.4	ug/L	10.0	1		09/20/15 06:11	1 74-82-8	
6010C MET ICP	Analytical Meth	nod: EPA 60	010C Preparation Me	ethod: E	PA 3010			
Iron	5250	ug/L	50.0	1	09/18/15 14:52	09/22/15 09:40	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	nod: 6010C	Met Preparation Me	thod: El	PA 3010			
Iron, Dissolved	1370	ug/L	50.0	1	09/21/15 18:02	09/22/15 00:13	3 7439-89-6	
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		09/19/15 01:52	2 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		09/19/15 01:52	2 107-05-1	
Benzene	ND	ug/L	1.0	1		09/19/15 01:52	2 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		09/19/15 01:52	2 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		09/19/15 01:52		
Bromodichloromethane	ND	ug/L	1.0	1		09/19/15 01:52		
Bromoform	ND	ug/L	4.0	1		09/19/15 01:52		
Bromomethane	ND ND	ug/L	4.0	1		09/19/15 01:52		
	ND ND	•	5.0	1		09/19/15 01:52		
2-Butanone (MEK)		ug/L						
n-Butylbenzene	ND	ug/L	1.0	1		09/19/15 01:52		
sec-Butylbenzene	ND	ug/L	1.0	1		09/19/15 01:52		
tert-Butylbenzene	ND	ug/L	1.0	1		09/19/15 01:52		
Carbon tetrachloride	ND	ug/L	1.0	1		09/19/15 01:52		
Chlorobenzene	ND	ug/L	1.0	1		09/19/15 01:52		
Chloroethane	ND	ug/L	1.0	1		09/19/15 01:52		
Chloroform	ND	ug/L	1.0	1		09/19/15 01:52	2 67-66-3	
Chloromethane	ND	ug/L	4.0	1		09/19/15 01:52	2 74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		09/19/15 01:52	2 95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		09/19/15 01:52	2 106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		09/19/15 01:52	2 96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		09/19/15 01:52	2 124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		09/19/15 01:52		
Dibromomethane	ND	ug/L	4.0	1		09/19/15 01:52		
1,2-Dichlorobenzene	ND	ug/L	1.0	1		09/19/15 01:52		
1,3-Dichlorobenzene	ND	ug/L	1.0	1		09/19/15 01:52		
1,4-Dichlorobenzene	ND ND	ug/L ug/L	1.0	1		09/19/15 01:52		
Dichlorodifluoromethane	ND ND	_	1.0	1		09/19/15 01:52		
		ug/L						
1,1-Dichloroethane	ND	ug/L	1.0	1		09/19/15 01:52		
1,2-Dichloroethane	ND	ug/L	1.0	1		09/19/15 01:52		
1,1-Dichloroethene	ND	ug/L	1.0	1		09/19/15 01:52		
cis-1,2-Dichloroethene	20.5	ug/L	1.0	1		09/19/15 01:52		
trans-1,2-Dichloroethene	42.3	ug/L	1.0	1		09/19/15 01:52		
Dichlorofluoromethane	ND	ug/L	1.0	1		09/19/15 01:52		
1,2-Dichloropropane	ND	ug/L	4.0	1		09/19/15 01:52		
1,3-Dichloropropane	ND	ug/L	1.0	1		09/19/15 01:52	2 142-28-9	

#### **REPORT OF LABORATORY ANALYSIS**





Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

Sample: PMW-03	Lab ID: 10	0322358002	Collected: 09/15/1	5 15:45	Received: 09	9/16/15 17:04 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
3260B VOC	Analytical M	ethod: EPA 82	260B					
2,2-Dichloropropane	ND	ug/L	4.0	1		09/19/15 01:52	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		09/19/15 01:52	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1		09/19/15 01:52	10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1		09/19/15 01:52	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		09/19/15 01:52	60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		09/19/15 01:52	100-41-4	L2
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		09/19/15 01:52	87-68-3	
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		09/19/15 01:52	98-82-8	
o-Isopropyltoluene	ND	ug/L	1.0	1		09/19/15 01:52	99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		09/19/15 01:52	75-09-2	
1-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		09/19/15 01:52	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		09/19/15 01:52		
Naphthalene	ND	ug/L	4.0	1		09/19/15 01:52		
n-Propylbenzene	ND	ug/L	1.0	1		09/19/15 01:52		
Styrene	ND	ug/L	1.0	1		09/19/15 01:52		
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		09/19/15 01:52		
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		09/19/15 01:52		
etrachloroethene	ND	ug/L	1.0	1		09/19/15 01:52		
Tetrahydrofuran	ND	ug/L	10.0	1		09/19/15 01:52	_	
Toluene	ND	ug/L	1.0	1		09/19/15 01:52		
,2,3-Trichlorobenzene	ND	ug/L	1.0	1		09/19/15 01:52		
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		09/19/15 01:52		
1,1,1-Trichloroethane	ND	ug/L	1.0	1		09/19/15 01:52		
1,1,2-Trichloroethane	ND	ug/L	1.0	1		09/19/15 01:52		
Frichloroethene	519	ug/L	2.0	5		09/21/15 16:31		
Frichlorofluoromethane	ND	ug/L ug/L	1.0	1		09/19/15 01:52		
1,2,3-Trichloropropane	ND ND	ug/L ug/L	4.0	1		09/19/15 01:52		
1,1,2-Trichlorotrifluoroethane	ND	-	1.0	1		09/19/15 01:52		
	ND ND	ug/L	1.0	1		09/19/15 01:52		
I,2,4-Trimethylbenzene		ug/L						
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		09/19/15 01:52		
Vinyl chloride	0.65	ug/L	0.40	1		09/19/15 01:52		
Xylene (Total)	ND	ug/L	3.0	1		09/19/15 01:52	1330-20-7	
Surrogates 1,2-Dichloroethane-d4 (S)	94	%.	75-125	1		09/19/15 01:52	17060 07 0	
	91	%. %.	75-125 75-125	1		09/19/15 01:52		
Toluene-d8 (S) 4-Bromofluorobenzene (S)	98	%. %.	75-125 75-125	1		09/19/15 01:52		
				ı		09/19/13 01.32	400-00-4	
4500S2D Sulfide Water	•	ethod: SM 450						
Sulfide	ND	mg/L	0.10	1		09/21/15 15:54		
2320B Alkalinity	Analytical M	ethod: SM 232	20B					
Alkalinity, Total as CaCO3	315	mg/L	5.0	1		09/21/15 10:54		
Carbon Dioxide (SM4500CO2D)	36.7	mg/L	5.0	1		09/22/15 11:01	124-38-9	
Alkalinity,Bicarbonate (CaCO3)	315	mg/L	5.0	1		09/21/15 10:54		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		09/21/15 10:54		

#### **REPORT OF LABORATORY ANALYSIS**





Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

Sample: PMW-03	Lab ID: 1032	2358002	Collected: 09/15/1	15 15:45	Received: 09	9/16/15 17:04 I	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
300.0 IC Anions	Analytical Method: EPA 300.0								
Sulfate	98.2	mg/L	2.4	2		09/21/15 23:19	14808-79-8		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		09/23/15 10:07	7		
5220D COD	Analytical Method: SM 5220D Preparation Method: SM 5220D								
Chemical Oxygen Demand	ND	mg/L	50.0	1	09/21/15 10:11	09/21/15 13:27	7		
5310C TOC	Analytical Meth	od: SM 5310	OC						
Total Organic Carbon	2.6	mg/L	1.0	1		09/24/15 02:53	3 7440-44-0		



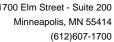
Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

Sample: PMW-02	Lab ID: 10322358003 (		Collected: 09/16/1	Collected: 09/16/15 11:35		9/16/15 17:04	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua		
RSK 175 AIR Headspace	Analytical Meth	od: RSK 17	75							
Ethane	ND	ug/L	10.0	1		09/20/15 06:19	9 74-84-0			
Ethene	ND	ug/L	10.0	1		09/20/15 06:19	9 74-85-1			
Methane	ND	ug/L	10.0	1		09/20/15 06:19	9 74-82-8			
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3010									
Iron	10800	ug/L	50.0	1	09/18/15 14:52	09/22/15 09:44	4 7439-89-6			
6010C MET ICP, Dissolved	Analytical Method: 6010C Met Preparation Method: EPA 3010									
Iron, Dissolved	1620	ug/L	50.0	1	09/21/15 18:02	09/22/15 00:16	6 7439-89-6			
8260B VOC	Analytical Meth	od: EPA 82	260B							
Acetone	ND	ug/L	20.0	1		09/21/15 18:57	7 67-64-1			
Allyl chloride	ND	ug/L	4.0	1		09/21/15 18:57	7 107-05-1			
Benzene	ND	ug/L	1.0	1		09/21/15 18:57	7 71-43-2			
Bromobenzene	ND	ug/L	1.0	1		09/21/15 18:57	7 108-86-1			
Bromochloromethane	ND	ug/L	1.0	1		09/21/15 18:57	7 74-97-5			
Bromodichloromethane	ND	ug/L	1.0	1		09/21/15 18:57	7 75-27-4			
Bromoform	ND	ug/L	4.0	1		09/21/15 18:57	7 75-25-2			
Bromomethane	ND	ug/L	4.0	1		09/21/15 18:57	7 74-83-9			
2-Butanone (MEK)	ND	ug/L	5.0	1		09/21/15 18:57	7 78-93-3			
n-Butylbenzene	ND	ug/L	1.0	1		09/21/15 18:57	7 104-51-8			
sec-Butylbenzene	ND	ug/L	1.0	1		09/21/15 18:57	7 135-98-8			
tert-Butylbenzene	ND	ug/L	1.0	1		09/21/15 18:57	7 98-06-6			
Carbon tetrachloride	ND	ug/L	1.0	1		09/21/15 18:57	7 56-23-5			
Chlorobenzene	ND	ug/L	1.0	1		09/21/15 18:57	7 108-90-7			
Chloroethane	ND	ug/L	1.0	1		09/21/15 18:57	7 75-00-3			
Chloroform	ND	ug/L	1.0	1		09/21/15 18:57	7 67-66-3			
Chloromethane	ND	ug/L	4.0	1		09/21/15 18:57	7 74-87-3			
2-Chlorotoluene	ND	ug/L	1.0	1		09/21/15 18:57	7 95-49-8			
4-Chlorotoluene	ND	ug/L	1.0	1		09/21/15 18:57	7 106-43-4			
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		09/21/15 18:57	7 96-12-8			
Dibromochloromethane	ND	ug/L	1.0	1		09/21/15 18:57				
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		09/21/15 18:57				
Dibromomethane	ND	ug/L	4.0	1		09/21/15 18:57				
1,2-Dichlorobenzene	ND	ug/L	1.0	1		09/21/15 18:57				
1,3-Dichlorobenzene	ND	ug/L	1.0	1		09/21/15 18:57				
1,4-Dichlorobenzene	ND	ug/L	1.0	1		09/21/15 18:57				
Dichlorodifluoromethane	ND	ug/L	1.0	1		09/21/15 18:57				
1,1-Dichloroethane	27.2	ug/L	1.0	1		09/21/15 18:57				
1,2-Dichloroethane	ND	ug/L	1.0	1		09/21/15 18:57				
1,1-Dichloroethene	16.9	ug/L	1.0	1		09/21/15 18:57				
cis-1,2-Dichloroethene	192	ug/L	1.0	1		09/21/15 18:57				
trans-1,2-Dichloroethene	230	ug/L	1.0	1		09/21/15 18:57				
Dichlorofluoromethane	ND	ug/L	1.0	1		09/21/15 18:57				
1,2-Dichloropropane	ND	ug/L	4.0	1		09/21/15 18:57				
1,3-Dichloropropane	ND	ug/L	1.0	1		09/21/15 18:57				

#### **REPORT OF LABORATORY ANALYSIS**





### **ANALYTICAL RESULTS**

Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

Sample: PMW-02	Lab ID: 103	22358003	Collected: 09/16/1	5 11:35	Received:	09/16/15 17:04	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B					
2,2-Dichloropropane	ND	ug/L	4.0	1		09/21/15 18:5	7 594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		09/21/15 18:5	7 563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1		09/21/15 18:5	7 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1		09/21/15 18:5	7 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		09/21/15 18:5	7 60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		09/21/15 18:5	7 100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		09/21/15 18:5	7 87-68-3	
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		09/21/15 18:5	7 98-82-8	
o-Isopropyltoluene	ND	ug/L	1.0	1		09/21/15 18:5	7 99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		09/21/15 18:5		
I-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		09/21/15 18:5		
Methyl-tert-butyl ether	ND	ug/L	1.0	1		09/21/15 18:5		
Naphthalene	ND	ug/L	4.0	1		09/21/15 18:5		
n-Propylbenzene	ND	ug/L	1.0	1		09/21/15 18:5		
Styrene	ND	ug/L	1.0	1		09/21/15 18:5		
I,1,1,2-Tetrachloroethane	ND ND	ug/L	1.0	1		09/21/15 18:5		
,1,2,2-Tetrachloroethane	ND ND	ug/L	1.0	1		09/21/15 18:5		
etrachloroethene	ND ND	-	1.0	1		09/21/15 18:5		
	ND ND	ug/L	10.0	1		09/21/15 18:5		
etrahydrofuran		ug/L						
oluene	ND	ug/L	1.0	1		09/21/15 18:5		
,2,3-Trichlorobenzene	ND	ug/L	1.0	1		09/21/15 18:5		
,2,4-Trichlorobenzene	ND	ug/L	1.0	1		09/21/15 18:5		
,1,1-Trichloroethane	ND	ug/L	1.0	1		09/21/15 18:5		
,1,2-Trichloroethane	ND	ug/L	1.0	1		09/21/15 18:5		
Trichloroethene	35.4	ug/L	0.40	1		09/21/15 18:5		
Trichlorofluoromethane	ND	ug/L	1.0	1		09/21/15 18:5		
,2,3-Trichloropropane	ND	ug/L	4.0	1		09/21/15 18:5		
,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		09/21/15 18:5		
,2,4-Trimethylbenzene	ND	ug/L	1.0	1		09/21/15 18:5		
,3,5-Trimethylbenzene	ND	ug/L	1.0	1		09/21/15 18:5	7 108-67-8	
/inyl chloride	2.7	ug/L	1.0	1		09/21/15 18:5	7 75-01-4	
(ylene (Total)	ND	ug/L	3.0	1		09/21/15 18:5	7 1330-20-7	
Surrogates								
,2-Dichloroethane-d4 (S)	96	%.	75-125	1		09/21/15 18:5		
Γoluene-d8 (S)	102	%.	75-125	1		09/21/15 18:5		
-Bromofluorobenzene (S)	99	%.	75-125	1		09/21/15 18:5	7 460-00-4	
500S2D Sulfide Water	Analytical Meth	nod: SM 450	00-S2-D					
Sulfide	ND	mg/L	0.10	1		09/21/15 15:5	5	
2320B Alkalinity	Analytical Meth	nod: SM 232	20B					
Carbon Dioxide (SM4500CO2D)	35.3	mg/L	5.0	1		09/22/15 11:09	9 124-38-9	
Alkalinity, Total as CaCO3	318	mg/L	5.0	1		09/21/15 11:02	2	
Alkalinity,Bicarbonate (CaCO3)	318	mg/L	5.0	1		09/21/15 11:02	2	
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		09/21/15 11:02	2	





### **ANALYTICAL RESULTS**

Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

Sample: PMW-02	Lab ID: 1032	22358003	Collected: 09/16/1	15 11:35	Received: 09	9/16/15 17:04 <b>I</b>	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions	Analytical Meth	od: EPA 300	0.0					
Sulfate	108	mg/L	2.4	2		09/21/15 23:37	14808-79-8	
353.2 Nitrate + Nitrite	Analytical Meth	od: EPA 353	3.2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		09/23/15 10:08	}	
5220D COD	Analytical Meth	od: SM 522	OD Preparation Me	thod: SN	M 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	09/21/15 10:11	09/21/15 13:28	}	
5310C TOC	Analytical Meth	od: SM 531	OC .					
Total Organic Carbon	3.1	mg/L	1.0	1		09/24/15 03:06	7440-44-0	

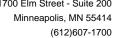


### **ANALYTICAL RESULTS**

Project: PS BETA NIROP

Date: 10/15/2015 10:20 AM

Sample: PMW-01	Lab ID: 1032	22358004	Collected: 09/16/1	15 14:25	Received: 09	9/16/15 17:04 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
RSK 175 AIR Headspace	Analytical Meth	od: RSK 1	 75			-		
Ethane	ND	ug/L	10.0	1		09/20/15 06:28	74-84-0	
Ethene	ND	ug/L	10.0	1		09/20/15 06:28	74-85-1	
Methane	ND	ug/L	10.0	1		09/20/15 06:28	74-82-8	
6010C MET ICP	Analytical Meth	od: EPA 60	010C Preparation Me	ethod: E	PA 3010			
Iron	10200	ug/L	50.0	1	09/18/15 14:52	09/22/15 09:49	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	od: 6010C	Met Preparation Me	thod: El	PA 3010			
Iron, Dissolved	135	ug/L	50.0	1	09/21/15 18:02	09/22/15 00:20	7439-89-6	
8260B VOC	Analytical Meth	od: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		09/19/15 02:20	67-64-1	
Allyl chloride	ND	ug/L	4.0	1		09/19/15 02:20	107-05-1	
Benzene	ND	ug/L	1.0	1		09/19/15 02:20	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		09/19/15 02:20	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		09/19/15 02:20	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		09/19/15 02:20	75-27-4	
Bromoform	ND	ug/L	4.0	1		09/19/15 02:20	75-25-2	
Bromomethane	ND	ug/L	4.0	1		09/19/15 02:20		
2-Butanone (MEK)	ND	ug/L	5.0	1		09/19/15 02:20		
n-Butylbenzene	ND	ug/L	1.0	1		09/19/15 02:20		
sec-Butylbenzene	ND	ug/L	1.0	1		09/19/15 02:20		
tert-Butylbenzene	ND	ug/L	1.0	1		09/19/15 02:20		
Carbon tetrachloride	ND	ug/L	1.0	1		09/19/15 02:20		
Chlorobenzene	ND	ug/L	1.0	1		09/19/15 02:20		
Chloroethane	ND ND	-	1.0	1		09/19/15 02:20		
		ug/L		1				
Chloroform	ND	ug/L	1.0			09/19/15 02:20		
Chloromethane	ND	ug/L	4.0	1		09/19/15 02:20		
2-Chlorotoluene	ND	ug/L	1.0	1		09/19/15 02:20		
4-Chlorotoluene	ND	ug/L	1.0	1		09/19/15 02:20		
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		09/19/15 02:20		
Dibromochloromethane	ND	ug/L	1.0	1		09/19/15 02:20		
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		09/19/15 02:20		
Dibromomethane	ND	ug/L	4.0	1		09/19/15 02:20	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		09/19/15 02:20	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		09/19/15 02:20	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		09/19/15 02:20	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		09/19/15 02:20	75-71-8	
1,1-Dichloroethane	7.1	ug/L	1.0	1		09/19/15 02:20	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		09/19/15 02:20	107-06-2	
1,1-Dichloroethene	2.3	ug/L	1.0	1		09/19/15 02:20		
cis-1,2-Dichloroethene	141	ug/L	1.0	1		09/19/15 02:20		
trans-1,2-Dichloroethene	154	ug/L	1.0	1		09/19/15 02:20		
Dichlorofluoromethane	ND	ug/L	1.0	1		09/19/15 02:20		
1,2-Dichloropropane	ND	ug/L	4.0	1		09/19/15 02:20		
1,3-Dichloropropane	ND ND	ug/L ug/L	1.0	1		09/19/15 02:20		





### **ANALYTICAL RESULTS**

Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

Sample: PMW-01	Lab ID: 10	322358004	Collected: 09/16/1	5 14:25	Received: 09/16/15	5 17:04 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared A	nalyzed	CAS No.	Qua
3260B VOC	Analytical Me	ethod: EPA 82	260B					
2,2-Dichloropropane	ND	ug/L	4.0	1	09/1	9/15 02:20	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1	09/1	9/15 02:20	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1	09/1	9/15 02:20	10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1	09/1	9/15 02:20	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1	09/1	9/15 02:20	60-29-7	
Ethylbenzene	ND	ug/L	1.0	1	09/1	9/15 02:20	100-41-4	L2
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1	09/1	9/15 02:20	87-68-3	
sopropylbenzene (Cumene)	ND	ug/L	1.0	1	09/1	9/15 02:20	98-82-8	
o-Isopropyltoluene	ND	ug/L	1.0	1	09/1	9/15 02:20	99-87-6	
Methylene Chloride	ND	ug/L	4.0	1	09/1	9/15 02:20	75-09-2	
1-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1			108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1			1634-04-4	
Naphthalene	ND	ug/L	4.0	1		9/15 02:20		
n-Propylbenzene	ND	ug/L	1.0	1			103-65-1	
Styrene	ND	ug/L	1.0	1			100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1			630-20-6	
1,1,2,2-Tetrachloroethane	ND ND	ug/L ug/L	1.0	1		9/15 02:20 9/15 02:20		
etrachloroethene	ND ND	ug/L ug/L	1.0	1			127-18-4	
	ND ND	_	10.0	1			109-99-9	
Tetrahydrofuran Foluene		ug/L						
	ND	ug/L	1.0	1		9/15 02:20 9/15 02:20	108-88-3	
I,2,3-Trichlorobenzene	ND	ug/L	1.0	1				
I,2,4-Trichlorobenzene	ND	ug/L	1.0	1			120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		9/15 02:20		
1,1,2-Trichloroethane	ND	ug/L	1.0	1		9/15 02:20		
Trichloroethene	156	ug/L	0.40	1		9/15 02:20		
Trichlorofluoromethane	ND	ug/L	1.0	1		9/15 02:20		
1,2,3-Trichloropropane	ND	ug/L	4.0	1		9/15 02:20		
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		9/15 02:20		
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		9/15 02:20		
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1			108-67-8	
Vinyl chloride	0.66	ug/L	0.40	1		9/15 02:20		
Xylene (Total)	ND	ug/L	3.0	1	09/1	9/15 02:20	1330-20-7	
Surrogates					2011			
1,2-Dichloroethane-d4 (S)	92	%.	75-125	1			17060-07-0	
Toluene-d8 (S)	92	%.	75-125	1			2037-26-5	
1-Bromofluorobenzene (S)	97	%.	75-125	1	09/1	9/15 02:20	460-00-4	
1500S2D Sulfide Water	Analytical Me	ethod: SM 450	00-S2-D					
Sulfide	ND	mg/L	0.10	1	09/2	1/15 15:56		
2320B Alkalinity	Analytical Me	ethod: SM 232	20B					
Alkalinity, Total as CaCO3	383	mg/L	5.0	1	09/2	1/15 11:06		
Carbon Dioxide (SM4500CO2D)	34.8	mg/L	5.0	1	09/2	2/15 11:18	124-38-9	
Alkalinity,Bicarbonate (CaCO3)	383	mg/L	5.0	1	09/2	1/15 11:06		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1	09/2	1/15 11:06		





### **ANALYTICAL RESULTS**

Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

Sample: PMW-01	Lab ID: 1032	<b>2358004</b> C	Collected: 09/16/1	15 14:25	Received: 09	9/16/15 17:04	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions	Analytical Meth	od: EPA 300.0	)					
Sulfate	157	mg/L	2.4	2		09/21/15 23:56	14808-79-8	
353.2 Nitrate + Nitrite	Analytical Meth	od: EPA 353.2	2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		09/23/15 10:09	)	
5220D COD	Analytical Meth	od: SM 5220D	Preparation Me	thod: SM	1 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	09/21/15 10:11	09/21/15 13:28	3	
5310C TOC	Analytical Meth	od: SM 53100						
Total Organic Carbon	2.8	mg/L	1.0	1		09/24/15 03:19	7440-44-0	



### **ANALYTICAL RESULTS**

Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

Sample: Trip Blank	Lab ID: 103	22358005	Collected: 09/16/1	5 00:00	Received:	09/16/15 17:04	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
3260B VOC	Analytical Met	hod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		09/18/15 23:1	4 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		09/18/15 23:1	4 107-05-1	
Benzene	ND	ug/L	1.0	1		09/18/15 23:1	4 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		09/18/15 23:1	4 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		09/18/15 23:1	4 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		09/18/15 23:1	4 75-27-4	
Bromoform	ND	ug/L	4.0	1		09/18/15 23:1	4 75-25-2	
Bromomethane	ND	ug/L	4.0	1		09/18/15 23:1	4 74-83-9	
P-Butanone (MEK)	ND	ug/L	5.0	1		09/18/15 23:1	4 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		09/18/15 23:1		
ec-Butylbenzene	ND	ug/L	1.0	1		09/18/15 23:1		
ert-Butylbenzene	ND	ug/L	1.0	1		09/18/15 23:1		
Carbon tetrachloride	ND	ug/L	1.0	1		09/18/15 23:1		
Chlorobenzene	ND	ug/L	1.0	1		09/18/15 23:1		
Chloroethane	ND	ug/L	1.0	1		09/18/15 23:1		
Chloroform	ND	ug/L	1.0	1		09/18/15 23:1		
Chloromethane	ND ND	ug/L ug/L	4.0	1		09/18/15 23:1		
-Chlorotoluene	ND ND	ug/L ug/L	1.0	1		09/18/15 23:1		
-Chlorotoluene	ND ND		1.0	1		09/18/15 23:1		
		ug/L		1		09/18/15 23:1		
,2-Dibromo-3-chloropropane	ND	ug/L	4.0					
Dibromochloromethane	ND	ug/L	1.0	1 1		09/18/15 23:1		
,2-Dibromoethane (EDB)	ND	ug/L	1.0			09/18/15 23:1		
Dibromomethane	ND	ug/L	4.0	1		09/18/15 23:1		
,2-Dichlorobenzene	ND	ug/L	1.0	1		09/18/15 23:1		
,3-Dichlorobenzene	ND	ug/L	1.0	1		09/18/15 23:1		
,4-Dichlorobenzene	ND	ug/L	1.0	1		09/18/15 23:1		
Dichlorodifluoromethane	ND	ug/L	1.0	1		09/18/15 23:1		
,1-Dichloroethane	ND	ug/L	1.0	1		09/18/15 23:1		
,2-Dichloroethane	ND	ug/L	1.0	1		09/18/15 23:1		
,1-Dichloroethene	ND	ug/L	1.0	1		09/18/15 23:1		
is-1,2-Dichloroethene	ND	ug/L	1.0	1		09/18/15 23:1		
rans-1,2-Dichloroethene	ND	ug/L	1.0	1		09/18/15 23:1		
Dichlorofluoromethane	ND	ug/L	1.0	1		09/18/15 23:1	4 75-43-4	
,2-Dichloropropane	ND	ug/L	4.0	1		09/18/15 23:1	4 78-87-5	
,3-Dichloropropane	ND	ug/L	1.0	1		09/18/15 23:1	4 142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		09/18/15 23:1	4 594-20-7	
,1-Dichloropropene	ND	ug/L	1.0	1		09/18/15 23:1	4 563-58-6	
is-1,3-Dichloropropene	ND	ug/L	4.0	1		09/18/15 23:1	4 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1		09/18/15 23:1	4 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		09/18/15 23:1	4 60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		09/18/15 23:1	4 100-41-4	L2
lexachloro-1,3-butadiene	ND	ug/L	1.0	1		09/18/15 23:1		
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		09/18/15 23:1		
o-Isopropyltoluene	ND	ug/L	1.0	1		09/18/15 23:1		
Methylene Chloride	ND	ug/L	4.0	1		09/18/15 23:1		
-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		09/18/15 23:1		
Methyl-tert-butyl ether	ND	ug/L	1.0	1		09/18/15 23:1		





### **ANALYTICAL RESULTS**

Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

Sample: Trip Blank	Lab ID: 103	22358005	Collected: 09/16/1	5 00:00	Received: 09	9/16/15 17:04 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		09/18/15 23:14	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		09/18/15 23:14	103-65-1	
Styrene	ND	ug/L	1.0	1		09/18/15 23:14	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		09/18/15 23:14	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		09/18/15 23:14	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		09/18/15 23:14	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		09/18/15 23:14	109-99-9	
Toluene	ND	ug/L	1.0	1		09/18/15 23:14	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		09/18/15 23:14	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		09/18/15 23:14	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		09/18/15 23:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		09/18/15 23:14	79-00-5	
Trichloroethene	ND	ug/L	0.40	1		09/18/15 23:14	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		09/18/15 23:14	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		09/18/15 23:14	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		09/18/15 23:14	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		09/18/15 23:14	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		09/18/15 23:14	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		09/18/15 23:14	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		09/18/15 23:14	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	93	%.	75-125	1		09/18/15 23:14	17060-07-0	
Toluene-d8 (S)	93	%.	75-125	1		09/18/15 23:14	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1		09/18/15 23:14	460-00-4	

Minneapolis, MN 55414 (612)607-1700



### **QUALITY CONTROL DATA**

Project: PS BETA NIROP

Pace Project No.: 10322358

QC Batch: AIR/24188 Analysis Method: **RSK 175** 

QC Batch Method: **RSK 175** Analysis Description: **RSK 175 AIR HEADSPACE** 

Associated Lab Samples: 10322358001, 10322358002, 10322358003, 10322358004

METHOD BLANK: 2083940 Matrix: Water

Associated Lab Samples: 10322358001, 10322358002, 10322358003, 10322358004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	09/20/15 05:55	
Ethene	ug/L	ND	10.0	09/20/15 05:55	
Methane	ug/L	ND	10.0	09/20/15 05:55	

LABORATORY CONTROL SAMPLE &	LCSD: 2083941		20	83942						
		Spike	LCS	LCSD	LCS	LCSD	% Rec		Max	
Parameter	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
Ethane	ug/L	114	127	122	112	107	85-115	4	20	
Ethene	ug/L	106	118	113	112	107	85-115	4	20	
Methane	ug/L	60.7	67.4	64.2	111	106	85-115	5	20	

SAMPLE DUPLICATE: 2083943

Date: 10/15/2015 10:20 AM

		10322151005	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Ethane	ug/L	<5.0	ND		20	
Ethene	ug/L	< 0.47	ND		20	
Methane	ug/L	5.2J	6.6J		20	

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



### **QUALITY CONTROL DATA**

Project:

PS BETA NIROP

Pace Project No.:

10322358

QC Batch: QC Batch Method: MPRP/57887

EPA 3010

Analysis Method:

**EPA 6010C** 

Analysis Description:

6010C Water

Associated Lab Samples:

10322358001, 10322358002, 10322358003, 10322358004

2081627 METHOD BLANK:

Matrix: Water Associated Lab Samples: 10322358001, 10322358002, 10322358003, 10322358004

Blank

Reporting

Parameter

Units

Limit Result

Analyzed

Qualifiers

Iron

Iron

Iron

ug/L

Units

ug/L

ND

50.0 09/22/15 08:24

LABORATORY CONTROL SAMPLE:

Parameter

Parameter

Date: 10/15/2015 10:20 AM

2081628

Spike Conc.

LCS Result

10000

LCS % Rec % Rec Limits

80-120

Qualifiers

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:

2081629

1940

2081630

9920

MS

10000

10000

10321990001 Units Result

ug/L

MSD Spike Spike Conc. Conc.

MS Result

12300

MSD Result

12200

99

MS % Rec 104

MSD % Rec 102

% Rec Limits RPD

75-125

Max RPD

20

Qual

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.



### **QUALITY CONTROL DATA**

Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

QC Batch: MPRP/57978 Analysis Method: 6010C Met

QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved

Associated Lab Samples: 10322358001, 10322358002, 10322358003, 10322358004

METHOD BLANK: 2084155 Matrix: Water

Associated Lab Samples: 10322358001, 10322358002, 10322358003, 10322358004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Iron, Dissolved ug/L ND 50.0 09/22/15 00:04

LABORATORY CONTROL SAMPLE: 2084156

Parameter Units Spike LCS LCS % Rec
Conc. Result % Rec Limits Qualifiers

Iron, Dissolved ug/L 10000 9610 96 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2084157 2084158

MS MSD 10322726001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Iron, Dissolved 10000 9710 75-125 3 20 ug/L 54.3 10000 9430 94 97

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.



Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

QC Batch: MSV/33204 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV 465 W

Associated Lab Samples: 10322358001, 10322358002, 10322358004, 10322358005

METHOD BLANK: 2082570 Matrix: Water
Associated Lab Samples: 10322358001, 10322358002, 10322358004, 10322358005

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	09/18/15 22:45	
1,1,1-Trichloroethane	ug/L	ND	1.0	09/18/15 22:45	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	09/18/15 22:45	
1,1,2-Trichloroethane	ug/L	ND	1.0	09/18/15 22:45	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	09/18/15 22:45	
1,1-Dichloroethane	ug/L	ND	1.0	09/18/15 22:45	
1,1-Dichloroethene	ug/L	ND	1.0	09/18/15 22:45	
1,1-Dichloropropene	ug/L	ND	1.0	09/18/15 22:45	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	09/18/15 22:45	
1,2,3-Trichloropropane	ug/L	ND	4.0	09/18/15 22:45	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	09/18/15 22:45	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	09/18/15 22:45	
1,2-Dibromo-3-chloropropane	ug/L	ND	4.0	09/18/15 22:45	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	09/18/15 22:45	
1,2-Dichlorobenzene	ug/L	ND	1.0	09/18/15 22:45	
1,2-Dichloroethane	ug/L	ND	1.0	09/18/15 22:45	
1,2-Dichloropropane	ug/L	ND	4.0	09/18/15 22:45	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	09/18/15 22:45	
1,3-Dichlorobenzene	ug/L	ND	1.0	09/18/15 22:45	
1,3-Dichloropropane	ug/L	ND	1.0	09/18/15 22:45	
1,4-Dichlorobenzene	ug/L	ND	1.0	09/18/15 22:45	
2,2-Dichloropropane	ug/L	ND	4.0	09/18/15 22:45	
2-Butanone (MEK)	ug/L	ND	5.0	09/18/15 22:45	
2-Chlorotoluene	ug/L	ND	1.0	09/18/15 22:45	
4-Chlorotoluene	ug/L	ND	1.0	09/18/15 22:45	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	09/18/15 22:45	
Acetone	ug/L	ND	20.0	09/18/15 22:45	
Allyl chloride	ug/L	ND	4.0	09/18/15 22:45	
Benzene	ug/L	ND	1.0	09/18/15 22:45	
Bromobenzene	ug/L	ND	1.0	09/18/15 22:45	
Bromochloromethane	ug/L	ND	1.0	09/18/15 22:45	
Bromodichloromethane	ug/L	ND	1.0	09/18/15 22:45	
Bromoform	ug/L	ND	4.0	09/18/15 22:45	
Bromomethane	ug/L	ND	4.0	09/18/15 22:45	
Carbon tetrachloride	ug/L	ND	1.0	09/18/15 22:45	
Chlorobenzene	ug/L	ND	1.0	09/18/15 22:45	
Chloroethane	ug/L	ND	1.0	09/18/15 22:45	
Chloroform	ug/L	ND	1.0	09/18/15 22:45	
Chloromethane	ug/L	ND	4.0	09/18/15 22:45	
cis-1,2-Dichloroethene	ug/L	ND	1.0	09/18/15 22:45	
cis-1,3-Dichloropropene	ug/L	ND	4.0	09/18/15 22:45	

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.



### **QUALITY CONTROL DATA**

Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

METHOD BLANK: 2082570 Matrix: Water
Associated Lab Samples: 10322358001, 10322358002, 10322358004, 10322358005

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/L	ND	1.0	09/18/15 22:45	
Dibromomethane	ug/L	ND	4.0	09/18/15 22:45	
Dichlorodifluoromethane	ug/L	ND	1.0	09/18/15 22:45	
Dichlorofluoromethane	ug/L	ND	1.0	09/18/15 22:45	
Diethyl ether (Ethyl ether)	ug/L	ND	4.0	09/18/15 22:45	
Ethylbenzene	ug/L	ND	1.0	09/18/15 22:45	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	09/18/15 22:45	
sopropylbenzene (Cumene)	ug/L	ND	1.0	09/18/15 22:45	
Methyl-tert-butyl ether	ug/L	ND	1.0	09/18/15 22:45	
Methylene Chloride	ug/L	ND	4.0	09/18/15 22:45	
n-Butylbenzene	ug/L	ND	1.0	09/18/15 22:45	
n-Propylbenzene	ug/L	ND	1.0	09/18/15 22:45	
Naphthalene	ug/L	ND	4.0	09/18/15 22:45	
o-Isopropyltoluene	ug/L	ND	1.0	09/18/15 22:45	
sec-Butylbenzene	ug/L	ND	1.0	09/18/15 22:45	
Styrene	ug/L	ND	1.0	09/18/15 22:45	
ert-Butylbenzene	ug/L	ND	1.0	09/18/15 22:45	
Tetrachloroethene	ug/L	ND	1.0	09/18/15 22:45	
Tetrahydrofuran	ug/L	ND	10.0	09/18/15 22:45	
Toluene	ug/L	ND	1.0	09/18/15 22:45	
rans-1,2-Dichloroethene	ug/L	ND	1.0	09/18/15 22:45	
rans-1,3-Dichloropropene	ug/L	ND	4.0	09/18/15 22:45	
Trichloroethene	ug/L	ND	0.40	09/18/15 22:45	
Trichlorofluoromethane	ug/L	ND	1.0	09/18/15 22:45	
Vinyl chloride	ug/L	ND	0.40	09/18/15 22:45	
Xylene (Total)	ug/L	ND	3.0	09/18/15 22:45	
1,2-Dichloroethane-d4 (S)	%.	94	75-125	09/18/15 22:45	
4-Bromofluorobenzene (S)	%.	98	75-125	09/18/15 22:45	
Toluene-d8 (S)	%.	93	75-125	09/18/15 22:45	

LABORATORY CONTROL SAMPLE:	2082571					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	17.8	89	75-125	
1,1,1-Trichloroethane	ug/L	20	17.9	89	75-125	
1,1,2,2-Tetrachloroethane	ug/L	20	15.4	77	75-125	
1,1,2-Trichloroethane	ug/L	20	17.2	86	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	15.2	76	60-135	
1,1-Dichloroethane	ug/L	20	16.1	81	69-125	
1,1-Dichloroethene	ug/L	20	16.9	84	68-125	
1,1-Dichloropropene	ug/L	20	16.4	82	74-125	
1,2,3-Trichlorobenzene	ug/L	20	15.8	79	69-136	
1,2,3-Trichloropropane	ug/L	20	16.7	84	75-125	
1,2,4-Trichlorobenzene	ug/L	20	15.6	78	73-127	

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.



Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

LABORATORY CONTROL SAMPLE:	2082571					
_		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	15.0	75	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	41.6	83	65-145	
1,2-Dibromoethane (EDB)	ug/L	20	15.1	76	75-125	
1,2-Dichlorobenzene	ug/L	20	15.8	79	75-125	
1,2-Dichloroethane	ug/L	20	16.9	85	73-125	
1,2-Dichloropropane	ug/L	20	17.3	86	75-125	
1,3,5-Trimethylbenzene	ug/L	20	15.0	75	75-125	
1,3-Dichlorobenzene	ug/L	20	16.4	82	74-125	
1,3-Dichloropropane	ug/L	20	15.8	79	75-125	
1,4-Dichlorobenzene	ug/L	20	15.8	79	75-125	
2,2-Dichloropropane	ug/L	20	16.2	81	59-139	
2-Butanone (MEK)	ug/L	100	100	100	63-130	
2-Chlorotoluene	ug/L	20	14.8	74	72-125	
4-Chlorotoluene	ug/L	20	15.5	77	73-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	98.3	98	71-126	
Acetone	ug/L	100	91.3	91	69-131	
Allyl chloride	ug/L	20	16.7	84	67-125	
Benzene	ug/L	20	16.7	84	71-125	
Bromobenzene	ug/L	20	15.3	77	75-125	
Bromochloromethane	ug/L	20	17.6	88	75-125	
Bromodichloromethane	ug/L	20	16.0	80	75-125	
Bromoform	ug/L	20	16.7	84	70-125	
Bromomethane	ug/L	20	8.1	41	30-150	
Carbon tetrachloride	ug/L	20	17.2	86	75-126	
Chlorobenzene	ug/L	20	15.8	79	75-125	
Chloroethane	ug/L	20	17.2	86	65-134	
Chloroform	ug/L	20	17.0	85	75-125	
Chloromethane	ug/L	20	14.9	75	39-150	
cis-1,2-Dichloroethene	ug/L	20	16.3	82	72-125	
cis-1,3-Dichloropropene	ug/L	20	17.7	89	75-125	
Dibromochloromethane	ug/L	20	15.9	79	75-125	
Dibromomethane	ug/L	20	18.2	91	75-125	
Dichlorodifluoromethane	ug/L	20	14.9	75	50-134	
Dichlorofluoromethane	ug/L	20	16.5	82	69-125	
Diethyl ether (Ethyl ether)	ug/L	20	17.0	85	72-125	
Ethylbenzene	ug/L	20	14.8	74	75-125 L	0
Hexachloro-1,3-butadiene	ug/L	20	14.9	74	70-138	.0
Isopropylbenzene (Cumene)	ug/L	20	17.5	87	75-125	
Methyl-tert-butyl ether	ug/L	20	16.5	83	73-125	
Methylene Chloride	ug/L	20	16.8	84	73-125	
n-Butylbenzene	ug/L	20	15.8	79	72-133	
n-Propylbenzene	ug/L	20	15.9	79	72-126	
Naphthalene	ug/L	20	15.9	75	72-120 70-127	
p-Isopropyltoluene	ug/L ug/L	20	14.9	75 74	70-127 72-132	
sec-Butylbenzene	ug/L ug/L	20	15.9	74 79	72-132 73-132	
Styrene	ug/L ug/L	20	16.2	81	75-132 75-125	
tert-Butylbenzene	-	20	16.4	82	73-125 73-128	
tert-butyiberizerie	ug/L	20	10.4	02	13-120	

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.



Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

ydrofuran ug/L 200 147 74 62-133 lee ug/L 20 15.5 77 74-125 l.,2-Dichloroethene ug/L 20 17.3 86 69-125 l.,3-Dichloropropene ug/L 20 16.1 80 75-125 lroethene ug/L 20 18.3 92 75-125 lrofluoromethane ug/L 20 14.8 74 74-127 lchloride ug/L 20 14.8 74 74-127 lchloride ug/L 20 14.9 75 66-132 lc (Total) ug/L 60 50.6 84 75-125 lchloroethane-d4 (S) %. 96 75-125 lnofluorobenzene (S) %.	LABORATORY CONTROL SAMPLE:	2082571					
hloroethene			Spike	LCS	LCS	% Rec	
ydrofuran ug/L 200 147 74 62-133 lee ug/L 20 15.5 77 74-125 l.,2-Dichloroethene ug/L 20 17.3 86 69-125 l.,3-Dichloropropene ug/L 20 16.1 80 75-125 lroethene ug/L 20 18.3 92 75-125 lroefluoromethane ug/L 20 14.8 74 74-127 lchloride ug/L 20 14.9 75 66-132 lchloride ug/L 20 14.9 75 66-132 lchloroethane-d4 (S) %. 96 75-125 lnofluorobenzene (S) %.	Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
sie     ug/L     20     15.5     77     74-125       J.2-Dichloroethene     ug/L     20     17.3     86     69-125       J.3-Dichloropropene     ug/L     20     16.1     80     75-125       J.3-Dichloropropene     ug/L     20     18.3     92     75-125       J.3-Dichloropropene     ug/L     20     14.8     74     74-127       J.3-Dichloropropene     ug/L     20     14.8     74     74-127       J.3-Dichloropropene     ug/L     20     14.8     74     74-127       J.3-Dichloropethane     ug/L     20     14.9     75     66-132       J.3-Dichloropethane     ug/L     60     50.6     84     75-125       J.3-Dichloropethane     ug/L     0     50.6     84     75-125       J.3-Dic	Tetrachloroethene	ug/L		14.8	74	74-125	
1,2-Dichloroethene	Tetrahydrofuran	ug/L	200	147	74	62-133	
ug/L     20     16.1     80     75-125       ug/L     20     18.3     92     75-125       ug/Lorofluoromethane     ug/L     20     14.8     74     74-127       ug/lorofluoromethane     ug/L     20     14.9     75     66-132       ug/Lorofluoromethane     ug/L     60     50.6     84     75-125       chloroethane-d4 (S)     %.     96     75-125       nofluorobenzene (S)     %.     95     75-125	oluene	ug/L	20	15.5	77	74-125	
broothene         ug/L         20         18.3         92         75-125           profluoromethane         ug/L         20         14.8         74         74-127           phloride         ug/L         20         14.9         75         66-132           profluorothane-d4 (S)         ug/L         60         50.6         84         75-125           phofluorobenzene (S)         %.         96         75-125           ps         75-125         75-125	ans-1,2-Dichloroethene	ug/L	20	17.3	86	69-125	
orofluoromethane     ug/L     20     14.8     74     74-127       chloride     ug/L     20     14.9     75     66-132       c (Total)     ug/L     60     50.6     84     75-125       chloroethane-d4 (S)     %.     96     75-125       nofluorobenzene (S)     %.     95     75-125	ans-1,3-Dichloropropene	ug/L	20	16.1	80	75-125	
chloride     ug/L     20     14.9     75     66-132       c (Total)     ug/L     60     50.6     84     75-125       chloroethane-d4 (S)     %.     96     75-125       nofluorobenzene (S)     %.     95     75-125	ichloroethene	ug/L	20	18.3	92	75-125	
e (Total) ug/L 60 50.6 84 75-125 chloroethane-d4 (S) %. 96 75-125 nofluorobenzene (S) %. 95 75-125	ichlorofluoromethane	ug/L	20	14.8	74	74-127	
chloroethane-d4 (S)       %.       96       75-125         nofluorobenzene (S)       %.       95       75-125	nyl chloride	ug/L	20	14.9	75	66-132	
nofluorobenzene (S) %. 95 75-125	/lene (Total)	ug/L	60	50.6	84	75-125	
• •	2-Dichloroethane-d4 (S)	%.			96	75-125	
e-d8 (S) %. 94 75-125	Bromofluorobenzene (S)	%.			95	75-125	
	oluene-d8 (S)	%.			94	75-125	

MATRIX SPIKE & MATRIX SPIR	KE DUPLICA	ATE: 20825	72		2082573							
			MS	MSD								
	1	10321843001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	1.0 U	15	15	14.0	14.1	93	94	70-138	1	30	
1,1,1-Trichloroethane	ug/L	1.0 U	15	15	14.6	14.2	97	95	55-150	3	30	
1,1,2,2-Tetrachloroethane	ug/L	1.0 U	15	15	12.2	12.0	82	80	64-140	2	30	
1,1,2-Trichloroethane	ug/L	1.0 U	15	15	13.1	13.1	87	87	67-137	0	30	
1,1,2-Trichlorotrifluoroethane	ug/L	1.0 U	15	15	14.9	15.0	99	100	51-150	1	30	
1,1-Dichloroethane	ug/L	1.0 U	15	15	13.4	12.3	89	82	49-150	9	30	
1,1-Dichloroethene	ug/L	1.0 U	15	15	14.3	14.0	96	93	40-150	2	30	
1,1-Dichloropropene	ug/L	1.0 U	15	15	14.5	13.7	97	91	50-150	6	30	
1,2,3-Trichlorobenzene	ug/L	1.0 U	15	15	12.0	12.9	80	86	59-148	7	30	
1,2,3-Trichloropropane	ug/L	4.0 U	15	15	12.7	13.3	84	89	65-141	5	30	
1,2,4-Trichlorobenzene	ug/L	1.0 U	15	15	11.8	12.2	79	81	61-140	3	30	
1,2,4-Trimethylbenzene	ug/L	1.0 U	15	15	11.7	11.9	78	79	58-141	1	30	
1,2-Dibromo-3-	ug/L	4.0 U	37.5	37.5	32.1	33.7	85	90	53-150	5	30	
chloropropane	-											
1,2-Dibromoethane (EDB)	ug/L	1.0 U	15	15	11.9	12.1	79	81	65-137			
1,2-Dichlorobenzene	ug/L	1.0 U	15	15	12.2	12.5	81	83	66-133			
1,2-Dichloroethane	ug/L	1.0 U	15	15	13.2	13.2	88	88	54-138	0		
1,2-Dichloropropane	ug/L	4.0 U	15	15	13.3	13.3	89	89	62-138	0		
1,3,5-Trimethylbenzene	ug/L	1.0 U	15	15	12.0	11.9	80	79	58-140	0	30	
1,3-Dichlorobenzene	ug/L	1.0 U	15	15	13.0	12.7	86	85	66-132	2	30	
1,3-Dichloropropane	ug/L	1.0 U	15	15	12.4	12.2	82	82	66-134	1	30	
1,4-Dichlorobenzene	ug/L	1.0 U	15	15	13.1	12.4	87	82	65-129	5	30	
2,2-Dichloropropane	ug/L	4.0 U	15	15	12.9	13.3	86	89	40-150	3	30	
2-Butanone (MEK)	ug/L	5.0 U	75	75	70.9	72.8	94	97	51-147	3	30	
2-Chlorotoluene	ug/L	1.0 U	15	15	11.7	11.9	78	79	58-147	2	30	
4-Chlorotoluene	ug/L	1.0 U	15	15	12.4	12.2	83	81	64-138	2	30	
4-Methyl-2-pentanone (MIBK)	ug/L	5.0 U	75	75	70.9	74.6	95	99	59-143	5	30	
Acetone	ug/L	20.0 U	75	75	64.7	69.0	86	92	63-147	6	30	

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### **REPORT OF LABORATORY ANALYSIS**

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Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

MATRIX SPIKE & MATRIX SPI	KE DUPLICA	TE: 20825	72		2082573							
			MS	MSD								
	1	0321843001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qua
Allyl chloride	ug/L	4.0 U	15	15	13.8	12.8	92	85	45-150	7	30	
Benzene	ug/L	1.0 U	15	15	13.6	13.3	91	89	53-139	2	30	
Bromobenzene	ug/L	1.0 U	15	15	12.3	12.1	82	81	66-136	1	30	
Bromochloromethane	ug/L	1.0 U	15	15	14.3	12.9	95	86	64-136	10	30	
Bromodichloromethane	ug/L	1.0 U	15	15	13.9	13.9	93	92	66-138	1	30	
Bromoform	ug/L	4.0 U	15	15	12.1	12.7	81	84	59-136	4	30	
Bromomethane	ug/L	4.0 U	20	20	6.8	7.0	34	35	30-150	2	30	
Carbon tetrachloride	ug/L	1.0 U	15	15	14.7	14.1	98	94	56-150	4	30	
Chlorobenzene	ug/L	1.0 U	15	15	12.6	12.2	84	81	65-133	3	30	
Chloroethane	ug/L	1.0 U	20	20	14.9	13.3	74	67	48-150		30	
Chloroform	ug/L	1.0 U	15	15	13.5	13.8	90	92	57-145			
Chloromethane	ug/L	4.0 U	20	20	13.0	11.5	65	58	30-150			
cis-1,2-Dichloroethene	ug/L	1.0 U	15	15	13.5	13.1	90	87	49-150			
cis-1,3-Dichloropropene	ug/L	4.0 U	15	15	14.3	13.9	95	93	64-130			
Dibromochloromethane	ug/L	1.0 U	15	15	12.7	12.6	85	84	68-138		30	
Dibromomethane	ug/L	4.0 U	15	15	14.7	14.0	98	93	67-134			
Dichlorodifluoromethane	ug/L	1.0 U	20	20	15.1	14.0	75	70	45-150		30	
Dichlorofluoromethane	ug/L	1.0 U	20	20	13.7	13.2	69	66	54-150			
Diethyl ether (Ethyl ether)	ug/L	4.0 U	15	15	13.7	13.2	91	88	50-145			
Ethylbenzene	ug/L	1.0 U	15	15	12.4	11.9	82	79	55-139			
Hexachloro-1,3-butadiene	ug/L	1.0 U	15	15	12.4	12.3	80	82	49-150			
sopropylbenzene (Cumene)	ug/L	1.0 U	15	15	14.1	13.9	94	93	64-142		30	
Methyl-tert-butyl ether	ug/L ug/L	1.0 U	15	15	13.4	13.4	90	89	62-129			
	ug/L ug/L	4.0 U	15	15	12.4	12.5	82	83	57-132			
Methylene Chloride				15		13.1	82 82	87			30	
n-Butylbenzene	ug/L	1.0 U	15		12.3				55-150			
n-Propylbenzene	ug/L	1.0 U	15	15	12.6	12.7	84	85	59-142		30	
Naphthalene	ug/L	4.0 U	15	15	11.1	12.1	74	81	51-150			
o-Isopropyltoluene	ug/L	1.0 U	15	15	12.0	12.4	80	82	60-149			
sec-Butylbenzene	ug/L	1.0 U	15	15	12.7	13.0	85	87	60-150			
Styrene	ug/L	1.0 U	15	15	13.2	13.2	88	88	68-134			
ert-Butylbenzene	ug/L	1.0 U	15	15	13.0	13.2	87	88	62-146			
Tetrachloroethene	ug/L	1.0 U	15	15	12.8	12.6	85	84	50-150			
Tetrahydrofuran	ug/L	10.0 U	150	150	122	124	81	83	59-145			
Toluene	ug/L	1.0 U	15	15	12.4	12.2	82	81	52-148			
rans-1,2-Dichloroethene	ug/L	1.0 U	15	15	14.2	13.2	94	88	45-150			
rans-1,3-Dichloropropene	ug/L	4.0 U	15	15	13.1	12.6	87	84	68-132			
richloroethene	ug/L	0.40 U	15	15	15.2	14.7	102	98	52-150			
richlorofluoromethane	ug/L	1.0 U	20	20	13.7	13.3	68	67	55-150			
/inyl chloride	ug/L	0.40 U	20	20	12.7	12.7	64	64	43-150			
(Ylene (Total)	ug/L	3.0 U	45	45	40.7	39.5	91	88	54-144		30	
,2-Dichloroethane-d4 (S)	%.						97	95	75-125			
I-Bromofluorobenzene (S)	%.						96	98	75-125			
Toluene-d8 (S)	%.						92	95	75-125			

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### **QUALITY CONTROL DATA**

Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

QC Batch: MSV/33205 Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B Analysis Description: 8260B MSV 465 W

Associated Lab Samples: 10322358003

METHOD BLANK: 2083584 Matrix: Water

Associated Lab Samples: 10322358003

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	09/21/15 16:01	
1,1,1-Trichloroethane	ug/L	ND	1.0	09/21/15 16:01	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	09/21/15 16:01	
1,1,2-Trichloroethane	ug/L	ND	1.0	09/21/15 16:01	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	09/21/15 16:01	
1,1-Dichloroethane	ug/L	ND	1.0	09/21/15 16:01	
1,1-Dichloroethene	ug/L	ND	1.0	09/21/15 16:01	
1,1-Dichloropropene	ug/L	ND	1.0	09/21/15 16:01	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	09/21/15 16:01	
1,2,3-Trichloropropane	ug/L	ND	4.0	09/21/15 16:01	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	09/21/15 16:01	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	09/21/15 16:01	
1,2-Dibromo-3-chloropropane	ug/L	ND	4.0	09/21/15 16:01	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	09/21/15 16:01	
1,2-Dichlorobenzene	ug/L	ND	1.0	09/21/15 16:01	
1,2-Dichloroethane	ug/L	ND	1.0	09/21/15 16:01	
1,2-Dichloropropane	ug/L	ND	4.0	09/21/15 16:01	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	09/21/15 16:01	
1,3-Dichlorobenzene	ug/L	ND	1.0	09/21/15 16:01	
1,3-Dichloropropane	ug/L	ND	1.0	09/21/15 16:01	
1,4-Dichlorobenzene	ug/L	ND	1.0	09/21/15 16:01	
2,2-Dichloropropane	ug/L	ND	4.0	09/21/15 16:01	
2-Butanone (MEK)	ug/L	ND	5.0	09/21/15 16:01	
2-Chlorotoluene	ug/L	ND	1.0	09/21/15 16:01	
4-Chlorotoluene	ug/L	ND	1.0	09/21/15 16:01	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	09/21/15 16:01	
Acetone	ug/L	ND	20.0	09/21/15 16:01	
Allyl chloride	ug/L	ND	4.0	09/21/15 16:01	
Benzene	ug/L	ND	1.0	09/21/15 16:01	
Bromobenzene	ug/L	ND	1.0	09/21/15 16:01	
Bromochloromethane	ug/L	ND	1.0	09/21/15 16:01	
Bromodichloromethane	ug/L	ND	1.0	09/21/15 16:01	
Bromoform	ug/L	ND	4.0	09/21/15 16:01	
Bromomethane	ug/L	ND	4.0	09/21/15 16:01	
Carbon tetrachloride	ug/L	ND	1.0	09/21/15 16:01	
Chlorobenzene	ug/L	ND	1.0	09/21/15 16:01	
Chloroethane	ug/L	ND	1.0	09/21/15 16:01	
Chloroform	ug/L	ND	1.0	09/21/15 16:01	
Chloromethane	ug/L	ND	4.0	09/21/15 16:01	
cis-1,2-Dichloroethene	ug/L	ND	1.0	09/21/15 16:01	
cis-1,3-Dichloropropene	ug/L	ND	4.0	09/21/15 16:01	

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### **QUALITY CONTROL DATA**

Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

METHOD BLANK: 2083584 Matrix: Water

Associated Lab Samples: 10322358003

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/L	ND	1.0	09/21/15 16:01	
Dibromomethane	ug/L	ND	4.0	09/21/15 16:01	
Dichlorodifluoromethane	ug/L	ND	1.0	09/21/15 16:01	
Dichlorofluoromethane	ug/L	ND	1.0	09/21/15 16:01	
Diethyl ether (Ethyl ether)	ug/L	ND	4.0	09/21/15 16:01	
Ethylbenzene	ug/L	ND	1.0	09/21/15 16:01	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	09/21/15 16:01	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	09/21/15 16:01	
Methyl-tert-butyl ether	ug/L	ND	1.0	09/21/15 16:01	
Methylene Chloride	ug/L	ND	4.0	09/21/15 16:01	
n-Butylbenzene	ug/L	ND	1.0	09/21/15 16:01	
n-Propylbenzene	ug/L	ND	1.0	09/21/15 16:01	
Naphthalene	ug/L	ND	4.0	09/21/15 16:01	
p-Isopropyltoluene	ug/L	ND	1.0	09/21/15 16:01	
sec-Butylbenzene	ug/L	ND	1.0	09/21/15 16:01	
Styrene	ug/L	ND	1.0	09/21/15 16:01	
tert-Butylbenzene	ug/L	ND	1.0	09/21/15 16:01	
Tetrachloroethene	ug/L	ND	1.0	09/21/15 16:01	
Tetrahydrofuran	ug/L	ND	10.0	09/21/15 16:01	
Toluene	ug/L	ND	1.0	09/21/15 16:01	
trans-1,2-Dichloroethene	ug/L	ND	1.0	09/21/15 16:01	
trans-1,3-Dichloropropene	ug/L	ND	4.0	09/21/15 16:01	
Trichloroethene	ug/L	ND	0.40	09/21/15 16:01	
Trichlorofluoromethane	ug/L	ND	1.0	09/21/15 16:01	
Vinyl chloride	ug/L	ND	1.0	09/21/15 16:01	
Xylene (Total)	ug/L	ND	3.0	09/21/15 16:01	
1,2-Dichloroethane-d4 (S)	%.	98	75-125	09/21/15 16:01	
4-Bromofluorobenzene (S)	%.	101	75-125	09/21/15 16:01	
Toluene-d8 (S)	%.	100	75-125	09/21/15 16:01	

LABORATORY CONTROL SAMPLE:	2083585					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.6	103	75-125	
1,1,1-Trichloroethane	ug/L	20	19.0	95	75-125	
1,1,2,2-Tetrachloroethane	ug/L	20	20.3	102	75-125	
1,1,2-Trichloroethane	ug/L	20	20.0	100	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	19.3	97	60-135	
1,1-Dichloroethane	ug/L	20	20.5	102	69-125	
1,1-Dichloroethene	ug/L	20	19.6	98	68-125	
1,1-Dichloropropene	ug/L	20	19.5	97	74-125	
1,2,3-Trichlorobenzene	ug/L	20	18.2	91	69-136	
1,2,3-Trichloropropane	ug/L	20	20.6	103	75-125	
1,2,4-Trichlorobenzene	ug/L	20	19.7	99	73-127	

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Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

ABORATORY CONTROL SAMPLE:	2083585	<b>-</b>				
Doromatan	11-4-	Spike	LCS	LCS	% Rec	Oug!!!:-
Parameter	Units	Conc	Result	% Rec	Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	20.2	101	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	53.3	107	65-145	
,2-Dibromoethane (EDB)	ug/L	20	20.1	101	75-125	
,2-Dichlorobenzene	ug/L	20	19.3	97	75-125	
,2-Dichloroethane	ug/L	20	20.6	103	73-125	
,2-Dichloropropane	ug/L	20	19.5	97	75-125	
,3,5-Trimethylbenzene	ug/L	20	19.9	100	75-125	
,3-Dichlorobenzene	ug/L	20	18.9	95	74-125	
,3-Dichloropropane	ug/L	20	20.8	104	75-125	
,4-Dichlorobenzene	ug/L	20	20.0	100	75-125	
,2-Dichloropropane	ug/L	20	20.9	104	59-139	
-Butanone (MEK)	ug/L	100	112	112	63-130	
-Chlorotoluene	ug/L	20	19.9	100	72-125	
-Chlorotoluene	ug/L	20	19.6	98	73-125	
-Methyl-2-pentanone (MIBK)	ug/L	100	109	109	71-126	
cetone	ug/L	100	104	104	69-131	
llyl chloride	ug/L	20	19.5	98	67-125	
enzene	ug/L	20	18.9	94	71-125	
romobenzene	ug/L	20	21.2	106	75-125	
romochloromethane	ug/L	20	19.5	98	75-125	
romodichloromethane	ug/L	20	20.2	101	75-125	
romoform	ug/L	20	20.7	104	70-125	
romomethane	ug/L	20	24.2	121	30-150	
arbon tetrachloride	ug/L	20	18.2	91	75-126	
Chlorobenzene	ug/L	20	20.4	102	75-125	
Chloroethane	ug/L	20	22.1	111	65-134	
Chloroform	ug/L	20	19.9	100	75-125	
Chloromethane	ug/L ug/L	20	21.5	108	39-150	
is-1,2-Dichloroethene	-	20	20.6			
s-1,2-Dichloropropene	ug/L ug/L	20	20.6 19.9	103 99	72-125 75-125	
libromochloromethane	-	20	20.4	102	75-125 75-125	
	ug/L	20 20	20.4		75-125 75-125	
Pibromomethane	ug/L		20.7 21.4	103	75-125 50-134	
Pichlorodifluoromethane	ug/L	20		107		
Dichlorofluoromethane	ug/L	20	20.1	100	69-125	
Piethyl ether (Ethyl ether)	ug/L	20	21.6	108	72-125 75-125	
thylbenzene	ug/L	20	19.6	98	75-125	
lexachloro-1,3-butadiene	ug/L	20	18.6	93	70-138	
sopropylbenzene (Cumene)	ug/L	20	18.4	92	75-125	
lethyl-tert-butyl ether	ug/L	20	21.8	109	73-125	
lethylene Chloride	ug/L	20	18.2	91	73-125	
-Butylbenzene	ug/L	20	18.7	94	72-133	
-Propylbenzene	ug/L	20	18.4	92	72-126	
laphthalene	ug/L	20	19.2	96	70-127	
-Isopropyltoluene	ug/L	20	20.3	102	72-132	
ec-Butylbenzene	ug/L	20	17.5	87	73-132	
Styrene	ug/L	20	20.0	100	75-125	
ert-Butylbenzene	ug/L	20	18.6	93	73-128	

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.



Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

LABORATORY CONTROL SAMPLE:	2083585					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Tetrachloroethene	ug/L	20	19.4	97	74-125	
Tetrahydrofuran	ug/L	200	198	99	62-133	
Toluene	ug/L	20	18.6	93	74-125	
trans-1,2-Dichloroethene	ug/L	20	19.8	99	69-125	
trans-1,3-Dichloropropene	ug/L	20	19.9	99	75-125	
Trichloroethene	ug/L	20	19.2	96	75-125	
Trichlorofluoromethane	ug/L	20	20.3	101	74-127	
Vinyl chloride	ug/L	20	19.1	96	66-132	
Xylene (Total)	ug/L	60	58.9	98	75-125	
1,2-Dichloroethane-d4 (S)	%.			96	75-125	
4-Bromofluorobenzene (S)	%.			98	75-125	
Toluene-d8 (S)	%.			100	75-125	

MATRIX SPIKE SAMPLE:	2083602						
		10321760001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<1.0	20	22.2	111	70-138	
1,1,1-Trichloroethane	ug/L	<1.0	20	21.4	107	55-150	
1,1,2,2-Tetrachloroethane	ug/L	<1.0	20	20.9	105	64-140	
1,1,2-Trichloroethane	ug/L	<1.0	20	20.5	102	67-137	
1,1,2-Trichlorotrifluoroethane	ug/L	<1.0	20	25.2	126	51-150	
1,1-Dichloroethane	ug/L	<1.0	20	21.9	110	49-150	
1,1-Dichloroethene	ug/L	<1.0	20	22.1	111	40-150	
1,1-Dichloropropene	ug/L	<1.0	20	21.8	109	50-150	
1,2,3-Trichlorobenzene	ug/L	<1.0	20	20.8	104	59-148	
1,2,3-Trichloropropane	ug/L	<4.0	20	19.0	95	65-141	
1,2,4-Trichlorobenzene	ug/L	<1.0	20	21.0	105	61-140	
1,2,4-Trimethylbenzene	ug/L	<1.0	20	21.6	108	58-141	
1,2-Dibromo-3-chloropropane	ug/L	<4.0	50	50.8	102	53-150	
1,2-Dibromoethane (EDB)	ug/L	<1.0	20	20.1	101	65-137	
1,2-Dichlorobenzene	ug/L	<1.0	20	21.0	105	66-133	
1,2-Dichloroethane	ug/L	<1.0	20	21.1	105	54-138	
1,2-Dichloropropane	ug/L	<4.0	20	21.3	107	62-138	
1,3,5-Trimethylbenzene	ug/L	<1.0	20	21.4	107	58-140	
1,3-Dichlorobenzene	ug/L	<1.0	20	20.6	103	66-132	
1,3-Dichloropropane	ug/L	<1.0	20	21.5	107	66-134	
1,4-Dichlorobenzene	ug/L	<1.0	20	21.7	109	65-129	
2,2-Dichloropropane	ug/L	<4.0	20	21.7	109	40-150	
2-Butanone (MEK)	ug/L	<5.0	100	107	107	51-147	
2-Chlorotoluene	ug/L	<1.0	20	21.2	106	58-147	
4-Chlorotoluene	ug/L	<1.0	20	20.8	104	64-138	
4-Methyl-2-pentanone (MIBK)	ug/L	<5.0	100	119	119	59-143	
Acetone	ug/L	<20.0	100	109	109	63-147	
Allyl chloride	ug/L	<4.0	20	21.3	107	45-150	
Benzene	ug/L	<1.0	20	20.6	103	53-139	

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.



Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

MATRIX SPIKE SAMPLE:	2083602						
_		10321760001	Spike	MS	MS	% Rec	_
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/L	<1.0	20	21.8	109	66-136	
Bromochloromethane	ug/L	<1.0	20	21.2	106	64-136	
Bromodichloromethane	ug/L	<1.0	20	20.7	104	66-138	
Bromoform	ug/L	<4.0	20	20.1	101	59-136	
Bromomethane	ug/L	<4.0	20	25.7	128	30-150	
Carbon tetrachloride	ug/L	<1.0	20	21.2	106	56-150	
Chlorobenzene	ug/L	<1.0	20	22.2	111	65-133	
Chloroethane	ug/L	<1.0	20	24.3	121	48-150	
Chloroform	ug/L	<1.0	20	22.1	111	57-145	
Chloromethane	ug/L	<4.0	20	23.6	118	30-150	
cis-1,2-Dichloroethene	ug/L	<1.0	20	21.3	107	49-150	
cis-1,3-Dichloropropene	ug/L	<4.0	20	20.1	100	64-130	
Dibromochloromethane	ug/L	<1.0	20	21.3	106	68-138	
Dibromomethane	ug/L	<4.0	20	21.2	106	67-134	
Dichlorodifluoromethane	ug/L	<1.0	20	27.5	137	45-150	
Dichlorofluoromethane	ug/L	<1.0	20	21.5	107	54-150	
Diethyl ether (Ethyl ether)	ug/L	<4.0	20	22.4	112	50-145	
Ethylbenzene	ug/L	<1.0	20	20.9	105	55-139	
Hexachloro-1,3-butadiene	ug/L	<1.0	20	20.4	102	49-150	
Isopropylbenzene (Cumene)	ug/L	<1.0	20	20.1	101	64-142	
Methyl-tert-butyl ether	ug/L	<1.0	20	21.8	109	62-129	
Methylene Chloride	ug/L	<4.0	20	19.0	95	57-132	
n-Butylbenzene	ug/L	<1.0	20	20.9	105	55-150	
n-Propylbenzene	ug/L	<1.0	20	20.0	100	59-142	
Naphthalene	ug/L	<4.0	20	20.2	101	51-150	
p-Isopropyltoluene	ug/L	<1.0	20	22.2	111	60-149	
sec-Butylbenzene	ug/L	<1.0	20	19.0	95	60-150	
Styrene	ug/L	<1.0	20	21.8	109	68-134	
tert-Butylbenzene	ug/L	<1.0	20	19.5	97	62-146	
Tetrachloroethene	ug/L	<1.0	20	21.2	104	50-150	
Tetrahydrofuran	ug/L	<10.0	200	208	104	59-145	
Toluene	ug/L	<1.0	20	20.1	100	52-148	
trans-1,2-Dichloroethene	ug/L	<1.0	20	21.8	109	45-150	
trans-1,3-Dichloropropene	ug/L	<4.0	20	20.9	105	68-132	
Trichloroethene	ug/L	<0.40	20	19.5	97	52-150	
Trichlorofluoromethane	ug/L	<1.0	20	23.5	118	55-150	
Vinyl chloride	ug/L	<1.0	20	22.1	111	43-150	
Xylene (Total)	ug/L	<3.0	60	63.8	106	54-144	
1,2-Dichloroethane-d4 (S)	%.				98	75-125	
4-Bromofluorobenzene (S)	%.				97	75-125	
Toluene-d8 (S)	%.				101	75-125	

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



Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

SAMPLE DUPLICATE: 2083603						
Parameter	Units	10321760002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<1.0	ND		30	
1,1,1-Trichloroethane	ug/L	<1.0	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	<1.0	ND		30	
1,1,2-Trichloroethane	ug/L	<1.0	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<1.0	ND		30	
1,1-Dichloroethane	ug/L	<1.0	ND		30	
1,1-Dichloroethene	ug/L	<1.0	ND		30	
1,1-Dichloropropene	ug/L	<1.0	ND		30	
1,2,3-Trichlorobenzene	ug/L	<1.0	ND		30	
1,2,3-Trichloropropane	ug/L	<4.0	ND		30	
1,2,4-Trichlorobenzene	ug/L	<1.0	ND		30	
1,2,4-Trimethylbenzene	ug/L	<1.0	ND		30	
1,2-Dibromo-3-chloropropane	ug/L	<4.0	ND		30	
1,2-Dibromoethane (EDB)	ug/L	<1.0	ND		30	
1,2-Dichlorobenzene	ug/L	<1.0	ND		30	
1,2-Dichloroethane	ug/L	<1.0	ND		30	
1,2-Dichloropropane	ug/L	<4.0	ND		30	
1,3,5-Trimethylbenzene	ug/L	<1.0	ND		30	
1,3-Dichlorobenzene	ug/L	<1.0	ND		30	
1,3-Dichloropropane	ug/L	<1.0	ND		30	
1,4-Dichlorobenzene	ug/L	<1.0	ND		30	
2,2-Dichloropropane	ug/L	<4.0	ND		30	
2-Butanone (MEK)	ug/L	<5.0	ND		30	
2-Chlorotoluene	ug/L	<1.0	ND		30	
4-Chlorotoluene	ug/L	<1.0	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<5.0	ND		30	
Acetone	ug/L	<20.0	ND		30	
Allyl chloride	ug/L	<4.0	ND		30	
Benzene	ug/L	<1.0	ND		30	
Bromobenzene	ug/L	<1.0	ND		30	
Bromochloromethane	ug/L	<1.0	ND		30	
Bromodichloromethane	ug/L	<1.0	ND		30	
Bromoform	ug/L	<4.0	ND		30	
Bromomethane	ug/L	<4.0	ND		30	
Carbon tetrachloride	ug/L	<1.0	ND		30	
Chlorobenzene	ug/L	<1.0	ND		30	
Chloroethane	ug/L	<1.0	ND		30	
Chloroform	ug/L	<1.0	ND		30	
Chloromethane	ug/L	<4.0	ND		30	
cis-1,2-Dichloroethene	ug/L	<1.0	ND		30	
cis-1,3-Dichloropropene	ug/L	<4.0	ND		30	
Dibromochloromethane	ug/L	<1.0	ND		30	
Dibromomethane	ug/L	<4.0	ND		30	
Dichlorodifluoromethane	ug/L	<1.0	ND		30	
Dichlorofluoromethane	ug/L	<1.0	ND		30	
Diethyl ether (Ethyl ether)	ug/L	<4.0	ND		30	
Ethylbenzene	ug/L	<1.0	ND		30	

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



### **QUALITY CONTROL DATA**

Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

SAMPLE DUPLICATE: 2083603						
Damanatan	11-26-	10321760002	Dup	DDD	Max	0
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/L	<1.0	ND		30	
Isopropylbenzene (Cumene)	ug/L	<1.0	ND		30	
Methyl-tert-butyl ether	ug/L	<1.0	ND		30	
Methylene Chloride	ug/L	<4.0	ND		30	
n-Butylbenzene	ug/L	<1.0	ND		30	
n-Propylbenzene	ug/L	<1.0	ND		30	
Naphthalene	ug/L	<4.0	1.1J		30	
p-Isopropyltoluene	ug/L	<1.0	ND		30	
sec-Butylbenzene	ug/L	<1.0	ND		30	
Styrene	ug/L	<1.0	ND		30	
tert-Butylbenzene	ug/L	<1.0	ND		30	
Tetrachloroethene	ug/L	<1.0	.29J		30	
Tetrahydrofuran	ug/L	<10.0	ND		30	
Toluene	ug/L	<1.0	.15J		30	
trans-1,2-Dichloroethene	ug/L	<1.0	ND		30	
trans-1,3-Dichloropropene	ug/L	<4.0	ND		30	
Trichloroethene	ug/L	< 0.40	ND		30	
Trichlorofluoromethane	ug/L	<1.0	ND		30	
Vinyl chloride	ug/L	<1.0	ND		30	
Xylene (Total)	ug/L	<3.0	ND		30	
1,2-Dichloroethane-d4 (S)	%.	98	100	2		
4-Bromofluorobenzene (S)	%.	100	98	2		
Toluene-d8 (S)	%.	98	99	0		

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.



Project: PS BETA NIROP

Pace Project No.: 10322358

QC Batch: MT/20609 Analysis Method: SM 4500-S2-D

QC Batch Method: SM 4500-S2-D Analysis Description: 4500S2D Sulfide Water

Associated Lab Samples: 10322358001, 10322358002, 10322358003, 10322358004

METHOD BLANK: 2084368 Matrix: Water

Associated Lab Samples: 10322358001, 10322358002, 10322358003, 10322358004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Sulfide mg/L ND 0.10 09/21/15 15:50

LABORATORY CONTROL SAMPLE: 2084369

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Sulfide mg/L 1.0 98 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2084371 2084372

MS MSD

10322623002 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Sulfide ND 80-120 5 20 mg/L 1 1 0.90 0.94 87 91

SAMPLE DUPLICATE: 2084370

Date: 10/15/2015 10:20 AM

 Parameter
 Units
 Result Result Result RPD
 Max RPD
 Qualifiers

 Sulfide
 mg/L
 ND
 .01J
 20

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



Project: PS BETA NIROP

Pace Project No.: 10322358

QC Batch: WET/33115 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10322358001, 10322358002, 10322358003, 10322358004

METHOD BLANK: 1338387 Matrix: Water

Associated Lab Samples:

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Carbon Dioxide (SM4500CO2D) mg/L ND 5.0 09/22/15 10:32

SAMPLE DUPLICATE: 1338389

 Parameter
 Units
 Result Result Result
 RPD RPD
 Max RPD
 Qualifiers

 Carbon Dioxide (SM4500CO2D)
 mg/L
 31.6
 30.0
 5

SAMPLE DUPLICATE: 1338390

Date: 10/15/2015 10:20 AM

Parameter Units Sesult Result RPD RPD Qualifiers

Carbon Dioxide (SM4500CO2D) mg/L <5.0 ND

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.



### **QUALITY CONTROL DATA**

Matrix: Water

Project: PS BETA NIROP

2084191

Pace Project No.: 10322358

METHOD BLANK:

Date: 10/15/2015 10:20 AM

QC Batch: WET/44230 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10322358001, 10322358002, 10322358003, 10322358004

 Alkalinity, Total as CaCO3
 mg/L
 ND
 5.0
 09/21/15 09:11

 Alkalinity, Bicarbonate (CaCO3)
 mg/L
 ND
 5.0
 09/21/15 09:11

 Alkalinity, Carbonate (CaCO3)
 mg/L
 ND
 5.0
 09/21/15 09:11

LABORATORY CONTROL SAMPLE & LCSD: 2084192 2084193 Spike LCS LCSD LCS **LCSD** % Rec Max Conc. Parameter Units Result Result % Rec % Rec Limits **RPD RPD** Qualifiers Alkalinity, Total as CaCO3 40 43.1 40.8 108 102 90-110 5 30 mq/L

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2084196 2084197 MSD MS 10321567002 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual 357000 Alkalinity, Total as CaCO3 mg/L 40 40 394 396 93 98 80-120 30 ug/L

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2084310 2084311 MSD MS 10321999002 Spike MS MSD MS MSD Spike % Rec Max % Rec Parameter Units Result Conc. Conc. Result Result % Rec Limits RPD RPD Qual Alkalinity, Total as CaCO3 mg/L 40 40 82.1 85.1 97 104 80-120 4 30 43.4

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.



Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

QC Batch: WETA/24782 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10322358001, 10322358002, 10322358003, 10322358004

METHOD BLANK: 2084245 Matrix: Water
Associated Lab Samples: 10322358001, 10322358002, 10322358003, 103223580

10322358001, 10322358002, 10322358003, 10322358004 Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Sulfate mg/L ND 1.2 09/21/15 14:38

LABORATORY CONTROL SAMPLE: 2084246

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Sulfate mg/L 12.5 11.9 95 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2084247 2084248

MS MSD 10322326001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Sulfate 90-110 20 M1 mg/L 20.4 12.5 12.5 30.5 30.5 81 81 0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2084249 2084250

MS MSD 10322326002 Spike MS MSD MS Spike MSD % Rec Max % Rec % Rec RPD Parameter Units Result Conc. Conc. Result Result Limits RPD Qual Sulfate 151 62.5 62.5 197 197 74 74 90-110 0 20 M1 mg/L

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.



Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

QC Batch: WETA/24726 Analysis Method: EPA 353.2

QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved

Associated Lab Samples: 10322358001, 10322358002, 10322358003, 10322358004

METHOD BLANK: 2080328 Matrix: Water

Associated Lab Samples: 10322358001, 10322358002, 10322358003, 10322358004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Nitrogen, NO2 plus NO3 mg/L ND 0.020 09/23/15 10:01

LABORATORY CONTROL SAMPLE: 2080329

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Nitrogen, NO2 plus NO3 mg/L 0.98 98 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2080330 2080331

MS MSD 10322358001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual Nitrogen, NO2 plus NO3 ND 0.81 90-110 20 M1 mg/L 1 1 0.81 81 81 0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2080332 2080333

MS MSD 10322384003 MS MSD MS MSD Spike Spike % Rec Max Parameter Conc. % Rec RPD Units Result Conc. Result Result % Rec Limits RPD Qual Nitrogen, NO2 plus NO3 mg/L 14.9 20 20 34.2 34.4 96 98 90-110 20

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



### **QUALITY CONTROL DATA**

Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

QC Batch: WETA/24784 Analysis Method: SM 5220D
QC Batch Method: SM 5220D Analysis Description: 5220D COD

Associated Lab Samples: 10322358001, 10322358002, 10322358003, 10322358004

METHOD BLANK: 2084265 Matrix: Water
Associated Lab Samples: 10322358001, 10322358002, 10322358003, 103223580

10322358001, 10322358002, 10322358003, 10322358004 Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Chemical Oxygen Demand mg/L ND 50.0 09/21/15 13:23

LABORATORY CONTROL SAMPLE: 2084266

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chemical Oxygen Demand mg/L 300 295 98 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2084267 2084268

MS MSD 10322271001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual 1270 80-120 2 20 M1 Chemical Oxygen Demand mg/L 896 500 500 1250 74 71

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2084269 2084270

MS MSD 10321930001 Spike MS MSD MS Spike MSD % Rec Max Parameter RPD Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD Qual Chemical Oxygen Demand ND 250 250 272 256 100 93 80-120 6 20 mg/L

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.



### **QUALITY CONTROL DATA**

Project: PS BETA NIROP

Pace Project No.: 10322358

QC Batch: WETA/13828
QC Batch Method: SM 5310C

Analysis Method: SM 5310C
Analysis Description: 5310C TOC

Associated Lab Samples: 10322358001, 10322358002, 10322358003, 10322358004

METHOD BLANK: 249994 Matrix: Water

Associated Lab Samples:

Date: 10/15/2015 10:20 AM

ParameterUnitsBlank Reporting ResultReporting LimitAnalyzedQualifiersTotal Organic Carbonmg/LND1.009/24/15 01:46

LABORATORY CONTROL SAMPLE: 249995

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Total Organic Carbon mg/L 25 25.5 102 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 249996 249997

MS MSD 10322358001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual **Total Organic Carbon** 2.2 25 27.5 80-120 2 20 mg/L 25 26.8 101 98

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 249998 249999

MS MSD 10322626001 MS MSD MS MSD Spike Spike % Rec Max Parameter Conc. % Rec RPD Units Result Conc. Result Result % Rec Limits RPD Qual 25 Total Organic Carbon mg/L 0.46J 25 25.9 25.5 102 100 80-120 1 20

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



### **QUALIFIERS**

Project: PS BETA NIROP
Pace Project No.: 10322358

### **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.

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
PASI-MT	Pace Analytical Services - Montana
PASI-O	Pace Analytical Services - Ormond Beach
PASI-V	Pace Analytical Services - Virginia

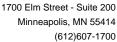
### **ANALYTE QUALIFIERS**

Date: 10/15/2015 10:20 AM

L0 Analyte recovery in the laboratory control sample (LCS) was outside QC limits.

L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results may be biased low.

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





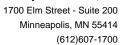
### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

₋ab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
0322358001	PMW-04	RSK 175	AIR/24188	•	
0322358002	PMW-03	RSK 175	AIR/24188		
0322358003	PMW-02	RSK 175	AIR/24188		
0322358004	PMW-01	RSK 175	AIR/24188		
0322358001	PMW-04	EPA 3010	MPRP/57887	EPA 6010C	ICP/25328
0322358002	PMW-03	EPA 3010	MPRP/57887		ICP/25328
0322358003	PMW-02	EPA 3010	MPRP/57887		ICP/25328
0322358004	PMW-01	EPA 3010	MPRP/57887		ICP/25328
0322358001	PMW-04	EPA 3010	MPRP/57978	6010C Met	ICP/25343
0322358002	PMW-03	EPA 3010	MPRP/57978		ICP/25343
0322358003	PMW-02	EPA 3010	MPRP/57978		ICP/25343
0322358004	PMW-01	EPA 3010	MPRP/57978		ICP/25343
0322358001	PMW-04	EPA 8260B	MSV/33204		
0322358002	PMW-03	EPA 8260B	MSV/33204		
0322358003	PMW-02	EPA 8260B	MSV/33205		
0322358004	PMW-01	EPA 8260B	MSV/33204		
0322358005	Trip Blank	EPA 8260B	MSV/33204		
0322358001	PMW-04	SM 4500-S2-D	MT/20609		
0322358002	PMW-03	SM 4500-S2-D	MT/20609		
0322358003	PMW-02	SM 4500-S2-D	MT/20609		
0322358004	PMW-01	SM 4500-S2-D	MT/20609		
0322358001	PMW-04	SM 2320B	WET/33115		
0322358001	PMW-04	SM 2320B	WET/44230		
0322358002	PMW-03	SM 2320B	WET/33115		
0322358002	PMW-03	SM 2320B	WET/44230		
0322358003	PMW-02	SM 2320B	WET/33115		
0322358003	PMW-02	SM 2320B	WET/44230		
0322358004	PMW-01	SM 2320B	WET/33115		
0322358004	PMW-01	SM 2320B	WET/44230		
0322358001	PMW-04	EPA 300.0	WETA/24782		
0322358002	PMW-03	EPA 300.0	WETA/24782		
0322358003	PMW-02	EPA 300.0	WETA/24782		
0322358004	PMW-01	EPA 300.0	WETA/24782		
0322358001	PMW-04	EPA 353.2	WETA/24726		
0322358002	PMW-03	EPA 353.2	WETA/24726		
0322358003	PMW-02	EPA 353.2	WETA/24726		
0322358004	PMW-01	EPA 353.2	WETA/24726		
0322358001	PMW-04	SM 5220D	WETA/24784	SM 5220D	WETA/247
0322358002	PMW-03	SM 5220D	WETA/24784		WETA/247
0322358003	PMW-02	SM 5220D	WETA/24784		WETA/247





### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: PS BETA NIROP

Pace Project No.: 10322358

Date: 10/15/2015 10:20 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10322358004	PMW-01	SM 5220D	WETA/24784	SM 5220D	WETA/24789
10322358001	PMW-04	SM 5310C	WETA/13828		
10322358002	PMW-03	SM 5310C	WETA/13828		
10322358003	PMW-02	SM 5310C	WETA/13828		
10322358004	PMW-01	SM 5310C	WETA/13828		

# CHAIN-OF-CUSTODY / Analytical Request Document

6352358

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

Pace Project No./ Lab I.D. DRINKING WATER 507  $\beta$ 3 ā 0) SAMPLE CONDITIONS a OTHER (0 (0 (0) ğ GROUND WATER Residual Chlorine (Y/N) 0 SWATTOM SHAME BLANTE N <u>6</u>83 Page: REGULATORY AGENCY ACBOAL COLD IN WATER RCRA 7  $\overline{\infty}$ 9 <u>S</u> 12021 Requested Analysis Filtered (Y/N) TIME DIAL DECANIC (ACEDA HOLDE IN MATER  $\overline{\mathcal{N}}$  $\overline{\wedge}$ 19/10/15 STATE Site Location NPDES DATE UST N  $\wedge$ COUNTIE FATTY ALLOS Ç X 25 ACCEPTED BY / AFFILIATION  $\overline{\wedge}$ HEWITOT OXINGEN DEUMO N Son Red PLINLWITY, CLOO3 IN WARE Attention: BAHAR NADSE JaeT siaylsnA J N/A Office 2MC Company Name Recently ALTE DE Methanol 21466 Preservatives Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> NaOH 328 HCI Invoice Information: Address: 1011 75 EONH <sup>₽</sup>OS<sup>Z</sup>H Section C ace Profile # 122 Reference: Pace Project 0 ace Quote Unpreserved Q TIME 0 Q Manager: 83 33 23 23 # OF CONTAINERS SAMPLE TEMP AT COLLECTION DATE TIME Ð COMPOSITE END/GRAB DATE COLLECTED 100111 9 Petan RELINGUISHED BY / AFFILIATION 1545 とき 1135 TIME 91619 125 文形 COMPOSITE START 1615 PS-BETA BETA 2 2 6 91515 DATE Report To: Me CLA YA Section B Required Project Information: Project Number: (G=GRAB C=COMP) **34YT 319MAS** urchase Order No.: Project Name: (see valid codes to left) MATRIX CODE Copy To: Matrix Codes
MATRIX / CODE Drinking Water Water Waste Water Poulct Soil/Solid Oil Wipe Air Tissue Other 99-36-800 F34-56-80h AN CLONENTE CH 92673 "AHAMO RECEDESIS. COM Sombled 50.00 ADDITIONAL COMMENTS (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE Pace Analytical www.pacelabs.com 0 Company: REGENIESIS SAMPLE ID Address: (DII CALLE Section A Required Client Information: Required Client Information Requested Due Date/TAT: OMW - 0 PAUN P PALW-03 333 Section D # MaTi 6 10 11 12 ĸ œ σ

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.

(N/A)

Samples Intact

(N/Y) sealed Cooler Custody

Received on Ice (Y/N)

J° ni qmeT

DATE Signed 9/6

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MEUS

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER;

SAMPLER NAME AND SIGNATURE

ORIGINAL

₱age 46 of 78

F-ALL-Q-020rev.07, 15-May-2007

## CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

	:												
Section A Required Client Information:	Section B Required P	Section is Required Project Information:			section c Invoice Information:	nation:					١		
Company: RECENESIS	Report To:	MEUNDA	PARK		Attention: BAHAR	HAR NADER	78		(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)			7965	538
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Jue Date/TAT:	Project Number:	PS S			Pace Profile #:				STATE:	3			
9								uested An	Requested Analysis Filtered (Y/N)	ed (Y/N)			
Section D Required Client Information	Matrix Codes		COLLECTED	2.0 2 2 2 3 4 4		Preservatives	¶N¼						
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'8			SIGNALURE	KE OF SAMPLER:	Z	7	(NABA)T	יאאיני	2			96	88

## Pace Analytical\*

Project Manager Review:/

hold, incorrect preservative, out of temp, incorrect containers).

### Document Name:

### Sample Condition Upon Receipt Form

Document No.:

F-MN-L-213-rev.13

Document Revised: 23Feb2015

Page 1 of 1

Issuing Authority:
Pace Minnesota Quality Office

Sample Condition **Client Name:** Project #: WO#: 10322358 **Upon Receipt** Courier: **USPS** □UPS Client Commercial SpeeDee Other: **Tracking Number:** Optional: Proj. Due Date: Proj. Name: No Custody Seal on Cooler/Box Present? Seals Intact? No Bubble Bags Packing Material: Bubble Wrap None Other: Temp Blank? No Thermometer B88A9130516413 B88A912167504 Blue Type of Ice: Wet None Samples on ice, cooling process has begun Used: Cooler Temp Read (°C): 1,4 2.2 Cooler Temp Corrected (°C): Biological Tissue Frozen? No Temp should be above freezing to 6°C Correction Factor: - O. Z Date and Initials of Person Examining Contents: USDA Regulated Soil ( N/A, water sample) Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, ID, LA. Did samples originate from a foreign source (internationally, MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)? Yes ΠNo 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? □N/A 1. No Chain of Custody Filled Out? 2. □N/A Chain of Custody Relinquished? □N/A Sampler Name and/or Signature on COC? □N/A Samples Arrived within Hold Time? □N/A Пио Short Hold Time Analysis (<72 hr)? □N/A **Rush Turn Around Time Requested?** 7. □N/A Sufficient Volume? No □N/A Yes ПNо □N/A Correct Containers Used? -Pace Containers Used? □No □N/A Containers Intact? □No □N/A 10. Filtered Volume Received for Dissolved Tests? □ No □N/A 11. Note if sediment is visible in the dissolved container Sample Labels Match COC? Yes □No □N/A 12. -Includes Date/Time/ID/Analysis Matrix: All containers needing acid/base preservation have been Пнсі Yes checked? □No □N/A Sample # OL All containers needing preservation are found to be in compliance with EPA recommendation? (HNO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub>, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) Yes □N/A Exceptions: VOA, Coliform, TOC, Oil and Grease, Initial when Lot # of added 115070 □Ng DRO/8015 (water) DOC □N/A completed: preservative: □N/A Headspace in VOA Vials (>6mm)? 14. Trip Blank Present? □No □N/A 15. Trip Blank Custody Seals Present? □No □N/A Pace Trip Blank Lot # (if purchased): 9 **CLIENT NOTIFICATION/RESOLUTION** Field Data Required? Yes No Person Contacted: Date/Time: BP3S for too analysis, Confirmed Comments/Resolution: Received with client WITH analysis. Jun 9/17/15

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

Date:

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Project Mana	ager Review:	/ LiQX	16	<u> </u>		Date:	21/2015	<b>.</b>	
	~	Lank				1	ı		

CLIENT: PACE MPLS

Due Date: 09/25/15

Page 50 of 78

	2	1	Transfers		<b>σ</b> 1	4 PMW-01	3 PMW-02	2 PMW-03	1 PMW-04	200 Sample 10	Jennifer Anderson Pace Analytical Services 1700 Elm Street, Suite 2 Minneapolis, MN 55414 Phone (612)607-1700 Fax (612)607-6444	Reportuosin	Workorder
	2	2007	Released By			H	2	B	*		Jennifer Anderson Pace Analytical Services, Inc. 1700 Elm Street, Suite 200 Minneapolis, MN 55414 Phone (612)607-1700 Fax (612)607-6444		Workorder: 10322358
						PS	PS	PS	PS				Workorder N
	41 CMG 224	14501 SILTIP	Date/Time			9/16/2015 14:25	9/16/2015 11:35	9/15/2015 15:45	9/15/2015 14:25		Pace 315 ( Virging Phores)		Workorder Name:PS BETA NIROP
-	224	12 Kg	Received By			10322358004	10322358003	10322358002	10322358001		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042	<b>基础间据增加</b>	A NIROP
	(	7	Ву			Water 1	Water 1	Water :	Water	H2SO4	inia MN t 42		
									1	50 60			Owi
		410915	Date/Time			<u>ب</u>	~	·	 	100			Owner Receive
-	<b>!</b>	520			<u>^</u>	X	<u>X</u>	X	X	100			ived Date:
												Requested	9/16/2015
<u> </u> 				III Comin			-					Danatysis!!	Results R
				ents:									Results Requested By:
<b>)</b>				是是一个人,但是是一个人,但是是一个人,他们也是一个人,他们就是一个人,他们就是一个人,他们也是一个人,他们也是一个人,他们也是一个人,他们也是一个人,他们也是						LAB USE ONLY		HARDEN REQUESTED A TO A SECURITION OF THE PROPERTY OF THE PROP	1 10/12/07/2015 /3/11/6/15
1_													

<sup>\*\*\*</sup>In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

## Pace Analytical\*

FECAL WAIVER ON FILE Y

## Document Name:

## Sample Condition Upon Receipt Form

Document No.: F-VM-C-001-Rev.09

Document Revised: 23Feb2015 Page 1 of 1

Issuing Authority:

Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt  Courier: Fed Ex UPS	✓ □usps		Project #	WO#:1253758
Commercial Pace  Tracking Number:	Other:_			1253758
Custody Seal on Cooler/Box Present?	lo	Seals in	tact?	Yes No Optional: Proj. Due Date: Proj. Namp:
Packing Material: Bubble Wrap Bubble Bag	s 🔲 No	one [	Other:	Temp Blank? Yes No
Thermométer Used: 140792808	Type of I	ce: 🔃	Wet [	Blue None Samples on ice, cooling process has begun
Cooler Temp Read °C: Cooler Temp Co Temp should be above freezing to 6°C Correction Factor				Biological Tissue Frozen? Yes No NA Initials of Person Examining Contents: Y/C/C/C/C
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 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.
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.
Filtered Volume Received for Dissolved Tests?	□Yes	□No	N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	Yes	□No	□n/a	12.
-Includes Date/Time/ID/Analysis Matrix:			<del></del>	
All containers needing acid/base preservation will be checked and documented in the pH logbook.	Yes	□No	□N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	Yes	□No	□N/A	13.
Headspace in VOA Vials ( >6mm)?	□Yes	□No	□n/a	14.
Trip Blank Present?	∐Yeş	□No	□n/a	15. 4
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:				
			<del></del>	
		<del></del>		
			<del></del>	

Project Manager Review:

Date: 900 D

TEMPERATURE WAIVER ON FILE

# Chain of Custody

MO#: 35208148

eace Analytical ®

10/1/2015水湖町 9/2/5 LAB USE ONLY Results Requested By: Comments Requested Analysis 9/16/2015 Owner Received Date: PIXOR X X Date/Time Preserved Containers HCF Pace Analytical Ormond Beach Matrix Water Water Water Water Ormond Beach, FL 32174 Received By Phone (386)672-5668 8 East Tower Circle 10322358001 10322358002 10322358003 10322358004 Workorder Name: PS BETA NIROP Lab ID Subcontract To altilis was 9/15/2015 15:45 9/16/2015 11:35 9/15/2015 14:25 9/16/2015 14:25 Date/Time Date/Time Collect Sample Туре PS PS PS Pace Analytical Services, Inc. 1700 Elm Street, Suite 200 Workorder: 10322358 Minneapolis, MN 55414 Phone (612)607-1700 Fax (612)607-6444 Released By Jennifer Anderson Sample ID PMW-03 PMW-01 **PMW-04 PMW-02 Transfers** Item

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Custody Seal Y or (N

ပွ

Cooler Temperature on Receipt

Z 9

Samples Intact (Y

Z

Received on Ice( Y )or

- Bank



### Document Name: Sample Condition Upon Receipt Form Document No.: F-FL-C-007 rev. 06

Document Revised: August 11, 2014 Issuing Authority: Pace-Florida-Quality-Office

Sample Condition Upon Recei	pt Form (SCUR) Table Number:
Client Name: TAC	Minnespons # 35208148
Courier: Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial	I ☐ Page ☐ Other
Tracking # 10484 8091 (0230)	Pace U Other
Custody Seal on Cooler/Box Present:  yes no Seal	s intact:  yes  no Date and Initials of person examining
Packing Material: Dubble Wrap Bubble Bags None	- pyrodrozalimity
Thermometer Used Type of Ice: Wei	Other
Cooler Temperature°C 4,1 (Visual) (Correction	(Temp should be above freezing to 6°C). If below 0°C, then was sample frozen?
Receipt of samples satisfactory:	□Yes □No Rush TAT requested on COC:
If yes, then all conditions below were met:	If no, then mark box & describe issue (use comments area if necessary):
Chain of Custody Present	The cessary):
Chain of Custody Filled Out	
Relinquished Signature & Sampler Name COC Samples Arrived within Hold Time	
Camples Arrived Within Hold Time	
Sufficient Volume	
Correct Containers Used	
Containers Intact	
Sample Labels match COC (sample IDs & date/time of collection)	
	No Labels: No Time/Date on Labels:
All containers needing preservation are found to be in compliance with EPA recommendation.	
No Headspace in VOA Vials ( >6mm):	
Client Notification/ Resolution:	
Person Contacted:Date/	Time:
Comments/ Resolution (use back for additional comments):	
Project Manager Review:	Date: 0
	Date. / /
Finished Product In	formation Only
	ionnation only
F.P. Sample ID:	Size & Qty of Bottles Received
Production Code:	x 5 Gal x 2.5 Gal
Date/Time Opened:	x 1 Gal
	x 1 Liter x 500 mL
Number of Unopened Bottles Remaining:	x 250 mL
Extra Sample in Shed: Yes No	x Other:



September 30, 2015

Jennifer Anderson

Pace Analytical Energy Services, LLC 220 William Pitt Way

Pittsburgh, PA 15238

Phone: (412) 826-5245 Fax: (412) 826-3433

Pace Analytical Services, Inc. 1700 Elm Street Suite 200 Minneapolis, MN 55414

RE: PS BETA NIROP / 10322358

Pace Workorder:

16727

Dear Jennifer Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on Tuesday, September 22, 2015. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

icas is a

Ruth Welsh

09/30/2015

Customer Service Representative

**Enclosures** 

As a valued client we would appreciate your comments on our service.

Please email info@microseeps.com.

Total Number of Pages

Page 1 of 11

Report ID: 16727 - 708946





Phone: (412) 826-5245 Fax: (412) 826-3433

## LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor: Pennsylvania Department of Environmental Protection, Bureau of Laboratories

Accreditation ID: 02-00538

Scope: NELAP Non-Potable Water and Solid & Hazardous Waste

Accreditor: South Carolina Department of Health and Environmental Control, Office of Environmental

Laboratory Certification

Accreditation ID: 89009003

Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA) Scope:

Accreditor: NELAP: New Jersey, Department of Environmental Protection

Accreditation ID: PA026

Scope: Non-Potable Water, Solid and Chemical Materials

NELAP: New York, Department of Health Wadsworth Center Accreditor:

Accreditation ID: 11815

Scope: Non-Potable Water; Solid and Hazardous Waste

State of Connecticut, Department of Public Health, Division of Environmental Health Accreditor:

Accreditation ID: PH-0263

Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA) Scope:

Accreditor: NELAP: Texas, Commission on Environmental Quality

Accreditation ID: T104704453-09-TX

Scope: Non-Potable Water

Accreditor: State of New Hampshire

Accreditation ID: 299409

Scope: Non-potable water

Accreditor: State of Georgia Accreditation ID: Chapter 391-3-26

Scope: As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is

accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

Report ID: 16727 - 708946





Pace Analytical Energy Services, LLC 220 William Pitt Way

Pittsburgh, PA 15238

Phone: (412) 826-5245 Fax: (412) 826-3433

## **SAMPLE SUMMARY**

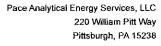
Workorder: 16727 PS BETA NIROP / 10322358

Lab ID	Sample ID	Matrix	Date Collected	Date Received
167270001	PMW-04	Water	9/15/2015 14:25	9/22/2015 12:00
167270002	PMW-03	Water	9/15/2015 15:45	9/22/2015 12:00
167270003	PMW-02	Water	9/16/2015 11:35	9/22/2015 12:00
167270004	PMW-01	Water	9/16/2015 14:25	9/22/2015 12:00

Report ID: 16727 - 708946



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## **ANALYTICAL RESULTS**

Workorder: 16727 PS BETA NIROP / 10322358

Lab ID:

167270001

Date Received: 9/22/2015 12:00

Matrix:

Water

Sample ID:

PMW-04

Date Collected: 9/15/2015 14:25

Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR	Analyd	ical Method: AM	121G			
	Analyt					
Acetic Acid	1.1 <b>J</b> mg/l	5.0	0.89 1	9/29/2015 21:54	BW	n
Propionic Acid	5.0 U mg/l	5.0	0.73 1	9/29/2015 21:54	BW	n
ropionior tota						
Pyruvic Acid	5.0 U mg/l	5.0	0.41 1	9/29/2015 21:54	BW	n
•	5.0 U mg/l 5.0 U mg/l	5.0 5.0	0.41 1 1.4 1	9/29/2015 21:54 9/29/2015 21:54	BW BW	n . n

Report ID: 16727 - 708946



Page 4 of 11



nicroseeps -

Pace Analytical Energy Services, LLC 220 William Pitt Way Pittsburgh, PA 15238

> Phone: (412) 826-5245 Fax: (412) 826-3433

## **ANALYTICAL RESULTS**

Workorder: 16727 PS BETA NIROP / 10322358

Lab ID:

167270002

Date Received: 9/22/2015 12:00

45 49:00 Mate

Matrix:

Water

Sample ID:

PMW-03

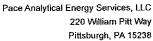
Date Collected: 9/15/2015 15:45

Parameters	Results Units	PQL	MDL [	DF	Analyzed	By	Qualifiers
EDonors - MICR							
Analysis Desc. AM21G	Analyt	ical Method: AN	121G	: .			
Acetic Acid	4.6J mg/l	5.0	0.89		9/29/2015 00:17	BW	n
Propionic Acid	5.0 U mg/l	5.0	0.73	1	9/29/2015 00:17	BW	n
Pyruvic Acid	5.0 U mg/l	5.0	0.41 1	1	9/29/2015 00:17	BW	n
Butyric Acid	5.0 U mg/l	5.0	1.4	1	9/29/2015 00:17	BW	n
Lactic Acid	10 U mg/l	10	2.4	1	9/29/2015 00:17	BW	n

Report ID: 16727 - 708946

nelac.

Page 5 of 11



Phone: (412) 826-5245



Fax: (412) 826-3433

## **ANALYTICAL RESULTS**

Workorder: 16727 PS BETA NIROP / 10322358

Lab ID:

167270003

Date Received: 9/22/2015 12:00

Matrix:

Water

Sample ID:

PMW-02

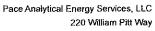
Date Collected: 9/16/2015 11:35

Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR Analysis Desc: AM21G	Analyt					
Acetic Acid	1.7J mg/l	5.0	0.89 1	9/29/2015 00:40	BW	n
Propionic Acid	5.0 U mg/l	5.0	0.73 1	9/29/2015 00:40	BW	n
Pyruvic Acid	5.0 U mg/l	5.0	0.41 1	9/29/2015 00:40	BW	n
Butyric Acid	5.0 U mg/l	5.0	1.4 1	9/29/2015 00:40	BW	n
Lactic Acid	10 U mg/l	10	2.4 1	9/29/2015 00:40	BW	n

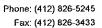
Report ID: 16727 - 708946



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Pittsburgh, PA 15238





## **ANALYTICAL RESULTS**

Workorder: 16727 PS BETA NIROP / 10322358

Lab ID:

167270004

Date Received: 9/22/2015 12:00

Matrix:

Water

Sample ID:

PMW-01

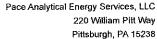
Date Collected: 9/16/2015 14:25

Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR						
Analysis Desc: AM21G	Analyti	ical Method: AN	121G			
Acetic Acid	5.0 U mg/l	5.0	0.89 1	9/29/2015 01:04	BW	n
Propionic Acid	5.0 U mg/l	5.0	0.73 1	9/29/2015 01:04	BW	n
Pyruvic Acid	5.0 U mg/l	5.0	0.41 1	9/29/2015 01:04	BW	n
Butyric Acid	5.0 U mg/l	5.0	1.4 1	9/29/2015 01:04	BW	n
Lactic Acid	10 U mg/l	10	2.4 1	9/29/2015 01:04	BW	n

Report ID: 16727 - 708946



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Phone: (412) 826-5245



Fax: (412) 826-3433

### **ANALYTICAL RESULTS QUALIFIERS**

Workorder: 16727 PS BETA NIROP / 10322358

### **DEFINITIONS/QUALIFIERS**

Disclaimer: The Pennsylvania Department of Environmental Protection (PADEP) has decided to no longer recognize analyses that do not

produce data for primary compliance, for NELAP accreditation. The methods affected by this decision are AM20GAx, AM21G, SW846 7199 and AM4.02. The laboratory shall continue to administer the NELAP/TNI standard requirements in the performance

of these methods.

MDL Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.

PQL Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.

ND Not detected at or above reporting limit.

DF Dilution Factor.

S Surrogate.

RPD Relative Percent Difference.

% Rec Percent Recovery.

U Indicates the compound was analyzed for, but not detected at or above the noted concentration.

J Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

n The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

nelac:

Report ID: 16727 - 708946

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## **QUALITY CONTROL DATA**

Workorder: 16727 PS BETA NIROP / 10322358

QC Batch:

EDON/2645

Analysis Method:

AM21G

QC Batch Method:

AM21G

Associated Lab Samples:

167270001, 167270002, 167270003, 167270004

	<b>METH</b>	od bl	ANK:	37261
--	-------------	-------	------	-------

Parameter	Units	Blank Result	Reporting Limit Qualifiers	
Faranielei	Omes	T(Count	Earth Qualificity	
EDonors				
Acetic Acid	mg/l	5.0 U	5.0 n	
Propionic Acid	mg/l	5.0 U	5.0 n	
Pyruvic Acid	mg/l	5.0 U	5.0 n	
Butyric Acid	mg/l	5.0 U	5.0 n	
Lactic Acid	mg/l	10 U	10 n	

### LABORATORY CONTROL SAMPLE: 37262

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EDonors						
Acetic Acid	mg/l	100	95	95	70-130	n
Propionic Acid	mg/l	100	94	94	70-130	n
Pyruvic Acid	mg/l	100	83	83	70-130	n
Butyric Acid	mg/l	100	94	94	70-130	n
Lactic Acid	mg/l	100	90	90	70-130	n

MATRIX SPIKE & MAT	TRIX SPIKE DUPLI	CATE: 37263		37264		Original:	16727000	)1			
Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
EDonors	<del></del>										
Acetic Acid	mg/l	1.1	100	120	110	123	111	70-130	10	20	n
Propionic Acid	mg/l	0	100	120	110	117	107	70-130	8.9	20	n
Pyruvic Acid	mg/l	0	100	92	83	92	83	70-130	10	20	n
Butyric Acid	mg/l	0	100	120	110	118	107	70-130	9.8	20	п
Lactic Acid	mg/l	0	100	99	92	99	92	70-130	7.3	20	n

Report ID: 16727 - 708946

Page 9 of 11





Pace Analytical Energy Services, Lt.C 220 William Pitt Way Pittsburgh, PA 15238

Phone: (412) 826-5245

Fax: (412) 826-3433

## **QUALITY CONTROL DATA QUALIFIERS**

Workorder: 16727 PS BETA NIROP / 10322358

## QUALITY CONTROL PARAMETER QUALIFIERS

n The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

Report ID: 16727 - 708946



Page 10 of 11



Phone: (412) 826-5245 Fax; (412) 826-3433



Workorder: 16727 PS BETA NIROP / 10322358

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
167270001	PMW-04			AM21G	EDON/2645
167270002	PMW-03			AM21G	EDON/2645
167270003	PMW-02			AM21G	EDON/2645
167270004	PMW-01			AM21G	EDON/2645

Report ID: 16727 - 708946



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16727

PS BETA NIROP Workorder Name:

Workorder: 10322358

9/24/2015 Results Requested

Pace Analytical" www.pecelebs.com

	Microseps P.O. 10322355 4
Report / Invoice To	Jennifer Anderson Pace Analytical Minnesota

Suite 200 Minneapolis, MN 55414 Phone (612)607-1700 Email: jennifer.anderson@pacelabs.com Jennifer Anderson Pace Analytical Mi 1700 Elm Street

_						1			
					Preserved Containers	mainers 十			
Ifem	Sample,ID:	Collect Date/Time	Lab ID	Matrix	рыльзылигу	€  ₽/\ 			LAB USE OF
-	PMW-04	9/15/2015 14:25	10322358001	Water	2	×			
2	PMW-03	9/15/2015 15:45	10322358002	Water	6	×			
ო	PMW-02	9/16/2015 11:35	10322358003	Water	, v.	×			
4	PMW-01	9/16/2015 14:25	10322358004	Water	6	×			
က									
								Comments	
Transfers	fers Rejeased By	Date/Time	me Received By	d By		Date/Time			
-	Me Paci	P1/21/15 (	15 080d V C	0	かかか	9,2213	9.22 (6 12 0)		
5	)			)			)		
ы									
Cool	Cooler Temperature on Receipt $ec{\mathcal{I}}\cdot \overline{\mathbb{X}}$ °C		Custody Seal / Y	Y or N	Rec	Received on loe	Y or N	Samples Intact Y or	V or

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Client	Name: <u>Pa ca - MN</u> Project: 10322	236	58	Lab W	ork Order: 16727
Â.	Shipping/Container Information (circle appropriate response)				
	Courier: FedEx UPS USPS Client Other:	Air	bill Pı	esent(	Yes) No
,	Tracking Number: 648986916979				•
	Custody Seal on Cooler/Box Present: Yes No Seals I	intact:	Yesi	No	
	Cooler/Box.Packing Material: Bybble Wrap Absorbent F	mso	Other	:	<u> </u>
	Type of Ice: Wet Blue None Ice Intact: Yes Meli	/			
•	Cooler Temperature: 3.8% Radiation Screened: Yes	(No	Cha	ain of t	Custody Present: Yels No
	Comments:	<u></u> .			
В.	Laboratory Assignment/Log-in (check appropriate response)		-		
[ ]		YES	NO	N/A	Comment Reference non-Conformance
	Chain of Custody properly filled out		<u> </u>		
	Chain of Custody relinquished			_	
	Sampler Name & Signature on COC	ļ	<u></u>	<u> </u>	
	Containers intact	V			
İ	Were samples in separate bags				
	Sample container labels match COC Sample name/date and time collected				
	Sufficient volume provided	V			
}	PAES containers used	<del>  -</del>	V		
	Are containers properly preserved for the requested testing? (as labeled)				
	If an unknown preservation state, were containers checked?  Exception: VOA's coliform			0	If yes, see pH form.
	Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			<u>ن</u>	
l	Comments:	<u> </u>			
	a Large transfer our mined fro	ceived	by ·		U Date: 9.22.15
	Cooler contents examined/re	FEIAER	₽,		y Date: 9-22:15  Date: 9-22-15
	Project Manage	er Revi	ew :		M nage: 1-09-17-



October 8, 2015

Pace Analytical Energy Services, LLC 220 William Pitt Way Pittsburgh, PA 15238

> Phone: (412) 826-5245 Fax: (412) 826-3433

Jennifer Anderson Pace Analytical Services, Inc. 1700 Elm Street Suite 200 Minneapolis, MN 55414

RE: PS BETA NIROP / 10322358

Pace Workorder:

16738

Dear Jennifer Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on Wednesday, September 23, 2015.

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

Sincerely,

Ruth Welds

Ruth Welsh

10/08/2015

Customer Service Representative

**Enclosures** 

Report ID: 16738 - 712720

As a valued client we would appreciate your comments on our service.

Please email info@microseeps.com.

Total Number of Pages K

Page 1 of 4

Pace Analytical\*

Client

Pace MN

1700 Elm Street, Suite 200

Minneapolis, MN 55414

Project

PS Beta Nirop 10322358

Project # Report to

Jennifer Anderson

Tel:

612.607.1700

Email:

jennifer.anderson @ pacelabs.com

Pace Analytical CSIA Center

220 William Pitt Way Pittsburgh, PA 15238

Tel: 412.826.5245

Report by: Dr. Yi Wang

Director, CSIA Center of Excellence

Cell: 609.721.2843

Email: yi.wang@zymaxusa.com

## REPORT OF ENVIRONMENTAL FORENSICS ISOTOPE ANALYSES

Date Received: 9/23/2015

Date Reported: 10/8/2015

Water sample submitted for  $\delta^{13}$ C (% VPDB) stable carbon isotope forensics of chlorinated solvents

Pace CSIA	Client's Sample ID	$\delta^{13}C$	$\delta^{13}C$	$\delta^{13}C$	$\delta^{13}C$	$\delta^{13}C$	$\delta^{13}C$
Lab ID	Description	TCE	cDCE	tDCE	11DCE	11DCA	VC
16738-1	PMW-04	5.56	-13.30	-17.99	υ <sub>-</sub>	u _	U_
16738-2	PMW-03	-21.82	-28.09	-28.07	υ_	u _	-29.94
16738-3	PMW-02	-0.63	-26.20	-35.25	-16.80	-27.41	-29.05
16738-4	PMW-01	-6.24	-29.87	-33.97	<sup>J</sup> -13.89	-26.26	-31.62

cDCE & tDCE: cis & trans-1,2-dichloroethene

TCE: trichloroethene

11DCA: 1,1-dichloroethane

11DCE: 1,1-dichloroethene

VC: vinyl chloride

Method: Compound Specific Isotope Analysis for <sup>13</sup>C and <sup>2</sup>H by GC-IRMS, for <sup>37</sup>CI by GC-qMS

	δ <sup>13</sup> C	$\delta^{13}C$	$\delta^{13}C$	δ <sup>13</sup> C	δ <sup>13</sup> C	δ <sup>13</sup> C
Quality Control STDs	TCE	cDCE	tDCE	11DCE	11DCA	VC
QC-1	-25.15	-9.99	-20.51	-28.59	-32.00	-28.05
QC-2	-25.15	-9.89	-20.50	-28.33	-32.40	-28.14
Mean	-25.15	-9.94	-20.51	-28.46	-32.20	-28.10
Analytical precision (1o)	0.00	0.07	0.01	0.18	0.28	0.06

## Pace CSIA Forensic Isotope Services

Product or Dissolved Organics: Chlorinated Solvents, Oil, Extract, Fraction and Kerogen

3D-CSIA of <sup>13</sup>C, <sup>37</sup>Cl, and <sup>2</sup>H for PCE, TCE, DCE, MTBE, BTEX, 1,4-Dioxane, Alkanes, Gasoline and Oil; Bulk <sup>13</sup>C, <sup>2</sup>H, <sup>18</sup>O, <sup>34</sup>S, and <sup>15</sup>N Gas Sample

Gas Composition and 2D-CSIA of <sup>13</sup>C and <sup>2</sup>H of C1 to C5; <sup>13</sup>C of CO<sub>2</sub>; <sup>14</sup>C of C1 and CO<sub>2</sub>; <sup>34</sup>S of H<sub>2</sub>S; <sup>15</sup>N and <sup>18</sup>O of N<sub>2</sub>O gas Water and Dissolved Inorganics

<sup>2</sup>H, <sup>3</sup>H and <sup>18</sup>O; <sup>34</sup>S and <sup>18</sup>O of dissolved sulfate; <sup>34</sup>S of dissolved H<sub>2</sub>S

 $^{15}$ N and  $^{18}$ O of dissolved Nitrate;  $^{15}$ N of Ammonia;  $^{13}$ C of dissolved CO $_2$  and Carbonate/Bicarbonate Soil and Minerals

<sup>13</sup>C, <sup>18</sup>O, <sup>15</sup>N, <sup>34</sup>S, D/H; <sup>14</sup>C of carbonate or organics

Post-Analysis Forensic Isotope Data Interpretation

J-Target analyte produced a low peak signal and the result is considered usable to ± 2‰, but not the standard ± 0.5‰

U-Either there was no peak corresponding to the target analyte or that such a peak did not produce a reliable CSIA result

# CSIA Report Carbon

16738
PACE-MN
Client Project Name:
Client Project #: 10

PS Beta Nirop

		3	Concentration	Ľ.			CSI	CSIA (Carbon)	(1	
_	vinyi cilionide		(I/gn)		Ą	Area	Significant acitude of	Applicate	<b>0</b> ‡0∪	Delte (9/.)
	Client ID	Sample	PQL	Date	Sample PQL	Pal	-CO-GIULIOI	Allalysis	רמות	Della ( 100)
167380001 PM	PMW-04	<0.4 (U)	9.0	9/19/15	< 1 (U)	-	Š	3903	10/6/15	1
167380002 PM	PMW-03	1	0.4	9/19/15	2.60		No	3910	10/6/15	-29.94
167380003 PM	PMW-02	3	-	9/21/15	4.92	_	<sub>S</sub>	3908	10/6/15	-29.05
167380004 PM	PMW-01	<b>-</b>	0.4	9/19/15	2.30	_	No	3909	10/6/15	-31.62
Duplicate PM	PMW-04	QN	0.4	9/19/15	< 1 (U)	_	No.	3904	10/6/15	
Blank -		0	,	ı	(U)	-	ŝ	3895	10/6/15	•
- or SOT		10	ŀ	,	19.0	-	No	3899	10/6/15	-28.05
LCS_Hi		20	1	E	20.3	<del></del>	οN	3900	10/6/15	-28.14
LCS acceptance range	9							-28.90	<=>	-27.90

AM-24-DL_C	%, VPDB	CJS
AM-24-AR_C	\ s\	CJS
8260B	l/gu	PACE-MN
Method	Units	Analyst

# CSIA Report Carbon

16738
PACE-MN
Client Project Name:
Client Project #: 10

10322358

PS Beta Nirop

7	Dioblogothono	Cor	Concentration	nc			'ISO	CSIA (Carbon)	(1	
<u>.</u>	i, i-Dicilioloculene		(l/gn)		Ar	Area	Applying Applying	Anolypoic	0+01	Delta (%)
Lab ID	Client ID	Sample	PQL	Date	Sample	PQL	CO-ciuioii	Alalysis	רמופ	Della ( 700)
167380001	PMW-04	<1 (U)	l	9/19/15	<2 (N)	9	N <sub>o</sub>	3903	10/6/15	1
167380002	PMW-03	(N) L>	ļ	9/19/15	< 5 (U)	2	No	3910	10/6/15	•
167380003	PMW-02	17	Ļ	9/21/15	16.4	S	oN N	3908	10/6/15	-16.80
167380004	PMW-01	2	ļ	9/19/15	4 (J)	2	No	3909	10/6/15	-13.89
Duplicate	PMW-04	QN	l	9/19/15	< 5 (U)	5	No	3904	10/6/15	1
Blank	_	0	-	ı	<5 (U)	9	No	3895	10/6/15	· F
on son		10	ı	1	9.34	2	No	3899	10/6/15	-28.59
LCS_Hi		50	-	1	43.2	9	No	3900	10/6/15	-28.33
LCS acceptance range	e range							-29.48	<b>:</b>	-28.48

Method	ROBCR	AM-24-AR C	AM-24-AR C AM-24-DI C
	2020	) "# Z-1 / " (	
Units	l/gu	۸s	%, VPDB
	P	CJS	CJS

# CSIA Report Carbon

16738 PACE-MN

Client Project Name: Client Project #:

PS Beta Nirop

10322358

4.000	trong Districtions	ပိ	Concentration	ָ בו		:	CSI	CSIA (Carbon)	(	
תשוני			(l/gn)		Ar	Area	Co children	Androin	O <sub>2</sub> to	Delfa (%)
Lab ID	Client ID	Sample	PQL	Date	Sample PQL	PQL	CO-ciution Analysis	Allalysis	חמונ	Delta ( 700)
167380001	PMW-04	32	-	9/19/15	46.3	-	Š	3903	10/6/15	-17.99
167380002	PMW-03	42	1	9/19/15	2.08	1	oN	3905	10/6/15	-28.07
167380003	PMW-02	230	1	9/21/15	20.7	-	No	3906	10/6/15	-35.25
167380004	PMW-01	154	1	9/19/15	57.1	l	oN	2068	10/6/15	-33.97
Duplicate	PMW-04	32	1	9/19/15	50.5	ļ	oN	3904	10/6/15	-19.00
Blank	ı	0	1	ľ	<1 (U)	-	No	3895	10/6/15	•
CS_Lo	1	10	1	•	9.86	-	oN	6688	10/6/15	-20.51
LCS_Hí	1	20	1	•	49.7	1	٥N	0068	10/6/15	-20.50
LCS acceptance range	e range							-22.08	<b>&lt;</b> ≡>	-21.08

Method	, 8260B	AM-24-AR_C	AM-24-DL_C
Units	l/bn	γs	%, VPDB
Analyst	PACE-MN	CJS	CJS

# CSIA Report Carbon

16738 PACE-MN

10322358 Client Project Name: Client Project #:

PS Beta Nirop

7	4 A Dichlorcothono	Cor	Concentration	uc			CSI	CSIA (Carbon)	(1	
	-Dicinol de uname		(I/Bn)		Ar	Area	Applying Applying	Applyoin	). 	Delta (%)
Lab ID	Client ID	Sample	DOL	Date	Sample	PQL		אַפּוֹאַ אַנּאַ	מפות	Della ( 100)
167380001	PMW-04	<1 (U)	ļ	9/19/15	< 4 (U)	4	Š	3903	10/6/15	1
167380002	PMW-03	<1 (U)	l	9/19/15	< 4 (U)	4	No	3910	10/6/15	1
167380003	PMW-02	27	Į.	9/21/15	30.7	7	oN	3908	10/6/15	-27.41
167380004	PMW-01	2	l	9/19/15	17.9	7	N <sub>o</sub>	3909	10/6/15	-26.26
Duplicate	(PMW-04	QN	l	9/19/15	< 4 (U)	7	No	3904	10/6/15	#
Blank	1	0		ı	<4 (U)	7	oN No	3895	10/6/15	1
LCS_Lo	1	10		ı	10.0	7	No	3901	10/6/15	-32.00
LCS_Hi	ţ.	20	-	1	9.03	7	oN	0068	10/6/15	-32.40
LCS acceptance range	e range							-32.88	<=>	-31.88

		0 00 10 110	0 10 10 10
Wethod	8790B	AM-Z4-AK_C	AM-24-DL_C
Units	l/gu	\ s\	%, VPDB
Analyst	PACE-MN	CJS	CJS

# CSIA Report Carbon

PS Beta Nirop

16738 PACE-MN Client Project Name:

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-	10322358
Older I older Marile.	Client Project #:

	Sic Dieblereethene	ပိ	Concentration	uc			CSI	CSIA (Carbon)	(1	
בוס			(I/gn)		Ar	Area	عنات می	A polytoin	Storial Control	Dolto (9/ )
Lab ID	Client ID	Sample	PQL	Date	Sample PQI	Pal	ספיים שיים שיים שיים שיים שיים שיים שיים	Zialysis	סמת	Della ( 700)
167380001	PMW-04	11	_	9/19/15	15.4	-	8 N	3903	10/6/15	-13.30
167380002	PMW-03	21	_	9/19/15	33.0	-	o N	3910	10/6/15	-28.09
167380003	PMW-02	192	τ-	9/21/15	17.2	~	å	3906	10/6/15	-26.20
167380004	PMW-01	141	1	9/19/15	39.1	1	S <sub>O</sub>	2068	10/6/15	-29.87
Duplicate	PMW-04	77	_	9/19/15	16.5	~	å	3904	10/6/15	-14.39
Blank		0	-	ı	<1 (N)	1	No	3895	10/6/15	1
LCS_Lo	_	10	1	,	12.2	1	No	6688	10/6/15	66.6-
LCS_Hi		20	,	ı	62.4	Ψ-	No	3900	10/6/15	-9.89
LCS acceptance range	s range							-12.22	<b>∧</b>   ∨	-11.22

υ <u></u>				
ug/l PACE-MN	Method	8260B	AM-24-AR_C	AM-24-DL_C
PACE-MN	Units	n	Vs	%, VPDB
	Analyst		CJS (	CJS

# CSIA Report Carbon

16738 PACE-MN

PS Beta Nirop

10322358 Client Project Name: Client Project #:

<u>-</u> -	Trioblosoothono	ဝိ	Concentration	Ü,			CSI/	CSIA (Carbon)	)	
-	iciliol delliene		(l/gn)		Αr	Area	Application Application	Analogia	0,00	Delta (%)
Lab ID	Client ID	Sample	bor	Date	Sample	Pal		ZI IQIYSIS	רמום	Della ( 700)
167380001	[PMW-04	14	4.0	9/19/15	13.0	-	N <sub>o</sub>	3903	10/6/15	5.56
167380002	PMW-03	519	2	9/21/15	45.5	_	No	3905	10/6/15	-21.82
167380003	PMW-02	35	0.4	9/21/15	24.2	τ-	S S	3908	10/6/15	-0.63
167380004	PMW-01	156	0.4	9/19/15	35.2	~	No	3907	10/6/15	-6.24
Duplicate	PMW-04	14	0.4	9/19/15	14.1	ν	No	3904	10/6/15	4.16
Blank	1	0	1	1	<(U) ►	~	No	3895	10/6/15	ì
LCS_Lo	1	10	ŀ	1	11.6	<b>\</b>	٥N	3899	10/6/15	-25.15
LCS_Hi	-	20	1	1	57.2	~	oN O	3900	10/6/15	-25.15
LCS acceptance range	e range							-26.48	<b>^=</b> >	-25.48
Method			8260B		₹	AM-24-AR_C	၁_		AM-24-DL_C	
Units			ng/l			۸s			%, VPDB	B(
Analyst		α.	PACE-MN			CJS			വട	

Method	8260B	AM-24-AR_C	AM-24-DL_C
Units	l/6n	Vs	%, VPDB
Analyst	PACE-MN	CJS	SCO

Pace CSIA Center of Excellence phone: 412-826-5245 Pittsburgh, PA 15238 220 William Pitt Way

## CSIA Report Carbon

16738 PACE-MN

Client Project Name: Client Project #:

PS Beta Nirop

10322358

7	(Surrecto)	Comple				CSIA (Carbon)	(د		
2	ICP (Surrogate)	Collection	V 700	acit. Ii.C	20	ر بار من منظر باره	Anchoin	3,00	( )0/ CHC(
Lab ID	Client ID		Z 2 2		۲ آ	CO-eluloll	Alialysis	- Date	Della (%)
167380001	PMW-04	09/15/15	1.83	1	1	No	3903	10/06/15	-35.31
167380002	PMW-03	09/15/15	1.75	1	1	No	3910	10/06/15	-36.19
167380002	PMW-03	09/15/15	1.91	10	_	No	3905	10/06/15	-36.18
167380003	PMW-02	09/16/15	1.76	7	1	No	3908	10/06/15	-36.77
167380003	PMW-02	09/16/15	1.75	10	-	No	3906	10/06/15	-36.06
167380004	PMW-01	09/16/15	1.86	-	-	No	3909	10/06/15	-35.23
167380004	PMW-01	09/16/15	1.78	5		No	3907	10/06/15	-35.69
Duplicate	PMW-04	09/15/15	1.74	1	1	No	3904	10/06/15	-36.23
Blank	1	1	1.58	_	1	No	3895	10/06/15	-36.55
LCS_Lo	1	1	1.75	1	1	No	3899	10/06/15	-36.57
LCS_Hi	-	1	1.76	1	1	No	3900	10/06/15	-36.60
Surrogate acceptance range	otance range						-37.49	<=>	-36.49

Method	AM-24-AR_C	AM-24-DL_C
Units	γ	%, VPDB
Analyst	CJS	CJS

Case Narrative: The blank, LCS's, duplicate and surrogates were all close to or within the acceptance range and the data is reported as valid and representative of the samples as received.

## Chain of Custody

Workorder Name: PS BETA NIROP

Subcontract To

Pace Analytical Services, Inc. 1700 Elm Street, Suite 200

Jennifer Anderson

Report To

Workorder: 10322358

Minneapolis, MN 55414 Phone (612)607-1700 Fax (612)607-6444

Owner Received Date:

Results Requested By:

は王元。と近

40/1/2046

Face Analytical www.pacelebs.com

9/16/2015

GNOG

Preserved Containers

Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600

HCF Cab ID Collect Date/Time Sample Type

AISO

LAB USE ONLY

Water Water 10322358001 10322358002 9/15/2015 14:25 9/15/2015 15:45 PS PS

Sample ID

Ten.

PMW-03

PMW-04

PMW-01

PMW-02

15 37 F ŵ دي + Water Water 10322358003 10322358004 9/16/2015 14:25 9/16/2015 11:35 S S

# UPP Received By वागाह ॥ज्य Date/Time Released By Transfers

Received on Ice ( Custody Seal 3, C 1 Cooler Temperature on Receipt

Samples Intact

Z |o |×

**国公**00

Comments

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Thursday, September 17, 2015 4:33:37 PM

16738

Pace Analytical\*

Document Name:

Sample Condition Upon Receipt Form

Document No.: F-MN-L-213-rev.13

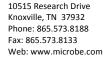
Document Revised: 23Feb2015

Page 1 of 1

Issuing Authority: Pace Minnesota Quality Office

Sample Condition Clic Upon Receipt	ent Name:			I	Project	#:	WO	#:1	032	235	8	
Courier:	Hecona Fedéx	 ∏∪PS [	USPS	——	ient							
	Pace		Other:	ب.								
	rdle	□]∋heenee [	lonsi:_				10322	2358	<b>-</b>	•		
Tracking Number:										<u></u>		·
Custody Seal on Cooler/	Box Present?	Yes Mo	s	eals Inta	ict?	]Yes	₽ No	Option	al: Proj. E	lue Date:	Proj. l	Name:
Packing Material:	lubble Wrap	Bubble Bags	None		)ther:	<i></i> .			Temp 8	Blank?	• Yes	□No
Used:		☑B88A912167504 □B88A014331009	8 r <b>yp</b> e	of Ice:	elwei Tarr		]Blue	□None			ling proce	ss has begur
Cooler Temp Read (°C): Temp should be above fre	$\frac{l_y l_y}{e^{zing}}$ to 6°C	Cooler Temp Corr Correction Facto		), "Z				~	ue Frozen? amining Cor	Yes ntents:	No	97161
USDA Regulated Soil ( 🐔				· 							4	
Did samples originate in a q MS, NC, NM, NY, OK, OR, SC If Yes	, TN, TX or WA (c				Yes	<u> </u>	No incl	uding Hawai	ginate from a ii and Puerto I SCUR/COC pa	Rico)?	∐Ye:	
n res	to cliner questi	on, in out a nege							COMMEN			
Chain of Custody Prozent	)		MYes	ΠNo	□N/A	1.			_ =			
Chain of Custody Present?				7		2.						
Chain of Custody Filled Ou			DY es	□No	□N/A		· · · · · · · · · · · · · · · · · · ·		**********	.=		
Chain of Custody Relinqui		***************************************	Yes	□No	□N/A	3.						
Sampler Name and/or Sig			Yes		□N/A	4.				·		
Samples Arrived within Ho	old Time?		[₽]Yes	□No	N/A	5.						<del>.</del>
Short Hold Time Analysis	(<72 hr)?		Yes	₩No.	^ □N/A	6.						
Rush Turn Around Time R	lequested?		☐Yes.	<b>Ø</b> No	□n/A	7.						<del></del>
Sufficient Volume?			<b>⊈</b> Yes-	□No	□N/A	8.						
Correct Containers Used?			V Yes	□No	□N/A	9.		-				
-Pace Containers Used	?		Z Yes	□No	□n/a							
Containers Intact?			Yes	□No	□n/a	10.				,		
Filtered Volume Received	for Dissolved Tes	ts?	ZY95	□No	□N/A	11.	Note if se	ediment is v	isible in the	dissolved c	ontainer	
Sample Labels Match COC			ZYes	□No	□N/A	12.						
•		A.N.	2,103	D.1.0	1			/				
-includes Date/Time/ID All containers needing acid						12	Mr.	for W	Telly co	20 m		Fluct
checked?	.,	200	Yes	∏No	□N/A	13.	علم 7	THNO3 Å®	H <sub>2</sub> SO <sub>4</sub>	MaO⊦	i	HCI
All containers needing pre		and to be in		A CONTRACTOR OF THE PARTY OF TH		Sampl	le#01-0	V-1		ı		
compliance with EPA reco (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaO		)H>12 Cyanide)	∐Yes	ANo	□n/a		Ą	(				
Exceptions: VOA, Coliform	•	, ,		_		Initial		16-		of added	11128	763
DRO/8015 (water) DOC			Yes	No.~		compl	leted:	1/4	preser	vative:	11150	<u> 1</u>
Headspace in VOA Vials (	>6mm)?		□Yes	ØNo 	□N/A	14.						
Trip Blank Present?			₫yes	□No	□N/A	15.						
Trip Blank Custody Seals P	~ · ·	9215_01	<b>☑</b> Yes	□No	∐n/a							
Pace Trip Blank Lot # (if pr	urchased): 😥 👢	WIN				l			<del></del>			
CLIENT NOTII Person Contacted:	FICATION/RESOL	LUTION				Date	e/Time:	F	ield Data Re	quired?	Yes	]No
Comments/Resolution:	Received	BP3S Fa	<i>trn.</i>	anaks	sic M	nAn	mel	With	chent	4,	1)//(۲	art
	Nectives SIS. JMA 9/1		100	anut.	JIP W	4411	LISLI	VY ([1]	<u> </u>			
	//	A4							1			
Project Manag	er Review:///		·					te: <u>9/</u>	17/15			
Note: Whenever there is a di hold, incorrect preservative,			mpliance sa	imples, a	copy of th	is form	will be se	nt to the No	rth Carolina E	EHNR Certi	fication O	ffice (i.e ou

	Shipping/Container Information (circle appropriate response)				
	Courier: FedEx UPS USPS Client Other: Face - (	Ź Ai	r bill P	resent	:: Yes No
	Tracking Number:				
4	Custody Seal on Cooler/Box Present: Yes No Seals	In <b>t</b> act:	Yes	No	·
	Cooler/Box.Packing Material: Bubble Wrap Absorbent F	oam	Other	-)	·
	Type of ice: Wet Blue None Ice Intact: Yes Mel	ted	The second secon		
	Cooler Temperature: 1.2°C Radiation Screened: Yes	s (No	Ch	ain of	Custody Present: Yes No
	Comments:				
В.	Laboratory Assignment/Log-in (check appropriate response)				
		YES	NO	N/A	Comment Reference non-Conformance
	Chain of Custody properly filled out				•
	Chain of Custody relinquished	-			
	Sampler Name & Signature on COC		V		
	Containers intact				
	Were samples in separate bags	V			
	Sample container labels match COC Sample name/date and time collected				
	Sufficient volume provided				
	PAES containers used	<u> </u>	<u></u>		
	Are containers properly preserved for the requested testing? (as labeled)	Ĺ			
	If an unknown preservation state, were containers checked? Exception: VOA's coliform			Ù.	If yes, see pH form.
	Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?				
	Comments:	-			





## **SITE LOGIC Report**

QuantArray® (Chlor) Study

Contact: Melinda Pham Phone: 949.366.8000

Address: Regenesis Bioremediation, Inc.

1011 Calle Sombra

San Clemente, CA 92673

Email: mpham@regenesis.com

MI Identifier: 055MI Report Date: 10/1/2015

Project: PS Beta - NIROP

**Comments:** 

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## The QuantArray® Approach

Quantification of *Dehalococcoides* spp., the only known bacterial group capable of complete reductive dechlorination of PCE and TCE to ethene, has become an indispensable component of assessment, remedy selection, and performance monitoring at sites impacted by chlorinated solvents. While undeniably a key group of halorespiring bacteria, *Dehalococcoides* spp. are not the only bacteria of interest in the subsurface because reductive dechlorination is not the only potential biodegradation pathway operative at contaminated sites, and chlorinated ethenes are not always the primary contaminants of concern. The Chlorinated QuantArray® not only includes a variety of halorespiring bacteria (*Dehalococcoides*, *Dehalobacter*, *Dehalogenimonas*, etc.) to assess the potential for reductive dechlorination of chloroethenes, chloroethanes, chlorobenzenes, chlorophenols, and chloroform, but also provides quantification of functional genes involved in aerobic (co)metabolic pathways for biodegradation of chlorinated solvents and even competing biological processes. Thus, the QuantArray® will give site managers the ability to simultaneously yet economically evaluate the potential for biodegradation of a spectrum of common chlorinated contaminants through a multitude of anaerobic and aerobic (co)metabolic pathways to give a much more clear and comprehensive view of contaminant biodegradation.

## The Chlorinated QuantArray® is used to quantify specific microorganisms and functional genes to evaluate the following:

Anaerobic Reductive Dechlorination

Quantification of important halorespiring bacteria (e.g. *Dehalococcoides*, *Dehalobacter*, *Dehalogenimonas*, *Desulfitobacterium* spp.) and key functional genes (e.g vinyl chloride reductases, TCE reductase, 1,2-DCP reductase) responsible for reductive dechlorination of a broad spectrum of chlorinated solvents.

Aerobic Cometabolism

 Several different types of bacteria including methanotrophs and some toluene/phenol utilizing bacteria can co-oxidize TCE, DCE, and vinyl chloride. The Chlorinated QuantArray® quantifies functional genes like soluble methane monooxygenase encoding enzymes capable of co-oxidation of chlorinated ethenes.

Aerobic (Co)metabolism of Vinyl chloride

•Ethene oxidizing bacteria are capable of cometabolism of vinyl chloride. In some cases, ethenotrophs can also utilize vinyl chloride as a growth supporting substrate. The QuantArray® targets key functional genes in ethene metabolism.

## How do QuantArrays® work?

The QuantArray® in many respects is a hybrid technology combining the highly parallel detection of microarrays with the accurate and precise quantification provided by qPCR into a single platform. The key to highly parallel qPCR reactions is the nanoliter fluidics platform for low volume, solution phase qPCR reactions.

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## How are QuantArray® results reported?

One of the primary advantages of the Chlorinated QuantArray® is the simultaneous quantification of a broad spectrum of different microorganisms and key functional genes involved in a variety of pathways for chlorinated hydrocarbon biodegradation. However, highly parallel quantification combined with the various metabolic and cometabolic capabilities of different target organisms can complicate data presentation. Therefore, in addition to Summary Tables, QuantArray® results will be presented as Microbial Population Summary and Comparison Figures to aid in data interpretation and subsequent evaluation of site management activities.

## Types of Tables and Figures:

**Microbial Population Summary** 

• Figure presenting the concentrations of QuantArray® target populations (e.g. Dehalococcoides spp.) and functional genes (e.g. vinyl chloride reductase) relative to typically observed values.

**Summary Tables** 

 Tables of target population concentrations grouped by biodegradation pathway and contaminant type.

**Comparison Figures** 

 Depending on the project, sample results can be presented to compare changes over time or examine differences in microbial populations for along a transect of the dissolved plume.

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## Results

Table 1. Summary of the QuantArray® results obtained for monitoring wells.

Sample Name	PMW-04	PMW-03	PMW-02	PMW-01
Reductive Dechlorination	(cells/mL)	(cells/mL)	(cells/mL)	(cells/mL)
Dehalococcoides spp. (DHC)	7.78E+02	6.74E+02	7.47E+03	8.90E+03
tceA Reductase (TCE)	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01
BAV1 Vinyl Chloride Reductase (BVC)	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01
Vinyl Chloride Reductase (VCR)	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01
Dehalobacter spp. (DHBt)	1.73E+03	5.51E+02	1.63E+04	2.30E+03
Dehalobacter DCM (DCM)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00
Dehalogenimonas spp. (DHG)	5.89E+03	2.51E+03	3.32E+04	4.90E+04
Desulfitobacterium spp. (DSB)	2.10E+03	2.43E+03	1.12E+04	4.81E+03
Dehalobium chlorocoercia (DECO)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00
Desulfuromonas spp. (DSM)	4.76E+02	1.21E+03	5.64E+02	8.60E+03
Chloroform reductase (CFR)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00
1,1 DCA Reductase (DCA)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00
1,2 DCA Reductase (DCAR)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00
Aerobic (Co)Metabolic				
Soluble Methane Monooxygenase (SMMO)	3.13E+02	1.50E+02	7.52E+02	5.38E+02
Particulate Methane Monooxygenase (PMMO)	9.00E-01 (J)	8.00E-01 (J)	4.27E+02	1.30E+00 (J)
Toluene Dioxygenase (TOD)	1.70E+03	2.56E+04	4.41E+04	2.09E+04
Phenol Hydroxylase (PHE)	5.56E+02	6.71E+02	1.11E+03	1.35E+03
Trichlorobenzene Dioxygenase (TCBO)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00
Toluene Monooxygenase 2 (RDEG)	1.30E+02	<4.70E+00	1.00E+03	4.12E+02
Toluene Monooyxgenase (RMO)	1.24E+02	9.16E+01	1.66E+02	1.76E+02
Ethene Monooxygenase (EtnC)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00
Epoxyalkane transferase (EtnE)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00
Dichloromethane dehalogenase (DCMA)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00
Other				
Total Eubacteria (EBAC)	1.58E+06	1.06E+06	4.69E+06	1.66E+06
Sulfate Reducing Bacteria (APS)	1.09E+04	1.24E+02	1.71E+04	2.06E+04
Methanogens (MGN)	6.62E+01	1.58E+01	7.94E+01	3.84E+01

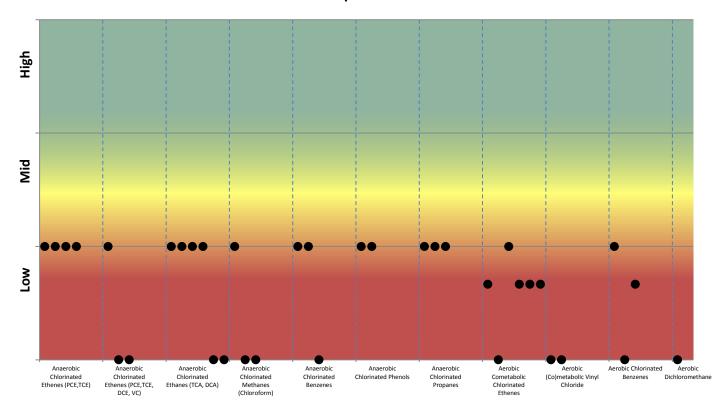
### Legend

NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited <= Result not detected



Figure 1. Microbial population summary to aid in evaluating potential pathways and biodegradation of specific contaminants.

## **Microbial Populations PMW-04**



### Anaerobic – Reductive Dechlorination or Dichloroelimination

Aerobic – (Co)metabolism

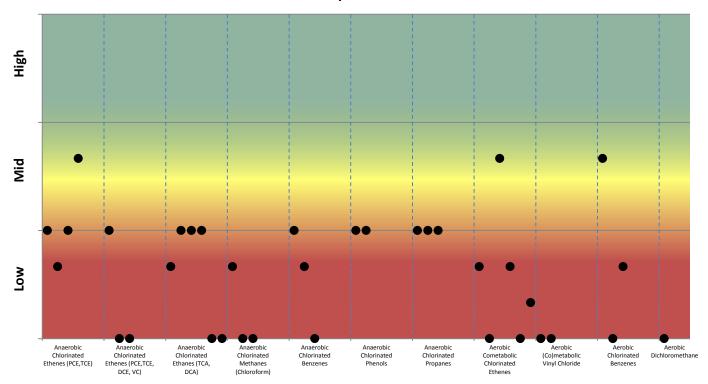
Chlorinated Ethenes (PCE, TCE)	DHC, DHBt, DSB, DSM	Chlorinated ethenes (TCE, DCE, VC)	sMMO, pMMO, TOD, PHE, RDEG, RMO	
Chlorinated Ethenes (PCE, TCE, DCE, VC)	DHC, BVC, VCR	(Co)metabolic vinyl chloride	etnC, etnE	
Chlorinated Ethanes (TCA and 1,2-DCA)	DHBt, DHG, DHC, DSB <sup>1</sup> , DCA, DCAR	Chlorinated Benzenes	TOD, TCBO, PHE	
Chlorinated Methanes (Chloroform)	DHBt, DCM, CFR	Dichloromethane	DCMA	
Chlorinated Benzenes	DHC, DHBt <sup>2</sup> , DECO			
Chlorinated Phenols	DHC, DSB			
Chlorinated Propanes	DHC, DHG, DSB <sup>1</sup>			
1 Described and a signal displaced in the DCA1 2 hardinated in and action despite the property of displaced and a startially obligated as a signal of the property of the prop				

<sup>&</sup>lt;sup>1</sup> Desulfitobacterium dichloroeliminans DCA1. <sup>2</sup> Implicated in reductive dechlorination of dichlorobenzene and potentially chlorobenzene



Figure 2. Microbial population summary to aid in evaluating potential pathways and biodegradation of specific contaminants.

## **Microbial Populations PMW-03**



### Anaerobic - Reductive Dechlorination or Dichloroelimination

6

Aerobic - (Co)metabolism

Chlorinated Ethenes (PCE, TCE)	DHC, DHBt, DSB, DSM	Chlorinated ethenes (TCE, DCE, VC)	sMMO, pMMO, TOD, PHE, RDEG, RMO	
Chlorinated Ethenes (PCE, TCE, DCE, VC)	DHC, BVC, VCR	(Co)metabolic vinyl chloride	etnC, etnE	
Chlorinated Ethanes (TCA and 1,2-DCA)	DHBt, DHG, DHC, DSB <sup>1</sup> , DCA, DCAR	Chlorinated Benzenes	TOD, TCBO, PHE	
Chlorinated Methanes (Chloroform)	DHBt, DCM, CFR	Dichloromethane	DCMA	
Chlorinated Benzenes	DHC, DHBt <sup>2</sup> , DECO			
Chlorinated Phenols	DHC, DSB			
Chlorinated Propanes	DHC, DHG, DSB <sup>1</sup>			
<sup>1</sup> Desulfitobacterium dichloroeliminans DCA1. <sup>2</sup> Implicated in reductive dechlorination of dichlorobenzene and potentially chlorobenzene				

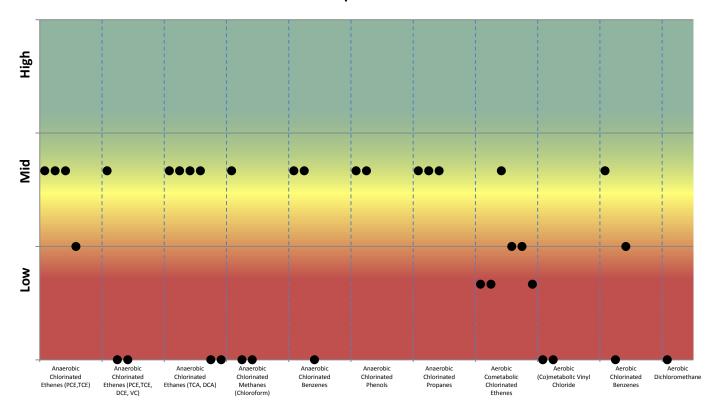
Phone: 865.573.8188 Fax: 865.573.8133 www.microbe.com

<sup>10515</sup> Research Drive Knoxville, TN 37932



Figure 3. Microbial population summary to aid in evaluating potential pathways and biodegradation of specific contaminants.

## **Microbial Populations PMW-02**



### Anaerobic - Reductive Dechlorination or Dichloroelimination

Aerobic – (Co)metabolism

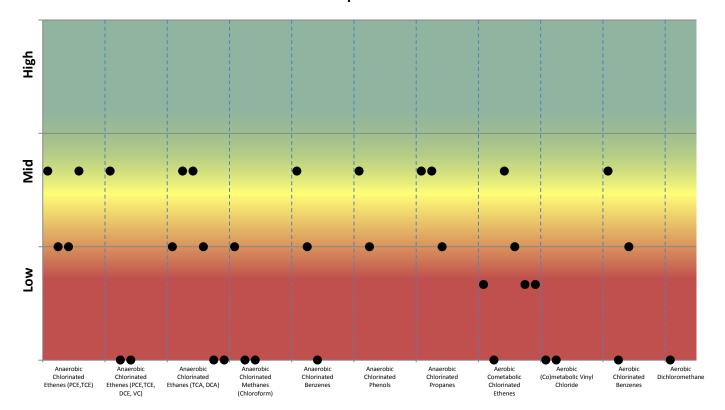
Chlorinated Ethenes (PCE, TCE)	DHC, DHBt, DSB, DSM	Chlorinated ethenes (TCE, DCE, VC)	sMMO, pMMO, TOD, PHE, RDEG, RMO
Chlorinated Ethenes (PCE, TCE, DCE, VC)	DHC, BVC, VCR	(Co)metabolic vinyl chloride	etnC, etnE
Chlorinated Ethanes (TCA and 1,2-DCA)	DHBt, DHG, DHC, DSB <sup>1</sup> , DCA, DCAR	Chlorinated Benzenes	TOD, TCBO, PHE
Chlorinated Methanes (Chloroform)	DHBt, DCM, CFR	Dichloromethane	DCMA
Chlorinated Benzenes	DHC, DHBt <sup>2</sup> , DECO		
Chlorinated Phenols	DHC, DSB		
Chlorinated Propanes	DHC, DHG, DSB <sup>1</sup>		

<sup>&</sup>lt;sup>1</sup> Desulfitobacterium dichloroeliminans DCA1. <sup>2</sup> Implicated in reductive dechlorination of dichlorobenzene and potentially chlorobenzene



Figure 4. Microbial population summary to aid in evaluating potential pathways and biodegradation of specific contaminants.

## **Microbial Populations PMW-01**



Aerobic - (Co)metabolism

Chlorinated Ethenes (PCE, TCE)	DHC, DHBt, DSB, DSM	Chlorinated ethenes (TCE, DCE, VC)	sMMO, pMMO, TOD, PHE, RDEG, RMO
Chlorinated Ethenes (PCE, TCE, DCE, VC)	DHC, BVC, VCR	(Co)metabolic vinyl chloride	etnC, etnE
Chlorinated Ethanes (TCA and 1,2-DCA)	DHBt, DHG, DHC, DSB <sup>1</sup> , DCA, DCAR	Chlorinated Benzenes	TOD, TCBO, PHE
Chlorinated Methanes (Chloroform)	DHBt, DCM, CFR	Dichloromethane	DCMA
Chlorinated Benzenes	DHC, DHBt <sup>2</sup> , DECO		
Chlorinated Phenols	DHC, DSB		
Chlorinated Propanes	DHC, DHG, DSB <sup>1</sup>		
10 10:1 : : : : : : : : : : : : : : : :	2	6 1: 1 1	AT THE REPORT OF THE PARTY OF T

<sup>&</sup>lt;sup>1</sup> Desulfitobacterium dichloroeliminans DCA1. <sup>2</sup> Implicated in reductive dechlorination of dichlorobenzene and potentially chlorobenzene



Table 2. Summary of the QuantArray® results for microorganisms responsible for reductive dechlorination.

Sample Name	PMW-04	PMW-03	PMW-02	PMW-01
Reductive Dechlorination	(cells/mL)	(cells/mL)	(cells/mL)	(cells/mL)
Dehalococcoides spp. (DHC)	7.78E+02	6.74E+02	7.47E+03	8.90E+03
tceA Reductase (TCE)	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01
BAV1 Vinyl Chloride Reductase (BVC)	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01
Vinyl Chloride Reductase (VCR)	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01
Dehalobacter spp. (DHBt)	1.73E+03	5.51E+02	1.63E+04	2.30E+03
Dehalobacter DCM (DCM)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00
Dehalogenimonas spp. (DHG)	5.89E+03	2.51E+03	3.32E+04	4.90E+04
Desulfitobacterium spp. (DSB)	2.10E+03	2.43E+03	1.12E+04	4.81E+03
Dehalobium chlorocoercia (DECO)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00
Desulfuromonas spp. (DSM)	4.76E+02	1.21E+03	5.64E+02	8.60E+03
Chloroform reductase (CFR)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00
1,1 DCA Reductase (DCA)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00
1,2 DCA Reductase (DCAR)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00

Figure 5. Comparison - Microbial populations involved in reductive dechlorination.

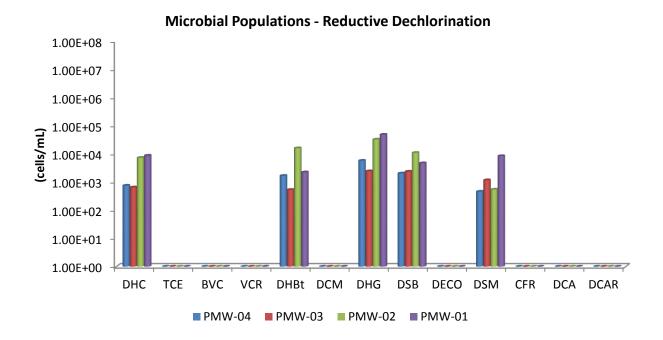
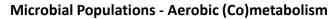




Table 3. Summary of the QuantArray® results for microorganisms responsible for aerobic (Co)metabolism.

Sample Name	PMW-04	PMW-03	PMW-02	PMW-01
Aerobic (Co)Metabolic	(cells/mL)	(cells/mL)	(cells/mL)	(cells/mL)
Soluble Methane Monooxygenase (SMMO)	3.13E+02	1.50E+02	7.52E+02	5.38E+02
Particulate Methane Monooxygenase (PMMO)	9.00E-01 (J)	8.00E-01 (J)	4.27E+02	1.30E+00 (J)
Toluene Dioxygenase (TOD)	1.70E+03	2.56E+04	4.41E+04	2.09E+04
Phenol Hydroxylase (PHE)	5.56E+02	6.71E+02	1.11E+03	1.35E+03
Trichlorobenzene Dioxygenase (TCBO)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00
Toluene Monooxygenase 2 (RDEG)	1.30E+02	<4.70E+00	1.00E+03	4.12E+02
Toluene Monooyxgenase (RMO)	1.24E+02	9.16E+01	1.66E+02	1.76E+02
Ethene Monooxygenase (EtnC)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00
Epoxyalkane transferase (EtnE)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00
Dichloromethane dehalogenase (DCMA)	<4.60E+00	<4.70E+00	<4.70E+00	<4.70E+00

Figure 6. Comparison - Microbial populations involved in aerobic (Co)metabolism.



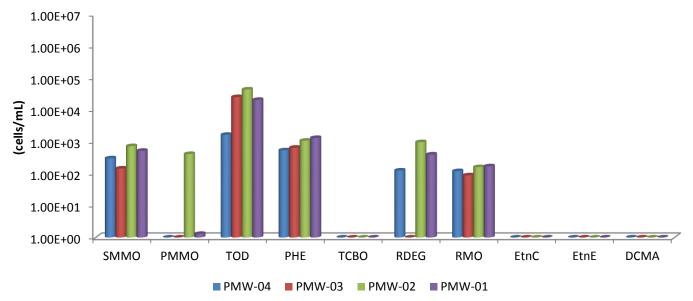


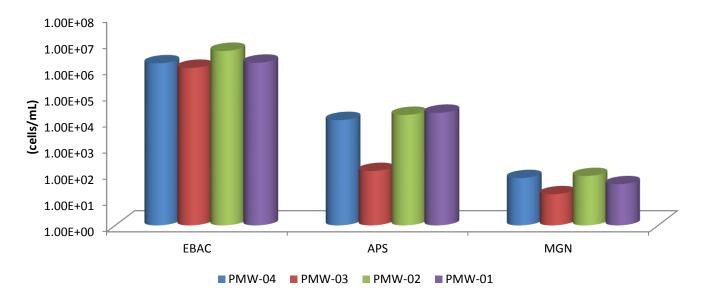


Table 4. Summary of the QuantArray® results for total bacteria and other populations.

Sample Name	PMW-04	PMW-03	PMW-02	PMW-01
Other	(cells/mL)	(cells/mL)	(cells/mL)	(cells/mL)
Total Eubacteria (EBAC)	1.58E+06	1.06E+06	4.69E+06	1.66E+06
Sulfate Reducing Bacteria (APS)	1.09E+04	1.24E+02	1.71E+04	2.06E+04
Methanogens (MGN)	6.62E+01	1.58E+01	7.94E+01	3.84E+01

Figure 7. Comparison - Microbial populations.

## **Microbial Populations - Total Bacteria and Other Populations**





# Interpretation

The overall purpose of the Chlorinated QuantArray® is to give site managers the ability to simultaneously yet economically evaluate the potential for biodegradation of a spectrum of common chlorinated contaminants through a multitude of anaerobic and aerobic (co)metabolic pathways in order to provide a clearer and more comprehensive view of contaminant biodegradation. The following discussion describes interpretation of results in general terms and is meant to serve as a guide.

Reductive Dechlorination – Chlorinated Ethenes: While a number of bacterial cultures including *Dehalococcoides*, *Dehalobacter*, *Desulfitobacterium*, and *Desulfuromonas* spp. capable of utilizing PCE and TCE as growth-supporting electron acceptors have been isolated [1-5], *Dehalococcoides* spp. may be the most important because they are the only bacterial group that has been isolated to date which is capable of complete reductive dechlorination of PCE to ethene [6]. In fact, the presence of *Dehalococcoides* spp. has been associated with complete reductive dechlorination to ethene at sites across North America and Europe [7]. More recently, Lu et al. [8] have proposed using a *Dehalococcoides* concentration of 1 x 10<sup>4</sup> cells/mL as a screening criterion to identify sites where biological reductive dechlorination is predicted to proceed at "generally useful" rates.

A "stall" (i.e., where daughter products *cis*-DCE and vinyl chloride accumulate) can occur at PCE- and TCE-impacted sites especially under MNA conditions. The accumulation of vinyl chloride, generally considered more carcinogenic than the parent compounds, is particularly problematic. Although elevated *Dehalococcoides* concentrations correspond to ethene production in numerous studies, the range of chlorinated ethenes metabolized and cometabolized varies by species and strains within the *Dehalococcoides* genus. For example, *Dehalococcoides* ethenogenes str. 195 metabolizes PCE, TCE, and *cis*-DCE and cometabolizes vinyl chloride [6] to produce ethene. Conversely, *Dehalococcoides* sp. CBDB1 utilizes PCE and TCE, but does not cometabolize additional chloroethenes [9]. Quantification of reductive dehalogenase genes is used to more definitively confirm the potential for reductive dechlorination of TCE, *cis*-DCE, and vinyl chloride [10-13].

Reductive Dechlorination – Chlorinated Ethanes: Under anaerobic conditions, chlorinated ethanes are susceptible to reductive dechlorination by several groups of halorespiring bacteria including *Dehalobacter*, *Dehalogenimonas*, and *Dehalococcoides* spp. While the reported range of chlorinated ethanes utilized varies by genus, species, and sometimes at the strain level, several general observations can be made regarding biodegradation pathways and daughter product formation. *Dehalobacter* spp. have been isolated that are capable of sequential reductive dechlorination of 1,1,1-TCA through 1,1-DCA to chloroethane. Biodegradation of 1,1,2-TCA by several halorespiring bacteria including *Dehalobacter* and *Dehalogenimonas* spp. proceeds via dichloroelimination producing vinyl chloride. Similarly, 1,2-DCA biodegradation by *Dehalobacter*, *Dehalogenimonas*, and *Dehalococcoides* spp. occurs via dichloroelimination producing ethene. While not utilized by many *Desulfitobacterium* isolates, at least one strain, *Desulfitobacterium dichloroeliminans* strain DCA1, is also capable of dichloroelimination of 1,2-DCA [14].

Reductive Dechlorination – Chlorinated Methanes: Chloroform is a common co-contaminant at chlorinated solvent sites and can inhibit reductive dechlorination of chlorinated ethenes. Grostern et al. demonstrated that a *Dehalobacter* population was capable of reductive dechlorination of chloroform to produce dichloromethane [15]. The *cfrA* gene encodes the reductase which catalyzes this initial step in chloroform biodegradation [16]. Justicia-Leon et al. have since shown that dichloromethane can support growth of a distinct group of *Dehalobacter* strains via fermentation [17]. The *Dehalobacter* DCM assay targets the 16S rRNA gene of these strains.

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Reductive Dechlorination – Chlorinated Benzenes: Chlorinated benzenes are an important class of industrial solvents and chemical intermediates in the production of drugs, dyes, herbicides, and insecticides. The physical-chemical properties of chlorinated benzenes as well as susceptibility to biodegradation are functions of their degree of chlorination and the positions of chlorine substituents. Under anaerobic conditions, reductive dechlorination of higher chlorinated benzenes including hexachlorobenzene (HCB), pentachlorobenzene (PeCB), tetrachlorobenzene (TeCB) isomers, and trichlorobenzene (TCB) isomers by halorespiring bacteria has been well documented [18]. For example, although biodegradation of individual compounds and specific isomers does vary somewhat between isolates, *Dehalococcoides* spp. such as strain CBDB1 have been identified which reductively dechlorinate HCB, PeCB, all three TeCB isomers, 1,2,3-TCB, and 1,2,4-TCB [9, 19]. *Dehalobium chlorocoercia* DF-1 has been shown to be capable of reductive dechlorination of HCB, PeCB, and 1,2,3,5-TeCB [20]. The dichlorobenzene (DCB) isomers and chlorobenzene (CB) were considered relatively recalcitrant under anaerobic conditions. However, new evidence has demonstrated reductive dechlorination of DCBs to CB and CB to benzene [21] with corresponding increases in concentrations of *Dehalobacter* spp. [22].

Reductive Dechlorination – Chlorinated Phenols: Pentachlorophenol (PCP) was one of the most widely used biocides in the U.S. and despite residential use restrictions, is still extensively used industrially as a wood preservative. Along with PCP, the tetrachlorophenol and trichlorophenol isomers were also used as fungicides in wood preserving formulations. 2,4-dichlorophenol and 2,4,5-TCP were used as chemical intermediates in herbicide production (e.g. 2,4-D) and chlorophenols are known byproducts of chlorine bleaching in the pulp and paper industry. While the range of compounds utilized varies by strain, some *Dehalococcoides* isolates are capable of reductive dechlorination of PCP and other chlorinated phenols. For example, *Dehalococcoides* strain CBDB1 is capable of utilizing pentachlorophenol (PCP), all three tetrachlorophenol (TeCP) congeners, all six trichlorophenol (TCP) congeners, and 2,3-dichlorophenol (2,3-DCP). PCP dechlorination by strain CBDB1 produces a mixture of 3,5-DCP, 3,4-DCP, 2,4-DCP, 3-CP, and 4-CP [23]. In the same study, however, *Dehalococcoides ethenogenes* strain 195 dechlorinated a more narrow spectrum of chlorophenols which included 2,3-DCP, 2,3,4-TCP, and 2,3,6-TCP, but no other TCPs or PCP. Similar to *Dehalocococcoides*, some species and strains of *Desulfitobacterium* are capable of utilizing PCP and other chlorinated phenols. *Desulfitobacterium hagniense* PCP-1 is capable of reductive dechlorination of PCP to 3-CP [24]. However, the ability to biodegrade PCP is not universal among *Desulfitobacterium* isolates. *Desulfitobacterium* sp. strain PCE1 and *D. chlororespirans* strain Co23, for example, can utilize some TCP and DCP isomers, but not PCP for growth [2, 25].

Reductive Dechlorination – Chlorinated Propanes: Dehalogenimonas is a recently described bacterial genus of the phylum Chloroflexi which also includes the well-known chloroethene-respiring Dehalococcoides spp [26]. The Dehalogenimonas isolates characterized to date are also halorespiring bacteria, but utilize a rather unique range of chlorinated compounds as electron acceptors including chlorinated propanes (1,2,3-TCP and 1,2-DCP) and a variety of other vicinally chlorinated alkanes including 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, and 1,2-dichloroethane [26].

Aerobic – Chlorinated Ethene Cometabolism: Under aerobic conditions, several different types of bacteria including methane-oxidizing bacteria (methanotrophs), ammonia-oxidizing bacteria, and some toluene/phenol-utilizing bacteria can cometabolize or co-oxidize trichloroethene (TCE), dichloroethene (DCE), and vinyl chloride (VC). In general, cometabolism of chlorinated ethenes is mediated by monooxygenase enzymes with "relaxed" specificity that oxidize a primary (growth supporting) substrate and co-oxidize the chlorinated compound. Most methanotrophs are only capable of producing particulate methane monooxygenase (pMMO) which is capable of aerobic cometabolism but often at lower rates. Other methanotrophs are capable of producing both pMMO and soluble methane monooxygenase (sMMO) enzymes, which in general are believed to be capable of greater rates of aerobic cometabolism.

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<u>Aerobic – Vinyl Chloride Cometabolism</u>: Beginning in the early 1990s, numerous microcosm studies demonstrated aerobic oxidation of vinyl chloride under MNA conditions without the addition of exogenous primary substrates. Since then, strains of *Mycobacterium*, *Nocardioides*, *Pseudomonas*, *Ochrobactrum*, and *Ralstonia* species have been isolated which are capable of aerobic growth on both ethene and vinyl chloride (see Mattes et al. [27] for a review). The initial steps in the pathway are the monooxygenase (*etn*ABCD) catalyzed conversion of ethene and vinyl chloride to their respective epoxyalkanes (epoxyethane and chlorooxirane), followed by epoxyalkane:CoM transferase (*etn*E) mediated conjugation and breaking of the epoxide [28].

Aerobic – Chlorinated Benzenes: In general, chlorobenzenes with four or less chlorine groups are susceptible to aerobic biodegradation and can serve as growth-supporting substrates. Toluene dioxygenase (TOD) has a relatively relaxed substrate specificity and mediates the incorporation of both atoms of oxygen into the aromatic ring of benzene and substituted benzenes (toluene and chlorobenzene). Comparison of TOD levels in background and source zone samples from a CB-impacted site suggested that CBs promoted growth of TOD-containing bacteria [29]. In addition, aerobic biodegradation of some trichlorobenzene and even tetrachlorobenzene isomers is initiated by a group of related trichlorobenzene dioxygenase genes (TCBO). Finally, phenol hydroxylases catalyze the continued oxidation and in some cases, the initial oxidation of a variety of monoaromatic compounds. In an independent study, significant increases in numbers of bacteria containing PHE genes corresponded to increases in biodegradation of DCB isomers [29].

**1,2** Dichloroethane Reductive Dehalogenase: Targets the 1,2 dichloroethane reductive dehalogenase gene from members of Desulfitobacterium and Dehalobacter which dechlorinate 1,2 DCA to ethene.

**1,1** Dichloroethane Reductive Dehalogenase: Targets the 1,1 dichloroethane reductive dehalogenase gene found in some strains of Dehalobacter..

**Dichloromethane Dehalogenase:** Targets the dcmA gene responsible for aerobic biodegradation of dichloromethane by methylotrophs..

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Fax: 865.573.8133 www.microbe.com



Green Bay, WI 54302 (920)469-2436



September 29, 2015

Ryan Moore Regenesis 1011 Calle Sombra San Clemente, CA 92673

RE: Project: BETA NIROP

Pace Project No.: 40121790

## Dear Ryan Moore:

Enclosed are the analytical results for sample(s) received by the laboratory on September 26, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI 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,

Laurie Woelfel

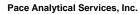
Laure Woerfel

laurie.woelfel@pacelabs.com

**Project Manager** 

**Enclosures** 





Pace Analytical www.pacelabs.com

1241 Bellevue Street - Suite 9 Green Bay, WI 54302 (920)469-2436

#### **CERTIFICATIONS**

Project: BETA NIROP
Pace Project No.: 40121790

**Green Bay Certification IDs** 

1241 Bellevue Street, Green Bay, WI 54302 Florida/NELAP Certification #: E87948 Illinois Certification #: 200050 Kentucky Certification #: 82 Louisiana Certification #: 04168 Minnesota Certification #: 055-999-334 North Dakota Certification #: R-150 South Carolina Certification #: 83006001 Texas Certification #: T104704529-14-1 US Dept of Agriculture #: S-76505 Wisconsin Certification #: 405132750

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## **SAMPLE SUMMARY**

Project: BETA NIROP
Pace Project No.: 40121790

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40121790001	PMW-02	Water	09/25/15 13:20	09/26/15 09:50
40121790002	PMW-01	Water	09/25/15 14:20	09/26/15 09:50
40121790003	TRIP BLANK	Water	09/25/15 08:00	09/26/15 09:50

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## **SAMPLE ANALYTE COUNT**

Project: BETA NIROP
Pace Project No.: 40121790

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40121790001	PMW-02	EPA 8260	HNW	71	PASI-G
40121790002	PMW-01	EPA 8260	HNW	71	PASI-G
40121790003	TRIP BLANK	EPA 8260	HNW	71	PASI-G



#### **ANALYTICAL RESULTS**

Project: BETA NIROP
Pace Project No.: 40121790

Date: 09/29/2015 03:02 PM

Sample: PMW-02	Lab ID: 401	21790001	Collected: 09/25/1	5 13:20	Received: 09/26/15 09:50 Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared Analyzed CAS No.	Qual
8260 MSV	Analytical Meth	hod: EPA 82	260			
Acetone	ND	ug/L	20.0	1	09/28/15 20:50 67-64-1	
Allyl chloride	ND	ug/L	5.0	1	09/28/15 20:50 107-05-1	
Benzene	ND	ug/L	1.0	1	09/28/15 20:50 71-43-2	
Bromobenzene	ND	ug/L	1.0	1	09/28/15 20:50 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1	09/28/15 20:50 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1	09/28/15 20:50 75-27-4	
Bromoform	ND	ug/L	1.0	1	09/28/15 20:50 75-25-2	
Bromomethane	ND	ug/L	5.0	1	09/28/15 20:50 74-83-9	
2-Butanone (MEK)	ND	ug/L	20.0	1	09/28/15 20:50 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1	09/28/15 20:50 104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1	09/28/15 20:50 135-98-8	
ert-Butylbenzene	ND	ug/L	1.0	1	09/28/15 20:50 98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1	09/28/15 20:50 56-23-5	
Chlorobenzene	ND	ug/L	1.0	1	09/28/15 20:50 108-90-7	
Chloroethane	ND	ug/L	1.0	1	09/28/15 20:50 75-00-3	
Chloroform	ND	ug/L	5.0	1	09/28/15 20:50 67-66-3	
Chloromethane	ND ND	ug/L	1.0	1	09/28/15 20:50 74-87-3	
2-Chlorotoluene	ND ND	ug/L	1.0	1	09/28/15 20:50 95-49-8	
I-Chlorotoluene	ND ND	ug/L ug/L	1.0	1	09/28/15 20:50 106-43-4	
		•		1	09/28/15 20:50 96-12-8	
,2-Dibromo-3-chloropropane	ND	ug/L	5.0			
Dibromochloromethane	ND	ug/L	1.0	1	09/28/15 20:50 124-48-1	
,2-Dibromoethane (EDB)	ND	ug/L	1.0	1	09/28/15 20:50 106-93-4	
Dibromomethane	ND	ug/L	1.0	1	09/28/15 20:50 74-95-3	
I,2-Dichlorobenzene	ND	ug/L	1.0	1	09/28/15 20:50 95-50-1	
I,3-Dichlorobenzene	ND	ug/L	1.0	1	09/28/15 20:50 541-73-1	
I,4-Dichlorobenzene	ND	ug/L	1.0	1	09/28/15 20:50 106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1	09/28/15 20:50 75-71-8	
1,1-Dichloroethane	31.7	ug/L	1.0	1	09/28/15 20:50 75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1	09/28/15 20:50 107-06-2	
,1-Dichloroethene	21.6	ug/L	1.0	1	09/28/15 20:50 75-35-4	
cis-1,2-Dichloroethene	224	ug/L	1.0	1	09/28/15 20:50 156-59-2	
rans-1,2-Dichloroethene	276	ug/L	1.0	1	09/28/15 20:50 156-60-5	
Dichlorofluoromethane	ND	ug/L	1.0	1	09/28/15 20:50 75-43-4	
,2-Dichloropropane	ND	ug/L	1.0	1	09/28/15 20:50 78-87-5	
,3-Dichloropropane	ND	ug/L	1.0	1	09/28/15 20:50 142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1	09/28/15 20:50 594-20-7	
,1-Dichloropropene	ND	ug/L	1.0	1	09/28/15 20:50 563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1	09/28/15 20:50 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	1.0	1	09/28/15 20:50 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	5.0	1	09/28/15 20:50 60-29-7	
Ethylbenzene	ND	ug/L	1.0	1	09/28/15 20:50 100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1	09/28/15 20:50 87-68-3	
sopropylbenzene (Cumene)	ND	ug/L	1.0	1	09/28/15 20:50 98-82-8	
o-Isopropyltoluene	ND	ug/L	1.0	1	09/28/15 20:50 99-87-6	
Methylene Chloride	ND	ug/L	1.0	1	09/28/15 20:50 75-09-2	
4-Methyl-2-pentanone (MIBK)	ND ND	ug/L ug/L	5.0	1	09/28/15 20:50 108-10-1	
Methyl-tert-butyl ether	ND ND	ug/L ug/L	1.0	1	09/28/15 20:50 1634-04-4	

## REPORT OF LABORATORY ANALYSIS

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#### **ANALYTICAL RESULTS**

Project: BETA NIROP
Pace Project No.: 40121790

Date: 09/29/2015 03:02 PM

Sample: PMW-02	Lab ID: 401	21790001	Collected: 09/25/1	5 13:20	Received: 09/26/15 09:50	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared Analyzed	CAS No.	Qua
8260 MSV	Analytical Meth	nod: EPA 82	260				
Naphthalene	ND	ug/L	5.0	1	09/28/15 20:	50 91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1	09/28/15 20:	50 103-65-1	
Styrene	ND	ug/L	1.0	1	09/28/15 20:	50 100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1	09/28/15 20:	50 630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1	09/28/15 20:	50 79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1	09/28/15 20:	50 127-18-4	
Tetrahydrofuran	ND	ug/L	5.0	1	09/28/15 20:	50 109-99-9	
Toluene	ND	ug/L	1.0	1	09/28/15 20:	50 108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1	09/28/15 20:	50 87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1	09/28/15 20:	50 120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1	09/28/15 20:	50 71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1	09/28/15 20:	50 79-00-5	
Trichloroethene	30.2	ug/L	1.0	1	09/28/15 20:	50 79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1	09/28/15 20:	50 75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1	09/28/15 20:	50 96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	5.0	1	09/28/15 20:	50 76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1	09/28/15 20:	50 95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1	09/28/15 20:	50 108-67-8	
Vinyl chloride	3.6	ug/L	1.0	1	09/28/15 20:	50 75-01-4	
m&p-Xylene	ND	ug/L	2.0	1	09/28/15 20:	50 179601-23-1	
o-Xylene	ND	ug/L	1.0	1	09/28/15 20:	50 95-47-6	
Surrogates							
4-Bromofluorobenzene (S)	99	%	70-130	1		50 460-00-4	
Dibromofluoromethane (S)	91	%	70-130	1		50 1868-53-7	
Toluene-d8 (S)	113	%	70-130	1	09/28/15 20:	50 2037-26-5	



#### **ANALYTICAL RESULTS**

Project: BETA NIROP
Pace Project No.: 40121790

Date: 09/29/2015 03:02 PM

Sample: PMW-01	Lab ID: 401	21790002	Collected: 09/25/1	15 14:20	Received:	09/26/15 09:50	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260 MSV	Analytical Met	hod: EPA 82	260					
Acetone	ND	ug/L	100	5		09/29/15 08:21	1 67-64-1	
Allyl chloride	ND	ug/L	25.0	5		09/29/15 08:21	1 107-05-1	
Benzene	ND	ug/L	5.0	5		09/29/15 08:21	1 71-43-2	
Bromobenzene	ND	ug/L	5.0	5		09/29/15 08:21	1 108-86-1	
Bromochloromethane	ND	ug/L	5.0	5		09/29/15 08:21	1 74-97-5	
Bromodichloromethane	ND	ug/L	5.0	5		09/29/15 08:21	1 75-27-4	
Bromoform	ND	ug/L	5.0	5		09/29/15 08:21	1 75-25-2	
Bromomethane	ND	ug/L	25.0	5		09/29/15 08:21	1 74-83-9	
2-Butanone (MEK)	ND	ug/L	100	5		09/29/15 08:21	1 78-93-3	
n-Butylbenzene	ND	ug/L	5.0	5		09/29/15 08:21	1 104-51-8	
sec-Butylbenzene	ND	ug/L	25.0	5		09/29/15 08:21		
ert-Butylbenzene	ND	ug/L	5.0	5		09/29/15 08:21		
Carbon tetrachloride	ND	ug/L	5.0	5		09/29/15 08:21		
Chlorobenzene	ND	ug/L	5.0	5		09/29/15 08:21		
Chloroethane	ND	ug/L	5.0	5		09/29/15 08:21		
Chloroform	ND	ug/L	25.0	5		09/29/15 08:21		
Chloromethane	ND	ug/L	5.0	5		09/29/15 08:21		
-Chlorotoluene	ND	ug/L	5.0	5		09/29/15 08:21		
-Chlorotoluene	ND	ug/L	5.0	5		09/29/15 08:21		
,2-Dibromo-3-chloropropane	ND ND	ug/L	25.0	5		09/29/15 08:21		
Dibromochloromethane	ND ND	ug/L	5.0	5		09/29/15 08:21		
,2-Dibromoethane (EDB)	ND ND	-	5.0	5		09/29/15 08:21		
)ibromomethane	ND ND	ug/L	5.0	5		09/29/15 08:21		
	ND ND	ug/L	5.0	5		09/29/15 08:21		
,2-Dichlorobenzene		ug/L		5				
,3-Dichlorobenzene	ND	ug/L	5.0			09/29/15 08:21		
,4-Dichlorobenzene	ND	ug/L	5.0	5		09/29/15 08:21		
Dichlorodifluoromethane	ND	ug/L	5.0	5		09/29/15 08:21		
,1-Dichloroethane	17.3	ug/L	5.0	5		09/29/15 08:21		
,2-Dichloroethane	ND	ug/L	5.0	5		09/29/15 08:21		
,1-Dichloroethene	10.1	ug/L	5.0	5		09/29/15 08:21		
sis-1,2-Dichloroethene	229	ug/L	5.0	5		09/29/15 08:21		
rans-1,2-Dichloroethene	438	ug/L	5.0	5		09/29/15 08:21		
Dichlorofluoromethane	ND	ug/L	5.0	5		09/29/15 08:21		
,2-Dichloropropane	ND	ug/L	5.0	5		09/29/15 08:21		
,3-Dichloropropane	ND	ug/L	5.0	5		09/29/15 08:21		
,2-Dichloropropane	ND	ug/L	5.0	5		09/29/15 08:21		
,1-Dichloropropene	ND	ug/L	5.0	5		09/29/15 08:21		
is-1,3-Dichloropropene	ND	ug/L	5.0	5		09/29/15 08:21		
rans-1,3-Dichloropropene	ND	ug/L	5.0	5		09/29/15 08:21	1 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	25.0	5		09/29/15 08:21		
Ethylbenzene	ND	ug/L	5.0	5		09/29/15 08:21		
Hexachloro-1,3-butadiene	ND	ug/L	25.0	5		09/29/15 08:21	1 87-68-3	
sopropylbenzene (Cumene)	ND	ug/L	5.0	5		09/29/15 08:21	1 98-82-8	
p-Isopropyltoluene	ND	ug/L	5.0	5		09/29/15 08:21	1 99-87-6	
Methylene Chloride	ND	ug/L	5.0	5		09/29/15 08:21	1 75-09-2	
-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	5		09/29/15 08:21		
Methyl-tert-butyl ether	ND	ug/L	5.0	5		09/29/15 08:21		

41 Bellevue Street - Suite 9 Green Bay, WI 54302 (920)469-2436



#### **ANALYTICAL RESULTS**

Project: BETA NIROP
Pace Project No.: 40121790

Date: 09/29/2015 03:02 PM

Sample: PMW-01	Lab ID: 401	21790002	Collected: 09/25/1	5 14:20	Received: 09/26/15 09:50	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared Analyzed	CAS No.	Qua
8260 MSV	Analytical Meth	nod: EPA 82	260				
Naphthalene	ND	ug/L	25.0	5	09/29/15 08:21	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	5	09/29/15 08:21	103-65-1	
Styrene	ND	ug/L	5.0	5	09/29/15 08:21	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	5	09/29/15 08:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	5	09/29/15 08:21	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	5	09/29/15 08:21	127-18-4	
Tetrahydrofuran	ND	ug/L	25.0	5	09/29/15 08:21	109-99-9	
Toluene	ND	ug/L	5.0	5	09/29/15 08:21	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	25.0	5	09/29/15 08:21	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	25.0	5	09/29/15 08:21	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	5	09/29/15 08:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	5	09/29/15 08:21	79-00-5	
Trichloroethene	332	ug/L	5.0	5	09/29/15 08:21	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	5	09/29/15 08:21	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	5	09/29/15 08:21	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	25.0	5	09/29/15 08:21	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	5	09/29/15 08:21	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	5	09/29/15 08:21	108-67-8	
Vinyl chloride	ND	ug/L	5.0	5	09/29/15 08:21	75-01-4	
m&p-Xylene	ND	ug/L	10.0	5	09/29/15 08:21	179601-23-1	
o-Xylene	ND	ug/L	5.0	5	09/29/15 08:21	95-47-6	
Surrogates							
4-Bromofluorobenzene (S)	100	%	70-130	5	09/29/15 08:21		
Dibromofluoromethane (S)	96	%	70-130	5	09/29/15 08:21	1868-53-7	
Toluene-d8 (S)	108	%	70-130	5	09/29/15 08:21	2037-26-5	



#### **ANALYTICAL RESULTS**

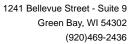
Project: BETA NIROP
Pace Project No.: 40121790

Date: 09/29/2015 03:02 PM

Sample: TRIP BLANK	Lab ID: 401	21790003	Collected: 09/25/1	5 08:00	Received: 09/26/15 09:50 Matrix: Water
Parameters	Results	Units	Report Limit	DF	Prepared Analyzed CAS No. Qu
8260 MSV	Analytical Met	hod: EPA 82	260		
Acetone	ND	ug/L	20.0	1	09/28/15 20:05 67-64-1
Allyl chloride	ND	ug/L	5.0	1	09/28/15 20:05 107-05-1
Benzene	ND	ug/L	1.0	1	09/28/15 20:05 71-43-2
Bromobenzene	ND	ug/L	1.0	1	09/28/15 20:05 108-86-1
Bromochloromethane	ND	ug/L	1.0	1	09/28/15 20:05 74-97-5
Bromodichloromethane	ND	ug/L	1.0	1	09/28/15 20:05 75-27-4
Bromoform	ND	ug/L	1.0	1	09/28/15 20:05 75-25-2
Bromomethane	ND	ug/L	5.0	1	09/28/15 20:05 74-83-9
2-Butanone (MEK)	ND	ug/L	20.0	1	09/28/15 20:05 78-93-3
n-Butylbenzene	ND	ug/L	1.0	1	09/28/15 20:05 104-51-8
sec-Butylbenzene	ND	ug/L	5.0	1	09/28/15 20:05 135-98-8
tert-Butylbenzene	ND	ug/L	1.0	1	09/28/15 20:05 98-06-6
Carbon tetrachloride	ND	ug/L	1.0	1	09/28/15 20:05 56-23-5
Chlorobenzene	ND	ug/L	1.0	1	09/28/15 20:05 108-90-7
Chloroethane	ND ND	•	1.0	1	09/28/15 20:05 75-00-3
		ug/L			
Chloroform	ND	ug/L	5.0	1	09/28/15 20:05 67-66-3
Chloromethane	ND	ug/L	1.0	1	09/28/15 20:05 74-87-3
2-Chlorotoluene	ND	ug/L	1.0	1	09/28/15 20:05 95-49-8
I-Chlorotoluene	ND	ug/L	1.0	1	09/28/15 20:05 106-43-4
,2-Dibromo-3-chloropropane	ND	ug/L	5.0	1	09/28/15 20:05 96-12-8
Dibromochloromethane	ND	ug/L	1.0	1	09/28/15 20:05 124-48-1
I,2-Dibromoethane (EDB)	ND	ug/L	1.0	1	09/28/15 20:05 106-93-4
Dibromomethane	ND	ug/L	1.0	1	09/28/15 20:05 74-95-3
1,2-Dichlorobenzene	ND	ug/L	1.0	1	09/28/15 20:05 95-50-1
,3-Dichlorobenzene	ND	ug/L	1.0	1	09/28/15 20:05 541-73-1
1,4-Dichlorobenzene	ND	ug/L	1.0	1	09/28/15 20:05 106-46-7
Dichlorodifluoromethane	ND	ug/L	1.0	1	09/28/15 20:05 75-71-8
1,1-Dichloroethane	ND	ug/L	1.0	1	09/28/15 20:05 75-34-3
1,2-Dichloroethane	ND	ug/L	1.0	1	09/28/15 20:05 107-06-2
I,1-Dichloroethene	ND	ug/L	1.0	1	09/28/15 20:05 75-35-4
cis-1,2-Dichloroethene	ND	ug/L	1.0	1	09/28/15 20:05 156-59-2
rans-1,2-Dichloroethene	ND	ug/L	1.0	1	09/28/15 20:05 156-60-5
Dichlorofluoromethane	ND	ug/L	1.0	1	09/28/15 20:05 75-43-4
I,2-Dichloropropane	ND	ug/L	1.0	1	09/28/15 20:05 78-87-5
,3-Dichloropropane	ND	ug/L	1.0	1	09/28/15 20:05 142-28-9
2,2-Dichloropropane	ND ND	J	1.0	•	09/28/15 20:05 594-20-7
• •	ND ND	ug/L	1.0	1 1	09/28/15 20:05 563-58-6
1,1-Dichloropropene		ug/L			
cis-1,3-Dichloropropene	ND	ug/L	1.0	1	09/28/15 20:05 10061-01-5
rans-1,3-Dichloropropene	ND	ug/L	1.0	1	09/28/15 20:05 10061-02-6
Diethyl ether (Ethyl ether)	ND	ug/L	5.0	1	09/28/15 20:05 60-29-7
Ethylbenzene	ND	ug/L	1.0	1	09/28/15 20:05 100-41-4
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1	09/28/15 20:05 87-68-3
sopropylbenzene (Cumene)	ND	ug/L	1.0	1	09/28/15 20:05 98-82-8
o-Isopropyltoluene	ND	ug/L	1.0	1	09/28/15 20:05 99-87-6
Methylene Chloride	ND	ug/L	1.0	1	09/28/15 20:05 75-09-2
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1	09/28/15 20:05 108-10-1
Methyl-tert-butyl ether	ND	ug/L	1.0	1	09/28/15 20:05 1634-04-4

#### **REPORT OF LABORATORY ANALYSIS**

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#### **ANALYTICAL RESULTS**

Project: BETA NIROP
Pace Project No.: 40121790

Date: 09/29/2015 03:02 PM

Sample: TRIP BLANK	Lab ID: 401	21790003	Collected: 09/25/1	5 08:00	Received: 09/26/15 09	:50 Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared Analy	zed CAS No.	Qua
8260 MSV	Analytical Meth	nod: EPA 82	260				
Naphthalene	ND	ug/L	5.0	1	09/28/15	20:05 91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1	09/28/15	20:05 103-65-1	
Styrene	ND	ug/L	1.0	1	09/28/15	20:05 100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1	09/28/15	5 20:05 630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1	09/28/15	20:05 79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1	09/28/15	20:05 127-18-4	
Tetrahydrofuran	ND	ug/L	5.0	1	09/28/15	20:05 109-99-9	
Toluene	ND	ug/L	1.0	1	09/28/15	20:05 108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1	09/28/15	20:05 87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1	09/28/15	20:05 120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1	09/28/15	20:05 71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1	09/28/15	20:05 79-00-5	
Trichloroethene	ND	ug/L	1.0	1	09/28/15	20:05 79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1	09/28/15	5 20:05 75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1	09/28/15	20:05 96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	5.0	1	09/28/15	20:05 76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1	09/28/15	20:05 95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1	09/28/15	20:05 108-67-8	
Vinyl chloride	ND	ug/L	1.0	1	09/28/15	20:05 75-01-4	
m&p-Xylene	ND	ug/L	2.0	1	09/28/15	20:05 179601-23-1	
o-Xylene	ND	ug/L	1.0	1	09/28/15	20:05 95-47-6	
Surrogates							
4-Bromofluorobenzene (S)	101	%	70-130	1	09/28/15	20:05 460-00-4	
Dibromofluoromethane (S)	91	%	70-130	1	09/28/15	20:05 1868-53-7	
Toluene-d8 (S)	112	%	70-130	1	09/28/15	20:05 2037-26-5	



#### **QUALITY CONTROL DATA**

Project: BETA NIROP
Pace Project No.: 40121790

Date: 09/29/2015 03:02 PM

QC Batch: MSV/30331 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV

Associated Lab Samples: 40121790001, 40121790002, 40121790003

METHOD BLANK: 1228186 Matrix: Water

Associated Lab Samples: 40121790001, 40121790002, 40121790003

	,	Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND ND	1.0	09/28/15 17:48	
1,1,1-Trichloroethane	ug/L	ND	1.0	09/28/15 17:48	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	09/28/15 17:48	
1,1,2-Trichloroethane	ug/L	ND	1.0	09/28/15 17:48	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	5.0	09/28/15 17:48	
1,1-Dichloroethane	ug/L	ND	1.0	09/28/15 17:48	
1,1-Dichloroethene	ug/L	ND	1.0	09/28/15 17:48	
1,1-Dichloropropene	ug/L	ND	1.0	09/28/15 17:48	
1,2,3-Trichlorobenzene	ug/L	ND	5.0	09/28/15 17:48	
1,2,3-Trichloropropane	ug/L	ND	1.0	09/28/15 17:48	
1,2,4-Trichlorobenzene	ug/L	ND	5.0	09/28/15 17:48	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	09/28/15 17:48	
1,2-Dibromo-3-chloropropane	ug/L	ND	5.0	09/28/15 17:48	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	09/28/15 17:48	
1,2-Dichlorobenzene	ug/L	ND	1.0	09/28/15 17:48	
1,2-Dichloroethane	ug/L	ND	1.0	09/28/15 17:48	
1,2-Dichloropropane	ug/L	ND	1.0	09/28/15 17:48	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	09/28/15 17:48	
1,3-Dichlorobenzene	ug/L	ND	1.0	09/28/15 17:48	
1,3-Dichloropropane	ug/L	ND	1.0	09/28/15 17:48	
1,4-Dichlorobenzene	ug/L	ND	1.0	09/28/15 17:48	
2,2-Dichloropropane	ug/L	ND	1.0	09/28/15 17:48	
2-Butanone (MEK)	ug/L	ND	20.0	09/28/15 17:48	
2-Chlorotoluene	ug/L	ND	1.0	09/28/15 17:48	
4-Chlorotoluene	ug/L	ND	1.0	09/28/15 17:48	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	09/28/15 17:48	
Acetone	ug/L	ND	20.0	09/28/15 17:48	
Allyl chloride	ug/L	ND	5.0	09/28/15 17:48	
Benzene	ug/L	ND	1.0	09/28/15 17:48	
Bromobenzene	ug/L	ND	1.0	09/28/15 17:48	
Bromochloromethane	ug/L	ND	1.0	09/28/15 17:48	
Bromodichloromethane	ug/L	ND	1.0	09/28/15 17:48	
Bromoform	ug/L	ND	1.0	09/28/15 17:48	
Bromomethane	ug/L	ND	5.0	09/28/15 17:48	
Carbon tetrachloride	ug/L	ND	1.0	09/28/15 17:48	
Chlorobenzene	ug/L	ND	1.0	09/28/15 17:48	
Chloroethane	ug/L	ND	1.0	09/28/15 17:48	
Chloroform	ug/L	ND	5.0	09/28/15 17:48	
Chloromethane	ug/L	ND	1.0	09/28/15 17:48	
cis-1,2-Dichloroethene	ug/L	ND	1.0	09/28/15 17:48	
cis-1,3-Dichloropropene	ug/L	ND	1.0	09/28/15 17:48	

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.



#### **QUALITY CONTROL DATA**

Project: BETA NIROP
Pace Project No.: 40121790

Date: 09/29/2015 03:02 PM

METHOD BLANK: 1228186 Matrix: Water

Associated Lab Samples: 40121790001, 40121790002, 40121790003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/L	ND	1.0	09/28/15 17:48	
Dibromomethane	ug/L	ND	1.0	09/28/15 17:48	
Dichlorodifluoromethane	ug/L	ND	1.0	09/28/15 17:48	
Dichlorofluoromethane	ug/L	ND	1.0	09/28/15 17:48	
Diethyl ether (Ethyl ether)	ug/L	ND	5.0	09/28/15 17:48	
Ethylbenzene	ug/L	ND	1.0	09/28/15 17:48	
Hexachloro-1,3-butadiene	ug/L	ND	5.0	09/28/15 17:48	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	09/28/15 17:48	
m&p-Xylene	ug/L	ND	2.0	09/28/15 17:48	
Methyl-tert-butyl ether	ug/L	ND	1.0	09/28/15 17:48	
Methylene Chloride	ug/L	ND	1.0	09/28/15 17:48	
n-Butylbenzene	ug/L	ND	1.0	09/28/15 17:48	
n-Propylbenzene	ug/L	ND	1.0	09/28/15 17:48	
Naphthalene	ug/L	ND	5.0	09/28/15 17:48	
o-Xylene	ug/L	ND	1.0	09/28/15 17:48	
p-Isopropyltoluene	ug/L	ND	1.0	09/28/15 17:48	
sec-Butylbenzene	ug/L	ND	5.0	09/28/15 17:48	
Styrene	ug/L	ND	1.0	09/28/15 17:48	
tert-Butylbenzene	ug/L	ND	1.0	09/28/15 17:48	
Tetrachloroethene	ug/L	ND	1.0	09/28/15 17:48	
Tetrahydrofuran	ug/L	ND	5.0	09/28/15 17:48	
Toluene	ug/L	ND	1.0	09/28/15 17:48	
trans-1,2-Dichloroethene	ug/L	ND	1.0	09/28/15 17:48	
trans-1,3-Dichloropropene	ug/L	ND	1.0	09/28/15 17:48	
Trichloroethene	ug/L	ND	1.0	09/28/15 17:48	
Trichlorofluoromethane	ug/L	ND	1.0	09/28/15 17:48	
Vinyl chloride	ug/L	ND	1.0	09/28/15 17:48	
4-Bromofluorobenzene (S)	%	105	70-130	09/28/15 17:48	
Dibromofluoromethane (S)	%	103	70-130	09/28/15 17:48	
Toluene-d8 (S)	%	100	70-130	09/28/15 17:48	

LABORATORY CONTROL SAMPLE:	1228187					
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Faianietei				/0 Nec		Qualifiers
1,1,1-Trichloroethane	ug/L	50	50.6	101	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	53.1	106	70-130	
1,1,2-Trichloroethane	ug/L	50	53.4	107	70-130	
1,1,2-Trichlorotrifluoroethane	ug/L	50	50.3	101	50-150	
1,1-Dichloroethane	ug/L	50	47.9	96	70-130	
1,1-Dichloroethene	ug/L	50	50.0	100	70-130	
1,2,4-Trichlorobenzene	ug/L	50	52.4	105	70-130	
1,2-Dibromo-3-chloropropane	ug/L	50	50.5	101	50-150	
1,2-Dibromoethane (EDB)	ug/L	50	52.0	104	70-130	
1.2-Dichlorobenzene	ua/l	50	52.6	105	70-130	

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.



#### **QUALITY CONTROL DATA**

Project: BETA NIROP
Pace Project No.: 40121790

Date: 09/29/2015 03:02 PM

LABORATORY CONTROL SAMPLE:	1228187					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
2-Dichloroethane	ug/L	50	49.6	99	70-131	
2-Dichloropropane	ug/L	50	49.5	99	70-130	
-Dichlorobenzene	ug/L	50	53.8	108	70-130	
-Dichlorobenzene	ug/L	50	53.7	107	70-130	
nzene	ug/L	50	45.1	90	70-130	
nodichloromethane	ug/L	50	48.9	98	70-130	
moform	ug/L	50	45.5	91	68-130	
omomethane	ug/L	50	38.1	76	38-137	
rbon tetrachloride	ug/L	50	45.8	92	70-130	
lorobenzene	ug/L	50	50.5	101	70-130	
nloroethane	ug/L	50	49.8	100	70-136	
loroform	ug/L	50	46.2	92	70-130	
loromethane	ug/L	50	47.6	95	48-144	
-1,2-Dichloroethene	ug/L	50	47.7	95	70-130	
-1,3-Dichloropropene	ug/L	50	45.4	91	70-130	
promochloromethane	ug/L	50	47.6	95	70-130	
hlorodifluoromethane	ug/L	50	42.3	85	33-157	
ylbenzene	ug/L	50	54.0	108	70-132	
propylbenzene (Cumene)	ug/L	50	53.3	107	70-130	
o-Xylene	ug/L	100	104	104	70-131	
hyl-tert-butyl ether	ug/L	50	49.7	99	48-141	
hylene Chloride	ug/L	50	47.5	95	70-130	
ylene	ug/L	50	51.2	102	70-131	
rene	ug/L	50	51.8	104	70-130	
achloroethene	ug/L	50	46.5	93	70-130	
uene	ug/L	50	53.1	106	70-130	
ns-1,2-Dichloroethene	ug/L	50	47.4	95	70-130	
ns-1,3-Dichloropropene	ug/L	50	50.6	101	70-130	
chloroethene	ug/L	50	47.9	96	70-130	
chlorofluoromethane	ug/L	50	51.4	103	50-150	
yl chloride	ug/L	50	49.4	99	65-142	
romofluorobenzene (S)	%			98	70-130	
romofluoromethane (S)	%			93	70-130	
iene-d8 (S)	%			112	70-130	

MATRIX SPIKE & MATRIX SPIR	KE DUPLI	CATE: 12281	88		1228189							
Parameter	Units	40121736006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1-Trichloroethane	ug/L	3.0	50	50	60.3	52.1	115	98	70-130	15	20	
1,1,2,2-Tetrachloroethane	ug/L	<1.0	50	50	50.5	51.4	101	103	70-130	2	20	
1,1,2-Trichloroethane	ug/L	<1.0	50	50	51.8	50.9	104	102	70-130	2	20	
1,1,2-Trichlorotrifluoroethane	ug/L	<5.0	50	50	58.5	51.1	109	94	50-151	14	20	
1,1-Dichloroethane	ug/L	53.3	50	50	115	94.3	123	82	70-134	20	20	
1,1-Dichloroethene	ug/L	<1.0	50	50	56.6	48.6	113	97	70-139	15	20	

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



#### **QUALITY CONTROL DATA**

Project: BETA NIROP
Pace Project No.: 40121790

Date: 09/29/2015 03:02 PM

MATRIX SPIKE & MATRIX SPIR	KE DUPLIC	CATE: 122818			1228189							
			MS	MSD								
Damanatan		40121736006	Spike	Spike	MS	MSD	MS	MSD	% Rec	DDD	Max	•
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qua
1,2,4-Trichlorobenzene	ug/L	<5.0	50	50	49.2	52.1	98	104	70-130	6	20	
1,2-Dibromo-3- chloropropane	ug/L	<5.0	50	50	51.8	47.5	104	95	50-150	9	20	
1,2-Dibromoethane (EDB)	ug/L	<1.0	50	50	52.9	50.6	106	101	70-130	5	20	
1,2-Dichlorobenzene	ug/L	1.4	50	50	51.3	52.1	100	101	70-130	1	20	
1,2-Dichloroethane	ug/L	<1.0	50	50	51.8	46.2	104	92	70-132	11	20	
1,2-Dichloropropane	ug/L	<1.0	50	50	54.0	47.1	108	94	70-130	14	20	
1,3-Dichlorobenzene	ug/L	<1.0	50	50	50.5	50.9	101	102	70-130	1	20	
1,4-Dichlorobenzene	ug/L	<1.0	50	50	48.6	49.0	97	98	70-130	1	20	
Benzene	ug/L	<1.0	50	50	49.5	43.5	99	87	70-130	13	20	
Bromodichloromethane	ug/L	<1.0	50	50	53.6	48.6	107	97	70-132	10	20	
Bromoform	ug/L	<1.0	50	50	46.2	44.9	92	90	68-130	3	20	
Bromomethane	ug/L	<5.0	50	50	41.3	36.0	83	72	38-141	14	20	
Carbon tetrachloride	ug/L	<1.0	50	50	52.7	47.6	105	95	70-130	10	20	
Chlorobenzene	ug/L	<1.0	50	50	49.2	48.3	98	97	70-130	2	20	
Chloroethane	ug/L	<1.0	50	50	57.7	48.7	115	97	66-152	17	20	
Chloroform	ug/L	<5.0	50	50	52.1	44.0	104	88	70-130	17	20	
Chloromethane	ug/L	<1.0	50	50	51.9	44.4	104	89	44-151	15	20	
cis-1,2-Dichloroethene	ug/L	6.0	50	50	59.6	52.0	107	92	70-130	13	20	
cis-1,3-Dichloropropene	ug/L	<1.0	50	50	49.4	44.4	99	89	70-130	11	20	
Dibromochloromethane	ug/L	<1.0	50	50	48.2	47.2	96	94	70-130	2	20	
Dichlorodifluoromethane	ug/L	<1.0	50	50	47.6	41.5	95	83	29-160	14	20	
Ethylbenzene	ug/L	<1.0	50	50	53.1	50.7	106	101	70-132	5	20	
sopropylbenzene (Cumene)	ug/L	<1.0	50	50	52.6	50.7	105	101	70-130	4	20	
m&p-Xylene	ug/L	<2.0	100	100	105	101	105	101	70-131	4	20	
Methyl-tert-butyl ether	ug/L	<1.0	50	50	55.9	47.9	112	96	48-143	15	20	
Methylene Chloride	ug/L	<1.0	50	50	52.7	44.6	105	89	70-130	17	20	
o-Xylene	ug/L	<1.0	50	50	51.1	50.3	102	101	70-131	2	20	
Styrene	ug/L	<1.0	50	50	51.1	49.9	102	100	70-130	2	20	
Tetrachloroethene	ug/L	3.3	50	50	48.7	47.4	91	88	70-130	3	20	
Toluene	ug/L	<1.0	50	50	52.1	50.9	104	102	70-130	2	20	
rans-1,2-Dichloroethene	ug/L	<1.0	50	50	53.5	46.3	105	91	70-132	15	20	
rans-1,3-Dichloropropene	ug/L	<1.0	50	50	49.5	49.2	99	98	70-130	1	20	
Trichloroethene	ug/L	14.2	50	50	69.2	60.5	110	93	70-130	13	20	
Frichlorofluoromethane	ug/L	<1.0	50	50	58.2	49.8	116	100	50-153	16	20	
Vinyl chloride	ug/L	1.3	50	50	55.4	49.6	108	97	60-155	11	20	
4-Bromofluorobenzene (S)	%	1.0	30	50	00.4	10.0	106	103	70-130	• • •	_5	
Dibromofluoromethane (S)	%						98	96	70-130			
Foluene-d8 (S)	%						104	110	70-130			

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.



#### **QUALIFIERS**

Project: BETA NIROP
Pace Project No.: 40121790

#### **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.

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.

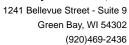
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

Date: 09/29/2015 03:02 PM

PASI-G Pace Analytical Services - Green Bay





#### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: BETA NIROP
Pace Project No.: 40121790

Date: 09/29/2015 03:02 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40121790001	PMW-02	EPA 8260	MSV/30331	_	
40121790002	PMW-01	EPA 8260	MSV/30331		
40121790003	TRIP BLANK	EPA 8260	MSV/30331		

Face Analytical www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

Company: BEGENESIS Required Client Information Section A 日から EMODER PERCENES D. UM AN CLEMENTE LA 97673 Required Client Information Section D 120 BONK PMW-02 PINE O (A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE CALLE SIMBER SAMPLE ID ADDITIONAL COMMENTS KO X Waste Water Product Soil/Solid Oil Wipe Air Tissue Other Drinking Water Water Matrix Codes
MATRIX / CODE ORIGINAL 300  $\forall$ Required Project Information Project Number Project Name: Report To: Section B ourchase Order No.: ATTOM RMODEER RELEASIS. COM OT AR MADE SE PANT DA 700 Tourse Meanway RYMIN € 1 RELINQUISHED BY / AFFILIATION MATRIX CODE (see valid codes to left) RETA 9 0 SAMPLE TYPE (G=GRAB C=COMP) DATE COMPOSITE START NIROP SAMPLER NAME AND SIGNATURE TIME COLLECTED MECOM 9/25/15 PRINT Name of SAMPLER: 112515 SIGNATURE of SAMPLER: The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately COMPOSITE END/GRAB B イなり 1320 TIME 200 N DATE SAMPLE TEMP AT COLLECTION Reference:
Pace Project
Manager: 4446 841 6 Invoice Information Section C S Company No # OF CONTAINERS ace Quote TIME Unpreserved H<sub>2</sub>SO, Preservatives HNO<sub>3</sub> ととい HCI ECENESIS NaOH Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> ACCEPTED BY / AFFILIATION WORLFEL Methanol うろがられる EMISEN Other 🛮 Analysis Test 🌡 Y/ N . 8266 VOC (MM/DD/YY): Requested Analysis Filtered (Y/N) REGULATORY AGENCY Site Location 2 UST NPDES 8 DATE STATE: 8 TIME RCRA GROUND WATER Page: ()· Temp in °C 5 Residual Chlorine (Y/N) Received on (6) SAMPLE CONDITIONS Pace Project No./ Lab I.D. Ice (Y/N) -HOSSIN CCCustody DRINKING WATER OTHER Sealed Cooler (Y/N) and annually a 0 O Samples Intact (Y/N) Pa ge 17 of 18

ITEM#

N

5 9

\*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

F-ALL-Q-020rev.07, 15-May-2007

# **Sample Condition Upon Receipt**

Pace Analytical Services, Inc. 1241 Bellevue Street, Suite 9 Green Bay, WI 54302

Pace Analytical\*

Client Name: Reapport			Project #	WO# :	40121790
	)	***		BI B B 11 18 B 13	
Courier: Fed Ex T UPS Client Pac Tracking #: 229	e Other:				
Custody Seal on Cooler/Box Present: 17 yes	<u> </u>			40121790	
Custody Seal on Samples Present: Tyes			: ௺yes ௺no		
Packing Material:  Bubble Wrap  Bubble		and the same of th	: 「yes / no e 「Other		
Thermometer Used		Non	Blue Dry None		
Cooler Temperature Uncorr: 3 /Corr:	2	Service Comments	gical Tissue is Fr		ice, cooling process has begun
Temp Blank Present:		_		r no [	Person examining contents:
Temp should be above freezing to 6°C for all sample exc Frozen Biota Samples should be received ≤ 0°C.	ept Biota.		Comments:		Date: 9 - 26 · 15 Initials:
Chain of Custody Present:	ØYes □No	□n/a			- 1 1
Chain of Custody Filled Out:	□Yes □No	□n/a			
Chain of Custody Relinquished:	✓Yes □No	□n/a	<u> </u>		
Sampler Name & Signature on COC:	√ Yes □No	□n/a	1		
Samples Arrived within Hold Time:	ZYes □No	□n/a	5.		
- VOA Samples frozen upon receipt	☐Yes ☐No		Date/Time:	•	
Short Hold Time Analysis (<72hr):	ØYes □No	□n/a	6.		
Rush Turn Around Time Requested:	□Yes ⊠No	□n/a	7.		
Sufficient Volume:	ØYes □No	□n/a	8.		
Correct Containers Used:	ØYes □No	□n/a	9.		
-Pace Containers Used:	ØYes □No	□Ņ/A			
-Pace IR Containers Used:	□Yes □No	ØN/A			
Containers Intact:	ØYes □No	□n/a	10.		
Filtered volume received for Dissolved tests	□Yes □No	ØN/A	11.		
Sample Labels match COC:	ØYes □No	□n/a	12.		. •.
-Includes date/time/ID/Analysis Matrix:	<u> W                                    </u>				
All containers needing preservation have been checked. (Non-Compliance noted in 13.)  All containers needing preservation are found to be in	□Yes □No	ØN/A	13. T HNO3	3 F H2SO4 F	NaOH   NaOH +ZnAct
compliance with EPA recommendation. (HNO3, H2SO4 ≤2; NaOH+ZnAct ≥9, NaOH ≥12)	□Yes □No	ØN/A	·		
exceptions: VOA, coliform, TOC, TOX, TOH, O&G, WIDROW, Phenolics, OTHER:	ZYes □No		Initial when completed	Lab Std #ID of preservative	Date/ Time:
Headspace in VOA Vials ( >6mm):	□Yes ØNo	□n/a	14.		
Trip Blank Present:	ØYes □No	□n/a	15.		
Trip Blank Custody Seals Present	ØYes □No	□n/a			
Pace Trip Blank Lot # (if purchased): 081015 -	SBZA		<u> </u>		
Client Notification/ Resolution:				checked, see attache	ed form for additional comments
Person Contacted:  Comments/ Resolution:		Date/T	īme:		1
Comments/ Nesolution.					
Project Manager Review:			Uw	Date:	9/28/1-





November 03, 2015

Melinda Pham Regenesis 1011 Calle Sombra San Clemente, CA 92673

RE: Project: PS Beta - NIROP

Pace Project No.: 10327623

#### Dear Melinda Pham:

Enclosed are the analytical results for sample(s) received by the laboratory on October 26, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI 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,

Jennifer Anderson jennifer.anderson@pacelabs.com Project Manager

**Enclosures** 

cc: Ryan Moore, Regenesis







#### **CERTIFICATIONS**

Project: PS Beta - NIROP

Pace Project No.: 10327623

#### **Minnesota Certification IDs**

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770 Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA Colorado Certification #Pace Connecticut Certification #: PH-0256 EPA Region 8 Certification #: 8TMS-L

Florida/NELAP Certification #: E87605 Guam Certification #:14-008r Georgia Certification #: 959 Georgia EPD #: Pace

Idaho Certification #: MN00064 Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01 Iowa Certification #: 368

Kansas Certification #: E-10167 Kentucky Dept of Envi. Protection - DW #90062 Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001 Maine Certification #: 2013011 Maryland Certification #: 322 Michigan DEPH Certification #: 9909 Mississippi Certification #: Pace Montana Certification #: MT0092 Nevada Certification #: MN\_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002

Minnesota Certification #: 027-053-137

New York Certification #: 11647 North Carolina Certification #: 530

North Carolina State Public Health #: 27700 North Dakota Certification #: R-036

Ohio EPA #: 4150 Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563

Puerto Rico Certification Saipan (CNMI) #:MP0003 South Carolina #:74003001 Texas Certification #: T104704192 Tennessee Certification #: 02818 Utah Certification #: MN000642013-4 Virginia DGS Certification #: 251 Washington Certification #: C486 West Virginia Certification #: 382 West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970





#### **SAMPLE SUMMARY**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10327623001	PMW-01	Water	10/26/15 14:40	10/26/15 18:12
10327623002	PMW-02	Water	10/26/15 13:20	10/26/15 18:12
10327623003	PMW-03	Water	10/26/15 17:10	10/26/15 18:12
10327623004	PMW-04	Water	10/26/15 16:05	10/26/15 18:12
10327623005	Trip Blank	Water	10/26/15 00:00	10/26/15 18:12





## **SAMPLE ANALYTE COUNT**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10327623001	PMW-01	EPA 8260B	LPM	70
10327623002	PMW-02	EPA 8260B	DR1, RTP	70
10327623003	PMW-03	EPA 8260B	LPM	70
10327623004	PMW-04	EPA 8260B	DJB	70
10327623005	Trip Blank	EPA 8260B	DR1	70

(612)607-1700



#### **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

Sample: PMW-01	Lab ID: 10	327623001	Collected: 10/26/1	15 14:40	Received:	10/26/15 18:12	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
3260B VOC	Analytical Me	thod: EPA 82	260B					
Acetone	ND	ug/L	200	10		10/29/15 13:1	6 67-64-1	
Allyl chloride	ND	ug/L	40.0	10		10/29/15 13:1	6 107-05-1	
Benzene	ND	ug/L	10.0	10		10/29/15 13:1	6 71-43-2	
Bromobenzene	ND	ug/L	10.0	10		10/29/15 13:1	6 108-86-1	
Bromochloromethane	ND	ug/L	10.0	10		10/29/15 13:1	6 74-97-5	
Bromodichloromethane	ND	ug/L	10.0	10		10/29/15 13:1	6 75-27-4	
Bromoform	ND	ug/L	40.0	10		10/29/15 13:1	6 75-25-2	
Bromomethane	ND	ug/L	40.0	10		10/29/15 13:1	6 74-83-9	CL
2-Butanone (MEK)	ND	ug/L	50.0	10		10/29/15 13:1	6 78-93-3	
n-Butylbenzene	ND	ug/L	10.0	10		10/29/15 13:1	6 104-51-8	
sec-Butylbenzene	ND	ug/L	10.0	10		10/29/15 13:1	6 135-98-8	
ert-Butylbenzene	ND	ug/L	10.0	10		10/29/15 13:1	6 98-06-6	
Carbon tetrachloride	ND	ug/L	10.0	10		10/29/15 13:1	6 56-23-5	
Chlorobenzene	ND	ug/L	10.0	10		10/29/15 13:1	6 108-90-7	
Chloroethane	ND	ug/L	10.0	10		10/29/15 13:1	6 75-00-3	
Chloroform	ND	ug/L	10.0	10		10/29/15 13:1	6 67-66-3	
Chloromethane	ND	ug/L	40.0	10		10/29/15 13:1	6 74-87-3	
2-Chlorotoluene	ND	ug/L	10.0	10		10/29/15 13:1	6 95-49-8	
I-Chlorotoluene	ND	ug/L	10.0	10		10/29/15 13:1	6 106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	40.0	10		10/29/15 13:1		
Dibromochloromethane	ND	ug/L	10.0	10		10/29/15 13:1		
I,2-Dibromoethane (EDB)	ND	ug/L	10.0	10		10/29/15 13:1		
Dibromomethane	ND	ug/L	40.0	10		10/29/15 13:1		
1,2-Dichlorobenzene	ND	ug/L	10.0	10		10/29/15 13:1		
,3-Dichlorobenzene	ND	ug/L	10.0	10		10/29/15 13:1		
1,4-Dichlorobenzene	ND	ug/L	10.0	10		10/29/15 13:1		
Dichlorodifluoromethane	ND	ug/L	10.0	10		10/29/15 13:1		
I,1-Dichloroethane	ND	ug/L	10.0	10		10/29/15 13:1		
I,2-Dichloroethane	ND	ug/L	10.0	10		10/29/15 13:1		
I,1-Dichloroethene	ND	ug/L	10.0	10		10/29/15 13:1		
cis-1,2-Dichloroethene	ND	ug/L	10.0	10		10/29/15 13:1		
rans-1,2-Dichloroethene	ND	ug/L	10.0	10		10/29/15 13:1		
Dichlorofluoromethane	ND	ug/L	10.0	10		10/29/15 13:1		
1,2-Dichloropropane	ND	ug/L	40.0	10		10/29/15 13:1		
1,3-Dichloropropane	ND	ug/L	10.0	10		10/29/15 13:1		
2,2-Dichloropropane	ND	ug/L	40.0	10		10/29/15 13:1	-	
I,1-Dichloropropene	ND	ug/L	10.0	10		10/29/15 13:1		
cis-1,3-Dichloropropene	ND	ug/L	40.0	10			6 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	40.0	10			6 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	40.0	10		10/29/15 13:1		
Ethylbenzene	ND	ug/L	10.0	10		10/29/15 13:1		
Hexachloro-1,3-butadiene	ND	ug/L	10.0	10		10/29/15 13:1		
sopropylbenzene (Cumene)	ND	ug/L	10.0	10		10/29/15 13:1		
p-Isopropyltoluene	ND	ug/L	10.0	10		10/29/15 13:1		
Methylene Chloride	ND	ug/L	40.0	10		10/29/15 13:1		
4-Methyl-2-pentanone (MIBK)	ND	ug/L	50.0	10		10/29/15 13:1		
TIVIOLITY A DOLLARIOUS (IVIDIX)	שוו	ug/∟	50.0	10		10/23/10 10.1	0 100 10-1	





#### **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

Sample: PMW-01	Lab ID: 103	27623001	Collected: 10/26/1	5 14:40	Received: 1	0/26/15 18:12	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	40.0	10		10/29/15 13:16	91-20-3	
n-Propylbenzene	ND	ug/L	10.0	10		10/29/15 13:16	5 103-65-1	
Styrene	ND	ug/L	10.0	10		10/29/15 13:16	6 100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	10.0	10		10/29/15 13:16	6 630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	10.0	10		10/29/15 13:16	6 79-34-5	
Tetrachloroethene	ND	ug/L	10.0	10		10/29/15 13:16	5 127-18-4	
Tetrahydrofuran	ND	ug/L	100	10		10/29/15 13:16	6 109-99-9	
Toluene	ND	ug/L	10.0	10		10/29/15 13:16	6 108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	10.0	10		10/29/15 13:16	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	10.0	10		10/29/15 13:16	5 120-82-1	
1,1,1-Trichloroethane	ND	ug/L	10.0	10		10/29/15 13:16	6 71-55-6	
1,1,2-Trichloroethane	ND	ug/L	10.0	10		10/29/15 13:16	6 79-00-5	
Trichloroethene	ND	ug/L	4.0	10		10/29/15 13:16	79-01-6	
Trichlorofluoromethane	ND	ug/L	10.0	10		10/29/15 13:16	5 75-69-4	
1,2,3-Trichloropropane	ND	ug/L	40.0	10		10/29/15 13:16	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	10.0	10		10/29/15 13:16	6 76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	10.0	10		10/29/15 13:16	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	10.0	10		10/29/15 13:16	6 108-67-8	
Vinyl chloride	ND	ug/L	4.0	10		10/29/15 13:16	5 75-01-4	
Xylene (Total)	ND	ug/L	30.0	10		10/29/15 13:16	6 1330-20-7	
Surrogates		•						
1,2-Dichloroethane-d4 (S)	1090	%.	75-125	10		10/29/15 13:16	6 17060-07-0	1M,S2
Toluene-d8 (S)	222	%.	75-125	10		10/29/15 13:16	6 2037-26-5	S2
4-Bromofluorobenzene (S)	121	%.	75-125	10		10/29/15 13:16	6 460-00-4	

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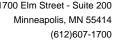
#### **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

Sample: PMW-02	Lab ID: 103	27623002	Collected: 10/26/1	15 13:20	Received:	10/26/15 18:12	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Met	hod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		10/27/15 22:3	0 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		10/27/15 22:3	0 107-05-1	
Benzene	ND	ug/L	1.0	1		10/27/15 22:3	0 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/27/15 22:3	0 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/27/15 22:3	0 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/27/15 22:3	0 75-27-4	
Bromoform	ND	ug/L	4.0	1		10/27/15 22:3	0 75-25-2	
Bromomethane	ND	ug/L	4.0	1		10/27/15 22:3	0 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/27/15 22:3	0 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/27/15 22:3	0 104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/27/15 22:3	0 135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/27/15 22:3	0 98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		10/27/15 22:3		
Chlorobenzene	ND	ug/L	1.0	1		10/27/15 22:3	0 108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/27/15 22:3		
Chloroform	ND	ug/L	1.0	1		10/27/15 22:3		
Chloromethane	ND	ug/L	4.0	1		10/27/15 22:3		
2-Chlorotoluene	ND	ug/L	1.0	1		10/27/15 22:3		
4-Chlorotoluene	ND	ug/L	1.0	1		10/27/15 22:3		
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		10/27/15 22:3		
Dibromochloromethane	ND ND	-	1.0	1		10/27/15 22:3		
1,2-Dibromoethane (EDB)	ND ND	ug/L ug/L	1.0	1		10/27/15 22:3		
Dibromomethane	ND ND	ug/L	4.0	1		10/27/15 22:3		
	ND ND	-	1.0	1		10/27/15 22:3		
1,2-Dichlorobenzene		ug/L		1		10/27/15 22:3		
1,3-Dichlorobenzene	ND	ug/L	1.0					
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/27/15 22:3		
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/27/15 22:3		
1,1-Dichloroethane	46.5	ug/L	1.0	1		10/27/15 22:3		
1,2-Dichloroethane	ND	ug/L	1.0	1		10/27/15 22:3		
1,1-Dichloroethene	32.1	ug/L	1.0	1		10/27/15 22:3		
cis-1,2-Dichloroethene	248	ug/L	10.0	10		10/29/15 12:4		
rans-1,2-Dichloroethene	303	ug/L	10.0	10		10/29/15 12:4		
Dichlorofluoromethane	ND	ug/L	1.0	1		10/27/15 22:3		
1,2-Dichloropropane	ND	ug/L	4.0	1		10/27/15 22:3		
1,3-Dichloropropane	ND	ug/L	1.0	1		10/27/15 22:3	0 142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		10/27/15 22:3		
1,1-Dichloropropene	ND	ug/L	1.0	1		10/27/15 22:3		
cis-1,3-Dichloropropene	ND	ug/L	4.0	1			0 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1		10/27/15 22:3	0 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		10/27/15 22:3	0 60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		10/27/15 22:3		
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/27/15 22:3	0 87-68-3	
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/27/15 22:3	0 98-82-8	
o-Isopropyltoluene	ND	ug/L	1.0	1		10/27/15 22:3	0 99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		10/27/15 22:3	0 75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/27/15 22:3		
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/27/15 22:3	0 1634-04-4	





#### **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

Sample: PMW-02	Lab ID: 103	27623002	Collected: 10/26/	15 13:20	Received:	10/26/15 18:12	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		10/27/15 22:30	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/27/15 22:30	103-65-1	
Styrene	ND	ug/L	1.0	1		10/27/15 22:30	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/27/15 22:30	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/27/15 22:30	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/27/15 22:30	) 127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		10/27/15 22:30	109-99-9	
Toluene	ND	ug/L	1.0	1		10/27/15 22:30	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/27/15 22:30	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/27/15 22:30	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/27/15 22:30	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/27/15 22:30	79-00-5	
Trichloroethene	39.7	ug/L	0.40	1		10/27/15 22:30	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/27/15 22:30	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		10/27/15 22:30	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		10/27/15 22:30	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/27/15 22:30	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/27/15 22:30	108-67-8	
Vinyl chloride	4.5	ug/L	0.40	1		10/27/15 22:30	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/27/15 22:30	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	110	%.	75-125	1		10/27/15 22:30		
Toluene-d8 (S)	103	%.	75-125	1		10/27/15 22:30	2037-26-5	
4-Bromofluorobenzene (S)	104	%.	75-125	1		10/27/15 22:30	460-00-4	

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#### **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

Sample: PMW-03	Lab ID: 103	27623003	Collected: 10/26/1	5 17:10	Received:	10/26/15 18:12	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
3260B VOC	Analytical Met	hod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		10/29/15 13:5	9 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		10/29/15 13:5	9 107-05-1	
Benzene	ND	ug/L	1.0	1		10/29/15 13:5	9 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/29/15 13:5	9 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/29/15 13:5	9 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/29/15 13:5	9 75-27-4	
Bromoform	ND	ug/L	4.0	1		10/29/15 13:5	9 75-25-2	
Bromomethane	ND	ug/L	4.0	1		10/29/15 13:5	9 74-83-9	CL
2-Butanone (MEK)	ND	ug/L	5.0	1		10/29/15 13:5	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/29/15 13:5	9 104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/29/15 13:5	9 135-98-8	
ert-Butylbenzene	ND	ug/L	1.0	1		10/29/15 13:5	9 98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		10/29/15 13:5		
Chlorobenzene	ND	ug/L	1.0	1		10/29/15 13:5	9 108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/29/15 13:5		
Chloroform	ND	ug/L	1.0	1		10/29/15 13:5		
Chloromethane	ND	ug/L	4.0	1		10/29/15 13:5		
2-Chlorotoluene	ND	ug/L	1.0	1		10/29/15 13:5		
4-Chlorotoluene	ND	ug/L	1.0	1		10/29/15 13:5		
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		10/29/15 13:5		
Dibromochloromethane	ND	ug/L	1.0	1		10/29/15 13:5		
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/29/15 13:5	-	
Dibromomethane	ND	ug/L	4.0	1		10/29/15 13:5		
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/29/15 13:5		
1,3-Dichlorobenzene	ND ND	ug/L ug/L	1.0	1		10/29/15 13:5		
1,4-Dichlorobenzene	ND ND	_	1.0	1		10/29/15 13:5		
Dichlorodifluoromethane	ND ND	ug/L	1.0	1		10/29/15 13:5		
1,1-Dichloroethane	ND ND	ug/L	1.0	1		10/29/15 13:5		
•	ND ND	ug/L	1.0	1		10/29/15 13:5		
1,2-Dichloroethane	ND ND	ug/L						
1,1-Dichloroethene		ug/L	1.0	1		10/29/15 13:5		
cis-1,2-Dichloroethene	15.6	ug/L	1.0	1		10/29/15 13:5		
rans-1,2-Dichloroethene	35.3	ug/L	1.0	1		10/29/15 13:5		
Dichlorofluoromethane	ND	ug/L	1.0	1		10/29/15 13:5		
1,2-Dichloropropane	ND	ug/L	4.0	1		10/29/15 13:5		
I,3-Dichloropropane	ND	ug/L	1.0	1		10/29/15 13:5		
2,2-Dichloropropane	ND	ug/L	4.0	1		10/29/15 13:5		
1,1-Dichloropropene	ND	ug/L	1.0	1		10/29/15 13:5		
cis-1,3-Dichloropropene	ND	ug/L	4.0	1		10/29/15 13:5		
rans-1,3-Dichloropropene	ND	ug/L	4.0	1			9 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		10/29/15 13:5		
Ethylbenzene	ND	ug/L	1.0	1		10/29/15 13:5		
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/29/15 13:5		
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/29/15 13:5		
o-Isopropyltoluene	ND	ug/L	1.0	1		10/29/15 13:5	9 99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		10/29/15 13:5	9 75-09-2	
1-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/29/15 13:5		
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/29/15 13:5	9 1634-04-4	





## **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

Sample: PMW-03	Lab ID: 103	27623003	Collected: 10/26/1	15 17:10	Received:	10/26/15 18:12	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		10/29/15 13:59	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/29/15 13:59	9 103-65-1	
Styrene	ND	ug/L	1.0	1		10/29/15 13:59	9 100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/29/15 13:59	9 630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/29/15 13:59	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/29/15 13:59	9 127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		10/29/15 13:59	109-99-9	
Toluene	ND	ug/L	1.0	1		10/29/15 13:59	9 108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/29/15 13:59	9 87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/29/15 13:59	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/29/15 13:59	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/29/15 13:59	79-00-5	
Trichloroethene	20.8	ug/L	0.40	1		10/29/15 13:59	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/29/15 13:59	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		10/29/15 13:59	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		10/29/15 13:59	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/29/15 13:59	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/29/15 13:59	9 108-67-8	
Vinyl chloride	0.92	ug/L	0.40	1		10/29/15 13:59	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/29/15 13:59	1330-20-7	
Surrogates		-						
1,2-Dichloroethane-d4 (S)	111	%.	75-125	1		10/29/15 13:59	9 17060-07-0	
Toluene-d8 (S)	109	%.	75-125	1		10/29/15 13:59	2037-26-5	
4-Bromofluorobenzene (S)	116	%.	75-125	1		10/29/15 13:59	9 460-00-4	



## **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

Sample: PMW-04	Lab ID: 103	27623004	Collected: 10/26/1	15 16:05	Received:	10/26/15 18:12	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
3260B VOC	Analytical Met	hod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		10/31/15 00:4	5 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		10/31/15 00:4	5 107-05-1	
Benzene	ND	ug/L	1.0	1		10/31/15 00:4	5 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/31/15 00:4	5 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/31/15 00:4	5 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/31/15 00:4	5 75-27-4	
Bromoform	ND	ug/L	4.0	1		10/31/15 00:4	5 75-25-2	
Bromomethane	ND	ug/L	4.0	1		10/31/15 00:4	5 74-83-9	CL
2-Butanone (MEK)	ND	ug/L	5.0	1		10/31/15 00:4	5 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/31/15 00:4	5 104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/31/15 00:4	5 135-98-8	
ert-Butylbenzene	ND	ug/L	1.0	1		10/31/15 00:4		
Carbon tetrachloride	ND	ug/L	1.0	1		10/31/15 00:4		
Chlorobenzene	ND	ug/L	1.0	1		10/31/15 00:4		
Chloroethane	ND	ug/L	1.0	1		10/31/15 00:4		
Chloroform	ND	ug/L	1.0	1		10/31/15 00:4		
Chloromethane	ND	ug/L	4.0	1		10/31/15 00:4		
2-Chlorotoluene	ND	ug/L	1.0	1		10/31/15 00:4		
4-Chlorotoluene	ND	ug/L	1.0	1		10/31/15 00:4		
1,2-Dibromo-3-chloropropane	ND ND	ug/L	4.0	1		10/31/15 00:4		
Dibromochloromethane	ND ND		1.0	1		10/31/15 00:4		
	ND ND	ug/L	1.0	1		10/31/15 00:4		
1,2-Dibromoethane (EDB) Dibromomethane	ND ND	ug/L	4.0	1		10/31/15 00:4		
	ND ND	ug/L	1.0	1		10/31/15 00:4		
1,2-Dichlorobenzene		ug/L						
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/31/15 00:4		
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/31/15 00:4		
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/31/15 00:4		
1,1-Dichloroethane	ND	ug/L	1.0	1		10/31/15 00:4		
1,2-Dichloroethane	ND	ug/L	1.0	1		10/31/15 00:4		
I,1-Dichloroethene	ND	ug/L	1.0	1		10/31/15 00:4		
cis-1,2-Dichloroethene	19.9	ug/L	1.0	1		10/31/15 00:4		
rans-1,2-Dichloroethene	55.3	ug/L	1.0	1		10/31/15 00:4		
Dichlorofluoromethane	ND	ug/L	1.0	1		10/31/15 00:4		
1,2-Dichloropropane	ND	ug/L	4.0	1		10/31/15 00:4		
1,3-Dichloropropane	ND	ug/L	1.0	1		10/31/15 00:4	5 142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		10/31/15 00:4		
1,1-Dichloropropene	ND	ug/L	1.0	1		10/31/15 00:4	5 563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1			5 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1		10/31/15 00:4	5 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		10/31/15 00:4	5 60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		10/31/15 00:4	5 100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/31/15 00:4	5 87-68-3	
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/31/15 00:4	5 98-82-8	
o-Isopropyltoluene	ND	ug/L	1.0	1		10/31/15 00:4	5 99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		10/31/15 00:4	5 75-09-2	
1-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/31/15 00:4		
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/31/15 00:4		





## **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

Sample: PMW-04	Lab ID: 103	27623004	Collected: 10/26/1	15 16:05	Received:	10/26/15 18:12	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		10/31/15 00:45	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/31/15 00:45	103-65-1	
Styrene	ND	ug/L	1.0	1		10/31/15 00:45	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/31/15 00:45	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/31/15 00:45	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/31/15 00:45	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		10/31/15 00:45	109-99-9	
Toluene	ND	ug/L	1.0	1		10/31/15 00:45	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/31/15 00:45	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/31/15 00:45	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/31/15 00:45	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/31/15 00:45	79-00-5	
Trichloroethene	17.8	ug/L	0.40	1		10/31/15 00:45	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/31/15 00:45	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		10/31/15 00:45	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		10/31/15 00:45	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/31/15 00:45	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/31/15 00:45	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		10/31/15 00:45	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/31/15 00:45	1330-20-7	
Surrogates		Ü						
1,2-Dichloroethane-d4 (S)	109	%.	75-125	1		10/31/15 00:45	17060-07-0	
Toluene-d8 (S)	109	%.	75-125	1		10/31/15 00:45	2037-26-5	
4-Bromofluorobenzene (S)	110	%.	75-125	1		10/31/15 00:45	460-00-4	



## **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

Sample: Trip Blank	Lab ID: 103	27623005	Collected: 10/26/1	5 00:00	Received:	10/26/15 18:12	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Met	hod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		10/27/15 20:2	2 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		10/27/15 20:2	2 107-05-1	
Benzene	ND	ug/L	1.0	1		10/27/15 20:2	2 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/27/15 20:2	2 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/27/15 20:2	2 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/27/15 20:2	2 75-27-4	
Bromoform	ND	ug/L	4.0	1		10/27/15 20:2	2 75-25-2	
Bromomethane	ND	ug/L	4.0	1		10/27/15 20:2	2 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/27/15 20:2	2 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/27/15 20:2	2 104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/27/15 20:2		
tert-Butylbenzene	ND	ug/L	1.0	1		10/27/15 20:2		
Carbon tetrachloride	ND	ug/L	1.0	1		10/27/15 20:2		
Chlorobenzene	ND	ug/L	1.0	1		10/27/15 20:2		
Chloroethane	ND	ug/L	1.0	1		10/27/15 20:2		
Chloroform	ND	ug/L	1.0	1		10/27/15 20:2		
Chloromethane	ND	ug/L	4.0	1		10/27/15 20:2		
2-Chlorotoluene	ND	ug/L	1.0	1		10/27/15 20:2		
4-Chlorotoluene	ND	ug/L	1.0	1		10/27/15 20:2		
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		10/27/15 20:2		
Dibromochloromethane	ND ND	-	1.0	1		10/27/15 20:2		
	ND ND	ug/L	1.0	1		10/27/15 20:2		
1,2-Dibromoethane (EDB) Dibromomethane	ND ND	ug/L	4.0	1		10/27/15 20:2		
	ND ND	ug/L	1.0	1		10/27/15 20:2		
1,2-Dichlorobenzene		ug/L				10/27/15 20:2		
1,3-Dichlorobenzene	ND	ug/L	1.0	1				
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/27/15 20:2		
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/27/15 20:2		
1,1-Dichloroethane	ND	ug/L	1.0	1		10/27/15 20:2		
1,2-Dichloroethane	ND	ug/L	1.0	1		10/27/15 20:2		
1,1-Dichloroethene	ND	ug/L	1.0	1		10/27/15 20:2		
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/27/15 20:2		
rans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/27/15 20:2		
Dichlorofluoromethane	ND	ug/L	1.0	1		10/27/15 20:2		
1,2-Dichloropropane	ND	ug/L	4.0	1		10/27/15 20:2		
1,3-Dichloropropane	ND	ug/L	1.0	1		10/27/15 20:2	2 142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		10/27/15 20:2		
1,1-Dichloropropene	ND	ug/L	1.0	1		10/27/15 20:2		
cis-1,3-Dichloropropene	ND	ug/L	4.0	1			2 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1		10/27/15 20:2	2 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		10/27/15 20:2	2 60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		10/27/15 20:2		
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/27/15 20:2	2 87-68-3	
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/27/15 20:2	2 98-82-8	
o-Isopropyltoluene	ND	ug/L	1.0	1		10/27/15 20:2	2 99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		10/27/15 20:2	2 75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/27/15 20:2		
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/27/15 20:2	2 1634-04-4	





## **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

Sample: Trip Blank	Lab ID: 1032	27623005	Collected: 10/26/1	15 00:00	Received: 1	0/26/15 18:12	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B VOC	Analytical Meth	od: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		10/27/15 20:2:	2 91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/27/15 20:2	2 103-65-1	
Styrene	ND	ug/L	1.0	1		10/27/15 20:2	2 100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/27/15 20:2	2 630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/27/15 20:2	2 79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/27/15 20:2	2 127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		10/27/15 20:2	2 109-99-9	
Toluene	ND	ug/L	1.0	1		10/27/15 20:2	2 108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/27/15 20:22	2 87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/27/15 20:22	2 120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/27/15 20:22	2 71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/27/15 20:22	2 79-00-5	
Trichloroethene	ND	ug/L	0.40	1		10/27/15 20:22	2 79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/27/15 20:22	2 75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		10/27/15 20:2:	2 96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		10/27/15 20:2:	2 76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/27/15 20:2:	2 95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/27/15 20:2:	2 108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		10/27/15 20:2:	2 75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/27/15 20:2:	2 1330-20-7	
Surrogates		•						
1,2-Dichloroethane-d4 (S)	113	%.	75-125	1		10/27/15 20:2	2 17060-07-0	
Toluene-d8 (S)	104	%.	75-125	1		10/27/15 20:2	2 2037-26-5	
4-Bromofluorobenzene (S)	100	%.	75-125	1		10/27/15 20:2	2 460-00-4	



Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

QC Batch: MSV/33557 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV 465 W

Associated Lab Samples: 10327623002, 10327623005

METHOD BLANK: 2118576 Matrix: Water

Associated Lab Samples: 10327623002, 10327623005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	10/27/15 19:50	
1,1,1-Trichloroethane	ug/L	ND	1.0	10/27/15 19:50	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	10/27/15 19:50	
1,1,2-Trichloroethane	ug/L	ND	1.0	10/27/15 19:50	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	10/27/15 19:50	
1,1-Dichloroethane	ug/L	ND	1.0	10/27/15 19:50	
1,1-Dichloroethene	ug/L	ND	1.0	10/27/15 19:50	
1,1-Dichloropropene	ug/L	ND	1.0	10/27/15 19:50	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	10/27/15 19:50	
1,2,3-Trichloropropane	ug/L	ND	4.0	10/27/15 19:50	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	10/27/15 19:50	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	10/27/15 19:50	
1,2-Dibromo-3-chloropropane	ug/L	ND	4.0	10/27/15 19:50	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	10/27/15 19:50	
1,2-Dichlorobenzene	ug/L	ND	1.0	10/27/15 19:50	
1,2-Dichloroethane	ug/L	ND	1.0	10/27/15 19:50	
1,2-Dichloropropane	ug/L	ND	4.0	10/27/15 19:50	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	10/27/15 19:50	
1,3-Dichlorobenzene	ug/L	ND	1.0	10/27/15 19:50	
1,3-Dichloropropane	ug/L	ND	1.0	10/27/15 19:50	
1,4-Dichlorobenzene	ug/L	ND	1.0	10/27/15 19:50	
2,2-Dichloropropane	ug/L	ND	4.0	10/27/15 19:50	
2-Butanone (MEK)	ug/L	ND	5.0	10/27/15 19:50	
2-Chlorotoluene	ug/L	ND	1.0	10/27/15 19:50	
4-Chlorotoluene	ug/L	ND	1.0	10/27/15 19:50	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	10/27/15 19:50	
Acetone	ug/L	ND	20.0	10/27/15 19:50	
Allyl chloride	ug/L	ND	4.0	10/27/15 19:50	
Benzene	ug/L	ND	1.0	10/27/15 19:50	
Bromobenzene	ug/L	ND	1.0	10/27/15 19:50	
Bromochloromethane	ug/L	ND	1.0	10/27/15 19:50	
Bromodichloromethane	ug/L	ND	1.0	10/27/15 19:50	
Bromoform	ug/L	ND	4.0	10/27/15 19:50	
Bromomethane	ug/L	ND	4.0	10/27/15 19:50	
Carbon tetrachloride	ug/L	ND	1.0	10/27/15 19:50	
Chlorobenzene	ug/L	ND	1.0	10/27/15 19:50	
Chloroethane	ug/L	ND	1.0	10/27/15 19:50	
Chloroform	ug/L	ND	1.0	10/27/15 19:50	
Chloromethane	ug/L	ND	4.0	10/27/15 19:50	
cis-1,2-Dichloroethene	ug/L	ND	1.0	10/27/15 19:50	
cis-1,3-Dichloropropene	ug/L	ND	4.0	10/27/15 19:50	

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**

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## **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

METHOD BLANK: 2118576 Matrix: Water

Associated Lab Samples: 10327623002, 10327623005

	,	Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/L	ND ND	1.0	10/27/15 19:50	
Dibromomethane	ug/L	ND	4.0	10/27/15 19:50	
Dichlorodifluoromethane	ug/L	ND	1.0	10/27/15 19:50	
Dichlorofluoromethane	ug/L	ND	1.0	10/27/15 19:50	
Diethyl ether (Ethyl ether)	ug/L	ND	4.0	10/27/15 19:50	
Ethylbenzene	ug/L	ND	1.0	10/27/15 19:50	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	10/27/15 19:50	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	10/27/15 19:50	
Methyl-tert-butyl ether	ug/L	ND	1.0	10/27/15 19:50	
Methylene Chloride	ug/L	ND	4.0	10/27/15 19:50	
n-Butylbenzene	ug/L	ND	1.0	10/27/15 19:50	
n-Propylbenzene	ug/L	ND	1.0	10/27/15 19:50	
Naphthalene	ug/L	ND	4.0	10/27/15 19:50	
p-Isopropyltoluene	ug/L	ND	1.0	10/27/15 19:50	
sec-Butylbenzene	ug/L	ND	1.0	10/27/15 19:50	
Styrene	ug/L	ND	1.0	10/27/15 19:50	
tert-Butylbenzene	ug/L	ND	1.0	10/27/15 19:50	
Tetrachloroethene	ug/L	ND	1.0	10/27/15 19:50	
Tetrahydrofuran	ug/L	ND	10.0	10/27/15 19:50	
Toluene	ug/L	ND	1.0	10/27/15 19:50	
trans-1,2-Dichloroethene	ug/L	ND	1.0	10/27/15 19:50	
trans-1,3-Dichloropropene	ug/L	ND	4.0	10/27/15 19:50	
Trichloroethene	ug/L	ND	0.40	10/27/15 19:50	
Trichlorofluoromethane	ug/L	ND	1.0	10/27/15 19:50	
Vinyl chloride	ug/L	ND	0.40	10/27/15 19:50	
Xylene (Total)	ug/L	ND	3.0	10/27/15 19:50	
1,2-Dichloroethane-d4 (S)	%.	110	75-125	10/27/15 19:50	
4-Bromofluorobenzene (S)	%.	101	75-125	10/27/15 19:50	
Toluene-d8 (S)	%.	104	75-125	10/27/15 19:50	

LABORATORY CONTROL SAMPLE:	2118577					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L		19.9	99	75-125	
1,1,1-Trichloroethane	ug/L	20	18.8	94	75-125	
1,1,2,2-Tetrachloroethane	ug/L	20	22.6	113	75-125	
1,1,2-Trichloroethane	ug/L	20	20.9	104	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	18.7	93	60-135	
1,1-Dichloroethane	ug/L	20	20.9	104	69-125	
1,1-Dichloroethene	ug/L	20	21.6	108	68-125	
1,1-Dichloropropene	ug/L	20	19.1	96	74-125	
1,2,3-Trichlorobenzene	ug/L	20	19.6	98	69-136	
1,2,3-Trichloropropane	ug/L	20	20.5	102	75-125	
1,2,4-Trichlorobenzene	ug/L	20	18.7	93	73-127	

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.



Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

LABORATORY CONTROL SAMPLE:	2118577	Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L		22.6	113	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	47.0	94	65-145	
1,2-Dibromoethane (EDB)	ug/L	20	19.5	97	75-125	
1,2-Dichlorobenzene	ug/L	20	20.8	104	75-125	
1,2-Dichloroethane	ug/L	20	18.8	94	73-125	
1,2-Dichloropropane	ug/L	20	18.8	94	75-125	
1,3,5-Trimethylbenzene	ug/L	20	21.7	109	75-125	
1,3-Dichlorobenzene	ug/L	20	21.4	107	74-125	
,3-Dichloropropane	ug/L	20	19.0	95	75-125	
I,4-Dichlorobenzene	ug/L	20	19.9	100	75-125	
2,2-Dichloropropane	ug/L	20	20.6	103	59-139	
2-Butanone (MEK)	ug/L	100	109	109	63-130	
2-Chlorotoluene	_	20	21.1	109	72-125	
	ug/L	20	21.1	105	72-125 73-125	
4-Chlorotoluene 4-Methyl-2-pentanone (MIBK)	ug/L ug/L	100	21.7 99.0	99	73-125 71-126	
	_		107			
Acetone	ug/L	100		107	69-131	
Allyl chloride	ug/L	20	20.1	100	67-125	
Benzene	ug/L	20	20.5	103	71-125	
Bromobenzene	ug/L	20	20.6	103	75-125 75-425	
Bromochloromethane	ug/L	20	21.2	106	75-125	
Bromodichloromethane	ug/L	20	19.0	95	75-125	
Bromoform	ug/L	20	17.8	89	70-125	
Bromomethane	ug/L	20	15.4	77	30-150	
Carbon tetrachloride	ug/L	20	20.1	100	75-126	
Chlorobenzene	ug/L	20	20.0	100	75-125	
Chloroethane	ug/L	20	21.6	108	65-134	
Chloroform	ug/L	20	19.9	100	75-125	
Chloromethane	ug/L	20	21.5	108	39-150	
cis-1,2-Dichloroethene	ug/L	20	20.4	102	72-125	
cis-1,3-Dichloropropene	ug/L	20	21.5	107	75-125	
Dibromochloromethane	ug/L	20	18.7	93	75-125	
Dibromomethane	ug/L	20	17.5	88	75-125	
Dichlorodifluoromethane	ug/L	20	18.0	90	50-134	
Dichlorofluoromethane	ug/L	20	21.2	106	69-125	
Diethyl ether (Ethyl ether)	ug/L	20	22.2	111	72-125	
Ethylbenzene	ug/L	20	20.9	105	75-125	
Hexachloro-1,3-butadiene	ug/L	20	19.9	100	70-138	
sopropylbenzene (Cumene)	ug/L	20	23.8	119	75-125	
Methyl-tert-butyl ether	ug/L	20	21.3	107	73-125	
Methylene Chloride	ug/L	20	24.6	123	73-125	
n-Butylbenzene	ug/L	20	20.8	104	72-133	
n-Propylbenzene	ug/L	20	23.1	116	72-126	
Naphthalene	ug/L	20	17.8	89	70-127	
o-Isopropyltoluene	ug/L	20	21.0	105	72-132	
sec-Butylbenzene	ug/L	20	23.9	120	73-132	
Styrene	ug/L	20	21.9	109	75-125	
ert-Butylbenzene	ug/L	20	21.8	109	73-128	

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Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

LABORATORY CONTROL SAMPLE:	2118577					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Tetrachloroethene	ug/L	20	18.7	94	74-125	
Tetrahydrofuran	ug/L	200	204	102	62-133	
Toluene	ug/L	20	19.2	96	74-125	
trans-1,2-Dichloroethene	ug/L	20	22.1	111	69-125	
trans-1,3-Dichloropropene	ug/L	20	18.8	94	75-125	
Trichloroethene	ug/L	20	18.9	95	75-125	
Trichlorofluoromethane	ug/L	20	18.3	92	74-127	
Vinyl chloride	ug/L	20	20.6	103	66-132	
Xylene (Total)	ug/L	60	64.9	108	75-125	
1,2-Dichloroethane-d4 (S)	%.			108	75-125	
4-Bromofluorobenzene (S)	%.			97	75-125	
Toluene-d8 (S)	%.			101	75-125	

MATRIX SPIKE SAMPLE:	2119963						
		10326993001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	21.2	106	70-138	
1,1,1-Trichloroethane	ug/L	ND	20	20.3	101	55-150	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	21.9	109	64-140	
1,1,2-Trichloroethane	ug/L	ND	20	21.4	107	67-137	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	28.1	141	51-150	
1,1-Dichloroethane	ug/L	ND	20	22.7	114	49-150	
1,1-Dichloroethene	ug/L	ND	20	22.2	111	40-150	
1,1-Dichloropropene	ug/L	ND	20	21.2	106	50-150	
1,2,3-Trichlorobenzene	ug/L	ND	20	18.5	93	59-148	
1,2,3-Trichloropropane	ug/L	ND	20	19.7	99	65-141	
1,2,4-Trichlorobenzene	ug/L	ND	20	17.3	86	61-140	
1,2,4-Trimethylbenzene	ug/L	ND	20	22.1	111	58-141	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	44.1	88	53-150	
1,2-Dibromoethane (EDB)	ug/L	ND	20	19.7	99	65-137	
1,2-Dichlorobenzene	ug/L	ND	20	20.4	102	66-133	
1,2-Dichloroethane	ug/L	ND	20	19.4	97	54-138	
1,2-Dichloropropane	ug/L	ND	20	19.7	98	62-138	
1,3,5-Trimethylbenzene	ug/L	ND	20	21.4	107	58-140	
1,3-Dichlorobenzene	ug/L	ND	20	20.9	104	66-132	
1,3-Dichloropropane	ug/L	ND	20	19.6	98	66-134	
1,4-Dichlorobenzene	ug/L	ND	20	19.8	99	65-129	
2,2-Dichloropropane	ug/L	ND	20	19.1	95	40-150	
2-Butanone (MEK)	ug/L	ND	100	108	108	51-147	
2-Chlorotoluene	ug/L	ND	20	21.2	106	58-147	
4-Chlorotoluene	ug/L	ND	20	21.7	108	64-138	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	104	104	59-143	
Acetone	ug/L	ND	100	109	109	63-147	
Allyl chloride	ug/L	ND	20	20.4	102	45-150	
Benzene	ug/L	ND	20	21.5	107	53-139	

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## **REPORT OF LABORATORY ANALYSIS**

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Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

MATRIX SPIKE SAMPLE:	2119963						
		10326993001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/L	ND	20	21.1	105	66-136	
Bromochloromethane	ug/L	ND	20	21.3	106	64-136	
Bromodichloromethane	ug/L	ND	20	17.8	89	66-138	
Bromoform	ug/L	ND	20	19.6	98	59-136	
Bromomethane	ug/L	ND	20	19.5	98	30-150	
Carbon tetrachloride	ug/L	ND	20	21.8	109	56-150	
Chlorobenzene	ug/L	ND	20	21.6	108	65-133	
Chloroethane	ug/L	ND	20	24.1	121	48-150	
Chloroform	ug/L	ND	20	21.0	105	57-145	
Chloromethane	ug/L	ND	20	23.1	115	30-150	
cis-1,2-Dichloroethene	ug/L	ND	20	21.4	107	49-150	
cis-1,3-Dichloropropene	ug/L	ND	20	21.6	108	64-130	
Dibromochloromethane	ug/L	ND	20	19.4	97	68-138	
Dibromomethane	ug/L	ND	20	17.1	86	67-134	
Dichlorodifluoromethane	ug/L	ND	20	28.7	143	45-150	
Dichlorofluoromethane	ug/L	ND	20	23.8	119	54-150	
Diethyl ether (Ethyl ether)	ug/L	ND	20	20.9	104	50-145	
Ethylbenzene	ug/L	ND	20	22.7	113	55-139	
Hexachloro-1,3-butadiene	ug/L	ND	20	19.9	100	49-150	
Isopropylbenzene (Cumene)	ug/L	ND	20	25.6	128	64-142	
Methyl-tert-butyl ether	ug/L	ND	20	22.3	112	62-129	
Methylene Chloride	ug/L	ND	20	25.7	129	57-132	
n-Butylbenzene	ug/L	ND	20	21.1	105	55-150	
n-Propylbenzene	ug/L	ND	20	23.6	118	59-142	
Naphthalene	ug/L	ND	20	17.0	85	51-150	
p-Isopropyltoluene	ug/L	ND	20	21.0	105	60-149	
sec-Butylbenzene	ug/L	ND	20	24.3	122	60-150	
Styrene	ug/L	ND	20	22.3	112	68-134	
tert-Butylbenzene	ug/L	ND	20	22.3	112	62-146	
Tetrachloroethene	ug/L	ND	20	20.1	100	50-150	
Tetrahydrofuran	ug/L	ND	200	208	104	59-145	
Toluene	ug/L	ND	20	20.6	103	52-148	
trans-1,2-Dichloroethene	ug/L	ND	20	23.6	118	45-150	
trans-1,3-Dichloropropene	ug/L	ND	20	19.8	99	68-132	
Trichloroethene	ug/L	ND	20	20.1	101	52-150	
Trichlorofluoromethane	ug/L	ND	20	26.4	132	55-150	
Vinyl chloride	ug/L	ND	20	24.7	124	43-150	
Xylene (Total)	ug/L	ND	60	69.2	115	54-144	
1,2-Dichloroethane-d4 (S)	%.			33.2	109	75-125	
4-Bromofluorobenzene (S)	%.				95	75-125	
Toluene-d8 (S)	%.				105	75-125	

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Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

SAMPLE DUPLICATE: 2119968		10326993002	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L		ND -		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,1-Dichloropropene	ug/L	ND	ND		30	
1,2,3-Trichlorobenzene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2,4-Trichlorobenzene	ug/L	ND	ND		30	
1,2,4-Trimethylbenzene	ug/L	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L ug/L	ND	ND		30	
1,3,5-Trimethylbenzene	ug/L ug/L	ND	ND		30	
1,3-Dichlorobenzene	ug/L ug/L	ND ND	ND ND		30	
1,3-Dichloropropane	ug/L	ND ND	ND ND		30	
	•	ND ND	ND ND		30	
1,4-Dichlorobenzene	ug/L	ND ND	ND ND		30	
2,2-Dichloropropane	ug/L	ND ND	ND ND			
2-Butanone (MEK)	ug/L	ND ND	ND ND		30	
2-Chlorotoluene	ug/L	ND ND	ND ND		30	
4-Chlorotoluene	ug/L	ND ND			30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND ND	ND ND		30 30	
Alled oblasido	ug/L	ND ND				
Allyl chloride	ug/L		ND		30	
Benzene	ug/L	ND ND	ND		30	
Bromobenzene	ug/L	ND ND	ND		30	
Bromochloromethane	ug/L		ND		30	
Bromodichloromethane	ug/L	ND ND	ND		30	
Bromoform	ug/L		ND		30	
Bromomethane	ug/L	ND ND	ND		30	
Carbon tetrachloride	ug/L		ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Dichlorodifluoromethane	ug/L	ND	ND		30	
Dichlorofluoromethane	ug/L	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	

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## **REPORT OF LABORATORY ANALYSIS**

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## **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

SAMPLE DUPLICATE: 2119968						
		10326993002	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/L	ND	ND		30	
Isopropylbenzene (Cumene)	ug/L	ND	ND		30	
Methyl-tert-butyl ether	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
n-Butylbenzene	ug/L	ND	ND		30	
n-Propylbenzene	ug/L	ND	ND		30	
Naphthalene	ug/L	ND	ND		30	
p-Isopropyltoluene	ug/L	ND	ND		30	
sec-Butylbenzene	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
tert-Butylbenzene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Tetrahydrofuran	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	112	113	1		
4-Bromofluorobenzene (S)	%.	104	104	0		
Toluene-d8 (S)	%.	104	103	1		

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#### **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

QC Batch: MSV/33585 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV 465 W

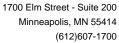
Associated Lab Samples: 10327623001, 10327623003

METHOD BLANK: 2121197 Matrix: Water

Associated Lab Samples: 10327623001, 10327623003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	10/29/15 11:50	
1,1,1-Trichloroethane	ug/L	ND	1.0	10/29/15 11:50	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	10/29/15 11:50	
1,1,2-Trichloroethane	ug/L	ND	1.0	10/29/15 11:50	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	10/29/15 11:50	
1,1-Dichloroethane	ug/L	ND	1.0	10/29/15 11:50	
1,1-Dichloroethene	ug/L	ND	1.0	10/29/15 11:50	
1,1-Dichloropropene	ug/L	ND	1.0	10/29/15 11:50	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	10/29/15 11:50	
1,2,3-Trichloropropane	ug/L	ND	4.0	10/29/15 11:50	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	10/29/15 11:50	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	10/29/15 11:50	
1,2-Dibromo-3-chloropropane	ug/L	ND	4.0	10/29/15 11:50	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	10/29/15 11:50	
1,2-Dichlorobenzene	ug/L	ND	1.0	10/29/15 11:50	
1,2-Dichloroethane	ug/L	ND	1.0	10/29/15 11:50	
1,2-Dichloropropane	ug/L	ND	4.0	10/29/15 11:50	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	10/29/15 11:50	
1,3-Dichlorobenzene	ug/L	ND	1.0	10/29/15 11:50	
1,3-Dichloropropane	ug/L	ND	1.0	10/29/15 11:50	
1,4-Dichlorobenzene	ug/L	ND	1.0	10/29/15 11:50	
2,2-Dichloropropane	ug/L	ND	4.0	10/29/15 11:50	
2-Butanone (MEK)	ug/L	ND	5.0	10/29/15 11:50	
2-Chlorotoluene	ug/L	ND	1.0	10/29/15 11:50	
4-Chlorotoluene	ug/L	ND	1.0	10/29/15 11:50	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	10/29/15 11:50	
Acetone	ug/L	ND	20.0	10/29/15 11:50	
Allyl chloride	ug/L	ND	4.0	10/29/15 11:50	
Benzene	ug/L	ND	1.0	10/29/15 11:50	
Bromobenzene	ug/L	ND	1.0	10/29/15 11:50	
Bromochloromethane	ug/L	ND	1.0	10/29/15 11:50	
Bromodichloromethane	ug/L	ND	1.0	10/29/15 11:50	
Bromoform	ug/L	ND	4.0	10/29/15 11:50	
Bromomethane	ug/L	ND	4.0	10/29/15 11:50	CL
Carbon tetrachloride	ug/L	ND	1.0	10/29/15 11:50	
Chlorobenzene	ug/L	ND	1.0	10/29/15 11:50	
Chloroethane	ug/L	ND	1.0	10/29/15 11:50	
Chloroform	ug/L	ND	1.0	10/29/15 11:50	
Chloromethane	ug/L	ND	4.0	10/29/15 11:50	
cis-1,2-Dichloroethene	ug/L	ND	1.0	10/29/15 11:50	
cis-1,3-Dichloropropene	ug/L	ND	4.0	10/29/15 11:50	

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Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

METHOD BLANK: 2121197 Matrix: Water

Associated Lab Samples: 10327623001, 10327623003

	11.56	Blank	Reporting		0 ""
Parameter	Units	Result	Limit	Analyzed	Qualifier
Dibromochloromethane	ug/L	ND	1.0	10/29/15 11:50	
Dibromomethane	ug/L	ND	4.0	10/29/15 11:50	
Dichlorodifluoromethane	ug/L	ND	1.0	10/29/15 11:50	
Dichlorofluoromethane	ug/L	ND	1.0	10/29/15 11:50	
Diethyl ether (Ethyl ether)	ug/L	ND	4.0	10/29/15 11:50	
Ethylbenzene	ug/L	ND	1.0	10/29/15 11:50	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	10/29/15 11:50	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	10/29/15 11:50	
Methyl-tert-butyl ether	ug/L	ND	1.0	10/29/15 11:50	
Methylene Chloride	ug/L	ND	4.0	10/29/15 11:50	
n-Butylbenzene	ug/L	ND	1.0	10/29/15 11:50	
n-Propylbenzene	ug/L	ND	1.0	10/29/15 11:50	
Naphthalene	ug/L	ND	4.0	10/29/15 11:50	
o-Isopropyltoluene	ug/L	ND	1.0	10/29/15 11:50	
sec-Butylbenzene	ug/L	ND	1.0	10/29/15 11:50	
Styrene	ug/L	ND	1.0	10/29/15 11:50	
ert-Butylbenzene	ug/L	ND	1.0	10/29/15 11:50	
Tetrachloroethene	ug/L	ND	1.0	10/29/15 11:50	
Tetrahydrofuran	ug/L	ND	10.0	10/29/15 11:50	
Toluene	ug/L	ND	1.0	10/29/15 11:50	
trans-1,2-Dichloroethene	ug/L	ND	1.0	10/29/15 11:50	
rans-1,3-Dichloropropene	ug/L	ND	4.0	10/29/15 11:50	
Trichloroethene	ug/L	ND	0.40	10/29/15 11:50	
Trichlorofluoromethane	ug/L	ND	1.0	10/29/15 11:50	
Vinyl chloride	ug/L	ND	0.40	10/29/15 11:50	
Xylene (Total)	ug/L	ND	3.0	10/29/15 11:50	
1,2-Dichloroethane-d4 (S)	%.	106	75-125	10/29/15 11:50	
4-Bromofluorobenzene (S)	%.	109	75-125	10/29/15 11:50	
Toluene-d8 (S)	%.	108	75-125	10/29/15 11:50	

LABORATORY CONTROL SAMPLE:	2121199					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L		20.3	101	75-125	
1,1,1-Trichloroethane	ug/L	20	20.9	105	75-125	
1,1,2,2-Tetrachloroethane	ug/L	20	21.6	108	75-125	
1,1,2-Trichloroethane	ug/L	20	20.5	103	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	14.8	74	60-135	
1,1-Dichloroethane	ug/L	20	21.3	106	69-125	
1,1-Dichloroethene	ug/L	20	19.0	95	68-125	
1,1-Dichloropropene	ug/L	20	20.2	101	74-125	
1,2,3-Trichlorobenzene	ug/L	20	20.2	101	69-136	
1,2,3-Trichloropropane	ug/L	20	22.2	111	75-125	
1,2,4-Trichlorobenzene	ug/L	20	20.5	103	73-127	

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## **REPORT OF LABORATORY ANALYSIS**

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Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

LABORATORY CONTROL SAMPLE:	2121199	Spike	LCS	LCS	% Rec
Parameter	Units	Conc.	Result	% Rec	Limits Qualifiers
1,2,4-Trimethylbenzene	ug/L		21.4	107	75-125
1,2-Dibromo-3-chloropropane	ug/L	50	51.1	102	65-145
1,2-Dibromoethane (EDB)	ug/L	20	21.7	108	75-125
1,2-Dichlorobenzene	ug/L	20	20.2	101	75-125
1,2-Dichloroethane	ug/L	20	20.4	102	73-125
1,2-Dichloropropane	ug/L	20	21.1	106	75-125
1,3,5-Trimethylbenzene	ug/L	20	20.9	105	75-125
1,3-Dichlorobenzene	ug/L	20	20.5	103	74-125
1,3-Dichloropropane	ug/L	20	22.2	111	75-125
1,4-Dichlorobenzene	ug/L	20	19.9	99	75-125
2,2-Dichloropropane	ug/L	20	21.7	108	59-139
2-Butanone (MEK)	ug/L	100	118	118	63-130
2-Chlorotoluene	ug/L	20	20.8	104	72-125
4-Chlorotoluene	ug/L	20	21.3	106	73-125
4-Methyl-2-pentanone (MIBK)	ug/L	100	112	112	71-126
Acetone	ug/L	100	87.6	88	69-131
Allyl chloride	ug/L	20	22.2	111	67-125
Benzene	ug/L	20	19.8	99	71-125
Bromobenzene	ug/L	20	20.1	101	75-125
Bromochloromethane	ug/L	20	18.9	95	75-125 75-125
Bromodichloromethane	ug/L	20	20.4	102	75-125 75-125
Bromoform	_	20	18.8	94	70-125 70-125
Bromomethane	ug/L	20	8.7	43	30-150 CL
	ug/L				
Carbon tetrachloride Chlorobenzene	ug/L	20 20	20.4 20.2	102 101	75-126 75-125
	ug/L				
Chloroethane Chloroform	ug/L	20	21.6 19.7	108	65-134
	ug/L	20		99	75-125
Chloromethane	ug/L	20	21.1	105	39-150
cis-1,2-Dichloroethene	ug/L	20	19.4	97	72-125
cis-1,3-Dichloropropene	ug/L	20	20.7	103	75-125
Dibromochloromethane	ug/L	20	20.3	102	75-125
Dibromomethane	ug/L	20	18.3	92	75-125
Dichlorodifluoromethane	ug/L	20	17.4	87	50-134
Dichlorofluoromethane	ug/L	20	20.4	102	69-125
Diethyl ether (Ethyl ether)	ug/L	20	20.8	104	72-125
Ethylbenzene	ug/L	20	21.5	108	75-125
Hexachloro-1,3-butadiene	ug/L	20	18.9	95	70-138
Isopropylbenzene (Cumene)	ug/L	20	21.2	106	75-125
Methyl-tert-butyl ether	ug/L	20	21.4	107	73-125
Methylene Chloride	ug/L	20	20.1	100	73-125
n-Butylbenzene	ug/L	20	22.5	112	72-133
n-Propylbenzene	ug/L	20	21.5	107	72-126
Naphthalene	ug/L	20	21.7	108	70-127
p-Isopropyltoluene	ug/L	20	20.9	104	72-132
sec-Butylbenzene	ug/L	20	21.1	105	73-132
Styrene	ug/L	20	21.0	105	75-125
tert-Butylbenzene	ug/L	20	20.5	102	73-128

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Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

ABORATORY CONTROL SAMPLE:	2121199					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
etrachloroethene	ug/L		19.7	99	74-125	
etrahydrofuran	ug/L	200	185	92	62-133	
oluene	ug/L	20	21.3	107	74-125	
ans-1,2-Dichloroethene	ug/L	20	20.4	102	69-125	
ans-1,3-Dichloropropene	ug/L	20	22.8	114	75-125	
richloroethene	ug/L	20	20.2	101	75-125	
richlorofluoromethane	ug/L	20	20.9	105	74-127	
'inyl chloride	ug/L	20	21.2	106	66-132	
(ylene (Total)	ug/L	60	62.5	104	75-125	
,2-Dichloroethane-d4 (S)	%.			113	75-125	
-Bromofluorobenzene (S)	%.			103	75-125	
oluene-d8 (S)	%.			108	75-125	

MATRIX SPIKE SAMPLE:	2121241						
		10327916001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	21.1	105	70-138	
1,1,1-Trichloroethane	ug/L	ND	20	22.3	112	55-150	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	22.5	113	64-140	
1,1,2-Trichloroethane	ug/L	ND	20	20.8	104	67-137	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	23.1	115	51-150	
1,1-Dichloroethane	ug/L	ND	20	21.2	106	49-150	
1,1-Dichloroethene	ug/L	ND	20	22.1	110	40-150	
1,1-Dichloropropene	ug/L	ND	20	22.3	111	50-150	
1,2,3-Trichlorobenzene	ug/L	ND	20	17.7	89	59-148	
1,2,3-Trichloropropane	ug/L	ND	20	24.2	121	65-141	
1,2,4-Trichlorobenzene	ug/L	ND	20	17.1	85	61-140	
1,2,4-Trimethylbenzene	ug/L	ND	20	21.6	108	58-141	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	49.9	100	53-150	
1,2-Dibromoethane (EDB)	ug/L	ND	20	21.3	107	65-137	
1,2-Dichlorobenzene	ug/L	ND	20	19.4	97	66-133	
1,2-Dichloroethane	ug/L	ND	20	21.3	107	54-138	
1,2-Dichloropropane	ug/L	ND	20	21.3	107	62-138	
1,3,5-Trimethylbenzene	ug/L	ND	20	23.1	116	58-140	
1,3-Dichlorobenzene	ug/L	ND	20	19.2	96	66-132	
1,3-Dichloropropane	ug/L	ND	20	22.1	111	66-134	
1,4-Dichlorobenzene	ug/L	ND	20	18.7	94	65-129	
2,2-Dichloropropane	ug/L	ND	20	22.5	112	40-150	
2-Butanone (MEK)	ug/L	ND	100	101	101	51-147	
2-Chlorotoluene	ug/L	ND	20	21.7	108	58-147	
4-Chlorotoluene	ug/L	ND	20	20.7	103	64-138	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	110	110	59-143	
Acetone	ug/L	ND	100	88.7	89	63-147	
Allyl chloride	ug/L	ND	20	21.7	109	45-150	
Benzene	ug/L	ND	20	20.4	102	53-139	

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Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

MATRIX SPIKE SAMPLE:	2121241						
		10327916001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/L	ND	20	20.2	101	66-136	
Bromochloromethane	ug/L	ND	20	18.2	91	64-136	
Bromodichloromethane	ug/L	ND	20	20.5	103	66-138	
Bromoform	ug/L	ND	20	18.4	92	59-136	
Bromomethane	ug/L	ND	20	10.2	51	30-150	CL
Carbon tetrachloride	ug/L	ND	20	22.2	111	56-150	
Chlorobenzene	ug/L	ND	20	20.1	101	65-133	
Chloroethane	ug/L	ND	20	20.1	101	48-150	
Chloroform	ug/L	ND	20	20.7	103	57-145	
Chloromethane	ug/L	ND	20	19.8	99	30-150	
cis-1,2-Dichloroethene	ug/L	ND	20	21.0	105	49-150	
cis-1,3-Dichloropropene	ug/L	ND	20	20.3	101	64-130	
Dibromochloromethane	ug/L	ND	20	20.3	102	68-138	
Dibromomethane	ug/L	ND	20	18.2	91	67-134	
Dichlorodifluoromethane	ug/L	ND	20	26.0	130	45-150	
Dichlorofluoromethane	ug/L	ND	20	18.5	92	54-150	
Diethyl ether (Ethyl ether)	ug/L	ND	20	20.2	101	50-145	
Ethylbenzene	ug/L	ND	20	21.7	108	55-139	
Hexachloro-1,3-butadiene	ug/L	ND	20	22.4	112	49-150	
Isopropylbenzene (Cumene)	ug/L	ND	20	22.0	110	64-142	
Methyl-tert-butyl ether	ug/L	ND	20	19.8	99	62-129	
Methylene Chloride	ug/L	ND	20	19.6	98	57-132	
n-Butylbenzene	ug/L	ND	20	22.4	112	55-150	
n-Propylbenzene	ug/L	ND	20	23.0	115	59-142	
Naphthalene	ug/L	ND	20	15.9	80	51-150	
p-Isopropyltoluene	ug/L	ND	20	22.8	114	60-149	
sec-Butylbenzene	ug/L	ND	20	23.9	120	60-150	
Styrene	ug/L	ND	20	19.4	97	68-134	
tert-Butylbenzene	ug/L	ND	20	23.2	116	62-146	
Tetrachloroethene	ug/L	ND	20	19.9	99	50-150	
Tetrahydrofuran	ug/L	ND	200	184	92	59-145	
Toluene	ug/L	ND	20	21.9	109	52-148	
trans-1,2-Dichloroethene	ug/L	ND	20	21.0	105	45-150	
trans-1,3-Dichloropropene	ug/L	ND	20	21.8	109	68-132	
Trichloroethene	ug/L	ND	20	21.4	107	52-150	
Trichlorofluoromethane	ug/L	ND	20	23.2	116	55-150	
Vinyl chloride	ug/L	ND	20	21.7	108	43-150	
Xylene (Total)	ug/L	ND	60	62.5	104	54-144	
1,2-Dichloroethane-d4 (S)	%.				112	75-125	
4-Bromofluorobenzene (S)	%.				110	75-125	
Toluene-d8 (S)	%.				108	75-125	

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## **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

SAMPLE DUPLICATE: 2121242		10327928002	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L		ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,1-Dichloropropene	ug/L	ND	ND		30	
1,2,3-Trichlorobenzene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2,4-Trichlorobenzene	ug/L	ND	ND		30	
1,2,4-Trimethylbenzene	ug/L	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,3,5-Trimethylbenzene	ug/L	ND	ND		30	
1,3-Dichlorobenzene	ug/L ug/L	ND	ND		30	
1,3-Dichloropropane	ug/L	ND ND	ND ND		30	
1,4-Dichlorobenzene	ug/L ug/L	ND ND	ND ND		30	
2,2-Dichloropropane	ug/L ug/L	ND	ND ND		30	
	_	ND	ND ND		30	
2-Butanone (MEK) 2-Chlorotoluene	ug/L	ND ND	ND ND		30	
4-Chlorotoluene	ug/L ug/L	ND ND	ND ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L ug/L	ND	ND ND		30	
Acetone	_	ND	ND ND		30	
	ug/L	ND	ND ND		30	
Allyl chloride	ug/L	ND ND	ND ND			
Benzene Bromobenzene	ug/L	ND ND	ND ND		30 30	
	ug/L	ND ND	ND ND			
Bromochloromethane	ug/L	ND ND	ND ND		30 30	
Bromodichloromethane Bromoform	ug/L	ND ND			30	
	ug/L	ND ND	ND			OI.
Bromomethane Carbon tetrachloride	ug/L	ND ND	ND		30	CL
	ug/L	ND ND	ND		30	
Chlorobenzene Chloroethane	ug/L	ND ND	ND ND		30 30	
	ug/L	ND ND				
Chlorograph and	ug/L	ND ND	ND		30	
Chloromethane	ug/L	ND ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND ND	ND		30	
cis-1,3-Dichloropropene	ug/L		ND		30	
Dibromochloromethane	ug/L	ND ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Dichlorodifluoromethane	ug/L	ND	ND		30	
Dichlorofluoromethane	ug/L	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	

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## **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

SAMPLE DUPLICATE: 2121242		10327928002	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/L	ND	ND		30	
Isopropylbenzene (Cumene)	ug/L	ND	ND		30	
Methyl-tert-butyl ether	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
n-Butylbenzene	ug/L	ND	ND		30	
n-Propylbenzene	ug/L	ND	ND		30	
Naphthalene	ug/L	ND	ND		30	
p-Isopropyltoluene	ug/L	ND	ND		30	
sec-Butylbenzene	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
tert-Butylbenzene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Tetrahydrofuran	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	111	111	0		
4-Bromofluorobenzene (S)	%.	110	111	1		
Toluene-d8 (S)	%.	109	108	1		

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#### **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

QC Batch: MSV/33596 Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B Analysis Description: 8260B MSV 465 W

Associated Lab Samples: 10327623004

METHOD BLANK: 2122825 Matrix: Water

Associated Lab Samples: 10327623004

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND ND	1.0	10/30/15 22:50	
1,1,1-Trichloroethane	ug/L	ND	1.0	10/30/15 22:50	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	10/30/15 22:50	
1,1,2-Trichloroethane	ug/L	ND	1.0	10/30/15 22:50	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	10/30/15 22:50	
1,1-Dichloroethane	ug/L	ND	1.0	10/30/15 22:50	
1,1-Dichloroethene	ug/L	ND	1.0	10/30/15 22:50	
1,1-Dichloropropene	ug/L	ND	1.0	10/30/15 22:50	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	10/30/15 22:50	
1,2,3-Trichloropropane	ug/L	ND	4.0	10/30/15 22:50	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	10/30/15 22:50	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	10/30/15 22:50	
1,2-Dibromo-3-chloropropane	ug/L	ND	4.0	10/30/15 22:50	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	10/30/15 22:50	
1,2-Dichlorobenzene	ug/L	ND	1.0	10/30/15 22:50	
1,2-Dichloroethane	ug/L	ND	1.0	10/30/15 22:50	
1,2-Dichloropropane	ug/L	ND	4.0	10/30/15 22:50	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	10/30/15 22:50	
1,3-Dichlorobenzene	ug/L	ND	1.0	10/30/15 22:50	
1,3-Dichloropropane	ug/L	ND	1.0	10/30/15 22:50	
1,4-Dichlorobenzene	ug/L	ND	1.0	10/30/15 22:50	
2,2-Dichloropropane	ug/L	ND	4.0	10/30/15 22:50	
2-Butanone (MEK)	ug/L	ND	5.0	10/30/15 22:50	
2-Chlorotoluene	ug/L	ND	1.0	10/30/15 22:50	
4-Chlorotoluene	ug/L	ND	1.0	10/30/15 22:50	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	10/30/15 22:50	
Acetone	ug/L	ND	20.0	10/30/15 22:50	
Allyl chloride	ug/L	ND	4.0	10/30/15 22:50	
Benzene	ug/L	ND	1.0	10/30/15 22:50	
Bromobenzene	ug/L	ND	1.0	10/30/15 22:50	
Bromochloromethane	ug/L	ND	1.0	10/30/15 22:50	
Bromodichloromethane	ug/L	ND	1.0	10/30/15 22:50	
Bromoform	ug/L	ND	4.0	10/30/15 22:50	
Bromomethane	ug/L	ND	4.0	10/30/15 22:50	CL
Carbon tetrachloride	ug/L	ND	1.0	10/30/15 22:50	
Chlorobenzene	ug/L	ND	1.0	10/30/15 22:50	
Chloroethane	ug/L	ND	1.0	10/30/15 22:50	
Chloroform	ug/L	ND	1.0	10/30/15 22:50	
Chloromethane	ug/L	ND	4.0	10/30/15 22:50	
cis-1,2-Dichloroethene	ug/L	ND	1.0	10/30/15 22:50	
cis-1,3-Dichloropropene	ug/L	ND	4.0	10/30/15 22:50	

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## **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

METHOD BLANK: 2122825 Matrix: Water

Associated Lab Samples: 10327623004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
ibromochloromethane	ug/L	ND -	1.0	10/30/15 22:50	
bromomethane	ug/L ug/L	ND ND	4.0	10/30/15 22:50	
ichlorodifluoromethane	ug/L ug/L	ND ND	1.0	10/30/15 22:50	
ichlorofluoromethane	ug/L ug/L	ND ND	1.0	10/30/15 22:50	
iethyl ether (Ethyl ether)	ug/L ug/L	ND ND	4.0	10/30/15 22:50	
thylbenzene	ug/L ug/L	ND ND	1.0	10/30/15 22:50	
exachloro-1,3-butadiene	ug/L ug/L	ND ND	1.0	10/30/15 22:50	
opropylbenzene (Cumene)	ug/L	ND ND	1.0	10/30/15 22:50	
ethyl-tert-butyl ether	ug/L	ND ND	1.0	10/30/15 22:50	
ethylene Chloride	ug/L ug/L	ND ND	4.0	10/30/15 22:50	
Butylbenzene	ug/L ug/L	ND ND	1.0	10/30/15 22:50	
Propylbenzene	ug/L ug/L	ND ND	1.0	10/30/15 22:50	
aphthalene	ug/L	ND ND	4.0	10/30/15 22:50	
Isopropyltoluene	ug/L	ND ND	1.0	10/30/15 22:50	
ec-Butylbenzene	ug/L ug/L	ND ND	1.0	10/30/15 22:50	
tyrene	ug/L ug/L	ND ND	1.0	10/30/15 22:50	
rt-Butylbenzene	ug/L ug/L	ND ND	1.0	10/30/15 22:50	
etrachloroethene	ug/L ug/L	ND ND	1.0	10/30/15 22:50	
etrachioroethene	Ū	ND ND	10.0	10/30/15 22:50	
bluene	ug/L ug/L	ND ND	1.0	10/30/15 22:50	
ans-1,2-Dichloroethene	ug/L ug/L	ND ND	1.0	10/30/15 22:50	
ans-1,3-Dichloropropene	ug/L ug/L	ND ND	4.0	10/30/15 22:50	
ichloroethene	ug/L ug/L	ND ND	0.40	10/30/15 22:50	
richlorofluoromethane	-	ND ND	1.0	10/30/15 22:50	
nyl chloride	ug/L	ND ND	0.40	10/30/15 22:50	
	ug/L	ND ND	3.0	10/30/15 22:50	
ylene (Total) 2-Dichloroethane-d4 (S)	ug/L %.	106	3.0 75-125	10/30/15 22:50	
Bromofluorobenzene (S)	%. %.	108	75-125 75-125	10/30/15 22:50	
oluene-d8 (S)	%.	108	75-125	10/30/15 22:50	

LABORATORY CONTROL SAMPLE:	2122826					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L		21.1	106	75-125	
1,1,1-Trichloroethane	ug/L	20	22.2	111	75-125	
1,1,2,2-Tetrachloroethane	ug/L	20	22.0	110	75-125	
1,1,2-Trichloroethane	ug/L	20	20.3	101	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	16.2	81	60-135	
1,1-Dichloroethane	ug/L	20	22.0	110	69-125	
1,1-Dichloroethene	ug/L	20	19.2	96	68-125	
1,1-Dichloropropene	ug/L	20	20.8	104	74-125	
1,2,3-Trichlorobenzene	ug/L	20	20.3	101	69-136	
1,2,3-Trichloropropane	ug/L	20	21.2	106	75-125	
1,2,4-Trichlorobenzene	ug/L	20	20.2	101	73-127	

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**

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Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

LABORATORY CONTROL SAMPLE	: 2122826	Spike	LCS	LCS	% Rec
Parameter	Units	Conc.	Result	% Rec	Limits Qualifier
1,2,4-Trimethylbenzene	ug/L		21.7	109	75-125
1,2-Dibromo-3-chloropropane	ug/L	50	49.9	100	65-145
1,2-Dibromoethane (EDB)	ug/L	20	21.6	108	75-125
1,2-Dichlorobenzene	ug/L	20	20.9	105	75-125
1,2-Dichloroethane	ug/L	20	21.0	105	73-125
1,2-Dichloropropane	ug/L	20	21.7	109	75-125
1,3,5-Trimethylbenzene	ug/L	20	21.8	109	75-125
1,3-Dichlorobenzene	ug/L	20	20.2	101	74-125
1,3-Dichloropropane	ug/L	20	21.8	109	75-125
1,4-Dichlorobenzene	ug/L	20	20.1	101	75-125
2,2-Dichloropropane	ug/L	20	21.0	105	59-139
2-Butanone (MEK)	ug/L	100	110	110	63-130
2-Chlorotoluene	ug/L	20	21.6	108	72-125
2-Chlorotoluene 4-Chlorotoluene	_	20	22.5	112	72-125 73-125
4-Chloroloidene 4-Methyl-2-pentanone (MIBK)	ug/L ug/L	100	22.5 123	123	73-125 71-126
	_	100	77.2	77	69-131
Acetone	ug/L				
Allyl chloride	ug/L	20	21.2	106	67-125
Benzene	ug/L	20	20.4	102	71-125
Bromobenzene	ug/L	20	20.9	104	75-125
Bromochloromethane	ug/L	20	18.8	94	75-125
Bromodichloromethane	ug/L	20	20.7	104	75-125
Bromoform	ug/L	20	17.7	88	70-125
Bromomethane	ug/L	20	9.2	46	30-150 CL
Carbon tetrachloride	ug/L	20	20.5	102	75-126
Chlorobenzene	ug/L	20	20.7	103	75-125
Chloroethane	ug/L	20	22.8	114	65-134
Chloroform	ug/L	20	20.5	103	75-125
Chloromethane	ug/L	20	20.8	104	39-150
cis-1,2-Dichloroethene	ug/L	20	21.3	107	72-125
cis-1,3-Dichloropropene	ug/L	20	20.7	103	75-125
Dibromochloromethane	ug/L	20	20.1	101	75-125
Dibromomethane	ug/L	20	18.7	93	75-125
Dichlorodifluoromethane	ug/L	20	22.0	110	50-134
Dichlorofluoromethane	ug/L	20	20.2	101	69-125
Diethyl ether (Ethyl ether)	ug/L	20	19.4	97	72-125
Ethylbenzene	ug/L	20	22.6	113	75-125
Hexachloro-1,3-butadiene	ug/L	20	22.2	111	70-138
sopropylbenzene (Cumene)	ug/L	20	21.9	110	75-125
Methyl-tert-butyl ether	ug/L	20	20.1	101	73-125
Methylene Chloride	ug/L	20	20.5	103	73-125
n-Butylbenzene	ug/L	20	22.6	113	72-133
n-Propylbenzene	ug/L	20	22.3	111	72-126
Naphthalene	ug/L	20	20.2	101	70-127
o-Isopropyltoluene	ug/L	20	21.5	108	72-132
sec-Butylbenzene	ug/L	20	22.3	111	73-132
Styrene	ug/L	20	21.5	107	75-125
ert-Butylbenzene	ug/L	20	21.2	106	73-128

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Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

ABORATORY CONTROL SAMPLE:	2122826					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Tetrachloroethene	ug/L	20	18.5	92	74-125	
Tetrahydrofuran	ug/L	200	166	83	62-133	
oluene	ug/L	20	22.2	111	74-125	
ans-1,2-Dichloroethene	ug/L	20	19.5	98	69-125	
ns-1,3-Dichloropropene	ug/L	20	22.2	111	75-125	
chloroethene	ug/L	20	21.3	106	75-125	
chlorofluoromethane	ug/L	20	21.0	105	74-127	
yl chloride	ug/L	20	22.2	111	66-132	
ene (Total)	ug/L	60	64.1	107	75-125	
2-Dichloroethane-d4 (S)	%.			115	75-125	
Bromofluorobenzene (S)	%.			105	75-125	
luene-d8 (S)	%.			108	75-125	
9-uo (S)	%.			106	75-125	

MATRIX SPIKE SAMPLE:	2123049						
		10328072004	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	17.4	87	70-138	
1,1,1-Trichloroethane	ug/L	ND	20	17.8	89	55-150	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	19.9	99	64-140	
1,1,2-Trichloroethane	ug/L	ND	20	18.3	92	67-137	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	16.3	81	51-150	
1,1-Dichloroethane	ug/L	ND	20	17.1	85	49-150	
1,1-Dichloroethene	ug/L	ND	20	13.7	69	40-150	
1,1-Dichloropropene	ug/L	ND	20	15.1	76	50-150	
1,2,3-Trichlorobenzene	ug/L	ND	20	14.7	73	59-148	
1,2,3-Trichloropropane	ug/L	ND	20	20.1	100	65-141	
1,2,4-Trichlorobenzene	ug/L	ND	20	15.2	76	61-140	
1,2,4-Trimethylbenzene	ug/L	ND	20	17.3	86	58-141	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	46.6	93	53-150	
1,2-Dibromoethane (EDB)	ug/L	ND	20	16.9	84	65-137	
1,2-Dichlorobenzene	ug/L	ND	20	17.3	87	66-133	
1,2-Dichloroethane	ug/L	ND	20	17.1	85	54-138	
1,2-Dichloropropane	ug/L	ND	20	17.6	88	62-138	
1,3,5-Trimethylbenzene	ug/L	ND	20	17.1	85	58-140	
1,3-Dichlorobenzene	ug/L	ND	20	16.9	85	66-132	
1,3-Dichloropropane	ug/L	ND	20	18.4	92	66-134	
1,4-Dichlorobenzene	ug/L	ND	20	16.4	82	65-129	
2,2-Dichloropropane	ug/L	ND	20	16.3	82	40-150	
2-Butanone (MEK)	ug/L	ND	100	87.6	88	51-147	
2-Chlorotoluene	ug/L	ND	20	17.7	89	58-147	
4-Chlorotoluene	ug/L	ND	20	18.3	91	64-138	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	109	109	59-143	
Acetone	ug/L	ND	100	72.4	72	63-147	
Allyl chloride	ug/L	ND	20	16.1	81	45-150	
Benzene	ug/L	ND	20	15.3	76	53-139	

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Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

MATRIX SPIKE SAMPLE:	2123049						
		10328072004	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/L	ND	20	17.6	88	66-136	
Bromochloromethane	ug/L	ND	20	14.5	73	64-136	
Bromodichloromethane	ug/L	ND	20	17.5	87	66-138	
Bromoform	ug/L	ND	20	15.9	80	59-136	
Bromomethane	ug/L	ND	20	7.6	38	30-150	CL
Carbon tetrachloride	ug/L	ND	20	17.4	87	56-150	
Chlorobenzene	ug/L	ND	20	16.7	84	65-133	
Chloroethane	ug/L	ND	20	26.0	130	48-150	
Chloroform	ug/L	ND	20	17.5	88	57-145	
Chloromethane	ug/L	ND	20	21.3	107	30-150	
cis-1,2-Dichloroethene	ug/L	ND	20	15.6	78	49-150	
cis-1,3-Dichloropropene	ug/L	ND	20	16.8	84	64-130	
Dibromochloromethane	ug/L	ND	20	15.9	80	68-138	
Dibromomethane	ug/L	ND	20	14.9	74	67-134	
Dichlorodifluoromethane	ug/L	ND	20	27.4	137	45-150	
Dichlorofluoromethane	ug/L	3.0	20	23.1	100	54-150	
Diethyl ether (Ethyl ether)	ug/L	ND	20	15.2	76	50-145	
Ethylbenzene	ug/L	ND	20	17.4	87	55-139	
Hexachloro-1,3-butadiene	ug/L	ND	20	16.0	80	49-150	
Isopropylbenzene (Cumene)	ug/L	ND	20	17.8	89	64-142	
Methyl-tert-butyl ether	ug/L	ND	20	16.8	84	62-129	
Methylene Chloride	ug/L	ND	20	14.6	73	57-132	
n-Butylbenzene	ug/L	ND	20	17.5	88	55-150	
n-Propylbenzene	ug/L	ND	20	18.0	90	59-142	
Naphthalene	ug/L	ND	20	16.4	82	51-150	
p-Isopropyltoluene	ug/L	ND	20	17.5	87	60-149	
sec-Butylbenzene	ug/L	ND	20	18.3	91	60-150	
Styrene	ug/L	ND	20	17.3	86	68-134	
tert-Butylbenzene	ug/L	ND	20	17.7	88	62-146	
Tetrachloroethene	ug/L	ND	20	14.0	70	50-150	
Tetrahydrofuran	ug/L	ND	200	153	76	59-145	
Toluene	ug/L	ND	20	16.3	81	52-148	
trans-1,2-Dichloroethene	ug/L	ND	20	12.4	62	45-150	
trans-1,3-Dichloropropene	ug/L	ND	20	18.0	90	68-132	
Trichloroethene	ug/L	ND	20	14.6	73	52-150	
Trichlorofluoromethane	ug/L	ND	20	24.4	121	55-150	
Vinyl chloride	ug/L	ND	20	23.7	118	43-150	
Xylene (Total)	ug/L	ND	60	50.1	83	54-144	
1,2-Dichloroethane-d4 (S)	%.				114	75-125	
4-Bromofluorobenzene (S)	%.				105	75-125	
Toluene-d8 (S)	%.				105	75-125	

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## **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

SAMPLE DUPLICATE: 2123050						
Parameter	Units	10328072005 Result	Dup Result	RPD	Max RPD C	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L		ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,1-Dichloropropene	ug/L	ND	ND		30	
1,2,3-Trichlorobenzene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2,4-Trichlorobenzene	ug/L	ND	ND		30	
1,2,4-Trimethylbenzene	ug/L	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,3,5-Trimethylbenzene	ug/L	ND	ND		30	
1,3-Dichlorobenzene	ug/L	ND	ND		30	
1,3-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2,2-Dichloropropane	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Chlorotoluene	ug/L	ND	ND		30	
4-Chlorotoluene	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Allyl chloride	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromobenzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND	ND		30 CL	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Dichlorodifluoromethane	ug/L	ND	ND		30	
Dichlorofluoromethane	ug/L ug/L	ND ND	ND ND		30	
Diethyl ether (Ethyl ether)	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Luiyibelizelie	ug/L	ND	ואט		30	

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## **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

SAMPLE DUPLICATE: 2123050						
		10328072005	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/L	ND	ND		30	
Isopropylbenzene (Cumene)	ug/L	ND	ND		30	
Methyl-tert-butyl ether	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
n-Butylbenzene	ug/L	ND	ND		30	
n-Propylbenzene	ug/L	ND	ND		30	
Naphthalene	ug/L	ND	ND		30	
p-Isopropyltoluene	ug/L	ND	ND		30	
sec-Butylbenzene	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
tert-Butylbenzene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Tetrahydrofuran	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	110	107	3		
4-Bromofluorobenzene (S)	%.	108	109	1		
Toluene-d8 (S)	%.	106	108	2		

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.



#### **QUALIFIERS**

Project: PS Beta - NIROP

Pace Project No.: 10327623

#### **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.

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.

#### **ANALYTE QUALIFIERS**

Date: 11/03/2015 09:11 AM

- 1M The internal standard recovery associated with this result exceeds the lower control limit. Results unaffected by a high bias. Confirmed by a second analysis.
- CL The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.
- S2 Surrogate recovery outside laboratory control limits due to matrix interferences (confirmed by similar results from sample re-analysis).





## **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: PS Beta - NIROP

Pace Project No.: 10327623

Date: 11/03/2015 09:11 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10327623001	PMW-01	EPA 8260B	MSV/33585		
10327623002	PMW-02	EPA 8260B	MSV/33557		
10327623003	PMW-03	EPA 8260B	MSV/33585		
10327623004	PMW-04	EPA 8260B	MSV/33596		
10327623005	Trip Blank	EPA 8260B	MSV/33557		

Section A Email To: Required Client Information: Requested Due Date/TAT: ddress: ompany: none: 949-366-8000 ITEM # Q-DAY Pace Analytical X 2 - TAY TICA Section D tequired Client Information (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE San Clemente, CA 92673 Regenesis 1011 Calle Sombra 20-0m Mpham@regenesis.com NW - 03 0- 226 012 no-on SAMPLE ID ADDITIONAL COMMENTS KANK 2 days Fax: 343-366-8090 Valid Matrix Codes

MATRIX

CODE

TRINKING WATER

WITE

OLD

OLD

OR

AR

OT

TS Copy To: Required Project Information: Section B Project Number: Project Name: Report To: Melinda Pham urchase Order No.: MATRIX CODE BELINGUISHED BY/AFFILIATION PS Beta - NIROP PS Beta - NIROP (G=GRAB C=COMP) SAMPLE TYPE DATE COMPOSITE イだのと COLLECTED SAMPLER NAME AND SIGNATURE TIME 10/26/15 antisted PRINT Name of SAMPLER: SIGNATURE of SAMPLER: COMPOSITE END/GRAB 1605 1710 330 192415 TIME DATE SAMPLE TEMP AT COLLECTION Company Name: Regenesis Attention: \ddress: ace Quote OF CONTAINERS  $\widetilde{\mathscr{O}}$ Unpreserved j H<sub>2</sub>SO<sub>4</sub> 1011 Calle Sombra Bahar Naderi Preservatives HNO₃ HCI W W W NaOH Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> Methanol Other Y/N Analysis Test EPA 8260, VOC MW S AFFILIATION Requested DATE Signed (MM/DD/YY): DS- NO Analysis Filtered (Y/N) REGULATORY AGENCY Site Location П UST NPDES STATE 10/24/17/18/12/03 DATE <u>8</u> TIME 6 RCRA **GROUND WATER** ₹ Temp in °C Residual Chlorine (Y/N) Received on Pace Project No./ Lab I.D. IJ SAMPLE CONDITIONS Ice (Y/N) 으 DRINKING WATER OTHER Custody Sealed Cooler (Y/N) 8 2000 8 28 Samples Intact (Y/N) Page 38 of 39

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately. CHAIN-OF-CUSTODY / Analytical Request Document

# Pace Analytical\*

# Document Name:

# Sample Condition Upon Receipt Form

Document No.: F-MN-L-213-rev.13

Document Revised: 23Feb2015

Page 1 of 1

Issuing Authority: Pace Minnesota Quality Office

Sample Condition Client Name: Upon Receipt			Project	#: W0#:10327623
Regenesis				
Courier: Fed Ex UPS	USPS	<b>D</b> C	lient	
Commercial Pace SpeeDee	Other:_	·		10327623
Tracking Number:				
Custody Seal on Cooler/Box Present?		Seals Inta	act?	Yes No Optional: Proj. Due Date: Proj. Name:
Packing Material: Bubble Wrap Bubble Bags	Non	e [](	Other:	Temp Blank?
Thermometer         ☐ B88A9130516413         ☐ B88A91216750           Used:         ☑ B88A01433100	98 i <b>yp</b> '	e of Ice:	<b>W</b> we	t Blue None Samples on ice, cooling process has begun
Cooler Temp Read (°C): $\frac{\sqrt{-2}}{\sqrt{0}}$ Cooler Temp Cor				Biological Tissue Frozen? Yes No N/A
Temp should be above freezing to 6°C Correction Fact USDA Regulated Soil ( ☑PN/A, water sample)	or:	_	Dat	e and Initials of Person Examining Contents: 10(26(15 1)
Did samples originate in a quarantine zone within the United S MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)?			Yes	ID, LA. Did samples originate from a foreign source (internationally,
ii res to either question, iii out a keg	uiateu Soii	CHECKIIS	er (L-MANA-	COMMENTS:
Chain of Custody Present?	<b>,⊠</b> Yes	□No	□N/A	1.
Chain of Custody Filled Out?	<b>∑</b> Pres	No	N/A	2.
Chain of Custody Relinquished?	<b>∑</b> Yes	□No	□N/A	3.
Sampler Name and/or Signature on COC?	Yes	□No	□N/A	4.
Samples Arrived within Hold Time?	<b>Æ</b> Yes	□No	□N/A	5.
Short Hold Time Analysis (<72 hr)?	□Yes	No	□N/A	6.
Rush Turn Around Time Requested?	∑Pres	□No	□N/A	7. 7 day
Sufficient Volume?	<b>⊠</b> Yes	□No	□N/A	8.
Correct Containers Used?	¥2]Yes	□No	□N/A	9.
-Pace Containers Used?	Yes	□No	□N/A	
Containers Intact?	¥€Yes	□No	□N/A	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?	¶ <b>∑</b> Yes	□No	□N/A	12.
-Includes Date/Time/ID/Analysis Matrix:	, 			
All containers needing acid/base preservation have been			ć	13. ∏HNO₃ ∏H₂SO₄ ∏NaOH ∏HCI
checked? All containers needing preservation are found to be in	☐Yes	No	N/A	Sample #
compliance with EPA recommendation?				
(HNO₃, H₂SO₄, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA Coliform, TOC, Oil and Grease,	☐Yes	□No	<b>≥</b> N/A	Initial when Lot # of added
DRO/8015 (water) DOC	¥¥es	□No	□N/A	completed: preservative:
Headspace in VOA Vials ( >6mm)?	□Yes	<b>⊠</b> Wo	□N/A	14.
Trip Blank Present?	<b>X</b> 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:				
				16/2-110
Project Manager Review:	omnlianas		2001/251	Date: 10// TIG5  his form will be sent to the North Carolina DEHNR Certification Office ( i.e. our





November 10, 2015

Melinda Pham Regenesis 1011 Calle Sombra San Clemente, CA 92673

RE: Project: PS Beta - NIROP Pace Project No.: 10327624

### Dear Melinda Pham:

Enclosed are the analytical results for sample(s) received by the laboratory on October 26, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

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

Sincerely,

Jennifer Anderson jennifer.anderson@pacelabs.com Project Manager

JAndera

Enclosures

cc: Ryan Moore, Regenesis







#### **CERTIFICATIONS**

Project: PS Beta - NIROP

Pace Project No.: 10327624

**Minnesota Certification IDs** 

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770 Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA Colorado Certification #Pace

Connecticut Certification #: PH-0256 EPA Region 8 Certification #: 8TMS-L Florida/NELAP Certification #: E87605

Guam Certification #:14-008r Georgia Certification #: 959 Georgia EPD #: Pace

Idaho Certification #: MN00064 Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01 Iowa Certification #: 368

Kansas Certification #: E-10167 Kentucky Dept of Envi. Protection - DW #90062 Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001 Maine Certification #: 2013011 Maryland Certification #: 322 Michigan DEPH Certification #: 9909

**Montana Certification IDs** 

150 N. 9th Street, Billings, MT 59101 Colorado Asbestos #: 17119 A2LA Certification #: 3590.01

EPA Region 8 Certification #: 8TMS-L Idaho Certification #: MT00012

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792 Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785 Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace Montana Certification #: MT0092 Nevada Certification #: MN\_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002 New York Certification #: 11647 North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150 Ohio VAP Certification #: CL101 Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563

Puerto Rico Certification Saipan (CNMI) #:MP0003 South Carolina #:74003001 Texas Certification #: T104704192 Tennessee Certification #: 02818 Utah Certification #: MN000642013-4 Virginia DGS Certification #: 251 Washington Certification #: C486

West Virginia Certification #: 382 West Virginia DHHR #:9952C Wisconsin Certification #: 999407970

Minnesota Dept of Health Certification #: 030-999-442

Montana Certification #: MT CERT0040 North Dakota Dept. Of Health #: R-209 NVLAP Certification #: 101292-0

Washington Department of Ecology #: C993

Wisconsin DNR Certification #: 998027470 WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

**Ormond Beach Certification IDs** 

8 East Tower Circle, Ormond Beach, FL 32174

Alabama Certification #: 41320 Connecticut Certification #: PH-0216

Delaware Certification: FL NELAC Reciprocity

Florida Certification #: E83079 Georgia Certification #: 955

Guam Certification: FL NELAC Reciprocity Hawaii Certification: FL NELAC Reciprocity

Illinois Certification #: 200068

Indiana Certification: FL NELAC Reciprocity

Kansas Certification #: E-10383 Kentucky Certification #: 90050

Louisiana Certification #: FL NELAC Reciprocity Louisiana Environmental Certificate #: 05007

Maryland Certification: #346 Michigan Certification #: 9911

Mississippi Certification: FL NELAC Reciprocity

Missouri Certification #: 236 Montana Certification #: Cert 0074 Nebraska Certification: NE-OS-28-14 Nevada Certification: FL NELAC Reciprocity

New Hampshire Certification #: 2958 New York Certification #: 11608

North Carolina Environmental Certificate #: 667

North Carolina Certification #: 12710 North Dakota Certification #: R-216 Oklahoma Certification #: D9947 Pennsylvania Certification #: 68-00547 Puerto Rico Certification #: FL01264 South Carolina Certification: #96042001 Tennessee Certification #: TN02974

Texas Certification: FL NELAC Reciprocity

US Virgin Islands Certification: FL NELAC Reciprocity

Virginia Environmental Certification #: 460165

#### REPORT OF LABORATORY ANALYSIS

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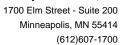
## **CERTIFICATIONS**

Project: PS Beta - NIROP

Pace Project No.: 10327624

**Ormond Beach Certification IDs** 

West Virginia Certification #: 9962C Wisconsin Certification #: 399079670 Wyoming (EPA Region 8): FL NELAC Reciprocity





# **SAMPLE SUMMARY**

Project: PS Beta - NIROP

Pace Project No.: 10327624

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10327624001	PMW-01	Water	10/26/15 14:40	10/26/15 18:12
10327624002	PMW-02	Water	10/26/15 13:20	10/26/15 18:12
10327624003	PMW-03	Water	10/26/15 17:10	10/26/15 18:12
10327624004	PMW-04	Water	10/26/15 16:05	10/26/15 18:12



# **SAMPLE ANALYTE COUNT**

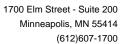
Project: PS Beta - NIROP

Pace Project No.: 10327624

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10327624001	PMW-01	RSK 175	JRB	3	PASI-M
		EPA 6010C	IP	1	PASI-M
		6010C Met	IP	1	PASI-M
		SM 4500-S2-D	JME	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	KAM	2	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	PH1	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V
0327624002	PMW-02	RSK 175	JRB	3	PASI-M
		EPA 6010C	IP	1	PASI-M
	6010C Met	IP	1	PASI-M	
	SM 4500-S2-D	JME	1	PASI-MT	
	SM 2320B	MW	3	PASI-M	
	SM 2320B	KAM	2	PASI-O	
	EPA 300.0	KEO	1	PASI-M	
		EPA 353.2	PH1	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V
0327624003	PMW-03	RSK 175	JRB	3	PASI-M
		EPA 6010C	IP	1	PASI-M
		6010C Met	IP	1	PASI-M
		SM 4500-S2-D	JME	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	KAM	2	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	PH1	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V
0327624004	PMW-04	RSK 175	JRB	3	PASI-M
		EPA 6010C	IP	1	PASI-M
		6010C Met	IP	1	PASI-M
		SM 4500-S2-D	JME	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	KAM	2	PASI-O
		EPA 300.0	KEO	1	PASI-M

## **REPORT OF LABORATORY ANALYSIS**

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# **SAMPLE ANALYTE COUNT**

Project: PS Beta - NIROP

Pace Project No.: 10327624

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 353.2	PH1	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V



# **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10327624

Date: 11/10/2015 04:08 PM

Sample: PMW-01	Lab ID: 1032	27624001	Collected: 10/26/1	5 14:40	Received: 10	0/26/15 18:12 N	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
RSK 175 AIR Headspace	Analytical Meth	nod: RSK 17	<b>7</b> 5						
Ethane	ND	ug/L	10.0	1		10/27/15 13:03	74-84-0		
Ethene	ND	ug/L	10.0	1		10/27/15 13:03	74-85-1		
Methane	ND	ug/L	10.0	1		10/27/15 13:03	74-82-8		
6010C MET ICP	Analytical Meth	alytical Method: EPA 6010C Preparation Method: EPA 3010							
ron	21400	ug/L	250	1	10/30/15 11:55	11/02/15 08:43	7439-89-6		
6010C MET ICP, Dissolved	Analytical Meth	nod: 6010C	Met Preparation Me	thod: El	PA 3010				
ron, Dissolved	2580	ug/L	50.0	1	11/03/15 09:02	11/03/15 13:26	7439-89-6		
4500S2D Sulfide Water	Analytical Meth	nod: SM 450	00-S2-D						
Sulfide	ND	mg/L	50.0	500		10/28/15 17:24		D3	
2320B Alkalinity	Analytical Meth	nod: SM 232	20B						
Alkalinity, Total as CaCO3	603	mg/L	100	20		10/30/15 12:48			
Alkalinity, Total as CaCO3	599	mg/L	5.0	1		11/06/15 13:27			
Carbon Dioxide (SM4500CO2D)	ND	mg/L	100	20		10/30/15 12:48			
Alkalinity,Bicarbonate (CaCO3)	595	mg/L	5.0	1		11/06/15 13:27			
Alkalinity, Carbonate (CaCO3)	ND	mg/L	5.0	1		11/06/15 13:27			
300.0 IC Anions	Analytical Meth	nod: EPA 30	0.0						
Sulfate	172	mg/L	120	100		11/04/15 14:30	14808-79-8		
353.2 Nitrate + Nitrite	Analytical Meth	nod: EPA 35	3.2						
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		11/02/15 16:55			
5220D COD	Analytical Meth	nod: SM 522	20D Preparation Me	thod: SI	M 5220D				
Chemical Oxygen Demand	1240	mg/L	500	1	11/04/15 11:21	11/04/15 15:47			
310C TOC	Analytical Meth	nod: SM 531	0C						
Total Organic Carbon	35.1	mg/L	10.0	10		11/02/15 18:41	7440-44-0		



# **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10327624

Date: 11/10/2015 04:08 PM

Sample: PMW-02	Lab ID: 1032	27624002	Collected: 10/26/1	5 13:20	Received: 10	)/26/15 18:12 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
RSK 175 AIR Headspace	Analytical Meth	od: RSK 17	75					
Ethane	ND	ug/L	10.0	1		10/27/15 13:12	74-84-0	
Ethene	ND	ug/L	10.0	1		10/27/15 13:12	74-85-1	
Methane	14.4	ug/L	10.0	1		10/27/15 13:12	74-82-8	
010C MET ICP	Analytical Meth	od: EPA 60	110C Preparation Me	ethod: E	PA 3010			
ron	3430	ug/L	50.0	1	10/30/15 11:55	10/30/15 17:13	7439-89-6	
010C MET ICP, Dissolved	Analytical Meth	od: 6010C	Met Preparation Me	thod: E	PA 3010			
ron, Dissolved	2600	ug/L	50.0	1	11/03/15 09:02	11/03/15 13:31	7439-89-6	
500S2D Sulfide Water	Analytical Meth	od: SM 450	00-S2-D					
Sulfide	ND	mg/L	0.10	1		10/28/15 17:25		
320B Alkalinity	Analytical Meth	od: SM 232	20B					
Alkalinity, Total as CaCO3	409	mg/L	5.0	1		10/30/15 13:03		
Alkalinity, Total as CaCO3	427	mg/L	5.0	1		11/06/15 13:32		
Carbon Dioxide (SM4500CO2D)	63.6	mg/L	5.0	1		10/30/15 13:03		
lkalinity,Bicarbonate (CaCO3)	427	mg/L	5.0	1		11/06/15 13:32		
Alkalinity, Carbonate (CaCO3)	ND	mg/L	5.0	1		11/06/15 13:32		
00.0 IC Anions	Analytical Meth	od: EPA 30	0.00					
Sulfate	156	mg/L	2.4	2		11/04/15 21:22	14808-79-8	
53.2 Nitrate + Nitrite	Analytical Meth	od: EPA 35	53.2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		11/02/15 16:56		
220D COD	Analytical Meth	od: SM 522	20D Preparation Met	thod: SI	M 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	11/04/15 11:21	11/04/15 15:47		
310C TOC	Analytical Meth	od: SM 53	10C					
otal Organic Carbon	2.3	mg/L	1.0	1		11/03/15 10:02	7440-44-0	
		-						



# **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10327624

Date: 11/10/2015 04:08 PM

Sample: PMW-03	Lab ID: 1032	27624003	Collected: 10/26/1	15 17:10	Received: 10	)/26/15 18:12 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Meth	od: RSK 17	75					
Ethane	ND	ug/L	10.0	1		10/27/15 13:20	74-84-0	
Ethene	ND	ug/L	10.0	1		10/27/15 13:20	74-85-1	
Methane	26.7	ug/L	10.0	1		10/27/15 13:20	74-82-8	
6010C MET ICP	Analytical Meth	od: EPA 60	10C Preparation Me	ethod: E	PA 3010			
Iron	10500	ug/L	50.0	1	10/30/15 11:55	10/30/15 17:17	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	od: 6010C	Met Preparation Me	thod: El	PA 3010			
Iron, Dissolved	4540	ug/L	50.0	1	11/03/15 09:02	11/03/15 14:05	7439-89-6	
4500S2D Sulfide Water	Analytical Meth	od: SM 450	0-S2-D					
Sulfide	ND	mg/L	0.10	1		10/28/15 17:26		
2320B Alkalinity	Analytical Meth	od: SM 232	20B					
Alkalinity, Total as CaCO3	300	mg/L	5.0	1		11/06/15 13:37		
Alkalinity, Total as CaCO3	285	mg/L	5.0	1		10/30/15 13:10		
Carbon Dioxide (SM4500CO2D)	36.1	mg/L	5.0	1		10/30/15 13:10		
Alkalinity,Bicarbonate (CaCO3)	300	mg/L	5.0	1		11/06/15 13:37		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		11/06/15 13:37		
300.0 IC Anions	Analytical Meth	od: EPA 30	0.0					
Sulfate	152	mg/L	2.4	2		11/04/15 21:40	14808-79-8	
353.2 Nitrate + Nitrite	Analytical Meth	od: EPA 35	3.2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		11/02/15 16:58		
5220D COD	Analytical Meth	od: SM 522	20D Preparation Me	thod: SI	M 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	11/04/15 11:21	11/04/15 15:47		
5310C TOC	Analytical Meth	od: SM 531	0C					
Total Organic Carbon	2.5	mg/L	1.0	1		11/02/15 19:09	7440-44-0	



# **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10327624

Date: 11/10/2015 04:08 PM

Sample: PMW-04	Lab ID: 1032	27624004	Collected: 10/26/1	15 16:05	Received: 10	0/26/15 18:12 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
RSK 175 AIR Headspace	Analytical Meth	od: RSK 1	75					
Ethane	ND	ug/L	10.0	1		10/27/15 13:28	74-84-0	
Ethene	ND	ug/L	10.0	1		10/27/15 13:28	74-85-1	
Methane	17.7	ug/L	10.0	1		10/27/15 13:28	74-82-8	
6010C MET ICP	Analytical Meth	od: EPA 60	010C Preparation Me	ethod: E	PA 3010			
ron	3880	ug/L	50.0	1	10/30/15 11:55	10/30/15 17:21	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	od: 6010C	Met Preparation Me	thod: E	PA 3010			
ron, Dissolved	2580	ug/L	50.0	1	11/03/15 09:02	11/03/15 14:09	7439-89-6	
1500S2D Sulfide Water	Analytical Meth	od: SM 450	00-S2-D					
Sulfide	ND	mg/L	0.10	1		10/28/15 17:27		
320B Alkalinity	Analytical Meth	od: SM 23	20B					
Alkalinity, Total as CaCO3	274	mg/L	5.0	1		11/06/15 13:42		
Alkalinity, Total as CaCO3	266	mg/L	5.0	1		10/30/15 13:17		
Alkalinity,Bicarbonate (CaCO3)	274	mg/L	5.0	1		11/06/15 13:42		
Carbon Dioxide (SM4500CO2D)	32.6	mg/L	5.0	1		10/30/15 13:17		
Alkalinity, Carbonate (CaCO3)	ND	mg/L	5.0	1		11/06/15 13:42		
300.0 IC Anions	Analytical Meth	od: EPA 30	0.00					
Sulfate	118	mg/L	2.4	2		11/04/15 21:59	14808-79-8	
353.2 Nitrate + Nitrite	Analytical Meth	od: EPA 35	53.2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		11/02/15 16:59		
3220D COD	Analytical Meth	od: SM 52	20D Preparation Me	thod: SI	M 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	11/04/15 11:21	11/04/15 15:48		
3310C TOC	Analytical Meth	od: SM 53	10C					
otal Organic Carbon	2.3	mg/L	1.0	1		11/02/15 19:22	7440-44-0	



#### **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10327624

Date: 11/10/2015 04:08 PM

QC Batch: AIR/24503 Analysis Method: RSK 175

QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE

Associated Lab Samples: 10327624001, 10327624002, 10327624003, 10327624004

METHOD BLANK: 2118653 Matrix: Water

Associated Lab Samples: 10327624001, 10327624002, 10327624003, 10327624004

		DIATIK	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	10/27/15 10:43	
Ethene	ug/L	ND	10.0	10/27/15 10:43	
Methane	ug/L	ND	10.0	10/27/15 10:43	

LABORATORY CONTROL SAMPLE & LCSD: 2118654 2118655										
		Spike	LCS	LCSD	LCS	LCSD	% Rec		Max	
Parameter	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
Ethane	ug/L	114	116	125	102	110	85-115	7	20	
Ethene	ug/L	106	109	117	102	110	85-115	7	20	
Methane	ug/L	60.7	61.7	66.2	102	109	85-115	7	20	

SAMPLE DUPLICATE: 2118656						
		92272855010	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	58.4	54.5	7	20	

SAMPLE DUPLICATE: 2118657						
		60205525003	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ua/l	1370	1770	26	20	R1

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.



#### **QUALITY CONTROL DATA**

PS Beta - NIROP Project:

Pace Project No.: 10327624

Date: 11/10/2015 04:08 PM

QC Batch: MPRP/59250 Analysis Method: **EPA 6010C** QC Batch Method: EPA 3010 Analysis Description: 6010C Water

10327624001, 10327624002, 10327624003, 10327624004 Associated Lab Samples:

METHOD BLANK: 2122493 Matrix: Water Associated Lab Samples:

10327624001, 10327624002, 10327624003, 10327624004

Blank Reporting

Limit Qualifiers Parameter Units Result Analyzed

Iron ND 50.0 10/30/15 15:56 ug/L

LABORATORY CONTROL SAMPLE: 2122494

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Iron ug/L 10000 9740 97 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2122495 2122496

MS MSD 10327845001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 10000 75-125 20 ug/L 1610 10000 11300 11500 97 99 Iron

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.



**QUALITY CONTROL DATA** 

Project: PS Beta - NIROP

Pace Project No.: 10327624

Iron, Dissolved

Date: 11/10/2015 04:08 PM

QC Batch: MPRP/59274 Analysis Method: 6010C Met

QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved

Associated Lab Samples: 10327624001, 10327624002, 10327624003, 10327624004

METHOD BLANK: 2122867 Matrix: Water

Associated Lab Samples: 10327624001, 10327624002, 10327624003, 10327624004

ug/L

Blank Reporting

ND

50.0

11/03/15 12:50

Parameter Units Result Limit Analyzed Qualifiers

LABORATORY CONTROL SAMPLE: 2122868

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Iron, Dissolved ug/L 10000 10500 105 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2124974 2124975

MS MSD 10327624002 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Iron, Dissolved 10000 75-125 2 20 ug/L 2600 10000 13500 13200 109 106

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.



#### **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10327624

Date: 11/10/2015 04:08 PM

QC Batch: MT/21205 Analysis Method: SM 4500-S2-D

QC Batch Method: SM 4500-S2-D Analysis Description: 4500S2D Sulfide Water

Associated Lab Samples: 10327624001, 10327624002, 10327624003, 10327624004

METHOD BLANK: 2120158 Matrix: Water

Associated Lab Samples: 10327624001, 10327624002, 10327624003, 10327624004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Sulfide mg/L ND 0.10 10/28/15 16:48

LABORATORY CONTROL SAMPLE: 2120159

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Sulfide mg/L .92 0.90 98 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2120261 2120262

MS MSD 10327242001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual

Sulfide mg/L ND .92 .92 0.79 0.81 86 89 80-120 2 20

SAMPLE DUPLICATE: 2120162

Parameter Units Result Result RPD RPD Qualifiers

Sulfide Mg/L ND ND 20

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



#### **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10327624

QC Batch: WET/33881 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10327624001, 10327624002, 10327624003, 10327624004

METHOD BLANK: 1377651 Matrix: Water

Associated Lab Samples:

Blank Reporting Parameter Units Result Limit Analyzed Qualifiers Alkalinity, Total as CaCO3 ND 5.0 10/30/15 12:36 mg/L Carbon Dioxide (SM4500CO2D) mg/L ND 5.0 10/30/15 12:36

LABORATORY CONTROL SAMPLE: 1377652

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Alkalinity, Total as CaCO3 mg/L 250 242 97 90-110

SAMPLE DUPLICATE: 1377653

10327624001 Dup Max **RPD RPD** Qualifiers Parameter Units Result Result Alkalinity, Total as CaCO3 603 601 0 20 mg/L Carbon Dioxide (SM4500CO2D) ND ND mg/L

SAMPLE DUPLICATE: 1377654

Date: 11/10/2015 04:08 PM

		35213841004	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	110	110	0	20	
Carbon Dioxide (SM4500CO2D)	mg/L	8.6	8.5	2		

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.



#### **QUALITY CONTROL DATA**

PS Beta - NIROP Project:

Pace Project No.: 10327624

Alkalinity, Total as CaCO3

Date: 11/10/2015 04:08 PM

QC Batch: WET/45109 Analysis Method: SM 2320B QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

303

mg/L

40

10327624001, 10327624002, 10327624003, 10327624004 Associated Lab Samples:

METHOD BLANK: 2128765 Matrix: Water Associated Lab Samples: 10327624001, 10327624002, 10327624003, 10327624004 Blank Reporting Parameter Limit Qualifiers Units Result Analyzed Alkalinity, Total as CaCO3 ND 5.0 11/06/15 11:43 mg/L Alkalinity, Bicarbonate (CaCO3) mg/L ND 5.0 11/06/15 11:43 Alkalinity, Carbonate (CaCO3) ND 11/06/15 11:43 mg/L 5.0 LABORATORY CONTROL SAMPLE & LCSD: 2128766 2128767 Spike LCS LCSD LCS LCSD % Rec Max Conc. Parameter Units Result Result % Rec % Rec Limits **RPD RPD** Qualifiers Alkalinity, Total as CaCO3 40 43.5 43.4 109 108 90-110 0 30 mq/L MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2128768 2128769 MSD MS 10328172005 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual 241 Alkalinity, Total as CaCO3 mg/L 194 40 40 240 117 115 80-120 0 30 MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2128770 2128771 MS MSD 10327629001 MS MS MSD MSD % Rec Spike Spike Max RPD Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD Qual

40

350

348

118

114

80-120

30

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



#### **QUALITY CONTROL DATA**

PS Beta - NIROP Project:

Pace Project No.: 10327624

Date: 11/10/2015 04:08 PM

QC Batch: WETA/25415 Analysis Method: EPA 300.0 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

10327624001, 10327624002, 10327624003, 10327624004 Associated Lab Samples:

METHOD BLANK: 2126156 Matrix: Water Associated Lab Samples:

10327624001, 10327624002, 10327624003, 10327624004

Blank Reporting

Limit Qualifiers Parameter Units Result Analyzed

Sulfate ND 1.2 11/04/15 13:44 mg/L

LABORATORY CONTROL SAMPLE: 2126157

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Sulfate mg/L 12.5 11.9 95 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2126158 2126159

MS MSD 10328124001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Sulfate 90-110 20 M1 mg/L 29.3 12.5 12.5 38.8 38.8 76 76 0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2126160 2126161

MS MSD Spike MS MSD MS 10328124002 Spike MSD % Rec Max % Rec % Rec RPD Parameter Units Result Conc. Conc. Result Result Limits RPD Qual Sulfate 260 125 125 359 358 79 79 90-110 0 20 M6 mg/L

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.



#### **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10327624

Date: 11/10/2015 04:08 PM

QC Batch: WETA/25361 Analysis Method: EPA 353.2

QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved

Associated Lab Samples: 10327624001, 10327624002, 10327624003, 10327624004

METHOD BLANK: 2123086 Matrix: Water

Associated Lab Samples: 10327624001, 10327624002, 10327624003, 10327624004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Nitrogen, NO2 plus NO3 mg/L ND 0.020 11/02/15 17:16

LABORATORY CONTROL SAMPLE: 2123087

Parameter Units Spike LCS LCS % Rec Limits Qualifiers

Nitrogen, NO2 plus NO3 mg/L 1 1.0 102 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2123088 2123089

MS MSD MS 10327537001 Spike Spike MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual Nitrogen, NO2 plus NO3 2.2 1 3.1 90-110 20 M1 mg/L 1 3.1 92 88

.....

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2123090 2123091 MS MSD 10328085002 MS MSD MS MSD % Rec Spike Spike Max Parameter Conc. % Rec RPD Units Result Conc. Result Result % Rec Limits RPD Qual Nitrogen, NO2 plus NO3 mg/L 31.8 20 20 37.2 36.4 27 23 90-110 2 20 M6

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.



#### **QUALITY CONTROL DATA**

PS Beta - NIROP Project:

Pace Project No.: 10327624

Date: 11/10/2015 04:08 PM

QC Batch: WETA/25403 Analysis Method: SM 5220D QC Batch Method: SM 5220D Analysis Description: 5220D COD

10327624001, 10327624002, 10327624003, 10327624004 Associated Lab Samples:

METHOD BLANK: 2125211 Matrix: Water Associated Lab Samples:

10327624001, 10327624002, 10327624003, 10327624004

Blank Reporting

Parameter Limit Analyzed Qualifiers Units Result

Chemical Oxygen Demand ND 50.0 11/04/15 15:40 mg/L

LABORATORY CONTROL SAMPLE: 2125212

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chemical Oxygen Demand mg/L 300 299 100 90-110

2125214 MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2125213

MS MSD 10327492001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual 250 80-120 11 20 Chemical Oxygen Demand mg/L 65.6 250 328 296 105 92

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2125215 2125216

MS MSD 10327765001 MS MSD MS MSD Spike Spike % Rec Max Parameter % Rec RPD Units Result Conc. Conc. Result Result % Rec Limits RPD Qual Chemical Oxygen Demand ND 250 250 266 269 91 92 80-120 20 mg/L

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.



#### **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10327624

QC Batch: WETA/14477 Analysis Method: SM 5310C
QC Batch Method: SM 5310C Analysis Description: 5310C TOC

Associated Lab Samples: 10327624001, 10327624002, 10327624003, 10327624004

METHOD BLANK: 263970 Matrix: Water

Associated Lab Samples:

Date: 11/10/2015 04:08 PM

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Total Organic Carbon mg/L ND 1.0 11/02/15 15:17

LABORATORY CONTROL SAMPLE: 263971

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Organic Carbon** mg/L 25 25.7 103 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 263972 263973

MS MSD 10327707004 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual **Total Organic Carbon** ND 25 80-120 0 20 mg/L 25 26.9 26.9 104 104

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 263974 263975

MS MSD 10327854001 MS MSD MS MSD Spike Spike % Rec Max Parameter Conc. % Rec RPD Units Result Conc. Result Result % Rec Limits RPD Qual 25 Total Organic Carbon mg/L 1.3 25 27.4 27.7 104 106 80-120 1 20

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



#### **QUALIFIERS**

Project: PS Beta - NIROP Pace Project No.: 10327624

#### **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.

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
PASI-MT	Pace Analytical Services - Montana
PASI-O	Pace Analytical Services - Ormond Beach
PASI-V	Pace Analytical Services - Virginia

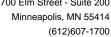
RPD value was outside control limits.

#### **ANALYTE QUALIFIERS**

Date: 11/10/2015 04:08 PM

R1

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.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.





# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: PS Beta - NIROP

Pace Project No.: 10327624

Date: 11/10/2015 04:08 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10327624001	PMW-01	RSK 175	AIR/24503		
10327624002	PMW-02	RSK 175	AIR/24503		
10327624003	PMW-03	RSK 175	AIR/24503		
10327624004	PMW-04	RSK 175	AIR/24503		
10327624001	PMW-01	EPA 3010	MPRP/59250	EPA 6010C	ICP/25804
0327624002	PMW-02	EPA 3010	MPRP/59250	EPA 6010C	ICP/25804
0327624003	PMW-03	EPA 3010	MPRP/59250	EPA 6010C	ICP/25804
0327624004	PMW-04	EPA 3010	MPRP/59250	EPA 6010C	ICP/25804
0327624001	PMW-01	EPA 3010	MPRP/59274	6010C Met	ICP/25834
0327624002	PMW-02	EPA 3010	MPRP/59274	6010C Met	ICP/25834
0327624003	PMW-03	EPA 3010	MPRP/59274	6010C Met	ICP/25834
0327624004	PMW-04	EPA 3010	MPRP/59274	6010C Met	ICP/25834
0327624001	PMW-01	SM 4500-S2-D	MT/21205		
0327624002	PMW-02	SM 4500-S2-D	MT/21205		
0327624003	PMW-03	SM 4500-S2-D	MT/21205		
0327624004	PMW-04	SM 4500-S2-D	MT/21205		
0327624001	PMW-01	SM 2320B	WET/33881		
0327624001	PMW-01	SM 2320B	WET/45109		
0327624002	PMW-02	SM 2320B	WET/33881		
0327624002	PMW-02	SM 2320B	WET/45109		
0327624003	PMW-03	SM 2320B	WET/33881		
0327624003	PMW-03	SM 2320B	WET/45109		
0327624004	PMW-04	SM 2320B	WET/33881		
0327624004	PMW-04	SM 2320B	WET/45109		
0327624001	PMW-01	EPA 300.0	WETA/25415		
0327624002	PMW-02	EPA 300.0	WETA/25415		
0327624003	PMW-03	EPA 300.0	WETA/25415		
0327624004	PMW-04	EPA 300.0	WETA/25415		
0327624001	PMW-01	EPA 353.2	WETA/25361		
0327624002	PMW-02	EPA 353.2	WETA/25361		
0327624003	PMW-03	EPA 353.2	WETA/25361		
0327624004	PMW-04	EPA 353.2	WETA/25361		
0327624001	PMW-01	SM 5220D	WETA/25403		WETA/254
0327624002	PMW-02	SM 5220D	WETA/25403		WETA/254
0327624003	PMW-03	SM 5220D	WETA/25403		WETA/254
0327624004	PMW-04	SM 5220D	WETA/25403	SM 5220D	WETA/254
0327624001	PMW-01	SM 5310C	WETA/14477		
0327624002	PMW-02	SM 5310C	WETA/14477		
0327624003	PMW-03	SM 5310C	WETA/14477		
10327624004	PMW-04	SM 5310C	WETA/14477		

Section A
Required Client Information: Company: Pace Analytical www.pacelabs.com Regenesis San Clemente, CA 92673 1011 Calle Sombra Section B
Required Project Information:
Report To: Melinda Pham Copy To: Section C
Invoice Information:
Attention: Baha Pace Quote Company Name: Regenesis Address: Bahar Naderi 1011 Calle Sombra TSU UST REGULATORY AGENCY NPDES ☐ RCRA GROUND WATER

Address:

Email To: Mpham@regenesis.com	Purchase Order No.: Project Name: PS Beta - NIROP	Page Project  Manager:	Site Location MN
sted Due Date/TAT: 10 days	Project Number: PS Beta - NIROP	Pace Profile #:	SIALE SIALE
		2 50	
Valid Matrix Co	o left)		
DRINKING WATER WATER WATER WASTE WATER PRODUCT SOIL/SOLID OIL	See valid codes to	COLLECTION  RS  St.1  CO3 in wate	e in water er er carbon
	MATRIX CODE  SAMPLE TYPE (G	SAMPLE TEMP AT # OF CONTAINE Unpreserved H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCI NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol Other  Alkalinity, CaC Chemical oxy	Total iron Dissolved iron Volatile fatty a Carbon dioxic Nitrate+Nitrite Sulfate in wat Sulfide in wat Total organic Total organic Residual Chlo
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ADDITIONAL COMMENTS	RELINGUISHED BY AFFILIATION H	5 1812	PAR SUR SUR Y Y
	SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER:	Tends W Schall	
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DRINKING WATER

OTHER

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately. **CHAIN-OF-CUSTODY / Analytical Request Document** 

F-ALL-Q-020rev.08, 12-Oct-2007

# Pace Analytical\*

# Document Name: Sample Condition Upon Receipt Form

Document No.: F-MN-L-213-rev.13

Document Revised: 23Feb2015 Page 1 of 1

Issuing Authority: Pace Minnesota Quality Office

Sample Condition Client Name: Upon Receipt		•		Project	#: [4]	O# :	10327624
Kegenesis			· · · · · · · · · · · · · · · · · · ·				
	Tups [	USPS	K)	Client			
	∐SpeeDee [	]Other:_	•		10	327624	
Tracking Number:			:				
Custody Seal on Cooler/Box Present?	<b>X</b> 0Yes □No		Seals Int	act? 2	<b>g</b> Yes [	∐No [	Optional: Proj. Due Date: Proj. Name:
Packing Material: Bubble Wrap	Bubble Bags	Non	e 🗆	Other:			Temp Blank?
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	ooler Temp Corre		4-2,	ا 5 ران		Biolog	ical Tissue Frozen? Yes No PN/A
Temp should be above freezing to 6°C	Correction Factor	: _ <u>ల</u>	_ 3	Dat	e and Init	ials of Pe	erson Examining Contents: 1026/15 D
USDA Regulated Soil ( PN/A, water sample Did samples originate in a quarantine zone wi	e) thin the United Sta	taci Ali A	D 47 C				
MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (ch	neck maps)?	ites: AL, P	ir, az, c	A, FL, GA, TYes	ID, LA. □No	Did sar	nples originate from a foreign source (internationally, ng Hawaii and Puerto Rico)?
		ated Soil	Checkli		-Q-338) ar	d includ	ng Hawaii and Puerto Rico)?
					<u> </u>		COMMENTS:
Chain of Custody Present?		Yes	□No	□N/A	1.	The second secon	
Chain of Custody Filled Out?		<b>∑</b> res	□No	□N/A	2.		
Chain of Custody Relinquished?		<b>X</b> 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	ZÑ∘	□N/A	6.	<u>                                     </u>	
Rush Turn Around Time Requested?		☐Yes	<del>(Z</del> No	* ************************************	7.	1	
Sufficient Volume?		<u>∑</u> tes		□N/A			
Correct Containers Used?		<u>γαυres</u> Σer Yes	□No □No	□N/A	8. 9.		
-Pace Containers Used?				□N/A	9.		
Containers Intact?		Yes	□No	□N/A			
Filtered Volume Received for Dissolved Tests	ر کھی ا	AdYes U	□No	□N/A	10.	11 .	
		Wes	□No	N/A	11. No	te if sedir	nent is visible in the dissolved container
Sample Labels Match COC?	WT	Yes	□No	□N/A	12.		
-Includes Date/Time/ID/Analysis Matrix:	<u> </u>		<u> </u>	<del>,</del>		1	
All containers needing acid/base preservatio checked?	n nave been	<b>₩</b> Yes	□No	□N/A	13.	[∑ <b>S</b> t+i	NO₃ ⊠H₂SO₄ □NaOH □HCI
All containers needing preservation are foun	d to be in	par es		L111/15	Sample #		3/4 3/4 Sample one:
compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH	4>12 Ovanida)		K-3a		1	11-4	1-4 could not dell
Exceptions: VOA, Coliform, DC, Oil and Grea	ase,	Yes	₩vo	□N/A	Initial wh	en	Lot # of added dock
DRO/8015 (water) DOC		<b>X</b> Yes	□No	□N/A	complete	1.1	Lot # of added dack preservative:
Headspace in VOA Vials (>6mm)?		□Yes	<b>⊠</b> No	□N/A	14.		
Trip Blank Present?		□Yes	/ZNo	□N/A	15.		
Trip Blank Custody Seals Present?		☐Yes	□No	₽N/A			
Pace Trip Blank Lot # (if purchased):		*****					
CLIENT NOTIFICATION/RESOLU Person Contacted:	ITION				Date/T	ime:	Field Data Required? Yes No
Comments/Resolution:	1	<del></del>			•		
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Project Manager Review: //	an				<del></del>	Date:	10127116
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IR Gun	: B88A0140728348,	Correction	Temp Co	orrected (°C	); 2.3		Filtred Voll	loc nH have Deen on	201.00	Yes No	NA X
Cooler Tel	mp Read (°C): 24	Arrived		Yes			4	Trip Blank P	0001101	Yes No No	NA X
<b></b>	Cus	tody Seal P	resent:	Yes	No.	<u>}</u>	Trip	Blank Custody Seals P	resent:	VI	+
	Dog Dog	uested < 72	Hours:		No.Z			Pace Tip bland	1 1200	Yes_ No_	NA X
	Ris	en IAIRCH	acoro. I	VAC	Z No_	,		Sample Composites Re Report Sa	mples:	Wet Wt.	Dry Wt
	Sufficie	ent Sample \	d Time	Yes	× No_			Reportin	g Units:		and the second second second
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CLIENT: PACE MPLS

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Owner Recated By:
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<sup>\*\*\*</sup>In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory,

Cooler Temperature on Receipt 2.5

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Custody Seal (Y for N

Received on Ice (Y or N

Samples Intact ( or

Page 1 of 1

# Pace Analytical\*

hold, incorrect preservative, out of temp, incorrect containers)

# Document Name: Sample Condition Upon Receipt Form

Document No.: F-VM-C-001-Rev.09 Document Revised: 23Feb2015

Page 1 of 1

Issuing Authority:

Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt  Client Name:  Dace - M	V		Project	#: W0#:1256142
Courier: Fed Ex UPS  Commercial Pace	USPS		–  Client	
Tracking Number:		•		
Custody Seal on Cooler/Box Present? Yes	No	Seals	Intact?	Yes No Optional: Proj. Due Date: Proj. Name:
Packing Material: WBubble Wrap WBubble Ba	es N	Jone {	Other:_	Temp Blank? Wes TNo
Thermometer Used: 140792808	Type of			
. •				
Cooler Temp Read °C: Cooler Temp C Temp should be above freezing to 6°C Correction Fact	or: <u>-{C</u>	3 _	Date an	Biological Tissue Frozen?   Yes No DNA  Initials of Person Examining Contents:   Comments:
Chain of Custody Present?	<b>X</b> Yes	□No	□n/a	1.
Chain of Custody Filled Out?	Yes	□No	□n/a	2.
Chain of Custody Relinquished?	<b>X</b> Yes	□No	□N/A	3.
Sampler Name and Signature on COC?	□Yes	No	□N/A	4.
Samples Arrived within Hold Time?	<b>\</b> Z]Yes	□No	□N/A	5.
Short Hold Time Analysis (<72 hr)?	□Yes	MNO	□n/a	6.
Rush Turn Around Time Requested?	Yes	No	N/A	7.
Sufficient Volume?	X)Yes .	□No	□n/a	8.
Correct Containers Used?	<b>X</b> Yes	ŪNo	□n/a	9.
-Pace Containers Used?	YCYes	□No	□n/a	
Containers Intact?	Yes	□No	□n/a	10.
Filtered Volume Received for Dissolved Tests?	□Yes	□No	_ N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	Yes	ÜÑo	□N/A	12
-Includes Date/Time/ID/Analysis Matrix: W	· .			
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<b>K</b> Yes	□No	□n/a	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	□Yes	□No	<b>₩</b> N/A	13.
Headspace in VOA Vials ( >6mm)?	□Yes	□No	XINA	14.
Trip Blank Present?	، []]Yes	□No	X)N/A	15.
Trip Blank Custody Seals Present?	□Yes	ĎNo	<b>W</b> JN/A	
Pace Trip Blank Lot # (if purchased):				
CLIENT NOTIFICATION/RESOLUTION				Field Data Required? Yes No
Person Contacted:			г	ate/Time:
Comments/Resolution:		· · · · · · · · · · · · · · · · · · ·		
	<del></del>		-	
	···········			
FECAL WAIVER ON FILE Y N Project Manager Review:	3	2		Date: 10/28/15
Note: Whenever there is a discrepancy affecting North Carolina	compliance	samples,	a copy of th	s form will be sent to the North Carolina DEHNR Certification Office (i.e out of

Chain of Custody

Pace Analytical www.pacelebs.com

Owner Received Date: Workorder Name: PS Beta - NIROP Workorder: 10327624

10/26/2015 Results Requested By: 11/10/2015

Preserved Containers	Sample Collect Type Date/Time Lab ID Matrix 5	PS 10/26/2015 14:40 10327624001 Water 1   X   Nater 1	PS 10/26/2015 13:20 10327624002 Water 1 ·	PS 10/26/2015 17:10 10327624003 Water 1 × × × × × × × × × × × × × × × × × ×	PS 10/26/2015 16:05 10327624004 Water 1 3 X		Comments	Date/Time Received By Date/Time
e L 32174 668								d By
race Analytical Ormond beach 8 East Tower Circle Ormond Beach, FL 32174 Phone (386)672-5668	Lab ID		1032762400	1032762400	1032762400			Receive
race 8 Eas Ormo Phone	Collect Date/Time	10/26/2015 14:40	10/26/2015 13:20	10/26/2015 17:10	10/26/2015 16:05			Date/Time
	Sample Type	PS	PS	PS	PS			
Jennifer Anderson Pace Analytical Services, Inc. 1700 Elm Street, Suite 200 Minneapolis, M. 55414 Phone (612)607-1700 Fax (612)607-6444	Item Sample ID	PMW-01	PMW-02	PMW-03	PMW-04			ers Released By
Jennifi Pace / 1700 E Minne, Phone Fax (6	Item	-	2	<sub>0</sub>	4	5		Transfers

SE ONLY

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. Cooler Temperature on Receipt  $2.8^\circ$  °C

Z

Custody Seal Y or

1/15 09 11

Z ō

Samples Intact Y

Received on Ice ( Y )or

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Page 1 of 1



Document Name: Sample Condition Upon Receipt Form Document No.; F-FL-C-007 rev. 06 Document Revised: August 11, 2014 Issuing Authority: Pace Florida Quality Office

# Sample Condition Upon Receipt Form (SCUR)

Table Number:\_\_

Client Name:	2-MN Project #35213804
Courier: Fed Ex UPS USPS Client Commercial  Tracking #	Date and Initials of person examining contents:  Other  Blue None  (Temp should be above freezing to 6°C). If below 0°C, then was sample frozen?
Receipt of samples satisfactory: ✓Yes □No	□Yes □No
/ coordinate of complete comments of the control of	Tradit 17th Toquodou on 500.
If yes, then all conditions below were met:  Chain of Custody Present	If no, then mark box & describe issue (use comments area if necessary):
Chain of Custody Friesent  Chain of Custody Filled Out	
Relinquished Signature & Sampler Name COC	
Samples Arrived within Hold Time	
Sufficient Volume	
Correct Containers Used Containers Intact	
Containers intact	
Sample Labels match COC (sample IDs & date/time of ∞llection)	No Labels: No Time/Date on Labels:
All containers needing preservation are found to be in compliance with EPA recommendation.	
No Headspace in VOA Vials ( >6mm):	
Client Notification/ Resolution:	
Person Contacted: Date	/Time:
Comments/ Resolution (use back for additional comments):	* 17,100
Project Manager Review:	Date: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
Finished Product I	nformation Only
F.P. Sample ID:	Size & Qty of Bottles Received
Production Code:	x 5 Gal x 2.5 Gal
Date/Time Opened:	x 1 Gal x 1 Liter
Number of Unopened Bottles Remaining:	x 500 mL x 250 mL
Extra Sample in Shed: Yes No	x Other:



November 10, 2015

Jennifer Anderson

1700 Elm Street Suite 200

Pace Analytical Services, Inc.

Minneapolis, MN 55414

Pace Analytical Energy Services, LLC 220 William Pitt Way Pittsburgh, PA 15238

Phone: (412) 826-5245

Fax: (412) 826-3433

PS BETA - NIROP / 10327624

Pace Workorder:

17185

Dear Jennifer Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on Wednesday, October 28, 2015. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

RE:

Ruth Welds

Ruth Welsh

11/10/2015 TM

Customer Service Representative

**Enclosures** 

As a valued client we would appreciate your comments on our service.

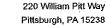
Please email info@microseeps.com.

Total Number of Pages 15

Report ID: 17185 - 728223

Page 1 of 13







Phone: (412) 826-5245 Fax: (412) 826-3433

### LABORATORY ACCREDITATIONS & CERTIFICATIONS

Pennsylvania Department of Environmental Protection, Bureau of Laboratories Accreditor:

Accreditation ID: 02-00538

Scope: NELAP Non-Potable Water and Solid & Hazardous Waste

South Carolina Department of Health and Environmental Control, Office of Environmental Accreditor:

Laboratory Certification

89009003 Accreditation ID:

Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA) Scope:

NELAP: New Jersey, Department of Environmental Protection Accreditor:

Accreditation ID: PA026

Non-Potable Water: Solid and Chemical Materials Scope:

NELAP: New York, Department of Health Wadsworth Center Accreditor:

Accreditation ID: 11815

Scope: Non-Potable Water; Solid and Hazardous Waste

State of Connecticut, Department of Public Health, Division of Environmental Health Accreditor:

Accreditation ID: PH-0263

Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA) Scope:

NELAP: Texas, Commission on Environmental Quality Accreditor:

T104704453-09-TX Accreditation ID: Non-Potable Water Scope:

Accreditor: State of New Hampshire

299409 Accreditation ID:

Scope: Non-potable water

Accreditor: State of Georgia Accreditation ID: Chapter 391-3-26

As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is Scope:

> accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

Report ID: 17185 - 728223



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Pace Analytical Energy Services, LLC 220 William Pitt Way

Pittsburgh, PA 15238

Phone: (412) 826-5245 Fax: (412) 826-3433

# **SAMPLE SUMMARY**

Workorder: 17185 PS BETA - NIROP / 10327624

Lab ID	Sample ID	Matrix	Date Collected Date Received
171850001	PMW-01	Water	10/26/2015 14:40 10/28/2015 12:00
171850002	PMW-02	Water	10/26/2015 13:20 10/28/2015 12:00
171850003	PMW-03	Water	10/26/2015 17:10 10/28/2015 12:00
171850004	PMW-04	Water	10/26/2015 16:05 10/28/2015 12:00

Report ID: 17185 - 728223



Page 3 of 13



Pace Analytical Energy Services, LLC 220 William Pitt Way Pittsburgh, PA 15238

> Phone: (412) 826-5245 Fax: (412) 826-3433

# **PROJECT SUMMARY**

Workorder: 17185 PS BETA - NIROP / 10327624

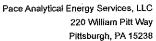
# **Workorder Comments**

The analysis for volatile fatty acids, method AM23G, was reported at dilution for samples 17185 (0001-0004) due to the measured chloride concentration within the sample. This interfering compound will affect the instruments ability to accurately resolve target analytes within the sample.

Report ID: 17185 - 728223



Page 4 of 13



Phone: (412) 826-5245





# **ANALYTICAL RESULTS**

Workorder: 17185 PS BETA - NIROP / 10327624

Lab ID:

171850001

Date Received: 10/28/2015 12:00 Matrix:

Water

PMW-01 Sample ID:

Date Collected: 10/26/2015 14:40

Parameters	Results Units	PQL	MDL	DF	Analyzed	Ву	Qualifiers
EDonors - MICR	en a esta a companya de la companya de la companya de la companya de la companya de la companya de la companya					we see to a sit.	nua na minama mandauta uni di didirita
Analysis Desc: AM23G	Analyti	cal Method: An	/123G				
Lactic Acid	<2.0 mg/i	2.0	0.030	10	11/5/2015 19:24	KB	d
Acetic Acid	<1.0 mg/i	1.0	0.060	10	11/5/2015 19:24	KB	d,B
Propionic Acid	1.5 mg/i	1.0	0.010	10	11/5/2015 19:24	KB	d,B
Formic Acid	<1.0 mg/l	1.0	0.040	10	11/5/2015 19:24	KB	d,B
Butyric Acid	<1.0 mg/l	1.0	0.050	10	11/5/2015 19:24	KB	d,B
Pyruvic Acid	<1.0 mg/l	1.0	0.12	10	11/5/2015 19:24	KB	d
i-Pentanoic Acid	<1.0 mg/l	1.0	0.12	10	11/5/2015 19:24	KB	d
Pentanoic Acid	<1.0 mg/l	1.0	0.060	10	11/5/2015 19:24	KB	d
i-Hexanoic Acid	<2.0 mg/l	2.0	0.10	10	11/5/2015 19:24	KB	d
Hexanoic Acid	<2.0 mg/i	2.0	0.10	10	11/5/2015 19:24	KB	d

Report ID: 17185 - 728223



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# ANALYTICAL RESULTS

Workorder: 17185 PS BETA - NIROP / 10327624

Lab ID: 171850002

Date Received: 10/28/2015 12:00 Matrix:

Water

Sample ID: PMW-02 Date Collected: 10/26/2015 13:20

Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR			<u> </u>			
Analysis Desc: AM23G	Analyti	cal Method: Al	И23G			
Lactic Acid	<2.0 mg/l	2.0	0.030 10	11/5/2015 20:17	КВ	d
Acetic Acid	<1:0 mg/l	1.0	0.060 10	11/5/2015 20:17	KB	d,B
Propionic Acid	<1.0 mg/l	1.0	0.010 10	11/5/2015 20:17	KB	d,B
Formic Acid	<1.0 mg/l	1.0	0.040 10	11/5/2015 20:17	KB	d,B
Butyric Acid	<1.0 mg/l	1.0	0.050 10	11/5/2015 20:17	KB	d,B
Pyruvic Acid	<1.0 mg/l	1.0	0.12 10	11/5/2015 20:17	KB	d
i-Pentanoic Acid	<1.0 mg/l	1.0	0.12 10	11/5/2015 20:17	KB	d
Pentanoic Acid	<1.0 mg/l	1.0	0.060 10	11/5/2015 20:17	KB	· d
i-Hexanoic Acid	<2.0 mg/l	2.0	0.10 10	11/5/2015 20:17	KB	d
Hexanoic Acid	<2.0 mg/l	2.0	0.10 10	11/5/2015 20:17	KB	d

Report ID: 17185 - 728223



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Pace Analytical Energy Services, LLC

220 William Pitt Way Pittsburgh, PA 15238

Phone: (412) 826-5245 Fax: (412) 826-3433

# **ANALYTICAL RESULTS**

Workorder: 17185 PS BETA - NIROP / 10327624

Lab ID:

171850003

Date Received: 10/28/2015 12:00 Matrix:

Water

Sample ID:

PMW-03

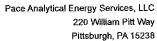
Date Collected: 10/26/2015 17:10

Parameters	Results Units	PQL	MDL I	DF	Analyzed	Ву	Qualifiers
EDonors - MICR							
Analysis Desc: AM23G	Analyti	cal Method: Al	M23G				
Lactic Acid	<2.0 mg/l	2.0	0.030		11/5/2015 21:11	KB	d
Acetic Acid	<1.0 mg/l	1.0	0.060	10	11/5/2015 21:11	KB	d,B
Propionic Acid	<1.0 mg/l	1.0	0.010	10	11/5/2015 21:11	KB	d,B
Formic Acid	<1.0 mg/l	1.0	0.040	10	11/5/2015 21:11	KB	d,B
Butyric Acid	<1.0 mg/l	1.0	0.050	10	11/5/2015 21:11	KB	d,B
Pyruvic Acid	<1.0 mg/l	1.0	0.12	10	11/5/2015 21:11	KB	d
i-Pentanoic Acid	<1.0 mg/l	1.0	0.12	10	11/5/2015 21:11	KB	d
Pentanoic Acid	<1.0 mg/l	1.0	0.060	10	11/5/2015 21:11	KB	d
i-Hexanoic Acid	<2.0 mg/l	2.0	0.10	10	11/5/2015 21:11	ΚB	d
Hexanoic Acid	<2.0 mg/l	2.0	0.10	10	11/5/2015 21:11	KB	d

Report ID: 17185 - 728223



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Fax: (412) 826-3433

# **ANALYTICAL RESULTS**

Workorder: 17185 PS BETA - NIROP / 10327624

Lab ID:

171850004

Date Received: 10/28/2015 12:00 Matrix:

Water

Sample ID:

PMW-04

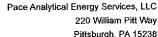
Date Collected: 10/26/2015 16:05

Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR						
Analysis Desc: AM23G	Analyti	cal Method: Af	M23G			
Lactic Acid	<2.0 mg/l	2.0	0.030 10	11/5/2015 22:04	KB	d
Acetic Acid	<1.0 mg/l	1.0	0.060 10	11/5/2015 22:04	KB	ď,B
Propionic Acid	<1.0 mg/l	1.0	0.010 10	11/5/2015 22:04	KB .	d,B
Formic Acid	<1.0 mg/l	1.0	0.040 10	11/5/2015 22:04	KB	d,B
Butyric Acid	<1.0 mg/l	1.0	0.050 10	11/5/2015 22:04	KB	d,B
Pyruvic Acid	<1.0 mg/i	1.0	0.12 10	11/5/2015 22:04	KB	· d
i-Pentanoic Acid	<1.0 mg/i	1.0	0.12 10	11/5/2015 22:04	KB	d
Pentanoic Acid	<1.0 mg/i	1.0	0.060 10	11/5/2015 22:04	KB	d
i-Hexanoic Acid	<2.0 mg/l	2,0	0.10 10	11/5/2015 22:04	KB	d
Hexanoic Acid	<2.0 mg/l	2.0	0.10 10	11/5/2015 22:04	KB	d

Report ID: 17185 - 728223



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Pittsburgh, PA 15238





### **ANALYTICAL RESULTS QUALIFIERS**

Workorder: 17185 PS BETA - NIROP / 10327624

# **DEFINITIONS/QUALIFIERS**

Disclaimer: The Pennsylvania Department of Environmental Protection (PADEP) has decided to no longer recognize analyses that do not

produce data for primary compliance, for NELAP accreditation. The methods affected by this decision are AM20GAx, AM21G, SW846 7199 and AM4.02. The laboratory shall continue to administer the NELAP/TNI standard requirements in the performance

of these methods.

MDL Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.

PQL Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.

ND Not detected at or above reporting limit.

DF Dilution Factor.

S Surrogate.

RPD Relative Percent Difference.

% Rec Percent Recovery.

U Indicates the compound was analyzed for, but not detected at or above the noted concentration.

J Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

B The analyte was detected in the associated blank.

d The analyte concentration was determined from a dilution.

Report ID: 17185 - 728223







# **QUALITY CONTROL DATA**

Workorder: 17185 PS BETA - NIROP / 10327624

QC Batch:

EDON/2697

Analysis Method:

AM23G

QC Batch Method:

AM23G

Associated Lab Samples:

171850001, 171850002, 171850003, 171850004

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Parameter	Units	Blank Result	Reporting Limit Qualifiers	
EDonors				
Lactic Acid	mg/l	< 0.20	0.20	
Acetic Acid	mg/l	< 0.10	0.10 B	
Propionic Acid	mg/l	<0.10	0.10 B	
Formic Acid	mg/i	<0.10	0.10 B	
Butyric Acid	mg/l	<0.10	0.10 B	
Pyruvic Acid	mg/l	<0.10	0.10	
-Pentanoic Acid	mg/l	< 0.10	0.10	
Pentanoic Acid	mg/l	< 0.10	0.10	
-Hexanoic Acid	mg/l	< 0.20	0.20	
Hexanoic Acid	mg/l	<0.20	0.20	

# LABORATORY CONTROL SAMPLE: 38270

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EDonors						
Lactic Acid	mg/l	2	2.2	109	70-130	
Acetic Acid	mg/l	2	2.1	104	70-130	В
Propionic Acid	mg/l	2	2.1	106	70-130	В
Formic Acid	mg/l	2	1.9	96	70-130	В
Butyric Acid	mg/l	2	2.1	. 106	70-130	В.
Pyruvic Acid	mg/l	2	2.0	100	70-130	
i-Pentanoic Acid	mg/l	2	2.1	105	70-130	
Pentanoic Acid	mg/l	2	2.0	102	70-130	
i-Hexanoic Acid	mg/l	2	2.1	104	70-130	
Hexanoic Acid	mg/l	2	2.0	102	70-130	

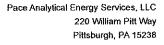
MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 38271				38272		Original: 171960001					
Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
EDonors Lactic Acid	mg/l	0.16	20	20	20	97	99	70-130	2	30	đ

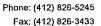
Report ID: 17185 - 728223

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# **CERTIFICATE OF ANALYSIS**







# **QUALITY CONTROL DATA**

Workorder: 17185 PS BETA - NIROP / 10327624

MATRIX SPIKE & MATI	RIX SPIKE DUPLI	CATE: 38271		38272		Original:	17196000	)1			
Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Acetic Acid	mg/l	0.27	20	20	20	101	101	70-130	0	30	d,B
Propionic Acid	mg/l	0.041	20	20	21	103	103	70-130	0	30	d,B
Formic Acid	mg/l	0.2	20	19	19	93	94	70-130	1.1	30	d,B
Butyric Acid	mg/l	0.12	20	20	21	102	103	70-130	0.98	30	d,B
Pyruvic Acid	mg/l	0	20	18	18	91	93	70-130	2.2	30	d
i-Pentanoic Acid	mg/l	0	20	20	20	98	100	70-130	2	30	d
Pentanoic Acid	mg/l	0	20	19	20	97	100	70-130	3	30	d
i-Hexanoic Acid	mg/l	0	20	19	19	95	97	70-130	2.1	30	d
Hexanoic Acid	mg/l	0.027	20	18	19	91	94	70-130	3.2	30	d

Report ID: 17185 - 728223



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Pace Analytical Energy Services, LLC 220 William Pitt Way Pittsburgh, PA 15238

> Phone: (412) 826-5245 Fax: (412) 826-3433

# **QUALITY CONTROL DATA QUALIFIERS**

Workorder: 17185 PS BETA - NIROP / 10327624

# **QUALITY CONTROL PARAMETER QUALIFIERS**

- B The analyte was detected in the associated blank.
- d The analyte concentration was determined from a dilution.

Report ID: 17185 - 728223



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Pace Analytical Energy Services, LLC 220 William Pitt Way

Pittsburgh, PA 15238

Phone: (412) 826-5245 Fax: (412) 826-3433

Workorder: 17185 PS BETA - NIROP / 10327624

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
171850001	PMW-01			AM23G	EDON/2697
171850002	PMW-02			AM23G	EDON/2697
171850003	PMW-03			AM23G	EDON/2697
171850004	PMW-04			AM23G	EDON/2697

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Report ID: 17185 - 728223



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### Chain of Custody

Workorder Name: PS Beta - NIROP

43 of 44

Workorder: 10327624  Report / Invoice To  Jennifer Anderson Pace Analytical Minnesota	Workorder Name: PS Beta - NIROP   Subcontract To   Dack Eregy   MKMSteps P.O.	P.O. 163271424 4	ults Reque	Requested Analysis
1700 Elm Štreet Suite 200 Minneapolis, MN 55414 Phone (612)607-1700 Email: jennifer.anderson@pacelabs.com	,	Preserved Containers  L Totty Acut	K IGITY TICKE	
Item Sample ID	Collect Date/Time Lab ID Matrix	Unpreserved	VO ICTI	
1 PMW-01	10/26/2015 14:40 10327624001 Water	× し の		
2 PMW-02	10/26/2015 13:20 10327624002 Water	) 2	1	
-	10327624003	2/12	`  ^`	
4 PMW-04	10/26/2015 16:05 10327624004 Water	× ×		
S		光中四米		
Transfers Refeased By	Date/Time Received By	Date/Time	3556	
1 1 10		1820 SAG		1300
3				
Cooler Temperature on Receipt えっ尖c	eceipt ゑ・屮°C   Custody Seaf Y or N	Received on Ice/	∐öi l	Y or N

<sup>\*\*\*</sup>In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Cooler	Receipt	Form
--------	---------	------

Shipping/Container Information (circle appropriate response)		-		
Courier: FedEx UPS USPS Client Other:	_ · Air	bill Pı	resent:	Yes No
Tracking Number: 6484 8693 0483				,;
Custody Seal on Cooler/Box Present: (Yes No Seals )	ntact:	Yes	No .	
Cooler/Box Packing Material: Byoble Wrap Absorbent Fo	msc	Other	·	
Type of Ice: Wet Blue None Ice Intact: (es Melt	ed _			
Cooler Temperature: 2,4°C Radiation Screened: Yes		) Chi	ain of (	Custody Present: Yes No
Comments:				<u> </u>
Laboratory Assignment/Log-in (check appropriate response)				
Laboratory Assignment Log in tender opportunity	YES	NO	N/A	Comment
				Reference non-Conformar
Chain of Custody properly filled out	1			
Chain of Custody relinquished	-			
Sampler Name & Signature on COC				-
Containers intact	~	, 		
Were samples in separate bags	V			
Sample container labels match COC Sample name/date and time collected	1			
Sufficient volume provided	·/			
PAES containers used	1			
Are containers properly preserved for the requested testing? (as labeled)	0			
If an unknown preservation state, were containers checked?  Exception: VOA's coliform			~	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?		-	1	
Comments:			·	
				7 Date: <u>/0, 28. /</u>





December 18, 2015

Melinda Pham Regenesis 1011 Calle Sombra San Clemente, CA 92673

RE: Project: PS BETA-NIROP

Pace Project No.: 10329197

### Dear Melinda Pham:

Enclosed are the analytical results for sample(s) received by the laboratory on November 06, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

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

Sincerely,

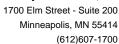
Jennifer Anderson jennifer.anderson@pacelabs.com Project Manager

JAndera

Enclosures

cc: Ryan Moore, Regenesis







### **CERTIFICATIONS**

Project: PS BETA-NIROP

Pace Project No.: 10329197

### **Minnesota Certification IDs**

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770 Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA Colorado Certification #Pace Connecticut Certification #: PH-0256 EPA Region 8 Certification #: 8TMS-L Florida/NELAP Certification #: E87605

Guam Certification #:14-008r Georgia Certification #: 959 Georgia EPD #: Pace

Idaho Certification #: MN00064 Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01 Iowa Certification #: 368

Kansas Certification #: E-10167 Kentucky Dept of Envi. Protection - DW #90062 Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001 Maine Certification #: 2013011 Maryland Certification #: 322 Michigan DEPH Certification #: 9909 Minnesota Certification #: 027-053-137 Mississippi Certification #: Pace Montana Certification #: MT0092 Nevada Certification #: MN\_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002 New York Certification #: 11647 North Carolina Certification #: 530 North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150 Ohio VAP Certification #: CL101 Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563

Puerto Rico Certification Saipan (CNMI) #:MP0003 South Carolina #:74003001 Texas Certification #: T104704192 Tennessee Certification #: 02818 Utah Certification #: MN000642013-4 Virginia DGS Certification #: 251 Washington Certification #: C486 West Virginia Certification #: 382 West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970



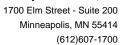


### **SAMPLE SUMMARY**

Project: PS BETA-NIROP

Pace Project No.: 10329197

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10329197001	PMW-04	Water	11/06/15 10:25	11/06/15 15:53
10329197002	PMW-03	Water	11/06/15 12:00	11/06/15 15:53
10329197003	PMW-02	Water	11/06/15 13:30	11/06/15 15:53
10329197004	PMW-01	Water	11/06/15 14:45	11/06/15 15:53





### **SAMPLE ANALYTE COUNT**

Project: PS BETA-NIROP

Pace Project No.: 10329197

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10329197001	PMW-04	EPA 8260B	LPM	70
10329197002	PMW-03	EPA 8260B	LPM	70
10329197003	PMW-02	EPA 8260B	LPM	70
10329197004	PMW-01	EPA 8260B	DJB	70



### **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

Sample: PMW-04	Lab ID: 103	29197001	Collected: 11/06/1	5 10:25	Received:	11/06/15 15:53	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Met	hod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		11/09/15 17:4	0 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		11/09/15 17:4	0 107-05-1	
Benzene	ND	ug/L	1.0	1		11/09/15 17:4	0 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		11/09/15 17:4	0 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		11/09/15 17:4	0 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/09/15 17:4	0 75-27-4	
Bromoform	ND	ug/L	4.0	1		11/09/15 17:4	0 75-25-2	
Bromomethane	ND	ug/L	4.0	1		11/09/15 17:4	0 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/09/15 17:4	0 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		11/09/15 17:4		
sec-Butylbenzene	ND	ug/L	1.0	1		11/09/15 17:4	0 135-98-8	
ert-Butylbenzene	ND	ug/L	1.0	1		11/09/15 17:4	0 98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		11/09/15 17:4	0 56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/09/15 17:4	0 108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/09/15 17:4		
Chloroform	ND	ug/L	1.0	1		11/09/15 17:4		
Chloromethane	ND	ug/L	4.0	1		11/09/15 17:4		
2-Chlorotoluene	ND	ug/L	1.0	1		11/09/15 17:4		
1-Chlorotoluene	ND	ug/L	1.0	1		11/09/15 17:4		
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		11/09/15 17:4		
Dibromochloromethane	ND	ug/L	1.0	1		11/09/15 17:4		
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		11/09/15 17:4		
Dibromomethane	ND	ug/L	4.0	1		11/09/15 17:4		
1,2-Dichlorobenzene	ND ND	ug/L	1.0	1		11/09/15 17:4		
1,3-Dichlorobenzene	ND ND	ug/L	1.0	1		11/09/15 17:4		
1,4-Dichlorobenzene	ND ND	-	1.0	1		11/09/15 17:4		
Dichlorodifluoromethane	ND ND	ug/L	1.0	1		11/09/15 17:4		
1,1-Dichloroethane	ND ND	ug/L ug/L	1.0	1		11/09/15 17:4		
•	ND ND		1.0	1		11/09/15 17:4		
1,2-Dichloroethane	ND ND	ug/L				11/09/15 17:40		
1,1-Dichloroethene		ug/L	1.0	1				
cis-1,2-Dichloroethene	18.2	ug/L	1.0	1		11/09/15 17:4		
trans-1,2-Dichloroethene	50.5	ug/L	1.0	1		11/09/15 17:4		
Dichlorofluoromethane	ND	ug/L	1.0	1		11/09/15 17:4		
1,2-Dichloropropane	ND	ug/L	4.0	1		11/09/15 17:4		
I,3-Dichloropropane	ND	ug/L	1.0	1		11/09/15 17:4		
2,2-Dichloropropane	ND	ug/L	4.0	1		11/09/15 17:4		
1,1-Dichloropropene	ND	ug/L	1.0	1		11/09/15 17:4		
cis-1,3-Dichloropropene	ND	ug/L	4.0	1			0 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1			0 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		11/09/15 17:4		
Ethylbenzene	ND	ug/L	1.0	1		11/09/15 17:4		
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		11/09/15 17:4		
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		11/09/15 17:4		
o-Isopropyltoluene	ND	ug/L	1.0	1		11/09/15 17:4		
Methylene Chloride	ND	ug/L	4.0	1		11/09/15 17:4		
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/09/15 17:4		
Methyl-tert-butyl ether	ND	ug/L	1.0	1		11/09/15 17:4	0 1634-04-4	

### **REPORT OF LABORATORY ANALYSIS**

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### **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

Sample: PMW-04	Lab ID: 103	29197001	Collected: 11/06/1	5 10:25	Received: 11/0	06/15 15:53	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		11/09/15 17:40	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		11/09/15 17:40	103-65-1	
Styrene	ND	ug/L	1.0	1		11/09/15 17:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/09/15 17:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/09/15 17:40	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/09/15 17:40	) 127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		11/09/15 17:40	109-99-9	
Toluene	ND	ug/L	1.0	1		11/09/15 17:40	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		11/09/15 17:40	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		11/09/15 17:40	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/09/15 17:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/09/15 17:40	79-00-5	
Trichloroethene	15.4	ug/L	0.40	1		11/09/15 17:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/09/15 17:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		11/09/15 17:40	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		11/09/15 17:40	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		11/09/15 17:40	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		11/09/15 17:40	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		11/09/15 17:40	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		11/09/15 17:40	1330-20-7	
Surrogates		-						
1,2-Dichloroethane-d4 (S)	94	%.	75-125	1		11/09/15 17:40	17060-07-0	
Toluene-d8 (S)	103	%.	75-125	1		11/09/15 17:40	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	75-125	1		11/09/15 17:40	460-00-4	



### **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

Sample: PMW-03	Lab ID: 103	29197002	Collected: 11/06/1	5 12:00	Received:	11/06/15 15:53	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
3260B VOC	Analytical Met	hod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		11/09/15 17:2	5 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		11/09/15 17:2	5 107-05-1	
Benzene	ND	ug/L	1.0	1		11/09/15 17:2	5 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		11/09/15 17:2	5 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		11/09/15 17:25	5 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/09/15 17:25	5 75-27-4	
Bromoform	ND	ug/L	4.0	1		11/09/15 17:25	5 75-25-2	
Bromomethane	ND	ug/L	4.0	1		11/09/15 17:29	5 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/09/15 17:29	5 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		11/09/15 17:29	5 104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		11/09/15 17:2		
ert-Butylbenzene	ND	ug/L	1.0	1		11/09/15 17:29	5 98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		11/09/15 17:2		
Chlorobenzene	ND	ug/L	1.0	1		11/09/15 17:2	5 108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/09/15 17:2		
Chloroform	ND	ug/L	1.0	1		11/09/15 17:2		
Chloromethane	ND	ug/L	4.0	1		11/09/15 17:2		
2-Chlorotoluene	ND	ug/L	1.0	1		11/09/15 17:2		
1-Chlorotoluene	ND	ug/L	1.0	1		11/09/15 17:2		
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		11/09/15 17:29		
Dibromochloromethane	ND	ug/L	1.0	1		11/09/15 17:20		
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		11/09/15 17:29		
Dibromomethane	ND	ug/L	4.0	1		11/09/15 17:20		
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/09/15 17:20		
1,3-Dichlorobenzene	ND ND	ug/L	1.0	1		11/09/15 17:20		
1,4-Dichlorobenzene	ND ND	-	1.0	1		11/09/15 17:2		
Dichlorodifluoromethane	ND ND	ug/L	1.0	1		11/09/15 17:2		
1,1-Dichloroethane	1.4	ug/L	1.0	1		11/09/15 17:2		
•	ND	ug/L	1.0	1		11/09/15 17:2		
1,2-Dichloroethane	ND ND	ug/L						
1,1-Dichloroethene		ug/L	1.0	1		11/09/15 17:2		
cis-1,2-Dichloroethene	19.4	ug/L	1.0	1 1		11/09/15 17:25		
rans-1,2-Dichloroethene	45.0	ug/L	1.0			11/09/15 17:25		
Dichlorofluoromethane	ND	ug/L	1.0	1		11/09/15 17:2		
1,2-Dichloropropane	ND	ug/L	4.0	1		11/09/15 17:2		
,3-Dichloropropane	ND	ug/L	1.0	1		11/09/15 17:2		
2,2-Dichloropropane	ND	ug/L	4.0	1		11/09/15 17:2		
1,1-Dichloropropene	ND	ug/L	1.0	1		11/09/15 17:2		
cis-1,3-Dichloropropene	ND	ug/L	4.0	1			5 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1			5 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		11/09/15 17:2		
Ethylbenzene	ND	ug/L	1.0	1		11/09/15 17:2		
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		11/09/15 17:2		
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		11/09/15 17:2		
o-Isopropyltoluene	ND	ug/L	1.0	1		11/09/15 17:2		
Methylene Chloride	ND	ug/L	4.0	1		11/09/15 17:2		
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/09/15 17:2		
Methyl-tert-butyl ether	ND	ug/L	1.0	1		11/09/15 17:2	5 1634-04-4	





### **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

Sample: PMW-03	Lab ID: 103	29197002	Collected: 11/06/1	5 12:00	Received: 11	/06/15 15:53 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		11/09/15 17:25	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		11/09/15 17:25	103-65-1	
Styrene	ND	ug/L	1.0	1		11/09/15 17:25	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/09/15 17:25	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/09/15 17:25	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/09/15 17:25	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		11/09/15 17:25	109-99-9	
Toluene	ND	ug/L	1.0	1		11/09/15 17:25	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		11/09/15 17:25	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		11/09/15 17:25	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/09/15 17:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/09/15 17:25	79-00-5	
Trichloroethene	21.0	ug/L	0.40	1		11/09/15 17:25	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/09/15 17:25	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		11/09/15 17:25	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		11/09/15 17:25	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		11/09/15 17:25	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		11/09/15 17:25	108-67-8	
Vinyl chloride	2.4	ug/L	0.40	1		11/09/15 17:25	75-01-4	
Xylene (Total) <b>Surrogates</b>	ND	ug/L	3.0	1		11/09/15 17:25	1330-20-7	
1,2-Dichloroethane-d4 (S)	99	%.	75-125	1		11/09/15 17:25	17060-07-0	
Toluene-d8 (S)	102	%.	75-125	1		11/09/15 17:25	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1		11/09/15 17:25	460-00-4	



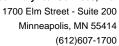
### **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

Sample: PMW-02	Lab ID: 103	29197003	Collected: 11/06/1	15 13:30	Received:	11/06/15 15:53 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B VOC	Analytical Met	hod: EPA 82	260B					
Acetone	ND	ug/L	200	10		11/09/15 17:55	67-64-1	
Allyl chloride	ND	ug/L	40.0	10		11/09/15 17:55	107-05-1	
Benzene	ND	ug/L	10.0	10		11/09/15 17:55	71-43-2	
Bromobenzene	ND	ug/L	10.0	10		11/09/15 17:55	108-86-1	
Bromochloromethane	ND	ug/L	10.0	10		11/09/15 17:55	74-97-5	
Bromodichloromethane	ND	ug/L	10.0	10		11/09/15 17:55	75-27-4	
Bromoform	ND	ug/L	40.0	10		11/09/15 17:55	75-25-2	
Bromomethane	ND	ug/L	40.0	10		11/09/15 17:55	74-83-9	
2-Butanone (MEK)	ND	ug/L	50.0	10		11/09/15 17:55	78-93-3	
n-Butylbenzene	ND	ug/L	10.0	10		11/09/15 17:55	104-51-8	
sec-Butylbenzene	ND	ug/L	10.0	10		11/09/15 17:55	135-98-8	
tert-Butylbenzene	ND	ug/L	10.0	10		11/09/15 17:55	98-06-6	
Carbon tetrachloride	ND	ug/L	10.0	10		11/09/15 17:55	56-23-5	
Chlorobenzene	ND	ug/L	10.0	10		11/09/15 17:55	108-90-7	
Chloroethane	ND	ug/L	10.0	10		11/09/15 17:55	75-00-3	
Chloroform	ND	ug/L	10.0	10		11/09/15 17:55	67-66-3	
Chloromethane	ND	ug/L	40.0	10		11/09/15 17:55	74-87-3	
2-Chlorotoluene	ND	ug/L	10.0	10		11/09/15 17:55	95-49-8	
4-Chlorotoluene	ND	ug/L	10.0	10		11/09/15 17:55	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	40.0	10		11/09/15 17:55		
Dibromochloromethane	ND	ug/L	10.0	10		11/09/15 17:55		
1,2-Dibromoethane (EDB)	ND	ug/L	10.0	10		11/09/15 17:55		
Dibromomethane	ND	ug/L	40.0	10		11/09/15 17:55		
1,2-Dichlorobenzene	ND	ug/L	10.0	10		11/09/15 17:55		
1,3-Dichlorobenzene	ND	ug/L	10.0	10		11/09/15 17:55		
1,4-Dichlorobenzene	ND	ug/L	10.0	10		11/09/15 17:55		
Dichlorodifluoromethane	ND	ug/L	10.0	10		11/09/15 17:55		
1,1-Dichloroethane	34.3	ug/L	10.0	10		11/09/15 17:55		
1,2-Dichloroethane	ND	ug/L	10.0	10		11/09/15 17:55		
1,1-Dichloroethene	20.5	ug/L	10.0	10		11/09/15 17:55		
cis-1,2-Dichloroethene	264	ug/L	10.0	10		11/09/15 17:55		
trans-1,2-Dichloroethene	318	ug/L	10.0	10		11/09/15 17:55		
Dichlorofluoromethane	ND	ug/L	10.0	10		11/09/15 17:55		
1,2-Dichloropropane	ND	ug/L	40.0	10		11/09/15 17:55		
1,3-Dichloropropane	ND	ug/L	10.0	10		11/09/15 17:55		
2,2-Dichloropropane	ND	ug/L	40.0	10		11/09/15 17:55		
1,1-Dichloropropene	ND	ug/L	10.0	10		11/09/15 17:55		
cis-1,3-Dichloropropene	ND	ug/L	40.0	10		11/09/15 17:55		
rans-1,3-Dichloropropene	ND	ug/L	40.0	10		11/09/15 17:55		
Diethyl ether (Ethyl ether)	ND	ug/L	40.0	10		11/09/15 17:55		
Ethylbenzene	ND ND	ug/L ug/L	10.0	10		11/09/15 17:55		
Hexachloro-1,3-butadiene	ND ND	ug/L ug/L	10.0	10		11/09/15 17:55		
Isopropylbenzene (Cumene)	ND ND	ug/L ug/L	10.0	10		11/09/15 17:55		
p-Isopropyltoluene	ND ND	ug/L ug/L	10.0	10		11/09/15 17:55		
		•						
Methylene Chloride	ND	ug/L	40.0	10		11/09/15 17:55		
4-Methyl-2-pentanone (MIBK)	ND	ug/L	50.0	10		11/09/15 17:55		
Methyl-tert-butyl ether	ND	ug/L	10.0	10		11/09/15 17:55	1634-04-4	





### **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

Sample: PMW-02	Lab ID: 103	29197003	Collected: 11/06/1	5 13:30	Received: 11	/06/15 15:53 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	40.0	10		11/09/15 17:55	91-20-3	
n-Propylbenzene	ND	ug/L	10.0	10		11/09/15 17:55	103-65-1	
Styrene	ND	ug/L	10.0	10		11/09/15 17:55	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	10.0	10		11/09/15 17:55	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	10.0	10		11/09/15 17:55	79-34-5	
Tetrachloroethene	ND	ug/L	10.0	10		11/09/15 17:55	127-18-4	
Tetrahydrofuran	ND	ug/L	100	10		11/09/15 17:55	109-99-9	
Toluene	ND	ug/L	10.0	10		11/09/15 17:55	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	10.0	10		11/09/15 17:55	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	10.0	10		11/09/15 17:55	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	10.0	10		11/09/15 17:55	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	10.0	10		11/09/15 17:55	79-00-5	
Trichloroethene	36.6	ug/L	4.0	10		11/09/15 17:55	79-01-6	
Trichlorofluoromethane	ND	ug/L	10.0	10		11/09/15 17:55	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	40.0	10		11/09/15 17:55	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	10.0	10		11/09/15 17:55	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	10.0	10		11/09/15 17:55	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	10.0	10		11/09/15 17:55	108-67-8	
Vinyl chloride	4.8	ug/L	4.0	10		11/09/15 17:55	75-01-4	
Xylene (Total)	ND	ug/L	30.0	10		11/09/15 17:55	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%.	75-125	10		11/09/15 17:55		
Toluene-d8 (S)	100	%.	75-125	10		11/09/15 17:55	2037-26-5	
4-Bromofluorobenzene (S)	103	%.	75-125	10		11/09/15 17:55	460-00-4	



### **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

Sample: PMW-01	Lab ID: 103	329197004	Collected: 11/06/1	5 14:45	Received:	11/06/15 15:53	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Met	thod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		11/11/15 16:45	5 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		11/11/15 16:45	5 107-05-1	
Benzene	ND	ug/L	1.0	1		11/11/15 16:45	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		11/11/15 16:45	5 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		11/11/15 16:45	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/11/15 16:45	5 75-27-4	
Bromoform	ND	ug/L	4.0	1		11/11/15 16:45	75-25-2	
Bromomethane	ND	ug/L	4.0	1		11/11/15 16:45	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/11/15 16:45	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		11/11/15 16:45	5 104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		11/11/15 16:45		
tert-Butylbenzene	ND	ug/L	1.0	1		11/11/15 16:45	5 98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		11/11/15 16:45	5 56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/11/15 16:45	5 108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/11/15 16:45	5 75-00-3	
Chloroform	ND	ug/L	1.0	1		11/11/15 16:45		
Chloromethane	ND	ug/L	4.0	1		11/11/15 16:45		
2-Chlorotoluene	ND	ug/L	1.0	1		11/11/15 16:45		
4-Chlorotoluene	ND	ug/L	1.0	1		11/11/15 16:45		
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		11/11/15 16:45		
Dibromochloromethane	ND	ug/L	1.0	1		11/11/15 16:45		
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		11/11/15 16:45		
Dibromomethane	ND	ug/L	4.0	1		11/11/15 16:45		
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/11/15 16:45		
1,3-Dichlorobenzene	ND	ug/L	1.0	1		11/11/15 16:45		
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/11/15 16:45		
Dichlorodifluoromethane	ND	ug/L	1.0	1		11/11/15 16:45		
1,1-Dichloroethane	ND	ug/L	1.0	1		11/11/15 16:45		
1,2-Dichloroethane	ND	ug/L	1.0	1		11/11/15 16:45		
1,1-Dichloroethene	ND	ug/L	1.0	1		11/11/15 16:45		
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/11/15 16:45		
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/11/15 16:45		
Dichlorofluoromethane	ND	ug/L	1.0	1		11/11/15 16:45		
1,2-Dichloropropane	ND	ug/L	4.0	1		11/11/15 16:45		
1,3-Dichloropropane	ND	ug/L	1.0	1		11/11/15 16:45		
2,2-Dichloropropane	ND	ug/L	4.0	1		11/11/15 16:45		
1,1-Dichloropropene	ND ND	ug/L	1.0	1		11/11/15 16:45		
cis-1,3-Dichloropropene	ND ND	ug/L	4.0	1			5 10061-01-5	
trans-1,3-Dichloropropene	ND ND	ug/L	4.0	1			5 10061-01-5	
Diethyl ether (Ethyl ether)	ND ND	ug/L ug/L	4.0	1		11/11/15 16:45		
Ethylbenzene	ND ND	ug/L ug/L	1.0	1		11/11/15 16:45		
Hexachloro-1,3-butadiene	ND ND	ug/L ug/L	1.0	1		11/11/15 16:45		
Isopropylbenzene (Cumene)	ND ND	ug/L ug/L	1.0	1		11/11/15 16:45		
	ND ND		1.0	1		11/11/15 16:45		
o-Isopropyltoluene		ug/L		1		11/11/15 16:45		
Methylene Chloride	ND ND	ug/L	4.0					
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/11/15 16:45		
Methyl-tert-butyl ether	ND	ug/L	1.0	1		11/11/15 16:45	1634-04-4	





### **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

Sample: PMW-01	Lab ID: 103	29197004	Collected: 11/06/1	5 14:45	Received: 1	1/06/15 15:53	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		11/11/15 16:45	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		11/11/15 16:45	103-65-1	
Styrene	ND	ug/L	1.0	1		11/11/15 16:45	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/11/15 16:45	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/11/15 16:45	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/11/15 16:45	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		11/11/15 16:45	109-99-9	
Toluene	ND	ug/L	1.0	1		11/11/15 16:45	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		11/11/15 16:45	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		11/11/15 16:45	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/11/15 16:45	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/11/15 16:45	79-00-5	
Trichloroethene	ND	ug/L	0.40	1		11/11/15 16:45	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/11/15 16:45	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		11/11/15 16:45	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		11/11/15 16:45	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		11/11/15 16:45	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		11/11/15 16:45	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		11/11/15 16:45	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		11/11/15 16:45	1330-20-7	
Surrogates		•						
1,2-Dichloroethane-d4 (S)	2460	%.	75-125	1		11/11/15 16:45	17060-07-0	S2
Toluene-d8 (S)	132	%.	75-125	1		11/11/15 16:45	2037-26-5	S2
4-Bromofluorobenzene (S)	49	%.	75-125	1		11/11/15 16:45	460-00-4	S2



Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

QC Batch: MSV/33694 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV 465 W

Associated Lab Samples: 10329197001, 10329197002, 10329197003

METHOD BLANK: 2130204 Matrix: Water

Associated Lab Samples: 10329197001, 10329197002, 10329197003

	•	Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	11/09/15 12:08	
1,1,1-Trichloroethane	ug/L	ND	1.0	11/09/15 12:08	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	11/09/15 12:08	
1,1,2-Trichloroethane	ug/L	ND	1.0	11/09/15 12:08	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	11/09/15 12:08	
1,1-Dichloroethane	ug/L	ND	1.0	11/09/15 12:08	
1,1-Dichloroethene	ug/L	ND	1.0	11/09/15 12:08	
1,1-Dichloropropene	ug/L	ND	1.0	11/09/15 12:08	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	11/09/15 12:08	
1,2,3-Trichloropropane	ug/L	ND	4.0	11/09/15 12:08	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	11/09/15 12:08	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	11/09/15 12:08	
1,2-Dibromo-3-chloropropane	ug/L	ND	4.0	11/09/15 12:08	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	11/09/15 12:08	
1,2-Dichlorobenzene	ug/L	ND	1.0	11/09/15 12:08	
1,2-Dichloroethane	ug/L	ND	1.0	11/09/15 12:08	
1,2-Dichloropropane	ug/L	ND	4.0	11/09/15 12:08	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	11/09/15 12:08	
1,3-Dichlorobenzene	ug/L	ND	1.0	11/09/15 12:08	
1,3-Dichloropropane	ug/L	ND	1.0	11/09/15 12:08	
1,4-Dichlorobenzene	ug/L	ND	1.0	11/09/15 12:08	
2,2-Dichloropropane	ug/L	ND	4.0	11/09/15 12:08	
2-Butanone (MEK)	ug/L	ND	5.0	11/09/15 12:08	
2-Chlorotoluene	ug/L	ND	1.0	11/09/15 12:08	
4-Chlorotoluene	ug/L	ND	1.0	11/09/15 12:08	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	11/09/15 12:08	
Acetone	ug/L	ND	20.0	11/09/15 12:08	
Allyl chloride	ug/L	ND	4.0	11/09/15 12:08	
Benzene	ug/L	ND	1.0	11/09/15 12:08	
Bromobenzene	ug/L	ND	1.0	11/09/15 12:08	
Bromochloromethane	ug/L	ND	1.0	11/09/15 12:08	
Bromodichloromethane	ug/L	ND	1.0	11/09/15 12:08	
Bromoform	ug/L	ND	4.0	11/09/15 12:08	
Bromomethane	ug/L	ND	4.0	11/09/15 12:08	
Carbon tetrachloride	ug/L	ND	1.0	11/09/15 12:08	
Chlorobenzene	ug/L	ND	1.0	11/09/15 12:08	
Chloroethane	ug/L	ND	1.0	11/09/15 12:08	
Chloroform	ug/L	ND	1.0	11/09/15 12:08	
Chloromethane	ug/L	ND	4.0	11/09/15 12:08	
cis-1,2-Dichloroethene	ug/L	ND	1.0	11/09/15 12:08	
cis-1,3-Dichloropropene	ug/L	ND	4.0	11/09/15 12:08	

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.



### **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

METHOD BLANK: 2130204 Matrix: Water

Associated Lab Samples: 10329197001, 10329197002, 10329197003

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/L	ND	1.0	11/09/15 12:08	
Dibromomethane	ug/L	ND	4.0	11/09/15 12:08	
Dichlorodifluoromethane	ug/L	ND	1.0	11/09/15 12:08	
Dichlorofluoromethane	ug/L	ND	1.0	11/09/15 12:08	
Diethyl ether (Ethyl ether)	ug/L	ND	4.0	11/09/15 12:08	
Ethylbenzene	ug/L	ND	1.0	11/09/15 12:08	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	11/09/15 12:08	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	11/09/15 12:08	
Methyl-tert-butyl ether	ug/L	ND	1.0	11/09/15 12:08	
Methylene Chloride	ug/L	ND	4.0	11/09/15 12:08	
n-Butylbenzene	ug/L	ND	1.0	11/09/15 12:08	
n-Propylbenzene	ug/L	ND	1.0	11/09/15 12:08	
Naphthalene	ug/L	ND	4.0	11/09/15 12:08	
p-Isopropyltoluene	ug/L	ND	1.0	11/09/15 12:08	
sec-Butylbenzene	ug/L	ND	1.0	11/09/15 12:08	
Styrene	ug/L	ND	1.0	11/09/15 12:08	
tert-Butylbenzene	ug/L	ND	1.0	11/09/15 12:08	
Tetrachloroethene	ug/L	ND	1.0	11/09/15 12:08	
Tetrahydrofuran	ug/L	ND	10.0	11/09/15 12:08	
Toluene	ug/L	ND	1.0	11/09/15 12:08	
trans-1,2-Dichloroethene	ug/L	ND	1.0	11/09/15 12:08	
trans-1,3-Dichloropropene	ug/L	ND	4.0	11/09/15 12:08	
Trichloroethene	ug/L	ND	0.40	11/09/15 12:08	
Trichlorofluoromethane	ug/L	ND	1.0	11/09/15 12:08	
Vinyl chloride	ug/L	ND	0.40	11/09/15 12:08	
Xylene (Total)	ug/L	ND	3.0	11/09/15 12:08	
1,2-Dichloroethane-d4 (S)	%.	97	75-125	11/09/15 12:08	
4-Bromofluorobenzene (S)	%.	103	75-125	11/09/15 12:08	
Toluene-d8 (S)	%.	102	75-125	11/09/15 12:08	

LABORATORY CONTROL SAMPLE:	2130205					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.5	102	75-125	
1,1,1-Trichloroethane	ug/L	20	20.2	101	75-125	
1,1,2,2-Tetrachloroethane	ug/L	20	20.2	101	75-125	
1,1,2-Trichloroethane	ug/L	20	20.4	102	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	18.1	90	60-135	
1,1-Dichloroethane	ug/L	20	20.1	101	69-125	
1,1-Dichloroethene	ug/L	20	20.4	102	68-125	
1,1-Dichloropropene	ug/L	20	20.0	100	74-125	
1,2,3-Trichlorobenzene	ug/L	20	17.3	86	69-136	
1,2,3-Trichloropropane	ug/L	20	20.5	102	75-125	
1,2,4-Trichlorobenzene	ug/L	20	19.1	96	73-127	

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.



Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

LABORATORY CONTROL SAMPLE:	2130205	Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L		20.8	104	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	49.9	100	65-145	
1,2-Dibromoethane (EDB)	ug/L	20	21.7	108	75-125	
1,2-Dichlorobenzene	ug/L	20	20.1	101	75-125	
1,2-Dichloroethane	ug/L	20	19.2	96	73-125	
1,2-Dichloropropane	ug/L	20	21.1	105	75-125	
1,3,5-Trimethylbenzene	ug/L	20	21.7	108	75-125	
1,3-Dichlorobenzene	ug/L	20	21.2	106	74-125	
1,3-Dichloropropane	ug/L	20	20.8	104	75-125	
1,4-Dichlorobenzene	ug/L	20	20.6	103	75-125	
2,2-Dichloropropane	ug/L	20	20.2	101	59-139	
2-Butanone (MEK)	ug/L	100	93.5	94	63-130	
2-Chlorotoluene	ug/L	20	20.6	103	72-125	
4-Chlorotoluene	ug/L	20	20.3	102	73-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	102	102	71-126	
Acetone	ug/L	100	107	107	69-131	
Allyl chloride	ug/L	20	20.4	102	67-125	
Benzene	ug/L	20	19.2	96	71-125	
Bromobenzene	ug/L	20	19.9	99	75-125	
Bromochloromethane	ug/L	20	18.8	94	75-125	
Bromodichloromethane	ug/L	20	20.2	101	75-125	
Bromoform	ug/L	20	19.3	96	70-125	
Bromomethane	ug/L	20	15.8	79	30-150	
Carbon tetrachloride	ug/L	20	19.1	96	75-126	
Chlorobenzene	ug/L	20	20.7	103	75-125	
Chloroethane	ug/L	20	19.1	95	65-134	
Chloroform	ug/L	20	19.4	97	75-125	
Chloromethane	ug/L	20	21.4	107	39-150	
cis-1,2-Dichloroethene	ug/L	20	20.3	102	72-125	
cis-1,3-Dichloropropene	ug/L	20	20.4	102	75-125	
Dibromochloromethane	ug/L	20	19.4	97	75-125	
Dibromomethane	ug/L	20	19.9	99	75-125	
Dichlorodifluoromethane	ug/L	20	17.3	87	50-134	
Dichlorofluoromethane	ug/L	20	20.1	101	69-125	
Diethyl ether (Ethyl ether)	ug/L	20	19.5	98	72-125	
Ethylbenzene	ug/L	20	20.1	100	75-125	
Hexachloro-1,3-butadiene	ug/L	20	20.0	100	70-138	
Isopropylbenzene (Cumene)	ug/L	20	21.1	106	75-125	
Methyl-tert-butyl ether	ug/L	20	19.8	99	73-125	
Methylene Chloride	ug/L	20	18.2	91	73-125	
n-Butylbenzene	ug/L	20	19.7	99	72-133	
n-Propylbenzene	ug/L	20	20.9	104	72-126	
Naphthalene	ug/L	20	17.0	85	70-127	
p-Isopropyltoluene	ug/L	20	21.3	107	72-132	
sec-Butylbenzene	ug/L	20	21.5	107	73-132	
Styrene	ug/L	20	20.2	101	75-125	
tert-Butylbenzene	ug/L	20	20.8	104	73-128	

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Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

ABORATORY CONTROL SAMPLE:	2130205					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
etrachloroethene	ug/L	20	20.1	100	74-125	
etrahydrofuran	ug/L	200	232	116	62-133	
oluene	ug/L	20	20.5	103	74-125	
ans-1,2-Dichloroethene	ug/L	20	19.9	100	69-125	
ans-1,3-Dichloropropene	ug/L	20	20.7	103	75-125	
richloroethene	ug/L	20	19.4	97	75-125	
richlorofluoromethane	ug/L	20	19.1	95	74-127	
nyl chloride	ug/L	20	19.3	96	66-132	
ylene (Total)	ug/L	60	61.8	103	75-125	
,2-Dichloroethane-d4 (S)	%.			98	75-125	
-Bromofluorobenzene (S)	%.			99	75-125	
oluene-d8 (S)	%.			102	75-125	

MATRIX SPIKE & MATRIX SPIR		2130207										
			MS	MSD								
	1	0328304020	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20	19.8	19.9	99	99	70-138	0	30	
1,1,1-Trichloroethane	ug/L	ND	20	20	22.5	22.6	112	113	55-150	1	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	20.0	20.6	100	103	64-140	3	30	
1,1,2-Trichloroethane	ug/L	ND	20	20	20.3	20.2	102	101	67-137	1	30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	20	25.1	24.0	126	120	51-150	4	30	
1,1-Dichloroethane	ug/L	ND	20	20	21.9	21.0	109	105	49-150	4	30	
1,1-Dichloroethene	ug/L	ND	20	20	23.5	22.3	118	111	40-150	6	30	
1,1-Dichloropropene	ug/L	ND	20	20	23.0	21.6	115	108	50-150	6	30	
1,2,3-Trichlorobenzene	ug/L	ND	20	20	21.5	22.9	107	115	59-148	6	30	
1,2,3-Trichloropropane	ug/L	ND	20	20	20.0	19.7	100	99	65-141	1	30	
1,2,4-Trichlorobenzene	ug/L	ND	20	20	22.3	22.6	112	113	61-140	1	30	
1,2,4-Trimethylbenzene	ug/L	ND	20	20	21.0	21.2	105	106	58-141	1	30	
1,2-Dibromo-3-	ug/L	ND	50	50	48.5	53.1	97	106	53-150	9	30	
chloropropane												
1,2-Dibromoethane (EDB)	ug/L	ND	20	20	20.3	20.6	102	103	65-137	1	30	
1,2-Dichlorobenzene	ug/L	ND	20	20	20.5	22.1	103	111	66-133	7	30	
1,2-Dichloroethane	ug/L	2.8	20	20	24.3	23.0	108	101	54-138	6	30	
1,2-Dichloropropane	ug/L	ND	20	20	21.1	20.8	106	104	62-138	1	30	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	21.7	22.0	109	110	58-140	1	30	
1,3-Dichlorobenzene	ug/L	ND	20	20	21.4	22.2	107	111	66-132	4	30	
1,3-Dichloropropane	ug/L	ND	20	20	20.5	21.4	103	107	66-134	4	30	
1,4-Dichlorobenzene	ug/L	ND	20	20	20.3	20.7	101	103	65-129	2	30	
2,2-Dichloropropane	ug/L	ND	20	20	21.9	20.8	110	104	40-150	5	30	
2-Butanone (MEK)	ug/L	ND	100	100	88.5	80.1	89	80	51-147	10	30	
2-Chlorotoluene	ug/L	ND	20	20	20.4	21.3	102	106	58-147	4	30	
4-Chlorotoluene	ug/L	ND	20	20	20.4	21.4	102	107	64-138	5	30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	100	100	99.0	100	99	59-143	1	30	
Acetone	ug/L	ND	100	100	86.8	76.1	87	76	63-147	13	30	

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Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

MATRIX SPIKE & MATRIX SPII					2130207							
			MS	MSD								
Parameter	Units	10328304020 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qu
Allyl chloride	ug/L		20	20	20.0	19.7	100	99	45-150		30	
Benzene	ug/L	57.2	20	20	88.3	87.9	155	153	53-139	0		МЗ
Bromobenzene	ug/L	ND	20	20	19.5	20.5	97	102	66-136	5	30	
Bromochloromethane	ug/L	ND	20	20	18.8	18.6	94	93	64-136	1	30	
Bromodichloromethane	ug/L	ND	20	20	20.8	20.7	104	104	66-138	0		
Bromoform	ug/L	ND	20	20	19.1	20.3	96	102	59-136	6	30	
Bromomethane	ug/L	ND	20	20	17.5	20.5	87	103	30-150	16		
Carbon tetrachloride	ug/L	ND	20	20	21.6	20.4	108	102	56-150	5	30	
Chlorobenzene	ug/L	ND	20	20	20.8	20.7	104	103	65-133	1	30	
Chloroethane	ug/L	ND	20	20	20.8	19.5	104	98	48-150	6	30	
Chloroform	ug/L	ND	20	20	21.3	21.3	106	107	57-145	0		
Chloromethane	ug/L	ND	20	20	25.3	27.6	126	138	30-150	9	30	
sis-1,2-Dichloroethene	ug/L	ND	20	20	21.3	19.6	106	98	49-150	8		
sis-1,3-Dichloropropene	ug/L	ND	20	20	21.2	20.8	106	104	64-130	2		
Dibromochloromethane	ug/L	ND	20	20	19.5	19.7	98	98	68-138	1	30	
Dibromomethane	ug/L	ND	20	20	19.6	19.8	98	99	67-134	1	30	
Dichlorodifluoromethane	ug/L	ND	20	20	22.1	21.2	111	106	45-150	5		
Dichlorofluoromethane	ug/L	ND	20	20	22.5	22.1	113	111	54-150	2		
Diethyl ether (Ethyl ether)	ug/L	ND	20	20	19.4	19.4	97	97	50-145	0		
Ethylbenzene	ug/L	ND	20	20	21.9	22.5	105	108	55-139	3		
lexachloro-1,3-butadiene	ug/L	ND	20	20	22.5	23.7	112	119	49-150	5	30	
sopropylbenzene (Cumene)	ug/L	ND	20	20	22.2	22.4	111	112	64-142	1	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	21.7	20.7	109	103	62-129	5		
Methylene Chloride	ug/L	ND	20	20	17.9	18.1	90	91	57-132	1	30	
n-Butylbenzene	ug/L	ND	20	20	21.3	21.8	106	109	55-150	2	30	
n-Propylbenzene	ug/L	ND	20	20	21.3	21.9	106	109	59-142	3	30	
Naphthalene	ug/L	ND	20	20	20.6	21.8	103	109	51-150	6	30	
p-Isopropyltoluene	ug/L	ND	20	20	23.0	23.2	115	116	60-149	1		
sec-Butylbenzene	ug/L	ND	20	20	22.6	23.5	113	117	60-150	4		
Styrene	ug/L	ND	20	20	21.8	21.4	109	107	68-134	2	30	
ert-Butylbenzene	ug/L	ND	20	20	22.6	22.5	113	113	62-146	0	30	
- Tetrachloroethene	ug/L	ND	20	20	20.6	21.7	103	109	50-150	6	30	
- etrahydrofuran	ug/L	ND	200	200	220	227	110	113	59-145	3	30	
oluene	ug/L	1.2	20	20	22.3	22.7	106	108	52-148	2	30	
rans-1,2-Dichloroethene	ug/L	ND	20	20	19.8	20.5	99	102	45-150	3	30	
rans-1,3-Dichloropropene	ug/L	ND	20	20	21.5	20.4	108	102	68-132	5	30	
richloroethene	ug/L	ND	20	20	20.8	21.6	104	108	52-150	4		
richlorofluoromethane	ug/L	ND	20	20	24.2	24.8	121	124	55-150			
/inyl chloride	ug/L	ND	20	20	21.4	22.7	107	114	43-150			
(ylene (Total)	ug/L	ND	60	60	63.6	64.3	106	107	54-144			
,2-Dichloroethane-d4 (S)	%.						103	98	75-125			
I-Bromofluorobenzene (S)	%.						95	99	75-125			
oluene-d8 (S)	%.						100	102	75-125			

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### **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

QC Batch: MSV/33726 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV 465 W

Associated Lab Samples: 10329197004

METHOD BLANK: 2132162 Matrix: Water

Associated Lab Samples: 10329197004

	Blank		Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	11/11/15 14:59	
1,1,1-Trichloroethane	ug/L	ND	1.0	11/11/15 14:59	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	11/11/15 14:59	
1,1,2-Trichloroethane	ug/L	ND	1.0	11/11/15 14:59	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	11/11/15 14:59	
1,1-Dichloroethane	ug/L	ND	1.0	11/11/15 14:59	
1,1-Dichloroethene	ug/L	ND	1.0	11/11/15 14:59	
1,1-Dichloropropene	ug/L	ND	1.0	11/11/15 14:59	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	11/11/15 14:59	
1,2,3-Trichloropropane	ug/L	ND	4.0	11/11/15 14:59	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	11/11/15 14:59	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	11/11/15 14:59	
1,2-Dibromo-3-chloropropane	ug/L	ND	4.0	11/11/15 14:59	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	11/11/15 14:59	
1,2-Dichlorobenzene	ug/L	ND	1.0	11/11/15 14:59	
1,2-Dichloroethane	ug/L	ND	1.0	11/11/15 14:59	
1,2-Dichloropropane	ug/L	ND	4.0	11/11/15 14:59	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	11/11/15 14:59	
1,3-Dichlorobenzene	ug/L	ND	1.0	11/11/15 14:59	
1,3-Dichloropropane	ug/L	ND	1.0	11/11/15 14:59	
1,4-Dichlorobenzene	ug/L	ND	1.0	11/11/15 14:59	
2,2-Dichloropropane	ug/L	ND	4.0	11/11/15 14:59	
2-Butanone (MEK)	ug/L	ND	5.0	11/11/15 14:59	
2-Chlorotoluene	ug/L	ND	1.0	11/11/15 14:59	
4-Chlorotoluene	ug/L	ND	1.0	11/11/15 14:59	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	11/11/15 14:59	
Acetone	ug/L	ND	20.0	11/11/15 14:59	
Allyl chloride	ug/L	ND	4.0	11/11/15 14:59	
Benzene	ug/L	ND	1.0	11/11/15 14:59	
Bromobenzene	ug/L	ND	1.0	11/11/15 14:59	
Bromochloromethane	ug/L	ND	1.0	11/11/15 14:59	
Bromodichloromethane	ug/L	ND	1.0	11/11/15 14:59	
Bromoform	ug/L	ND	4.0	11/11/15 14:59	
Bromomethane	ug/L	ND	4.0	11/11/15 14:59	
Carbon tetrachloride	ug/L	ND	1.0	11/11/15 14:59	
Chlorobenzene	ug/L	ND	1.0	11/11/15 14:59	
Chloroethane	ug/L	ND	1.0	11/11/15 14:59	
Chloroform	ug/L	ND	1.0	11/11/15 14:59	
Chloromethane	ug/L	ND	4.0	11/11/15 14:59	
cis-1,2-Dichloroethene	ug/L	ND	1.0	11/11/15 14:59	
cis-1,3-Dichloropropene	ug/L	ND	4.0	11/11/15 14:59	

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### **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

METHOD BLANK: 2132162 Matrix: Water

Associated Lab Samples: 10329197004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/L	ND -	1.0	11/11/15 14:59	
Dibromomethane	ug/L	ND	4.0	11/11/15 14:59	
Dichlorodifluoromethane	ug/L	ND	1.0	11/11/15 14:59	
Dichlorofluoromethane	ug/L	ND	1.0	11/11/15 14:59	
Diethyl ether (Ethyl ether)	ug/L	ND	4.0	11/11/15 14:59	
Ethylbenzene	ug/L	ND	1.0	11/11/15 14:59	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	11/11/15 14:59	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	11/11/15 14:59	
Methyl-tert-butyl ether	ug/L	ND	1.0	11/11/15 14:59	
Methylene Chloride	ug/L	ND	4.0	11/11/15 14:59	
n-Butylbenzene	ug/L	ND	1.0	11/11/15 14:59	
n-Propylbenzene	ug/L	ND	1.0	11/11/15 14:59	
Naphthalene	ug/L	ND	4.0	11/11/15 14:59	
p-Isopropyltoluene	ug/L	ND	1.0	11/11/15 14:59	
sec-Butylbenzene	ug/L	ND	1.0	11/11/15 14:59	
Styrene	ug/L	ND	1.0	11/11/15 14:59	
tert-Butylbenzene	ug/L	ND	1.0	11/11/15 14:59	
Tetrachloroethene	ug/L	ND	1.0	11/11/15 14:59	
Tetrahydrofuran	ug/L	ND	10.0	11/11/15 14:59	
Toluene	ug/L	ND	1.0	11/11/15 14:59	
trans-1,2-Dichloroethene	ug/L	ND	1.0	11/11/15 14:59	
trans-1,3-Dichloropropene	ug/L	ND	4.0	11/11/15 14:59	
Trichloroethene	ug/L	ND	0.40	11/11/15 14:59	
Trichlorofluoromethane	ug/L	ND	1.0	11/11/15 14:59	
Vinyl chloride	ug/L	ND	0.40	11/11/15 14:59	
Xylene (Total)	ug/L	ND	3.0	11/11/15 14:59	
1,2-Dichloroethane-d4 (S)	%.	100	75-125	11/11/15 14:59	
4-Bromofluorobenzene (S)	%.	100	75-125	11/11/15 14:59	
Toluene-d8 (S)	%.	102	75-125	11/11/15 14:59	

LABORATORY CONTROL SAMPLE:	2132163					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	19.7	98	75-125	
1,1,1-Trichloroethane	ug/L	20	20.1	101	75-125	
1,1,2,2-Tetrachloroethane	ug/L	20	19.3	96	75-125	
1,1,2-Trichloroethane	ug/L	20	21.3	107	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	18.3	91	60-135	
1,1-Dichloroethane	ug/L	20	19.8	99	69-125	
1,1-Dichloroethene	ug/L	20	19.7	98	68-125	
1,1-Dichloropropene	ug/L	20	19.4	97	74-125	
1,2,3-Trichlorobenzene	ug/L	20	17.2	86	69-136	
1,2,3-Trichloropropane	ug/L	20	21.1	105	75-125	
1,2,4-Trichlorobenzene	ug/L	20	18.5	93	73-127	

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.



Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

LABORATORY CONTROL SAMPLE:	2132163	Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L		20.1	100	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	46.6	93	65-145	
1,2-Dibromoethane (EDB)	ug/L	20	21.0	105	75-125	
1,2-Dichlorobenzene	ug/L	20	19.6	98	75-125	
1,2-Dichloroethane	ug/L	20	20.0	100	73-125	
1,2-Dichloropropane	ug/L	20	19.4	97	75-125	
1,3,5-Trimethylbenzene	ug/L	20	20.3	102	75-125	
1,3-Dichlorobenzene	ug/L	20	20.6	103	74-125	
1,3-Dichloropropane	ug/L	20	21.3	106	75-125	
1,4-Dichlorobenzene	ug/L	20	19.4	97	75-125	
2,2-Dichloropropane	ug/L	20	19.9	99	59-139	
2-Butanone (MEK)	ug/L	100	97.9	98	63-130	
2-Chlorotoluene	ug/L	20	20.2	101	72-125	
4-Chlorotoluene	ug/L	20	19.8	99	73-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	89.4	89	71-126	
Acetone	ug/L	100	104	104	69-131	
Allyl chloride	ug/L	20	18.8	94	67-125	
Benzene	ug/L	20	19.5	98	71-125	
Bromobenzene	ug/L	20	20.3	101	75-125	
Bromochloromethane	ug/L	20	18.4	92	75-125	
Bromodichloromethane	ug/L	20	19.5	98	75-125	
Bromoform	ug/L	20	18.3	92	70-125	
Bromomethane	ug/L	20	18.0	90	30-150	
Carbon tetrachloride	ug/L	20	17.7	88	75-126	
Chlorobenzene	ug/L	20	20.0	100	75-125	
Chloroethane	ug/L	20	23.4	117	65-134	
Chloroform	ug/L	20	20.1	101	75-125	
Chloromethane	ug/L	20	20.6	103	39-150	
cis-1,2-Dichloroethene	ug/L	20	20.5	102	72-125	
cis-1,3-Dichloropropene	ug/L	20	18.6	93	75-125	
Dibromochloromethane	ug/L	20	19.1	96	75-125	
Dibromomethane	ug/L	20	19.2	96	75-125	
Dichlorodifluoromethane	ug/L	20	18.6	93	50-134	
Dichlorofluoromethane	ug/L	20	21.9	110	69-125	
Diethyl ether (Ethyl ether)	ug/L	20	18.6	93	72-125	
Ethylbenzene	ug/L	20	19.5	98	75-125	
Hexachloro-1,3-butadiene	ug/L	20	19.2	96	70-138	
Isopropylbenzene (Cumene)	ug/L	20	20.4	102	75-125	
Methyl-tert-butyl ether	ug/L	20	19.9	99	73-125	
Methylene Chloride	ug/L	20	17.8	89	73-125	
n-Butylbenzene	ug/L	20	19.0	95	72-133	
n-Propylbenzene	ug/L	20	19.7	99	72-126	
Naphthalene	ug/L	20	15.9	80	70-127	
p-Isopropyltoluene	ug/L	20	21.1	106	72-132	
sec-Butylbenzene	ug/L	20	20.3	102	73-132	
Styrene	ug/L	20	20.3	101	75-125	
tert-Butylbenzene	ug/L	20	20.3	101	73-128	
•	J					

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.



Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

LABORATORY CONTROL SAMPLE:	2132163					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Tetrachloroethene	ug/L	20	19.2	96	74-125	
Tetrahydrofuran	ug/L	200	237	119	62-133	
Toluene	ug/L	20	20.4	102	74-125	
trans-1,2-Dichloroethene	ug/L	20	19.1	96	69-125	
trans-1,3-Dichloropropene	ug/L	20	18.9	94	75-125	
Trichloroethene	ug/L	20	19.4	97	75-125	
richlorofluoromethane	ug/L	20	19.4	97	74-127	
'inyl chloride	ug/L	20	20.3	101	66-132	
(ylene (Total)	ug/L	60	60.4	101	75-125	
,2-Dichloroethane-d4 (S)	%.			100	75-125	
-Bromofluorobenzene (S)	%.			98	75-125	
oluene-d8 (S)	%.			101	75-125	

MATRIX SPIKE SAMPLE:	2132380						
		10329032008	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	11.1	55	70-138	M1
1,1,1-Trichloroethane	ug/L	ND	20	17.7	89	55-150	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	16.4	82	64-140	
1,1,2-Trichloroethane	ug/L	ND	20	20.2	101	67-137	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	23.9	119	51-150	
1,1-Dichloroethane	ug/L	ND	20	21.9	109	49-150	
1,1-Dichloroethene	ug/L	ND	20	22.9	115	40-150	
1,1-Dichloropropene	ug/L	ND	20	21.4	107	50-150	
1,2,3-Trichlorobenzene	ug/L	ND	20	15.2	76	59-148	
1,2,3-Trichloropropane	ug/L	ND	20	19.8	99	65-141	
1,2,4-Trichlorobenzene	ug/L	ND	20	18.8	94	61-140	
1,2,4-Trimethylbenzene	ug/L	ND	20	20.5	102	58-141	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	17.3	35	53-150	M1
1,2-Dibromoethane (EDB)	ug/L	ND	20	17.7	89	65-137	
1,2-Dichlorobenzene	ug/L	ND	20	20.2	101	66-133	
1,2-Dichloroethane	ug/L	ND	20	20.0	100	54-138	
1,2-Dichloropropane	ug/L	ND	20	20.9	104	62-138	
1,3,5-Trimethylbenzene	ug/L	ND	20	21.6	108	58-140	
1,3-Dichlorobenzene	ug/L	ND	20	21.3	107	66-132	
1,3-Dichloropropane	ug/L	ND	20	21.2	106	66-134	
1,4-Dichlorobenzene	ug/L	ND	20	20.7	104	65-129	
2,2-Dichloropropane	ug/L	ND	20	18.3	92	40-150	
2-Butanone (MEK)	ug/L	ND	100	81.7	82	51-147	
2-Chlorotoluene	ug/L	ND	20	20.9	104	58-147	
4-Chlorotoluene	ug/L	ND	20	20.3	102	64-138	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	88.8	89	59-143	
Acetone	ug/L	ND	100	106	106	63-147	
Allyl chloride	ug/L	ND	20	17.4	87	45-150	
Benzene	ug/L	ND	20	20.0	100	53-139	

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.



Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

MATRIX SPIKE SAMPLE:	2132380						
Danasatan	11-9	10329032008	Spike	MS	MS	% Rec	D 1101 -
Parameter	Units	Result	Conc	Result	% Rec	Limits (	Qualifiers
Bromobenzene	ug/L	ND	20	20.9	105	66-136	
Bromochloromethane	ug/L	ND	20	19.1	96	64-136	
Bromodichloromethane	ug/L	ND	20	13.9	70	66-138	
Bromoform	ug/L	ND	20	6.7	34	59-136 M1	
Bromomethane	ug/L	ND	20	22.9	115	30-150	
Carbon tetrachloride	ug/L	ND	20	11.2	56	56-150	
Chlorobenzene	ug/L	ND	20	20.6	103	65-133	
Chloroethane	ug/L	ND	20	23.5	118	48-150	
Chloroform	ug/L	ND	20	20.4	102	57-145	
Chloromethane	ug/L	ND	20	21.9	109	30-150	
cis-1,2-Dichloroethene	ug/L	ND	20	20.6	103	49-150	
cis-1,3-Dichloropropene	ug/L	ND	20	17.0	85	64-130	
Dibromochloromethane	ug/L	ND	20	9.3	47	68-138 M1	
Dibromomethane	ug/L	ND	20	20.0	100	67-134	
Dichlorodifluoromethane	ug/L	ND	20	24.1	121	45-150	
Dichlorofluoromethane	ug/L	ND	20	23.4	117	54-150	
Diethyl ether (Ethyl ether)	ug/L	ND	20	19.1	96	50-145	
Ethylbenzene	ug/L	ND	20	20.9	104	55-139	
Hexachloro-1,3-butadiene	ug/L	ND	20	17.1	85	49-150	
Isopropylbenzene (Cumene)	ug/L	ND	20	21.5	107	64-142	
Methyl-tert-butyl ether	ug/L	ND	20	19.8	99	62-129	
Methylene Chloride	ug/L	ND	20	18.1	91	57-132	
n-Butylbenzene	ug/L	ND	20	20.1	100	55-150	
n-Propylbenzene	ug/L	ND	20	21.2	106	59-142	
Naphthalene	ug/L	ND	20	14.0	70	51-150	
p-Isopropyltoluene	ug/L	ND	20	21.6	108	60-149	
sec-Butylbenzene	ug/L	ND	20	21.8	109	60-150	
Styrene	ug/L	ND	20	20.6	103	68-134	
tert-Butylbenzene	ug/L	ND	20	21.6	108	62-146	
Tetrachloroethene	ug/L	ND	20	21.7	108	50-150	
Tetrahydrofuran	ug/L	ND	200	248	124	59-145	
Toluene	ug/L	ND	200	20.8	104	52-148	
trans-1,2-Dichloroethene	ug/L	ND ND	20	20.8	104	45-150	
trans-1,2-Dichloropropene	ug/L ug/L	ND ND	20	20.9 15.8	79	45-150 68-132	
Trichloroethene	ug/L ug/L	ND ND	20	20.7	103	52-150	
Trichlorofluoromethane	ug/L	ND ND	20	25.6	128	52-150 55-150	
		ND ND	20	23.3	120	43-150	
Vinyl chloride	ug/L	ND ND					
Xylene (Total)	ug/L	טאו	60	63.9	106	54-144 75-125	
1,2-Dichloroethane-d4 (S)	%.				98	75-125	
4-Bromofluorobenzene (S)	%.				98	75-125	
Toluene-d8 (S)	%.				98	75-125	

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



Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

SAMPLE DUPLICATE: 2132381		4000000047	_			
Parameter	Units	10329032017 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,1-Dichloropropene	ug/L	ND	ND		30	
1,2,3-Trichlorobenzene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2,4-Trichlorobenzene	ug/L	ND	ND		30	
1,2,4-Trimethylbenzene	ug/L	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,3,5-Trimethylbenzene	ug/L	ND	ND		30	
1,3-Dichlorobenzene	ug/L	ND	ND		30	
1,3-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2,2-Dichloropropane	ug/L	ND ND	ND ND		30	
2-Butanone (MEK)	_	ND ND	ND ND		30	
2-Chlorotoluene	ug/L	ND ND	ND ND		30	
4-Chlorotoluene	ug/L ug/L	ND ND	ND ND		30	
	_	ND	ND ND		30	
4-Methyl-2-pentanone (MIBK) Acetone	ug/L	ND ND	ND ND		30	
	ug/L	ND ND	ND ND			
Allyl chloride	ug/L	ND ND	ND ND		30	
Benzene	ug/L	ND ND	ND ND		30	
Bromobenzene	ug/L	ND ND			30	
Bromochloromethane	ug/L	ND ND	ND		30	
Bromodichloromethane	ug/L		ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND ND	ND		30	
Carbon tetrachloride	ug/L		ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Dichlorodifluoromethane	ug/L	ND	ND		30	
Dichlorofluoromethane	ug/L	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	

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



### **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

SAMPLE DUPLICATE: 2132381		10329032017	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/L		ND		30	
Isopropylbenzene (Cumene)	ug/L	ND	ND		30	
Methyl-tert-butyl ether	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
n-Butylbenzene	ug/L	ND	ND		30	
n-Propylbenzene	ug/L	ND	ND		30	
Naphthalene	ug/L	ND	ND		30	
p-Isopropyltoluene	ug/L	ND	ND		30	
sec-Butylbenzene	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
tert-Butylbenzene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Tetrahydrofuran	ug/L	ND	ND		30	
Toluene	ug/L	ND	.24J		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	95	100	6		
4-Bromofluorobenzene (S)	%.	102	99	4		
Toluene-d8 (S)	%.	99	101	3		

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.



### **QUALIFIERS**

Project: PS BETA-NIROP
Pace Project No.: 10329197

### **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.

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.

### **ANALYTE QUALIFIERS**

Date: 12/18/2015 09:47 AM

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

M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.

S2 Surrogate recovery outside laboratory control limits due to matrix interferences (confirmed by similar results from sample

re-analysis).





### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: PS BETA-NIROP

Pace Project No.: 10329197

Date: 12/18/2015 09:47 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10329197001	PMW-04	EPA 8260B	MSV/33694	_	
10329197002	PMW-03	EPA 8260B	MSV/33694		
10329197003	PMW-02	EPA 8260B	MSV/33694		
10329197004	PMW-01	EPA 8260B	MSV/33726		

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Sompany: ddress:

Section A Required Client Information:

FAM TATA CHAIN-OF-CUSTODY / Analytical Request Document
The Chain-of-Custody is a LEGAL DOCUMENT. All refevant fields must be completed accurately.

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DRINKING WATER 1000001 1000001 OTHER NPDES GROUND WATER Page: REGULATORY AGENCY RCRA Requested Analysis Filtered (Y/N) STATE: Site Location □ UST ALLE SOMBA Company Name: Recently Attention: BANAR NACES Section C Invoice Information: 1001 Manager: Pace Profile #: Pace Quote Reference: Pace Project Address: R-BOTA MIRED MELLINDA PHAM Section B
Required Project Information:
Report To: Purchase Order No.: Project Number: Project Name: Copy To: monte, CA Witts 49-34-500 G49-34 8090 JOAN TAI

·*************************************	Section D Required Client Information	a 등				COLLECTED	СТЕВ				Pres	Preservatives	ves	N/A											
		Drinking Water DW Water WT Waste Water WW Product P Soil/Soild SL	see valid codes t	=GEAB C=CC	COMPOSITE	JSITE	COMPOSITE END/GRAB		SOLLECTION													(N/A)			
	SAMPLE ID (A-Z, 0-9 /,-) Sample IDs MUST BE UNIQUE		***************************************			-		TEMP AT	RANIATMO		4			*****	iseT sis US KA							oninolhD lr			
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of 39							SIGNATURE	SIGNATURE of SAMPLER;	$\bigcirc$	1	1		0		DA	DATE Signed (MM/DD/YY):	``	10/1	5		Ten	DeR Pool	o	)	gms2 )

F-ALL-Q-020rev.07, 15-May-2007

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\*

Project Manager Review,

hold, incorrect preservative, out of temp, incorrect containers).

### Document Name:

### Sample Condition Upon Receipt Form

Document No.: F-MN-L-213-rev.13

Document Revised: 23Feb2015

Page 1 of 1

Issuing Authority:
Pace Minnesota Quality Office

Sample Condition Client Name: Project #: WO#: 10329197 Upon Receipt Courier: **USPS** Client Commercial Pace SpeeDee Other: Tracking Number: Optional: Proj. Due Date: Proj. Name: No Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes Packing Material: Bubble Wrap Bubble Bags None Other: Temp Blank? ΠNo □B88A912167504 - □B88A0143310098 Thermometer Type of Ice: ☐Wet ☐Blue None Samples on ice, cooling process has begun Used: Cooler Temp Read (°C): 5.8 0.1, Cooler Temp Corrected (°C): 5.8 0.1 G. Biological Tissue Frozen? Yes No Temp should be above freezing to 6°C Correction Factor: Date and Initials of Person Examining Contents: Biological Tissue Frozen? Yes No N/A Temp should be above freezing to 6°C USDA Regulated Soil ( N/A, water sample) Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, ID, LA. Did samples originate from a foreign source (internationally, MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)? Yes No including Hawaii and Puerto Rico)? 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 □N/A 1. Chain of Custody Filled Out? Yes □No □N/A 2. Ves Chain of Custody Relinquished? □No N/A Sampler Name and/or Signature on COC? Yes □No □N/A 4. Samples Arrived within Hold Time? □No □N/A Short Hold Time Analysis (<72 hr)? Yes No □N/A 6. Yes **Rush Turn Around Time Requested?** □No □N/A Sufficient Volume? □No □N/A 8. Correct Containers Used? Yes □No 9. □N/A Yes -Pace Containers Used? □No □N/A 10/Capsightly broken in Sample procures No Containers Intact? Yes □N/A Filtered Volume Received for Dissolved Tests? ₩/A ∐Yes □No Note if sediment is visible in the dissolved contained Sample Labels Match COC? Ves □No □N/A 12. -Includes Date/Time/ID/Analysis Matrix: All containers needing acid/base preservation have been 13. ☐HNO₃ ∏H<sub>2</sub>SO<sub>4</sub> NaOH Пнсі N/A Yes □No All containers needing preservation are found to be in Sample # compliance with EPA recommendation? (HNO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub>, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) □No Yes Exceptions VOA Coliform, TOC, Oil and Grease, Initial when Lot # of added DRO/8015 (water) DOC Yes □No □N/A completed: preservative: Headspace in VOA Vials ( >6mm)? No □N/A 14. ☐Yes No Trip Blank Present? Yes □N/A 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:

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

Date:



November 22, 2015

Jennifer Anderson

1700 Elm Street Suite 200

Pace Analytical Services, Inc.

Minneapolis, MN 55414

Pace Analytical Energy Services, LLC 220 William Pitt Way

Pittsburgh, PA 15238

Phone: (412) 826-5245 Fax: (412) 826-3433

PS BETA-NIROP

Pace Workorder:

17314

Dear Jennifer Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on Tuesday, November 10, 2015.

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

Sincerely,

RE:

Ruth Weld.

Ruth Welsh 1

11/22/2015

Ruth.Welsh@pacelabs.com

Customer Service Representative

**Enclosures** 

As a valued client we would appreciate your comments on our service.

Please email info@microseeps.com.

Total Number of Pages

Report ID: 17314 - 734669

Page 1 of 9

Pace Analytical\*

Client

Pace MN

1700 Elm Street, Suite 200

Minneapolis, MN 55414

Project

PS Beta Nirop

Project #

10329197

Report to Tel:

Jennifer Anderson 612.607.1700

Email:

jennifer.anderson @ pacelabs.com

Pace Analytical CSIA Center

220 William Pitt Way

Pittsburgh, PA 15238

Tel: 412.826.5245

Report by: Dr. Yi Wang

Director, CSIA Center of Excellence

Cell: 609.721.2843

Email: yi.wang@zymaxusa.com

### REPORT OF ENVIRONMENTAL FORENSICS ISOTOPE ANALYSES

Date Received: 11/10/2015

Date Reported: 11/19/2015

Water sample submitted for  $\delta^{13}$ C (‰ VPDB) stable carbon isotope forensics of chlorinated solvents

Pace CSIA	Client's Sample ID	$\delta^{13}C$	$\delta^{13}C$	$\delta^{13}C$	$\delta^{13}C$	δ <sup>13</sup> C	δ <sup>13</sup> C
Lab ID	Description	TCE	cDCE	tDCE	11DCE	11DCA	VC
17314-1	PMW-04	7.39	-17.46	-20.12	U_	υ_	U _
17314-2	PMW-03	-8.52	-20.10	-20.97	U_	U_	-20.39
17314-3	PMW-02	12.09	-27.03	-37.54	-20.23	-29.16	-23.97
17314-4	PMW-01	U_	U_	U _	υ	υ_	U _

cDCE & tDCE: cis & trans-1,2-dichloroethene

11DCA: 1,1-dichloroethane

VC: vinyl chloride

TCE: trichloroethene

11DCE: 1,1-dichloroethene

Method: Compound Specific Isotope Analysis for <sup>13</sup>C and <sup>2</sup>H by GC-IRMS, for <sup>37</sup>Cl by GC-qMS

	$\delta^{13}C$	$\delta^{13}C$	δ <sup>13</sup> C	δ <sup>13</sup> C	δ <sup>13</sup> C	δ <sup>13</sup> C
Quality Control STDs	TCE	cDCE	tDCE	11DCE	11DCA	VC
QC-1	-26.29	-12.18	-22.74	-30.77	-33.03	-28.99
QC-2	-26.08	-11.77	-21.60	-30.37	-31.86	-28.92
<b>M</b> ean	-26.19	-11.98	-22.17	-30.57	-32.45	-28.96
Analytical precision (1σ)	0.15	0.29	0.81	0.28	0.83	0.05

### Pace CSIA Forensic Isotope Services

Product or Dissolved Organics: Chlorinated Solvents, Oil, Extract, Fraction and Kerogen

3D-CSIA of <sup>13</sup>C, <sup>37</sup>Cl, and <sup>2</sup>H for PCE, TCE, DCE, MTBE, BTEX, 1,4-Dioxane, Alkanes, Gasoline and Oil; Bulk <sup>13</sup>C, <sup>2</sup>H, <sup>18</sup>O, <sup>34</sup>S, and <sup>15</sup>N Gas Sample

Gas Composition and 2D-CSIA of <sup>13</sup>C and <sup>2</sup>H of C1 to C5; <sup>13</sup>C of CO<sub>2</sub>; <sup>14</sup>C of C1 and CO<sub>2</sub>; <sup>34</sup>S of H<sub>2</sub>S; <sup>15</sup>N and <sup>18</sup>O of N<sub>2</sub>O gas Water and Dissolved Inorganics

 $^{2}\text{H}, \, ^{3}\text{H}$  and  $^{18}\text{O}; \, ^{34}\text{S}$  and  $^{18}\text{O}$  of dissolved sulfate;  $^{34}\text{S}$  of dissolved  $\text{H}_{2}\text{S}$ 

<sup>15</sup>N and <sup>18</sup>O of dissolved Nitrate; <sup>15</sup>N of Ammonia; <sup>13</sup>C of dissolved CO<sub>2</sub> and Carbonate/Bicarbonate Soil and Minerals

<sup>13</sup>C, <sup>18</sup>O, <sup>15</sup>N, <sup>34</sup>S, D/H; <sup>14</sup>C of carbonate or organics

Post-Analysis Forensic Isotope Data Interpretation

<sup>&</sup>lt;sup>J</sup>-Target analyte produced a low peak signal and the result is considered usable to ± 2‰, but not the standard ± 0.5‰

<sup>&</sup>lt;sup>U</sup>-Either there was no peak corresponding to the target analyte or that such a peak did not produce a reliable CSIA result

Pace CSIA Center of Excellence phone: 412-826-5245 Pittsburgh, PA 15238 220 William Pitt Way

# CSIA Report Carbon

PACE-MN Client Project Name:

PS Beta Nirop 10329197 Client Project #:

		Ş	Concentration	L			CSI	CSIA (Carbon	(1	
	Vinyl Chloride		(l/gn)		A	Area	On elution Analysis	Analycic	Dafe	Delta (%)
l ab ID	Client ID	Sample	Pal	Date	Sample PQL	PQL	ionnio-oo	A layer		, (ac.)
173140001	PMW-04	<1 (U)	-	11/9/15	< 1 (U)	_	No	4241	11/18/15	1
173140002	PMW-03	2	-	11/9/15	3.25	Ψ.	No	4242	11/18/15	-20.39
173140003	PMW-02	5	4	11/9/15	5.62	-	No	4246	11/18/15	-23.97
173140004	PMW-01	<1 (U)	-	11/11/15	× 1 (U)	-	No	4245	11/18/15	1
Duplicate	PMW-03	2	-	11/9/15	3.23	-	No	4243	11/18/15	-20.46
Blank	22	0	١,	,	(U) 1×	-	οN	4238	11/18/15	1
		10	,		12.4	-	oN N	4239	11/18/15	-28.99
		20	,	3	15.7	~	SN N	4240	11/18/15	-28.92
I OS accentance rande	te rande							-28.90	\ \ \	-27.90
בסס מססס סיים										

8260B AM-24-AR_C AM-24-DL_C	ug// Vs ‰, VPDB	NA CJS CJS	
Method	Unife	Analyst	

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## CSIA Report Carbon

PS Beta Nirop 10329197

PACE-MN Client Project Name: Client Project #: 10

1,1-Dichloroethene  Lab ID   Client ID   173140001	•	<u> </u>	こうこうこうこう	-			5		,	
001	ethene		(l/gn)		Ar	Area	Co of rtion Analysis	Analyeie	Dafa	Delta (%)
100		Sample	Pal	Date	Sample	PQL	1011010-00	Allalysis		רמונק (יומו)
		<1 (U)	-	11/9/15	< 5 (U)	5	No	4241	11/18/15	ŧ
		<1 (U)	-	11/9/15	< 5 (U)	5	No	4242	11/18/15	ı
		21	9	11/9/15	24.8	5	No	4246	11/18/15	-20.23
		√1 (U)	-	11/11/15	< 5 (U)	3	No	4245	11/18/15	1
		<1 (U)	-	11/9/15	< 5 (U)	5	S S	4243	11/18/15	1
		0			<5 (U)	5	Š	4238	11/18/15	ı
- 0 80		10	,	,	7.95	5	No	4239	11/18/15	-30.77
CS Hi		50	,		37.0	5	SN SN	4240	11/18/15	-30.37
CS accentance rande								-30,36	<b>&lt;=&gt;</b>	-31.36

			(
	8260B	AM-24-AR_C	AM-24-DL_C
Inits	ua/I	Vs	%, VPDB
Ansiyet	AN	CJS	CJS
Algiyat			

Pace CSIA Center of Excellence phone: 412-826-5245 Pittsburgh, PA 15238 220 William Pitt Way

## CSIA Report Carbon

PACE-MN Client Project Name: Client Project #: 10 17314

10329197

PS Beta Nirop

,		S	Concentration	u.			CSI	CSIA (Carbon	(1	
trans	trans-Dichloroethene		(l/gn)		Ą	Area	Co alution Analysis	Analyeic	Date	Delta (%)
ab ID	Client ID	Sample	Pal	Date	Sample	Pal	כס-פומנוסוו	Alalysis	המנה	למטן איים
173140001	PMW-04	51	_	11/9/15	39.0	Ψ-	No	4241	11/18/15	-20.12
173140002	PMW-03	45	-	11/9/15	38.2	ļ	No No	4242	11/18/15	-20.97
173140003	PMW-02	318	10	11/9/15	20.3	<del></del>	No	4544	·	-37.54
173140004	PMW-01	<1 (U)	-	11/11/15	< 1 (U)	ļ	SN N	4245	11/18/15	į
Duplicate	PMW-03	45	-	11/9/15	38.2	-	No	4243	11/18/15	-21.24
Blank		0	,	1	(U) 1>	-	SN S	4238	11/18/15	1
ol SO		10	1		7.23	-	οN	4239	11/18/15	-22.74
CS Hi	-	50		,	38.1	-	No	4240	11/18/15	-21.60
CS accentance range	o range							-22.29	<b>∧</b> ::∨	-23.29

Method	8260B	AM-24-AR_C	AM-24-DL_C
Units	l/Bn	Λs	%, VPDB
Analyst	AA	CJS	CJS
The state of the s			

Pace CSIA Center of Excellence 220 William Pitt Way Pittsburgh, PA 15238 phone: 412-826-5245

## CSIA Report Carbon

PACE-MN Client Project Name: Client Project #: 10

PS Beta Nirop 10329197

		Col	Concentration	nc			CSI/	CSIA (Carbon	(1	
	1,1-Dichloroethane		(l/gn)		Ar	Area	Co elution Analysis	Analyeie	Dafe	Delta (%)
Lab ID	Client ID	Sample	PQL	Date	Sample PQL	PQL	-COCIAGOI	Allaysis		לפטר ( מסו)
173140001	PMW-04	(U)	1	11/9/15	<4(U)	4	No	4241	11/18/15	ŧ
173140002	PMW-03	1	1	11/9/15	<4(U)	4	No	4242	11/18/15	ı
173140003	PMW-02	34	10	11/9/15	45.4	4	No	4246	11/18/15	-29.16
173140004	PMW-01	(U) \>	1	11/11/15	< 4 (U)	4	No	4245	11/18/15	1
Duplicate	PMW-03	1	1	11/9/15	< 4 (U)	4	Š	4243	11/18/15	1
Blank		0	,	t	(U) 42	4	°Z	4238	11/18/15	
I CS To	-	10		,	6.70	4	Š	4269	11/18/15	-33.03
LCS Hi	t the second sec	50	ı		39.6	4	SN N	4270	11/18/15	-31.86
I C.S acceptance range	se rande							-32.67	<b>&lt;=&gt;</b>	-33.67

Method	8260B	AM-24-AR_C	AM-24-DL_C
Units	l/gu	λS	%, VPDB
Analyst	NA	CJS	CJS

Pace CSIA Center of Excellence phone: 412-826-5245 Pittsburgh, PA 15238 220 William Pitt Way

### CSIA Report

PACE-MN 17314

Do Rata Niron

-20.10-27.03

11/18/15 11/18/15

4242

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14.5 15.6

13.2

11/9/15 11/9/15 11/9/15

18 9

-17.46

11/18/15

4241

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11/18/15 11/18/15 11/18/15

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**PMW-03** 

Duplicate

Blank

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LCS acceptance range

264

PMW-04 PMW-03 PMW-02 PMW-01

Client ID

ab ID

-11.77

-11.22

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-12.22

Method         AM-24-DL_C           Units         Ug/I         Vs         %, VPDB           Analyst         NA         CJS         CJS				
ts ug/l Vs % <sub>0,</sub> N vst NA CJS C	Method	8260B	AM-24-AR_C	AM-24-DL_C
wst	Units	l/gu	Vs	‰, VPDB
	S	NA	CJS	CJS

Pace CSIA Center of Excellence 220 William Pitt Way Pittsburgh, PA 15238 phone: 412-826-5245

# CSIA Report Carbon

PACE-MN Client Project Name: Client Project #: 10 17314

PS Beta Nirop

10329197

	110000	Cor	Concentration	Li C			CSI/	CSIA (Carbon)	()	
	richloroethene		(J/gn)		٩Ŀ	Area	Co alution Analysis	Analyeie	Dafe	Delta (%)
Lab ID	Client ID	Sample	PQL	Date	Sample	Pal	TOURIS-OS	ماقريمانار	Care	Jene (100)
173140001	PMW-04	15	-	11/9/15	8.47	ς-	No	4241	11/18/15	7.39
173140002	PMW-03	21	-	11/9/15	11.6	<b>-</b>	No	4242	11/18/15	-8.52
173140003	PMW-02	37	4	11/9/15	23.0	τ-	No	4246	11/18/15	12.09
173140004	PMW-01	<1 (U)	-	11/11/15	<1 (U)	-	No	4245	11/18/15	•
Duplicate	PMW-03	21	-	11/9/15	11.7	<b>-</b>	oN N	4243	11/18/15	-8.81
Blank	1	0	ı	1	<1 (U)	~	No	4238	11/18/15	-
LCS Lo		10	ı	ŧ	5.10	ς	No	4239	11/18/15	-26.29
ILCS_Hi	t	50	1	1	27.7	τ-	No	4240	11/18/15	-26.08
LCS acceptance range	range							-26.48	<=>	-25.48

Method	8260B	AM-24-AR_C	AM-24-DL_C
Units	l/Bn	s/\	%, VPDB
Analyst	AN	CJS	CJS

Pace CSIA Center of Excellence 220 William Pitt Way phone: 412-826-5245 Pittsburgh, PA 15238

# CSIA Report Carbon

Client Project Name: PACE-MN 17314

PS Beta Nirop

10329197 Client Project #:

7.4	(-)	ماسسي				CSIA (Carbon)	(ر			
7	1CP (Surrogate)	Sample	Aroa	Dilution	ΙĊα	Co-elition	Analysis	Date	Delta (‰)	
Lab ID	Client ID		Z Z	כוומפוסו	L K	OO-CIANOLI	داد رهای ا	3	ממי ( ימס)	
173140001	PMW-04	11/09/15	11.4	1	<u> </u>	No	4241	11/18/15	-37.49	
173140002	PMW-03	11/09/15	9.34	1	-	No	4242	11/18/15	-37.35	
173140003	PMW-02	11/09/15	12.7	10	1	No	4244	11/18/15	-37.18	
173140003	PMW-02	11/09/15	6.56	-	-	No	4246	11/18/15	-38.30	
173140004	PMVV-01	11/09/15	5.81	-	-	No	4245	11/18/15	-36.85	
Duplicate	PMW-03	11/09/15	8.30	_	-	No	4243	11/18/15	-37.94	
Blank		1	12.4	-	-	No	4238	11/18/15	-36.69	
LCS Lo	1	1	11.8	-	_	No	4239	11/18/15	-37.49	
LCS Hi		1	12.3	-	-	No	4240	11/18/15	-37.54	
Surrogate acceptance range	otance range						-37.49	<=>	-36.49	

Method         AM-24-AR C           Units         Vs           Analyst         C.IS	AM-24-DL_C %, VPDB CJS
Major	

Case Narrative: The blank, LCS's, duplicate and surrogates were all close to or within the acceptance range and the data is reported as valid and representative of the samples as received.

### Chain of Custody

17314

Pace Analytical "
www.pacelabs.com

1111912015 12/11/5 11.1A 11/9/15 LAB USE ONLY Will send Voc data once analysis Comments Requested Analysis Results Requested Completes HIST × × × × Date/Time Preserved Containers P.O. 103291977 нсг  $\omega$ Matrix Water Water Water Water PS BETA-NIROP Received By 10329197002 10329197003 10329197001 10329197004 Lab ID NET 1750 Date/Time WIC TO Seeps Workorder Name: 11/6/2015 12:00 11/6/2015 14:45 11/6/2015 10:25 11/6/2015 13:30 Collect Date/Time Minneapolis, MN 55414 Phone (612)607-1700 Email: jennifer.anderson@pacelabs.com Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Workorder: 10329197 Released By Report / Invoice To Sample ID PMW-03 PMW-02 PMW-01 PMW-04 Suite 200 Transfers ltem က

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

Custody Seal (Y )or

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Cooler Temperature on Receipt

Z ö

Samples Intact Y

Z

Received on Ice/Y or

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Coole	r Rec	eipt	Fo	IM
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- marine Marine Marine	mation (circle appropriate r  USPS Client Other:		Air	bill Pi	resent	Yes No
Tracking Number: 64	8486934478					.*
Custody Seal on Cooler/E		Seals Ir	1		No	•
Cooler/Box Packing Mate	erial: Bubble Wrap Absor	rbent Fo	msı	Other	· ·	
	None Ice Intact:	Contract of the Contract of th				:
Cooler Temperature: 🐰	Radiation Screen	ned: Yes	No	) Chi	ain of (	Custody Present: Yes No
Comments:						
Laboratory Assignment/l	Log-in (check appropriate re	sponse)				
. Laboratory Assignments			1	L 110	1 11/4	
			YES	NO	N/A	Comment  Reference non Conformat
Chain of Custody properly	y filled out		V			
Chain of Custody relinqui	shed		V			
Sampler Name & Signatur	re on COC					
Containers intact						
Were samples in separate	e bags		V			
Sample container labels n Sample name/date and ti					•	,
Sufficient volume provide						
PAES containers used						
(as labeled)	reserved for the requested i	•				
If an unknown preservation Exception: VOA's colifo	on state, were containers ch rm					If yes, see pH form.
Was volume for dissolved the COC? Was volume re	l testing field filtered, as not ceived in a preserved contai	ed on ner?			i	
	1					
Comments:						





November 20, 2015

Melinda Pham Regenesis 1011 Calle Sombra San Clemente, CA 92673

RE: Project: PS BETA-NIROP

Pace Project No.: 10329206

### Dear Melinda Pham:

Enclosed are the analytical results for sample(s) received by the laboratory on November 06, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

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

Sincerely,

Jennifer Anderson jennifer.anderson@pacelabs.com Project Manager

JAndera

Enclosures

cc: Ryan Moore, Regenesis







### **CERTIFICATIONS**

Project: PS BETA-NIROP

Pace Project No.: 10329206

**Minnesota Certification IDs** 

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770 Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA Colorado Certification #Pace

Connecticut Certification #: PH-0256 EPA Region 8 Certification #: 8TMS-L Florida/NELAP Certification #: E87605

Guam Certification #:14-008r

Georgia Certification #: 959 Georgia EPD #: Pace

Idaho Certification #: MN00064 Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01 Iowa Certification #: 368

Kansas Certification #: E-10167 Kentucky Dept of Envi. Protection - DW #90062 Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001 Maine Certification #: 2013011 Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace Montana Certification #: MT0092 Nevada Certification #: MN\_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002 New York Certification #: 11647 North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150 Ohio VAP Certification #: CL101 Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563

Puerto Rico Certification Saipan (CNMI) #:MP0003 South Carolina #:74003001 Texas Certification #: T104704192 Tennessee Certification #: 02818 Utah Certification #: MN000642013-4 Virginia DGS Certification #: 251 Washington Certification #: C486 West Virginia Certification #: 382 West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970

**Montana Certification IDs** 

150 N. 9th Street, Billings, MT 59101 Colorado Asbestos #: 17119 A2LA Certification #: 3590.01 EPA Region 8 Certification #: 8TMS-L

Idaho Certification #: MT00012

Minnesota Dept of Health Certification #: 030-999-442 Montana Certification #: MT CERT0040

North Dakota Dept. Of Health #: R-209 NVLAP Certification #: 101292-0

Washington Department of Ecology #: C993

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785 Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470 WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

**Ormond Beach Certification IDs** 

8 East Tower Circle, Ormond Beach, FL 32174

Alabama Certification #: 41320 Connecticut Certification #: PH-0216

Delaware Certification: FL NELAC Reciprocity

Florida Certification #: E83079 Georgia Certification #: 955

Guam Certification: FL NELAC Reciprocity Hawaii Certification: FL NELAC Reciprocity

Illinois Certification #: 200068

Indiana Certification: FL NELAC Reciprocity

Kansas Certification #: E-10383 Kentucky Certification #: 90050

Louisiana Certification #: FL NELAC Reciprocity Louisiana Environmental Certificate #: 05007

Maryland Certification: #346 Michigan Certification #: 9911

Mississippi Certification: FL NELAC Reciprocity

Missouri Certification #: 236 Montana Certification #: Cert 0074 Nebraska Certification: NE-OS-28-14 Nevada Certification: FL NELAC Reciprocity New Hampshire Certification #: 2958 New York Certification #: 11608

North Carolina Environmental Certificate #: 667

North Carolina Certification #: 12710 North Dakota Certification #: R-216 Oklahoma Certification #: D9947 Pennsylvania Certification #: 68-00547 Puerto Rico Certification #: FL01264 South Carolina Certification: #96042001 Tennessee Certification #: TN02974

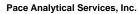
Texas Certification: FL NELAC Reciprocity

US Virgin Islands Certification: FL NELAC Reciprocity

Virginia Environmental Certification #: 460165

### REPORT OF LABORATORY ANALYSIS

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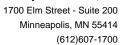
### **CERTIFICATIONS**

Project: PS BETA-NIROP

Pace Project No.: 10329206

**Ormond Beach Certification IDs** 

West Virginia Certification #: 9962C Wisconsin Certification #: 399079670 Wyoming (EPA Region 8): FL NELAC Reciprocity





### **SAMPLE SUMMARY**

Project: PS BETA-NIROP

Pace Project No.: 10329206

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10329206001	PMW-04	Water	11/06/15 10:25	11/06/15 15:53
10329206002	PMW-03	Water	11/06/15 12:00	11/06/15 15:53
10329206003	PMW-02	Water	11/06/15 13:30	11/06/15 15:53
10329206004	PMW-01	Water	11/06/15 14:45	11/06/15 15:53



### **SAMPLE ANALYTE COUNT**

Project: PS BETA-NIROP

Pace Project No.: 10329206

_ab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10329206001	PMW-04	RSK 175	JRB	3	PASI-M
		EPA 6010C	WBS	1	PASI-M
		6010C Met	WBS	1	PASI-M
		SM 4500-S2-D	JME	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	KAM	2	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	KEO	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V
0329206002	PMW-03	RSK 175	JRB	3	PASI-M
		EPA 6010C	WBS	1	PASI-M
		6010C Met	WBS	1	PASI-M
		SM 4500-S2-D	JME	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	KAM	2	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	KEO	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V
0329206003	PMW-02	RSK 175	JRB	3	PASI-M
		EPA 6010C	WBS	1	PASI-M
		6010C Met	WBS	1	PASI-M
		SM 4500-S2-D	JME	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	KAM	2	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	KEO	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V
0329206004	PMW-01	RSK 175	JRB	3	PASI-M
		EPA 6010C	WBS	1	PASI-M
		6010C Met	WBS	1	PASI-M
		SM 4500-S2-D	JME	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	KAM	2	PASI-O
		EPA 300.0	KEO	1	PASI-M

### **REPORT OF LABORATORY ANALYSIS**

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### **SAMPLE ANALYTE COUNT**

Project: PS BETA-NIROP

Pace Project No.: 10329206

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 353.2	KEO	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V



Project: PS BETA-NIROP

Pace Project No.: 10329206

Date: 11/20/2015 10:46 AM

Analytical Method: RSK 175  Six 175 AIR Headspace  Analytical Method: RSK 175  ND ug/L 10.0 1 11/10/15 21:52 74-84-0 11/10/15 21:52 74-85-1 11/10/15 11:52 74-85-1 11/10/15 11:52 11/10/15 11:52 74-85-1 11/10	Sample: PMW-04	Lab ID: 1032	29206001	Collected: 11/06/1	5 10:25	Received: 11	/06/15 15:53 N	Matrix: Water	
ND	Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
ND	RSK 175 AIR Headspace	Analytical Meth	od: RSK 1	75					
Analytical Method: EPA 6010C   Preparation Method: EPA 3010	Ethane	ND	ug/L	10.0	1		11/10/15 21:52	74-84-0	
Analytical Method: EPA 6010C   Preparation Method: EPA 3010	Ethene	ND	ug/L	10.0	1		11/10/15 21:52	74-85-1	
Analytical Method: 6010C Met Preparation Method: EPA 3010  Analytical Method: 6010C Met Preparation Method: EPA 3010  Analytical Method: 6010C Met Preparation Method: EPA 3010  Analytical Method: SM 4500-S2-D  Analytical Method: SM 4500-S2-D  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: EPA 300.0  Analytical Method: EPA 300.0  Analytical Method: EPA 353.2  Analytical Method: SM 5220D  Analytical Method: SM 5220D  Analytical Method: SM 5220D  Analytical Method: SM 5220D  Analytical Method: SM 5310C  Analytical Method: SM 5310C	Methane	21.0	ug/L	10.0	1		11/10/15 21:52	74-82-8	
Analytical Method: 6010C Met Preparation Method: EPA 3010  on, Dissolved  2580 ug/L  50.0 1 11/10/15 10:00 11/10/15 18:15 7439-89-6  500S2D Sulfide Water  Analytical Method: SM 4500-S2-D  sulfide  ND  mg/L  0.10 1  11/11/15 12:49  320B Alkalinity  Analytical Method: SM 2320B  ukalinity, Total as CaCO3  275 mg/L  5.0 1  11/17/15 13:19  24-38-9  ukalinity, Total as CaCO3  281 mg/L  5.0 1  11/17/15 13:19  124-38-9  ukalinity, Total as CaCO3  281 mg/L  5.0 1  11/18/15 12:42  ukalinity, Total as CaCO3  281 mg/L  5.0 1  11/18/15 12:42  ukalinity, Carbonate (CaCO3)  ND  mg/L  5.0 1  11/18/15 12:42  ukalinity, Carbonate (CaCO3)  Analytical Method: EPA 300.0  EURonions  Analytical Method: EPA 353.2  utrate + Nitrite  Analytical Method: EPA 353.2  DD  mg/L  0.020 1  11/18/15 11:41  11/19/15 10:06  Analytical Method: SM 5220D  Preparation Method: SM 5220D  Chemical Oxygen Demand  ND  mg/L  5.0 1  11/18/15 11:41  11/19/15 10:06  Analytical Method: SM 5310C	6010C MET ICP	Analytical Meth	od: EPA 60	010C Preparation Me	ethod: E	PA 3010			
2580 ug/L 50.0 1 11/10/15 10:00 11/10/15 18:15 7439-89-6  500S2D Sulfide Water Analytical Method: SM 4500-S2-D  Sulfide ND mg/L 0.10 1 11/11/15 12:49  320B Alkalinity Analytical Method: SM 2320B  Sarbon Dioxide (SM4500CO2D) 24.5 mg/L 5.0 1 11/17/15 13:19 124-38-9  Sarbon Dioxide (SM4500CO2D) 24.5 mg/L 5.0 1 11/17/15 13:19 124-38-9  Sarbon Dioxide (SM4500CO2D) 28.1 mg/L 5.0 1 11/18/15 12:42  Sulkalinity, Total as CaCO3 28.1 mg/L 5.0 1 11/18/15 12:42  Sulkalinity, Eicarbonate (CaCO3) 28.1 mg/L 5.0 1 11/18/15 12:42  Sulkalinity, Carbonate (CaCO3) ND mg/L 5.0 1 11/18/15 12:42  Sulfide 115 mg/L 2.4 2 11/09/15 20:48 14808-79-8  Sarbon Dioxide (SM4500CO2D) 24.5 mg/L 5.0 1 11/18/15 12:42  Sulfalinity, Total as CaCO3 28.1 mg/L 5.0 1 11/18/15 12:42  Sulfalinity, Total as CaCO3 28.1 mg/L 5.0 1 11/18/15 12:42  Sulfalinity, Total as CaCO3 28.1 mg/L 5.0 1 11/18/15 12:42  Sulfalinity, Total as CaCO3 28.1 mg/L 5.0 1 11/18/15 12:42  Sulfalinity, Total as CaCO3 28.1 mg/L 5.0 1 11/18/15 12:42  Sulfalinity, Total as CaCO3 28.1 mg/L 5.0 1 11/18/15 12:42  Sulfalinity, Total as CaCO3 28.1 mg/L 5.0 1 11/18/15 12:42  Sulfalinity, Total as CaCO3 11/18/15 12:42  Sulfalinity, Total as CaCO3 11/18/15 12:42  Sulfalinity, Total as CaCO3 11/18/15 12:42  Sulfalinity, Total as CaCO3 11/18/15 13:19  Sulfalinity, Total as CaCO3 1 11/18/15 13:19  Sulfalinity, Total as CaCO3 1 11/18/15 13:19  Sulfalinity, Total as CaCO3 1 11/18/15 13:19  Sulfalinity, Total as CaCO3 1 11/18/15 13:19  Sulfalinity, Total as CaCO3 1 11/18/15 13:19  Sulfalinity, Total as CaCO3 1 11/18/15 13:19  Sulfalinity, Total as CaCO3 1 11/18/15 13:19  Sulfalinity, Total as CaCO3 1 11/18/15 13:19  Sulfalinity, Total as CaCO3 1 11/18/15 13:19  Sulfalinity, Total as CaCO3 1 11/18/15 13:19  Sulfalinity, Total as CaCO3 1 11/18/15 13:19  Sulfalinity, Total as CaCO3 1 11/18/15 13:19  Sulfalinity, Total as CaCO3 1 11/18/15 13:19  Sulfalinity, Total as CaCO3 1 11/18/15 13:19  Sulfalinity, Total as CaCO3 1 11/18/15 13:19  Sulfalinity, Total as CaCO3 1 11/18/15 13:19  Sulfalinity, Total as Ca	ron	4970	ug/L	50.0	1	11/10/15 10:00	11/10/15 19:21	7439-89-6	
500S2D Sulfide Water         Analytical Method: SM 4500-S2-D           Sulfide         ND         mg/L         0.10         1         11/11/15 12:49           320B Alkalinity         Analytical Method: SM 2320B           Alkalinity, Total as CaCO3         275         mg/L         5.0         1         11/17/15 13:19         124-38-9           Alkalinity, Total as CaCO3         281         mg/L         5.0         1         11/17/15 13:19         124-38-9           Alkalinity, Total as CaCO3         281         mg/L         5.0         1         11/17/15 13:19         124-38-9           Alkalinity, Total as CaCO3         281         mg/L         5.0         1         11/18/15 12:42           Alkalinity, Eigenbonate (CaCO3)         281         mg/L         5.0         1         11/18/15 12:42           Alkalinity, Carbonate (CaCO3)         ND         mg/L         5.0         1         11/18/15 12:42           Oo.0 IC Anions         Analytical Method: EPA 300.0         2.4         2         11/09/15 20:48         14808-79-8           53.2 Nitrate + Nitrite         Analytical Method: SM 533.2         ND         mg/L         0.020         1         11/12/15 10:25           220D COD         Analytical Method: SM 5220D         Preparation Method:	010C MET ICP, Dissolved	Analytical Meth	od: 6010C	Met Preparation Me	thod: El	PA 3010			
Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: SM 2320B  Analytical Method: EPA 300.0  Analytical Method: EPA 353.2  Analytical Method: SM 5220D  Analytical Method: SM 5220D  Analytical Method: SM 5220D  Analytical Method: SM 5310C  Analytical Method: SM 5310C	ron, Dissolved	2580	ug/L	50.0	1	11/10/15 10:00	11/10/15 18:15	7439-89-6	
320B Alkalinity  Analytical Method: SM 2320B  Alkalinity, Total as CaCO3  275 mg/L  5.0 1  11/17/15 13:19  11/17/15 13:19  24.5 mg/L  5.0 1  11/17/15 13:19  124-38-9  Alkalinity, Total as CaCO3  281 mg/L  5.0 1  11/18/15 12:42  Alkalinity, Bicarbonate (CaCO3)  281 mg/L  5.0 1  11/18/15 12:42  Alkalinity, Carbonate (CaCO3)  ND mg/L  5.0 1  11/18/15 12:42  Analytical Method: EPA 300.0  Bulfate  115 mg/L  2.4 2  11/09/15 20:48  14808-79-8  Analytical Method: EPA 353.2  Analytical Method: EPA 353.2  Analytical Method: SM 5220D  Analytical Method: SM 5220D  Analytical Method: SM 5220D  Analytical Method: SM 5310C  Analytical Method: SM 5310C	1500S2D Sulfide Water	Analytical Meth	od: SM 45	00-S2-D					
Alkalinity, Total as CaCO3	Sulfide	ND	mg/L	0.10	1		11/11/15 12:49		
Carbon Dioxide (SM4500CO2D)       24.5 mg/L       5.0 1       11/17/15 13:19       124-38-9         Alkalinity, Total as CaCO3       281 mg/L       5.0 1       11/18/15 12:42         Alkalinity, Bicarbonate (CaCO3)       281 mg/L       5.0 1       11/18/15 12:42         Alkalinity, Carbonate (CaCO3)       ND mg/L       5.0 1       11/18/15 12:42         O0.0 IC Anions       Analytical Method: EPA 300.0         Sulfate       115 mg/L       2.4 2       11/09/15 20:48       14808-79-8         53.2 Nitrate + Nitrite       Analytical Method: EPA 353.2         Alkalinity, Carbonate (CaCO3)       ND mg/L       0.020 1       11/109/15 20:48       14808-79-8         53.2 Nitrate + Nitrite       Analytical Method: EPA 353.2         Chemical Oxygen Demand       ND mg/L       0.020 1       11/12/15 10:25         Chemical Oxygen Demand       ND mg/L       50.0 1       11/18/15 11:41       11/19/15 10:06         310C TOC       Analytical Method: SM 5310C	320B Alkalinity	Analytical Meth	od: SM 23	20B					
Section   Sect	Alkalinity, Total as CaCO3	275	mg/L	5.0	1		11/17/15 13:19		
281 mg/L   5.0   1   11/18/15 12:42	Carbon Dioxide (SM4500CO2D)	24.5	mg/L	5.0	1		11/17/15 13:19	124-38-9	
Alkalinity, Carbonate (CaCO3)       ND       mg/L       5.0       1       11/18/15 12:42         00.0 IC Anions       Analytical Method: EPA 300.0       Bulfate       115       mg/L       2.4       2       11/09/15 20:48       14808-79-8         53.2 Nitrate + Nitrite       Analytical Method: EPA 353.2       ND       mg/L       0.020       1       11/12/15 10:25         220D COD       Analytical Method: SM 5220D       Preparation Method: SM 5220D       ND       11/18/15 11:41       11/19/15 10:06         Chemical Oxygen Demand       ND       mg/L       50.0       1       11/18/15 11:41       11/19/15 10:06         310C TOC       Analytical Method: SM 5310C	Alkalinity, Total as CaCO3		mg/L		1				
O0.0 IC Anions       Analytical Method: EPA 300.0         Sulfate       115 mg/L       2.4 2       11/09/15 20:48 14808-79-8         53.2 Nitrate + Nitrite       Analytical Method: EPA 353.2         Litrogen, NO2 plus NO3       ND mg/L       0.020 1       11/12/15 10:25         220D COD       Analytical Method: SM 5220D       Preparation Method: SM 5220D         Chemical Oxygen Demand       ND mg/L       50.0 1 11/18/15 11:41 11/19/15 10:06         310C TOC       Analytical Method: SM 5310C	Alkalinity,Bicarbonate (CaCO3)		-						
Sulfate       115       mg/L       2.4       2       11/09/15 20:48       14808-79-8         53.2 Nitrate + Nitrite       Analytical Method: EPA 353.2         Sitrogen, NO2 plus NO3       ND       mg/L       0.020       1       11/12/15 10:25         220D COD       Analytical Method: SM 5220D       Preparation Method: SM 5220D         Chemical Oxygen Demand       ND       mg/L       50.0       1       11/18/15 11:41       11/19/15 10:06         310C TOC       Analytical Method: SM 5310C	Alkalinity, Carbonate (CaCO3)	ND	mg/L	5.0	1		11/18/15 12:42		
53.2 Nitrate + Nitrite  Analytical Method: EPA 353.2  ND mg/L 0.020 1 11/12/15 10:25  220D COD  Analytical Method: SM 5220D Preparation Method: SM 5220D  Chemical Oxygen Demand  ND mg/L 50.0 1 11/18/15 11:41 11/19/15 10:06  310C TOC  Analytical Method: SM 5310C	00.0 IC Anions	Analytical Meth	od: EPA 30	0.00					
Analytical Method:         SM 5220D         Preparation Method:         SM 5220D           310C TOC         Analytical Method:         SM 5310C	Sulfate	115	mg/L	2.4	2		11/09/15 20:48	14808-79-8	
220D COD         Analytical Method: SM 5220D         Preparation Method: SM 5220D           Chemical Oxygen Demand         ND mg/L         50.0 1 11/18/15 11:41 11/19/15 10:06           310C TOC         Analytical Method: SM 5310C	353.2 Nitrate + Nitrite	Analytical Meth	od: EPA 35	53.2					
Chemical Oxygen Demand ND mg/L 50.0 1 11/18/15 11:41 11/19/15 10:06  310C TOC Analytical Method: SM 5310C	Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		11/12/15 10:25		
310C TOC Analytical Method: SM 5310C	220D COD	Analytical Meth	od: SM 52	20D Preparation Met	thod: SI	M 5220D			
·	Chemical Oxygen Demand	ND	mg/L	50.0	1	11/18/15 11:41	11/19/15 10:06		
otal Organic Carbon <b>2.6</b> mg/L 1.0 1 11/12/15 19:37 7440-44-0	310C TOC	Analytical Meth	od: SM 53	10C					
	otal Organic Carbon	2.6	mg/L	1.0	1		11/12/15 19:37	7440-44-0	



Project: PS BETA-NIROP

Pace Project No.: 10329206

Date: 11/20/2015 10:46 AM

Sample: PMW-03	Lab ID: 1032	29206002	Collected: 11/06/1	5 12:00	Received: 11	/06/15 15:53 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
RSK 175 AIR Headspace	Analytical Meth	od: RSK 1	75					
Ethane	ND	ug/L	10.0	1		11/10/15 22:01	74-84-0	
Ethene	ND	ug/L	10.0	1		11/10/15 22:01	74-85-1	
Methane	51.3	ug/L	10.0	1		11/10/15 22:01	74-82-8	
010C MET ICP	Analytical Meth	od: EPA 60	010C Preparation Me	ethod: E	PA 3010			
ron	7270	ug/L	50.0	1	11/10/15 10:00	11/10/15 19:36	7439-89-6	
010C MET ICP, Dissolved	Analytical Meth	od: 6010C	Met Preparation Me	thod: El	PA 3010			
ron, Dissolved	5180	ug/L	50.0	1	11/10/15 10:00	11/10/15 18:31	7439-89-6	
500S2D Sulfide Water	Analytical Meth	od: SM 450	00-S2-D					
Sulfide	ND	mg/L	0.10	1		11/11/15 12:50		
320B Alkalinity	Analytical Meth	od: SM 23	20B					
Alkalinity, Total as CaCO3	357	mg/L	5.0	1		11/17/15 13:34		
lkalinity, Total as CaCO3	369	mg/L	5.0	1		11/18/15 12:46		
Carbon Dioxide (SM4500CO2D)	28.0	mg/L	5.0	1		11/17/15 13:34		
lkalinity,Bicarbonate (CaCO3)	369	mg/L	5.0	1		11/18/15 12:46		
Ikalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		11/18/15 12:46		
00.0 IC Anions	Analytical Meth	od: EPA 30	0.00					
Sulfate	121	mg/L	2.4	2		11/09/15 21:37	14808-79-8	
53.2 Nitrate + Nitrite	Analytical Meth	od: EPA 35	53.2					
litrogen, NO2 plus NO3	ND	mg/L	0.020	1		11/12/15 10:26		
220D COD	Analytical Meth	od: SM 52	20D Preparation Me	thod: SI	M 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	11/18/15 11:41	11/19/15 10:07		
310C TOC	Analytical Meth	od: SM 53	10C					
otal Organic Carbon	2.6	mg/L	1.0	1		11/12/15 20:15	7440-44-0	



Project: PS BETA-NIROP

Pace Project No.: 10329206

Date: 11/20/2015 10:46 AM

Sample: PMW-02	Lab ID: 1032	Matrix: Water						
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
RSK 175 AIR Headspace	Analytical Meth	nod: RSK 1	75					
Ethane	ND	ug/L	10.0	1		11/10/15 22:09	74-84-0	
Ethene	ND	ug/L	10.0	1		11/10/15 22:09	74-85-1	
Methane	16.0	ug/L	10.0	1		11/10/15 22:09	74-82-8	
010C MET ICP	Analytical Meth	nod: EPA 6	010C Preparation M	ethod: E	PA 3010			
ron	3860	ug/L	50.0	1	11/10/15 10:00	11/10/15 19:40	7439-89-6	
010C MET ICP, Dissolved	Analytical Meth	nod: 6010C	Met Preparation Me	ethod: El	PA 3010			
ron, Dissolved	3420	ug/L	50.0	1	11/10/15 10:00	11/10/15 18:34	7439-89-6	
1500S2D Sulfide Water	Analytical Meth	nod: SM 45	00-S2-D					
Sulfide	ND	mg/L	0.10	1		11/11/15 12:51		
320B Alkalinity	Analytical Meth	nod: SM 23	20B					
lkalinity, Total as CaCO3	426	mg/L	5.0	1		11/18/15 12:50		
lkalinity, Total as CaCO3	409	mg/L	5.0	1		11/17/15 13:43		
Carbon Dioxide (SM4500CO2D)	34.8	mg/L	5.0	1		11/17/15 13:43	124-38-9	
Ikalinity,Bicarbonate (CaCO3)	426	mg/L	5.0	1		11/18/15 12:50		
Ikalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		11/18/15 12:50		
00.0 IC Anions	Analytical Meth	nod: EPA 3	0.00					
Sulfate	149	mg/L	2.4	2		11/09/15 21:55	14808-79-8	
53.2 Nitrate + Nitrite	Analytical Meth	nod: EPA 3	53.2					
litrogen, NO2 plus NO3	ND	mg/L	0.020	1		11/12/15 10:27		
220D COD	Analytical Meth	nod: SM 52	20D Preparation Me	ethod: SN	/I 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	11/18/15 11:41	11/19/15 10:07		
310C TOC	Analytical Meth	nod: SM 53	10C					
otal Organic Carbon	2.5	mg/L	1.0	1		11/12/15 20:28	7440-44-0	



Project: PS BETA-NIROP

Pace Project No.: 10329206

Date: 11/20/2015 10:46 AM

Sample: PMW-01	Lab ID: 1032	29206004	Collected: 11/06/1	5 14:45	Received: 11	/06/15 15:53 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Meth	nod: RSK 17	75					
Ethane	ND	ug/L	10.0	1		11/10/15 22:17	74-84-0	
Ethene	ND	ug/L	10.0	1		11/10/15 22:17	74-85-1	
Methane	ND	ug/L	10.0	1		11/10/15 22:17	74-82-8	
010C MET ICP	Analytical Meth	nod: EPA 60	110C Preparation Me	thod: E	PA 3010			
ron	10500	ug/L	50.0	1	11/10/15 10:00	11/10/15 19:43	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	nod: 6010C	Met Preparation Me	thod: El	PA 3010			
ron, Dissolved	833	ug/L	50.0	1	11/10/15 10:00	11/10/15 18:37	7439-89-6	
4500S2D Sulfide Water	Analytical Meth	nod: SM 450	00-S2-D					
Sulfide	ND	mg/L	20.0	200		11/11/15 13:05		D3
2320B Alkalinity	Analytical Meth	nod: SM 232	20B					
Alkalinity, Total as CaCO3	519	mg/L	25.0	5		11/17/15 13:48	<b>;</b>	
Carbon Dioxide (SM4500CO2D)	ND	mg/L	25.0	5		11/17/15 13:48		
Alkalinity, Total as CaCO3	521	mg/L	5.0	1		11/18/15 12:54		
Alkalinity,Bicarbonate (CaCO3)	521	mg/L	5.0	1		11/18/15 12:54		
Alkalinity, Carbonate (CaCO3)	ND	mg/L	5.0	1		11/18/15 12:54		
300.0 IC Anions	Analytical Meth	nod: EPA 30	0.00					
Sulfate	172	mg/L	60.0	50		11/09/15 15:42	14808-79-8	
353.2 Nitrate + Nitrite	Analytical Meth	nod: EPA 35	53.2					
Nitrogen, NO2 plus NO3	2.6	mg/L	0.20	10		11/12/15 10:28	;	
5220D COD	Analytical Meth	nod: SM 522	20D Preparation Me	hod: SN	И 5220D			
Chemical Oxygen Demand	995	mg/L	500	1	11/18/15 11:41	11/19/15 10:07	•	
310C TOC	Analytical Meth	nod: SM 53	10C					
Total Organic Carbon	ND	mg/L	100	100		11/14/15 13:57	7440-44-0	D3



### **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10329206

Date: 11/20/2015 10:46 AM

QC Batch: AIR/24604 Analysis Method: RSK 175

QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE

Associated Lab Samples: 10329206001, 10329206002, 10329206003, 10329206004

METHOD BLANK: 2130456 Matrix: Water

Associated Lab Samples: 10329206001, 10329206002, 10329206003, 10329206004

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	11/10/15 19:17	
Ethene	ug/L	ND	10.0	11/10/15 19:17	
Methane	ug/L	ND	10.0	11/10/15 19:17	

LABORATORY CONTROL SAMPLE &	LCSD: 2130457		21	30458						
		Spike	LCS	LCSD	LCS	LCSD	% Rec		Max	
Parameter	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
Ethane	ug/L	114	120	118	106	104	85-115	2	20	
Ethene	ug/L	106	112	111	106	104	85-115	1	20	
Methane	ug/L	60.7	63.3	61.9	104	102	85-115	2	20	

SAMPLE DUPLICATE: 2131438						
		92274799005	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	14.2	14.0	1	20	

SAMPLE DUPLICATE: 2131439						
		92275222009	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Ethane	ug/L	ND ND	ND		20	
Ethene	ug/L	860	729	16	20	
Methane	ug/L	1300	1090	17	20	

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



**QUALITY CONTROL DATA** 

PS BETA-NIROP Project:

Pace Project No.: 10329206

Date: 11/20/2015 10:46 AM

QC Batch: MPRP/59483 Analysis Method: **EPA 6010C** QC Batch Method: EPA 3010 Analysis Description: 6010C Water

Associated Lab Samples: 10329206001, 10329206002, 10329206003, 10329206004

METHOD BLANK: 2130775 Matrix: Water Associated Lab Samples:

10329206001, 10329206002, 10329206003, 10329206004 Blank Reporting

Limit Parameter Units Result Analyzed

Qualifiers

Iron ND 50.0 11/10/15 18:53 ug/L

LABORATORY CONTROL SAMPLE: 2130776

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Iron ug/L 10000 9730 97 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2130777 2130778

MS MSD 10329206001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 10000 14700 75-125 20 ug/L 4970 10000 14900 97 99 Iron

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.



### **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10329206

Date: 11/20/2015 10:46 AM

QC Batch: MPRP/59482 Analysis Method: 6010C Met

QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved

Associated Lab Samples: 10329206001, 10329206002, 10329206003, 10329206004

METHOD BLANK: 2130771 Matrix: Water

Associated Lab Samples: 10329206001, 10329206002, 10329206003, 10329206004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Iron, Dissolved ug/L ND 50.0 11/10/15 17:47

LABORATORY CONTROL SAMPLE: 2130772

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Iron, Dissolved ug/L 10000 9580 96 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2130773 2130774

MS MSD 10329206001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Iron, Dissolved 10000 75-125 0 20 ug/L 2580 10000 12000 12000 95 95

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.



### **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10329206

Date: 11/20/2015 10:46 AM

QC Batch: MT/21411 Analysis Method: SM 4500-S2-D

QC Batch Method: SM 4500-S2-D Analysis Description: 4500S2D Sulfide Water

Associated Lab Samples: 10329206001, 10329206002, 10329206003, 10329206004

METHOD BLANK: 2132180 Matrix: Water

Associated Lab Samples: 10329206001, 10329206002, 10329206003, 10329206004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Sulfide mg/L ND 0.10 11/11/15 12:40

LABORATORY CONTROL SAMPLE: 2132181

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Sulfide mg/L .99 0.94 96 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2132182 2132183

MS MSD 10329308001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Sulfide 80-120 20 mg/L < 0.0071 .99 .99 0.97 1.0 99 103

SAMPLE DUPLICATE: 2132184

 Parameter
 Units
 Result Result RPD
 Max RPD
 Qualifiers

 Sulfide
 mg/L
 <0.0071</td>
 ND
 20

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



### **QUALITY CONTROL DATA**

Matrix: Water

Project: PS BETA-NIROP

Pace Project No.: 10329206

QC Batch: WET/34192 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10329206001, 10329206002, 10329206003, 10329206004

METHOD BLANK: 1394719

Associated Lab Samples:

Blank Reporting Limit Parameter Units Result Analyzed Qualifiers Alkalinity, Total as CaCO3 ND 5.0 11/17/15 13:05 mg/L Carbon Dioxide (SM4500CO2D) mg/L ND 5.0 11/17/15 13:05

LABORATORY CONTROL SAMPLE: 1394720

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Alkalinity, Total as CaCO3 mg/L 250 244 98 90-110

SAMPLE DUPLICATE: 1394721

Parameter	Units	10329206001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	275	273	1	20	
Carbon Dioxide (SM4500CO2D)	mg/L	24.5	22.5	9		

SAMPLE DUPLICATE: 1394722

Date: 11/20/2015 10:46 AM

		35216416007	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	252	253	0	20	
Carbon Dioxide (SM4500CO2D)	mg/L	20.2	20.7	2		

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.



### **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10329206

Parameter

Alkalinity, Total as CaCO3

Date: 11/20/2015 10:46 AM

Units

mg/L

Result

178

Conc.

40

Conc.

40

Result

221

Result

219

% Rec

108

% Rec

104

Limits

80-120

QC Batch: WET/45280 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10329206001, 10329206002, 10329206003, 10329206004

METHOD BLANK: 2138105 Matrix: Water Associated Lab Samples: 10329206001, 10329206002, 10329206003, 10329206004 Blank Reporting Parameter Limit Qualifiers Units Result Analyzed Alkalinity, Total as CaCO3 ND 5.0 11/18/15 10:18 mg/L Alkalinity, Bicarbonate (CaCO3) mg/L ND 5.0 11/18/15 10:18 11/18/15 10:18 Alkalinity, Carbonate (CaCO3) ND mg/L 5.0 LABORATORY CONTROL SAMPLE & LCSD: 2138106 2138107 Spike LCS LCSD LCS LCSD % Rec Max Parameter Units Conc. Result Result % Rec % Rec Limits **RPD RPD** Qualifiers Alkalinity, Total as CaCO3 40 42.0 42.8 105 107 90-110 2 30 mq/L MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2138108 2138109 MSD MS 10329231012 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual Alkalinity, Total as CaCO3 mg/L 443 40 40 486 488 107 112 80-120 0 30 MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2138111 2138110 MS MSD 10329231013 MS MS MSD MSD % Rec Spike Spike Max

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**

RPD

30

Qual

RPD



### **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10329206

Date: 11/20/2015 10:46 AM

QC Batch: WETA/25494 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10329206001, 10329206002, 10329206003, 10329206004

METHOD BLANK: 2130173 Matrix: Water
Associated Lab Samples: 10329206001, 10329206002, 10329206003, 10329206004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Sulfate mg/L ND 1.2 11/09/15 12:39

LABORATORY CONTROL SAMPLE: 2130174

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Sulfate mg/L 12.5 11.7 93 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2130175 2130176

MS MSD 10328811001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Sulfate 125 90-110 20 M6 mg/L 125 206 206 88 88 0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2130177 2130178

MS MSD 10328999001 MS MSD MS Spike Spike MSD % Rec Max % Rec Limits RPD Parameter Units Result Conc. Conc. Result Result % Rec RPD Qual Sulfate 7.3 12.5 12.5 18.6 18.6 90 90 90-110 0 20 mg/L

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.



### **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10329206

Date: 11/20/2015 10:46 AM

QC Batch: WETA/25557 Analysis Method: EPA 353.2

QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved

Associated Lab Samples: 10329206001, 10329206002, 10329206003, 10329206004

METHOD BLANK: 2133292 Matrix: Water

Associated Lab Samples: 10329206001, 10329206002, 10329206003, 10329206004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Nitrogen, NO2 plus NO3 mg/L ND 0.020 11/12/15 10:08

LABORATORY CONTROL SAMPLE: 2133293

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Nitrogen, NO2 plus NO3 mg/L 1.0 101 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2133294 2133295

MS MSD MS 10328335001 Spike Spike MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual Nitrogen, NO2 plus NO3 1 1.1 90-110 0 20 mg/L 0.16 1 1.1 94 94

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2133296 2133297

MS MSD 10329166001 MS MSD MS MSD Spike Spike % Rec Max Parameter Units Conc. % Rec RPD Result Conc. Result Result % Rec Limits RPD Qual Nitrogen, NO2 plus NO3 mg/L 12.8 20 20 31.6 31.4 94 93 90-110 20

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



### **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10329206

Date: 11/20/2015 10:46 AM

QC Batch: WETA/25624 Analysis Method: SM 5220D
QC Batch Method: SM 5220D Analysis Description: 5220D COD

Associated Lab Samples: 10329206001, 10329206002, 10329206003, 10329206004

METHOD BLANK: 2137619 Matrix: Water

Associated Lab Samples: 10329206001, 10329206002, 10329206003, 10329206004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Chemical Oxygen Demand mg/L ND 50.0 11/19/15 10:03

LABORATORY CONTROL SAMPLE: 2137620

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chemical Oxygen Demand mg/L 300 299 100 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2137621 2137622

MS MSD 10329606001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual ND 250 80-120 2 20 Chemical Oxygen Demand mg/L 250 261 265 96 98

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2137623 2137624

MS MSD 10329246001 MS MSD MS Spike Spike MSD % Rec Max Parameter % Rec RPD Units Result Conc. Conc. Result Result % Rec Limits RPD Qual Chemical Oxygen Demand 103 250 250 350 353 99 100 80-120 20 mg/L

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.



**QUALITY CONTROL DATA** 

Project: PS BETA-NIROP

Pace Project No.: 10329206

QC Batch: WETA/14684 Analysis Method: SM 5310C
QC Batch Method: SM 5310C Analysis Description: 5310C TOC

Associated Lab Samples: 10329206001, 10329206002, 10329206003

METHOD BLANK: 267850 Matrix: Water

Associated Lab Samples:

Date: 11/20/2015 10:46 AM

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Total Organic Carbon mg/L ND 1.0 11/12/15 19:11

LABORATORY CONTROL SAMPLE: 267851

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Organic Carbon** mg/L 25 25.6 102 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 267852 267853

MSD MS 10329206001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Total Organic Carbon 25 27.9 27.8 80-120 0 20 mg/L 2.6 25 101 101

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.



### **QUALITY CONTROL DATA**

SM 5310C

5310C TOC

Analyzed

Qualifiers

Analysis Method:

Analysis Description:

Matrix: Water

PS BETA-NIROP Project:

Pace Project No.: 10329206

QC Batch: WETA/14709 QC Batch Method: SM 5310C

Associated Lab Samples: 10329206004

METHOD BLANK: 268307

Associated Lab Samples:

Date: 11/20/2015 10:46 AM

Blank Reporting Parameter Units Result Limit

Total Organic Carbon ND 1.0 11/14/15 06:01 mg/L

LABORATORY CONTROL SAMPLE: 268308

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Organic Carbon** mg/L 25 25.8 103 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 268310 268309

MSD MS 10329195001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual **Total Organic Carbon** 25 80-120 0 20 mg/L 10.4 25 34.9 35.0 98 98

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 268311 268312

MS MSD 10329195010 MS MSD MS MSD Spike Spike % Rec Max Parameter Conc. % Rec RPD Units Result Conc. Result Result % Rec Limits RPD Qual 25 Total Organic Carbon mg/L 5.2 25 30.1 30.4 100 101 80-120 1 20

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



### **QUALIFIERS**

Project: PS BETA-NIROP Pace Project No.: 10329206

### **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.

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
PASI-MT	Pace Analytical Services - Montana
PASI-O	Pace Analytical Services - Ormond Beach
PASI-V	Pace Analytical Services - Virginia

### **ANALYTE QUALIFIERS**

Date: 11/20/2015 10:46 AM

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

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.



### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: PS BETA-NIROP

Pace Project No.: 10329206

Date: 11/20/2015 10:46 AM

10329206002   PMW-03   RSK 175   AIR/24604   AIR/24604   AIR/24604   AIR/24604   AIR/24604   AIR/24604   AIR/24604   AIR/24604   AIR/24604   AIR/24604   AIR/24604   AIR/24604   AIR/24604   AIR/24604   AIR/24604   AIR/24604   AIR/24604   AIR/24604   AIR/246004   AIR/246004   AIR/246002   PMW-03   EPA 3010   MPRP/59483   EPA 6010C   ICP/25906   AIR/246003   PMW-02   EPA 3010   MPRP/59483   EPA 6010C   ICP/25906   AIR/246004   AIR/246004   AIR/246004   AIR/246004   AIR/246003   AIR/246004   AIR/246003   AIR/246004   AIR/246003   AIR/246004   AIR/246003   AIR/246004   AIR/246004   AIR/246004   AIR/246	Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10329206001	10329206001	PMW-04	RSK 175	AIR/24604	•	· ·
10329206004   PMW-01	10329206002	PMW-03	RSK 175	AIR/24604		
PMW-04	10329206003	PMW-02	RSK 175	AIR/24604		
10329206002   PMW-03   EPA 3010   MPRP/59483   EPA 6010C   ICP/25906   ICP/25905   ICP/25906   ICP/25905   ICP/2	10329206004	PMW-01	RSK 175	AIR/24604		
10329206003	10329206001	PMW-04	EPA 3010	MPRP/59483	EPA 6010C	ICP/25906
10329206004   PMW-01	10329206002	PMW-03	EPA 3010	MPRP/59483	EPA 6010C	ICP/25906
10329206001	0329206003	PMW-02	EPA 3010	MPRP/59483	EPA 6010C	ICP/25906
0329206002         PMW-03         EPA 3010         MPRP/59482         6010C Met         ICP/25905           0329206003         PMW-04         EPA 3010         MPRP/59482         6010C Met         ICP/25905           0329206004         PMW-04         EPA 3010         MPRP/59482         6010C Met         ICP/25905           0329206001         PMW-04         SM 4500-S2-D         MT/21411         MT/21411         MT/21411           0329206002         PMW-03         SM 4500-S2-D         MT/21411         MT/21411         MT/21411           0329206004         PMW-01         SM 4500-S2-D         MT/21411         MT/21411         MT/21411           0329206001         PMW-04         SM 2320B         WET/34192         WET/34192         WET/34192           0329206002         PMW-03         SM 2320B         WET/45280         WET/45280         WET/45280           0329206002         PMW-03         SM 2320B         WET/45280         WET/45280         WET/45280           0329206003         PMW-02         SM 2320B         WET/45280         WET/45280         WET/45280           0329206004         PMW-01         SM 2320B         WET/45280         WET/45280         WET/45280           03292060004         PMW-01         SM 232	0329206004	PMW-01	EPA 3010	MPRP/59483	EPA 6010C	ICP/25906
0329206003         PMW-02         EPA 3010         MPRP/69482         6010C Met         ICP/25905           0329206004         PMW-01         EPA 3010         MPRP/69482         6010C Met         ICP/25905           0329206001         PMW-04         SM 4500-S2-D         MT/21411         MT/21411           0329206002         PMW-02         SM 4500-S2-D         MT/21411         MT/21411           0329206004         PMW-01         SM 4500-S2-D         MT/21411         MT/21411           0329206001         PMW-04         SM 2320B         WET/34192           0329206002         PMW-04         SM 2320B         WET/34192           0329206002         PMW-03         SM 2320B         WET/45280           0329206002         PMW-03         SM 2320B         WET/45280           0329206003         PMW-02         SM 2320B         WET/45280           0329206004         PMW-01         SM 2320B         WET/45280           0329206004         PMW-01         SM 2320B         WET/34192           0329206004         PMW-01         SM 2320B         WET/34580           0329206004         PMW-01         SM 2320B         WET/35280           0329206001         PMW-03         EPA 300.0         WETA/25494<	0329206001	PMW-04	EPA 3010	MPRP/59482	6010C Met	ICP/25905
0329206004         PMW-01         EPA 3010         MPRP/59482         6010C Met         ICP/25905           0329206001         PMW-04         SM 4500-S2-D         MT/21411         M721411         M7214111         M7214111         M7214111         M7214111	0329206002	PMW-03	EPA 3010	MPRP/59482	6010C Met	ICP/25905
D329206001	0329206003	PMW-02	EPA 3010	MPRP/59482	6010C Met	ICP/25905
0329206002         PMW-03         SM 4500-S2-D         MT/21411           0329206003         PMW-02         SM 4500-S2-D         MT/21411           0329206004         PMW-01         SM 4500-S2-D         MT/21411           0329206001         PMW-04         SM 2320B         WET/34192           0329206002         PMW-03         SM 2320B         WET/34192           0329206002         PMW-03         SM 2320B         WET/34192           0329206002         PMW-03         SM 2320B         WET/34192           0329206003         PMW-02         SM 2320B         WET/34192           0329206003         PMW-01         SM 2320B         WET/34192           0329206004         PMW-01         SM 2320B         WET/34192           0329206001         PMW-04         EPA 300.0         WETA/25480           0329206002         PMW-03         EPA 300.0         WETA/25494           0329206003 <t< td=""><td>0329206004</td><td>PMW-01</td><td>EPA 3010</td><td>MPRP/59482</td><td>6010C Met</td><td>ICP/25905</td></t<>	0329206004	PMW-01	EPA 3010	MPRP/59482	6010C Met	ICP/25905
0329206003         PMW-02         SM 4500-S2-D         MT/21411           0329206004         PMW-01         SM 4500-S2-D         MT/21411           0329206001         PMW-04         SM 2320B         WET/34192           0329206001         PMW-04         SM 2320B         WET/45280           0329206002         PMW-03         SM 2320B         WET/34192           0329206003         PMW-03         SM 2320B         WET/45280           0329206003         PMW-02         SM 2320B         WET/45280           0329206004         PMW-01         SM 2320B         WET/45280           0329206001         PMW-04         EPA 300.0         WETA/25494           0329206002         PMW-03         EPA 300.0         WETA/25494           0329206003         PMW-02         EPA 300.0         WETA/25494           0329206004         PMW-01         EPA 353.2         WETA/25557           0329206007         PMW-03         EPA 353.2         WETA/25557           0329206007	0329206001	PMW-04	SM 4500-S2-D	MT/21411		
0329206004         PMW-01         SM 4500-S2-D         MT/21411           0329206001         PMW-04         SM 2320B         WET/34192           0329206001         PMW-04         SM 2320B         WET/45280           0329206002         PMW-03         SM 2320B         WET/34192           0329206003         PMW-03         SM 2320B         WET/45280           0329206003         PMW-02         SM 2320B         WET/34192           0329206004         PMW-01         SM 2320B         WET/34192           0329206004         PMW-01         SM 2320B         WET/45280           0329206004         PMW-01         SM 2320B         WET/45280           0329206001         PMW-04         EPA 300.0         WETA/25494           0329206002         PMW-03         EPA 300.0         WETA/25494           0329206003         PMW-01         EPA 300.0         WETA/25494           0329206004         PMW-01         EPA 300.0         WETA/25494           0329206001         PMW-04         EPA 353.2         WETA/25494           0329206004         PMW-03         EPA 363.2         WETA/25567           0329206001         PMW-04         EPA 353.2         WETA/25657           0329206002	0329206002	PMW-03	SM 4500-S2-D	MT/21411		
0329206001         PMW-04         SM 2320B         WET/34192           0329206002         PMW-03         SM 2320B         WET/34192           0329206002         PMW-03         SM 2320B         WET/34192           0329206002         PMW-03         SM 2320B         WET/34192           0329206003         PMW-02         SM 2320B         WET/34192           0329206004         PMW-01         SM 2320B         WET/34192           0329206004         PMW-01         SM 2320B         WET/345280           0329206004         PMW-01         SM 2320B         WET/45280           0329206004         PMW-01         SM 2320B         WET/45280           0329206001         PMW-04         EPA 300.0         WETA/25494           0329206002         PMW-03         EPA 300.0         WETA/25494           0329206003         PMW-04         EPA 300.0         WETA/25494           0329206004         PMW-01         EPA 353.2         WETA/25557           0329206007         PMW-03         EPA 353.2         WETA/25557           0329206007         PMW-04         SM 5220D         WETA/25657           0329206001         PMW-04         SM 5220D         WETA/25624         SM 5220D         WETA/2560	0329206003	PMW-02	SM 4500-S2-D	MT/21411		
0329206001         PMW-04         SM 2320B         WET/45280           0329206002         PMW-03         SM 2320B         WET/34192           0329206002         PMW-03         SM 2320B         WET/45280           0329206003         PMW-02         SM 2320B         WET/34192           0329206004         PMW-01         SM 2320B         WET/34192           0329206004         PMW-01         SM 2320B         WET/45280           0329206004         PMW-01         SM 2320B         WET/45280           0329206001         PMW-04         EPA 300.0         WETA/25494           0329206002         PMW-03         EPA 300.0         WETA/25494           0329206003         PMW-04         EPA 300.0         WETA/25494           0329206004         PMW-01         EPA 300.0         WETA/25494           0329206003         PMW-04         EPA 353.2         WETA/25557           0329206004         PMW-04         EPA 353.2         WETA/25557           0329206007         PMW-03         EPA 353.2         WETA/25557           0329206001         PMW-04         SM 5220D         WETA/25657           0329206002         PMW-03         SM 5220D         WETA/25624         SM 5220D         WETA/2560	0329206004	PMW-01	SM 4500-S2-D	MT/21411		
0329206002         PMW-03         SM 2320B         WET/34192           0329206002         PMW-03         SM 2320B         WET/45280           0329206003         PMW-02         SM 2320B         WET/34192           0329206003         PMW-02         SM 2320B         WET/45280           0329206004         PMW-01         SM 2320B         WET/34192           0329206004         PMW-01         SM 2320B         WET/45280           0329206001         PMW-04         EPA 300.0         WETA/25494           0329206002         PMW-03         EPA 300.0         WETA/25494           0329206003         PMW-01         EPA 300.0         WETA/25494           0329206004         PMW-01         EPA 300.0         WETA/25494           0329206001         PMW-04         EPA 353.2         WETA/25494           0329206001         PMW-04         EPA 353.2         WETA/25557           0329206002         PMW-03         EPA 353.2         WETA/25557           0329206001         PMW-04         SM 5220D         WETA/25657           0329206002         PMW-04         SM 5220D         WETA/25624         SM 5220D         WETA/25624           0329206001         PMW-03         SM 5220D         WETA/25624	0329206001	PMW-04	SM 2320B	WET/34192		
0329206002         PMW-03         SM 2320B         WET/45280           0329206003         PMW-02         SM 2320B         WET/34192           0329206003         PMW-02         SM 2320B         WET/45280           0329206004         PMW-01         SM 2320B         WET/34192           0329206004         PMW-01         SM 2320B         WET/45280           0329206001         PMW-04         EPA 300.0         WETA/25494           0329206002         PMW-03         EPA 300.0         WETA/25494           0329206004         PMW-01         EPA 300.0         WETA/25494           0329206004         PMW-01         EPA 300.0         WETA/25494           0329206004         PMW-01         EPA 353.2         WETA/25494           0329206004         PMW-04         EPA 353.2         WETA/25557           0329206001         PMW-04         EPA 353.2         WETA/25557           0329206002         PMW-03         EPA 353.2         WETA/25557           0329206001         PMW-04         SM 5220D         WETA/25624         SM 5220D         WETA/2563           0329206002         PMW-03         SM 5220D         WETA/25624         SM 5220D         WETA/25620           0329206003         PMW-02 <td>0329206001</td> <td>PMW-04</td> <td>SM 2320B</td> <td>WET/45280</td> <td></td> <td></td>	0329206001	PMW-04	SM 2320B	WET/45280		
0329206003         PMW-02         SM 2320B         WET/34192           0329206003         PMW-02         SM 2320B         WET/45280           0329206004         PMW-01         SM 2320B         WET/34192           0329206004         PMW-01         SM 2320B         WET/45280           0329206001         PMW-04         EPA 300.0         WETA/25494           0329206002         PMW-03         EPA 300.0         WETA/25494           0329206003         PMW-02         EPA 300.0         WETA/25494           0329206004         PMW-01         EPA 300.0         WETA/25494           0329206001         PMW-04         EPA 353.2         WETA/25557           0329206002         PMW-03         EPA 353.2         WETA/25557           0329206003         PMW-00         EPA 353.2         WETA/25557           0329206004         PMW-01         EPA 353.2         WETA/25557           0329206004         PMW-04         SM 5220D         WETA/25624         SM 5220D         WETA/25657           0329206001         PMW-04         SM 5220D         WETA/25624         SM 5220D         WETA/25620         SM 5220D         WETA/25624         SM 5220D         WETA/25624         SM 5220D         WETA/25624         SM 5220D	0329206002	PMW-03	SM 2320B	WET/34192		
0329206003         PMW-02         SM 2320B         WET/45280           0329206004         PMW-01         SM 2320B         WET/34192           0329206004         PMW-01         SM 2320B         WET/45280           0329206001         PMW-04         EPA 300.0         WETA/25494           0329206002         PMW-03         EPA 300.0         WETA/25494           0329206003         PMW-02         EPA 300.0         WETA/25494           0329206004         PMW-01         EPA 300.0         WETA/25494           0329206001         PMW-04         EPA 353.2         WETA/25557           0329206002         PMW-03         EPA 353.2         WETA/25557           0329206003         PMW-04         EPA 353.2         WETA/25557           0329206004         PMW-01         EPA 353.2         WETA/25657           0329206004         PMW-04         SM 5220D         WETA/25657           0329206001         PMW-04         SM 5220D         WETA/25624         SM 5220D         WETA/25624           0329206002         PMW-03         SM 5220D         WETA/25624         SM 5220D         WETA/25624           0329206003         PMW-04         SM 5220D         WETA/25624         SM 5220D         WETA/25624	0329206002	PMW-03	SM 2320B	WET/45280		
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0329206004         PMW-01         SM 2320B         WET/45280           0329206001         PMW-04         EPA 300.0         WETA/25494           0329206002         PMW-03         EPA 300.0         WETA/25494           0329206003         PMW-02         EPA 300.0         WETA/25494           0329206004         PMW-01         EPA 300.0         WETA/25494           0329206001         PMW-04         EPA 353.2         WETA/25557           0329206002         PMW-03         EPA 353.2         WETA/25557           0329206003         PMW-02         EPA 353.2         WETA/25557           0329206004         PMW-01         EPA 353.2         WETA/25557           0329206004         PMW-01         EPA 353.2         WETA/25624           0329206001         PMW-04         SM 5220D         WETA/25624           0329206002         PMW-03         SM 5220D         WETA/25624           0329206003         PMW-02         SM 5220D         WETA/25624           0329206001         PMW-01         SM 5220D         WETA/25624           0329206002         PMW-01         SM 5220D         WETA/25624           0329206001         PMW-04         SM 5310C         WETA/14684           0329206002	0329206003	PMW-02	SM 2320B	WET/45280		
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0329206001         PMW-04         EPA 353.2         WETA/25557           0329206002         PMW-03         EPA 353.2         WETA/25557           0329206003         PMW-02         EPA 353.2         WETA/25557           0329206004         PMW-01         EPA 353.2         WETA/25657           0329206001         PMW-04         SM 5220D         WETA/25624         SM 5220D         WETA/2563           0329206002         PMW-03         SM 5220D         WETA/25624         SM 5220D         WETA/2563           0329206003         PMW-02         SM 5220D         WETA/25624         SM 5220D         WETA/2563           0329206004         PMW-01         SM 5220D         WETA/25624         SM 5220D         WETA/2563           0329206001         PMW-04         SM 5310C         WETA/14684         WETA/14684           0329206002         PMW-03         SM 5310C         WETA/14684           0329206003         PMW-02         SM 5310C         WETA/14684						
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0329206003         PMW-02         EPA 353.2         WETA/25557           0329206004         PMW-01         EPA 353.2         WETA/25557           0329206001         PMW-04         SM 5220D         WETA/25624         SM 5220D         WETA/2563           0329206002         PMW-03         SM 5220D         WETA/25624         SM 5220D         WETA/2563           0329206003         PMW-02         SM 5220D         WETA/25624         SM 5220D         WETA/2563           0329206004         PMW-01         SM 5220D         WETA/25624         SM 5220D         WETA/2563           0329206001         PMW-04         SM 5310C         WETA/14684         WETA/14684           0329206002         PMW-03         SM 5310C         WETA/14684           0329206003         PMW-02         SM 5310C         WETA/14684	0329206001	PMW-04	EPA 353.2	WETA/25557		
0329206004         PMW-01         EPA 353.2         WETA/25557           0329206001         PMW-04         SM 5220D         WETA/25624         SM 5220D         WETA/2560           0329206002         PMW-03         SM 5220D         WETA/25624         SM 5220D         WETA/2560           0329206003         PMW-02         SM 5220D         WETA/25624         SM 5220D         WETA/2560           0329206004         PMW-01         SM 5220D         WETA/25624         SM 5220D         WETA/2560           0329206001         PMW-04         SM 5310C         WETA/14684         WETA/14684           0329206002         PMW-03         SM 5310C         WETA/14684           0329206003         PMW-02         SM 5310C         WETA/14684		PMW-03	EPA 353.2			
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0329206004         PMW-01         SM 5220D         WETA/25624         SM 5220D         WETA/25626           0329206001         PMW-04         SM 5310C         WETA/14684         WETA/14684           0329206002         PMW-03         SM 5310C         WETA/14684           0329206003         PMW-02         SM 5310C         WETA/14684	0329206002	PMW-03	SM 5220D	WETA/25624	SM 5220D	WETA/256
0329206001         PMW-04         SM 5310C         WETA/14684           0329206002         PMW-03         SM 5310C         WETA/14684           0329206003         PMW-02         SM 5310C         WETA/14684	0329206003	PMW-02	SM 5220D	WETA/25624	SM 5220D	WETA/256
0329206002       PMW-03       SM 5310C       WETA/14684         0329206003       PMW-02       SM 5310C       WETA/14684	0329206004	PMW-01	SM 5220D	WETA/25624	SM 5220D	WETA/256
<b>0329206003 PMW-02</b> SM 5310C WETA/14684	0329206001	PMW-04	SM 5310C	WETA/14684		
	0329206002	PMW-03	SM 5310C	WETA/14684		
<b>0329206004 PMW-01</b> SM 5310C WETA/14709	0329206003	PMW-02	SM 5310C	WETA/14684		
	0329206004	PMW-01	SM 5310C	WETA/14709		

CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately. |OS2OCO|

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of 7	1980825	ENCY	GROUND WATER   DRINKING WATER	RCRA TOTHER		W.V.	N)	<u> </u>	(N/A) = JEJ JSC	Residual Chloring Pace No./Lab I.D.	3-	\(\frac{1}{\chi_0}\)	7	7						E SAMPLE CONDITIONS	358 × N Y	<u> </u>	1.0	on (	oni qma bevieco (Y/N) (Y/N) (Y/N)	Seal C C Seal
		REGULATORY AGENCY	L NPDES L G	L UST F	Site Location	STATE:	Requested Analysis Filtered (Y/N)	21° 118° X	STALL STALL	MITRATE HANDER	21111	7 j. j. ( ( (	7	2 Î II î (						DATE TIME	19/16/15	<b>\</b>		*		11/1/11
Section C Invoice Information:	Attention: BAHAR NADER!	No Section	Address: 1011 Colle Somble	Pace Quote 21 Mb		Pace Profile #:		Preservatives V	S	SAMPLE TEMP AT CANTAINER  Was Sada	5 1/2/83/2		1, 832	1 1 2 2 3 7 1		i i				E TIME ACCEPTED BY / AFFILIATION	15-1553 Kmy Veil Baca		ā		Marss Means	PLER: / / M DATE Signed
Section B Required Project Information:	Report Tong 1 1 1 2000 1			Purchase Order No.:	Project Name; DS BETA - NIROP	- KIN		(f)əl c	WW COMPOSITE COMPOSITE ENDIGRAB	) HODE (		W.G. 170	(53) (532)	1 Sp		in the second se				RELINQUISHED BY / AFFILIATION DATE	Merson Wearest Heaville	ł	\$	SAMPLER NAME AND SIGNATURE		SIGNATIIRE of SAMPI FR.
Section A Required Client Information:	Company: RECENTES IS	Address: Oll Caute Smuges	ENENTE!	CHAMB RELEATESIS CON	800 1949-36-80 B	Due Date/TAT: 10 DAYS		Section D Matrix Codes Required Client Information MATRIX / CODE	Drinking Water Water Waste Water Product Product	SAMPLE ID Wipe (A-Z, 0-9 / -) Air Sample IDs MUST BE UNIQUE Tissue Other	1 PMW-04	2 fam -03	3 FMW -02	-	5	9	88	10	11	ADDITIONAL COMMENTS					24 0	\f

### Pace Analytical\*

### Document Name:

### Sample Condition Upon Receipt Form

Document No.: F-MN-L-213-rev.13

Document Revised: 23Feb2015 Page 1 of 1

Issuing Authority:
Pace Minnesota Quality Office

Sample Condition Client Name: Upon Receipt Regents 15			Project	MO# · 10329200
Courier: Fed Ex UPS	USPS		lient	
Commercial Pace SpeeDee [	Other:_			10329206
Tracking Number:				
Custody Seal on Cooler/Box Present? Yes No		Seals Int	act?	Yes No Optional: Proj. Due Date: Proj. Name:
Packing Material: Bubble Wrap Bubble Bags	□Non	е 🔲	Other:	Temp Blank? Tes No
Thermometer ☐ B88A9130516413 ☐ B88A912167504 Used: ☐ B88A014331009	3	e of Ice:	Dwe	
Cooler Temp Read (°C): 5-8,0.1,6. Cooler Temp Corre	ected (°C)	): 5.8	10.16	Biological Tissue Frozen? Yes, No NA
Temp should be above freezing to 6°C Correction Facto		0.0	Dat	e and Initials of Person Examining Contents: 4 u/6/
USDA Regulated Soil ( ☑ N/A, water sample) Did samples originate in a quarantine zone within the United St	atoc: Al /	AR A7 C/	\ FI GA	ID, LA. Did samples originate from a foreign source (internationally,
MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)?			☐Yes	No including Hawaii and Puerto Rico)?   Q-338) and include with SCUR/COC paperwork.
			***************************************	COMMENTS:
Chain of Custody Present?	□Xes	□No	□N/A	1.
Chain of Custody Filled Out?	Pres	□No	□N/A	2.
Chain of Custody Relinquished?	<b>∠</b> Yes	□No	□N/A	3.
Sampler Name and/or Signature on COC?	Yes	□No	□N/A	4.
Samples Arrived within Hold Time?	Ves	□No	□N/A	5.
Short Hold Time Analysis (<72 hr)?	□Yes	₽No	□n/a	6.
Rush Turn Around Time Requested?	□Yes	<b>⊿</b> No	□N/A	7.
Sufficient Volume?	Yes	□No	□N/A	8.
Correct Containers Used?	<b></b> ✓ Yes	□No	□N/A	9.
-Pace Containers Used?	Yes	□No	□N/A	
Containers Intact?	Yes	□No	□N/A	10.
Filtered Volume Received for Dissolved Tests?	Yeş	□No	□N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	Yes	□No	□N/A	12.
-Includes Date/Time/ID/Analysis Matrix:				
All containers needing acid/base preservation have been			<del></del>	13. ☑HNO₃ ☑H₂SO₄ ☑NaOH ☐HCI
checked? All containers needing preservation are found to be in	Yes	□No	□N/A	Sample # 2/2 2/2
compliance with EPA recommendation?	. ,			1-4
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH > 9 Sulfide, NaOH > 12 Cyanide)	<b>∠</b> Yes	□No	□N/A	Table Locker
Exception (VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	Yes	□No	□N/A	Initial when Lot # of added completed: 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:				
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Pace WO: 10329206										
Project Manager: JMA										
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Tests

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Page 1 of 1

Pace Analytical

hold, incorrect preservative, out of temp, incorrect containers)

Document Name:

Sample Condition Upon Receipt Form

Document Revised: 23Feb2015

Page 1 of 1

Document No.: F-VM-C-001-Rev.09 Issuing Authority:
Pace Virginia, Minnesota Quality Office

Sample Condition Client Name: WO#: 1256911 **Upon Receipt □UPS** Courier: | Fed Ex USPS Client Commercial Pace Other: Tracking Number: Optional: Proj. Due Date: Proj. Name: Seals Intact? Yes No X No Packing Material: Bubble Wrap Bubble Bags None VOther: Hazpan Temp Blank? Yes No Thermometer Used: 140792808 ₩et Type of Ice: Blue None Samples on ice, cooling process has begun Cooler Temp Read 'C: 5,1 Cooler Temp Corrected C: 5.4 Biological Tissue Frozen? \_\_\_\_Yes Femp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: Comments: Chain of Custody Present? Yes □No □N/A | 1. Chain of Custody Filled Out? **X** Yes □No □N/A 2. Chain of Custody Relinquished? Yes □No □N/A 3. Sampler Name and Signature on COC? **⊠**No Yes □N/A 4. Yes Samples Arrived within Hold Time? □No □N/A Short Hold Time Analysis (<72 hr)? Yes **W**No □N/A 6. Rush Turn Around Time Requested? Yes No □N/A Sufficient Volume? XiYes □No □N/A 8. Correct Containers Used? ✓ Yes □No □N/A -Pace Containers Used? Yes □No □N/A Containers Intact? XYes □N/A □No Filtered Volume Received for Dissolved Tests? Yes □ No **∑**N/A 11. Note if sediment is visible in the dissolved containers. Sample Labels Match COC? Yes ■No □N/A -Includes Date/Time/ID/Analysis Matrix:\_\_ See pH log for results and additional preservation All containers needing acid/base preservation will be MYes. □No □N/A documentation checked and documented in the pH logbook. Yes □No N/A Headspace in Methyl Mercury Container 13. 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: FECAL WAIVER ON FILE **TEMPERATURE WAIVER ON FILE** 

Chain of Custody

Workorder: 10329206

Pace Analytical®

11/20/2015 Results Requested By: Requested Analysis 11/6/2015 Owner Received Date: Workorder Name: PS BETA-NIROP Subcontract To

MARK IN MARK Pace Analytical Ormond Beach 8 East Tower Circle Ormond Beach, FL 32174 Phone (386)672-5668 Pace Analytical Services, Inc. 1700 Elm Street, Suite 200 Minneapolis, MN 55414 Phone (612)607-1700 Fax (612)607-6444 Jennifer Anderson Report To

Preserved Containers

Item	Sample ID	Sample Collect Type Date/Tin	Collect Date/Time	Lab ID	Matrix	Гиргезегчед	. Urdig			LAB USE C
-	PMW-04	PS	11/6/2015 10:25	10329206001	Water	1	X			
2	PMW-03	PS	11/6/2015 12:00	10329206002	Water	1 1	×			
က	PMW-02	PS	11/6/2015 13:30	10329206003	Water	1 1 1	×			
4	PMW-01	PS	11/6/2015 14:45	10329206004	Water	1	X			
5										
						(			Comments	
Transfers	fers Released By		Date/Time	Received By	λ		Dațe/Time			
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က		1,71	2 southern		1)			TSV		
Coo	Cooler Temperature on Receipt-	1	sc Cust	Custody Seal (Y)or N	Oor N		Received on Ice / Y or N	Y or N	Samples Intact Y or N	or N

ONLY

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Page 1 of 1



### Document Name: Sample Condition Upon Receipt Form Document No.: F-FL-C-007 rev. 06

Document Revised. August 11, 2014 Issuing Authority: Pace Florida Quality Office

### Sample Condition Upon Receipt Form (SCUR)

Table Number:\_

Client Name: Are N	Project #35216173
Courier: Fed Ex UPS USPS Client Commercial	☐ Pace ☐ Other
Tracking # 6484 8693.4732	
	s intact Dyes no Date and Initials of person examining
	Othercontents:
Thermometer Used TVT Type of Ice: Wet	
	(Temp should be above freezing to 6°C). If below 0°C, then we
Cooler Temperature C (Visual) (Correction	sample frozen?
Receipt of samples satisfactory:	Maria de talectarios de la compansión de
	If no, then mark box & describe issue (use comments area if necessary):
If yes, then all conditions below were met:	If no, their mark box a describe issue (use comments area in recessary).
Chain of Custody Present	
Chain of Custody Filled Out	
Relinquished Signature & Sampler Name COC Samples Arrived within Hold Time	
Sufficient Volume	
Correct Containers Used	
Containers Intact	
Sample Labels match COC (sample IDs & date/time of collection)	
	No Labels: No Time/Date on Labels:
All containers needing preservation are found to be in	
compliance with EPA recommendation.  No Headspace in VOA Vials ( >6mm):	
* * * * * * * * * * * * * * * * * * *	
Client Notification/ Resolution:	
Person Contacted: Date	e/Time:
Comments/ Resolution (use back for additional comments):	
	7
	/
Project Manager Review:	Date:
Finished Product	Information Only
Fillistied Froduct	
F.P. Sample ID:	Size & Qty of Bottles Received
Bus duration Code:	x 5 Gal x 2.5 Gal
Production Code:	x 2.5 Gal x 1 Gal
Date/Time Opened:	x 1 Liter
Number of Unopened Bottles Remaining:	x 500 mL x 250 mL
Talification only ened bottles itemaning	x Other:
Extra Sample in Shed: Yes No	



November 19, 2015

Pace Analytical Energy Services, LLC 220 William Pitt Way Pittsburgh, PA 15238

> Phone: (412) 826-5245 Fax: (412) 826-3433

Jennifer Anderson Pace Analytical Services, Inc. 1700 Elm Street Suite 200 Minneapolis, MN 55414

RE: PS BETA-NIROP / 10329206

Pace Workorder:

17310

Dear Jennifer Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on Tuesday, November 10, 2015. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Ruth Weld

Ruth Welsh

11/19/2015

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.

Please email info@microseeps.com.

Total Number of Pages

Report ID: 17310 - 733102

Page 1 of 13



### **CERTIFICATE OF ANALYSIS**



Phone: (412) 826-5245 Fax: (412) 826-3433

## LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor: Pennsylvania Department of Environmental Protection, Bureau of Laboratories

Accreditation ID: 02-00538

Scope: NELAP Non-Potable Water and Solid & Hazardous Waste

Accreditor: South Carolina Department of Health and Environmental Control, Office of Environmental

Laboratory Certification

Accreditation ID: 89009003

Scope: Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)

Accreditor: NELAP: New Jersey, Department of Environmental Protection

Accreditation ID: PA026

Scope: Non-Potable Water; Solid and Chemical Materials

Accreditor: NELAP: New York, Department of Health Wadsworth Center

Accreditation ID: 11815

Scope: Non-Potable Water; Solid and Hazardous Waste

Accreditor: State of Connecticut, Department of Public Health, Division of Environmental Health

Accreditation ID: PH-0263

Scope: Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)

Accreditor: NELAP: Texas, Commission on Environmental Quality

Accreditation ID: T104704453-09-TX
Scope: Non-Potable Water

Accreditor: State of New Hampshire

Accreditation ID: 299409

Scope: Non-potable water

Accreditor: State of Georgia
Accreditation ID: Chapter 391-3-26

Scope: As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is

accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

Report ID: 17310 - 733102



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Phone: (412) 826-5245

Fax: (412) 826-3433

## SAMPLE SUMMARY

Workorder: 17310 PS BETA-NIROP / 10329206

Lab ID	Sample ID	Matrix	Date Collected	Date Received
173100001	PMW-04	Water	11/6/2015 10:25	11/10/2015 11:30
173100002	PMW-03	Water	11/6/2015 12:00	11/10/2015 11:30
173100003	PMW-02	Water	11/6/2015 13:30	11/10/2015 11:30
173100004	PMW-01	Water	11/6/2015 14:45	11/10/2015 11:30

Report ID: 17310 - 733102



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Phone: (412) 826-5245

Fax: (412) 826-3433

## **PROJECT SUMMARY**

Workorder: 17310 PS BETA-NIROP / 10329206

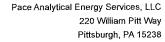
#### **Workorder Comments**

The analysis for volatile fatty acids, method AM23G, was reported at dilution for samples 17310 (0001-0004) due to the measured chloride concentration within the sample. This interfering compound will affect the instruments ability to accurately resolve target analytes within the sample.

Report ID: 17310 - 733102



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Phone: (412) 826-5245 Fax: (412) 826-3433



# **ANALYTICAL RESULTS**

Workorder: 17310 PS BETA-NIROP / 10329206

Lab ID:

173100001

Sample ID: PMW-04

Date Received: 11/10/2015 11:30 Matrix:

ix: Water

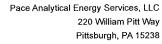
Date Collected: 11/6/2015 10:25

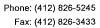
Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR Analysis Desc: AM23G	Analyti	ical Method: AN	123G			and the second second
		ta da di da di d		44.44.510.04.5.40.00	KD	4D
Lactic Acid	< <b>2.0</b> mg/l	2.0	0.030 10	11/15/2015 16:39		d,B
Acetic Acid	<1.0 mg/l	1.0	0.060 10	11/15/2015 16:39	KB	d,B
Propionic Acid	<1.0 mg/l	1.0	0.010 10	11/15/2015 16:39	KB	d,B
Formic Acid	<1.0 mg/l	1.0	0.040 10	11/15/2015 16:39	KB	d,B
Butyric Acid	<1.0 mg/l	1.0	0.050 10	11/15/2015 16:39	KB.	d,B
Pyruvic Acid	<1.0 mg/l	1.0	0.12 10	11/15/2015 16:39	KB	· d
i-Pentanoic Acid	<1.0 mg/l	1.0	0.12 10	11/15/2015 16:39	KB	d
Pentanoic Acid	<1.0 mg/l	1.0	0.060 10	11/15/2015 16:39	KB	d
i-Hexanoic Acid	<2.0 mg/l	2.0	0.10 10	11/15/2015 16:39	KB	d
Hexanoic Acid	<2.0 mg/l	2.0	0.10 10	11/15/2015 16:39	KB	d

Report ID: 17310 - 733102



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# **ANALYTICAL RESULTS**

Workorder: 17310 PS BETA-NIROP / 10329206

Lab ID:

173100002

PMW-03 Sample ID:

Date Received: 11/10/2015 11:30 Matrix:

Water

Date Collected: 11/6/2015 12:00

Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR Analysis Desc: AM23G	Analytic	cal Method: Al	м23G			
Lactic Acid	<2.0 mg/l	2.0	0.030 10	11/15/2015 17:	33 KB	d,B
Acetic Acid	<1.0 mg/l	1.0	0.060 10	11/15/2015 17:	33 KB	d,B
Propionic Acid	<1.0 mg/l	1.0	0.010 10	11/15/2015 17:	33 KB	d,B
Formic Acid	<1.0 mg/l	1.0	0.040 10	11/15/2015 17:	33 KB	d,B
Butyric Acid	<1.0 mg/l	1.0	0.050 10	11/15/2015 17:	33 KB	d,B
Pyruvic Acid	<1,0 mg/l	1.0	0.12 10	11/15/2015 17:	33 KB	d
i-Pentanoic Acid	<1.0 mg/l	1.0	0.12 10	11/15/2015 17:	33 KB	d
Pentanoic Acid	<1.0 mg/l	1.0	0.060 10	11/15/2015 17:	33 KB	d
i-Hexanoic Acid	<2.0 mg/l	2.0	0.10 10	11/15/2015 17:	33 KB	d
Hexanoic Acid	<2.0 mg/l	2.0	0.10 10	11/15/2015 17:	33 KB	d

Report ID: 17310 - 733102



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Phone: (412) 826-5245 Fax: (412) 826-3433



Workorder: 17310 PS BETA-NIROP / 10329206

Lab ID:

173100003

Sample ID: PMW-02

Date Received: 11/10/2015 11:30 Matrix:

Water

Date Collected: 11/6/2015 13:30

Parameters	Results Units	PQL	MDL	DF	Analyzed		Ву	Qualifiers
EDonors - MICR								
Analysis Desc: AM23G		Analytical Method: A	M23G					
Lactic Acid	<2.0 mg/l	2.0	0.030	10	11/15/2015	18:26	KB	d,B
Acetic Acid	<1.0 mg/l	1.0	0.060	10	11/15/2015	18:26	KB	d,B
Propionic Acid	<1.0 mg/l	. 1.0	0.010	10	11/15/2015	18:26	KB	d,B
Formic Acid	<1.0 mg/l	1.0	0.040	10	11/15/2015	18:26	KB	d,B
Butyric Acid	<1.0 mg/l	1.0	0.050	10	11/15/2015	18:26	KB	d,B
Pyruvic Acid	<1.0 mg/l	1.0	0.12	10	11/15/2015	18:26	KB	d
i-Pentanoic Acid	<1.0 mg/l	1.0	0.12	10	11/15/2015	18:26	KB	d
Pentanoic Acid	<1.0 mg/l	1.0	0.060	10	11/15/2015	18:26	KB	d
i-Hexanoic Acid	<2,0 mg/l	2.0	0.10	10	11/15/2015	18:26	KB	d
Hexanoic Acid	<2.0 mg/l	2.0	0.10	10	11/15/2015	18:26	KB	· d

Report ID: 17310 - 733102



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Phone: (412) 826-5245

Fax: (412) 826-3433

# **ANALYTICAL RESULTS**

Workorder: 17310 PS BETA-NIROP / 10329206

Lab ID: Sample ID: 173100004

PMW-01

Date Received: 11/10/2015 11:30 Matrix:

Water

Date Collected: 11/6/2015 14:45

Parameters	Results Units	PQL	MDL [	DF	Analyzed	Ву		Qualifiers
EDonors - MICR Analysis Desc: AM23G		Analytical Method: Al	M23G			. 1		
Lactic Acid	<2.0 mg/l	2.0	0.030 1		11/15/2015 19:2	0 KB		d,B
Acetic Acid	<1.0 mg/i	1.0	0.060 1	10	11/15/2015 19:2	0 KB		d,B
Propionic Acid	<1.0 mg/l	1.0	0.010 1	10	11/15/2015 19:2	0 KB		d,B
Formic Acid	<1.0 mg/i	1.0	0.040 1	10	11/15/2015 19:2	0 KB	1	d,B
Butyric Acid	<1.0 mg/i	1.0	0.050 1	10	11/15/2015 19:2	0 KB		d,B
Pyruvic Acid	<1.0 mg/l	1.0	0.12 1	10	11/15/2015 19:2	0 KB		d
i-Pentanoic Acid	<1.0 mg/l	1.0	0.12 1	10	11/15/2015 19:2	0 KB		d
Pentanoic Acid	<1.0 mg/l	1.0	0.060 1	10	11/15/2015 19:2	0 KB		d
i-Hexanoic Acid	<2.0 mg/l	2.0	0.10 1	10	11/15/2015 19:2	0 KB		d
Hexanoic Acid	<2.0 mg/l	2.0	0.10 1	10	11/15/2015 19:2	0 KB		d

Report ID: 17310 - 733102



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Phone: (412) 826-5245

Fax: (412) 826-3433

#### **ANALYTICAL RESULTS QUALIFIERS**

Workorder: 17310 PS BETA-NIROP / 10329206

#### **DEFINITIONS/QUALIFIERS**

Disclaimer: The Pennsylvania Department of Environmental Protection (PADEP) has decided to no longer recognize analyses that do not

produce data for primary compliance, for NELAP accreditation. The methods affected by this decision are AM20GAx, AM21G, SW846 7199 and AM4.02. The laboratory shall continue to administer the NELAP/TNI standard requirements in the performance

of these methods.

MDL Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.

PQL Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.

ND Not detected at or above reporting limit.

DF Dilution Factor.

S Surrogate.

RPD Relative Percent Difference.

% Rec Percent Recovery.

U Indicates the compound was analyzed for, but not detected at or above the noted concentration.

J Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

B The analyte was detected in the associated blank.

d The analyte concentration was determined from a dilution.

Report ID: 17310 - 733102



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## **QUALITY CONTROL DATA**

Workorder: 17310 PS BETA-NIROP / 10329206

QC Batch:

EDON/2715

Analysis Method:

AM23G

QC Batch Method:

AM23G

Associated Lab Samples:

173100001, 173100002, 173100003, 173100004

METHOD BLANK: 38566

Parameter	Units	Blank Result	Reporting Limit Qualifiers
EDonors		· · · · · · · · · · · · · · · · · · ·	
Lactic Acid	mg/l	<0.20	0.20 B
Acetic Acid	mg/l	< 0.10	0.10 B
Propionic Acid	mg/l	< 0.10	0.10 B
Formic Acid	mg/l	< 0.10	0.10 B
Butyric Acid	mg/l	<0.10	0.10 B
Pyruvic Acid	mg/l	< 0.10	0.10
i-Pentanoic Acid	mg/l	<0.10	0.10
Pentanoic Acid	mg/l	<0.10	0.10
i-Hexanoic Acid	mg/l	<0.20	0.20
Hexanoic Acid	mg/l	< 0.20	0.20

LABORATORY CONTROL SAMPLE: 38567

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EDonors						
Lactic Acid	mg/l	2	2.1	104	70-130	В
Acetic Acid	mg/l	2	2.1	105	70-130	В
Propionic Acid	mg/l	2	2.1	105	70-130	В
Formic Acid	mg/l	2	1.9	95	70-130	В
Butyric Acid	mg/l	2	2.1	105	70-130	В
Pyruvic Acid	mg/l	2	2.2	111	70-130	
i-Pentanoic Acid	mg/l	2	2.1	104	70-130	
Pentanoic Acid	mg/l	2	2.0	102	70-130	
i-Hexanoic Acid	mg/l	2	2.0	102	70-130	
Hexanoic Acid	mg/l	2	2.0	99	70-130	

MATRIX SPIKE & MA	ATRIX SPIKE DUPLI	CATE: 38568		38569		Original:	17335000	1		
		Original	Spike	MS	MSD	MS	MSD	% Rec	Max	
Parameter	Units	Result	Conc.	Result	Result	% Rec	% Rec	Limit F	RPD RPD	Qualifiers
EDonors										

200

200

102

101

70-130 0.99

30

Report ID: 17310 - 733102

mg/l

0.5

200

Lactic Acid

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d,B





Phone: (412) 826-5245

Fax: (412) 826-3433

# QUALITY CONTROL DATA

Workorder: 17310 PS BETA-NIROP / 10329206

MATRIX SPIKE & MATI	RIX SPIKE DUPLIC	CATE: 38568		38569		Original:	17335000	)1			
Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Acetic Acid	mg/l	15	200	230	230	107	106	70-130	0.94	30	d,B
Propionic Acid	mg/l	0.59	200	210	210	107	106	70-130	0.94	30	d,B
Formic Acid	mg/l	1.4	200	190	190	94	93	70-130	1.1	30	d,B
Butyric Acid	mg/l	1.1	200	220	210	107	106	70-130	0.94	30	d,B
Pyruvic Acid	mg/l	0	200	210	210	106	107	70-130	0.94	30	d
i-Pentanoic Acid	mg/l	0	200	210	210	106	104	70-130	1.9	30	d
Pentanoic Acíd	mg/l	0	200	210	200	105	103	70-130	1.9	30	d
i-Hexanoic Acid	mg/l	0	200	210	200	105	101	70-130	3.9	30	d
Hexanoic Acid	mg/l	0.37	200	210	200	103	100	70-130	3	30	d

Report ID: 17310 - 733102



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Phone: (412) 826-5245

Fax: (412) 826-3433

## **QUALITY CONTROL DATA QUALIFIERS**

Workorder: 17310 PS BETA-NIROP / 10329206

## **QUALITY CONTROL PARAMETER QUALIFIERS**

- B The analyte was detected in the associated blank.
- d The analyte concentration was determined from a dilution.

Report ID: 17310 - 733102



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Phone: (412) 826-5245

Fax: (412) 826-3433

# QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 17310 PS BETA-NIROP / 10329206

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
173100001	PMW-04			AM23G	EDON/2715
173100002	PMW-03			AM23G	EDON/2715
173100003	PMW-02			AM23G	EDON/2715
173100004	PMW-01			AM23G	EDON/2715

Report ID: 17310 - 733102



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# Chain of Custody

Pace Analytical Page 44 of 47

Work	Workorder: 10329206 Report/Invoice To	Workorder Name: PS I	PS BETA-NIROP	ROP		Z.	sults Re	Results Requested 11/20/20 Requested Analysis
ennife ace A	Jennifer Anderson Pace Analytical Minnesota 1700 Flm Street	Microserps	X	P.O	P.O. 1032920L	)()	<u> </u>	
Suite 200 Minneapo Phone (61 Email: jen	Suite 200 Minneapolis, MN 55414 Phone (612)607-1700 Email: jennifer.anderson@pacelabs.com	vs.com		***	Preserved Containers	Conta		
Item	Sample ID	Collect Date/Time	LabiD	Matrix	Unpreserved			Volatile
	PMW-04	11/6/2015 10:25	10329206001	Water	72		×	×
2	PMW-03	11/6/2015 12:00	10329206002	Water	2		×	×
3	PMW-02	11/6/2015 13:30	10329206003	Water	7		×	×
4	PMW-01	11/6/2015 14:45	10329206004	Water	2		×	×
5								
Transfers	rs Released By	Date/Time	me Received By	і Ву			Date/Time	Date/Time
,					NASA NASA	<u> </u>	11.10.15	10.15 1130
ω								
Coole	Cooler Temperature on Receipt	°C	Custody Seal Y or	Y or N	77	Received on		lce /
•			ند	Associate the second				ed.

<sup>\*\*\*</sup>In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Workorder: 10329206

Workorder Name:

PS BETA-NIROP

Results Requested 11/20/2015

<sup>\*\*\*</sup>In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Monday, November 09, 2015 11:25:30 AM

FMT-ALL-C-002rev.00 24March2009

Page 1 of 1

# NON-CONFORMANCE FORM

	PAES Work Order #:
Date 1/ 1/2 / Time of Receipt _	1130 RECEIVET. 17
Client Pace	
REASON FOR NON-CONFORMANCE:	in a hand of the
LOC was not rel	Inquished by Client.
ACTION TAKEN:	
	Daie: Time:
Palinarieshed Co	Ottached
Clinquina	
	<u> </u>
5	
· · · · · · · · · · · · · · · · · · ·	
·	
·	
Cusiomer Service Initials RD	Date 11/63

F-P. LE-Q-0]4-184.00, 20 NOV20]4

_	Name: <u>Pace</u> Project: <u>PS Betac</u> 1032  Shipping/Container Information (circle appropriate response)	720	6		
۹.					
	Courier: FedEx UPS USPS Client Other:	Ai	r bill P	resent	:(Yes) No
	Tracking Number: <u>6484 8693 44</u> 78				··
	Custody Seal on Cooler/Box Present: Yes No Seals	Intact:	Yes	No	
	Cooler/Box.Packing Material: Bubble Wrap Absorbent F	-oam	Other	·	
	Type of Ice: Wei Blue None Ice Intact: Yes MEI	ted			
	Cooler Temperature: 20 Radiation Screened: Yes	s (No	) ch	ain of	Custody Present: Yes No
	Comments:	3. No. 100			· · · · · · · · · · · · · · · · · · ·
3.	Laboratory Assignment/Log-in (check appropriate response)			·	
		YES	NO	N/A	Comment Reference non Conformanc
	Chain of Custody properly filled out	1			
	Chain of Custody relinquished		1		
	Sampler Name & Signature on COC				
	Containers intact	1			·
	Were samples in separate bags		,		
	Sample container labels match COC Sample name/date and time collected				,
	Sufficient volume provided	1			;
	PAES containers used	1			
	Are containers properly preserved for the requested testing? (as labeled)				
	If an unknown preservation state, were containers checked?  Exception: VOA's coliform			L	If yes, see pH form.
	Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			C-	
	Comments:	<del></del>			
	Cooler contents examined/red				



10515 Research Drive Knoxville, TN 37932 Phone: (865) 573-8188 Fax: (865) 573-8133

Client: Melinda Pham Phone:

Regenesis Bioremediation, Inc.

1011 Calle Sombra

San Clemente, CA 92673 Fax:

Client Project #: Client Project Name:

Purchase Order #:

Analysis Requested: CENSUS

Reviewed By:

NOTICE: This report is intended only for the addressee shown above and may contain confidential or privileged information. If the recipient of this material is not the intended recipient or if you have received this in error, please notify Microbial Insights, Inc. immediately. The data and other information in this report represent only the sample(s) analyzed and are rendered upon condition that it is not to be reproduced without approval from Microbial Insights, Inc. Thank you for your cooperation.

# MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932

Tel. (865) 573-8188 Fax. (865) 573-8133

Regenesis Bioremediation, Inc.

MI Project Number: 022MK

Date Received: 11/07/2015

**CENSUS** 

**Sample Information** 

Client:

Project:

Client Sample ID: PMW-04 PMW-03 PMW-02 PMW-01 11/06/2015 11/06/2015 11/06/2015 11/06/2015 Sample Date: cells/mL cells/mL cells/mL cells/mL Units: Analyst: JS JS JS JS

**Dechlorinating Bacteria** 

Dehalococcoides DHC 1.05E+02 7.97E+03 6.30E+02 1.74E+04

Legend:

NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited

< = Result not detected

# **Quality Assurance/Quality Control Data**

# Samples Received 11/7/2015

	Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control	
-	DHC	11/07/2015	11/10/2015	0 °C	110%	non-detect	non-detect	





December 09, 2015

Melinda Pham Regenesis 1011 Calle Sombra San Clemente, CA 92673

RE: Project: PS BETA-NIROP Pace Project No.: 10332212

## Dear Melinda Pham:

Enclosed are the analytical results for sample(s) received by the laboratory on December 04, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI 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,

Jennifer Anderson jennifer.anderson@pacelabs.com Project Manager

**Enclosures** 

cc: Ryan Moore, Regenesis







## **CERTIFICATIONS**

Project: PS BETA-NIROP

Pace Project No.: 10332212

#### **Minnesota Certification IDs**

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770 Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA Colorado Certification #Pace Connecticut Certification #: PH-0256 EPA Region 8 Certification #: 8TMS-L

Florida/NELAP Certification #: E87605 Guam Certification #:14-008r Georgia Certification #: 959 Georgia EPD #: Pace

Idaho Certification #: MN00064 Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01 Iowa Certification #: 368

Kansas Certification #: E-10167 Kentucky Dept of Envi. Protection - DW #90062 Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001 Maine Certification #: 2013011 Maryland Certification #: 322 Michigan DEPH Certification #: 9909 Minnesota Certification #: 027-053-137 Mississippi Certification #: Pace Montana Certification #: MT0092 Nevada Certification #: MN\_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002 New York Certification #: 11647 North Carolina Certification #: 530 North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150 Ohio VAP Certification #: CL101 Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563

Puerto Rico Certification Saipan (CNMI) #:MP0003 South Carolina #:74003001 Texas Certification #: T104704192 Tennessee Certification #: 02818 Utah Certification #: MN000642013-4 Virginia DGS Certification #: 251 Washington Certification #: C486 West Virginia Certification #: 382 West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970





## **SAMPLE SUMMARY**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10332212001	PMW-4	Water	12/04/15 09:25	12/04/15 15:06
10332212002	PMW-3	Water	12/04/15 10:50	12/04/15 15:06
10332212003	PMW-2	Water	12/04/15 12:35	12/04/15 15:06
10332212004	PMW-1	Water	12/04/15 13:40	12/04/15 15:06
10332212005	TB-1	Water	12/04/15 07:00	12/04/15 15:06





# **SAMPLE ANALYTE COUNT**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10332212001	PMW-4	EPA 8260B	DJB	70
10332212002	PMW-3	EPA 8260B	DJB	70
10332212003	PMW-2	EPA 8260B	DJB	70
10332212004	PMW-1	EPA 8260B	DJB	70
10332212005	TB-1	EPA 8260B	DJB	70

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## **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

Sample: PMW-4	Lab ID: 103	32212001	Collected: 12/04/1	5 09:25	Received:	12/04/15 15:06	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Met	hod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		12/05/15 17:4	8 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		12/05/15 17:4	8 107-05-1	
Benzene	ND	ug/L	1.0	1		12/05/15 17:4	8 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/05/15 17:4	8 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/05/15 17:4	8 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/05/15 17:4	8 75-27-4	
Bromoform	ND	ug/L	4.0	1		12/05/15 17:4	8 75-25-2	
Bromomethane	ND	ug/L	4.0	1		12/05/15 17:4	8 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/05/15 17:4	8 78-93-3	L3
n-Butylbenzene	ND	ug/L	1.0	1		12/05/15 17:4	8 104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		12/05/15 17:4	8 135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		12/05/15 17:4		
Carbon tetrachloride	ND	ug/L	1.0	1		12/05/15 17:4	8 56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/05/15 17:4	8 108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/05/15 17:4		
Chloroform	ND	ug/L	1.0	1		12/05/15 17:4		
Chloromethane	ND	ug/L	4.0	1		12/05/15 17:4		
2-Chlorotoluene	ND	ug/L	1.0	1		12/05/15 17:4		
4-Chlorotoluene	ND	ug/L	1.0	1		12/05/15 17:4		
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		12/05/15 17:4		
Dibromochloromethane	ND	ug/L	1.0	1		12/05/15 17:4		
1,2-Dibromoethane (EDB)	ND ND	ug/L ug/L	1.0	1		12/05/15 17:4	-	
Dibromomethane	ND ND	ug/L ug/L	4.0	1		12/05/15 17:4		
1,2-Dichlorobenzene	ND ND	ug/L ug/L	1.0	1		12/05/15 17:4		
	ND	_	1.0	1		12/05/15 17:4		
1,3-Dichlorobenzene		ug/L		1				
1,4-Dichlorobenzene Dichlorodifluoromethane	ND ND	ug/L	1.0 1.0	1		12/05/15 17:4 12/05/15 17:4		
1,1-Dichloroethane	1.4	ug/L	1.0	1		12/05/15 17:4		
,	ND	ug/L		1				
1,2-Dichloroethane		ug/L	1.0			12/05/15 17:4		
1,1-Dichloroethene	ND	ug/L	1.0	1		12/05/15 17:4		
cis-1,2-Dichloroethene	23.2	ug/L	1.0	1		12/05/15 17:4		
trans-1,2-Dichloroethene	69.0	ug/L	1.0	1		12/05/15 17:4		
Dichlorofluoromethane	ND	ug/L	1.0	1		12/05/15 17:4		
1,2-Dichloropropane	ND	ug/L	4.0	1		12/05/15 17:4		
1,3-Dichloropropane	ND	ug/L	1.0	1		12/05/15 17:4		
2,2-Dichloropropane	ND	ug/L	4.0	1		12/05/15 17:4		
1,1-Dichloropropene	ND	ug/L	1.0	1		12/05/15 17:4		
cis-1,3-Dichloropropene	ND	ug/L	4.0	1			8 10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	4.0	1			8 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		12/05/15 17:4		
Ethylbenzene	ND	ug/L	1.0	1		12/05/15 17:4		
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/05/15 17:4		
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		12/05/15 17:4		
p-Isopropyltoluene	ND	ug/L	1.0	1		12/05/15 17:4		
Methylene Chloride	ND	ug/L	4.0	1		12/05/15 17:4	8 75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/05/15 17:4	8 108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/05/15 17:4	8 1634-04-4	





## **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

Sample: PMW-4	Lab ID: 103	32212001	Collected: 12/04/1	5 09:25	Received: 1	2/04/15 15:06 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		12/05/15 17:48	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		12/05/15 17:48	103-65-1	
Styrene	ND	ug/L	1.0	1		12/05/15 17:48	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/05/15 17:48	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/05/15 17:48	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		12/05/15 17:48	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		12/05/15 17:48	109-99-9	
Toluene	ND	ug/L	1.0	1		12/05/15 17:48	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/05/15 17:48	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/05/15 17:48	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/05/15 17:48	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/05/15 17:48	79-00-5	
Trichloroethene	16.5	ug/L	0.40	1		12/05/15 17:48	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/05/15 17:48	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		12/05/15 17:48	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		12/05/15 17:48	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		12/05/15 17:48	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		12/05/15 17:48	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		12/05/15 17:48	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		12/05/15 17:48	1330-20-7	
Surrogates 1,2-Dichloroethane-d4 (S)	101	%.	75-125	1		12/05/15 17:48	17060-07-0	
Toluene-d8 (S)	96	%.	75-125	1		12/05/15 17:48		
4-Bromofluorobenzene (S)	95	%.	75-125 75-125	1		12/05/15 17:48		

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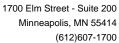
## **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

Sample: PMW-3	Lab ID: 103	32212002	Collected: 12/04/1	15 10:50	Received:	12/04/15 15:06	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
3260B VOC	Analytical Met	hod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		12/05/15 18:04	4 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		12/05/15 18:04	4 107-05-1	
Benzene	ND	ug/L	1.0	1		12/05/15 18:04	4 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/05/15 18:04	4 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/05/15 18:04	4 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/05/15 18:04	4 75-27-4	
Bromoform	ND	ug/L	4.0	1		12/05/15 18:04	4 75-25-2	
Bromomethane	ND	ug/L	4.0	1		12/05/15 18:04	4 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/05/15 18:04	4 78-93-3	L3
n-Butylbenzene	ND	ug/L	1.0	1		12/05/15 18:04	4 104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		12/05/15 18:04	4 135-98-8	
ert-Butylbenzene	ND	ug/L	1.0	1		12/05/15 18:04		
Carbon tetrachloride	ND	ug/L	1.0	1		12/05/15 18:04		
Chlorobenzene	ND	ug/L	1.0	1		12/05/15 18:04		
Chloroethane	ND	ug/L	1.0	1		12/05/15 18:04		
Chloroform	ND	ug/L	1.0	1		12/05/15 18:04		
Chloromethane	ND	ug/L	4.0	1		12/05/15 18:04		
2-Chlorotoluene	ND	ug/L	1.0	1		12/05/15 18:04		
4-Chlorotoluene	ND ND	ug/L ug/L	1.0	1		12/05/15 18:0		
1,2-Dibromo-3-chloropropane	ND ND	ug/L	4.0	1		12/05/15 18:0		
Dibromochloromethane	ND ND			1		12/05/15 18:0		
	ND ND	ug/L	1.0 1.0	1		12/05/15 18:04	_	
1,2-Dibromoethane (EDB) Dibromomethane		ug/L		1				
	ND	ug/L	4.0			12/05/15 18:04		
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/05/15 18:04		
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/05/15 18:04		
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/05/15 18:04		
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/05/15 18:04		
1,1-Dichloroethane	3.1	ug/L	1.0	1		12/05/15 18:04		
1,2-Dichloroethane	ND	ug/L	1.0	1		12/05/15 18:04		
1,1-Dichloroethene	ND	ug/L	1.0	1		12/05/15 18:04		
cis-1,2-Dichloroethene	34.5	ug/L	1.0	1		12/05/15 18:04		
rans-1,2-Dichloroethene	70.5	ug/L	1.0	1		12/05/15 18:04		
Dichlorofluoromethane	ND	ug/L	1.0	1		12/05/15 18:04		
1,2-Dichloropropane	ND	ug/L	4.0	1		12/05/15 18:04	4 78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/05/15 18:04	4 142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		12/05/15 18:04	4 594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/05/15 18:04	4 563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1		12/05/15 18:04	4 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1		12/05/15 18:04	4 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		12/05/15 18:04	4 60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		12/05/15 18:04	4 100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/05/15 18:04	4 87-68-3	
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		12/05/15 18:04	4 98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		12/05/15 18:04	4 99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		12/05/15 18:04	4 75-09-2	
1-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/05/15 18:04		
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/05/15 18:04		





## **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

Sample: PMW-3	Lab ID: 103	32212002	Collected: 12/04/1	15 10:50	Received: 1	2/04/15 15:06 N	/latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		12/05/15 18:04	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		12/05/15 18:04	103-65-1	
Styrene	ND	ug/L	1.0	1		12/05/15 18:04	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/05/15 18:04	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/05/15 18:04	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		12/05/15 18:04	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		12/05/15 18:04	109-99-9	
Toluene	ND	ug/L	1.0	1		12/05/15 18:04	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/05/15 18:04	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/05/15 18:04	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/05/15 18:04	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/05/15 18:04	79-00-5	
Trichloroethene	19.5	ug/L	0.40	1		12/05/15 18:04	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/05/15 18:04	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		12/05/15 18:04	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		12/05/15 18:04	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		12/05/15 18:04	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		12/05/15 18:04	108-67-8	
Vinyl chloride	1.7	ug/L	0.40	1		12/05/15 18:04	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		12/05/15 18:04	1330-20-7	
Surrogates		-						
1,2-Dichloroethane-d4 (S)	108	%.	75-125	1		12/05/15 18:04	17060-07-0	
Toluene-d8 (S)	96	%.	75-125	1		12/05/15 18:04	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1		12/05/15 18:04	460-00-4	

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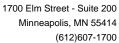
## **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

Sample: PMW-2	Lab ID: 103	332212003	Collected: 12/04/1	15 12:35	Received:	12/04/15 15:06	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
3260B VOC	Analytical Met	hod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		12/05/15 16:3	1 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		12/05/15 16:3	1 107-05-1	
Benzene	ND	ug/L	1.0	1		12/05/15 16:3	1 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/05/15 16:3	1 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/05/15 16:3	1 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/05/15 16:3	1 75-27-4	
Bromoform	ND	ug/L	4.0	1		12/05/15 16:3	1 75-25-2	
Bromomethane	ND	ug/L	4.0	1		12/05/15 16:3	1 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/05/15 16:3	1 78-93-3	L3
n-Butylbenzene	ND	ug/L	1.0	1		12/05/15 16:3		
sec-Butylbenzene	ND	ug/L	1.0	1		12/05/15 16:3	1 135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		12/05/15 16:3		
Carbon tetrachloride	ND	ug/L	1.0	1		12/05/15 16:3		
Chlorobenzene	ND	ug/L	1.0	1		12/05/15 16:3		
Chloroethane	ND	ug/L	1.0	1		12/05/15 16:3		
Chloroform	ND	ug/L	1.0	1		12/05/15 16:3		
Chloromethane	ND	ug/L	4.0	1		12/05/15 16:3		
2-Chlorotoluene	ND	ug/L	1.0	1		12/05/15 16:3		
4-Chlorotoluene	ND	ug/L	1.0	1		12/05/15 16:3		
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		12/05/15 16:3		
Dibromochloromethane	ND ND		1.0	1		12/05/15 16:3		
1,2-Dibromoethane (EDB)	ND ND	ug/L ug/L	1.0	1		12/05/15 16:3		
Dibromomethane	ND ND	ug/L	4.0	1		12/05/15 16:3		
	ND ND	_	1.0	1		12/05/15 16:3		
,2-Dichlorobenzene	ND ND	ug/L		1				
1,3-Dichlorobenzene		ug/L	1.0			12/05/15 16:3		
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/05/15 16:3		
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/05/15 16:3		
1,1-Dichloroethane	50.5	ug/L	1.0	1		12/05/15 16:3		
1,2-Dichloroethane	ND	ug/L	1.0	1		12/05/15 16:3		
I,1-Dichloroethene	30.7	ug/L	1.0	1		12/05/15 16:3		
cis-1,2-Dichloroethene	257	ug/L	5.0	5		12/08/15 11:0		M1
rans-1,2-Dichloroethene	284	ug/L	5.0	5		12/08/15 11:0		M1
Dichlorofluoromethane	ND	ug/L	1.0	1		12/05/15 16:3		
1,2-Dichloropropane	ND	ug/L	4.0	1		12/05/15 16:3		
1,3-Dichloropropane	ND	ug/L	1.0	1		12/05/15 16:3	1 142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		12/05/15 16:3		
1,1-Dichloropropene	ND	ug/L	1.0	1		12/05/15 16:3		
cis-1,3-Dichloropropene	ND	ug/L	4.0	1			1 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1			1 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		12/05/15 16:3	1 60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		12/05/15 16:3		
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/05/15 16:3	1 87-68-3	
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		12/05/15 16:3	1 98-82-8	
o-Isopropyltoluene	ND	ug/L	1.0	1		12/05/15 16:3	1 99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		12/05/15 16:3	1 75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/05/15 16:3	1 108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/05/15 16:3		





## **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

Sample: PMW-2	Lab ID: 103	32212003	Collected: 12/04/1	5 12:35	Received: 12/04/15 15	:06 Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared Analy	zed CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B				
Naphthalene	ND	ug/L	4.0	1	12/05/15	16:31 91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1	12/05/15	16:31 103-65-1	
Styrene	ND	ug/L	1.0	1	12/05/15	16:31 100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1	12/05/15	16:31 630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1	12/05/15	16:31 79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1	12/05/15	16:31 127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1	12/05/15	16:31 109-99-9	
Toluene	ND	ug/L	1.0	1	12/05/15	16:31 108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1	12/05/15	16:31 87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1	12/05/15	16:31 120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1	12/05/15	16:31 71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1	12/05/15	16:31 79-00-5	
Trichloroethene	54.4	ug/L	0.40	1	12/05/15	16:31 79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1	12/05/15	16:31 75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1	12/05/15	16:31 96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1	12/05/15	16:31 76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1	12/05/15	16:31 95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1	12/05/15	16:31 108-67-8	
Vinyl chloride	4.1	ug/L	0.40	1	12/05/15	16:31 75-01-4	
Xylene (Total)	ND	ug/L	3.0	1	12/05/15	16:31 1330-20-7	
Surrogates		•					
1,2-Dichloroethane-d4 (S)	105	%.	75-125	1	12/05/15	16:31 17060-07-0	
Toluene-d8 (S)	96	%.	75-125	1	12/05/15	16:31 2037-26-5	
4-Bromofluorobenzene (S)	94	%.	75-125	1	12/05/15	16:31 460-00-4	

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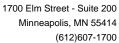
## **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

Sample: PMW-1	Lab ID: 10332212004		Collected: 12/04/1	Collected: 12/04/15 13:40		12/04/15 15:06	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Met	hod: EPA 82	260B					
Acetone	ND	ug/L	100	5		12/08/15 13:3	1 67-64-1	
Allyl chloride	ND	ug/L	20.0	5		12/08/15 13:3	1 107-05-1	
Benzene	ND	ug/L	5.0	5		12/08/15 13:3	1 71-43-2	
Bromobenzene	ND	ug/L	5.0	5		12/08/15 13:3	1 108-86-1	
Bromochloromethane	ND	ug/L	5.0	5		12/08/15 13:3	1 74-97-5	
Bromodichloromethane	ND	ug/L	5.0	5		12/08/15 13:3	1 75-27-4	
Bromoform	ND	ug/L	20.0	5		12/08/15 13:3	1 75-25-2	
Bromomethane	ND	ug/L	20.0	5		12/08/15 13:3	1 74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	5		12/08/15 13:3	1 78-93-3	
n-Butylbenzene	ND	ug/L	5.0	5		12/08/15 13:3	1 104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	5		12/08/15 13:3	1 135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	5		12/08/15 13:3		
Carbon tetrachloride	ND	ug/L	5.0	5		12/08/15 13:3		
Chlorobenzene	ND	ug/L	5.0	5		12/08/15 13:3		
Chloroethane	ND	ug/L	5.0	5		12/08/15 13:3		
Chloroform	ND	ug/L	5.0	5		12/08/15 13:3		
Chloromethane	ND	ug/L	20.0	5		12/08/15 13:3		
2-Chlorotoluene	ND	ug/L	5.0	5		12/08/15 13:3		
4-Chlorotoluene	ND	ug/L	5.0	5		12/08/15 13:3		
1,2-Dibromo-3-chloropropane	ND	ug/L	20.0	5		12/08/15 13:3		
Dibromochloromethane	ND ND		5.0	5		12/08/15 13:3		
1,2-Dibromoethane (EDB)	ND ND	ug/L ug/L	5.0	5		12/08/15 13:3	-	
Dibromomethane	ND ND	ug/L	20.0	5		12/08/15 13:3		
	ND ND	-	5.0	5		12/08/15 13:3		
1,2-Dichlorobenzene	ND ND	ug/L	5.0	5 5		12/08/15 13:3		
1,3-Dichlorobenzene		ug/L		5 5				
1,4-Dichlorobenzene Dichlorodifluoromethane	ND ND	ug/L	5.0 5.0	5 5		12/08/15 13:3 12/08/15 13:3		
1,1-Dichloroethane	ND ND	ug/L	5.0	5 5		12/08/15 13:3		
•		ug/L						
1,2-Dichloroethane	ND	ug/L	5.0	5		12/08/15 13:3		
1,1-Dichloroethene	ND	ug/L	5.0	5		12/08/15 13:3		
cis-1,2-Dichloroethene	ND	ug/L	5.0	5		12/08/15 13:3		
rans-1,2-Dichloroethene	ND	ug/L	5.0	5		12/08/15 13:3		
Dichlorofluoromethane	ND	ug/L	5.0	5		12/08/15 13:3		
1,2-Dichloropropane	ND	ug/L	20.0	5		12/08/15 13:3		
I,3-Dichloropropane	ND	ug/L	5.0	5		12/08/15 13:3		
2,2-Dichloropropane	ND	ug/L	20.0	5		12/08/15 13:3		
1,1-Dichloropropene	ND	ug/L	5.0	5		12/08/15 13:3		
cis-1,3-Dichloropropene	ND	ug/L	20.0	5			1 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	20.0	5			1 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	20.0	5		12/08/15 13:3		
Ethylbenzene	ND	ug/L	5.0	5		12/08/15 13:3		
Hexachloro-1,3-butadiene	ND	ug/L	5.0	5		12/08/15 13:3		
sopropylbenzene (Cumene)	ND	ug/L	5.0	5		12/08/15 13:3		
o-Isopropyltoluene	ND	ug/L	5.0	5		12/08/15 13:3		
Methylene Chloride	ND	ug/L	20.0	5		12/08/15 13:3		
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	5		12/08/15 13:3		
Methyl-tert-butyl ether	ND	ug/L	5.0	5		12/08/15 13:3	1 1634-04-4	





## **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

Sample: PMW-1	Lab ID: 103	32212004	Collected: 12/04/1	15 13:40	Received: 1	2/04/15 15:06	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	20.0	5		12/08/15 13:31	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	5		12/08/15 13:31	103-65-1	
Styrene	ND	ug/L	5.0	5		12/08/15 13:31	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	5		12/08/15 13:31	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	5		12/08/15 13:31	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	5		12/08/15 13:31	127-18-4	
Tetrahydrofuran	ND	ug/L	50.0	5		12/08/15 13:31	109-99-9	
Toluene	ND	ug/L	5.0	5		12/08/15 13:31	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	5		12/08/15 13:31	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	5		12/08/15 13:31	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	5		12/08/15 13:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	5		12/08/15 13:31	79-00-5	
Trichloroethene	ND	ug/L	2.0	5		12/08/15 13:31	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	5		12/08/15 13:31	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	20.0	5		12/08/15 13:31	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	5.0	5		12/08/15 13:31	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	5		12/08/15 13:31	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	5		12/08/15 13:31	108-67-8	
Vinyl chloride	ND	ug/L	2.0	5		12/08/15 13:31	75-01-4	
Xylene (Total)	ND	ug/L	15.0	5		12/08/15 13:31	1330-20-7	
Surrogates		-						
1,2-Dichloroethane-d4 (S)	133	%.	75-125	5		12/08/15 13:31	17060-07-0	1M,C0
Toluene-d8 (S)	164	%.	75-125	5		12/08/15 13:31	2037-26-5	C0
4-Bromofluorobenzene (S)	188	%.	75-125	5		12/08/15 13:31	460-00-4	C0

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## **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

	<b>Lab ID: 10332212005</b> C			ollected: 12/04/15 07:00		12/04/15 15:06 I	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua	
8260B VOC	Analytical Met	hod: EPA 82	260B						
Acetone	ND	ug/L	20.0	1		12/05/15 14:28	67-64-1		
Allyl chloride	ND	ug/L	4.0	1		12/05/15 14:28	107-05-1		
Benzene	ND	ug/L	1.0	1		12/05/15 14:28	71-43-2		
Bromobenzene	ND	ug/L	1.0	1		12/05/15 14:28	108-86-1		
Bromochloromethane	ND	ug/L	1.0	1		12/05/15 14:28	74-97-5		
Bromodichloromethane	ND	ug/L	1.0	1		12/05/15 14:28	75-27-4		
Bromoform	ND	ug/L	4.0	1		12/05/15 14:28	75-25-2		
Bromomethane	ND	ug/L	4.0	1		12/05/15 14:28	74-83-9		
2-Butanone (MEK)	ND	ug/L	5.0	1		12/05/15 14:28	78-93-3	L3	
n-Butylbenzene	ND	ug/L	1.0	1		12/05/15 14:28	104-51-8		
sec-Butylbenzene	ND	ug/L	1.0	1		12/05/15 14:28	135-98-8		
tert-Butylbenzene	ND	ug/L	1.0	1		12/05/15 14:28	98-06-6		
Carbon tetrachloride	ND	ug/L	1.0	1		12/05/15 14:28	56-23-5		
Chlorobenzene	ND	ug/L	1.0	1		12/05/15 14:28	108-90-7		
Chloroethane	ND	ug/L	1.0	1		12/05/15 14:28	75-00-3		
Chloroform	ND	ug/L	1.0	1		12/05/15 14:28			
Chloromethane	ND	ug/L	4.0	1		12/05/15 14:28			
2-Chlorotoluene	ND	ug/L	1.0	1		12/05/15 14:28	95-49-8		
4-Chlorotoluene	ND	ug/L	1.0	1		12/05/15 14:28	106-43-4		
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		12/05/15 14:28	96-12-8		
Dibromochloromethane	ND	ug/L	1.0	1		12/05/15 14:28			
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/05/15 14:28			
Dibromomethane ,	ND	ug/L	4.0	1		12/05/15 14:28	74-95-3		
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/05/15 14:28			
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/05/15 14:28			
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/05/15 14:28			
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/05/15 14:28			
1,1-Dichloroethane	ND	ug/L	1.0	1		12/05/15 14:28			
1,2-Dichloroethane	ND	ug/L	1.0	1		12/05/15 14:28			
1,1-Dichloroethene	ND	ug/L	1.0	1		12/05/15 14:28			
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/05/15 14:28			
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/05/15 14:28			
Dichlorofluoromethane	ND	ug/L	1.0	1		12/05/15 14:28			
1,2-Dichloropropane	ND	ug/L	4.0	1		12/05/15 14:28			
1,3-Dichloropropane	ND	ug/L	1.0	1		12/05/15 14:28			
2,2-Dichloropropane	ND	ug/L	4.0	1		12/05/15 14:28			
1,1-Dichloropropene	ND	ug/L	1.0	1		12/05/15 14:28			
cis-1,3-Dichloropropene	ND	ug/L	4.0	1		12/05/15 14:28			
trans-1,3-Dichloropropene	ND	ug/L	4.0	1		12/05/15 14:28			
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		12/05/15 14:28			
Ethylbenzene	ND ND	ug/L	1.0	1		12/05/15 14:28			
Hexachloro-1,3-butadiene	ND ND	ug/L ug/L	1.0	1		12/05/15 14:28			
Isopropylbenzene (Cumene)	ND ND	ug/L	1.0	1		12/05/15 14:28			
p-Isopropyltoluene	ND ND	ug/L ug/L	1.0	1		12/05/15 14:28			
Methylene Chloride	ND ND	ug/L ug/L	4.0	1		12/05/15 14:26			
		ug/L ug/L	5.0	1		12/05/15 14:26			
4-Methyl-2-pentanone (MIBK)	ND								





## **ANALYTICAL RESULTS**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

Sample: TB-1	Lab ID: 10332212005		Collected: 12/04/1	Collected: 12/04/15 07:00		2/04/15 15:06 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		12/05/15 14:28	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		12/05/15 14:28	103-65-1	
Styrene	ND	ug/L	1.0	1		12/05/15 14:28	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/05/15 14:28	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/05/15 14:28	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		12/05/15 14:28	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		12/05/15 14:28	109-99-9	
Toluene	ND	ug/L	1.0	1		12/05/15 14:28	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/05/15 14:28	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/05/15 14:28	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/05/15 14:28	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/05/15 14:28	79-00-5	
Trichloroethene	ND	ug/L	0.40	1		12/05/15 14:28	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/05/15 14:28	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		12/05/15 14:28	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		12/05/15 14:28	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		12/05/15 14:28	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		12/05/15 14:28	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		12/05/15 14:28	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		12/05/15 14:28	1330-20-7	
Surrogates 1,2-Dichloroethane-d4 (S)	103	%.	75-125	1		12/05/15 14:28	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1		12/05/15 14:28		
4-Bromofluorobenzene (S)	98	%.	75-125	1		12/05/15 14:28		



## **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

QC Batch: MSV/33992 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV 465 W

Associated Lab Samples: 10332212001, 10332212002, 10332212003, 10332212005

METHOD BLANK: 2150208 Matrix: Water
Associated Lab Samples: 10332212001, 10332212002, 10332212003, 10332212005

	,	Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	12/05/15 14:13	
1,1,1-Trichloroethane	ug/L	ND	1.0	12/05/15 14:13	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	12/05/15 14:13	
1,1,2-Trichloroethane	ug/L	ND	1.0	12/05/15 14:13	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	12/05/15 14:13	
1,1-Dichloroethane	ug/L	ND	1.0	12/05/15 14:13	
1,1-Dichloroethene	ug/L	ND	1.0	12/05/15 14:13	
1,1-Dichloropropene	ug/L	ND	1.0	12/05/15 14:13	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	12/05/15 14:13	
1,2,3-Trichloropropane	ug/L	ND	4.0	12/05/15 14:13	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	12/05/15 14:13	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	12/05/15 14:13	
1,2-Dibromo-3-chloropropane	ug/L	ND	4.0	12/05/15 14:13	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	12/05/15 14:13	
1,2-Dichlorobenzene	ug/L	ND	1.0	12/05/15 14:13	
1,2-Dichloroethane	ug/L	ND	1.0	12/05/15 14:13	
1,2-Dichloropropane	ug/L	ND	4.0	12/05/15 14:13	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	12/05/15 14:13	
1,3-Dichlorobenzene	ug/L	ND	1.0	12/05/15 14:13	
1,3-Dichloropropane	ug/L	ND	1.0	12/05/15 14:13	
1,4-Dichlorobenzene	ug/L	ND	1.0	12/05/15 14:13	
2,2-Dichloropropane	ug/L	ND	4.0	12/05/15 14:13	
2-Butanone (MEK)	ug/L	ND	5.0	12/05/15 14:13	
2-Chlorotoluene	ug/L	ND	1.0	12/05/15 14:13	
4-Chlorotoluene	ug/L	ND	1.0	12/05/15 14:13	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	12/05/15 14:13	
Acetone	ug/L	ND	20.0	12/05/15 14:13	
Allyl chloride	ug/L	ND	4.0	12/05/15 14:13	
Benzene	ug/L	ND	1.0	12/05/15 14:13	
Bromobenzene	ug/L	ND	1.0	12/05/15 14:13	
Bromochloromethane	ug/L	ND	1.0	12/05/15 14:13	
Bromodichloromethane	ug/L	ND	1.0	12/05/15 14:13	
Bromoform	ug/L	ND	4.0	12/05/15 14:13	
Bromomethane	ug/L	ND	4.0	12/05/15 14:13	
Carbon tetrachloride	ug/L	ND	1.0	12/05/15 14:13	
Chlorobenzene	ug/L	ND	1.0	12/05/15 14:13	
Chloroethane	ug/L	ND	1.0	12/05/15 14:13	
Chloroform	ug/L	ND	1.0	12/05/15 14:13	
Chloromethane	ug/L	ND	4.0	12/05/15 14:13	
cis-1,2-Dichloroethene	ug/L	ND	1.0	12/05/15 14:13	
cis-1,3-Dichloropropene	ug/L	ND	4.0	12/05/15 14:13	

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.

1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700



## **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

METHOD BLANK: 2150208 Matrix: Water
Associated Lab Samples: 10332212001, 10332212002, 10332212003, 10332212005

	,	Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/L	ND	1.0	12/05/15 14:13	
Dibromomethane	ug/L	ND	4.0	12/05/15 14:13	
Dichlorodifluoromethane	ug/L	ND	1.0	12/05/15 14:13	
Dichlorofluoromethane	ug/L	ND	1.0	12/05/15 14:13	
Diethyl ether (Ethyl ether)	ug/L	ND	4.0	12/05/15 14:13	
Ethylbenzene	ug/L	ND	1.0	12/05/15 14:13	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	12/05/15 14:13	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	12/05/15 14:13	
Methyl-tert-butyl ether	ug/L	ND	1.0	12/05/15 14:13	
Methylene Chloride	ug/L	ND	4.0	12/05/15 14:13	
n-Butylbenzene	ug/L	ND	1.0	12/05/15 14:13	
n-Propylbenzene	ug/L	ND	1.0	12/05/15 14:13	
Naphthalene	ug/L	ND	4.0	12/05/15 14:13	
p-Isopropyltoluene	ug/L	ND	1.0	12/05/15 14:13	
sec-Butylbenzene	ug/L	ND	1.0	12/05/15 14:13	
Styrene	ug/L	ND	1.0	12/05/15 14:13	
tert-Butylbenzene	ug/L	ND	1.0	12/05/15 14:13	
Tetrachloroethene	ug/L	ND	1.0	12/05/15 14:13	
Tetrahydrofuran	ug/L	ND	10.0	12/05/15 14:13	
Toluene	ug/L	ND	1.0	12/05/15 14:13	
trans-1,2-Dichloroethene	ug/L	ND	1.0	12/05/15 14:13	
trans-1,3-Dichloropropene	ug/L	ND	4.0	12/05/15 14:13	
Trichloroethene	ug/L	ND	0.40	12/05/15 14:13	
Trichlorofluoromethane	ug/L	ND	1.0	12/05/15 14:13	
Vinyl chloride	ug/L	ND	0.40	12/05/15 14:13	
Xylene (Total)	ug/L	ND	3.0	12/05/15 14:13	
1,2-Dichloroethane-d4 (S)	%.	108	75-125	12/05/15 14:13	
4-Bromofluorobenzene (S)	%.	94	75-125	12/05/15 14:13	
Toluene-d8 (S)	%.	97	75-125	12/05/15 14:13	

LABORATORY CONTROL SAMPLE:	2150209					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	22.6	113	75-125	
1,1,1-Trichloroethane	ug/L	20	22.3	112	75-125	
1,1,2,2-Tetrachloroethane	ug/L	20	22.8	114	75-125	
1,1,2-Trichloroethane	ug/L	20	23.6	118	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	21.2	106	60-135	
1,1-Dichloroethane	ug/L	20	23.0	115	69-125	
1,1-Dichloroethene	ug/L	20	21.8	109	68-125	
1,1-Dichloropropene	ug/L	20	21.9	109	74-125	
1,2,3-Trichlorobenzene	ug/L	20	21.9	110	69-136	
1,2,3-Trichloropropane	ug/L	20	22.8	114	75-125	
1,2,4-Trichlorobenzene	ug/L	20	21.9	109	73-127	

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## **REPORT OF LABORATORY ANALYSIS**

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## **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

ABORATORY CONTROL SAMPLE:	2150209				
<b>.</b>		Spike	LCS	LCS	% Rec
Parameter	Units	Conc	Result	% Rec	Limits Qualifier
,2,4-Trimethylbenzene	ug/L	20	19.9	99	75-125
,2-Dibromo-3-chloropropane	ug/L	50	55.9	112	65-145
,2-Dibromoethane (EDB)	ug/L	20	24.2	121	75-125
,2-Dichlorobenzene	ug/L	20	21.3	107	75-125
,2-Dichloroethane	ug/L	20	23.6	118	73-125
,2-Dichloropropane	ug/L	20	20.8	104	75-125
,3,5-Trimethylbenzene	ug/L	20	20.1	100	75-125
,3-Dichlorobenzene	ug/L	20	20.5	103	74-125
,3-Dichloropropane	ug/L	20	23.2	116	75-125
,4-Dichlorobenzene	ug/L	20	20.0	100	75-125
,2-Dichloropropane	ug/L	20	23.4	117	59-139
-Butanone (MEK)	ug/L	100	133	133	63-130 L0
-Chlorotoluene	ug/L	20	20.0	100	72-125
-Chlorotoluene	ug/L	20	19.9	99	73-125
-Methyl-2-pentanone (MIBK)	ug/L	100	125	125	71-126
cetone	ug/L	100	85.3	85	69-131 SS
allyl chloride	ug/L	20	21.2	106	67-125
Benzene	ug/L	20	21.9	110	71-125
romobenzene	ug/L	20	21.2	106	75-125
romochloromethane	ug/L	20	21.0	105	75-125
romodichloromethane	ug/L	20	22.3	112	75-125
romoform	ug/L	20	21.8	109	70-125
romomethane	ug/L	20	15.1	75	30-150
Carbon tetrachloride	ug/L	20	19.6	98	75-126
Chlorobenzene	ug/L	20	20.8	104	75-125
Chloroethane	ug/L	20	22.2	111	65-134
Chloroform	ug/L	20	23.1	115	75-125
Chloromethane	ug/L	20	21.2	106	39-150
is-1,2-Dichloroethene	ug/L	20	22.5	112	72-125
is-1,3-Dichloropropene	ug/L	20	22.6	113	75-125
Dibromochloromethane	ug/L	20	21.3	107	75-125
Dibromomethane	ug/L	20	23.3	116	75-125
Dichlorodifluoromethane	ug/L	20	22.7	114	50-134
Dichlorofluoromethane	ug/L	20	22.0	110	69-125
Diethyl ether (Ethyl ether)	ug/L	20	22.5	113	72-125
Ethylbenzene	ug/L	20	20.4	102	75-125
lexachloro-1,3-butadiene	ug/L	20	21.0	105	70-138
sopropylbenzene (Cumene)	ug/L	20	18.7	93	75-125
Methyl-tert-butyl ether	ug/L	20	22.6	113	73-125
lethylene Chloride	ug/L	20	20.7	103	73-125
-Butylbenzene	ug/L	20	21.0	105	72-133
-Propylbenzene	ug/L	20	18.4	92	72-133
laphthalene	ug/L	20	21.4	107	70-127
-Isopropyltoluene	ug/L	20	19.9	99	70-127
ec-Butylbenzene	ug/L ug/L	20	17.8	89	72-132 73-132
ec-butylberizerie Styrene	ug/L ug/L	20	21.4	107	75-132 75-125
ert-Butylbenzene	ug/L ug/L	20	19.1	96	75-125 73-128

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Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

LABORATORY CONTROL SAMPLE:	2150209					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Tetrachloroethene	ug/L	20	19.8	99	74-125	
Tetrahydrofuran	ug/L	200	168	84	62-133	SS
Toluene	ug/L	20	21.2	106	74-125	
trans-1,2-Dichloroethene	ug/L	20	22.8	114	69-125	
trans-1,3-Dichloropropene	ug/L	20	21.7	109	75-125	
Trichloroethene	ug/L	20	22.5	113	75-125	
Trichlorofluoromethane	ug/L	20	19.3	97	74-127	
Vinyl chloride	ug/L	20	20.6	103	66-132	
Xylene (Total)	ug/L	60	60.9	101	75-125	
1,2-Dichloroethane-d4 (S)	%.			106	75-125	
4-Bromofluorobenzene (S)	%.			94	75-125	
Toluene-d8 (S)	%.			98	75-125	

MATRIX SPIKE SAMPLE:	2150709						
		10332212003	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	21.2	106	70-138	
1,1,1-Trichloroethane	ug/L	ND	20	23.4	117	55-150	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	22.0	110	64-140	
1,1,2-Trichloroethane	ug/L	ND	20	23.7	118	67-137	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	26.1	131	51-150	
1,1-Dichloroethane	ug/L	50.5	20	75.0	123	49-150	
1,1-Dichloroethene	ug/L	30.7	20	56.5	129	40-150	
1,1-Dichloropropene	ug/L	ND	20	23.9	119	50-150	
1,2,3-Trichlorobenzene	ug/L	ND	20	20.1	101	59-148	
1,2,3-Trichloropropane	ug/L	ND	20	23.5	117	65-141	
1,2,4-Trichlorobenzene	ug/L	ND	20	21.1	105	61-140	
1,2,4-Trimethylbenzene	ug/L	ND	20	20.3	102	58-141	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	41.8	84	53-150	
1,2-Dibromoethane (EDB)	ug/L	ND	20	23.3	116	65-137	
1,2-Dichlorobenzene	ug/L	ND	20	20.0	100	66-133	
1,2-Dichloroethane	ug/L	ND	20	22.4	112	54-138	
1,2-Dichloropropane	ug/L	ND	20	21.9	110	62-138	
1,3,5-Trimethylbenzene	ug/L	ND	20	20.3	101	58-140	
1,3-Dichlorobenzene	ug/L	ND	20	21.4	107	66-132	
1,3-Dichloropropane	ug/L	ND	20	22.5	113	66-134	
1,4-Dichlorobenzene	ug/L	ND	20	20.3	102	65-129	
2,2-Dichloropropane	ug/L	ND	20	24.4	122	40-150	
2-Butanone (MEK)	ug/L	ND	100	116	116	51-147	
2-Chlorotoluene	ug/L	ND	20	20.2	101	58-147	
4-Chlorotoluene	ug/L	ND	20	20.9	105	64-138	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	121	121	59-143	
Acetone	ug/L	ND	100	146	146	63-147 I	S,SS
Allyl chloride	ug/L	ND	20	24.1	120	45-150	
Benzene	ug/L	ND	20	22.7	112	53-139	

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Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

MATRIX SPIKE SAMPLE:	2150709						
		10332212003	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/L	ND	20	22.4	112	66-136	
Bromochloromethane	ug/L	ND	20	22.5	112	64-136	
Bromodichloromethane	ug/L	ND	20	21.4	107	66-138	
Bromoform	ug/L	ND	20	18.3	91	59-136	
Bromomethane	ug/L	ND	20	14.6	73	30-150	
Carbon tetrachloride	ug/L	ND	20	20.5	102	56-150	
Chlorobenzene	ug/L	ND	20	21.4	107	65-133	
Chloroethane	ug/L	ND	20	21.5	107	48-150	
Chloroform	ug/L	ND	20	23.4	117	57-145	
Chloromethane	ug/L	ND	20	20.9	105	30-150	
cis-1,2-Dichloroethene	ug/L	257	20	384	638	49-150 E	,M1
cis-1,3-Dichloropropene	ug/L	ND	20	20.3	101	64-130	
Dibromochloromethane	ug/L	ND	20	19.1	95	68-138	
Dibromomethane	ug/L	ND	20	22.9	115	67-134	
Dichlorodifluoromethane	ug/L	ND	20	24.1	120	45-150	
Dichlorofluoromethane	ug/L	ND	20	21.5	108	54-150	
Diethyl ether (Ethyl ether)	ug/L	ND	20	23.6	118	50-145	
Ethylbenzene	ug/L	ND	20	21.4	107	55-139	
Hexachloro-1,3-butadiene	ug/L	ND	20	19.0	95	49-150	
Isopropylbenzene (Cumene)	ug/L	ND	20	19.5	97	64-142	
Methyl-tert-butyl ether	ug/L	ND	20	22.9	114	62-129	
Methylene Chloride	ug/L	ND	20	19.3	97	57-132	
n-Butylbenzene	ug/L	ND	20	21.3	106	55-150	
n-Propylbenzene	ug/L	ND	20	19.1	96	59-142	
Naphthalene	ug/L	ND	20	19.3	97	51-150	
p-Isopropyltoluene	ug/L	ND	20	20.3	101	60-149	
sec-Butylbenzene	ug/L	ND	20	18.4	92	60-150	
Styrene	ug/L	ND	20	22.4	112	68-134	
tert-Butylbenzene	ug/L	ND	20	19.9	99	62-146	
Tetrachloroethene	ug/L	ND	20	20.7	104	50-150	
Tetrahydrofuran	ug/L	ND	200	313	156	59-145 IS	S M1 SS
Toluene	ug/L	ND	20	22.0	110	52-148	,, 00
trans-1,2-Dichloroethene	ug/L	284	20	448	823	45-150 E	.M1
trans-1,3-Dichloropropene	ug/L	ND	20	21.0	105	68-132	,
Trichloroethene	ug/L	54.4	20	76.1	109	52-150	
Trichlorofluoromethane	ug/L	ND	20	19.6	98	55-150	
Vinyl chloride	ug/L	4.1	20	25.7	108	43-150	
Xylene (Total)	ug/L	ND	60	63.4	106	54-144	
1,2-Dichloroethane-d4 (S)	%.	.10	00	00.4	103	75-125	
4-Bromofluorobenzene (S)	%. %.				96	75-125 75-125	
Toluene-d8 (S)	%. %.				98	75-125 75-125	

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Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

SAMPLE DUPLICATE: 2152277		40000040004	Dom		N4	
Parameter	Units	10332212001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L		ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	1.4	1.5	5	30	
1,1-Dichloroethene	ug/L	ND	.46J		30	
1,1-Dichloropropene	ug/L	ND	ND		30	
1,2,3-Trichlorobenzene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2,4-Trichlorobenzene	ug/L	ND	ND		30	
1,2,4-Trimethylbenzene	ug/L	ND	.8J		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,3,5-Trimethylbenzene	ug/L	ND	.43J		30	
1,3-Dichlorobenzene	ug/L	ND	ND		30	
I,3-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2,2-Dichloropropane	ug/L	ND	ND		30	
2-Butanone (MEK)	_	ND ND	ND ND		30	
2-Chlorotoluene	ug/L	ND ND	ND ND		30	
4-Chlorotoluene	ug/L	ND ND	ND ND		30	
	ug/L	ND ND	ND ND			
4-Methyl-2-pentanone (MIBK)	ug/L	ND ND			30 30	
Acetone	ug/L	ND ND	ND			
Allyl chloride	ug/L		ND		30	
Benzene	ug/L	ND	ND		30	
Bromobenzene	ug/L	ND	ND		30	
3romochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	23.2	23.6	2	30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Dichlorodifluoromethane	ug/L	ND	ND		30	
Dichlorofluoromethane	ug/L	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	.3J		30	

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



**QUALITY CONTROL DATA** 

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

SAMPLE DUPLICATE: 2152277						
		10332212001	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/L	ND	ND		30	)
Isopropylbenzene (Cumene)	ug/L	ND	ND		30	)
Methyl-tert-butyl ether	ug/L	ND	ND		30	)
Methylene Chloride	ug/L	ND	ND		30	)
n-Butylbenzene	ug/L	ND	ND		30	)
n-Propylbenzene	ug/L	ND	ND		30	)
Naphthalene	ug/L	ND	ND		30	)
p-Isopropyltoluene	ug/L	ND	ND		30	)
sec-Butylbenzene	ug/L	ND	ND		30	)
Styrene	ug/L	ND	ND		30	)
tert-Butylbenzene	ug/L	ND	ND		30	)
Tetrachloroethene	ug/L	ND	ND		30	)
Tetrahydrofuran	ug/L	ND	ND		30	)
Toluene	ug/L	ND	1.2		30	C8
trans-1,2-Dichloroethene	ug/L	69.0	66.5	4	30	)
trans-1,3-Dichloropropene	ug/L	ND	ND		30	)
Trichloroethene	ug/L	16.5	16.1	2	30	)
Trichlorofluoromethane	ug/L	ND	ND		30	)
Vinyl chloride	ug/L	ND	.18J		30	)
Xylene (Total)	ug/L	ND	5.6		30	)
1,2-Dichloroethane-d4 (S)	%.	101	105	4		
4-Bromofluorobenzene (S)	%.	95	97	2		
Toluene-d8 (S)	%.	96	96	0		

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## **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

QC Batch: MSV/34009 Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B Analysis Description: 8260B MSV 465 W

Associated Lab Samples: 10332212004

METHOD BLANK: 2151496 Matrix: Water

Associated Lab Samples: 10332212004

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	12/08/15 10:46	
1,1,1-Trichloroethane	ug/L	ND	1.0	12/08/15 10:46	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	12/08/15 10:46	
1,1,2-Trichloroethane	ug/L	ND	1.0	12/08/15 10:46	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	12/08/15 10:46	
1,1-Dichloroethane	ug/L	ND	1.0	12/08/15 10:46	
1,1-Dichloroethene	ug/L	ND	1.0	12/08/15 10:46	
1,1-Dichloropropene	ug/L	ND	1.0	12/08/15 10:46	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	12/08/15 10:46	
1,2,3-Trichloropropane	ug/L	ND	4.0	12/08/15 10:46	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	12/08/15 10:46	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	12/08/15 10:46	
1,2-Dibromo-3-chloropropane	ug/L	ND	4.0	12/08/15 10:46	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	12/08/15 10:46	
1,2-Dichlorobenzene	ug/L	ND	1.0	12/08/15 10:46	
1,2-Dichloroethane	ug/L	ND	1.0	12/08/15 10:46	
1,2-Dichloropropane	ug/L	ND	4.0	12/08/15 10:46	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	12/08/15 10:46	
1,3-Dichlorobenzene	ug/L	ND	1.0	12/08/15 10:46	
1,3-Dichloropropane	ug/L	ND	1.0	12/08/15 10:46	
1,4-Dichlorobenzene	ug/L	ND	1.0	12/08/15 10:46	
2,2-Dichloropropane	ug/L	ND	4.0	12/08/15 10:46	
2-Butanone (MEK)	ug/L	ND	5.0	12/08/15 10:46	
2-Chlorotoluene	ug/L	ND	1.0	12/08/15 10:46	
4-Chlorotoluene	ug/L	ND	1.0	12/08/15 10:46	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	12/08/15 10:46	
Acetone	ug/L	ND	20.0	12/08/15 10:46	
Allyl chloride	ug/L	ND	4.0	12/08/15 10:46	
Benzene	ug/L	ND	1.0	12/08/15 10:46	
Bromobenzene	ug/L	ND	1.0	12/08/15 10:46	
Bromochloromethane	ug/L	ND	1.0	12/08/15 10:46	
Bromodichloromethane	ug/L	ND	1.0	12/08/15 10:46	
Bromoform	ug/L	ND	4.0	12/08/15 10:46	
Bromomethane	ug/L	ND	4.0	12/08/15 10:46	
Carbon tetrachloride	ug/L	ND	1.0	12/08/15 10:46	
Chlorobenzene	ug/L	ND	1.0	12/08/15 10:46	
Chloroethane	ug/L	ND	1.0	12/08/15 10:46	
Chloroform	ug/L	ND	1.0	12/08/15 10:46	
Chloromethane	ug/L	ND	4.0	12/08/15 10:46	
cis-1,2-Dichloroethene	ug/L	ND	1.0	12/08/15 10:46	
cis-1,3-Dichloropropene	ug/L	ND	4.0	12/08/15 10:46	

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



# **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

METHOD BLANK: 2151496 Matrix: Water

Associated Lab Samples: 10332212004

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/L	ND	1.0	12/08/15 10:46	
Dibromomethane	ug/L	ND	4.0	12/08/15 10:46	
Dichlorodifluoromethane	ug/L	ND	1.0	12/08/15 10:46	
Dichlorofluoromethane	ug/L	ND	1.0	12/08/15 10:46	
Diethyl ether (Ethyl ether)	ug/L	ND	4.0	12/08/15 10:46	
Ethylbenzene	ug/L	ND	1.0	12/08/15 10:46	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	12/08/15 10:46	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	12/08/15 10:46	
Methyl-tert-butyl ether	ug/L	ND	1.0	12/08/15 10:46	
Methylene Chloride	ug/L	ND	4.0	12/08/15 10:46	
n-Butylbenzene	ug/L	ND	1.0	12/08/15 10:46	
n-Propylbenzene	ug/L	ND	1.0	12/08/15 10:46	
Naphthalene	ug/L	ND	4.0	12/08/15 10:46	
p-Isopropyltoluene	ug/L	ND	1.0	12/08/15 10:46	
sec-Butylbenzene	ug/L	ND	1.0	12/08/15 10:46	
Styrene	ug/L	ND	1.0	12/08/15 10:46	
tert-Butylbenzene	ug/L	ND	1.0	12/08/15 10:46	
Tetrachloroethene	ug/L	ND	1.0	12/08/15 10:46	
Tetrahydrofuran	ug/L	ND	10.0	12/08/15 10:46	
Toluene	ug/L	ND	1.0	12/08/15 10:46	
trans-1,2-Dichloroethene	ug/L	ND	1.0	12/08/15 10:46	
trans-1,3-Dichloropropene	ug/L	ND	4.0	12/08/15 10:46	
Trichloroethene	ug/L	ND	0.40	12/08/15 10:46	
Trichlorofluoromethane	ug/L	ND	1.0	12/08/15 10:46	
Vinyl chloride	ug/L	ND	0.40	12/08/15 10:46	
Xylene (Total)	ug/L	ND	3.0	12/08/15 10:46	
1,2-Dichloroethane-d4 (S)	%.	94	75-125	12/08/15 10:46	
4-Bromofluorobenzene (S)	%.	98	75-125	12/08/15 10:46	
Toluene-d8 (S)	%.	96	75-125	12/08/15 10:46	

LABORATORY CONTROL SAMPLE:	2151497					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L		20.4	102	75-125	
1,1,1-Trichloroethane	ug/L	20	19.2	96	75-125	
1,1,2,2-Tetrachloroethane	ug/L	20	19.4	97	75-125	
1,1,2-Trichloroethane	ug/L	20	20.4	102	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.9	90	60-135	
1,1-Dichloroethane	ug/L	20	18.2	91	69-125	
1,1-Dichloroethene	ug/L	20	18.4	92	68-125	
1,1-Dichloropropene	ug/L	20	18.6	93	74-125	
1,2,3-Trichlorobenzene	ug/L	20	19.5	97	69-136	
1,2,3-Trichloropropane	ug/L	20	20.3	102	75-125	
1,2,4-Trichlorobenzene	ug/L	20	19.2	96	73-127	

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Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

_ABORATORY CONTROL SAMPLE:	2151497	Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,2,4-Trimethylbenzene	 ug/L		20.9	105	75-125	
,2-Dibromo-3-chloropropane	ug/L	50	51.4	103	65-145	
,2-Dibromoethane (EDB)	ug/L	20	20.6	103	75-125	
,2-Dichlorobenzene	ug/L	20	19.9	100	75-125	
,2-Dichloroethane	ug/L	20	18.7	93	73-125	
,2-Dichloropropane	ug/L	20	19.8	99	75-125	
,3,5-Trimethylbenzene	ug/L	20	20.2	101	75-125	
,3-Dichlorobenzene	ug/L	20	19.8	99	74-125	
,3-Dichloropropane	ug/L	20	19.4	97	75-125	
,4-Dichlorobenzene	ug/L	20	19.1	95	75-125	
,2-Dichloropropane	ug/L	20	19.3	96	59-139	
-Butanone (MEK)	ug/L	100	90.9	91	63-130	
-Chlorotoluene	ug/L	20	19.4	97	72-125	
-Chlorotoluene	ug/∟ ug/L	20	20.1	101	72-125	
Chloroloidene Methyl-2-pentanone (MIBK)	ug/∟ ug/L	100	95.0	95	71-126	
Acetone	ug/∟ ug/L	100	95.0 82.4	95 82	69-131	
Allyl chloride		20	16.2	81	67-125	
Renzene	ug/L ug/L	20	18.7	93	71-125	
	ug/L ug/L			100	71-125 75-125	
Bromobenzene Bromochloromethane		20	20.0		75-125 75-125	
	ug/L	20 20	19.6 20.7	98	75-125 75-125	
Bromodichloromethane	ug/L			104		
romoform	ug/L	20	22.4	112	70-125	
romomethane	ug/L	20	19.1	96	30-150	
Carbon tetrachloride	ug/L	20	19.2	96	75-126	
Chlorobenzene	ug/L	20	19.1	96	75-125	
Chloroethane	ug/L	20	18.7	94	65-134	
Chloroform	ug/L	20	19.8	99	75-125	
chloromethane	ug/L	20	17.3	86	39-150	
is-1,2-Dichloroethene	ug/L	20	18.3	91	72-125	
is-1,3-Dichloropropene	ug/L	20	21.1	106	75-125	
Dibromochloromethane	ug/L	20	20.6	103	75-125	
Dibromomethane	ug/L	20	21.8	109	75-125	
Dichlorodifluoromethane	ug/L	20	17.8	89	50-134	
Dichlorofluoromethane	ug/L	20	19.0	95	69-125	
Diethyl ether (Ethyl ether)	ug/L	20	18.8	94	72-125	
thylbenzene	ug/L	20	19.9	99	75-125	
lexachloro-1,3-butadiene	ug/L	20	20.6	103	70-138	
sopropylbenzene (Cumene)	ug/L	20	22.1	110	75-125	
1ethyl-tert-butyl ether	ug/L	20	19.9	100	73-125	
lethylene Chloride	ug/L	20	18.6	93	73-125	
-Butylbenzene	ug/L	20	19.6	98	72-133	
-Propylbenzene	ug/L	20	19.5	98	72-126	
laphthalene	ug/L	20	18.3	92	70-127	
-Isopropyltoluene	ug/L	20	20.4	102	72-132	
ec-Butylbenzene	ug/L	20	20.1	100	73-132	
Styrene	ug/L	20	21.3	106	75-125	
ert-Butylbenzene	ug/L	20	20.2	101	73-128	

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Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

ABORATORY CONTROL SAMPLE:	2151497					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Tetrachloroethene	ug/L	20	20.4	102	74-125	
- etrahydrofuran	ug/L	200	176	88	62-133	
oluene	ug/L	20	18.8	94	74-125	
ans-1,2-Dichloroethene	ug/L	20	18.5	93	69-125	
ns-1,3-Dichloropropene	ug/L	20	20.7	104	75-125	
chloroethene	ug/L	20	20.4	102	75-125	
chlorofluoromethane	ug/L	20	20.1	101	74-127	
yl chloride	ug/L	20	18.7	94	66-132	
lene (Total)	ug/L	60	61.0	102	75-125	
2-Dichloroethane-d4 (S)	%.			98	75-125	
Bromofluorobenzene (S)	%.			97	75-125	
oluene-d8 (S)	%.			96	75-125	

MATRIX SPIKE SAMPLE:	2151890						
		10331531004	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	21.5	107	70-138	
1,1,1-Trichloroethane	ug/L	ND	20	20.4	102	55-150	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	18.9	95	64-140	
1,1,2-Trichloroethane	ug/L	ND	20	21.0	105	67-137	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	20.3	102	51-150	
1,1-Dichloroethane	ug/L	ND	20	19.1	96	49-150	
1,1-Dichloroethene	ug/L	ND	20	19.9	100	40-150	
1,1-Dichloropropene	ug/L	ND	20	19.5	98	50-150	
1,2,3-Trichlorobenzene	ug/L	ND	20	19.0	95	59-148	
1,2,3-Trichloropropane	ug/L	ND	20	20.3	101	65-141	
1,2,4-Trichlorobenzene	ug/L	ND	20	19.5	98	61-140	
1,2,4-Trimethylbenzene	ug/L	19.0	20	41.1	111	58-141	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	52.1	104	53-150	
1,2-Dibromoethane (EDB)	ug/L	ND	20	20.6	103	65-137	
1,2-Dichlorobenzene	ug/L	ND	20	19.7	98	66-133	
1,2-Dichloroethane	ug/L	175	20	229	272	54-138 M	1
1,2-Dichloropropane	ug/L	ND	20	19.6	98	62-138	
1,3,5-Trimethylbenzene	ug/L	6.4	20	27.2	104	58-140	
1,3-Dichlorobenzene	ug/L	ND	20	19.9	100	66-132	
1,3-Dichloropropane	ug/L	ND	20	20.2	101	66-134	
1,4-Dichlorobenzene	ug/L	ND	20	18.5	93	65-129	
2,2-Dichloropropane	ug/L	ND	20	20.7	103	40-150	
2-Butanone (MEK)	ug/L	ND	100	91.1	91	51-147	
2-Chlorotoluene	ug/L	ND	20	20.6	103	58-147	
4-Chlorotoluene	ug/L	ND	20	19.9	100	64-138	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	93.8	94	59-143	
Acetone	ug/L	ND	100	98.9	89	63-147	
Allyl chloride	ug/L	ND	20	15.9	80	45-150	
Benzene	ug/L	50.5	20	71.7	106	53-139	

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Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

MATRIX SPIKE SAMPLE:	2151890						
_		10331531004	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/L	ND	20	20.3	101	66-136	
Bromochloromethane	ug/L	ND	20	19.5	98	64-136	
Bromodichloromethane	ug/L	ND	20	20.5	102	66-138	
Bromoform	ug/L	ND	20	22.6	113	59-136	
Bromomethane	ug/L	ND	20	20.0	100	30-150	
Carbon tetrachloride	ug/L	ND	20	20.9	105	56-150	
Chlorobenzene	ug/L	ND	20	19.4	97	65-133	
Chloroethane	ug/L	ND	20	19.1	96	48-150	
Chloroform	ug/L	ND	20	20.4	102	57-145	
Chloromethane	ug/L	ND	20	19.2	88	30-150	
cis-1,2-Dichloroethene	ug/L	ND	20	19.8	99	49-150	
cis-1,3-Dichloropropene	ug/L	ND	20	21.2	106	64-130	
Dibromochloromethane	ug/L	ND	20	21.2	106	68-138	
Dibromomethane	ug/L	ND	20	21.3	106	67-134	
Dichlorodifluoromethane	ug/L	ND	20	19.4	97	45-150	
Dichlorofluoromethane	ug/L	ND	20	18.6	93	54-150	
Diethyl ether (Ethyl ether)	ug/L	ND	20	19.2	96	50-145	
Ethylbenzene	ug/L	36.3	20	49.7	67	55-139	
Hexachloro-1,3-butadiene	ug/L	ND	20	20.2	101	49-150	
Isopropylbenzene (Cumene)	ug/L	2.0	20	24.2	111	64-142	
Methyl-tert-butyl ether	ug/L	ND	20	19.7	98	62-129	
Methylene Chloride	ug/L	ND	20	20.6	96	57-132	
n-Butylbenzene	ug/L	ND	20	20.3	100	55-150	
n-Propylbenzene	ug/L	3.4	20	22.5	95	59-142	
Naphthalene	ug/L	ND	20	20.3	89	51-150	
p-Isopropyltoluene	ug/L	ND	20	21.1	104	60-149	
sec-Butylbenzene	ug/L	ND	20	20.8	102	60-150	
Styrene	ug/L	ND	20	22.5	112	68-134	
tert-Butylbenzene	ug/L	ND	20	20.6	103	62-146	
Tetrachloroethene	ug/L	ND	20	21.5	107	50-150	
Tetrahydrofuran	ug/L	ND	200	174	87	59-145	
Toluene	ug/L	113	20	107	-28	52-148 M	11
trans-1,2-Dichloroethene	ug/L	ND	20	19.8	99	45-150	
trans-1,3-Dichloropropene	ug/L	ND	20	21.0	105	68-132	
Trichloroethene	ug/L	ND	20	21.5	107	52-150	
Trichlorofluoromethane	ug/L	ND	20	21.5	107	55-150	
Vinyl chloride	ug/L	ND	20	20.4	102	43-150	
Xylene (Total)	ug/L	121	60	161	67	54-144	
1,2-Dichloroethane-d4 (S)	%.	121	00	101	93	75-125	
4-Bromofluorobenzene (S)	%. %.				98	75-125 75-125	
Toluene-d8 (S)	%. %.				98	75-125 75-125	

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Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

SAMPLE DUPLICATE: 2151891		10332176003	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L		ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,1-Dichloropropene	ug/L	ND	ND		30	
1,2,3-Trichlorobenzene	ug/L	8.6	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2,4-Trichlorobenzene	ug/L	ND	ND		30	
1,2,4-Trimethylbenzene	ug/L	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/L	ND	ND		30	
1,2-Distribution (LDB)	ug/L	ND ND	ND ND		30	
1,2-Dichloroethane	-	ND	ND ND		30	
-	ug/L	ND ND	ND ND		30	
1,2-Dichloropropane	ug/L	ND ND	ND ND			
1,3,5-Trimethylbenzene	ug/L	ND ND			30	
1,3-Dichlorobenzene	ug/L	ND ND	ND		30	
1,3-Dichloropropane	ug/L		ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2,2-Dichloropropane	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	18.4J		30	
2-Chlorotoluene	ug/L	ND	ND		30	
4-Chlorotoluene	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	63.9J		30	
Allyl chloride	ug/L	ND	ND		30	
Benzene	ug/L	ND	1.6J		30	
Bromobenzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Dichlorodifluoromethane	ug/L	ND	ND		30	
Dichlorofluoromethane	ug/L	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	

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# **QUALITY CONTROL DATA**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

SAMPLE DUPLICATE: 2151891						
		10332176003	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/L	ND	ND		30	
Isopropylbenzene (Cumene)	ug/L	ND	ND		30	
Methyl-tert-butyl ether	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
n-Butylbenzene	ug/L	ND	ND		30	
n-Propylbenzene	ug/L	ND	ND		30	
Naphthalene	ug/L	ND	10.1J		30	
p-Isopropyltoluene	ug/L	ND	ND		30	
sec-Butylbenzene	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
tert-Butylbenzene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Tetrahydrofuran	ug/L	ND	ND		30	
Toluene	ug/L	ND	2.1J		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	94	93	1		
4-Bromofluorobenzene (S)	%.	95	97	2		
Toluene-d8 (S)	%.	96	96	0		

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## **QUALIFIERS**

Project: PS BETA-NIROP
Pace Project No.: 10332212

#### **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.

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.

## **ANALYTE QUALIFIERS**

Date: 12/09/2015 09:18 AM

1M	The sample was analyzed at a dilution due to a large amount of sediment in the vials.
C0	Result confirmed by second analysis.
C8	Result may be biased high due to carryover from previously analyzed sample.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
IS	The internal standard recovery associated with this result exceeds the lower control limit. The reported result should be considered an estimated value.
L0	Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples. Results unaffected by high bias.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
SS	This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.





# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: PS BETA-NIROP

Pace Project No.: 10332212

Date: 12/09/2015 09:18 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10332212001	PMW-4	EPA 8260B	MSV/33992	_	
10332212002	PMW-3	EPA 8260B	MSV/33992		
10332212003	PMW-2	EPA 8260B	MSV/33992		
10332212004	PMW-1	EPA 8260B	MSV/34009		
10332212005	TB-1	EPA 8260B	MSV/33992		

# CHAIN-OF-CUSTODY / Analytical Request Document

Pace Analytical #2-DA TRTX

Fax: 343-366-8090 2 days

equested Due Date/TAT: hone: 949-366-8000

San Clemente, CA 92673 Mpham@regenesis.com

mail To:

1011 Calle Sombra

ddress:

Regenesis

ompany:

Section A Required Client Information:

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

DRINKING WATER OTHER ₽ GROUND WATER Page: REGULATORY AGENCY RCRA Σ L Site Location STATE: L NPDES TSU \_\_ 1011 Calle Sombra Company Name: Regenesis Bahar Naderi 21466 Pace Quote Reference: Pace Project Manager: Pace Profile #: Section C Attention: Address: roject Name: PS Beta - NIROP roject Number: PS Beta - NIROP Section B
Required Project Information:
Report To: Melinda Pham urchase Order No.: Copy To:

Requested Analysis Filtered (Y/N)

SAMPLE ID WATER WA	Preservatives >
AUST BE UNIQUE TISSUE TO THE TIME DATE DATE DATE DATE DATE DATE DATE DAT	
4 TAT & TAVIS 0925 3  10	H2SO <sub>4</sub> HNO <sub>3</sub> HOI NaOH Ma <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol Other  The State of the state of the
3	· ·
DAY TAT & MATE 1235 3  THE STATE STA	er n
ADDITIONAL COMMENTS  ADDITIONAL COMMENTS  RELINGUISHED BY (AFFILIATION DATE  RELINGUISHED BY (AFFILIATION PAYER)	
ADDITIONAL COMMENTS  RELINQUISHED BY AFFILIATION  RELINQUISHED BY AFFILIATION  RELINGUISHED  AFFILIATION  RELINGUISH BY AFFILIATION  RELINGUISH BY AFFILIATION  R	2
ADDITIONAL COMMENTS  RELINGUISHED BY / AFFILIATION  DATE  RELINGUISHED BY / AFFILIATION  PUL/1/5	
RELINQUISHED BY / AFFILIATION DATE	
RELINQUISHED BY / AFFILIATION DATE	
RELINQUISHED BY / AFFILIATION DATE	
RELINQUISHED BY / AFFILIATION DATE    Manual	
18/1	IE ACCEPTED BY / AFPILIATION DATE TIME SAMPLE CONDITIONS
	25 Jun 16 2 Dec 14th 1506 4.5 7 1
	3.i
SAMPLER NAME AND SIGNATURE	u() pejr
PRINT Name of SAMPLER: HE	Temp in °C Temp in °C

F-ALL-Q-020rev.08, 12-Oct-2007

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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Project Manager Review:/

hold, incorrect preservative, out of temp, incorrect containers).

# Document Name:

## Sample Condition Upon Receipt Form

Document No.: F-MN-L-213-rev.13

Document Revised: 23Feb2015 Page 1 of 1

Issuing Authority:
Pace Minnesota Quality Office

Sample Condition Client Name: Project #: WO#:10332212 Upon Receipt Regenest 5 USPS Courier: SpeeDee Commercial Pace Other: Tracking Number: \_\_\_\_ rioj. Due Date: Proj. Name: No Seals Intact? Yes No None Other:\_\_ Packing Material: Bubble Wrap Bubble Bags Temp Blank? Yes Thermometer B88A9130516413 B88A912167504 Type of Ice: Wet Blue None Samples on ice, cooling process has begun Used: **™**B88A0143310098 Cooler Temp Corrected (°C): 4.5/3.1 Cooler Temp Read (°C): 4.1/2, 7 Biological Tissue Frozen? Yes No to.4 Date and Initials of Person Examining Contents: | Bm 12/4/15 Temp should be above freezing to 6°C Correction Factor: USDA Regulated Soil ( N/A, water sample) Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, ID, LA. Did samples originate from a foreign source (internationally, Yes No including Hawaii and Puerto Rico)? MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)? TYes □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? □N/A 1. Yes □No Chain of Custody Filled Out? Yes □No 2. □N/A Yes Chain of Custody Relinquished? □No □N/A 3. Yes □No 4. Sampler Name and/or Signature on COC? □N/A Samples Arrived within Hold Time? □No □N/A Short Hold Time Analysis (<72 hr)? ∐Yes No □N/A 6. Rush Turn Around Time Requested? □No □N/A Sufficient Volume? YYes □No □N/A Correct Containers Used? Yes □No □N/A -Pace Containers Used? Yes □No □N/A Containers Intact? Yes □No □N/A 10. Filtered Volume Received for Dissolved Tests? □Yes □No MN/A 11. Note if sediment is visible in the dissolved container Sample Labels Match COC? Yes □No □N/A 12. -Includes Date/Time/ID/Analysis Matrix: All containers needing acid/base preservation have been 13. ∏HNO<sub>3</sub> ☐H<sub>2</sub>SO<sub>4</sub> □NaOH Пнсі N/A checked? Yes □No All containers needing preservation are found to be in Sample # compliance with EPA recommendation? (HNO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub>, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) Yes □No N/A Exceptions A, Coliform, TOC, Oil and Grease, Initial when Lot # of added Yes DRO/8015 (water) DOC No □N/A completed: preservative: Headspace in VOA Vials (>6mm)? Yes MNO □N/A 14. 15. Trip Blank Present? **∑**Yes □No □N/A Trip Blank Custody Seals Present? Yes □No □N/A Pace Trip Blank Lot # (if purchased):\_ **CLIENT NOTIFICATION/RESOLUTION** Field Data Required? Yes No Date/Time: Person Contacted: Comments/Resolution:

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

Date:

Page 32 of 32





December 18, 2015

Melinda Pham Regenesis 1011 Calle Sombra San Clemente, CA 92673

RE: Project: PS Beta-NIROP

Pace Project No.: 10332217

## Dear Melinda Pham:

Enclosed are the analytical results for sample(s) received by the laboratory on December 04, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

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

Sincerely,

Jennifer Anderson jennifer.anderson@pacelabs.com Project Manager

JAndera

Enclosures

cc: Ryan Moore, Regenesis







## **CERTIFICATIONS**

Project: PS Beta-NIROP Pace Project No.: 10332217

**Minnesota Certification IDs** 

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770 Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA Colorado Certification #Pace Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L Florida/NELAP Certification #: E87605 Guam Certification #:14-008r

Georgia Certification #: 959 Georgia EPD #: Pace

Idaho Certification #: MN00064 Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01 Iowa Certification #: 368

Kansas Certification #: E-10167 Kentucky Dept of Envi. Protection - DW #90062 Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001 Maine Certification #: 2013011 Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace Montana Certification #: MT0092 Nevada Certification #: MN\_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002 New York Certification #: 11647 North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036 Ohio EPA #: 4150 Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563

Puerto Rico Certification Saipan (CNMI) #:MP0003 South Carolina #:74003001 Texas Certification #: T104704192 Tennessee Certification #: 02818 Utah Certification #: MN000642013-4 Virginia DGS Certification #: 251 Washington Certification #: C486 West Virginia Certification #: 382 West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970

**Montana Certification IDs** 

150 N. 9th Street, Billings, MT 59101 Colorado Asbestos #: 17119 A2LA Certification #: 3590.01 EPA Region 8 Certification #: 8TMS-L

Idaho Certification #: MT00012

Minnesota Dept of Health Certification #: 030-999-442

Montana Certification #: MT CERT0040 North Dakota Dept. Of Health #: R-209 NVLAP Certification #: 101292-0

Washington Department of Ecology #: C993

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785 Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470 WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

**Ormond Beach Certification IDs** 

8 East Tower Circle, Ormond Beach, FL 32174

Alabama Certification #: 41320 Connecticut Certification #: PH-0216

Delaware Certification: FL NELAC Reciprocity

Florida Certification #: E83079 Georgia Certification #: 955

Guam Certification: FL NELAC Reciprocity

Hawaii Certification: FL NELAC Reciprocity

Illinois Certification #: 200068

Indiana Certification: FL NELAC Reciprocity

Kansas Certification #: E-10383

Kentucky Certification #: 90050

Louisiana Certification #: FL NELAC Reciprocity Louisiana Environmental Certificate #: 05007

Maryland Certification: #346

Michigan Certification #: 9911

Mississippi Certification: FL NELAC Reciprocity

Missouri Certification #: 236 Montana Certification #: Cert 0074 Nebraska Certification: NE-OS-28-14 Nevada Certification: FL NELAC Reciprocity New Hampshire Certification #: 2958 New York Certification #: 11608

North Carolina Environmental Certificate #: 667

North Carolina Certification #: 12710 North Dakota Certification #: R-216 Oklahoma Certification #: D9947 Pennsylvania Certification #: 68-00547 Puerto Rico Certification #: FL01264 South Carolina Certification: #96042001 Tennessee Certification #: TN02974

Texas Certification: FL NELAC Reciprocity US Virgin Islands Certification: FL NELAC Reciprocity

Virginia Environmental Certification #: 460165

## REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700

# **CERTIFICATIONS**

Project: PS Beta-NIROP
Pace Project No.: 10332217

Ormond Beach Certification IDs West Virginia Certification #: 9962C Wisconsin Certification #: 399079670

Wyoming (EPA Region 8): FL NELAC Reciprocity

1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700



# **SAMPLE SUMMARY**

Project: PS Beta-NIROP
Pace Project No.: 10332217

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
10332217001	PMW-4	Water	12/04/15 09:25	12/04/15 15:06	
10332217002	PMW-3	Water	12/04/15 10:50	12/04/15 15:06	
10332217003	PMW-2	Water	12/04/15 12:35	12/04/15 15:06	
10332217004	PMW-1	Water	12/04/15 13:40	12/04/15 15:06	



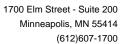
# **SAMPLE ANALYTE COUNT**

Project: PS Beta-NIROP
Pace Project No.: 10332217

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10332217001	PMW-4	RSK 175	DR1	3	PASI-M
		EPA 6010C	DM	1	PASI-M
		6010C Met	IP	1	PASI-M
		SM 4500-S2-D	JME	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	NMT	2	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	KEO	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V
0332217002	PMW-3	RSK 175	DR1	3	PASI-M
		EPA 6010C	DM	1	PASI-M
		6010C Met	IP	1	PASI-M
		SM 4500-S2-D	JME	1	PASI-MT
		SM 2320B	MW	3	PASI-M
	SM 2320B	NMT	2	PASI-O	
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	KEO	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V
0332217003	PMW-2	RSK 175	DR1	3	PASI-M
		EPA 6010C	DM	1	PASI-M
		6010C Met	IP	1	PASI-M
		SM 4500-S2-D	JME	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	NMT	2	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	KEO	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V
0332217004	PMW-1	RSK 175	DR1	3	PASI-M
		EPA 6010C	DM	1	PASI-M
		6010C Met	IP	1	PASI-M
		SM 4500-S2-D	JME	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	NMT	2	PASI-O
		EPA 300.0	KEO	1	PASI-M

# **REPORT OF LABORATORY ANALYSIS**

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# **SAMPLE ANALYTE COUNT**

Project: PS Beta-NIROP
Pace Project No.: 10332217

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 353.2	KEO	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V



# **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10332217

Date: 12/18/2015 01:09 PM

Sample: PMW-4	Lab ID: 1033	32217001	Collected: 12/04/1	5 09:25	Received: 12	2/04/15 15:06	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual		
RSK 175 AIR Headspace	Analytical Meth	nod: RSK 1	75							
Ethane	ND	ug/L	10.0	1		12/08/15 11:41	74-84-0			
Ethene	ND	ug/L	10.0	1		12/08/15 11:41	74-85-1			
Methane	ND	ug/L	10.0	1		12/08/15 11:41	74-82-8			
6010C MET ICP	Analytical Meth	Analytical Method: EPA 6010C Preparation Method: EPA 3010								
ron	8940	ug/L	50.0	1	12/07/15 21:52	12/08/15 12:48	7439-89-6			
6010C MET ICP, Dissolved	Analytical Meth	nod: 6010C	Met Preparation Me	thod: El	PA 3010					
ron, Dissolved	3370	ug/L	50.0	1	12/07/15 21:49	12/08/15 10:45	7439-89-6			
4500S2D Sulfide Water	Analytical Meth	nod: SM 45	00-S2-D							
Sulfide	ND	mg/L	0.10	1		12/10/15 11:49	l			
2320B Alkalinity	Analytical Meth	nod: SM 23	20B							
Alkalinity, Total as CaCO3	268	mg/L	5.0	1		12/09/15 12:05	;			
Carbon Dioxide (SM4500CO2D)	36.0	mg/L	5.0	1		12/09/15 12:05	124-38-9			
Alkalinity, Total as CaCO3	273	mg/L	5.0	1		12/16/15 12:58				
Alkalinity,Bicarbonate (CaCO3)	273	mg/L	5.0	1		12/16/15 12:58				
Alkalinity, Carbonate (CaCO3)	ND	mg/L	5.0	1		12/16/15 12:58	}			
300.0 IC Anions	Analytical Meth	nod: EPA 30	0.00							
Sulfate	97.1	mg/L	1.2	1		12/10/15 18:41	14808-79-8			
353.2 Nitrate + Nitrite	Analytical Meth	nod: EPA 35	53.2							
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		12/10/15 09:21				
5220D COD	Analytical Meth	nod: SM 52	20D Preparation Met	thod: SN	/I 5220D					
Chemical Oxygen Demand	ND	mg/L	50.0	1	12/09/15 09:44	12/09/15 15:22				
310C TOC	Analytical Meth	od: SM 53	10C							
Total Organic Carbon	2.9	mg/L	1.0	1		12/09/15 17:13	7440-44-0			



# **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10332217

Date: 12/18/2015 01:09 PM

Sample: PMW-3	Lab ID: 1033	32217002	Collected:	12/04/1	5 10:50	Received: 1	2/04/15 15:06 I	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qua
RSK 175 AIR Headspace	Analytical Meth	od: RSK 1	75						
Ethane	ND	ug/L		10.0	1		12/08/15 11:49		
Ethene	ND	ug/L		10.0	1		12/08/15 11:49		
Methane	36.9	ug/L		10.0	1		12/08/15 11:49	74-82-8	
6010C MET ICP	Analytical Meth	od: EPA 60	010C Prepar	ation Me	ethod: El	PA 3010			
Iron	8360	ug/L		50.0	1	12/07/15 21:52	12/08/15 12:51	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	od: 6010C	Met Prepara	ation Me	thod: EF	PA 3010			
Iron, Dissolved	7260	ug/L		50.0	1	12/07/15 21:49	12/08/15 11:05	7439-89-6	
4500S2D Sulfide Water	Analytical Meth	od: SM 45	00-S2-D						
Sulfide	ND	mg/L		0.10	1		12/10/15 11:52	!	
2320B Alkalinity	Analytical Meth	od: SM 23	20B						
Alkalinity, Total as CaCO3	364	mg/L		5.0	1		12/09/15 12:20	)	
Carbon Dioxide (SM4500CO2D)	48.0	mg/L		5.0	1		12/09/15 12:20		
Alkalinity, Total as CaCO3	370	mg/L		5.0	1		12/16/15 13:09		
Alkalinity,Bicarbonate (CaCO3)	370	mg/L		5.0	1		12/16/15 13:09		
Alkalinity, Carbonate (CaCO3)	ND	mg/L		5.0	1		12/16/15 13:09	)	
300.0 IC Anions	Analytical Meth	od: EPA 30	0.00						
Sulfate	136	mg/L		2.4	2		12/10/15 21:06	14808-79-8	
353.2 Nitrate + Nitrite	Analytical Meth	od: EPA 3	53.2						
Nitrogen, NO2 plus NO3	ND	mg/L		0.020	1		12/10/15 09:22	2	
5220D COD	Analytical Meth	od: SM 52	20D Prepara	ation Met	thod: SM	1 5220D			
Chemical Oxygen Demand	ND	mg/L		50.0	1	12/09/15 09:44	12/09/15 15:23	3	
5310C TOC	Analytical Meth	od: SM 53	10C						
Total Organic Carbon	3.0	mg/L		1.0	1		12/09/15 17:52	7440-44-0	



# **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10332217

Date: 12/18/2015 01:09 PM

Sample: PMW-2	Lab ID: 1033	32217003	Collected:	12/04/1	5 12:35	Received: 12	/04/15 15:06 N	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Meth	nod: RSK 1	75						
Ethane	ND	ug/L		10.0	1		12/08/15 12:30	74-84-0	
Ethene	ND	ug/L		10.0	1		12/08/15 12:30		
Methane	13.2	ug/L		10.0	1		12/08/15 12:30	74-82-8	
6010C MET ICP	Analytical Meth	nod: EPA 60	010C Prepara	ation Me	ethod: El	PA 3010			
Iron	7070	ug/L		50.0	1	12/07/15 21:52	12/08/15 12:54	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	nod: 6010C	Met Prepara	ition Me	thod: EF	PA 3010			
Iron, Dissolved	5480	ug/L		50.0	1	12/07/15 21:49	12/08/15 11:09	7439-89-6	
4500S2D Sulfide Water	Analytical Meth	nod: SM 45	00-S2-D						
Sulfide	ND	mg/L		0.10	1		12/10/15 11:54		
2320B Alkalinity	Analytical Meth	nod: SM 23	20B						
Alkalinity, Total as CaCO3	413	mg/L		5.0	1		12/09/15 12:29		
Carbon Dioxide (SM4500CO2D)	51.9	mg/L		5.0	1		12/09/15 12:29		
Alkalinity, Total as CaCO3	425	mg/L		5.0	1		12/16/15 13:14		
Alkalinity,Bicarbonate (CaCO3)	425	mg/L		5.0	1		12/16/15 13:14		
Alkalinity,Carbonate (CaCO3)	ND	mg/L		5.0	1		12/16/15 13:14		
300.0 IC Anions	Analytical Meth	nod: EPA 30	0.00						
Sulfate	147	mg/L		2.4	2		12/10/15 21:55	14808-79-8	
353.2 Nitrate + Nitrite	Analytical Meth	nod: EPA 3	53.2						
Nitrogen, NO2 plus NO3	ND	mg/L		0.020	1		12/10/15 09:26		
5220D COD	Analytical Meth	nod: SM 52	20D Prepara	tion Met	thod: SM	1 5220D			
Chemical Oxygen Demand	ND	mg/L		50.0	1	12/09/15 09:44	12/09/15 15:23		
5310C TOC	Analytical Meth	nod: SM 53	10C						
Total Organic Carbon	2.5	mg/L		1.0	1		12/09/15 18:04	7440-44-0	



Date: 12/18/2015 01:09 PM

# **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10332217

Sample: PMW-1	Lab ID: 103	32217004	Collected: 12/04/1	5 13:40	Received: 12	/04/15 15:06 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Meth	od: RSK 1	75					
Ethane	ND	ug/L	10.0	1		12/08/15 11:57	74-84-0	
Ethene	ND	ug/L	10.0	1		12/08/15 11:57	74-85-1	
Methane	ND	ug/L	10.0	1		12/08/15 11:57	74-82-8	
6010C MET ICP	Analytical Meth	od: EPA 60	010C Preparation Me	thod: E	PA 3010			
Iron	13300	ug/L	250	1	12/07/15 21:52	12/08/15 13:04	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	od: 6010C	Met Preparation Me	thod: El	PA 3010			
Iron, Dissolved	2190	ug/L	50.0	1	12/07/15 21:49	12/08/15 11:14	7439-89-6	
4500S2D Sulfide Water	Analytical Meth	od: SM 450	00-S2-D					
Sulfide	ND	mg/L	5.0	50		12/10/15 12:11		D3
2320B Alkalinity	Analytical Meth	od: SM 23	20B					
Alkalinity, Total as CaCO3	611	mg/L	100	20		12/09/15 12:34		D3
Carbon Dioxide (SM4500CO2D)	ND	mg/L	100	20		12/09/15 12:34	124-38-9	D3
Alkalinity, Total as CaCO3	575	mg/L	5.0	1		12/16/15 13:18		
Alkalinity,Bicarbonate (CaCO3)	575	mg/L	5.0	1		12/16/15 13:18		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		12/16/15 13:18		
300.0 IC Anions	Analytical Meth	od: EPA 30	0.00					
Sulfate	117	mg/L	2.4	2		12/10/15 22:14	14808-79-8	
353.2 Nitrate + Nitrite	Analytical Meth	od: EPA 35	53.2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		12/10/15 09:27		
5220D COD	Analytical Meth	od: SM 52	20D Preparation Met	hod: SN	И 5220D			
Chemical Oxygen Demand	342	mg/L	50.0	1	12/15/15 13:18	12/16/15 13:29		
5310C TOC	Analytical Meth	od: SM 53	10C					
Total Organic Carbon	36.7	mg/L	20.0	20		12/09/15 18:18	7440-44-0	



Date: 12/18/2015 01:09 PM

## **QUALITY CONTROL DATA**

Project: PS Beta-NIROP
Pace Project No.: 10332217

QC Batch: AIR/24784 Analysis Method: RSK 175

QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE

Associated Lab Samples: 10332217001, 10332217002, 10332217003, 10332217004

METHOD BLANK: 2151500 Matrix: Water
Associated Lab Samples: 10332217001, 10332217002, 10332217003, 10332217004

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Ethane	ug/L	ND ND	10.0	12/08/15 10:09	
Ethene	ug/L	ND	10.0	12/08/15 10:09	
Methane	ug/L	ND	10.0	12/08/15 10:09	

LABORATORY CONTROL SAMPLE &	LCSD: 2151501		21	151502						
		Spike	LCS	LCSD	LCS	LCSD	% Rec		Max	
Parameter	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
Ethane	ug/L	114	100	105	88	92	85-115	5	20	
Ethene	ug/L	106	94.7	98.5	89	93	85-115	4	20	
Methane	ug/L	60.7	54.0	56.0	89	92	85-115	4	20	

MATRIX SPIKE & MATRIX SPIK	E DUPLIC	CATE: 21519	61		2151962							
			MS	MSD								
		92278506003	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Ethane	ug/L	ND	114	114	79.6	111	70	97	54-148	33	20	R1
Ethene	ug/L	ND	106	106	76.4	103	72	97	50-150	30	20	R1
Methane	ug/L	676	60.7	60.7	575	784	-166	179	30-150	31	20	M1,R1

		92278363004	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	ND	1.7J		20	

SAMPLE DUPLICATE: 2151797						
		10332217003	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Ethane	ug/L	ND	ND		20	)
Ethene	ug/L	ND	ND		20	)
Methane	ug/L	13.2	3.2J		20	)

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



**QUALITY CONTROL DATA** 

Project: PS Beta-NIROP

Pace Project No.: 10332217

Date: 12/18/2015 01:09 PM

QC Batch: MPRP/60144 Analysis Method: EPA 6010C
QC Batch Method: EPA 3010 Analysis Description: 6010C Water

Associated Lab Samples: 10332217001, 10332217002, 10332217003, 10332217004

METHOD BLANK: 2150466 Matrix: Water
Associated Lab Samples: 10332217001, 10332217002, 10332217003, 10332217004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Iron ug/L ND 50.0 12/08/15 12:26

LABORATORY CONTROL SAMPLE: 2150467

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Iron ug/L 10000 9750 98 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2150468 2150469

MS MSD 10332185001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 10000 75-125 20 ug/L 501 10000 10400 10500 99 100 Iron

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.



**QUALITY CONTROL DATA** 

Reporting

Project: PS Beta-NIROP

Pace Project No.: 10332217

Date: 12/18/2015 01:09 PM

QC Batch: MPRP/60145 Analysis Method: 6010C Met

QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved

Associated Lab Samples: 10332217001, 10332217002, 10332217003, 10332217004

METHOD BLANK: 2150470 Matrix: Water

Associated Lab Samples: 10332217001, 10332217002, 10332217003, 10332217004

Blank

Parameter Units Result Limit Analyzed Qualifiers

Iron, Dissolved ug/L ND 50.0 12/08/15 10:36

LABORATORY CONTROL SAMPLE: 2150471

Spike LCS LCS % Rec
Parameter Units Conc. Result % Rec Limits Qualifiers

Iron, Dissolved ug/L 10000 9750 97 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2150472 2150473

MS MSD 10332217001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Iron, Dissolved 10000 75-125 20 ug/L 3370 10000 12600 13200 93 98

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.



Project: PS Beta-NIROP
Pace Project No.: 10332217

QC Batch: MT/21790 Analysis Method: SM 4500-S2-D

QC Batch Method: SM 4500-S2-D Analysis Description: 4500S2D Sulfide Water

Associated Lab Samples: 10332217001, 10332217002, 10332217003, 10332217004

METHOD BLANK: 2152704 Matrix: Water
Associated Lab Samples: 10332217001, 10332217002, 10332217003, 10332217004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Sulfide mg/L ND 0.10 12/10/15 11:47

LABORATORY CONTROL SAMPLE: 2152705

Date: 12/18/2015 01:09 PM

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Sulfide mg/L .87 0.84 96 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2152706 2152707

MS MSD 10332217001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Sulfide ND 80-120 20 mg/L .87 .87 0.86 0.91 95 101 6

SAMPLE DUPLICATE: 2152708

 Parameter
 Units
 Result Result Result RPD
 Max RPD
 Qualifiers

 Sulfide
 mg/L
 ND
 .023J
 20

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



Project: PS Beta-NIROP

Pace Project No.: 10332217

QC Batch: WET/34583 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10332217001, 10332217002, 10332217003, 10332217004

METHOD BLANK: 1414754

Matrix: Water

Associated Lab Samples:

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND ND	5.0	12/09/15 11:50	
Carbon Dioxide (SM4500CO2D)	ma/L	ND	5.0	12/09/15 11:50	

LABORATORY CONTROL SAMPLE: 1414755

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	250	246	98	90-110	

SAMPLE DUPLICATE: 1414756

Parameter	Units	10332217001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3 Carbon Dioxide (SM4500CO2D)	mg/L mg/L	268 36.0	270 35.0	1 3	20	

SAMPLE DUPLICATE: 1414757

Date: 12/18/2015 01:09 PM

Parameter	Units	35219863001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3 Carbon Dioxide (SM4500CO2D)	mg/L mg/L	8.8 34.9	8.5 34.6	3 1	20	

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



## **QUALITY CONTROL DATA**

Project: PS Beta-NIROP

Pace Project No.: 10332217

Date: 12/18/2015 01:09 PM

QC Batch: WET/45676 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10332217001, 10332217002, 10332217003, 10332217004

METHOD BLANK: 2158895 Matrix: Water

Associated Lab Samples: 10332217001, 10332217002, 10332217003, 10332217004

Blank Reporting

Reporting Limit Qualifiers Parameter Units Result Analyzed Alkalinity, Total as CaCO3 ND 5.0 12/16/15 12:44 mg/L Alkalinity, Bicarbonate (CaCO3) mg/L ND 5.0 12/16/15 12:44 12/16/15 12:44 Alkalinity, Carbonate (CaCO3) mg/L ND 5.0

LABORATORY CONTROL SAMPLE & LCSD: 2158896 2158897 Spike LCS LCSD LCS LCSD % Rec Max Conc. Parameter Units Result Result % Rec % Rec Limits **RPD RPD** Qualifiers Alkalinity, Total as CaCO3 40 42.2 42.2 106 105 90-110 0 30 mq/L

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2158898 2158899 MSD MS 10332217001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual Alkalinity, Total as CaCO3 mg/L 273 40 40 315 315 104 105 80-120 0 30

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2158900 2158901 MS MSD 10333108001 MS MS MSD MSD % Rec Spike Spike Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 463 40 40 522 510 148 116 80-120 2 30 M1 Alkalinity, Total as CaCO3 mg/L

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.



Project: PS Beta-NIROP

Pace Project No.: 10332217

Date: 12/18/2015 01:09 PM

QC Batch: WETA/25834 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10332217001, 10332217002, 10332217003, 10332217004

METHOD BLANK: 2153511 Matrix: Water
Associated Lab Samples: 10332217001, 10332217002, 10332217003, 1033221700

10332217001, 10332217002, 10332217003, 10332217004 Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Sulfate mg/L ND 1.2 12/10/15 15:40

LABORATORY CONTROL SAMPLE: 2153512

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Sulfate mg/L 12.5 11.6 93 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2153513 2153514

MS MSD 10332275001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Sulfate 90-110 20 mg/L 4.8 12.5 12.5 16.1 16.2 90 91

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2153515 2153516

MS MSD 10332275002 Spike MS MSD MS Spike MSD % Rec Max % Rec RPD Parameter Units Result Conc. Conc. Result Result % Rec Limits RPD Qual Sulfate 345 125 125 432 431 69 69 90-110 0 20 M6 mg/L

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.



## **QUALITY CONTROL DATA**

PS Beta-NIROP Project:

Pace Project No.: 10332217

QC Batch:

WETA/25837

Analysis Method:

EPA 353.2

QC Batch Method: EPA 353.2

Analysis Description:

353.2 Nitrate + Nitrite, preserved

Associated Lab Samples:

10332217001, 10332217002, 10332217003, 10332217004

METHOD BLANK: 2154006 Associated Lab Samples:

Matrix: Water 10332217001, 10332217002, 10332217003, 10332217004

Blank

Reporting

Parameter

Units

Limit Result

Analyzed

102

1.1

Qualifiers

Nitrogen, NO2 plus NO3

Nitrogen, NO2 plus NO3

mg/L

ND

0.020 12/10/15 09:29

LABORATORY CONTROL SAMPLE: 2154007

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:

Parameter

Units

Spike Conc.

LCS Result

LCS % Rec % Rec Limits

90-110

Qualifiers

2154008

0.16

2154009

MS

1.0

MS

10332275001 Units Result

mg/L

mg/L

Spike Spike Conc. Conc. 1

MSD Result

MS MSD % Rec

% Rec Limits

Max RPD RPD

Nitrogen, NO2 plus NO3

Date: 12/18/2015 01:09 PM

Parameter

1

MSD

Result 1.2

99

% Rec 98

90-110

20

Qual

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.



## **QUALITY CONTROL DATA**

Project: PS Beta-NIROP

Pace Project No.: 10332217

Date: 12/18/2015 01:09 PM

QC Batch: WETA/25826 Analysis Method: SM 5220D
QC Batch Method: SM 5220D Analysis Description: 5220D COD

Associated Lab Samples: 10332217001, 10332217002, 10332217003

METHOD BLANK: 2152684 Matrix: Water

Associated Lab Samples: 10332217001, 10332217002, 10332217003

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Chemical Oxygen Demand mg/L ND 50.0 12/09/15 15:16

LABORATORY CONTROL SAMPLE: 2152685

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chemical Oxygen Demand mg/L 300 292 97 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2152686 2152687

MS MSD 10332338001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual ND 250 80-120 20 Chemical Oxygen Demand mg/L 250 268 278 99 103

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2152688 2152689

MS MSD 10331877001 Spike MS MSD MS Spike MSD % Rec Max Parameter % Rec RPD Units Result Conc. Conc. Result Result % Rec Limits RPD Qual Chemical Oxygen Demand 2290 2500 2500 4670 4760 95 99 80-120 2 20 mg/L

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.



Project: PS Beta-NIROP
Pace Project No.: 10332217

QC Batch: WETA/25862 Analysis Method: SM 5220D
QC Batch Method: SM 5220D Analysis Description: 5220D COD

Associated Lab Samples: 10332217004

METHOD BLANK: 2157376 Matrix: Water

Associated Lab Samples: 10332217004

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Chemical Oxygen Demand mg/L ND 50.0 12/16/15 13:24

LABORATORY CONTROL SAMPLE: 2157377

Date: 12/18/2015 01:09 PM

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chemical Oxygen Demand mg/L 300 292 97 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2157378 2157379

MS MSD 10332604001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 1370 500 1810 80-120 0 20 Chemical Oxygen Demand mg/L 500 1820 89 90

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2157380 2157381

MS MSD 10332691001 MS MSD MS Spike Spike MSD % Rec Max Parameter % Rec % Rec **RPD** RPD Units Result Conc. Conc. Result Result Limits Qual Chemical Oxygen Demand ND 250 250 270 264 99 97 80-120 2 20 mg/L

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.



## **QUALITY CONTROL DATA**

PS Beta-NIROP Project: Pace Project No.: 10332217

QC Batch: WETA/14997

Analysis Method: SM 5310C QC Batch Method: SM 5310C Analysis Description: 5310C TOC

Associated Lab Samples: 10332217001, 10332217002, 10332217003, 10332217004

METHOD BLANK: 273845 Matrix: Water

Associated Lab Samples:

Date: 12/18/2015 01:09 PM

Blank Reporting Parameter Units Limit Analyzed Qualifiers Result

Total Organic Carbon ND 1.0 12/09/15 14:30 mg/L

LABORATORY CONTROL SAMPLE: 273846

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Organic Carbon** mg/L 25 25.0 100 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 273847 273848

MS MSD 1258020001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual **Total Organic Carbon** 25 80-120 20 mg/L 12.7 25 38.4 38.0 103 101

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 273849 273850

MS MSD 10332217001 MS MSD MS MSD Spike Spike % Rec Max Parameter Conc. % Rec **RPD** RPD Units Result Conc. Result Result % Rec Limits Qual 25 Total Organic Carbon mg/L 2.9 25 27.8 27.8 99 99 80-120 0 20

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



### **QUALIFIERS**

Project: PS Beta-NIROP
Pace Project No.: 10332217

### **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.

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
PASI-MT	Pace Analytical Services - Montana
PASI-O	Pace Analytical Services - Ormond Beach
PASI-V	Pace Analytical Services - Virginia

### **ANALYTE QUALIFIERS**

Date: 12/18/2015 01:09 PM

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.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
R1	RPD value was outside control limits.





### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: PS Beta-NIROP Pace Project No.: 10332217

Date: 12/18/2015 01:09 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch		
10332217001	PMW-4	RSK 175	AIR/24784				
10332217002	PMW-3	RSK 175	AIR/24784				
10332217003	PMW-2	RSK 175	AIR/24784				
0332217004	PMW-1	RSK 175	AIR/24784				
0332217001	PMW-4	EPA 3010	MPRP/60144	EPA 6010C	ICP/26197		
10332217002	PMW-3	EPA 3010	MPRP/60144	EPA 6010C	ICP/26197		
0332217003	PMW-2	EPA 3010	MPRP/60144	EPA 6010C	ICP/26197		
0332217004	PMW-1	EPA 3010	MPRP/60144	EPA 6010C	ICP/26197		
0332217001	PMW-4	EPA 3010	MPRP/60145	6010C Met	ICP/26200		
0332217002	PMW-3	EPA 3010	MPRP/60145	6010C Met	ICP/26200		
0332217003	PMW-2	EPA 3010	MPRP/60145	6010C Met	ICP/26200		
0332217004	PMW-1	EPA 3010	MPRP/60145	6010C Met	ICP/26200		
0332217001	PMW-4	SM 4500-S2-D	MT/21790				
0332217002	PMW-3	SM 4500-S2-D	MT/21790				
0332217003	PMW-2	SM 4500-S2-D	MT/21790				
0332217004	PMW-1	SM 4500-S2-D	MT/21790				
0332217001	PMW-4	SM 2320B	WET/34583				
0332217001	PMW-4	SM 2320B	WET/45676				
0332217002	PMW-3	SM 2320B	WET/34583				
0332217002	PMW-3	SM 2320B	WET/45676				
0332217003	PMW-2	SM 2320B	WET/34583				
0332217003	PMW-2	SM 2320B	WET/45676				
0332217004	PMW-1	SM 2320B	WET/34583				
0332217004	PMW-1	SM 2320B	WET/45676				
0332217001	PMW-4	EPA 300.0	WETA/25834				
0332217002	PMW-3	EPA 300.0	WETA/25834				
0332217003	PMW-2	EPA 300.0	WETA/25834				
0332217004	PMW-1	EPA 300.0	WETA/25834				
0332217001	PMW-4	EPA 353.2	WETA/25837				
0332217002	PMW-3	EPA 353.2	WETA/25837				
0332217003	PMW-2	EPA 353.2	WETA/25837				
0332217004	PMW-1	EPA 353.2	WETA/25837				
0332217001	PMW-4	SM 5220D	WETA/25826		WETA/2582		
0332217002	PMW-3	SM 5220D	WETA/25826		WETA/2582		
0332217003	PMW-2	SM 5220D	WETA/25826	SM 5220D	WETA/2582		
0332217004	PMW-1	SM 5220D	SM 5220D WETA/25862 SM 5220D		WETA/2587		
0332217001	PMW-4	SM 5310C	WETA/14997				
0332217002	PMW-3	SM 5310C	WETA/14997				
0332217003	PMW-2	SM 5310C	WETA/14997				
0332217004	PMW-1	SM 5310C	WETA/14997				

Sec	
Section A	70
	Pace Analytical"
	Analytical
	<b>ytic</b>
	g 67

Required Client Information:

Section B

Required Project Information:

Invoice Infor Section C

Bahar Naderi

Report To: Melinda Pham

Regenesis

# CHAIN-OF-CUSTODY / Analytical Request Document

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

잌

Page 24 of 45

Address: equested Due Date/TAT: ITEM # な ð 949-366-8000 PMW-2 lequired Client Information マスピッ PMW -3 PMW-4 Sample IDs MUST BE UNIQUE Mpham@regenesis.com San Clemente, CA 92673 1011 Calle Sombra SAMPLE ID ADDITIONAL COMMENTS Fax: 343-366-8090 10 days DRINKING WATER WATER WASTE WATER PRODUCT SOIL/SOLID Valid Matrix Codes

MATRIX CODE ST P WW DW Project Number: PS Beta - NIROP roject Name: Copy To: urchase Order No.: 12 Ş Ę MATRIX CODE RELINQUISHED BY / AFFILIATION (see valid codes to left) PS Beta - NIROP SAMPLE TYPE (G=GRAB C=COMP) DATE COMPOSITE START SAMPLER NAME AND SIGNATURE TIME COLLECTED PRINT Name of SAMPLER: MEUSS SIGNATURE of SAMPLER DATE COMPOSITE END/GRAB 12/02/20 1050 123S 1340 TIME DATE SAMPLE TEMP AT COLLECTION Reference: Pace Project Manager: Company Name: Regenesis Address: Ē ace Profile # Z E # OF CONTAINERS 506 tce Quote TIME 00 00 00 00 00 00 01 11 11 837 Unpreserved H<sub>2</sub>SO<sub>4</sub> HNO₃ 21466 Preservatives 1011 Calle Sombra HCI SELLES SE NaOH Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> ACCEPTED BY / AFFILIATION Z Methanol Other Y/ N . I Analysis Test↓ Alkalinity, CaCO3 in wate DATE Signed (MM/DD/YY): Requested Analysis Filtered (Y/N) Chemical oxygen demand Total iron Dissolved iron REGULATORY AGENCY Volatile fatty acids Site Location 1214/15 Carbon dioxide in water UST NPDES DATE STATE: Vitrate+Nitrite Sulfate in water Sulfide in water 98 TIME Total organic carbon GROUND WATER RCRA HEADSPACE: PSK-175 ₹ N verhave, etalus, etalus いて Temp in °C Residual Chlorine (Y/N) Received on Pace Project No./ Lab I.D. Ice (Y/N) SAMPLE CONDITIONS DRINKING WATER OTHER Custody Sealed Cooler (Y/N) Samples Intact 8  $\varphi_{\mathcal{V}}$ 4 Š (Y/N)

### Pace Analytical\*

### Document Name:

### Sample Condition Upon Receipt Form

Document No.: F-MN-L-213-rev.13

Document Revised: 23Feb2015 Page 1 of 1 Issuing Authority: Pace Minnesota Quality Office

Upon Receipt	• .		Projec	` '''.	10# : 1 <i>0</i>	<b> 3322</b>	. (
Courier: Ped Ex DUPS		•					-
Courier: Fed Ex UPS	USPS	'n	- Client				
Commercial Pace SpeeDee	Other:			10			
Tracking Number:						man managara (2.20 a a a a a a a a a a a a	
Custody Seal on Cooler/Box Present? Yes	Jo	Seals In	tact? 「	]Yes [☑	Optional:	Proj. Due Date:	Proj. Name:
Packing Material: ☐Bubble Wrap ☑Bubble Bag		*	Other:				
Thermometer			· ·			Temp Blank?	□Yes 🕅 No
Used: ₩B88A0143310	0098	pe of ice:	,—	et 🔲 Blue	□None □	Samples on ice, coo	oling process has begun
Cooler Temp Read (°C): 4.1/2, 7 Cooler Temp Co	orrected (°C				Biological Tissue F	rozen? Yes	□No <b>M</b> N/A
Temp should be above freezing to 6°C Correction Facus (NA), water sample)	ctor:	10.4	/ Da	te and Initial	s of Person Exami	ning Contents:	Bon 12/4/15
Did samples originate in a quarantine zone within the United	States: AL,	AR. AZ. C	A. FL. GA.	ID. IA.	Pid samples originat	o from a foreign on	
MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)?	11 -	A	□Yes	□No.	including Hawaii and	Puprto Pico12	Myon Mai-
If Yes to either question, fill out a Re	gulated So	il Checkli	ist (F-MN	-Q-338) and i	include with SCUR	COC paperwork	
Chain of Custody Present?	i jeka			<u> </u>	Ċ	OMMENTS:	
Chain of Custody Piesent?  Chain of Custody Filled Out?	Yes	□No	□N/A	1.		<u> </u>	
	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?	[ <b>X</b> Yes	□No	□N/A	5.			
Short Hold Time Analysis (<72 hr)?	Yes	WNo	□n/a	6.			
Rush Turn Around Time Requested?	Yes	MNO	□N/A	7.			
Sufficient Volume?	Yes	□No	□N/A	8.			
Correct Containers Used?	<b>∑</b> Yes	□No	□N/A	9.	1 1 1 1		
-Pace Containers Used?	¥¥Yes	□No	□N/A				
Containers Intact?	Yes	□No	□N/A	10.	I se	:	
Filtered Volume Received for Dissolved Tests?	Yes	□No	□N/A	11. Note i	if sediment is visible	in the dissolved c	ontainer
Sample Labels Match COC?	¥¥Yes	□No	□N/A	12.			
-Includes Date/Time/ID/Analysis Matrix:	1						
All containers needing acid/base preservation have been checked?				13.	MILINO VOIL	CO 1000	
All containers needing preservation are found to be in	Ş≇Yes	□No	□N/A	Sample #	12 2/2 H	SO4 (MaOH	□HCI
compliance with EPA recommendation?				1	1-04	<b>i</b> .	
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC Oil and Grease,	Yes	□No	□N/A		1: /		
DRO/8015 (water) DOC	∑ <b>Y</b> es	□No	□n/a	Initial when completed:		Lot # of added	
Headspace in VOA Vials ( >6mm)?	□Yes	□No	°⊠n/a	14.		preservative:	
Trip Blank Present?	□Yes	□No	[Z]N/A	15.	1	1	<u> </u>
Trip Blank Custody Seals Present?	□Yes	□No	<b>½</b> N/A			accommon and	
Pace Trip Blank Lot # (if purchased):			,				
CLIENT NOTIFICATION/RESOLUTION		***************************************	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	·····	Field F	ata Required?	Dva. Du
Person Contacted:	To store the store of the store	,		Date/Time	1 .	rea vedausas	Yes □_No
Comments/Resolution:						1	
			<del>~ </del>				
<u> </u>				<del></del>			
					1 1		

	Pacel	Analytical -	Document Name: Revised Date: 14Jui/2014  MN to MT Sample Transfer Form Page: 1 of 1  Document Number: Issuing Authority: F-MN-C-043-rev.11 Pace Minnesota Quality Office							
		ping (circle): Tracking #: Client: Due Date: Pace WO: ect Manager:	10332217	~~~~	Cal-manner ramme	54 84	94 3862			
egeneraturnya dina dipensipy dipensipy dia dia da da da da da da da da da da da da da	WN to	o MT Sam	ple Tr	ANALYSIS	Condit	ion Upor	Receipt Form	Manifest A		b Marks C
ethod Number	& Description	Container	Туре	# of Bottles	Lai	) ID's	Preservative Yes or No	Verify A	nitial	
s 4500S2D Sul	lfide Waler	BP2Z		4	00	1-004		12/8	W	12-
		REPO	RTING RE	QUIREME	ENTS/ADDI	TIONAL CON	IMENTS			
and the state of t	errende er er er er er er er er er er er er er			A ŞAMPLE	RECEIPT	INFORMATIO	ON ·			
	0140728348, Cor				arawa f	"Illumed a college	Sample Matrix: rec'd for dissolved tests:		MO.	XNA
ler Temp Rea		Coaler Temp Arrived on Ice:		(°C): / _ < s _	<u> </u>		pH have been checked:	Yes 💉		NA NA
<del></del>		Seal Present:		s _X No_		Campio	Trip Blank Present:	· · · · · · · · · · · · · · · · · · ·	No.	NA 🎿
Short Ho	ld Time Request		Ye	sNo	Ž T	Trip Blan	Custody Seals Present:	Yes	No_	NA 🌫
3,13(1)10	Rush T	AT Requested:	Ye	esNo_	><		Pace Trip Blank Lot #:			<i>7</i> ₹
·	Sufficient Sa	ample Volume:	Υe	osXNo_		Samp	le Composites Required:	Yes		
Sai	mples Arrived wil			es 🔭 No			Report Samples:	Wet Wt.		Dry Wt
ONTHE SETTING THE PROPERTY OF	Co	ntainers intact:	Ye	es 🎾 No		an yang sagang pang kepada kanan kanan kanan kanan kanan kanan kanan kanan kanan kanan kanan kanan kanan kanan	Reporting Units:		and the same	Yalan ing pagamatan kang pagan kang pagan kang pagan kang pagan pagan pagan pagan pagan pagan pagan pagan paga
	<del>ng ng mananagala, makala di dami makala di</del>			CUSTO	DY TRANS			,		
Relind	quished by/Affillat	ion	Date	fime	<u> </u>	Accepted I	By Affiliation	Date		Time
V Pace	Sed E		12/1/15	105	Mi	or flu	printer and the second	pkl.	5	0945
					Landentermoner	eropii polendo circulo reinidolicu et palette e la decida de la decida de la decida de la decida de la decida d	Copyright Control of C			######################################
	erson Contacted		CLIE	NT NOTIFI	ICATION/R	ESOLUTION Date	):			
esa que estre contra contra cando	ager Review: /	Mad	JA	<u> </u>		Dat	»: <u>12/8/</u> 15	######################################		

Due Date: 12/22/15

CLIENT: PACE MPLS

Worl	Workorder: 10332217 Wo	Workorder: 10332217 Workorder Name: PS Beta-NIROP Owner Received
Se in l	Jennifer Anderson Pace Analytical Services, Inc.	Pace Analytical Virginia MN 315 Chestnut Street
Minne Phon Fax (	17/00 Ejin Street, Suite 200 Minneapolis, MN 55414 Phone (612)607-1700 Fax (612)607-6444	Virginia, MN 55792 Phone (218)742-1042
		##Preserved Containers ##
	Sample D	Sample Collect  Hipe Batteriums Lagaro  H2SO4
1	PMW-4	PS 12/4/2015 09:25 10332217001 Water 1
2	PMW-3	PS 12/4/2015 10:50 10332217002 Water 1
ω	PMW-2	PS 12/4/2015 12:35 10332217003 Water 1
4	PMW-1	PS 12/4/2015 13:40 10332217004 Water 1
თ		
Transfers	ers Released By	Date/Time Received By
1	AMUNACE	10/1/2 11/59 / 1/9/
N		
ω		
8	Cooler Temperature on Receipt	eipt 3.5( °C   Custody Seal /Y) or N

<sup>\*\*\*</sup>In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Page 1 of 1

### . Pace Analytical °

### Document Name:

### Sample Condition Upon Receipt Form

Document No.: F-VM-C-001-Rev.09 Document Revised: 23Feb2015 Page 1 of 1

Issuing Authority:

Pace Virginia, Minnesota Quality Office

Sample Condition Client Name:	Project	# (10# : 4050047
Upon Receipt PACE	MPLS	WO#:1258217
Courier: Fed Ex UPS	USPS Client	
Commercial Pace	Other:	1258217
Tracking Number:		1236217
Custody Seal on Cooler/Box Present?	No Seals Intact?	yes □No Optional: Proj. Due Date: Proj. Name:
Packing Material: Bubble Wrap Bubble B	ags None Other:_	Temp Blank? Yes No
		Blue None Samples on ice, cooling process has begun
		Biological Tissue Frozen? Yes No NA
Cooler Temp Read °C: 3.6 Cooler Temp Cooler Temp Correction Fac	ctor: Date an	d Initials of Person Examining Contents: 2-8-15
		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 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.
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.
Filtered Volume Received for Dissolved Tests?	□Yes □No ŹN/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	☑Yes □No □N/A	12.
-Includes Date/Time/ID/Analysis Matrix:	1	
All containers needing acid/base preservation will be checked and documented in the pH logbook.	✓ Yes □No □N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	□Yes □No ØN/A	13.
Headspace in VOA Vials ( >6mm)?	□Yes □No ᡬN/A	14.
Trip Blank Present?	□Yes □No ᡚN/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 (Danalistica)		
		-
FECAL WAIVER ON FILE Y N	TEMPERATU	RE WAIVER ON FILE Y N

Project Manager Review: 4444 300 Date: 13/8/15

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)

## W0#:35219976

Pace Analytical "

<sup>\*\*\*</sup>In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.



### Document Name: Sample Condition Upon Receipt Form Document No.: F-FL-C-007 rev. 06

Document Revised: August 11, 2014 Issuing Authority: Pace Florida Quality Office

### Sample Condition Upon Receipt Form (SCUR)

Table Number:\_\_\_

Client Name PACE N	NO Project # 35219976
Courier: Fed Ex UPS USPS Client Commercial  Tracking # UPS USPS Client Commercial	☐ Pace ☐ Other
Custody Seal on Cooler/Box Present: yes no Seals	s intact:
Packing Material: Bubble Wrap Bubble Bags None	Othercontents:
Thermometer Used Type of Ice: Wet	Blue None
Cooler Temperature C 3 + (Visual) + (Correction	Factor) (Actual) (Temp should be above freezing to 6°C). If below 0°C, then we sample frozen?
Receipt of samples satisfactory:	Rush TAT requested on COC:
If yes, then all conditions below were met:	If no, then mark box & describe issue (use comments area if necessary):
Chain of Custody Present	in no, then mark box a describe issue (use comments area if necessary):
Chain of Custody Filled Out	
Relinquished Signature & Sampler Name COC	
Samples Arrived within Hold Time	
Sufficient Volume	
Correct Containers Used Containers Intact	
Containers intact	
Sample Labels match COC (sample IDs & date/time of collection)	
y	
All containers needing preservation are found to be in	No Labels: No Time/Date on Labels:
compliance with EPA recommendation.	
No Headspace in VOA Vials ( >6mm):	
Client Notification/ Resolution:	
Person Contacted: Date/ Comments/ Resolution (use back for additional comments):	Time:
Project Manager Review:	Date: WA
	Date: (V)
Finished Product In	formation Only
F.P. Sample ID:	Size & Qty of Bottles Received
	x 5 Gal
Production Code:	x 2.5 Gal x 1 Gal
Date/Time Opened:	x 1 Gal x 1 Liter
367	x 500 mL
Number of Unopened Bottles Remaining:	x 250 mL x Other:
Extra Sample in Shed: Yes No	x oner



December 17, 2015

Jennifer Anderson

1700 Elm Street Suite 200

Pace Analytical Services, Inc.

Minneapolis, MN 55414

Pace Analytical Energy Services, LLC 220 William Pitt Way Pittsburgh, PA 15238

> Phone: (412) 826-5245 Fax: (412) 826-3433

RE: **PS BETA - NIROP / 10332217** 

Pace Workorder:

17579

Dear Jennifer Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on Tuesday, December 08, 2015. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Ruth Welsh

12/17/2015

Ruth.Welsh@pacelabs.com

M

Customer Service Representative

**Enclosures** 

As a valued client we would appreciate your comments on our service.

Please email info@microseeps.com.

Total Number of Pages

Page 1 of 13



Report ID: 17579 - 744044

**CERTIFICATE OF ANALYSIS** 

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





LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:

Pennsylvania Department of Environmental Protection, Bureau of Laboratories

Accreditation ID:

02-00538

Scope:

NELAP Non-Potable Water and Solid & Hazardous Waste

Accreditor:

South Carolina Department of Health and Environmental Control, Office of Environmental

Laboratory Certification

Accreditation ID: 89009003

Scope:

Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)

Accreditor:

NELAP: New Jersey, Department of Environmental Protection

Accreditation ID:

PA026

Scope:

Non-Potable Water: Solid and Chemical Materials

Accreditor:

NELAP: New York, Department of Health Wadsworth Center

Accreditation ID:

11815

Scope:

Non-Potable Water; Solid and Hazardous Waste

Accreditor:

State of Connecticut, Department of Public Health, Division of Environmental Health

Accreditation ID:

PH-0263

Scope:

Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)

Accreditor:

Accreditor:

NELAP: Texas, Commission on Environmental Quality

Accreditation ID: Scope:

T104704453-09-TX Non-Potable Water

State of New Hampshire

Accreditation ID:

299409

Scope:

Non-potable water

Accreditor:

State of Georgia Accreditation ID: Chapter 391-3-26

Scope:

As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

Report ID: 17579 - 744044

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Pace Analytical Energy Services, LLC 220 William Pitt Way Pittsburgh, PA 15238

> Phone: (412) 826-5245 Fax: (412) 826-3433

### SAMPLE SUMMARY

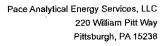
Workorder: 17579 PS BETA - NIROP / 10332217

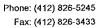
Lab ID	Sample ID	Matrix	Date Collected	Date Received
175790001	PMW-4	Water	12/4/2015 09:25	12/8/2015 11:00
175790002	PMW-3	Water	12/4/2015 10:50	12/8/2015 11:00
175790003	PMW-2	Water	12/4/2015 12:35	12/8/2015 11:00
175790004	PMW-1	Water	12/4/2015 13:40	12/8/2015 11:00

Report ID: 17579 - 744044



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Workorder: 17579 PS BETA - NIROP / 10332217

Lab ID: Sample ID: PMW-4

175790001

Date Received: 12/8/2015 11:00

Matrix:

Water

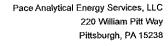
Date Collected: 12/4/2015 09:25

Parameters	Results Un	iits	PQL	MDL	DF	Analyzed	Ву	Qualifiers
EDonors - MICR						5 40 0 000 000 000 000	V4 1 1	en i de el ser exemple de la la companya de la compa
Analysis Desc: AM23G		Analytical Met	hod: A	M23G	45.57			
Lactic Acid	<0,20 mg	y/I	0.20	0.0080	1	12/10/2015 22:3	S KB	В
Acetic Acid	< <b>0.10</b> mg	j/l	0.10	0.012	1	12/10/2015 22:3	S KB	
Propionic Acid	<0.10 mg	g/l	0.10	0.0060	1	12/10/2015 22:3	S KB	
Formic Acid	<0.10 mg	y/I	0.10	0.0070	1	12/10/2015 22:3	6 KB	В
Butyric Acid	<0.10 mg	<b>J/I</b>	0.10	0.010	1	12/10/2015 22:3	6 KB	
Pyruvic Acid	< <b>0.10</b> mg	J/I	0.10	0.015	1	12/10/2015 22:3	6 KB	
i-Pentanoic Acid	< <b>0.10</b> mg	<sub>3</sub> /I	0.10	0.0070	1	12/10/2015 22:3	6 KB	
Pentanoic Acid	<0.10 mg	<b>3/</b> I	0.10	0.012	1	12/10/2015 22:3	6 KB	
i-Hexanoic Acid	<0.20 mg	<b>y/</b> l	0.20	0.014	1	12/10/2015 22:3	KB	
Hexanoic Acid	<0.20 mg	<b>3/</b>	0.20	0.0070	1	12/10/2015 22:3	5 KB	

Report ID: 17579 - 744044



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Fax: (412) 826-3433

### **ANALYTICAL RESULTS**

Workorder: 17579 PS BETA - NIROP / 10332217

Lab ID:

175790002

Date Received: 12/8/2015 11:00

Matrix:

Water

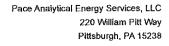
Sample ID: PMW-3 Date Collected: 12/4/2015 10:50

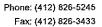
Parameters	Results	Units	PQL	MDL E	F	Analyzed	Ву	Qualifiers
EDonors - MICR Analysis Desc: AM23G	un mar koma (lagrar una la	:	utical Method: Al	M23G		i de la fallagata estella a	TO EXAL.	n eg, elke eg Mileginign om ketelse eg.
				0.0000		40/40/004E 23/0	ND.	
Lactic Acid	<0.20	•	0.20	0.0080 1		12/10/2015 23:29		ь
Acetic Acid	<0.10	mg/l	0.10	0.012 1		12/10/2015 23:29	} KB	
Propionic Acid	<0.10	mg/l	0.10	0.0060 1		12/10/2015 23:29	} KB	
Formic Acid	<0.10	mg/l	0.10	0.0070 1		12/10/2015 23:29	) KB	В
Butyric Acid	<0.10	mg/l	0.10	0.010 1		12/10/2015 23:29	) KB	
Pyruvic Acid	<0.10	mg/i	0.10	0.015 1		12/10/2015 23:29	) KB	
i-Pentanoic Acid	<0.10	mg/l	0.10	0.0070 1		12/10/2015 23:29	) KB	
Pentanoic Acid	< 0.10	mg/l	0.10	0.012 1		12/10/2015 23:29	) KB	
i-Hexanoic Acid	<0.20	mg/l	0.20	0.014 1		12/10/2015 23:29	) KB	
Hexanoic Acid	<0.20	mg/l	0.20	0.0070 1		12/10/2015 23.29	) KB	

Report ID: 17579 - 744044



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Workorder: 17579 PS BETA - NIROP / 10332217

Lab ID: Sample ID: 175790003

PMW-2

Date Received: 12/8/2015 11:00

Matrix:

Water

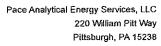
Date Collected: 12/4/2015 12:35

Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR Analysis Desc: AM23G	Analyti	ical Method: A	M23G	Mariero establica Material escoluci		
Lactic Acid	<0.20 mg/l	0.20	0.0080 1	12/11/2015 00:		В
Acetic Acid	<0.10 mg/l	0.10	0.012 1	12/11/2015 00:	23 KB	
Propionic Acid	<0.10 mg/l	0.10	0.0060 1	12/11/2015 00:	23 KB	
Formic Acid	<0.10 mg/l	0.10	0.0070 1	12/11/2015 00:	23 KB	В
Butyric Acid	<0.10 mg/i	0.10	0.010 1	12/11/2015 00:	23 KB	
Pyruvic Acid	<0.10 mg/l	0.10	0.015 1	12/11/2015 00:	23 KB	
i-Pentanoic Acid	<0.10 mg/l	0.10	0.0070 1	12/11/2015 00:	23 KB	
Pentanoic Acid	<0.10 mg/l	0.10	0.012 1	12/11/2015 00:	23 KB	
i-Hexanoic Acid	<0.20 mg/l	0.20	0.014 1	12/11/2015 00:	23 KB	
Hexanoic Acid	<0.20 mg/l	0.20	0.0070 1	12/11/2015 00:	23 KB	

Report ID: 17579 - 744044



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Workorder: 17579 PS BETA - NIROP / 10332217

Lab ID:

Sample ID:

175790004

PMW-1

Date Received: 12/8/2015 11:00

15 11:00 Matrix:

Water

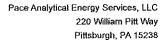
Date Collected: 12/4/2015 13:40

Parameters	Results Uni	its PQL	MDL	DF	Analyzed	Ву	Qualifiers
EDonors - MICR	·		NA CO		unio e no estado estado estado	P14	and the statement of th
Analysis Desc: AM23G		Analytical Method: /	4M23G	1964	A endiklikatır		
Lactic Acid	<2.0 mg		0.080		12/11/2015 21:14		d,B
Acetic Acid	30 mg	// 1.0	0.12	10	12/11/2015 21:14	KB	d
Propionic Acid	15 mg	// 1.0	0.060	10	12/11/2015 21:14	KB	d
Formic Acid	<0.10 mg	/  0.10	0.0070	1	12/11/2015 01:16	KB	В
Butyric Acid	<0.10 mg	/ 0.10	0.010	1	12/11/2015 01:16	KB	
Pyruvic Acid	<0.10 mg	/  0.10	0.015	1	12/11/2015 01:16	ΚB	
i-Pentanoic Acid	<0.10 mg	/  0.10	0.0070	1	12/11/2015 01:16	KB	
Pentanoic Acid	<0.10 mg	/  0.10	0.012	1	12/11/2015 01:16	KB	
i-Hexanoic Acid	<0.20 mg	/ 0.20	0.014	1	12/11/2015 01:16	KΒ	
Hexanoic Acid	< <b>0.20</b> mg	// 0.20	0.0070	1	12/11/2015 01:16	KB	

Report ID: 17579 - 744044



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Phone: (412) 826-5245





### **ANALYTICAL RESULTS QUALIFIERS**

Workorder: 17579 PS BETA - NIROP / 10332217

### **DEFINITIONS/QUALIFIERS**

Disclaimer: The Pennsylvania Department of Environmental Protection (PADEP) has decided to no longer recognize analyses that do not

produce data for primary compliance, for NELAP accreditation. The methods affected by this decision are AM20GAx, AM21G, SW846 7199 and AM4.02. The laboratory shall continue to administer the NELAP/TNI standard requirements in the performance

of these methods.

Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection. MDL

Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation. **PQL** 

ND Not detected at or above reporting limit.

DF Dilution Factor.

s Surrogate.

RPD Relative Percent Difference.

% Rec Percent Recovery.

U Indicates the compound was analyzed for, but not detected at or above the noted concentration.

Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

В The analyte was detected in the associated blank.

d The analyte concentration was determined from a dilution.

Report ID: 17579 - 744044



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### **QUALITY CONTROL DATA**

Workorder: 17579 PS BETA - NIROP / 10332217

QC Batch:

EDON/2744

Analysis Method:

AM23G

QC Batch Method:

AM23G

Associated Lab Samples:

175790001, 175790002, 175790003, 175790004

METHOD BLANK: 39141

December	l la la	Blank	Reporting Limit Qualifiers	
Parameter	Units	Result	Limit Qualifiers	
EDonors			•	
Lactic Acid	mg/i	< 0.20	0.20 B	
Acetic Acid	mg/l	<0.10	0.10	
Propionic Acid	mg/l	<0.10	0.10	
Formic Acid	mg/l	< 0.10	0.10 B	•
Butyric Acid	mg/l	< 0.10	0.10	
Pyruvic Acid	mg/l	< 0.10	0.10	
i-Pentanoic Acid	mg/l	< 0.10	0.10	
Pentanoic Acid	mg/l	< 0.10	0.10	
i-Hexanoic Acid	mg/l	< 0.20	0.20	
Hexanoic Acid	mg/l	< 0.20	0.20	

LABORATORY CONTROL SAMPLE: 39142

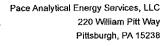
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EDonors						
Lactic Acid	mg/l	2	2.0	100	70-130	В
Acetic Acid	mg/l	2	2.1	103	70-130	
Propionic Acid	mg/l	2	2.1	104	70-130	
Formic Acid	mg/l	2	1.8	90	70-130	В
Butyric Acid	mg/l	2	2.1	103	70-130	
Pyruvic Acid	mg/l	2	2.0	101	70-130	
i-Pentanoic Acid	mg/l	2	2.0	102	70-130	
Pentanoic Acid	mg/l	2	2.1	103	70-130	
i-Hexanoic Acid	mg/l	2	2.0	103	70-130	
Hexanoic Acid	mg/l	2	2.0	98	70-130	

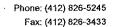
MATRIX SPIKE & M	•	39144	•	Original: 175570001							
Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
EDonors Lactic Acid	mg/l	0.027	2	2.1	2.1	102	102	70-130	0	30	В

Report ID: 17579 - 744044

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### **QUALITY CONTROL DATA**

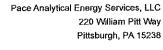
Workorder: 17579 PS BETA - NIROP / 10332217

MATRIX SPIKE & MATI	RIX SPIKE DUPLIC	CATE: 39143		39144		Original:	17557000	)1			
Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Acetic Acid	, mg/l	0.038	2	2.2	2.2	109	109	70-130	0	30	
Propionic Acid	mg/l	0.0022	2	2.2	2.2	112	112	70-130	0	30	
Formic Acid	mg/l	0.022	2	1.9	1.9	95	95	70-130	0	30	. В
Butyric Acid	mg/l	0.006	2	2.2	2.2	111	111	70-130	0	30	
Pyruvic Acid	mg/l	0	2	2.1	2.1	105	105	70-130	0	30	
i-Pentanoic Acid	mg/l	0	2	2.2	2.2	111	111	70-130	0	30	
Pentanoic Acid	mg/l	0	2	2.4	2.3	118	117	70-130	0.85	30	
i-Hexanoic Acid	mg/l	0	2	2.4	2.4	121	121	70-130	0	30	
Hexanoic Acid	mg/l	0.0056	2	2.4	2.4	120	119	70-130	0.84	30	

Report ID: 17579 - 744044

nelac:

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### **QUALITY CONTROL DATA**

Workorder: 17579 PS BETA - NIROP / 10332217

QC Batch:

EDON/2748

Analysis Method:

AM23G

QC Batch Method:

AM23G

Associated Lab Samples:

175790004

METHOD BLANK: 39252

Parameter	Units	Blank Result	Reporting Limit Qualifiers	
EDonors				•
Lactic Acid	mg/l	<0.20	0.20 B	
Acetic Acid	mg/l	<0.10	0.10	
Propionic Acid	mg/l	<0.10	0.10	

LABORATORY CONTROL SAMPLE: 39253

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EDonors						
Lactic Acid	mg/l	2	2.1	104	70-130	В
Acetic Acid	mg/l	2	2.1	105	70-130	
Propionic Acid	mg/l	2	2.1	107	70-130	

Report ID: 17579 - 744044



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Pace Analytical Energy Services, LLC 220 William Pitt Way Pittsburgh, PA 15238

> Phone: (412) 826-5245 Fax: (412) 826-3433

### **QUALITY CONTROL DATA QUALIFIERS**

Workorder: 17579 PS BETA - NIROP / 10332217

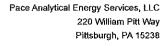
### **QUALITY CONTROL PARAMETER QUALIFIERS**

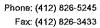
B The analyte was detected in the associated blank.

Report ID: 17579 - 744044

/nelac

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 17579 PS BETA - NIROP / 10332217

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
175790001	PMW-4			AM23G	EDON/2744
175790002	PMW-3			AM23G	EDON/2744
175790003	PMW-2			AM23G	EDON/2744
175790004	PMW-1	•		AM23G	EDON/2744
175790004	PMW-1			AM23G	EDON/2748

Report ID: 17579 - 744044





### Chain of Custody

Workorder Name:

Face Analyticase 44 of 45

Cool	ω	2	-1	Transfers		ĊΊ	4	ω	N	ت	ltem	Jennifer A Pace Anal 1700 Elm Suite 200 Minneapo Phone (61 Email: jen	Repor	Work
Cooler Temperature on Receipt 📝			Jan Vace	fers Released By			PMW-1	PMW-2	PMW-3	PMW-4	Sample ID	Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-1700 Email: jennifer.anderson@pacelabs.com	Report / Invoice To	Workorder: 10332217 V
t & °c			12/11	Date/Time			12/4/2015 13:40	12/4/2015 12:35	12/4/2015 10:50	12/4/2015 09:25	Collect Date/Time	nga marana	Subc	Workorder Name:
Custody Seal Y or		· · ·	103 NOC	71			10332217004	10332217003	10332217002	10332217001	Lab ID	Pace Energy/MicroSecps	Subcontract To	PS Beta-NIROP
Y or N			7	d By			Water 2	Water 2	Water 2	Water 2	Matrix Unpreserved	P.O		ROP
Received on		ļ	PASS IR	Da								1997717		
(S			12.8.15 /	Date/Time			×	×	×	×	Volahle	Tatty Acids		Results
(Y) or N	,	4	000										Request	Results Requested
Samples Intact Y or N					Comments						LAB USE ONLY		Requested Analysis	12/18/2015

<sup>\*\*\*</sup>In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Cooler	Receipt	Form
000101	- · - 1	

	Name: Pace Project: PS Befa	N! 6	700 L	ab Wo	ork Order:
Client î	Vame: Poce Project: 13 Pope		-4 -		
A.	Shipping/Container Information (circle appropriate response)		•		
	Courier: FedEx UPS USPS Client Other:	_ Air	bill Pre	esent: (	Yes) No
	Tracking Number: 6984 86943840				
	Custody Seal on Cooler/Box Present: (Yes No Seals I	ntaci:(	Yes	No	
	Cooler/Box Packing Material: Bubble Wrap Absorbent Fo	oam (	Other:		·
	Type of Ice: Web Blue None Ice Intact: Yes Melt	red			
	Cooler Temperature: 20 Radiation Screened: Yes	(No)	Cha	in of (	Custody Present: Yes No .
	Comments:				•
В.	Laboratory Assignment/Log-in (check appropriate response)				
		YES	NO	N/A	Comment ' Reference non-Conformance
	Chain of Custody properly filled out	1		· 	
	Chain of Custody relinquished	J.			
,	Sampler Name & Signature on COC		V		•
	Containers intact	1			
	Were samples in separate bags				
	Sample container labels match COC Sample name/date and time collected				
	Sufficient volume provided	<u> </u>			}
	PAES containers used			<u> </u>	
	Are containers properly preserved for the requested testing?  (as labeled)		1		If yes, see pH form.
	If an unknown preservation state, were containers checked?				LI YES, SEC PIT FORMS
	Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?				
	Comments:				
					13 0 15
	Cooler contents examined/re				Date: 12.8.15
	Project Manag	er Rev	iew :_	Ru	Date: 12-9-15
					Page 45 of 45





February 05, 2016

Melinda Pham Regenesis 1011 Calle Sombra San Clemente, CA 92673

RE: Project: PS Beta-NIROP

Pace Project No.: 10335268

### Dear Melinda Pham:

Enclosed are the analytical results for sample(s) received by the laboratory on January 06, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

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

Sincerely,

Jennifer Anderson jennifer.anderson@pacelabs.com Project Manager

JAndera

Enclosures

cc: Ryan Moore, Regenesis







### **CERTIFICATIONS**

Project: PS Beta-NIROP Pace Project No.: 10335268

### **Minnesota Certification IDs**

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

525 N 8th Street, Salina, KS 67401 A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770 Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA Colorado Certification #Pace Connecticut Certification #: PH-0256 EPA Region 8 Certification #: 8TMS-L

Florida/NELAP Certification #: E87605 Guam Certification #:14-008r Georgia Certification #: 959

Georgia EPD #: Pace Idaho Certification #: MN00064 Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01 Iowa Certification #: 368 Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062 Kentucký Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001 Maine Certification #: 2013011 Maryland Certification #: 322 Michigan DEPH Certification #: 9909 Minnesota Certification #: 027-053-137 Mississippi Certification #: Pace Montana Certification #: MT0092 Nevada Certification #: MN\_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002 New York Certification #: 11647 North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150 Ohio VAP Certification #: CL101 Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563

Puerto Rico Certification Saipan (CNMI) #:MP0003 South Carolina #:74003001 Texas Certification #: T104704192 Tennessee Certification #: 02818 Utah Certification #: MN000642013-4 Virginia DGS Certification #: 251 Virginia/VELAP Certification #: Pace Washington Certification #: C486 West Virginia Certification #: 382 West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970

1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700



### **SAMPLE SUMMARY**

Project: PS Beta-NIROP
Pace Project No.: 10335268

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10335268001	PMW-01	Water	01/06/16 14:20	01/06/16 16:34
10335268002	PMW-02	Water	01/06/16 13:25	01/06/16 16:34
10335268003	PMW-03	Water	01/06/16 10:55	01/06/16 16:34
10335268004	PMW-04	Water	01/06/16 09:25	01/06/16 16:34
10335268005	Trip Blank	Water	01/06/16 00:00	01/06/16 16:54





### **SAMPLE ANALYTE COUNT**

Project: PS Beta-NIROP Pace Project No.: 10335268

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10335268001	PMW-01	EPA 8260B	DJB	70
10335268002	PMW-02	EPA 8260B	DJB	70
10335268003	PMW-03	EPA 8260B	DJB	70
10335268004	PMW-04	EPA 8260B	DJB	70
10335268005	Trip Blank	EPA 8260B	DJB	70

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### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Page Project No: 10335268

Date: 02/05/2016 12:51 PM

Sample: PMW-01	Lab ID: 103	35268001	Collected: 01/06/1	6 14:20	Received:	01/06/16 16:34	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Met	hod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		01/08/16 14:4	9 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		01/08/16 14:4	9 107-05-1	
Benzene	ND	ug/L	1.0	1		01/08/16 14:4	9 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		01/08/16 14:4	9 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		01/08/16 14:4	9 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/08/16 14:4	9 75-27-4	
Bromoform	ND	ug/L	4.0	1		01/08/16 14:4	9 75-25-2	
Bromomethane	ND	ug/L	4.0	1		01/08/16 14:4	9 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/08/16 14:4		
n-Butylbenzene	ND	ug/L	1.0	1		01/08/16 14:4		
sec-Butylbenzene	ND	ug/L	1.0	1		01/08/16 14:4		
ert-Butylbenzene	ND	ug/L	1.0	1		01/08/16 14:4		
Carbon tetrachloride	ND ND		1.0	1		01/08/16 14:4		
		ug/L						
Chlorobenzene	ND	ug/L	1.0	1		01/08/16 14:4		
Chloroethane	ND	ug/L	4.0	1		01/08/16 14:4		
Chloroform	ND	ug/L	1.0	1		01/08/16 14:4		
Chloromethane	ND	ug/L	4.0	1		01/08/16 14:4		
-Chlorotoluene	ND	ug/L	1.0	1		01/08/16 14:4		
-Chlorotoluene	ND	ug/L	1.0	1		01/08/16 14:4	9 106-43-4	
,2-Dibromo-3-chloropropane	ND	ug/L	10.0	1		01/08/16 14:4	9 96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		01/08/16 14:4	9 124-48-1	
,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		01/08/16 14:4	9 106-93-4	
Dibromomethane	ND	ug/L	4.0	1		01/08/16 14:4	9 74-95-3	
,2-Dichlorobenzene	ND	ug/L	1.0	1		01/08/16 14:4	9 95-50-1	
,3-Dichlorobenzene	ND	ug/L	1.0	1		01/08/16 14:4	9 541-73-1	
,4-Dichlorobenzene	ND	ug/L	1.0	1		01/08/16 14:4	9 106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		01/08/16 14:4	9 75-71-8	
,1-Dichloroethane	ND	ug/L	1.0	1		01/08/16 14:4	9 75-34-3	
,2-Dichloroethane	ND	ug/L	1.0	1		01/08/16 14:4		
,1-Dichloroethene	ND	ug/L	1.0	1		01/08/16 14:4		
sis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/08/16 14:4		
rans-1,2-Dichloroethene	ND ND	ug/L ug/L	1.0	1		01/08/16 14:4		
Dichlorofluoromethane	ND ND		1.0	1		01/08/16 14:4		
,2-Dichloropropane	ND ND	ug/L	4.0	1		01/08/16 14:4		
· ' '		ug/L						
,3-Dichloropropane	ND	ug/L	1.0	1		01/08/16 14:4		
2,2-Dichloropropane	ND	ug/L	4.0	1		01/08/16 14:4		
,1-Dichloropropene	ND	ug/L	1.0	1		01/08/16 14:4		
is-1,3-Dichloropropene	ND	ug/L	4.0	1		01/08/16 14:4		
ans-1,3-Dichloropropene	ND	ug/L	4.0	1		01/08/16 14:4	9 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		01/08/16 14:4		
Ethylbenzene	ND	ug/L	1.0	1		01/08/16 14:4	9 100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		01/08/16 14:4	9 87-68-3	
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		01/08/16 14:4	9 98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		01/08/16 14:4	9 99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		01/08/16 14:4		
I-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/08/16 14:4		
Methyl-tert-butyl ether	ND	ug/L	1.0	1		01/08/16 14:4		

### **REPORT OF LABORATORY ANALYSIS**

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



Project: PS Beta-NIROP
Pace Project No.: 10335268

Date: 02/05/2016 12:51 PM

Sample: PMW-01	Lab ID: 103	35268001	Collected: 01/06/1	6 14:20	Received: 01/06/16 16:34	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B				
Naphthalene	ND	ug/L	4.0	1	01/08/16 14	49 91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1	01/08/16 14	:49 103-65-1	
Styrene	ND	ug/L	1.0	1	01/08/16 14	:49 100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1	01/08/16 14	49 630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1	01/08/16 14	:49 79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1	01/08/16 14	:49 127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1	01/08/16 14	:49 109-99-9	
Toluene	ND	ug/L	1.0	1	01/08/16 14	:49 108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1	01/08/16 14	:49 87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1	01/08/16 14	:49 120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1	01/08/16 14	:49 71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1	01/08/16 14	:49 79-00-5	
Trichloroethene	ND	ug/L	0.40	1	01/08/16 14	:49 79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1	01/08/16 14	:49 75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1	01/08/16 14	:49 96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1	01/08/16 14	:49 76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1	01/08/16 14	:49 95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1	01/08/16 14	:49 108-67-8	
Vinyl chloride	ND	ug/L	0.40	1	01/08/16 14	:49 75-01-4	
Xylene (Total)	ND	ug/L	3.0	1	01/08/16 14	:49 1330-20-7	
Surrogates		-					
1,2-Dichloroethane-d4 (S)	103	%.	75-125	1	01/08/16 14	49 17060-07-0	
Toluene-d8 (S)	106	%.	75-125	1	01/08/16 14	49 2037-26-5	
4-Bromofluorobenzene (S)	166	%.	75-125	1	01/08/16 14	:49 460-00-4	S3

(612)607-1700

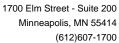


### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Page Project No: 10335268

Date: 02/05/2016 12:51 PM

Sample: PMW-02	Lab ID: 103	35268002	Collected: 01/06/1	6 13:25	Received: 01/06/16 16:34 Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared Analyzed CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B			
Acetone	ND	ug/L	40.0	2	01/08/16 15:05 67-64-1	
Allyl chloride	ND	ug/L	8.0	2	01/08/16 15:05 107-05-1	
Benzene	ND	ug/L	2.0	2	01/08/16 15:05 71-43-2	
Bromobenzene	ND	ug/L	2.0	2	01/08/16 15:05 108-86-1	
Bromochloromethane	ND	ug/L	2.0	2	01/08/16 15:05 74-97-5	
Bromodichloromethane	ND	ug/L	2.0	2	01/08/16 15:05 75-27-4	
Bromoform	ND	ug/L	8.0	2	01/08/16 15:05 75-25-2	
Bromomethane	ND	ug/L	8.0	2	01/08/16 15:05 74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	2	01/08/16 15:05 78-93-3	
n-Butylbenzene	ND	ug/L	2.0	2	01/08/16 15:05 104-51-8	
sec-Butylbenzene	ND	ug/L	2.0	2	01/08/16 15:05 135-98-8	
ert-Butylbenzene	ND ND	ug/L	2.0	2	01/08/16 15:05 98-06-6	
Carbon tetrachloride	ND ND		2.0	2	01/08/16 15:05 56-23-5	
		ug/L				
Chlorobenzene	ND	ug/L	2.0	2	01/08/16 15:05 108-90-7	
Chloroethane	ND	ug/L	8.0	2	01/08/16 15:05 75-00-3	
Chloroform	ND	ug/L	2.0	2	01/08/16 15:05 67-66-3	
Chloromethane	ND	ug/L	8.0	2	01/08/16 15:05 74-87-3	
2-Chlorotoluene	ND	ug/L	2.0	2	01/08/16 15:05 95-49-8	
I-Chlorotoluene	ND	ug/L	2.0	2	01/08/16 15:05 106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	20.0	2	01/08/16 15:05 96-12-8	
Dibromochloromethane	ND	ug/L	2.0	2	01/08/16 15:05 124-48-1	
,2-Dibromoethane (EDB)	ND	ug/L	2.0	2	01/08/16 15:05 106-93-4	
Dibromomethane	ND	ug/L	8.0	2	01/08/16 15:05 74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	2	01/08/16 15:05 95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.0	2	01/08/16 15:05 541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.0	2	01/08/16 15:05 106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.0	2	01/08/16 15:05 75-71-8	
1,1-Dichloroethane	37.8	ug/L	2.0	2	01/08/16 15:05 75-34-3	
1,2-Dichloroethane	ND	ug/L	2.0	2	01/08/16 15:05 107-06-2	
I,1-Dichloroethene	22.2	ug/L	2.0	2	01/08/16 15:05 75-35-4	
cis-1,2-Dichloroethene	282	ug/L	2.0	2	01/08/16 15:05 156-59-2	
rans-1,2-Dichloroethene	320	ug/L	2.0	2	01/08/16 15:05 156-60-5	
Dichlorofluoromethane	ND	ug/L	2.0	2	01/08/16 15:05 75-43-4	
1,2-Dichloropropane	ND ND	ug/L	8.0	2	01/08/16 15:05 78-87-5	
' ' '	ND ND	ug/L	2.0	2		
1,3-Dichloropropane		J			01/08/16 15:05 142-28-9	
2,2-Dichloropropane	ND	ug/L	8.0	2	01/08/16 15:05 594-20-7	
I,1-Dichloropropene	ND	ug/L	2.0	2	01/08/16 15:05 563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	8.0	2	01/08/16 15:05 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	8.0	2	01/08/16 15:05 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	8.0	2	01/08/16 15:05 60-29-7	
Ethylbenzene	ND	ug/L	2.0	2	01/08/16 15:05 100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2	01/08/16 15:05 87-68-3	
sopropylbenzene (Cumene)	ND	ug/L	2.0	2	01/08/16 15:05 98-82-8	
o-Isopropyltoluene	ND	ug/L	2.0	2	01/08/16 15:05 99-87-6	
Methylene Chloride	ND	ug/L	8.0	2	01/08/16 15:05 75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	2	01/08/16 15:05 108-10-1	
Methyl-tert-butyl ether	ND	ug/L	2.0	2	01/08/16 15:05 1634-04-4	





Project: PS Beta-NIROP
Pace Project No.: 10335268

Date: 02/05/2016 12:51 PM

Sample: PMW-02	Lab ID: 103	35268002	Collected: 01/06/1	6 13:25	Received: 01	/06/16 16:34 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	8.0	2		01/08/16 15:05	91-20-3	
n-Propylbenzene	ND	ug/L	2.0	2		01/08/16 15:05	103-65-1	
Styrene	ND	ug/L	2.0	2		01/08/16 15:05	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2		01/08/16 15:05	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2		01/08/16 15:05	79-34-5	
Tetrachloroethene	ND	ug/L	2.0	2		01/08/16 15:05	127-18-4	
Tetrahydrofuran	ND	ug/L	20.0	2		01/08/16 15:05	109-99-9	
Toluene	ND	ug/L	2.0	2		01/08/16 15:05	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2		01/08/16 15:05	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2		01/08/16 15:05	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	2.0	2		01/08/16 15:05	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	2		01/08/16 15:05	79-00-5	
Trichloroethene	51.2	ug/L	0.80	2		01/08/16 15:05	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2		01/08/16 15:05	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	8.0	2		01/08/16 15:05	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	2.0	2		01/08/16 15:05	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	2.0	2		01/08/16 15:05	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	2.0	2		01/08/16 15:05	108-67-8	
Vinyl chloride	ND	ug/L	0.80	2		01/08/16 15:05	75-01-4	
Xylene (Total)	ND	ug/L	6.0	2		01/08/16 15:05	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%.	75-125	2		01/08/16 15:05		
Toluene-d8 (S)	100	%.	75-125	2		01/08/16 15:05		
4-Bromofluorobenzene (S)	104	%.	75-125	2		01/08/16 15:05	460-00-4	

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### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10335268

Date: 02/05/2016 12:51 PM

Sample: PMW-03	Lab ID: 103	35268003	Collected: 01/06/1	6 10:55	Received:	01/06/16 16:34	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Met	nod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		01/07/16 22:0	7 67-64-1	M1
Allyl chloride	ND	ug/L	4.0	1		01/07/16 22:0	7 107-05-1	
Benzene	ND	ug/L	1.0	1		01/07/16 22:0	7 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		01/07/16 22:0	7 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		01/07/16 22:0	7 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/07/16 22:0	7 75-27-4	
Bromoform	ND	ug/L	4.0	1		01/07/16 22:0	7 75-25-2	
Bromomethane	ND	ug/L	4.0	1		01/07/16 22:0	7 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/07/16 22:0	7 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		01/07/16 22:0	7 104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		01/07/16 22:0	7 135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		01/07/16 22:0	7 98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		01/07/16 22:0	7 56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/07/16 22:0	7 108-90-7	
Chloroethane	ND	ug/L	4.0	1		01/07/16 22:0		M1
Chloroform	ND	ug/L	1.0	1		01/07/16 22:0		
Chloromethane	ND	ug/L	4.0	1		01/07/16 22:0		
2-Chlorotoluene	ND	ug/L	1.0	1		01/07/16 22:0		
4-Chlorotoluene	ND	ug/L	1.0	1		01/07/16 22:0		
1,2-Dibromo-3-chloropropane	ND	ug/L	10.0	1		01/07/16 22:0		
Dibromochloromethane	ND	ug/L	1.0	1		01/07/16 22:0		
1,2-Dibromoethane (EDB)	ND ND	ug/L	1.0	1		01/07/16 22:0	-	
Dibromomethane	ND	ug/L	4.0	1		01/07/16 22:0		
1,2-Dichlorobenzene	ND ND	ug/L	1.0	1		01/07/16 22:0		
1,3-Dichlorobenzene	ND ND	ug/L	1.0	1		01/07/16 22:0		
1,4-Dichlorobenzene	ND ND	•	1.0	1		01/07/16 22:0		
Dichlorodifluoromethane	ND ND	ug/L	1.0	1		01/07/16 22:0		
		ug/L		1				
1,1-Dichloroethane	2.6	ug/L	1.0			01/07/16 22:0		
1,2-Dichloroethane	ND	ug/L	1.0	1		01/07/16 22:0		
1,1-Dichloroethene	ND	ug/L	1.0	1		01/07/16 22:0		
cis-1,2-Dichloroethene	37.7	ug/L	1.0	1		01/07/16 22:0		
trans-1,2-Dichloroethene	67.7	ug/L	1.0	1		01/07/16 22:0		
Dichlorofluoromethane	ND	ug/L	1.0	1		01/07/16 22:0		M1
1,2-Dichloropropane	ND	ug/L	4.0	1		01/07/16 22:0		
1,3-Dichloropropane	ND	ug/L	1.0	1		01/07/16 22:0		
2,2-Dichloropropane	ND	ug/L	4.0	1		01/07/16 22:0		
1,1-Dichloropropene	ND	ug/L	1.0	1		01/07/16 22:0		
cis-1,3-Dichloropropene	ND	ug/L	4.0	1			7 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1			7 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		01/07/16 22:0		
Ethylbenzene	ND	ug/L	1.0	1		01/07/16 22:0		
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		01/07/16 22:0		
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		01/07/16 22:0		
o-Isopropyltoluene	ND	ug/L	1.0	1		01/07/16 22:0	7 99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		01/07/16 22:0		
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/07/16 22:0		
Methyl-tert-butyl ether	ND	ug/L	1.0	1		01/07/16 22:0	7 1634-04-4	

### **REPORT OF LABORATORY ANALYSIS**

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Project: PS Beta-NIROP
Pace Project No.: 10335268

Date: 02/05/2016 12:51 PM

Sample: PMW-03	Lab ID: 103	35268003	Collected: 01/06/1	6 10:55	Received: 0	1/06/16 16:34 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B VOC	Analytical Meth	od: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		01/07/16 22:07	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		01/07/16 22:07	103-65-1	
Styrene	ND	ug/L	1.0	1		01/07/16 22:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/07/16 22:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/07/16 22:07	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/07/16 22:07	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		01/07/16 22:07	109-99-9	M1
Toluene	ND	ug/L	1.0	1		01/07/16 22:07	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		01/07/16 22:07	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		01/07/16 22:07	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/07/16 22:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/07/16 22:07	79-00-5	
Trichloroethene	13.0	ug/L	0.40	1		01/07/16 22:07	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/07/16 22:07	75-69-4	M1
1,2,3-Trichloropropane	ND	ug/L	4.0	1		01/07/16 22:07	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		01/07/16 22:07	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		01/07/16 22:07	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		01/07/16 22:07	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		01/07/16 22:07	75-01-4	
Xylene (Total) <b>Surrogates</b>	ND	ug/L	3.0	1		01/07/16 22:07	1330-20-7	
1,2-Dichloroethane-d4 (S)	102	%.	75-125	1		01/07/16 22:07	17060-07-0	
Toluene-d8 (S)	99	%.	75-125	1		01/07/16 22:07	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1		01/07/16 22:07		

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### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10335268

Date: 02/05/2016 12:51 PM

Sample: PMW-04	Lab ID: 103	35268004	Collected: 01/06/1	6 09:25	Received:	01/06/16 16:34	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Metl	nod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		01/07/16 23:0	9 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		01/07/16 23:0	9 107-05-1	
Benzene	ND	ug/L	1.0	1		01/07/16 23:0	9 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		01/07/16 23:0	9 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		01/07/16 23:0	9 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/07/16 23:0	9 75-27-4	
Bromoform	ND	ug/L	4.0	1		01/07/16 23:0	9 75-25-2	
Bromomethane	ND	ug/L	4.0	1		01/07/16 23:0	9 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/07/16 23:0	9 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		01/07/16 23:0	9 104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		01/07/16 23:0	9 135-98-8	
ert-Butylbenzene	ND	ug/L	1.0	1		01/07/16 23:0	9 98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		01/07/16 23:0	9 56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/07/16 23:0		
Chloroethane	ND	ug/L	4.0	1		01/07/16 23:0		
Chloroform	ND	ug/L	1.0	1		01/07/16 23:0		
Chloromethane	ND	ug/L	4.0	1		01/07/16 23:0		
-Chlorotoluene	ND	ug/L	1.0	1		01/07/16 23:0		
I-Chlorotoluene	ND	ug/L	1.0	1		01/07/16 23:0		
,2-Dibromo-3-chloropropane	ND	ug/L	10.0	1		01/07/16 23:0		
Dibromochloromethane	ND ND	ug/L	1.0	1		01/07/16 23:0		
,2-Dibromoethane (EDB)	ND ND	ug/L	1.0	1		01/07/16 23:0		
Dibromomethane	ND	ug/L	4.0	1		01/07/16 23:0		
I,2-Dichlorobenzene	ND ND	ug/L	1.0	1		01/07/16 23:0		
,	ND ND	•	1.0	1		01/07/16 23:0		
,3-Dichlorobenzene		ug/L		1				
1,4-Dichlorobenzene Dichlorodifluoromethane	ND ND	ug/L	1.0 1.0	1		01/07/16 23:09 01/07/16 23:09		
		ug/L						
1,1-Dichloroethane	ND	ug/L	1.0	1		01/07/16 23:0		
,2-Dichloroethane	ND	ug/L	1.0	1		01/07/16 23:0		
I,1-Dichloroethene	ND	ug/L	1.0	1		01/07/16 23:0		
cis-1,2-Dichloroethene	16.4	ug/L	1.0	1		01/07/16 23:0		
rans-1,2-Dichloroethene	47.1	ug/L	1.0	1		01/07/16 23:0		
Dichlorofluoromethane	ND	ug/L	1.0	1		01/07/16 23:0		
,2-Dichloropropane	ND	ug/L	4.0	1		01/07/16 23:0		
,3-Dichloropropane	ND	ug/L	1.0	1		01/07/16 23:0		
2,2-Dichloropropane	ND	ug/L	4.0	1		01/07/16 23:0		
,1-Dichloropropene	ND	ug/L	1.0	1		01/07/16 23:0		
is-1,3-Dichloropropene	ND	ug/L	4.0	1		01/07/16 23:0		
rans-1,3-Dichloropropene	ND	ug/L	4.0	1		01/07/16 23:0		
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		01/07/16 23:0		
Ethylbenzene	ND	ug/L	1.0	1		01/07/16 23:0		
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		01/07/16 23:0	9 87-68-3	
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		01/07/16 23:0		
o-Isopropyltoluene	ND	ug/L	1.0	1		01/07/16 23:0	9 99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		01/07/16 23:0	9 75-09-2	
I-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/07/16 23:0	9 108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		01/07/16 23:0	9 1634-04-4	





Project: PS Beta-NIROP
Pace Project No.: 10335268

Date: 02/05/2016 12:51 PM

Sample: PMW-04	Lab ID: 103	35268004	Collected: 01/06/1	6 09:25	Received: 01/06/16 16:34	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B				
Naphthalene	ND	ug/L	4.0	1	01/07/16 23:0	9 91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1	01/07/16 23:0	9 103-65-1	
Styrene	ND	ug/L	1.0	1	01/07/16 23:0	9 100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1	01/07/16 23:0	9 630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1	01/07/16 23:0	9 79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1	01/07/16 23:0	9 127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1	01/07/16 23:0	9 109-99-9	
Toluene	ND	ug/L	1.0	1	01/07/16 23:0	9 108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1	01/07/16 23:0	9 87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1	01/07/16 23:0	9 120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1	01/07/16 23:0	9 71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1	01/07/16 23:0	9 79-00-5	
Trichloroethene	14.4	ug/L	0.40	1	01/07/16 23:0	9 79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1	01/07/16 23:0	9 75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1	01/07/16 23:0	9 96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1	01/07/16 23:0	9 76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1	01/07/16 23:0	9 95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1	01/07/16 23:0	9 108-67-8	
Vinyl chloride	ND	ug/L	0.40	1	01/07/16 23:0	9 75-01-4	
Xylene (Total)	ND	ug/L	3.0	1	01/07/16 23:0	9 1330-20-7	
Surrogates		-					
1,2-Dichloroethane-d4 (S)	101	%.	75-125	1	01/07/16 23:0	9 17060-07-0	
Toluene-d8 (S)	100	%.	75-125	1	01/07/16 23:0	9 2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1	01/07/16 23:0	9 460-00-4	



### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No: 10335268

Date: 02/05/2016 12:51 PM

Sample: Trip Blank	Lab ID: 103	Lab ID: 10335268005		6 00:00	Received:	Received: 01/06/16 16:54		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Met	hod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		01/07/16 20:50	0 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		01/07/16 20:50	0 107-05-1	
Benzene	ND	ug/L	1.0	1		01/07/16 20:50	0 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		01/07/16 20:50	0 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		01/07/16 20:50	0 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/07/16 20:50	0 75-27-4	
Bromoform	ND	ug/L	4.0	1		01/07/16 20:50	0 75-25-2	
Bromomethane	ND	ug/L	4.0	1		01/07/16 20:50	0 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/07/16 20:50		
n-Butylbenzene	ND	ug/L	1.0	1		01/07/16 20:50		
sec-Butylbenzene	ND	ug/L	1.0	1		01/07/16 20:50		
ert-Butylbenzene	ND	ug/L	1.0	1		01/07/16 20:50		
Carbon tetrachloride	ND	ug/L	1.0	1		01/07/16 20:50		
Chlorobenzene	ND	•	1.0	1		01/07/16 20:50		
Chloroethane		ug/L		1				
	ND	ug/L	4.0			01/07/16 20:50		
Chloroform	ND	ug/L	1.0	1		01/07/16 20:50		
Chloromethane	ND	ug/L	4.0	1		01/07/16 20:50		
-Chlorotoluene	ND	ug/L	1.0	1		01/07/16 20:50		
-Chlorotoluene	ND	ug/L	1.0	1		01/07/16 20:50		
,2-Dibromo-3-chloropropane	ND	ug/L	10.0	1		01/07/16 20:50	0 96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		01/07/16 20:50	0 124-48-1	
,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		01/07/16 20:50	0 106-93-4	
Dibromomethane	ND	ug/L	4.0	1		01/07/16 20:50	0 74-95-3	
,2-Dichlorobenzene	ND	ug/L	1.0	1		01/07/16 20:50	0 95-50-1	
,3-Dichlorobenzene	ND	ug/L	1.0	1		01/07/16 20:50	0 541-73-1	
,4-Dichlorobenzene	ND	ug/L	1.0	1		01/07/16 20:50	0 106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		01/07/16 20:50	0 75-71-8	
,1-Dichloroethane	ND	ug/L	1.0	1		01/07/16 20:50	0 75-34-3	
,2-Dichloroethane	ND	ug/L	1.0	1		01/07/16 20:50	0 107-06-2	
,1-Dichloroethene	ND	ug/L	1.0	1		01/07/16 20:50		
sis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/07/16 20:50		
rans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/07/16 20:50		
Dichlorofluoromethane	ND	ug/L	1.0	1		01/07/16 20:50		
,2-Dichloropropane	ND	ug/L	4.0	1		01/07/16 20:50		
,3-Dichloropropane	ND	ug/L	1.0	1		01/07/16 20:50		
	ND	Ū	4.0	1		01/07/16 20:50		
2,2-Dichloropropane	ND ND	ug/L	1.0	1		01/07/16 20:50		
,1-Dichloropropene		ug/L						
is-1,3-Dichloropropene	ND	ug/L	4.0	1		01/07/16 20:50		
rans-1,3-Dichloropropene	ND	ug/L	4.0	1		01/07/16 20:50		
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		01/07/16 20:50		
Ethylbenzene	ND	ug/L	1.0	1		01/07/16 20:50		
lexachloro-1,3-butadiene	ND	ug/L	1.0	1		01/07/16 20:50		
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		01/07/16 20:50		
-Isopropyltoluene	ND	ug/L	1.0	1		01/07/16 20:50	0 99-87-6	
lethylene Chloride	ND	ug/L	4.0	1		01/07/16 20:50	0 75-09-2	
-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/07/16 20:50	0 108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		01/07/16 20:50	0 1634-04-4	





### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP Pace Project No.: 10335268

Date: 02/05/2016 12:51 PM

Sample: Trip Blank	Lab ID: 103	Lab ID: 10335268005		6 00:00	Received: 0'	1/06/16 16:54 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		01/07/16 20:50	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		01/07/16 20:50	103-65-1	
Styrene	ND	ug/L	1.0	1		01/07/16 20:50	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/07/16 20:50	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/07/16 20:50	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/07/16 20:50	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		01/07/16 20:50	109-99-9	
Toluene	ND	ug/L	1.0	1		01/07/16 20:50	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		01/07/16 20:50	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		01/07/16 20:50	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/07/16 20:50	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/07/16 20:50	79-00-5	
Trichloroethene	ND	ug/L	0.40	1		01/07/16 20:50	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/07/16 20:50	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		01/07/16 20:50	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		01/07/16 20:50	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		01/07/16 20:50	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		01/07/16 20:50	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		01/07/16 20:50	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		01/07/16 20:50	1330-20-7	
Surrogates		-						
1,2-Dichloroethane-d4 (S)	104	%.	75-125	1		01/07/16 20:50	17060-07-0	
Toluene-d8 (S)	99	%.	75-125	1		01/07/16 20:50	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	75-125	1		01/07/16 20:50	460-00-4	



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP

Pace Project No.: 10335268

Date: 02/05/2016 12:51 PM

QC Batch: MSV/34345 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV 465 W

Associated Lab Samples: 10335268003, 10335268004, 10335268005

METHOD BLANK: 2171177 Matrix: Water

Associated Lab Samples: 10335268003, 10335268004, 10335268005

		Blank Reporting			
Parameter	Units	Result	Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	01/07/16 20:34	
1,1,1-Trichloroethane	ug/L	ND	1.0	01/07/16 20:34	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	01/07/16 20:34	
1,1,2-Trichloroethane	ug/L	ND	1.0	01/07/16 20:34	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	01/07/16 20:34	
1,1-Dichloroethane	ug/L	ND	1.0	01/07/16 20:34	
1,1-Dichloroethene	ug/L	ND	1.0	01/07/16 20:34	
1,1-Dichloropropene	ug/L	ND	1.0	01/07/16 20:34	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	01/07/16 20:34	
1,2,3-Trichloropropane	ug/L	ND	4.0	01/07/16 20:34	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	01/07/16 20:34	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	01/07/16 20:34	
1,2-Dibromo-3-chloropropane	ug/L	ND	10.0	01/07/16 20:34	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	01/07/16 20:34	
1,2-Dichlorobenzene	ug/L	ND	1.0	01/07/16 20:34	
1,2-Dichloroethane	ug/L	ND	1.0	01/07/16 20:34	
1,2-Dichloropropane	ug/L	ND	4.0	01/07/16 20:34	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	01/07/16 20:34	
1,3-Dichlorobenzene	ug/L	ND	1.0	01/07/16 20:34	
1,3-Dichloropropane	ug/L	ND	1.0	01/07/16 20:34	
1,4-Dichlorobenzene	ug/L	ND	1.0	01/07/16 20:34	
2,2-Dichloropropane	ug/L	ND	4.0	01/07/16 20:34	
2-Butanone (MEK)	ug/L	ND	5.0	01/07/16 20:34	
2-Chlorotoluene	ug/L	ND	1.0	01/07/16 20:34	
4-Chlorotoluene	ug/L	ND	1.0	01/07/16 20:34	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	01/07/16 20:34	
Acetone	ug/L	ND	20.0	01/07/16 20:34	
Allyl chloride	ug/L	ND	4.0	01/07/16 20:34	
Benzene	ug/L	ND	1.0	01/07/16 20:34	
Bromobenzene	ug/L	ND	1.0	01/07/16 20:34	
Bromochloromethane	ug/L	ND	1.0	01/07/16 20:34	
Bromodichloromethane	ug/L	ND	1.0	01/07/16 20:34	
Bromoform	ug/L	ND	4.0	01/07/16 20:34	
Bromomethane	ug/L	ND	4.0	01/07/16 20:34	
Carbon tetrachloride	ug/L	ND	1.0	01/07/16 20:34	
Chlorobenzene	ug/L	ND	1.0	01/07/16 20:34	
Chloroethane	ug/L	ND	4.0	01/07/16 20:34	
Chloroform	ug/L	ND	1.0	01/07/16 20:34	
Chloromethane	ug/L	ND	4.0	01/07/16 20:34	
cis-1,2-Dichloroethene	ug/L	ND	1.0	01/07/16 20:34	
cis-1,3-Dichloropropene	ug/L	ND	4.0	01/07/16 20:34	

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.



Date: 02/05/2016 12:51 PM

### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10335268

METHOD BLANK: 2171177 Matrix: Water

Associated Lab Samples: 10335268003, 10335268004, 10335268005

,		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/L	ND	1.0	01/07/16 20:34	
Dibromomethane	ug/L	ND	4.0	01/07/16 20:34	
Dichlorodifluoromethane	ug/L	ND	1.0	01/07/16 20:34	
Dichlorofluoromethane	ug/L	ND	1.0	01/07/16 20:34	
Diethyl ether (Ethyl ether)	ug/L	ND	4.0	01/07/16 20:34	
Ethylbenzene	ug/L	ND	1.0	01/07/16 20:34	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	01/07/16 20:34	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	01/07/16 20:34	
Methyl-tert-butyl ether	ug/L	ND	1.0	01/07/16 20:34	
Methylene Chloride	ug/L	ND	4.0	01/07/16 20:34	
n-Butylbenzene	ug/L	ND	1.0	01/07/16 20:34	
n-Propylbenzene	ug/L	ND	1.0	01/07/16 20:34	
Naphthalene	ug/L	ND	4.0	01/07/16 20:34	
p-Isopropyltoluene	ug/L	ND	1.0	01/07/16 20:34	
sec-Butylbenzene	ug/L	ND	1.0	01/07/16 20:34	
Styrene	ug/L	ND	1.0	01/07/16 20:34	
tert-Butylbenzene	ug/L	ND	1.0	01/07/16 20:34	
Tetrachloroethene	ug/L	ND	1.0	01/07/16 20:34	
Tetrahydrofuran	ug/L	ND	10.0	01/07/16 20:34	
Toluene	ug/L	ND	1.0	01/07/16 20:34	
trans-1,2-Dichloroethene	ug/L	ND	1.0	01/07/16 20:34	
trans-1,3-Dichloropropene	ug/L	ND	4.0	01/07/16 20:34	
Trichloroethene	ug/L	ND	0.40	01/07/16 20:34	
Trichlorofluoromethane	ug/L	ND	1.0	01/07/16 20:34	
Vinyl chloride	ug/L	ND	0.40	01/07/16 20:34	
Xylene (Total)	ug/L	ND	3.0	01/07/16 20:34	
1,2-Dichloroethane-d4 (S)	%.	102	75-125	01/07/16 20:34	
4-Bromofluorobenzene (S)	%.	100	75-125	01/07/16 20:34	
Toluene-d8 (S)	%.	99	75-125	01/07/16 20:34	

LABORATORY CONTROL SAMPLE:	2171178					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L		18.9	95	75-125	
1,1,1-Trichloroethane	ug/L	20	19.2	96	73-125	
1,1,2,2-Tetrachloroethane	ug/L	20	19.8	99	75-128	
1,1,2-Trichloroethane	ug/L	20	20.7	103	75-129	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.0	85	69-125	
1,1-Dichloroethane	ug/L	20	18.0	90	75-131	
1,1-Dichloroethene	ug/L	20	17.1	85	72-125	
1,1-Dichloropropene	ug/L	20	18.1	90	74-125	
1,2,3-Trichlorobenzene	ug/L	20	20.9	105	68-127	
1,2,3-Trichloropropane	ug/L	20	21.6	108	75-125	
1,2,4-Trichlorobenzene	ug/L	20	20.0	100	70-125	

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### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10335268

ABORATORY CONTROL SAMPLE:	2171178					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifier
,2,4-Trimethylbenzene	ug/L	20	19.5	98	75-130	
,2-Dibromo-3-chloropropane	ug/L	50	49.5	99	74-125	
,2-Dibromoethane (EDB)	ug/L	20	20.2	101	75-125	
,2-Dichlorobenzene	ug/L	20	19.6	98	75-125	
,2-Dichloroethane	ug/L	20	20.7	104	72-129	
,2-Dichloropropane	ug/L	20	19.1	96	71-129	
,3,5-Trimethylbenzene	ug/L	20	19.4	97	75-127	
,3-Dichlorobenzene	ug/L	20	18.2	91	75-125	
,3-Dichloropropane	ug/L	20	19.9	100	75-125	
,4-Dichlorobenzene	ug/L	20	18.9	95	75-125	
,2-Dichloropropane	ug/L	20	17.5	87	71-125	
-Butanone (MEK)	ug/L	100	104	104	58-150	
-Chlorotoluene	ug/L	20	19.0	95	75-125	
-Chlorotoluene	ug/L	20	18.5	93	75-130	
-Methyl-2-pentanone (MIBK)	ug/L	100	100	100	72-140	
cetone	ug/L	100	89.6	90	69-137	
Ilyl chloride	ug/L	20	16.4	82	68-132	
enzene	ug/L	20	17.6	88	75-125	
romobenzene	ug/L	20	19.0	95	75-125	
romochloromethane	ug/L	20	18.2	91	75-125	
romodichloromethane	ug/L	20	20.9	104	69-128	
romoform	ug/L	20	20.6	103	75-125	
romomethane	ug/L	20	17.9	89	30-150	SS
arbon tetrachloride	ug/L	20	19.4	97	74-125	
Chlorobenzene	ug/L	20	18.7	93	75-125	
Chloroethane	ug/L	20	17.2	86	60-150	
Chloroform	ug/L	20	19.2	96	75-126	
Chloromethane	ug/L	20	16.1	80	46-150	
is-1,2-Dichloroethene	ug/L	20	18.2	91	75-126	
is-1,3-Dichloropropene	ug/L	20	19.1	96	75-125	
Dibromochloromethane	ug/L	20	19.9	99	75-125	
Dibromomethane	ug/L	20	19.5	97	72-127	
Dichlorodifluoromethane	ug/L	20	18.4	92	58-135	
Dichlorofluoromethane	ug/L	20	20.3	101	68-149	
Diethyl ether (Ethyl ether)	ug/L	20	18.5	93	66-144	
thylbenzene	ug/L	20	19.3	97	75-125	
lexachloro-1,3-butadiene	ug/L	20	19.9	99	73-125	
copropylbenzene (Cumene)	ug/L	20	20.2	101	69-140	
lethyl-tert-butyl ether	ug/L	20	20.2	101	75-126	
lethylene Chloride	ug/L	20	16.1	81	71-130	
-Butylbenzene	ug/L	20	19.7	99	71-130	
-Butylbenzene -Propylbenzene	ug/L ug/L	20	18.2	99	71-129	
laphthalene	ug/L	20	21.5	107	59-137	
-Isopropyltoluene	ug/L	20	19.5	98	74-127	
ec-Butylbenzene	ug/L	20	18.4	92 100	66-140 75-135	
tyrene	ug/L	20	19.9	100	75-125	

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### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10335268

ABORATORY CONTROL SAMPLE:	2171178					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
etrachloroethene	ug/L		19.0	95	75-125	
trahydrofuran	ug/L	200	179	90	71-129	
uene	ug/L	20	18.9	94	75-125	
ns-1,2-Dichloroethene	ug/L	20	17.5	88	75-125	
ns-1,3-Dichloropropene	ug/L	20	19.0	95	75-125	
nloroethene	ug/L	20	19.5	97	75-125	
lorofluoromethane	ug/L	20	22.5	113	74-128	
chloride	ug/L	20	17.9	90	71-131	
ne (Total)	ug/L	60	59.3	99	75-125	
Dichloroethane-d4 (S)	%.			102	75-125	
omofluorobenzene (S)	%.			98	75-125	
ene-d8 (S)	%.			101	75-125	

MATRIX SPIKE SAMPLE:	2172067						
		10335268003	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	24.2	121	75-125	
1,1,1-Trichloroethane	ug/L	ND	20	27.1	135	71-144	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	22.3	111	75-131	
1,1,2-Trichloroethane	ug/L	ND	20	24.6	123	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	24.8	124	75-150	
1,1-Dichloroethane	ug/L	2.6	20	25.9	117	64-150	
1,1-Dichloroethene	ug/L	ND	20	24.2	117	68-150	
1,1-Dichloropropene	ug/L	ND	20	25.2	126	68-145	
1,2,3-Trichlorobenzene	ug/L	ND	20	21.3	106	57-142	
1,2,3-Trichloropropane	ug/L	ND	20	23.0	115	75-125	
1,2,4-Trichlorobenzene	ug/L	ND	20	22.1	110	60-135	
1,2,4-Trimethylbenzene	ug/L	ND	20	23.3	117	67-148	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	51.4	103	32-137	
1,2-Dibromoethane (EDB)	ug/L	ND	20	24.4	122	75-125	
1,2-Dichlorobenzene	ug/L	ND	20	23.0	115	75-125	
1,2-Dichloroethane	ug/L	ND	20	26.2	131	62-138	
1,2-Dichloropropane	ug/L	ND	20	24.3	121	62-144	
1,3,5-Trimethylbenzene	ug/L	ND	20	23.2	116	67-148	
1,3-Dichlorobenzene	ug/L	ND	20	22.6	113	74-131	
1,3-Dichloropropane	ug/L	ND	20	24.6	123	75-127	
1,4-Dichlorobenzene	ug/L	ND	20	23.2	116	74-126	
2,2-Dichloropropane	ug/L	ND	20	23.0	115	56-146	
2-Butanone (MEK)	ug/L	ND	100	99.4	99	47-150	
2-Chlorotoluene	ug/L	ND	20	23.0	115	74-137	
4-Chlorotoluene	ug/L	ND	20	23.4	117	72-138	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	112	112	60-147	
Acetone	ug/L	ND	100	186	186	61-150 I	S,M1
Allyl chloride	ug/L	ND	20	21.1	106	53-150	
Benzene	ug/L	ND	20	22.7	114	52-147	

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### **REPORT OF LABORATORY ANALYSIS**

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### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10335268

MATRIX SPIKE SAMPLE:	2172067						
_		10335268003	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/L	ND	20	23.2	116	75-129	
Bromochloromethane	ug/L	ND	20	24.7	124	72-128	
Bromodichloromethane	ug/L	ND	20	25.1	125	65-137	
Bromoform	ug/L	ND	20	24.0	120	59-133	
Bromomethane	ug/L	ND	20	23.4	117	30-150 S	S
Carbon tetrachloride	ug/L	ND	20	27.9	140	73-144	
Chlorobenzene	ug/L	ND	20	24.2	121	75-126	
Chloroethane	ug/L	ND	20	37.7	188	55-150 N	11
Chloroform	ug/L	ND	20	24.4	122	66-143	
Chloromethane	ug/L	ND	20	25.4	127	42-150	
cis-1,2-Dichloroethene	ug/L	37.7	20	62.5	124	65-143	
cis-1,3-Dichloropropene	ug/L	ND	20	23.4	117	75-125	
Dibromochloromethane	ug/L	ND	20	24.2	121	75-125	
Dibromomethane	ug/L	ND	20	24.3	121	66-133	
Dichlorodifluoromethane	ug/L	ND	20	29.6	148	74-150	
Dichlorofluoromethane	ug/L	ND	20	30.4	152	68-150 N	11
Diethyl ether (Ethyl ether)	ug/L	ND	20	21.5	107	57-148	
Ethylbenzene	ug/L	ND	20	24.0	120	67-149	
Hexachloro-1,3-butadiene	ug/L	ND	20	24.9	124	65-143	
Isopropylbenzene (Cumene)	ug/L	ND	20	25.3	127	64-150	
Methyl-tert-butyl ether	ug/L	ND	20	24.3	121	71-130	
Methylene Chloride	ug/L	ND	20	20.5	102	67-137	
n-Butylbenzene	ug/L	ND	20	23.8	119	70-138	
n-Propylbenzene	ug/L	ND	20	22.8	114	70-148	
Naphthalene	ug/L	ND	20	20.3	102	39-150	
p-Isopropyltoluene	ug/L	ND	20	24.1	120	74-138	
sec-Butylbenzene	ug/L	ND	20	22.4	112	64-150	
Styrene	ug/L	ND	20	23.8	119	75-132	
tert-Butylbenzene	ug/L	ND	20	23.6	118	75-138	
Tetrachloroethene	ug/L	ND	20	24.8	124	73-136	
Tetrahydrofuran	ug/L	ND	200	432	216	68-142 IS	S,M1
Toluene	ug/L	ND	20	23.5	117	69-139	
trans-1,2-Dichloroethene	ug/L	67.7	20	91.4	119	75-135	
trans-1,3-Dichloropropene	ug/L	ND	20	23.7	118	66-136	
Trichloroethene	ug/L	13.0	20	37.9	124	74-135	
Trichlorofluoromethane	ug/L	ND	20	36.5	182	75-150 N	11
Vinyl chloride	ug/L	ND	20	28.6	143	69-150	
Xylene (Total)	ug/L	ND	60	72.2	120	70-147	
1,2-Dichloroethane-d4 (S)	%.				100	75-125	
4-Bromofluorobenzene (S)	%.				99	75-125	
Toluene-d8 (S)	%.				101	75-125	

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### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10335268

Date: 02/05/2016 12:51 PM

SAMPLE DUPLICATE: 2172068		4022520204	Dun		Marr	
Parameter	Units	10335268004 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L		ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	.41J		30	
1,1-Dichloropropene	ug/L	ND	ND		30	
1,2,3-Trichlorobenzene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2,4-Trichlorobenzene	ug/L	ND	ND		30	
1,2,4-Trimethylbenzene	ug/L	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,3,5-Trimethylbenzene	ug/L	ND	ND		30	
1,3-Dichlorobenzene	ug/L	ND	ND		30	
1,3-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2,2-Dichloropropane	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Chlorotoluene	ug/L	ND	ND		30	
4-Chlorotoluene	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Allyl chloride	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromobenzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	16.4	16.9	3	30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Dichlorodifluoromethane	ug/L	ND	ND		30	
Dichlorofluoromethane	ug/L	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	

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Tetrachloroethene

trans-1,2-Dichloroethene

Trichlorofluoromethane

trans-1,3-Dichloropropene

1,2-Dichloroethane-d4 (S)

4-Bromofluorobenzene (S)

Date: 02/05/2016 12:51 PM

Tetrahydrofuran

Trichloroethene

Vinyl chloride

Xylene (Total)

Toluene-d8 (S)

Toluene

### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10335268

SAMPLE DUPLICATE: 2172068 10335268004 Dup Max Parameter Units Result Result **RPD** RPD Qualifiers ND Hexachloro-1,3-butadiene ug/L ND 30 ND ND Isopropylbenzene (Cumene) ug/L 30 ND Methyl-tert-butyl ether ug/L ND 30 Methylene Chloride ND ND 30 ug/L n-Butylbenzene ND ND 30 ug/L n-Propylbenzene ug/L ND ND 30 ND Naphthalene ug/L ND 30 p-Isopropyltoluene ND ND 30 ug/L sec-Butylbenzene ug/L ND ND 30 ND Styrene ug/L ND 30 ND tert-Butylbenzene ug/L ND 30

ND

ND

ND

47.1

ND

14.4

ND

ND

ND

101

99

100

ND

ND

ND

48.1

ND

14.2

ND

ND

ND

105

99

99

30

30

30

30

30

30

30

30

30

2

1

4

1

1

ug/L

ug/L

ug/L

ug/L

ug/L

ug/L

ug/L

ug/L

ug/L

%.

%.

%.

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### **QUALITY CONTROL DATA**

Analysis Description:

8260B MSV 465 W

Project: PS Beta-NIROP

Pace Project No.: 10335268

QC Batch Method:

Date: 02/05/2016 12:51 PM

QC Batch: MSV/34351 Analysis Method: EPA 8260B

EPA 8260B Associated Lab Samples: 10335268001, 10335268002

METHOD BLANK: 2171993 Matrix: Water

Associated Lab Samples: 10335268001, 10335268002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
,1,1,2-Tetrachloroethane	ug/L	ND	1.0	01/08/16 12:46	
,1,1-Trichloroethane	ug/L	ND	1.0	01/08/16 12:46	
,1,2,2-Tetrachloroethane	ug/L	ND	1.0	01/08/16 12:46	
,1,2-Trichloroethane	ug/L	ND	1.0	01/08/16 12:46	
,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	01/08/16 12:46	
,1-Dichloroethane	ug/L	ND	1.0	01/08/16 12:46	
,1-Dichloroethene	ug/L	ND	1.0	01/08/16 12:46	
,1-Dichloropropene	ug/L	ND	1.0	01/08/16 12:46	
,2,3-Trichlorobenzene	ug/L	ND	1.0	01/08/16 12:46	
,2,3-Trichloropropane	ug/L	ND	4.0	01/08/16 12:46	
,2,4-Trichlorobenzene	ug/L	ND	1.0	01/08/16 12:46	
,2,4-Trimethylbenzene	ug/L	ND	1.0	01/08/16 12:46	
,2-Dibromo-3-chloropropane	ug/L	ND	10.0	01/08/16 12:46	
,2-Dibromoethane (EDB)	ug/L	ND	1.0	01/08/16 12:46	
,2-Dichlorobenzene	ug/L	ND	1.0	01/08/16 12:46	
,2-Dichloroethane	ug/L	ND	1.0	01/08/16 12:46	
,2-Dichloropropane	ug/L	ND	4.0	01/08/16 12:46	
,3,5-Trimethylbenzene	ug/L	ND	1.0	01/08/16 12:46	
,3-Dichlorobenzene	ug/L	ND	1.0	01/08/16 12:46	
,3-Dichloropropane	ug/L	ND	1.0	01/08/16 12:46	
,4-Dichlorobenzene	ug/L	ND	1.0	01/08/16 12:46	
,2-Dichloropropane	ug/L	ND	4.0	01/08/16 12:46	
-Butanone (MEK)	ug/L	ND	5.0	01/08/16 12:46	
-Chlorotoluene	ug/L	ND	1.0	01/08/16 12:46	
-Chlorotoluene	ug/L	ND	1.0	01/08/16 12:46	
-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	01/08/16 12:46	
cetone	ug/L	ND	20.0	01/08/16 12:46	
llyl chloride	ug/L	ND	4.0	01/08/16 12:46	
enzene	ug/L	ND	1.0	01/08/16 12:46	
romobenzene	ug/L	ND	1.0	01/08/16 12:46	
romochloromethane	ug/L	ND	1.0	01/08/16 12:46	
romodichloromethane	ug/L	ND	1.0	01/08/16 12:46	
romoform	ug/L	ND	4.0	01/08/16 12:46	
romomethane	ug/L	ND	4.0	01/08/16 12:46	
arbon tetrachloride	ug/L	ND	1.0	01/08/16 12:46	
Chlorobenzene	ug/L	ND	1.0	01/08/16 12:46	
Chloroethane	ug/L	ND	4.0	01/08/16 12:46	
chloroform	ug/L	ND	1.0	01/08/16 12:46	
Chloromethane	ug/L	ND	4.0	01/08/16 12:46	
is-1,2-Dichloroethene	ug/L	ND	1.0	01/08/16 12:46	
is-1,3-Dichloropropene	ug/L	ND	4.0	01/08/16 12:46	

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### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10335268

Date: 02/05/2016 12:51 PM

METHOD BLANK: 2171993 Matrix: Water

Associated Lab Samples: 10335268001, 10335268002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/L	ND ND	1.0	01/08/16 12:46	
Dibromomethane	ug/L	ND	4.0	01/08/16 12:46	
Dichlorodifluoromethane	ug/L	ND	1.0	01/08/16 12:46	
Dichlorofluoromethane	ug/L	ND	1.0	01/08/16 12:46	
Diethyl ether (Ethyl ether)	ug/L	ND	4.0	01/08/16 12:46	
Ethylbenzene	ug/L	ND	1.0	01/08/16 12:46	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	01/08/16 12:46	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	01/08/16 12:46	
Methyl-tert-butyl ether	ug/L	ND	1.0	01/08/16 12:46	
Methylene Chloride	ug/L	ND	4.0	01/08/16 12:46	
n-Butylbenzene	ug/L	ND	1.0	01/08/16 12:46	
n-Propylbenzene	ug/L	ND	1.0	01/08/16 12:46	
Naphthalene	ug/L	ND	4.0	01/08/16 12:46	
p-Isopropyltoluene	ug/L	ND	1.0	01/08/16 12:46	
sec-Butylbenzene	ug/L	ND	1.0	01/08/16 12:46	
Styrene	ug/L	ND	1.0	01/08/16 12:46	
tert-Butylbenzene	ug/L	ND	1.0	01/08/16 12:46	
Tetrachloroethene	ug/L	ND	1.0	01/08/16 12:46	
Tetrahydrofuran	ug/L	ND	10.0	01/08/16 12:46	
Toluene	ug/L	ND	1.0	01/08/16 12:46	
trans-1,2-Dichloroethene	ug/L	ND	1.0	01/08/16 12:46	
trans-1,3-Dichloropropene	ug/L	ND	4.0	01/08/16 12:46	
Trichloroethene	ug/L	ND	0.40	01/08/16 12:46	
Trichlorofluoromethane	ug/L	ND	1.0	01/08/16 12:46	
Vinyl chloride	ug/L	ND	0.40	01/08/16 12:46	
Xylene (Total)	ug/L	ND	3.0	01/08/16 12:46	
1,2-Dichloroethane-d4 (S)	%.	104	75-125	01/08/16 12:46	
4-Bromofluorobenzene (S)	%.	100	75-125	01/08/16 12:46	
Toluene-d8 (S)	%.	98	75-125	01/08/16 12:46	

LABORATORY CONTROL SAMPLE:	2171994					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	18.8	94	75-125	
1,1,1-Trichloroethane	ug/L	20	18.9	95	73-125	
1,1,2,2-Tetrachloroethane	ug/L	20	19.5	97	75-128	
1,1,2-Trichloroethane	ug/L	20	19.9	99	75-129	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.8	89	69-125	
1,1-Dichloroethane	ug/L	20	18.0	90	75-131	
1,1-Dichloroethene	ug/L	20	16.8	84	72-125	
1,1-Dichloropropene	ug/L	20	17.9	89	74-125	
1,2,3-Trichlorobenzene	ug/L	20	19.9	99	68-127	
1,2,3-Trichloropropane	ug/L	20	20.9	104	75-125	
1,2,4-Trichlorobenzene	ug/L	20	19.0	95	70-125	

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### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10335268

ABORATORY CONTROL SAMPLE:	2171994					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifier
I,2,4-Trimethylbenzene	ug/L	20	18.0	90	75-130	
,2-Dibromo-3-chloropropane	ug/L	50	47.9	96	74-125	
I,2-Dibromoethane (EDB)	ug/L	20	20.7	103	75-125	
I,2-Dichlorobenzene	ug/L	20	18.6	93	75-125	
I,2-Dichloroethane	ug/L	20	21.4	107	72-129	
I,2-Dichloropropane	ug/L	20	17.6	88	71-129	
1,3,5-Trimethylbenzene	ug/L	20	18.5	93	75-127	
1,3-Dichlorobenzene	ug/L	20	17.8	89	75-125	
1,3-Dichloropropane	ug/L	20	19.8	99	75-125	
I,4-Dichlorobenzene	ug/L	20	17.8	89	75-125	
2,2-Dichloropropane	ug/L	20	18.5	92	71-125	
2-Butanone (MEK)	ug/L	100	102	102	58-150	
2-Chlorotoluene	ug/L	20	18.3	91	75-125	
1-Chlorotoluene	ug/L	20	18.5	93	75-130	
1-Methyl-2-pentanone (MIBK)	ug/L	100	104	104	72-140	
Acetone	ug/L	100	116	116	69-137	
Allyl chloride	ug/L	20	16.0	80	68-132	
Benzene	ug/L	20	17.4	87	75-125	
Bromobenzene	ug/L	20	17.7	88	75-125	
Bromochloromethane	ug/L	20	18.5	92	75-125	
Bromodichloromethane	ug/L	20	19.9	99	69-128	
Bromoform	ug/L	20	20.8	104	75-125	
Bromomethane	ug/L	20	15.3	76	30-150	SS
Carbon tetrachloride	ug/L	20	19.6	98	74-125	
Chlorobenzene	ug/L	20	18.1	90	75-125	
Chloroethane	ug/L	20	17.3	87	60-150	
Chloroform	ug/L	20	19.0	95	75-126	
Chloromethane	ug/L	20	16.1	81	46-150	
cis-1,2-Dichloroethene	ug/L	20	18.2	91	75-126	
cis-1,3-Dichloropropene	ug/L	20	19.2	96	75-125	
Dibromochloromethane	ug/L	20	20.3	101	75-125	
Dibromomethane	ug/L	20	20.2	101	72-127	
Dichlorodifluoromethane	ug/L	20	19.2	96	58-135	
Dichlorofluoromethane	ug/L	20	20.3	102	68-149	
Diethyl ether (Ethyl ether)	ug/L	20	16.9	85	66-144	
Ethylbenzene	ug/L	20	18.5	92	75-125	
Hexachloro-1,3-butadiene	ug/L	20	20.9	105	73-125	
sopropylbenzene (Cumene)	ug/L	20	19.6	98	69-140	
Methyl-tert-butyl ether	ug/L	20	20.0	100	75-126	
Methylene Chloride	ug/L	20	15.4	77	71-130	
n-Butylbenzene	ug/L	20	19.4	97	71-130	
n-Propylbenzene	ug/L	20	18.1	91	71-123	
Naphthalene	ug/L	20	18.9	94	59-137	
o-Isopropyltoluene	ug/L	20	19.1	95	74-127	
sec-Butylbenzene	ug/L ug/L	20	18.1	95 91	66-140	
Styrene	ug/∟ ug/L	20	18.8	94	75-125	
ert-Butylbenzene	ug/L ug/L	20	18.7	93	73-125	

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### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10335268

LABORATORY CONTROL SAMPLE:	2171994					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Tetrachloroethene	ug/L		18.3	92	75-125	
Tetrahydrofuran	ug/L	200	242	121	71-129	
Toluene	ug/L	20	17.9	89	75-125	
trans-1,2-Dichloroethene	ug/L	20	16.9	84	75-125	
rans-1,3-Dichloropropene	ug/L	20	19.6	98	75-125	
richloroethene	ug/L	20	18.5	93	75-125	
richlorofluoromethane	ug/L	20	24.3	121	74-128	
nyl chloride	ug/L	20	17.3	86	71-131	
ylene (Total)	ug/L	60	55.7	93	75-125	
,2-Dichloroethane-d4 (S)	%.			111	75-125	
Bromofluorobenzene (S)	%.			97	75-125	
oluene-d8 (S)	%.			100	75-125	
uene-d8 (S)	%.			100	75-125	

MATRIX SPIKE SAMPLE:	2172509						
		10335138001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	18.1	90	75-125	
1,1,1-Trichloroethane	ug/L	ND	20	19.0	95	71-144	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	16.1	80	75-131	
1,1,2-Trichloroethane	ug/L	ND	20	17.4	87	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	18.7	94	75-150	
1,1-Dichloroethane	ug/L	ND	20	17.0	85	64-150	
1,1-Dichloroethene	ug/L	ND	20	17.0	85	68-150	
1,1-Dichloropropene	ug/L	ND	20	18.5	93	68-145	
1,2,3-Trichlorobenzene	ug/L	ND	20	17.7	88	57-142	
1,2,3-Trichloropropane	ug/L	ND	20	15.7	78	75-125	
1,2,4-Trichlorobenzene	ug/L	ND	20	17.0	85	60-135	
1,2,4-Trimethylbenzene	ug/L	ND	20	18.0	88	67-148	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	39.0	78	32-137	
1,2-Dibromoethane (EDB)	ug/L	ND	20	17.2	86	75-125	
1,2-Dichlorobenzene	ug/L	ND	20	17.7	89	75-125	
1,2-Dichloroethane	ug/L	ND	20	18.8	94	62-138	
1,2-Dichloropropane	ug/L	ND	20	17.5	88	62-144	
1,3,5-Trimethylbenzene	ug/L	ND	20	17.9	90	67-148	
1,3-Dichlorobenzene	ug/L	ND	20	17.3	87	74-131	
1,3-Dichloropropane	ug/L	ND	20	17.3	87	75-127	
1,4-Dichlorobenzene	ug/L	ND	20	16.7	84	74-126	
2,2-Dichloropropane	ug/L	ND	20	18.3	91	56-146	
2-Butanone (MEK)	ug/L	ND	100	76.8	77	47-150	
2-Chlorotoluene	ug/L	ND	20	17.6	88	74-137	
4-Chlorotoluene	ug/L	ND	20	17.8	89	72-138	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	77.8	78	60-147	
Acetone	ug/L	ND	100	153	153	61-150 N	<b>Л1</b>
Allyl chloride	ug/L	ND	20	16.3	81	53-150	
Benzene	ug/L	ND	20	17.2	85	52-147	

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**

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### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10335268

MATRIX SPIKE SAMPLE:	2172509						
		10335138001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/L	ND	20	17.6	88	75-129	
Bromochloromethane	ug/L	ND	20	17.9	90	72-128	
Bromodichloromethane	ug/L	ND	20	19.1	95	65-137	
Bromoform	ug/L	ND	20	17.5	87	59-133	
Bromomethane	ug/L	ND	20	16.2	81	30-150	SS
Carbon tetrachloride	ug/L	ND	20	21.3	106	73-144	
Chlorobenzene	ug/L	ND	20	17.6	88	75-126	
Chloroethane	ug/L	ND	20	19.7	99	55-150	
Chloroform	ug/L	ND	20	18.1	91	66-143	
Chloromethane	ug/L	ND	20	16.7	83	42-150	
cis-1,2-Dichloroethene	ug/L	ND	20	18.2	91	65-143	
cis-1,3-Dichloropropene	ug/L	ND	20	17.4	87	75-125	
Dibromochloromethane	ug/L	ND	20	17.6	88	75-125	
Dibromomethane	ug/L	ND	20	18.2	91	66-133	
Dichlorodifluoromethane	ug/L	ND	20	20.4	102	74-150	
Dichlorofluoromethane	ug/L	ND	20	19.8	99	68-150	
Diethyl ether (Ethyl ether)	ug/L	ND	20	16.4	82	57-148	
Ethylbenzene	ug/L	ND	20	18.4	92	67-149	
Hexachloro-1,3-butadiene	ug/L	ND	20	19.6	98	65-143	
Isopropylbenzene (Cumene)	ug/L	ND	20	19.7	99	64-150	
Methyl-tert-butyl ether	ug/L	ND	20	18.1	90	71-130	
Methylene Chloride	ug/L	ND	20	15.2	76	67-137	
n-Butylbenzene	ug/L	ND	20	18.8	94	70-138	
n-Propylbenzene	ug/L	ND	20	17.8	89	70-148	
Naphthalene	ug/L	ND	20	15.8	79	39-150	
p-Isopropyltoluene	ug/L	ND	20	18.7	93	74-138	
sec-Butylbenzene	ug/L	ND	20	17.7	88	64-150	
Styrene	ug/L	ND	20	18.0	90	75-132	
tert-Butylbenzene	ug/L	ND	20	18.0	90	75-138	
Tetrachloroethene	ug/L	ND	20	18.5	93	73-136	
Tetrahydrofuran	ug/L	ND	200	342	171	68-142 I	M1
Toluene	ug/L	ND	20	17.7	87	69-139	
trans-1,2-Dichloroethene	ug/L	ND	20	17.0	85	75-135	
rans-1,3-Dichloropropene	ug/L	ND	20	17.0	85	66-136	
Trichloroethene	ug/L	ND	20	19.0	95	74-135	
Trichlorofluoromethane	ug/L	ND	20	24.9	125	75-150	
Vinyl chloride	ug/L	ND	20	18.1	90	69-150	
Xylene (Total)	ug/L	ND	60	55.3	92	70-147	
1,2-Dichloroethane-d4 (S)	%.				104	75-125	
4-Bromofluorobenzene (S)	%.				99	75-125	
Toluene-d8 (S)	%.				98	75-125	

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



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10335268

SAMPLE DUPLICATE: 2172508 10335137001 Dup Max Parameter Units Result Result **RPD** RPD Qualifiers ND 1,1,1,2-Tetrachloroethane ug/L ND 30 ND 1,1,1-Trichloroethane ug/L ND 30 ND 1,1,2,2-Tetrachloroethane ND 30 ug/L ND ND 30 1,1,2-Trichloroethane ug/L ND 1,1,2-Trichlorotrifluoroethane ug/L ND 30 1.1-Dichloroethane ND ND 30 ug/L ND 1,1-Dichloroethene ND 30 ug/L ND ND 30 1,1-Dichloropropene ug/L 1,2,3-Trichlorobenzene ND ND 30 ug/L ND 1,2,3-Trichloropropane ug/L ND 30 ND 1,2,4-Trichlorobenzene ug/L ND 30 ND 1,2,4-Trimethylbenzene ug/L .22J 30 ND 1,2-Dibromo-3-chloropropane ug/L ND 30 1,2-Dibromoethane (EDB) ND ND 30 ug/L 1,2-Dichlorobenzene ND ND 30 ug/L ND 1.2-Dichloroethane ug/L ND 30 1,2-Dichloropropane ND ND 30 ug/L 1,3,5-Trimethylbenzene ND .34J 30 ug/L ND 1,3-Dichlorobenzene ND 30 ug/L ND ND 1,3-Dichloropropane ug/L 30 ND 1,4-Dichlorobenzene ND 30 ug/L ND 2,2-Dichloropropane ug/L ND 30 ND 2-Butanone (MEK) ug/L ND 30 2-Chlorotoluene ND ND 30 ug/L 4-Chlorotoluene ND ND 30 ug/L 4-Methyl-2-pentanone (MIBK) ug/L ND ND 30 ND Acetone ug/L ND 30 ND Allyl chloride ND 30 ug/L ND ND Benzene 30 ug/L ND ND Bromobenzene 30 ug/L ND ND Bromochloromethane 30 ug/L ND ND Bromodichloromethane ug/L 30 ND **Bromoform** ug/L ND 30 **Bromomethane** ug/L ND ND 30 Carbon tetrachloride ug/L ND ND 30 ND Chlorobenzene ug/L ND 30 Chloroethane ug/L ND ND 30 ND Chloroform ug/L ND 30 Chloromethane ND ND 30 ug/L ND ND 30 cis-1,2-Dichloroethene ug/L ND ND 30 cis-1,3-Dichloropropene ug/L ND ND Dibromochloromethane 30 ug/L ND ND 30 Dibromomethane ug/L ND Dichlorodifluoromethane ug/L ND 30 ND Dichlorofluoromethane ug/L ND 30 ND Diethyl ether (Ethyl ether) ug/L ND 30 Ethylbenzene ND ND 30 ug/L

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**

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### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10335268

SAMPLE DUPLICATE: 2172508

Date: 02/05/2016 12:51 PM

SAMPLE DUPLICATE: 21/2508						
		10335137001	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/L	ND	ND		30	
Isopropylbenzene (Cumene)	ug/L	ND	ND		30	
Methyl-tert-butyl ether	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
n-Butylbenzene	ug/L	ND	ND		30	
n-Propylbenzene	ug/L	ND	ND		30	
Naphthalene	ug/L	ND	ND		30	
p-Isopropyltoluene	ug/L	ND	ND		30	
sec-Butylbenzene	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
tert-Butylbenzene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Tetrahydrofuran	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	106	107	1		
4-Bromofluorobenzene (S)	%.	100	98	1		
Toluene-d8 (S)	%.	96	100	4		

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.



### **QUALIFIERS**

Project: PS Beta-NIROP
Pace Project No.: 10335268

### **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.

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.

### **ANALYTE QUALIFIERS**

Date: 02/05/2016 12:51 PM

IS	The internal standard recovery associated with this result exceeds the lower control limit. The reported result should be
	considered an estimated value.

- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- S3 Surrogate recovery exceeded laboratory control limits. Analyte presence below reporting limits in associated samples. Results unaffected by high bias.
- SS This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.





### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: PS Beta-NIROP Pace Project No.: 10335268

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10335268001	PMW-01	EPA 8260B	MSV/34351	_	
10335268002	PMW-02	EPA 8260B	MSV/34351		
10335268003	PMW-03	EPA 8260B	MSV/34345		
10335268004	PMW-04	EPA 8260B	MSV/34345		
10335268005	Trip Blank	EPA 8260B	MSV/34345		

# CHAIN-OF-CUSTODY / Analytical Request Document

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

Face Analytical"

W335568

Pace Project No./ Lab I.D. DRINKING WATER SAMPLE CONDITIONS ) OTHER ŏ 200  $\frac{3}{2}$ 3 7 GROUND WATER lu, 2.3 Residual Chlorine (Y/N) તે Page: RCRA REGULATORY AGENCY Σ 16:34 TIME Requested Analysis Filtered (Y/N) L Site Location STATE 5/e/ie NPDES DATE UST L 3 ACCEPTED BY / AFFILIATION N **EPA 8260, VOC** mm mm Î N/A **↓**tesT sisylsnA **↓** Other 1011 Calle Sombra Methanol Company Name: Regenesis Preservatives Bahar Naderi Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> NaOH 21466 HCI N 3 3 Invoice Information: <sup>€</sup>ONH <sup>⁵</sup>OS<sup>₹</sup>H Reference: Pace Project Manager: Pace Profile #: 1634 Unpreserved TIME Attention: ace Quote Address: MM # OF CONTAINERS M SAMPLE TEMP AT COLLECTION 1/6/16 DATE 1325 SS BOX 3 TIME COMPOSITE END/GRAB 2000 を放え DATE COLLECTED RELINQUISHED BY / AFFILIATION TIME Theister COMPOSITE START Project Name: PS Beta - NIROP roject Number: PS Beta - NIROP DATE Report To: Melinda Pham Required Project Information: 9 7 9 SAMPLE TYPE S (G=GRAB C=COMP) N SS I urchase Order No.: 3 MATRIX CODE Section B Copy To: Valid Matrix Codes DRINKING WATER
WASTER
WASTER
PRODUCT
SOIL/SOLID
OIL
WIPE
AIR
TISSUE Fax: 343-366-8090 **ADDITIONAL COMMENTS** San Clemente, CA 92673 Mpham@regenesis.com (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE 1011 Calle Sombra SAMPLE ID Duren - 03 Phlw -02 20-02 Section D Required Client Information D-137 Regenesis Section A Required Client Information: Requested Due Date/TAT: hone: 949-366-8000 Sompany: mail To: ddress: `G) 2 F 으 n w 9 ∞ 4 ٢ # MaTI

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.

DATE Signed (MM/DD/YY):

MELLY MELLUSEL

SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: SIGNATURE of SAMPLER:

Page 31 of 44

F-ALL-Q-020rev.08, 12-Oct-2007

(N/Y)

Samples Intact

Custody Sealed Cooler (Y/N)

Received on Ice (Y/N)

O° ni qmeT

2

フ



Document Name:

### Sample Condition Upon Receipt Form

Document No.: F-MN-L-213-rev.15

Document Revised: 05Jan2016

Page 1 of 1

Issuing Authority:
Pace Minnesota Quality Office

Ourier: Fed Ex UPS  Commercial Pace SpeeDee  Tracking Number:	USPS	-		W0#:10335268
ourier: Fed Ex UPS  Commercial Pace SpeeDee		-		
		X	Client	
Tracking Number:	Other:_			
				10333260
Custody Seal on Cooler/Box Present? Yes	No :	Seals Int	tact?	Yes Optional: Proj. Due Date: Proj. Name:
Packing Material: 🔲 Bubble Wrap 🕅 Bubble Bag	s Non	е 🗌	Other:	Temp Blank?
Thermometer         ☐ 151401163         ☐ B88A9121675           Used:         ☐ 151401164         ☐ \$888A0143310	0098 Typ	e of Ice:	<b>W</b> We	
Cooler Temp Read (°C): Cooler Temp Co	orrected (°C)	: 21	L,_	Biological Tissue Frozen?
emp should be above freezing to 6°C Correction Fa SDA Regulated Soil ( N/A, water sample)	ctor: 10.2	<u> </u>	O. Dat	e and Initials of Person Examining Contents: Rm 1/6/16
id samples originate in a quarantine zone within the United IS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)?			Yes	D, LA. Did samples originate from a foreign source (internationally, Including Hawaii and Puerto Rico)? Yes No. Q-338) and include with SCUR/COC paperwork.
	3			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?	<b>∑</b> Yes	□No	□n/a	5.
Short Hold Time Analysis (<72 hr)?	□Yes	<b>∑</b> No	□N/A	6.
Rush Turn Around Time Requested?	₩Yes	□No	□n/a	7.
Sufficient Volume?	Yes	□No	□n/a	8.
Correct Containers Used?	∑¥Yes	□No	□n/a	9.
-Pace Containers Used?	Yes	□No	□N/A	
Containers Intact?	∑¥Ŷes	□No	□n/a	10.
Filtered Volume Received for Dissolved Tests?	□Yes	□No	<b>⊠</b> tv/a	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	Yes	□No	□n/a	12.
-Includes Date/Time/ID/Analysis Matrix:	15			
All containers needing acid/base preservation have been	<b>-</b> 1, .	F-1.	No.	13.
checked? All containers needing preservation are found to be in	∐Yes	∐No	<b>∑</b> M/A	Sample #
compliance with EPA recommendation? (HNO3, H2SO4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	Пи	[T].	€ Th€i / s	
$(HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>12 Cyanide)$ Exceptions: VOA) Coliform, TOC, Oil and Grease,		∐No	<b>Ņ</b> M√A	Initial when Lot # of added
DRO/8015 (water) DOC	Yes	□No	□N/A	completed: preservative:
Headspace in VOA Vials ( >6mm)?	□Yes	No	□N/A	14.
Trip Blank Present?	Yes	□No	□N/A	15.
Trip Blank Present?  Trip Blank Custody Seals Present?   Pace Trip Blank Lot # (if purchased): 120 8 L	MYes :	□No	□n/a	
	. <u>J U \</u>			Full Date of the Charles
CLIENT NOTIFICATION/RESOLUTION Person Contacted:				Field Data Required? Yes No Date/Time:
				Date/Time:
Comments/Resolution:	· · · · · · · · · · · · · · · · · · ·			
/				
Project Manager Review:				Date: \
	compliance s	amoles, a	copy of th	is form will be sent to the North Carolina DEHNR Certification Office (i.e. or



February 5, 2016

Pace Analytical Energy Services LLC 220 William Pitt Way Pittsburgh, PA 15238

> Phone: (412) 826-5245 Fax: (412) 826-3433

Jennifer Anderson Pace Analytical Services, Inc. 1700 Elm Street Suite 200 Minneapolis, MN 55414

RE:

**PS BETA-NIROP** 

Pace Workorder:

17890

Dear Jennifer Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, January 08, 2016.

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

Sincerely,

Ruth Welsh

02/05/2016

Ruth Welds

Ruth.Welsh@pacelabs.com

Customer Service Representative

**Enclosures** 

As a valued client we would appreciate your comments on our service.

Please email info@microseeps.com.

Total Number of Pages

Report ID: 17890 - 762043



Pace Analytical Energy Services LLC 220 William Pitt Way Pittsburgh, PA 15238

> Phone: (412) 826-5245 Fax: (412) 826-3433

### **SAMPLE SUMMARY**

Workorder: 17890 PS BETA-NIROP

Lab ID	Sample ID	Matrix	Date Collected	Date Received
178900001	PMW-03	Water	1/6/2016 10:55	1/8/2016 14:36

Report ID: 17890 - 762043

Pace Analytical\*

Client

Pace MN

1700 Elm Street, Suite 200

Minneapolis, MN 55414

Project #

PS Beta Nirop

Report to

10335268 Jennifer Anderson

Tel:

612.607.1700

Email:

jennifer.anderson @ pacelabs.com

Pace Analytical CSIA Center

220 William Pitt Way Pittsburgh, PA 15238

Tel: 412.826.5245

Report by: Dr. Yi Wang Director, CSIA Center of Excellence

Cell: 609.721.2843

Email: yi.wang@pacelabs.com

### REPORT OF ENVIRONMENTAL FORENSICS ISOTOPE ANALYSES

Date Received: 1/8/2016

Date Reported: 2/2/2016

Water sample submitted for  $\delta^{13}$ C (‰ VPDB) stable carbon isotope forensics of chlorinated solvents

Pace CSIA	Client's Sample ID	$\delta^{13}C$	$\delta^{13}C$	$\delta^{13}C$	δ <sup>13</sup> C	$\delta^{13}C$	δ <sup>13</sup> C
Lab ID	Description	VC	cDCE	tDCE	11DCE	11DCA	TCE
17890-1	PMW-03	Ű_	-19.78	-22.58	U _	-23.48	-3.77

VC: vinyl chloride

cDCE: *cis*-1,2-dichloroethene tDCE: trans-1,2-dichloroethene 11DCE: 1,1-dichloroethene 11DCA: 1,1-dichloroethane TCE: trichloroethene

Method: Compound Specific Isotope Analysis for <sup>13</sup>C and <sup>2</sup>H by GC-IRMS, for <sup>37</sup>Cl by GC-qMS

		$\delta^{13}C$					
Quality Control STDs	VC.	cDCE	tDCE	11DCE	11DCA	TCE	
QC-1	-29.39	-11.85	-21.72	-31.10	-33.17	-26.62	
QC-2	-28.92	-11.70	-21.53	-30.62	-32.73	-26.24	
Mean	-29.16	-11.78	-21.63	-30.86	-32.95	-26.43	
Analytical precision (1σ)	0.33	0.11	0.13	0.34	0.31	0.27	

### Pace CSIA Forensic Isotope Services

Product or Dissolved Organics: Chlorinated Solvents, Oil, Extract, Fraction and Kerogen

3D-CSIA of <sup>13</sup>C, <sup>37</sup>Cl, and <sup>2</sup>H for PCE, TCE, DCE, MTBE, BTEX, 1,4-Dioxane, Alkanes, Gasoline and Oil; Bulk <sup>13</sup>C, <sup>2</sup>H, <sup>18</sup>O, <sup>34</sup>S, and <sup>15</sup>N Gas Sample

Gas Composition and 2D-CSIA of <sup>13</sup>C and <sup>2</sup>H of C1 to C5; <sup>13</sup>C of CO<sub>2</sub>; <sup>14</sup>C of C1 and CO<sub>2</sub>; <sup>34</sup>S of H<sub>2</sub>S; <sup>15</sup>N and <sup>18</sup>O of N<sub>2</sub>O gas Water and Dissolved Inorganics

 $^{2}\text{H},\,^{3}\text{H}$  and  $^{18}\text{O};\,^{34}\text{S}$  and  $^{18}\text{O}$  of dissolved sulfate;  $^{34}\text{S}$  of dissolved H $_{2}\text{S}$ 

 $^{15}$ N and  $^{18}$ O of dissolved Nitrate;  $^{15}$ N of Ammonia;  $^{13}$ C of dissolved CO $_2$  and Carbonate/Bicarbonate Soil and Minerals

<sup>13</sup>C, <sup>18</sup>O, <sup>15</sup>N, <sup>34</sup>S, D/H; <sup>14</sup>C of carbonate or organics

Post-Analysis Forensic Isotope Data Interpretation

<sup>&</sup>lt;sup>J</sup>-Target analyte produced a low peak signal and the result is considered usable to ± 2‰, but not the standard ± 0.5‰

<sup>&</sup>lt;sup>U</sup>-Either there was no peak corresponding to the target analyte or that such a peak did not produce a reliable CSIA result due to sample matrix effect or dilutions applied to prevent instrument contamination

Pace CSIA Center of Excellence 220 William Pitt Way Pittsburgh, PA 15238 phone: 412-826-5245

## CSIA Report Carbon

17890 PACE-MN

10335268 Client Project Name: Client Project #:

PS Beta Nirop

:/\ :/\		S)	Concentration	nc			CSI/	CSIA (Carbon	(	
Š	vinyi cilionde		(l/gn)		Ar	Area	عزعبراجع العجائد ع	Oiovion V	Date	( /o/ c#loCl
ab ID	Client ID	Sample	PQL	Date	Sample	PQL	-00-min-00	בואלואור  -	רמות	טפווס ( ייס)
78900001	PMW-03	<1 (U)	-	1/7/16	< 1 (U)	γ	N <sub>o</sub>	4612	1/26/16	1
uplicate	PMW-03 (DF2)	Q	,	1/7/16	< 1 (U)	τ-	Š	4611	1/26/16	
lank	1	0	1	1	<1 (U)	τ-	S <sub>N</sub>	4598	1/26/16	,
CS_Lo	I	10	ı	1	11.6	_	<sub>S</sub>	4599	1/26/16	-29.39
CS_Hi	-	20	ı	I	16.4	1	No	4600	1/26/16	-28.92
CS acceptance range	range							-28.90	<b>\</b>    <b>\</b>    <b>\</b>	-27.90

AM-24-DL_C	‰, VPDB	CJS	
AM-24-AR_C	Vs	CJS	
8260B	l/bn	ΨN	
Method	Units	Analyst	

Page 2 of 7

Pace CSIA Center of Excellence 220 William Pitt Way Pittsburgh, PA 15238 phone: 412-826-5245

CSIA Report Carbon

17890 PACE-MN Client Project Name: Client Project #: 10

10335268

PS Beta Nirop

7	4 Dicklescottone	် ေ	Concentration	u			CSI	CSIA (Carbon	(	
<u>.</u> .	Octobemene		(l/gn)		JY	Area	acitude of	منصياصة	0,00	(-W) clta
Lab ID	Client ID	Sample	PQL	Date	Sample	Pal		Zigliyais	רמת.	Daila ( 700)
178900001	PMW-03	<1 (U)	_	1/7/16	< 1 (U)	_	No	4612	1/26/16	1
Duplicate	PMW-03 (DF2)	ΑN	Υ-	1/7/16	< 1 (U)	_	No No	4611	1/26/16	-
Blank		0	1	•	<1 (U)	~	N <sub>o</sub>	4598	1/26/16	•
LCS_Lo	1	10	1	1	3.11	1	No	4599	1/26/16	-31.10
LCS_Hi	ı	90	ı	I	15.3	_	٥N	4600	1/26/16	-30.62
LCS acceptance range	e range							-29.49	<b>:</b>	-28.49

lethod	8260B	AM-24-AR_C	AM-24-DL_C
Units	l/gu	γs	‰, VPDB
nalyst	ΑN	CJS	CJS

Page 3 of 7

Pace CSIA Center of Excellence 220 William Pitt Way Pittsburgh, PA 15238 phone: 412-826-5245

CSIA Report Carbon

17890 PACE-MN Client Project Name:

PS Beta Nirop	10335268
Client Project Name:	Client Project #:
_	_

	( )%/ C#IOU	Della ( ///0)	-22.58	-22.59	•	-21.72	-21.53	-21.08	ر ا_ د	)B	
(	0,40	רמום	1/26/16	1/26/16	1/26/16	1/26/16	1/26/16	<u>^</u> :	AM-24-DL_C	%, VPDB	C.IS
CSIA (Carbon)	Analytein	Allalysis	4610	4611	4598	4599	4600	-22.08			
SS	acitica Analysis	00-00	No	No	No	o N	S		ပ		
	Area	PQL	_	_	~	_	~		AM-24-AR_C	۸s	SIC
	A	Sample PQL	17.5	16.0	<1 (U)	4.51	24.7		<i>'</i>		
'n		Date	1/7/16	1/7/16	1	ī	1				
Concentration	(J/gn)	POL	1	Υ-	1	1	ł		8260B	l/gn	ΑN
<u>ა</u>		Sample	89	89	0	10	20				
D:01-010-00-00-00-00-00-00-00-00-00-00-00-	rans-Dichloroeniene	Client ID	PMW-03	PMW-03 (DF2)	1	I	1	e range			
, e. e. e.	Lan	Lab ID	178900001	Duplicate	Blank	LCS_Lo	LCS_Hi	LCS acceptance range	Method	Units	Analyst

Page 4 of 7

Pace CSIA Center of Excellence 220 William Pitt Way Pittsburgh, PA 15238 phone: 412-826-5245

CSIA Report Carbon

17890 PACE-MN

Client Project Name: Client Project #:

PS Beta Nirop 10335268

* *		<u>ა</u>	Concentration	n			CSI CSI	CSIA (Carbon)	<u> </u>	
	ı,ı-Dicnioroetnane		(l/gn)		Ar	Area	منائن می	0:0,400	400	( %) c#c
Lab ID	Client ID	Sample	Pal	Date	Sample PQL	PQL	CO-diation Analysis	Alialysis	ממ	רשוש ( /00)
178900001	PMW-03	က	1	1/7/16	3.73	_	S N	4612	1/26/16	-23.48
Duplicate	PMW-03 (DF2)	က	_	1/7/16	< 1 (U)	-	8	4611	1/26/16	ı
Blank	F	0	1	•	<1 (U)	_	S.	4598	1/26/16	ı
LCS Lo	1	10	-	ı	5.05	-	<sub>S</sub>	4599	1/26/16	-33.17
LCS_Hi		20	ı	•	27.0	_	oN	4600	1/26/16	-32.73
LCS acceptance range	e range							-32.88	<b>∧</b> 	-31.88

Method	8260B	AM-24-AR_C	AM-24-DL_C
Units	l/gn	Vs	%, VPDB
Analyst	AN	CJS	CJS

Page 5 of 7

Pace CSIA Center of Excellence 220 William Pitt Way Pittsburgh, PA 15238 phone: 412-826-5245

CSIA Report Carbon

17890 PACE-MN Client Project Name: Client Project #: 10

10335268

PS Beta Nirop

منن	oie Diebloreethone	S	Concentration	น			CSI	CSIA (Carbon		
בים			(l/gn)		Ar	Area	20:4:10	ojo, jou v	2000	( /6/ -71
Lab ID	Client ID	Sample	PQL	Date	Sample	PQL	CO-elution Analysis	Alialysis	Dale	Della (700)
178900001	PMW-03	38	-	1/7/16	9.30	_	No	4610	1/26/16	-19.78
Duplicate	PMW-03 (DF2)	38	1	1/7/16	8.55	_	No	4611	1/26/16	-19.76
Blank	-	0	•		<1 (U)	_	No	4598	1/26/16	ı
LCS_Lo	-	10	ı	1	4.99	1	No	4599	1/26/16	-11.85
LCS_Hi	_	20	-	1	27.0	1	No	4600	1/26/16	-11.70
LCS acceptance range	range							-12.22	<b>^</b> ≡ <b>∨</b> ≡	-11.22

AM-24-DL C

AM-24-AR C Vs CJS

8260B Ng/I

Units Analyst Method

%, VPDB CJS

2222	10 of 11	

Page 6 of 7

Pace CSIA Center of Excellence 220 William Pitt Way Pittsburgh, PA 15238 phone: 412-826-5245

CSIA Report Carbon

17890 PACE-MN Client Project Name: Client Project #: 10

PS Beta Nirop 10335268

F	Trichloroothono	<u>හ</u>	Concentration	n			CSI	CSIA (Carbon			
	oilloi Oetilelle		(l/gn)		Ar	Area	مناز الاست	oio, dog A	0.40	( /0/ 01/00	
DI QI	Client ID	Sample	PaL	Date	Sample PQL	PQL	CO-elution Analysis	Alialysis	Dale	Della (700)	
8900001	PMW-03	13	Υ-	1/7/16	6.13	Ψ-	Š	4612	1/26/16	-3.77	
uplicate	PMW-03 (DF2)	13	Υ-	1/7/16	< 1 (U)	<b>~</b>	S <sub>O</sub>	4611	1/26/16		
ank	1	0	1	1	<1 (U)	Ψ-	S <sub>O</sub>	4598	1/26/16	ı	
S Lo	_	10	1	ı	2.69	<b>~</b>	S <sub>O</sub>	4599	1/26/16	-26.62	
S_Hi	_	20	ı		15.9	τ-	°N	4600	1/26/16	-26.24	_
S acceptance range	range							-26.48	<b>^:</b>	-25.48	
Method			8260B		∀	AM-24-AR_C	ပ		AM-24-DL_C	O <sub>,</sub>	
Units			l/gu			Λs		-	%, VPDB	æ	,
Analyst			NA			CJS			SCO		_

Pace CSIA Center of Excellence phone: 412-826-5245 Pittsburgh, PA 15238 220 William Pitt Way

### CSIA Report Carbon

PACE-MN 17890

Client Project Name:

PS Beta Nirop

10335268 Client Project #:

_	(0,000,000,000)	olamo0				CSIA (Carbon	ר)		
_	ICF (Surrogate)	Collection	Aros	Oil rtion	100	Co-elution	Analysis	Date	Delta (%.)
Lab ID	Client ID		ב מ	Clideloci		00-01	الالعالك	ı	Colta (100)
178900001	PMW-03	01/06/16	4.22	2	1	No	4610	.01/26/16	-36.71
178900001	PMW-03	01/06/16	1.75	ν-	1	No	4612	01/26/16	-36.69
Duplicate	PMW-03 (DF2)	01/06/16	5.05	2	_	No	4611	01/26/16	-36.83
Blank	1	1	4.86	1	γ-	No	4598	01/26/16	-36.90
LCS_Lo	1	ı	4.85	_	1	No	4599	01/26/16	-37.20
LCS Hi	ı	-	4.60	-	_	No	4600	01/26/16	-37.31
Surrogate acceptance range	ptance range						-37.49	<b>\</b> = <b>\</b>	-36.49

Method	AM-24-AR_C	AM-24-DL_C
Units	Vs	%, VPDB
Analyst	CJS	CJS

Case Narrative: The blank, LCS's, duplicate and surrogates were all close to or within the acceptance range and the data is reported as valid and representative of the samples as received.

Chai	Chain of Custody			0686		TOWN AND PROPERTY OF THE PROPE	HEADS MATERIAL RESTAURANCES			THE RESIDENCE OF THE PERSON OF	24/15/15	Pace Analytical ** **********************************	<b>⊕</b>
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Jennife Pace Ai 1700 Ei	Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street	R	is Errege	Part Energy/Microsceps P.O. 11335248	steps P.C	. 1032	5246						
Minnea Phone Email: j	Minneapolis, MN 55414 Phone (612)607-1700 Email: jennifer.anderson@pacelabs.com	s.com											
						Preserv	Preserved Containers	ers					
Item	Sample ID	Collect Date/Time		Lab ID	Matrix	НСГ		GEIR				LAB USE ONLY	
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\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Cooler Receipt Fo	Cani	ρr	Re	cei	υt	Fo	m
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January 19, 2016

Melinda Pham Regenesis 1011 Calle Sombra San Clemente, CA 92673

RE: Project: PS Beta-NIROP

Pace Project No.: 10335267

### Dear Melinda Pham:

Enclosed are the analytical results for sample(s) received by the laboratory on January 06, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

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

Sincerely,

Jennifer Anderson jennifer.anderson@pacelabs.com Project Manager

JAndera

Enclosures

cc: Ryan Moore, Regenesis







### **CERTIFICATIONS**

Project: PS Beta-NIROP Pace Project No.: 10335267

**Minnesota Certification IDs** 

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

525 N 8th Street, Salina, KS 67401 A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770 Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA

Connecticut Certification #: PH-0256 EPA Region 8 Certification #: 8TMS-L Florida/NELAP Certification #: E87605

Guam Certification #:14-008r Georgia Certification #: 959 Georgia EPD #: Pace

Colorado Certification #Pace

Idaho Certification #: MN00064 Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01 Iowa Certification #: 368 Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062 Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001 Maine Certification #: 2013011 Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace Montana Certification #: MT0092 Nevada Certification #: MN\_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002 New York Certification #: 11647 North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150 Ohio VAP Certification #: CL101 Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563

Puerto Rico Certification Saipan (CNMI) #:MP0003 South Carolina #:74003001 Texas Certification #: T104704192 Tennessee Certification #: 02818 Utah Certification #: MN000642013-4 Virginia DGS Certification #: 251 Virginia/VELAP Certification #: Pace Washington Certification #: C486 West Virginia Certification #: 382

West Virginia DHHR #:9952C Wisconsin Certification #: 999407970

**Montana Certification IDs** 

150 N. 9th Street, Billings, MT 59101 Colorado Asbestos #: 17119 A2LA Certification #: 3590.01 EPA Region 8 Certification #: 8TMS-L

Idaho Certification #: MT00012

Minnesota Dept of Health Certification #: 030-999-442

Montana Certification #: MT CERT0040 North Dakota Dept. Of Health #: R-209 NVLAP Certification #: 101292-0 Washington Department of Ecology #: C993

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792 Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470 WA Department of Ecology Lab ID# C1007 Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

**Ormond Beach Certification IDs** 

8 East Tower Circle, Ormond Beach, FL 32174

Alabama Certification #: 41320 Connecticut Certification #: PH-0216

Delaware Certification: FL NELAC Reciprocity Florida Certification #: E83079

Georgia Certification #: 955

Guam Certification: FL NELAC Reciprocity
Hawaii Certification: FL NELAC Reciprocity

Illinois Certification #: 200068

Indiana Certification: FL NELAC Reciprocity

Kansas Certification #: E-10383 Kentucky Certification #: 90050

Louisiana Certification #: FL NELAC Reciprocity Louisiana Environmental Certificate #: 05007

Maryland Certification: #346 Michigan Certification #: 9911 Mississippi Certification: FL NELAC Reciprocity

Missouri Certification #: 236 Montana Certification #: Cert 0074 Nebraska Certification: NE-OS-28-14
Nevada Certification: FL NELAC Reciprocity New Hampshire Certification #: 2958

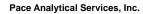
New York Certification #: 11608

North Carolina Environmental Certificate #: 667 North Carolina Certification #: 12710 North Dakota Certification #: R-216 Oklahoma Certification #: D9947 Pennsylvania Certification #: 68-00547 Puerto Rico Certification #: FL01264 South Carolina Certification: #96042001

Tennessee Certification #: TN02974
Texas Certification: FL NELAC Reciprocity

### REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700

### **CERTIFICATIONS**

Project: PS Beta-NIROP Pace Project No.: 10335267

**Ormond Beach Certification IDs** 

US Virgin Islands Certification: FL NELAC Reciprocity Virginia Environmental Certification #: 460165 West Virginia Certification #: 9962C

Wisconsin Certification #: 399079670 Wyoming (EPA Region 8): FL NELAC Reciprocity

1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700



### **SAMPLE SUMMARY**

Project: PS Beta-NIROP Pace Project No.: 10335267

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10335267001	PMW-01	Water	01/06/16 14:20	01/06/16 16:54
10335267002	PMW-02	Water	01/06/16 13:25	01/06/16 16:54
10335267003	PMW-03	Water	01/06/16 10:55	01/06/16 16:54
10335267004	PMW-04	Water	01/06/16 09:25	01/06/16 16:54



### **SAMPLE ANALYTE COUNT**

Project: PS Beta-NIROP Pace Project No.: 10335267

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10335267001	PMW-01	RSK 175	DR1	3	PASI-M
		EPA 6010C	DM	1	PASI-M
		6010C Met	DM	1	PASI-M
		SM 4500-S2-D	CAC	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	NMT	1	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	MW	1	PASI-M
		SM 5220D	DCL	1	PASI-M
		SM 5310C	MAR	1	PASI-V
0335267002	PMW-02	RSK 175	DR1	3	PASI-M
		EPA 6010C	DM	1	PASI-M
		6010C Met	DM	1	PASI-M
		SM 4500-S2-D	CAC	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	NMT	1	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	MW	1	PASI-M
		SM 5220D	DCL	1	PASI-M
		SM 5310C	MAR	1	PASI-V
0335267003	PMW-03	RSK 175	DR1	3	PASI-M
		EPA 6010C	DM	1	PASI-M
		6010C Met	DM	1	PASI-M
		SM 4500-S2-D	CAC	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	NMT	1	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	MW	1	PASI-M
		SM 5220D	DCL	1	PASI-M
		SM 5310C	MAR	1	PASI-V
0335267004	PMW-04	RSK 175	DR1	3	PASI-M
		EPA 6010C	DM	1	PASI-M
		6010C Met	DM	1	PASI-M
		SM 4500-S2-D	CAC	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	NMT	1	PASI-O
		EPA 300.0	KEO	1	PASI-M

### **REPORT OF LABORATORY ANALYSIS**

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### **SAMPLE ANALYTE COUNT**

Project: PS Beta-NIROP Pace Project No.: 10335267

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 353.2	MW	1	PASI-M
		SM 5220D	DCL	1	PASI-M
		SM 5310C	MAR	1	PASI-V



Date: 01/19/2016 03:09 PM

### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10335267

Sample: PMW-01	Lab ID: 1033	35267001	Collected: 01/06/1	6 14:20	Received: 01	/06/16 16:54 N	Natrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Meth	nod: RSK 1	75					
Ethane	ND	ug/L	10.0	1		01/07/16 09:07	74-84-0	
Ethene	ND	ug/L	10.0	1		01/07/16 09:07		
Methane	31.7	ug/L	10.0	1		01/07/16 09:07	74-82-8	
6010C MET ICP	Analytical Meth	nod: EPA 6	010C Preparation Me	ethod: E	PA 3010			
Iron	17600	ug/L	50.0	1	01/07/16 09:11	01/13/16 11:47	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	nod: 6010C	Met Preparation Me	thod: Ef	PA 3010			
Iron, Dissolved	11600	ug/L	50.0	1	01/07/16 09:03	01/07/16 14:22	7439-89-6	
4500S2D Sulfide Water	Analytical Meth	od: SM 45	00-S2-D					
Sulfide	ND	mg/L	0.10	1		01/11/16 16:32		
2320B Alkalinity	Analytical Meth	nod: SM 23	20B					
Carbon Dioxide (SM4500CO2D)	103	mg/L	25.0	5		01/16/16 10:30	124-38-9	
Alkalinity, Total as CaCO3	605	mg/L	5.0	1		01/07/16 13:41		
Alkalinity,Bicarbonate (CaCO3)	605	mg/L	5.0	1		01/07/16 13:41		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		01/07/16 13:41		
300.0 IC Anions	Analytical Meth	nod: EPA 3	0.00					
Sulfate	104	mg/L	2.4	2		01/07/16 14:46	14808-79-8	
353.2 Nitrate + Nitrite	Analytical Meth	od: EPA 3	53.2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		01/13/16 09:25		
5220D COD	Analytical Meth	od: SM 52	20D Preparation Me	thod: SN	/I 5220D			
Chemical Oxygen Demand	278	mg/L	50.0	1	01/11/16 09:32	01/11/16 14:06		
5310C TOC	Analytical Meth	nod: SM 53	10C					
Total Organic Carbon	91.9	mg/L	5.0	5		01/13/16 11:46	7440-44-0	



Date: 01/19/2016 03:09 PM

### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10335267

Sample: PMW-02	Lab ID: 10335267002		Collected: 01/06/1	6 13:25	Received: 01	/06/16 16:54 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Meth	od: RSK 17	75					
Ethane	ND	ug/L	10.0	1		01/07/16 09:23	74-84-0	
Ethene	ND	ug/L	10.0	1		01/07/16 09:23		
Methane	13.0	ug/L	10.0	1		01/07/16 09:23	74-82-8	
6010C MET ICP	Analytical Meth	od: EPA 60	110C Preparation Me	thod: E	PA 3010			
ron	8910	ug/L	50.0	1	01/07/16 09:11	01/13/16 12:02	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	od: 6010C	Met Preparation Me	thod: El	PA 3010			
ron, Dissolved	6320	ug/L	50.0	1	01/07/16 09:03	01/07/16 14:43	7439-89-6	
1500S2D Sulfide Water	Analytical Meth	od: SM 450	00-S2-D					
Sulfide	ND	mg/L	0.10	1		01/11/16 16:34		
2320B Alkalinity	Analytical Meth	od: SM 232	20B					
Carbon Dioxide (SM4500CO2D)	54.0	mg/L	5.0	1		01/16/16 10:44	124-38-9	
Alkalinity, Total as CaCO3	421	mg/L	5.0	1		01/07/16 13:45		
Alkalinity,Bicarbonate (CaCO3)	421	mg/L	5.0	1		01/07/16 13:45		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		01/07/16 13:45		
300.0 IC Anions	Analytical Meth	od: EPA 30	0.00					
Sulfate	157	mg/L	2.4	2		01/07/16 15:05	14808-79-8	
353.2 Nitrate + Nitrite	Analytical Meth	od: EPA 35	53.2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		01/13/16 09:26		
5220D COD	Analytical Meth	od: SM 522	20D Preparation Met	hod: SN	/I 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	01/11/16 09:32	01/11/16 14:07		
5310C TOC	Analytical Meth	od: SM 53	10C					
Total Organic Carbon	2.4	mg/L	1.0	1		01/12/16 21:12	7440-44-0	



Date: 01/19/2016 03:09 PM

### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10335267

Sample: PMW-03	Lab ID: 103	35267003	Collected: 01/06/	16 10:55	Received: 01	/06/16 16:54 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Meth	nod: RSK 1	75					
Ethane	ND	ug/L	10.0	1		01/07/16 09:32	74-84-0	
Ethene	ND	ug/L	10.0	1		01/07/16 09:32		
Methane	24.6	ug/L	10.0	1		01/07/16 09:32	74-82-8	
6010C MET ICP	Analytical Meth	nod: EPA 60	010C Preparation Me	ethod: E	PA 3010			
ron	10800	ug/L	50.0	1	01/07/16 09:11	01/13/16 12:06	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	nod: 6010C	Met Preparation Me	thod: El	PA 3010			
Iron, Dissolved	7410	ug/L	50.0	1	01/07/16 09:03	01/07/16 14:46	7439-89-6	
4500S2D Sulfide Water	Analytical Meth	od: SM 45	00-S2-D					
Sulfide	ND	mg/L	0.10	1		01/11/16 16:35		
2320B Alkalinity	Analytical Meth	nod: SM 23	20B					
Alkalinity, Total as CaCO3	328	mg/L	5.0	1		01/07/16 13:50		
Carbon Dioxide (SM4500CO2D)	35.9	mg/L	5.0	1		01/16/16 10:53	124-38-9	
Alkalinity,Bicarbonate (CaCO3)	328	mg/L	5.0	1		01/07/16 13:50		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		01/07/16 13:50		
300.0 IC Anions	Analytical Meth	nod: EPA 30	0.00					
Sulfate	130	mg/L	2.4	2		01/07/16 13:33	14808-79-8	
353.2 Nitrate + Nitrite	Analytical Meth	nod: EPA 3	53.2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		01/13/16 09:28		
5220D COD	Analytical Meth	od: SM 52	20D Preparation Me	thod: SN	Л 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	01/11/16 09:32	01/11/16 14:07		
310C TOC	Analytical Meth	nod: SM 53	10C					
otal Organic Carbon	2.8	mg/L	1.0	1		01/12/16 22:15	7440-44-0	



### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10335267

Date: 01/19/2016 03:09 PM

Sample: PMW-04	Lab ID: 103	35267004	Collected: 01/06/1	16 09:25	Received: 01	/06/16 16:54 <b>I</b>	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
RSK 175 AIR Headspace	Analytical Meth	nod: RSK 1	75					
Ethane	ND	ug/L	10.0	1		01/07/16 09:40	74-84-0	
Ethene	ND	ug/L	10.0	1		01/07/16 09:40		
Methane	ND	ug/L	10.0	1		01/07/16 09:40	74-82-8	
6010C MET ICP	Analytical Meth	nod: EPA 60	010C Preparation Me	ethod: E	PA 3010			
ron	5920	ug/L	50.0	1	01/07/16 09:11	01/13/16 12:09	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	nod: 6010C	Met Preparation Me	thod: El	PA 3010			
ron, Dissolved	3330	ug/L	50.0	1	01/07/16 09:03	01/07/16 14:49	7439-89-6	
500S2D Sulfide Water	Analytical Meth	od: SM 45	00-S2-D					
Sulfide	ND	mg/L	0.10	1		01/11/16 16:38	}	
320B Alkalinity	Analytical Meth	nod: SM 23	20B					
Alkalinity, Total as CaCO3	267	mg/L	5.0	1		01/07/16 14:04	ļ	
Carbon Dioxide (SM4500CO2D)	35.9	mg/L	5.0	1		01/16/16 11:00	124-38-9	
lkalinity,Bicarbonate (CaCO3)	267	mg/L	5.0	1		01/07/16 14:04		
lkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		01/07/16 14:04	ļ	
00.0 IC Anions	Analytical Meth	nod: EPA 30	0.00					
Sulfate	101	mg/L	2.4	2		01/07/16 13:57	14808-79-8	
53.2 Nitrate + Nitrite	Analytical Meth	nod: EPA 3	53.2					
litrogen, NO2 plus NO3	0.46	mg/L	0.020	1		01/13/16 09:29	)	
220D COD	Analytical Meth	od: SM 52	20D Preparation Me	thod: SN	M 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	01/11/16 09:32	01/11/16 14:07	•	
310C TOC	Analytical Meth	nod: SM 53	10C					
otal Organic Carbon	3.2	mg/L	1.0	1		01/12/16 22:28	7440-44-0	



Date: 01/19/2016 03:09 PM

### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP
Pace Project No.: 10335267

QC Batch: AIR/24976 Analysis Method: RSK 175

QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE

Associated Lab Samples: 10335267001, 10335267002, 10335267003, 10335267004

METHOD BLANK: 2171096 Matrix: Water
Associated Lab Samples: 10335267001, 10335267002, 10335267003, 1033526700

Associated Lab Samples: 10335267001, 10335267002, 10335267003, 10335267004

Blank Reporting

Parameter	Units	Result	Limit	Analyzed	Qualifiers
Ethane	ug/L	ND ND	10.0	01/07/16 08:59	
Ethene	ug/L	ND	10.0	01/07/16 08:59	
Methane	ug/L	ND	10.0	01/07/16 08:59	

LABORATORY CONTROL SAMPLE &	LCSD: 2171097		21	171098						
		Spike	LCS	LCSD	LCS	LCSD	% Rec		Max	
Parameter	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
Ethane	ug/L	114	103	98.3	91	86	85-115	5	20	
Ethene	ug/L	106	97.1	92.9	91	88	85-115	4	20	
Methane	ug/L	60.7	57.0	57.2	94	94	85-115	0	20	

SAMPLE DUPLICATE: 2172099		10335267001	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	.57J		20	
Methane	ug/L	31.7	30.8	3	20	

SAMPLE DUPLICATE: 2172100						
		92281981001	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	1.1J		20	
Methane	ua/L	ND	9.5J		20	

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



**QUALITY CONTROL DATA** 

Project: PS Beta-NIROP

Pace Project No.: 10335267

Date: 01/19/2016 03:09 PM

QC Batch: MPRP/60797 Analysis Method: EPA 6010C
QC Batch Method: EPA 3010 Analysis Description: 6010C Water

Associated Lab Samples: 10335267001, 10335267002, 10335267003, 10335267004

METHOD BLANK: 2171054 Matrix: Water
Associated Lab Samples: 10335267001, 10335267002, 10335267003, 10335267004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Iron ug/L ND 50.0 01/13/16 11:41

LABORATORY CONTROL SAMPLE: 2171055

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Iron ug/L 10000 9600 96 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2171056 2171057

MS MSD 10335267001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 10000 75-125 20 ug/L 17600 10000 27700 28000 101 103 Iron

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.



**QUALITY CONTROL DATA** 

Project: PS Beta-NIROP

Pace Project No.: 10335267

Date: 01/19/2016 03:09 PM

QC Batch: MPRP/60796 Analysis Method: 6010C Met

QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved

Associated Lab Samples: 10335267001, 10335267002, 10335267003, 10335267004

METHOD BLANK: 2171050 Matrix: Water

Associated Lab Samples: 10335267001, 10335267002, 10335267003, 10335267004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Iron, Dissolved ug/L ND 50.0 01/07/16 14:16

LABORATORY CONTROL SAMPLE: 2171051

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Iron, Dissolved ug/L 10000 9690 97 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2171052 2171053

MS MSD 10335267001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Iron, Dissolved 10000 21300 75-125 0 20 ug/L 11600 10000 21300 97 97

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.



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP
Pace Project No.: 10335267

QC Batch: MT/22121 Analysis Method: SM 4500-S2-D

QC Batch Method: SM 4500-S2-D Analysis Description: 4500S2D Sulfide Water

Associated Lab Samples: 10335267001, 10335267002, 10335267003, 10335267004

METHOD BLANK: 2173060 Matrix: Water
Associated Lab Samples: 10335267001, 10335267002, 10335267003, 10335267004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Sulfide mg/L ND 0.10 01/11/16 15:56

LABORATORY CONTROL SAMPLE: 2173061

Date: 01/19/2016 03:09 PM

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Sulfide mg/L .97 1.0 104 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2173062 2173063

MS MSD 10335025001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Sulfide ND 80-120 2 20 mg/L .97 .97 0.84 0.82 85 84

SAMPLE DUPLICATE: 2173064 10335267003 Dup Max

Parameter Units Result Result RPD ARPD Qualifiers

Sulfide Mg/L ND ND 20

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



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP

Pace Project No.: 10335267

QC Batch: WET/35249 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10335267001, 10335267002, 10335267003, 10335267004

METHOD BLANK: 1450327 Matrix: Water

Associated Lab Samples:

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Carbon Dioxide (SM4500CO2D) mg/L ND 5.0 01/16/16 10:18

SAMPLE DUPLICATE: 1450329

SAMPLE DUPLICATE: 1450330

Date: 01/19/2016 03:09 PM

 Parameter
 Units
 10335267001 Result
 Dup Result
 Max Republic

 Carbon Dioxide (SM4500CO2D)
 mg/L
 103
 104
 1

Parameter Units Result Result RPD ARPD Qualifiers

Carbon Dioxide (SM4500CO2D) mg/L 5.0U ND

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.



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP

Pace Project No.: 10335267

Date: 01/19/2016 03:09 PM

QC Batch: WET/45936 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10335267001, 10335267002, 10335267003, 10335267004

METHOD BLANK: 2171082 Matrix: Water
Associated Lab Samples: 10335267001, 10335267002, 10335267003, 10335267004

Reporting Blank Parameter Result Limit Qualifiers Units Analyzed Alkalinity, Total as CaCO3 ND 5.0 01/07/16 13:06 mg/L Alkalinity, Bicarbonate (CaCO3) mg/L ND 5.0 01/07/16 13:06 Alkalinity, Carbonate (CaCO3) ND 01/07/16 13:06 mg/L 5.0

LABORATORY CONTROL SAMPLE & LCSD: 2171083 2171084 Spike LCS LCSD LCS LCSD % Rec Max Parameter Units Conc. Result Result % Rec % Rec Limits **RPD RPD** Qualifiers Alkalinity, Total as CaCO3 mg/L 40 41.4 42.0 103 105 90-110 30

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2171085 2171086 MSD MS 10334947004 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual Alkalinity, Total as CaCO3 mg/L 338 40 40 376 379 95 102 80-120 30

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



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP

Pace Project No.: 10335267

Date: 01/19/2016 03:09 PM

QC Batch: WETA/26041 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10335267001, 10335267002, 10335267003, 10335267004

METHOD BLANK: 2171281 Matrix: Water

Associated Lab Samples: 10335267001, 10335267002, 10335267003, 10335267004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Sulfate mg/L ND 1.2 01/07/16 11:32

LABORATORY CONTROL SAMPLE: 2171282

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Sulfate mg/L 12.5 12.0 96 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2171283 2171284

MS MSD 10335056002 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Sulfate 90-110 0 20 mg/L < 0.60 12.5 12.5 12.0 12.1 96 97

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.



### **QUALITY CONTROL DATA**

Project:

PS Beta-NIROP

Pace Project No.:

10335267

QC Batch:

WETA/26084

Analysis Method:

EPA 353.2

QC Batch Method: EPA 353.2 Analysis Description:

353.2 Nitrate + Nitrite, preserved

Associated Lab Samples:

Associated Lab Samples:

10335267001, 10335267002, 10335267003, 10335267004

METHOD BLANK: 2174103

Matrix: Water 10335267001, 10335267002, 10335267003, 10335267004

Blank

Reporting

Parameter

Parameter

Units

Result

Limit

Qualifiers Analyzed

Nitrogen, NO2 plus NO3

mg/L

ND

0.020 01/13/16 09:24

LABORATORY CONTROL SAMPLE: 2174104

Spike Units Conc.

LCS Result

LCS % Rec % Rec Limits

Qualifiers

Nitrogen, NO2 plus NO3

mg/L

Result

Units

mg/L

1.0

100

90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:

2174105

7.6

2174106

MS

MSD Spike

MS MSD

27.8

MS % Rec

101

MSD

101

% Rec Limits RPD

Max RPD

Nitrogen, NO2 plus NO3

Date: 01/19/2016 03:09 PM

Parameter

10335639001 Spike

Conc. Conc.

20

Result 20

Result 27.8 % Rec

90-110

Qual 0 20

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

Qualifiers

(612)607-1700



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP

Pace Project No.: 10335267

Date: 01/19/2016 03:09 PM

QC Batch: WETA/26067 Analysis Method: SM 5220D
QC Batch Method: SM 5220D Analysis Description: 5220D COD

Associated Lab Samples: 10335267001, 10335267002, 10335267003, 10335267004

METHOD BLANK: 2172937 Matrix: Water Associated Lab Samples: 10335267001, 10335267002, 10335267003, 1033526700

10335267001, 10335267002, 10335267003, 10335267004 Blank Reporting

Parameter Units Result Limit Analyzed

Chemical Oxygen Demand mg/L ND 50.0 01/11/16 14:01

LABORATORY CONTROL SAMPLE: 2172938

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chemical Oxygen Demand mg/L 300 294 98 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2172939 2172940

MS MSD 10335110001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 80-120 20 Chemical Oxygen Demand mg/L 1340 2500 2500 3560 3520 89 87

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2172941 2172942

MS MSD 10334884002 MS MSD MS Spike Spike MSD % Rec Max Parameter % Rec RPD Units Result Conc. Conc. Result Result % Rec Limits RPD Qual Chemical Oxygen Demand 27000 25000 25000 49800 49800 91 91 80-120 0 20 mg/L

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.



### **QUALITY CONTROL DATA**

PS Beta-NIROP Project: Pace Project No.: 10335267

QC Batch: WETA/15362 Analysis Method: SM 5310C QC Batch Method: SM 5310C Analysis Description: 5310C TOC

Associated Lab Samples: 10335267001, 10335267002, 10335267003, 10335267004

METHOD BLANK: 280850 Matrix: Water

Associated Lab Samples:

Date: 01/19/2016 03:09 PM

Blank Reporting Parameter Units Limit Analyzed Qualifiers Result

Total Organic Carbon ND 1.0 01/12/16 16:30 mg/L

LABORATORY CONTROL SAMPLE: 280851

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Organic Carbon** mg/L 25 25.4 102 90-110

LABORATORY CONTROL SAMPLE: 280888

LCS LCS Spike % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Organic Carbon** 25 25.5 102 90-110 mg/L

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 280852 280853

			MS	MSD								
		10335267002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Total Organic Carbon	mg/L	2.4	25	25	27.6	27.8	101	102	80-120	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 280854 280855

Parameter	Units	10335414001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec	RPD	Max RPD	Qual
Total Organic Carbon	mg/L	1.6	25	25	26.9	27.1	101	102	80-120	1	20	

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



### **QUALIFIERS**

Project: PS Beta-NIROP Pace Project No.: 10335267

### **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.

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.

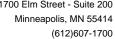
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### **LABORATORIES**

Date: 01/19/2016 03:09 PM

PASI-M Pace Analytical Services - Minneapolis
PASI-MT Pace Analytical Services - Montana
PASI-O Pace Analytical Services - Ormond Beach
PASI-V Pace Analytical Services - Virginia





### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: PS Beta-NIROP Pace Project No.: 10335267

Date: 01/19/2016 03:09 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytica Batch
10335267001	PMW-01	RSK 175	AIR/24976	•	
0335267002	PMW-02	RSK 175	AIR/24976		
0335267003	PMW-03	RSK 175	AIR/24976		
0335267004	PMW-04	RSK 175	AIR/24976		
0335267001	PMW-01	EPA 3010	MPRP/60797	EPA 6010C	ICP/26476
0335267002	PMW-02	EPA 3010	MPRP/60797	EPA 6010C	ICP/26476
0335267003	PMW-03	EPA 3010	MPRP/60797		ICP/26476
0335267004	PMW-04	EPA 3010	MPRP/60797	EPA 6010C	ICP/26476
0335267001	PMW-01	EPA 3010	MPRP/60796	6010C Met	ICP/2647
0335267002	PMW-02	EPA 3010	MPRP/60796	6010C Met	ICP/2647
0335267003	PMW-03	EPA 3010	MPRP/60796		ICP/2647
0335267004	PMW-04	EPA 3010	MPRP/60796	6010C Met	ICP/2647
0335267001	PMW-01	SM 4500-S2-D	MT/22121		
0335267002	PMW-02	SM 4500-S2-D	MT/22121		
0335267003	PMW-03	SM 4500-S2-D	MT/22121		
0335267004	PMW-04	SM 4500-S2-D	MT/22121		
0335267001	PMW-01	SM 2320B	WET/35249		
0335267001	PMW-01	SM 2320B	WET/45936		
0335267002	PMW-02	SM 2320B	WET/35249		
0335267002	PMW-02	SM 2320B	WET/45936		
0335267003	PMW-03	SM 2320B	WET/35249		
0335267003	PMW-03	SM 2320B	WET/45936		
0335267004	PMW-04	SM 2320B	WET/35249		
0335267004	PMW-04	SM 2320B	WET/45936		
0335267001	PMW-01	EPA 300.0	WETA/26041		
0335267002	PMW-02	EPA 300.0	WETA/26041		
0335267003	PMW-03	EPA 300.0	WETA/26041		
0335267004	PMW-04	EPA 300.0	WETA/26041		
0335267001	PMW-01	EPA 353.2	WETA/26084		
0335267002	PMW-02	EPA 353.2	WETA/26084		
0335267003	PMW-03	EPA 353.2	WETA/26084		
0335267004	PMW-04	EPA 353.2	WETA/26084		
0335267001	PMW-01	SM 5220D	WETA/26067		WETA/26
0335267002	PMW-02	SM 5220D	WETA/26067		WETA/26
0335267003	PMW-03	SM 5220D	WETA/26067		WETA/26
0335267004	PMW-04	SM 5220D	WETA/26067	SIVI 5220D	WETA/26
0335267001	PMW-01	SM 5310C	WETA/15362		
0335267002	PMW-02	SM 5310C	WETA/15362		
0335267003	PMW-03	SM 5310C	WETA/15362		
0335267004	PMW-04	SM 5310C	WETA/15362		



Regenesis

Section B
Required Project Information:
Report To: Melinda Pham

Section C
Invoice Information:
Attention: Baha

Bahar Naderi

# **CHAIN-OF-CUSTODY / Analytical Request Document**

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

Page 23 of 44

							12	1	ð	9	8	7	6	O1	4	3	2	<b>-</b>	ITEM#		Reques	Phone:	Email To:		Address:
					21 mg	ADDITION												6,000	SAMPLE ID  (A-Z, 0-9 / -)  Sample IDs MUST BE UNIQUE	Section D	Requested Due Date/TAT:	949-366-8000	o: Mpham@regenesis.com	San Clemen	1011 Calle Sombra
					CE	ADDITIONAL COMMENTS	-								PMW-AL	PMW- <b>®</b>	PMW-22	PWW-D	ID UNIQUE	Valid N	10 days	Fax: 343-366-8090	jenesis.com	San Clemente, CA 92673	ombra
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DATE Signed (MM/DD/YY):						ACCEPTED BY / AFFILIATION	$\vdash$	$\vdash$			_	_			_	_			Alkalinity, CaCO3 in water Chemical oxygen demand	<b>-   품</b>					
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	y Sealed er (Y/N)		۷	ک	مح	SAMPLE CONDITIONS													Project N				OTHER	DRINKIN	
	es Intact '/N)		<	(		ONS									h66	20%	ST	8	Pace Project No./ Lab I.D.					DRINKING WATER	

## Pace Analytical\*

hold, incorrect preservative, out of temp, incorrect containers).

### Document Name:

### Sample Condition Upon Receipt Form

Document No.:

F-MN-L-213-rev.15

Document Revised: 05Jan2016 Page 1 of 1

Issuing Authority:
Pace Minnesota Quality Office

Sample Condition	Client Name:			Project	
Upon Receipt	Regenes	5			WO#: 10335267
Courier:	Fed Ex UPS	□usps	χίc	Client	MOJII . TA9925/
Commercial	Pace SpeeDee	Other:			
Tracking Number:	· Action of the control of the contr	t			10335267
			-	_	Upnoman
Custody Seal on Coo	oler/Box Present? Yes	No :	Seals Int	act?	Yes No Optional.
Packing Material:	☐ Bubble Wrap <b>X</b> Bubble Bag	gs Non	е 🗌	Other:	Temp Blank? ✓ Yes ☐ No
	151401163 ☐B88A912167 151401164 ☑B88A014331	100	e of Ice:	₩we	t Blue None Samples on ice, cooling process has begun
Cooler Temp Read (°	C): Cooler Temp C	Corrected (°C)	: el	A	Biological Tissue Frozen? Yes No XN/A
Temp should be abov		ictor: 18.2	- °C	Dat	e and Initials of Person Examining Contents:
	( ( \times \text{N/A, water sample)} n a quarantine zone within the Unite	d States: AL /	ΔR Δ7 C	Δ ΕΙ GΔ	ID, LA. Did samples originate from a foreign source (internationally,
	PR, SC, TN, TX or WA (check maps)?	u states. AL, F	λιν, <i>Η</i> Ζ, <i>C</i> /	Yes	No including Hawaii and Puerto Rico)?  Yes No
		egulated Soil	Checkli	st (F-MN-	Q-338) and include with SCUR/COC paperwork.
					COMMENTS:
Chain of Custody Pres	sent?	Ŷes	□No	□N/A	1.
Chain of Custody Fille	ed Out?	¥¥es	□No	□N/A	2.
Chain of Custody Reli	nquished?	<b>¥</b> Yes	□No	□N/A	3.
Sampler Name and/o	r Signature on COC?	¥Yes	□No	□N/A	4.
Samples Arrived with	in Hold Time?	Yes	□No	□N/A	5.
Short Hold Time Ana	lysis (<72 hr)?	∐Yes	₩No	□N/A	6.
Rush Turn Around Ti	me Requested?	□Yes	No	□N/A	7.
Sufficient Volume?		₩Yes	□No	□N/A	8.
Correct Containers U	sed?	¥ZÍYes	□No	□N/A	9.
-Pace Containers L	Jsed?	<b>K</b> Yes	□No	□N/A	
Containers Intact?		Yes	□No	□N/A	10.
Filtered Volume Rece	ived for Dissolved Tests?	√ZYes	□No	□N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match	COC?	<b>₩</b> Yes	□No	□n/a	12.
-Includes Date/Tim	ne/ID/Analysis Matrix:	~5			
	g acid/base preservation have been				13. XHNO₃ XH₂SO₄ , XNaOH ∏HCI
checked?	a procognistion are found to be in	Yes	□No	□N/A	13. 2/2HNO <sub>3</sub> 2/2H <sub>2</sub> SO <sub>4</sub> / MaOH HCI Sample #
compliance with EPA	g preservation are found to be in recommendation?				Sample # 01~0 4
	NaOH >9 Sulfide, NaOH>12 Cyanide	<b>∑</b> Yes	□No	□N/A	
DRO/8015 (Water) DC	iform TOC, Oil and Grease,	<b>▼</b> Yes	□No	□N/A	Initial when Lot # of added completed: preservative:
Headspace in VOA Vis		Yes	MNo	□N/A	14.
Trip Blank Present?		□Yes	□No	<b>∑</b> N/A	15.
Trip Blank Custody Se	eals Present?	□Yes	□No	<b>∑</b> N/A	•
Pace Trip Blank Lot #	(if purchased):				
CLIENT N	IOTIFICATION/RESOLUTION				Field Data Required? Yes No
Person Contacted:					Date/Time:
Comments/Resoluti					
	A				
	anager Review				Date: \\7\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
Note: Whenever there i	s a discrepancy affecting North Carolin	a compliance s	amples, a	a copy of th	nis form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of

	Pace	Analytical -	MN to M D	ocument Nu	ransfer Form mbor:	هده و متود شه و خرش به و خدم درند بو میور و مت	ised Date: 14Jul2014 Page: 1 of 1 Issuing Authority: Jinnesota Quality Office		
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	<b>Տ</b> ուն	Tracking #:	/a484 Regenesis	8625	1246	د می در در در در در در در در در در در در در			
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Tests	A 10.1.	1		T	001.00			mu 1	8/16
4500S2D	Sulfide	BP2Z		4	001-00	J4		1122	8//6
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IR Gun: B88A	0140728348, Co			,			Sample Matrix:	HEO	
Cooler Temp Rea		Cooler Temp	Corrected	(°C): /,	Filtr		rec'd for dissolved tests:	Yes No	
	\ -/_//\\	Arrived on Ice:		s X No		Samples	pH have been checked:	YeyanNo	
	Custod	y Seal Present:	Ye	s_X No.			Trip Blank Present:	Yes No	
Short Ho	old Time Request	ted < 72 Hours:	Ye	sNo	X	Trip Blank	Custody Seals Present:	Yes No	
		AT Requested:	****	98 No.			Pace Trip Blank Lot #:		124
	Sufficient S	ample Volume:	·	es y No	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Sampl	e Composites Required:		NA 🗡
Sa	mples Arrived wi			es Y No.	~~~~		Report Samples:	Wet Wt.	Dry Wt
	Co	ntainers Intact:	Y	es.x. No		mademinents of the factor and the fa	Reporting Units:	No. and 1-14-2-14 (Annual Constitution)	
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	STANSON STANSO	1A M	1/1/		one production of the second control	THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER.	1/0/1/	THE PERSON AND PROPERTY.	<u>Saran i Adrianis nisa a marin marin</u>
Project Man	ager Review:	7/1/X/L	XVL		1	Date	:' 0  15		

Rovised Date: 14Jul2014



Pace Analytical

Item Cooler Temperature on Receipt Transfers Phone (612)607-1700 Fax (612)607-6444 Minneapolis, MN 55414 Pace Analytical Services, Inc. 1700 Elm Street, Suite 200 Jennifer Anderson Report To Workorder: 10335267 Sample ID PMW-02 PMW-04 PMW-03 PMW-01 Released By Workorder Name: PS Beta-NIROP PS PS PS ype S Sample S. 6 Collect 1/6/2016 09:25 Date/Time 1/6/2016 10:55 1/6/2016 13:25 1/6/2016 14:20 Subcontract To Date/Time Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042 1440 Custody Seal 10335267004 Lab ID 10335267003 10335267001 10335267002 Received Y or N Water Water Water Water Watrix H2SO4 Received on Ice / Y or Owner Received Date: Date/Time 180 91-8-17/10/800 × × z 1/6/2016 Requested Analysis Results Requested By: Samples Intact (Y or Comments LAB USE ONLY 1/20/2016 z

Page 1 of 1

<sup>\*\*\*</sup>In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document This chain of custody is considered complete as is since this information is available in the owner laboratory.



### Document Name: Sample Condition Upon Receipt form

Document No.: F-VM-C-001-Rev.09 Document Revised: 23Feb2015 Page 1 of 1

Issuing Authority:

Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt  Client Name:  Pace   Name   Pace   Name			Projec	WUH · LZUYUZH
Courier:Fed ExUPS Commercial	∭USPS ∭Othe		Client	1259524
Tracking Number:		′ ' <u></u>		1.50405.4
Custody Seal on Cooler/Box Present? ( Yes [	No	Seals	Intact?	Yes No Optional: Proj. Due Date: Proj. Name:
Packing Material: 🗹 Bubble Wrap 🕅 Bubble B	ags 🔲	Vone (	Other:_	Temp Blank? Yes No
Thermometer Used: 140792808	Type of	fice:	<b>j</b> Wet	Blue None Samples on ice, cooling process has begu
Cooler Temp Read °C: 1 2 Cooler Temp Temp should be above freezing to 6°C Correction Fai	Corrected ctor:	<u>c:</u>	Date a	Biological Tissue Frozen? Yes No NN.  Ind Initials of Person Examíning Contents: If C 17/16
Chain of Custody Present?	□Yes	□No	□N/A	Comments: 1-6-16 CL
Chain of Custody Filled Out?	Z Yes	□No		2.
Chain of Custody Relinquished?	Z Yes	□No		3.
Sampler Name and Signature on COC?	□Yes	[Z]No		4.
Samples Arrived within Hold Time?	☑Yes	□No	□N/A	5.
Short Hold Time Analysis (<72 hr)?	WHY.	ØÑο	N/A	6.
Rush Turn Around Time Requested?	□Yes		□N/A	7.
Sufficient Volume?	☑Yes	□N <sub>0</sub>	□N/A	8.
Correct Containers Used?	ØYes	□No	□N/A	9.
-Pace Containers Used?	✓ ✓Yes	□No	□N/A	
Containers Intact?	<b>⊘</b> Yes	□No	□N/A	10.
Filtered Volume Received for Dissolved Tests?	Yes	No	ZÎN/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	[Z]Yes	□No	□n/a	12.
-Includes Date/Time/ID/Analysis Matrix:	WF		23.43.1	•
Alf containers needing acid/base preservation will be checked and documented in the pH logbook.	//Yes	□No	□N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	Yes	□No	ZÎN/A	13.
Headspace in VOA Vials ( >6mm)?	Yes	□No	⊠n/a	14.
Trip Blank Present?	□Yes	□No	ØN/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:			D	ate/Time:
Comments/Resolution:				
			<del></del>	
		······································		
	<del></del>	·		
FECAL WAIVER ON FILE Y N	*	TEMP	ERATUR	E WAIVER ON FILE Y N

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

## Chain of Custody —

Pace Analytical

WO#: 35224227

LAB USE ONLY 1/20/2016 Samples Intact (Y),or Results Requested By: Comments 1/6/2016 Z Owner Received Date: Received on Ice 1/8/112 × Date/Time Preserved Containers Unpreserved Z Pace Analytical Ormond Beach Matrix Water Water Water Water 8 East Tower Circle Ormond Beach, FL 32174 Phone (386)672-5668 Custody Seal (Y or Received By 10335267002 10335267003 10335267004 10335267001 Workorder Name: PS Beta-NIROP Cab 10 1011 011117 Date/Time 1/6/2016 13:25 1/6/2016 09:25 1/6/2016 10:55 1/6/2016 14:20 Date/Time Collect ပွ Sample Type ьS S PS PS Cooler Temperature on Receipt Pace Analytical Services, Inc. 1700 Elm Street, Suite 200 Minneapolis, MN 55414 Workorder: 10335267 Released By Phone (612)607-1700 Fax (612)607-6444 Jennifer Anderson Sample 1D PMW-04 PMW-03 PMW-02 PMW-01 Report To **Transfers** Item

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name: Sample Condition Upon Receipt Form Document No.: F-FL-C-007 rev. 07 Document Revised: December 28, 2015 Issuing Authority: Pace Florida Quality Office

### Sample Condition Upon Receipt Form (SCUR)

Project# A	0#:35	<b>522</b>	42	<b>27</b>			nitials of perso	n examining
Project Manager: PM:	JJV	Due	Date	: 01/14/1	ıs	contents:_ Label:	110110 N	:
O11 4.	ENT: PACMI			·· ••/±7/2		Deliver:	<del>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</del>	:
					İ	pH:	<u> </u>	
Courier: DFFed Ex UPS	□usps □	Client	Пс	ommercial [		Other	1	
Shipping Method:  First Overnight					☐ Ground	Oulei_ <u>c</u>		1
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		80	1,		.,	Occiet Cize ii	Appliodolo;	-
Tracking # <u>OYOY B</u> (	<u> </u>	-00						
Custody Seal on Cooler/Box Present:	yes □ ا	no	Seals	intact: 🙉 yes	□ no			: :
	Bubble Bags	□No	ļ <u>.</u>	Other		Biological 3	lissue is Frozen:	Yes No N/A
Thermometer Used 770				Blue None		_	, cooling process	
Cooler #1 Temperature c (Vi			1				,	
Cooler #2 Temperature C(V)	,		1 .			•		!
Cooler #3 Temperature C(Vi			ļ			•	emp should be a	hove freezing
Cooler #4 Temperature C(Vi			1			*	to 6°(	
Cooler #5 Temperature C(Vis			1		(Acti	•		i
	sual)		1	actor)	(Acti	•		:
Obdies #5 Testiperature C(**	- Jueij	(OO) ( @	S.O.	Comments:	(A011	Jaij		•
Chain of Custody Present	ΔYe	s □ No	□N/A					
Chain of Custody Filled Out	<b>∠</b> ZÝe:	s 🗆 No	□N/A					
Relinquished Signature & Sampler Name	COC ZYes	s □ No	□N/A					
Samples Arrived within Hold Time	Z/Ye:	s 🗆 No	□N/A					
Rush TAT requested on COC	□Yes	s Z No	□N/A					
Sufficient Volume	ZYe	s 🗆 No	□N/A					
Correct Containers Used	(2Yes	s 🗆 No	□N/A					1
Pace Containers Used	. <i>17</i> Yes	s □ No	□N/A					
Containers Intact	. tz/Yes	s 🗆 No	□N/A					
Sample Labels match COC (sample IDs & date collection)	e/time of	s 🗆 No	□N/A					
All containers needing acid/base preservation in	have been		1	HNO3 pH<2			<u> </u>	
checked. All Containers needing preservation are found t	☐Yes to be in	s ⊔No	ANIA	HCI pH<2 H2SO4 pH<2				
compliance with EPA recommendation:	□Yes	s □ No	5/NA	NaOH pH>12				:
Exceptions: VOA, Colifo			 	NaOH/ZnOAc pl	H>9	<del></del> .		
No Headspace in VOA Vials ( >6mm);	□Yes		Z					<u> </u>
Trip Blank Present:	□Yes	s LINO	DIN/A					
Client Notification/ Resolution:					, pages			·
Person Contacted:				D	ate/Time:_			
Comments/ Resolution (use back for addit	tional comments)	);						
: :		····	<u> </u>					<u>!</u>
			ļ <u>.</u>	<del> </del>				
	<u> </u>		<u> </u>					
			1		<del>/</del>			
	***************************************	<del>,</del>	<u> </u>	A -	<del>/</del>		11=	
Project Manager Review:		·-,	1	<u> </u>		Date:	1,,,	· · · · · · · · · · · · · · · · · · ·



January 18, 2016

Jennifer Anderson

1700 Elm Street Suite 200

Pace Analytical Services, Inc.

Minneapolis, MN 55414

Pace Analytical Energy Services LLC 220 William Pitt Way Pittsburgh, PA 15238

Phone: (412) 826-5245

Fax: (412) 826-3433

PS BETA-NIROP / 10335267

Pace Workorder:

17899

Dear Jennifer Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, January 08, 2016. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

RE:

Russ Wels

Ruth Welsh 01/18/2016 Ruth.Welsh@pacelabs.com

Customer Service Representative

**Enclosures** 

As a valued client we would appreciate your comments on our service.

Please email info@microseeps.com.

Total Number of Pages

Report ID: 17899 - 755160

Page 1 of 13





### LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor: Pennsylvania Department of Environmental Protection, Bureau of Laboratories

Accreditation ID: 02-00538

Scope: NELAP Non-Potable Water and Solid & Hazardous Waste

Accreditor: South Carolina Department of Health and Environmental Control, Office of Environmental

Laboratory Certification

Accreditation ID: 89009003

Scope: Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)

Accreditor: NELAP: New Jersey, Department of Environmental Protection

Accreditation ID: PA026

Scope: Non-Potable Water; Solid and Chemical Materials

Accreditor: NELAP: New York, Department of Health Wadsworth Center

Accreditation ID: 11815

Scope: Non-Potable Water; Solid and Hazardous Waste

Accreditor: State of Connecticut, Department of Public Health, Division of Environmental Health

Accreditation ID: PH-0263

Scope: Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)

Accreditor: NELAP: Texas, Commission on Environmental Quality

Accreditation ID: T104704453-09-TX Scope: Non-Potable Water

Accreditor: State of New Hampshire

Accreditation ID: 299409

Scope: Non-potable water

Accreditor: State of Georgia
Accreditation ID: Chapter 391-3-26

Scope: As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is

accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

Report ID: 17899 - 755160

/nelac

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Pace Analytical Energy Services LLC 220 William Pitt Way

Pittsburgh, PA 15238

Phone: (412) 826-5245 Fax: (412) 826-3433

### SAMPLE SUMMARY

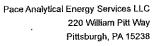
Workorder: 17899 PS BETA-NIROP / 10335267

Lab ID	Sample ID	Matrix	Date Collected	Date Received
178990001	PMW-01	Water	1/6/2016 14:20	1/8/2016 11:15
178990002	PMW-02	Water	1/6/2016 13:25	1/8/2016 11:15
178990003	PMW-03	Water	1/6/2016 10:55	1/8/2016 11:15
178990004	PMW-04	Water	1/6/2016 09:25	1/8/2016 11:15

Report ID: 17899 - 755160



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### **ANALYTICAL RESULTS**

Workorder: 17899 PS BETA-NIROP / 10335267

Lab ID:

178990001

Date Received: 1/8/2016 11:15

Matrix:

Water

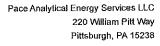
Date Collected: 1/6/2016 14:20 PMW-01 Sample ID:

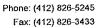
Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR	Augustin in Halling a morthagilia.	- hultient Matheady A	Mago Tillian	n ( voj novjejski dilako ili d		een stare ee walke beskil ee soorts. He
Analysis Desc: AM23G		narytical Method. A	IVIZ3G			
Lactic Acid	<2.0 mg/l	2.0	0.030 10	1/15/2016 08:27	KB	d,B
Acetic Acid	120 mg/l	10	0.60 100	1/15/2016 09:21	KB	d,B
Propionic Acid	86 mg/l	10	0.10 100	1/15/2016 09:21	KB	d,B
Formic Acid	<1.0 mg/l	1.0	0.040 10	1/15/2016 08:27	KB	d,B
Butyric Acid	1.8 mg/l	1.0	0.050 10	1/15/2016 08:27	KB	d,B
Pyruvic Acid	<1.0 mg/l	1.0	0.12 10	1/15/2016 08:27	KB	d
i-Pentanoic Acid	<1.0 mg/l	1.0	0.12 10	1/15/2016 08:27	KB	d
Pentanoic Acid	<1.0 mg/l	1.0	0.060 10	1/15/2016 08:27	KB	d
i-Hexanoic Acid	<2.0 mg/l	2.0	0.10 10	1/15/2016 08:27	KB	d
Hexanoic Acid	<2.0 mg/l	2.0	0.10 10	1/15/2016 08:27	KB	d

Report ID: 17899 - 755160



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### **ANALYTICAL RESULTS**

Workorder: 17899 PS BETA-NIROP / 10335267

Lab ID:

178990002

PMW-02

Date Received: 1/8/2016 11:15

Matrix:

Water

Sample ID: PMW-02			Date Collec	ted: 1/6/2016 13:25	5	
Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR						
Analysis Desc: AM23G	Analytic	cal Method: A	M23G			
Lactic Acid	<0.20 mg/l	0.20	0.0030 1	1/12/2016 09:57	KB	В
Acetic Acid	< <b>0.10</b> mg/l	0.10	0.0060 1	1/12/2016 09:57	KB	В
Propionic Acid	<0.10 mg/l	0.10	0.0010 1	1/12/2016 09:57	KB	
Formic Acid	<0.10 mg/l	0.10	0.0040 1	1/12/2016 09:57	KB	В
Butyric Acid	<0.10 mg/l	0.10	0.0050 1	1/12/2016 09:57	KB	
Pvruvic Acid	<0.10 mg/l	0.10	0.012 1	1/12/2016 09:57	KB	
i-Pentanoic Acid	<0.10 mg/l	0.10	0.012 1	1/12/2016 09:57	KB	
Pentanoic Acid	< <b>0.10</b> mg/l	0.10	0.0060 1	1/12/2016 09:57	KB	
i-Hexanoic Acid	<0.20 mg/l	0.20	0.010 1	1/12/2016 09:57	KB	
Hexanoic Acid	<0.20 mg/l	0.20	0.010 1	1/12/2016 09:57	KB	

Report ID: 17899 - 755160



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Fax: (412) 826-3433

### **ANALYTICAL RESULTS**

Workorder: 17899 PS BETA-NIROP / 10335267

Lab ID:

178990003

Date Received: 1/8/2016 11:15

Matrix:

Water

Sample ID:

PMW-03

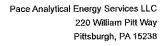
Date Collected: 1/6/2016 10:55

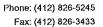
Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualiflers
EDonors - MICR Analysis Desc: AM23G	Analyt	ical Method: A	M23G			
Lactic Acid	<0.20 mg/l	0.20	0.0030 1	1/12/2016 10:5		В
Acetic Acid	<0.10 mg/l	0.10	0.0060 1	1/12/2016 10:5	1 KB	В
Propionic Acid	<0.10 mg/l	0.10	0.0010 1	1/12/2016 10:5	1 KB	
Formic Acid	<0.10 mg/l	0.10	0.0040 1	1/12/2016 10:5	1 KB .	В
Butyric Acid	<0.10 mg/l	0.10	0.0050 1	1/12/2016 10:5	1 KB	
Pyruvic Acid	<0.10 mg/l	0.10	0.012 1	1/12/2016 10:5	1 KB	
i-Pentanoic Acid	<0.10 mg/l	0.10	0.012 1	1/12/2016 10:5	1 KB	
Pentanoic Acid	<0.10 mg/l	0.10	0.0060 1	1/12/2016 10:5	1 KB	
i-Hexanoic Acid	<0.20 mg/l	0.20	0.010 1	1/12/2016 10:5	1 KB	
Hexanoic Acid	<0.20 mg/l	0.20	0.010 1	1/12/2016 10:5	1 KB	

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### **ANALYTICAL RESULTS**

Workorder: 17899 PS BETA-NIROP / 10335267

Lab ID:

178990004

Date Received: 1/8/2016 11:15

Matrix:

Water

Sample ID: PMW-04 Date Collected: 1/6/2016 09:25

Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR Analysis Desc: AM23G	Ana	lytical Method: A	M23G			
Lactic Acid	<0.20 mg/l	0.20	0.0030 1	1/12/2016 11:44	КВ	В
Acetic Acid	0.14 mg/l	0.10	0.0060 1	1/12/2016 11:44	KB <sup>.</sup>	В
Propionic Acid	<0.10 mg/l	0.10	0.0010 1	1/12/2016 11:44	KВ	
Formic Acid	<0.10 mg/l	0.10	0.0040 1	1/12/2016 11:44	KB	В
Butyric Acid	<0.10 mg/l	0.10	0.0050 1	1/12/2016 11:44	KB	
Pyruvic Acid	<0.10 mg/i	0.10	0.012 1	1/12/2016 11:44	KB	
i-Pentanoic Acid	<0.10 mg/i	0.10	0.012 1	1/12/2016 11:44	KB	
Pentanoic Acid	<0.10 mg/l	0.10	0.0060 1	1/12/2016 11:44	KB	
i-Hexanoic Acid	<0.20 mg/l	0.20	0.010 1	1/12/2016 11:44	KB	
Hexanolc Acid	<0.20 mg/l	0.20	0.010 1	1/12/2016 11:44	KB	

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### ANALYTICAL RESULTS QUALIFIERS

Workorder: 17899 PS BETA-NIROP / 10335267

### **DEFINITIONS/QUALIFIERS**

Disclaimer: The Pennsylvania Department of Environmental Protection (PADEP) has decided to no longer recognize analyses that do not

produce data for primary compliance, for NELAP accreditation. The methods affected by this decision are AM20GAx, AM21G,

SW846 7199 and AM4.02. The laboratory shall continue to administer the NELAP/TNI standard requirements in the performance

of these methods.

Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection. MDL

Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation. PQL.

Not detected at or above reporting limit. ND

DF Dilution Factor.

S Surrogate.

**RPD** Relative Percent Difference.

% Rec Percent Recovery.

Indicates the compound was analyzed for, but not detected at or above the noted concentration. U

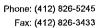
Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL). J

В The analyte was detected in the associated blank.

d The analyte concentration was determined from a dilution.

Report ID: 17899 - 755160







### **QUALITY CONTROL DATA**

Workorder: 17899 PS BETA-NIROP / 10335267

QC Batch:

EDON/2770

Analysis Method:

AM23G

QC Batch Method:

AM23G

Associated Lab Samples:

178990002, 178990003, 178990004

METHOD BLANK: 39699

Parameter	Units	Blank Result	Reporting Limit Qualifiers	
EDonors				
Lactic Acid	mg/l	<0.20	0.20 B	
Acetic Acid	mg/l	<0.10	0.10 B	
Propionic Acid	mg/l	< 0.10	0.10	
Formic Acid	mg/l	< 0.10	0.10 B	
Butyric Acid	mg/l	<0.10	0.10	
Pyruvic Acid	mg/l	<0.10	0.10	
i-Pentanoic Acid	mg/i	< 0.10	0.10	
Pentanoic Acid	mg/l	< 0.10	0.10	
i-Hexanoic Acid	mg/l	< 0.20	0.20	
Hexanoic Acid	mg/l	< 0.20	0.20	

LABORATORY	CONTROL	CAMDIE:	30700
LABORATORY	CONTRUL	SAMPLE.	39700

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EDonors						
Lactic Acid	mg/l	. 2	2.1	103	70 <del>-</del> 130	В
Acetic Acid	mg/l	2	2.1	106	70-130	В
Propionic Acid	mg/l	2	2.2	109	70-130	
Formic Acid	mg/l	2	1.9	93	70-130	В
Butyric Acid	mg/l	2	2.1	107	70-130	
Pyruvic Acid	mg/l	2	2,1	104	70-130	
i-Pentanoic Acid	mg/l	2	2.1	105	70-130	
Pentanoic Acid	mg/l	2	2.1	107	70-130	
i-Hexanoic Acid	mg/l	2	2.1	104	70-130	,
Hexanoic Acid	mg/l	2	2.0	101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 39701			39702 Original:				178670001				
Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
EDonors Lactic Acid	mg/l	1.1	20	22	22	103	102	70-130	0.98	30	d,B

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Pace Analytical Energy Services LLC 220 William Pitt Way Pittsburgh, PA 15238

Phone: (412) 826-5245

Fax: (412) 826-3433

### **QUALITY CONTROL DATA**

Workorder: 17899 PS BETA-NIROP / 10335267

MATRIX SPIKE & MATI	39702 Original: 1				17867000	178670001					
Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Acetic Acid	mg/l	49	20	68	67	94	91	70-130	3.2	30	d,B
Propionic Acid	mg/l	48	20	66	66	92	89	70-130	3.3	30	d
Formic Acid	mg/l	6	20	25	24	94	93	70-130	1.1	30	d,B
Butyric Acid	mg/l	10	20	32	32	109	107	70-130	1.9	30	d
Pyruvic Acid	mg/l	1.4	20	23	23	109	108	70-130	0.92	30	d
i-Pentanoic Acid	mg/l	0.56	20	22	22	107	106	70-130	0.94	30	d
Pentanoic Acid	mg/l	12	20	34	34	110	108	70-130	1.8	30	d
i-Hexanoic Acid	mg/l	0	20	21	21	107	105	70-130	1.9	30	d
Hexanoic Acid	mg/l	1.3	20	22	22	107	105	70-130	1.9	30	d

Report ID: 17899 - 755160



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Pace Analytical Energy Services LLC 220 William Pitt Way Pittsburgh, PA 15238

Topicame.

Phone: (412) 826-5245

Fax: (412) 826-3433

### **QUALITY CONTROL DATA**

Workorder: 17899 PS BETA-NIROP / 10335267

QC Batch:

EDON/2774

Analysis Method:

AM23G

QC Batch Method:

AM23G

Associated Lab Samples:

178990001

METHOD BLANK: 39782

Parameter	Units	Blank Result	Reporting Limit Qualifiers	
EDonors				
Lactic Acid	mg/l	<0.20	0.20 B	
Acetic Acid	mg/l	<0.10	0.10 B	
Propionic Acid	mg/l	<0.10	0.10 B	
Formic Acid	mg/l	< 0.10	0.10 B	
Butyric Acid	mg/l	<0.10	0.10 B	
Pyruvic Acid	mg/l	<0.10	0.10	
-Pentanoic Acid	mg/l	<0.10	0.10	
Pentanoic Acid	mg/l	<0.10	0.10	
-Hexanoic Acid	mg/i	< 0.20	0.20	
Hexanoic Acid	mg/l	< 0.20	0.20	

LABORATORY CONTROL SAMPLE: 39783

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EDonors					-	
Lactic Acid	mg/l	2	2.1	104	70-130	В
Acetic Acid	mg/l	2	2.2	108	70-130	В
Propionic Acid	mg/l	2	2.2	110	70-130	В
Formic Acid	mg/l	2	1.9	94	70-130	В
Butyric Acid	mg/l	2	2.1	107	70-130	В
Pyruvic Acid	mg/l	2	2.1	105	70-130	
i-Pentanoic Acid	mg/l	2	2.1	105	70-130	
Pentanoic Acid	mg/l	2	2.1	107	70-130	
i-Hexanoic Acid	mg/l	2	2.1	105	70-130	
Hexanoic Acid	mg/l	2	2.0	102	70-130	

Report ID: 17899 - 755160

inelac:

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Pace Analytical Energy Services LLC 220 William Pitt Way Pittsburgh, PA 15238

Phone: (412) 826-5245

Fax: (412) 826-3433

#### **QUALITY CONTROL DATA QUALIFIERS**

Workorder: 17899 PS BETA-NIROP / 10335267

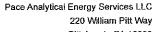
#### **QUALITY CONTROL PARAMETER QUALIFIERS**

- B The analyte was detected in the associated blank.
- d The analyte concentration was determined from a dilution.

Report ID: 17899 - 755160



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Phone: (412) 826-5245 Fax: (412) 826-3433

#### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 17899 PS BETA-NIROP / 10335267

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
178990002	PMW-02			AM23G	EDON/2770
178990003	PMW-03			AM23G	EDON/2770
178990004	PMW-04			AM23G	EDON/2770
178990001	PMW-01			AM23G	EDON/2774

Report ID: 17899 - 755160

/nelac:

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## Chain of Custody

7899

Pace Analytical Page 43 of 44

Workorder: 10335267 Work	Workorder Name:	PS Beta-NIROP	OP .	Res	Results Requested	1/20/2016	
Report/Invoice To	Subco	SubcontractTo			Requested Analysis	d Analysis 🐳 🤻 💉	
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-1700 Email: Jennifer anderson@nacelahe com		nergy Micros	Par Energy/Microsceps P.O. 111325267	the Acuts			
			:: <td>িPreserved Containers ে ু</td> <td><u> </u></td> <td></td> <td></td>	িPreserved Containers ে ু	<u> </u>		
item Sample ID	Collect () Date/Time	Lab ID	HCL Unpreserved	Volat			LAB USE ONLY
1 PMW-01	1/6/2016 14:20	10335267001	Water 2	×			
2 PMW-02	1/6/2016 13:25	10335267002	Water 2	×			
3 PMW-03	1/6/2016 10:55	10335267003	Water 2	×			
4 PMW-04	1/6/2016 09:25	10335267004	Water 2	×			
5							
		を 一生を 年のこと	· · · · · · · · · · · · · · · · · · ·	語の生活で変形と変を多見		Comments:	
Transfers Released By	Date/Time	ime Received By	Ву	Date/Time			
1 HAT 173CE	MLM		の一つの	18.18 X			
2		,		•			
3			)				
Cooler Temperature on Receipt 1:400		Clistody Seal / Y or N	Y	Received on Ica	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	i Sampies in	Samples intact Y or N

<sup>\*\*\*</sup>In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Cooler R	eceipt	Form
----------	--------	------

ent Name: Pace MN Project: PS Beta		<u>{</u>	ab W	ork Order: 17899
ent Name: Focke Wiv Project. 1 Vin	3 D		•	
A. Shipping/Container Information (circle appropriate response)	7			
	Air	Sill Po	≃sent/	Yes No
Courier: FedEx UPS USPS Client Other:	FJ1	רז וואַע		<u></u>
Tracking Number: 6484 8695 1768				•
	n <del>( /</del>	YPE	No	
Costobly Seal off Cooled Boy 1 Leachtral	`		,	
Cooler/Box.Packing Material: Bubble Wrap Absorbent Fi	បានប	Other.		
Type of Ide: (West) Blue None Ice Intact: (Yes )Melt	ed			
Cooler Temperature: 1. 4°C Radiation Screened: Yes		) Cha	in of (	Custody Present Yes No
Cooler Temperature: 1. 1 Radiation Screened.		,		
Commens:	<u>,</u>			
B. Laboratory Assignment/Log-in (check appropriate response)				
	YES	ND	N/A	Comment . Reference non Conforman
	<u> </u>	<u> </u>		Ketelebrs uch fomouglen.
Chain of Sustody properly filled out	1			
Chain of Custody relinquished	$\cup$		<del>-</del> ;	
Sampler Name & Signature on COC		V		
Containers intact	V			
Were samples in separate bags	1			
Sample container labels match COC	1	}	•	
Sample name/date and time collected	<del>                                     </del>	<u> </u>	<u> </u>	
Sufficient volume provided		<u> </u>		
PAES containers used	U	ł <u> </u>		
Are containers properly preserved for the requested testing?			1	
(ac labeled)	<u> </u>		<u> </u> 	Lif yes, see pH form.
If an unknown preservation state, were containers circuled				
Supportion: VON'S CONTOUR	ļ	<u> </u>	1	
Was volume for dissolved testing field filtered, as noted on				
the COC? Was volume received in a preserved container?	<u>.                                    </u>	<u> </u>	!	
Comments:		:		
Cooler contents examined/re	ce;ved	Ьу:	25	1 Date: 1. 8. 16
Copies coursing exemittee/		,		ã.Ο Date: <u>1-11-14</u>
Project Manage	er Revi	≥₩ :	<u>&lt;</u>	(1) Date: 1-11/14
				Page 44 of 44





January 28, 2016

Melinda Pham Regenesis 1011 Calle Sombra San Clemente, CA 92673

RE: Project: PS Beta -NIROP

Pace Project No.: 10336701

#### Dear Melinda Pham:

Enclosed are the analytical results for sample(s) received by the laboratory on January 25, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI 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.

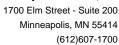
Sincerely,

Jennifer Anderson jennifer.anderson@pacelabs.com Project Manager

**Enclosures** 

cc: Ryan Moore, Regenesis







#### **CERTIFICATIONS**

Project: PS Beta -NIROP Pace Project No.: 10336701

#### **Minnesota Certification IDs**

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

525 N 8th Street, Salina, KS 67401 A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770 Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA Colorado Certification #Pace

Connecticut Certification #: PH-0256 EPA Region 8 Certification #: 8TMS-L Florida/NELAP Certification #: E87605

Guam Certification #:14-008r Georgia Certification #: 959 Georgia EPD #: Pace Idaho Certification #: MN00064 Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01

Iowa Certification #: 368 Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062 Kentucký Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001 Maine Certification #: 2013011 Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137 Mississippi Certification #: Pace Montana Certification #: MT0092 Nevada Certification #: MN\_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002

New York Certification #: 11647 North Carolina Certification #: 530 North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150 Ohio VAP Certification #: CL101 Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563

Puerto Rico Certification Saipan (CNMI) #:MP0003 South Carolina #:74003001 Texas Certification #: T104704192 Tennessee Certification #: 02818 Utah Certification #: MN000642013-4 Virginia DGS Certification #: 251 Virginia/VELAP Certification #: Pace Washington Certification #: C486 West Virginia Certification #: 382 West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970



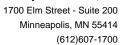


#### **SAMPLE SUMMARY**

Project: PS Beta -NIROP

Pace Project No.: 10336701

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10336701001	PMW-03	Water	01/25/16 12:25	01/25/16 13:55
10336701002	PMW-04	Water	01/25/16 11:05	01/25/16 13:55
10336701003	Trip Blank	Water	01/25/16 00:00	01/25/16 13:55





#### **SAMPLE ANALYTE COUNT**

Project: PS Beta -NIROP

Pace Project No.: 10336701

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10336701001	PMW-03	EPA 8260B	DJB	70
10336701002	PMW-04	EPA 8260B	DJB	70
10336701003	Trip Blank	EPA 8260B	DJB	70



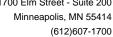
#### **ANALYTICAL RESULTS**

Project: PS Beta -NIROP

Pace Project No.: 10336701

Date: 01/28/2016 08:25 AM

Sample: PMW-03	Lab ID: 103	36701001	Collected: 01/25/1	6 12:25	Received:	01/25/16 13:55	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Met	hod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		01/26/16 17:5	4 67-64-1	L3,M0
Allyl chloride	ND	ug/L	4.0	1		01/26/16 17:5	4 107-05-1	
Benzene	ND	ug/L	1.0	1		01/26/16 17:5	4 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		01/26/16 17:5	4 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		01/26/16 17:5	4 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/26/16 17:5	4 75-27-4	
Bromoform	ND	ug/L	4.0	1		01/26/16 17:5	4 75-25-2	
Bromomethane	ND	ug/L	4.0	1		01/26/16 17:5	4 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/26/16 17:5	4 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		01/26/16 17:5	4 104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		01/26/16 17:5	4 135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		01/26/16 17:5	4 98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		01/26/16 17:5	4 56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/26/16 17:5	4 108-90-7	
Chloroethane	ND	ug/L	4.0	1		01/26/16 17:5	4 75-00-3	
Chloroform	ND	ug/L	1.0	1		01/26/16 17:5	4 67-66-3	
Chloromethane	ND	ug/L	4.0	1		01/26/16 17:5	4 74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		01/26/16 17:5	4 95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		01/26/16 17:5	4 106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	10.0	1		01/26/16 17:5		
Dibromochloromethane	ND	ug/L	1.0	1		01/26/16 17:5		
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		01/26/16 17:5	_	
Dibromomethane	ND	ug/L	4.0	1		01/26/16 17:5		
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/26/16 17:5		
1,3-Dichlorobenzene	ND	ug/L	1.0	1		01/26/16 17:5		
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/26/16 17:5		
Dichlorodifluoromethane	ND	ug/L	1.0	1		01/26/16 17:5		
1,1-Dichloroethane	2.8	ug/L	1.0	1		01/26/16 17:5		
1,2-Dichloroethane	ND	ug/L	1.0	1		01/26/16 17:5		
1,1-Dichloroethene	ND	ug/L	1.0	1		01/26/16 17:5		
cis-1,2-Dichloroethene	42.3	ug/L	1.0	1		01/26/16 17:5		
trans-1,2-Dichloroethene	65.9	ug/L	1.0	1		01/26/16 17:5		
Dichlorofluoromethane	ND	ug/L	1.0	1		01/26/16 17:5		
1,2-Dichloropropane	ND	ug/L	4.0	1		01/26/16 17:5		
1,3-Dichloropropane	ND ND	ug/L ug/L	1.0	1		01/26/16 17:5		
		•						
2,2-Dichloropropane 1,1-Dichloropropene	ND ND	ug/L ug/L	4.0 1.0	1 1		01/26/16 17:5 01/26/16 17:5		
cis-1,3-Dichloropropene	ND ND	ug/L ug/L	4.0	1			4 10061-01-5	
trans-1,3-Dichloropropene	ND ND	-	4.0	1			4 10061-01-5	
Diethyl ether (Ethyl ether)	ND ND	ug/L	4.0	1		01/26/16 17:5		
, , ,		ug/L				01/26/16 17:5		
Ethylbenzene	ND	ug/L	1.0	1				
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		01/26/16 17:5		
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		01/26/16 17:5		
p-Isopropyltoluene	ND	ug/L	1.0	1		01/26/16 17:5		
Methylene Chloride	ND	ug/L	4.0	1		01/26/16 17:5		
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/26/16 17:5		
Methyl-tert-butyl ether	ND	ug/L	1.0	1		01/26/16 17:5	4 1634-04-4	





#### **ANALYTICAL RESULTS**

Project: PS Beta -NIROP

Pace Project No.: 10336701

Date: 01/28/2016 08:25 AM

Sample: PMW-03	Lab ID: 103	36701001	Collected: 01/25/1	16 12:25	Received: 0	1/25/16 13:55	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		01/26/16 17:54	4 91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		01/26/16 17:54	4 103-65-1	
Styrene	ND	ug/L	1.0	1		01/26/16 17:54	4 100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/26/16 17:54	4 630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/26/16 17:54	4 79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/26/16 17:54	4 127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		01/26/16 17:54	4 109-99-9	L3,M0
Toluene	ND	ug/L	1.0	1		01/26/16 17:54	4 108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		01/26/16 17:54	4 87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		01/26/16 17:54	4 120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/26/16 17:54	4 71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/26/16 17:54	4 79-00-5	
Trichloroethene	10.8	ug/L	0.40	1		01/26/16 17:54	4 79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/26/16 17:54	4 75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		01/26/16 17:54	4 96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		01/26/16 17:54	4 76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		01/26/16 17:54	4 95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		01/26/16 17:54	4 108-67-8	
Vinyl chloride	0.72	ug/L	0.40	1		01/26/16 17:54	4 75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		01/26/16 17:54	4 1330-20-7	
Surrogates		0.4	75			04/00/40 4= =	4 47000 07 5	
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1		01/26/16 17:54		
Toluene-d8 (S)	100	%.	75-125	1		01/26/16 17:54		
4-Bromofluorobenzene (S)	101	%.	75-125	1		01/26/16 17:54	4 460-00-4	



#### **ANALYTICAL RESULTS**

Project: PS Beta -NIROP

Pace Project No.: 10336701

Date: 01/28/2016 08:25 AM

Sample: PMW-04	Lab ID: 103	36701002	Collected: 01/25/1	6 11:05	Received:	01/25/16 13:55	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Met	nod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		01/26/16 18:4	1 67-64-1	L3
Allyl chloride	ND	ug/L	4.0	1		01/26/16 18:4	1 107-05-1	
Benzene	ND	ug/L	1.0	1		01/26/16 18:4	1 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		01/26/16 18:4	1 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		01/26/16 18:4	1 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/26/16 18:4	1 75-27-4	
Bromoform	ND	ug/L	4.0	1		01/26/16 18:4	1 75-25-2	
Bromomethane	ND	ug/L	4.0	1		01/26/16 18:4	1 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/26/16 18:4	1 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		01/26/16 18:4	1 104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		01/26/16 18:4	1 135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		01/26/16 18:4	1 98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		01/26/16 18:4	1 56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/26/16 18:4	1 108-90-7	
Chloroethane	ND	ug/L	4.0	1		01/26/16 18:4	1 75-00-3	
Chloroform	ND	ug/L	1.0	1		01/26/16 18:4		
Chloromethane	ND	ug/L	4.0	1		01/26/16 18:4		
2-Chlorotoluene	ND	ug/L	1.0	1		01/26/16 18:4		
4-Chlorotoluene	ND	ug/L	1.0	1		01/26/16 18:4		
1,2-Dibromo-3-chloropropane	ND	ug/L	10.0	1		01/26/16 18:4		
Dibromochloromethane	ND	ug/L	1.0	1		01/26/16 18:4		
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		01/26/16 18:4		
Dibromomethane	ND	ug/L	4.0	1		01/26/16 18:4		
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/26/16 18:4		
1,3-Dichlorobenzene	ND	ug/L	1.0	1		01/26/16 18:4		
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/26/16 18:4		
Dichlorodifluoromethane	ND	ug/L	1.0	1		01/26/16 18:4		
1,1-Dichloroethane	1.1	ug/L	1.0	1		01/26/16 18:4		
1,2-Dichloroethane	ND	ug/L ug/L	1.0	1		01/26/16 18:4		
1,1-Dichloroethene	ND	-	1.0	1		01/26/16 18:4		
cis-1,2-Dichloroethene		ug/L		1		01/26/16 18:4		
trans-1,2-Dichloroethene	19.3 49.9	ug/L	1.0 1.0	1		01/26/16 18:4		
Dichlorofluoromethane		ug/L		1				
	ND	ug/L	1.0			01/26/16 18:4 01/26/16 18:4		
1,2-Dichloropropane	ND	ug/L	4.0	1				
1,3-Dichloropropane	ND	ug/L	1.0	1		01/26/16 18:4		
2,2-Dichloropropane	ND	ug/L	4.0	1		01/26/16 18:4		
1,1-Dichloropropene	ND	ug/L	1.0	1		01/26/16 18:4		
cis-1,3-Dichloropropene	ND	ug/L	4.0	1			1 10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	4.0	1		01/26/16 18:4		
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		01/26/16 18:4		
Ethylbenzene	ND	ug/L	1.0	1		01/26/16 18:4		
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		01/26/16 18:4		
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		01/26/16 18:4		
p-Isopropyltoluene	ND	ug/L	1.0	1		01/26/16 18:4		
Methylene Chloride	ND	ug/L	4.0	1		01/26/16 18:4	1 75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/26/16 18:4	1 108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		01/26/16 18:4	1 1634-04-4	





#### **ANALYTICAL RESULTS**

Project: PS Beta -NIROP

Pace Project No.: 10336701

Date: 01/28/2016 08:25 AM

Sample: PMW-04	Lab ID: 103	36701002	Collected: 01/25/1	16 11:05	Received: 01/	/25/16 13:55 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		01/26/16 18:41	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		01/26/16 18:41	103-65-1	
Styrene	ND	ug/L	1.0	1		01/26/16 18:41	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/26/16 18:41	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/26/16 18:41	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/26/16 18:41	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		01/26/16 18:41	109-99-9	L3
Toluene	ND	ug/L	1.0	1		01/26/16 18:41	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		01/26/16 18:41	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		01/26/16 18:41	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/26/16 18:41	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/26/16 18:41	79-00-5	
Trichloroethene	19.3	ug/L	0.40	1		01/26/16 18:41	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/26/16 18:41	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		01/26/16 18:41	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		01/26/16 18:41	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		01/26/16 18:41	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		01/26/16 18:41	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		01/26/16 18:41	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		01/26/16 18:41	1330-20-7	
Surrogates 1,2-Dichloroethane-d4 (S)	101	%.	75-125	1		01/26/16 18:41	17060-07-0	
Toluene-d8 (S)	96	%.	75-125	1		01/26/16 18:41	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	75-125	1		01/26/16 18:41	460-00-4	



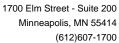
#### **ANALYTICAL RESULTS**

Project: PS Beta -NIROP

Pace Project No.: 10336701

Date: 01/28/2016 08:25 AM

Analytical Method: EPA 8260B   Acatone	Sample: Trip Blank	Lab ID: 103	36701003	Collected: 01/25/1	16 00:00	Received:	01/25/16 13:55	Matrix: Water	
Acetone ND ugl. 20.0 1 01/26/16 16:36 67-64-1 L3 Allyl chloride ND ugl. 4.0 1 01/26/16 16:36 107-05-1 2 Barzane ND ugl. 1.0 1 01/26/16 16:36 107-05-1 2 Barzane ND ugl. 1.0 1 01/26/16 16:36 107-43-2 Barzane ND ugl. 1.0 1 01/26/16 16:36 108-86-1 Barzane ND ugl. 1.0 1 01/26/16 16:36 74-97-5 Barzane ND ugl. 1.0 1 01/26/16 16:36 74-97-5 Barzane ND ugl. 1.0 1 01/26/16 16:36 74-97-5 Barzane ND ugl. 4.0 1 01/26/16 16:36 75-27-4 Barzane ND ugl. 4.0 1 01/26/16 16:36 75-27-4 Barzane ND ugl. 4.0 1 01/26/16 16:36 75-25-2 Barzane (MEK) ND ugl. 4.0 1 01/26/16 16:36 74-93-3 Barzane ND ugl. 4.0 1 01/26/16 16:36 74-93-3 Barzane ND ugl. 1.0 1 01/26/16 16:36 104-51-8 Basz-Butylbenzene ND ugl. 1.0 1 01/26/16 16:36 104-51-8 Basz-Butylbenzene ND ugl. 1.0 1 01/26/16 16:36 104-51-8 Basz-Butylbenzene ND ugl. 1.0 1 01/26/16 16:36 104-51-8 Basz-Butylbenzene ND ugl. 1.0 1 01/26/16 16:36 104-51-8 Basz-Butylbenzene ND ugl. 1.0 1 01/26/16 16:36 104-51-8 Basz-Butylbenzene ND ugl. 1.0 1 01/26/16 16:36 104-51-8 Basz-Butylbenzene ND ugl. 1.0 1 01/26/16 16:36 16:36 98-06-6 Carbon tetrachloride ND ugl. 1.0 1 01/26/16 16:36 16:36 50-66 Carbon tetrachloride ND ugl. 1.0 1 01/26/16 16:36 57-00-3 Chlorochane ND ugl. 1.0 1 01/26/16 16:36 16:36 57-00-3 Chlorochane ND ugl. 1.0 1 01/26/16 16:36 67-26-3 Chlorochane ND ugl. 1.0 1 01/26/16 16:36 67-26-3 Chlorochane ND ugl. 1.0 1 01/26/16 16:36 67-26-3 Chlorochane ND ugl. 1.0 1 01/26/16 16:36 67-26-3 Chlorochane ND ugl. 1.0 1 01/26/16 16:36 67-26-3 Chlorochane ND ugl. 1.0 1 01/26/16 16:36 67-26-3 Chlorochane ND ugl. 1.0 1 01/26/16 16:36 16:36 67-26-3 Chlorochane ND ugl. 1.0 1 01/26/16 16:36 16:36 67-26-3 Chlorochane ND ugl. 1.0 1 01/26/16 16:36 16:36 67-26-3 Chlorochane ND ugl. 1.0 1 01/26/16 16:36 16:36 16-34-34 ND Ugl. 1.0 1 01/26/16 16:36 16:36 16-34-34 ND Ugl. 1.0 1 01/26/16 16:36 16:36 16-34-34 ND Ugl. 1.0 1 01/26/16 16:36 16:36 16-34-34 ND Ugl. 1.0 1 01/26/16 16:36 16:36 16-35 5-34-34 ND Ugl. 1.0 1 01/26/16 16:36 16:36 16-35-34-34 ND Ugl. 1.0 1 01/26/16 16:36 16:36 16-35-34-34 ND Ugl. 1.0 1 01/26/16 16:36	Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
No	3260B VOC	Analytical Met	hod: EPA 82	260B					
Benzene   ND	Acetone	ND	ug/L	20.0	1		01/26/16 16:36	67-64-1	L3
Bromobenzene   ND	Allyl chloride	ND	ug/L	4.0	1		01/26/16 16:36	6 107-05-1	
Bromochloromethane   ND   ugL   1.0   1   01/26/16 16:38 74-97-5	Benzene	ND	ug/L	1.0	1		01/26/16 16:36	5 71-43-2	
Bromotion   ND	Bromobenzene	ND	ug/L	1.0	1		01/26/16 16:36	5 108-86-1	
Bromonethane	Bromochloromethane	ND	ug/L	1.0	1		01/26/16 16:36	6 74-97-5	
Bromordorm ND ug/L 4.0 1 01/26/16 16:36 78-25-2 Bromomethane ND ug/L 4.0 1 01/26/16 16:36 78-25-2 Bromomethane ND ug/L 5.0 1 01/26/16 16:36 78-93-3 P-Butylbenzene ND ug/L 1.0 1 01/26/16 16:36 104-51-8 sec-Butylbenzene ND ug/L 1.0 1 01/26/16 16:36 135-98-8 tert-Butylbenzene ND ug/L 1.0 1 01/26/16 16:36 98-06-6 Carbon tetrachloride ND ug/L 1.0 1 01/26/16 16:36 98-06-6 Carbon tetrachloride ND ug/L 1.0 1 01/26/16 16:36 56-23-5 Chlorobenzene ND ug/L 1.0 1 01/26/16 16:36 67-23-5 Chlorobenzene ND ug/L 1.0 1 01/26/16 16:36 78-00-7 Chlorotethane ND ug/L 1.0 1 01/26/16 16:36 78-00-7 Chlorotethane ND ug/L 1.0 1 01/26/16 16:36 67-66-3 Chloromethane ND ug/L 1.0 1 01/26/16 16:36 67-66-3 Chloromethane ND ug/L 1.0 1 01/26/16 16:36 67-66-3 Chloromethane ND ug/L 1.0 1 01/26/16 16:36 98-49-8 4-Chlorotoluene ND ug/L 1.0 1 01/26/16 16:36 96-49-8 4-Chlorotoluene ND ug/L 1.0 1 01/26/16 16:36 96-49-8 4-Chlorotoluene ND ug/L 1.0 1 01/26/16 16:36 96-49-8 4-Chlorotoluene ND ug/L 1.0 1 01/26/16 16:36 96-49-8 4-Chlorotoluene ND ug/L 1.0 1 01/26/16 16:36 96-49-8 1,2-Dibromo-3-chloropropane ND ug/L 1.0 1 01/26/16 16:36 96-12-8 Dibromomethane ND ug/L 1.0 1 01/26/16 16:36 16-49-3 1,2-Dibromoethane ND ug/L 1.0 1 01/26/16 16:36 96-34-9 1,2-Dibromoethane ND ug/L 1.0 1 01/26/16 16:36 96-50-1 1,3-Dichlorotenzene ND ug/L 1.0 1 01/26/16 16:36 95-50-1 1,3-Dichlorotenzene ND ug/L 1.0 1 01/26/16 16:36 95-50-1 1,3-Dichlorotethane ND ug/L 1.0 1 01/26/16 16:36 95-50-1 1,3-Dichlorotethane ND ug/L 1.0 1 01/26/16 16:36 75-71-8 1,1-Dichlorotethane ND ug/L 1.0 1 01/26/16 16:36 75-74-8 1,2-Dibromomethane ND ug/L 1.0 1 01/26/16 16:36 75-74-8 1,2-Dichlorotethane ND ug/L 1.0 1 01/26/16 16:36 75-74-8 1,2-Dichlorotethane ND ug/L 1.0 1 01/26/16 16:36 75-34-8 1,2-Dichlorotethane ND ug/L 1.0 1 01/26/16 16:36 16-46-7 10-10/26/16 16:36 16-46-7 10-10/26/16 16:36 16-46-7 10-10/26/16 16:36 16-46-7 10-10/26/16 16:36 16-46-7 10-10/26/16 16:36 16-46-7 10-10/26/16 16:36 16-46-7 10-10/26/16 16:36 16-46-7 10-10/26/16 16:36 16-46-7 10-10/26/16 16:36 16-46-7 10-10/26/16 16:36 16-46	Bromodichloromethane	ND	ug/L	1.0	1		01/26/16 16:36	5 75-27-4	
Stromomethane	Bromoform	ND		4.0	1		01/26/16 16:36	5 75-25-2	
2-Butanone (MEK) ND ug/L 1.0 1 01/26/16 16:36 78-93-3 Tebutylbenzene ND ug/L 1.0 1 01/26/16 16:36 104-51-8 sec-Butylbenzene ND ug/L 1.0 1 01/26/16 16:36 104-51-8 sec-Butylbenzene ND ug/L 1.0 1 01/26/16 16:36 395-98-8 ert-Butylbenzene ND ug/L 1.0 1 01/26/16 16:36 98-06-6 Zarbon tetrachloride ND ug/L 1.0 1 01/26/16 16:36 95-23-5 Chlorobenzene ND ug/L 1.0 1 01/26/16 16:36 75-00-3 Chlorordrane ND ug/L 1.0 1 01/26/16 16:36 75-00-3 Chlorordrane ND ug/L 1.0 1 01/26/16 16:36 75-00-3 Chlorordrane ND ug/L 1.0 1 01/26/16 16:36 75-00-3 Chlorordrane ND ug/L 1.0 1 01/26/16 16:36 75-00-3 Chlorordrane ND ug/L 1.0 1 01/26/16 16:36 75-00-3 Chlorordrane ND ug/L 1.0 1 01/26/16 16:36 75-00-3 Chlorordrane ND ug/L 1.0 1 01/26/16 16:36 75-00-3 Chlororduene ND ug/L 1.0 1 01/26/16 16:36 75-98-8 4-Chlorotoluene ND ug/L 1.0 1 01/26/16 16:36 95-49-8 4-Chlorotoluene ND ug/L 1.0 1 01/26/16 16:36 91-49-8 4-Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 91-28 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 91-28 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 124-48-1 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 124-48-1 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 124-48-1 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 10-93-4 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 10-93-4 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 54-73-3 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 54-73-1 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 54-73-3 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 54-73-3 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 55-0-1 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 55-0-1 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 55-0-1 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 55-0-1 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 55-0-1 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 55-0-2 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 55-3-4 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 55-3-5 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 55-3-5 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 55-3-5 Chlororbuene- ND ug/L 1.0 1 01/26/16 16:36 55-3-5 Chlororpopane ND ug/L 1.0 1 01/26/16 16:36 55-3	Bromomethane	ND		4.0	1		01/26/16 16:36	6 74-83-9	
NBU tybenzene ND ug/L 1.0 1 01/26/16 16:36 104-51-8 to ese-Butylbenzene ND ug/L 1.0 1 01/26/16 16:36 135-98-8 tert-Butylbenzene ND ug/L 1.0 1 01/26/16 16:36 98-06-6 2arbon tetrachloride ND ug/L 1.0 1 01/26/16 16:36 98-06-6 2arbon tetrachloride ND ug/L 1.0 1 01/26/16 16:36 98-06-6 2arbon tetrachloride ND ug/L 1.0 1 01/26/16 16:36 98-06-6 2arbon tetrachloride ND ug/L 1.0 1 01/26/16 16:36 98-06-7 2blorocethane ND ug/L 1.0 1 01/26/16 16:36 198-90-7 2blorocethane ND ug/L 1.0 1 01/26/16 16:36 198-90-7 2blorocethane ND ug/L 1.0 1 01/26/16 16:36 75-00-3 2bloroform ND ug/L 1.0 1 01/26/16 16:36 75-00-3 2bloroform ND ug/L 1.0 1 01/26/16 16:36 75-00-3 2blorocethane ND ug/L 1.0 1 01/26/16 16:36 75-87-3 2blorocethane ND ug/L 1.0 1 01/26/16 16:36 95-49-8 2blorocethorocethane ND ug/L 1.0 1 01/26/16 16:36 95-49-8 2blorocethorocethane ND ug/L 1.0 1 01/26/16 16:36 96-12-8 2blorocethorocethane ND ug/L 1.0 1 01/26/16 16:36 96-12-8 2blorocethorocethane ND ug/L 1.0 1 01/26/16 16:36 96-12-8 2blorocethorocethane (EDB) ND ug/L 1.0 1 01/26/16 16:36 106-33-4 2blorocethorocethane (EDB) ND ug/L 1.0 1 01/26/16 16:36 95-50-1 01/26/16 16:36 95-50-1 01/26/16 16:36 95-50-1 01/26/16 16:36 95-50-1 01/26/16 16:36 95-50-1 01/26/16 16:36 95-50-1 01/26/16 16:36 95-50-1 01/26/16 16:36 95-50-1 01/26/16 16:36 95-50-1 01/26/16 16:36 95-50-1 01/26/16 16:36 95-50-1 01/26/16 16:36 95-50-1 01/26/16 16:36 95-24-3 01/26/16 16:36	2-Butanone (MEK)	ND		5.0	1		01/26/16 16:36	78-93-3	
See-Butybenzene		ND	-	1.0	1		01/26/16 16:36	6 104-51-8	
ent-Butylbenzene         ND         ug/L         1.0         1         01/26/16 16:36         68-06-6           Carbon tetrachloride         ND         ug/L         1.0         1         01/26/16 16:36         66-23-5           Chlorobenzene         ND         ug/L         1.0         1         01/26/16 16:36         76-00-3           Chlorotethane         ND         ug/L         4.0         1         01/26/16 16:36         75-00-3           Chlorotethane         ND         ug/L         4.0         1         01/26/16 16:36         76-08-3           Chloroteluene         ND         ug/L         1.0         1         01/26/16 16:36         74-87-3           2-Chloroteluene         ND         ug/L         1.0         1         01/26/16 16:36         95-49-8           4-Chloroteluene         ND         ug/L         1.0         1         01/26/16 16:36         96-12-8           1-2-Dibromo-S-chloropropane         ND         ug/L         1.0         1         01/26/16 16:36         96-12-8           1-2-Dibromo-S-chloropropane         ND         ug/L         1.0         1         01/26/16 16:36         16-28-18-11           1-2-Dibromo-S-chloropropane         ND         ug/L	sec-Butylbenzene		-	1.0	1		01/26/16 16:36	3 135-98-8	
Carbon tetrachloride	ert-Butylbenzene	ND		1.0	1		01/26/16 16:36	98-06-6	
Chlorobenzene	-		•	1.0	1		01/26/16 16:36	5 56-23-5	
Chloresthane	Chlorobenzene	ND	-	1.0	1		01/26/16 16:36	6 108-90-7	
Chloroform	Chloroethane				1		01/26/16 16:36	5 75-00-3	
Chloromethane									
Part   Part									
Chorotoluene									
Dibromochloromethane   ND   ug/L   1.0   1   01/26/16 16:36   124-48-1			-						
1,2-Dibromoethane (EDB)	• •		-						
ND								-	
1,2-Dichlorobenzene         ND         ug/L         1.0         1         01/26/16 16:36         95-50-1           1,3-Dichlorobenzene         ND         ug/L         1.0         1         01/26/16 16:36         541-73-1           1,4-Dichlorobenzene         ND         ug/L         1.0         1         01/26/16 16:36         541-73-1           1,4-Dichloromethane         ND         ug/L         1.0         1         01/26/16 16:36         75-71-8           1,1-Dichloroethane         ND         ug/L         1.0         1         01/26/16 16:36         75-71-8           1,2-Dichloroethane         ND         ug/L         1.0         1         01/26/16 16:36         107-06-2           1,1-Dichloroethane         ND         ug/L         1.0         1         01/26/16 16:36         107-06-2           1,1-Dichloroethane         ND         ug/L         1.0         1         01/26/16 16:36         156-59-2           1,1-Dichloroethane         ND         ug/L         1.0         1         01/26/16 16:36         156-60-5           Dichloroptofluoromethane         ND         ug/L         1.0         1         01/26/16 16:36         75-43-4           1,2-Dichloroptopane         ND         ug/L	, ,		•						
1,3-Dichlorobenzene ND ug/L 1.0 1 01/26/16 16:36 541-73-1 1.4-Dichlorobenzene ND ug/L 1.0 1 01/26/16 16:36 106-46-7 Dichlorodifluoromethane ND ug/L 1.0 1 01/26/16 16:36 75-71-8 1.1-Dichlorodifluoromethane ND ug/L 1.0 1 01/26/16 16:36 75-34-3 1.2-Dichloroethane ND ug/L 1.0 1 01/26/16 16:36 75-34-3 1.2-Dichloroethane ND ug/L 1.0 1 01/26/16 16:36 75-34-3 1.2-Dichloroethane ND ug/L 1.0 1 01/26/16 16:36 75-35-4 1.2-Dichloroethene ND ug/L 1.0 1 01/26/16 16:36 156-69-2 1.1-Dichloroethene ND ug/L 1.0 1 01/26/16 16:36 156-69-2 1.1-Dichloroethene ND ug/L 1.0 1 01/26/16 16:36 156-60-5 1.2-Dichloropthane ND ug/L 1.0 1 01/26/16 16:36 156-60-5 1.3-Dichloroptopane ND ug/L 1.0 1 01/26/16 16:36 78-87-5 1.3-Dichloroptopane ND ug/L 1.0 1 01/26/16 16:36 78-87-5 1.3-Dichloroptopane ND ug/L 1.0 1 01/26/16 16:36 78-87-5 1.3-Dichloroptopane ND ug/L 1.0 1 01/26/16 16:36 594-20-7 1.1-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 594-20-7 1.1-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 594-20-7 1.1-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 563-58-6 1.3-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 100-10-5 1-2-13-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 100-10-5 1-2-13-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 100-01-5 1-2-13-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 100-01-5 1-2-13-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 100-01-5 1-2-13-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 100-01-5 1-2-13-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 89-82-8 1-2-13-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 89-82-8 1-2-13-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 89-82-8 1-2-13-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 89-82-8 1-2-13-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 89-82-8 1-2-13-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 89-82-8 1-2-13-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 89-82-8 1-2-13-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 89-82-8 1-2-13-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 89-82-8 1-2-13-Dichloroptopene ND ug/L 1.0 1 01/26/16 16:36 89-82-8 1-2-13-Dichloroptopene ND ug/L 1.0 1 01/26			-						
1,4-Dichlorobenzene			-						
Dichlorodifluoromethane			-						
1,1-Dichloroethane       ND       ug/L       1.0       1       01/26/16 16:36       75-34-3         1,2-Dichloroethane       ND       ug/L       1.0       1       01/26/16 16:36       107-06-2         1,1-Dichloroethene       ND       ug/L       1.0       1       01/26/16 16:36       75-35-4         cis-1,2-Dichloroethene       ND       ug/L       1.0       1       01/26/16 16:36       156-59-2         bichlorofluoromethane       ND       ug/L       1.0       1       01/26/16 16:36       156-69-2         1,2-Dichloroptoptane       ND       ug/L       1.0       1       01/26/16 16:36       75-43-4         1,2-Dichloropropane       ND       ug/L       4.0       1       01/26/16 16:36       75-43-4         1,3-Dichloropropane       ND       ug/L       4.0       1       01/26/16 16:36       78-87-5         1,1-Dichloropropane       ND       ug/L       4.0       1       01/26/16 16:36       594-20-7         1,1-Dichloropropene       ND       ug/L       4.0       1       01/26/16 16:36       594-20-7         1,1-Dichloropropene       ND       ug/L       4.0       1       01/26/16 16:36       60-29-7         1,1-Dichloroprop	,								
1,2-Dichloroethane       ND       ug/L       1.0       1       01/26/16 16:36       107-06-2         1,1-Dichloroethene       ND       ug/L       1.0       1       01/26/16 16:36       75-35-4         cis-1,2-Dichloroethene       ND       ug/L       1.0       1       01/26/16 16:36       156-69-2         trans-1,2-Dichloroethene       ND       ug/L       1.0       1       01/26/16 16:36       156-60-5         Dichlorofluoromethane       ND       ug/L       1.0       1       01/26/16 16:36       75-43-4         1,2-Dichloropropane       ND       ug/L       4.0       1       01/26/16 16:36       78-87-5         1,3-Dichloropropane       ND       ug/L       4.0       1       01/26/16 16:36       78-22-8         2,2-Dichloropropane       ND       ug/L       4.0       1       01/26/16 16:36       594-20-7         1,1-Dichloropropane       ND       ug/L       4.0       1       01/26/16 16:36       594-20-7         1,1-Dichloropropene       ND       ug/L       4.0       1       01/26/16 16:36       594-20-7         1,1-Dichloropropene       ND       ug/L       4.0       1       01/26/16 16:36       10061-01-5         trans-1									
1,1-Dichloroethene ND ug/L 1.0 1 01/26/16 16:36 75-35-4 cis-1,2-Dichloroethene ND ug/L 1.0 1 01/26/16 16:36 156-59-2 cirans-1,2-Dichloroethene ND ug/L 1.0 1 01/26/16 16:36 156-60-5 Dichlorofluoromethane ND ug/L 1.0 1 01/26/16 16:36 75-43-4 1,2-Dichloropropane ND ug/L 1.0 1 01/26/16 16:36 75-43-4 1,3-Dichloropropane ND ug/L 1.0 1 01/26/16 16:36 78-87-5 1,3-Dichloropropane ND ug/L 1.0 1 01/26/16 16:36 594-20-7 1,1-Dichloropropane ND ug/L 1.0 1 01/26/16 16:36 594-20-7 1,1-Dichloropropene ND ug/L 1.0 1 01/26/16 16:36 563-58-6 cis-1,3-Dichloropropene ND ug/L 4.0 1 01/26/16 16:36 563-58-6 cis-1,3-Dichloropropene ND ug/L 4.0 1 01/26/16 16:36 10061-01-5 cirans-1,3-Dichloropropene ND ug/L 4.0 1 01/26/16 16:36 10061-01-5 cirans-1,3-Dichloropropene ND ug/L 4.0 1 01/26/16 16:36 60-29-7 Ethylbenzene ND ug/L 4.0 1 01/26/16 16:36 60-29-7 Ethylbenzene ND ug/L 1.0 1 01/26/16 16:36 60-29-7 Ethylbenzene ND ug/L 1.0 1 01/26/16 16:36 87-68-3 cis-propylbenzene (Cumene) ND ug/L 1.0 1 01/26/16 16:36 98-82-8 cis-propylbenzene (Cumene) ND ug/L 1.0 1 01/26/16 16:36 99-87-6 ND ug/L 1.0 1 01/26/16 16:36 99-87-6 ND ug/L 1.0 1 01/26/16 16:36 99-87-6 ND ug/L 1.0 1 01/26/16 16:36 75-09-2 4-Methyl-2-pentanone (MIBK) ND ug/L 5.0 1 01/26/16 16:36 108-10-1	•								
cis-1,2-Dichloroethene         ND         ug/L         1.0         1         01/26/16 16:36 156-59-2           cirans-1,2-Dichloroethene         ND         ug/L         1.0         1         01/26/16 16:36 156-60-5           Dichlorofluoromethane         ND         ug/L         1.0         1         01/26/16 16:36 75-43-4           1,2-Dichloropropane         ND         ug/L         4.0         1         01/26/16 16:36 78-87-5           1,3-Dichloropropane         ND         ug/L         1.0         1         01/26/16 16:36 78-87-5           2,2-Dichloropropane         ND         ug/L         4.0         1         01/26/16 16:36 142-28-9           2,2-Dichloropropane         ND         ug/L         4.0         1         01/26/16 16:36 594-20-7           1,1-Dichloropropene         ND         ug/L         4.0         1         01/26/16 16:36 594-20-7           1,1-Dichloropropene         ND         ug/L         4.0         1         01/26/16 16:36 563-58-6           circan-1,3-Dichloropropene         ND         ug/L         4.0         1         01/26/16 16:36 10061-01-5           trans-1,3-Dichloropropene         ND         ug/L         4.0         1         01/26/16 16:36 10061-02-6           Diethyl ether (Ethyl ether) </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
ND	•								
Dichlorofluoromethane         ND         ug/L         1.0         1         01/26/16 16:36         75-43-4           1,2-Dichloropropane         ND         ug/L         4.0         1         01/26/16 16:36         78-87-5           1,3-Dichloropropane         ND         ug/L         1.0         1         01/26/16 16:36         142-28-9           2,2-Dichloropropane         ND         ug/L         4.0         1         01/26/16 16:36         594-20-7           1,1-Dichloropropene         ND         ug/L         1.0         1         01/26/16 16:36         594-20-7           1,1-Dichloropropene         ND         ug/L         4.0         1         01/26/16 16:36         563-58-6           cis-1,3-Dichloropropene         ND         ug/L         4.0         1         01/26/16 16:36         10061-01-5           rans-1,3-Dichloropropene         ND         ug/L         4.0         1         01/26/16 16:36         10061-02-6           Diethyl ether (Ethyl ether)         ND         ug/L         4.0         1         01/26/16 16:36         60-29-7           Ethylbenzene         ND         ug/L         1.0         1         01/26/16 16:36         87-68-3           sopropylbenzene (Cumene)         ND	•								
1,2-Dichloropropane	•								
1,3-Dichloropropane ND ug/L 1.0 1 01/26/16 16:36 142-28-9 2,2-Dichloropropane ND ug/L 1,1-Dichloropropene ND ug/L 1.0 1 01/26/16 16:36 594-20-7 1,1-Dichloropropene ND ug/L 1.0 1 01/26/16 16:36 563-58-6 cis-1,3-Dichloropropene ND ug/L 1.0 1 01/26/16 16:36 10061-01-5 crans-1,3-Dichloropropene ND ug/L 1.0 1 01/26/16 16:36 10061-02-6 Diethyl ether (Ethyl ether) ND ug/L 2,2-Dichloropropene ND ug/L 4.0 1 01/26/16 16:36 10061-01-5 crans-1,3-Dichloropropene ND ug/L 1.0 1 01/26/16 16:36 10061-02-6 Diethyl ether (Ethyl ether) ND ug/L 1.0 1 01/26/16 16:36 87-68-3 Sopropylbenzene ND ug/L 1.0 1 01/26/16 16:36 87-68-3 Sopropylbenzene (Cumene) ND ug/L 1.0 1 01/26/16 16:36 98-82-8 Do-Isopropyltoluene ND ug/L 1.0 1 01/26/16 16:36 99-87-6 Methylene Chloride ND ug/L 4.0 1 01/26/16 16:36 75-09-2 4-Methyl-2-pentanone (MIBK) ND ug/L 5.0 1 01/26/16 16:36 108-10-1									
2,2-Dichloropropane  ND ug/L  1,1-Dichloropropene  ND ug/L  1.0 1  01/26/16 16:36 594-20-7  1,1-Dichloropropene  ND ug/L  1.0 1  01/26/16 16:36 563-58-6  cis-1,3-Dichloropropene  ND ug/L  rans-1,3-Dichloropropene  ND ug/L  rans-1,3-Dichloropropene  ND ug/L  value  1.0 1  01/26/16 16:36 10061-01-5  rans-1,3-Dichloropropene  ND ug/L  1.0 1  01/26/16 16:36 00-29-7  Ethylbenzene  ND ug/L  Hexachloro-1,3-butadiene  ND ug/L  1.0 1  01/26/16 16:36 87-68-3  sopropylbenzene (Cumene)  ND ug/L  1.0 1  01/26/16 16:36 98-82-8  D-Isopropyltoluene  ND ug/L  1.0 1  01/26/16 16:36 99-87-6  Methylene Chloride  ND ug/L  1.0 1  01/26/16 16:36 99-87-6  Methylene Chloride  ND ug/L  1.0 1  01/26/16 16:36 75-09-2  1-Methyl-2-pentanone (MIBK)  ND ug/L  1.0 1  01/26/16 16:36 108-10-1			•						
1,1-Dichloropropene       ND       ug/L       1.0       1       01/26/16 16:36       563-58-6         cis-1,3-Dichloropropene       ND       ug/L       4.0       1       01/26/16 16:36       10061-01-5         crans-1,3-Dichloropropene       ND       ug/L       4.0       1       01/26/16 16:36       10061-02-6         Diethyl ether (Ethyl ether)       ND       ug/L       4.0       1       01/26/16 16:36       60-29-7         Ethylbenzene       ND       ug/L       1.0       1       01/26/16 16:36       60-29-7         Hexachloro-1,3-butadiene       ND       ug/L       1.0       1       01/26/16 16:36       87-68-3         sopropylbenzene (Cumene)       ND       ug/L       1.0       1       01/26/16 16:36       88-82-8         b-Isopropyltoluene       ND       ug/L       1.0       1       01/26/16 16:36       99-87-6         Methylene Chloride       ND       ug/L       4.0       1       01/26/16 16:36       75-09-2         4-Methyl-2-pentanone (MIBK)       ND       ug/L       5.0       1       01/26/16 16:36       108-10-1	·		•						
cis-1,3-Dichloropropene       ND       ug/L       4.0       1       01/26/16 16:36       10061-01-5         rans-1,3-Dichloropropene       ND       ug/L       4.0       1       01/26/16 16:36       10061-02-6         Diethyl ether (Ethyl ether)       ND       ug/L       4.0       1       01/26/16 16:36       60-29-7         Ethylbenzene       ND       ug/L       1.0       1       01/26/16 16:36       100-41-4         Hexachloro-1,3-butadiene       ND       ug/L       1.0       1       01/26/16 16:36       87-68-3         sopropylbenzene (Cumene)       ND       ug/L       1.0       1       01/26/16 16:36       98-82-8         o-Isopropyltoluene       ND       ug/L       1.0       1       01/26/16 16:36       99-87-6         Methylene Chloride       ND       ug/L       4.0       1       01/26/16 16:36       75-09-2         4-Methyl-2-pentanone (MIBK)       ND       ug/L       5.0       1       01/26/16 16:36       108-10-1			-		-				
rans-1,3-Dichloropropene ND ug/L 4.0 1 01/26/16 16:36 10061-02-6 Diethyl ether (Ethyl ether) ND ug/L 4.0 1 01/26/16 16:36 60-29-7 Ethylbenzene ND ug/L 1.0 1 01/26/16 16:36 100-41-4 Hexachloro-1,3-butadiene ND ug/L 1.0 1 01/26/16 16:36 87-68-3 sopropylbenzene (Cumene) ND ug/L 1.0 1 01/26/16 16:36 98-82-8 Diethylbenzene (Cumene) ND ug/L 1.0 1 01/26/16 16:36 98-82-8 Diethylbenzene (Cumene) ND ug/L 1.0 1 01/26/16 16:36 99-87-6 Methylene Chloride ND ug/L 4.0 1 01/26/16 16:36 75-09-2 Methyl-2-pentanone (MIBK) ND ug/L 5.0 1 01/26/16 16:36 108-10-1			•						
Diethyl ether (Ethyl ether)         ND         ug/L         4.0         1         01/26/16 16:36         60-29-7           Ethylbenzene         ND         ug/L         1.0         1         01/26/16 16:36         100-41-4           Hexachloro-1,3-butadiene         ND         ug/L         1.0         1         01/26/16 16:36         87-68-3           sopropylbenzene (Cumene)         ND         ug/L         1.0         1         01/26/16 16:36         98-82-8           b-Isopropyltoluene         ND         ug/L         1.0         1         01/26/16 16:36         99-87-6           Methylene Chloride         ND         ug/L         4.0         1         01/26/16 16:36         75-09-2           4-Methyl-2-pentanone (MIBK)         ND         ug/L         5.0         1         01/26/16 16:36         108-10-1			-						
Ethylbenzene ND ug/L 1.0 1 01/26/16 16:36 100-41-4 Hexachloro-1,3-butadiene ND ug/L 1.0 1 01/26/16 16:36 87-68-3 sopropylbenzene (Cumene) ND ug/L 1.0 1 01/26/16 16:36 98-82-8 b-Isopropyltoluene ND ug/L 1.0 1 01/26/16 16:36 99-87-6 Methylene Chloride ND ug/L 4.0 1 01/26/16 16:36 75-09-2 4-Methyl-2-pentanone (MIBK) ND ug/L 5.0 1 01/26/16 16:36 108-10-1	• •		-						
Hexachloro-1,3-butadiene         ND         ug/L         1.0         1         01/26/16 16:36         87-68-3           sopropylbenzene (Cumene)         ND         ug/L         1.0         1         01/26/16 16:36         98-82-8           b-Isopropyltoluene         ND         ug/L         1.0         1         01/26/16 16:36         99-87-6           Methylene Chloride         ND         ug/L         4.0         1         01/26/16 16:36         75-09-2           4-Methyl-2-pentanone (MIBK)         ND         ug/L         5.0         1         01/26/16 16:36         108-10-1	, , ,		•						
sopropylbenzene (Cumene)         ND         ug/L         1.0         1         01/26/16 16:36         98-82-8           o-Isopropyltoluene         ND         ug/L         1.0         1         01/26/16 16:36         99-87-6           Methylene Chloride         ND         ug/L         4.0         1         01/26/16 16:36         75-09-2           4-Methyl-2-pentanone (MIBK)         ND         ug/L         5.0         1         01/26/16 16:36         108-10-1			-						
Delsopropyltoluene ND ug/L 1.0 1 01/26/16 16:36 99-87-6 Wethylene Chloride ND ug/L 4.0 1 01/26/16 16:36 75-09-2 4-Methyl-2-pentanone (MIBK) ND ug/L 5.0 1 01/26/16 16:36 108-10-1	•		•						
Wethylene Chloride         ND         ug/L         4.0         1         01/26/16 16:36         75-09-2           4-Methyl-2-pentanone (MIBK)         ND         ug/L         5.0         1         01/26/16 16:36         108-10-1									
4-Methyl-2-pentanone (MIBK) ND ug/L 5.0 1 01/26/16 16:36 108-10-1			-						
	•		•						
	4-Methyl-2-pentanone (MIBK) Methyl-tert-butyl ether	ND ND	ug/L ug/L	5.0 1.0	1 1				





#### **ANALYTICAL RESULTS**

Project: PS Beta -NIROP

Pace Project No.: 10336701

Date: 01/28/2016 08:25 AM

Sample: Trip Blank	Lab ID: 103	36701003	Collected: 01/25/1	6 00:00	Received: 0	1/25/16 13:55 M	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B VOC	Analytical Meth	od: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		01/26/16 16:36	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		01/26/16 16:36	103-65-1	
Styrene	ND	ug/L	1.0	1		01/26/16 16:36	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/26/16 16:36	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/26/16 16:36	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/26/16 16:36	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		01/26/16 16:36	109-99-9	L3
Toluene	ND	ug/L	1.0	1		01/26/16 16:36	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		01/26/16 16:36	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		01/26/16 16:36	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/26/16 16:36	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/26/16 16:36	79-00-5	
Trichloroethene	ND	ug/L	0.40	1		01/26/16 16:36	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/26/16 16:36	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		01/26/16 16:36	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		01/26/16 16:36	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		01/26/16 16:36	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		01/26/16 16:36	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		01/26/16 16:36	75-01-4	
Xylene (Total) <b>Surrogates</b>	ND	ug/L	3.0	1		01/26/16 16:36	1330-20-7	
1,2-Dichloroethane-d4 (S)	102	%.	75-125	1		01/26/16 16:36	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1		01/26/16 16:36	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125	1		01/26/16 16:36	460-00-4	



#### **QUALITY CONTROL DATA**

Project: PS Beta -NIROP

Pace Project No.: 10336701

Date: 01/28/2016 08:25 AM

QC Batch: MSV/34462 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV 465 W

Associated Lab Samples: 10336701001, 10336701002, 10336701003

METHOD BLANK: 2180972 Matrix: Water

Associated Lab Samples: 10336701001, 10336701002, 10336701003

	,	Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	01/26/16 16:20	
1,1,1-Trichloroethane	ug/L	ND	1.0	01/26/16 16:20	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	01/26/16 16:20	
1,1,2-Trichloroethane	ug/L	ND	1.0	01/26/16 16:20	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	01/26/16 16:20	
1,1-Dichloroethane	ug/L	ND	1.0	01/26/16 16:20	
1,1-Dichloroethene	ug/L	ND	1.0	01/26/16 16:20	
1,1-Dichloropropene	ug/L	ND	1.0	01/26/16 16:20	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	01/26/16 16:20	
1,2,3-Trichloropropane	ug/L	ND	4.0	01/26/16 16:20	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	01/26/16 16:20	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	01/26/16 16:20	
1,2-Dibromo-3-chloropropane	ug/L	ND	10.0	01/26/16 16:20	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	01/26/16 16:20	
1,2-Dichlorobenzene	ug/L	ND	1.0	01/26/16 16:20	
1,2-Dichloroethane	ug/L	ND	1.0	01/26/16 16:20	
1,2-Dichloropropane	ug/L	ND	4.0	01/26/16 16:20	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	01/26/16 16:20	
1,3-Dichlorobenzene	ug/L	ND	1.0	01/26/16 16:20	
1,3-Dichloropropane	ug/L	ND	1.0	01/26/16 16:20	
1,4-Dichlorobenzene	ug/L	ND	1.0	01/26/16 16:20	
2,2-Dichloropropane	ug/L	ND	4.0	01/26/16 16:20	
2-Butanone (MEK)	ug/L	ND	5.0	01/26/16 16:20	
2-Chlorotoluene	ug/L	ND	1.0	01/26/16 16:20	
4-Chlorotoluene	ug/L	ND	1.0	01/26/16 16:20	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	01/26/16 16:20	
Acetone	ug/L	ND	20.0	01/26/16 16:20	
Allyl chloride	ug/L	ND	4.0	01/26/16 16:20	
Benzene	ug/L	ND	1.0	01/26/16 16:20	
Bromobenzene	ug/L	ND	1.0	01/26/16 16:20	
Bromochloromethane	ug/L	ND	1.0	01/26/16 16:20	
Bromodichloromethane	ug/L	ND	1.0	01/26/16 16:20	
Bromoform	ug/L	ND	4.0	01/26/16 16:20	
Bromomethane	ug/L	ND	4.0	01/26/16 16:20	
Carbon tetrachloride	ug/L	ND	1.0	01/26/16 16:20	
Chlorobenzene	ug/L	ND	1.0	01/26/16 16:20	
Chloroethane	ug/L	ND	4.0	01/26/16 16:20	
Chloroform	ug/L	ND	1.0	01/26/16 16:20	
Chloromethane	ug/L	ND	4.0	01/26/16 16:20	
cis-1,2-Dichloroethene	ug/L	ND	1.0	01/26/16 16:20	
cis-1,3-Dichloropropene	ug/L	ND	4.0	01/26/16 16:20	

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



Date: 01/28/2016 08:25 AM

#### **QUALITY CONTROL DATA**

Project: PS Beta -NIROP Pace Project No.: 10336701

METHOD BLANK: 2180972 Matrix: Water

Associated Lab Samples: 10336701001, 10336701002, 10336701003

	,	Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/L	ND ND	1.0	01/26/16 16:20	
Dibromomethane	ug/L	ND	4.0	01/26/16 16:20	
Dichlorodifluoromethane	ug/L	ND	1.0	01/26/16 16:20	
Dichlorofluoromethane	ug/L	ND	1.0	01/26/16 16:20	
Diethyl ether (Ethyl ether)	ug/L	ND	4.0	01/26/16 16:20	
Ethylbenzene	ug/L	ND	1.0	01/26/16 16:20	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	01/26/16 16:20	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	01/26/16 16:20	
Methyl-tert-butyl ether	ug/L	ND	1.0	01/26/16 16:20	
Methylene Chloride	ug/L	ND	4.0	01/26/16 16:20	
n-Butylbenzene	ug/L	ND	1.0	01/26/16 16:20	
n-Propylbenzene	ug/L	ND	1.0	01/26/16 16:20	
Naphthalene	ug/L	ND	4.0	01/26/16 16:20	
p-Isopropyltoluene	ug/L	ND	1.0	01/26/16 16:20	
sec-Butylbenzene	ug/L	ND	1.0	01/26/16 16:20	
Styrene	ug/L	ND	1.0	01/26/16 16:20	
tert-Butylbenzene	ug/L	ND	1.0	01/26/16 16:20	
Tetrachloroethene	ug/L	ND	1.0	01/26/16 16:20	
Tetrahydrofuran	ug/L	ND	10.0	01/26/16 16:20	
Toluene	ug/L	ND	1.0	01/26/16 16:20	
trans-1,2-Dichloroethene	ug/L	ND	1.0	01/26/16 16:20	
trans-1,3-Dichloropropene	ug/L	ND	4.0	01/26/16 16:20	
Trichloroethene	ug/L	ND	0.40	01/26/16 16:20	
Trichlorofluoromethane	ug/L	ND	1.0	01/26/16 16:20	
Vinyl chloride	ug/L	ND	0.40	01/26/16 16:20	
Xylene (Total)	ug/L	ND	3.0	01/26/16 16:20	
1,2-Dichloroethane-d4 (S)	%.	98	75-125	01/26/16 16:20	
4-Bromofluorobenzene (S)	%.	100	75-125	01/26/16 16:20	
Toluene-d8 (S)	%.	99	75-125	01/26/16 16:20	

LABORATORY CONTROL SAMPLE:	2180973					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L		20.1	100	75-125	
1,1,1-Trichloroethane	ug/L	20	20.3	101	73-125	
1,1,2,2-Tetrachloroethane	ug/L	20	22.6	113	75-128	
1,1,2-Trichloroethane	ug/L	20	23.0	115	75-129	
1,1,2-Trichlorotrifluoroethane	ug/L	20	18.6	93	69-125	
1,1-Dichloroethane	ug/L	20	20.4	102	75-131	
1,1-Dichloroethene	ug/L	20	19.3	96	72-125	
1,1-Dichloropropene	ug/L	20	19.5	97	74-125	
1,2,3-Trichlorobenzene	ug/L	20	22.8	114	68-127	
1,2,3-Trichloropropane	ug/L	20	23.2	116	75-125	
1,2,4-Trichlorobenzene	ug/L	20	21.3	107	70-125	

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



Date: 01/28/2016 08:25 AM

#### **QUALITY CONTROL DATA**

Project: PS Beta -NIROP

Pace Project No.: 10336701 LABORATORY CONTROL SAMPLE: 2180973 Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers 1,2,4-Trimethylbenzene ug/L 20 20.5 102 75-130 1,2-Dibromo-3-chloropropane ug/L 50 56.9 114 74-125 1,2-Dibromoethane (EDB) 20 22.2 111 75-125 ug/L 20 20.4 1,2-Dichlorobenzene ug/L 102 75-125 21.6 1,2-Dichloroethane ug/L 20 108 72-129 1,2-Dichloropropane 20 19.3 97 71-129 ug/L 1,3,5-Trimethylbenzene 20 20.5 102 75-127 ug/L 20 19.8 75-125 1,3-Dichlorobenzene ug/L 99 20 21.3 107 75-125 1,3-Dichloropropane ug/L 1,4-Dichlorobenzene ug/L 20 20.2 101 75-125 2,2-Dichloropropane ug/L 20 19.5 97 71-125 2-Butanone (MEK) ug/L 100 114 114 58-150 2-Chlorotoluene 20 19.9 99 75-125 ug/L 100 4-Chlorotoluene ug/L 20 20.1 75-130 4-Methyl-2-pentanone (MIBK) ug/L 100 107 107 72-140 Acetone ug/L 100 157 157 69-137 CH.L0 Allyl chloride 20 18.4 92 68-132 ug/L Benzene ug/L 20 19.0 95 75-125 Bromobenzene 20 20.4 102 75-125 ug/L Bromochloromethane ug/L 20 20.1 100 75-125 Bromodichloromethane 20 21.2 106 69-128 ug/L Bromoform ug/L 20 22.7 114 75-125 Bromomethane ug/L 20 20.6 103 30-150 Carbon tetrachloride 20 21.1 106 74-125 ug/L Chlorobenzene 20 20.4 102 75-125 ug/L Chloroethane ug/L 20 18.4 92 60-150 Chloroform ug/L 20 19.2 96 75-126 Chloromethane 20 17.5 87 46-150 ug/L 20 20.1 101 75-126 cis-1,2-Dichloroethene ug/L 20 75-125 cis-1,3-Dichloropropene 19.6 98 ug/L Dibromochloromethane 20 20.9 104 75-125 ug/L 20 21.0 105 72-127 Dibromomethane ug/L 20 18.5 Dichlorodifluoromethane ug/L 93 58-135 Dichlorofluoromethane ug/L 20 20.2 101 68-149 Diethyl ether (Ethyl ether) ug/L 20 19.5 98 66-144 Ethylbenzene ug/L 20 20.0 100 75-125 Hexachloro-1,3-butadiene ug/L 20 20.6 103 73-125 Isopropylbenzene (Cumene) ug/L 20 20.6 103 69-140 Methyl-tert-butyl ether 20 21.3 106 75-126 ug/L Methylene Chloride 20 18.6 93 71-130 ug/L 20 21.0 105 n-Butylbenzene 71-129 ug/L 20 n-Propylbenzene 19.8 99 71-133 ug/L Naphthalene 20 21.6 108 ug/L 59-137 p-Isopropyltoluene ug/L 20 20.7 104 74-127 sec-Butylbenzene ug/L 20 19.4 97 66-140 Styrene ug/L 20 20.2 101 75-125 tert-Butylbenzene 20 20.3 73-129 ug/L 101

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.



Xylene (Total)

Toluene-d8 (S)

1,2-Dichloroethane-d4 (S)

4-Bromofluorobenzene (S)

Date: 01/28/2016 08:25 AM

#### **QUALITY CONTROL DATA**

Project: PS Beta -NIROP Pace Project No.: 10336701

LABORATORY CONTROL SAMPLE: 2180973 Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Tetrachloroethene ug/L 20 20.9 105 75-125 Tetrahydrofuran ug/L 200 323 162 71-129 CH,L0 Toluene ug/L 20 20.5 103 75-125 trans-1,2-Dichloroethene 20 19.1 95 75-125 ug/L trans-1,3-Dichloropropene 20 20.9 104 75-125 ug/L Trichloroethene ug/L 20 20.2 101 75-125 Trichlorofluoromethane ug/L 20 22.6 113 74-128 Vinyl chloride 20 20.4 102 71-131 ug/L

60

62.1

103

106

97

102

75-125

75-125

75-125

75-125

ug/L

%.

%.

%.

MATRIX SPIKE SAMPLE:	2181174						
		10336701001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.3	96	75-125	
1,1,1-Trichloroethane	ug/L	ND	20	19.8	99	71-144	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	19.6	98	75-131	
1,1,2-Trichloroethane	ug/L	ND	20	20.6	103	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	20.7	103	75-150	
1,1-Dichloroethane	ug/L	2.8	20	21.0	91	64-150	
1,1-Dichloroethene	ug/L	ND	20	20.4	98	68-150	
1,1-Dichloropropene	ug/L	ND	20	19.2	96	68-145	
1,2,3-Trichlorobenzene	ug/L	ND	20	19.9	99	57-142	
1,2,3-Trichloropropane	ug/L	ND	20	20.3	101	75-125	
1,2,4-Trichlorobenzene	ug/L	ND	20	18.9	95	60-135	
1,2,4-Trimethylbenzene	ug/L	ND	20	19.4	96	67-148	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	46.2	92	32-137	
1,2-Dibromoethane (EDB)	ug/L	ND	20	19.9	100	75-125	
1,2-Dichlorobenzene	ug/L	ND	20	18.8	94	75-125	
1,2-Dichloroethane	ug/L	ND	20	19.2	96	62-138	
1,2-Dichloropropane	ug/L	ND	20	18.7	93	62-144	
1,3,5-Trimethylbenzene	ug/L	ND	20	19.2	96	67-148	
1,3-Dichlorobenzene	ug/L	ND	20	19.1	95	74-131	
1,3-Dichloropropane	ug/L	ND	20	18.9	95	75-127	
1,4-Dichlorobenzene	ug/L	ND	20	18.7	93	74-126	
2,2-Dichloropropane	ug/L	ND	20	18.0	90	56-146	
2-Butanone (MEK)	ug/L	ND	100	87.9	88	47-150	
2-Chlorotoluene	ug/L	ND	20	19.2	96	74-137	
4-Chlorotoluene	ug/L	ND	20	19.2	96	72-138	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	91.1	91	60-147	
Acetone	ug/L	ND	100	157	157	61-150 (	CH,M0
Allyl chloride	ug/L	ND	20	16.7	83	53-150	
Benzene	ug/L	ND	20	17.9	89	52-147	

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.



#### **QUALITY CONTROL DATA**

Project: PS Beta -NIROP

Pace Project No.: 10336701

Date: 01/28/2016 08:25 AM

MATRIX SPIKE SAMPLE:	2181174						
_		10336701001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/L	ND	20	19.4	97	75-129	
Bromochloromethane	ug/L	ND	20	19.4	97	72-128	
Bromodichloromethane	ug/L	ND	20	19.2	96	65-137	
Bromoform	ug/L	ND	20	19.8	99	59-133	
Bromomethane	ug/L	ND	20	19.6	98	30-150	
Carbon tetrachloride	ug/L	ND	20	21.3	107	73-144	
Chlorobenzene	ug/L	ND	20	18.4	92	75-126	
Chloroethane	ug/L	ND	20	17.8	89	55-150	
Chloroform	ug/L	ND	20	18.0	90	66-143	
Chloromethane	ug/L	ND	20	18.3	91	42-150	
cis-1,2-Dichloroethene	ug/L	42.3	20	61.1	94	65-143	
cis-1,3-Dichloropropene	ug/L	ND	20	17.7	88	75-125	
Dibromochloromethane	ug/L	ND	20	19.5	97	75-125	
Dibromomethane	ug/L	ND	20	18.6	93	66-133	
Dichlorodifluoromethane	ug/L	ND	20	19.8	99	74-150	
Dichlorofluoromethane	ug/L	ND	20	20.1	100	68-150	
Diethyl ether (Ethyl ether)	ug/L	ND	20	18.7	94	57-148	
Ethylbenzene	ug/L	ND	20	18.5	93	67-149	
Hexachloro-1,3-butadiene	ug/L	ND	20	20.4	102	65-143	
Isopropylbenzene (Cumene)	ug/L	ND	20	19.3	97	64-150	
Methyl-tert-butyl ether	ug/L	ND	20	19.2	96	71-130	
Methylene Chloride	ug/L	ND	20	16.4	82	67-137	
n-Butylbenzene	ug/L	ND	20	20.4	102	70-138	
n-Propylbenzene	ug/L	ND	20	19.3	97	70-148	
Naphthalene	ug/L	ND	20	19.6	98	39-150	
p-Isopropyltoluene	ug/L	ND	20	20.2	101	74-138	
sec-Butylbenzene	ug/L	ND	20	19.2	96	64-150	
Styrene	ug/L	ND	20	18.6	93	75-132	
tert-Butylbenzene	ug/L	ND	20	19.5	97	75-138	
Tetrachloroethene	ug/L	ND	20	19.1	96	73-136	
Tetrahydrofuran	ug/L	ND	200	315	158	68-142 (	CH,M0
Toluene	ug/L	ND	20	19.1	94	69-139	
trans-1,2-Dichloroethene	ug/L	65.9	20	87.1	106	75-135	
trans-1,3-Dichloropropene	ug/L	ND	20	18.7	93	66-136	
Trichloroethene	ug/L	10.8	20	30.6	99	74-135	
Trichlorofluoromethane	ug/L	ND	20	26.0	130	75-150	
Vinyl chloride	ug/L	0.72	20	20.8	100	69-150	
Xylene (Total)	ug/L	ND	60	55.9	93	70-147	
1,2-Dichloroethane-d4 (S)	%.				104	75-125	
4-Bromofluorobenzene (S)	%.				100	75-125	
Toluene-d8 (S)	%.				103	75-125	

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



#### **QUALITY CONTROL DATA**

Project: PS Beta -NIROP

Pace Project No.: 10336701

Date: 01/28/2016 08:25 AM

SAMPLE DUPLICATE: 2181175						
		10336701002	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	1.1	1.1	0	30	
1,1-Dichloroethene	ug/L	ND	.67J		30	
1,1-Dichloropropene	ug/L	ND	ND		30	
1,2,3-Trichlorobenzene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2,4-Trichlorobenzene	ug/L	ND	ND		30	
1,2,4-Trimethylbenzene	ug/L	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,3,5-Trimethylbenzene	ug/L	ND	ND		30	
1,3-Dichlorobenzene	ug/L	ND	ND		30	
1,3-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2,2-Dichloropropane	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Chlorotoluene	ug/L	ND	ND		30	
4-Chlorotoluene	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Allyl chloride	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromobenzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	19.3	20.6	7	30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Dichlorodifluoromethane	ug/L	ND	ND		30	
Dichlorofluoromethane	ug/L	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	

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



#### **QUALITY CONTROL DATA**

Project: PS Beta -NIROP

Pace Project No.: 10336701

Date: 01/28/2016 08:25 AM

SAMPLE DUPLICATE: 2181175						
		10336701002	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/L	ND	ND		30	
Isopropylbenzene (Cumene)	ug/L	ND	ND		30	
Methyl-tert-butyl ether	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
n-Butylbenzene	ug/L	ND	ND		30	
n-Propylbenzene	ug/L	ND	ND		30	
Naphthalene	ug/L	ND	ND		30	
p-Isopropyltoluene	ug/L	ND	ND		30	
sec-Butylbenzene	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
tert-Butylbenzene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Tetrahydrofuran	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	49.9	51.6	4	30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
Trichloroethene	ug/L	19.3	20.1	4	30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	.31J		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	101	101	0		
4-Bromofluorobenzene (S)	%.	102	98	5		
Toluene-d8 (S)	%.	96	98	2		

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.



#### **QUALIFIERS**

Project: PS Beta -NIROP
Pace Project No.: 10336701

#### **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.

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.

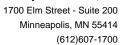
TNI - The NELAC Institute.

#### **ANALYTE QUALIFIERS**

Date: 01/28/2016 08:25 AM

CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased
	high.

- LO Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples. Results unaffected by high bias.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.





#### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: PS Beta -NIROP

Pace Project No.: 10336701

Date: 01/28/2016 08:25 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10336701001	PMW-03	EPA 8260B	MSV/34462	_	
10336701002	PMW-04	EPA 8260B	MSV/34462		
10336701003	Trip Blank	EPA 8260B	MSV/34462		

\* DAY TAY Pace Analytical

# CHAIN-OF-CUSTODY / Analytical Request Document

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

Section C

Pace Project No./ Lab I.D. (N/A) DRINKING WATER SAMPLE CONDITIONS OTHER 3 Cooler (Y/N) b Custody Sealer Received on Ice (Y/N) I GROUND WATER (N/Y) eninoldO lsubiseR O° ni qmaT age: Z Z REGULATORY AGENCY **RCRA** B Requested Analysis Filtered (Y/N) TIME  $\overline{\alpha}$ 4 STATE NPDES -Site Location 155 (TE DATE UST DATE Signed (MM/DD/YY): ACCEPTED BY / AFFILIATION EPA 8260, VOC MEENWSEN taeT sisylsnA N// TediO 1011 Calle Sombra Nethanol nation: Bahar Naderi Company Name: Regenesis Preservatives Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> NaOH 21466 HCI \* 8ONH PRINT Name of SAMPLER: MECISSA <sup>7</sup>OS<sup>7</sup>H ace Profile # Unpreserved HE ace Quote Address: SIGNATURE of SAMPLER: M # OF CONTAINERS SAMPLER NAME AND SIGNATURE SAMPLE TEMP AT COLLECTION DATE 125/ TIME 5721 911 52/1 1105 DATE COLLECTED HEUSH MEEW SERVITERAR RELINQUISHED BY / AFFILIATION TIME COMPOSITE START roject Name: PS Beta - NIROP roject Number: PS Beta - NIROP DATE Section B Required Project Information: eport To: Melinda Pham d (G=GRAB C=COMP) SAMPLE TYPE urchase Order No.: (see valid codes to left) **AMATRIX CODE** Valid Matrix Codes

MATRIX

DODINGING WATER
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MATRIX 343-366-8090 PMW-04 PMW-03 ADDITIONAL COMMENTS San Clemente, CA 92673 Mpham @regenesis.com (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE 2 days 1011 Calle Sombra SAMPLE ID Section D Required Client Information Regenesis Section A Required Client Information: Phone: 949-366-8000 Requested Due Date/TAT: Page 20 of 21 8 2 F w ص ø ILEM # e

F-ALL-Q-020rev.08, 12-Oct-2007

mportant 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 involces not paid within 30 days.

### Pace Analytical "

#### Document Name:

#### Sample Condition Upon Receipt Form

Document No.: F-MN-L-213-rev.15 Document Revised: 05Jan2016 Page 1 of 1

Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt	Client Name:				Project	#: AAG	)量:1	0336	701	rea Flagre	
. Opon Neccipe	<u>Keaen</u>	esis_								aren er Barren	
Courier:	☐Fed Ex	□ups [	USPS	Zo	lient			A CONTRACTOR			
Commercial	Pace	SpeeDee [	Other:_			103	36701				
Tracking Number:		····								7.2345E44	Maria (Maria Sa)
Custody Seal on Cod	oler/Box Present?	□Yes No	;	Seals Int	act?	]Yes 🗹	No Opti	ional: Proj. I	Due Date:	Proj. I	Vame:
Packing Material:	Bubble Wrap	Bubble Bags	Non	e 🔲	Other:			Temp	Blank?	Yes	□No
	151401163 151401164	☐B88A912167504 ☐B88A014331009	1 1 1 1	e of Ice:	<b>∑</b> We	t 🔲 Blue	□None	e Sample	s on ice, cooli	ng proce	ss has begun
Cooler Temp Read (		Cooler Temp Corr		: <i>(</i> )	5		Biological T	issue Frozen?	Yes	□No	. N/A
Temp should be abov	e freezing to 6°C	Correction Factor					_	Examining Co			125/10
USDA Regulated Soil	N/A, water sam	ple)		ND 47 61		ID 14	Did I			(:	
Did samples originate i MS, NC, NM, NY, OK, C			tates: AL, A	AR, AZ, CA	A, FL, GA, □Yes			originate from a waii and Puerto	-	ce (interr Ye!	
	f Yes to either quest		lated Soil	Checklis	_	<del></del>	_			_	
								COMME	NTS:		
Chain of Custody Pre	sent?		Yes	□No	□n/a	1.					
Chain of Custody Fille	ed Out?		Yes	□No	□n/a	2.					
Chain of Custody Reli	inquished?		Yes	□No	□N/A	3.					
Sampler Name and/o	or Signature on COC?		<b>Z</b> ÎYes	□No	□N/A	4.				·	
Samples Arrived with	nin Hold Time?		Yes	□No	□n/a	5.					
Short Hold Time Ana	alysis (<72 hr)?		Yes	ZNo	□N/A	6.					
Rush Turn Around Ti	ime Requested?		√Yes	□No	□N/A	72-1	$\alpha\gamma$				
Sufficient Volume?			Yes	□No	□n/A	8.					
Correct Containers U	Ised?		ZYes	□No	□n/A	9.					·
-Pace Containers l	Used?		<b>Z</b> Yes	□No	□n/A						
Containers Intact?			Yes	□No	□N/A	10.					
Filtered Volume Rece	eived for Dissolved Te	sts?	□Yes	□No	ĎN/A	11. Note	if sediment	is visible in the	dissolved co	ntainer	
Sample Labels Match	COC?	· · · · · · · · · · · · · · · · · · ·	Yes	 □No	_ <b>/</b> N/A	12.	• • • • • • • • • • • • • • • • • • • •				
-Includes Date/Tin	ne/ID/Analysis Mat	rix: Water									
All containers needin	ng acid/base preserva	tion have been			<b>-</b>	13.	∏HNO₃	∐H₂SO₄	□NaOH		□нсі
checked? All containers needin	ng preservation are fo	und to be in	Yes	∏No	PIN/A	Sample #		,			
compliance with EPA	recommendation?				•						
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; Exceptions, VOA), Col			Yes	No	<b>∏</b> N/A	Initial when	,	Lot #	of added		
DRO/8015 (Water) Do		i case,	Yes	□No	□N/A	completed:			rvative:		
Headspace in VOA Vi			☐Yes	ZÎNo	N/A	14.					
Trip Blank Present?			Yes	□No	□n/a	15.					
Trip Blank Custody Se			<b>Z</b> Yes	□No	□N/A						
Pace Trip Blank Lot #	(if purchased): <u>()]2</u>	016-01	<u>,                                    </u>								<del></del>
CLIENT N	NOTIFICATION/RESC	LUTION						Field Data R	equired? [	Yes [	No
Person Contacted:						Date/Tim	ne:				
Comments/Resoluti	ion:										· ·
		<u> </u>									
Project Ma	anager Review:	( 01 1 1 1 1	11 0	10.			Date:	1/25/16			

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).





February 10, 2016

Melinda Pham Regenesis 1011 Calle Sombra San Clemente, CA 92673

RE: Project: PS Beta -NIROP

Pace Project No.: 10336704

#### Dear Melinda Pham:

Enclosed are the analytical results for sample(s) received by the laboratory on January 25, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

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

Sincerely,

Jennifer Anderson jennifer.anderson@pacelabs.com Project Manager

JAndera

Enclosures

cc: Ryan Moore, Regenesis







#### **CERTIFICATIONS**

Project: PS Beta -NIROP Pace Project No.: 10336704

**Minnesota Certification IDs** 

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

525 N 8th Street, Salina, KS 67401 A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770 Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA Colorado Certification #Pace

Connecticut Certification #: PH-0256 EPA Region 8 Certification #: 8TMS-L Florida/NELAP Certification #: E87605

Guam Certification #:14-008r Georgia Certification #: 959 Georgia EPD #: Pace Idaho Certification #: MN00064

Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01 Iowa Certification #: 368 Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062

Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001 Maine Certification #: 2013011 Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace Montana Certification #: MT0092 Nevada Certification #: MN\_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002 New York Certification #: 11647 North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150 Ohio VAP Certification #: CL101 Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563

Puerto Rico Certification Saipan (CNMI) #:MP0003 South Carolina #:74003001 Texas Certification #: T104704192 Tennessee Certification #: 02818 Utah Certification #: MN000642013-4 Virginia DGS Certification #: 251 Virginia/VELAP Certification #: Pace Washington Certification #: C486 West Virginia Certification #: 382 West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970

**Montana Certification IDs** 

150 N. 9th Street, Billings, MT 59101 Colorado Asbestos #: 17119 A2LA Certification #: 3590.01 EPA Region 8 Certification #: 8TMS-L

Idaho Certification #: MT00012

Virginia Minnesota Certification ID's 315 Chestnut Street, Virginia, MN 55792 Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785 Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Minnesota Dept of Health Certification #: 030-999-442

Montana Certification #: MT CERT0040 North Dakota Dept. Of Health #: R-209 NVLAP Certification #: 101292-0 Washington Department of Ecology #: C993

Wisconsin DNR Certification #: 998027470 WA Department of Ecology Lab ID# C1007 Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

**Ormond Beach Certification IDs** 

8 East Tower Circle, Ormond Beach, FL 32174

Alabama Certification #: 41320 Connecticut Certification #: PH-0216

Delaware Certification: FL NELAC Reciprocity Florida Certification #: E83079

Georgia Certification #: 955

Guam Certification: FL NELAC Reciprocity
Hawaii Certification: FL NELAC Reciprocity

Illinois Certification #: 200068

Indiana Certification: FL NELAC Reciprocity

Kansas Certification #: E-10383 Kentucky Certification #: 90050

Louisiana Certification #: FL NELAC Reciprocity Louisiana Environmental Certificate #: 05007

Maryland Certification: #346 Michigan Certification #: 9911 Mississippi Certification: FL NELAC Reciprocity

Missouri Certification #: 236 Montana Certification #: Cert 0074 Nebraska Certification: NE-OS-28-14
Nevada Certification: FL NELAC Reciprocity New Hampshire Certification #: 2958

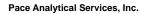
New York Certification #: 11608

North Carolina Environmental Certificate #: 667

North Carolina Certification #: 12710 North Dakota Certification #: R-216 Oklahoma Certification #: D9947 Pennsylvania Certification #: 68-00547 Puerto Rico Certification #: FL01264 South Carolina Certification: #96042001 Tennessee Certification #: TN02974
Texas Certification: FL NELAC Reciprocity

#### REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700

#### **CERTIFICATIONS**

Project: PS Beta -NIROP Pace Project No.: 10336704

**Ormond Beach Certification IDs** 

US Virgin Islands Certification: FL NELAC Reciprocity Virginia Environmental Certification #: 460165 West Virginia Certification #: 9962C

Wisconsin Certification #: 399079670 Wyoming (EPA Region 8): FL NELAC Reciprocity



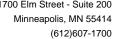


#### **SAMPLE SUMMARY**

Project: PS Beta -NIROP

Pace Project No.: 10336704

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10336704001	PMW-03	Water	01/25/16 12:25	01/25/16 13:55
10336704002	PMW-04	Water	01/25/16 11:05	01/25/16 13:55





#### **SAMPLE ANALYTE COUNT**

Project: PS Beta -NIROP

Pace Project No.: 10336704

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10336704001	PMW-03	RSK 175	STV	3	PASI-M
		EPA 6010C	IP	1	PASI-M
		6010C Met	IP	1	PASI-M
		SM 4500-S2-D	WT1	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	KAM	1	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	MW	1	PASI-M
		SM 5220D	DCL	1	PASI-M
		SM 5310C	KRV	1	PASI-V
0336704002	PMW-04	RSK 175	STV	3	PASI-M
		EPA 6010C	IP	1	PASI-M
		6010C Met	IP	1	PASI-M
		SM 4500-S2-D	WT1	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	KAM	1	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	MW	1	PASI-M
		SM 5220D	DCL	1	PASI-M
		SM 5310C	KRV	1	PASI-V



#### **ANALYTICAL RESULTS**

Project: PS Beta -NIROP

Pace Project No.: 10336704

Date: 02/10/2016 09:20 AM

Sample: PMW-03	Lab ID: 1033	36704001	Collected: 01/25/1	6 12:25	Received: 01	/25/16 13:55 N	Natrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	10.0	1		01/27/16 17:34	74-84-0	
Ethene	ND	ug/L	10.0	1		01/27/16 17:34		
Methane	23.1	ug/L	10.0	1		01/27/16 17:34	74-82-8	
6010C MET ICP	Analytical Meth	od: EPA 60	010C Preparation Me	ethod: E	PA 3010			
ron	10700	ug/L	50.0	1	01/26/16 08:30	01/26/16 14:35	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	od: 6010C	Met Preparation Me	thod: E	PA 3010			
ron, Dissolved	5880	ug/L	50.0	1	01/26/16 08:33	01/26/16 13:54	7439-89-6	
1500S2D Sulfide Water	Analytical Meth	od: SM 45	00-S2-D					
Sulfide	ND	mg/L	0.10	1		02/01/16 14:06		1M
320B Alkalinity	Analytical Meth	od: SM 23	20B					
Carbon Dioxide (SM4500CO2D)	40.6	mg/L	5.0	1		02/02/16 15:59	124-38-9	
Alkalinity, Total as CaCO3	341	mg/L	5.0	1		01/29/16 10:55		
Alkalinity,Bicarbonate (CaCO3)	341	mg/L	5.0	1		01/29/16 10:55		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		01/29/16 10:55		
00.0 IC Anions	Analytical Meth	od: EPA 30	0.00					
Sulfate	141	mg/L	6.0	5		01/26/16 13:14	14808-79-8	M1
53.2 Nitrate + Nitrite	Analytical Meth	od: EPA 3	53.2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		01/27/16 10:03		
3220D COD	Analytical Meth	od: SM 52	20D Preparation Met	thod: SI	M 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	02/02/16 10:22	02/02/16 15:38		
310C TOC	Analytical Meth	od: SM 53	10C					
otal Organic Carbon	3.1	mg/L	1.0	1		01/29/16 14:45	7440-44-0	



#### **ANALYTICAL RESULTS**

Project: PS Beta -NIROP

Pace Project No.: 10336704

Date: 02/10/2016 09:20 AM

Sample: PMW-04	Lab ID: 1033	36704002	Collected: 01/25/1	6 11:05	Received: 01	/25/16 13:55 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
RSK 175 AIR Headspace	Analytical Meth	od: RSK 17	75					
Ethane	ND	ug/L	10.0	1		01/27/16 17:50		
Ethene	ND	ug/L	10.0	1		01/27/16 17:50		
Methane	ND	ug/L	10.0	1		01/27/16 17:50	74-82-8	
6010C MET ICP	Analytical Meth	od: EPA 60	010C Preparation Me	thod: E	PA 3010			
ron	4860	ug/L	50.0	1	01/26/16 08:30	01/26/16 14:51	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	od: 6010C	Met Preparation Me	thod: E	PA 3010			
ron, Dissolved	3420	ug/L	50.0	1	01/26/16 08:33	01/26/16 14:10	7439-89-6	
1500S2D Sulfide Water	Analytical Meth	od: SM 450	00-S2-D					
Sulfide	ND	mg/L	0.10	1		02/01/16 14:11		1M
2320B Alkalinity	Analytical Meth	od: SM 232	20B					
Carbon Dioxide (SM4500CO2D)	32.4	mg/L	5.0	1		02/02/16 16:15	124-38-9	
Alkalinity, Total as CaCO3	251	mg/L	5.0	1		01/29/16 10:59		
Alkalinity,Bicarbonate (CaCO3)	251	mg/L	5.0	1		01/29/16 10:59		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		01/29/16 10:59		
300.0 IC Anions	Analytical Meth	od: EPA 30	0.00					
Sulfate	80.5	mg/L	2.4	2		01/26/16 12:58	14808-79-8	
353.2 Nitrate + Nitrite	Analytical Meth	od: EPA 35	53.2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		01/27/16 09:19		
5220D COD	Analytical Meth	od: SM 522	20D Preparation Met	hod: Si	M 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	02/02/16 10:22	02/02/16 15:39		
5310C TOC	Analytical Meth	od: SM 53	10C					
Total Organic Carbon	3.2	mg/L	1.0	1		01/29/16 14:58	7440 44 0	



**QUALITY CONTROL DATA** 

Project: PS Beta -NIROP

Pace Project No.: 10336704

QC Batch: AIR/25095 Analysis Method: RSK 175

QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE

Associated Lab Samples: 10336704001, 10336704002

METHOD BLANK: 2181051 Matrix: Water

Associated Lab Samples: 10336704001, 10336704002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	01/27/16 17:26	
Ethene	ug/L	ND	10.0	01/27/16 17:26	
Methane	ug/L	ND	10.0	01/27/16 17:26	

LABORATORY CONTROL SAMPLE &		21	81053							
		Spike	LCS	LCSD	LCS	LCSD	% Rec		Max	
Parameter	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
Ethane	ug/L	114	106	106	93	93	85-115	0	20	
Ethene	ug/L	106	98.1	98.7	92	93	85-115	1	20	
Methane	ug/L	60.7	54.9	55.1	91	91	85-115	0	20	

SAMPLE DUPLICATE: 2182262

Date: 02/10/2016 09:20 AM

		10336704001	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	23.1	3.2J		20	

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



**QUALITY CONTROL DATA** 

Project: PS Beta -NIROP

Pace Project No.: 10336704

Date: 02/10/2016 09:20 AM

QC Batch: MPRP/61125 Analysis Method: EPA 6010C
QC Batch Method: EPA 3010 Analysis Description: 6010C Water

Associated Lab Samples: 10336704001, 10336704002

METHOD BLANK: 2180616 Matrix: Water

Associated Lab Samples: 10336704001, 10336704002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Iron ug/L ND 50.0 01/26/16 14:29

LABORATORY CONTROL SAMPLE: 2180617

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Iron ug/L 10000 9710 97 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2180618 2180619

MS MSD

10336704001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 10000 75-125 20 Iron ug/L 10700 10000 20600 20800 98 101

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.



#### **QUALITY CONTROL DATA**

Project:

PS Beta -NIROP

Pace Project No.:

10336704

QC Batch:

MPRP/61124

QC Batch Method:

Analysis Method:

6010C Met

EPA 3010

Analysis Description:

Matrix: Water

6010C Water Dissolved

Associated Lab Samples:

10336704001, 10336704002

Associated Lab Samples:

METHOD BLANK: 2180612

10336704001, 10336704002

Blank

Reporting

Parameter

Units

Result

Limit

Qualifiers Analyzed

80-120

Iron, Dissolved

ug/L

ND

50.0 01/26/16 13:48

LABORATORY CONTROL SAMPLE:

Parameter

Parameter

Date: 02/10/2016 09:20 AM

2180613

Units

ug/L

Spike Conc.

LCS Result

LCS % Rec % Rec Limits

Qualifiers

Iron, Dissolved

Iron, Dissolved

ug/L

Units

2180615

MSD

MS Spike Spike

10000

9530

MSD

95

% Rec

MS

% Rec Limits

Max RPD

RPD

Qual

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:

2180614

Conc.

MS Result

Result 15500 % Rec

MSD

96

10336704001

Result

5880

Conc. 10000 10000

15300

94

75-125

20

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



#### **QUALITY CONTROL DATA**

SM 4500-S2-D

4500S2D Sulfide Water

Analysis Method:

Analysis Description:

Matrix: Water

Project: PS Beta -NIROP

Pace Project No.: 10336704

METHOD BLANK: 2184141

QC Batch: MT/22348

QC Batch Method: SM 4500-S2-D

Associated Lab Samples: 10336704001, 10336704002

Associated Lab Samples: 10336704001, 10336704002

,

Blank Reporting
Parameter Units Result Limit

ParameterUnitsResultLimitAnalyzedQualifiersSulfidemg/LND0.1002/01/16 13:57

LABORATORY CONTROL SAMPLE: 2184142

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Sulfide mg/L .99 1.0 105 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2184143 2184144

MS MSD

10336680001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Sulfide ND 80-120 20 mg/L .99 .99 1.2 1.2 119 119 0

SAMPLE DUPLICATE: 2184145

Date: 02/10/2016 09:20 AM

Parameter Units Result Result RPD ARPD Qualifiers

Sulfide mg/L ND ND 20

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



### **QUALITY CONTROL DATA**

Project: PS Beta -NIROP

Pace Project No.: 10336704

QC Batch: WET/35658 Analysis Method: SM 2320B QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

10336704001, 10336704002 Associated Lab Samples:

METHOD BLANK: 1466874 Matrix: Water

Associated Lab Samples: 10336704001, 10336704002

Reporting Parameter Limit Analyzed Qualifiers Units Result

Blank

Carbon Dioxide (SM4500CO2D) ND 5.0 02/02/16 15:43 mg/L

SAMPLE DUPLICATE: 1466876

10336704001 Dup Max Parameter Units Result Result **RPD RPD** Qualifiers

7 Carbon Dioxide (SM4500CO2D) 40.6 mg/L 38.0

SAMPLE DUPLICATE: 1466877

Date: 02/10/2016 09:20 AM

35226920005 Dup Max **RPD RPD** Parameter Units Result Result Qualifiers Carbon Dioxide (SM4500CO2D) 50.0U ND mg/L

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.



### **QUALITY CONTROL DATA**

Project: PS Beta -NIROP

Pace Project No.: 10336704

Date: 02/10/2016 09:20 AM

QC Batch: WET/46236 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10336704001, 10336704002

METHOD BLANK: 2182977 Matrix: Water

Associated Lab Samples: 10336704001, 10336704002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND -	5.0	01/29/16 09:29	
Alkalinity, Bicarbonate (CaCO3)	mg/L	ND	5.0	01/29/16 09:29	
Alkalinity.Carbonate (CaCO3)	ma/L	ND	5.0	01/29/16 09:29	

LABORATORY CONTROL SAMPLE &	LCSD: 2182978		21	182979						
		Spike	LCS	LCSD	LCS	LCSD	% Rec		Max	
Parameter	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	41.9	42.3	105	106	90-110	1	30	

MATRIX SPIKE & MATRIX SPIR	KE DUPLICA	ATE: 21829	80		2182981							
			MS	MSD								
	1	0336626002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Alkalinity, Total as CaCO3	mg/L	849	40	40	905	909	139	148	80-120	0	30	M1

MATRIX SPIKE & MATRIX SPI	IKE DUPLICA	ATE: 21829	82		2182983							
			MS	MSD								
	1	0336946001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Alkalinity, Total as CaCO3	mg/L	11.0	40	40	52.7	52.8	104	105	80-120	0	30	

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



**QUALITY CONTROL DATA** 

Project: PS Beta -NIROP

Pace Project No.: 10336704

Date: 02/10/2016 09:20 AM

QC Batch: WETA/26172 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10336704001, 10336704002

METHOD BLANK: 2180677 Matrix: Water

Associated Lab Samples: 10336704001, 10336704002

Parameter Units Result Limit Analyzed Qualifiers

Sulfate mg/L ND 1.2 01/26/16 10:54

LABORATORY CONTROL SAMPLE: 2180678

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Sulfate mg/L 12.5 11.9 95 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2180679 2180680

MS MSD 10336704001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Sulfate 75 90-110 0 20 M1 mg/L 141 62.5 62.5 187 188 75

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.



### **QUALITY CONTROL DATA**

Project:

PS Beta -NIROP

Pace Project No.:

10336704

QC Batch:

WETA/26178

Analysis Method:

EPA 353.2

QC Batch Method:

EPA 353.2

Analysis Description:

Matrix: Water

353.2 Nitrate + Nitrite, preserved

Associated Lab Samples:

10336704001, 10336704002

METHOD BLANK: 2181532

Associated Lab Samples:

Parameter

10336704001, 10336704002

Blank

Reporting

Result

Limit Analyzed Qualifiers

Nitrogen, NO2 plus NO3

Units mg/L

ND

0.020 01/27/16 09:04 FS

LABORATORY CONTROL SAMPLE: 2181533

Parameter

Spike Conc.

MS

LCS Result

LCS % Rec % Rec Limits

Nitrogen, NO2 plus NO3

Units mg/L

1.0

104

90-110 FS

Qualifiers

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:

2181534

10336764001

MSD Spike

MS

MSD Result

MS % Rec

MSD % Rec % Rec Limits

Max RPD RPD

Nitrogen, NO2 plus NO3

Result

2181535

104

90-110

Qual

Parameter

Units Result mg/L 11.2

Spike Conc. Conc. 20 20

33.0 32.0 109

3

20

Date: 02/10/2016 09:20 AM

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.



### **QUALITY CONTROL DATA**

Project: PS Beta -NIROP

Pace Project No.: 10336704

Date: 02/10/2016 09:20 AM

QC Batch: WETA/26237 Analysis Method: SM 5220D
QC Batch Method: SM 5220D Analysis Description: 5220D COD

Associated Lab Samples: 10336704001, 10336704002

METHOD BLANK: 2184550 Matrix: Water

Associated Lab Samples: 10336704001, 10336704002

Parameter Units Result Limit Analyzed Qualifiers

Chemical Oxygen Demand mg/L ND 50.0 02/02/16 15:30

LABORATORY CONTROL SAMPLE: 2184551

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chemical Oxygen Demand mg/L 300 314 105 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2184552 2184553

MS MSD 10336682007 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 8470 80-120 20 Chemical Oxygen Demand mg/L 5840 2500 2500 8560 105 109

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2184554 2184555

MS MSD 10336682008 MS MSD MS Spike Spike MSD % Rec Max Parameter % Rec % Rec RPD Units Result Conc. Conc. Result Result Limits RPD Qual Chemical Oxygen Demand 2110 2500 2500 2040 2140 -3 1 80-120 5 20 M6 mg/L

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.



### **QUALITY CONTROL DATA**

Project:

PS Beta -NIROP

Pace Project No.:

10336704

QC Batch:

WETA/15512

SM 5310C

Analysis Method: Analysis Description: SM 5310C 5310C TOC

QC Batch Method:

10336704001, 10336704002

Matrix: Water

METHOD BLANK: 284229 Associated Lab Samples:

Associated Lab Samples:

Blank Result Reporting

Parameter

Units

Limit

Analyzed

Qualifiers

Total Organic Carbon

mg/L

ND

1.0 01/29/16 11:08

LABORATORY CONTROL SAMPLE:

Parameter

284230

Units

mg/L

Units

mg/L

Spike Conc.

MS

Conc.

25

25

LCS Result

LCS % Rec % Rec Limits

Qualifiers

**Total Organic Carbon** 

Parameter

Parameter

Total Organic Carbon

Date: 02/10/2016 09:20 AM

Result

10336707001

Result

Units

mg/L

25

284232

25.3

25.1

MSD

Result

101

90-110

Max

**Total Organic Carbon** 

10336705001 Spike

ND

284231

Spike Conc.

MSD

MS Result

MS

25.7

MS % Rec

MSD % Rec

99

% Rec Limits RPD

RPD

Qual

Qual

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:

284233

ND

284234

102

80-120

2 20

MSD

25

MSD

MSD

% Rec

Max RPD

MS Spike Conc.

25

Spike Conc.

Result Result 25.3

% Rec 25.5 100

MS

% Rec 101 Limits 80-120

RPD

1 20

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

**REPORT OF LABORATORY ANALYSIS** 

without the written consent of Pace Analytical Services, Inc..



### **QUALIFIERS**

Project: PS Beta -NIROP Pace Project No.: 10336704

### **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.

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
PASI-MT	Pace Analytical Services - Montana
PASI-O	Pace Analytical Services - Ormond Beach
PASI-V	Pace Analytical Services - Virginia

### **ANALYTE QUALIFIERS**

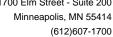
Date: 02/10/2016 09:20 AM

1M Closing CCV failed low. Sample result could be biased low. Rerun out of hold confirms this result.

FS The sample was filtered in the laboratory prior to analysis.

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

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.





### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: PS Beta -NIROP

Pace Project No.: 10336704

Date: 02/10/2016 09:20 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10336704001 10336704002	PMW-03 PMW-04	RSK 175 RSK 175	AIR/25095 AIR/25095		
10336704001 10336704002	PMW-03 PMW-04	EPA 3010 EPA 3010	MPRP/61125 MPRP/61125	EPA 6010C EPA 6010C	ICP/26635 ICP/26635
10336704001 10336704002	PMW-03 PMW-04	EPA 3010 EPA 3010	MPRP/61124 MPRP/61124		ICP/26634 ICP/26634
10336704001	PMW-03	SM 4500-S2-D	MT/22348		
10336704001	PMW-03	SM 4500-S2-D	MT/22386		
10336704002	PMW-04	SM 4500-S2-D	MT/22348		
10336704002	PMW-04	SM 4500-S2-D	MT/22386		
10336704001	PMW-03	SM 2320B	WET/35658		
10336704001	PMW-03	SM 2320B	WET/46236		
10336704002	PMW-04	SM 2320B	WET/35658		
10336704002	PMW-04	SM 2320B	WET/46236		
10336704001 10336704002	PMW-03 PMW-04	EPA 300.0 EPA 300.0	WETA/26172 WETA/26172		
10336704001 10336704002	PMW-03 PMW-04	EPA 353.2 EPA 353.2	WETA/26178 WETA/26178		
10336704001 10336704002	PMW-03 PMW-04	SM 5220D SM 5220D	WETA/26237 WETA/26237	SM 5220D SM 5220D	WETA/26244 WETA/26244
10336704001 10336704002	PMW-03 PMW-04	SM 5310C SM 5310C	WETA/15512 WETA/15512		

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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.

Page 20 of 39

						308 308 308	12	1	10	9	8	7	6	5	4	3	2	1	ITEM#			Request	Phone:	Email To:		Address:	Company:	Section Required
						ADDITIONAL						The second secon							SAMPLE ID  (A-Z, 0-9 /)  Sample IDS MUST BE UNIQUE	Section D Required Client Information		Requested Due Date/TAT:	949-366-8000	Mpham@regenesis.com	San Clemente, CA 92673	1011 Calle Sombra	/ Regenesis	Section A Required Client Information:
						ADDITIONAL COMMENTS											PMW-04	PMW-03				10 days	Fax: 343-366-8090	nesis.com	, CA 92673	mbra		
					/														WATER WT WASTE WATER WW PRODUCT PSOLUSOLID OL OL OTHER AR OTHER TSSUE TISSUE TS			Projec		Purcha		Сору То:	Repor	Secti Requi
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				:	MEENWEAM	RELINQUISHED BY / AFFILIATION												•	COMPOSITE START			PS Beta - NIROP	PS Beta - NIROP		1		a Pham	ormation:
SI	PA	SAMPLER				AFFILIATION													अताह ना TIME	COLLECTED		ЮP	POP					
SIGNATURE of SAMPLER	PRINT Name of SAMPLER:	SAMPLER NAME AND SIGNATURE			MEGALI												1	125/16 12	COMPOSITE ENDIGRADE DATE T	TED								
SAMPLER	SAMPLER:	SIGNATURE		-	19/57	DATE											(05)	725	SAMPLE TEMP AT COLLECTION				27	71.70			,	= 40
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### Pace Analytical\*

### Document Name:

### Sample Condition Upon Receipt Form

Document No.:

F-MN-L-213-rev.15

Document Revised: 05Jan2016

Page 1 of 1

Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt  Client Name:  Peoplesis			Project	MOH · TA3301A4
Courier: Fed Ex UPS [	USPS	<b>/</b> c	lient	
Commercial Pace SpeeDee [	Other:_			10336704
Tracking Number:				
Custody Seal on Cooler/Box Present? Yes No	:	Seals Inta	act?	Yes No Optional: Proj. Due Date: Proj. Name:
Packing Material: Bubble Wrap Bubble Bags	Non	е 🔲	Other:	Temp Blank? Yes No
Thermometer         ☐ 151401163         ☐ B888A912167504           Used:         ☐ 151401164         ☐ B888A014331009		e of Ice:	We	t Blue None Samples on ice, cooling process has begun
Cooler Temp Read (°C): 0.3 Cooler Temp Corr		): O.S	5	Biological Tissue Frozen? Yes No N/A
Temp should be above freezing to 6°C Correction Factor			Dat	e and Initials of Person Examining Contents: OMB 1/28/19
USDA Regulated Soil ( N/A, water sample)				
Did samples originate in a quarantine zone within the United S MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)?	tates: AL, A	AR, AZ, CA	N, FL, GA, □Yes	ID, LA. Did samples originate from a foreign source (internationally,  No including Hawaii and Puerto Rico)?  Yes No
	lated Soi	l Checklis		Q-338) and include with SCUR/COC paperwork.
				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	ΖNο	□N/A	6.
Rush Turn Around Time Requested?	Yes	ΖÎΝο	□N/A	7.
Sufficient Volume?	Yes	□No	□N/A	8.
Correct Containers Used?	☑ Yes	□No	□N/A	9.
-Pace Containers Used?	<b>✓</b> Yes	□No	□N/A	
Containers Intact?	Yes	□No	□N/A	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: Water All containers needing acid/base preservation have been	- [			
All containers needing acid/base preservation have been checked?	T/V~~	□No	□n/a	13. ☑HNO₃ ☑H₂SO₄ ☐NaOH ☐HCI
All containers needing preservation are found to be in	Yes	Ľ∏ <sub>MO</sub>	⊔м/А	Sample # 44 Toke om Bilzsly
compliance with EPA recommendation?		,,,,,,,		1-2 4/4
(HNO₃, H₂SO₄, HCl<2; NaOH>9-Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform (TOC) Oil and Grease,	Yes	∐No	□N/A	Initial when Lot # of added
DRO/8015 (water) DOC	Yes	□No	□N/A	completed: preservative:
Headspace in VOA Vials ( >6mm)?	Yes	□No	ØN/A	14.
Trip Blank Present?	∐Yes	□No	ØN/A	15.
Trip Blank Custody Seals Present?	Yes	□No	ØN/A	
Pace Trip Blank Lot # (if purchased):		,		
CLIENT NOTIFICATION/RESOLUTION				Field Data Required? Yes No
Person Contacted:				Date/Time:
Comments/Resolution:				

Project Manager Review (1) (1) (2) Date: 1/2 (1) (2) 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).

	Ship	ping (circle): Tracking #: Client: F Due Date: 8 Pace WO: ect Manager: J	MN to M Do F- UPS W 182 Regenesis 3-Feb-2016	##	ansfer For mber:	Pace	vised Date: 14Jul2014 Page: 1 of 1 Issuing Authority: Minnesota Quality Office		
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Comm	ents/Resolution					***************************************			
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W0#:1260251

CLIENT: PACE MPLS

sacelabs.com

Due Date: 02/10/16

Workorder: 10336704 Workorder Name: PS Beta - NIROP Owner Received Date: 1/25/2016 Results Requested By: \_z/8/2016

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Cooler Temperature on Receipt		2	JAN,	Transfers Rejeased By					PMW-04	PMW-03	Sample ID	Jennifer Anderson Pace Analytical Services, Inc. 1700 Elm Street, Suite 200 Minneapolis, MN 55414 Phone (612)607-1700 Fax (612)607-6444
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Custody Seal		2035	12 /	Reci					10336704002	10336704001	Labito	Pace Analytical Virgini 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042
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<sup>\*\*\*</sup>In order to maintain client confideritiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Page 1 of 1

### Pace Analytical®

hold, incorrect preservative, out of temp, incorrect containers)

### Document Name:

### Sample Condition Upon Receipt Form Document No.: F-VM-C-001-Rev.09

Document Revised: 23Feb2015 Page 1 of 1

Issuing Authority:

Pace Virginia, Minnesota Quality Office

Upon Receipt PACe	h 11 /			
	1911			WO#:1260251
Courier: Fed Ex UPS	USPS		- ]Client	
Commercial NPace	Othe	r;		
Tracking Number:				1260251
Custody Seal on Cooler/Box Present? Yes	□No		Intact?	Yes No Optional: Proj. Due Date: Proj. Name
Packing Material: DBubble Wrap DBubble	Bags []	None (	Other:_	Temp Blank? Yes
hermometer Used: 🕡 140792808	Type of	lce:	<b>∄</b> Wet ∣	Blue None (Samples on ice, cooling process has
Cooler Temp Read °C:	p Corrected Factor:	c. 1	Date an	Biological Tissue Frozen? Yes No d Initials of Person Examining Contents:  Comments: 1-26 1-27-1/
Chain of Custody Present?	ZÍYes	□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 Signature on COC?	Yes	ØΝο	N/A	4.
Samples Arrived within Hold Time?	ØYes	□No	□N/A	5.
Short Hold Time Analysis (<72 hr)?	□Yes	[Z]No	N/A	6.
Rush Turn Around Time Requested?	☐Yes	ØN₀	□N/A	7.
Sufficient Volume?	☑Yes	□No	□N/A	8.
Correct Containers Used?	[Z]Yes	□No	□n/a	9.
-Pace Containers Used?	✓Yes	□No	□N/A	
Containers Intact?	Yes	□No	□N/A	10.
Filtered Volume Received for Dissolved Tests?	Yes	□No	[]A\/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<b>□</b> rtes	□No	□N/A	12.
-Includes Date/Time/ID/Analysis Matrix:	Wit			
All containers needing acid/base preservation will be checked and documented in the pH logbook.	∕ZÍYes	□No	□n/a	See pH log for results and additional preservation
Headspace in Methyl Mercury Container	Yes	□No	ØN/A	13.
Headspace in VOA Vials ( >6mm)?	□Yes	□No	ØN/A	14.
Trip Blank Present?	□Yes	□No	[Z]N/A	15.
Trip Blank Custody Seals Present?	Yes	□No	ØN/A	
Pace Trip Blank Lot # (if purchased):		·	i	
LIENT NOTIFICATION/RESOLUTION				Field Data Required? Yes No
Person Contacted:			D	ate/Time:
Comments/Resolution:				
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## MO#:35226759



Chain of Custody

Workorder: 10336704

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Pace Analytical \*\*

1/25/2016 Results Requested By: 2/8/2016 Owner Received Date: Workorder Name: PS Beta -NIROP

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		, Inc.		ALCOHOL:		
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	14.645.44	derson tical Se treet, 3 , MN , MN )607-1		<u>0</u>	03	40
Report To		Jennifer Anderson Pace Analytical Services, Inc. 1700 Elm Street, Suite 200 Minneapolis, MN 55414 Phone (612)607-1700 Fax (612)607-6444		Sample ID	PMW-03	PMW-04
Reno		Jenn Pace 1700 Minne Phon Fax (			<b>7</b>	2

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	}		<b>\(\frac{1}{2}\)</b>	
Cooler Temperature on Receipt べ、 🖔 °C		Custody Seal (V) or N Rec	Received on Ice Oor N	Samples Infact Y or N
TAXES CONTRACTOR AND AND AND AND AND AND AND AND AND AND				

"In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.



### Document Name: Sample Condition Upon Receipt Form Document No.:

F-FL-C-007 rev. 07

Document Revised: December 28, 2015 Issuing Authority: Pace Florida Quality Office

### Sample Condition Upon Receipt Form (SCUR)

Project # Project Manager:
Client:

WO#: 35226759

ita PM:

Due Date: 02/02/16

CLIENT: PACMIN

Date and Initials of person examining contents: 1-27-10 1210

Label: Deliver: pH:

	pH:	
Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial		
Shinning Mathada Ci Circl Countries City	Pace Other Ground	
Billing: ☐ Recipient ☐ Sender ☐ Third Party ☐ Unkow	· ·	
Tracking # 7755 0449 8165	Cooler Size if Applicable:	
7,00 1,-11 0100		
Custody Seal on Cooler/Box Present:  yes  no Seals intact:  ves		
Desire the second secon	s no	
Packing Material: Bubble Wrap Bubble Bags None Other	Biological Tissue is Frozen: Yes No N/A	
Thermometer Used Type of Ice: Wet Blue None	Samples on ice, cooling process has begun	
Cooler #1 Temperature C 15.8 (Visual) -0.3 (Correction Factor) 15.	S_(Actual)	
Cooler #2 Temperature C (Visual) (Correction Factor)	(Actual)	
Cooler #3 Temperature C (Visual) (Correction Factor)	(Actual) Temp should be above freezing	
Cooler #4 Temperature C (Visual) (Correction Factor)	(Actual) to 6°C	
Cooler #5 Temperature C (Visual) (Correction Factor)	(Actual)	
Cooler #5 Temperature C(Visual)(Correction Factor)	(Actual)	
Chain of Custody Present Cives MA CINA		
Chair of Court is Tribute		
Pellosuiched Cienature C. Co., J. M. Co.		
Samples Arrived within Head T		
Push TAT required at 000		
Sufficient Volume		
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Programme Line & No Line & Technology	a was and Ashestas Both (	$\mathcal{H}$
Containous Industrial	MANDEY Glass thilders	숬》
Sample Labels match COC (sample IDs & date/time of		K.
ollection) □Yes □ No □N/A		:
necked.	. *	
ompliance with EPA recommendation		,
Exceptions: VOA, Coliform, TOC, O&G  NaOH pH>12  NaOH/ZnOAc pH>	<b>&gt;9</b>	
lo Headspace in VOA Vials ( >6mm): □Yes □ No □N/A		
rip Blank Present: □Yes □ No □N/A		
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Litolect wangdet Keklem:	Date: 117/b	



February 9, 2016

Pace Analytical Energy Services LLC 220 William Pitt Way Pittsburgh, PA 15238

> Phone: (412) 826-5245 Fax: (412) 826-3433

Jennifer Anderson Pace Analytical Services, Inc. 1700 Elm Street Suite 200 Minneapolis, MN 55414

RE: PS BETA - NIROP / 10336704

Pace Workorder:

18011

Dear Jennifer Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on Wednesday, January 27, 2016. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Rush Welds

Ruth Welsh

02/09/2016

Ruth.Welsh@pacelabs.com

Customer Service Representative

**Enclosures** 

As a valued client we would appreciate your comments on our service.

Please email info@microseeps.com.

Total Number of Pages \_\_\_\_

Report ID: 18011 - 762662

Page 1 of 11



### **CERTIFICATE OF ANALYSIS**



### LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor: Pennsylvania Department of Environmental Protection, Bureau of Laboratories

Accreditation ID: 02-00538

Scope: NELAP Non-Potable Water and Solid & Hazardous Waste

Accreditor: South Carolina Department of Health and Environmental Control, Office of Environmental

Laboratory Certification

Accreditation ID: 89009003

Scope: Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)

Accreditor: NELAP: New Jersey, Department of Environmental Protection

Accreditation ID: PA026

Non-Potable Water; Solid and Chemical Materials Scope:

Accreditor: NELAP: New York, Department of Health Wadsworth Center

Accreditation ID: 11815

Scope: Non-Potable Water; Solid and Hazardous Waste

State of Connecticut, Department of Public Health, Division of Environmental Health Accreditor:

Accreditation ID: PH-0263

Scope: Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)

Accreditor: NELAP: Texas, Commission on Environmental Quality

Accreditation ID: T104704453-09-TX Scope: Non-Potable Water

Accreditor: State of New Hampshire

Accreditation ID: 299409

Scope: Non-potable water

Accreditor: State of Georgia Accreditation ID: Chapter 391-3-26

As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is Scope:

accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

Report ID: 18011 - 762662

Page 2 of 11





Phone: (412) 826-5245

Fax: (412) 826-3433

### SAMPLE SUMMARY

Workorder: 18011 PS BETA - NIROP / 10336704

Lab ID	Sample ID	Matrix	Date Collected	Date Received
180110001	PMW-03	Water	1/25/2016 12:25	1/27/2016 11:30
180110002	PMW-04	Water	1/25/2016 11:05	1/27/2016 11:30

Report ID: 18011 - 762662

Page 3 of 11





> Phone: (412) 826-5245 Fax: (412) 826-3433

### PROJECT SUMMARY

Workorder: 18011 PS BETA - NIROP / 10336704

### Workorder Comments

The analysis for volatile fatty acids, method AM23G, was reported at dilution for samples 18011 (0001-0002) due to the measured chloride concentration within the sample; matrix interfering compound.

Report ID: 18011 - 762662



Page 4 of 11



Phone: (412) 826-5245

Fax: (412) 826-3433

### **ANALYTICAL RESULTS**

Workorder: 18011 PS BETA - NIROP / 10336704

Lab ID: Sample ID: 180110001

PMW-03

Date Received: 1/27/2016 11:30

Matrix:

Water

Date Collected: 1/25/2016 12:25

Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR Analysis Desc: AM23G	Analyti	cal Method; Al	M23G			
Lactic Acid	<2.0 mg/l	2.0	0.080 10	2/4/2016 13:06	KB	d
Acetic Acid	<1.0 mg/l	1.0	0.12 10	2/4/2016 13:06	KB	d,B
Propionic Acid	<1.0 mg/l	1.0	0.060 10	2/4/2016 13:06	KB	d
Formic Acid	<1.0 mg/l	1.0	0.070 10	2/4/2016 13:06	KB	d,B
Butyric Acid	<1.0 mg/l	1.0	0.10 10	2/4/2016 13:06	KB	ď
Pyruvic Acid	<1.0 mg/l	1.0	0.15 10	2/4/2016 13:06	KB	d
I-Pentanoic Acid	<1.0 mg/l	1.0	0.070 10	2/4/2016 13:06	KB	d
Pentanoic Acid	<1.0 mg/l	1.0	0.12 10	2/4/2016 13:06	KB	d
I-Hexanoic Acid	<2.0 mg/l	2.0	0.14 10	2/4/2016 13:06	KB	đ
Hexanoic Acid	<2.0 mg/l	2.0	0.070 10	2/4/2016 13:06	KB	d

Report ID: 18011 - 762662

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> Phone: (412) 826-5245 Fax: (412) 826-3433

### **ANALYTICAL RESULTS**

Workorder: 18011 PS BETA - NIROP / 10336704

Lab ID:

180110002

PMW-04 Sample ID:

Date Received: 1/27/2016 11:30

Matrix:

Water

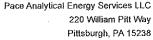
Date Collected: 1/25/2016 11:05

		•				•
Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR		I & 4 - ci- , - J- & I	1000		a maj en	
Analysis Desc: AM23G	Anaiyti	cal Method: Al	VI23G			
Lactic Acid	<2.0 mg/l	2.0	0.080 10	2/4/2016 13:59	KB	d
Acetic Acid	<1.0 mg/l	1.0	0.12 10	2/4/2016 13:59	KB	d,B
Propionic Acid	<1.0 mg/i	1.0	0.060 10	2/4/2016 13:59	KB	ď
Formic Acid	<1.0 mg/l	1.0	0.070 10	2/4/2016 13:59	KΒ	d,B
Butyric Acid	<1.0 mg/l	1.0	0.10 10	2/4/2016 13:59	KB	ď
Pyruvic Acid	<1.0 mg/l	1.0	0.15 10	2/4/2016 13:59	KB	d
i-Pentanoic Acid	<1.0 mg/l	1.0	0.070 10	2/4/2016 13:59	KB	d
Pentanoic Acid	<1.0 mg/i	1.0	0.12 10	2/4/2016 13:59	KB	d
i-Hexanoic Acid	<2.0 mg/l	2.0	0.14 10	2/4/2016 13:59	KB	đ
Hexanoic Acid	<2.0 mg/i	2.0	0.070 10	2/4/2016 13:59	ΚB	ď

Report ID: 18011 - 762662

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Phone: (412) 826-5245 Fax: (412) 826-3433



### ANALYTICAL RESULTS QUALIFIERS

Workorder: 18011 PS BETA - NIROP / 10336704

### **DEFINITIONS/QUALIFIERS**

Disclaimer: The Pennsylvania Department of Environmental Protection (PADEP) has decided to no longer recognize analyses that do not

produce data for primary compliance, for NELAP accreditation. The methods affected by this decision are AM20GAx, AM21G, SW846 7199 and AM4.02. The laboratory shall continue to administer the NELAP/TNI standard requirements in the performance

of these methods.

MDL Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.

PQL Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.

ND Not detected at or above reporting limit.

DF Dilution Factor.

S Surrogate.

RPD Relative Percent Difference.

% Rec Percent Recovery.

U Indicates the compound was analyzed for, but not detected at or above the noted concentration.

J Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

B The analyte was detected in the associated blank.

d The analyte concentration was determined from a dilution.

Report ID: 18011 - 762662





### QUALITY CONTROL DATA

Workorder: 18011 PS BETA - NIROP / 10336704

QĆ Batch:

EDON/2790

Analysis Method:

AM23G

QC Batch Method:

AM23G

Associated Lab Samples:

180110001, 180110002

METHOD BLANK: 40014	
	ŀ

Parameter	Units	Blank Result	Reporting Limit Qualifiers	
EDonors				
Lactic Acid	mg/l	< 0.20	0.20	
Acetic Acid	mg/l	<0.10	0.10 B	
Propionic Acid	mg/l	< 0.10	0.10	
Formic Acid	mg/l	< 0.10	0.10 B	
Butyric Acid	mg/l	< 0.10	0.10	
Pyruvic Acid	mg/l	<0.10	0.10	
i-Pentanoic Acid	mg/l	<0.10	0.10	
Pentanoic Acid	mg/l	< 0.10	0.10	
i-Hexanoic Acid	mg/l	<0.20	0.20	
Hexanolc Acid	mg/l	< 0.20	0.20	

### LABORATORY CONTROL SAMPLE: 40015

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EDonors						
Lactic Acid	mg/l	2	1.9	94	70-130	
Acetic Acid	mg/l	2	2.0	102	70-130	В
Propionic Acid	mg/l	2	2.0	100	70-130	
Formic Acid	mg/l	2	1.7	87	70-130	В
Butyric Acid	mg/l	2	1.9	97	70-130	
Pyruvic Acid	mg/l	2	1.9	97	70-130	
i-Pentanoic Acid	mg/l	2	1.9	95	70-130	
Pentanoic Acid	mg/l	2	2.0	100	70-130	
I-Hexanoic Acid	mg/l	2	1.9	96	70-130	
Hexanoic Acid	mg/l	2	1.7	85	70-130	

MATRIX SPIKE & M	ATRIX SPIKE DUPLIC	ATE: 40016		40017		Original:	18016000	)1			
Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
EDonors Lactic Acid	mg/l	0.071	20	18	19	89	94	70-130	5.5	30	d

Report ID: 18011 - 762662

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Phone: (412) 826-5245

Fax: (412) 826-3433

### **QUALITY CONTROL DATA**

Workorder: 18011 PS BETA - NIROP / 10336704

MATRIX SPIKE & MAT	RIX SPIKE DUPLI	CATE: 40016		40017		Original:	18016000	)1			
Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Acetic Acid	mg/l	0.55	20	21	21	102	104	70-130	1.9	30	d,B
Propionic Acid	mg/l	0.061	20	21	21	103	104	70-130	0.97	30	d
Formic Acid	mg/l	0.18	20	17	18	86	90	70-130	4.5	30	đ,B
Butyric Acid	mg/l	0.12	20	21	21	102	102	70-130	0	30	d
Pyruvic Acid	mg/l	0	20	19	20	95	99	70-130	4.1	30	d
i-Pentanoic Acid	mg/l	0	20	21	20	104	103	70-130	0.97	30	d
Pentanoic Acid	mg/l	0	20	22	22	113	109	70-130	3.6	30	d
i-Hexanoic Acid	mg/l	0	20	24	23	118	117	70-130	0.85	30	d
Hexanoic Acid	mg/l	0	20	24	23	119	114	70-130	4.3	30	đ

Report ID: 18011 - 762662

nelac:

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Phone: (412) 826-5245

Fax: (412) 826-3433

### **QUALITY CONTROL DATA QUALIFIERS**

Workorder: 18011 PS BETA - NIROP / 10336704

### QUALITY CONTROL PARAMETER QUALIFIERS

- B The analyte was detected in the associated blank.
- d The analyte concentration was determined from a dilution.

Report ID: 18011 - 762662



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Phone: (412) 826-5245

Fax: (412) 826-3433

### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 18011 PS BETA - NIROP / 10336704

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
180110001	PMW-03			AM23G	EDON/2790
180110002	PMW-04			AM23G	EDON/2790

Report ID: 18011 - 762662



Page 11 of 11

### Chain of Custody

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Workorder: 10336704	Workorder Name:	PS Beta -NIROP	Results Requested	2/8/2016	
Report / Invoice To	Subco	Subcontract To	Requested Analys	d Analysis	

8801KOIC	PROFROIGET: 10000/04 PROFR	workorder Name:	TO DOIS -NIXOT	Ĉ		Xes	Results Requested 2	2/8/2016	
Report / Invoice To	voice To	Subcontract To	tract To				Requested Analysis	lnalysis	
Jennifer Anderson Pace Analytical M	Jennifer Anderson Pace Analytical Minnesota	Pod Energy/Nonserps	/ Microsecps	P.O. 1	P.O. 1030107014		,		
3/00 Elm Street Suite 200 Minneapolis MN	1/00 Elm Street Suite 200 Minneapolis MN 55414					ads.			
Phone (6: Email: jer	Minneapolis, MN 55414 Phone (612)607-1700 Email: jennifer.anderson@pacelabs.com					Hy Ac			
					Preserved Containers				
		Collect			eserved	olah)			,
ltem Sa	Sample ID	Date/Time		Matrix	Unpre	Ve			LAB USE ONLY
1 PN	PMW-03	1/25/2016 12:25	10336704001	Water	<i>b</i>	×			
2 PN	PMW-04	1/25/2016 11:05	10336704002	Water	L <sub>i</sub>	×			
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4									
Cī									
	が まだい かんかん かんぱん はいかん ないない ないない							Comments	The Control of the State of the second
Transfers	Released By	Date/Time	ne Received By	l By		Date/Time			
_	1201 PM	27115141		KSV	でなべ	1-27.16	のなつ		
22		, ,	V = 2	(			()		
3				)			)	\	,
Cooler T	Cooler Temperature on Receipt	7°°C	Custody Seal ( Y or	Y or N	Rece	Received on Ice	YOTN	Samples Infact Y or	Y or N
			,	(		_		•	

<sup>\*\*\*</sup>In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Page 1 of 1

	PO Ratio =		1	ab W	ork Order: [80]
	Name: <u>Pace - MN</u> Project: <u>PS Beta -</u> N i R	OP			
Δ.,	Shipping/Container Information (circle appropriate response)		٠		
	Courier: FedEx UPS USPS Client Other:	_ Air	bill Pr	esent(	Yes).No
	Tracking Number: 6484 8695 4436		~		•
	Custody Seal on Cooler/Box Present: Yes No Seals II	ಗರ್ದ:(	Ye)	No	·
	Cooler/Box Packing Material: Bubble Wrap Absorbent Fo	ពាទប	Other		· .
	Type of Ice: (New Blue None Ice Intact: (Yes) Malt	,	)		
	Cooler Temperature: 50 Radiation Screened: Yes	(No	) Chi	sin of (	Custody Present (Ye) No
	Commen.s:				
В.	Laboratory Assignment/Log-in (check appropriate response)				· · · · · · · · · · · · · · · · · · ·
		YES	NO	N/A	Comment Reference non Conformance
	Chain of Custody properly filled out	V			
	Chain of Custody relinquished	<u></u>			
	Sampler Name & Signature on COC		<u></u>		
	Containers intact	V		<u> </u>	
	Were samples in separate bags		/	<u> </u>	
•	Sample container labels match COC				· · · · · · · · · · · · · · · · · · ·
	Sample name/date and time collected Sufficient volume provided		1		
	PAES containers used		<del>}</del>	<u>,</u>	
	Are containers properly preserved for the requested testing?			<u> </u>	
	(as labeled)  If an unknown preservation state, were containers checked?				If yes, see pH form.
	Exception: VDA's colliform  Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			i	
	Comments:				
	Cooler contents examined/red	ceived	ьу:	L	9 Date: 1. 27.16
	Cooler contents examined, or		,	0.5	9 Date: 1. 27.16 Date: 1-28-11p
	Project M≥nage	er Kevi	≘₩ ( <u> </u>	FA.V	, 08th. 1 (00) 101





February 11, 2016

Melinda Pham Regenesis 1011 Calle Sombra San Clemente, CA 92673

RE: Project: PS Beta-NIROP Pace Project No.: 10337912

### Dear Melinda Pham:

Enclosed are the analytical results for sample(s) received by the laboratory on February 08, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI 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.

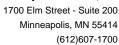
Sincerely,

Jennifer Anderson jennifer.anderson@pacelabs.com Project Manager

Enclosures

cc: Ryan Moore, Regenesis







### **CERTIFICATIONS**

Project: PS Beta-NIROP
Pace Project No.: 10337912

### **Minnesota Certification IDs**

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

525 N 8th Street, Salina, KS 67401 A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770 Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA Colorado Certification #Pace Connecticut Certification #: PH-0256 EPA Region 8 Certification #: 8TMS-L

Florida/NELAP Certification #: E87605 Guam Certification #:14-008r Georgia Certification #: 959 Georgia EPD #: Pace Idaho Certification #: MN00064

Idaho Certification #: MN00064 Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01 Iowa Certification #: 368 Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062 Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001 Maine Certification #: 2013011 Maryland Certification #: 322 Michigan DEPH Certification #: 9909 Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN\_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647

North Carolina Certification #: 530
North Carolina State Public Health #: 27700

North Dakota Certification #: R-036 Ohio EPA #: 4150

Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563

Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382

West Virginia DHHR #:9952C Wisconsin Certification #: 999407970





### **SAMPLE SUMMARY**

Project: PS Beta-NIROP
Pace Project No.: 10337912

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
10337912001	PMW-03	Water	02/08/16 10:30	02/08/16 11:13	
10337912002	PMW-04	Water	02/08/16 09:00	02/08/16 11:13	
10337912003	TRIP BLANK	Water	02/08/16 07:00	02/08/16 11:13	

1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700



### **SAMPLE ANALYTE COUNT**

Project: PS Beta-NIROP
Pace Project No.: 10337912

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10337912001	PMW-03	EPA 8260B	AH2	70
10337912002	PMW-04	EPA 8260B	AH2	70
10337912003	TRIP BLANK	EPA 8260B	AH2	70



Date: 02/11/2016 06:39 PM

### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Page Project No: 10337912

Sample: PMW-03	Lab ID: 103	37912001	Collected: 02/08/1	6 10:30	Received: 02/08/16 11:13	Matrix: Water
Parameters	Results	Units	Report Limit	DF	Prepared Analyze	d CAS No. Qu
8260B VOC	Analytical Meth	nod: EPA 82	260B			
Acetone	ND	ug/L	20.0	1	02/11/16 0	):08 67-64-1
Allyl chloride	ND	ug/L	4.0	1	02/11/16 0	):08 107-05-1
Benzene	ND	ug/L	1.0	1	02/11/16 0	):08 71-43-2
Bromobenzene	ND	ug/L	1.0	1	02/11/16 0	):08 108-86-1
Bromochloromethane	ND	ug/L	1.0	1	02/11/16 0	):08 74-97-5
Bromodichloromethane	ND	ug/L	1.0	1	02/11/16 0	):08 75-27-4
Bromoform	ND	ug/L	4.0	1	02/11/16 0	):08 75-25-2
Bromomethane	ND	ug/L	4.0	1	02/11/16 0	):08 74-83-9
2-Butanone (MEK)	ND	ug/L	5.0	1	02/11/16 0	):08 78-93-3
n-Butylbenzene	ND	ug/L	1.0	1	02/11/16 0	):08 104-51-8
sec-Butylbenzene	ND	ug/L	1.0	1	02/11/16 0	):08 135-98-8
ert-Butylbenzene	ND	ug/L	1.0	1		):08 98-06-6
Carbon tetrachloride	ND	ug/L	1.0	1		):08 56-23-5
Chlorobenzene	ND	ug/L	1.0	1		0:08 108-90-7
Chloroethane	ND	ug/L	1.0	1		):08 75-00-3
Chloroform	ND	ug/L	1.0	1		0:08 67-66-3
Chloromethane	ND	ug/L	4.0	1		):08 74-87-3
2-Chlorotoluene	ND	ug/L	1.0	1		):08 95-49-8
I-Chlorotoluene	ND	ug/L	1.0	1		):08 106-43-4
,2-Dibromo-3-chloropropane	ND ND	ug/L	4.0	1		):08 96-12-8
Dibromochloromethane	ND ND	-	1.0	1		):08 124-48-1
	ND ND	ug/L	1.0	1		):08
,2-Dibromoethane (EDB)		ug/L		1		
Dibromomethane	ND	ug/L	4.0			0:08 74-95-3
,2-Dichlorobenzene	ND	ug/L	1.0	1		0:08 95-50-1
I,3-Dichlorobenzene	ND	ug/L	1.0	1		):08 541-73-1
,4-Dichlorobenzene	ND	ug/L	1.0	1		0:08 106-46-7
Dichlorodifluoromethane	ND	ug/L	1.0	1		):08 75-71-8
I,1-Dichloroethane	3.7	ug/L	1.0	1		):08 75-34-3
,2-Dichloroethane	ND	ug/L	1.0	1		0:08 107-06-2
,1-Dichloroethene	1.5	ug/L	1.0	1		):08 75-35-4
cis-1,2-Dichloroethene	57.6	ug/L	1.0	1		):08 156-59-2
rans-1,2-Dichloroethene	97.6	ug/L	1.0	1		):08 156-60-5
Dichlorofluoromethane	ND	ug/L	1.0	1		):08 75-43-4
,2-Dichloropropane	ND	ug/L	4.0	1	02/11/16 0	):08 78-87-5
,3-Dichloropropane	ND	ug/L	1.0	1	02/11/16 0	):08 142-28-9
2,2-Dichloropropane	ND	ug/L	4.0	1	02/11/16 0	):08 594-20-7
,1-Dichloropropene	ND	ug/L	1.0	1	02/11/16 0	):08 563-58-6
sis-1,3-Dichloropropene	ND	ug/L	4.0	1	02/11/16 0	0:08 10061-01-5
rans-1,3-Dichloropropene	ND	ug/L	4.0	1	02/11/16 0	):08 10061-02-6
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1	02/11/16 0	):08 60-29-7
Ethylbenzene	ND	ug/L	1.0	1	02/11/16 0	):08 100-41-4
Hexachloro-1,3-butadiene	ND	ug/L	2.0	1	02/11/16 0	):08 87-68-3
sopropylbenzene (Cumene)	ND	ug/L	1.0	1	02/11/16 0	):08 98-82-8
o-Isopropyltoluene	ND	ug/L	1.0	1	02/11/16 0	):08 99-87-6
Methylene Chloride	ND	ug/L	4.0	1		):08 75-09-2
1-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		0:08 108-10-1
Methyl-tert-butyl ether	ND	ug/L	1.0	1		0:08 1634-04-4





### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10337912

Date: 02/11/2016 06:39 PM

Sample: PMW-03	Lab ID: 103	37912001	Collected: 02/08/1	6 10:30	Received: 02/08/16 11:13	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B				
Naphthalene	ND	ug/L	4.0	1	02/11/16 00:0	8 91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1	02/11/16 00:0	8 103-65-1	
Styrene	ND	ug/L	1.0	1	02/11/16 00:0	8 100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1	02/11/16 00:0	08 630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1	02/11/16 00:0	8 79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1	02/11/16 00:0	8 127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1	02/11/16 00:0	8 109-99-9	
Toluene	ND	ug/L	1.0	1	02/11/16 00:0	8 108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1	02/11/16 00:0	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1	02/11/16 00:0	8 120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1	02/11/16 00:0	8 71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1	02/11/16 00:0	8 79-00-5	
Trichloroethene	12.9	ug/L	0.40	1	02/11/16 00:0	8 79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1	02/11/16 00:0	8 75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1	02/11/16 00:0	8 96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1	02/11/16 00:0	8 76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1	02/11/16 00:0	8 95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1	02/11/16 00:0	8 108-67-8	
Vinyl chloride	1.2	ug/L	0.40	1	02/11/16 00:0	8 75-01-4	
Xylene (Total)	ND	ug/L	3.0	1	02/11/16 00:0	8 1330-20-7	
Surrogates							
1,2-Dichloroethane-d4 (S)	97	%.	75-125	1	02/11/16 00:0	8 17060-07-0	
Toluene-d8 (S)	104	%.	75-125	1	02/11/16 00:0	08 2037-26-5	
4-Bromofluorobenzene (S)	102	%.	75-125	1	02/11/16 00:0	8 460-00-4	



Date: 02/11/2016 06:39 PM

### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10337912

Sample: PMW-04	Lab ID: 103	37912002	Collected: 02/08/1	6 09:00	Received:	02/08/16 11:13	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		02/11/16 00:3	5 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		02/11/16 00:3	5 107-05-1	
Benzene	ND	ug/L	1.0	1		02/11/16 00:3	5 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		02/11/16 00:3	5 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		02/11/16 00:3	5 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/11/16 00:3	5 75-27-4	
Bromoform	ND	ug/L	4.0	1		02/11/16 00:3	5 75-25-2	
Bromomethane	ND	ug/L	4.0	1		02/11/16 00:3	5 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/11/16 00:3	5 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		02/11/16 00:3		
sec-Butylbenzene	ND	ug/L	1.0	1		02/11/16 00:3	5 135-98-8	
ert-Butylbenzene	ND	ug/L	1.0	1		02/11/16 00:3		
Carbon tetrachloride	ND	ug/L	1.0	1		02/11/16 00:3		
Chlorobenzene	ND	ug/L	1.0	1		02/11/16 00:3		
Chloroethane	ND	ug/L	1.0	1		02/11/16 00:3		
Chloroform	ND	ug/L	1.0	1		02/11/16 00:3		
Chloromethane	ND	ug/L	4.0	1		02/11/16 00:3		
2-Chlorotoluene	ND	ug/L	1.0	1		02/11/16 00:3		
4-Chlorotoluene	ND	ug/L	1.0	1		02/11/16 00:3		
1,2-Dibromo-3-chloropropane	ND ND	ug/L ug/L	4.0	1		02/11/16 00:3		
Dibromochloromethane	ND ND	-	1.0	1		02/11/16 00:3		
	ND ND	ug/L	1.0	1		02/11/16 00:3		
1,2-Dibromoethane (EDB)		ug/L						
Dibromomethane	ND	ug/L	4.0	1		02/11/16 00:3		
,2-Dichlorobenzene	ND	ug/L	1.0	1		02/11/16 00:3		
I,3-Dichlorobenzene	ND	ug/L	1.0	1		02/11/16 00:3		
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/11/16 00:3		
Dichlorodifluoromethane	ND	ug/L	1.0	1		02/11/16 00:3		
1,1-Dichloroethane	1.2	ug/L	1.0	1		02/11/16 00:3		
1,2-Dichloroethane	ND	ug/L	1.0	1		02/11/16 00:3		
1,1-Dichloroethene	ND	ug/L	1.0	1		02/11/16 00:3		
cis-1,2-Dichloroethene	23.8	ug/L	1.0	1		02/11/16 00:3		
rans-1,2-Dichloroethene	60.4	ug/L	1.0	1		02/11/16 00:3		
Dichlorofluoromethane	ND	ug/L	1.0	1		02/11/16 00:3		
1,2-Dichloropropane	ND	ug/L	4.0	1		02/11/16 00:3	5 78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		02/11/16 00:3	5 142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		02/11/16 00:3	5 594-20-7	
,1-Dichloropropene	ND	ug/L	1.0	1		02/11/16 00:3	5 563-58-6	
sis-1,3-Dichloropropene	ND	ug/L	4.0	1		02/11/16 00:3	5 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1		02/11/16 00:3	5 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		02/11/16 00:3	5 60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		02/11/16 00:3		
Hexachloro-1,3-butadiene	ND	ug/L	2.0	1		02/11/16 00:3	5 87-68-3	
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		02/11/16 00:3		
o-Isopropyltoluene	ND	ug/L	1.0	1		02/11/16 00:3		
Methylene Chloride	ND	ug/L	4.0	1		02/11/16 00:3		
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/11/16 00:3		
Methyl-tert-butyl ether	ND	ug/L	1.0	1		02/11/16 00:3		

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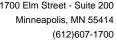


### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10337912

Date: 02/11/2016 06:39 PM

Sample: PMW-04	Lab ID: 103	37912002	Collected: 02/08/1	6 09:00	Received: 02	2/08/16 11:13 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		02/11/16 00:35	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		02/11/16 00:35	103-65-1	
Styrene	ND	ug/L	1.0	1		02/11/16 00:35	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/11/16 00:35	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/11/16 00:35	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/11/16 00:35	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		02/11/16 00:35	109-99-9	
Toluene	ND	ug/L	1.0	1		02/11/16 00:35	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		02/11/16 00:35	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		02/11/16 00:35	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/11/16 00:35	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/11/16 00:35	79-00-5	
Trichloroethene	21.6	ug/L	0.40	1		02/11/16 00:35	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/11/16 00:35	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		02/11/16 00:35	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		02/11/16 00:35	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		02/11/16 00:35	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		02/11/16 00:35	108-67-8	
Vinyl chloride	0.40	ug/L	0.40	1		02/11/16 00:35	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		02/11/16 00:35	1330-20-7	
Surrogates		-						
1,2-Dichloroethane-d4 (S)	97	%.	75-125	1		02/11/16 00:35	17060-07-0	
Toluene-d8 (S)	104	%.	75-125	1		02/11/16 00:35	2037-26-5	
4-Bromofluorobenzene (S)	105	%.	75-125	1		02/11/16 00:35	460-00-4	





### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10337912

Date: 02/11/2016 06:39 PM

Sample: TRIP BLANK	Lab ID: 103	37912003	Collected: 02/08/1	6 07:00	Received:	02/08/16 11:13	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		02/10/16 20:3	5 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		02/10/16 20:3	5 107-05-1	
Benzene	ND	ug/L	1.0	1		02/10/16 20:3	5 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		02/10/16 20:3	5 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		02/10/16 20:3	5 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/10/16 20:3	5 75-27-4	
Bromoform	ND	ug/L	4.0	1		02/10/16 20:3	5 75-25-2	
Bromomethane	ND	ug/L	4.0	1		02/10/16 20:3	5 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/10/16 20:3	5 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		02/10/16 20:3	5 104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		02/10/16 20:3	5 135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		02/10/16 20:3	5 98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		02/10/16 20:3	5 56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/10/16 20:3	5 108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/10/16 20:3		
Chloroform	ND	ug/L	1.0	1		02/10/16 20:3		
Chloromethane	ND	ug/L	4.0	1		02/10/16 20:3		
2-Chlorotoluene	ND	ug/L	1.0	1		02/10/16 20:3		
4-Chlorotoluene	ND	ug/L	1.0	1		02/10/16 20:3		
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		02/10/16 20:3		
Dibromochloromethane	ND	ug/L	1.0	1		02/10/16 20:3		
1,2-Dibromoethane (EDB)	ND ND	ug/L	1.0	1		02/10/16 20:3		
Dibromomethane	ND ND	ug/L	4.0	1		02/10/16 20:3		
1,2-Dichlorobenzene	ND ND	ug/L	1.0	1		02/10/16 20:3		
1,3-Dichlorobenzene	ND ND	ug/L	1.0	1		02/10/16 20:3		
1,4-Dichlorobenzene	ND ND	ug/L	1.0	1		02/10/16 20:3		
Dichlorodifluoromethane	ND ND	ug/L ug/L	1.0	1		02/10/16 20:3		
1,1-Dichloroethane	ND ND	•	1.0	1		02/10/16 20:3		
1,2-Dichloroethane	ND ND	ug/L	1.0	1		02/10/16 20:3		
,		ug/L		1				
1,1-Dichloroethene	ND	ug/L	1.0			02/10/16 20:3		
cis-1,2-Dichloroethene	ND	ug/L	1.0	1 1		02/10/16 20:3 02/10/16 20:3		
trans-1,2-Dichloroethene	ND	ug/L	1.0					
Dichlorofluoromethane	ND	ug/L	1.0	1		02/10/16 20:3		
1,2-Dichloropropane	ND	ug/L	4.0	1		02/10/16 20:3		
1,3-Dichloropropane	ND	ug/L	1.0	1		02/10/16 20:3		
2,2-Dichloropropane	ND	ug/L	4.0	1		02/10/16 20:3		
1,1-Dichloropropene	ND	ug/L	1.0	1		02/10/16 20:3		
cis-1,3-Dichloropropene	ND	ug/L	4.0	1			5 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1			5 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		02/10/16 20:3		
Ethylbenzene	ND	ug/L	1.0	1		02/10/16 20:3		
Hexachloro-1,3-butadiene	ND	ug/L	2.0	1		02/10/16 20:3		
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		02/10/16 20:3		
o-Isopropyltoluene	ND	ug/L	1.0	1		02/10/16 20:3		
Methylene Chloride	ND	ug/L	4.0	1		02/10/16 20:3	5 75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/10/16 20:3	5 108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		02/10/16 20:3	5 1634-04-4	

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### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10337912

Sample: TRIP BLANK	Lab ID: 103	37912003	Collected: 02/08/1	16 07:00	Received: 02/0	08/16 11:13 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1	(	02/10/16 20:35	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1	(	02/10/16 20:35	103-65-1	
Styrene	ND	ug/L	1.0	1	(	02/10/16 20:35	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1	(	02/10/16 20:35	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1	(	02/10/16 20:35	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1	(	02/10/16 20:35	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1	(	02/10/16 20:35	109-99-9	
Toluene	ND	ug/L	1.0	1	(	02/10/16 20:35	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1	(	02/10/16 20:35	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1	(	02/10/16 20:35	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1	(	02/10/16 20:35	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1	(	02/10/16 20:35	79-00-5	
Trichloroethene	ND	ug/L	0.40	1	(	02/10/16 20:35	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1	(	02/10/16 20:35	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1	(	02/10/16 20:35	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1	(	02/10/16 20:35	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1	(	02/10/16 20:35	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1	(	02/10/16 20:35	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1	(	02/10/16 20:35	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1	(	02/10/16 20:35	1330-20-7	
Surrogates		•						
1,2-Dichloroethane-d4 (S)	101	%.	75-125	1	(	02/10/16 20:35	17060-07-0	
Toluene-d8 (S)	105	%.	75-125	1	(	02/10/16 20:35	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	75-125	1	(	02/10/16 20:35	460-00-4	



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10337912

QC Batch: MSV/34593

Analysis Method: EPA 8260B QC Batch Method: EPA 8260B Analysis Description: 8260B MSV 465 W

Associated Lab Samples: 10337912001, 10337912002, 10337912003

METHOD BLANK: 2190025 Matrix: Water

Associated Lab Samples: 10337912001, 10337912002, 10337912003

	,	Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	02/10/16 20:08	
1,1,1-Trichloroethane	ug/L	ND	1.0	02/10/16 20:08	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	02/10/16 20:08	
1,1,2-Trichloroethane	ug/L	ND	1.0	02/10/16 20:08	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	02/10/16 20:08	
1,1-Dichloroethane	ug/L	ND	1.0	02/10/16 20:08	
1,1-Dichloroethene	ug/L	ND	1.0	02/10/16 20:08	
1,1-Dichloropropene	ug/L	ND	1.0	02/10/16 20:08	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	02/10/16 20:08	
1,2,3-Trichloropropane	ug/L	ND	4.0	02/10/16 20:08	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	02/10/16 20:08	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	02/10/16 20:08	
1,2-Dibromo-3-chloropropane	ug/L	ND	4.0	02/10/16 20:08	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	02/10/16 20:08	
1,2-Dichlorobenzene	ug/L	ND	1.0	02/10/16 20:08	
1,2-Dichloroethane	ug/L	ND	1.0	02/10/16 20:08	
1,2-Dichloropropane	ug/L	ND	4.0	02/10/16 20:08	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	02/10/16 20:08	
1,3-Dichlorobenzene	ug/L	ND	1.0	02/10/16 20:08	
1,3-Dichloropropane	ug/L	ND	1.0	02/10/16 20:08	
1,4-Dichlorobenzene	ug/L	ND	1.0	02/10/16 20:08	
2,2-Dichloropropane	ug/L	ND	4.0	02/10/16 20:08	
2-Butanone (MEK)	ug/L	ND	5.0	02/10/16 20:08	
2-Chlorotoluene	ug/L	ND	1.0	02/10/16 20:08	
4-Chlorotoluene	ug/L	ND	1.0	02/10/16 20:08	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	02/10/16 20:08	
Acetone	ug/L	ND	20.0	02/10/16 20:08	
Allyl chloride	ug/L	ND	4.0	02/10/16 20:08	
Benzene	ug/L	ND	1.0	02/10/16 20:08	
Bromobenzene	ug/L	ND	1.0	02/10/16 20:08	
Bromochloromethane	ug/L	ND	1.0	02/10/16 20:08	
Bromodichloromethane	ug/L	ND	1.0	02/10/16 20:08	
Bromoform	ug/L	ND	4.0	02/10/16 20:08	
Bromomethane	ug/L	ND	4.0	02/10/16 20:08	
Carbon tetrachloride	ug/L	ND	1.0	02/10/16 20:08	
Chlorobenzene	ug/L	ND	1.0	02/10/16 20:08	
Chloroethane	ug/L	ND	1.0	02/10/16 20:08	
Chloroform	ug/L	ND	1.0	02/10/16 20:08	
Chloromethane	ug/L	ND	4.0	02/10/16 20:08	
cis-1,2-Dichloroethene	ug/L	ND	1.0	02/10/16 20:08	
cis-1,3-Dichloropropene	ug/L	ND	4.0	02/10/16 20:08	

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### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10337912

METHOD BLANK: 2190025 Matrix: Water

Associated Lab Samples: 10337912001, 10337912002, 10337912003

,	,	Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/L	ND	1.0	02/10/16 20:08	
Dibromomethane	ug/L	ND	4.0	02/10/16 20:08	
Dichlorodifluoromethane	ug/L	ND	1.0	02/10/16 20:08	
Dichlorofluoromethane	ug/L	ND	1.0	02/10/16 20:08	
Diethyl ether (Ethyl ether)	ug/L	ND	4.0	02/10/16 20:08	
Ethylbenzene	ug/L	ND	1.0	02/10/16 20:08	
Hexachloro-1,3-butadiene	ug/L	ND	2.0	02/10/16 20:08	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	02/10/16 20:08	
Methyl-tert-butyl ether	ug/L	ND	1.0	02/10/16 20:08	
Methylene Chloride	ug/L	ND	4.0	02/10/16 20:08	
n-Butylbenzene	ug/L	ND	1.0	02/10/16 20:08	
n-Propylbenzene	ug/L	ND	1.0	02/10/16 20:08	
Naphthalene	ug/L	ND	4.0	02/10/16 20:08	
p-Isopropyltoluene	ug/L	ND	1.0	02/10/16 20:08	
sec-Butylbenzene	ug/L	ND	1.0	02/10/16 20:08	
Styrene	ug/L	ND	1.0	02/10/16 20:08	
tert-Butylbenzene	ug/L	ND	1.0	02/10/16 20:08	
Tetrachloroethene	ug/L	ND	1.0	02/10/16 20:08	
Tetrahydrofuran	ug/L	ND	10.0	02/10/16 20:08	
Toluene	ug/L	ND	1.0	02/10/16 20:08	
trans-1,2-Dichloroethene	ug/L	ND	1.0	02/10/16 20:08	
trans-1,3-Dichloropropene	ug/L	ND	4.0	02/10/16 20:08	
Trichloroethene	ug/L	ND	0.40	02/10/16 20:08	
Trichlorofluoromethane	ug/L	ND	1.0	02/10/16 20:08	
Vinyl chloride	ug/L	ND	0.40	02/10/16 20:08	
Xylene (Total)	ug/L	ND	3.0	02/10/16 20:08	
1,2-Dichloroethane-d4 (S)	%.	103	75-125	02/10/16 20:08	
4-Bromofluorobenzene (S)	%.	107	75-125	02/10/16 20:08	
Toluene-d8 (S)	%.	102	75-125	02/10/16 20:08	

LABORATORY CONTROL SAMPLE:	2190026					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.3	102	75-125	
1,1,1-Trichloroethane	ug/L	20	20.0	100	73-125	
1,1,2,2-Tetrachloroethane	ug/L	20	19.3	96	75-128	
1,1,2-Trichloroethane	ug/L	20	19.2	96	75-129	
1,1,2-Trichlorotrifluoroethane	ug/L	20	20.9	105	69-125	
1,1-Dichloroethane	ug/L	20	19.2	96	75-131	
1,1-Dichloroethene	ug/L	20	20.4	102	72-125	
1,1-Dichloropropene	ug/L	20	20.4	102	74-125	
1,2,3-Trichlorobenzene	ug/L	20	21.6	108	68-127	
1,2,3-Trichloropropane	ug/L	20	18.2	91	75-125	
1,2,4-Trichlorobenzene	ug/L	20	22.2	111	70-125	

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### **REPORT OF LABORATORY ANALYSIS**

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### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10337912

LABORATORY CONTROL SAMPLE:	2190026	Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L		23.4	117	75-130	
1,2-Dibromo-3-chloropropane	ug/L	50	50.1	100	74-125	
I,2-Dibromoethane (EDB)	ug/L	20	19.8	99	75-125	
,2-Dichlorobenzene	ug/L	20	21.2	106	75-125	
,2-Dichloroethane	ug/L	20	19.7	98	72-129	
,2-Dichloropropane	ug/L	20	19.4	97	71-129	
1,3,5-Trimethylbenzene	ug/L	20	23.5	118	75-127	
,3-Dichlorobenzene	ug/L	20	21.3	106	75-125	
,3-Dichloropropane	ug/L	20	18.4	92	75-125	
,4-Dichlorobenzene	ug/L	20	19.1	96	75-125	
,,2-Dichloropropane	ug/L	20	22.8	114	71-125	
-Butanone (MEK)	ug/L	100	100	100	58-150	
-Chlorotoluene	ug/L	20	21.6	108	75-125	
-Chlorotoluene	ug/L	20	22.7	113	75-130	
I-Methyl-2-pentanone (MIBK)	ug/L	100	105	105	72-140	
acetone (Wilsit)	ug/L	100	110	110	69-137	
Allyl chloride	ug/L	20	19.8	99	68-132	
Benzene	ug/L	20	21.1	105	75-125	
Bromobenzene	ug/L	20	20.2	101	75-125	
Bromochloromethane	ug/L	20	19.0	95	75-125	
Promodichloromethane	ug/L	20	19.8	99	69-128	
Bromoform	ug/L	20	19.2	96	75-125	
Bromomethane	ug/L	20	24.8	124	30-150	
Carbon tetrachloride	ug/L	20	20.5	102	74-125	
Chlorobenzene	ug/L ug/L	20	21.0	105	74-125 75-125	
Chloroethane	ug/L	20	19.1	95	60-150	
Chloroform	ug/L	20	20.8	104	75-126	
Chloromethane	_	20	19.4	97	46-150	
is-1,2-Dichloroethene	ug/L ug/L	20	19.4	99	75-126	
-				107	75-126 75-125	
is-1,3-Dichloropropene Dibromochloromethane	ug/L	20 20	21.3	97	75-125 75-125	
	ug/L		19.5			
Dibromomethane Dichlorodifluoromethane	ug/L	20	20.0	100 84	72-127 59 125	
	ug/L	20	16.8		58-135 68-140	
Dichlorofluoromethane	ug/L	20	19.2	96 94	68-149 66-144	
Diethyl ether (Ethyl ether)	ug/L	20 20	18.8 22.1		66-144 75-125	
Ethylbenzene Hexachloro-1,3-butadiene	ug/L			111		
·	ug/L	20	22.0	110	73-125	
sopropylbenzene (Cumene)	ug/L	20	22.2	111	69-140	
Methyl-tert-butyl ether	ug/L	20	19.6	98	75-126 71 120	
Methylene Chloride	ug/L	20	19.9	99 117	71-130	
Butylbenzene	ug/L	20	23.4	117	71-129	
-Propylbenzene	ug/L	20	22.8	114	71-133	
laphthalene	ug/L	20	18.5	93	59-137	
o-Isopropyltoluene	ug/L	20	24.1	120	74-127	
ec-Butylbenzene	ug/L	20	24.4	122	66-140	
Styrene	ug/L	20	22.7	114	75-125	
ert-Butylbenzene	ug/L	20	21.8	109	73-129	

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### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10337912

ABORATORY CONTROL SAMPLE:	2190026					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
etrachloroethene	ug/L		19.5	98	75-125	
etrahydrofuran	ug/L	200	219	110	71-129	
oluene	ug/L	20	19.1	95	75-125	
rans-1,2-Dichloroethene	ug/L	20	21.4	107	75-125	
ans-1,3-Dichloropropene	ug/L	20	20.3	101	75-125	
richloroethene	ug/L	20	19.8	99	75-125	
richlorofluoromethane	ug/L	20	19.2	96	74-128	
nyl chloride	ug/L	20	20.0	100	71-131	
vlene (Total)	ug/L	60	66.1	110	75-125	
2-Dichloroethane-d4 (S)	%.			97	75-125	
Bromofluorobenzene (S)	%.			101	75-125	
oluene-d8 (S)	%.			97	75-125	

MATRIX SPIKE & MATRIX SPIR	KE DUPLIC	ATE: 21905	68		2190569							
			MS	MSD								
		10337311001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20	28.2	28.4	141	142	75-125	1	30	M1
1,1,1-Trichloroethane	ug/L	ND	20	20	29.1	30.9	145	155	71-144	6	30	M1
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	25.7	26.4	128	132	75-131	3	30	M1
1,1,2-Trichloroethane	ug/L	ND	20	20	25.6	26.5	128	132	75-125	3	30	M1
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	20	30.6	31.3	153	156	75-150	2	30	M1
1,1-Dichloroethane	ug/L	ND	20	20	26.4	29.2	132	146	64-150	10	30	
1,1-Dichloroethene	ug/L	ND	20	20	28.8	31.6	144	158	68-150	9	30	M1
1,1-Dichloropropene	ug/L	ND	20	20	29.4	30.2	147	151	68-145	3	30	M1
1,2,3-Trichlorobenzene	ug/L	ND	20	20	27.6	26.8	138	134	57-142	3	30	
1,2,3-Trichloropropane	ug/L	ND	20	20	24.8	25.4	124	127	75-125	3	30	M1
1,2,4-Trichlorobenzene	ug/L	ND	20	20	28.1	27.7	141	138	60-135	2	30	M1
1,2,4-Trimethylbenzene	ug/L	ND	20	20	29.6	29.1	148	145	67-148	2	30	
1,2-Dibromo-3-	ug/L	ND	50	50	65.8	65.9	132	132	32-137	0	30	
chloropropane	-											
1,2-Dibromoethane (EDB)	ug/L	ND	20	20	26.6	27.0	133	135	75-125			
1,2-Dichlorobenzene	ug/L	ND	20	20	26.1	26.1	130	130	75-125	-		
1,2-Dichloroethane	ug/L	ND	20	20	26.5	28.3	132	142	62-138	7	30	M1
1,2-Dichloropropane	ug/L	ND	20	20	25.7	27.4	128	137	62-144	_	30	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	30.2	29.9	151	149	67-148	1	30	M1
1,3-Dichlorobenzene	ug/L	ND	20	20	26.2	25.7	131	129	74-131	2	30	
1,3-Dichloropropane	ug/L	ND	20	20	25.5	25.8	127	129	75-127	1	30	M1
1,4-Dichlorobenzene	ug/L	ND	20	20	24.1	23.3	120	117	74-126	3	30	
2,2-Dichloropropane	ug/L	ND	20	20	28.5	30.7	143	153	56-146	7	30	M1
2-Butanone (MEK)	ug/L	ND	100	100	127	133	127	133	47-150	5	30	
2-Chlorotoluene	ug/L	ND	20	20	27.5	27.9	138	139	74-137	1	30	M1
4-Chlorotoluene	ug/L	ND	20	20	28.0	27.8	140	139	72-138	1	30	M1
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	100	138	143	138	143	60-147	4	30	
Acetone	ug/L	ND	100	100	139	131	139	131	61-150	6	30	

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



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10337912

MATRIX SPIKE & MATRIX SPII	KE DUPLIC	CATE: 21905			2190569							
			MS	MSD								
Parameter	Units	10337311001 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qua
Allyl chloride	ug/L	 ND	20	20	26.5	29.3	132	147	53-150	10		
Benzene	ug/L	ND	20	20	27.9	30.4	140	152	52-147	8		M1
Bromobenzene	ug/L	ND	20	20	26.1	26.1	131	130	75-129	0		M1
Bromochloromethane	ug/L	ND	20	20	24.8	26.3	124	131	72-128	6		M1
Bromodichloromethane	ug/L	ND	20	20	27.6	28.6	138	143	65-137	3		M1
Bromoform	ug/L	ND	20	20	26.1	27.1	131	136	59-133	4		M1
Bromomethane	ug/L	ND	20	20	23.2	30.5	116	152	30-150	27		M1
Carbon tetrachloride	ug/L	ND	20	20	30.3	30.5	151	152	73-144	1		M1
Chlorobenzene	ug/L	ND	20	20	28.0	28.2	140	141	75-126			M1
Chloroethane	ug/L	ND	20	20	20.8	27.7	104	139	55-150	28		
Chloroform	ug/L	ND	20	20	29.2	30.8	146	154	66-143	5		M1
Chloromethane	ug/L	ND	20	20	21.2	27.7	106	139	42-150	27	30	
cis-1,2-Dichloroethene	ug/L	ND	20	20	26.8	29.7	134	149	65-143	10		M1
cis-1,3-Dichloropropene	ug/L	ND	20	20	27.5	29.7	137	148	75-125	8		M1
Dibromochloromethane	ug/L	ND	20	20	26.6	27.7	133	138	75-125	4		M1
Dibromomethane	ug/L	ND	20	20	25.3	27.5	126	138	66-133	9		M1
Dichlorodifluoromethane	ug/L	ND	20	20	19.8	26.2	99	131	74-150	28		
Dichlorofluoromethane	ug/L	ND	20	20	20.1	27.4	101	137	68-150	31		R1
Diethyl ether (Ethyl ether)	ug/L	ND	20	20	25.1	27.0	126	135	57-148	7		
Ethylbenzene	ug/L	ND	20	20	30.4	29.7	152	149	67-149	2		M1
Hexachloro-1,3-butadiene	ug/L	ND	20	20	30.4	30.9	152	155	65-143	2		M1
sopropylbenzene (Cumene)	ug/L	ND	20	20	29.5	29.0	148	145	64-150	2		
Methyl-tert-butyl ether	ug/L	ND	20	20	26.6	28.7	133	144	71-130	8		M1
Methylene Chloride	ug/L	ND	20	20	26.4	29.9	132	150	67-137	13		M1
n-Butylbenzene	ug/L	ND	20	20	30.6	29.5	153	148	70-138	3		M1
n-Propylbenzene	ug/L	ND	20	20	29.0	28.5	145	142	70-148	2		
Naphthalene	ug/L	ND	20	20	24.3	24.5	122	123	39-150	1		
o-Isopropyltoluene	ug/L	ND	20	20	31.0	31.0	155	155	74-138	0		M1
sec-Butylbenzene	ug/L	ND	20	20	31.4	31.8	157	159	64-150	1		M1
Styrene	ug/L	ND	20	20	30.4	30.5	152	152	75-132			M1
ert-Butylbenzene	ug/L	ND	20	20	27.4	28.1	137	141	75-138	3	30	M1
Tetrachloroethene	ug/L	ND	20	20	25.7	25.1	128	126	73-136	2		
Tetrahydrofuran	ug/L	ND	200	200	292	278	146	139	68-142	5		M1
Toluene	ug/L	ND	20	20	25.5	26.5	127	132	69-139	4		
rans-1,2-Dichloroethene	ug/L	ND	20	20	30.8	32.0	154	160	75-135	4		M1
rans-1,3-Dichloropropene	ug/L	ND	20	20	27.4	27.7	137	138	66-136	1	30	M1
Frichloroethene	ug/L	ND	20	20	27.9	28.0	139	140	74-135			M1
Frichlorofluoromethane	ug/L	ND	20	20	20.6	28.5	103	143	75-150			R1
Vinyl chloride	ug/L	ND	20	20	22.3	30.2	111	151	69-150			M1
Kylene (Total)	ug/L	ND	60	60	90.0	90.4	150	151	70-147			MS
1,2-Dichloroethane-d4 (S)	%.		30	30			99	98	75-125			
4-Bromofluorobenzene (S)	%.						100	101	75-125			
Foluene-d8 (S)	%.						97	97	75-125			

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



### **QUALIFIERS**

Project: PS Beta-NIROP
Pace Project No.: 10337912

### **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.

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.

### **ANALYTE QUALIFIERS**

Date: 02/11/2016 06:39 PM

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

Analyte recovery in the matrix spike was outside QC limits for one or more of the constituent analytes used in the calculated result.

R1 RPD value was outside control limits.





### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: PS Beta-NIROP
Pace Project No.: 10337912

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10337912001	PMW-03	EPA 8260B	MSV/34593	_	
10337912002	PMW-04	EPA 8260B	MSV/34593		
10337912003	TRIP BLANK	EPA 8260B	MSV/34593		

Face Analytical X2-DAY TAT X

CHAIN-OF-CUSTODY / Analytical Request Document
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section C

Section B

Section A	Section A	Section B	oiont Infr	formation					yec invo	Section C Invoice Information:	ation:					!			Page:		ō	7		٦
Company:	ollen monnanon. V. Rodonesis	Report To: Melinda Pham	Veling	a Phan	-				Atte	Attention:	Bahai	Bahar Naderi												1
Volumes		Copy To:							Com	Company Name:	1	Regenesis	S				REGULATORY AGENCY	JRY AG	ENCY					
3000									Addi	Address:	1011	1011 Calle Sombra	ombra			1-	NPDES	C	GROUND WATER	O WATE	L E	DRINKIN	DRINKING WATER	K-VIII
1		Durchage Order No	dar No						Pace	Pace Quote	21466					T	TSN	L	HCRA		L	OTHER		
Email 10:	Mpham @ reger	r ulcilase O							Refe	rence:						1								
Phone:		Project Name:	ē. Ģ	S Beta	PS Beta - NIROP				Man	Manager:						<i>y</i>	Site Location	<b>5</b> 1	Σ					
Request	Requested Due Date/TAT: (2 days)	Project Number: PS Beta - NIROP	ber: P	S Beta	- NIROI	C			T S S	Pace Profile #:							STATE			4				
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	Section D Valid Matrix Codes	Codes	-	(,1		1100	<u> </u>				Prece	Presenzatives		<b>†</b> N//										
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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.

F-ALL-Q-020rev.08, 12-Oct-2007

# Pace Analytical\*

Document Name:

Sample Condition Upon Receipt Form

Document No.: F-MN-L-213-rev.15

Document Revised: 05Jan2016 Page 1 of 1

Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt	Client Name:	a i <sup>c</sup> -			Project	#:	Ыl	) 世	103	)776	\	
	regenes	515		· · ·			il s		, TAS	)J/5	12	
Courier:	Fed Ex	UPS [	USPS	VC	lient			11111				
Commercial	Pace	Spee Dee [	Other:_				1033	1111				
Tracking Number: _												
Custody Seal on Cool	ler/Box Present?	□Yes No	5	Seals Int	act?	]Yes [	No	Opti	onal: Proj	. Due Date:	Proj.	Ivames
Packing Material:	Bubble Wrap	Bubble Bags	None	e 🔲	Other:				Tem	p Blank?	Yes	□No
	151401163 151401164	□B88A912167504 ▼B88A014331009		e of Ice:	We	t 🔲 B	lue	□None	Samp	les on ice, co	oling proce	ess has begun
Cooler Temp Read (°C		 Cooler Temp Corr	ected (°C)	: 5.8	3		Biol	ogical T	issue Frozei	n? [Yes	□No	DN/A
Temp should be above	freezing to 6°C	Correction Facto		+		e and Ini	tials of	Person	Examining (	Contents:	CM	3 218/14
USDA Regulated Soil ( Did samples originate in			entoc: Al A	D A7 CA	N EL GA	ID IA	Dide	ampler e	rialanta fran	a foreign co	ueco lintor	nationally
MS, NC, NM, NY, OK, OF			iales. AL, F	in, AZ, CF	Yes	ID, LA. □No			originate from vali and Puerl	-	urce (inter	******
if'	Yes to either question	on, fill out a Regu	lated Soil	Checklis	st (F-MN-	Q-338) a	nd inclu	ıde with	SCUR/COC	paperworl	ζ.	
									COMM	ENTS:		
Chain of Custody Pres	ent?	· · · · · · · · · · · · · · · · · · ·	Yes	□No	□N/A	1.						
Chain of Custody Filled	d Out?		Yes	□No	□N/A	2.						
Chain of Custody Relin	nquished?		Yes	□No	□N/A	3.						
Sampler Name and/or	Signature on COC?		✓Yes	□No	□N/A	4.						
Samples Arrived withi	n Hold Time?		Yes	□No	□N/A	5.				····		
Short Hold Time Anal	ysis (<72 hr)?		□Yes	ØNo/	□N/A	6.						
Rush Turn Around Tin	ne Requested?		□Yes	No	□N/A	7.						
Sufficient Volume?			✓ Yes_	□No	□N/A	8.						
Correct Containers Us	ed?		Yes	□No	□N/A	9.						
-Pace Containers U	sed?		Yes	□No_	- □n/a							
Containers Intact?			∐Yes	□No	□N/A	10. J T	MP	Blar	ik vec	d br	oker	)
Filtered Volume Recei	ved for Dissolved Tes	ts?	□Yes	□No	<b>⊠</b> N/A	11. No	ote if se	diment i	s visible in th	e dissolved	container	
Sample Labels Match	COC?		₩Yes	□No	□N/A	12.		-				
-Includes Date/Tim	e/ID/Analysis Matrix	x: WCHC	<u>/</u>									
All containers needing	g acid/base preservati	on have been	<u>гт</u> у	гъ.	rasi.	13.		HNO₃	∐H₂SO₄	NaC	Н	□нсі
checked? All containers needing	g preservation are fou	nd to be in	Yes	□No	[]N/A	Sample	#					
compliance with EPA	recommendation?											.
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; Exceptions, VOA) Colif			☐Yes	□No	□N/A	Initial w	hon		lot	# of added		
DRO/8015 (Water) DO			<b>∑</b> Yes	□No	□n/a	complet				servative:		
Headspace in VOA Via	ıls ( >6mm)?		□Yes	No	□n/a	14.						
Trip Blank Present?			₩Y96	□No	□n/a	15.						
Trip Blank Custody Sea			Yes	□No	□N/A							
Pace Trip Blank Lot # (	if purchased):	316-01										
	OTIFICATION/RESOL					D	Ti		Field Data	•		
Person Contacted:						_ Date/	Time:					
Comments/Resolution	on:											
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hold, incorrect preservati	ive, out of temp, incorr	ect containers).	pnunce 3	annpica, a	sopy or tr	101111 191	DC 3C11	co me i	orkii caroiiii	a action cer	ancadon O	meet ne outor





February 23, 2016

Melinda Pham Regenesis 1011 Calle Sombra San Clemente, CA 92673

RE: Project: PS Beta-NIROP

Pace Project No.: 10337913

### Dear Melinda Pham:

Enclosed are the analytical results for sample(s) received by the laboratory on February 08, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

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

Sincerely,

Jennifer Anderson jennifer.anderson@pacelabs.com Project Manager

JAndera

Enclosures

cc: Ryan Moore, Regenesis







### **CERTIFICATIONS**

Project: PS Beta-NIROP Pace Project No.: 10337913

**Minnesota Certification IDs** 

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

525 N 8th Street, Salina, KS 67401 A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770 Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA Colorado Certification #Pace

Connecticut Certification #: PH-0256 EPA Region 8 Certification #: 8TMS-L Florida/NELAP Certification #: E87605

Guam Certification #:14-008r Georgia Certification #: 959 Georgia EPD #: Pace Idaho Certification #: MN00064

Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01 Iowa Certification #: 368 Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062 Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001

Maine Certification #: 2013011 Maryland Certification #: 322 Michigan DEPH Certification #: 9909 Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace Montana Certification #: MT0092 Nevada Certification #: MN\_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002 New York Certification #: 11647 North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150 Ohio VAP Certification #: CL101 Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563

Puerto Rico Certification Saipan (CNMI) #:MP0003 South Carolina #:74003001 Texas Certification #: T104704192 Tennessee Certification #: 02818 Utah Certification #: MN000642013-4 Virginia DGS Certification #: 251 Virginia/VELAP Certification #: Pace Washington Certification #: C486 West Virginia Certification #: 382 West Virginia DHHR #:9952C Wisconsin Certification #: 999407970

**Montana Certification IDs** 

150 N. 9th Street, Billings, MT 59101 Colorado Asbestos #: 17119 A2LA Certification #: 3590.01 EPA Region 8 Certification #: 8TMS-L

Idaho Certification #: MT00012

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792 Alaska Certification #MN01084

North Dakota Certification: # R-203

Minnesota Dept of Health Certification #: 030-999-442

Montana Certification #: MT CERT0040 North Dakota Dept. Of Health #: R-209 NVLAP Certification #: 101292-0 Washington Department of Ecology #: C993

Arizona Department of Health Certification #AZ0785 Minnesota Dept of Health Certification #: 027-137-445 Wisconsin DNR Certification #: 998027470 WA Department of Ecology Lab ID# C1007 Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

**Ormond Beach Certification IDs** 

8 East Tower Circle, Ormond Beach, FL 32174

Alabama Certification #: 41320 Connecticut Certification #: PH-0216

Delaware Certification: FL NELAC Reciprocity Florida Certification #: E83079

Georgia Certification #: 955

Guam Certification: FL NELAC Reciprocity Hawaii Certification: FL NELAC Reciprocity Illinois Certification #: 200068

Indiana Certification: FL NELAC Reciprocity

Kansas Certification #: E-10383

Louisiana Certification #: FL NELAC Reciprocity Louisiana Environmental Certificate #: 05007

Maryland Certification: #346

Michigan Certification #: 9911

Mississippi Certification: FL NELAC Reciprocity

Missouri Certification #: 236 Montana Certification #: Cert 0074 Nebraska Certification: NE-OS-28-14 Nevada Certification: FL NELAC Reciprocity

New York Certification #: 11608

North Carolina Environmental Certificate #: 667

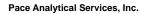
North Carolina Certification #: 12710 North Dakota Certification #: R-216 Oklahoma Certification #: D9947 Pennsylvania Certification #: 68-00547 Puerto Rico Certification #: FL01264 South Carolina Certification: #96042001 Tennessee Certification #: TN02974

Texas Certification: FL NELAC Reciprocity

US Virgin Islands Certification: FL NELAC Reciprocity Virginia Environmental Certification #: 460165

### REPORT OF LABORATORY ANALYSIS

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



1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700

### **CERTIFICATIONS**

Project: PS Beta-NIROP Pace Project No.: 10337913

Ormond Beach Certification IDs Wyoming Certification: FL NELAC Reciprocity West Virginia Certification #: 9962C Wisconsin Certification #: 399079670 Wyoming (EPA Region 8): FL NELAC Reciprocity





### **SAMPLE SUMMARY**

Project: PS Beta-NIROP
Pace Project No.: 10337913

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10337913001	PMW-03	Water	02/08/16 10:30	02/08/16 11:13
10337913002	PMW-04	Water	02/08/16 09:00	02/08/16 11:13





### **SAMPLE ANALYTE COUNT**

Project: PS Beta-NIROP
Pace Project No.: 10337913

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10337913001	PMW-03	RSK 175	DR1	3	PASI-M
		EPA 6010C	IP	1	PASI-M
		6010C Met	IP	1	PASI-M
		SM 4500-S2-D	CAC	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	KAM	1	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	MW	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V
0337913002	PMW-04	RSK 175	DR1	3	PASI-M
		EPA 6010C	IP	1	PASI-M
		6010C Met	IP	1	PASI-M
		SM 4500-S2-D	CAC	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	KAM	1	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	MW	1	PASI-M
		SM 5220D	KEO	1	PASI-M
		SM 5310C	KRV	1	PASI-V



Date: 02/23/2016 09:24 AM

### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10337913

Sample: PMW-03	Lab ID: 103	37913001	Collected: 02/08/1	16 10:30	Received: 02	2/08/16 11:13 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Meth	od: RSK 1	75					
Ethane	ND	ug/L	10.0	1		02/09/16 18:03	74-84-0	
Ethene	ND	ug/L	10.0	1		02/09/16 18:03	74-85-1	
Methane	37.0	ug/L	10.0	1		02/09/16 18:03	74-82-8	
6010C MET ICP	Analytical Meth	od: EPA 6	010C Preparation Me	ethod: E	PA 3010			
ron	8300	ug/L	50.0	1	02/11/16 09:32	02/11/16 15:25	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	od: 6010C	Met Preparation Me	thod: El	PA 3010			
Iron, Dissolved	6350	ug/L	50.0	1	02/12/16 12:03	02/12/16 15:24	7439-89-6	
4500S2D Sulfide Water	Analytical Meth	od: SM 45	00-S2-D					
Sulfide	ND	mg/L	0.10	1		02/11/16 16:11		
2320B Alkalinity	Analytical Meth	od: SM 23	20B					
Carbon Dioxide (SM4500CO2D)	55.8	mg/L	5.0	1		02/12/16 12:41	124-38-9	
Alkalinity, Total as CaCO3	343	mg/L	5.0	1		02/12/16 11:30		
Alkalinity,Bicarbonate (CaCO3)	343	mg/L	5.0	1		02/12/16 11:30		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		02/12/16 11:30		
300.0 IC Anions	Analytical Meth	od: EPA 3	0.00					
Sulfate	150	mg/L	2.4	2		02/09/16 16:14	14808-79-8	
853.2 Nitrate + Nitrite	Analytical Meth	od: EPA 3	53.2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		02/10/16 08:45		
5220D COD	Analytical Meth	od: SM 52	20D Preparation Me	thod: SN	Л 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	02/09/16 10:28	02/09/16 15:52		
310C TOC	Analytical Meth	od: SM 53	10C					
Total Organic Carbon	2.8	mg/L	1.0	1		02/10/16 22:22	7440-44-0	



Date: 02/23/2016 09:24 AM

### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10337913

Sample: PMW-04	Lab ID: 103	37913002	Collected: 02/08/	16 09:00	Received: 02	2/08/16 11:13 M	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
RSK 175 AIR Headspace	Analytical Meth	nod: RSK 1	75					
Ethane	ND	ug/L	10.0	1		02/09/16 18:19		
Ethene	ND	ug/L	10.0	1		02/09/16 18:19		
Methane	ND	ug/L	10.0	1		02/09/16 18:19	74-82-8	
6010C MET ICP	Analytical Meth	od: EPA 60	010C Preparation Me	ethod: E	PA 3010			
ron	3980	ug/L	50.0	1	02/11/16 09:32	02/11/16 15:43	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	nod: 6010C	Met Preparation Me	ethod: Ef	PA 3010			
ron, Dissolved	3070	ug/L	50.0	1	02/12/16 12:03	02/12/16 15:40	7439-89-6	
500S2D Sulfide Water	Analytical Meth	nod: SM 45	00-S2-D					
Sulfide	ND	mg/L	0.10	1		02/11/16 16:12		
2320B Alkalinity	Analytical Meth	nod: SM 23	20B					
Carbon Dioxide (SM4500CO2D)	30.6	mg/L	5.0	1		02/12/16 12:56	124-38-9	
Alkalinity, Total as CaCO3	241	mg/L	5.0	1		02/12/16 11:34		
Alkalinity,Bicarbonate (CaCO3)	241	mg/L	5.0	1		02/12/16 11:34		
Alkalinity, Carbonate (CaCO3)	ND	mg/L	5.0	1		02/12/16 11:34		
00.0 IC Anions	Analytical Meth	nod: EPA 30	0.00					
Sulfate	84.2	mg/L	2.4	2		02/09/16 14:33	14808-79-8	
53.2 Nitrate + Nitrite	Analytical Meth	nod: EPA 3	53.2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		02/10/16 08:46		
220D COD	Analytical Meth	nod: SM 52	20D Preparation Me	thod: SN	/I 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	02/09/16 10:28	02/09/16 15:52		
310C TOC	Analytical Meth	nod: SM 53	10C					
otal Organic Carbon	3.3	mg/L	1.0	1		02/10/16 23:01	7440-44-0	



Date: 02/23/2016 09:24 AM

### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP
Pace Project No.: 10337913

QC Batch: AIR/25185 Analysis Method: RSK 175

QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE

Associated Lab Samples: 10337913001, 10337913002

METHOD BLANK: 2188335 Matrix: Water

Associated Lab Samples: 10337913001, 10337913002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	02/09/16 16:16	
Ethene	ug/L	ND	10.0	02/09/16 16:16	
Methane	ug/L	ND	10.0	02/09/16 16:16	

LABORATORY CONTROL SAMPLE &	LCSD: 2188336		21	88337						
		Spike	LCS	LCSD	LCS	LCSD	% Rec		Max	
Parameter	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
Ethane	ug/L	114	110	108	96	95	85-115	2	20	
Ethene	ug/L	106	102	100	96	94	85-115	2	20	
Methane	ug/L	60.7	57.6	56.4	95	93	85-115	2	20	

SAMPLE DUPLICATE: 2189037		92285469001	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	1.5J	1J		20	

SAMPLE DUPLICATE: 2189038						
		10337913001	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	37.0	37.1	0	20	

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



### **QUALITY CONTROL DATA**

Project:

PS Beta-NIROP

Pace Project No.:

10337913

QC Batch:

MPRP/61396

Analysis Method:

EPA 6010C

QC Batch Method: EPA 3010

METHOD BLANK: 2189724

Analysis Description:

6010C Water

Associated Lab Samples:

10337913001, 10337913002

Matrix: Water

Associated Lab Samples:

10337913001, 10337913002

Blank

Reporting

Parameter

Units

Units

ug/L

Result

Limit Analyzed Qualifiers

Iron

Iron

Iron

ug/L

ND

50.0 02/11/16 15:19

LABORATORY CONTROL SAMPLE:

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:

Parameter

2189725

Spike Conc.

MS

10000

10000

LCS Result

LCS % Rec

99

18000

% Rec Limits

80-120

Qualifiers

Parameter

Date: 02/23/2016 09:24 AM

2189726

2189727

9910

MSD

10337913001 Spike Units Result Conc.

8300

Spike Conc.

10000

MS MSD Result Result

18400

MS % Rec

101

MSD % Rec

97

% Rec Max Limits RPD RPD

75-125

Qual 2 20

ug/L

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.



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP

Pace Project No.: 10337913

Date: 02/23/2016 09:24 AM

QC Batch: MPRP/61409 Analysis Method: 6010C Met

QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved

Associated Lab Samples: 10337913001, 10337913002

METHOD BLANK: 2190346 Matrix: Water

Associated Lab Samples: 10337913001, 10337913002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Iron, Dissolved ug/L ND 50.0 02/12/16 15:18

LABORATORY CONTROL SAMPLE: 2190347

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Iron, Dissolved ug/L 10000 9110 91 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2190348 2190349

MS MSD 10337913001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Iron, Dissolved 10000 75-125 20 ug/L 6350 10000 15600 15700 92 94

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.



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP
Pace Project No.: 10337913

QC Batch: MT/22471 Analysis Method: SM 4500-S2-D
QC Batch Method: SM 4500-S2-D Analysis Description: 4500S2D Sulfide Water

Associated Lab Samples: 10337913001, 10337913002

METHOD BLANK: 2190215 Matrix: Water

Associated Lab Samples: 10337913001, 10337913002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Sulfide mg/L ND 0.10 02/11/16 16:07

LABORATORY CONTROL SAMPLE: 2190216

Date: 02/23/2016 09:24 AM

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Sulfide mg/L .92 0.94 102 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2190218 2190219

MS MSD 10337959001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Sulfide ND 20 mg/L .92 .92 0.90 0.91 98 99 80-120

Parameter Units Result Result RPD RPD Qualifiers
Sulfide mg/L ND .035J 20

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



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP

Pace Project No.: 10337913

QC Batch: WET/35915 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10337913001, 10337913002

METHOD BLANK: 1478518 Matrix: Water

Associated Lab Samples: 10337913001, 10337913002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Carbon Dioxide (SM4500CO2D) mg/L ND 5.0 02/12/16 12:25

SAMPLE DUPLICATE: 1478520

 Parameter
 Units
 10337913001 Result
 Dup Result
 Max RPD
 RPD
 Qualifiers

 Carbon Dioxide (SM4500CO2D)
 mg/L
 55.8
 50.5
 10

SAMPLE DUPLICATE: 1478521

Date: 02/23/2016 09:24 AM

Parameter Units Result Result RPD Max Result RPD Qualifiers

Carbon Dioxide (SM4500CO2D) mg/L 37.4 34.2 9

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.



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP

Pace Project No.: 10337913

Date: 02/23/2016 09:24 AM

QC Batch: WET/46446 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10337913001, 10337913002

METHOD BLANK: 2190647 Matrix: Water

Associated Lab Samples: 10337913001, 10337913002

Reporting Blank Parameter Result Limit Qualifiers Units Analyzed Alkalinity, Total as CaCO3 ND 5.0 02/12/16 10:08 mg/L Alkalinity, Bicarbonate (CaCO3) mg/L ND 5.0 02/12/16 10:08 Alkalinity, Carbonate (CaCO3) ND 02/12/16 10:08 mg/L 5.0

LABORATORY CONTROL SAMPLE & LCSD: 2190648 2190649 Spike LCS LCSD LCS LCSD % Rec Max Conc. Parameter Units Result Result % Rec % Rec Limits **RPD RPD** Qualifiers Alkalinity, Total as CaCO3 40 41.2 41.1 103 103 90-110 0 30 mq/L

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2190650 2190651 MSD MS 10337632004 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual Alkalinity, Total as CaCO3 mg/L 313 40 40 357 356 110 108 80-120 0 30

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2190653 2190652 MS MSD 10337666001 MS MS MSD MSD % Rec Spike Spike Max RPD Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD Qual 87.8 40 40 128 128 99 101 80-120 30 Alkalinity, Total as CaCO3 mg/L

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.



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP
Pace Project No.: 10337913

QC Batch: WETA/26289 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10337913001, 10337913002

METHOD BLANK: 2188268 Matrix: Water

Associated Lab Samples: 10337913001, 10337913002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Sulfate mg/L ND 1.2 02/09/16 10:02

LABORATORY CONTROL SAMPLE: 2188269

Date: 02/23/2016 09:24 AM

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Sulfate mg/L 12.5 11.8 94 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2188270 2188271

MS MSD 10337497001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Sulfate 90-110 20 M6 mg/L 533 250 250 727 727 78 78 0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2188606 2188607

MS MSD 10337980001 Spike MS MSD MS Spike MSD % Rec Max % Rec Limits RPD Parameter Units Result Conc. Conc. Result Result % Rec RPD Qual Sulfate < 0.60 12.5 12.5 11.8 11.9 92 93 90-110 1 20 mg/L

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.



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP

Pace Project No.: 10337913

Date: 02/23/2016 09:24 AM

QC Batch: WETA/26306 Analysis Method: EPA 353.2

QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved

Associated Lab Samples: 10337913001, 10337913002

METHOD BLANK: 2188954 Matrix: Water

Associated Lab Samples: 10337913001, 10337913002

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Nitrogen, NO2 plus NO3 mg/L ND 0.020 02/10/16 08:30 FS

LABORATORY CONTROL SAMPLE: 2188955

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers 90-110 FS Nitrogen, NO2 plus NO3 mg/L 1.0 100

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2188956 2188957

MS MSD

10338022001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Nitrogen, NO2 plus NO3 20 90-110 20 mg/L 4.6 20 25.8 24.8 106 101

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.

Qualifiers

(612)607-1700



**QUALITY CONTROL DATA** 

Project: PS Beta-NIROP Pace Project No.: 10337913

Pace Project No.: 10337913

Date: 02/23/2016 09:24 AM

QC Batch: WETA/26284 Analysis Method: SM 5220D
QC Batch Method: SM 5220D Analysis Description: 5220D COD

Associated Lab Samples: 10337913001, 10337913002

METHOD BLANK: 2188238 Matrix: Water

Associated Lab Samples: 10337913001, 10337913002

Blank Reporting
Parameter Units Result Limit Analyzed

Chemical Oxygen Demand mg/L ND 50.0 02/09/16 15:48

LABORATORY CONTROL SAMPLE: 2188239

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chemical Oxygen Demand mg/L 300 315 105 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2188240 2188241

MS MSD 10337959001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Chemical Oxygen Demand ND 250 80-120 0 20 mg/L 250 299 298 102 102

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.



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP
Pace Project No.: 10337913

QC Batch: WETA/15633
QC Batch Method: SM 5310C

Analysis Method: SM 5310C
Analysis Description: 5310C TOC

Associated Lab Samples: 10337913001, 10337913002

METHOD BLANK: 287329 Matrix: Water

Associated Lab Samples:

Date: 02/23/2016 09:24 AM

ParameterUnitsBlank ResultReporting LimitAnalyzedQualifiersTotal Organic Carbonmg/LND1.002/10/16 17:51

LABORATORY CONTROL SAMPLE: 287330

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Organic Carbon** mg/L 25 25.0 100 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 287331 287332

MSD MS 1260589001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual **Total Organic Carbon** 25 26.3 80-120 20 mg/L 1.5 25 26.5 99 100

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 287333 287334

MS MSD 10337913002 MS MSD MS MSD Spike Spike % Rec Max Parameter Conc. % Rec **RPD** RPD Units Result Conc. Result Result % Rec Limits Qual 25 Total Organic Carbon mg/L 3.3 25 27.8 27.9 98 98 80-120 0 20

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



### **QUALIFIERS**

Project: PS Beta-NIROP
Pace Project No.: 10337913

### **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.

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
PASI-MT	Pace Analytical Services - Montana
PASI-O	Pace Analytical Services - Ormond Beach
PASI-V	Pace Analytical Services - Virginia

### **ANALYTE QUALIFIERS**

Date: 02/23/2016 09:24 AM

FS The sample was filtered in the laboratory prior to analysis.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.



Date: 02/23/2016 09:24 AM

### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: PS Beta-NIROP
Pace Project No.: 10337913

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10337913001 10337913002	PMW-03 PMW-04	RSK 175 RSK 175	AIR/25185 AIR/25185		
10337913001 10337913002	PMW-03 PMW-04	EPA 3010 EPA 3010	MPRP/61396 MPRP/61396	EPA 6010C EPA 6010C	ICP/26780 ICP/26780
10337913001 10337913002	PMW-03 PMW-04	EPA 3010 EPA 3010	MPRP/61409 MPRP/61409	6010C Met 6010C Met	ICP/26786 ICP/26786
10337913001 10337913002	PMW-03 PMW-04	SM 4500-S2-D SM 4500-S2-D	MT/22471 MT/22471		
10337913001	PMW-03	SM 2320B	WET/35915		
10337913001	PMW-03	SM 2320B	WET/46446		
10337913002	PMW-04	SM 2320B	WET/35915		
10337913002	PMW-04	SM 2320B	WET/46446		
10337913001 10337913002	PMW-03 PMW-04	EPA 300.0 EPA 300.0	WETA/26289 WETA/26289		
10337913001 10337913002	PMW-03 PMW-04	EPA 353.2 EPA 353.2	WETA/26306 WETA/26306		
10337913001 10337913002	PMW-03 PMW-04	SM 5220D SM 5220D	WETA/26284 WETA/26284	SM 5220D SM 5220D	WETA/2630 WETA/2630
10337913001 10337913002	PMW-03 PMW-04	SM 5310C SM 5310C	WETA/15633 WETA/15633		

# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Pace Analytical"

							Attantion	Attention: Rat	Bahar Naderi	17.7											
Company:	Regenesis	Report To: Melinda Pham	£ L				Allender	D	ומו יימר	Jer											
Address:	1011 Calle Sombra	Copy To:					Company Name:	1	Regenesis	esis				REGU	REGULATORY AGENCY	Y AGE	NCY				
	San Clemente, CA 92673						Address:	1	11 Calle	1011 Calle Sombra	g			z L	NPDES		GROUND WATER	WATER	<u>ا</u>	DRINKIN	DRINKING WATER
Email To:	Mpham@regenesis.com	Purchase Order No.:					Pace Quote Reference:		21466						UST	L	RCRA		L	OTHER	
ne:	Phone: 949-366-8000 Fax: 343-366-8090	Project Name: PS Bet	PS Beta - NIROP				Pace Proj. Manager:	3ct						Site L	Site Location						
ueste	Requested Due Date/TAT: 10 days	Project Number: PS Beta - NIROP	a - NIROP				Pace Prof	ie #:					1		STATE	l:	2				
												Redu	ested	Analys	Requested Analysis Filtered (Y/N)	red (Y/	2				
V, 1L	Section D  Valid Matrix Codes Required Client Information  MATRIX  COI	odes CODE to	ŏ	COLLECTED	0	-		Pre	Preservatives	sə/	<b>†</b> N/A	1									
		B M M M 의 전 등 Sepo pilev ees	COMPOSITE	8.	COMPOSITE END/GRAB	COLLECTION	St											(N/Y) ə			
# M∃TI	SAMPLE ID WITE AM AM (A-Z, 0-9 /) OTHER Sample IDs MUST BE UNIQUE TISSUE	SAMPLE TYPE (G.	DATE TIN	TIME DATE	III	m SAMPLE TEMP AT (	# OF CONTAINEF	HNO <sup>3</sup> H <sup>5</sup> 2O <sup>4</sup>	N <sup>g</sup> OH HCl	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol	Other Analysis Tes	Alkalinity, CaCC Chemical oxyge	Total iron Dissolved iron	Volatile fatty aci Carbon dioxide	Nitrate+Nitrite Sulfate in water	Sulfide in water Total organic ca	Dissolved gase	ninoldO IsubiseA	Pace	Project N	Pace Project No./ Lab I.D.
	DM113-03	シュ	-	1	_	3	_								/ [		3		÷		
2	Plus not	1		2/8/16	<del>                                     </del>		77.00	332						- 2		1	3				
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6												4	$\dashv$			4					
9					_	1	$\exists$					$\dashv$	$\dashv$	$\frac{1}{2}$	1	1					
F				-		-							+					1			
12						$\dashv$		1				-	$\dashv$			1	1				
	ADDITIONAL COMMENTS	RELINGUISHED BY / AFFILIATION	ED BY / AFFI	LATION		DATE	TIME			ACCEPTED BY / AFFILIATION	ED BY/	AFFILIA	NOL		DATE	TIME	ш		SAMPL	SAMPLE-CONDITIONS	ONS
		MEINGH MEE	METUPICO)	Helon	12	9//6	1113	~	B	1	X		250	12	78-10	119	W	2.6	13	X	گ
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_			SA	SAMPLER NAME AND SIGNATURE	IE AND SK	SNATURI															ntact
ige 2				PRINT	PRINT Name of SAMPLER:	AMPLER:	MEN	N N	MEE	EE UMUSE	M							uį dwa	1/Y) eo	ody S oler (7	(N/A)
				SIGNA	SIGNATURE of SAMPLER:	MAPLER:	7					DATE	DATE Signed		8	_		-			នពា

# Pace Analytical®

Courier:

Document Name:

### Sample Condition Upon Receipt Form

Document No.: F-MN-L-213-rev.15 Document Revised: 05Jan2016 Page 1 of 1

Issuing Authority: Pace Minnesota Quality Office

Sample Condition
Upon Receipt **Client Name:** Project #: WO#: 10337913 USPS Client

Commercial Pace SpeeDee	Other:	
Tracking Number:	<u> </u>	10337913
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         ☐ 151401163         ☐ B888A912167504           Used:         ☐ 151401164         ☑ 888A014331009		Blue None Samples on ice, cooling process has begun
	rected (°C): 5.8	Biological Tissue Frozen? Yes No N/A
Temp should be above freezing to 6°C Correction Facti USDA Regulated Soil ( N/A, water sample)	or: †(). Date	e and Initials of Person Examining Contents: WIDZIEIIC
Did samples originate in a quarantine zone within the United S	states: AL, AR, AZ, CA, FL, GA, I	D, LA. Did samples originate from a foreign source (internationally,
MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)?	☐Yes	□No including Hawaii and Puerto Rico)? □Yes □No
if Yes to either question, fill out a Reg	uiated Soli Checklist (F-IVIN-	Q-338) and include with SCUR/COC paperwork.  COMMENTS:
Chaland Country II. Danner 12		
Chain of Custody Present?	Yes No N/A	1.
Chain of Custody Filled Out?	MYes □No □N/A	2.
Chain of Custody Relinquished?	MYes □No □N/A	3.
Sampler Name and/or Signature on COC?		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?	Ayes ON UNA	7. 2 GG \ 3 000 1/2/10
Sufficient Volume?	Yes No N/A	8.
Correct Containers Used?	Mygs □No □N/A	9.
-Pace Containers Used?	MYes □No □N/A	
Containers Intact?	DAYOS NO NA	10.
Filtered Volume Received for Dissolved Tests?	VYes □No □N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	Mes □No □N/A	12.
-Includes Date/Time/ID/Analysis Matrix: When have been		,
All containers needing acid/base preservation have been checked?		13. ☑HNO₃ ☑H₂ṢO₄ ☐NaOH ☐HCI
All containers needing preservation are found to be in	☑Yes □No □N/A	Sample # 414 QtoanBZ18114
compliance with EPA recommendation?		1-2 414
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, (TOC, Oil and Grease,	Yes No N/A	Initial when Lot # of added
DRO/8015 (water) DOC	Yes No N/A	completed: 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:
m		

Comments/Resolution:

Project Manager Review:

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).

# Intra-Regional Chain of Custody

Face Analytical ® www.pacelebs.com

Jennifer Anderson

Report To:

2/8/2016

LAB USE ONLY Samples Intact(Y) or N Requested Analysis 19/16 45 CBC 2/9 LA Z ō Owner Received Date: Received on Ice/ × 2M4500522-D Date/Time Preserved Containers Other Z Matrix Water Water Custody Seal /Y) or Pace Analytical Billings MT 150 N Ninth Street Received By 10337913002 10337913001 Billings, MT 59101 Phone (406)254-7226 Workorder Name: PS Beta-NIROP Lab ID Send To Lab: Date/Time 2/8/2016 09:00 2/8/2016 10:30 2/8/10 Date/Time Collect Sample Type PS PS Cooler Temperature on Receipt Pace Analytical Minnesota Workorder: 10337913 Released By Minneapolis, MN 55414 Phone (612)607-1700 1700 Elm Street Sample ID PMW-04 PMW-03 Received at: Suite 200 Transfers Item

<sup>\*\*\*</sup>In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

## Pace Analytical\*

### Document Name:

### Sample Condition Upon Receipt Form

Document No.: F-MT-C-184-rev.06

Document Revised: 23Feb2015 Page 1 of 1

Issuing Authority: Pace Montana Quality Office

Sample Condition Client Name:		F	Project #:	WO#:10337913							
Upon Receipt  Home MI				MOH · IASS/AIS							
1402											
	USPS	Cli	ent								
	Other:			10337913							
Tracking Number: 6484 8695 653	<u> </u>										
Custody Seal on Cooler/Box Present?	o <b>Seals In</b>	tact?	Ves	No Optional: Proj. Due Date: Proj. Name:							
Packing Material: Bubble Wrap Dubble Bags	None		Other:	Temp Blank? 🖟 es 🔲 No							
Thermometer Used: 140821733 NA	Type of Ice	: A	, Vet □E	Blue None Samples on ice, cooling process has begun							
Cooler Temp Read: 1.0 Date and Initials of Person Examining Contents: 2 A A  Cooler Temp Corrected: 0.8 Biological Tissue Frozen? Yes No											
Cooler Temp Corrected:				Biological Tissue Frozen? Yes No							
Temp should be above freezing to 6°C				Comments:							
Chain of Custody Present?	∑Ves	□No	□N/A	1.							
Chain of Custody Filled Out?	<b>∑</b> √es	□No	□N/A	2.							
Chain of Custody Relinquished?	X¥Yes	□No	□N/A	3.							
Sampler Name and Signature on COC?	Yes	□\(\varphi_0	□N/A	4.							
Samples Arrived within Hold Time?	Yes	□No	□N/A	5.							
Short Hold Time Analysis (<72 hr)?	□Yes	<b>⊠</b> N₀	□N/A	6.							
Rush Turn Around Time Requested?	Yes	No	□n/a	7.							
Sufficient Volume?	Yes	□No	□N/A	8.							
Correct Containers Used?	Yes	□No	□n/a	9.							
-Pace Containers Used?	Z Yes	□No	□n/a								
Containers Intact?	Yes	□No	□N/A	10.							
Filtered Volume Received for Dissolved Tests?	Yes	<b>⊠</b> Kio	□N/A	11. Note if sediment is visible in the dissolved container.							
Sample Labels Match COC?	Yes	□No	□N/A	12.							
-Includes Date/Time/ID/Analysis Matrix:											
All containers needing acid/base preservation have been	Yes	□No-	□N/A	13. □HNO₃ □H₂SO₄ ⅔ ☒NaOH □HCI							
checked?	Aics			15. 11204 72 Although 1204 72 Although							
All containers needing preservation are found to be in				Sample # 201-002							
compliance with EPA recommendation?	Yes	□No	□N/A	11 d IN NORWA							
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)				- Office							
- 11 - 21 - 21 - 12	r	<b>M</b> .									
Exceptions: VOA, Coliform, TOC, Oil and Grease, Wi-DRO (water)	Yes	Mo		Initial when completed: Lot # of added preservative:							
Headspace in VOA Vials ( >6mm)?	Yes	□No	⊠N/A	14.							
			M/A √M/A	15.							
Trip Blank Present?  Trip Blank Custody Seals Present?	□Yes □Yes	□No	MN/A MN/A	15.							
l ' Mi*		□No	EJV/A								
Pace Trip Blank Lot # (if purchased):											
CLIENT NOTIFICATION/RESOLUTION				Field Data Required? Yes No							
Person Contacted:				Date/Time:							
Comments/Resolution:											
	\\										
			<del></del>								
/han \/ \	<del></del>			01-10							
Project Manager Review: Date: 2   2   2   0											
Note: Whenever there is a discrepancy affecting North Carolina hold, incorrect preservative, out of temp, incorrect containers)	compliance sa	ımples, a	copy of this	form will be sent to the North Cardlina DEHNR Certification Office (i.e. out of							
mora, incorrect preservative, out of temp, ingorrect containers)											

**Chain of Custody** 

W0#∶1260762

CLIENT: PACE MPLS ice Analytical\*

www.раса/адз.com

Workorder: 10337913	Workorder Name: PS Beta-NIROP	Owner Received Date: 2/	2/8/2016 Results Requested By:
Report To	Subcontract To	不可能 的复数多数 人名英格兰人姓氏克里特的变体	Requested Analysis
Jennifer Anderson Pace Analytical Services, In			
1700 Elm Street, Suite 200 Minneapolis, MN 55414 Phone (612)607-1700 Fax (612)607-6444			
		Preserved Combiners	
	4		
Item Sample ID	Sample Collect Type Date/Time LabiD Matrix	700	
1 PMW-03	PS 2/8/2016 10:30 10337913001 Water 1	×	
2 PMW-04	PS 2/8/2016 09:00 10337913002 Water 1	×	
3			
4			
5			
		※ おいてきまでは「大きないない」というできます。	Comments
Transfers Released By	Date/Time Received By	Date/Time	
1 and the	2/6/IV 13/6	0x11 DIATE.	
2 11.5	N	34.11, 0000	
3			
Cooler Temperature on Receipt (/, 7 °C	Receipt (/, 7 °C   Custody Seal (x or N	Received on Ice (Vor N	N Samples Intact For N

<sup>\*\*\*</sup>In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Page 1 of 1

# Pace Analytical\*

### Document Name: Sample Condition Upon Receipt Form

Document No.: F-VM-C-001-Rev.09

Document Revised: 23Feb2015

Page 1 of 1
Issuing Authority:
Pace Virginia, Minnesota Quality Office

Upon Receipt Client Name:	MIL		Project	"    WO#: 1260762
Courier: Fed Ex DUPS	USPS		llient	
Commercial Pace	Other:			1260762
stody Seal on Cooler/Box Present?	]No	Seals Ir	ntact?	Yes No Optional: Proj. Due Date: Proj. Name:
cking Material: Bubble Wrap Bubble B	ags 🔲 N	one [	]Other:	Temp Blank? Yes - No
rmometer Used: 140792808	Type of	lce: 💆	Wet [	Blue None Samples on ice, cooling process has beg
ooler Temp Read °C: 17 Cooler Temp on should be above freezing to 6°C Correction Fac			O Date and	Biological Tissue Frozen? Yes No No Initials of Person Examining Contents: 1-9-11-11
hain of Custody Present?	☑Yes	□No	□N/A	1.
hain of Custody Filled Out?	<b>∠</b> Yes	□No	□N/A	2.
hain of Custody Relinquished?	✓Yes	□No	□N/A	3.
ampler Name and Signature on COC?	□Yes	[Z]No	□N/A	4.
amples Arrived within Hold Time?	ØYes	[]]No	□n/a	S.
nort Hold Time Analysis (<72 hr)?	□Yes	ĎNo	□n/a	6.
ush Turn Around Time Requested?	□Yes	ΩNo	□N/A	7.
ifficient Volume?	ØYes	□No	□Ņ/A	8.
orrect Containers Used?	[Z]Yes	□No	□n/a	9.
-Pace Containers Used?	∑aYes	∏No	□N/A	
ontainers Intact?	<b>/</b> Yes	□No	□N/A	10.
Itered Volume Received for Dissolved Tests?	Yes	□No	D⁄n/a	11. Note if sediment is visible in the dissolved containers.
ample Labels Match COC?	<b>⊠</b> Yes	□No	□N/A	12.
-Includes Date/Time/ID/Analysis Matrix:	WT			
II containers needing acid/base preservation will be necked and documented in the pH logbook.	<b>Z</b> ÎYes	□No	□n/a	See pH log for results and additional preservation documentation
eadspace in Methyl Mercury Container	□Yes	□No	[Z]N/A	13.
eadspace in VOA Vials ( >6mm)?	□Yes	□No	ØN/A	14.
ip Blank Present?	□Yes	∏No	Ín/a	15.
rip Blank Custody Seals Present?	□Yes	∏No	Øn/a	
ace Trip Blank Lot # (if purchased):				
ENT NOTIFICATION/RESOLUTION				Field Data Required? Yes No
Person Contacted:			ı	Date/Time:
Comments/Resolution:				
			•	
CAL WAIVER ON FILE Y N		TEMI	PERATU	RE WAIVER ON FILE Y N
1 .		•		

Pace Analytical ®

LAB USE ONLY 2/22/2016 ō Results Requested By: Samples Intact Y Comments Requested Analysis 2/8/2016 Received on Ice (Y) or Owner Received Date: 2-9-16 1133 Carbun Dixide in Water Date/Time Preserved Containers Unpreserved z Pace Analytical Ormond Beach Matrix Wafer Water Custody Seal (7) or 8 East Tower Circle Ormond Beach, FL 32174 Phone (386)672-5668 Received By 10337913001 10337913002 Workorder Name: PS Beta-NIROP Lab ID Subcontract To Date/Time 2/8/2016 09:00 2/8/2016 10:30 Date/Time Collect ပွ Sample Type S Sd Cooler Temperature on Receipt Pace Analytical Services, Inc. 1700 Elm Street, Suite 200 Minneapolis, MN 55414 Phone (612)607-1700 Workorder: 10337913 Refeased By Fax (612)607-6444 Jennifer Anderson Sample ID PMW-04 PMW-03 Transfers tem 4

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.



# Document Name: Sample Condition Upon Receipt Form Document No.: F-FL-C-007 rev. 07

December 28, 2015 Issuing Authority: Pace Florida Quality Office

# Sample Condition Upon Receipt Form (SCUR)

Project# Project Manager:

Date and Initials of person examining contents: 2-7-16 //23 0V

Client: CLIENT: RACMIN Due Date: 02/15/16 Capel: Deliver:
pH:
Courier: Fed Ex UPS USPS Client Commercial Pace Other
Shipping Method: ☐ First Overnight ☐ Priority Overnight ☐ Standard Overnight ☐ Ground
Billing: ☐ Recipient ☐ Sender ☐ Third Party ☐ Unkown Cooler Size if Applicable:
Tracking # <u>648486956553</u>
Custody Seal on Cooler/Box Present: Lyes  no  Seals Intact: yes no
Packing Material: Bubble Wrap Bubble Bags
Thermometer Used
Cooler #1 Temperature C / / (Visual) + O . 3 (Correction Factor) / (Actual)
Cooler #2 Temperature°C(Visual)(Correction Factor)(Actual)
Cooler #3 Temperature°C (Visual) (Correction Factor) (Actual) Temp should be above freezing
Cooler #4 Temperature°C(Visual)(Correction Factor)(Actual) to 6°C
Cooler #5 Temperature°C(Visual)(Correction Factor)(Actual)
Cooler #6 Temperature°C(Visual)(Correction Factor)(Actual)
Comments:
Chain of Custody Present
Chain of Custody Filled Out
Relinquished Signature & Sampler Name COC IPYes INO IN/A
Samples Arrived within Hold Time
Rush TAT requested on COC
Sufficient Volume RYes No N/A
Correct Containers Used No DN/A
Pace Containers Used
Containers Intact 2/19es □ No □N/A Sample Labels match COC (sample IDs & date/time of
collection) \$\hat{\mathbb{A}}\footnote{\mathbb{Y}}\footnote{\mathbb{N}}\tag{\mathbb{A}}\footnote{\mathbb{N}}\footnote{\mathbb{A}}\footnote{\mathbb{N}}\footnote{\mathbb{A}}
All containers needing acid/base preservation have been checked.  HNO3 pH<2 checked.  UYes □ No UANA HCI pH<2
All Containers needing preservation are found to be in H2SO4 pH<2 compliance with EPA recommendation:
Exceptions: VOA, Coliform, TOC, O&G NaOH/ZnOAc pH>9
No Headspace in VOA Vials ( >6mm): □Yes □ No 🗚N/A
Trip Blank Present: □Yes □ No □N/A
Client Notification/ Resolution:
Person Contacted: Date/Time:
Comments/ Resolution (use back for additional comments):
Project Manager Review: Date: 45



February 22, 2016

Pace Analytical Energy Services LLC 220 William Pitt Way

Pittsburgh, PA 15238

Phone: (412) 826-5245 Fax: (412) 826-3433

Jennifer Anderson Pace Analytical Services, Inc. 1700 Elm Street Suite 200 Minneapolis, MN 55414

RE: I

PS BETA-NIROP / 10337913

Pace Workorder:

18129

Dear Jennifer Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on Tuesday, February 09, 2016. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Ruth Welsh 02/

02/22/2016

Ruth.Welsh@pacelabs.com

Customer Service Representative

**Enclosures** 

As a valued client we would appreciate your comments on our service.

Please email info@microseeps.com.

Total Number of Pages

Page 1 of 10



Report ID: 18129 - 766143



Phone: (412) 826-5245 Fax: (412) 826-3433

## LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor: Pennsylvania Department of Environmental Protection, Bureau of Laboratories

Accreditation ID: 02-00538

Scope: NELAP Non-Potable Water and Solid & Hazardous Waste

Accreditor: South Carolina Department of Health and Environmental Control, Office of Environmental

Laboratory Certification

Accreditation ID: 89009003

Scope: Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)

Accreditor: NELAP: New Jersey, Department of Environmental Protection

Accreditation ID: PA026

Scope: Non-Potable Water; Solid and Chemical Materials

Accreditor: NELAP: New York, Department of Health Wadsworth Center

Accreditation ID: 11815

Scope: Non-Potable Water; Solid and Hazardous Waste

Accreditor: State of Connecticut, Department of Public Health, Division of Environmental Health

Accreditation ID: PH-0263

Scope: Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)

Accreditor: NELAP: Texas, Commission on Environmental Quality

Accreditation ID: T104704453-09-TX
Scope: Non-Potable Water

Accreditor: State of New Hampshire

Accreditation ID: 299409

Scope: Non-potable water

Accreditor: State of Georgia

Accreditation ID: Chapter 391-3-26

**Scope:** As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is

accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

Report ID: 18129 - 766143



Page 2 of 10



Pace Analytical Energy Services LLC 220 William Pitt Way

Pittsburgh, PA 15238 Phone: (412) 826-5245

Fax: (412) 826-3433

# SAMPLE SUMMARY

Workorder: 18129 PS BETA-NIROP / 10337913

Lab ID	Sample ID	Matrix	Date Collected	Date Received
181290001	PMW-03	Water	2/8/2016 10:30	2/9/2016 10:45
181290002	PMW-04	Water	2/8/2016 09:00	2/9/2016 10:45

Report ID: 18129 - 766143



Page 3 of 10



Phone: (412) 826-5245

Fax: (412) 826-3433

# **ANALYTICAL RESULTS**

Workorder: 18129 PS BETA-NIROP / 10337913

Lab ID:

181290001

Date Received: 2/9/2016 10:45

Matrix:

Water

Sample ID: PMW-03 Date Collected: 2/8/2016 10:30

Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR						
Analysis Desc: AM23G	Analyt	ical Method: A	.M23G			
Lactic Acid	0.20 U mg/l	0.20	0.0080 1	2/18/2016 00:19	KB	
Acetic Acid	0.016J mg/l	0.10	0.012 1	2/18/2016 00:19	KB	В
Propionic Acid	0.10 U mg/l	0.10	0.0060 1	2/18/2016 00:19	KB	
Formic Acid	0.014J mg/l	0.10	0.0070 1	2/18/2016 00:19	KB	В
Butyric Acid	0.10 U mg/l	0.10	0.010 1	2/18/2016 00:19	KB	
Pyruvic Acid	0.10 U mg/l	0.10	0.015 1	2/18/2016 00:19	KB	
i-Pentanoic Acid	0.10 U mg/l	0.10	0.0070 1	2/18/2016 00:19	KB	
Pentanoic Acid	0.10 U mg/l	0.10	0.012 1	2/18/2016 00:19	KB	
i-Hexanoic Acid	0.20 U mg/l	0.20	0.014 1	2/18/2016 00:19	KB	
Hexanoic Acid	0.20 U mg/l	0.20	0.0070 1	2/18/2016 00:19	KB	

Report ID: 18129 - 766143



Page 4 of 10



> Phone: (412) 826-5245 Fax: (412) 826-3433

### **ANALYTICAL RESULTS**

Workorder: 18129 PS BETA-NIROP / 10337913

Lab ID:

181290002

Sample ID:

PMW-04

Date Received: 2/9/2016 10:45

Matrix:

Water

Date Collected: 2/8/2016 09:00

Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR			,			
Analysis Desc: AM23G	Analyt	ical Method: A	M23G			
Lactic Acid	0.20 U mg/l	0.20	0.0080 1	2/18/2016 01:12	KB	
Acetic Acid	0.036J mg/l	0.10	0.012 1	2/18/2016 01:12	KB	В
Propionic Acid	0.10 U mg/l	0.10	0.0060 1	2/18/2016 01:12	KB	
Formic Acid	0.016J mg/l	0.10	0.0070 1	2/18/2016 01:12	KB	В
Butyric Acid	0.10 U mg/l	0.10	0.010 1	2/18/2016 01:12	KB	
Pyruvic Acid	0.10 U mg/l	0.10	0.015 1	2/18/2016 01:12	KB	
i-Pentanoic Acid	0.10 U mg/l	0.10	0.0070 1	2/18/2016 01:12	KB	
Pentanoic Acid	0.10 U mg/l	0.10	0.012 1	2/18/2016 01:12	KB	
i-Hexanoic Acid	0.20 U mg/l	0.20	0.014 1	2/18/2016 01:12	KB	
Hexanoic Acid	0.20 U mg/l	0.20	0.0070 1	2/18/2016 01:12	KB	

Report ID: 18129 - 766143



Page 5 of 10



> Phone: (412) 826-5245 Fax: (412) 826-3433

#### ANALYTICAL RESULTS QUALIFIERS

Workorder: 18129 PS BETA-NIROP / 10337913

#### **DEFINITIONS/QUALIFIERS**

Disclaimer: The Pennsylvania Department of Environmental Protection (PADEP) has decided to no longer recognize analyses that do not

produce data for primary compliance, for NELAP accreditation. The methods affected by this decision are AM20GAx, AM21G, SW846 7199 and AM4.02. The laboratory shall continue to administer the NELAP/TNI standard requirements in the performance

of these methods.

MDL Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.

PQL Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.

ND Not detected at or above reporting limit.

DF Dilution Factor.

Surrogate.

S

RPD Relative Percent Difference.

% Rec Percent Recovery.

U Indicates the compound was analyzed for, but not detected at or above the noted concentration.

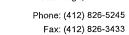
J Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

B The analyte was detected in the associated blank.

Report ID: 18129 - 766143



Page 6 of 10





### QUALITY CONTROL DATA

Workorder: 18129 PS BETA-NIROP / 10337913

QC Batch:

EDON/2802

Analysis Method:

AM23G

QC Batch Method:

AM23G

181290001, 181290002

METHOD	BI	ANK:	40319

Associated Lab Samples:

Parameter	Units	Blank Result	Reporting Limit Qualifiers	
EDonors				
Lactic Acid	mg/l	0.20 U	0.20	
Acetic Acid	mg/l	0.022J	0.10 B	
Propionic Acid	mg/l	0.10 U	0.10	
Formic Acid	mg/l	0.012J	0.10 B	
Butyric Acid	mg/l	0.10 U	0.10	
Pyruvic Acid	mg/l	0.10 U	0.10	
i-Pentanoic Acid	mg/l	0.10 U	0.10	
Pentanoic Acid	mg/l	0.10 U	0.10	
i-Hexanoic Acid	mg/l	0.20 U	0.20	
Hexanoic Acid	mg/l	0.20 U	0.20	

LABORATORY CONTROL SAMPLE: 40320

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EDonors						
Lactic Acid	mg/l	2	1.9	96	70-130	
Acetic Acid	mg/l	2	2.0	103	70-130	В
Propionic Acid	mg/l	2	2.0	100	70-130	
Formic Acid	mg/l	2	1.8	88	70-130	В
Butyric Acid	mg/l	2	2.0	98	70-130	
Pyruvic Acid	mg/l	2	2.0	98	70-130	
i-Pentanoic Acid	mg/l	2	2.0	98	70-130	
Pentanoic Acid	mg/l	2	2.0	100	70-130	
i-Hexanoic Acid	mg/l	2	2.0	101	70-130	
Hexanoic Acid	mg/l	2	2.0	98	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:	40321	40322	Original:	182150001

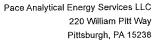
Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit		Max RPD	Qualifiers
EDonors Lactic Acid	mg/l	0	20	19	19	96	. 97	70-130	1	30	d

Report ID: 18129 - 766143

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### **CERTIFICATE OF ANALYSIS**







# **QUALITY CONTROL DATA**

Workorder: 18129 PS BETA-NIROP / 10337913

MATRIX SPIKE & MATI	RIX SPIKE DUPLIC	CATE: 40321		40322		Original:	18215000	1			
Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Acetic Acid	mg/l	0.23	20	22	21	106	104	70-130	1.9	30	d,B
Propionic Acid	mg/l	0	20	21	21	106	103	70-130	2.9	30	d
Formic Acid	mg/l	1	20	18	18	86	85	70-130	1.2	30	d,B
Butyric Acid	mg/l	0	20	22	21	108	103	70-130	4.7	30	d
Pyruvic Acid	mg/l	0	20	20	20	100	100	70-130	0	30	d
i-Pentanoic Acid	mg/l	0	20	22	21	110	104	70-130	5.6	30	d
Pentanoic Acid	mg/l	0	20	23	21	114	107	70-130	6.3	30	d
i-Hexanoic Acid	mg/l	0	20	24	22	118	109	70-130	7.9	30	d
Hexanoic Acid	mg/l	0.11	20	24	22	117	110	70-130	6.2	30	d

Report ID: 18129 - 766143



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> Phone: (412) 826-5245 Fax: (412) 826-3433

### **QUALITY CONTROL DATA QUALIFIERS**

Workorder: 18129 PS BETA-NIROP / 10337913

#### QUALITY CONTROL PARAMETER QUALIFIERS

- B The analyte was detected in the associated blank.
- d The analyte concentration was determined from a dilution.

Report ID: 18129 - 766143



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Pace Analytical Energy Services LLC 220 William Pitt Way

Pittsburgh, PA 15238 Phone: (412) 826-5245

Fax: (412) 826-3433

# QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 18129 PS BETA-NIROP / 10337913

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
181290001	PMW-03			AM23G	EDON/2802
181290002	PMW-04		•	AM23G	EDON/2802

Report ID: 18129 - 766143



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18129

Face Analytical Page 38 of 39

	4					
der: 10337913	Workorder Name:	PS Beta-NIROP		Results Requested 2	2/22/2016	
voice To	Subcon	Subcontract To		Requested A	≀nalysis	
Anderson Nytical Minnesota	Michologopo	MiciosepyPace Energy	P.O. <u>1033-1913</u>			

Workorder: 10337913 Work	Workorder Name:	PS Beta-NIROP	QP		Resu	Results Requested 2/2	2/22/2016	
Report / Invoice To	Subco	Subcontract To				Requested Analysis	alysis	
Jennifer Anderson Pace Analytical Minnesota	Microseca	MICOSEPYPACE ENERY	y P.O. <u>1033-1913</u>	21913				
Suite 200					ď			DIAMETA S
Minneapolis, MN 55414					Ci			
Phone (612)607-1700					A	pp. and a		wheelings
Email: jennifer.anderson@pacelabs.com					¥			
			ס	Preserved Containers				
			ved		hle			
	Collect		orese		ola			
Item Sample ID	Date/Time	Lab ID	Matrix		V			LAB USE ONLY
1 PMW-03	2/8/2016 10:30	10337913001	Water 2	P. Spiler	×			
2 PMW-04	2/8/2016 09:00	10337913002	Water 12		×			
ω								
4								
CI								
							Comments	
Transfers Released By	Date/Time	ime Received By	Ву		Date/Time			
1 180	2/6/10	218/10 1321 XQS	1	1 3tao	2.9.16	1045		
2				(				
3	J		)			J. J. J. J. J. J. J. J. J. J. J. J. J. J		
Cooler Temperature on Receipt 化多。C		Custody Seal Y )or	Y)or N	Receiv	Received on Ice	Y)or N	Samples Intact Y or N	Y or N

<sup>\*\*\*</sup>In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

		•			
,		a ^	1 .	_ L \	18129
Client l	Vame: PaceMN ProjectS Beta-NiR	<u>0 P</u>		9 D AA(	JIK 01951
Ā.	Shinning/Container Information (circle appropriate response)				
	Courier: (FedEx) UPS USPS Client Other:	Ajr	bill Pra	esent:	YES NO
	Tracking Number: 648486956542				•
		itact:(	YES	Мo	
	Custody Seal on Cooler/Box Present: (725) No Seals In Cooler/Box Packing Material: Buttle Wind Absorbent Fo	`			
	Cooler/Box Packing Material: Buxtle WIPP Australia	-			
	Type of ke: (V. F.) Blue None Ice Intact: Yes Melte		\	:_ ~£ {	Custody Present: TES No
	Cooler Temperature: 4.8°C Radiation Screened: Yes	(NO	) Lha	iii Di (	Lustout
	Comments:	·			
5	Laboratory Assignment/Log-in (chack appropriate response)			٠	
<b>D.</b>	Laborator; 1213	YES	NO	N/A	Comment / Reference non Conformani
				<u> </u>	RETEIENCE TICH STITUTE
	Chain of Sustody properly filled out			<u> </u>	
	Chain of Custody relinquished	12	1. /		
	Sampler Name & Signature on COC			1	
	Containers intact			<u> </u>	
	Were samples in separate begs	V		1.	
•	Sample container labels match COC	V			
	Sample name/date and time collected	V			
	PAES containers used	V			
	Are containers properly preserved for the requested testing?				
		<del> </del>			if yes, see pill form.
	If an unknown preservation state, were containers checked:				
	Exception: VOA's colliform  Was volume for dissolved testing field filtered, as noted on			1	
	the COC? Was volume received in a preserved container?				
	Comments:				
					J Data 2.9.16
	Cooler contants examined/re	sceive:	д ÞA : <sup>_</sup>		Dele Wille
	Project Manas	er Rey	ie₩ :_	<u> </u>	20 Date: 2-10-14
		•			Page 39 of 39





April 21, 2016

Melinda Pham Regenesis 1011 Calle Sombra San Clemente, CA 92673

RE: Project: PS Beta-NIROP

Pace Project No.: 10343283

#### Dear Melinda Pham:

Enclosed are the analytical results for sample(s) received by the laboratory on March 31, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

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

Sincerely,

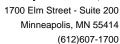
Jennifer Anderson jennifer.anderson@pacelabs.com Project Manager

Sonder

Enclosures

cc: Ryan Moore, Regenesis







#### **CERTIFICATIONS**

Project: PS Beta-NIROP Pace Project No.: 10343283

#### **Minnesota Certification IDs**

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

525 N 8th Street, Salina, KS 67401 A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770 Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA Colorado Certification #Pace Connecticut Certification #: PH-0256 EPA Region 8 Certification #: 8TMS-L Florida/NELAP Certification #: E87605

Guam Certification #:14-008r Georgia Certification #: 959 Georgia EPD #: Pace Idaho Certification #: MN00064 Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01

Iowa Certification #: 368 Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062 Kentucký Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001 Maine Certification #: 2013011 Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137 Mississippi Certification #: Pace Montana Certification #: MT0092 Nevada Certification #: MN\_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002 New York Certification #: 11647 North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150 Ohio VAP Certification #: CL101 Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563 Puerto Rico Certification

Saipan (CNMI) #:MP0003 South Carolina #:74003001 Texas Certification #: T104704192 Tennessee Certification #: 02818 Utah Certification #: MN000642013-4 Virginia DGS Certification #: 251 Virginia/VELAP Certification #: Pace Washington Certification #: C486 West Virginia Certification #: 382 West Virginia DHHR #:9952C Wisconsin Certification #: 999407970

1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700



### **SAMPLE SUMMARY**

Project: PS Beta-NIROP
Pace Project No.: 10343283

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10343283001	PMW-01	Water	03/31/16 09:42	03/31/16 15:38
10343283002	PMW-02	Water	03/31/16 11:00	03/31/16 15:38
10343283003	PMW-03	Water	03/31/16 12:30	03/31/16 15:38
10343283004	PMW-04	Water	03/31/16 13:50	03/31/16 15:38
10343283005	Trip Blank 1	Water	03/31/16 07:00	03/31/16 15:38
10343283006	Trip Blank 2	Water	03/31/16 07:05	03/31/16 15:38





# **SAMPLE ANALYTE COUNT**

Project: PS Beta-NIROP Pace Project No.: 10343283

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10343283001	PMW-01	EPA 8260B	PRD	70
10343283002	PMW-02	EPA 8260B	PRD	70
10343283003	PMW-03	EPA 8260B	PRD	70
10343283004	PMW-04	EPA 8260B	PRD	70
10343283005	Trip Blank 1	EPA 8260B	PRD	70
10343283006	Trip Blank 2	EPA 8260B	PRD	70



Date: 04/21/2016 08:26 AM

### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10343283

Sample: PMW-01	Lab ID:	10343283001	Collected: 03/31/16	09:42	Received: (	03/31/16 15:38	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical	Method: EPA 82	260B					
Acetone	NE	ug/L	20.0	1		04/01/16 17:30	67-64-1	
Allyl chloride	NE	ug/L	4.0	1		04/01/16 17:30	107-05-1	
Benzene	NE	) ug/L	1.0	1		04/01/16 17:30	71-43-2	
Bromobenzene	NE	) ug/L	1.0	1		04/01/16 17:30	108-86-1	
Bromochloromethane	NE	) ug/L	1.0	1		04/01/16 17:30	74-97-5	M1
Bromodichloromethane	NE	ug/L	1.0	1		04/01/16 17:30	75-27-4	
Bromoform	NE	ug/L	4.0	1		04/01/16 17:30	75-25-2	
Bromomethane	NE	) ug/L	4.0	1		04/01/16 17:30	74-83-9	
2-Butanone (MEK)	NE	ug/L	5.0	1		04/01/16 17:30	78-93-3	
n-Butylbenzene	NE	ug/L	1.0	1		04/01/16 17:30	104-51-8	
sec-Butylbenzene	NE	ug/L	1.0	1		04/01/16 17:30	135-98-8	
tert-Butylbenzene	NE	ug/L	1.0	1		04/01/16 17:30	98-06-6	
Carbon tetrachloride	NE	ug/L	1.0	1		04/01/16 17:30	56-23-5	M1
Chlorobenzene	NE	ug/L	1.0	1		04/01/16 17:30	108-90-7	M1
Chloroethane	NE	-	1.0	1		04/01/16 17:30	75-00-3	
Chloroform	NE	-	1.0	1		04/01/16 17:30	0 67-66-3	
Chloromethane	NE	ug/L	4.0	1		04/01/16 17:30	74-87-3	
2-Chlorotoluene	NE	ug/L	1.0	1		04/01/16 17:30	95-49-8	
4-Chlorotoluene	NE	ug/L	1.0	1		04/01/16 17:30	106-43-4	
1,2-Dibromo-3-chloropropane	NE	-	4.0	1		04/01/16 17:30	96-12-8	
Dibromochloromethane	NE	-	1.0	1		04/01/16 17:30	124-48-1	M1
1,2-Dibromoethane (EDB)	NE	-	1.0	1		04/01/16 17:30	106-93-4	M1
Dibromomethane	NE	ug/L	4.0	1		04/01/16 17:30	74-95-3	M1
1,2-Dichlorobenzene	NE	ug/L	1.0	1		04/01/16 17:30	95-50-1	
1,3-Dichlorobenzene	NE	-	1.0	1		04/01/16 17:30	541-73-1	
1,4-Dichlorobenzene	NE	-	1.0	1		04/01/16 17:30	106-46-7	
Dichlorodifluoromethane	NE	-	1.0	1		04/01/16 17:30	75-71-8	M1
1,1-Dichloroethane	NE	ug/L	1.0	1		04/01/16 17:30	75-34-3	
1,2-Dichloroethane	NE	-	1.0	1		04/01/16 17:30	107-06-2	
1,1-Dichloroethene	NE	-	1.0	1		04/01/16 17:30	75-35-4	M1
cis-1,2-Dichloroethene	NE	-	1.0	1		04/01/16 17:30	156-59-2	M1
rans-1,2-Dichloroethene	NE	-	1.0	1		04/01/16 17:30	156-60-5	M1
Dichlorofluoromethane	NE	ug/L	1.0	1		04/01/16 17:30	75-43-4	M1
1,2-Dichloropropane	NE	-	4.0	1		04/01/16 17:30	78-87-5	
1,3-Dichloropropane	NE	-	1.0	1		04/01/16 17:30	142-28-9	M1
2,2-Dichloropropane	NE	· · · · · · · · · · · · · · · · · · ·	4.0	1		04/01/16 17:30	594-20-7	M1
1,1-Dichloropropene	NE	_	1.0	1		04/01/16 17:30		M1
cis-1,3-Dichloropropene	NE	-	4.0	1		04/01/16 17:30	10061-01-5	M1
trans-1,3-Dichloropropene	NE	_	4.0	1		04/01/16 17:30	10061-02-6	
Diethyl ether (Ethyl ether)	NE	Ū	4.0	1		04/01/16 17:30	0 60-29-7	
Ethylbenzene	NE	ū	1.0	1		04/01/16 17:30		
Hexachloro-1,3-butadiene	NE	-	1.0	1		04/01/16 17:30		
Isopropylbenzene (Cumene)	NE	ū	1.0	1		04/01/16 17:30		
p-Isopropyltoluene	NE	ū	1.0	1		04/01/16 17:30		
Methylene Chloride	NE	ū	4.0	1		04/01/16 17:30		
4-Methyl-2-pentanone (MIBK)	NE	ū	5.0	1		04/01/16 17:30		
Methyl-tert-butyl ether	NE	-	1.0	1		04/01/16 17:30		M1





### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10343283

Sample: PMW-01	Lab ID: 1034	43283001	Collected: 03/31/1	6 09:42	Received: 0	3/31/16 15:38 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		04/01/16 17:30	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		04/01/16 17:30	103-65-1	
Styrene	ND	ug/L	1.0	1		04/01/16 17:30	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/01/16 17:30	630-20-6	M1
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/01/16 17:30	79-34-5	M1
Tetrachloroethene	ND	ug/L	1.0	1		04/01/16 17:30	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		04/01/16 17:30	109-99-9	M1
Toluene	ND	ug/L	1.0	1		04/01/16 17:30	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		04/01/16 17:30	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		04/01/16 17:30	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/01/16 17:30	71-55-6	M1
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/01/16 17:30	79-00-5	M1
Trichloroethene	ND	ug/L	0.40	1		04/01/16 17:30	79-01-6	M1
Trichlorofluoromethane	ND	ug/L	1.0	1		04/01/16 17:30	75-69-4	M1
1,2,3-Trichloropropane	ND	ug/L	4.0	1		04/01/16 17:30	96-18-4	M1
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		04/01/16 17:30	76-13-1	M1
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		04/01/16 17:30	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		04/01/16 17:30	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		04/01/16 17:30	75-01-4	M1
Xylene (Total)	ND	ug/L	3.0	1		04/01/16 17:30	1330-20-7	
Surrogates		-						
1,2-Dichloroethane-d4 (S)	103	%.	75-125	1		04/01/16 17:30	17060-07-0	
Toluene-d8 (S)	100	%.	75-125	1		04/01/16 17:30	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	75-125	1		04/01/16 17:30	460-00-4	



Date: 04/21/2016 08:26 AM

### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10343283

Sample: PMW-02	Lab ID: 103	43283002	Collected: 03/31/1	16 11:00	Received:	03/31/16 15:38	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Met	hod: EPA 82	260B					
Acetone	ND	ug/L	40.0	2		04/04/16 18:1	9 67-64-1	
Allyl chloride	ND	ug/L	8.0	2		04/04/16 18:1	9 107-05-1	
Benzene	ND	ug/L	2.0	2		04/04/16 18:1	9 71-43-2	
Bromobenzene	ND	ug/L	2.0	2		04/04/16 18:1	9 108-86-1	
Bromochloromethane	ND	ug/L	2.0	2		04/04/16 18:1	9 74-97-5	
Bromodichloromethane	ND	ug/L	2.0	2		04/04/16 18:1	9 75-27-4	
Bromoform	ND	ug/L	8.0	2		04/04/16 18:1	9 75-25-2	
Bromomethane	ND	ug/L	8.0	2		04/04/16 18:1	9 74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	2		04/04/16 18:1	9 78-93-3	
n-Butylbenzene	ND	ug/L	2.0	2		04/04/16 18:1	9 104-51-8	
sec-Butylbenzene	ND	ug/L	2.0	2		04/04/16 18:1	9 135-98-8	
ert-Butylbenzene	ND	ug/L	2.0	2		04/04/16 18:1		
Carbon tetrachloride	ND	ug/L	2.0	2		04/04/16 18:1	9 56-23-5	
Chlorobenzene	ND	ug/L	2.0	2		04/04/16 18:1	9 108-90-7	
Chloroethane	ND	ug/L	2.0	2		04/04/16 18:1		
Chloroform	ND	ug/L	2.0	2		04/04/16 18:1		
Chloromethane	ND	ug/L	8.0	2		04/04/16 18:1		
2-Chlorotoluene	ND	ug/L	2.0	2		04/04/16 18:1		
-Chlorotoluene	ND	ug/L	2.0	2		04/04/16 18:1		
,2-Dibromo-3-chloropropane	ND	ug/L	8.0	2		04/04/16 18:1		
Dibromochloromethane	ND	ug/L	2.0	2		04/04/16 18:1		
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	2		04/04/16 18:1		
Dibromomethane	ND	ug/L	8.0	2		04/04/16 18:1		
1,2-Dichlorobenzene	ND	ug/L	2.0	2		04/04/16 18:1		
,3-Dichlorobenzene	ND	ug/L	2.0	2		04/04/16 18:1		
1,4-Dichlorobenzene	ND	ug/L	2.0	2		04/04/16 18:1		
Dichlorodifluoromethane	ND ND	ug/L	2.0	2		04/04/16 18:1		
1,1-Dichloroethane	35.2	•	2.0	2		04/04/16 18:1		
	ND	ug/L	2.0	2		04/04/16 18:1		
I,2-Dichloroethane I,1-Dichloroethene		ug/L	2.0	2				
cis-1,2-Dichloroethene	23.6	ug/L		2		04/04/16 18:19 04/04/16 18:19		
•	361	ug/L	2.0					
rans-1,2-Dichloroethene	309	ug/L	2.0	2		04/04/16 18:19 04/04/16 18:19		
Dichlorofluoromethane	ND	ug/L	2.0	2 2		04/04/16 18:1		
I,2-Dichloropropane	ND	ug/L	8.0	2				
,3-Dichloropropane	ND	ug/L	2.0			04/04/16 18:1		
2,2-Dichloropropane	ND	ug/L	8.0	2		04/04/16 18:1		
I,1-Dichloropropene	ND	ug/L	2.0	2		04/04/16 18:1		
cis-1,3-Dichloropropene	ND	ug/L	8.0	2		04/04/16 18:1		
rans-1,3-Dichloropropene	ND	ug/L	8.0	2			9 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	8.0	2		04/04/16 18:1		
Ethylbenzene	ND	ug/L	2.0	2		04/04/16 18:1		
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2		04/04/16 18:1		
sopropylbenzene (Cumene)	ND	ug/L	2.0	2		04/04/16 18:1		
p-Isopropyltoluene	ND	ug/L	2.0	2		04/04/16 18:1		
Methylene Chloride	ND	ug/L	8.0	2		04/04/16 18:1		
I-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	2		04/04/16 18:1		
Methyl-tert-butyl ether	ND	ug/L	2.0	2		04/04/16 18:1	9 1634-04-4	





### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10343283

Sample: PMW-02	Lab ID: 1034	43283002	Collected: 03/31/1	6 11:00	Received: 03/31/16 15:	38 Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared Analy	zed CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B				
Naphthalene	ND	ug/L	8.0	2	04/04/16	18:19 91-20-3	
n-Propylbenzene	ND	ug/L	2.0	2	04/04/16	18:19 103-65-1	
Styrene	ND	ug/L	2.0	2	04/04/16	18:19 100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2	04/04/16	18:19 630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2	04/04/16	18:19 79-34-5	
Tetrachloroethene	ND	ug/L	2.0	2	04/04/16	18:19 127-18-4	
Tetrahydrofuran	ND	ug/L	20.0	2	04/04/16	18:19 109-99-9	
Toluene	ND	ug/L	2.0	2	04/04/16	18:19 108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2	04/04/16	18:19 87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2	04/04/16	18:19 120-82-1	
1,1,1-Trichloroethane	ND	ug/L	2.0	2	04/04/16	18:19 71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	2	04/04/16	18:19 79-00-5	
Trichloroethene	93.8	ug/L	0.80	2	04/04/16	18:19 79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2	04/04/16	18:19 75-69-4	
1,2,3-Trichloropropane	ND	ug/L	8.0	2	04/04/16	18:19 96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	2.0	2	04/04/16	18:19 76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	2.0	2	04/04/16	18:19 95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	2.0	2	04/04/16	18:19 108-67-8	
Vinyl chloride	3.7	ug/L	2.0	2	04/04/16	18:19 75-01-4	
Xylene (Total)	ND	ug/L	6.0	2	04/04/16	18:19 1330-20-7	
Surrogates		-					
1,2-Dichloroethane-d4 (S)	105	%.	75-125	2	04/04/16	18:19 17060-07-0	
Toluene-d8 (S)	98	%.	75-125	2	04/04/16	18:19 2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	2	04/04/16	18:19 460-00-4	



Date: 04/21/2016 08:26 AM

### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10343283

Sample: PMW-03	Lab ID: 103	43283003	Collected: 03/31/1	6 12:30	Received:	03/31/16 15:38	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		04/01/16 15:20	6 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		04/01/16 15:20	6 107-05-1	
Benzene	ND	ug/L	1.0	1		04/01/16 15:20	6 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		04/01/16 15:20	6 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		04/01/16 15:20	6 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/01/16 15:20	6 75-27-4	
Bromoform	ND	ug/L	4.0	1		04/01/16 15:20	6 75-25-2	
Bromomethane	ND	ug/L	4.0	1		04/01/16 15:20	6 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/01/16 15:20	6 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		04/01/16 15:20		
sec-Butylbenzene	ND	ug/L	1.0	1		04/01/16 15:20	6 135-98-8	
ert-Butylbenzene	ND	ug/L	1.0	1		04/01/16 15:20		
Carbon tetrachloride	ND	ug/L	1.0	1		04/01/16 15:20		
Chlorobenzene	ND	ug/L	1.0	1		04/01/16 15:20		
Chloroethane	ND	ug/L	1.0	1		04/01/16 15:20		
Chloroform	ND	ug/L	1.0	1		04/01/16 15:20		
Chloromethane	ND ND	ug/L	4.0	1		04/01/16 15:20		
-Chlorotoluene	ND ND	ug/L	1.0	1		04/01/16 15:20		
-Chlorotoluene	ND ND	ug/L	1.0	1		04/01/16 15:20		
	ND ND	•	4.0	1		04/01/16 15:20		
,2-Dibromo-3-chloropropane		ug/L		1				
Dibromochloromethane	ND	ug/L	1.0			04/01/16 15:20		
,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		04/01/16 15:20		
Dibromomethane	ND	ug/L	4.0	1		04/01/16 15:20		
,2-Dichlorobenzene	ND	ug/L	1.0	1		04/01/16 15:20		
,3-Dichlorobenzene	ND	ug/L	1.0	1		04/01/16 15:20		
,4-Dichlorobenzene	ND	ug/L	1.0	1		04/01/16 15:20		
Dichlorodifluoromethane	ND	ug/L	1.0	1		04/01/16 15:20		
,1-Dichloroethane	2.7	ug/L	1.0	1		04/01/16 15:20		
,2-Dichloroethane	ND	ug/L	1.0	1		04/01/16 15:20		
,1-Dichloroethene	1.6	ug/L	1.0	1		04/01/16 15:20	6 75-35-4	
is-1,2-Dichloroethene	53.6	ug/L	1.0	1		04/01/16 15:20		
rans-1,2-Dichloroethene	91.0	ug/L	1.0	1		04/01/16 15:20	6 156-60-5	
Dichlorofluoromethane	ND	ug/L	1.0	1		04/01/16 15:20	6 75-43-4	
,2-Dichloropropane	ND	ug/L	4.0	1		04/01/16 15:20	6 78-87-5	
,3-Dichloropropane	ND	ug/L	1.0	1		04/01/16 15:20	6 142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		04/01/16 15:20	6 594-20-7	
,1-Dichloropropene	ND	ug/L	1.0	1		04/01/16 15:20	6 563-58-6	
is-1,3-Dichloropropene	ND	ug/L	4.0	1		04/01/16 15:20	6 10061-01-5	
ans-1,3-Dichloropropene	ND	ug/L	4.0	1		04/01/16 15:20	6 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		04/01/16 15:20	6 60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		04/01/16 15:20		
lexachloro-1,3-butadiene	ND	ug/L	1.0	1		04/01/16 15:20		
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		04/01/16 15:20		
-Isopropyltoluene	ND	ug/L	1.0	1		04/01/16 15:20		
Methylene Chloride	ND	ug/L	4.0	1		04/01/16 15:20		
I-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/01/16 15:20		
Methyl-tert-butyl ether	ND ND	ug/L	1.0	1		04/01/16 15:20		





### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10343283

Sample: PMW-03	Lab ID: 1034	43283003	Collected: 03/31/1	6 12:30	Received: 03/31/16 15:3	8 Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared Analyz	ed CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B				
Naphthalene	ND	ug/L	4.0	1	04/01/16 1	5:26 91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1	04/01/16 1	5:26 103-65-1	
Styrene	ND	ug/L	1.0	1	04/01/16 1	5:26 100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1	04/01/16 1	5:26 630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1	04/01/16 1	5:26 79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1	04/01/16 1	5:26 127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1	04/01/16 1	5:26 109-99-9	
Toluene	ND	ug/L	1.0	1	04/01/16 1	5:26 108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1	04/01/16 1	5:26 87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1	04/01/16 1	5:26 120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1	04/01/16 1	5:26 71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1	04/01/16 1	5:26 79-00-5	
Trichloroethene	13.9	ug/L	0.40	1	04/01/16 1	5:26 79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1	04/01/16 1	5:26 75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1	04/01/16 1	5:26 96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1	04/01/16 1	5:26 76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1	04/01/16 1	5:26 95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1	04/01/16 1	5:26 108-67-8	
Vinyl chloride	ND	ug/L	1.0	1	04/01/16 1	5:26 75-01-4	
Xylene (Total)	ND	ug/L	3.0	1	04/01/16 1	5:26 1330-20-7	
Surrogates							
1,2-Dichloroethane-d4 (S)	102	%.	75-125	1	04/01/16 1	5:26 17060-07-0	
Toluene-d8 (S)	99	%.	75-125	1	04/01/16 1	5:26 2037-26-5	
4-Bromofluorobenzene (S)	100	%.	75-125	1	04/01/16 1	5:26 460-00-4	



Date: 04/21/2016 08:26 AM

### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP

Sample: PMW-04	Lab ID: 103	43283004	Collected: 03/31/1	16 13:50	Received: 03/31/16 15:38	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared Analyzed	CAS No.	Qua
8260B VOC	Analytical Met	hod: EPA 82	260B				
Acetone	ND	ug/L	20.0	1	04/01/16 15:50	6 67-64-1	
Allyl chloride	ND	ug/L	4.0	1	04/01/16 15:50	6 107-05-1	
Benzene	ND	ug/L	1.0	1	04/01/16 15:50	6 71-43-2	
Bromobenzene	ND	ug/L	1.0	1	04/01/16 15:50	6 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1	04/01/16 15:50	6 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1	04/01/16 15:50	6 75-27-4	
Bromoform	ND	ug/L	4.0	1	04/01/16 15:50	6 75-25-2	
Bromomethane	ND	ug/L	4.0	1	04/01/16 15:50	6 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1	04/01/16 15:50	6 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1	04/01/16 15:50	6 104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1	04/01/16 15:50		
ert-Butylbenzene	ND	ug/L	1.0	1	04/01/16 15:50		
Carbon tetrachloride	ND	ug/L	1.0	1	04/01/16 15:50	6 56-23-5	
Chlorobenzene	ND	ug/L	1.0	1	04/01/16 15:50		
Chloroethane	ND	ug/L	1.0	1	04/01/16 15:50		
Chloroform	ND	ug/L	1.0	1	04/01/16 15:50		
Chloromethane	ND	ug/L	4.0	1	04/01/16 15:50		
2-Chlorotoluene	ND ND	ug/L	1.0	1	04/01/16 15:50		
-Chlorotoluene	ND ND	ug/L ug/L	1.0	1	04/01/16 15:50		
,2-Dibromo-3-chloropropane	ND ND	ug/L ug/L	4.0	1	04/01/16 15:50		
, I		•		1			
Dibromochloromethane	ND ND	ug/L	1.0 1.0	1	04/01/16 15:50 04/01/16 15:50		
I,2-Dibromoethane (EDB)		ug/L					
Dibromomethane	ND	ug/L	4.0	1	04/01/16 15:50		
I,2-Dichlorobenzene	ND	ug/L	1.0	1	04/01/16 15:50		
I,3-Dichlorobenzene	ND	ug/L	1.0	1	04/01/16 15:50		
I,4-Dichlorobenzene	ND	ug/L	1.0	1	04/01/16 15:50		
Dichlorodifluoromethane	ND	ug/L	1.0	1	04/01/16 15:50		
1,1-Dichloroethane	ND	ug/L	1.0	1	04/01/16 15:50		
1,2-Dichloroethane	ND	ug/L	1.0	1	04/01/16 15:50		
1,1-Dichloroethene	1.2	ug/L	1.0	1	04/01/16 15:50		
cis-1,2-Dichloroethene	23.8	ug/L	1.0	1	04/01/16 15:50		
rans-1,2-Dichloroethene	57.5	ug/L	1.0	1	04/01/16 15:50		
Dichlorofluoromethane	ND	ug/L	1.0	1	04/01/16 15:50	6 75-43-4	
,2-Dichloropropane	ND	ug/L	4.0	1	04/01/16 15:50	6 78-87-5	
,3-Dichloropropane	ND	ug/L	1.0	1	04/01/16 15:50	6 142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1	04/01/16 15:50	5 594-20-7	
,1-Dichloropropene	ND	ug/L	1.0	1	04/01/16 15:50	5 563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1	04/01/16 15:50	6 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1	04/01/16 15:50	6 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1	04/01/16 15:50	6 60-29-7	
Ethylbenzene	ND	ug/L	1.0	1	04/01/16 15:50	6 100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1	04/01/16 15:50		
sopropylbenzene (Cumene)	ND	ug/L	1.0	1	04/01/16 15:50		
o-Isopropyltoluene	ND	ug/L	1.0	1	04/01/16 15:50		
Methylene Chloride	ND	ug/L	4.0	1	04/01/16 15:50		
4-Methyl-2-pentanone (MIBK)	ND ND	ug/L	5.0	1	04/01/16 15:50		
Methyl-tert-butyl ether	ND ND	ug/L ug/L	1.0	1	04/01/16 15:50		





### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10343283

Sample: PMW-04	Lab ID: 1034	43283004	Collected: 03/31/1	16 13:50	Received: 03/31/16 15:38	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	od: EPA 82	260B				
Naphthalene	ND	ug/L	4.0	1	04/01/16 15:56	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1	04/01/16 15:56	103-65-1	
Styrene	ND	ug/L	1.0	1	04/01/16 15:56	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1	04/01/16 15:56	6 630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1	04/01/16 15:56	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1	04/01/16 15:56	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1	04/01/16 15:56	109-99-9	
Toluene	ND	ug/L	1.0	1	04/01/16 15:56	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1	04/01/16 15:56	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1	04/01/16 15:56	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1	04/01/16 15:56	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1	04/01/16 15:56	79-00-5	
Trichloroethene	28.4	ug/L	0.40	1	04/01/16 15:56	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1	04/01/16 15:56	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1	04/01/16 15:56	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1	04/01/16 15:56	6 76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1	04/01/16 15:56	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1	04/01/16 15:56	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1	04/01/16 15:56	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1	04/01/16 15:56	3 1330-20-7	
Surrogates		-					
1,2-Dichloroethane-d4 (S)	102	%.	75-125	1	04/01/16 15:56	17060-07-0	
Toluene-d8 (S)	99	%.	75-125	1	04/01/16 15:56	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	75-125	1	04/01/16 15:56	6 460-00-4	



Date: 04/21/2016 08:26 AM

### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10343283

Sample: Trip Blank 1	Lab ID: 103	43283005	Collected: 03/31/1	6 07:00	Received:	03/31/16 15:38	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		04/01/16 12:5	7 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		04/01/16 12:5	7 107-05-1	
Benzene	ND	ug/L	1.0	1		04/01/16 12:5	7 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		04/01/16 12:5	7 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		04/01/16 12:5	7 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/01/16 12:5	7 75-27-4	
Bromoform	ND	ug/L	4.0	1		04/01/16 12:5	7 75-25-2	
Bromomethane	ND	ug/L	4.0	1		04/01/16 12:5	7 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/01/16 12:5	7 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		04/01/16 12:5	7 104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		04/01/16 12:5	7 135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		04/01/16 12:5	7 98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		04/01/16 12:5		
Chlorobenzene	ND	ug/L	1.0	1		04/01/16 12:5	7 108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/01/16 12:5		
Chloroform	ND	ug/L	1.0	1		04/01/16 12:5		
Chloromethane	ND	ug/L	4.0	1		04/01/16 12:5		
2-Chlorotoluene	ND	ug/L	1.0	1		04/01/16 12:5		
4-Chlorotoluene	ND ND	ug/L	1.0	1		04/01/16 12:5		
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		04/01/16 12:5		
Dibromochloromethane	ND ND	ug/L	1.0	1		04/01/16 12:5		
1,2-Dibromoethane (EDB)	ND ND	ug/L ug/L	1.0	1		04/01/16 12:5	-	
Dibromomethane	ND ND	-	4.0	1		04/01/16 12:5		
		ug/L		1				
1,2-Dichlorobenzene	ND	ug/L	1.0			04/01/16 12:5		
1,3-Dichlorobenzene	ND	ug/L	1.0	1		04/01/16 12:5		
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/01/16 12:5		
Dichlorodifluoromethane	ND	ug/L	1.0	1		04/01/16 12:5		
1,1-Dichloroethane	ND	ug/L	1.0	1		04/01/16 12:5		
1,2-Dichloroethane	ND	ug/L	1.0	1		04/01/16 12:5		
1,1-Dichloroethene	ND	ug/L	1.0	1		04/01/16 12:5		
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/01/16 12:5		
rans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/01/16 12:5		
Dichlorofluoromethane	ND	ug/L	1.0	1		04/01/16 12:5		
1,2-Dichloropropane	ND	ug/L	4.0	1		04/01/16 12:5	7 78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		04/01/16 12:5	7 142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		04/01/16 12:5	7 594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		04/01/16 12:5	7 563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1		04/01/16 12:5	7 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1		04/01/16 12:5	7 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		04/01/16 12:5	7 60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		04/01/16 12:5	7 100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		04/01/16 12:5	7 87-68-3	
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		04/01/16 12:5	7 98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		04/01/16 12:5	7 99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		04/01/16 12:5	7 75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/01/16 12:5	7 108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		04/01/16 12:5		



### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10343283

Sample: Trip Blank 1	Lab ID: 1034	43283005	Collected: 03/31/1	6 07:00	Received: 03/31/16 15:3	8 Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared Analyz	ed CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B				
Naphthalene	ND	ug/L	4.0	1	04/01/16 1	2:57 91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1	04/01/16 1	2:57 103-65-1	
Styrene	ND	ug/L	1.0	1	04/01/16 1	2:57 100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1	04/01/16 1	2:57 630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1	04/01/16 1	2:57 79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1	04/01/16 1	2:57 127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1	04/01/16 1	2:57 109-99-9	
Toluene	ND	ug/L	1.0	1	04/01/16 1	2:57 108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1	04/01/16 1	2:57 87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1	04/01/16 1	2:57 120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1	04/01/16 1	2:57 71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1	04/01/16 1	2:57 79-00-5	
Trichloroethene	ND	ug/L	0.40	1	04/01/16 1	2:57 79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1	04/01/16 1	2:57 75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1	04/01/16 1	2:57 96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1	04/01/16 1	2:57 76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1	04/01/16 1	2:57 95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1	04/01/16 1	2:57 108-67-8	
Vinyl chloride	ND	ug/L	1.0	1	04/01/16 1	2:57 75-01-4	
Xylene (Total)	ND	ug/L	3.0	1	04/01/16 1	2:57 1330-20-7	
Surrogates		-					
1,2-Dichloroethane-d4 (S)	103	%.	75-125	1	04/01/16 1	2:57 17060-07-0	
Toluene-d8 (S)	100	%.	75-125	1	04/01/16 1	2:57 2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125	1	04/01/16 1	2:57 460-00-4	



Date: 04/21/2016 08:26 AM

### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP

Sample: Trip Blank 2	Lab ID: 103	43283006	Collected: 03/31/1	6 07:05	Received: 0	03/31/16 15:38	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Acetone	ND	ug/L	20.0	1		04/01/16 13:1:	2 67-64-1	
Allyl chloride	ND	ug/L	4.0	1		04/01/16 13:1:	2 107-05-1	
Benzene	ND	ug/L	1.0	1		04/01/16 13:1:	2 71-43-2	
Bromobenzene	ND	ug/L	1.0	1		04/01/16 13:1:	2 108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		04/01/16 13:1:	2 74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/01/16 13:1:	2 75-27-4	
Bromoform	ND	ug/L	4.0	1		04/01/16 13:1:	2 75-25-2	
Bromomethane	ND	ug/L	4.0	1		04/01/16 13:1:	2 74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/01/16 13:1:	2 78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		04/01/16 13:1:	2 104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		04/01/16 13:1:	2 135-98-8	
ert-Butylbenzene	ND	ug/L	1.0	1		04/01/16 13:1:		
Carbon tetrachloride	ND	ug/L	1.0	1		04/01/16 13:1:		
Chlorobenzene	ND	ug/L	1.0	1		04/01/16 13:1:		
Chloroethane	ND	ug/L	1.0	1		04/01/16 13:1:		
Chloroform	ND	ug/L	1.0	1		04/01/16 13:1:		
Chloromethane	ND ND	ug/L	4.0	1		04/01/16 13:1:		
2-Chlorotoluene	ND ND	ug/L	1.0	1		04/01/16 13:1:		
		-		1				
I-Chlorotoluene	ND	ug/L	1.0			04/01/16 13:1:		
I,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		04/01/16 13:1:		
Dibromochloromethane	ND	ug/L	1.0	1		04/01/16 13:1:		
I,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		04/01/16 13:1:		
Dibromomethane	ND	ug/L	4.0	1		04/01/16 13:1:		
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/01/16 13:1:		
1,3-Dichlorobenzene	ND	ug/L	1.0	1		04/01/16 13:1:		
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/01/16 13:1:		
Dichlorodifluoromethane	ND	ug/L	1.0	1		04/01/16 13:1:		
I,1-Dichloroethane	ND	ug/L	1.0	1		04/01/16 13:1:	2 75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/01/16 13:1:	2 107-06-2	
,1-Dichloroethene	ND	ug/L	1.0	1		04/01/16 13:1:	2 75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/01/16 13:1:	2 156-59-2	
rans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/01/16 13:1:	2 156-60-5	
Dichlorofluoromethane	ND	ug/L	1.0	1		04/01/16 13:1:	2 75-43-4	
1,2-Dichloropropane	ND	ug/L	4.0	1		04/01/16 13:1:	2 78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		04/01/16 13:1:	2 142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		04/01/16 13:1:		
,1-Dichloropropene	ND	ug/L	1.0	1		04/01/16 13:1:	2 563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1		04/01/16 13:1:	2 10061-01-5	
rans-1,3-Dichloropropene	ND	ug/L	4.0	1			2 10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		04/01/16 13:1:		
Ethylbenzene	ND	ug/L	1.0	1		04/01/16 13:1:		
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		04/01/16 13:1:		
sopropylbenzene (Cumene)	ND	ug/L	1.0	1		04/01/16 13:1:		
p-Isopropyltoluene	ND ND	ug/L ug/L	1.0	1		04/01/16 13:1:		
Methylene Chloride	ND ND	•		1				
		ug/L	4.0			04/01/16 13:1:		
4-Methyl-2-pentanone (MIBK) Methyl-tert-butyl ether	ND ND	ug/L ug/L	5.0 1.0	1 1		04/01/16 13:1: 04/01/16 13:1:		





### **ANALYTICAL RESULTS**

Project: PS Beta-NIROP
Pace Project No.: 10343283

Sample: Trip Blank 2	Lab ID: 103	43283006	Collected: 03/31/1	6 07:05	Received: 03	3/31/16 15:38 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8260B VOC	Analytical Meth	nod: EPA 82	260B					
Naphthalene	ND	ug/L	4.0	1		04/01/16 13:12	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		04/01/16 13:12	103-65-1	
Styrene	ND	ug/L	1.0	1		04/01/16 13:12	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/01/16 13:12	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/01/16 13:12	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/01/16 13:12	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		04/01/16 13:12	109-99-9	
Toluene	ND	ug/L	1.0	1		04/01/16 13:12	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		04/01/16 13:12	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		04/01/16 13:12	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/01/16 13:12	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/01/16 13:12	79-00-5	
Trichloroethene	ND	ug/L	0.40	1		04/01/16 13:12	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/01/16 13:12	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		04/01/16 13:12	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		04/01/16 13:12	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		04/01/16 13:12	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		04/01/16 13:12	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		04/01/16 13:12	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		04/01/16 13:12	1330-20-7	
Surrogates		-						
1,2-Dichloroethane-d4 (S)	103	%.	75-125	1		04/01/16 13:12	17060-07-0	
Toluene-d8 (S)	100	%.	75-125	1		04/01/16 13:12	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1		04/01/16 13:12	460-00-4	



#### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP

Pace Project No.: 10343283

Date: 04/21/2016 08:26 AM

 QC Batch:
 MSV/35072
 Analysis Method:
 EPA 8260B

 QC Batch Method:
 EPA 8260B
 Analysis Description:
 8260B MSV 465 W

 Associated Lab Samples:
 10343283001, 10343283003, 10343283004, 10343283005, 10343283006

METHOD BLANK: 2221638 Matrix: Water

Associated Lab Samples: 10343283001, 10343283003, 10343283004, 10343283005, 10343283006

	•	Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	04/01/16 12:28	
1,1,1-Trichloroethane	ug/L	ND	1.0	04/01/16 12:28	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	04/01/16 12:28	
1,1,2-Trichloroethane	ug/L	ND	1.0	04/01/16 12:28	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	04/01/16 12:28	
1,1-Dichloroethane	ug/L	ND	1.0	04/01/16 12:28	
1,1-Dichloroethene	ug/L	ND	1.0	04/01/16 12:28	
1,1-Dichloropropene	ug/L	ND	1.0	04/01/16 12:28	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	04/01/16 12:28	
1,2,3-Trichloropropane	ug/L	ND	4.0	04/01/16 12:28	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	04/01/16 12:28	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	04/01/16 12:28	
1,2-Dibromo-3-chloropropane	ug/L	ND	4.0	04/01/16 12:28	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	04/01/16 12:28	
1,2-Dichlorobenzene	ug/L	ND	1.0	04/01/16 12:28	
1,2-Dichloroethane	ug/L	ND	1.0	04/01/16 12:28	
1,2-Dichloropropane	ug/L	ND	4.0	04/01/16 12:28	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	04/01/16 12:28	
1,3-Dichlorobenzene	ug/L	ND	1.0	04/01/16 12:28	
1,3-Dichloropropane	ug/L	ND	1.0	04/01/16 12:28	
1,4-Dichlorobenzene	ug/L	ND	1.0	04/01/16 12:28	
2,2-Dichloropropane	ug/L	ND	4.0	04/01/16 12:28	
2-Butanone (MEK)	ug/L	ND	5.0	04/01/16 12:28	
2-Chlorotoluene	ug/L	ND	1.0	04/01/16 12:28	
4-Chlorotoluene	ug/L	ND	1.0	04/01/16 12:28	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	04/01/16 12:28	
Acetone	ug/L	ND	20.0	04/01/16 12:28	
Allyl chloride	ug/L	ND	4.0	04/01/16 12:28	
Benzene	ug/L	ND	1.0	04/01/16 12:28	
Bromobenzene	ug/L	ND	1.0	04/01/16 12:28	
Bromochloromethane	ug/L	ND	1.0	04/01/16 12:28	
Bromodichloromethane	ug/L	ND	1.0	04/01/16 12:28	
Bromoform	ug/L	ND	4.0	04/01/16 12:28	
Bromomethane	ug/L	ND	4.0	04/01/16 12:28	
Carbon tetrachloride	ug/L	ND	1.0	04/01/16 12:28	
Chlorobenzene	ug/L	ND	1.0	04/01/16 12:28	
Chloroethane	ug/L	ND	1.0	04/01/16 12:28	
Chloroform	ug/L	ND	1.0	04/01/16 12:28	
Chloromethane	ug/L	ND	4.0	04/01/16 12:28	
cis-1,2-Dichloroethene	ug/L	ND	1.0	04/01/16 12:28	
cis-1,3-Dichloropropene	ug/L	ND	4.0	04/01/16 12:28	

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.





### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10343283

METHOD BLANK: 2221638 Matrix: Water

Associated Lab Samples: 10343283001, 10343283003, 10343283004, 10343283005, 10343283006

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/L	ND ND	1.0	04/01/16 12:28	
Dibromomethane	ug/L	ND	4.0	04/01/16 12:28	
Dichlorodifluoromethane	ug/L	ND	1.0	04/01/16 12:28	
Dichlorofluoromethane	ug/L	ND	1.0	04/01/16 12:28	
Diethyl ether (Ethyl ether)	ug/L	ND	4.0	04/01/16 12:28	
Ethylbenzene	ug/L	ND	1.0	04/01/16 12:28	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	04/01/16 12:28	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	04/01/16 12:28	
Methyl-tert-butyl ether	ug/L	ND	1.0	04/01/16 12:28	
Methylene Chloride	ug/L	ND	4.0	04/01/16 12:28	
n-Butylbenzene	ug/L	ND	1.0	04/01/16 12:28	
n-Propylbenzene	ug/L	ND	1.0	04/01/16 12:28	
Naphthalene	ug/L	ND	4.0	04/01/16 12:28	
p-Isopropyltoluene	ug/L	ND	1.0	04/01/16 12:28	
sec-Butylbenzene	ug/L	ND	1.0	04/01/16 12:28	
Styrene	ug/L	ND	1.0	04/01/16 12:28	
tert-Butylbenzene	ug/L	ND	1.0	04/01/16 12:28	
Tetrachloroethene	ug/L	ND	1.0	04/01/16 12:28	
Tetrahydrofuran	ug/L	ND	10.0	04/01/16 12:28	
Toluene	ug/L	ND	1.0	04/01/16 12:28	
trans-1,2-Dichloroethene	ug/L	ND	1.0	04/01/16 12:28	
trans-1,3-Dichloropropene	ug/L	ND	4.0	04/01/16 12:28	
Trichloroethene	ug/L	ND	0.40	04/01/16 12:28	
Trichlorofluoromethane	ug/L	ND	1.0	04/01/16 12:28	
Vinyl chloride	ug/L	ND	1.0	04/01/16 12:28	
Xylene (Total)	ug/L	ND	3.0	04/01/16 12:28	
1,2-Dichloroethane-d4 (S)	%.	104	75-125	04/01/16 12:28	
4-Bromofluorobenzene (S)	%.	119	75-125	04/01/16 12:28	
Toluene-d8 (S)	%.	101	75-125	04/01/16 12:28	

LABORATORY CONTROL SAMPLE &	LCSD: 2221639		22	22246						
		Spike	LCS	LCSD	LCS	LCSD	% Rec		Max	
Parameter	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	21.6	21.1	108	105	75-125	3	20	
1,1,1-Trichloroethane	ug/L	20	20.5	19.5	103	98	73-125	5	20	
1,1,2,2-Tetrachloroethane	ug/L	20	20.4	20.6	102	103	75-128	1	20	
1,1,2-Trichloroethane	ug/L	20	20.2	20.0	101	100	75-129	1	20	
1,1,2-Trichlorotrifluoroethane	ug/L	20	22.5	22.0	113	110	69-125	2	20	
1,1-Dichloroethane	ug/L	20	19.6	19.4	98	97	75-131	1	20	
1,1-Dichloroethene	ug/L	20	23.6	22.9	118	115	72-125	3	20	
1,1-Dichloropropene	ug/L	20	21.5	21.6	108	108	74-125	0	20	
1,2,3-Trichlorobenzene	ug/L	20	20.5	19.7	103	99	68-127	4	20	
1,2,3-Trichloropropane	ug/L	20	20.8	21.1	104	105	75-125	2	20	
1,2,4-Trichlorobenzene	ug/L	20	20.8	18.9	104	95	70-125	9	20	

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



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10343283

LABORATORY CONTROL SAMPLE &	LCSD: 2221639			22246						
		Spike	LCS	LCSD	LCS	LCSD	% Rec		Max	
Parameter	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qualifier
1,2,4-Trimethylbenzene	ug/L	20	20.8	20.7	104	103	75-130	1	20	
1,2-Dibromo-3-chloropropane	ug/L	50	53.9	49.1	108	98	74-125	9	20	
1,2-Dibromoethane (EDB)	ug/L	20	21.5	21.4	108	107	75-125	1	20	
1,2-Dichlorobenzene	ug/L	20	19.3	19.8	96	99	75-125	2	20	
1,2-Dichloroethane	ug/L	20	18.3	19.3	92	96	72-129	5	20	
1,2-Dichloropropane	ug/L	20	20.9	20.9		104	71-129	0	20	
1,3,5-Trimethylbenzene	ug/L	20	20.9	20.9	104	104	75-127	0	20	
1,3-Dichlorobenzene	ug/L	20	19.7	19.9	99	100	75-125	1	20	
1,3-Dichloropropane	ug/L	20	20.2	20.4	101	102	75-125	1	20	
1,4-Dichlorobenzene	ug/L	20	19.1	19.2	96	96	75-125	0	20	
2,2-Dichloropropane	ug/L	20	21.4	18.7	107	94	71-125	13	20	
2-Butanone (MEK)	ug/L	100	97.5	103	98	103	58-150	6	20	
2-Chlorotoluene	ug/L	20	20.0	19.8	100	99	75-125	1	20	
1-Chlorotoluene	ug/L	20	20.2	19.9		100	75-130	1	20	
4-Methyl-2-pentanone (MIBK)	ug/L	100	107	107		107	72-140	0	20	
Acetone	ug/L	100	107	112	107	112	69-137	4	20	
Allyl chloride	ug/L	20	21.1	20.0	106	100	68-132	6	20	
	ug/L	20	20.8	20.9		105	75-125	1	20	
Bromobenzene	ug/L	20	19.9	19.8		99	75-125	0	20	
Bromochloromethane	ug/L	20	20.3	21.6		108	75-125	6	20	
Bromodichloromethane	ug/L	20	20.9	20.0			69-128	5	20	
Bromoform	ug/L	20	20.8	15.3		77	75-125	30	20 F	R1
Bromomethane	ug/L	20	23.4	15.4		77	30-150	41	20 F	
Carbon tetrachloride	ug/L	20	22.7	21.6			74-125	5	20	
Chlorobenzene	ug/L	20	20.5	20.6			75-125	1	20	
Chloroethane	ug/L	20	20.3	21.1	101	105	60-150	4	20	
Chloroform	ug/L	20	18.9	18.9		94	75-126	0	20	
Chloromethane	ug/L	20	21.2	19.0			46-150	11	20	
cis-1,2-Dichloroethene	ug/L	20	21.2	21.0		105	75-126	1	20	
cis-1,3-Dichloropropene	ug/L	20	21.8	20.9		104	75-125	4	20	
Dibromochloromethane	ug/L	20	20.7	18.2			75-125	13	20	
Dibromomethane	ug/L	20	21.7	21.4		107	72-127	1	20	
Dichlorodifluoromethane	ug/L	20	23.6	23.3		117	58-135	1	20	
Dichlorofluoromethane	ug/L	20	21.3	21.2		106	68-149	1	20	
Diethyl ether (Ethyl ether)	ug/L	20	19.5	20.3		101	66-144	4	20	
Ethylbenzene	ug/L	20	19.9	20.0		100	75-125	0	20	
Hexachloro-1,3-butadiene	ug/L	20	23.5	19.8			73-125	17	20	
sopropylbenzene (Cumene)	ug/L	20	20.6	20.6			69-140	0	20	
Methyl-tert-butyl ether	ug/L	20	20.0	20.7			75-126	3	20	
Methylene Chloride	ug/L	20	19.5	20.0			71-130	3	20	
n-Butylbenzene	ug/L	20	21.6	20.2			71-129	7	20	
n-Propylbenzene	ug/L	20	20.0	20.1			71-133	0	20	
Naphthalene	ug/L	20	20.1	20.1		100	59-137	0	20	
o-Isopropyltoluene	ug/L	20	20.1	20.1			74-127	3	20	
sec-Butylbenzene	ug/L	20	20.3	19.9			66-140	2	20	
Styrene	ug/L	20	21.4	21.8			75-125	2	20	
ert-Butylbenzene	ug/L	20	19.7	19.1			73-129	3	20	

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



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10343283

LABORATORY CONTROL SAMPLE	& LCSD: 2221639	9	22	22246						
		Spike	LCS	LCSD	LCS	LCSD	% Rec		Max	
Parameter	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
Tetrachloroethene	ug/L	20	21.2	19.9	106	99	75-125	6	20	
Tetrahydrofuran	ug/L	200	231	237	116	118	71-129	2	20	
Toluene	ug/L	20	20.9	20.7	104	104	75-125	1	20	
trans-1,2-Dichloroethene	ug/L	20	20.6	20.9	103	105	75-125	2	20	
trans-1,3-Dichloropropene	ug/L	20	21.5	20.6	107	103	75-125	4	20	
Trichloroethene	ug/L	20	21.2	20.1	106	100	75-125	5	20	
Trichlorofluoromethane	ug/L	20	22.9	22.5	115	112	74-128	2	20	
Vinyl chloride	ug/L	20	23.5	22.6	117	113	71-131	4	20	
Xylene (Total)	ug/L	60	61.2	61.5	102	103	75-125	0	20	
1,2-Dichloroethane-d4 (S)	%.				101	99	75-125			
4-Bromofluorobenzene (S)	%.				100	99	75-125			
Toluene-d8 (S)	%.				102	100	75-125			

MATRIX SPIKE SAMPLE:	2222895						
		10343283001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	28.8	144	75-125	M1
1,1,1-Trichloroethane	ug/L	ND	20	30.4	152	71-144	M1
1,1,2,2-Tetrachloroethane	ug/L	ND	20	27.0	135	75-131	M1
1,1,2-Trichloroethane	ug/L	ND	20	26.4	132	75-125	M1
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	31.5	158	75-150	M1
1,1-Dichloroethane	ug/L	ND	20	28.7	143	64-150	
1,1-Dichloroethene	ug/L	ND	20	32.0	160	68-150	M1
1,1-Dichloropropene	ug/L	ND	20	30.5	152	68-145	M1
1,2,3-Trichlorobenzene	ug/L	ND	20	22.0	109	57-142	
1,2,3-Trichloropropane	ug/L	ND	20	28.2	141	75-125	M1
1,2,4-Trichlorobenzene	ug/L	ND	20	20.4	101	60-135	
1,2,4-Trimethylbenzene	ug/L	ND	20	24.6	123	67-148	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	67.0	134	32-137	
1,2-Dibromoethane (EDB)	ug/L	ND	20	27.4	137	75-125	M1
1,2-Dichlorobenzene	ug/L	ND	20	24.0	120	75-125	
1,2-Dichloroethane	ug/L	ND	20	25.2	126	62-138	
1,2-Dichloropropane	ug/L	ND	20	28.7	143	62-144	
1,3,5-Trimethylbenzene	ug/L	ND	20	25.5	128	67-148	
1,3-Dichlorobenzene	ug/L	ND	20	22.8	114	74-131	
1,3-Dichloropropane	ug/L	ND	20	27.2	136	75-127	M1
1,4-Dichlorobenzene	ug/L	ND	20	22.2	111	74-126	
2,2-Dichloropropane	ug/L	ND	20	29.4	147	56-146	M1
2-Butanone (MEK)	ug/L	ND	100	138	138	47-150	
2-Chlorotoluene	ug/L	ND	20	24.6	123	74-137	
4-Chlorotoluene	ug/L	ND	20	24.1	121	72-138	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	141	141	60-147	
Acetone	ug/L	ND	100	143	140	61-150	
Allyl chloride	ug/L	ND	20	26.6	133	53-150	
Benzene	ug/L	ND	20	28.6	143	52-147	

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Date: 04/21/2016 08:26 AM

### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10343283

MATRIX SPIKE SAMPLE:	2222895						
_		10343283001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/L	ND	20	24.5	122	75-129	
Bromochloromethane	ug/L	ND	20	28.5	142	72-128 M	/11
Bromodichloromethane	ug/L	ND	20	26.7	134	65-137	
Bromoform	ug/L	ND	20	22.8	114	59-133	
Bromomethane	ug/L	ND	20	18.3	92	30-150	
Carbon tetrachloride	ug/L	ND	20	31.7	159	73-144 N	Л1
Chlorobenzene	ug/L	ND	20	26.4	132	75-126 N	Л1
Chloroethane	ug/L	ND	20	30.4	149	55-150	
Chloroform	ug/L	ND	20	26.1	131	66-143	
Chloromethane	ug/L	ND	20	24.2	121	42-150	
cis-1,2-Dichloroethene	ug/L	ND	20	29.2	146	65-143 N	Л1
cis-1,3-Dichloropropene	ug/L	ND	20	25.7	129	75-125 N	/11
Dibromochloromethane	ug/L	ND	20	25.9	129	75-125 N	/11
Dibromomethane	ug/L	ND	20	28.2	141	66-133 N	/11
Dichlorodifluoromethane	ug/L	ND	20	32.3	162	74-150 N	Л1
Dichlorofluoromethane	ug/L	ND	20	30.5	153	68-150 N	Л1
Diethyl ether (Ethyl ether)	ug/L	ND	20	27.2	136	57-148	
Ethylbenzene	ug/L	ND	20	25.4	127	67-149	
Hexachloro-1,3-butadiene	ug/L	ND	20	27.3	136	65-143	
Isopropylbenzene (Cumene)	ug/L	ND	20	26.4	132	64-150	
Methyl-tert-butyl ether	ug/L	ND	20	28.2	141	71-130 N	/11
Methylene Chloride	ug/L	ND	20	26.4	132	67-137	
n-Butylbenzene	ug/L	ND	20	22.9	114	70-138	
n-Propylbenzene	ug/L	ND	20	24.8	124	70-148	
Naphthalene	ug/L	ND	20	23.1	115	39-150	
p-Isopropyltoluene	ug/L	ND	20	25.4	127	74-138	
sec-Butylbenzene	ug/L	ND	20	25.8	129	64-150	
Styrene	ug/L	ND	20	25.3	126	75-132	
tert-Butylbenzene	ug/L	ND	20	25.4	127	75-138	
Tetrachloroethene	ug/L	ND	20	26.8	134	73-136	
Tetrahydrofuran	ug/L	ND	200	298	149	68-142 N	/11
Toluene	ug/L	ND	20	27.6	138	69-139	
trans-1,2-Dichloroethene	ug/L	ND	20	27.8	139	75-135 N	/11
trans-1,3-Dichloropropene	ug/L	ND	20	25.2	126	66-136	
Trichloroethene	ug/L	ND	20	28.3	142	74-135 N	/11
Trichlorofluoromethane	ug/L	ND	20	33.1	165	75-150 N	/11
Vinyl chloride	ug/L	ND	20	30.8	154	69-150 N	/11
Xylene (Total)	ug/L	ND	60	77.7	129	70-147	
1,2-Dichloroethane-d4 (S)	%.				99	75-125	
4-Bromofluorobenzene (S)	%.				100	75-125	
Toluene-d8 (S)	%.				100	75-125	

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#### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10343283

SAMPLE DUPLICATE: 2222896 10343283003 Dup Max Parameter Units Result Result **RPD** RPD Qualifiers ND 1,1,1,2-Tetrachloroethane ug/L ND 30 ND 1,1,1-Trichloroethane ug/L ND 30 ND 1,1,2,2-Tetrachloroethane ND 30 ug/L ND ND 30 1,1,2-Trichloroethane ug/L ND ND 1,1,2-Trichlorotrifluoroethane ug/L 30 1.1-Dichloroethane 2.7 3.0 10 30 ug/L 1,1-Dichloroethene 1.6 1.7 7 30 ug/L ND ND 30 1,1-Dichloropropene ug/L 1,2,3-Trichlorobenzene ND ND 30 ug/L ND 1,2,3-Trichloropropane ug/L ND 30 ND 1,2,4-Trichlorobenzene ug/L ND 30 ND 1,2,4-Trimethylbenzene ug/L ND 30 ND 1,2-Dibromo-3-chloropropane ug/L ND 30 1,2-Dibromoethane (EDB) ND ND 30 ug/L 1,2-Dichlorobenzene ND ND 30 ug/L ND 1.2-Dichloroethane ug/L ND 30 ND 1,2-Dichloropropane ND 30 ug/L 1,3,5-Trimethylbenzene ug/L ND ND 30 ND 1,3-Dichlorobenzene ND 30 ug/L ND ND 1,3-Dichloropropane ug/L 30 ND 1,4-Dichlorobenzene ND 30 ug/L ND 2,2-Dichloropropane ug/L ND 30 ND 2-Butanone (MEK) ug/L ND 30 2-Chlorotoluene ND ND 30 ug/L 4-Chlorotoluene ND ND 30 ug/L 4-Methyl-2-pentanone (MIBK) ug/L ND ND 30 ND Acetone ug/L ND 30 ND Allyl chloride ND 30 ug/L ND ND Benzene 30 ug/L ND ND Bromobenzene 30 ug/L ND ND Bromochloromethane 30 ug/L ND ND Bromodichloromethane ug/L 30 ND **Bromoform** ug/L ND 30 Bromomethane ug/L ND ND 30 Carbon tetrachloride ug/L ND ND 30 ND Chlorobenzene ug/L ND 30 Chloroethane ug/L ND ND 30 ND Chloroform ug/L ND 30 ND Chloromethane ND 30 ug/L 53.6 54.4 2 30 cis-1,2-Dichloroethene ug/L cis-1,3-Dichloropropene ND ND 30 ug/L ND ND Dibromochloromethane 30 ug/L ND ND 30 Dibromomethane ug/L ND Dichlorodifluoromethane ug/L ND 30 ND Dichlorofluoromethane ug/L ND 30 ND Diethyl ether (Ethyl ether) ug/L ND 30 Ethylbenzene ND ND 30 ug/L

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### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP

Pace Project No.: 10343283

Date: 04/21/2016 08:26 AM

SAMPLE DUPLICATE: 2222896						
		10343283003	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/L	ND ND	ND		30	
Isopropylbenzene (Cumene)	ug/L	ND	ND		30	
Methyl-tert-butyl ether	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
n-Butylbenzene	ug/L	ND	ND		30	
n-Propylbenzene	ug/L	ND	ND		30	
Naphthalene	ug/L	ND	ND		30	
p-Isopropyltoluene	ug/L	ND	ND		30	
sec-Butylbenzene	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
tert-Butylbenzene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Tetrahydrofuran	ug/L	ND	ND		30	
Toluene	ug/L	ND	.25J		30	
trans-1,2-Dichloroethene	ug/L	91.0	92.0	1	30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
Trichloroethene	ug/L	13.9	13.6	3	30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	.96J		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	102	105	3		
4-Bromofluorobenzene (S)	%.	100	100	0		
Toluene-d8 (S)	%.	99	99	0		

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### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP

Pace Project No.: 10343283

Date: 04/21/2016 08:26 AM

QC Batch: MSV/35087 Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B Analysis Description: 8260B MSV 465 W

Associated Lab Samples: 10343283002

METHOD BLANK: 2223097 Matrix: Water

Associated Lab Samples: 10343283002

Blanl		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	04/04/16 15:25	
1,1,1-Trichloroethane	ug/L	ND	1.0	04/04/16 15:25	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	04/04/16 15:25	
1,1,2-Trichloroethane	ug/L	ND	1.0	04/04/16 15:25	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	04/04/16 15:25	
1,1-Dichloroethane	ug/L	ND	1.0	04/04/16 15:25	
1,1-Dichloroethene	ug/L	ND	1.0	04/04/16 15:25	
1,1-Dichloropropene	ug/L	ND	1.0	04/04/16 15:25	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	04/04/16 15:25	
1,2,3-Trichloropropane	ug/L	ND	4.0	04/04/16 15:25	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	04/04/16 15:25	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	04/04/16 15:25	
1,2-Dibromo-3-chloropropane	ug/L	ND	4.0	04/04/16 15:25	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	04/04/16 15:25	
1,2-Dichlorobenzene	ug/L	ND	1.0	04/04/16 15:25	
1,2-Dichloroethane	ug/L	ND	1.0	04/04/16 15:25	
1,2-Dichloropropane	ug/L	ND	4.0	04/04/16 15:25	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	04/04/16 15:25	
1,3-Dichlorobenzene	ug/L	ND	1.0	04/04/16 15:25	
1,3-Dichloropropane	ug/L	ND	1.0	04/04/16 15:25	
1,4-Dichlorobenzene	ug/L	ND	1.0	04/04/16 15:25	
2,2-Dichloropropane	ug/L	ND	4.0	04/04/16 15:25	
2-Butanone (MEK)	ug/L	ND	5.0	04/04/16 15:25	
2-Chlorotoluene	ug/L	ND	1.0	04/04/16 15:25	
4-Chlorotoluene	ug/L	ND	1.0	04/04/16 15:25	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	04/04/16 15:25	
Acetone	ug/L	ND	20.0	04/04/16 15:25	
Allyl chloride	ug/L	ND	4.0	04/04/16 15:25	
Benzene	ug/L	ND	1.0	04/04/16 15:25	
Bromobenzene	ug/L	ND	1.0	04/04/16 15:25	
Bromochloromethane	ug/L	ND	1.0	04/04/16 15:25	
Bromodichloromethane	ug/L	ND	1.0	04/04/16 15:25	
Bromoform	ug/L	ND	4.0	04/04/16 15:25	
Bromomethane	ug/L	ND	4.0	04/04/16 15:25	
Carbon tetrachloride	ug/L	ND	1.0	04/04/16 15:25	
Chlorobenzene	ug/L	ND	1.0	04/04/16 15:25	
Chloroethane	ug/L	ND	1.0	04/04/16 15:25	
Chloroform	ug/L	ND	1.0	04/04/16 15:25	
Chloromethane	ug/L	ND	4.0	04/04/16 15:25	
cis-1,2-Dichloroethene	ug/L	ND	1.0	04/04/16 15:25	
cis-1,3-Dichloropropene	ug/L	ND	4.0	04/04/16 15:25	

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### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10343283

Date: 04/21/2016 08:26 AM

METHOD BLANK: 2223097 Matrix: Water

Associated Lab Samples: 10343283002

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/L	ND	1.0	04/04/16 15:25	
Dibromomethane	ug/L	ND	4.0	04/04/16 15:25	
Dichlorodifluoromethane	ug/L	ND	1.0	04/04/16 15:25	
Dichlorofluoromethane	ug/L	ND	1.0	04/04/16 15:25	
Diethyl ether (Ethyl ether)	ug/L	ND	4.0	04/04/16 15:25	
Ethylbenzene	ug/L	ND	1.0	04/04/16 15:25	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	04/04/16 15:25	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	04/04/16 15:25	
Methyl-tert-butyl ether	ug/L	ND	1.0	04/04/16 15:25	
Methylene Chloride	ug/L	ND	4.0	04/04/16 15:25	
n-Butylbenzene	ug/L	ND	1.0	04/04/16 15:25	
n-Propylbenzene	ug/L	ND	1.0	04/04/16 15:25	
Naphthalene	ug/L	ND	4.0	04/04/16 15:25	
p-Isopropyltoluene	ug/L	ND	1.0	04/04/16 15:25	
sec-Butylbenzene	ug/L	ND	1.0	04/04/16 15:25	
Styrene	ug/L	ND	1.0	04/04/16 15:25	
tert-Butylbenzene	ug/L	ND	1.0	04/04/16 15:25	
Tetrachloroethene	ug/L	ND	1.0	04/04/16 15:25	
Tetrahydrofuran	ug/L	ND	10.0	04/04/16 15:25	
Toluene	ug/L	ND	1.0	04/04/16 15:25	
trans-1,2-Dichloroethene	ug/L	ND	1.0	04/04/16 15:25	
trans-1,3-Dichloropropene	ug/L	ND	4.0	04/04/16 15:25	
Trichloroethene	ug/L	ND	0.40	04/04/16 15:25	
Trichlorofluoromethane	ug/L	ND	1.0	04/04/16 15:25	
Vinyl chloride	ug/L	ND	1.0	04/04/16 15:25	
Xylene (Total)	ug/L	ND	3.0	04/04/16 15:25	
1,2-Dichloroethane-d4 (S)	%.	102	75-125	04/04/16 15:25	
4-Bromofluorobenzene (S)	%.	99	75-125	04/04/16 15:25	
Toluene-d8 (S)	%.	98	75-125	04/04/16 15:25	

LABORATORY CONTROL SAMPLE:	2223098					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L		22.2	111	75-125	
1,1,1-Trichloroethane	ug/L	20	20.1	101	73-125	
1,1,2,2-Tetrachloroethane	ug/L	20	19.1	95	75-128	
1,1,2-Trichloroethane	ug/L	20	20.1	100	75-129	
1,1,2-Trichlorotrifluoroethane	ug/L	20	19.5	98	69-125	
1,1-Dichloroethane	ug/L	20	18.1	91	75-131	
1,1-Dichloroethene	ug/L	20	21.2	106	72-125	
1,1-Dichloropropene	ug/L	20	19.7	99	74-125	
1,2,3-Trichlorobenzene	ug/L	20	20.6	103	68-127	
1,2,3-Trichloropropane	ug/L	20	20.9	104	75-125	
1,2,4-Trichlorobenzene	ug/L	20	20.4	102	70-125	

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### **REPORT OF LABORATORY ANALYSIS**

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



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10343283

LABORATORY CONTROL SAMPLE:	2223098					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifier
1,2,4-Trimethylbenzene	ug/L		20.7	104	75-130	
I,2-Dibromo-3-chloropropane	ug/L	50	55.7	111	74-125	
I,2-Dibromoethane (EDB)	ug/L	20	21.5	107	75-125	
1,2-Dichlorobenzene	ug/L	20	19.6	98	75-125	
,2-Dichloroethane	ug/L	20	18.7	94	72-129	
,,2-Dichloropropane	ug/L	20	19.7	98	71-129	
I,3,5-Trimethylbenzene	ug/L	20	20.2	101	75-127	
1,3-Dichlorobenzene	ug/L	20	19.9	100	75-125	
,3-Dichloropropane	ug/L	20	20.2	101	75-125	
I,4-Dichlorobenzene	ug/L	20	19.4	97	75-125	
2,2-Dichloropropane	ug/L	20	19.9	99	71-125	
2-Butanone (MEK)	ug/L	100	102	102	58-150	
2-Chlorotoluene	ug/L	20	19.5	97	75-125	
I-Chlorotoluene	ug/L	20	19.4	97	75-130	
I-Methyl-2-pentanone (MIBK)	ug/L	100	107	107	72-140	
Acetone	ug/L	100	104	104	69-137	
Allyl chloride	ug/L	20	20.1	101	68-132	
Benzene	ug/L	20	19.3	96	75-125	
Bromobenzene	ug/L	20	19.9	100	75-125	
Bromochloromethane	ug/L	20	21.1	105	75-125	
Bromodichloromethane	ug/L	20	22.1	110	69-128	
Bromoform	ug/L	20	23.6	118	75-125	
Bromomethane	ug/L	20	18.2	91	30-150	
Carbon tetrachloride	ug/L	20	22.5	113	74-125	
Chlorobenzene	ug/L	20	20.3	102	75-125	
Chloroethane	ug/L	20	19.1	96	60-150	
Chloroform	ug/L	20	19.0	95	75-126	
Chloromethane	ug/L	20	18.3	91	46-150	
sis-1,2-Dichloroethene	ug/L	20	20.2	101	75-126	
sis-1,3-Dichloropropene	ug/L	20	21.6	108	75-125	
Dibromochloromethane	ug/L	20	23.1	116	75-125	
Dibromomethane	ug/L	20	22.3	111	72-127	
Dichlorodifluoromethane	ug/L	20	21.9	109	58-135	
Dichlorofluoromethane	ug/L	20	20.7	103	68-149	
Diethyl ether (Ethyl ether)	ug/L	20	19.1	96	66-144	
Ethylbenzene	ug/L	20	19.6	98	75-125	
Hexachloro-1,3-butadiene	ug/L	20	21.7	108	73-125	
sopropylbenzene (Cumene)	ug/L	20	20.8	104	69-140	
Methyl-tert-butyl ether	ug/L	20	19.9	99	75-126	
Methylene Chloride	ug/L	20	18.6	93	71-130	
n-Butylbenzene	ug/L	20	20.6	103	71-130	
n-Propylbenzene	ug/L	20	19.6	98	71-123	
Naphthalene	ug/L	20	20.3	101	59-137	
o-Isopropyltoluene	ug/L	20	20.3	101	74-127	
sec-Butylbenzene	ug/L	20	19.6	98	66-140	
Styrene	ug/L ug/L	20	21.6	108	75-125	
ert-Butylbenzene	ug/L ug/L	20	18.6	93	73-125	

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



### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10343283

LABORATORY CONTROL SAMPLE:	2223098					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Tetrachloroethene	ug/L		20.8	104	75-125	
Tetrahydrofuran	ug/L	200	213	107	71-129	
Toluene	ug/L	20	20.4	102	75-125	
trans-1,2-Dichloroethene	ug/L	20	19.0	95	75-125	
trans-1,3-Dichloropropene	ug/L	20	21.8	109	75-125	
Trichloroethene	ug/L	20	20.2	101	75-125	
Trichlorofluoromethane	ug/L	20	22.6	113	74-128	
Vinyl chloride	ug/L	20	20.3	102	71-131	
Xylene (Total)	ug/L	60	60.3	101	75-125	
1,2-Dichloroethane-d4 (S)	%.			103	75-125	
4-Bromofluorobenzene (S)	%.			97	75-125	
Toluene-d8 (S)	%.			98	75-125	

MATRIX SPIKE & MATRIX SPIK	KE DUPLICA	ATE: 222309	99		2223100							
			MS	MSD								
	1	0342716001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20	20.9	21.7	105	109	75-125	4	30	
1,1,1-Trichloroethane	ug/L	ND	20	20	22.3	21.9	112	109	71-144	2	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	18.2	18.8	91	94	75-131	4	30	
1,1,2-Trichloroethane	ug/L	ND	20	20	19.0	19.8	95	99	75-125	4	30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	20	24.4	23.9	122	120	75-150	2	30	
1,1-Dichloroethane	ug/L	ND	20	20	20.0	19.7	100	98	64-150	2	30	
1,1-Dichloroethene	ug/L	ND	20	20	21.2	21.1	106	106	68-150	0	30	
1,1-Dichloropropene	ug/L	ND	20	20	20.7	20.9	103	104	68-145	1	30	
1,2,3-Trichlorobenzene	ug/L	ND	20	20	18.0	18.7	90	93	57-142	4	30	
1,2,3-Trichloropropane	ug/L	ND	20	20	19.3	19.5	96	98	75-125	1	30	
1,2,4-Trichlorobenzene	ug/L	ND	20	20	17.5	18.4	87	92	60-135	5	30	
1,2,4-Trimethylbenzene	ug/L	ND	20	20	18.2	18.6	91	93	67-148	2	30	
1,2-Dibromo-3-	ug/L	ND	50	50	46.5	47.0	93	94	32-137	1	30	
chloropropane	_											
1,2-Dibromoethane (EDB)	ug/L	ND	20	20	19.5	19.2	97	96	75-125		30	
1,2-Dichlorobenzene	ug/L	ND	20	20	18.5	18.6	92	93	75-125		30	
1,2-Dichloroethane	ug/L	ND	20	20	19.1	18.7	95	93	62-138	2	30	
1,2-Dichloropropane	ug/L	ND	20	20	19.4	19.7	97	99	62-144	2	30	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	18.7	18.8	93	94	67-148	1	30	
1,3-Dichlorobenzene	ug/L	ND	20	20	17.9	18.3	90	92	74-131	2	30	
1,3-Dichloropropane	ug/L	ND	20	20	18.8	19.2	94	96	75-127	2	30	
1,4-Dichlorobenzene	ug/L	ND	20	20	17.1	17.7	85	88	74-126	3	30	
2,2-Dichloropropane	ug/L	ND	20	20	20.4	20.3	102	101	56-146	1	30	
2-Butanone (MEK)	ug/L	ND	100	100	97.1	95.8	97	96	47-150	1	30	
2-Chlorotoluene	ug/L	ND	20	20	18.1	18.6	91	93	74-137	2	30	
4-Chlorotoluene	ug/L	ND	20	20	18.3	18.5	92	92	72-138	1	30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	100	98.2	100	98	100	60-147	2	30	
Acetone	ug/L	ND	100	100	98.5	105	97	104	61-150	7	30	

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### **QUALITY CONTROL DATA**

Project: PS Beta-NIROP Pace Project No.: 10343283

MATRIX SPIKE & MATRIX SPIR	KE DUPLIC	ATE: 22230		MSD	2223100							
		10342716001	MS Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qu
Allyl chloride	ug/L	ND ND	20	20	18.8	18.6	94	93	53-150	1	30	
Benzene	ug/L	ND	20	20	19.3	18.9	96	95	52-147	2	30	
Bromobenzene	ug/L	ND	20	20	17.8	18.2	89	91	75-129	2	30	
Bromochloromethane	ug/L	ND	20	20	20.6	19.6	103	98	72-128	5	30	
Bromodichloromethane	ug/L	ND	20	20	21.4	21.5	107	107	65-137	0	30	
Bromoform	ug/L	ND	20	20	19.6	19.6	98	98	59-133	0	30	
Bromomethane	ug/L	ND	20	20	14.9	12.9	75	65	30-150	15	30	
Carbon tetrachloride	ug/L	ND	20	20	24.6	24.1	123	121	73-144	2	30	
Chlorobenzene	ug/L	ND	20	20	19.1	19.2	96	96	75-126	1	30	
Chloroethane	ug/L	ND	20	20	21.2	20.5	106	103	55-150	3	30	
Chloroform	ug/L	ND	20	20	19.2	19.3	96	97	66-143	1	30	
Chloromethane	ug/L	ND	20	20	16.6	16.7	83	84	42-150	1	30	
cis-1,2-Dichloroethene	ug/L	ND	20	20	20.5	20.3	102	101	65-143	1	30	
sis-1,3-Dichloropropene	ug/L	ND	20	20	17.9	18.8	90	94	75-125	5	30	
Dibromochloromethane	ug/L	ND	20	20	20.5	20.2	103	101	75-125	2	30	
Dibromomethane	ug/L	ND	20	20	20.0	20.1	100	101	66-133	1	30	
Dichlorodifluoromethane	ug/L	ND	20	20	22.4	22.8	112	114	74-150	2	30	
Dichlorofluoromethane	ug/L	ND	20	20	21.3	21.0	107	105	68-150	1	30	
Diethyl ether (Ethyl ether)	ug/L	ND	20	20	18.6	18.9	93	95	57-148	2	30	
Ethylbenzene	ug/L	ND	20	20	18.2	18.2	91	91	67-149	0	30	
Hexachloro-1,3-butadiene	ug/L	ND	20	20	19.7	20.2	98	101	65-143	3	30	
sopropylbenzene (Cumene)	ug/L	ND	20	20	20.2	20.0	101	100	64-150	1	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	19.9	19.5	99	98	71-130	2	30	
Methylene Chloride	ug/L	ND	20	20	18.0	17.7	90	88	67-137	2	30	
n-Butylbenzene	ug/L	ND	20	20	18.6	19.6	93	98	70-138	5	30	
n-Propylbenzene	ug/L	ND	20	20	18.7	18.8	93	94	70-148	0	30	
Naphthalene	ug/L	ND	20	20	17.4	18.2	87	90	39-150	4	30	
o-Isopropyltoluene	ug/L	ND	20	20	18.8	19.1	94	96	74-138	2	30	
sec-Butylbenzene	ug/L	ND	20	20	19.2	19.7	96	98	64-150	3	30	
Styrene	ug/L	ND	20	20	19.0	19.3	95	96	75-132	1	30	
ert-Butylbenzene	ug/L	ND	20	20	18.7	19.0	93	95	75-138	2	30	
Tetrachloroethene	ug/L	ND	20	20	19.6	19.4	98	97	73-136	1	30	
Tetrahydrofuran	ug/L	ND	200	200	201	210	101	105	68-142	4	30	
Toluene	ug/L	ND	20	20	18.6	18.6	93	93	69-139	0	30	
rans-1,2-Dichloroethene	ug/L	ND	20	20	18.2	17.7	91	89	75-135	3	30	
rans-1,3-Dichloropropene	ug/L	ND	20	20	18.6	19.8	93	99	66-136	6	30	
Frichloroethene	ug/L	ND	20	20	19.7	19.8	99	99	74-135	0	30	
Trichlorofluoromethane	ug/L	ND	20	20	24.5	25.5	122	128	75-150	4	30	
/inyl chloride	ug/L	ND	20	20	20.9	20.6	105	103	69-150		30	
Xylene (Total)	ug/L	ND	60	60	56.7	56.5	95	94	70-147		30	
1,2-Dichloroethane-d4 (S)	%.						106	107	75-125			
I-Bromofluorobenzene (S)	%.						99	99	75-125			
Toluene-d8 (S)	%.						100	100	75-125			

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



### **QUALIFIERS**

Project: PS Beta-NIROP
Pace Project No.: 10343283

### **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.

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.

### **ANALYTE QUALIFIERS**

Date: 04/21/2016 08:26 AM

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

R1 RPD value was outside control limits.





### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: PS Beta-NIROP
Pace Project No.: 10343283

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10343283001	PMW-01	EPA 8260B	MSV/35072		
10343283002	PMW-02	EPA 8260B	MSV/35087		
10343283003	PMW-03	EPA 8260B	MSV/35072		
10343283004	PMW-04	EPA 8260B	MSV/35072		
10343283005	Trip Blank 1	EPA 8260B	MSV/35072		
10343283006	Trip Blank 2	EPA 8260B	MSV/35072		

# CHAIN-OF-CUSTODY / Analytical Request Document

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

Pace Analytical

16343283

Pace Project No./ Lab I.D. DRINKING WATER SAMPLE CONDITIONS 2 OTHER 53 3 000 3 ĕ 3 3 P NPDES G GROUND WATER Residual Chlorine (Y/N) Page: HCRA Σ REGULATORY AGENCY Requested Analysis Filtered (Y/N) TIME STATE 1 NIEIS Site Location DATE IS AGCEPTED BY / AFFILIATION JEMNIFER ANDERSON EPA 8260, VOC ↓tesT eisylenA ↓ N/A Other 1011 Calle Sombra Methanol company Name: Regenesis Bahar Naderi Preservatives Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> 35413 HORN 21466 HCI 7 \* 80 80 3 nvoice Information: еОИН P<sub>S</sub>SO<sub>4</sub> Reference:
Pace Project
Manager:
Pace Profile #: Section C Unpreserved Pace Quote TIME Address: # OF CONTAINERS M **(**\) ~ SAMPLE TEMP AT COLLECTION DATE 33112 030 ONUZ. 33/16/1350 3 3 1 3 1230 8 IME COMPOSITE END/GRAB 3kl)b 3/3/16 Veust Maguere /400 DATE COLLECTED RELINQUISHED BY / AFFILIATION **JIME** COMPOSITE START Project Name: PS Beta - NIROP Project Number: PS Beta - NIROP DATE Required Project Information: Report To: Melinda Pham **13** J 6 6 **At 6** 1 ۲ (G=GRAB C=COMP) SAMPLE TYPE urchase Order No.: 5 7 MATRIX CODE 
 Valid Matrix Codes

 MATRIX
 CODE

 DENKNIWS WATER
 WY

 WASTE WATER
 WY

 PRODUCT
 P

 POLSOLID
 SL

 OIL
 WP

 WIF
 MP

 AIR
 AR

 AIR
 AR

 TRSUE
 TS
 Telo RIANK Fax: 343-366-8090 Trip Blank 🏅 PMW-03 PMW-04 PMW-02 PMW-01 ADDITIONAL COMMENTS San Clemente, CA 92673 Mpham@regenesis.com (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE 2 days 1011 Calle Sombra **SAMPLE ID** lequired Client Information Regenesis Section A Required Client Information: hone: 949-366-8000 tequested Due Date/TAT: Section D ompany: 2 œ ന . F # MHLI

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

Page 31 of 44

DATE Signed (MM/DD/YY): PRINT Name of SAMPLER: MELLSSA MEELLSSEN SIGNATURE of SAMPLER

SAMPLER NAME AND SIGNATURE

F-ALL-Q-020rev.08, 12-Oct-2007

(N/A)

Samples Intact

Cooler (Y/N)

Ice (Y/N) по bevieceл

O° ni qmeT

3/31

# Pace Analytical\*

## Document Name: Sample Condition Upon Receipt Form

Document No.: F-MN-L-213-rev.15 Document Revised: 05Jan2016
Page 1 of 1
Issuing Authority;
Pace Minnesota Quality Office

Sample Condition Upon Receipt  Client Name:	Proje	tt#: WO#:10343283
Welglin'sis		MONTH OF THEM BUILD
	USPS Client	
	Other:	10343283
Tracking Number:	<del></del>	
Custody Seal on Cooler/Box Present? Yes	Seals Intact?	Yes Optional: Proj. Due Date: Proj. Name:
Packing Material: Bubble Wrap	None Other:	Temp Blank? ☐res ☐No
Thermometer         ☐ 151401163         ☐ B88A912167504           Used:         ☐ 151401164         ☐ B88A0143310098	Type of Ice:	Net ☐Blue ☐None ☐Samples on ice, cooling process has begun
Cooler Temp Read (°C): 0.2, /. Cooler Temp Correct		Biological Tissue Frozen? Yes No No
Temp should be above freezing to 6°C	The D	ate and Initials of Person Examining Contents: 3-31-16//
USDA Regulated Soil ( N/A, water sample) Did samples originate in a quarantine zone within the United State	es: Al AR AZ CA FI GA	•
MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)?	☐Ye:	
	······································	COMMENTS:
Chain of Custody Present?	No No	1.
Chain of Custody Filled Out?	No N/	2.
Chain of Custody Relinquished?	Yes No N/	3.
Sampler Name and/or Signature on COC?	₽Ves □No □N/A	4.
Samples Arrived within Hold Time?	∐Yes □No □N/	5.
Short Hold Time Analysis (<72 hr)?	□Yes JONO □N/A	6.
Rush Turn Around Time Requested?	□Yes ••••••••••••••••••••••••••••••••••••	7.
Sufficient Volume?	Yes No No	8.
Correct Containers Used?	ØYes □No □N/A	9.
-Pace Containers Used?	■Yes □No □N/A	
Containers Intact?	Ves ONO ON/	10.
Filtered Volume Received for Dissolved Tests?	Yes No N/	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	ØYes □No □N/A	
-Includes Date/Time/ID/Analysis Matrix:		·
All containers needing acid/base preservation have been		13. AHNO3 AH2SO4 ANAOHAN CHCI
checked? All containers needing preservation are found to be in	ØYes □No □N/A	Sample #14 47 42
compliance with EPA recommendation?		Sample # 7 /C /C
	☑Yes □No □N/A	
Exceptions: VOA, Coliform, TOO Oil and Grease, DRO/8015 (water) DOC	Yes Ono On/	Initial when Lot # of added completed: preservative:
	□Yes □No □N/A	
	Yes ONO ON/	
	Yes No N/	
Pace Trip Blank Lot # (if purchased): 030716-3634	<del>,</del>	
CLIENT NOTIFICATION/RESOLUTION		Field Data Required? Yes No
Person Contacted:		Date/Time:
Comments/Resolution:		

Project Manager Review: Date: 04/01/2016

Note: Whenever there is a discrepancy affectific worth 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).



April 21, 2016

Pace Analytical Energy Services LLC 220 William Pitt Way Pittsburgh, PA 15238

> Phone: (412) 826-5245 Fax: (412) 826-3433

Jennifer Anderson Pace Analytical Services, Inc. 1700 Elm Street Suite 200 Minneapolis, MN 55414

RE:

PS BETA - NIROP / 10343283

Pace Workorder:

18663

Dear Jennifer Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on Monday, April 04, 2016.

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

Sincerely,

Ruth Welsh

04/21/2016

Ruth Wels

Ruth.Welsh@pacelabs.com

Customer Service Representative

**Enclosures** 

As a valued client we would appreciate your comments on our service.

Please email info@microseeps.com.

Total Number of Pages 🔀

Report ID: 18663 - 785745



Pace Analytical Energy Services LLC 220 William Pitt Way Pittsburgh, PA 15238

> Phone: (412) 826-5245 Fax: (412) 826-3433

### **SAMPLE SUMMARY**

Workorder: 18663 PS BETA - NIROP / 10343283

Lab ID	Sample ID	Matrix	Date Collected	Date Received
186630001	PMW-01	Water	3/31/2016 09:42	4/4/2016 08:30
186630002	PMW-02	Water	3/31/2016 11:00	4/4/2016 08:30
186630003	PMW-03	Water	3/31/2016 12:30	4/4/2016 08:30
186630004	PMW-04	Water	3/31/2016 13:50	4/4/2016 08:30

Report ID: 18663 - 785745

Client

Pace MN

1700 Elm Street, Suite 200

Minneapolis, MN 55414

Project Project # PS Beta Nirop 10343283

Report to

Jennifer Anderson

Tel:

612.607.1700

Email:

jennifer.anderson @ pacelabs.com

Pace Analytical CSIA Center

220 William Pitt Way

Pittsburgh, PA 15238 Tel: 412.826.5245

Report by: Dr. Yi Wang

Director, CSIA Center of Excellence

Cell: 609.721.2843

Email: yi.wang@pacelabs.com

### REPORT OF ENVIRONMENTAL FORENSICS ISOTOPE ANALYSES

Date Received: 4/4/2016 Date Reported: 4/20/2016

Water sample submitted for  $\delta^{13}$ C (‰ VPDB) stable carbon isotope forensics of chlorinated solvents

Pace CSIA	Client's Sample ID	δ <sup>13</sup> C	δ <sup>13</sup> C	δ <sup>13</sup> C	δ <sup>13</sup> C	δ <sup>13</sup> C	$\delta^{13}C$
Lab ID	Description	TCE	cDCE	tDCE	11DCE	11DCA	VC
18663-1	PMW-01	U.	υ_	υŢ	n ¯	U _	υ_
18663-2	PMW-02	6.28	-19.24	-37.86	-18.67	-26.40	-23.79
18663-3	PMW-03	-0.26	-19.77	-23.10	U _	-23.01	υ <sub>-</sub>
18663-4	PMW-04	4.39	-25.88	-29.16	U_	υ_	υ <sub>-</sub>

cDCE & tDCE: cis & trans-1,2-dichloroethene

11DCA: 1,1-dichloroethane

VC: vinyl chloride

TCE: trichloroethene

11DCE: 1,1-dichloroethene

Method: Compound Specific Isotope Analysis for <sup>13</sup>C and <sup>2</sup>H by GC-IRMS, for <sup>37</sup>Cl by GC-aMS

_	δ <sup>13</sup> C	δ <sup>13</sup> C	δ <sup>13</sup> C	_ δ <sup>13</sup> C	δ <sup>13</sup> C	δ <sup>13</sup> C	
Quality Control STDs	TCE	cDCE	tDCE	11DCE	11DCA	VC	•
QC-1	-26.34	-11.63	-22.45	-30.57	-33.00	-25.87	
QC-2	-26.30	-12.01	-22.38	-30.64	-32.79	-26.18	
Mean	-26.32	-11.82	-22.42	-30.61	-32.90	-26.03	
Analytical precision (1σ)	0.03	0.27	0.05	0.05	0.15	0.22	

### Pace CSIA Forensic Isotope Services

Product or Dissolved Organics: Chlorinated Solvents, Oil, Extract, Fraction and Kerogen

CSIA of <sup>13</sup>C, <sup>37</sup>Cl, and <sup>2</sup>H for PCE, TCE, DCE, MTBE, BTEX, 1,4-Dioxane, Alkanes, Gasoline and Oil; Bulk <sup>13</sup>C, <sup>2</sup>H, <sup>18</sup>O, <sup>34</sup>S, and <sup>15</sup>N Gas Sample

Gas Composition and 2D-CSIA of <sup>13</sup>C and <sup>2</sup>H of C1 to C5; <sup>13</sup>C of CO<sub>2</sub>, <sup>14</sup>C of C1 and CO<sub>2</sub>, <sup>34</sup>S of H<sub>2</sub>S; <sup>15</sup>N and <sup>18</sup>O of N<sub>2</sub>O gas Water and Dissolved Inorganics

<sup>2</sup>H, <sup>3</sup>H and <sup>18</sup>O; <sup>34</sup>S and <sup>18</sup>O of dissolved sulfate; <sup>34</sup>S of dissolved H<sub>2</sub>S

<sup>15</sup>N and <sup>18</sup>O of dissolved Nitrate; <sup>15</sup>N of Ammonia; <sup>13</sup>C of dissolved CO<sub>2</sub> and Carbonate/Bicarbonate Soil and Minerals

<sup>13</sup>C, <sup>18</sup>O, <sup>15</sup>N, <sup>34</sup>S, D/H; <sup>14</sup>C of carbonate or organics

Post-Analysis Forensic Isotope Data Interpretation

 $<sup>^{</sup>m J}$ -Target analyte produced a low peak signal and the result is considered usable to  $\pm\,2$ %, but not the standard  $\pm\,0.5$ % <sup>U</sup>-Either there was no peak corresponding to the target analyte or that such a peak did not produce a reliable CSIA result

Page 1 of 7

Pace Analytical Energy Sevices 220 William Pitt Way Pittsburgh, PA 15238 phone: 412-826-5245

CSIA Report Carbon

18663
Pace-MN
Client Project Name:
Client Project #: 10

PS Beta Nirop 10343283

3		Š	Concentration	=			CSI	CSIA (Carbon	)	
>	Virias Chioride		(l/gn)		Ą	Area	Co olimbon Analysis	Analyeie	Date	Delta (%)
Lab ID	Client ID	Sample	Pal	Date	Sample PQL	POL		A larged	Care	رهدا صاب
186630001	PMW-01	<1(U)	٦	4/1/16	< 1 (U)	ļ	No	2114	4/19/16	•
186630002	PMW-02	4	2	4/4/16	14.0	ļ	No	2123	4/19/16	-23.79
186630003	PMW-03	<1 (U)	1	4/1/16	<1(0)	į	No	2122	4/19/16	١
186630004	PMW-04	(U)	1	4/1/16	<1(U)	-	No	2121	4/19/16	4
Duplicate	PMW-02 (DF10)	4	2	4/4/16	× 1(U)	<b></b>	No	2116	91/61/4	,
Biank	3	0	1		(C)	-	N <sub>O</sub>	2111	4/19/16	1
CS to		10	1	,	12.0	-	oN N	2129	4/20/16	-25.87
LCS Hi		20	,	1	22.6	-	S <sub>N</sub>	2130	4/20/16	-26.18
LCS acceptance range	range							-27.87	<b>&lt;</b> ≖>	-26.87
		***************************************								

AM-24-DL_C	‰, VPDB	CJS
AM-24-AR_C	Vs	CJS
8260B	/bn	NA
Method	Units	Analyst

CSIA Report Carbon

18663
Pace-MN
Client Project Name:
Client Project #: 10

PS Beta Nirop 10343283

7.7		3	Concentration	E			CSI	CSIA (Carbon)	(1	
-I.'F	1,1-Dichloroemene		(µgn)		A	Area	Co alution Analysis	Anaheie	Date	Dotta (%)
Lab ID	Client ID	Sample	PQL	Date	Sample	POL	i longia-oo	All laighte	2000	(201)
188630001	PMW-01	(C)	-	4/1/16	< 5 (U)	5	No	2114	4/19/16	j
186630002	PMW-02	24	2	4/4/16	36.4	သ	No	2123	4/19/16	-18.67
186630003	PMW-03	2	-	4/1/16	< 5 (U)	က	ON	2122	4/19/16	•
186630004	PMW-04	1	-	4/1/16	< 5 (U)	2	No	2121	4/19/16	ı
Duplicate	PMW-02 (DF10)	24	2	4/4/16	< 5 (U)	2	No	2116	91/61/7	*
Blank	t.	0	,	,	(£)	2	o <u>N</u>	2111	4/19/16	•
LCS Lo	\$	5	,	,	5.88	5	ş	2112	4/19/16	-30.57
H SOT		25		-	24.8	က	S S	2113	4/19/16	-30.64
LCS acceptance range	e range							-30.36	<b>&lt;=&gt;</b>	-31.36

Method	8260B	AM-24-AR_C	AM-24-DL_C
Units	/gn	Vs	‰, VPDB
Analyst	NA	CJS	CJS

CSIA Report Carbon

18663
Pace-MN
Client Project Name:
Client Project #: 10

10343283

PS Beta Nirop

	Distinguish	රී	Concentration	Ę			'ISO	CSIA (Carbon)	(	
trans	dans-Dichloroemene		(l/gu)		A	Area	Co olution Anaheis	Anahreie	Data	Called (%)
Lab ID	Client ID	Sample	Pal	Date	Sample PQL	PQL		Aliaiysis	Date	Color (we)
186630001	PMW-01	(J)	-	4/1/16	<1(U)	-	No	2114	4/19/16	
186630002	PMW-02	308	2	4/4/16	28.5	-	Š	2115	4/19/16	-37.86
186630003	PMW-03	91		4/1/16	22.5	-	S S	2117	4/19/16	-23.10
186630004	PMW-04	58	1	4/1/16	11.7	-	Š	2118	4/19/16	-29.16
Duplicate	PMW-02 (DF10)	309	2	4/4/16	32.2	-	9 N	2116	4/19/16	-37.82
Blank		0		,	(S) ∑	-	No	2111	4/19/16	1
07 SOT	1	5	,	•	7.30	-	S	2129	4/20/16	-22.45
LCS Hi		25	•	1	28.2	-	ž	2113	4/19/16	-22.38
LCS acceptance range	range							-22.29	<b>&lt;</b> =>	-23.29

8260B AM-24-AR_C AM-2	ug/l Vs %, VPDB	NA CJS CJS
Method	Units	Analyst

CSIA Report Carbon

PS Beta Nirop 10343283 18663
Pace-MN
Client Project Name:
Client Project #: 10

•	Diotionothone	Ö	Concentration	5			CSI	CSIA (Carbon	<u>-</u>	
	I, I-DICEIO OGGINATE		(l/gn)		¥	Area	مربان من	Angkaio	٥٠٠٥	Collection (9.)
Lab ID	Client ID	Sample	Pol	Date	Sample PQL	Pac	codingin Aidiyas	Sign	Calc	Della ( 100)
186630001	PMW-01	<1(U)		4/1/16	< 3 (n)	3	SN N	2114	4/19/16	ŗ
186630002	PMW-02	35	2	4/4/16	3.49	က	Š	2115	4/19/16	-26.40
186630003	PMW-03	m	ı	4/1/16	4.28	က	ŝ	2122	4/19/16	-23.01
186630004	PMW-04	(U) F	1	4/1/16	< 3(U)	3	9	2121	4/19/16	
Duplicate	PMW-02 (DF10)	35	2	4/4/16	3.90	က	N <sub>o</sub>	2116	4/19/16	-26
Blank	•	0	ı	i	(U) &S	33	SN N	2111	4/19/16	ţ
on_son	-	က			5.10	က	No	2112	4/19/16	-33.00
LCS_Hi	4	25	,		23.3	က	S N	2113	4/19/16	-32.79
LCS acceptance range	ce range							-32.67	<b>(1)</b>	-33.67
Method			8260B	5		AM-24-AR C	ပ		AM-24-DL C	2
Units			l/gu			\$\			%, VPDB	38

Page 5 of 7

Pace Analytical Energy Sevices 220 William Pitt Way Pittsburgh, PA 15238 phone: 412-826-5245

CSIA Report Carbon

10343283 18663
Pace-MN
Client Project Name:
Client Project #: 10

PS Beta Nirop

	cie_Dichloroothono	Š	Concentration	Ľ.			CSI	CSIA (Carbon)		
25			(J/Bn)		Area	eg Sa	200	A A		, W, L414.C
Lab ID	Client ID	Sample	Pal	Date	Sample	Pal	Co-elation Arianysis	Aliallysis	) die	Della (%)
186630001	PMW-01	<1 (U)	1	4/1/16	<1(U)	-	Š	2114	4/19/16	7
186630002	PMW-02	361	2	4/4/16	29.2	-	Š	2115	4/19/16	-19.24
186630003	PMW-03	54	1	4/1/16	12.9	-	Š	2117	4/19/16	-19.77
186630004	PMW-04	24	*	4/1/16	25.5	-	S <sub>N</sub>	2121	4/19/16	-25.88
Duplicate	PMW-02 (DF10)	361	2	4/4/16	33.1	1	S S	2116	4/19/16	-19.62
Blank		0	-	,	(n) I>	1	N <sub>o</sub>	2111	4/19/16	1
LCS Lo	1	5	•	1	4.69	<b>,</b>	No	2112	4/18/16	-11.63
LCS_Hi		25		•	22.3	*	S	2113	4/19/16	-12.01
LCS acceptance range	æ range							-12.22	<b>&lt;=&gt;</b>	-11.22

AM-24-DL\_C %, VPDB CJS

AM-24-AR\_C Vs CJS

8260B ug/l NA

Method Units Analyst

CSIA Report

18663 Pace-MN

phone; 412-826-5245	-5245		Ca	Carbon		Client Project N: Client Project #:	Client Project Name: Client Project #:	10343283	PS Beta Nirop	<del>0.</del>
-		8	Concentration	E			CSI	CSIA (Carbon		
-	richioroemene		(l/bn)		¥	Area	1 - 0	1	+	14,47
Lab ID	Client ID	Sample	POL	Date	Sample	Pal	- Co-eiulion Analysis	Arraiysis	nate	Della
186630001	PMW-01	(C) ∇	-	4/1/16	<1(U)	-	N <sub>o</sub>	2114	4/19/16	•
186630002	PMW-02	94	0.8	4/4/16	6.16	-	S	2115	4/19/16	6.28
186630003	PMW-03	4	0.4	4/1/16	15.9	-	S	2122	4/19/16	-0.26
186630004	PMW-04	28	0.4	4/1/16	21.0	-	S S	2121	4/19/16	4.39
Duplicate	PMW-02 (DF10)	8	9.0	4/4/16	7.43	-	ŝ	2116	4/19/16	5.93
Blank	-	0	1	1	<1(U)	-	Š	2111	4/19/16	1
ാ ടാ		S	,	1	3.09	-	SN N	2112	4/19/16	-26.3
LCS_Hi		25	٠	ı	15.3	-	Š	2113	4/19/16	-26.3(
LCS acceptance range	e range							-26.48	Û	-25.4

	8260B AM-	AM-24-AR C	AM-24-DL C
Units ug/l		Vs	%, VPDB
Vnalyst NA		CJS	CJS

# CSIA Report Carbon

Pace-MN Client Project Name: 18663

Client Project #:

PS Beta Nirop

•	4CD (Citer)	Comole				CSIA (Carbon	in)		
	Con (Sailt.)	Sample	V COL	40.11.0	Ğ	محظربات می	Anchair	0,00	Collection (%)
Lab ID	Client ID	Collection	ES EX	HONNIG	۲ کا		Singly Singly	2 2 3	Della (200)
186630001	PMW-01	03/31/16	19.9	-	-	S <sub>O</sub>	2114	04/19/16	-36.60
186630002	PMW-02	03/31/16	26.7	10	-	No.	2115	04/19/16	-36.92
188630002	PMW-02	03/31/16	33.0	Ψ-	-	ON	2123	04/19/16	-37.08
186630003	PMW-03	03/31/16	33.1	5	1	S N	2117	04/19/16	-36.73
186630003	PMW-03	03/31/16	21.3	-	-	No	2122	04/19/16	-36.77
186630004	PMW-04	03/31/16	23.8	5	-	ON	2118	04/19/16	-36.69
186630004	PMW-04	03/31/16	13.1	_	-	ON.	2121	04/19/16	-36.62
Duplicate	PMW-02 (DF10)	03/31/16	10.9	10	-	No	2116	04/19/16	-36.55
Blank	-	-	25.7	-	Ţ	No	2111	04/18/16	-36.53
or sor	-	•	42.3	-	-	ON	2112	04/19/16	-37.05
LCS_HI		,	13.0	1	+	ON	2113	04/19/16	-36.91
Surrogate acceptance range	ance range						-37.49	<b>^ii &gt;</b>	-36.49

Method	AM-24-AR_C	AM-24-DL_C
Units	λ	%, VPDB
Analyst	CJS	CJS

Case Narrative: The blank, LCS's, duplicate and surrogates were all close to or within the acceptance range and the data is reported as valid and representative of the samples as received. Pace Analytical ®

Z

Samples Intact Y or

Z

ح کو

Received on Ice/

ē

Custody Seal / Y

Cooler Temperature on Receipt 3.6.°C

Worl	Workorder: 10343283	Workorder Name:	PS Beta-NIROP	Д(		Resu	Results Requested 4/4/2016 4/20/10 JM# 4/1110	4/4/2016	4/29/10	JM# 4/11/L
Repo	Report / Invoice To	Subcon	Subcontract To				Redues	Requested Analysis		
Pace 1700	Pace Analytical Minnesota 1700 Elm Street	Microse	Microsepp pade brough P.O. 10343263	—.0.A ₩	10343262	~ ~				England and the second of the
Suite 200 Minneapol Phone (61	Suite 200 Minneapolis, MN 55414 Phone (612)607-1700									Workshift (Albert Or Manharana consciona
Emai	Email: jennifer.anderson@pacelabs.com	labs.com								
				-0-5 -0-5	Preserved Containers	ners				<del>uchtaen</del> sico
161.14696 - 10346		Collact		D Comment	CF	AIS				т. б. жатарара қазақса араланда а
Tem .	Sample ID	Date/Time	Cab D	Matrix		0				LAB USE ONLY
_	PMW-01	3/31/2016 09:42	10343283001	Water	<i>∞</i>	×				
2	PMW-02	3/31/2016 11:00	10343283002	Water 19	33	×		eranceans.		
3	PMW-03	3/31/2016 12:30	10343283003	Water	8)	×				
4	PMW-04	3/31/2016 13:50	10343283004	Water 16	5	×				
5		)=00 <b>00</b> 00000								
								Comn	Comments	
Transfers	sters Rejeased By	Date/Time	ne Received By	ξλ	Ω	Date/Time				
1	CAL PACE	JI//I/I	1 1201 1	,1 CS	) S2H0	91.4.4	08:30			
2				Sec						

	0	K 19 Z	nP	1 a b 1 A	1001 Ordan 18663
lient	Name: Pace - MN Project: PS Beta-1	VIA	<u> </u>	Lab W	Tork Order, / O
A.	Shipping/Container Information (circle appropriate response)				
	Courier: FedEx UPS USPS Client Other:	Ai	· bill P	resent	Yes No
÷	Tracking Number: 6484 8 696 5823				
	Custody Seal on Cooler/Box Present: Yes No Seals	Intact/	Yes	No	· ·
	Cooler/Box.Packing Material: Bubble Wrap Absorbent F	oam	Other	·	
	Type of Ice: Wet Blue None Ice Intact: Yes Mel				
	Cooler Temperature: 3.6°C Radiation Screened: Yes	No	Ch	ain of	Custody Present: Yes No
	Comments:				
В.	Laboratory Assignment/Log-in (check appropriate response)				
		YES	NO	N/A	Comment
		1123		13//3	Reference non-Conformance
	Chain of Custody properly filled out	1			
	Chain of Custody relinquished				
	Sample: Name & Signature on COC				
	Containers intact	V			,
	Were samples in separate bags				
	Sample container labels match COC Sample name/date and time collected	V			
	Sufficient volume provided				
	PAES containers used				
	Are containers properly preserved for the requested testing? (as labeled)			-	
	If an unknown preservation state, were containers checked?  Exception: VOA's coliform				If yes, see pH form.
	Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			Ů.	
,	Comments:				
			70.00	1 :	9 11 11 1
	Cooler contents examined/red	ceived	ьу :	L.	Date: 4. 4.16
	Project Manage	er Revi	ew ;		Date:





April 13, 2016

Melinda Pham Regenesis 1011 Calle Sombra San Clemente, CA 92673

RE: Project: PS Beta - NIROP

Pace Project No.: 10343262

### Dear Melinda Pham:

Enclosed are the analytical results for sample(s) received by the laboratory on March 31, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

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

Sincerely,

Jennifer Anderson jennifer.anderson@pacelabs.com Project Manager

Sonder

Enclosures

cc: Ryan Moore, Regenesis







### **CERTIFICATIONS**

Project: PS Beta - NIROP

Pace Project No.: 10343262

**Minnesota Certification IDs** 

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

525 N 8th Street, Salina, KS 67401 A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770

Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA Colorado Certification #Pace

Connecticut Certification #: PH-0256 EPA Region 8 Certification #: 8TMS-L Florida/NELAP Certification #: E87605

Guam Certification #:14-008r Georgia Certification #: 959 Georgia EPD #: Pace

Idaho Certification #: MN00064 Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01 Iowa Certification #: 368 Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062 Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001 Maine Certification #: 2013011 Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace Montana Certification #: MT0092 Nevada Certification #: MN\_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002 New York Certification #: 11647 North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036 Ohio EPA #: 4150 Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563

Puerto Rico Certification Saipan (CNMI) #:MP0003 South Carolina #:74003001 Texas Certification #: T104704192 Tennessee Certification #: 02818 Utah Certification #: MN000642013-4 Virginia DGS Certification #: 251 Virginia/VELAP Certification #: Pace Washington Certification #: C486 West Virginia Certification #: 382 West Virginia DHHR #:9952C Wisconsin Certification #: 999407970

### **Montana Certification IDs**

150 N. 9th Street, Billings, MT 59101 Colorado Asbestos #: 17119 A2LA Certification #: 3590.01 EPA Region 8 Certification #: 8TMS-L

Idaho Certification #: MT00012

Minnesota Dept of Health Certification #: 030-999-442

Montana Certification #: MT CERT0040 North Dakota Dept. Of Health #: R-209 NVLAP Certification #: 101292-0 Washington Department of Ecology #: C993

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792 Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785 Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470 WA Department of Ecology Lab ID# C1007 Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

### **Ormond Beach Certification IDs**

8 East Tower Circle, Ormond Beach, FL 32174

Alabama Certification #: 41320 Connecticut Certification #: PH-0216

Delaware Certification: FL NELAC Reciprocity Florida Certification #: E83079

Georgia Certification #: 955

Guam Certification: FL NELAC Reciprocity Hawaii Certification: FL NELAC Reciprocity Illinois Certification #: 200068

Indiana Certification: FL NELAC Reciprocity

Kansas Certification #: E-10383

Louisiana Certification #: FL NELAC Reciprocity Louisiana Environmental Certificate #: 05007

Maryland Certification: #346 Michigan Certification #: 9911

Mississippi Certification: FL NELAC Reciprocity

Missouri Certification #: 236

Montana Certification #: Cert 0074 Nebraska Certification: NE-OS-28-14 Nevada Certification: FL NELAC Reciprocity

New York Certification #: 11608

North Carolina Environmental Certificate #: 667

North Carolina Certification #: 12710 North Dakota Certification #: R-216 Oklahoma Certification #: D9947 Pennsylvania Certification #: 68-00547 Puerto Rico Certification #: FL01264 South Carolina Certification: #96042001 Tennessee Certification #: TN02974

Texas Certification: FL NELAC Reciprocity US Virgin Islands Certification: FL NELAC Reciprocity

Virginia Environmental Certification #: 460165

### REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700

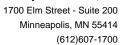
### **CERTIFICATIONS**

Project: PS Beta - NIROP

Pace Project No.: 10343262

**Ormond Beach Certification IDs** 

Wyoming Certification: FL NELAC Reciprocity
West Virginia Certification #: 9962C Wisconsin Certification #: 399079670 Wyoming (EPA Region 8): FL NELAC Reciprocity





### **SAMPLE SUMMARY**

Project: PS Beta - NIROP

Pace Project No.: 10343262

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10343262001	PMW-01	Water	03/31/16 09:42	03/31/16 15:38
10343262002	PMW-02	Water	03/31/16 11:00	03/31/16 15:38
10343262003	PMW-03	Water	03/31/16 12:30	03/31/16 15:38
10343262004	PMW-04	Water	03/31/16 13:50	03/31/16 15:38



### **SAMPLE ANALYTE COUNT**

Project: PS Beta - NIROP

Pace Project No.: 10343262

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10343262001	PMW-01	RSK 175	MLS	3	PASI-M
		EPA 6010C	IP	1	PASI-M
		6010C Met	IP	1	PASI-M
		SM 4500-S2-D	WT1	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	KAM	1	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	MW	1	PASI-M
		SM 5220D	DCL	1	PASI-M
		SM 5310C	JP1	1	PASI-V
0343262002	PMW-02	RSK 175	MLS	3	PASI-M
		EPA 6010C	IP	1	PASI-M
		6010C Met	IP	1	PASI-M
		SM 4500-S2-D	WT1	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	KAM	1	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	MW	1	PASI-M
		SM 5220D	DCL	1	PASI-M
		SM 5310C	JP1	1	PASI-V
0343262003	PMW-03	RSK 175	MLS	3	PASI-M
		EPA 6010C	IP	1	PASI-M
		6010C Met	IP	1	PASI-M
		SM 4500-S2-D	WT1	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	KAM	1	PASI-O
		EPA 300.0	KEO	1	PASI-M
		EPA 353.2	MW	1	PASI-M
		SM 5220D	DCL	1	PASI-M
		SM 5310C	JP1	1	PASI-V
0343262004	PMW-04	RSK 175	MLS	3	PASI-M
		EPA 6010C	IP	1	PASI-M
		6010C Met	IP	1	PASI-M
		SM 4500-S2-D	WT1	1	PASI-MT
		SM 2320B	MW	3	PASI-M
		SM 2320B	KAM	1	PASI-O
		EPA 300.0	KEO	1	PASI-M

### **REPORT OF LABORATORY ANALYSIS**

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### **SAMPLE ANALYTE COUNT**

Project: PS Beta - NIROP

Pace Project No.: 10343262

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 353.2	MW	1	PASI-M
		SM 5220D	DCL	1	PASI-M
		SM 5310C	JP1	1	PASI-V



### **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10343262

Date: 04/13/2016 12:00 PM

Sample: PMW-01	Lab ID: 1034	43262001	Collected: 03/31/1	6 09:42	Received: 03	3/31/16 15:38 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Meth	nod: RSK 1	75					
Ethane	ND	ug/L	10.0	1		04/01/16 10:20	74-84-0	
Ethene	ND	ug/L	10.0	1		04/01/16 10:20	74-85-1	
Methane	1710	ug/L	10.0	1		04/01/16 10:20	74-82-8	
6010C MET ICP	Analytical Meth	nod: EPA 60	010C Preparation Me	ethod: E	PA 3010			
ron	12100	ug/L	50.0	1	04/01/16 10:14	04/01/16 14:20	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	nod: 6010C	Met Preparation Me	thod: El	PA 3010			
Iron, Dissolved	7240	ug/L	50.0	1	04/01/16 10:14	04/06/16 14:26	7439-89-6	
4500S2D Sulfide Water	Analytical Meth	nod: SM 45	00-S2-D					
Sulfide	0.25	mg/L	0.10	1		04/04/16 14:02		
2320B Alkalinity	Analytical Meth	nod: SM 23	20B					
Carbon Dioxide (SM4500CO2D)	100	mg/L	5.0	1		04/04/16 14:12	124-38-9	
Alkalinity, Total as CaCO3	519	mg/L	5.0	1		04/11/16 09:49		
Alkalinity,Bicarbonate (CaCO3)	519	mg/L	5.0	1		04/11/16 09:49		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		04/11/16 09:49		
300.0 IC Anions	Analytical Meth	nod: EPA 30	0.00					
Sulfate	102	mg/L	2.4	2		04/08/16 03:14	14808-79-8	
353.2 Nitrate + Nitrite	Analytical Meth	nod: EPA 3	53.2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		04/08/16 11:52		
5220D COD	Analytical Meth	nod: SM 52	20D Preparation Met	thod: SI	M 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	04/01/16 10:14	04/01/16 12:55		
5310C TOC	Analytical Meth	nod: SM 53	10C					
Total Organic Carbon	14.5	mg/L	1.0	1		04/08/16 14:38	7440-44-0	



### **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10343262

Date: 04/13/2016 12:00 PM

Sample: PMW-02	Lab ID: 1034	13262002	Collected: 03/31/1	6 11:00	Received: 03	3/31/16 15:38 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
RSK 175 AIR Headspace	Analytical Meth	od: RSK 1	75					
Ethane	ND	ug/L	10.0	1		04/01/16 10:36	74-84-0	
Ethene	ND	ug/L	10.0	1		04/01/16 10:36		
Methane	18.6	ug/L	10.0	1		04/01/16 10:36	74-82-8	
6010C MET ICP	Analytical Meth	od: EPA 60	010C Preparation Me	ethod: E	PA 3010			
ron	9170	ug/L	50.0	1	04/01/16 10:14	04/01/16 14:23	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	od: 6010C	Met Preparation Me	thod: E	PA 3010			
ron, Dissolved	6320	ug/L	50.0	1	04/01/16 10:14	04/06/16 14:29	7439-89-6	
1500S2D Sulfide Water	Analytical Meth	od: SM 45	00-S2-D					
Sulfide	0.13	mg/L	0.10	1		04/04/16 14:04		
320B Alkalinity	Analytical Meth	od: SM 23	20B					
Carbon Dioxide (SM4500CO2D)	60.7	mg/L	5.0	1		04/04/16 14:34	124-38-9	
Alkalinity, Total as CaCO3	499	mg/L	5.0	1		04/11/16 09:54		
Alkalinity,Bicarbonate (CaCO3)	499	mg/L	5.0	1		04/11/16 09:54		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		04/11/16 09:54		
00.0 IC Anions	Analytical Meth	od: EPA 30	0.00					
Sulfate	128	mg/L	2.4	2		04/07/16 22:11	14808-79-8	
53.2 Nitrate + Nitrite	Analytical Meth	od: EPA 35	53.2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		04/08/16 11:59		
220D COD	Analytical Meth	od: SM 52	20D Preparation Met	thod: SI	M 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	04/01/16 10:14	04/01/16 12:55		
310C TOC	Analytical Meth	od: SM 53	10C					
otal Organic Carbon	5.3	mg/L	1.0	1		04/08/16 14:51	7440-44-0	



### **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10343262

Date: 04/13/2016 12:00 PM

Sample: PMW-03	Lab ID: 1034	3262003	Collected: 03/31/1	16 12:30	Received: 03	3/31/16 15:38 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
RSK 175 AIR Headspace	Analytical Meth	od: RSK 1	75					
Ethane	ND	ug/L	10.0	1		04/01/16 10:44	74-84-0	
Ethene	ND	ug/L	10.0	1		04/01/16 10:44		
Methane	27.3	ug/L	10.0	1		04/01/16 10:44	74-82-8	
6010C MET ICP	Analytical Meth	od: EPA 60	010C Preparation Me	ethod: E	PA 3010			
ron	8680	ug/L	50.0	1	04/01/16 10:14	04/01/16 14:39	7439-89-6	
6010C MET ICP, Dissolved	Analytical Meth	od: 6010C	Met Preparation Me	thod: E	PA 3010			
ron, Dissolved	7600	ug/L	50.0	1	04/01/16 10:14	04/06/16 14:45	7439-89-6	
1500S2D Sulfide Water	Analytical Meth	od: SM 45	00-S2-D					
Sulfide	ND	mg/L	0.10	1		04/04/16 14:07		
2320B Alkalinity	Analytical Meth	od: SM 23	20B					
Carbon Dioxide (SM4500CO2D)	41.3	mg/L	5.0	1		04/04/16 14:42	124-38-9	
Alkalinity, Total as CaCO3	356	mg/L	5.0	1		04/11/16 09:57		
Alkalinity,Bicarbonate (CaCO3)	356	mg/L	5.0	1		04/11/16 09:57		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		04/11/16 09:57		
00.0 IC Anions	Analytical Meth	od: EPA 30	0.00					
Sulfate	151	mg/L	2.4	2		04/07/16 22:35	14808-79-8	
53.2 Nitrate + Nitrite	Analytical Meth	od: EPA 35	53.2					
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		04/08/16 12:00		
220D COD	Analytical Meth	od: SM 52	20D Preparation Me	thod: SI	M 5220D			
Chemical Oxygen Demand	ND	mg/L	50.0	1	04/01/16 10:14	04/01/16 12:55		
310C TOC	Analytical Meth	od: SM 53	10C					
otal Organic Carbon	3.1	mg/L	1.0	1		04/08/16 15:04	7440-44-0	



### **ANALYTICAL RESULTS**

Project: PS Beta - NIROP

Pace Project No.: 10343262

Date: 04/13/2016 12:00 PM

Sample: PMW-04	Lab ID: 1034	43262004	Collected: 03/31/	16 13:50	Received: 03	3/31/16 15:38 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
RSK 175 AIR Headspace	Analytical Meth	od: RSK 1	75					
Ethane	ND	ug/L	10.0	1		04/01/16 10:52	74-84-0	
Ethene	ND	ug/L	10.0	1		04/01/16 10:52		
Methane	ND	ug/L	10.0	1		04/01/16 10:52	74-82-8	
010C MET ICP	Analytical Meth	od: EPA 60	010C Preparation Me	ethod: E	PA 3010			
ron	6310	ug/L	50.0	1	04/01/16 10:14	04/01/16 14:56	7439-89-6	
010C MET ICP, Dissolved	Analytical Meth	od: 6010C	Met Preparation Me	thod: El	PA 3010			
ron, Dissolved	3350	ug/L	50.0	1	04/01/16 10:14	04/06/16 14:48	7439-89-6	
500S2D Sulfide Water	Analytical Meth	od: SM 45	00-S2-D					
ulfide	ND	mg/L	0.10	1		04/04/16 14:07		
320B Alkalinity	Analytical Meth	od: SM 23	20B					
Carbon Dioxide (SM4500CO2D)	22.7	mg/L	5.0	1		04/04/16 14:49	124-38-9	
Ikalinity, Total as CaCO3	231	mg/L	5.0	1		04/11/16 10:01		
Ikalinity,Bicarbonate (CaCO3)	231	mg/L	5.0	1		04/11/16 10:01		
Ikalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1		04/11/16 10:01		
00.0 IC Anions	Analytical Meth	od: EPA 30	0.00					
sulfate	90.5	mg/L	2.4	2		04/07/16 22:53	14808-79-8	
53.2 Nitrate + Nitrite	Analytical Meth	od: EPA 3	53.2					
litrogen, NO2 plus NO3	ND	mg/L	0.020	1		04/08/16 12:01		
220D COD	Analytical Meth	od: SM 52	20D Preparation Me	thod: SN	M 5220D			
hemical Oxygen Demand	ND	mg/L	50.0	1	04/01/16 10:14	04/01/16 12:55		
310C TOC	Analytical Meth	od: SM 53	10C					
otal Organic Carbon	3.6	mg/L	1.0	1		04/08/16 15:16	7440-44-0	



### **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10343262

Date: 04/13/2016 12:00 PM

QC Batch: AIR/25586 Analysis Method: **RSK 175** 

QC Batch Method: **RSK 175** Analysis Description: **RSK 175 AIR HEADSPACE** 

Associated Lab Samples: 10343262001, 10343262002, 10343262003, 10343262004

METHOD BLANK: 2221533 Matrix: Water

Associated Lab Samples: 10343262001, 10343262002, 10343262003, 10343262004 Dionic

		Biank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	04/01/16 07:01	
Ethene	ug/L	ND	10.0	04/01/16 07:01	
Methane	ug/L	ND	10.0	04/01/16 07:01	

LABORATORY CONTROL SAMPLE &		2221535								
		Spike	LCS	LCSD	LCS	LCSD	% Rec		Max	
Parameter	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
Ethane	ug/L	114	109	112	96	99	85-115	3	20	
Ethene	ug/L	106	102	104	96	99	85-115	2	20	
Methane	ug/L	60.7	58.4	59.4	96	98	85-115	2	20	

SAMPLE DUPLICATE: 2223990						
		10343262001	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	1710	104	177	20 R1	

SAMPLE DUPLICATE: 2223991						
		92291781003	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	)
Methane	ua/L	1.7J	1.8J		20	)

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



**QUALITY CONTROL DATA** 

PS Beta - NIROP Project:

Pace Project No.: 10343262

Date: 04/13/2016 12:00 PM

QC Batch: MPRP/62354 Analysis Method: **EPA 6010C** QC Batch Method: EPA 3010 Analysis Description: 6010C Water

10343262001, 10343262002, 10343262003, 10343262004 Associated Lab Samples:

METHOD BLANK: 2221459 Matrix: Water Associated Lab Samples:

10343262001, 10343262002, 10343262003, 10343262004

Blank Reporting

Limit Qualifiers Parameter Units Result Analyzed

Iron ND 50.0 04/01/16 14:13 ug/L

LABORATORY CONTROL SAMPLE: 2221460

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Iron ug/L 10000 9320 93 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2221461 2221462

MS MSD 10343262002 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 75-125 2 20 ug/L 9170 10000 10000 17900 18400 88 92 Iron

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.



### **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10343262

Date: 04/13/2016 12:00 PM

QC Batch: MPRP/62353 Analysis Method: 6010C Met

QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved

Associated Lab Samples: 10343262001, 10343262002, 10343262003, 10343262004

METHOD BLANK: 2221455 Matrix: Water

Associated Lab Samples: 10343262001, 10343262002, 10343262003, 10343262004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Iron, Dissolved ug/L ND 50.0 04/06/16 14:19

LABORATORY CONTROL SAMPLE: 2221456

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Iron, Dissolved ug/L 10000 8960 90 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2221457 2221458

MS MSD 10343262002 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Iron, Dissolved 10000 75-125 2 20 ug/L 6320 10000 15600 15300 93 90

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.



### **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10343262

Date: 04/13/2016 12:00 PM

QC Batch: MT/23071 Analysis Method: SM 4500-S2-D

QC Batch Method: SM 4500-S2-D Analysis Description: 4500S2D Sulfide Water

Associated Lab Samples: 10343262001, 10343262002, 10343262003, 10343262004

METHOD BLANK: 2222793 Matrix: Water

Associated Lab Samples: 10343262001, 10343262002, 10343262003, 10343262004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Sulfide mg/L ND 0.10 04/04/16 13:53

LABORATORY CONTROL SAMPLE: 2222794

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Sulfide mg/L .94 0.81 85 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2222795 2222796

MS MSD 10342808001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Sulfide ND 70 80-120 20 M1 mg/L .94 .94 0.67 0.67 71 0

SAMPLE DUPLICATE: 2222797

Parameter Units Result Result RPD AND Qualifiers

Sulfide mg/L ND .016J 20

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



# **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10343262

QC Batch: WET/36890 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10343262001, 10343262002, 10343262003, 10343262004

METHOD BLANK: 1526956 Matrix: Water
Associated Lab Samples: 10343262001, 10343262002, 10343262003, 10343262004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Carbon Dioxide (SM4500CO2D) mg/L ND 5.0 04/04/16 13:54

SAMPLE DUPLICATE: 1526958

 Parameter
 Units
 10343262001 Result
 Dup Result
 Max RPD
 RPD
 Qualifiers

 Carbon Dioxide (SM4500CO2D)
 mg/L
 100
 88.1
 13

SAMPLE DUPLICATE: 1526959

Date: 04/13/2016 12:00 PM

Parameter Units Result Result RPD Qualifiers

Carbon Dioxide (SM4500CO2D) mg/L 5.2 ND

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.



# **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10343262

METHOD BLANK: 2228411

Date: 04/13/2016 12:00 PM

QC Batch: WET/47339 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10343262001, 10343262002, 10343262003, 10343262004

Associated Lab Samples: 10343262001, 10343262002, 10343262003, 10343262004 Reporting Blank Qualifiers Parameter Result Limit Units Analyzed Alkalinity, Total as CaCO3 mg/L ND 5.0 04/11/16 08:44 Alkalinity, Bicarbonate (CaCO3) mg/L ND 5.0 04/11/16 08:44 Alkalinity, Carbonate (CaCO3) ND 04/11/16 08:44 mg/L 5.0 LABORATORY CONTROL SAMPLE & LCSD: 2228412 2228413 Spike LCS **LCSD** LCS LCSD % Rec Max Qualifiers Parameter Units Conc. Result Result % Rec % Rec Limits **RPD RPD** Alkalinity, Total as CaCO3 mg/L 40 43.0 43.1 107 108 90-110 0 30

Matrix: Water

MATRIX SPIKE & MATRIX SPI	KE DUPLICA	ATE: 22284	14		2228415							
			MS	MSD								
	1	10343048013	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Alkalinity, Total as CaCO3	mg/L	334	40	40	372	374	93	100	80-120	1	30	

MATRIX SPIKE & MATRIX SPI	KE DUPLICA	ATE: 22284	16		2228417							
			MS	MSD								
	1	10343221003	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Alkalinity, Total as CaCO3	mg/L	301	40	40	350	347	121	114	80-120	1	30	M1

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.



# **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10343262

Date: 04/13/2016 12:00 PM

QC Batch: WETA/26787 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10343262001, 10343262002, 10343262003, 10343262004

METHOD BLANK: 2226222 Matrix: Water
Associated Lab Samples: 10343262001, 10343262002, 10343262003, 103432620

10343262001, 10343262002, 10343262003, 10343262004 Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Sulfate mg/L ND 1.2 04/08/16 10:41

LABORATORY CONTROL SAMPLE: 2226223

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Sulfate mg/L 12.5 12.5 100 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2226224 2226225

MS MSD 10342403001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Sulfate 90-110 20 mg/L 12.4 12.5 12.5 24.1 24.1 94 94 0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2226226 2226227

MS MSD MS MSD MS 10343221003 Spike Spike MSD % Rec Max % Rec RPD Parameter Units Result Conc. Conc. Result Result % Rec Limits RPD Qual Sulfate 76.6 12.5 12.5 80.0 78.0 27 11 90-110 2 20 M1 mg/L

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.



# **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10343262

Date: 04/13/2016 12:00 PM

QC Batch: WETA/26794 Analysis Method: EPA 353.2

QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved

Associated Lab Samples: 10343262001, 10343262002, 10343262003, 10343262004

METHOD BLANK: 2227194 Matrix: Water

Associated Lab Samples: 10343262001, 10343262002, 10343262003, 10343262004

Blank Reporting

ParameterUnitsResultLimitAnalyzedQualifiersNitrogen, NO2 plus NO3mg/LND0.02004/08/16 11:44

LABORATORY CONTROL SAMPLE: 2227195

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Nitrogen, NO2 plus NO3 mg/L 1.0 105 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2227196 2227197

MS MSD 10343330001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual Nitrogen, NO2 plus NO3 1 90-110 2 20 mg/L 0.39 1 1.4 1.3 98 95

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2227198 2227199

MS MSD 10343330002 MS MSD MS MSD Spike Spike % Rec Max Parameter % Rec RPD Units Result Conc. Conc. Result Result % Rec Limits RPD Qual Nitrogen, NO2 plus NO3 mg/L 0.39 1 1 1.4 1.4 96 102 90-110 20

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



# **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10343262

Date: 04/13/2016 12:00 PM

QC Batch: WETA/26740 Analysis Method: SM 5220D
QC Batch Method: SM 5220D Analysis Description: 5220D COD

Associated Lab Samples: 10343262001, 10343262002, 10343262003, 10343262004

METHOD BLANK: 2221504 Matrix: Water
Associated Lab Samples: 10343262001, 10343262002, 10343262003, 10343262004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Chemical Oxygen Demand mg/L ND 50.0 04/01/16 12:50

LABORATORY CONTROL SAMPLE: 2221505

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chemical Oxygen Demand mg/L 300 312 104 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2221506 2221507

MS MSD 10342472001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual 25000 80-120 20 M1 Chemical Oxygen Demand mg/L 21900 25000 49500 48100 110 105 3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2221508 2221509

MS MSD 10342811001 MS MS Spike Spike MSD MSD % Rec Max Parameter % Rec RPD Qual Units Result Conc. Conc. Result Result % Rec Limits RPD Chemical Oxygen Demand 12500 2500 2500 14800 15200 92 105 80-120 2 20 mg/L

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.



# **QUALITY CONTROL DATA**

Project: PS Beta - NIROP

Pace Project No.: 10343262

QC Batch: WETA/16222 Analysis Method: SM 5310C
QC Batch Method: SM 5310C Analysis Description: 5310C TOC

Associated Lab Samples: 10343262001, 10343262002, 10343262003, 10343262004

METHOD BLANK: 304454 Matrix: Water

Associated Lab Samples:

Date: 04/13/2016 12:00 PM

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Total Organic Carbon mg/L ND 1.0 04/08/16 14:00

LABORATORY CONTROL SAMPLE: 304455

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Organic Carbon** mg/L 25 24.8 99 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 304456 304457

MS MSD 1263443001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual **Total Organic Carbon** 25 29.4 80-120 20 mg/L 4.3 25 29.6 100 101

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 304458 304459

MS MSD 1263693001 MS MSD MS Spike Spike MSD % Rec Max Parameter Conc. % Rec **RPD** RPD Units Result Conc. Result Result % Rec Limits Qual 25 Total Organic Carbon mg/L 3.2 25 28.3 28.7 100 102 80-120 2 20

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



# **QUALIFIERS**

Project: PS Beta - NIROP

Pace Project No.: 10343262

#### **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.

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
PASI-MT	Pace Analytical Services - Montana
PASI-O	Pace Analytical Services - Ormond Beach
PASI-V	Pace Analytical Services - Virginia

# **ANALYTE QUALIFIERS**

Date: 04/13/2016 12:00 PM

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

R1 RPD value was outside control limits.



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: PS Beta - NIROP

Pace Project No.: 10343262

Date: 04/13/2016 12:00 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10343262001	PMW-01	RSK 175	AIR/25586		
10343262002	PMW-02	RSK 175	AIR/25586		
10343262003	PMW-03	RSK 175	AIR/25586		
10343262004	PMW-04	RSK 175	AIR/25586		
10343262001	PMW-01	EPA 3010	MPRP/62354	EPA 6010C	ICP/27285
10343262002	PMW-02	EPA 3010	MPRP/62354	EPA 6010C	ICP/27285
10343262003	PMW-03	EPA 3010	MPRP/62354	EPA 6010C	ICP/27285
0343262004	PMW-04	EPA 3010	MPRP/62354	EPA 6010C	ICP/27285
0343262001	PMW-01	EPA 3010	MPRP/62353	6010C Met	ICP/27286
0343262002	PMW-02	EPA 3010	MPRP/62353	6010C Met	ICP/27286
0343262003	PMW-03	EPA 3010	MPRP/62353	6010C Met	ICP/27286
0343262004	PMW-04	EPA 3010	MPRP/62353	6010C Met	ICP/27286
0343262001	PMW-01	SM 4500-S2-D	MT/23071		
0343262002	PMW-02	SM 4500-S2-D	MT/23071		
0343262003	PMW-03	SM 4500-S2-D	MT/23071		
0343262004	PMW-04	SM 4500-S2-D	MT/23071		
0343262001	PMW-01	SM 2320B	WET/36890		
0343262001	PMW-01	SM 2320B	WET/47339		
0343262002	PMW-02	SM 2320B	WET/36890		
0343262002	PMW-02	SM 2320B	WET/47339		
0343262003	PMW-03	SM 2320B	WET/36890		
0343262003	PMW-03	SM 2320B	WET/47339		
0343262004	PMW-04	SM 2320B	WET/36890		
0343262004	PMW-04	SM 2320B	WET/47339		
0343262001	PMW-01	EPA 300.0	WETA/26787		
0343262002	PMW-02	EPA 300.0	WETA/26787		
0343262003	PMW-03	EPA 300.0	WETA/26787		
0343262004	PMW-04	EPA 300.0	WETA/26787		
0343262001	PMW-01	EPA 353.2	WETA/26794		
0343262002	PMW-02	EPA 353.2	WETA/26794		
0343262003	PMW-03	EPA 353.2	WETA/26794		
0343262004	PMW-04	EPA 353.2	WETA/26794		
0343262001	PMW-01	SM 5220D	WETA/26740		WETA/267
0343262002	PMW-02	SM 5220D	WETA/26740		WETA/267
0343262003	PMW-03	SM 5220D	WETA/26740		WETA/267
0343262004	PMW-04	SM 5220D	WETA/26740	SM 5220D	WETA/267
0343262001	PMW-01	SM 5310C	WETA/16222		
0343262002	PMW-02	SM 5310C	WETA/16222		
0343262003	PMW-03	SM 5310C	WETA/16222		
10343262004	PMW-04	SM 5310C	WETA/16222		

# CHAIN-OF-CUSTODY / Analytical Request Document

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

Section C

Section B

Pace Analytical"

Pace Project No./ Lab I.D. DRINKING WATER SAMPLE CONDITIONS OTHER 3 ر رو 200 ટ NPDES K GROUND WATER Residual Chlorine (Y/N) 3 (8 3 18 AISO 8 Page: RCRA Ζ REGULATORY AGENCY sessg bevlossiO 3 ~ TIME Requested Analysis Filtered (Y/N) otal organic carbon Sulfide in water STATE sulfate in water Site Location DATE Vitrate+Nitrite UST Carbon dioxide in water Volatile fatty acids nozi bevlossiC COSPTED BY / AFFILIATION otal iron Spemical oxygen demand Pace Project Jann | Fek Apperson |
Pace Project | Jann | Fek Apperson |
Pace Project | Jann | Fek Apperson | Alkalinity, CaCO3 in water ÌΝ/λ taseT eisylenA t Other 1011 Calle Sombra Methanol Company Name: Regenesis Bahar Naderi Preservatives <sub>E</sub>O<sub>S</sub>S<sub>S</sub>BN NaOH 21466 HC 3 X 18 nvoice Information: <sup>€</sup>ONH <sup>†</sup>OS<sup>z</sup>H Unpreserved TIME OC) Attention: Address: 32 R # OF CONTAINERS Ø SAMPLE TEMP AT COLLECTION DATE **8**4 38/6/1250 200 3/3/16/13:50 TIME COMPOSITE END/GRAB 3.31 DATE COLLECTED 331 RELINQUISHED BY / AFFILIATION **TIME** COMPOSITE START roject Name: PS Beta - NIROP roject Number: PS Beta - NIROP DATE Required Project Information: Report To: Melinda Pham <del>ار</del> 1 (GMCO=O BARD=D) SAMPLE TYPE ق b 'urchase Order No.: え শ ন (see valid codes to left) MATRIX CODE Copy To: 
 Valid Matrix Codes

 MATBIX
 CODE

 DRINKING WATER
 WT

 WASTE WATER
 WP

 PRODUCT
 \$1

 PRODUCT
 \$2

 OIL
 QL

 WP
 WP

 AR
 AR

 AR
 AR

 TISSIE
 TS
 DEINKING WATER
WATER
WASTER
PRODUCT
SOLLSOLID
SOLL
WIPE
AR
AR
TISSUE Fax: 343-366-8090 PMW-02 PMW-03 PMW-04 PMW-01 San Clemente, CA 92673 ADDITIONAL COMMENTS Mpham@regenesis.com (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE 1011 Calle Sombra SAMPLE ID Section D Required Client Information Section A Required Client Information: Regenesis hone: 949-366-8000 equested Due Date/TAT: ompany: Email To: ddress: 8 2 0 F 잗 N e ø ITEM #

F-ALL-Q-020rev.08, 12-Oct-2007

 $(N/\lambda)$ Samples Intact

(N/Y) relood selses ybotsuc

Ice (Y/V) Received on

O° ni qmeT

3 31

533

S Billio

38

Merces Means to AECON 3B()16

PRINT Name of SAMPLER: WELLSSA SIGNATURE of SAMPLER

Page 23 of 45

SAMPLER NAME AND SIGNATURE

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

# Pace Analytical`

hold, incorrect preservative, out of temp, incorrect containers).

# Document Name:

# Sample Condition Upon Receipt Form

Document No.:

F-MN-L-213-rev.15

Document Revised: 05Jan2016

Page 1 of 1 Issuing Authority: Pace Minnesota Quality Office

Sample Condition Client Name: Project #: WO#: 10343262 **Upon Receipt** Courier: Fed Ex MUPS USPS Commercial Pace Other: SpeeDee Tracking Number: Optional: Proj. Due Date: Proj. Name: Custody Seal on Cooler/Box Present? Seals Intact? Yes Packing Material: Bubble Wrap Bubble Bags None Other:\_ Temp Blank? Tes □No Thermometer □B88A912167504 □Blue Type of Ice: None Samples on ice, cooling process has begun Used: B88A0143310098 Cooler Temp Read (°C): 0.2, /. Cooler Temp Corrected (°C): 0.2,/.6 Biological Tissue Frozen? Yes No TN/A USDA Regulated Soil ( N/A, water sample) Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, ID, LA. Did samples originate from a foreign source (internationally, MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)? Yes □No including Hawaii and Puerto Rico)? Yes If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork. Chain of Custody Present? Wes □No □N/A Chain of Custody Filled Out? Yes □No □N/A 2. Chain of Custody Relinquished? Yes □No □N/A Sampler Name and/or Signature on COC? Yes □No □N/A Samples Arrived within Hold Time? Yes □No ∏N/A Short Hold Time Analysis (<72 hr)? - No Yes □N/A Rush Turn Around Time Requested? Yes -WO □N/A Sufficient Volume? Yes □No □N/A Correct Containers Used? Yes □No □N/A 9. -Pace Containers Used? Yes ΠNo □N/A Containers Intact? Yes □No □N/A 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? □No Yes □N/A 12. -Includes Date/Time/ID/Analysis Matrix: All containers needing acid/base preservation have been HCI checked? □No □N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO<sub>3</sub>, H<sub>2</sub>SO<sub>2</sub>, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) □No □N/A Exceptions: OA, Coliform, OO Oil and Grease, Initial when Lot # of added DRO/8015 (water) DOC □No □N/A completed: preservative: Headspace in VOA Vials (>6mm)? **⊿**No □N/A 14. Trip Blank Present? □No 15. □n/a Yes Trip Blank Custody Seals Present? □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: Inderv. Date: <u>04/01/2016</u>

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

Due Date: 4/14/2016

Owner Received Date: 3/31/2016

Requested Analysis Send To Lab: Pace Analytical Minnesota 1700 Elm Street Received at: Suite 200

Workorder Name: PS Beta - NIROP

Workorder: 10343262

अब्रिश्म प्रद Preserved Containers Pace Analytical Billings MT 150 N Ninth Street Billings, MT 59101 Phone (406)254-7226 Minneapolis, MN 55414 Phone (612)607-1700 Jennifer Anderson Report To:

		Sample   Collect	Collect			ther				
Item	Item Sample ID	Туре	Date/Time	Lab ID	Matrix	0			LAB USE ONLY	E ONLY
_	PMW-01	PS	3/31/2016 09:42	10343262001	Water		×			
2	PMW-02	PS	3/31/2016 11:00	10343262002	Water		×			
8	PMW-03	PS	3/31/2016 12:30	10343262003	Water		×			
4	PMW-04	PS	3/31/2016 13:50	10343262004	Water		×			
5										
製		1000円の							Comments	
Trar	Transfers Released By		Date/Time	Received By	>		Date/Time			
-	DY DAG		991117	(4C)			//			
2	3/2,			Hhrs	usn/lac		4/2/14 09 3W			
е										
4										
ပြိ	Cooler Temperature on Receipt	1.9°C		Custody Seal (Y	Y Jor N	Re	Received on Ice (Y or	Y br N	Samples Intact (Y) or N	

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Page 1 of 1



# Document Name: Sample Condition Upon Receipt Form

Document No.: F-MT-C-184-rev.07 Document Revised: 24Mar2016
Page 1 of 1
Issuing Authority:

Pace Montana Quality Office

Sample Condition **Client Name:** Project #: **Upon Receipt** 10343262 UPS Client Courier: USPS Commercial Pace Other: 6484 8096 Tracking Number: Yes Custody Seal on Cooler/Box Present? No Seals Intact? No Optional: Proj. Due Date: Proj. Name: Packing Material: Bubble Wrap Bubble Bags None Other: Temp Blank? Yes No Thermometer Used: 13830045 Type of Ice: Wet ☐Blue ☐None ☐Samples on ice, cooling process has begun Cooler Temp Read: Date and Initials of Person Examining Contents: No Cooler Temp Corrected: **Biological Tissue Frozen?** Yes Temp should be above freezing to 6°C Comments: Yes Chain of Custody Present? Пио □N/A 1. Chain of Custody Filled Out? Yes □No □N/A Chain of Custody Relinquished? Yes □No □N/A 3. Sampler Name and Signature on COC? □Yes ⊠No □N/A 4. Samples Arrived within Hold Time? Yes □No □N/A Short Hold Time Analysis (<72 hr)? Yes No □N/A 6. Yes Rush Turn Around Time Requested? **∠**Klo □N/A 7. Sufficient Volume? Yes □No □N/A 8. Correct Containers Used? Yes □No □N/A 9. Yes □No □N/A -Pace Containers Used? Yes □N/A Containers Intact? □No 10. Filtered Volume Received for Dissolved Tests? Yes □N/A 11. Note if sediment is visible in the dissolved container. **200** Yes Sample Labels Match COC? No □N/A 12. -Includes Date/Time/ID/Analysis Matrix: All containers needing acid/base preservation have been □H<sub>2</sub>SO<sub>4</sub> 4/4 ⊠NaOH Yes Пнсі □No □N/A checked? Sample # 001-004 All containers needing preservation are found to be in Wes □No □N/A compliance with EPA recommendation? (HNO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub>, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) Yes No Exceptions: VOA, Coliform, TOC, Oil and Grease, Lot # of added Initial when completed: \( \) WI-DRO (water) preservative: N/A 14. Headspace in VOA Vials (>6mm)? Yes □No Trip Blank Present? **□**Yes □No N/A 15. Trip Blank Custody Seals Present? Yes □No **□**M/A NA Pace Trip Blank Lot # (if purchased): Field Data Required? Yes No CLIENT NOTIFICATION/RESOLUTION Person Contacted: Date/Time: Comments/Resolution:

Project Manager Review: Date: 04/04/2016Note: Whenever there is a discrepancy affecting with 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)

Page 27 of 45

Cooler	ω	2	1	Transfers		υ	4 PM	3 PM	2 PM	1 PN	item s	Jennifer Pace Ar 1700 EI Suite 20 Minnear Phone (	Report To	A COLVO
Cooler Temperature on Receipt		7		s Released By	· · · · · · · · · · · · · · · · · · ·		PMW-04	PMW-03	PMW-02	PMW-01	Sample ID	Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-1700	O	AACIVOLOGI. 10040202
re on Rece			KAR.	By	では、からない							esota 414 0		
09	(	1			(A) 的名词复数 · 教育		PS	PS	PS	PS	Sample Type			VOIKOIGE
ငိ		11/10	12	Date/Time			3/31/2016 13:50	3/31/2016 12:30	3/31/2016 11:00	3/31/2016 09:42	Collect Date/Time	υ < ω ο	Subco	Name: Po
Custody Seal		1620	7 FCIII 41				3:50 10343262004	2:30 10343262003	1:00 10343262002	9:42 10343262001	Latin	Pace Analytical Virgin 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042	Subcontract To	Workorder Name: PS Beta - NIKOP
eal Wor	-	13.00/	D	Received By			62004 Water	62003 Water	.62002 Water	:62001 Water	Matrix	Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042		7
z	7	7	1		機体をおう		er 1	er 1	er 1	er 1	(40) (32)			
Received on		Τ.	u	0								Preserved Containers		Owner
ed on Ice		14-16 08	11110 170	Date/Time			×	×	×	×		ners c		Owner Received
y or N		8												red Date: 3
													Requested Analysis	3/31/2016
Samp					Comments								Analysis	Results R
Samples Intact y or					ents						2000			Results Requested By:
Y or N											LAB USE ONLY			<b>3y:</b> 4/14/2016
											ONLY		教育主	2016

# Pace Analytical\*

Document Name:

# Sample Condition Upon Receipt Form

Document No.: F-VM-C-001-Rev.09 Document Revised: 23Feb2015

Page 1 of 1

Issuing Authority: Pace Virginia, Minnesota Quality Office

FECAL WAIVER ON FILE Y

Sample Condition Upon Receipt    Jd Cl   N   V			Project	WO#:1263451
Courier: Fed Ex UPS	USPS		_ Client	
Commercial Tracking Number:	Other	:		1263451
Custody Seal on Cooler/Box Present? 🏻 🔲 Yes 🗀	No	Seals	intact?	es No Optional: Proj. Due Date: Proj. Name:
Packing Material: MBubble Wrap 1 Bubble Bag	gs []N	one [	Other:	Temp Blank? VYes No
hermometer Used: 140792808	Type of	Ice:	<b>J</b> Wet	Blue None Samples on ice, cooling process has begun
Cooler Temp Read °C: Cooler Temp Coemp should be above freezing to 6°C Correction Fact	orrected *	<u> </u>	Date as	Biological Tissue Frozen? Yes No NA nd Initials of Person Examining Contents: 4-4-1
Chain of Custody Present?	☑Yes	□No	□N/A	
Chain of Custody Filled Out?	ÌZÌYes	□No	□N/A	2.
Chain of Custody Relinquished?	Yes	∭No	□N/A	3.
Sampler Name and Signature on COC?	Yes	No	□N/A	4.
Samples Arrived within Hold Time?	ZYes	∐No	□N/A	5.
Short Hold Time Analysis (<72 hr)?	☐Yes	[ZÎNo	□N/A	6.
Rush Turn Around Time Requested?	□Yes	ΖNο	□n/a	7.
Sufficient Volume?	<b>⊘</b> Yes	∏No	□n/a	
Correct Containers Used?	<b>Z</b> Yes	□No	□N/A	
-Pace Containers Used?	[Z]Yes	□No	□N/A	
Containers Intact?		□No	□N/A	
Filtered Volume Received for Dissolved Tests?	□Yes	□No	☑n/a	
Sample Labels Match COC?	Yes	No	□N/A	
-Includes Date/Time/ID/Analysis Matrix: (	WT.			
All containers needing acid/base preservation will be checked and documented in the pH logbook.	Z Yes	□No	□N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	∐Yes	□No	ØN/A	13.
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	<b>⊠</b> N/A	
Pace Trip Blank Lot # (if purchased):				
CLIENT NOTIFICATION/RESOLUTION				Field Data Required? Yes No
Person Contacted:			1	Date/Time:
Comments/Resolution:				

Project Manager Review:

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)

TEMPERATURE WAIVER ON FILE

# Chain of Custody -

MO#::35286932

Face Analytical

LAB USE ONLY 4/14/2016 Z ō 3/31/2016 Results Requested By: Samples Intact Comments Requested Analysis Z (Y)or Owner Received Date: Received on Ice DIOXIDE × × Date/Time Preserved Containers Unpreserved or (N Pace Analytical Ormond Beach Matrix Water Water Water Water 8 East Tower Circle Ormond Beach, FL 32174 Phone (386)672-5668 Received By 10343262002 10343262003 10343262004 10343262001 **Custody Seal** Workorder Name: PS Beta - NIROP Lab ID Subcontract To 3/31/2016 13:50 MIII IN 3/31/2016 09:42 3/31/2016 11:00 3/31/2016 12:30 Date/Time Date/Time Collect られる Sample Туре PS PS S PS Cooler Temperature on Receipt Pace Analytical Minnesota 1700 Elm Street Workorder: 10343262 Released By Minneapolis, MN 55414 Phone (612)607-1700 Jennifer Anderson Sample ID PMW-02 PMW-03 PMW-04 PMW-01 Report To Suite 200 Transfers Item



Document Name: Sample Condition Upon Receipt Form Document No.: F-FL-C-007 rev. 07 Document Revised: December 28, 2015 Issuing Authority: Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project # Project Manager:

WO#:35256982

PM: JJV | Due Date: 04/08/15

Client: CLIENT: PAGMIN	Deliver:
	pH:
Courier: Fed Ex UPS USPS Client Commercial Pace	مد ا
Shipping Method:  First Overnight  Priority Overnight  Standard Overnight  Ground	Other
Billing II Propinget	oler Size if Applicable:
Tracking # (MS+57) 6484 8696 5591	One Onze ii Applicabie.
- 10/06/10/30/	
Custody Seal on Copler/Box Present:	
Packing Material: Bubble Wrap Bubble Bags None Other	Biological Tissue is Frozen: Yes No N/A
312	nples on ice, cooling process has begun
Cooler #1 Temperature C O.O(Visual) +6./ (Correction Factor) O./ (Actual)	
Cooler #2 Temperature C 5/6 (Visual) +O-1 (Correction Factor) 5,7 (Actual)	
Cooler #3 Temperature°C (Visual) (Correction Factor) (Actual)	
Cooler #4 Temperature°C (Visual) (Correction Factor) (Actual)	to 6°C
Cooler #5 Temperature°C (Visual) (Correction Factor) (Actual)	
Cooler #6 Temperature°C (Visual) (Correction Factor) (Actual)	
Comments:	
Chain of Custody Present	
Chain of Custody Filled Out   ZYes □ No □N/A	
Relinquished Signature & Sampler Name COC	
Samples Arrived within Hold Time	
Rush TAT requested on COC	
Sufficient Volume	
Correct Containers Used	
Pace Containers Used	:
Containers Intact    Yes   No   N/A	
collection)	
All containers needing acid/base preservation have been ☐Yes ☐ No ☑N/A HCi pH<2 ☐ HCi pH<2	
All Containers needing preservation are found to be in H2SO4 pH<2	
compliance with EPA recommendation:   Exceptions: VOA, Coliform, TOC, O&G  NaOH/ZnOAc pH>9	
No Headspace in VOA Vials ( >6mm): ☐Yes ☐ No ZN/A	
Trip Blank Present: □Yes □ No ☑N/A	
Client Notification/ Resolution:	
Person Contacted: Date/Time:	
Comments/ Resolution (use back for additional comments):	
	:
	1
Project Manager Review:	Date: 1/2



April 8, 2016

Pace Analytical Energy Services LLC 220 William Pitt Way Pittsburgh, PA 15238

> Phone: (412) 826-5245 Fax: (412) 826-3433

Jennifer Anderson Pace Analytical Services, Inc. 1700 Elm Street Suite 200 Minneapolis, MN 55414

RE: PS BETA - NIROP / 10343262

Pace Workorder:

18665

Dear Jennifer Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on Monday, April 04, 2016. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Ruth Wels

Ruth Welsh

04/08/2016

Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures.

As a valued client we would appreciate your comments on our service.

Please email info@microseeps.com.

Total Number of Pages 6

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# LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor: Pennsylvania Department of Environmental Protection, Bureau of Laboratories

Accreditation ID: 02-00538

Scope: NELAP Non-Potable Water and Solid & Hazardous Waste

Accreditor: South Carolina Department of Health and Environmental Control, Office of Environmental

Laboratory Certification

Accreditation ID: 89009003

Scope: Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)

Accreditor: NELAP: New Jersey, Department of Environmental Protection

Accreditation ID: PA026

Scope: Non-Potable Water; Solid and Chemical Materials

Accreditor: NELAP: New York, Department of Health Wadsworth Center

Accreditation ID: 11815

Scope: Non-Potable Water; Solid and Hazardous Waste

Accreditor: State of Connecticut, Department of Public Health, Division of Environmental Health

Accreditation ID: PH-0263

Scope: Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)

Accreditor: NELAP: Texas, Commission on Environmental Quality

Accreditation ID: T104704453-09-TX
Scope: Non-Potable Water

Scope: Non-Potable Water

Accreditor: State of New Hampshire

Accreditation ID: 299409

Scope: Non-potable water

Accreditor: State of Georgia
Accreditation ID: Chapter 391-3-26

Scope: As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is

accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

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# SAMPLE SUMMARY

Workorder: 18665 PS BETA - NIROP / 10343262

Lab ID	Sample ID	Matrix	Date Collected	Date Received
186650001	PMW-01	Water	3/31/2016 09:42	4/4/2016 08:30
186650002	PMW-02	Water	3/31/2016 11:00	4/4/2016 08:30
186650003	PMW-03	Water	3/31/2016 12:30	4/4/2016 08:30
186650004	PMW-04	Water	3/31/2016 13:50	4/4/2016 08:30

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Phone: (412) 826-5245

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# **ANALYTICAL RESULTS**

Workorder: 18665 PS BETA - NIROP / 10343262

Lab ID:

186650001

Date Received: 4/4/2016 08:30

Matrix:

Water

Sample ID: PMW-01 Date Collected: 3/31/2016 09:42

Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR						
Analysis Desc: AM23G	Analyt	ical Method: A	M23G			
Lactic Acid	0.10J mg/l	0.20	0.0080 1	4/6/2016 02:14	MD	
Acetic Acid	17 mg/l	1.0	0.12 10	4/6/2016 17:23	MD	d
Propionic Acid	10 mg/l	1.0	0.060 10	4/6/2016 17:23	MD	d
Formic Acid	0.044J mg/l	0.10	0.0070 1	4/6/2016 02:14	MD	В
Butyric Acid	1.4 mg/l	0.10	0.010 1	4/6/2016 02:14	MD	
Pyruvic Acid	0.066J mg/l	0.10	0.015 1	4/6/2016 02:14	MD	
i-Pentanoic Acid	0.054J mg/l	0.10	0.0070 1	4/6/2016 02:14	MD	
Pentanoic Acid	0.10 U mg/l	0.10	0.012 1	4/6/2016 02:14	MD	
i-Hexanoic Acid	0,20 U mg/l	0.20	0.014 1	4/6/2016 02:14	MD	
Hexanoic Acid	0.20 U mg/l	0.20	0.0070 1	4/6/2016 02:14	MD	

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> Phone: (412) 826-5245 Fax: (412) 826-3433

# **ANALYTICAL RESULTS**

Workorder: 18665 PS BETA - NIROP / 10343262

Lab ID: Sample ID: 186650002

PMW-02

Date Received: 4/4/2016 08:30

Matrix:

Water

Date Collected: 3/31/2016 11:00

Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR		A   -	MOOC			
Analysis Desc: AM23G		Analytical Method: A	IVI23G			
Lactic Acid	0.043J mg/l	0.20	0.0080 1	4/6/2016 03:08	MD	
Acetic Acid	2.7 mg/l	0.10	0.012 1	4/6/2016 03:08	MD	
Propionic Acid	2.2 mg/l	0.10	0.0060 1	4/6/2016 03:08	MD	
Formic Acid	0.10 U mg/l	0.10	0.0070 1	4/6/2016 03:08	MD	В
Butyric Acid	0.10 U mg/l	0.10	0.010 1	4/6/2016 03:08	MD .	
Pyruvic Acid	0.10 U mg/l	0.10	0.015 1	4/6/2016 03:08	MD	
i-Pentanoic Acid	0.10 U mg/l	0.10	0.0070 1	4/6/2016 03:08	MD	
Pentanoic Acid	0.10 U mg/l	0.10	0.012 1	4/6/2016 03:08	MD	
i-Hexanoic Acid	0.20 U mg/l	0.20	0.014 1	4/6/2016 03:08	MD	
Hexanoic Acid	0.20 U mg/l	0.20	0.0070 1	4/6/2016 03:08	MD	

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> Phone: (412) 826-5245 Fax: (412) 826-3433

# **ANALYTICAL RESULTS**

Workorder: 18665 PS BETA - NIROP / 10343262

Lab ID:

186650003

Date Received: 4/4/2016 08:30

Matrix:

Water

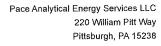
Sample ID: PMW-03 Date Collected: 3/31/2016 12:30

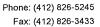
Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR			,			
Analysis Desc: AM23G	Analyt	ical Method: A	M23G			
Lactic Acid	0.20 U mg/l	0.20	0.0080 1	4/6/2016 04:01	MD	
Acetic Acid	0.035J mg/l	0.10	0.012 1	4/6/2016 04:01	MD	
Propionic Acid	0.10 U mg/l	0.10	0.0060 1	4/6/2016 04:01	MD	
Formic Acid	0.028J mg/l	0.10	0.0070 1	4/6/2016 04:01	MD	В
Butyric Acid	0.10 U mg/l	0.10	0.010 1	4/6/2016 04:01	MD	
Pyruvic Acid	0.10 U mg/l	0.10	0.015 1	4/6/2016 04:01	MD	
i-Pentanoic Acid	0,10 U mg/l	0.10	0.0070 1	4/6/2016 04:01	MD	
Pentanoic Acid	0.10 U mg/l	0.10	0.012 1	4/6/2016 04:01	MD	
i-Hexanoic Acid	0.20 U mg/l	0.20	0.014 1	4/6/2016 04:01	MD	
Hexanoic Acid	0.20 U mg/l	0.20	0.0070 1	4/6/2016 04:01	MD	

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# **ANALYTICAL RESULTS**

Workorder: 18665 PS BETA - NIROP / 10343262

Lab ID:

186650004

PMW-04 Sample ID:

Date Received: 4/4/2016 08:30

Matrix:

Water

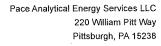
Date Collected: 3/31/2016 13:50

Parameters	Results Units	PQL	MDL DF	Analyzed	Ву	Qualifiers
EDonors - MICR Analysis Desc: AM23G	Analyt	ical Method: A	M23G			
	0.20 U mg/l	0.20	0.0080 1	4/6/2016 04:55	MD	
Lactic Acid Acetic Acid	0.20 U mg/l	0.20	0.0000 1	4/6/2016 04:55	MD	
Propionic Acid	0.10 U mg/l	0.10	0.0060 1	4/6/2016 04:55	MD	
Formic Acid	0.016J mg/l	0.10	0.0070 1	4/6/2016 04:55	MD	В
Butyric Acid	0.10 U mg/l	0.10	0.010 1	4/6/2016 04:55	MD	
Pyruvic Acid	0.10 U mg/l	0.10	0.015 1	4/6/2016 04:55	MD	
i-Pentanoic Acid	0.10 U mg/l	0.10	0.0070 1	4/6/2016 04:55	MD	
Pentanoic Acid	0.10 U mg/l	0.10	0.012 1	4/6/2016 04:55	MD	
i-Hexanoic Acid	0.20 U mg/l	0.20	0.014 1	4/6/2016 04:55	MD	
Hexanoic Acid	0.20 U mg/l	0.20	0.0070 1	4/6/2016 04:55	MD	

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# **ANALYTICAL RESULTS QUALIFIERS**

Workorder: 18665 PS BETA - NIROP / 10343262

# **DEFINITIONS/QUALIFIERS**

Disclaimer: The Pennsylvania Department of Environmental Protection (PADEP) has decided to no longer recognize analyses that do not

produce data for primary compliance, for NELAP accreditation. The methods affected by this decision are AM20GAx, AM21G, SW846 7199 and AM4.02. The laboratory shall continue to administer the NELAP/TNI standard requirements in the performance

of these methods.

MDL Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.

PQL Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.

ND Not detected at or above reporting limit.

DF Dilution Factor.

S Surrogate.

RPD Relative Percent Difference.

% Rec Percent Recovery.

U Indicates the compound was analyzed for, but not detected at or above the noted concentration.

J Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

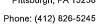
B The analyte was detected in the associated blank.

d The analyte concentration was determined from a dilution.

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# **QUALITY CONTROL DATA**

Workorder: 18665 PS BETA - NIROP / 10343262

QC Batch:

EDON/2850

Analysis Method:

AM23G

QC Batch Method:

AM23G

Associated Lab Samples:

186650001, 186650002, 186650003, 186650004

METHOD BLANK: 41201

		Blank	Reporting	
Parameter	Units	Result	Limit Qualifiers	
EDonors				
Lactic Acid	mg/l	0.20 U	0.20	
Acetic Acid	mg/l	0.10 U	0.10	
Propionic Acid	mg/l	0.10 U	0.10	
Formic Acid	mg/l	0.0078J	0.10 B	
Butyric Acid	mg/l	0.10 U	0.10	
Pyruvic Acid	mg/l	0.10 U	0.10	
i-Pentanoic Acid	mg/l	0.10 U	0.10	
Pentanoic Acid	mg/l	0.10 U	0.10	
i-Hexanoic Acid	mg/l	0.20 U	0.20	
Hexanoic Acid	mg/l	0.20 U	0.20	

LABORATORY CONTROL SAM	MPLE: 41202
------------------------	-------------

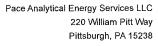
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EDonors						
Lactic Acid	mg/l	2	2.0	99	70-130	
Acetic Acid	mg/l	2	2.0	98	70-130	
Propionic Acid	mg/l	2	2.0	102	70-130	
Formic Acid	mg/l	2	1.9	93	70-130	. B
Butyric Acid	mg/l	2	2.0	101	70-130	
Pyruvic Acid	mg/l	2	2.0	102	70-130	
i-Pentanoic Acid	mg/l	2	2.0	100	70-130	•
Pentanoic Acid	mg/l	. 2	2.0	99	70-130	
i-Hexanoic Acid	mg/l	2	1.9	95	70-130	
Hexanoic Acid	mg/l	2	1.8	88	70-130	

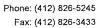
MATRIX SPIKE & MA	ATRIX SPIKE DUPLIC	ATE: 41203		41204		Original:	18677000	)1			
Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
EDonors Lactic Acid	mg/l	0.37	20	20	20	99	98	70-130	1	30	d

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# **QUALITY CONTROL DATA**

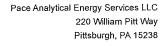
Workorder: 18665 PS BETA - NIROP / 10343262

MATRIX SPIKE & MATI	RIX SPIKE DUPLIC	CATE: 41203		41204		Original:	18677000	)1			
Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Acetic Acid	mg/l	17	20	36	36	97	97	70-130	0	30	. d
Propionic Acid	mg/l	3.4	20	25	24	107	106	70-130	0.94	30	d
Formic Acid	mg/l	0.1	20	19	19	94	94	70-130	0	30	d,B
Butyric Acid	mg/l	0.75	20	22	22	106	105	70-130	0.95	30	ď
Pyruvic Acid	mg/l	0.67	20	21	20	100	100	70-130	0	30	d
i-Pentanoic Acid	mg/l	0.53	20	22	21	105	104	70-130	0.96	30	d
Pentanoic Acid	mg/l	0.14	20	22	22	110	109	70-130	0.91	30	d
i-Hexanoic Acid	mg/l	0	20	22	22	110	111	70-130	0.9	30	d
Hexanoic Acid	mg/l	0	20	21	22	106	109	70-130	2.8	30	d

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# **QUALITY CONTROL DATA**

Workorder: 18665 PS BETA - NIROP / 10343262

QC Batch:

EDON/2854

Analysis Method:

AM23G

QC Batch Method:

AM23G

Associated Lab Samples:

186650001

METHOD BLANK: 41241

Parameter	Units	Blank Result	Reporting Limit Qualifiers
EDonors Acetic Acid Propionic Acid	mg/l mg/l	0.10 U 0.10 U	0.10 0.10

LABORATORY CONTROL SAMPLE: 41242

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EDonors Acetic Acid Propionic Acid	mg/l mg/l	2 2	2.0 2.1	99 104	70-130 70-130	

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# **QUALITY CONTROL DATA QUALIFIERS**

Workorder: 18665 PS BETA - NIROP / 10343262

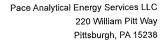
# QUALITY CONTROL PARAMETER QUALIFIERS

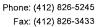
- B The analyte was detected in the associated blank.
- d The analyte concentration was determined from a dilution.

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# QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 18665 PS BETA - NIROP / 10343262

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
186650001	PMW-01	,		AM23G	EDON/2850
186650002	PMW-02			AM23G	EDON/2850
186650003	PMW-03			AM23G	EDON/2850
186650004	PMW-04			AM23G	EDON/2850
186650001	PMW-01			AM23G	EDON/2854

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Samples Intact Y	CE Y OF N	Received on Ice	OFN	Custouy Seal			oloi ionipola	9
- [	\ \ 			7	ر پ	Cooler Temperature on Receipt 《	oler Tempera	ဂ ဂ
	)		()					ω
	1		V.	N.	-	AND THE REAL PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE P		2
	District Control of the control of t	9.4.4 Jate				, Vdcc	7	1-
		Date/Time	Ву	e Received By	Date/Time	sed By	Transfers Réleased By	Trar
-								12
_								5
	×		Water 2	10343262004	3/31/2016 13:50	ω	PMW-04	4
	×		Water 2	10343262003	3/31/2016 12:30	3	PMW-03	ω
	×		Water 2	10343262002	3/31/2016 11:00	ω	PMW-02	2
	×		Water 2	10343262001	3/31/2016 09:42	w	PMW-01	
	Velah		Matrix X Unpreserved	Lab ID	Collect Date/Time		n Sample ID	Item
	le Edty	Preserved Combiners		·		Phone (612)607-1700 Email: jennifer.anderson@pacelabs.com	Phone (612)607-1700 Email: jennifer.anderso	Em:
	Adds	03432102		MICHISEEPS/ROLE Energy P.O.	Microse	nesota	Pace Analytical Minnesota 1700 Elm Street Suite 200	Pac 170 Suit
و مند و	Requested Analysis			Subcontract To	Subcont		Report / Invoice To	Kep
4/14/2016	Results Requested 4	mya.	ROP	PS Beta - NIROP	Workorder Name:	3262	Workorder: 10343262	Į ×

Α.	Name: <u>Pace - MN</u> Project: <u>PS Betar</u> Shipping/Container Information (circle appropriate response)				·
	Courier: FedEX UPS USPS Client Other:		· bill P	resent	Yes No
	Tracking Number: 6484 8696 5823				
•		Into otes	Voc	No	
		,		,	·
	Cooler/Box Packing Material: Bubble Wrap Absorbent F	oam	Other	·	
	Type of Ice: Wet Blue None Ice Intact: Yes Mel	ted			
	Cooler Temperature: 3 6°C Radiation Screened: Yes	(No)	Ch	ain of	Custody Present; Yes No
	Comments:				
В.	Laboratory Assignment/Log-in (check appropriate response)		· · · · ·	1	
		YES	NO	N/A	Comment Reference non-Conformance
	Chain of Custody properly filled out	V			
	Chain of Custody relinquished	10			
	Sample: Name & Signature on COC			/	
•	Containers intact	1			,
	Were samples in separate bags				
	Sample container labels match COC Sample name/date and time collected				
	Sufficient volume provided	1.1			
	PAES containers used	(C)			
	Are containers properly preserved for the requested testing? (as labeled)				
	If an unknown preservation state, were containers checked?  Exception: VOA's coliform				If yes, see pH form.
	Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?				
	Comments:				
	Cooler contents examined/red			10	0 12 (1 12

Appendix I
Description of Laboratory and Field
Parameters Related to Reductive
Dechlorination

# Description of Laboratory and Field Parameters Related to Reductive Dechlorination

Field Tests:	
рН	Various species of dechlorinating bacteria survive in a pH range of 6 to 9, but will not completely dechlorinate chlorinated ethenes. Optimum range for
	Dehalococcoides spp to dechlorinate completely dechlorinate chlorinated ethenes.
Dissolved	≤0.5 mg/L is tolerated. Anaerobic biodegradation is suppressed at higher
Oxygen	concentrations
Oxidation	At <50 millivolts (mV) anaerobic biodegradation is possible, at <-100mV a strong
Reduction	reductive pathway is likely
Potential	
(ORP)	
Laboratory Test	S:
CVOCs	Primary analytical test of interest. The goal of the study is a reduction in the
	concentrations of CVOCs within the vicinity of injections by approximately one
	order of magnitude (from baseline sample concentration). Further, the presence
	of daughter products can indicate dechlorination is occurring.
Ethane/	The presence of ethane/ethene provides evidence of complete dechlorination of
Ethene	chlorinated ethanes and ethenes.
Methane	The presence of methane in groundwater indicates that that hydrogen from
	oxidation of electron donor being used by methanogenic bacteria to generate
	methane.
Total and	Ferric iron is used as an electron acceptor during anaerobic biodegradation of
Dissolved Iron	organic carbon (electron donor) and converted to ferrous iron (assumed to be
Dissolved from	dissolved iron).
Sulfate	Sulfate is used as an electron acceptor for anaerobic biodegradation and reduced
	to sulfide. Sulfide can combine with metals such as iron to form iron sulfide.
	Concentrations of sulfate greater than 20 mg/L cause competitive exclusion of
	dechlorination. However, plumes with high concentrations of sulfate can still have
	reductive dechlorination.
Carbon	Carbon dioxide is a byproduct of naturally occurring aerobic and anaerobic
Dioxide	biodegradation processes that naturally occur in groundwater.

Total	There is a positive correlation between range of migraphial activity, and increased
Total	There is a positive correlation between zones of microbial activity and increased
Alkalinity	alkalinity. Increases in alkalinity result from the dissolution of rock driven by the
	production of carbon dioxide produced by the metabolism of microorganisms.
	Increases in alkalinity may indicate elevated microbial activity.
Sulfide	The presence of sulfide likely provides evidence of sulfate reduction. However,
	sulfide might not be detected even if sulfate-reducing bacteria are active because
	it can react with various oxygenated chemical species and metals.
Nitrate and	Nitrate is used as an electron acceptor by denitrifying bacteria once the dissolved
Nitrite	oxygen is depleted. Under anaerobic conditions, nitrate is reduced to nitrite which
	is further reduced to nitrogen under anaerobic conditions. In order for reductive
	dechlorination to occur, nitrate concentrations in the contaminated portion of the
	aquifer must be less than 1.0 mg/L.
COD	COD is an indication of organic carbon or reduced minerals or both. High values of
	COD may indicate effective distribution of HRC, biological growth, and/or the
	presence of reduced iron or manganese.
TOC	TOC serves as a carbon and energy source that drives anaerobic dechlorination.
	The presence of TOC indicates potential availability of general growth substrates
	for microorganisms and would be a favorable indicator for enhanced reductive
	dechlorination.
CSIA	CSIA provides the ability to quantify the ratio of atomic isotopes within sampled
	molecules (e.g. TCE). Changes to the ratio of atomic isotopes within sampled
	molecules (e.g. TCE) and comparison to established standards of the ratio can
	differentiate between biological (e.g. enhanced reductive dechlorination (ERD))
	and non-biological (e.g. sorption) processes.
Volatile Fatty	
Acids	organic carbon (e.g., HRC) by microbial community which are further broken down
	to hydrogen which serves as an electron donor for reductive dechlorination of
	chlorinated solvents
Microorganism	Microbial population density between impacted and non-impacted areas of a site
Data	can be compared to assess whether microbial populations are responsible for the
Data	observed degradation and provide insight into the progress of natural attenuation
Notes:	processes.

Notes:

Specified concentrations are in the most contaminated zone.

Sources: ITRC, 1999 and EPA 1998

# Appendix J Concentration vs. Time Graphs

