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GROUNDWATER REMEDIATION STARTUP REPORT
SITE MONITORNG & PERFORMANCE EVALUATON

REPORT REVISION 1.0

CHEMICAL INJECTIONS & ATTENUATION MONITORING
KDHE 2ND & KIRBY SITE

Hutchinson, Reno County, Kansas
KDHE Project Code: C2-078-70770

February 6, 2015

Prepared for:

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AND

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For Submittal to:

KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT
BER Site Remediation Unit
Topeka, Kansas

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GSI Project No. 148032

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February 6, 2015

Ms. Mary Daily
Kansas Department of Health & Environment
1000 SW Jackson, Suite 410
Topeka, KS 66612

RE: Groundwater Remediation Startup Report
Site Monitoring & Performance Evaluation
KDHE 2nd & Kirby Site, Hutchinson, Kansas
GSI No. 148032 / KDHE Project Code: C2-078-70770

Dear Ms. Daily:

GSI Engineering, LLC ("GSI") is pleased to submit this Startup Report on behalf of Groendyke Transport, Inc. and V & M Transport, Inc. ("Client"). Direct-push injection of chemical amendments was performed to enhance the chemical and biological degradation of chlorinated solvents in groundwater. This Report documents remedial activities and performance monitoring consistent with final Remedial Design Plan dated June 2014 and technical amendments thereto.

GSI implemented the remedial design following formal authorizations from our Client and KDHE, pursuant to Consent Order No. 99-E-0209. Specific field activities and performance evaluations are presented in the corresponding sections of this Report. The next performance monitoring event is scheduled for February 2015.

Please contact me directly at (913) 495-2360 or at bconrad@gsinetwork.com if you have questions or wish to discuss the project in greater detail. We look forward to supporting KDHE through completion of this project.

Sincerely,
GSI ENGINEERING, LLC

Brian M. Conrad
Manager, Kansas City Operations

Enclosures

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1.0 INTRODUCTION

Groendyke Transport, Inc. ("Groendyke" or "Client") retained GSI Engineering, LLC ("GSI") to support ongoing monitoring and groundwater remediation activities for the East 2nd Avenue and Kirby Street Site in southeast Hutchinson, Kansas ("2nd & Kirby" or "site"). This site includes the Groendyke Transport facility at the intersection of 2nd and Kirby Street and downgradient trichloroethylene (TCE) impacts to groundwater extending approximately one-half mile to the southeast. Appendix A provides topographic and aerial diagrams illustrating the site location and surrounding areas.

The 2nd and Kirby intersection is within a larger area of groundwater contamination known as 4th and Carey site. A potential source of TCE in groundwater was identified near the Groendyke facility in 1998-1999 during investigation of the larger site. Groendyke and the property owner V & M Transport, Inc ("V & M") subsequently entered into a Consent Order with the Kansas Department of Health and Environment ("KDHE") in December 1999 (Case No. 99-E-0209). The Order outlined specific measures to address TCE impacts to soil and groundwater, which appeared to originate near the intersection of 2nd & Kirby. In support of the Order, GSI has worked cooperatively with Groendyke, V & M, and Environmental Management, Inc. ("EMI") as another project consultant to support previous remedial measures and the remediation work documented in this Report.

Site investigation and monitoring data over time indicate persistent TCE impacts above the KDHE Tier 2 cleanup standard. These data also suggest naturally occurring conditions are limited in the ability to degrade chlorinated contaminants in the subsurface. Following several phases of investigation, the KDHE Corrective Action Decision (CAD) in 2009 selected enhanced biodegradation as the preferred remedial alternative.

This Groundwater Remediation Startup Report demonstrates the specific measures applied to accelerate the chemical and biological degradation of TCE and related contaminants in groundwater. Chemical amendments were introduced to shallow groundwater using direct-push methods as detailed in the corresponding sections of this Report.

1.1 Project History

Groendyke has operated a truck transportation facility at the 2nd & Kirby intersection since the 1950s. Specific operations include parking, truck staging/dispatching areas, and light vehicle maintenance facilities. In conjunction with routine maintenance operations, various solvents have been used at the facility. These include benzene, methyl-ethyl ketone (MEK), tetrachloroethylene (PCE), and trichloroethylene (TCE). The spent solvent is contained on site and routinely recovered by Safety-Kleen Systems, Inc. for recycling. KDHE records do not document any known solvent releases or point sources associated with the facility. As such, the inferred TCE source is based on the findings of previous site investigations as discussed below.

4th & Carey Remedial Investigation (RI), 1998-1999 – The 2nd and Kirby intersection is within a larger area of groundwater contamination known as 4th and Carey site. Various contaminant sources have been identified within the 4th & Carey limits comprising more than 1,200 acres over impacted groundwater. These contaminants generally include petroleum hydrocarbons, other chlorinated solvents, carbon tetrachloride, and chlorides. A potential source of TCE in groundwater was identified near the Groendyke facility in 1998 and 1999 during investigation of the larger site.

KDHE Site Investigation, 1998-1999 – KDHE completed various phases of site investigation in 1998-1999 including a Preliminary Assessment (PA), Supplemental Site Investigation (SSI) and Removal Site Evaluation (RSE) following EPA's pre-CERCLIS screening process. These investigations identified potential TCE release conditions near the northwest corner of the 2nd & Kirby intersection. KDHE findings were similar to those reported during the 4th & Carey RI in that the predominant contaminant was TCE in shallow groundwater, with a localized secondary source of TCE near the intersection of 2nd & Kirby. These findings resulted in KDHE classification of the 2nd & Kirby site as a point source of TCE in soil and groundwater. The specific conditions resulting in the TCE release to groundwater have not been confirmed.

Interim Remedial Measures (IRM), 2003 – IRM work commenced in March 2003 and included various phases of supplemental investigation and cleanup planning to characterize and address subsurface TCE impacts as documented by KDHE. Specifically, interim measures included supplemental soil and groundwater investigations, expanded source area characterization, and geochemical/geotechnical evaluations. GSI applied this information to evaluate cumulative risk consistent with EPA guidance for CERCLA investigations. Cleanup alternatives were then evaluated specific to the nature and extent of TCE contamination characterized in soil and groundwater.

Interim Soil Removal, 2006-2008 – Groendyke implemented a source removal in 2006 through excavation and on-site treatment of TCE-contaminated soil. The KDHE Bureau of Waste Management closed the soil treatment cell in September 2008 following soil characterization testing subsequent to treatment.

Vapor Intrusion Assessment, 2008 – In March 2008, KDHE evaluated potential vapor intrusion in residences located over the documented TCE groundwater plume. Indoor air samples were collected at three homes within the area. Laboratory testing for VOCs did not indicate TCE or associated degradation products above laboratory detection limits.

Pre-Design Groundwater Evaluation, 2010-2013 – GSI completed a Pre-Design Report in June 2013, which provided a supplemental evaluation of groundwater conditions critical to microbial degradation of chlorinated solvents. With consideration to specific geochemical and microbial parameters, the Pre-Design Report supported continued application of enhanced bioremediation as the preferred alternative consistent with the previous KDHE Corrective Action Decision (CAD). This recommendation was contingent upon specific amendments to enhance the availability of microorganisms that support reductive dechlorination.

Semi-Annual Groundwater Monitoring, 2012-2014 – Semi-annual monitoring of groundwater conditions has been ongoing since October 2012. Recent monitoring data indicate persistent TCE impacts to shallow monitoring wells installed less than 30 feet below ground surface (bgs). TCE has not been identified in intermediate or deep wells through the recent monitoring events. TCE levels near the apparent source have generally decreased since the 2006 soil removal. Downgradient levels indicate migration of dissolved-phase TCE to the southeast consistent with the hydraulic gradient. These data also suggest downgradient movement of two concentrated masses of TCE which are no longer in direct connection with the previously characterized source area.

Relatively low levels cis-1,2-dichloroethylene (cDCE) suggest reductive dechlorination has occurred prior to the groundwater injections. Degradation constituents beyond DCE have not been observed to date. Historical monitoring data are presented in Tables 1 & 2 of Appendix B.

1.2 Overview of Remedial Technology

Microorganisms capable of degrading TCE and other chlorinated ethenes are common in aquifers. Various species of naturally occurring bacteria derive energy from breaking the carbon to chlorine bond through a process known as reductive dehalogenation. This process reduces TCE (an electron acceptor) using electrons from an exogenous donor, resulting in the sequential removal of chlorine atoms. Intermediates of this sequential reaction are the compounds cDCE, and vinyl chloride (VC), with non-toxic ethene as the end product.

Biodegradation can be enhanced by adding amendments that provide sufficient carbon, energy, and/or nutrients for microorganisms to grow and thrive. The required amendments are typically electron donors (i.e. a carbon source) for VOC degradation through reduction reactions, or electron acceptors for VOC degradation through oxidation reactions. The reductive mechanism is typically the most efficient and viable degradation pathway for chlorinated ethenes, and thus is the approach applied for this site. Based on previous monitoring results, chemical amendments were necessary to better support and accelerate these processes.

GSI introduced emulsified vegetable oil (EVO) as the carbon source through direct-push injections. This chemical amendment provides the electron donor necessary to produce the necessary reducing and anaerobic conditions, generally defined by dissolved oxygen, oxidation-reduction potential (ORP), and the levels of competing electron acceptors such as nitrate, iron, and sulfate. Once optimum conditions are achieved, anaerobic microbial respiration can occur and support reductive dehalogenation as described above. Intermediate reactions also support chemical dehalogenation through the release of molecular hydrogen that reacts with the chlorinated ethenes, particularly in the reduction of TCE to cDCE.

1.3 Remedial Objectives & Scope

The remedial objective was to enhance and accelerate the in-situ chemical and biological degradation of TCE and related contaminants in groundwater. This process was designed reduce dissolved-phase contaminant levels by degrading TCE, DCE, and other chlorinated compounds at the molecular level, eventually reducing the contaminants to non-toxic byproducts. Enhanced degradation will diminish TCE impacts to groundwater and ultimately meet specific KDHE cleanup standards if the desired reducing anaerobic conditions are maintained over time.

The remedial design was specific to defined areas of the groundwater plume where TCE levels are the highest based on previous monitoring (i.e. near MW-27 and GMW-8). Chemical amendments were introduced in these areas using the following procedures:

- Groundwater injection of chemical amendments using direct-push (Geoprobe®) methods and in-situ dispersion at target subsurface intervals. GSI completed two (2) in-line barrier formations intercepting the center point of the TCE plume. Emulsified vegetable oil (EVO) was injected at each location as a concentrated electron donor.

- Installation, development, and sampling of two (2) new monitoring wells located directly downgradient of each injection formation. Additional monitoring points were installed to provide groundwater data directly upgradient and downgradient of the injection points.

- Interim and quarterly performance monitoring though sampling of the existing monitoring well network and the new wells as indicated above. Performance monitoring evaluations are presented in the corresponding sections of this report.

1.4 Scope & Report Limitations

The technical approach presented herein is specific to the preferred remedial alternative established through the KDHE Corrective Action Decision finalized in 2009. Enhanced biodegradation was accepted by KDHE as the most viable solution based on previous evaluation of technical feasibility and cost. Accordingly, GSI implemented a remedial design consistent with industry practice and published literature specific to enhanced bioremediation. Alternative remedial designs that may be appropriate or necessary to address subsurface contamination are beyond the scope and intent of the GSI remedial design.

The findings and recommendations presented in this report are based solely upon the site conditions, information, and supporting data obtained and reviewed through Client-authorized work and related KDHE approvals. This information is subject to change over time and GSI cannot represent any site conditions beyond those specifically identified through the authorized Scope of Work. As with any remedial design, performance monitoring may indicate the need for modified or alternative measures beyond the scope of the approved remedial design. GSI makes no warranties, express or implied, with regard to professional services, associated findings, or any third party information used in connection with this project.

1.5 Reliance

This Report has been developed for exclusive use and reliance by Groendyke Transport, Inc., V & M Transport, Inc., and Environmental Management, Inc. ("Client"), pursuant to the terms and limitations established in our Professional Services Agreement and the technical proposals authorized by Agreement. The Startup Report shall only be presented in full and may not be used to support any non-scope objectives without prior approval from Client and GSI. Reliance by any other party is prohibited without prior written authorization. GSI assumes no liability for future work performed by others in relation to the findings presented in this report.

GSI recognizes technical reports submitted to KDHE are considered public record pursuant to the Freedom of Information Act and Kansas Open Records Act. This dissemination does not represent authorized use by GSI to additional parties or an extension of professional liability beyond the limitations of our existing Agreement.

2.0 SITE DESCRIPTION

2.1 Property Location & Description

The subject site is located in east/southeast Hutchinson, Kansas at the intersection East 2nd Avenue and Kirby Street. The documented groundwater plume extends up to one-half of a mile to the southeast, mostly all located south of 2nd Avenue and east of Kirby. GSI estimates a groundwater plume area of approximately 25-27 acres based on recent monitoring results. Most of this area is located within the north ½ of Section 16, Township 23 South, Range 5 West in Reno County, Kansas. Figure 1 provides a topographic site location map illustrating the site and surrounding areas.

The upgradient (northwest) portion of subject site includes trucking facilities currently operated by Groendyke Transport, Inc. These facilities are located at 301 North Kirby Street, extending north and south of East 2nd Avenue. Downgradient areas to the southeast mostly include residential developments, large tracts of vacant land, and the Eaton Corporation manufacturing complex farther to the east. The tracts comprise areas of both commercial and residential zoning. Figure 2 provides an aerial site location maps illustrating the site location and surrounding land use.

2.2 Topography & Surface Drainage

Hutchinson is located within the broad alluvial plain of the Arkansas River. At its closest point, the Arkansas River is located approximately three miles south/southwest of the site. Similarly, the Little Arkansas River is located approximately 6.5 miles to the northeast. The surface area is very flat with residential and industrial developments along the perimeter of the TCE plume. Much of the remaining areas over the plume are vacant, unpaved areas with limited trees and brush vegetation. Appendix A provides topographic and aerial base maps illustrating surface conditions and topography.

A stormwater drainage canal flows north to south and bisects the central portion of the TCE plume. Most stormwater runoff from this area enters the canal through an engineered drainage system. The canal directs surface drainage to the south where it discharges to Cow Creek approximately three miles south of 2nd & Kirby, then ultimately to the Arkansas River approximately six miles downstream.

2.3 Regional Geology

The southeast Hutchinson area is characterized by unconsolidated alluvial deposits underlain by the Ninnescah Shale. Alluvial deposits are variable and typically consist of sand and gravel interbedded with clay or silt. Particle size distributions generally become coarser with depth. These deposits are present at approximate depths of 55 to 69 feet below ground surface (bgs) throughout the previous investigation areas.

The Ninnescah Shale acts as an aquitard with an average thickness of approximately 300 feet. The Milan Limestone Member of the Wellington Formation is found immediately below the Ninnescah Shale. This formation generally consists of shaly or dolomitic limestone. The Hutchinson Salt Member underlies the Milan Limestone, which represents the formation mined for salt in the Hutchinson area.

2.4 Soil Classifications

Soils in the vicinity of the 2nd and Kirby site are mapped as the urban land-Darlow-Elmer complex. The parent material is loamy alluvium characterized by poorly drained soils with very slow surface runoff. Sandy loam exists in localized areas. Soils within the area are protected by the Hutchinson levee system. The minimum depth to groundwater is greater than 80 inches.

2.5 Soil Boring Logs

Site-specific data are available from soil boring logs prepared during previous subsurface investigations and monitoring well installations. Boring logs generally indicate lower permeability unconsolidated materials for the first 10 to 12 feet bgs, typically logged as silty or clayey silts, sandy or silty clays, or clay. Occasionally, very fine to fine sand is found at or near ground level. Between the finer-grained materials and bedrock, there is a layer of sand that coarsens with depth and may contain gravel, particularly as depth approaches bedrock. This layer may also contain occasional thin or relatively thick seams of silt and clay. Bedrock is generally encountered around 60 feet, with a documented range of 55 to 69 feet bgs. In nearly all cases where bedrock was encountered, it was classified as shale.

2.6 Aquifer Conditions

Groundwater impacts to the subject site are within unconsolidated alluvium of the Equus Beds system. The Equus Beds consist of alluvial deposits that underlie and border the

Arkansas River. The water table in the Equus Beds aquifer varies from as little as 10 feet bgs near the Arkansas River to much greater depths farther away. Monitoring wells on site generally indicate ranges from 8 to 14 feet bgs. Monitoring data also indicate shallow ground water flow the southeast, parallel to the direction of the Arkansas River and consistent with surrounding regional conditions.

The Equus Beds system is generally characterized as a slow moving aquifer with a groundwater velocity of 300 to 500 feet per year (KGS, 1983). Historical pump test data from the adjoining Cessna/Eaton site and the IMC Salt facility to the southwest have indicated variable hydraulic conductivities in the range of 517 to 2891 feet/day (Burns & McDonnell). These findings suggest higher velocity conditions may exist in localized areas of the site, upwards of 1,000 feet per year under high-flow conditions.

The most notable aspect of regional ground water quality in the Hutchinson area is the high salt (chloride) levels. Both naturally occurring and anthropogenic sources (e.g. oil fields & salt mining) have contributed to these conditions. The biodegradation of chlorinated solvents in groundwater also produces chlorides, yet this influence appears to be minimal in comparison to other documented sources.

2.7 Groundwater Chemistry

Recent monitoring data indicate slightly aerobic conditions with relatively neutral values for pH and oxidation-reduction potential (ORP). The occurrence of cDCE in downgradient portions of the site indicates reductive dechlorination is already occurring to some degree. Other specific oxidation-reduction ("redox") parameters are either inconclusive or suggest groundwater conditions that are limited in the ability to consistently support the dechlorination of TCE beyond the cDCE byproduct. Vinyl chloride (VC) or other byproducts beyond cDCE have not been identified to date.

Monitoring data report depleted levels of nitrate as a competing electron acceptor; however, reported levels of iron and sulfate are relatively abundant in the system. Indications of sulfate (to sulfide) or other highly reducing conditions have not been identified to date. Indications of intermediate reductions such as chemically reduced iron (to ferrous iron) and/or manganese are generally inconclusive. As such, competing electron accepters on a significant scale appear to include oxidized manganese (IV), ferric iron, and sulfate.

The presence of cDCE may be an indicator of limited biological activity. Yet available data suggest limited anaerobic degradation with not dechlorination byproducts beyond cDCE. Based on these conditions, groundwater amendments are necessary to produce and maintain anaerobic microbial growth and highly reducing conditions over time. Other chemical and physical parameters generally indicate neutral and non-toxic conditions amenable to reductive dechlorination with the appropriate groundwater conditioning.

Figures 3 and 4 provide isoconcentration diagrams contouring recent TCE and cDCE concentrations. Figures 5 and 6 provide isoconcentration diagrams contouring ORP and total organic carbon (TOC) as critical geochemical parameters.

3.0 FIELD METHODS

3.1 Technical Approach

GSI injected emulsified vegetable oil (EVO) into areas of TCE contamination to manipulate specific groundwater conditions. Based on case study of this remedial technology, the EVO (concentrated electron donor) will initiate a step-wise series of reactions to reduce ORP, dissolved oxygen, and competing electron acceptors in the groundwater system. Oxygen depleted and chemically reducing conditions will then support specific chemical and biological processes to further enhance the dechlorination of TCE and related contaminants.

EVO distributed throughout the treatment zone collides with the aquifer material and gradually builds as a long-lasting carbon source. In contact with groundwater, emulsified oils are fermented to molecular hydrogen (H_2) and acetate by naturally occurring microorganisms. The hydrogen and acetate are then used as a carbon and energy source for enhanced microbial growth. Enhanced biological activity ultimately produces the anaerobic and reducing conditions required for reductive dehalogenation.

GSI introduced the EVO groundwater amendment using direct-push (Geoprobe®) methods and in-situ dispersion at target subsurface treatment intervals. GSI initiated the remedial design as two (2) injection formations within defined areas of the groundwater plume where TCE levels are highest (i.e. near MW-27 and GMW-8). The specific injection points were configured in barrier formations intercepting the center point of the TCE plume.

GSI implemented a Performance Monitoring Program to evaluate the performance of the remedial design. Performance monitoring was initiated as a “baseline” monitoring event consistent with the pre-established monitoring program for the site. Subsequent performance monitoring included interim and first quarter sampling as defined in the approved Remedial Design Plan.

The following sections detail the specific injection methods applied by GSI. Appendix C provides a photograph log of specific field activities. Baseline, interim, and first quarter performance monitoring are presented under Section 4.0.

3.2 Injection Formations & Design Rationale

GSI initiated the remedial design as two (2) injection formations within the highest TCE concentrations as indicated above. The first formation (“Area 1”) was located in the center of the plume near MW-27. The second formation (“Area 2”) intercepted the downgradient end of the plume near GMW-8.

Each formation was comprised of 10 injection points in a row oriented perpendicular to the documented hydraulic gradient. Each injection point along the formation was spaced approximately 19-21 feet apart, comprising barriers of approximately 185 to 195 feet. The distribution of the barriers was designed to extend through the most concentrated areas of

impact, based on the 5.0 micrograms per liter (µg/L) contour lines established through previous monitoring. The spacing between points was based on the proposed injection volumes and an effective porosity in the range of 0.30 to 0.40, adjusted to account for preferential dispersion pathways. Although difficult to predict, injection spacing was also determined by the area of radial influence estimated by the EVO manufacturer.

Figure 2 illustrates the two injection formations over the areal base map. Figures 7 and 8 illustrate the specific injection points based on field survey data.

3.3 Direct-Push Injection Methods

GSI applied direct-push methods (Geoprobe® Model 6620) to hydraulically advance injection borings and introduce the EVO chemical amendment. Injection borings were advanced, retracted, and subsequently abandoned with bentonite following the baseline direct-push operations presented in the approved Pre-Design Work Plan. Both formations comprised a total of 20 direct-push injection points.

The advancing tip of the Geoprobe® tool string was equipped with a 41-inch stainless steel screen-point (Geoprobe® SP-15) to distribute the amendments in-situ at specific subsurface intervals. Each injection boring was advanced to approximately 28 feet bgs, then retracted at intervals of approximately 2-4 feet for "bottom-up" injections. This process continued upward to a depth of approximately 12 feet bgs – i.e. comprising a total injection interval of approximately 16 feet.

Groundwater amendments were introduced as liquid blends through a batch tank and feed line at the surface. An injection machine was used to inject the materials through positive pressure generated from a pump at the surface. The material was delivered through high-pressure nylon tubing extending from the machine, through the tool string, and into the injection screen for subsurface distribution. Figure 9 provides a schematic illustrating the tool string design used to inject the materials.

The chemical amendment and water blend was injected at relatively low surface pressures maintained at approximately 18 to 22 pounds per square inch (psi). This resulted in the injection of approximately 10 to 15 gallons per minute (gpm) within each injection interval. Table 3 of Appendix B details the pressure readings recorded during the injections. Field logs are included in Appendix D.

3.4 Injection Amendments

GSI injected emulsified vegetable oil (EVO) as the chemical amendment and carbon source to enhance the availability of electron donor. This process was also applied as a means to reduce the mobility of TCE and similar contaminants as these compounds absorb to the oil droplets introduced into the system. Each batch of material was visually assessed and blended in the field according to the Design Plan prior to use.

The emulsified oil was prepared for batch delivery to the site using patented emulsification processes established and applied by Terra Systems, Inc. The EVO product was supplied as SRS®-FRL large droplet EVO substrate containing at least 60% (by weight) food grade vegetable oil. The EVO product was enhanced with proprietary carbon source release and nutrient blends containing sodium lactate, yeast extracts, nitrogen/phosphorus, and Vitamin B12. In addition, this EVO product is prepared with a relatively large mean droplet size (5 micron) and contains a proprietary anionic emulsifier for maximum retention in the aquifer.

Injection points were established in two barrier formations as previously described. The EVO material was diluted with clean water by a factor of 10 to enhance the transport of the emulsion into and through the treatment zone. Each dilution was prepared at the surface in dedicated batch tanks prior to the injections. Dilution water was supplied by a water hydrant on site connected to the City water supply system.

The EVO-water blend was injected at a rate of approximately 25 to 30 gallons per vertical foot within the treatment interval – i.e. 2.5 to 3.0 gallons of EVO product per vertical foot. This rate was established based on geochemical conditions, estimated dispersion, and stoichiometric calculations for electron donor demand. The injection rate was also supported by commercial volume calculators available through the EVO provider. The treatment interval extended from approximately 12 to 28 feet bgs to address the most concentrated areas of impact and treat the target area captured by the existing shallow monitoring wells.

The injection details presented above resulted in the addition of approximately 45 gallons of EVO product per location, or approximately 450 gallons of the EVO-water solution. This approach resulted in the injection of approximately 450 gallons (or 3,640 pounds) of EVO product in each barrier formation. As such, GSI injected a total of approximately 9,000 gallons of the EVO-water solution (900 gallons EVO product) throughout the course of the project.

3.5 Deviations from Remedial Design

The EVO product and solution volumes indicated above differ from the totals projected in the Final Remedial Design Plan. This variation is due to the use of the more concentrated SRS®-FRL product (i.e. 60% oil content by weight), rather than the 46% oil content EVO product used in the previous estimates. Using the SRS®-FRL product weight of 8.09 lb/gal, these adjustments reflect slightly higher totals for the amount of vegetable oil injected by weight.

GSI adjusted the injection formations to 10 points each based on the location access and surface conditions encountered in the field (e.g. fence lines, etc.). The amount of EVO per location was adjusted accordingly to distribute equivalent EVO volumes per formation. Spacing between individual points was also slightly adjusted in response to these same conditions.

3.6 Monitoring Well Installations

3.6.1 Installation Methods

GSI installed of two (2) additional one-inch diameter monitoring wells directly downgradient of each barrier formation. These monitoring points were located to better assess the effectiveness of the chemical injections in a direct "before/after" alignment. Field activities were performed by GSI as a Kansas-licensed driller, following the procedures and technical oversight established in the Remedial Design Plan Addendum dated June 19, 2014. Figure 2 and the subsequent contour maps illustrate the new "TMW-1" and "TMW-2" locations.

Monitoring wells were installed using the dual-tube capabilities of the Geoprobe® Model 6620 rig. Specifically, each well was advanced to approximately 24 feet bgs using a 3.5" dual-tube core barrel. Subsurface soil profiles were observed and logged during advancement; however, soil samples were not collected for further screening or laboratory analysis. Each well was installed and completed through the following methods:

- Installation of 10 feet of one-inch diameter, 0.010-inch machine slotted PVC well screen with a threaded bottom cap. One-inch PVC riser pipe to the surface.

- Addition of pre-sieved silica sand for annular sand pack around the well screen from the bottom of the boring to approximately 4 feet above the top of the well screen. Sealed with bentonite from top of sand pack to approximately 2 feet bgs. Soil/gravel backfill to the surface.

- Flush mount well completions using concrete pads and bolted steel well enclosures. The top of the PVC casing was secured with a locking plug within the enclosure consistent with industry practice and KDHE monitoring well completion requirements.

Monitoring well installation and WWC5 well registration records are provided in Appendix E. Well development and sampling methods are discussed in the following sections.

3.6.2 Monitoring Well Development

The new monitoring wells were developed 2 to 4 days following the installations. Each well was developed consistent with industry practice and KDHE well development requirements, generally by groundwater surging within the screened interval using a well developer. Groundwater purging and sediment removals occurred until visual turbidity was reduced. Approximately five borehole volumes of purge water were removed from each well during development. Stable readings (generally within 10%) for pH, temperature, and specific conductivity were established in the wells prior to sampling. Monitoring well development records are included in Appendix D.

3.7 Underground Injection Controls

Field operations were implemented in accordance with the Underground Injection Control (UIC) Permit issued by the KDHE Bureau of Water. Each point was plugged with bentonite and restored to the surface similar following the injection to preexisting conditions. The two permanent monitoring wells were completed at the surface with secured well vaults and concrete pads. Monitoring well installation records are provided as Appendix E. The UIC Application and KDHE authorization is provided as Appendix F.

3.8 Field Documentation

GSI surveyed the new monitoring wells and injection points using high-resolution (sub-meter) GPS equipment in the field. Monitoring well elevations were established to 0.01 ft accuracy at top of casing using differential leveling in relation to other surveyed wells within the same area. GPS data for the injection points are provided in Table 3 of Appendix B. GPS data for the new well installations are indicated in the well installation logs included in Appendix E. These measurements are also reflected in the scaled site diagrams in Appendix A.

Field logs were maintained by GSI through the duration of the project. These records include performance logs documenting specific injection details, field monitoring data, and other related field measurements used to document implementation of the Remedial Design. Field logs are attached as Appendix D.

4.0 PERFORMANCE MONITORING

4.1 Field Sampling Methods

The baseline sampling event was completed in July 2014, approximately 30 days prior to the EVO injections. The first quarter monitoring event was completed on October 2014, approximately 11 weeks following the injections (“Quarter 1”). Additionally, GSI completed various rounds of interim monitoring as discussed under Section 4.7 below.

Consistent with the Monitoring Program established in the Final Design Plan, GSI obtained water level data and groundwater samples from several monitoring wells in place for the Groendyke facility and other regional monitoring networks. The baseline event included sampling of 16 target wells with water level measurements from four (4) additional locations. Similarly, the first quarter monitoring event included sampling of 17 monitoring wells with water level measurements from two (2) additional locations. Interim and first quarter sampling also included sampling of the new monitoring well locations as indicated under Section 3.6. Monitoring well locations are identified on Figure 2 of Appendix A and the following isoconcentration maps.

Static groundwater levels and total well depth measurements were collected from each well prior to sampling. Groundwater samples were then collected using controlled-flow, parametric

sampling methods consistent with KDHE low-flow sampling guidelines. Samples were recovered using a submersible pump in connection with a low-flow controller and flow-thru cell for direct groundwater quality measurements.

Due to limited groundwater yield and casing restrictions, low-flow sampling procedures were not applied during baseline sampling of one-inch wells GMW-1, GMW-2, GMW-3, and GMW-4. Alternatively, these three wells were sampled with a check valve and dedicated tubing following volumetric purging procedures consistent with industry practice – i.e. following removal of three well casing volumes. In response to these conditions, GSI used a peristaltic pump to retrieve groundwater from the one-inch wells (including the new TMW-1 and TMW-2 installations) for interim and first quarter sampling. This sampling was performed using controlled flow methods and a flow-thru cell as described above.

GSI monitored specific water quality parameters for water column stability prior to sampling. These parameters included temperature, pH, specific conductivity, ORP, and dissolved oxygen (DO). Stable parameters, generally within 10 percent for at least three consecutive readings, were demonstrated prior to sampling. Static water level readings generally indicated limited draw-down on purging, using optimum low-flow rates of approximately 400 to 600 milliliters per minute (mL/min). Field parameters are discussed in the results sections of this report.

GSI collected groundwater samples after field monitoring indicated stable conditions as discussed above. Samples were collected directly from dedicated polyethylene tubing into preserved, laboratory-supplied sample containers with minimal agitation. Samples were placed on ice in a dedicated sample cooler and maintained under chain-of-custody.

4.2 Laboratory Methods

GSI submitted each groundwater sample for full-range volatile organic compound (VOC) analysis by Method 8260B. In addition, geochemical samples were obtained from target monitoring locations to provide results for critical natural attenuation parameters before and following the EVO injections. Geochemical sampling was performed at 5 locations during the baseline event, 4 interim locations, and 7 locations during first quarter monitoring. Tables 4 and 5 of Appendix B outline the specific monitoring wells sampled for VOCs during each respective event. Table 6 outlines the monitoring wells subject to geochemical testing.

Laboratory procedures were performed by ESC Lab Sciences in Mount Juliet, Tennessee ("ESC") and Pace Analytical Services in Lenexa, Kansas ("Pace"). Both facilities are accredited through the KDHE Environmental Laboratory Accreditation Program for the specific analytical methods performed.

4.3 Water Level Conditions & Groundwater Flow

Static water level data from both the baseline and first quarter monitoring events indicate an overall groundwater flow to the southeast consistent with the previous semi-annual events. In general, baseline water level elevations were slightly higher than the previous December 2013 monitoring event. Observed first quarter water elevations were slightly lower than both the December 2013 and July 2014 monitoring events. Significant anomalies were not observed. The Groundwater Flow Map is presented as Figure 2 of Appendix A. Groundwater elevation measurements are presented in Table 1 of Appendix B.

4.4 Baseline Monitoring Results

Baseline monitoring indicated TCE concentrations above laboratory detection limits in 13 of the 16 monitoring wells sampled during this event. As previously described, the new TMW-1 and TMW-2 monitoring wells were not installed at the time of the baseline event. The laboratory data tables in Attachment B present historical and baseline VOC results in full detail.

Consistent with previous events, the highest concentrations of TCE were reported at locations GMW-8S and MW-27S, with reported TCE levels of 150 and 48 micrograms per liter (μg/L), respectively. TCE concentrations above the KDHE Tier 2 Risk-Based Standard (RSK) of 5.0 μg/L were also identified in monitoring wells GMW-1, GMW-6S, GMW-7S, GMW-9S, GMW-10S, CMW-10S, MW-15, and MW-28S at levels ranging from 7.2 to 24 ug/L. Figure 3A provides a TCE isoconcentration diagram illustrating the groundwater plume based on these results.

Cis-1, 2-dichloroethylene (cDCE) was reported above laboratory detection limits in 10 of the 16 monitoring wells. Monitoring wells GMW-6S and GMW 8S indicated cDCE concentrations of 84 and 98 ug/L, respectively. These levels exceed the KDHE Tier 2 Standard of 70 μg/L. Other reported concentrations do not exceed the 17 μg/L detection at GMW-9S. Figure 4A provides a cDCE isoconcentration diagram illustrating these results.

Non-detect levels of TCE and cDCE were limited to monitoring wells CMW-10D, GMW-3, and GMW-4. These locations are upgradient of the drainage canal where TCE levels appear to be decreasing. The CMW-10D location reflects a deeper well screened below the documented limits of the shallow plume. Baseline monitoring did not identify *trans*-1,2-DCE or vinyl chloride concentrations above laboratory detection limits.

Downgradient locations GWM-6S, GMW-8S, GMW-9S, and MW-27S indicated tetrachloroethylene (PCE) levels above laboratory detection limits. These conditions are discussed further under Section 4.5 below.

Additional baseline VOC detections included acetone, sec-butylbenzene, 1,1-dichloroehane (DCA), and 1,1,1-trichloroethane (TCA) at residual levels below applicable KDHE standards. Acetone and sec-butylbenzene in the GMW-4 sample do not correspond with elevated levels of TCE or other chlorinated solvents. Trace levels of 1,1-DCA and/or 1,1,1-TCA were reported in

the GMW-5S, GMW-6S, GMW-8S, and GMW-9S samples in combination with low to moderate levels of TCE.

4.5 First Quarter Monitoring Results

First quarter monitoring indicated TCE concentrations above laboratory detection limits in 15 of the 17 monitoring wells sampled during this event. Consistent with the previous events, the highest concentrations of TCE were reported at locations GMW-8S and MW-27S, in addition to the new TMW-2 location. These wells indicated respective TCE levels of 150, 64.2, and 67.2 ug/L, compared to the KDHE Tier 2 Standard of 5.0 ug/L. TCE levels above the KDHE standard were also reported at monitoring wells GMW-1, GMW-6S, GMW-7S, GMW-9S, GMW-10S, CMW-10S, MW-15, and MW-28S, and TMW-1 at levels ranging from 5.1 to 24.6 ug/L. Figure 3B provides a TCE isoconcentration diagram based on these results.

Cis-1, 2-dichloroethylene (cDCE) was reported above laboratory detection limits in 12 of the 17 monitoring wells sampled during this event. Location GMW-8S indicated the highest cDCE detection of 99.8 ug/L, relative to the Tier 2 Standard of 70 ug/L. Although below the Tier 2 limit, locations GMW-6S, TMW-2, and GMW-9S (duplicate sample) also indicated notable cDCE concentrations of 48.6, 59.7, and 19.8 ug/L, respectively. Other reported concentrations do not exceed the 3.7 µg/L detection at MW-15. Overall, reported cDCE concentrations are also very consistent with the baseline monitoring conditions. Figure 4B provides a cDCE isoconcentration diagram illustrating these results.

Non-detect levels of TCE and cDCE were limited to monitoring wells GMW-5S and GMW-6I. The GMW-5S location generally defines the northern limit of the TCE in downgradient areas to the southeast. The GMW-6I well represents an intermediate monitoring interval of approximately 35 to 45 feet bgs. The historical and ongoing absence of TCE in intermediate and deep monitoring intervals defines the vertical extent of the groundwater plume.

Similar to the baseline event, first quarter monitoring did not identify *trans*-1,2-DCE or vinyl chloride concentrations above laboratory detection limits. These parameters have remained below detection limits since scheduled monitoring began in 2006.

Downgradient locations GWM-6S, GMW-8S, GMW-9S, and MW-27S indicated PCE levels very consistent with the baseline monitoring event. The GMW-8S sample indicated PCE at 8.1 ug/L, compared to the baseline concentration of 9.3 ug/L. Both results exceed the Tier 2 Standard for PCE of 5.0 ug/L. This detection correlates with the highest levels reported for TCE as discussed above. The remaining PCE detections also correlate with elevated TCE in groundwater but do not exceed 2.4 ug/L. PCE was not identified upgradient of the MW-27 location consistent with other recent monitoring.

Trace levels of 1,1-DCA and/or 1,1,1-TCA were reported in the GMW-6S, GMW-8S, and GMW-9S samples. These compounds were reported in combination with low to moderate levels of TCE consistent with the baseline results. DCA was also indentified in TMW-2. Reported levels reflect residual detections below applicable KDHE standards.

Table 2 provides first quarter monitoring results for TCE and related degradation products in relation to historical data. Table 5 provides first quarter VOC results in full detail. The laboratory analytical reports are provided in Appendix G.

4.6 Historical VOC Trends

Historical TCE and cDCE concentration trends remain consistent with the findings of the baseline and previous semi-annual monitoring events. Specific VOC trends and notable conditions are detailed below:

- The most concentrated areas of TCE in groundwater remain in the vicinity of MW-27/TMW-1 and GMW-8/TMW-2. These impacts are downgradient of the documented source near CMW-10S and suggest dissolved phase TCE migration in concentrated masses (or "waves") over time. TCE levels at CMW-10S have consistently decreased from a peak of 190 µg/L in 2003 to the baseline and first quarter concentrations of 4.1 and 5.1 ug/L, respectively.

- TCE levels in the downgradient MW-27S well have generally decreased from a peak of 200 µg/L in 2009 to baseline and first quarter concentrations 48 and 64.2 ug/L, respectively. TCE levels directly upgradient and downgradient of this location decrease considerably and further suggest the non-continuous or very narrow movement of higher levels of TCE within the system.

- Historical results similar to MW-27S are also apparent in the TCE results for GMW-1, GMW-2, and MW-28S. Each of these locations indicated peak concentrations through various events conducted between 2007 and 2009. These results further demonstrate the mass movement of TCE to the southeast over time. As expected, peak levels at the GMW-1 and GMW-2 locations precede peak concentrations at MW-27S.

- TCE levels in the far downgradient GMW-8S well have consistently increased from a concentration of 50 ug/L in 2012 to 150 ug/L during the baseline and first quarter events. Similar to the above, reported TCE levels directly upgradient of GMW-8S continue to suggest the non-continuous or narrow movement of higher levels of TCE within the system.

- Locations GMW-9S, TMW-2, and MW-15 indicated respective TCE levels of 13.3, 24.6, and 67.2 ug/L near the southeast property line. The GMW-9S and MW-15 results are slightly higher than the 2013 and baseline monitoring results. First quarter results suggest the potential for TCE migration beyond the existing well network.

- The highest levels of cDCE remain at locations GMW-6S, GMW-8S, and GMW-9S with first quarter concentrations of 48.6, 99.8, and 18.1 ug/L, respectively. Reported cDCE at GMW-6S decreased from 84 ug/L during the baseline event, which represented a concentration spike relative to the previous results. Elevated cDCE correlates well with

higher levels of TCE; however, some trailing edge influences are apparent as TCE moves to the southeast.

- Vertical migration of TCE to deeper intervals has not been identified to date. Monitoring wells installed at "intermediate" and "deep" intervals have consistently indicated non-detect results since 2003. Similarly, first quarter monitoring of GMW-6I did not indicate VOC concentrations above laboratory detection limits.

- Detectable levels of PCE were identified at four (4) downgradient locations east/southeast of the drainage canal. PCE above the Tier 2 Standard at location GMW-8S correlates with the highest levels reported for TCE. The remaining PCE detections also correlate with elevated TCE. These results suggest commingled PCE within downgradient areas of the plume, generally at concentrations an order of magnitude less than reported TCE levels. Available data are not indicative of a PCE source within the limits of the plume; however, potential secondary sources and PCE migration should be evaluated through future monitoring of the site.

- Other low-level VOC detections from the baseline and first quarter events include 1,1-DCA, 1,1,1-TCA, acetone, & sec-butylbenzene below KDHE standards. These detections do not appear to represent significant groundwater conditions related to ongoing monitoring or performance of the remedial design.

- Groundwater monitoring to date has not reported vinyl chloride groundwater. These data indicate that reductive dechlorination has not progressed beyond cDCE.

4.7 Interim Monitoring Results

GSI performed additional "interim" monitoring of paired locations MW-27S/TMW-1 and GMW-8S/TMW-2 as marked center points directly upgradient and downgradient of the EVO injections. GSI obtained additional field and laboratory samples from the four interim reference locations the same week of the remediation work ("Week 0") and at subsequent intervals of one week, two weeks, and four weeks following the injections. The purpose of this sampling was to better demonstrate localized conditions immediately following injection of the EVO carbon source.

The initial "Week 0" sampling included field, laboratory VOC, and laboratory geochemical parameters consistent with baseline and quarterly monitoring. The subsequent interim events included field parameters only. Table 7 provides a summary of the critical interim sampling parameters.

Interim results for dissolved oxygen are sporadic and may fluctuate due to the sampling methods applied – i.e. use of peristaltic pump for one-inch wells. Locations TMW-1 and TMW-2 indicated negative ORP during the initial interim event and/or first quarter monitoring, but these results are also sporadic and do not reflect reducing conditions on a consistent basis.

No significant interim variations were observed with PCE, TCE, cDCE, or other target geochemical parameters. Additional VOC detections were limited to trace levels of PCE, trans-1,2-DCE and 1,1-DCA in the downgradient GMW-8S sample This consistency suggests the desired chemical and biological processes are likely to over period of several months to years, rather than weeks. Expanded geochemical evaluations are presented in Section 4.8 below.

4.8 Geochemical Evaluation

Field parameters including dissolved oxygen, ORP, and pH were collected in conjunction with low flow sampling during the baseline, first quarter, interim monitoring events. Samples from target monitoring wells were evaluated for additional chemical parameters following the Sampling Program outlined in the approved Design Plan. These target wells include, TWM-1, TMW-2, GMW-6S, GMW-8S, MW-15, MW-21, and MW-27S based on specific upgradient and downgradient locations within the TCE plume.

All field parameters from low-flow sampling are recorded in the field logs in Appendix D. Geochemical results including laboratory data are provided as Table 6. Table 7 provides additional geochemical results obtained through interim monitoring. Specific parameters are detailed below:

Dissolved Oxygen – Reported dissolved oxygen levels range from <0.10 up to 1.05 mg/L. Most results fall within the range of 0.10 to 0.80 mg/L. Conditions consistently below 0.5 mg/L (generally considered to be anaerobic) have not been observed in any target well locations to date. Baseline sampling reported anaerobic levels <0.20 mg/L; however, interim and first quarter results do not support these conditions. These findings may be attributable to several variables including seasonal fluctuations, equipment performance, and slight differences in the specific field methods applied (e.g. submersible pumps vs. peristaltic, etc.).

The increase in dissolved oxygen observed following the baseline event may be associated with localized oxygen introduced into the system during the direct push injections. Given this scenario, dissolved oxygen levels should steadily decrease on a relatively short scale. Better distribution of the EVO amendment over time should also deplete oxygen within and downgradient of the injection sites. Other significant dissolved oxygen trends are not apparent in the recent field data.

Oxidation-Reduction Potential (ORP) – Reported ORP levels mostly reflect positive values indicative of neutral groundwater conditions. Baseline ORP levels were reported in the range of 11.5 to 179 millivolts (mV), with an average ORP of 105 mV. First quarter ORP levels were reported in the range of -35 to 144 mV, with an average ORP of 91 mV. Reduced conditions are apparent in localized areas directly downgradient of the injections (i.e. TMW-1 & TMW-2); however, significant changes in the reduction potential of the aquifer have not been observed to date. These conditions are illustrated in the ORP isoconcentration diagrams provided as Figures 5A and 5B.

pH & Alkalinity – Reported pH levels through all sampling events indicate mostly neutral groundwater conditions generally between 6.4 and 7.0 standard units. Reported alkalinity has not changed significantly since the injection work. These data give no indications weak buffering capacity or other potentially toxic or limiting conditions.

Nitrate/Nitrite – Baseline and first quarter results generally indicate depleted nitrate within the aquifer. Downgradient locations TMW-2, MW-15, and MW-21 have recently indicated low levels of nitrate from 0.91 to 2.1 mg/L. Significant trends or specific indications of chemical nitrate reduction (to nitrate) are not apparent in the existing data, yet reported conditions do not suggest nitrate in groundwater as significant competition for the electron donor.

Iron & Manganese – Total and dissolved iron and manganese concentrations are significantly higher in the TMW-1/TMW-2 first quarter results compared to the interim sampling data. These variations may be attributable to field methods and sample turbidity; however, the increase in manganese is a potential indicator of reducing groundwater conditions. These findings also correlate with the TMW locations directly downgradient of the injection points. The presence of reduced iron (ferrous) is another indicator of reducing conditions through the intermediate iron and manganese reductions, which occur in the absence of oxygen and nitrate. Similarly, reported ferrous iron levels are highest in the first quarter results from TMW-1 and TMW-2, with field-reported levels of 3.3 mg/L at each location. First quarter sampling also indicated ferrous iron at GMW-8S and MW-15 with respective concentrations of 2.8 and 0.52 mg/L.

Other results for iron and manganese are generally inconclusive. GSI recommends continued field testing for ferrous iron as the most reliable indicator of reducing conditions beyond the reduction of nitrate. Further testing of total and dissolved manganese if of limited value based on the geochemical conditions reported to date.

Sulfate/Sulfide – Monitoring results document relatively high levels of sulfate within the groundwater plume. Baseline sulfate levels were reported in the range of 98 to 290 mg/L, with an average concentration of 230 mg/L. First quarter sulfate levels were reported in the range of 76 to 275 mg/L, with an average concentration of 179 mg/L. Reported first quarter sulfate levels at TMW-1 and TMW-2 are generally lower than upgradient conditions. These results may be an indicator of sulfate reduction and highly reducing conditions near the injection points. TMW-1 also indicated reduced sulfate in the chemical form of sulfide at a concentration of 0.059 mg/L. Sulfide levels above detection limits were not identified at additional locations.

Despite slightly lower levels following the injections, significant decreasing trends and sulfate reduction beyond localized points are not yet apparent. Abundant sulfate remains in the system as competition for the electron donor and should be monitored consistently through future sampling events. Better distribution of the EVO amendment over time will likely affect sulfate levels on a larger scale.

Methane/Ethane/Ethene – Trace levels of methane were detected at locations TMW-1 and TMW-2 through interim and first quarter monitoring. These detections may be an indicator of anaerobic fermentation, yet reported levels are far from optimum conditions in the range of 1.0 mg/L. Future methane levels should be reviewed in comparison with changing cDCE concentrations to evaluate the potential need for additional electron donor. Ethane and ethene have not been identified in groundwater to date.

Chloride – Reported chloride levels have not changed significantly since the injection work. Chloride levels remain in the range of 140 to 190 mg/L are consistent with documented regional conditions. Future chloride results may be limited in its use as an indicator of reductive dechlorination due to known background influences.

Total Organic Carbon (TOC) – Baseline TOC levels within groundwater plume generally range from 1.0 to 2.0 mg/L. Locations TMW-1 and TMW-2 directly downgradient of the injections points indicated increased TOC levels during first quarter sampling as anticipated following the injection of the carbon source. TWM-1 indicated the highest TOC concentration of 4.1 mg/L. TMW-2 increased from 1.0 to 2.1 mg/L. But reported levels are relatively modest considering the EVO volume introduced. These data suggest the distribution of the EVO substrate has been limited to date. TOC distribution is illustrated in the isoconcentration diagrams provided as Figures 6A and 6B.

Better distribution of the EVO amendment over time will be demonstrated through increasing TOC concentrations in target areas. As such, this parameter remains critical in future performance evaluations.

4.9 Data Validation

GSI submitted field duplicate and blank samples for laboratory testing to demonstrate specific data quality indicators in accordance with the Final Remedial Design Plan. These samples specifically included a rinsate blank, two trip blanks, and field duplicates for both the baseline and first quarter sampling events. Quality control samples were submitted for VOC testing following the procedures outlined in the corresponding sections of this report.

Relative percent difference (RPD) values were calculated below 11 percent for all VOCs with the exception of individual PCE and 1,1,1-TCA results. The baseline duplicate indicated an RPD value for PCE of 20.1 percent. The first quarter duplicate indicated an RPD value for 1,1,1-TCA of 22.2 percent. Rinsate and trip blank samples were non-detect for all VOC constituents. Table 8 provides quality control sample results and individual RPD calculations.

Field and laboratory samples were collected and handled following industry practice and the Pre-Design Work Plan approved by KDHE. The field logs in Appendix D document specific field sampling procedures and collection details. All laboratory samples were submitted to KDHE-accredited facilities under chain-of-custody. Chain-of-custody records and laboratory quality control packages are provided in Appendix G.

GSI validated field laboratory data in accordance with the Final Remedial Design Plan and Quality Assurance Project Plan (QAPP) Addendum to further demonstrate data usability. These evaluations included review of the duplicate and blank sample results indicated above, in addition to other data quality criteria such as laboratory holding times, detection limits, and Level II intra-laboratory controls. Based on the cumulative data validation review, project data meet established data quality objectives and are usable for valid determinations regarding the extent of environmental impacts to the subject site. The minor duplicate variances outlined above do not represent significant data quality failures or other conditions that significantly affect the overall findings of this Startup Report.

5.0 FIRST QUARTER PERFORMANCE REVIEW

GSI compared laboratory VOC results to the KDHE Tier 2 RSK Standards presented in Appendix A of the Risk-Based Standards for Kansas (RSK Manual) – 5th Revision, as amended in March 2014. These thresholds also mirror federal Maximum Contaminant Levels (MCLs) for PCE, TCE and cDCE in both residential and non-residential settings. Thirteen (13) of the 18 target wells in the current Monitoring Program indicated TCE levels above the Tier 2 Standard through the baseline and/or first quarter sampling events. Non-detect conditions were limited to intermediate well GMW-6I and shallow well GMW-3 which were not sampled during both of the monitoring events.

The overall differences in reported in VOC levels from the baseline to the first quarter monitoring events are not significant. Slight variations were observed at GMW-4, GMW-5S, and CMW-10S. The GWM-4 location indicated TCE at 4.2 ug/L following non-detect conditions during baseline sampling. This may be associated with minor widening of the groundwater plume upgradient; however, more data is necessary over time to fully assess this condition. Reported TCE at CMW-10S increased slightly from 4.1 to 5.1 ug/L. Reported TCE at GMW-5S decreased from 1.7 ug/L during baseline sampling to non-detect first quarter conditions. Both of the new TMW well installations indicated elevated TCE levels consistent with the paired MW-27 and GMW-8S locations. Figures 3A and 3B illustrate these slight modifications as TCE isoconcentration diagrams for each respective monitoring event.

Reported cDCE levels at GMW-4 and GMW-5S correlate with the TCE fluctuations as described above. The GWM-4 location indicated cDCE at 1.5 ug/L following non-detect conditions during baseline sampling. Reported cDCE at GMW-5S decreased from 2.4 ug/L during baseline sampling to non-detect first quarter conditions. Additionally, cDCE decreased at GMW-6S from 84 ug/L during the baseline event to 48.6 ug/L as reported through first quarter sampling. Both of the new TMW well installations indicated elevated cDCE levels consistent with the paired upgradient locations as indicated above. Figures 4A and 43B illustrate these slight modifications as cDCE isoconcentration diagrams for each respective monitoring event.

The presence of cDCE as a degradation product of TCE indicates ongoing reductive dechlorination to some degree. Similar conditions were observed during the baseline and previous semi-annual monitoring events. First quarter data do not yet indicate the accelerated

degradation of TCE to cDCE subsequent to the injections. The consistent absence of vinyl chloride, ethane, and ethene give no indications of dechlorination beyond cDCE.

Potential geochemical fluctuations as a result of the EVO injections are detailed above under Section 4.8. In general, first quarter data give positive indications of localized reducing conditions within the immediate vicinity of the injection points. Continued distribution of the EVO in the system should further manipulate redox-conditions sufficient for reductive dechlorination throughout the target remediation areas. Figures 5A and 5B illustrate observed ORP conditions for each respective monitoring event.

Slow moving aquifer conditions and other localized variables may delay the secondary and tertiary reactions necessary to produce more compelling results. As such, specific geochemical parameters should be monitored over extended quarterly periods to better assess overall performance, which cannot be accurately determined though one quarterly monitoring event. Alternatively, slower moving conditions may further support retention of the carbon source and product long-lasting results over a period of years. Figures 6A and 6B illustrate observed TOC conditions as an indicator of EVO distributions within the system.

The cumulative findings of the baseline and first quarter monitoring events give preliminary indications of localized and relatively slow moving EVO distribution surrounding the injection points. Observed redox parameters report similar conditions and suggest localized reductions have been accelerated to some degree. These processes have not yet progressed to enhanced chemical or biological dechlorination; however, the desired effects apparent in the preliminary phase. Future efforts to mix and better distribute EVO in the may therefore be appropriate based on future monitoring results.

6.0 RECOMMENDATIONS

GSI recommends continued groundwater monitoring to assess the effectiveness of the EVO injections completed in August 2014. Subsequent monitoring for chlorinated VOCs and target geochemical parameters should be performed on a quarterly basis as defined in the KDHE-approved Design Plan. The next quarterly monitoring event will be completed in February 2015.

Current groundwater data indicate the existing Monitoring Program as sufficient to support the ongoing characterization of plume conditions. Program modifications and/or ancillary monitoring points may be necessary based on future quarterly reviews. Any expanded monitoring downgradient would require legal access to additional properties.

First quarter findings suggest several rounds of quarterly monitoring may be necessary to accurately determine the overall performance of the remedial design. Continued observation of limited EVO distributions may warrant specific efforts to better mix distribute the carbon source. GSI recommends at least one more round of quarterly monitoring prior to any supplemental procedures.

7.0 REFERENCES

GSI Engineering, LLC (GSI). 2014. Quarterly Groundwater Monitoring Report – Baseline Event, Summer 2014, 2nd & Kirby site, Hutchinson, KS. GSI, Lenexa, Kansas.

GSI Engineering, LLC (GSI). 2014. Remedial Design Plan Addendum, 2nd & Kirby site, Hutchinson, KS. GSI, Lenexa, Kansas.

GSI Engineering, LLC (GSI). 2014. Groundwater Remedial Design Plan – Final Revision, KDHE 2nd & Kirby site, Hutchinson, KS. GSI, Lenexa, Kansas.

GSI Engineering. LLC (GSI). 2013. Semi-Annual Monitoring Report. 2nd & Kirby Site, Hutchinson, KS. GSI, Wichita, KS.

GSI Engineering, LLC (GSI). 2013. Pre-Design Report. Groendyke Transport, Inc., 2nd & Kirby Site, Hutchinson, KS. GSI Wichita, KS.

Geotechnical Services, Inc. (GSI). 2009. Pre-Design Work Plan. 2nd & Kirby Site, Hutchinson, KS. GSI Wichita, KS.

Geotechnical Services, Inc. (GSI). 2006. Interim Remedial Measures Report. 2nd & Kirby Site, Hutchinson, KS. GSI Wichita, KS.

KDHE. 2010. Risk-Based Standards for Kansas, RSK Manual-5th Version. Amended March 2014. KDHE Bureau of Environmental Remediation, Topeka.

Terra Systems, Inc. 2014. Specification Sheet – 60% SRS® - FRL Large Droplet Emulsified Vegetable Oil (EVO) Substrate for Maximum Retention, United States Patent #RE40,448. Terra Systems, Claymont, Delaware. Available online at http://www.terrasystems.net/index-2.html.

U.S. Department of Agriculture (USDA). 2000. Soil Survey of Reno County, Kansas. USDA Soil Conservation Service in cooperation with Kansas Agricultural Experiment Station.

U.S. Environmental Protection Agency (EPA). 2014. Contaminated Site Cleanup Information, Bioremediation. EPA Office of Superfund Remediation and Technology Innovations. Available online at http://www.clu-in.org/techfocus.

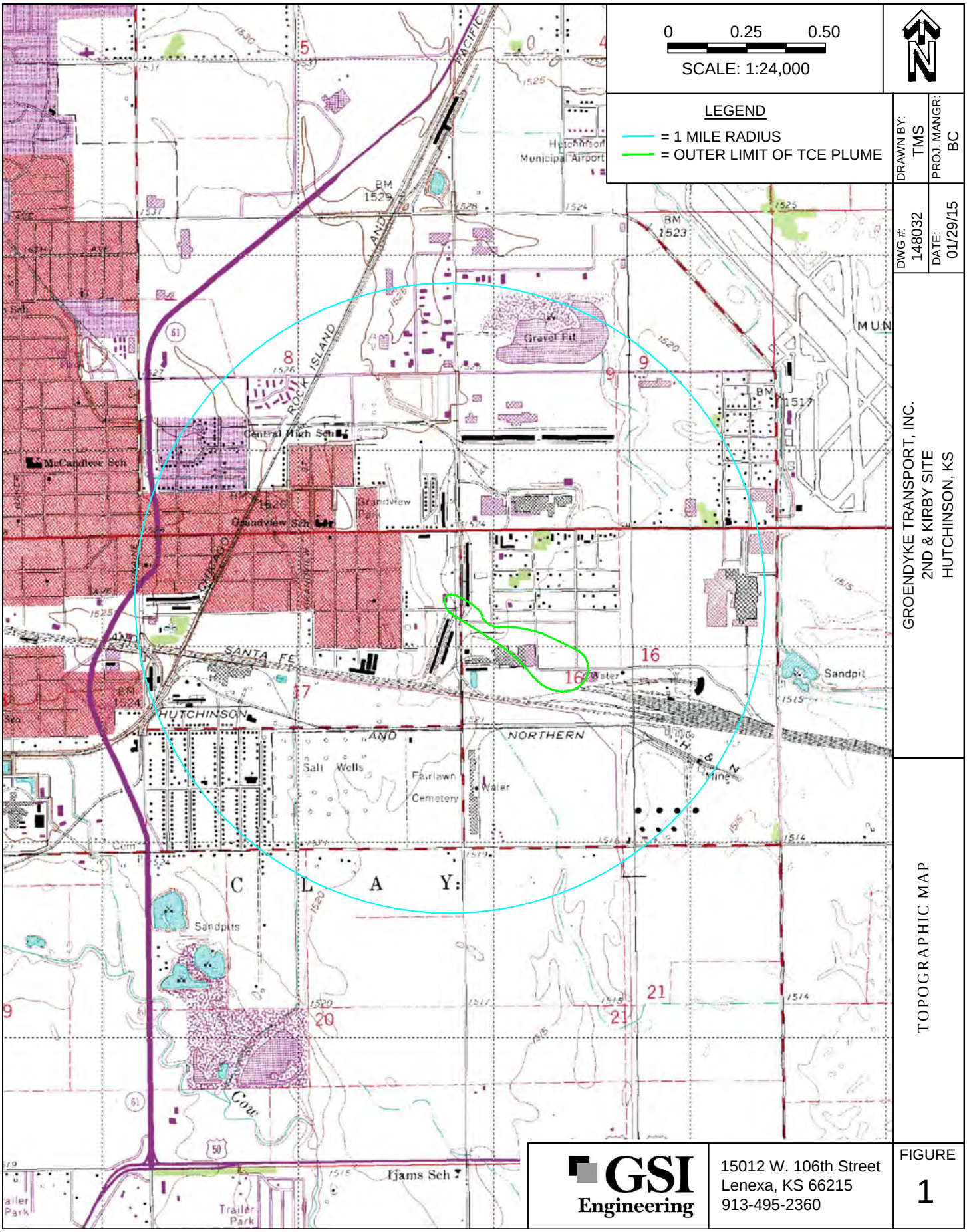
U.S. Geological Survey (USGS). 1978. Topographic Map (7.5 Minute Series), Hutchinson, Kansas Quadrangle. USGS, Reston, VA. Digital source provided by www.mapcard.com.

APPENDIX A

Report Figures

GSI Engineering

A division of Alt & Witzig Engineering



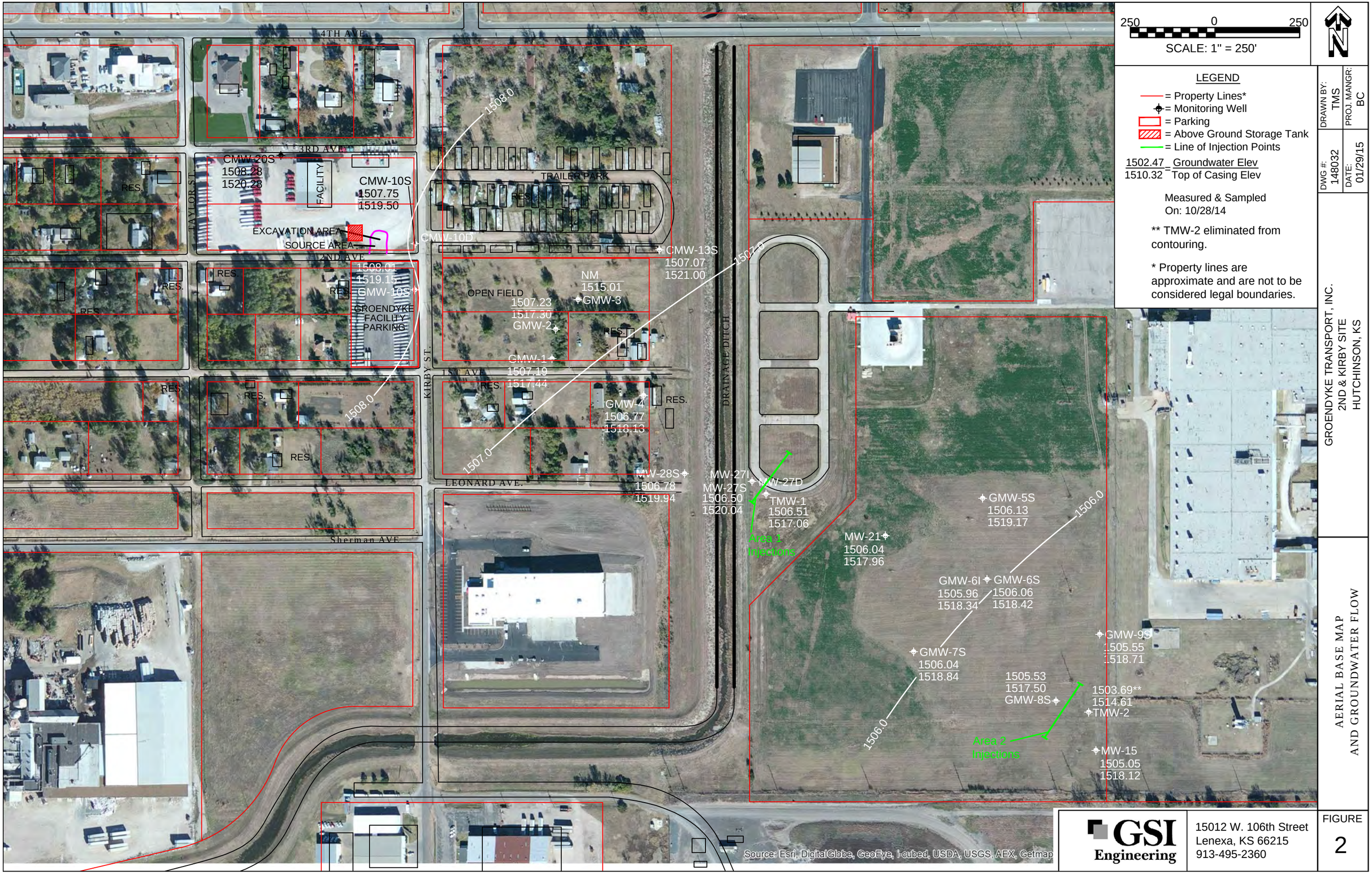
DRAWN BY: TMS
PROJ. MANGR: BC
DWG #: 148032
DATE: 01/29/15

GROENDYKE TRANSPORT, INC.
2ND & KIRBY SITE
HUTCHINSON, KS

TOPOGRAPHIC MAP

GSI Engineering
15012 W. 106th Street
Lenexa, KS 66215
913-495-2360

FIGURE
1



250 0 250

SCALE: 1" = 250'

N

LEGEND

= Property Lines*
= Monitoring Well
= Parking
= Above Ground Storage Tank
= Line of Injection Points

1502.47 = Groundwater Elev
1510.32 = Top of Casing Elev

Measured & Sampled On: 10/28/14

** TMW-2 eliminated from contouring.

* Property lines are approximate and are not to be considered legal boundaries.

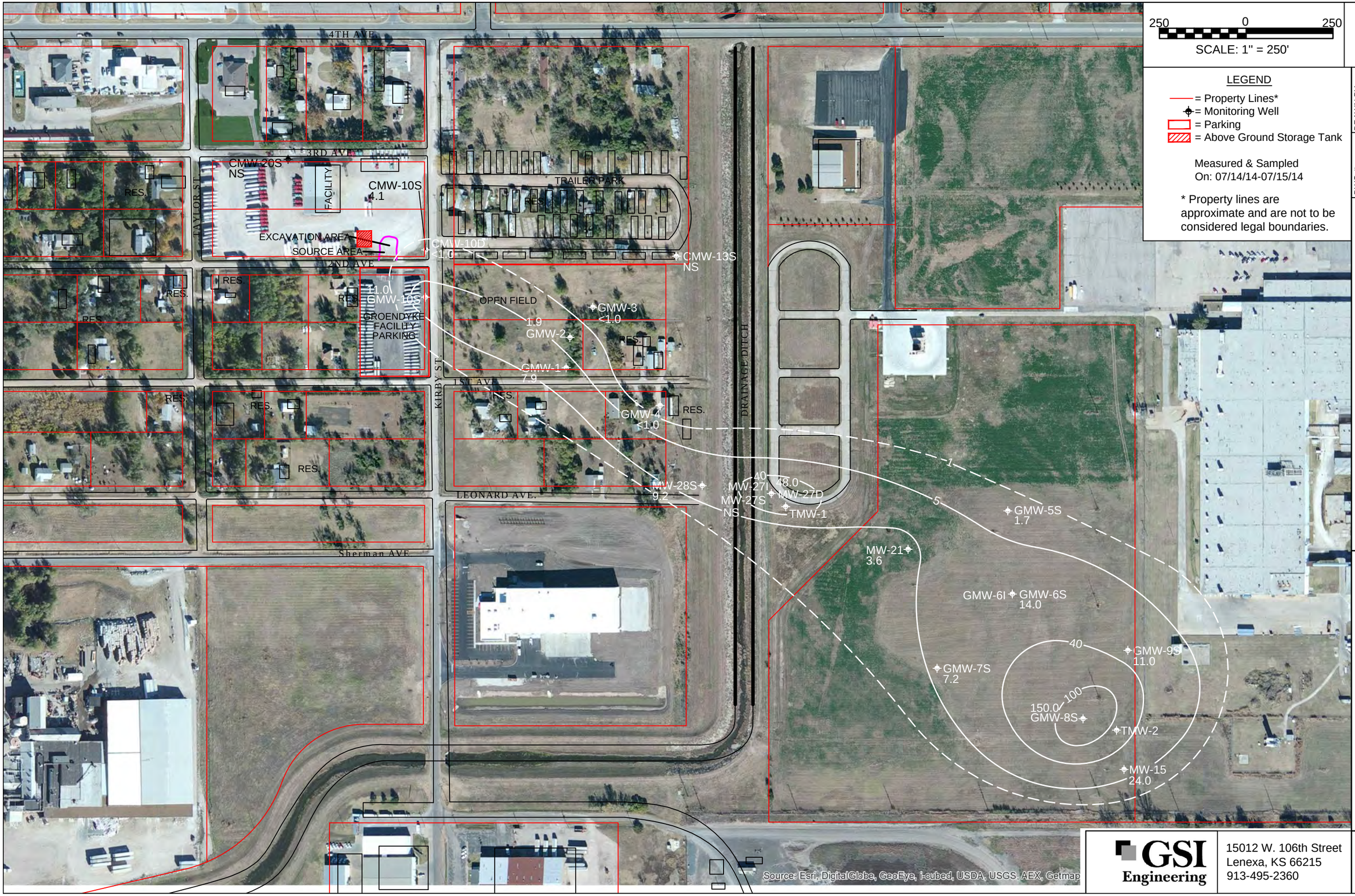
DRAWN BY: TMS
PROJ. MANGR: BC
DWG #: 148032
DATE: 01/29/15

GROENDYKE TRANSPORT, INC.
2ND & KIRBY SITE
HUTCHINSON, KS

AERIAL BASE MAP AND GROUNDWATER FLOW

GSI Engineering
15012 W. 106th Street
Lenexa, KS 66215
913-495-2360

FIGURE 2



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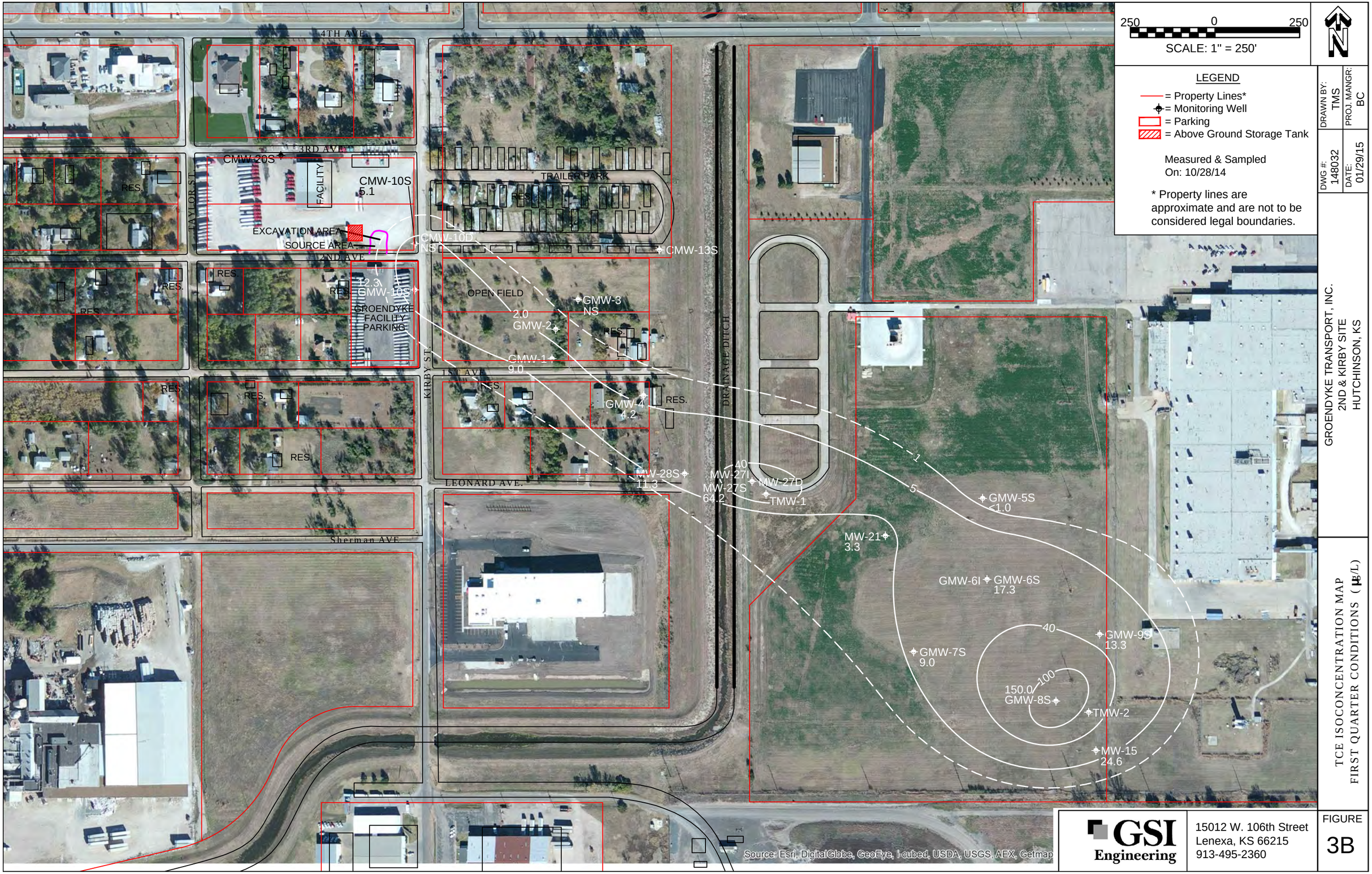
PROJ. MANGR: BC
DWG #: 148032
DATE: 01/29/15

GROENDYKE TRANSPORT, INC.
2ND & KIRBY SITE
HUTCHINSON, KS

TCE ISOCONCENTRATION MAP
BASELINE CONDITIONS (µg/L)

GSI Engineering
15012 W. 106th Street
Lenexa, KS 66215
913-495-2360

FIGURE
3A



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PROJ. MANGR: BC
DWG #: 148032
DATE: 01/29/15

GROENDYKE TRANSPORT, INC.
2ND & KIRBY SITE
HUTCHINSON, KS

TCE ISOCONCENTRATION MAP
FIRST QUARTER CONDITIONS (µg/L)

GSI Engineering
15012 W. 106th Street
Lenexa, KS 66215
913-495-2360

FIGURE
3B

DRAWN BY: TMS
PROJ. MANGR: BC
DWG #: 148032
DATE: 01/29/15

GROENDYKE TRANSPORT, INC.
2ND & KIRBY SITE
HUTCHINSON, KS

DCE ISOCONCENTRATION MAP
BASELINE CONDITIONS (µg/L)

GSI Engineering
15012 W. 106th Street
Lenexa, KS 66215
913-495-2360

FIGURE
4A

250 0 250

SCALE: 1" = 250'

N

LEGEND

= Property Lines*
= Monitoring Well
= Parking
= Above Ground Storage Tank

Measured & Sampled On: 10/28/14

* Property lines are approximate and are not to be considered legal boundaries.

DRAWN BY: TMS | PROJ. MANGR: BC

DWG #: 148032 | DATE: 01/29/15

GROENDYKE TRANSPORT, INC.
2ND & KIRBY SITE
HUTCHINSON, KS

DCE ISOCONCENTRATION MAP
FIRST QUARTER CONDITIONS (µg/L)

4TH AVE
3RD AVE
2ND AVE
1ST AVE
LEONARD AVE.
Sherman AVE
TAYLOR ST.
KIRBY ST.
DRAINAGE DITCH
FACILITY
RES.
TRAILER PARK
OPEN FIELD
GROENDYKE FACILITY PARKING
EXCAVATION AREA
SOURCE AREA
CMW-20S
CMW-10S <1.0
CMW-10D NS
CMW-13S
CMW-10S 1.5
NS GMW-3
<1.0 GMW-2
<1.0 GMW-1
GMW-4 1.5
MW-28S 1.4
MW-27I
MW-27S 2.1
MW-27D
TMW-1
GMW-5S <1.0
MW-21 2.2
GMW-6I
GMW-6S 48.6
GMW-9S 18.1
GMW-7S 2.8
99.8 GMW-8S
TMW-2
MW-15 3.7
1
5
50

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmap

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Lenexa, KS 66215
913-495-2360

FIGURE 4B

250 0 250

SCALE: 1" = 250'

N

LEGEND

= Property Lines*
= Monitoring Well
= Parking
= Above Ground Storage Tank

Measured & Sampled
On: 07/14/14-07/15/14

* Property lines are approximate and are not to be considered legal boundaries.

DRAWN BY: TMS

PROJ. MANGR: BC

DWG #: 148032

DATE: 01/29/15

GROENDYKE TRANSPORT, INC.
2ND & KIRBY SITE
HUTCHINSON, KS

OXIDATION-REDUCTION POTENTIAL (ORP)
BASELINE CONDITIONS (mV)

GSI Engineering

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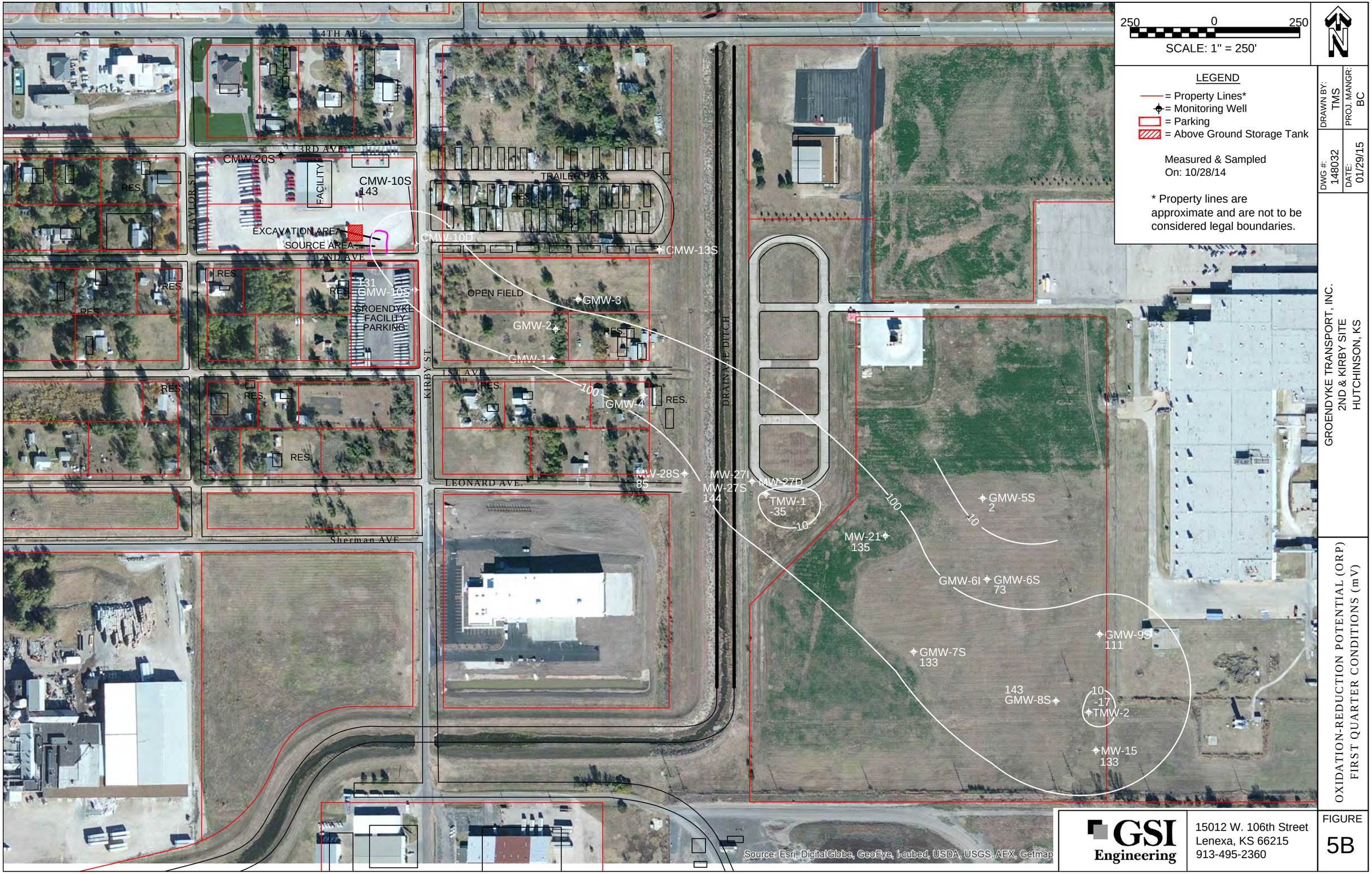
Lenexa, KS 66215
913-495-2360

FIGURE
5A



DRAWN BY: TMS | PROJ. MANGR: BC

DWG #: 148032 | DATE: 01/29/15

GROENDYKE TRANSPORT, INC.
2ND & KIRBY SITE
HUTCHINSON, KS

OXIDATION-REDUCTION POTENTIAL (ORP)
FIRST QUARTER CONDITIONS (mV)

GSI Engineering

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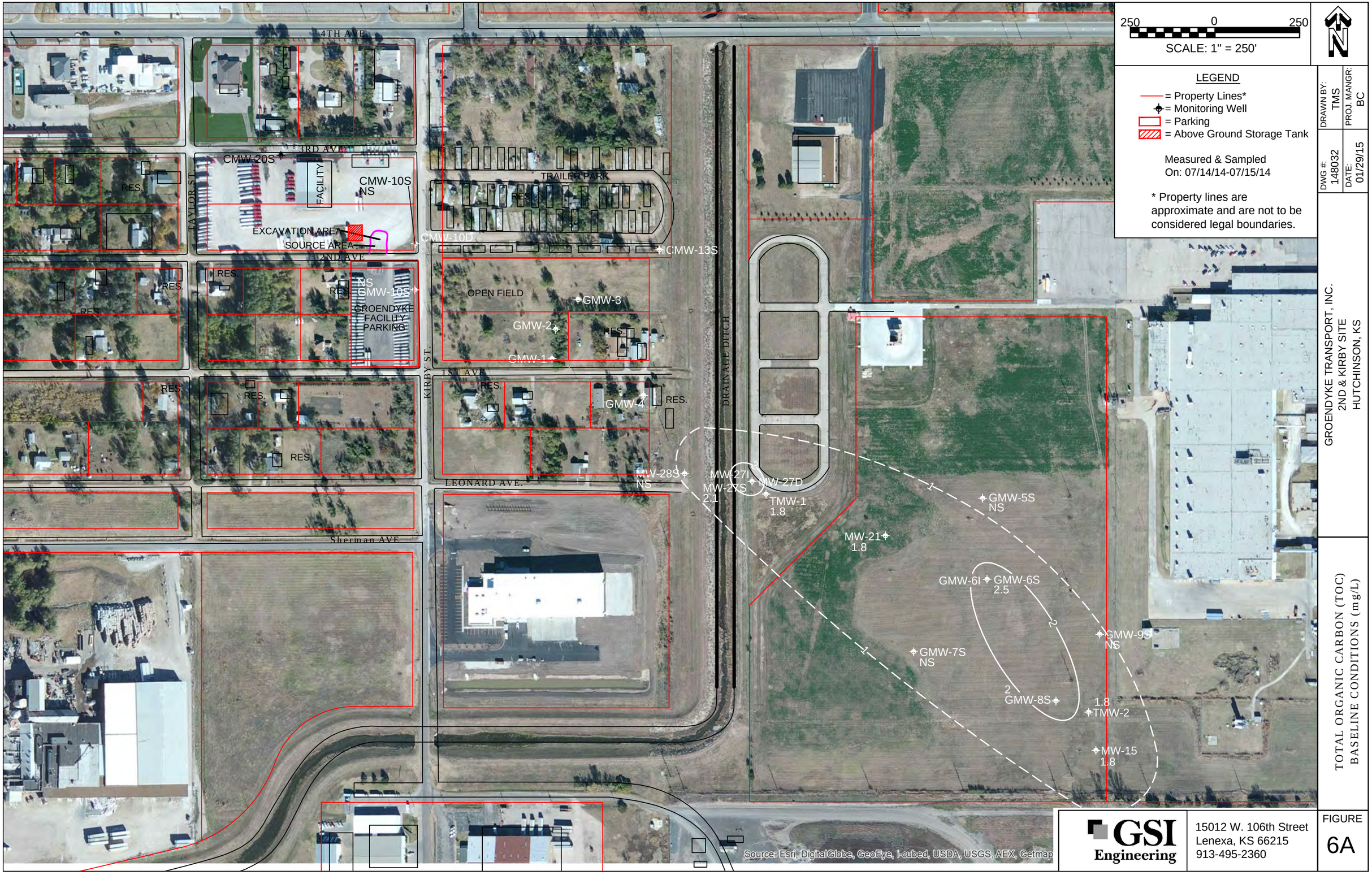
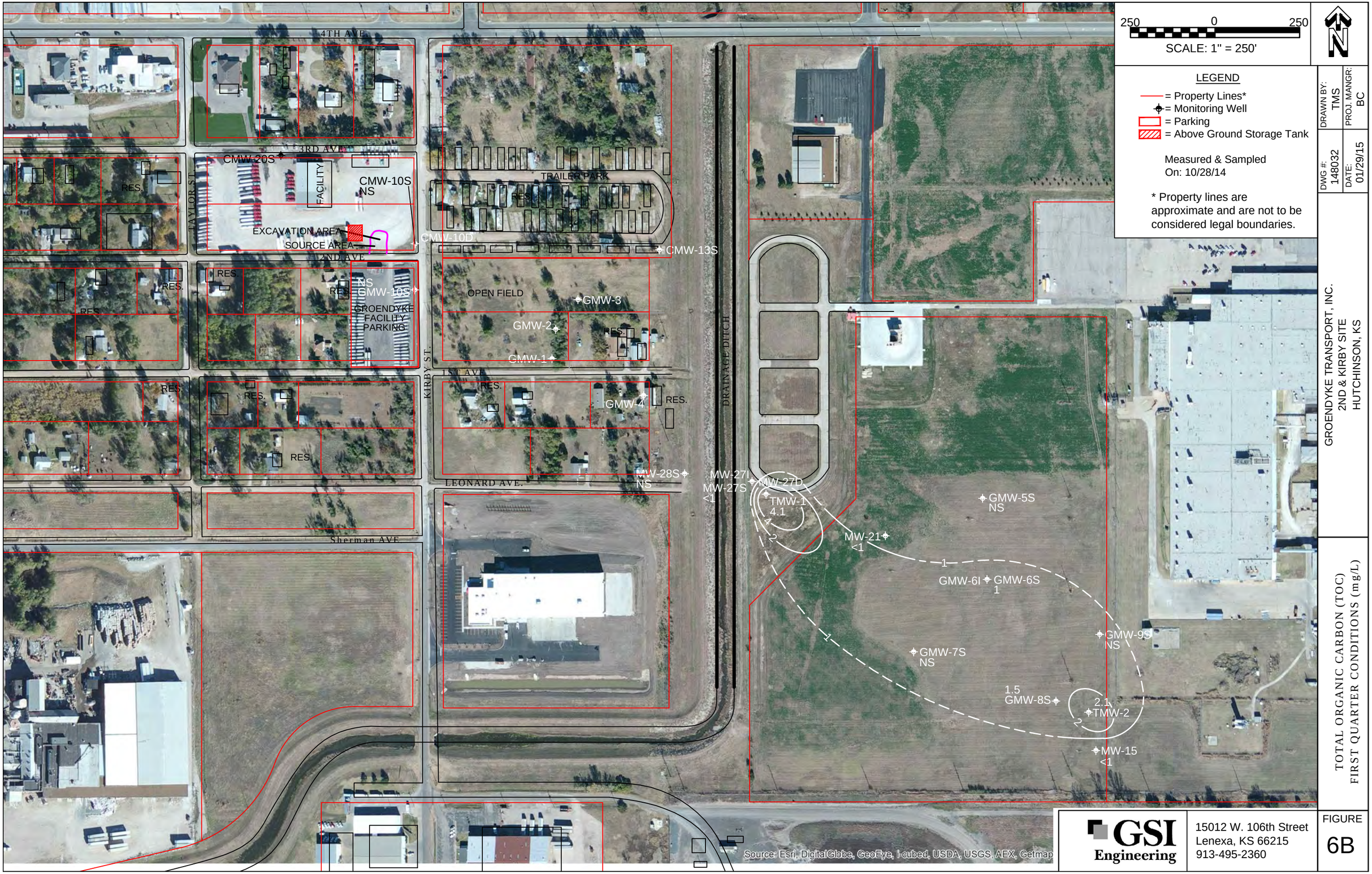
Lenexa, KS 66215
913-495-2360

FIGURE
5B


250 0 250
SCALE: 1" = 250'
LEGEND
= Property Lines*
= Monitoring Well
= Parking
= Above Ground Storage Tank
Measured & Sampled On: 07/14/14-07/15/14
* Property lines are approximate and are not to be considered legal boundaries.
4TH AVE
3RD AVE
2ND AVE
1ST AVE
LEONARD AVE.
Sherman AVE
TAYLOR ST.
KIRBY ST.
DRAINAGE DITCH
FACILITY
RES.
CMW-20S
CMW-10S
NS
EXCAVATION AREA
SOURCE AREA
CMW-10D
CMW-13S
TRAILER PARK
OPEN FIELD
GMW-3
GMW-2
GMW-1
CMW-10S
GROENDYKE FACILITY PARKING
GMW-4
MW-28S
NS
MW-27I
MW-27S
2.1
MW-27D
TMW-1
1.8
GMW-5S
NS
MW-21
1.8
GMW-6I
GMW-6S
2.5
GMW-7S
NS
GMW-9S
NS
2
GMW-8S
1.8
TMW-2
MW-15
1.8
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmap
DRAWN BY: TMS
PROJ. MANGR: BC
DWG #: 148032
DATE: 01/29/15
GROENDYKE TRANSPORT, INC.
2ND & KIRBY SITE
HUTCHINSON, KS
TOTAL ORGANIC CARBON (TOC)
BASELINE CONDITIONS (mg/L)
GSI Engineering
15012 W. 106th Street
Lenexa, KS 66215
913-495-2360
FIGURE
6A



DRAWN BY: TMS | PROJ. MANGR: BC

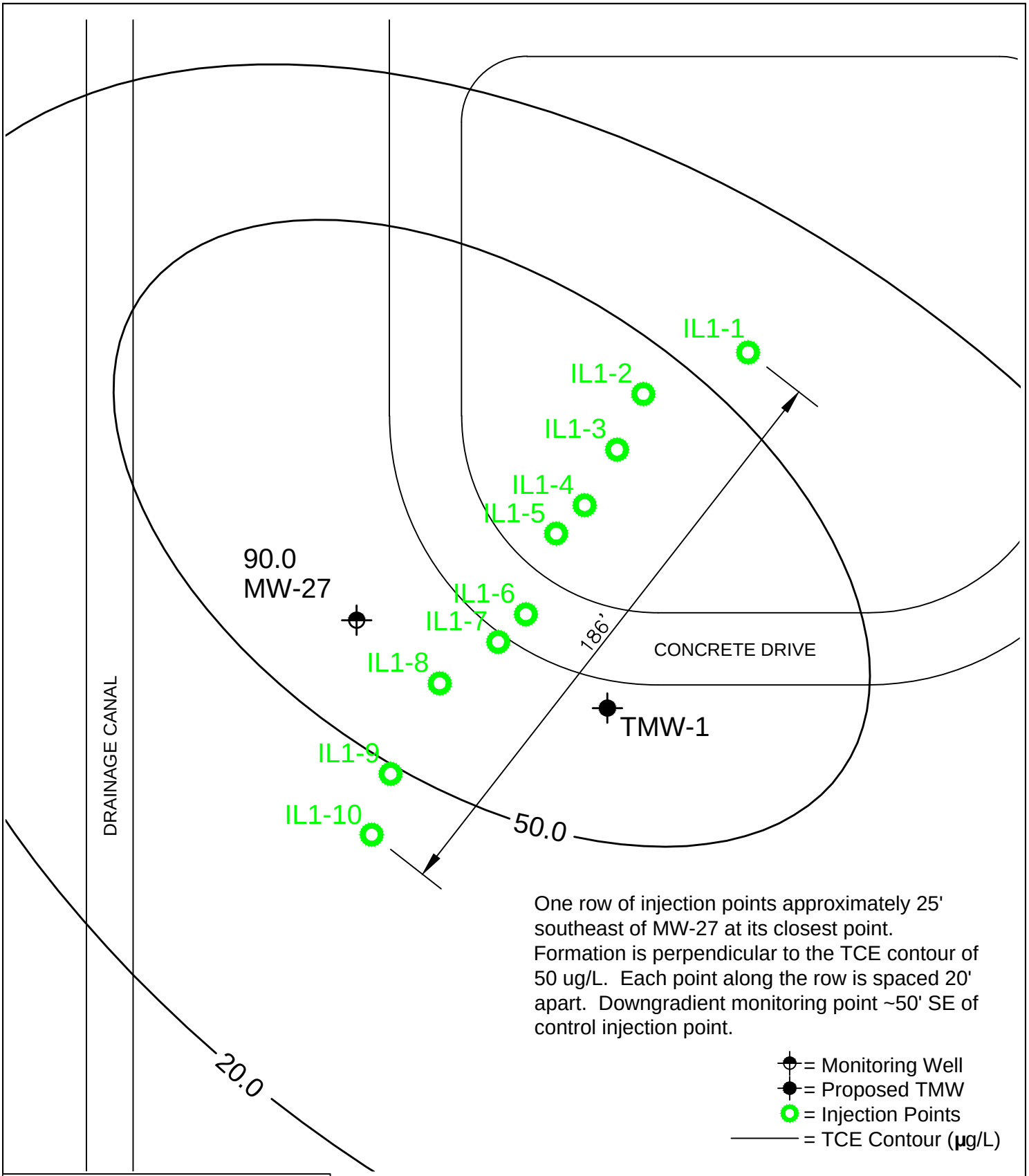
DWG #: 148032 | DATE: 01/29/15

GROENDYKE TRANSPORT, INC.
2ND & KIRBY SITE
HUTCHINSON, KS

TOTAL ORGANIC CARBON (TOC)
FIRST QUARTER CONDITIONS (mg/L)

GSI Engineering
15012 W. 106th Street
Lenexa, KS 66215
913-495-2360

FIGURE
6B



One row of injection points approximately 25' southeast of MW-27 at its closest point. Formation is perpendicular to the TCE contour of 50 ug/L. Each point along the row is spaced 20' apart. Downgradient monitoring point ~50' SE of control injection point.

= Monitoring Well
= Proposed TMW
= Injection Points
= TCE Contour (µg/L)

40 0 40

SCALE: 1" = 40'

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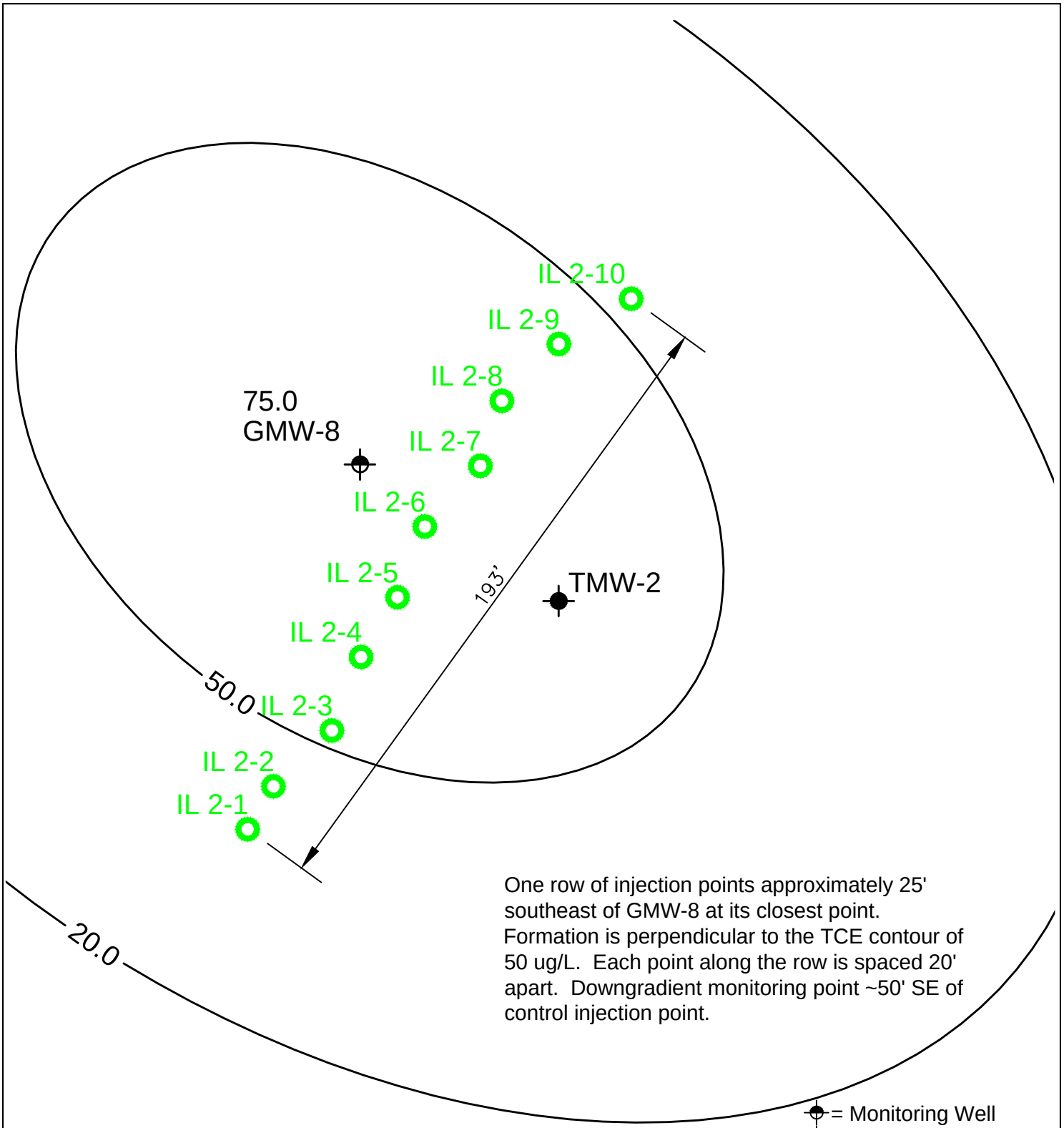
316-554-0725

FIGURE 7	GROUNDWATER INJECTION DETAIL AREA 1	GROENDYKE TRANSPORT, INC. 2ND & KIRBY SITE HUTCHINSON, KANSAS	DWG #: 148032	DRAWN BY: TMS
			DATE: 01/29/15	PROJ. MANGR: BC



One row of injection points approximately 25' southeast of GMW-8 at its closest point. Formation is perpendicular to the TCE contour of 50 ug/L. Each point along the row is spaced 20' apart. Downgradient monitoring point ~50' SE of control injection point.

= Monitoring Well
= Proposed TMW
= Injection Points
= TCE Contour (µg/L)

40 0 40

SCALE: 1" = 40'

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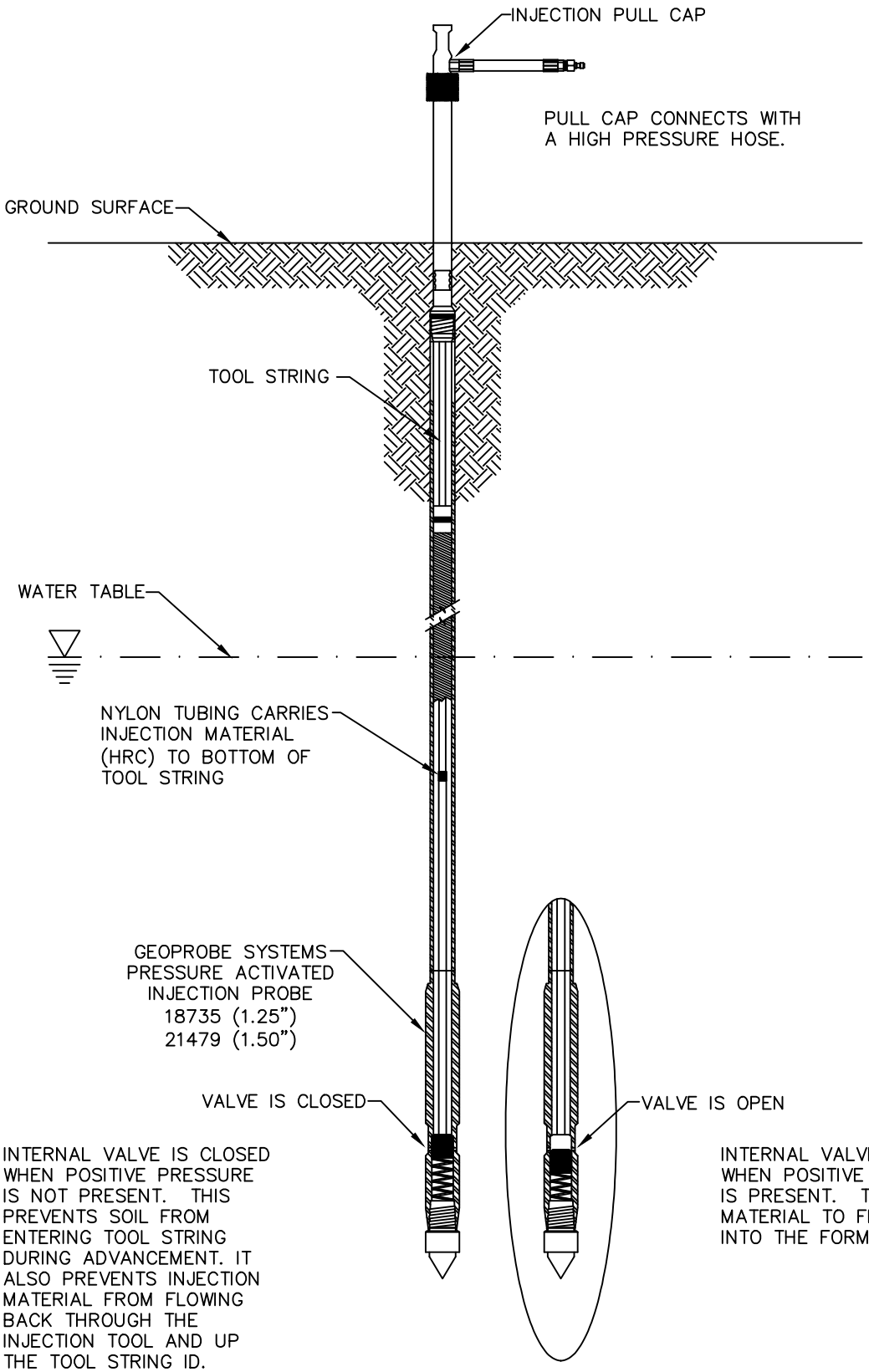
Wichita, KS 67210
316-554-0725

FIGURE 8	GROUNDWATER INJECTION DETAIL AREA 2	GROENDYKE TRANSPORT, INC. 2ND & KIRBY SITE HUTCHINSON, KANSAS	DWG #: 148032	DRAWN BY: TMS
			DATE: 01/29/15	PROJ. MANGR: BC



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316-554-0725

FIGURE				
9	DIRECT-PUSH INJECTION DIAGRAM	GROENDYKE TRANSPORT, INC. 2ND & KIRBY SITE HUTCHINSON, KANSAS	DWG #: 148032	DRAWN BY: TMS
			DATE: 01/29/15	PROJ. MANGR: BC

APPENDIX B

Report Tables

GSI Engineering

A division of Alt & Witzig Engineering

TABLE 1
WATER LEVEL OBSERVATIONS
Site Monitoring & Performance Evaluation
KDHE 2nd & Kirby Site

Well ID	Date Measured	Measuring Point Elevation	Depth to Water	Groundwater Elevation
GMW-1	06/05/08	1517.44	6.44	1511.00
	06/29/09		6.11	1511.33
	04/20/10		8.84	1508.60
	10/15/12		11.14	1506.30
	05/20/13		11.28	1506.16
	12/04/13		9.73	1507.71
	07/14/14		10.19	1507.25
	07/14/14		10.19	1507.25
	10/28/14		**10.25**	**1507.19**
GMW-2	06/06/08	1517.30	6.50	1510.80
	06/29/09		5.90	1511.40
	04/20/10		8.63	1508.67
	10/15/12		11.06	1506.24
	05/20/13		11.13	1506.17
	12/04/13		9.59	1507.71
	07/14/14		9.05	1508.25
	10/28/14		**10.07**	**1507.23**
GMW-3	06/06/08	1515.01	7.23	1507.78
	06/29/09		6.62	1508.39
	04/20/10		9.36	1505.65
	10/15/12		11.78	1503.23
	05/20/13		11.87	1503.14
	12/04/13		NM	NM
	07/14/14		9.79	-9.79
	10/28/14		**NM - Damaged**	**NM - Damaged**
GMW-4	06/05/08	1518.13	7.53	1510.60
	06/29/09		7.13	1511.00
	04/20/10		9.83	1508.30
	10/15/12		12.25	1505.88
	05/20/13		12.27	1505.86
	12/04/13		NM	NM
	07/14/14		10.21	1507.92
	10/28/14		**11.36**	**1506.77**

TABLE 1
WATER LEVEL OBSERVATIONS
Site Monitoring & Performance Evaluation
KDHE 2nd & Kirby Site

Well ID	Date Measured	Measuring Point Elevation	Depth to Water	Groundwater Elevation
GMW-5S	10/12/12	1519.17	13.98	1505.19
	05/20/13		13.89	1505.28
	12/05/13		12.53	1506.64
	07/14/14		11.85	1507.32
	10/28/14		**13.04**	**1506.13**
GMW-6S	10/11/12	1518.43	13.27	1505.16
	05/20/13		13.20	1505.23
	12/05/13		11.83	1506.60
	07/15/14		11.25	1507.18
	10/28/14		**12.37**	**1506.06**
GMW-6I	10/11/12	1518.34	13.34	1505.00
	05/20/13		13.27	1505.07
	12/04/13		NM	NM
	07/14/14		NM	NM
	10/28/14		**12.38**	**1505.96**
GMW-7S	10/11/12	1518.84	13.69	1505.15
	05/20/13		13.65	1505.19
	12/05/13		12.29	1506.55
	07/15/14		11.58	1507.26
	10/28/14		**12.80**	**1506.04**
GMW-8S	10/11/12	1517.50	12.87	1504.63
	05/20/13		12.74	1504.76
	12/05/13		11.42	1506.08
	07/15/14		10.82	1506.68
	10/28/14		**11.97**	**1505.53**
GMW-9S	10/11/12	1518.71	14.05	1504.66
	05/20/13		13.95	1504.76
	12/05/13		12.88	1505.83
	07/15/14		12.04	1506.67
	10/28/14		**13.16**	**1505.55**
GMW-10S	10/12/12	1519.15	NM	NM
	05/20/13		12.07	1507.08
	12/04/13		10.57	1508.58
	07/14/14		10.06	1509.09
	10/28/14		**11.14**	**1508.01**

TABLE 1
WATER LEVEL OBSERVATIONS
Site Monitoring & Performance Evaluation
KDHE 2nd & Kirby Site

Well ID	Date Measured	Measuring Point Elevation	Depth to Water	Groundwater Elevation
CMW-10S	06/06/08	1519.50	8.14	1511.36
	06/29/09		NM	NM
	04/20/10		10.21	1509.29
	10/12/12		12.65	1506.85
	05/20/13		12.79	1506.71
	12/04/13		11.17	1508.33
	07/14/14		10.66	1508.84
	10/28/14		**11.75**	**1507.75**
CMW-13S WATER LEVELS ONLY	06/06/08	1521.00	10.32	1510.68
	06/29/09		9.64	1511.36
	04/20/10		12.38	1508.62
	10/12/12		NM	NM
	05/20/13		14.95	1506.05
	12/05/13		13.46	1507.54
	07/14/14		NM - locked	NM - locked
	10/28/14		**13.93**	**1507.07**
CMW-20S WATER LEVELS ONLY	06/05/08	1520.28	NM	NM
	06/29/09		NM	NM
	04/20/10		10.57	1509.71
	10/12/12		NM	NM
	05/20/13		NM	NM
	12/04/13		11.47	1508.81
	07/14/14		11.07	-11.07
	10/28/14		**12.00**	**1508.28**
MW-15	07/15/14	1518.12	11.97	1506.15
	10/28/14		**13.07**	**1505.05**
MW-21	05/20/13	1517.96	12.81	1505.15
	12/05/13		11.44	1506.52
	07/15/14		10.83	1507.13
	10/28/14		**11.92**	**1506.04**

TABLE 1
WATER LEVEL OBSERVATIONS
Site Monitoring & Performance Evaluation
KDHE 2nd & Kirby Site

Well ID	Date Measured	Measuring Point Elevation	Depth to Water	Groundwater Elevation
MW-27S	06/05/08	1520.04	9.76	1510.28
	06/29/09		9.43	1510.61
	04/20/10		12.11	1507.93
	10/12/12		14.50	1505.54
	05/20/13		14.48	1505.56
	12/04/13		13.10	1506.94
	07/15/14		12.55	1507.49
	10/28/14		**13.54**	**1506.50**
MW-28S	06/05/08	1519.94	9.37	1510.57
	06/29/09		9.02	1510.92
	04/20/10		11.67	1508.27
	10/12/12		NM	NM
	05/20/13		14.07	1505.87
	12/04/13		12.68	1507.26
	07/14/14		12.09	1507.85
	10/28/14		**13.16**	**1506.78**
TMW-1	**10/28/14**	1517.06	**10.55**	**1506.51**
TMW-2	**10/28/14**	1514.61	**10.92**	**1503.69**

NOTES:

NM = not measured Elevations in feet above mean seal level (MSL)

Bold Shading - Most recent field data - October 2014

TABLE 2
HISTORICAL VOC RESULTS
Site Monitoring & Performance Evaluation
KDHE 2nd & Kirby Site

Well ID	Sample Date	TCE (µg/L)	cis-1,2-DCE (µg/L)	trans-1,2-DCE (µg/L)	Vinyl Chloride (µg/L)
Tier 2 RSK Standards		*5.0*	*70.0*	*100.0*	*2.0*
GMW-1	6/5/2008	**180.0**	**12.0**	**2.4**	<1.0
	6/29/2009	**98.0**	**6.2**	<1.0	<1.0
	4/20/2010	**23.0**	**1.3**	<1.0	<1.0
	10/15/2012	**1.7**	<1.0	<1.0	<1.0
	5/20/2013	**11.0**	**1.0**	<1.0	<1.0
	12/4/2013	**14.0**	**7.5**	<1.0	<1.0
	7/14/2014	**7.5**	<1.0	<1.0	<1.0
	10/28/2014	**9.0**	<1.0	<1.0	<1.0
GMW-2	6/6/2008	**140.0**	**6.9**	<1.0	<1.0
	6/29/2009	**80.0**	**5.7**	<1.0	<1.0
	4/20/2010	**12.0**	<1.0	<1.0	<1.0
	10/15/2012	**1.5**	<1.0	<1.0	<1.0
	5/20/2013	**6.7**	<1.0	<1.0	<1.0
	12/4/2013	**5.7**	<1.0	<1.0	<1.0
	7/14/2014	**1.9**	<1.0	<1.0	<1.0
	10/28/2014	**2.0**	<1.0	<1.0	<1.0
GMW-3	7/14/2014	<1.0	<1.0	<1.0	<1.0
	10/28/2014	**Not Sampled - Damage/Roots in Well**			
GMW-4	7/14/2014	<1.0	<1.0	<1.0	<1.0
	10/28/2014	**4.2**	**1.5**	<1.0	<1.0
GMW-5S	10/12/2012	**4.1**	**9.1**	<1.0	<1.0
	5/20/2013	**2.5**	**1.9**	<1.0	<1.0
	12/4/2013	**1.5**	**8.1**	<1.0	<1.0
	7/14/2014	**1.7**	**2.4**	<1.0	<1.0
	10/28/2014	**<1.0**	**<1.0**	<1.0	<1.0
GMW-6S	10/11/2012	**20.0**	**100.0**	<1.0	<1.0
	5/20/2013	**8.8**	**28.0**	<1.0	<1.0
	12/5/2013	**15.0**	**8.6**	<1.0	<1.0
	7/15/2014	**14.0**	**84.0**	<1.0	<1.0
	10/28/2014	**17.3**	**48.6**	<1.0	<1.0
GMW-6I	10/11/2012	1.3	4.0	<1.0	<1.0
	5/20/2013	<1.0	<1.0	<1.0	<1.0
	12/4/2013	NS	NS	NS	NS
	7/14/2014	NS	NS	NS	NS
	10/28/2014	<1.0	<1.0	<1.0	<1.0

TABLE 2
HISTORICAL VOC RESULTS
Site Monitoring & Performance Evaluation
KDHE 2nd & Kirby Site

Well ID	Sample Date	TCE (µg/L)	cis-1,2-DCE (µg/L)	trans-1,2-DCE (µg/L)	Vinyl Chloride (µg/L)
Tier 2 RSK Standards		*5.0*	*70.0*	*100.0*	*2.0*
GMW-7S	10/11/2012	**3.9**	**2.2**	<1.0	<1.0
	5/20/2013	**9.0**	**4.3**	<1.0	<1.0
	12/4/2013	**4.8**	**1.8**	<1.0	<1.0
	7/14/2014	**7.2**	**2.5**	<1.0	<1.0
	10/28/2014	**9.0**	**2.8**	<1.0	<1.0
GMW-8S	10/11/2012	**50.0**	**36.0**	<1.0	<1.0
	5/20/2013	**75.0**	**49.0**	<1.0	<1.0
	12/5/2013	**110.0**	**67.0**	<1.0	<1.0
	7/15/2014	**150.0**	**98.0**	<1.0	<1.0
	Field Duplicate	**140**	**100.0**	<1.0	<1.0
	10/28/2014	**150**	**99.8**	<1.0	<1.0
GMW-9S	10/11/2012	**7.8**	**9.6**	<1.0	<1.0
	5/20/2013	**12.0**	**13.0**	<1.0	<1.0
	12/4/2013	**6.1**	**9.7**	<1.0	<1.0
	7/14/2014	**11.0**	**17.0**	<1.0	<1.0
	10/28/2014	**13.3**	**18.1**	<1.0	<1.0
GMW-10S	10/12/2012	NS	NS	NS	NS
	5/20/2013	**14.0**	**8.1**	<1.0	<1.0
	12/4/2013	**8.5**	**2.7**	<1.0	<1.0
	7/14/2014	**11**	**5.5**	<1.0	<1.0
	10/28/2014	**12.3**	**2.5**	<1.0	<1.0
CMW-10S	6/6/2008	**6.8**	<1.0	<1.0	<1.0
	6/29/2009	NS	NS	NS	NS
	4/20/2010	**14.0**	<1.0	<1.0	<1.0
	10/12/2012	**3.0**	<1.0	<1.0	<1.0
	5/20/2013	**9.9**	<1.0	<1.0	<1.0
	12/4/2013	**8.8**	<1.0	<1.0	<1.0
	7/14/2014	**4.1**	<1.0	<1.0	<1.0
	10/28/2014	**5.1**	<1.0	<1.0	<1.0
MW-15	7/15/2014	**24.0**	**3.4**	<1.0	<1.0
	10/28/2014	**24.6**	**3.7**	<1.0	<1.0
MW-21	5/20/2013	**15.0**	**24.0**	<1.0	<1.0
	12/5/2013	**3.0**	**2.3**	<1.0	<1.0
	7/15/2014	**3.5**	**2.2**	<1.0	<1.0
	10/28/2014	**3.3**	**2.2**	<1.0	<1.0

TABLE 2
HISTORICAL VOC RESULTS
Site Monitoring & Performance Evaluation
KDHE 2nd & Kirby Site

Well ID	Sample Date	TCE (µg/L)	cis-1,2-DCE (µg/L)	trans-1,2-DCE (µg/L)	Vinyl Chloride (µg/L)
Tier 2 RSK Standards		*5.0*	*70.0*	*100.0*	*2.0*
MW-27S	6/5/2008	**47.0**	**1.8**	<1.0	<1.0
	6/29/2009	**200.0**	**4.7**	<1.0	<1.0
	4/20/2010	**15.0**	<1.0	<1.0	<1.0
	10/11/2012	**15.0**	**1.2**	<1.0	<1.0
	5/20/2013	**90.0**	<1.0	<1.0	<1.0
	12/4/2013	**87.0**	**1.2**	<1.0	<1.0
	7/15/2014	**48.0**	**1.6**	<1.0	<1.0
	10/28/2014	**64.2**	**2.1**	<1.0	<1.0
MW-28S	6/5/2008	**40.0**	**7.2**	<1.0	<1.0
	6/29/2009	**39.0**	**4.6**	<1.0	<1.0
	4/20/2010	**33.0**	**4.7**	<1.0	<1.0
	10/11/2012	NS	NS	NS	NS
	5/20/2013	**15.0**	**2.4**	<1.0	<1.0
	12/4/2013	**11.0**	**1.3**	<1.0	<1.0
	7/14/2014	**9.2**	**1.4**	<1.0	<1.0
	10/28/2014	**11.3**	**1.4**	<1.0	<1.0
TMW-1	10/28/2014	**21.3**	**3.0**	<1.0	<1.0
TMW-2	10/28/2014	**67.2**	**59.7**	<1.0	<1.0

NOTES:

All concentrations provided in micrograms per liter (ug/L)

Bold Font - Concentrations above laboratory detection limits

Bold Shading - Concentrations above KDHE Tier 2 Standard

Red Font - increasing trend **Green Font** - decreasing trend

TCE - Trichloroethene

DCE - dichloroethene

NS - Location not sampled

TABLE 3
SUMMARY OF GROUNDWATER INJECTION POINTS
Site Monitoring & Performance Evaluation
KDHE 2nd & Kirby Site

Location	Date	Location (Decimal Degrees)	TD (ft)	Dilution (gal)	Total Gallons	Time (24 Hour)	Screen Intervals (ft)	Injection Pressure (psi)	Approx Volume (gal)	Abandonment Date/Time
IL1-1	8/12/2014	38.05419363 °N	28	**Product (gal):** 45	450	**Start:** 0843	12-16	22	180	8/12/2014
							16-20	18	140	
		97.87491787 °W		**Dilution Water (gal): 405**		**Stop:** 0920	20-24	20	160	0940
							24-28	20	160	
IL1-2	8/12/2014	38.05414508 °N	28	**Product (gal):** 45	450	**Start:** 0942	12-16	20	160	8/12/2014
							16-20	20	160	
		97.87496186 °W		**Dilution Water (gal): 405**		**Stop:** 1020	20-24	18	160	1028
							24-28	20	160	
IL1-3	8/12/2014	38.05409769 °N	28	**Product (gal):** 45	450	**Start:** 1035	12-16	20	160	8/12/2014
							16-20	20	160	
		97.87499792 °W		**Dilution Water (gal): 405**		**Stop:** 1115	20-24	20	160	1120
							24-28	20	160	
IL1-4	8/12/2014	38.05405158 °N	28	**Product (gal):** 45	450	**Start:** 1234	12-16	20	160	8/12/2014
							16-20	20	160	
		97.87503864 °W		**Dilution Water (gal): 405**		**Stop:** 1308	20-24	20	160	1315
							24-28	20	160	
IL1-5	8/12/2014	38.05401739 °N	28	**Product (gal):** 45	450	**Start:** 1326	12-16	20	160	8/12/2014
							16-20	20	160	
		97.87506847 °W		**Dilution Water (gal): 405**		**Stop:** 1400	20-24	20	160	1405
							24-28	20	160	
IL1-6	8/12/2014	38.05395506 °N	28	**Product (gal):** 45	450	**Start:** 1411	12-16	20	160	8/12/2014
							16-20	20	160	
		97.87511462 °W		**Dilution Water (gal): 405**		**Stop:** 1449	20-24	20	160	1455
							24-28	20	160	
IL1-7	8/12/2014	38.05390839 °N	28	**Product (gal):** 45	450	**Start:** 1532	12-16	20	160	8/12/2014
							16-20	18	140	
		97.87514509 °W		**Dilution Water (gal): 405**		**Stop:** 1615	20-24	22	180	1630
							24-28	20	160	

TABLE 3
SUMMARY OF GROUNDWATER INJECTION POINTS
Site Monitoring & Performance Evaluation
KDHE 2nd & Kirby Site

IL1-8	8/13/2014	38.05386318 °N	28	**Product (gal):** 45	450	**Start:** 0745	12-16	20	160	8/13/2014
							16-20	20	160	
		97.87518710 °W		**Dilution Water (gal): 405**		**Stop:** 0822	20-24	20	160	0828
							24-28	20	160	
IL1-9	8/13/2014	38.05380844 °N	28	**Product (gal):** 45	450	**Start:** 0842	12-16	20	160	8/13/2014
							16-20	18	140	
		97.87523331 °W		**Dilution Water (gal): 405**		**Stop:** 0923	20-24	18	140	0928
							24-28	22	180	
IL1-10	8/13/2014	38.05375073 °N	28	**Product (gal):** 45	450	**Start:** 0956	12-16	20	160	8/13/2014
							16-20	20	160	
		97.87527373 °W		**Dilution Water (gal): 405**		**Stop:** 1035	20-24	20	160	1040
							24-28	20	160	
IL2-1	8/13/2014	38.05190480 °N	28	**Product (gal):** 45	450	**Start:** 1116	12-16	20	160	8/13/2014
							16-20	20	160	
		97.87232760 °W		**Dilution Water (gal): 405**		**Stop:** 1149	20-24	20	160	1155
							24-28	20	160	
IL2-2	8/13/2014	38.05194985 °N	28	**Product (gal):** 45	450	**Start:** 1322	12-16	20	160	8/13/2014
							16-20	20	160	
		97.87229360 °W		**Dilution Water (gal): 405**		**Stop:** 1400	20-24	18	140	1405
							24-28	22	180	
IL2-3	8/13/2014	38.05199928 °N	28	**Product (gal):** 45	450	**Start:** 1415	12-16	20	160	8/13/2014
							16-20	20	160	
		97.87225365 °W		**Dilution Water (gal): 405**		**Stop:** 1515	20-24	20	160	1520
							24-28	20	160	
IL2-4	8/13/2014	38.05204585 °N	28	**Product (gal):** 45	450	**Start:** 1530	12-16	20	160	8/13/2014
							16-20	20	160	
		97.87221413 °W		**Dilution Water (gal): 405**		**Stop:** 1621	20-24	20	160	1630
							24-28	20	160	

TABLE 3
SUMMARY OF GROUNDWATER INJECTION POINTS
Site Monitoring & Performance Evaluation
KDHE 2nd & Kirby Site

IL2-5	8/14/2014	38.05209388 °N	28	**Product (gal):** 45	450	**Start:** 0735	12-16	20	160	8/14/2014
							16-20	20	160	
		97.87216885 °W		**Dilution Water (gal): 405**		**Stop:** 0800	20-24	18	140	0805
							24-28	20	160	
IL2-6	8/14/2014	38.05214417 °N	28	**Product (gal):** 45	450	**Start:** 0845	12-16	20	160	8/14/2014
							16-20	20	160	
		97.87212670 °W		**Dilution Water (gal): 405**		**Stop:** 0933	20-24	20	160	0938
							24-28	20	160	
IL2-7	8/14/2014	38.05219090 °N	28	**Product (gal):** 45	450	**Start:** 0945	12-16	20	160	8/14/2014
							16-20	20	160	
		97.87207257 °W		**Dilution Water (gal): 405**		**Stop:** 1030	20-24	20	160	1035
							24-28	20	160	
IL2-8	8/14/2014	38.05223891 °N	28	**Product (gal):** 45	450	**Start:** 1225	12-16	20	160	8/14/2014
							16-20	20	160	
		97.87203135 °W		**Dilution Water (gal): 405**		**Stop:** 1317	20-24	20	160	1320
							24-28	20	160	
IL2-9	8/14/2014	38.05228128 °N	28	**Product (gal):** 45	450	**Start:** 1338	12-16	20	160	8/14/2014
							16-20	20	160	
		97.87198363 °W		**Dilution Water (gal): 405**		**Stop:** 1422	20-24	20	160	1430
							24-28	20	160	
IL2-10	8/14/2014	38.05232478 °N	28	**Product (gal):** 45	450	**Start:** 1442	12-16	20	160	8/14/2014
							16-20	20	160	
		97.87194450 °W		**Dilution Water (gal): 405**		**Stop:** 1528	20-24	20	160	1530
							24-28	20	160	

TABLE 4
BASELINE VOC LEVELS IN GROUNDWATER
Site Monitoring & Performance Evaluation
KDHE 2nd & Kirby Site

MONITORING WELL ID	Sampling Date	Acetone	sec-Butylbenzene	1,1-DCA	cis-1,2-DCE	trans-1,2-DCE	PCE	1,1,1-TCA	TCE	TOTAL VOC
	Method:	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B
	Units:	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
Tier 2 RSK Standards		11500	305	25.0	70.0	100	5.0	200	5.0	NA
GMW-1	7/14/2014	<50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**7.9**	ND
GMW-2	7/14/2014	<50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.9**	**1.9**
GMW-3	7/14/2014	<50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND
GMW-4	7/14/2014	**240**	**2**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**242**
GMW-5S	7/14/2014	<50	<1.0	**1.8**	**2.4**	<1.0	<1.0	<1.0	**1.7**	**5.9**
GMW-6S	7/15/2014	<50	<1.0	**2.5**	**84**	<1.0	**1.4**	<1.0	**14**	**101.9**
GMW-7S	7/14/2014	<50	<1.0	<1.0	**2.5**	<1.0	<1.0	<1.0	**7.2**	**9.7**
GMW-8S	7/15/2014	<50	<1.0	**3.9**	**98**	<1.0	**9.3**	<1.0	**150**	**261.2**
DUPLICATE*	7/15/2014	<50	<1.0	**4.3**	**100**	<1.0	**7.6**	<1.0	**140**	**251.9**
GMW-9S	7/14/2014	<50	<1.0	**7.5**	**17**	<1.0	**1.4**	**1.2**	**11**	**38.1**
GMW-10S	7/14/2014	<50	<1.0	<1.0	**5.5**	<1.0	<1.0	<1.0	**11**	**16.5**
CMW-10S	7/14/2014	<50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**4.1**	**4.1**
CMW-10D	7/14/2014	<50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND
MW-15	7/15/2014	<50	<1.0	<1.0	**3.4**	<1.0	<1.0	<1.0	**24**	**27.4**
MW-21	7/15/2014	<50	<1.0	<1.0	**2.2**	<1.0	<1.0	<1.0	**3.6**	**5.8**
MW-27S	7/15/2014	<50	<1.0	<1.0	**1.6**	<1.0	**1.4**	<1.0	**48**	**51**
MW-28S	7/14/2014	<50	<1.0	<1.0	**1.4**	<1.0	<1.0	<1.0	**9.2**	**10.6**
RINSATE	7/15/2014	<50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND
TRIP BLANK	7/15/2014	<50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND

NOTES:

All concentrations provided in micrograms per liter (ug/L)

* Duplicate sample obtained from GMW-8S

Bold Font - Concentrations above laboratory detection limits

Bold Shading - Concentrations above KDHE Tier 2 Risk-Based Standard

ND - Non-detect for all VOC constituents

NA - Tier 2 Standard not applicable

DCA - Dichloroethane

DCE - Dichloroethylene

PCE - Tetrachloroethylene

TCE - Trichloroethylene

TABLE 5
FIRST QUARTER VOC LEVELS IN GROUNDWATER
Site Monitoring & Performance Evaluation
KDHE 2nd & Kirby Site

MONITORING WELL ID	Sampling Date	1,1-DCA	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	PCE	1,1,1-TCA	TCE	Total VOC
	Method:	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B
	Units:	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
Tier 2 RSK Standards		25.0	70.0	100.0	2.0	5.0	200	5.0	NA
GMW-1	10/28/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**9.0**	**9.0**
GMW-2	10/28/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**2.0**	**2.0**
GMW-4	10/28/2014	<1.0	**1.5**	<1.0	<1.0	<1.0	<1.0	**4.2**	**5.7**
GMW-5S	10/28/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND
GMW-6S	10/28/2014	**1.5**	**48.6**	<1.0	<1.0	**1.6**	<1.0	**17.3**	**69.0**
GMW-6I	10/28/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**ND**
GMW-7S	10/28/2014	<1.0	**2.8**	<1.0	<1.0	<1.0	<1.0	**9.0**	**11.8**
GMW-8S	10/28/2014	**4.6**	**99.8**	<2.0	<2.0	**8.1**	<1.0	**150.0**	**263**
DUPLICATE*	10/28/2014	**6.8**	**19.8**	<1.0	<1.0	**2.1**	**1.5**	**14.3**	**44.5**
GMW-9S	10/28/2014	**6.1**	**18.1**	<1.0	<1.0	**2.0**	**1.2**	**13.3**	**40.7**
GMW-10S	10/28/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**5.1**	**5.1**
CMW-10S	10/28/2014	<1.0	**2.5**	<1.0	<1.0	<1.0	<1.0	**12.3**	**14.8**
MW-15	10/28/2014	<1.0	**3.7**	<1.0	<1.0	<1.0	<1.0	**24.6**	**28.3**
MW-21	10/28/2014	<1.0	**2.2**	<1.0	<1.0	<1.0	<1.0	**3.3**	**5.5**
MW-27S	10/28/2014	<1.0	**2.1**	<1.0	<1.0	**2.4**	<1.0	**64.2**	**68.7**
MW-28S	10/28/2014	<1.0	**1.4**	<1.0	<1.0	<1.0	<1.0	**11.3**	**12.7**
TMW-1	10/28/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**21.3**	**21.3**
TMW-2	10/28/2014	**1.1**	**59.7**	<1.0	<1.0	7.7	<1.0	**67.2**	**136**
TRIP BLANK	10/28/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**ND**

NOTES:

All concentrations provided in micrograms per liter (ug/L)

* Duplicate sample obtained from GMW-8S

Bold Font - Concentrations above laboratory detection limits

Bold Shading - Concentrations above KDHE Tier 2 Risk-Based Standard

ND - Non-detect for all VOC constituents

NA - Tier 2 Standard not applicable

DCA - Dichloroethane

DCE - Dichloroethylene

PCE - Tetrachloroethylene

TCE - Trichloroethylene

TABLE 6
GEOCHEMICAL RESULTS
Site Monitoring & Performance Evaluation
KDHE 2nd & Kirby Site

Parameters	Analytical Method	Units	TMW-1		TMW-2		GMW-6S		GMW-8S			MW-15		MW-21		MW-27S		
			August 2014	Oct 2014	August 2014	Oct 2014	July 2014	Oct 2014	July 2014	August 2014	Oct 2014	July 2014	Oct 2014	July 2014	Oct 2014	July 2014	August 2014	Oct 2014
Nitrate	9056	mg/L	<0.10	<0.10	0.91	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**1.3**	**2.1**	**1.0**	**2.1**	<0.10	<0.10	<0.010
Nitrite	9056	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010
Iron - total	6010B	mg/L	0.96	**7.60**	4.59	**4.20**	**2.50**	<0.05	**0.65**	2.15	<0.05	**0.44**	<0.05	**1.50**	<0.05	**0.21**	<0.05	<0.05
Iron - dissolved	6010B	mg/L	0.97	**7.46**	<0.05	**4.35**	<0.10	<0.05	<0.10	<0.05	<0.05	<0.10	<0.05	<0.10	<0.05	<0.10	<0.05	<0.05
Ferrous Iron - Lab	3500Fe	mg/L	NA	<0.20	NA	<0.20	1.60	<0.20	0.10	NA	<0.20	<0.050	<0.20	0.06	<0.20	0.12	NA	<0.20
Ferrous Iron - Field	8146	mg/L	NA	3.30	NA	3.30	NA	0.63	NA	NA	2.80	NA	0.52	NA	ND	NA	NA	ND
Manganese - total	6010B	mg/L	0.45	**1.15**	NA	**2.63**	**0.25**	**0.199**	**0.30**	NA	**0.249**	**0.38**	**0.188**	**0.94**	**0.798**	**0.57**	**0.54**	**0.553**
Manganese - dissolved	6010B	mg/L	0.46	**1.13**	0.32	**2.73**	**0.18**	**0.194**	**0.27**	0.26	**0.249**	**0.12**	**0.184**	**0.87**	**0.806**	**0.43**	**0.57**	**0.545**
Sulfate	9056	mg/L	NA	**100**	NA	**136**	**98**	**75.7**	**280**	NA	**244**	**280**	**190**	**290**	**275**	**200**	NA	**229**
Sulfide	4500s2	mg/L	<0.050	**0.059**	<0.050	<0.50	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Methane	RSK 175	mg/L	<0.0066	0.0083	0.0135	0.0198	0.170	0.4060	0.014	<0.0066	0.0167	<0.010	<0.0066	<0.010	<0.0066	<0.010	<0.0066	<0.0066
Ethane	RSK 175	mg/L	<0.0062	<0.0062	<0.0062	<0.0062	<0.013	<0.0062	<0.013	<0.0062	<0.0062	<0.013	<0.0062	<0.013	<0.0062	<0.013	<0.0062	<0.0062
Ethene	RSK 175	mg/L	<0.0062	<0.0062	<0.0062	<0.0062	<0.013	<0.0062	<0.013	<0.0062	<0.0062	<0.013	<0.0062	<0.013	<0.0062	<0.013	<0.0062	<0.0062
Alkalinity	2320 B	mg/L	NA	469	NA	405	390	424	300	NA	311	250	299	300	312	240	NA	294
Chloride	9056	mg/L	184	187	171	157	160	148	170	169	156	160	160	190	178	150	150	142
TOC	9060A	mg/L	NA	4.1	1.0	2.1	2.5	1.0	2.0	1.0	1.5	1.8	<1.0	1.8	<1.0	2.1	NA	<1.0
pH	Field**	std units	6.61	6.78	6.65	6.72	6.91	6.98	6.62	6.59	6.51	6.48	6.51	6.50	6.48	6.58	6.64	6.58
Dissolved Oxygen*	Field**	mg/L	0.19	1.05	0.36	0.76	0.10	0.58	0.07	0.3	0.87	0.08	0.75	0.07	0.71	0.16	0.70	0.40
ORP	Field**	m/V	29.9	-35	-11.9	-18	70	73	124	59.9	144	156	133	125	135	81	66	144

NOTES:

Bold Results - Reflect detections of competing electron acceptors which may inhibit reductive dechlorination

mg/L = milligrams per liter mV - mllivolts

* July and August field data recorded in percent oxygen converted using dissolved oxygen calculator

** Field Parameters recorded immediately before sample collection using low-flow methods

ND - Below field detection limits NA - Sample not analyzed for listed parameter

TABLE 7
INTERIM MONITORING RESULTS
Site Monitoring & Performance Evaluation
KDHE 2nd & Kirby Site

Location		Time Lapse (weeks)	Date	Dissolved Oxygen (mg/L)*	pH	ORP	TOC (mg/L)	Sulfate (mg/L)	TCE (µg/L)	cDCE (µg/L)
Injection Line 1 - Upgradient	MW-27S	July Baseline	7/15/2014	0.16	6.58	81	**2.1**	**200**	**48**	**1.6**
		0	8/13/2014	0.70	6.64	66	NR	NR	**33**	**1.9**
		1	8/22/2014	0.96	6.24	42	NA	NA	NA	NA
		2	8/29/2014	0.73	6.36	40	NA	NA	NA	NA
		4	9/12/2014	0.13	6.37	47	NA	NA	NA	NA
		11 (1st QTR)	10/28/2014	0.40	6.58	144	<1.0	**229**	**64.2**	**2.1**
	TMW-1	July Baseline	7/15/2014	NA	NA	NA	NA	NA	NA	NA
		0	8/13/2014	0.18	6.61	30	NR	NR	**26.7**	**2.0**
		1	8/22/2014	0.27	6.46	10	NA	NA	NA	NA
		2	8/29/2014	0.58	6.42	28	NA	NA	NA	NA
		4	9/12/2014	1.87	6.34	11	NA	NA	NA	NA
		11 (1st QTR)	10/28/2014	1.05	6.78	**-35**	**4.1**	**100**	**21.3**	**3.0**
Injection Line - Downgradient	GMW-8S	July Baseline	7/15/2014	0.07	6.62	124	**2.0**	**280**	**150**	**98**
		0	8/13/2014	0.32	6.59	60	**1.0**	NR	**159**	**107**
		1	8/22/2014	0.25	6.68	81	NA	NA	NA	NA
		2	8/29/2014	0.61	6.56	117	NA	NA	NA	NA
		4	9/12/2014	0.13	6.37	18	NA	NA	NA	NA
		11 (1st QTR)	10/28/2014	0.87	6.51	143	**1.5**	**244**	**150**	**99.8**
	TMW-2	July Baseline	7/15/2014	NA	NA	NA	NA	NA	NA	NA
		0	8/13/2014	0.36	6.65	-12	**1.0**	NR	**65.1**	**47.5**
		1	8/22/2014	0.18	6.71	73	NA	NA	NA	NA
		2	8/29/2014	0.50	6.57	95	NA	NA	NA	NA
		4	9/12/2014	0.10	6.38	13	NA	NA	NA	NA
		11 (1st QTR)	10/28/2014	0.76	6.72	**-17**	**2.1**	**136**	**67.2**	**59.7**

NOTES:

* Field data recorded in percent oxygen converted using dissolved oxygen calculator

Bold Font - Laboratory results above detection limits

Red Font - increasing trend **Green Font** - decreasing trend

NA - Location not applicable

NR - Data not reported

TABLE 8
QUALITY CONTROL REVIEW
2nd & Kirby Remediation
Hutchinson, Kansas

Client Sample ID			EQUIPMENT BLANK	TRIP BLANK	TRIP BLANK	Baseline Duplicate			First Quarter Duplicate		
						GMW-8S	DUP-1	RPD	GMW-9S	Dup-1	RPD
Collection Date			7/15/2014	7/15/2014	10/28/2014	7/15/2014	7/15/2014	7/15/2014	10/28/2014	10/28/2014	10/28/2014
Method	Parameter	Units									
8260B	1,1-Dichloroethane	µg/l	<1.0	<1.0	<1.0	3.9	4.3	**-9.76%**	6.1	6.8	**-10.85%**
8260B	cis-1,2-Dichloroethene	µg/l	<1.0	<1.0	<1.0	98.0	100.0	**-2.02%**	18.1	19.8	**-8.97%**
8260B	Tetrachloroethene (PCE)	µg/l	<1.0	<1.0	<1.0	9.3	7.6	**20.12%**	2.0	2.1	**-4.88%**
8260B	Trichloroethene (TCE)	µg/l	<1.0	<1.0	<1.0	150.0	140.0	**6.90%**	13.3	14.3	**-7.25%**
8260B	1,1,1-Trichloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	***	1.2	1.5	**-22.22%**
8260B	Vinyl Chloride	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	***	<1.0	<1.0	***

Notes:

Groundwater concentrations provided in micrograms per liter (µg/L)

RPD - Relative Percent Difference

*** RPD not calculated due to results below laboratory detection limits

APPENDIX C

Photograph Log

GSI Engineering

A division of Alt & Witzig Engineering

PHOTO 1 – 8/12/14

Emulsified Vegetable Oil (EVO) totes provided by Terra Systems Inc. Delivered 8/12/14

PHOTO 2 – 8/12/14

Truck with mounted dilution tank

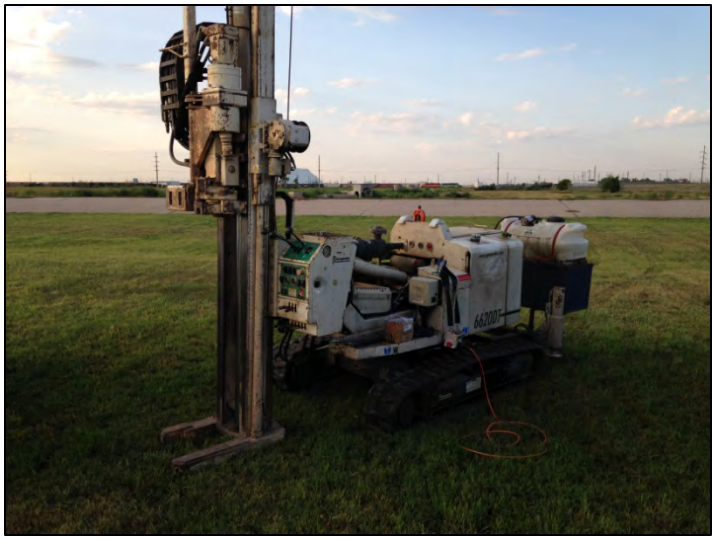


PHOTO 3 – 8/12/14

Geoprobe® 6620 – Used to advance borings and facilitate injections

GSI Engineering
A division of Alt & Witzig Engineering

PHOTO 4 – 8/12/14

Lead driller Corey Lewis preparing pumping apparatus.

PHOTO 5 – 8/12/14

Connection of pump apparatus to Geoprobe® advanced Macro-core rods with an extendable screen.

PHOTO 6 – 8/14/14

Terra Systems Inc. MSDS labels on EVO totes.

GSI Engineering
A division of Alt & Witzig Engineering

PHOTO 7 – 8/14/14

Geoprobe® pump attachment.

PHOTO 8 – 8/14/14

Pumping apparatus.

PHOTO 9 – 8/14/14

Development of new TMW-2 on 8/15/14.

GSI Engineering
A division of Alt & Witzig Engineering

PHOTO 10 – 8/14/14

City provided water meter. Installed on 8/12/14 and removed by city employees on 8/14/14

PHOTO 11 – 8/14/14

Final meter values before pickup by city.

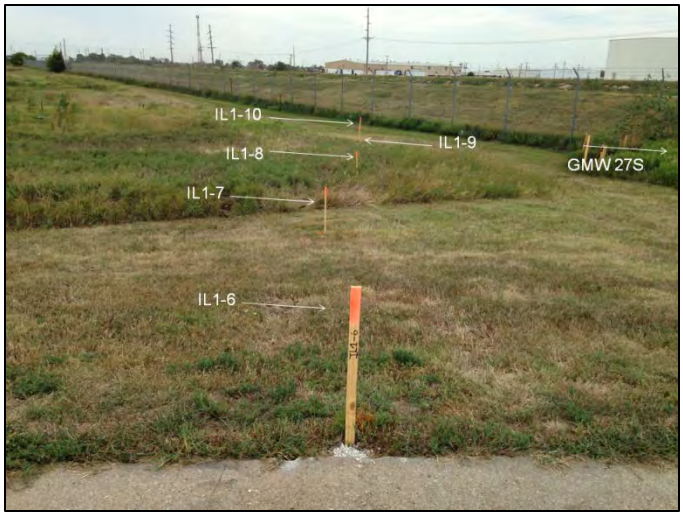


PHOTO 12 – 8/15/14

View facing south west of the southern most points in injection line number 1. Also includes GMW 27S west of the injection line.

GSI Engineering
A division of Alt & Witzig Engineering

PHOTO 13 – 8/15/14

View facing south west of the southern most points in injection line number 1. Includes newly installed TMW-1 to the east of the injection line.

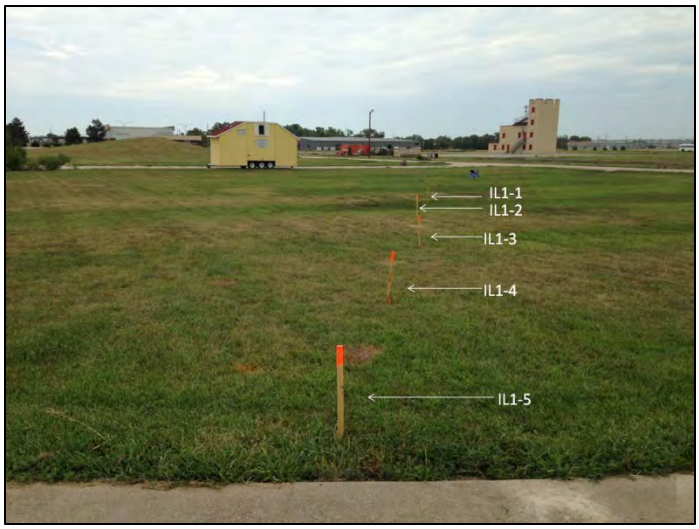


PHOTO 14 – 8/15/14

View facing north east of the northern most points in injection line 1.

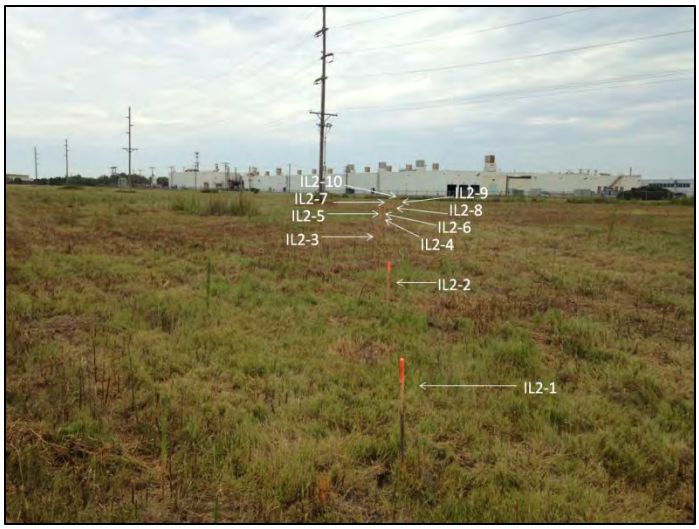


PHOTO 15– 8/15/14

View facing north east of injection line number 2.

GSI Engineering
A division of Alt & Witzig Engineering

PHOTO 16 – 8/15/14

View facing east of injection line number 2. Includes GMW 8S west of the injection line, and the approximate location of the newly installed flush mount TMW-2.

PHOTO 17 – 8/15/14

View facing south east of southern most points in injection line number 2.

GSI Engineering
A division of Alt & Witzig Engineering

APPENDIX D

Field Logs

GSI Engineering

A division of Alt & Witzig Engineering

IN SITU BIOREMEDIATION INJECTION LOG

Site Name: 2nd & Kirby Remediation City/State: Hutchinson, Kansas
GSI Project Number: 148032
KDHE Project Number: C2-078-70770
Date: August 2014 6/12/14
GSI Professionals J. Mellema, B. Ortega, C. Lewis, C. Hoffert

Injection Product: Terra Systems SRS Emulsified Vegetable Oil
Dilution Material: City of Hutchinson Municipal Water
Targeted Dilution: 1:10
GPS: Trimble GeoExplorer Datum: WGS 1984
Plugging Material: Hydrated Bentonite Chips
Direct Push Equipment: Track Mounted Geoprobe 6620

Location	Location (Decimal Degrees)	TD (ft TOC)	Dilution	Total Gallons	Time (24 Hour)	Screen Intervals (ft)	Pressure (psi)	Approximate Volume (gal)	Plug Date/Time
IL1-1	38.05419343 °N 97.57491787 °W	28	Product (gal) 45 Water (gal) 405	450	Start 0943 Stop 0928	12-14 14-20 20-24 24-28	22 14 20 20	110 110 110 110	6/12/14 0940
IL1-2	38.05414508 °N 97.57491654 °W	28	Product (gal) 45 Water (gal) 405	450	Start 0942 Stop 1020	12-14 14-20 20-24 24-28	20 20 20 20	110 110 110 110	6/12/14 1024
IL1-3	38.05404749 °N 97.57499742 °W	28	Product (gal) 45 Water (gal) 405	450	Start 1035 Stop 1115	12-14 14-20 20-24 24-28	20 20 20 20	110 110 110 110	6/12/14 1120
IL1-4	38.05405158 °N 97.57503844 °W	28	Product (gal) 45 Water (gal) 405	450	Start 1234 Stop 1304	12-14 14-20 20-24 24-28	20 20 20 20	110 110 110 110	6/12/14 1315
IL1-5	38.05401734 °N 97.57506547 °W	28	Product (gal) 45 Water (gal) 405	450	Start 1324 Stop 1400	12-14 14-20 20-24 24-28	20 20 20 20	110 110 110 110	6/12/14 1405
IL1-6	38.05395504 °N 97.57511462 °W	28	Product (gal) 45 Water (gal) 405	450	Start 1411 Stop 1449	12-14 14-20 20-24 24-28	20 20 20 20	110 110 110 110	6/12/14 1455 [redacted]

IN SITU BIOREMEDIATION INJECTION LOG

Site Name: 2nd & Kirby Remediation | City/State: Hutchinson, Kansas | Injection Product: Terra Systems SRS Emulsified Vegetable Oil

GSI Project Number: 148032 | Dilution Material: City of Hutchinson Municipal Water

KDHE Project Number: C2-078-70770 | Targeted Dilution: 1:10

Date: August 2014 5/12/14 | GPS: Trimble GeoExplorer | Datum: WGS 1984

GSI Professionals J. Mellema, B. Ortega, C. Lewis, C. Hoffert | Plugging Material: Hydrated Bentonite Chips

Direct Push Equipment: Track Mounted Geoprobe 6620

Location	Location (Decimal Degrees)	TD (ft TOC)	Dilution	Total Gallons	Time (24 Hour)	Screen Intervals (ft)	Pressure (psi)	Approximate Volume (gal)	Plug Date/Time
IL1-7	38.053910434 °N	24	Product (gal) 45	450	Start 1532	12-14	20	110	5/12/14
	97.875145094 °W		Water (gal) 405		Stop 1615	14-20	16	110	
						20-24	22	110	1630
						24-28	20	110	
	°N		Product (gal)		Start				
	°W		Water (gal)		Stop				
	°N		Product (gal)		Start				
	°W		Water (gal)		Stop				
	°N		Product (gal)		Start				
	°W		Water (gal)		Stop				
	°N		Product (gal)		Start				
	°W		Water (gal)		Stop				
	°N		Product (gal)		Start				
	°W		Water (gal)		Stop				

IN SITU BIOREMEDIATION INJECTION LOG

Site Name: 2nd & Kirby Remediation City/State: Hutchinson, Kansas Injection Product: Terra Systems SRS Emulsified Vegetable Oil

GSI Project Number: 148032 Dilution Material: City of Hutchinson Municipal Water

KDHE Project Number: C2-078-70770 Targeted Dilution: 1:10

Date: August 2014 6/13/14 GPS: Trimble GeoExplorer Datum: WGS 1984

GSI Professionals: J. Mellema, B. Ortega, C. Lewis, C. Hoffert Plugging Material: Hydrated Bentonite Chips

Direct Push Equipment: Track Mounted Geoprobe 6620

Location	Location (Decimal Degrees)	TD (ft TOC)	Dilution	Total Gallons	Time (24 Hour)	Screen Intervals (ft)	Pressure (psi)	Approximate Volume (gal)	Plug Date/Time
IL1-8	38.053943 °N 97.675167 °W	28	Product (gal) 45 Water (gal) 405	450	Start 0745 Stop 0822	12-14 14-20 20-24 24-28	26 20 20 20	110 110 110 110	6/13/14 0828
IL1-9	38.053860 °N 97.675233 °W	28	Product (gal) 45 Water (gal) 405	450	Start 0842 Stop 0923	12-14 14-20 20-24 24-28	20 18 18 22		6/13/14 0926
IL1-10	38.053756 °N 97.675273 °W	28	Product (gal) 45 Water (gal) 405	450	Start 0956 Stop 1035	12-14 14-20 20-24 24-28	20 20 20 20		6/13/14 1040
IL2-1	38.051904 °N 97.672327 °W	28	Product (gal) 45 Water (gal) 405	450	Start 1114 Stop 1149	12-14 14-20 20-24 24-28	20 20 20 20		6/13/14 1155
IL2-2	38.051949 °N 97.672293 °W	28	Product (gal) 45 Water (gal) 405	450	Start 1322 Stop 1400	12-14 14-20 20-24 24-28	20 20 18 20		6/13/14 1405
IL2-3	38.051949 °N 97.672253 °W	28	Product (gal) 45 Water (gal) 405	450	Start 1415 Stop 1515	12-14 14-20 20-24 24-28	20 20 20 20		6/13/14 1520

IN SITU BIOREMEDIATION INJECTION LOG

Site Name: 2nd & Kirby Remediation City/State: Hutchinson, Kansas Injection Product: Terra Systems SRS Emulsified Vegetable Oil

GSI Project Number: 148032 Dilution Material: City of Hutchinson Municipal Water

KDHE Project Number: C2-078-70770 Targeted Dilution: 1:10

Date: August 2014 6/13/14 GPS: Trimble GeoExplorer Datum: WGS 1984

GSI Professionals: J. Mellema, B. Ortega, C. Lewis, C. Hoffert Plugging Material: Hydrated Bentonite Chips

Direct Push Equipment: Track Mounted Geoprobe 6620

Location	Location (Decimal Degrees)	TD (ft TOC)	Dilution	Total Gallons	Time (24 Hour)	Screen Intervals (ft)	Pressure (psi)	Approximate Volume (gal)	Plug Date/Time
IL2-4	38.05204565 °N	28	Product (gal): 45	450	Start: 1530	12-14	20	110	6/13/14
	97.97221413 °W		Water (gal): 405		Stop: 1621	14-20	20	110	
						20-24	20	110	1630
						24-28	20	110	
	°N		Product (gal)		Start				
	°W		Water (gal)		Stop				
	°N		Product (gal)		Start				
	°W		Water (gal)		Stop				
	°N		Product (gal)		Start				
	°W		Water (gal)		Stop				
	°N		Product (gal)		Start				
	°W		Water (gal)		Stop				
	°N		Product (gal)		Start				
	°W		Water (gal)		Stop				

IN SITU BIOREMEDIATION INJECTION LOG

Site Name: 2nd & Kirby Remediation City/State: Hutchinson, Kansas Injection Product: Terra Systems SRS Emulsified Vegetable Oil

GSI Project Number: 148032 Dilution Material: City of Hutchinson Municipal Water

KDHE Project Number: C2-078-70770 Targeted Dilution: 1:10

Date: August 2014 6/14/14 GPS: Trimble GeoExplorer Datum: WGS 1984

GSI Professionals J. Mellema, B. Ortega, C. Lewis, C. Hoffert Plugging Material: Hydrated Bentonite Chips

Direct Push Equipment: Track Mounted Geoprobe 6620

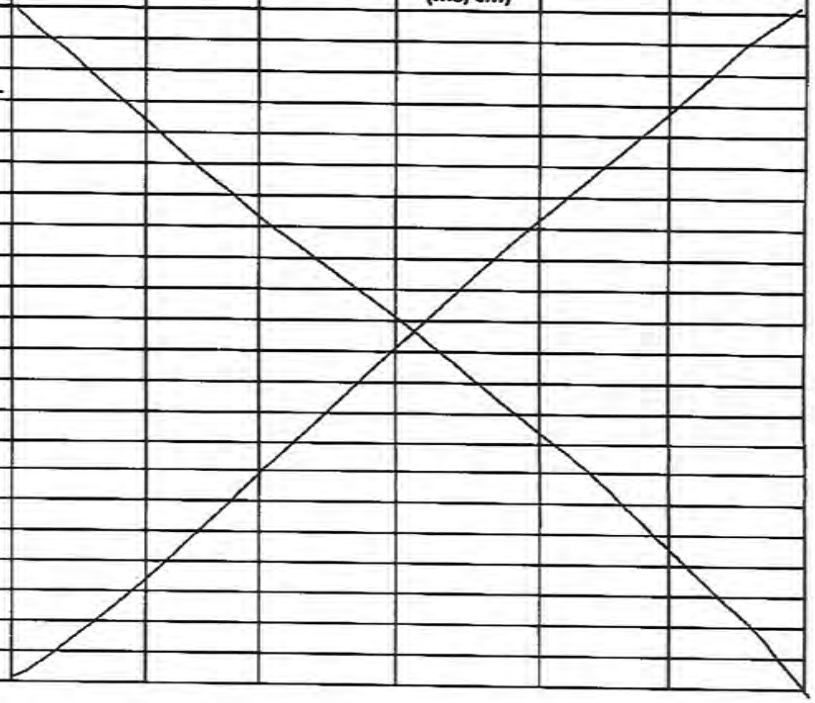
Location	Location (Decimal Degrees)	TD (ft TOC)	Dilution	Total Gallons	Time (24 Hour)	Screen Intervals (ft)	Pressure (psi)	Approximate Volume (gal)	Plug Date/Time
IL2-5	38.05204336°N 97.87314535°W	28	Product (gal) 45 Water (gal) 405	450	Start 0735 Stop 0800	12-14 14-20 20-24 24-28	20 20 20 20	110 110 110 110	6/14/14 0805
IL2-6	38.05314417°N 97.87212470°W	26	Product (gal) 45 Water (gal) 405	450	Start 0845 Stop 0933	12-14 14-20 20-24 24-26	20 20 20 20	110 110 110 110	6/14/14 0938
IL2-7	38.05219040°N 97.87207257°W	26	Product (gal) 45 Water (gal) 405	450	Start 0945 Stop 1030	12-14 14-20 20-24 24-28	20 20 20 20	110 110 110 110	6/14/14 1035
IL2-8	38.05223541°N 97.87203135°W	28	Product (gal) 45 Water (gal) 405	450	Start 1225 Stop 1317	12-14 14-20 20-24 24-28	20 20 20 20	110 110 110 110	6/14/14 1320
IL2-9	38.05225128°N 97.87148343°W	28	Product (gal) 45 Water (gal) 405	450	Start 1338 Stop 1422	12-14 14-20 20-24 24-28	20 20 20 20	110 110 110 110	6/14/14 1430
IL2-10	38.05232478°N 97.87144458°W	28	Product (gal) 45 Water (gal) 405	450	Start 1442 Stop 1528	12-14 14-20 20-24 24-28	20 20 20 20	110 110 110 110	6/14/14 1530

GROUNDWATER WELL DEVELOPMENT LOG

Site Name: 2nd & Kirby Remediation
City/State: Hutchinson, Kansas
GSI Project Number: 148032
KDHE Project Number: C2-078-70770
KDHE Project Manager: M. Daily
Date: August 2014

Pump: Pegasus Athena Peristaltic
Development Method: 5x Well Volume
Tubing Material/Size: 3/8"x1/2" Tygon
GPS: Trimble GeoExplorer 3000 **Datum:** WGS 1984
Water Quality Meter (If Required): N/A
GSI Professionals J. Mellema, B. Ortega

Location	Date/Time	TD	SWL	Well Volume	Purge Volume	Low-Flow Field Parameters (If Required)					
						Temp (°C)	pH	ORP (mV)	Cond (mS/cm)	Turbidity	DO (mg/L)
TMW-1	8/13/14	23.44	10.09	13.35×0.04							
38.05374457	1130			= 0.54	~5 GAL						
97.97506457				5x = 2.74							
TMW-2	8/15/14	23 57	10.47	13.10×0.04							
38.05[illegible]0450	0930			= 0.54	~5GAL						
97.97190248				5x = 2.48							



Notes:
PURGED (WHILE SURGING) TO 5x WELL VOLUME, THEN PURGED UNTIL CLEAR.

J. MELLEMA

GROUNDWATER SAMPLE COLLECTION LOG

[redacted]

Date: 7-14-14

DO

Location	Installation Depth (feet bgs)	Recorded TD	Sample Time	Purge Volume	SWL	Low-Flow Field Parameters					
						Temp (°C)	pH	Sp Cond (mS/CM)	~~Turbidity~~ DO (NTU)	ORP (mV)	Other
CMW-10S	1105	19.21			10.66	17.63	5.90	1.455	1.58	204.0	
	1108					17.39	5.88	1.444	1.42	192.1	
	1110					17.36	6.03	1.429	1.38	178.9	
			1115								
CMW-10D	1120	62.92			11.02						
	1125					18.43	6.93	1.664	0.78	61.6	
	1127					16.72	6.91	1.662	0.68	41.0	
	1129					18.74	6.93	1.664	0.67	32.1	
	1130					18.64	6.97	1.658	0.63	18.4	
	1132					18.43	6.96	1.653	0.60	9.8	
	1134					18.57	6.98	1.654	0.59	5.6	
	1138					18.44	6.99	1.648	0.52	-9.6	
	1140					18.47	6.99	1.647	0.51	-10.2	
	1141					18.45	6.99	1.647	0.49	-11.0	
			1145								
GMW-10S	1253	22.61			10-06	16.90	6.67	1.746	1.51	109.5	
	1254					16.82	6.66	1.727	1.42	109.0	
	1255					16.78	6.67	1.715	1.37	108.0	
			1300								

GROUNDWATER SAMPLE COLLECTION LOG [redacted]

[redacted] Date: 7-14-11 DO

Location	Installation Depth (feet bgs)	Recorded TD	Sample Time	Purge Volume	SWL	Low-Flow Field Parameters					
						Temp (°C)	pH	Sp Cond (mS/CM)	Turbidity (DO)	ORP (mV)	Other
GMW-1		21.83	1320		10.19	NO Purge w/	low check	flow :	1" well valve		
GMW-2		21.66	1330		9.05		AA				
MW-2S	1340	22.80			12.09	19.53	6.74	1.633	1.83	57.6	
	1345					17.99	6.60	1.538	1.25	70.2	
	1348					17.94	6.63	1.538	1.19	72.2	
	1350					17.85	6.62	1.531	1.15	74.5	
			1355								
GMW-4		28.97	1405		10.21	1" well, no		low	flow		

GROUNDWATER SAMPLE COLLECTION LOG [redacted]

[redacted] Date: 7-14-14 DO

Location	Installation Depth (feet bgs)	Recorded TD	Sample Time	Purge Volume	SWL	Low-Flow Field Parameters					
						Temp (°C)	pH	Sp Cond (mS/CM)	Turbidity (NTU)	ORP (mV)	Other
GMW-3		10.65	1415		9.79		NO	low flow;		1" well	
GMW-5S	1430	24.84			11.55						
	1435					18.63	7.25	1.306	1.54	-6.6	
	1440					17.76	7.17	1.286	1.27	10.9	
	1445					17.56	7.12	1.271	1.21	11.2	
	1450					17.68	7.12	1.270	1.18	11.5	
			1455								
GMW-9S	1505	22.13			12.04						
	1508					16.14	7.00	1.240	1.47	104.0	
	1510					15.53	6.91	1.199	1.00	105.3	
	1512					15.56	6.87	1.197	0.91	105.0	
	1514					15.57	6.88	1.197	0.90	104.0	
			1515								
GMW-7S	1530	22.39			11.58	14.77	6.61	1.242	1.17	112.4	
	1535					14.67	6.59	1.238	1.00	116.5	
	1540					14.57	6.57	1.235	0.95	120.0	
	1545					14.57	6.54	1.234	0.91	120.5	
			1550								

GROUNDWATER SAMPLE COLLECTION LOG Jul 2 14

[redacted]

Date: 7-15-14 DO

Location	Installation Depth (feet bgs)	Recorded TD	Sample Time	Purge Volume	SWL	Low-Flow Field Parameters					
						Temp (°C)	pH	Sp Cond (mS/CM)	Turbidity (NTU)	ORP (mV)	Other
✓✓ MW-27S	1310	25.31			12.55						
	1315					14.80	6.84	1.166	3.10	102.5	
	1320					15.00	6.48	1.141	1.82	83.1	
	1323					14.97	6.48	1.110	1.69	83.4	
	1326					14.90	6.58	1.103	1.65	80.9	
			1330								
✓✓ MW-6S	1340	~~1400~~ 22.30			11.25						
	1345					14.80	6.90	1.112	1.10	73.0	
	1350					14.78	6.91	1.119	1.07	72.8	
	1355					14.73	6.91	1.122	1.00	70.2	
		1400 →									
✓✓ MW-21	1410	31.81			10.83						
	1415					15.19	6.51	1.378	1.14	133.6	
	1420					15.18	6.51	1.372	0.72	128.3	
	1423					15.19	6.51	1.370	0.70	126.9	
	1426					15.19	6.50	1.369	0.69	125.1	
		1430 →									
✓✓ MW-15	1440	27.98			11.97						
	1445					14.80	6.54	1.159	0.85	156.0	
	1450					14.76	6.47	1.133	0.81	157.1	
	1455					14.79	6.48	1.126	0.80	156.4	
			1500								

GROUNDWATER SAMPLE COLLECTION LOG [redacted]

[redacted]

Date: 7-15-14 DO

Location	Installation Depth (feet bgs)	Recorded TD	Sample Time	Purge Volume	SWL	Low-Flow Field Parameters					
						Temp (°C)	pH	Sp Cond (mS/CM)	Turbidity (NTU)	ORP (mV)	Other
CMW-20S ✓		12.32			11.07						
CMW-13S ✓		NA			NA			LOCKED → padlock no KEY			
6MW-8S ✓	1505	21.97			10.82	15.23	6.74	1.280	1.23	124.3	
	1510					14.94	6.60	1.271	0.82	125.5	
	1515					14.96	6.62	1.274	0.78	124.1	
	1520					14.97	6.62	1.271	0.76	123.6	
			1530								

Geotechnical Services, Inc.

1/0

J. MELLEMA

GROUNDWATER SAMPLE COLLECTION LOG
Quarterly Groundwater Monitoring - 2nd & Kirby
GSI Project Number: 128032

Date: 10-28-14

Location	Installation Depth (feet bgs)	Recorded TD	Sample Time	Purge Volume	SWL	Low-Flow Field Parameters					
						Temp (°C)	pH	Sp Cond (mS/CM)	~~Turbidity (NTU)~~ DO	ORP (mV)	Other
CMW-20S		12.17	—	—	12.00						
CMW-13S		18.51	—	—	13.93						
CMW-10S	Start 1110	19.07			11.71						
	1115				11.75	19.33	6.71	1.503	0.86	148.2	
	1120				11.75	19.62	6.69	1.516	0.46	145.1	
	1125				11.75	19.88	6.70	1.528	0.46	142.4	
	1130		1130	2.5 gal	11.75	19.68	6.70	1.523	0.42	143.2	
CMW-10S	Start 1145	22.24			11.08	18.05	6.62	1.552	1.59	48.6	
	1150				11.13	18.17	6.59	1.510	0.56	81.9	
	1155				11.13	18.33	6.61	1.428	0.42	122.0	
	1158				11.13	18.40	6.62	1.421	0.38	128.7	
	1201				11.14	18.41	6.62	1.418	0.37	130.2	
	1205		1205	3 gal	11.14	18.41	6.62	1.417	0.38	131.1	

mg/L

GROUNDWATER SAMPLE COLLECTION LOG
Quarterly Groundwater Monitoring - 2nd & Kirby
GSI Project Number: 128032

Date: 10/28

Location	Installation Depth (feet bgs)	Recorded TD	Sample Time	Purge Volume	SWL	Low-Flow Field Parameters					
						Temp (°C)	pH	Sp Cond (mS/CM)	Turbidity (NTU)	ORP (mV)	~~Other~~ Iron
GMW-8S	1730	21.98		5 gal	11.93	16.18	6.57	1.239	0.90	145.6	
	1733				11.97	16.19	6.55	1.238	0.88	145.1	
	1736				11.97	16.21	6.53	1.238	0.86	144.6	
	1739				11.97	16.19	6.55	1.236	0.87	142.8	
	1742				11.97	16.19	6.51	1.235	0.87	143.5	
			1745								2.8 mg/L
TMW-2	1750	23.52			10.92	16.32	6.75	1.219	0.80	-17.1	
	1753					16.25	6.74	1.218	0.75	-18.1	
	1756					16.22	6.68	1.216	0.81	-18.0	
	1759					16.22	6.70	1.208	0.79	-17.9	
	1802			3 gal		16.21	6.72	1.201	0.76	-17.5	
			1805								3.3 mg/L
MW-15	1810	27.98			13.07	16.08	6.50	1.315	1.11	106.4	
	1815				13.11	16.05	6.46	1.333	0.81	123.9	
	1820				13.11	16.11	6.47	1.225	0.76	132.1	
	1825		1825	3 gal	13.11	16.10	6.51	1.215	0.75	133.2	
											0.52 mg/L
GMW-9S	~~1830~~	24.92			13.16						
	1835					16.90	6.73	1.196	1.08	90.2	
	1840					16.98	6.87	1.201	0.78	104.5	
	1845					16.97	6.79	1.219	0.73	108.8	
	1850		1850	8 gal		16.95	6.75	1.222	0.71	111.3	

MG/L

GROUNDWATER SAMPLE COLLECTION LOG
Quarterly Groundwater Monitoring - 2nd & Kirby
GSI Project Number: 128032

Date: 10/28

Location	Installation Depth (feet bgs)	Recorded TD	Sample Time	Purge Volume	SWL	Low-Flow Field Parameters					
						Temp (°C)	pH	Sp Cond (mS/CM)	Turbidity (NTU) DO	ORP (mV)	~~Other~~ Iron
6/MW-6S	1615	22.31			12.33	16.73	6.97	1.144	1.21	65.8	
	1620				12.37	17.21	6.92	1.157	0.61	73.7	
	1625				12.37	17.30	6.91	1.159	0.60	73.5	
	1628			4 gal	12.37	17.28	6.98	1.157	0.58	73.4	
			1630								0.63 mg/L
6/MW-6I	1635	47.21			12.38	16.66	6.75	1.361	0.91	111.1	
	1638					16.24	6.71	1.354	0.54	116.5	
	1641					16.22	6.71	1.354	0.51	119.4	
	1644					16.21	6.70	1.353	0.49	119.6	
	1647					16.23	6.69	1.353	0.48	120.2	
			1650								
6/MW-7S	1653	22.40			12.77	16.31	6.51	1.393	0.89	121.4	
	1655				12.80	16.33	6.45	1.381	0.91	117.6	
	1658				12.80	16.27	6.44	1.368	0.88	125.8	
	1703				12.80	16.26	6.44	1.361	0.85	132.6	
			1705	2.5 gal							
MW-21	1710	31.78			11.88	15.99	6.48	1.341	0.72	139.2	
	1713				11.91	16.04	6.48	1.338	0.69	136.8	
	1716				11.92	16.01	6.47	1.335	0.70	136.6	
	1719				11.92	16.02	6.47	1.338	0.71	135.9	
	1722				11.92	16.02	6.48	1.341	0.71	135.1	
			1725	3.5 gal							

mS/L

GROUNDWATER SAMPLE COLLECTION LOG
Quarterly Groundwater Monitoring - 2nd & Kirby
GSI Project Number: 128032

Date: 10/28

Location	Installation Depth (feet bgs)	Recorded TD	Sample Time	Purge Volume	SWL	Low-Flow Field Parameters					Fe Field Readings
						Temp (°C)	pH	Sp Cond (mS/CM)	Turbidity (NTU) DO	ORP (mV)	
GMW-3		NA	—	—	11.41*						
		No	Sample	—	Roots	in	well	@	11.41'		
MW-27S	1445	25.22			13.54	18.0	6.68	1.365	2.53	138.6	
	1450					18.21	6.35	1.405	1.20	146.5	
	1455					17.45	6.37	1.269	0.45	144.0	
	1500					17.40	6.59	1.218	0.40	144.1	
	1505		1505	1 gal		17.39	6.58	1.216	0.40	144.2	0 mg/L
TMW-1	1515	23.49			10.51	17.14	6.74	1.357	2.44	-45.5	
	1520				10.55	16.99	6.74	1.361	1.06	-36.6	
	1525				10.55	17.01	6.75	1.364	1.05	-36.0	
	1530		1530	2.5 gal	10.55	17.02	6.78	1.365	1.05	-35.3	3.30 mg/L
GMW-5S	1545	24.65			13.00	17.70	7.20	1.237	3.89	-21.7	
	1550				13.03	17.75	7.16	1.237	0.95	-8.5	
	1555				13.04	17.81	7.16	1.242	0.51	2.0	
	1600				13.04	17.85	7.17	1.243	0.48	2.1	
	1605				13.04	17.87	7.17	1.243	0.46	2.2	
			1610	2.5 gal							

mg/L

GROUNDWATER SAMPLE COLLECTION LOG
Quarterly Groundwater Monitoring - 2nd & Kirby
GSI Project Number: 128032

Date: 10/28/14

Location	Installation Depth (feet bgs)	Recorded TD	Sample Time	Purge Volume	SWL	Low-Flow Field Parameters					
						Temp (°C)	pH	Sp Cond (mS/CM)	Turbidity (NTU) DO	ORP (mV)	Other
MW-28S	Start 1210	22.85			13.12	18.1	6.67	1.488	1.68	97.4	
	1215				13.16	17.25	6.58	1.473	0.75	78.1	
	1218				13.16	17.19	6.58	1.472	0.68	82.9	
	1221				13.16	17.29	6.58	1.474	0.61	83.8	
	1225		1225	2.5 gal	13.16	17.28	6.59	1.474	0.59	85.5	
GMW-4	[redacted]	24.93			11.31						
	1240				11.36	17.58	6.78	1.525	2.31	4.4	
	1245				11.36	17.35	6.77	1.520	1.28	5.4	
	1250				11.36	17.11	6.65	1.507	0.98	6.4	
	1253				11.36	16.88	6.63	1.495	0.95	5.8	
	1255		1255	2.5 gal	11.36	16.89	6.63	1.493	0.89	5.5	
GMW-1	[redacted]1305	21.81			10.27	17.38	6.69	1.433	1.89	109.6	
	1310				10.25	17.25	6.57	1.436	0.54	128.1	
	1315				10.25	17.27	6.57	1.442	0.49	136.2	
	1320		1320	2.5 gal	10.25	17.28	6.57	1.444	0.48	138.6	
GMW-2	1325	21.65		[redacted]	10.07	16.98	6.83	1.573	7.50	156.8	
	1330				10.10	16.63	6.63	1.579	0.60	149.3	
	1335				10.10	16.54	6.62	1.584	0.55	149.2	
	1340				10.10	16.55	6.62	1.579	0.57	148.9	

Geotechnical Services, Inc.

MS/L

2ND - KIRBY
REMEDIATION
145032

SCIENTISTS: B ORTELA, J. MELLEMA
DRILLERS: COREY LEWIS, CHRIS

TERRA SYSTEMS MICHAEL FREE 484-459-2214

[redacted] (785) 294-8894

MARY DAILY - KDHE

KIM FORBES: FIRE CHIEF 620-644-2871

DAY 1: 8/11/14

- INSTALLED TWO PERMANENT PIEZOMETERS

1	2
SWL: 10.09 ft	SWL: 10.47 ft
TD: 23.44 ft	TD: 23.57

- TERRA SYSTEMS DELIVERED FOUR (4) TANKS w/ EVO ~ 330 GAL PER TANK

DAY 2. 8/12/14

- TOOK SWL + TD FROM 2 WELLS
- CUT DELIVERED WATER METER

Rite in the Rain

INJECTION SITE 1:

TIME:	ACTION	
834	START DRILL - PROBE 1	
837	STOP DRILL	
843	START INJECTIONS (~~30~~ PSI) - 41	IL1-1
920	STOP INJECTION (450 gal)	
942	INJECTION 2	IL1-2
1020	STOP INJECTION	"
1055	START INJECTION (19 PSI)	IL1-3
1115	STOP INJECTION	"
1234	START INJECTION (20 PSI)	IL1-4
1308	STOP INJECTION	"
1324	START INJECTION (20 PSI)	IL1-5
1400	STOP INJECTION	"
1411	START INJECTION (20 PSI)	IL1-6
1449	STOP INJECTIONS	"
1532	START INJECTION (20 PSI)	IL1-7
1615	STOP INJECTION'S	"
0745	START INJECTIONS (20 PSI)	IL1-8
0822	STOP INJECTIONS	"
0842	START INJECTIONS (18 PSI)	IL1-9
0923	STOP INJECTIONS	"
0956	START INJECTIONS	IL1-10
1035	STOP	"

7:00 AM
5:09 PM

MW-1 PURGE 5 GAL

37	700
38	
40	
34	
34	
38	
43	
264 / 7	= 38 min - AVG TIME

INJECTION SITE 2.

TIME	ACTION	
1116	START INJECTIONS	IL2-1
1149	STOP INJECTIONS	"
1322	START INJECTIONS	IL2-2
1400	STOP INJECTIONS	"
1415	START INJECTIONS	IL2-3
1515	STOP INJECTIONS	"
1530	START INJECTIONS	IL2-4
1621	STOP INJECTIONS	"
0735	START INJECTIONS	IL2-5
0800	STOP INJECTIONS	"
0845	START INJECTIONS	IL2-6
0933	STOP INJECTIONS	"
0945	START INJECTIONS	IL2-7
1030	STOP INJECTIONS	"
1225	START INJECTIONS	IL2-8
1317	STOP INJECTIONS	"
1338	START INJECTIONS	IL2-9
1422	STOP INJECTIONS	"
1442	START INJECTIONS	IL2-10
1528	STOP INJECTIONS	"

10 LEFT

AVG POND TIME. 35 MIN

DOWNTIME : 25 MIN

35 MIN PER CELL

1:00 4 DONE AT 4:00

5 TOM

- HIGHER CLAY CONTENT

- TMW-2 PURGE 5 GALLONS

DEVELOPMENT:

- KOHE RFP 5X WELL VOLUME
- TMW1 = 13.35 × (0.041 × 5) = 2.74 GAL
- TMW2 = 13.10 × (0.041 × 5) = 2.68 GAL

PURGED BOTH TO SPECIFIED VOLUME, THEN PURGED UNTIL CLEAR (~5 GALLONS)

"WEEK 0" INTERIM

8

TMW-1 SAMPLE 8/13/14

MIN	DO	ORP	TEMP	pH	CONDUCT
0	61.5%	92.4	17.49	6.75	1408
5	7.9%	88.1	16.54	6.57	1284
10	3.1%	45.2	16.55	6.57	1296
15	2.1	32.8	16.72	6.59	1287
18	2.0	30.7	16.55	6.60	1285
21	2.0	29.9	16.61	6.61	1285

- Sample @ 1500

GMW-27S SAMPLE 8/13/14

MIN	DO	ORP	TEMP	pH	CONDUCT
0	30%	54.7	17.40	6.77	1197
5	14.8	64.3	16.43	6.63	1160
10	10.0	66.5	16.53	6.61	1195
12	7.9	66.7	16.54	6.60	1178
15	7.7	66.1	16.52	6.62	1151
18	7.6	66.0	16.50	6.64	1123

- Sample @ 1530

9

TMW-2 SAMPLE 8/15/14

MIN	DO	ORP	TEMP	pH	CONDUCT
5	9.4%	-14	15.43	6.45	1211
10	4.6	-13.2	15.74	6.49	1206
12	3.9	-11.9	15.79	6.45	1205

- SAMPLE @ 1203

GMW-8S SAMPLE 8/15/14

MIN	DO	ORP	TEMP	pH	CONDUCT
0	28.1	50.1	17.41	6.70	1391
5	3.9	60.9	17.54	6.59	1248
6	3.8	60.3	17.52	6.59	1246
10	3.4	59.9	17.55	6.59	1242

- SAMPLE @ 1235

WEEK 1 INTERIM

GMW -27S 6/22/14

MIN	TEMP	CONDUCT	DO	PH	ORP
0	14.21	1.517	7.7%	6.53	58.5
5	17.20	1.471	10.2%	6.13	69.6
7	17.00	1.452	9.2%	6.09	62.9
9	17.03	1.434	6.3%	6.12	53.0
11	16.53	1.423	9.0%	6.15	49.1
13	16.89	1.419	9.0%	6.18	45.7
15	16.93	1.396	10.5%	6.24	41.9

GMW -6S 6/22/14

MIN	TEMP	CONDUCT	DO	PH	ORP
0	20.72	1.431	10.0	6.72	75.3
5	18.51	1.342	4.4	6.48	60.9
7	16.43	1.337	3.4	6.47	61.4
9	16.48	1.337	2.8	6.48	61.3
11	16.44	1.336	2.3	6.48	60.4
13	16.43	1.335	2.8	6.48	60.4
15					

TMW -1

MIN	TEMP	CONDUCT	DO	PH	~~CONDUCT~~ ORP
0	17.71	1.456	7.4	6.64	21.5
5	16.56	1.378	2.9	6.56	9.5
7	16.92	1.349	2.2%	6.54	7.7
9	17.15	1.345	2.2%	6.53	7.2
11	17.23	1.344	2.3	6.43	12.4
13	17.29	1.346	3.0%	6.46	9.9

TMW-2

MIN	TEMP	CONDUCT	DO	PH	ORP
0	20.81	1.140	47.0	6.83	67.7
5	17.93	1.320	2.6	6.72	73.3
7	18.04	1.324	2.3	6.72	73.3
9	18.01	1.322	2.2	6.71	73.1
11	18.22	1.323	2.2	6.72	73.6
13	17.60	1.317	2.0	6.71	73.0

Rita in the Rain

INJECTION COORDINATES:

IL1-1: 38.05419363°N 97.87491757°W
IL1-2: 38.05414505°N 97.87494156°W
IL1-3: 38.05409769°N 97.87499792°W
IL1-4: 38.05405188°N 97.87503644°W
IL1-5: 38.05401739°N 97.87504847°W
IL1-6: 38.05395506°N 97.87511442°W
IL1-7: 38.05390539°N 97.87514504°W
IL1-8: 38.05386318°N 97.87518740°W
IL1-9: 38.05385944°N 97.87523339°W
IL1-10: 38.05375073°N 97.87527373°W
TMW-1: 38.05374457°N 97.87506457°W
IL2-1: 38.05190460°N 97.87232760°W
IL2-2: 38.05194985°N 97.87229360°W
IL2-3: 38.05194928°N 97.87225365°W
IL2-4: 38.05204555°N 97.87221413°W
IL2-5: 38.05209388°N 97.87216885°W
IL2-6: 38.05214417°N 97.87212670°W
IL2-7: 38.05219090°N 97.87207257°W
IL2-8: 38.05223891°N 97.87203138°W
IL2-9: 38.05228128°N 97.87196343°W
IL2-10: 38.05232478°N 97.87194450°W
MW-27S: 38.05392205°N 97.87527642°W
TMW-2: 38.05210950°N 97.87190244°W
CMW-55: 38.05215714°N 97.87221107°W

WEEK 2 Interim 8/29/14

MW-~~27S~~ SWL: 13.29 TD: 25.09

MIN	TEMP	CONDUCT	DO	PH	ORP
2	18.46	1493	12.1	6.39	30.2
4	18.09	1458	11.4	6.30	29.2
6	17.64	1474	11.3	6.38	32.1
8	17.73	1481	10.4	6.28	32.0
10	17.64	1477	9.5	6.32	27.8
12	17.55	1468	9.0	6.34	29.3
14	17.44	1464	8.6	6.34	33.0
16	17.58	1461	8.1	6.34	34.7

TMW-1 SWL: 10.27 TD: 23.45

MIN	TEMP	CONDUCT	DO	PH	ORP
2	18.78	1497	27.0	6.59	19.4
4	18.55	1451	6.4	6.55	14.7
6	18.13	1415	5.8	6.51	14.0
8	18.00	1401	5.9	6.46	22.2
10	17.94	1393	6.2	6.40	28.2
12	17.84	1390	6.58	6.41	28.8
14	17.69	1384	6.7	6.41	28.0
16	17.65	1376	6.5	6.42	27.9

TEMP: °C CONDUCT: $\frac{mS}{cm}$ DO: %

Rain in the Rain

WEEK 2 Interim 8/29/14

GMW-85 SWL: 11.67 TD: 22.00

MIN	TEMP	CONDUCT	DO	PH	ORP
2	15.67	1357	13.5	6.42	116.4
4	14.49	1342	8.1%	6.58	116.7
6	14.72	1347	7.3	6.55	117.5
8	14.54	1351	7.2	6.54	116.9
10	14.45	1347	6.9	6.54	117.2

TMW-2 SWL: 10.66 TD: 23.52

MIN	TEMP	CONDUCT	DO	PH	ORP
2	16.56	1356	14.1	6.65	92.4
4	14.51	1348	6.7	6.63	92.1
6	15.23	1337	5.2	6.61	92.6
8	17.15	1318	4.8	6.56	94.1
10	14.17	1324	5.4	6.57	94.6

EQUIP PEGASUS - ATHENA PEGS PUMP

TRIMBLE - GEO XT GPS

MW 275: 2.34 toc TMW 1: 5.32 toc

SWL = 13.31

TD = 25.21

-2.98m DIFFERENCE

WEEK 4 Interim

9/12/14

MW-275

MIN	TEMP	CONDUCT	DO	PH	ORP
0	15.24	1427	14.9	4.41	151.1
5	15.28	1422	4.61	4.37	135.3
7	15.34	1423	3.5%	4.37	141.0
9	15.34	1423	2.9%	4.34	136.5
11	15.33	1422	2.6%	4.34	119.0
13	15.35	1421	2.3%	4.34	100.5
15	15.35	1420	2.3%	4.34	90.2
17	15.37	1415	2.1%	4.37	79.5
19	15.33	1412	2.0%	4.34	69.4
21	15.29	1408	2.0%	4.37	60.2
23	15.24	1404	2.0	4.37	53.8
25	15.27	1395	1.7%	4.37	44.4
27	15.25	1382	1.4%	4.37	43.1
29	15.20	1374	1.5%	4.37	49.1
31	15.24	1347	1.4%	4.32	48.5
33	15.29	1340	1.4	4.37	42.0

Week 4 Info

TMW -1 SWL = 10.24 TD: 23.45

MIN	TEMP	CONDUCT	DO	PH	ORP
0	14.03	1328	51.1	6.40	45.0
5	15.44	1328	15.7	6.34	7.7
7	15.40	1324	17.8	6.34	7.5
9	15.37	1319	17.3	6.35	9.9
11	15.37	1313	15.0	6.34	11.2
13	15.35	1307	26.0	6.34	10.1
15	15.34	1304	14.8	6.34	10.4
17	15.30	1301	19.8	6.34	10.5

GMW - 55 : 3.28 TOC

TMW - 2 : 4.39 TOC

- 2.89 ft TOC DIFFERENT

GMW - 55 : SWL: 11.73 TD: 21.99

MIN	TEMP	CONDUCT	DO	PH	ORP
0	15.18	1158	47.0	6.37	260.0
5	15.07	1145	5.2	6.34	132.8
7	15.04	1144	4.5	6.34	126.5
9	15.04	1143	3.5	6.34	113.2
11	15.07	1142	2.9	6.34	101.6
13	15.09	1142	3.3	6.34	91.0
15	15.09	1141	2.4	6.34	82.4
17	15.11	1140	2.7	6.34	76.2
19	15.11	1140	2.9	6.34	70.6
21	15.11	1139	2.3	6.34	66.0
23	15.11	1137	1.8	6.34	60.7
25	15.07	1136	2.1	6.34	56.5
27	15.07	1135	2.0	6.34	54.5
29	15.08	1135	1.7	6.34	51.8
31	15.06	1133	1.6	6.34	46.5
33	15.07	1133	1.4	6.34	45.3
35	15.08	1133	1.4	6.34	36.8
37	15.08	1132	1.5	6.32	26.4
39	15.04	1131	1.4	6.37	29.8
41	15.04	1131	1.5	6.37	25.4
43	15.04	1130	1.4	6.37	19.7
45	15.07	1130	1.4	6.37	17.9

WEEK 4 Interim (cont.)

TMW-2 | Rec: 10.74 | TD: 23.52

min	TEMP	CONDUCT	DO	PH	ORP
0	14.93	1154	56.0	6.37	150.0
5	14.87	1147	7.3	6.38	92.7
7	14.87	1145	4.6	6.38	83.4
9	14.85	1142	3.3	6.39	73.4
11	14.84	1140	2.1	6.39	60.3
13	14.84	1135	2.1	6.39	52.6
15	14.83	1134	2.0	6.39	46.1
17	14.84	1136	2.2	6.39	40.6
19	14.85	1135	1.7	6.39	32.8
21	14.82	1133	1.5	6.39	24.7
23	14.80	1131	1.4	6.39	20.7
25	14.78	1129	1.3	6.39	15.3
27	14.76	1128	1.2	6.39	16.4
29	14.75	1127	1.1	6.39	10.0
31	14.75	1126	1.1	6.39	12.0
33	14.74	1125	1.1	6.39	9.0
35	14.77	1124	1.0	6.39	6.3
37	14.77	1123	1.0	6.38	12.9
39					
41					

Rite in the Rain

APPENDIX E

Monitoring Well Installation Records

GSI Engineering

A division of Alt & Witzig Engineering

Boring Log / Monitoring Well Schematic TMW-1

DATE DRILLED	LOCATION OF WELL	STATE I.D. No.	DRILLER	GEOLOGIST
08/12/14	2nd & Kirby	NA	C. Lewis	B. Ortega

TYPE OF SURFACE	DRILLING METHOD / SAMPLING METHOD	DRILL RIG
Soil	Direct Push / 3.5"Diam Dual Tube	Geoprobe 6620DT

DEPTH (feet)	SAMPLE NO. & TYPE*	"N" (blows/ft)	REC. (%)	PID (ppm)	GRAPHIC LOG	MATERIAL DESCRIPTION
0	DT-1					SILTY CLAY- brown, damp, soft to firm, trace roots
						SAND- well sorted, brown, loose, fine to medium grained
5	DT-2					
	DT-3					
10						- damp to moist - wet
	DT-4					
15	DT-5					SAND- poorly sorted, brown, loose, fine to coarse grained
20	DT-6					- trace gravel
25						Bottom of Boring @ 24'
30						

NOTES:

***SAMPLE TYPE**

Shelby Tube | Split Spoon | Auger | NX Core | Continuous Sampler | Macro-Core

WELL CONSTRUCTION DETAILS

DEPTH (feet) | SCHEMATIC | CONSTRUCTION DETAILS

COORDINATES

Latitude: N 38.05376857
Longitude: W 97.87506457

ELEVATION

Casing: 1517.09
Pad:

PROTECTIVE COVER

Type: Flushmount manhole
Size: 7"x10"

PAD

Type: Concrete
Size: 2'x2'

WELL SEAL/GROUT

Type: Bentonite
Amount: 25 lbs
Water:

WELL SEAL/GROUT

Type: NA
Amount:
Water:

WELL PACK

Type: Sand
Amount:

RISER

Type: PVC
Schedule: 40
Inside Dia.: 1"

SCREEN

Type: PVC
Schedule: 40
Slot: 0.010
Inside Dia.: 1"

WATER LEVEL MEASUREMENTS

While Drilling	End of Drilling	Static Level	Static Elev.	Datum	Static Date
NA	10.77	10.75	1506.34'	TOC	08/12/14

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

BY: sw APPROV.: bo

GSI Engineering
4503 East 47th Street South
Wichita, KS 67210
316-554-0725

Groendyke Transport, Inc.
2nd & Kirby
Hutchinson, Kansas

BORING LOG / MONITOR WELL SCHEMATIC

PROJECT NO.: 148032

Boring Log / Monitoring Well Schematic TMW-2

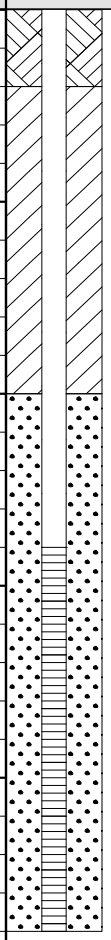
DATE DRILLED	LOCATION OF WELL	STATE I.D. No.	DRILLER	GEOLOGIST
08/13/14	2nd & Kirby	NA	C. Lewis	B. Ortega

TYPE OF SURFACE	DRILLING METHOD / SAMPLING METHOD	DRILL RIG
Soil	Direct Push / 3.5"Diam Dual Tube	Geoprobe 6620DT

DEPTH (feet)	SAMPLE NO. & TYPE*	"N" (blows/ft)	REC. (%)	PID (ppm)	GRAPHIC LOG	MATERIAL DESCRIPTION
0	DT-1					SILTY CLAY- brown, damp, soft to firm, trace roots
						SAND- well sorted, brown, loose, fine to medium grained
5	DT-2					
	DT-3					
10						- damp to moist
	DT-4					- wet
15	DT-5					SAND- poorly sorted, brown, loose, fine to coarse grained
20	DT-6					- trace gravel
25						Bottom of Boring @ 24'
30						

WELL CONSTRUCTION DETAILS

SCHEMATIC



CONSTRUCTION DETAILS

COORDINATES

Latitude: N 38.05210950
Longitude: W 97.87190248

ELEVATION

Casing: 1516.39
Pad:

PROTECTIVE COVER

Type: Flushmount manhole
Size: 7"x10"

PAD

Type: Concrete
Size: 2'x2'

WELL SEAL/GROUT

Type: Bentonite
Amount: 25 lbs
Water:

WELL SEAL/GROUT

Type: NA
Amount:
Water:

WELL PACK

Type: Sand
Amount:

RISER

Type: PVC
Schedule: 40
Inside Dia.: 1"

SCREEN

Type: PVC
Schedule: 40
Slot: 0.010
Inside Dia.: 1"

NOTES:

***SAMPLE TYPE**

Shelby Tube | Split Spoon | Auger | NX Core | Continuous Sampler | Macro-Core

WATER LEVEL MEASUREMENTS

While Drilling	End of Drilling	Static Level	Static Elev.	Datum	Static Date
NA ▽	11.12 ▽	11.1 ▽	1505.29'	TOC	08/13/14

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

BY: sw APPROV.: bo

GSI Engineering
4503 East 47th Street South
Wichita, KS 67210
316-554-0725

Groendyke Transport, Inc.
2nd & Kirby
Hutchinson, Kansas

BORING LOG / MONITOR WELL SCHEMATIC

PROJECT NO.: 148032

GSI Job No. 148032 **TMW-1**

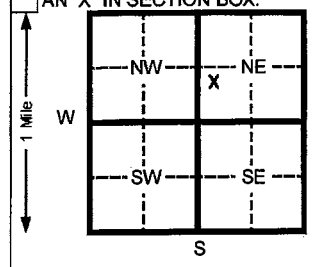
WATER WELL RECORD Form WWC-5 KSA 82a-1212 ID No. _____

1 LOCATION OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
County: **Reno**	**NW** ¼ **SW** ¼ **NE** ¼	**16**	T **23** S	R **5** W

Distance and direction from nearest town or city street address of well if located within city?
2nd & Kirby – Hutchinson

2 WATER WELL OWNER: **Groendyke Transport, V&M Transport, Inc.**
RR#, St. Address, Box # : **2701 E. 4th Ave.** Board of Agriculture, Division of Water Resources
City, State, ZIP Code : **Hutchinson, KS 67501** Application Number:

3 LOCATE WELL'S LOCATON WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL **24** ft. ELEVATION: **1517.09 (TOC)**
Depth(s) Groundwater Encountered 1 **10.77** ft. 2 _____ ft. 3 _____ ft.
WELL'S STATIC WATER LEVEL **10.75** ft. below TOC measured on mo/day/yr **08/12/14**
Pump test data: Well water was _____ ft. after _____ hours pumping _____ gpm
Est. Yield _____ gpm: Well water was _____ ft. after _____ hours pumping _____ gpm
Bore Hole Diameter **3.5** in. to **24** ft. and _____ in. to _____ ft.
WELL WATER TO BE USED AS: 1 Domestic 3 Feed lot 5 Public water supply 6 Oil field water supply 7 Lawn and garden (domestic) 8 Air conditioning 9 Dewatering **10 Monitoring well** 11 Injection well 12 Other (Specify below) 2 Irrigation 4 Industrial
Was a chemical/bacteriological sample submitted to Department? Yes ____ No **X** If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes ____ No **X**

OFFICE USE ONLY

5 TYPE OF BLANK CASING USED: 1 Steel **2 PVC** 3 RMP (SR) 4 ABS 5 Wrought Iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)
CASING JOINTS: Glued ____ Clamped ____ Welded Threaded **Flush**
Blank casing diameter **1** in. to **14** ft., Dia _____ in. to _____ ft., Dia _____ in. to _____ ft.
Casing height above land surface **0** in., weight **0.703** lbs./ft. Wall thickness or gauge No. **SCH. 40**
TYPE OF SCREEN OR PERFORATION MATERIAL: **7 PVC** 10 Asbestos-cement
1 Steel 3 Stainless steel 5 Fiberglass 8 RMP (SR) 11 Other (specify) _____
2 Brass 4 Galvanized steel 6 Concrete tile 9 ABS 12 None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
1 Continuous slot **3 Mill slot** 6 Wire wrapped 9 Drilled holes
2 Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify) _____
SCREEN-PERFORATED INTERVALS: From **14** ft. to **24** ft. From _____ ft. to _____ ft.
From _____ ft. to _____ ft. From _____ ft. to _____ ft.
GRAVEL PACK INTERVALS: From **10** ft. to **24** ft. From _____ ft. to _____ ft.
From _____ ft. to _____ ft. From _____ ft. to _____ ft.

T R

6 GROUT MATERIAL: 1 Neat cement 2 Cement grout **3 Bentonite** 4 Other _____
Grout Intervals From **2** ft. to **10** ft. From _____ ft. to _____ ft. From _____ ft. to _____ ft.
What is the nearest source of possible contamination:
1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/ Gas well 16 Other (specify below)
Direction from well? How many feet?

FROM	TO	CODE	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	2		**Silty Clay, brown, trace roots**			
2	15		**Sand, well sorted, brown, fine to medium grained**			
15	24		**Sand, poorly sorted, brown, fine to coarse grained**			
						GPS: (Datum WGS84)
						Latitude: N 38.05376857
						Longitude: W 97.87506457

SEC

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was **(1) constructed**, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/yr) **08/12/14** and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. **531** This Water Well Record was completed on (mo/day/yr) **11/12/14**
under the business name of **GSI Engineering, LLC** by (signature)

INSTRUCTIONS:. Please fill in blanks and circle the correct answers. Send three copies to Kansas Department of Health and Environment, Bureau of Water, 1000 S W Jackson St., Ste. 420, Topeka, Kansas 66612-1367. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

GSI Job No. 148032 **TMW-2**

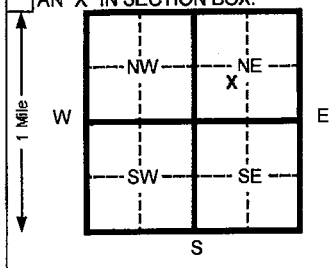
WATER WELL RECORD Form WWC-5 KSA 82a-1212 ID No. _____

1 LOCATION OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
County: **Reno**	**NE** ¼ **SW** ¼ **NE** ¼	**16**	T **23** S	R **5** W

Distance and direction from nearest town or city street address of well if located within city?
2nd & Kirby – Hutchinson

2 WATER WELL OWNER: **Groendyke Transport, V&M Transport, Inc.**
RR#, St. Address, Box # : **2701 E. 4th Ave.** Board of Agriculture, Division of Water Resources
City, State, ZIP Code : **Hutchinson, KS 67501** Application Number:

3 LOCATE WELL'S LOCATON WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL **24** ft. ELEVATION: **1516.39 (TOC)**
Depth(s) Groundwater Encountered 1 **11.12** ft. 2 _____ ft. 3 _____ ft.
WELL'S STATIC WATER LEVEL **11.1** ft. below TOC measured on mo/day/yr **08/12/14**
Pump test data: Well water was _____ ft. after _____ hours pumping _____ gpm
Est. Yield _____ gpm: Well water was _____ ft. after _____ hours pumping _____ gpm
Bore Hole Diameter **3.5** in. to **24** ft. and _____ in. to _____ ft.
WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well
1 Domestic 3 Feed lot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)
2 Irrigation 4 Industrial 7 Lawn and garden (domestic) **10 Monitoring well**
Was a chemical/bacteriological sample submitted to Department? Yes _____ No **X** If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes _____ No **X**

5 TYPE OF BLANK CASING USED: 5 Wrought Iron 8 Concrete tile CASING JOINTS: Glued _____ Clamped _____
1 Steel 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below) Welded
2 PVC 4 ABS 7 Fiberglass _____ Threaded **Flush**
Blank casing diameter **1** in. to **14** ft., Dia _____ in. to _____ ft., Dia _____ in. to _____ ft.
Casing height above land surface **0** in., weight **0.703** lbs./ft. Wall thickness or gauge No. **SCH. 40**
TYPE OF SCREEN OR PERFORATION MATERIAL: **7 PVC** 10 Asbestos-cement
1 Steel 3 Stainless steel 5 Fiberglass 8 RMP (SR) 11 Other (specify) _____
2 Brass 4 Galvanized steel 6 Concrete tile 9 ABS 12 None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
1 Continuous slot **3 Mill slot** 6 Wire wrapped 9 Drilled holes
2 Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify) _____
SCREEN-PERFORATED INTERVALS: From **14** ft. to **24** ft. From _____ ft. to _____ ft.
From _____ ft. to _____ ft. From _____ ft. to _____ ft.
GRAVEL PACK INTERVALS: From **10** ft. to **24** ft. From _____ ft. to _____ ft.
From _____ ft. to _____ ft. From _____ ft. to _____ ft.

6 GROUT MATERIAL: 1 Neat cement 2 Cement grout **3 Bentonite** 4 Other _____
Grout Intervals From **2** ft. to **10** ft. From _____ ft. to _____ ft. From _____ ft. to _____ ft.
What is the nearest source of possible contamination:
1 Septic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well
2 Sewer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/ Gas well
3 Watertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage 16 Other (specify below)
13 Insecticide storage
Direction from well? How many feet?

FROM	TO	CODE	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	2		**Silty Clay, brown, trace roots**			
2	15		**Sand, well sorted, brown, fine to medium grained**			
15	24		**Sand, poorly sorted, brown, fine to coarse grained**			
						GPS: (Datum WGS84)
						Latitude: N 38.05210950
						Longitude: W 97.87190248

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was **(1) constructed**, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/yr) **08/13/14** and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. **531** This Water Well Record was completed on (mo/day/yr) **11/12/14**
under the business name of **GSI Engineering, LLC** by (signature) _____

INSTRUCTIONS:. Please fill in blanks and circle the correct answers. Send three copies to Kansas Department of Health and Environment, Bureau of Water, 1000 S W Jackson St., Ste. 420, Topeka, Kansas 66612-1367. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

OFFICE USE ONLY T R SEC

APPENDIX F

KDHE Underground Injection Control (UIC) Application

GSI Engineering

A division of Alt & Witzig Engineering

GSI Engineering
A division of Alt & Witzig Engineering

15012 W. 106th Street
Lenexa, KS 66215
913.495.2360 tel
913.495.2360 fax
www.gsinetwork.com

July 29, 2014

Ms. Ms. Cynthia Khan, P.G.
Kansas Department of Health and Environment
Bureau of Water – Geology Section
Underground Injection Control Program
1000 SW Jackson Street, Suite 420
Topeka, Kansas 66612-1367

RE: CLASS V UNDERGROUND INJECTION CONTROL APPLICATION FOR AUTHORIZATION TO INJECT REMEDIAL COMPOUNDS IN CONJUNCTION WITH A GROUNDWATER REMEDIATION PROJECT

KDHE 2nd and Kirby Site, Hutchinson, Kansas
Consent Order Number 99-E-0209 / BER Project Code C2-078-70770

Dear Ms. Khan:

GSI Engineering, LLC ("GSI") is pleased to submit this application for the underground injection of emulsified vegetable oil (EVO) in support of an ongoing KDHE, Bureau of Environmental Remediation (BER) remediation project. BER has approved our remedial design to enhance the chemical and biological degradation of chlorinated solvents in groundwater. Our responses to each required application item are detailed below:

1. KDHE 2nd & Kirby site – BER Project Code: C2-078-70770.

   County Description of Injection Site:

Parcel ID:	0781351601001002020
Address:	00000 E 4TH AVE, Hutchinson, KS 67501
Legal:	EATON, S16, T23, R05W, LOT 1 BLK 1 EXC N 436.68 FT

   Groendyke Transport, Inc. as the operator ("Groendyke") and V & M Transport, Inc ("V & M") as the property owner have entered into a Consent Order with KDHE (Case No. 99-E-0209). Proposed injection points are located downgradient of the Groendyke facility on property owned by the City of Hutchinson.

2. CITY OF HUTCHINSON (owner of injection site)
   P.O. Box 1567
   Hutchinson, KS 67505-1567
   City Utilities: (620) 694-2624 / City Fire Department: (620) 694-2871

   V&M TRANSPORT, INC (owner of release site)
   P.O. Box 536
   Hutchinson, KS 67504-0536
   (620) 662-7281

3. Area 1 Injections: N 38.053906
   W 97.875011

   Area 2 Injections: N 38.052111
   W 97.872135

   Attachment A provides site diagrams illustrating specific injection points.

4. BER correspondence documenting approval of remedial design is provided as Attachment B.

5. The 2nd and Kirby intersection is within a larger area of groundwater contamination known as 4th and Carey site. A potential source of trichloroethylene (TCE) in groundwater was identified near the Groendyke facility in 1998-1999 during investigation of the larger site. Groendyke and the property owner V & M Transport subsequently entered into a Consent Order with KDHE-BER to address the TCE source, which appeared to originate near the intersection of 2nd & Kirby. Site investigation and monitoring data over time continue to indicate persistent TCE impacts to groundwater above the applicable KDHE Tier 2 risk-based cleanup standards.

   Groendyke has operated a truck transportation facility at the 2nd & Kirby intersection since 1955. Groendyke operations on site include parking, truck staging/dispatching areas, and light vehicle maintenance facilities. In conjunction with maintenance operations, various solvents have been used at the facility over time. These include benzene, methyl-ethyl ketone (MEK), tetrachloroethylene (PCE), and TCE. The spent solvent is contained on site and routinely recovered by Safety-Kleen Systems, Inc. for recycling. KDHE records do not document any known solvent releases; however, groundwater conditions are consistent with these historical operations and the documented use of chlorinated solvents at the facility.

6. The proposed underground injections will be performed using direct-push methods and Geoprobe® screen-point technology. Attachment C provides a schematic illustrating the proposed injection point design.

7. The proposed injections will occur in shallow groundwater and the unconsolidated deposits of the Equus Beds system. This system consists of alluvial deposits that underlie and border the Arkansas River. The water table in the Equus Beds aquifer varies from as little as 10 feet below ground surface (bgs) near the Arkansas River to 300 feet in areas downstream of Hutchinson. Its saturated thickness in the vicinity of south Hutchinson is approximately 40 to 50 feet, or in the general range of 10 to 60 feet bgs. The base of this shallow aquifer is predominantly the Ninnescah Shale, which serves as an aquitard separating shallow groundwater from deeper bedrock systems.

   The Equus Beds system is generally characterized as a slow moving aquifer with a groundwater velocity of 300 to 500 feet per year (KGS, 1983). Variable pump test and hydraulic conductivity data for the area suggest high velocity conditions may exist in localized areas within and surrounding the subject site. Considering these data, groundwater velocity may approach or exceed 1,000 feet per year under high-flow conditions.

   Site-specific groundwater flow is to the southeast parallel to the direction of the Arkansas River. Hydraulic gradients generally range from 0.0007 to 0.001 ft/ft; however, flow lines may be distorted directly south and southwest of the Groendyke facility. In these instances, the hydraulic gradient may be as high as 0.002 ft/ft.

8. Depth to shallow ground water over the site generally ranges from 8 to 14 feet bgs. The proposed injection interval at each location will extend from approximately 12 to 28 feet bgs to address the most concentrated areas of impact, as determined through ongoing monitoring. Injections beyond 28 feet bgs are not proposed due to the absence of TCE in the intermediate monitoring wells.

9. Injection Procedures. GSI will apply direct-push methods (Geoprobe® Model 6620 or equivalent) to hydraulically advance injection borings and introduce chemical amendments to groundwater. Injection borings will be advanced, retracted, and subsequently abandoned with bentonite following the baseline direct-push operations presented in KDHE-BER approved work plans. Proposed injection formations are illustrated in Attachment A. Both formations will comprise a total of 22 direct-push injection points.

   The advancing tip of the Geoprobe® tool string will be equipped with a pressure-activated, 360 degree injection probe or screen-point to distribute the amendments in-situ at specific subsurface intervals. Each injection boring will be advanced to approximately 28 feet bgs, then retracted at intervals of approximately 2-4 feet for “bottom-up” injections. This process will continue upward to a depth of approximately 12 feet bgs (i.e. injection interval of 16 feet).

   Groundwater amendments will be introduced as liquid water/product blends through a batch tank and feed line at the surface. A Geoprobe® model GP350 or GP800 Injection Machine, or technical equivalent will be used to inject the materials through positive pressure generated from a surface pump or auxiliary hydraulics on the drill rig. The material will be delivered through nylon tubing extending from the machine, through the tool string, and into

the injection probe for subsurface distribution. The tool string will be equipped with a pressure-activated check valve to prevent back-flow of the injection material.

Based on documented subsurface permeability and equipment specifications, the chemical amendment and water blend will be injected at a maximum surface pressure no greater than 50 psi, or approximately 10 gallons per minute (gpm) at each injection interval. GSI will maintain a surface injection pressure no greater than 50 psi based on KDHE requirements. These conditions should be readily achieved due to the high-permeability aquifer. In addition, the surface injection pressure will be continuously monitoring using surface pressure gauges on the proposed pump equipment. If injection pressures approaching 50 psi are observed, the estimated 10 gpm injection will be modified accordingly.

10. Injection Compounds. GSI proposes to inject proprietary, commercial-grade emulsified vegetable oil (EVO) as the chemical amendment to enhance the availability of hydrogen and electron donor in the aquifer. Each batch of EVO will contain 60 percent (by weight) food grade vegetable oil enhanced with sodium lactate, Vitamin B_{12} and/or proprietary nutrients to further enhance biodegradation. GSI proposes a relatively larger mean droplet size of ~5 microns to better adhere to soil particles in high permeability conditions. Lecithin may be added to further increase adsorption and long-term availability of electron donor for up to five years. Attachment D provides the EVO product specifications.

    Clean dilution water at a water to EVO ratio of approximately 10:1 will be added to each batch of chemical amendment. This approach will support the overall injection process and increase subsurface distribution. As added measures, additional dilution water and/or inert nitrogen gas may be introduced with or following the EVO amendment to further enhance subsurface distribution. This process effectively "stirs" the reducing agents within the aquifer allowing a more complete distribution. Dilution water will be obtained from a monitored municipal water source accessible on site.

    If used, nitrogen gas injections would be performed consistent with the direct-push methods proposed for liquid amendments. Gas would be implemented through a sealed pressure line and a commercially-provided nitrogen gas tank at similar or slightly reduced injection pressures. Proprietary designs may used to supplement the delivery process.

11. Injection Volume. Considering the clean water dilution, the EVO-water blend will be injected at a rate of approximately 25 to 30 gallons per vertical foot within the treatment interval – i.e. 2.5 to 3 gallons of EVO product per vertical foot. This rate has been projected based on estimated subsurface resistance and dispersion, KDHE surface pressure requirements, known geochemical conditions, and related stoichiometric calculations for electron donor demand. The injection rate is also supported by commercial volume calculators available through the EVO providers.

A total of 22 injection points are proposed in two barrier formations as previously defined. Given the proposed vertical treatment interval of 16 feet per location, the following outlines the amount of remedial compound to be injected:

Description	EVO Volume[1] (gallons)	EVO-Water Dilution[2] (gallons)	EVO by Weight[1] (pounds)
Each Location	40-48	400-480	324-388
Each Barrier Formation (11 locations)	440-528	4400-5280	3560-4272
Total Injections (2 formations)	880-1056	8800-10560	7119-8543

NOTES:
[1] EVO product only before dilution; weight based on manufacturer's labeled density of 8.09 lb/gallon
[2] Total injection volume following water to EVO batch dilution of 10:1

12. Injection Frequency. The injection work is proposed as a single event. We anticipate completion of 3 to 5 injection points per day of field work. GSI has scheduled a tentative start date of August 11, 2014. All injection work will be completed within two weeks of the initial field mobilization.

    If necessary based performance monitoring, additional injections may be performed using similar procedures. GSI will submit an amended application for BOW review prior to any expanded injection work.

13. Plugging Procedures. GSI will plug each injection point with bentonite following the one-time EVO injections. Excluding the expendable metal tip of the screen point, all equipment and supplies will be completely removed from each location. The screen-point borings will then backfilled to the surface with bentonite chips. Surface areas and pavements will be restored and patched accordingly. Attachment C provides a schematic illustrating the proposed injection points following plugging.

14. Remediation Chemistry & Biological Processes. Various species of naturally occurring bacteria derive energy from breaking the carbon to chlorine bond through a process known as reductive dehalogenation. This process reduces TCE (an electron acceptor) using electrons from an exogenous donor, resulting in the sequential removal of chlorine atoms. Intermediates of this sequential reaction are the compounds cis-1,2-dichloroethylene (cDCE), and vinyl chloride (VC), with non-toxic ethene as the end product. Inorganic chlorine is released as the byproduct.

    In contact with groundwater, the emulsified oils are fermented produce molecular hydrogen (H_2) and acetate as electron donors. As the oxygen is depleted, the hydrogen and acetate become available as an energy source for reducing anaerobic bacteria. Reducing conditions generally progress through more efficient electron acceptors such as nitrate (reduced to nitrite) and ferric iron (reduced to ferrous) before significant dechlorination of TCE can occur.

EVO as a concentrated electron donor also stimulates abiotic processes which further accelerate intermediate reactions, particularly in the TCE to cDCE reduction.

The EVO injections are designed to produce localized groundwater conditions conducive to the chemical and biological processes outlined above. Specifically, the EVO amendments will manipulate groundwater chemistry through reduced oxidation-reduction potential (ORP) and depleted levels of dissolved oxygen, nitrate, sulfate, and other competing electron acceptors. Accordingly, the EVO injection volume has been predicted based on the stoichiometric demand exerted by the known quantities of these electron acceptors.

We appreciate the opportunity to support this project. Please contact me directly at (913) 495-2360 or at bconrad@gsinetwork.com if you have questions or wish to discuss our proposed remediation work in greater detail.

Sincerely,
GSI ENGINEERING, LLC

Brian M. Conrad
Manager, Kansas City Operations

Attachment A – Site Diagrams
Attachment B – KDHE Approval (BER)
Attachment C – Injection & Plugging Diagrams
Attachment D – Product Specifications

60% SRS®-FRL Large Droplet Emulsified Vegetable Oil (EVO) Substrate for Maximum Retention

United States Patent# RE40,448

The anaerobic bioremediation process uses native or introduced microorganisms (*Dehalococcoides*) to degrade chlorinated solvents such as tetrachloroethene (PCE) and trichloroethene (TCE) to innocuous end products including ethene and ethane. Terra Systems patented **SRS®-FRL** Large Droplet Emulsified Vegetable Oil Substrate includes an anionic emulsifier, which sticks to soil particles and is specifically designed when adherence to the formation is key to making contact with the bacteria. It is particularly useful in high groundwater flow formations such as fractured bedrock formations and is added to the groundwater to rapidly generate reducing conditions and provide the necessary carbon and hydrogen to support biodegradation of the chlorinated solvents.

Table I: SRS®-FRL Large Droplet Emulsified Vegetable Oil Substrate Specifications

Ingredient	Percent	Description	Benefit
Food Grade U.S. Grown Soybean Oil	60%	Terra Systems operates its own state-of-the-art manufacturing facility.	Long lasting source of carbon and hydrogen, consistent product quality, uniform droplet size, neutral pH, QA/QC lab on floor to check product before shipment.
Food Grade Sodium or Potassium Lactate	4%	Rapidly biodegradable soluble substrate	Rapidly generate anaerobic conditions
Proprietary Food Grade Nutrients	<1%	Proprietary organic and inorganic nutrients such as yeast extract, nitrogen and phosphorus.	Nutrients have been demonstrated to support the growth of the anaerobic microbial population.
Proprietary Food Grade Emulsifiers and Preservatives	7.5%	Proprietary anionic emulsifier	Maximum retention in high groundwater flow-rate aquifers
Vitamin B_{12}	<1%	At least 250 µg/L of Vitamin B_{12}	He et al. 2007 demonstrated Vitamin B_{12} to be an important micronutrient to enhance dechlorination activity with 25 µg/L providing maximum stimulation
Median Oil Droplet Size (microns)	NA	5 µm	Maximum retention in high groundwater flow-rate aquifers
pH	6.5 - 7	6.5 - 7	Optimum microbial activity

Application: Terra Systems **patented**, nutrient enriched, proven slow release SRS®-FRL **large droplet** emulsified vegetable oil substrate with an **anionic emulsifier** is used when a long lasting carbon substrate is desired that provides maximum retention in high groundwater flow-rate aquifers. SRS®-FRL sticks to soil particles and is specifically designed when adherence to the formation is key to making contact with the bacteria.

130 Hickman Road – Suite 1 – Claymont – Delaware – 19703
For More Information Call Michael Free at 302-798-9553 or Email: mfree@terrasystems.net

Customers: SRS®-FRL is used extensively by consultants working with the Air Force, DOD, Navy, and EPA, current and former drycleaners, semiconductor plants and private firms to remediate chlorinated solvent sites and is designed for fractured rock formations, PRBs and high groundwater flow-rate aquifers. SRS®-FRL releases bio-available hydrogen over a period of 3 to 5 years thus enhancing the long-term anaerobic biodegradation of the chlorinated solvents and reducing the frequency of reinjection.

Manufactured vs. Field Emulsion

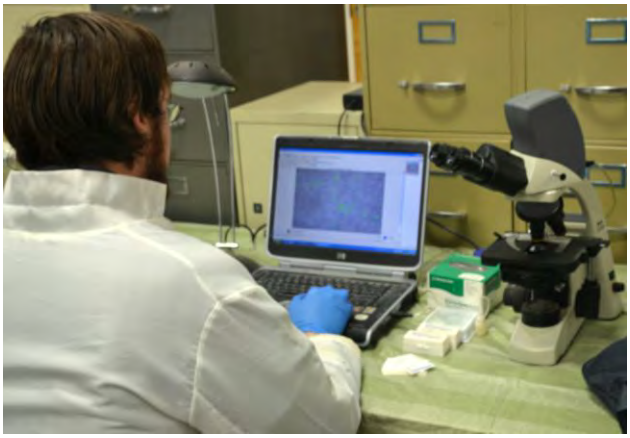
In the early days of in-situ bioremediation when Terra Systems first patented the technology, it was common to bring the water, emulsifiers, oil, and other ingredients to the site and using trash or other pumps to mix the ingredients together to form an emulsion. It soon became apparent that poor emulsion consistency and a broad range of droplet sizes resulted in inadequate and uneven distribution when injected. This resulted in higher long-term costs due to higher reinjection frequency and higher substrate volumes to adequately make contact with the COC.

Don't be "***penny wise and pound foolish***".

Consider:

- ✓ The labor and equipment time and cost of mixing in the field.
- ✓ The need to mix the nutrients and Vitamin B_{12} longer to achieve consistency.
- ✓ The cost of inadequate distribution due to droplet size and emulsion inconsistency
- ✓ The inability to accurately determine if you have 100% emulsification.
- ✓ The lack of QA/QC in the field

- Terra Systems owns and operates a state of the art US based manufacturing plant with an in-house quality control laboratory for strict quality assurance of the emulsion, droplet size and pH.
- SRS®-FRL arrives at the site "***injection ready***" with all the ingredients – Vitamin B_{12}, proprietary nutrients, sodium or potassium lactate and anionic emulsifier(s) already blended together.
- At the PM's request Terra Systems will blend 2-8 g/L of sodium bicarbonate into the SRS®-FRL during manufacturing to counter the acids produced during the fermentation process in the aquifer. This is especially beneficial for marginal pH aquifers of pH 5 – 6.



A Digital Microscope is connected to a laptop computer with proprietary "***Droplet Size Calculation Software***"

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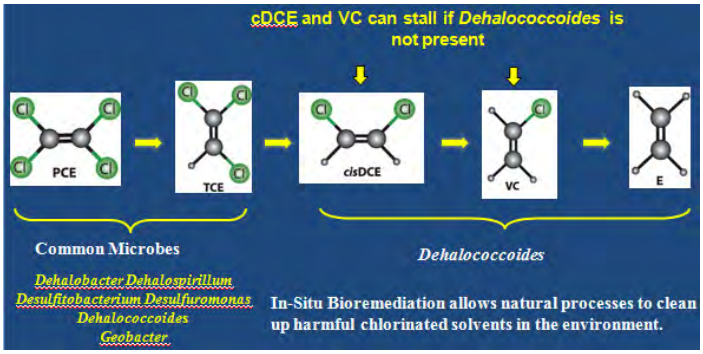
- SRS®-FRL optimizes the naturally occurring biodegradation system by supplying the rate limiting factor (in this case hydrogen) in the degradation of CVOC's, certain pesticides/herbicides, perchlorate, and immobilization of certain metals (Chromium, Arsenic, and some radionucleides).
- The **large droplet size** of **5 µm** combined with the **negative surface charge** on the droplets results in a higher retention in the subsurface.
- Terra Systems holds United States Patent#**RE40,448** for the use of emulsified vegetable oil for remediation of chlorinated solvents.
- The soy bean oil is grown in the United States and provides a **slow release** biodegradable carbon source, which promotes long-term biological activity.
- SRS®-FRL comes **standard** with **biostimulating vitamins** like Vitamin $B_{12,}$ which He et al. 2007 demonstrated is an important micronutrient to enhance dechlorination activity.
- SRS®-FRL contains proprietary organic and inorganic nutrients such as yeast extract, nitrogen and phosphorus, which have been demonstrated to support the growth of the anaerobic microbial population.
- SRS®-FRL comes with **at least 4% sodium** or **potassium lactate** a quick release biodegradable substrate, which helps to "*jump start*" bacterial growth.
- SRS®-FRL emulsified vegetable oil substrate has been validated by the Florida DEP, California Water Board and others.
- SRS®-FRL contains only non-toxic food grade materials, which results in green, sustainable remediation.

Packaging: Terra Systems patented SRS®-FRL can be shipped in 5-gallon buckets, 55-gallon drums, 275-gallon IBC totes, 275-gallon cardboard totes or bulk tankers.

If the *Dehalococcoides* are not present or are in small numbers Terra Systems **TSI DC®** Bioaugmentation Culture can also be injected.



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For More Information Call Michael Free at 302-798-9553 or Email: mfree@terrasystems.net

60% LARGE DROPLET SLOW RELEASE EMULSIFIED VEGETABLE OIL SUBSTRATE (SRS®-FRL) SAFETY DATA SHEET

1. Product Identification

Synonyms:	60% Large Droplet Slow Release Substrate (SRS®-FRL) Emulsified Vegetable Oil (EVO)
Recommended Use:	Treatment of groundwater contaminated with chlorinated solvents and other anaerobically degradable compounds.
Supplier:	Terra Systems, Inc. 130 Hickman Road, Suite 1 Claymont, Delaware 19703 Telephone (302) 798-9553 Fax (302) 798-9554 www.terrasystems.net

2. Hazards Identification

Emergency Overview	
Caution:	May cause eye irritation.
Health Rating:	1 - Slight
Flammability Rating:	1 - Slight
Reactivity Rating:	1 - Slight
Contact Rating:	1 - Slight
Protective Equipment:	Goggles; Proper Gloves
Storage Color Code:	Green (General Storage)
Potential Health Effects	
Inhalation:	Not expected to be a health hazard. If heated, may produce vapors or mists that irritate the mucous membranes and cause irritation, dizziness, and nausea. Remove to fresh air.
Ingestion:	Not expected to be a health hazard via ingestion. Large doses may produce abdominal spasms, diarrhea.
Skin Contact:	No adverse effects expected. May cause irritation or sensitization in sensitive individuals.
Eye Contact:	May cause mild irritation, possible reddening.
Chronic Exposure:	No information found.
Aggravation of Pre-existing Conditions:	No information found.

3. Composition/Information on Ingredients

Ingredient	Synonyms	CAS #	Percent	Hazardous
Soy bean oil	Soya oil	8001-22-7	60%	No
Emulsifiers, lecithin, and proprietary nutrient package containing nitrogen, phosphorus and vitamin B_{12}		Mixture	5 – 15%	No
Sodium lactate	2-hydroxpropionic acid sodium salt	72-17-3	<5%	Yes
Water		7732-18-5	20 - 30%	No

The emulsifiers, lecithin, and nutrient package mixture is a trade secret and consists of ingredients of unknown acute toxicity.

4. First Aid Measures

Inhalation: Not expected to require first aid measures. Remove to fresh air. Get medical attention for any breathing difficulty.

Ingestion: If large amounts were swallowed, give water to drink and get medical advice.

Skin Contact: Not expected to require first aid measures. Wash exposed area with soap and water. Get medical advice if irritation develops.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

5. Fire Fighting Measures

Fire: Flash point: >200 C (>392 F). Not considered to be a fire hazard. Isolate from heat and open flame.

Explosion: Not considered to be an explosion hazard. Closed containers may explode if exposed to extreme heat.

Fire Extinguishing Media: Dry chemical, foam, or carbon dioxide. Water spray may be ineffective on fire, but can protect fire-fighters and cool closed containers. Use fog nozzles if water is used.

Special Information: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Clean-up personnel may require protective clothing. Absorb in sand, paper towels, “Oil Dry”, or other inert material. Scoop up and containerize for disposal. Flush trace residues to sewer with soap and water. Containerized waste may be sent to an approved waste disposal facility.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material are not hazardous when empty since they do vapors or harmful substances; observe all warnings and precautions listed for the product. Do not store above 49 C (120 F). Keep container tightly closed and upright when not in use to prevent leakage.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:	None established.
Ventilation System:	Not expected to require any special ventilation.
Personal Respirators (NIOSH Approved):	Not expected to require personal respirator usage.
Skin Protection:	Wear protective gloves and clean body-covering clothing.
Eye Protection:	Use chemical safety goggles and/or a full face shield where splashing is possible. Provide readily accessible eye wash stations and safety showers.
Slips, Trips, and Falls:	Material is slippery when spilled. Clean up with sand, paper towels, “Oil Dry”, or other inert material.

9. Physical and Chemical Properties

Appearance:	White liquid.
Odor:	Vegetable oil.
Solubility:	Miscible in water.
Specific Gravity (water=1):	0.95-0.98. 8.09 pounds per gallon.
pH:	6-7 (40% aqueous solution)
% Volatiles by volume @ 21C (70F):	Negligible.
Boiling Point:	$\geq$ 100C ($\geq$ 212F)
Melting Point:	No information found.
Flash Point (F):	No information found.
Autoignition Temperature:	No information found.
Decomposition Temperature:	No information found.
Vapor Density (Air=1):	No information found.
Vapor Pressure (mm Hg):	< 1.0 @ 20C (68F).
Evaporation Rate (BuAc=1):	No information found.
Viscosity @23 C (73 F):	213 centipoises (1.2 centipoises diluted 1:10)
Partition Coefficient (octanol/water):	No information found.

10. Stability and Reactivity

Stability:	Stable under ordinary conditions of use and storage.
Reactivity:	Not reactive under ordinary conditions.
Hazardous Decomposition Products:	Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization:	Will not occur.
Incompatibilities:	Strong oxidizers, acids.
Conditions to Avoid:	Incompatibles. Isolate from heat and open flame.

11. Toxicological Information

Soybean Oil:	No information found on toxicology. It is not a carcinogen listed by IARC, NTP, NIOSH, OSHA, or ACGIH.
Emulsifier/Nutrient Mixture:	No information found on toxicology. It is not a carcinogen listed by IARC, NTP, NIOSH, OSHA, or ACGIH.
Sodium Lactate:	Oral rat LD50: 2,000 mg/kg. 100 mg caused mild irritation to rabbit eye in Draize test. This compound is not listed as a carcinogen by IARC, NRP, NIOSH, OSHA, or ACGIM.
SRS-SD:	The toxicity of the mixture has not been measured.

12. Ecological Information

Environmental Fate:	No information found.
Environmental Toxicity:	No information found.
Degradability:	This product is completely biodegradable under both aerobic and anaerobic conditions.
Soil Mobility:	This compound will move with groundwater until the adsorbed onto the soil. Degradation products may be mobile.
Bioaccumulation Potential:	No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

OSHA STATUS: This product is not hazardous under the criteria of the Federal OSHA hazard Communication Standard 29 CFR 1910.1200. However, thermal processing and decomposition fumes from this product may be hazardous as noted in Section 10.

TSCA STATUS: No component of this product is listed on the TSCA inventory.

CERCLA (Comprehensive Response Compensation, and Liability Act): Not reportable.

SARA TITLE III (Superfund Amendments and Reauthorization Act)
Section 312 Extremely Hazardous Substances: None
Section 311/312 Hazard Categories: Non-hazardous Under Section 311/312
Section 313 Toxic Chemicals: None

RCRA STATUS: If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

CALIFORNIA PROPOSITION 65: The following statement is made in order to comply with the California safe Drinking Water and Toxic Enforcement Act of 1986. The product contains no chemicals known to the State of California to cause cancer.

16. Other Information

NFPA Ratings:	Health: **1** Flammability: **1** Reactivity: **1**
Date Prepared:	June 19, 2014
Revision Information:	SDS Section(s) changed since last revision of document include: None.
Disclaimer:	Terra Systems, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. TERRA SYSTEMS, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, TERRA

SYSTEMS, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

Prepared by: Terra Systems, Inc.
Phone Number: (302) 798-9553 (U.S.A.)

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* New File

Class V 2nd & Kirby (RN) General

Cynthia Khan

From: Cynthia Khan
Sent: Friday, August 08, 2014 4:32 PM
To: 'Brian Conrad'
Cc: Mary Daily; Terry Bobo (tbobo@emiok.com); Jo Peters
Subject: RE: Underground Injection Control Application - 2nd & Kirby Site, Hutchinson, KS

Mr. Conrad:

The Kansas Department of Health & Environment's Geology Section KDHE administers the Underground Injection Control (UIC) program. The UIC program has oversight of Class V injection wells and has completed its review of this injection proposal submitted under your letter dated July 29, 2014, for compliance with the Underground Injection Control (UIC) Program Requirements. We have determined the proposal complies with the UIC Program requirements. This letter serves as the UIC Program authorization for the injection of a compound for groundwater remediation into approximately 22 injection points.

This proposal was only reviewed for compliance with the UIC Program requirements. The KDHE Bureau of Environmental Remediation (BER) has oversight authority for this project. You must obtain BER's approval to install and operate the injection wells (points).

The following conditions required by the UIC Program apply:

The injection wells (points) shall not endanger human health or the environment.

This authorization is valid only for this proposal.

This authorization is only for the injection of amended emulsified vegetable oil (EVO)

Proposed significant changes of the injection proposal must be submitted to KDHE in writing, with supportive information, and have the approval of both KDHE's Bureau of Environmental Remediation and the UIC program prior to implementation.

If you have any questions or need assistance, please contact me by e-mail at **ckhan@kdheks.gov** or by telephone at **(785) 296-5554** or by fax at (785) 296-5509.

Regards,

CYNTHIA KHAN, P.G.
KANSAS DEPT OF HEALTH AND ENVIRONMENT
1000 SW JACKSON, SUITE 420
TOPEKA, KANSAS 66612
785-296-5554
CKHAN@KDHEKS.GOV

From: Brian Conrad [mailto:bconrad@gsinetwork.com]
Sent: Tuesday, July 29, 2014 6:08 PM
To: Cynthia Khan

APPENDIX G

Laboratory Analytical Reports

GSI Engineering

A division of Alt & Witzig Engineering

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

August 20, 2014

BRIAN CONRAD
GSI
15012 W. 106th Street
Lenexa, KS 66219

RE: Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

Dear BRIAN CONRAD:
Enclosed are the analytical results for sample(s) received by the laboratory on August 13, 2014. 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,

Angie Brown
Angie.Brown@pacelabs.com
Project Manager

Enclosures

cc: Josh Mellema, GSI Engineering, LLC

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alabama Certification #40770
Alabama Certification #40770
Alaska Certification #: UST-078
Alaska Certification #MN00064
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 #: Pace
Georgia Certification #: 959
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
Nebraska Certification #: Pace
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
Wisconsin Certification #: 999407970
West Virginia Certification #: 382
West Virginia DHHR #:9952C

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 13-012-0
Illinois Certification #: 003097
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60175723001	**MW-27**	Water	08/13/14 15:30	08/13/14 16:30
60175723002	**TMW-1**	Water	08/13/14 15:00	08/13/14 16:30
60175723003	**MW-27**	Water	08/13/14 15:30	08/13/14 16:30
60175723004	**TMW-1**	Water	08/13/14 15:00	08/13/14 16:30

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SAMPLE ANALYTE COUNT

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60175723001	**MW-27**	EPA 200.7	JGP	2	PASI-K
		EPA 200.7	JGP	2	PASI-K
60175723002	**TMW-1**	EPA 200.7	JGP	2	PASI-K
		EPA 200.7	JGP	2	PASI-K
60175723003	**MW-27**	RSK 175	JRB	3	PASI-M
		EPA 5030B/8260	PRG	69	PASI-K
		SM 4500-S-2 D	JMC1	1	PASI-K
		EPA 300.0	OL	1	PASI-K
		EPA 353.2	AJM	3	PASI-K
60175723004	**TMW-1**	RSK 175	JRB	3	PASI-M
		EPA 5030B/8260	PRG	69	PASI-K
		SM 4500-S-2 D	JMC1	1	PASI-K
		EPA 300.0	OL	1	PASI-K
		EPA 353.2	AJM	3	PASI-K

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Lenexa, KS 66219
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ANALYTICAL RESULTS

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

Sample: MW-27 **Lab ID: 60175723001** Collected: 08/13/14 15:30 Received: 08/13/14 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron	ND	ug/L	50.0	1	08/14/14 08:03	08/14/14 10:38	7439-89-6	
Manganese	**535**	ug/L	5.0	1	08/14/14 08:03	08/14/14 10:38	7439-96-5	
200.7 Metals, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron, Dissolved	ND	ug/L	50.0	1	08/14/14 07:59	08/14/14 10:59	7439-89-6	
Manganese, Dissolved	**556**	ug/L	5.0	1	08/14/14 07:59	08/14/14 10:59	7439-96-5	D9

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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(913)599-5665

ANALYTICAL RESULTS

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

Sample: TMW-1 **Lab ID: 60175723002** Collected: 08/13/14 15:00 Received: 08/13/14 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron	**955**	ug/L	50.0	1	08/14/14 08:03	08/14/14 10:49	7439-89-6	
Manganese	**454**	ug/L	5.0	1	08/14/14 08:03	08/14/14 10:49	7439-96-5	
200.7 Metals, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron, Dissolved	**973**	ug/L	50.0	1	08/14/14 07:59	08/14/14 11:16	7439-89-6	D9
Manganese, Dissolved	**462**	ug/L	5.0	1	08/14/14 07:59	08/14/14 11:16	7439-96-5	D9

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

Sample: MW-27 **Lab ID: 60175723003** Collected: 08/13/14 15:30 Received: 08/13/14 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	6.2	1		08/15/14 17:25	74-84-0	
Ethene	ND	ug/L	6.2	1		08/15/14 17:25	74-85-1	
Methane	ND	ug/L	6.6	1		08/15/14 17:25	74-82-8	
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		08/14/14 19:42	67-64-1	
Benzene	ND	ug/L	1.0	1		08/14/14 19:42	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		08/14/14 19:42	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		08/14/14 19:42	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		08/14/14 19:42	75-27-4	
Bromoform	ND	ug/L	1.0	1		08/14/14 19:42	75-25-2	
Bromomethane	ND	ug/L	5.0	1		08/14/14 19:42	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		08/14/14 19:42	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		08/14/14 19:42	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		08/14/14 19:42	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		08/14/14 19:42	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		08/14/14 19:42	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		08/14/14 19:42	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		08/14/14 19:42	108-90-7	
Chloroethane	ND	ug/L	1.0	1		08/14/14 19:42	75-00-3	
Chloroform	ND	ug/L	1.0	1		08/14/14 19:42	67-66-3	
Chloromethane	ND	ug/L	1.0	1		08/14/14 19:42	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/14/14 19:42	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/14/14 19:42	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		08/14/14 19:42	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		08/14/14 19:42	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		08/14/14 19:42	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		08/14/14 19:42	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		08/14/14 19:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		08/14/14 19:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		08/14/14 19:42	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		08/14/14 19:42	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		08/14/14 19:42	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		08/14/14 19:42	107-06-2	
1,2-Dichloroethene (Total)	**1.9**	ug/L	1.0	1		08/14/14 19:42	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		08/14/14 19:42	75-35-4	
cis-1,2-Dichloroethene	**1.9**	ug/L	1.0	1		08/14/14 19:42	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		08/14/14 19:42	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		08/14/14 19:42	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		08/14/14 19:42	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		08/14/14 19:42	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		08/14/14 19:42	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		08/14/14 19:42	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		08/14/14 19:42	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		08/14/14 19:42	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		08/14/14 19:42	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		08/14/14 19:42	591-78-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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ANALYTICAL RESULTS

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

Sample: MW-27 **Lab ID: 60175723003** Collected: 08/13/14 15:30 Received: 08/13/14 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		08/14/14 19:42	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		08/14/14 19:42	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		08/14/14 19:42	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		08/14/14 19:42	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		08/14/14 19:42	1634-04-4	
Naphthalene	ND	ug/L	10.0	1		08/14/14 19:42	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		08/14/14 19:42	103-65-1	
Styrene	ND	ug/L	1.0	1		08/14/14 19:42	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		08/14/14 19:42	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		08/14/14 19:42	79-34-5	
Tetrachloroethene	**1.2**	ug/L	1.0	1		08/14/14 19:42	127-18-4	
Toluene	ND	ug/L	1.0	1		08/14/14 19:42	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		08/14/14 19:42	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		08/14/14 19:42	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		08/14/14 19:42	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		08/14/14 19:42	79-00-5	
Trichloroethene	**33.1**	ug/L	1.0	1		08/14/14 19:42	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		08/14/14 19:42	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		08/14/14 19:42	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		08/14/14 19:42	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		08/14/14 19:42	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		08/14/14 19:42	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		08/14/14 19:42	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	80-120	1		08/14/14 19:42	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	80-120	1		08/14/14 19:42	17060-07-0	
Toluene-d8 (S)	100	%	80-120	1		08/14/14 19:42	2037-26-5	
Preservation pH	**1.0**		0.10	1		08/14/14 19:42		
4500S2D Sulfide, Total	Analytical Method: SM 4500-S-2 D							
Sulfide, Total	ND	mg/L	0.050	1		08/15/14 10:43	18496-25-8	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**150**	mg/L	10.0	10		08/19/14 16:20	16887-00-6	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	ND	mg/L	0.10	1		08/14/14 10:38		
Nitrogen, Nitrite	ND	mg/L	0.10	1		08/14/14 10:38		
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	1		08/14/14 10:38		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

Sample: TMW-1 **Lab ID: 60175723004** Collected: 08/13/14 15:00 Received: 08/13/14 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	6.2	1		08/15/14 17:36	74-84-0	
Ethene	ND	ug/L	6.2	1		08/15/14 17:36	74-85-1	
Methane	ND	ug/L	6.6	1		08/15/14 17:36	74-82-8	
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		08/14/14 19:28	67-64-1	
Benzene	ND	ug/L	1.0	1		08/14/14 19:28	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		08/14/14 19:28	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		08/14/14 19:28	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		08/14/14 19:28	75-27-4	
Bromoform	ND	ug/L	1.0	1		08/14/14 19:28	75-25-2	
Bromomethane	ND	ug/L	5.0	1		08/14/14 19:28	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		08/14/14 19:28	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		08/14/14 19:28	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		08/14/14 19:28	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		08/14/14 19:28	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		08/14/14 19:28	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		08/14/14 19:28	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		08/14/14 19:28	108-90-7	
Chloroethane	ND	ug/L	1.0	1		08/14/14 19:28	75-00-3	
Chloroform	ND	ug/L	1.0	1		08/14/14 19:28	67-66-3	
Chloromethane	ND	ug/L	1.0	1		08/14/14 19:28	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/14/14 19:28	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/14/14 19:28	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		08/14/14 19:28	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		08/14/14 19:28	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		08/14/14 19:28	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		08/14/14 19:28	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		08/14/14 19:28	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		08/14/14 19:28	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		08/14/14 19:28	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		08/14/14 19:28	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		08/14/14 19:28	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		08/14/14 19:28	107-06-2	
1,2-Dichloroethene (Total)	**2.0**	ug/L	1.0	1		08/14/14 19:28	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		08/14/14 19:28	75-35-4	
cis-1,2-Dichloroethene	**2.0**	ug/L	1.0	1		08/14/14 19:28	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		08/14/14 19:28	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		08/14/14 19:28	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		08/14/14 19:28	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		08/14/14 19:28	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		08/14/14 19:28	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		08/14/14 19:28	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		08/14/14 19:28	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		08/14/14 19:28	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		08/14/14 19:28	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		08/14/14 19:28	591-78-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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ANALYTICAL RESULTS

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

Sample: TMW-1 **Lab ID: 60175723004** Collected: 08/13/14 15:00 Received: 08/13/14 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		08/14/14 19:28	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		08/14/14 19:28	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		08/14/14 19:28	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		08/14/14 19:28	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		08/14/14 19:28	1634-04-4	
Naphthalene	ND	ug/L	10.0	1		08/14/14 19:28	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		08/14/14 19:28	103-65-1	
Styrene	ND	ug/L	1.0	1		08/14/14 19:28	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		08/14/14 19:28	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		08/14/14 19:28	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		08/14/14 19:28	127-18-4	
Toluene	ND	ug/L	1.0	1		08/14/14 19:28	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		08/14/14 19:28	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		08/14/14 19:28	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		08/14/14 19:28	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		08/14/14 19:28	79-00-5	
Trichloroethene	**26.7**	ug/L	1.0	1		08/14/14 19:28	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		08/14/14 19:28	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		08/14/14 19:28	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		08/14/14 19:28	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		08/14/14 19:28	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		08/14/14 19:28	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		08/14/14 19:28	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	103	%	80-120	1		08/14/14 19:28	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	80-120	1		08/14/14 19:28	17060-07-0	
Toluene-d8 (S)	96	%	80-120	1		08/14/14 19:28	2037-26-5	
Preservation pH	**3.0**		0.10	1		08/14/14 19:28		pH
4500S2D Sulfide, Total	Analytical Method: SM 4500-S-2 D							
Sulfide, Total	ND	mg/L	0.050	1		08/15/14 10:43	18496-25-8	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**184**	mg/L	10.0	10		08/19/14 16:34	16887-00-6	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	ND	mg/L	0.10	1		08/14/14 10:40		
Nitrogen, Nitrite	ND	mg/L	0.10	1		08/14/14 10:40		
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	1		08/14/14 10:40		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

QC Batch: AIR/21058 Analysis Method: RSK 175
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 60175723003, 60175723004

METHOD BLANK: 1762118 Matrix: Water
Associated Lab Samples: 60175723003, 60175723004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	6.2	08/15/14 12:19	
Ethene	ug/L	ND	6.2	08/15/14 12:19	
Methane	ug/L	ND	6.6	08/15/14 12:19	

LABORATORY CONTROL SAMPLE & LCSD: 1762119 1762120

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	118	117	104	103	85-115	1	20	
Ethene	ug/L	106	110	109	104	103	85-115	1	20	
Methane	ug/L	60.7	62.5	61.6	103	102	85-115	1	20	

SAMPLE DUPLICATE: 1762121

Parameter	Units	35149905031 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	3.1U	ND		20	
Ethene	ug/L	3.1U	ND		20	
Methane	ug/L	711	745	5	20	

SAMPLE DUPLICATE: 1762491

Parameter	Units	10277755002 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	99.1	90.7	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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

QC Batch: MPRP/28503 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60175723001, 60175723002

METHOD BLANK: 1425210 Matrix: Water
Associated Lab Samples: 60175723001, 60175723002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron	ug/L	ND	50.0	08/14/14 10:31	
Manganese	ug/L	ND	5.0	08/14/14 10:31	

LABORATORY CONTROL SAMPLE: 1425211

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	10000	10200	102	85-115	
Manganese	ug/L	1000	1020	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1425212 1425213

Parameter	Units	60175723001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	ug/L	ND	10000	10000	10000	9810	100	98	70-130	2	10	
Manganese	ug/L	535	1000	1000	1550	1500	101	97	70-130	3	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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

QC Batch: MPRP/28502 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Dissolved
Associated Lab Samples: 60175723001, 60175723002

METHOD BLANK: 1425206 Matrix: Water
Associated Lab Samples: 60175723001, 60175723002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron, Dissolved	ug/L	ND	50.0	08/14/14 10:55	
Manganese, Dissolved	ug/L	ND	5.0	08/14/14 10:55	

LABORATORY CONTROL SAMPLE: 1425207

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Dissolved	ug/L	10000	10300	103	85-115	
Manganese, Dissolved	ug/L	1000	1040	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1425208 1425209

Parameter	Units	60175723001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron, Dissolved	ug/L	ND	10000	10000	10000	9900	100	99	70-130	1	10	
Manganese, Dissolved	ug/L	556	1000	1000	1540	1550	99	99	70-130	0	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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

QC Batch: MSV/63569
QC Batch Method: EPA 5030B/8260
Analysis Method: EPA 5030B/8260
Analysis Description: 8260 MSV Water 10 mL Purge
Associated Lab Samples: 60175723003, 60175723004

METHOD BLANK: 1425556
Matrix: Water
Associated Lab Samples: 60175723003, 60175723004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	08/14/14 14:24	
1,1,1-Trichloroethane	ug/L	ND	1.0	08/14/14 14:24	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	08/14/14 14:24	
1,1,2-Trichloroethane	ug/L	ND	1.0	08/14/14 14:24	
1,1-Dichloroethane	ug/L	ND	1.0	08/14/14 14:24	
1,1-Dichloroethene	ug/L	ND	1.0	08/14/14 14:24	
1,1-Dichloropropene	ug/L	ND	1.0	08/14/14 14:24	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	08/14/14 14:24	
1,2,3-Trichloropropane	ug/L	ND	2.5	08/14/14 14:24	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	08/14/14 14:24	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	08/14/14 14:24	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.5	08/14/14 14:24	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	08/14/14 14:24	
1,2-Dichlorobenzene	ug/L	ND	1.0	08/14/14 14:24	
1,2-Dichloroethane	ug/L	ND	1.0	08/14/14 14:24	
1,2-Dichloroethene (Total)	ug/L	ND	1.0	08/14/14 14:24	
1,2-Dichloropropane	ug/L	ND	1.0	08/14/14 14:24	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	08/14/14 14:24	
1,3-Dichlorobenzene	ug/L	ND	1.0	08/14/14 14:24	
1,3-Dichloropropane	ug/L	ND	1.0	08/14/14 14:24	
1,4-Dichlorobenzene	ug/L	ND	1.0	08/14/14 14:24	
2,2-Dichloropropane	ug/L	ND	1.0	08/14/14 14:24	
2-Butanone (MEK)	ug/L	ND	10.0	08/14/14 14:24	
2-Chlorotoluene	ug/L	ND	1.0	08/14/14 14:24	
2-Hexanone	ug/L	ND	10.0	08/14/14 14:24	
4-Chlorotoluene	ug/L	ND	1.0	08/14/14 14:24	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	10.0	08/14/14 14:24	
Acetone	ug/L	ND	10.0	08/14/14 14:24	
Benzene	ug/L	ND	1.0	08/14/14 14:24	
Bromobenzene	ug/L	ND	1.0	08/14/14 14:24	
Bromochloromethane	ug/L	ND	1.0	08/14/14 14:24	
Bromodichloromethane	ug/L	ND	1.0	08/14/14 14:24	
Bromoform	ug/L	ND	1.0	08/14/14 14:24	
Bromomethane	ug/L	ND	5.0	08/14/14 14:24	
Carbon disulfide	ug/L	ND	5.0	08/14/14 14:24	
Carbon tetrachloride	ug/L	ND	1.0	08/14/14 14:24	
Chlorobenzene	ug/L	ND	1.0	08/14/14 14:24	
Chloroethane	ug/L	ND	1.0	08/14/14 14:24	
Chloroform	ug/L	ND	1.0	08/14/14 14:24	
Chloromethane	ug/L	ND	1.0	08/14/14 14:24	
cis-1,2-Dichloroethene	ug/L	ND	1.0	08/14/14 14:24	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

METHOD BLANK: 1425556 Matrix: Water
Associated Lab Samples: 60175723003, 60175723004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
cis-1,3-Dichloropropene	ug/L	ND	1.0	08/14/14 14:24	
Dibromochloromethane	ug/L	ND	1.0	08/14/14 14:24	
Dibromomethane	ug/L	ND	1.0	08/14/14 14:24	
Dichlorodifluoromethane	ug/L	ND	1.0	08/14/14 14:24	
Ethylbenzene	ug/L	ND	1.0	08/14/14 14:24	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	08/14/14 14:24	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	08/14/14 14:24	
Methyl-tert-butyl ether	ug/L	ND	1.0	08/14/14 14:24	
Methylene chloride	ug/L	ND	1.0	08/14/14 14:24	
n-Butylbenzene	ug/L	ND	1.0	08/14/14 14:24	
n-Propylbenzene	ug/L	ND	1.0	08/14/14 14:24	
Naphthalene	ug/L	ND	10.0	08/14/14 14:24	
p-Isopropyltoluene	ug/L	ND	1.0	08/14/14 14:24	
sec-Butylbenzene	ug/L	ND	1.0	08/14/14 14:24	
Styrene	ug/L	ND	1.0	08/14/14 14:24	
tert-Butylbenzene	ug/L	ND	1.0	08/14/14 14:24	
Tetrachloroethene	ug/L	ND	1.0	08/14/14 14:24	
Toluene	ug/L	ND	1.0	08/14/14 14:24	
trans-1,2-Dichloroethene	ug/L	ND	1.0	08/14/14 14:24	
trans-1,3-Dichloropropene	ug/L	ND	1.0	08/14/14 14:24	
Trichloroethene	ug/L	ND	1.0	08/14/14 14:24	
Trichlorofluoromethane	ug/L	ND	1.0	08/14/14 14:24	
Vinyl chloride	ug/L	ND	1.0	08/14/14 14:24	
Xylene (Total)	ug/L	ND	3.0	08/14/14 14:24	
1,2-Dichloroethane-d4 (S)	%	94	80-120	08/14/14 14:24	
4-Bromofluorobenzene (S)	%	104	80-120	08/14/14 14:24	
Toluene-d8 (S)	%	100	80-120	08/14/14 14:24	

LABORATORY CONTROL SAMPLE: 1425557

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	19.8	99	80-124	
1,1,1-Trichloroethane	ug/L	20	20.4	102	80-121	
1,1,2,2-Tetrachloroethane	ug/L	20	19.8	99	73-124	
1,1,2-Trichloroethane	ug/L	20	19.2	96	80-120	
1,1-Dichloroethane	ug/L	20	20.4	102	77-120	
1,1-Dichloroethene	ug/L	20	18.9	94	78-126	
1,1-Dichloropropene	ug/L	20	19.9	99	80-120	
1,2,3-Trichlorobenzene	ug/L	20	18.8	94	75-130	
1,2,3-Trichloropropane	ug/L	20	20.5	103	76-127	
1,2,4-Trichlorobenzene	ug/L	20	18.6	93	79-124	
1,2,4-Trimethylbenzene	ug/L	20	19.9	99	80-122	
1,2-Dibromo-3-chloropropane	ug/L	20	20.4	102	68-131	
1,2-Dibromoethane (EDB)	ug/L	20	19.6	98	80-127	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

LABORATORY CONTROL SAMPLE: 1425557

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	20	21.1	105	80-122	
1,2-Dichloroethane	ug/L	20	19.9	100	77-123	
1,2-Dichloroethene (Total)	ug/L	40	39.4	98	80-120	
1,2-Dichloropropane	ug/L	20	19.6	98	80-121	
1,3,5-Trimethylbenzene	ug/L	20	20.0	100	80-121	
1,3-Dichlorobenzene	ug/L	20	20.7	104	80-120	
1,3-Dichloropropane	ug/L	20	18.9	95	80-120	
1,4-Dichlorobenzene	ug/L	20	19.6	98	80-120	
2,2-Dichloropropane	ug/L	20	19.5	97	50-137	
2-Butanone (MEK)	ug/L	100	96.5	96	52-145	
2-Chlorotoluene	ug/L	20	20.7	103	80-120	
2-Hexanone	ug/L	100	93.9	94	57-139	
4-Chlorotoluene	ug/L	20	21.6	108	80-121	
4-Methyl-2-pentanone (MIBK)	ug/L	100	100	100	71-131	
Acetone	ug/L	100	93.5	94	32-155	
Benzene	ug/L	20	19.4	97	80-120	
Bromobenzene	ug/L	20	20.5	103	80-120	
Bromochloromethane	ug/L	20	18.9	95	77-123	
Bromodichloromethane	ug/L	20	19.9	100	80-120	
Bromoform	ug/L	20	19.0	95	73-124	
Bromomethane	ug/L	20	21.9	109	31-144	
Carbon disulfide	ug/L	20	20.5	102	65-125	
Carbon tetrachloride	ug/L	20	20.0	100	78-128	
Chlorobenzene	ug/L	20	19.6	98	80-120	
Chloroethane	ug/L	20	19.4	97	55-137	
Chloroform	ug/L	20	19.0	95	79-120	
Chloromethane	ug/L	20	17.4	87	22-138	
cis-1,2-Dichloroethene	ug/L	20	19.4	97	80-120	
cis-1,3-Dichloropropene	ug/L	20	19.7	98	80-120	
Dibromochloromethane	ug/L	20	19.7	98	80-120	
Dibromomethane	ug/L	20	20.5	102	80-122	
Dichlorodifluoromethane	ug/L	20	17.7	89	23-120	
Ethylbenzene	ug/L	20	19.8	99	80-121	
Hexachloro-1,3-butadiene	ug/L	20	20.5	103	77-129	
Isopropylbenzene (Cumene)	ug/L	20	20.3	102	80-136	
Methyl-tert-butyl ether	ug/L	20	19.5	97	74-125	
Methylene chloride	ug/L	20	18.9	95	73-126	
n-Butylbenzene	ug/L	20	20.8	104	83-123	
n-Propylbenzene	ug/L	20	20.9	105	80-122	
Naphthalene	ug/L	20	18.4	92	73-130	
p-Isopropyltoluene	ug/L	20	19.6	98	80-124	
sec-Butylbenzene	ug/L	20	19.5	97	80-129	
Styrene	ug/L	20	20.4	102	80-120	
tert-Butylbenzene	ug/L	20	19.5	97	80-126	
Tetrachloroethene	ug/L	20	19.2	96	80-121	
Toluene	ug/L	20	20.2	101	80-122	
trans-1,2-Dichloroethene	ug/L	20	19.9	100	79-121	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

LABORATORY CONTROL SAMPLE: 1425557

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
trans-1,3-Dichloropropene	ug/L	20	19.9	99	80-127	
Trichloroethene	ug/L	20	19.5	97	80-120	
Trichlorofluoromethane	ug/L	20	21.6	108	67-120	
Vinyl chloride	ug/L	20	19.2	96	59-120	
Xylene (Total)	ug/L	60	58.9	98	80-121	
1,2-Dichloroethane-d4 (S)	%			97	80-120	
4-Bromofluorobenzene (S)	%			105	80-120	
Toluene-d8 (S)	%			100	80-120	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

QC Batch: WET/49635 Analysis Method: SM 4500-S-2 D
QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total
Associated Lab Samples: 60175723003, 60175723004

METHOD BLANK: 1426074 Matrix: Water
Associated Lab Samples: 60175723003, 60175723004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfide, Total	mg/L	ND	0.050	08/15/14 10:38	

LABORATORY CONTROL SAMPLE: 1426075

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.5	0.51	101	80-120	

MATRIX SPIKE SAMPLE: 1426076

Parameter	Units	60175554001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	0.85	2.5	3.3	99	75-125	

SAMPLE DUPLICATE: 1426077

Parameter	Units	60175554002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	ND	ND		20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

QC Batch: WETA/30650 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60175723003, 60175723004

METHOD BLANK: 1427150 Matrix: Water
Associated Lab Samples: 60175723003, 60175723004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	08/19/14 09:58	

LABORATORY CONTROL SAMPLE: 1427151

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1427152 1427153

Parameter	Units	60175493004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	6.2	5	5	10.8	10.8	91	91	80-120	0	15	

MATRIX SPIKE SAMPLE: 1427154

Parameter	Units	60175330001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	1690	500	2230	108	80-120	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

QC Batch: WETA/30618
QC Batch Method: EPA 353.2
Analysis Method: EPA 353.2
Analysis Description: 353.2 Nitrate + Nitrite, Unpres.
Associated Lab Samples: 60175723003, 60175723004

METHOD BLANK: 1425344 Matrix: Water
Associated Lab Samples: 60175723003, 60175723004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Nitrate	mg/L	ND	0.10	08/14/14 09:57	
Nitrogen, Nitrite	mg/L	ND	0.10	08/14/14 09:57	
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	08/14/14 09:57	

LABORATORY CONTROL SAMPLE: 1425345

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/L	1.6	1.8	110	85-115	
Nitrogen, Nitrite	mg/L	.4	0.39	98	90-110	
Nitrogen, NO2 plus NO3	mg/L	2	2.2	108	90-110	

MATRIX SPIKE SAMPLE: 1425346

Parameter	Units	60175635003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/L	4.7	1.6	5.7	63	85-115	M1
Nitrogen, Nitrite	mg/L	ND	.4	0.44	111	90-110	M1
Nitrogen, NO2 plus NO3	mg/L	4.7	2	6.1	73	90-110	M1

SAMPLE DUPLICATE: 1425347

Parameter	Units	60175696003 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrogen, Nitrate	mg/L	18.6	18.7	0	20	
Nitrogen, Nitrite	mg/L	ND	ND		20	
Nitrogen, NO2 plus NO3	mg/L	18.6	18.7	0	20	

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REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALIFIERS

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

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 (8270 listed analyte) decomposes to Azobenzene.

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-K	Pace Analytical Services - Kansas City
PASI-M	Pace Analytical Services - Minneapolis

BATCH QUALIFIERS

Batch: MSV/63569

[M5]	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

D9	Dissolved result is greater than the total. Data is within laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
pH	Post-analysis pH measurement indicates insufficient VOA sample preservation.

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 2nd & Kirby Remediation
Pace Project No.: 60175723

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60175723003	**MW-27**	RSK 175	AIR/21058		
60175723004	**TMW-1**	RSK 175	AIR/21058		
60175723001	**MW-27**	EPA 200.7	MPRP/28503	EPA 200.7	ICP/21494
60175723002	**TMW-1**	EPA 200.7	MPRP/28503	EPA 200.7	ICP/21494
60175723001	**MW-27**	EPA 200.7	MPRP/28502	EPA 200.7	ICP/21493
60175723002	**TMW-1**	EPA 200.7	MPRP/28502	EPA 200.7	ICP/21493
60175723003	**MW-27**	EPA 5030B/8260	MSV/63569		
60175723004	**TMW-1**	EPA 5030B/8260	MSV/63569		
60175723003	**MW-27**	SM 4500-S-2 D	WET/49635		
60175723004	**TMW-1**	SM 4500-S-2 D	WET/49635		
60175723003	**MW-27**	EPA 300.0	WETA/30650		
60175723004	**TMW-1**	EPA 300.0	WETA/30650		
60175723003	**MW-27**	EPA 353.2	WETA/30618		
60175723004	**TMW-1**	EPA 353.2	WETA/30618		

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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.

Section A
Required Client Information:
Company: GSI Engineering
Address: 15012 W 106th St
Lenexa, KS
Email To:
Phone:
Fax:
Requested Due Date/TAT:

Section B
Required Project Information:
Report To: bconrad@gsinetwork.com
Copy To:
Purchase Order No.:
Project Name: 24 Kirby Remediation
Project Number: 148032

Section C
Invoice Information:
Attention: Brian Conrad
Company Name: Same
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

Page: of

1731426

REGULATORY AGENCY
NPDES / GROUND WATER / DRINKING WATER
UST / RCRA / OTHER
Site Location
STATE:

Section D Required Client Information

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

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

Requested Analysis Filtered (Y/N)

Analysis Test: Full VOCs 8260; Sulfide; Chloride, NO2/NO3, etc.; Dis. Fe/Mn; TOC; Total Fe/Mn; Methane, Ethane, Ethene

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Full VOCs 8260	Sulfide	Chloride, NO2/NO3, etc.	Dis. Fe/Mn	TOC	Total Fe/Mn	Methane, Ethane, Ethene	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 60175723
1	MW-27 B12U A65S (2) BP3N BP3Z	WT	G	8/13/14	1530				11	X	X	X	X				X	✓	✓	✓	✓	✓	✓	✓ (3) DG4H	(3) VG4U	001 / 003
2	TMW-1 ↓ ↓ ↓ ↓	WT	G	↓	1500				11	X	X	X	X				X	✓	✓	✓	✓	✓	✓	✓ ↓	↓	002 / 004
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
24 hr ~~both~~ turn metals, 7 day ~~both~~ turn	[signature]	8/13/14	1430	[signature] Pace	8/13	1630	6.0	Y	N	Y
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Brian Ortega
SIGNATURE of SAMPLER: [signature]
DATE Signed (MM/DD/YY): 8/13/14

ORIGINAL

*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.07, 15-May-2007

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

August 27, 2014

BRIAN CONRAD
GSI
15012 W. 106th Street
Lenexa, KS 66219

RE: Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

Dear BRIAN CONRAD:
Enclosed are the analytical results for sample(s) received by the laboratory on August 15, 2014. 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,

Heather Wilson
heather.wilson@pacelabs.com
Project Manager

Enclosures

cc: Josh Mellema, GSI Engineering, LLC

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alabama Certification #40770
Alabama Certification #40770
Alaska Certification #: UST-078
Alaska Certification #MN00064
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 #: Pace
Georgia Certification #: 959
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
Nebraska Certification #: Pace
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
Wisconsin Certification #: 999407970
West Virginia Certification #: 382
West Virginia DHHR #:9952C

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 13-012-0
Illinois Certification #: 003097
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
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SAMPLE SUMMARY

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60175918001	**TMW-2**	Water	08/15/14 12:03	08/15/14 17:20
60175918002	**GMW-8S**	Water	08/15/14 13:03	08/15/14 17:20

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SAMPLE ANALYTE COUNT

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60175918001	**TMW-2**	RSK 175	JRB	3	PASI-M
		EPA 200.7	NDJ	1	PASI-K
		EPA 200.7	NDJ	2	PASI-K
		EPA 5030B/8260	PRG	69	PASI-K
		SM 4500-S-2 D	JMC1	1	PASI-K
		EPA 300.0	OL	1	PASI-K
		EPA 353.2	AJM	3	PASI-K
		SM 5310C	JMC1	1	PASI-K
60175918002	**GMW-8S**	RSK 175	JRB	3	PASI-M
		EPA 200.7	NDJ	1	PASI-K
		EPA 200.7	NDJ	2	PASI-K
		EPA 5030B/8260	PRG	69	PASI-K
		SM 4500-S-2 D	JMC1	1	PASI-K
		EPA 300.0	OL	1	PASI-K
		EPA 353.2	AJM	3	PASI-K
		SM 5310C	JMC1	1	PASI-K

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ANALYTICAL RESULTS

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

Sample: TMW-2 **Lab ID: 60175918001** Collected: 08/15/14 12:03 Received: 08/15/14 17:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	6.2	1		08/20/14 16:16	74-84-0	
Ethene	ND	ug/L	6.2	1		08/20/14 16:16	74-85-1	
Methane	**13.5**	ug/L	6.6	1		08/20/14 16:16	74-82-8	
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron	**4590**	ug/L	50.0	1	08/20/14 17:25	08/21/14 11:21	7439-89-6	
200.7 Metals, Dissolved (LF)	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron, Dissolved	ND	ug/L	50.0	1	08/24/14 09:07	08/25/14 13:18	7439-89-6	
Manganese, Dissolved	**321**	ug/L	5.0	1	08/24/14 09:07	08/25/14 13:18	7439-96-5	
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		08/19/14 17:27	67-64-1	
Benzene	ND	ug/L	1.0	1		08/19/14 17:27	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		08/19/14 17:27	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		08/19/14 17:27	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		08/19/14 17:27	75-27-4	
Bromoform	ND	ug/L	1.0	1		08/19/14 17:27	75-25-2	
Bromomethane	ND	ug/L	5.0	1		08/19/14 17:27	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		08/19/14 17:27	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		08/19/14 17:27	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		08/19/14 17:27	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		08/19/14 17:27	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		08/19/14 17:27	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		08/19/14 17:27	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		08/19/14 17:27	108-90-7	
Chloroethane	ND	ug/L	1.0	1		08/19/14 17:27	75-00-3	
Chloroform	ND	ug/L	1.0	1		08/19/14 17:27	67-66-3	
Chloromethane	ND	ug/L	1.0	1		08/19/14 17:27	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/19/14 17:27	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/19/14 17:27	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		08/19/14 17:27	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		08/19/14 17:27	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		08/19/14 17:27	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		08/19/14 17:27	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		08/19/14 17:27	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		08/19/14 17:27	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		08/19/14 17:27	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		08/19/14 17:27	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		08/19/14 17:27	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		08/19/14 17:27	107-06-2	
1,2-Dichloroethene (Total)	**48.2**	ug/L	1.0	1		08/19/14 17:27	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		08/19/14 17:27	75-35-4	
cis-1,2-Dichloroethene	**47.5**	ug/L	1.0	1		08/19/14 17:27	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		08/19/14 17:27	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		08/19/14 17:27	78-87-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Lenexa, KS 66219
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ANALYTICAL RESULTS

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

Sample: TMW-2 **Lab ID: 60175918001** Collected: 08/15/14 12:03 Received: 08/15/14 17:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
1,3-Dichloropropane	ND	ug/L	1.0	1		08/19/14 17:27	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		08/19/14 17:27	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		08/19/14 17:27	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		08/19/14 17:27	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		08/19/14 17:27	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		08/19/14 17:27	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		08/19/14 17:27	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		08/19/14 17:27	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		08/19/14 17:27	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		08/19/14 17:27	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		08/19/14 17:27	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		08/19/14 17:27	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		08/19/14 17:27	1634-04-4	
Naphthalene	ND	ug/L	10.0	1		08/19/14 17:27	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		08/19/14 17:27	103-65-1	
Styrene	ND	ug/L	1.0	1		08/19/14 17:27	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		08/19/14 17:27	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		08/19/14 17:27	79-34-5	
Tetrachloroethene	**7.6**	ug/L	1.0	1		08/19/14 17:27	127-18-4	
Toluene	ND	ug/L	1.0	1		08/19/14 17:27	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		08/19/14 17:27	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		08/19/14 17:27	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		08/19/14 17:27	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		08/19/14 17:27	79-00-5	
Trichloroethene	**65.1**	ug/L	1.0	1		08/19/14 17:27	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		08/19/14 17:27	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		08/19/14 17:27	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		08/19/14 17:27	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		08/19/14 17:27	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		08/19/14 17:27	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		08/19/14 17:27	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	101	%	80-120	1		08/19/14 17:27	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	80-120	1		08/19/14 17:27	17060-07-0	
Toluene-d8 (S)	100	%	80-120	1		08/19/14 17:27	2037-26-5	
Preservation pH	**1.0**		0.10	1		08/19/14 17:27		
4500S2D Sulfide, Total	Analytical Method: SM 4500-S-2 D							
Sulfide, Total	ND	mg/L	0.050	1		08/21/14 09:14	18496-25-8	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**171**	mg/L	10.0	10		08/21/14 21:13	16887-00-6	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**0.91**	mg/L	0.10	1		08/16/14 11:17		
Nitrogen, Nitrite	ND	mg/L	0.10	1		08/16/14 11:17		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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(913)599-5665

ANALYTICAL RESULTS

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

Sample: TMW-2 **Lab ID: 60175918001** Collected: 08/15/14 12:03 Received: 08/15/14 17:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.91**	mg/L	0.10	1		08/16/14 11:17		
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**1.0**	mg/L	1.0	1		08/20/14 20:29	7440-44-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

Sample: GMW-8S **Lab ID: 60175918002** Collected: 08/15/14 13:03 Received: 08/15/14 17:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	6.2	1		08/20/14 16:28	74-84-0	
Ethene	ND	ug/L	6.2	1		08/20/14 16:28	74-85-1	
Methane	ND	ug/L	6.6	1		08/20/14 16:28	74-82-8	
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron	**2150**	ug/L	50.0	1	08/20/14 17:25	08/21/14 11:23	7439-89-6	
200.7 Metals, Dissolved (LF)	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron, Dissolved	ND	ug/L	50.0	1	08/24/14 09:07	08/25/14 13:25	7439-89-6	
Manganese, Dissolved	**260**	ug/L	5.0	1	08/24/14 09:07	08/25/14 13:25	7439-96-5	
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		08/19/14 17:41	67-64-1	
Benzene	ND	ug/L	1.0	1		08/19/14 17:41	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		08/19/14 17:41	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		08/19/14 17:41	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		08/19/14 17:41	75-27-4	
Bromoform	ND	ug/L	1.0	1		08/19/14 17:41	75-25-2	
Bromomethane	ND	ug/L	5.0	1		08/19/14 17:41	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		08/19/14 17:41	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		08/19/14 17:41	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		08/19/14 17:41	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		08/19/14 17:41	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		08/19/14 17:41	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		08/19/14 17:41	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		08/19/14 17:41	108-90-7	
Chloroethane	ND	ug/L	1.0	1		08/19/14 17:41	75-00-3	
Chloroform	ND	ug/L	1.0	1		08/19/14 17:41	67-66-3	
Chloromethane	ND	ug/L	1.0	1		08/19/14 17:41	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/19/14 17:41	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/19/14 17:41	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		08/19/14 17:41	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		08/19/14 17:41	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		08/19/14 17:41	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		08/19/14 17:41	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		08/19/14 17:41	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		08/19/14 17:41	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		08/19/14 17:41	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		08/19/14 17:41	75-71-8	
1,1-Dichloroethane	**4.9**	ug/L	1.0	1		08/19/14 17:41	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		08/19/14 17:41	107-06-2	
1,2-Dichloroethene (Total)	**109**	ug/L	1.0	1		08/19/14 17:41	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		08/19/14 17:41	75-35-4	
cis-1,2-Dichloroethene	**107**	ug/L	1.0	1		08/19/14 17:41	156-59-2	
trans-1,2-Dichloroethene	**1.7**	ug/L	1.0	1		08/19/14 17:41	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		08/19/14 17:41	78-87-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

Sample: GMW-8S **Lab ID: 60175918002** Collected: 08/15/14 13:03 Received: 08/15/14 17:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
1,3-Dichloropropane	ND	ug/L	1.0	1		08/19/14 17:41	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		08/19/14 17:41	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		08/19/14 17:41	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		08/19/14 17:41	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		08/19/14 17:41	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		08/19/14 17:41	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		08/19/14 17:41	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		08/19/14 17:41	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		08/19/14 17:41	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		08/19/14 17:41	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		08/19/14 17:41	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		08/19/14 17:41	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		08/19/14 17:41	1634-04-4	
Naphthalene	ND	ug/L	10.0	1		08/19/14 17:41	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		08/19/14 17:41	103-65-1	
Styrene	ND	ug/L	1.0	1		08/19/14 17:41	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		08/19/14 17:41	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		08/19/14 17:41	79-34-5	
Tetrachloroethene	**8.8**	ug/L	1.0	1		08/19/14 17:41	127-18-4	
Toluene	ND	ug/L	1.0	1		08/19/14 17:41	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		08/19/14 17:41	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		08/19/14 17:41	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		08/19/14 17:41	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		08/19/14 17:41	79-00-5	
Trichloroethene	**159**	ug/L	1.0	1		08/19/14 17:41	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		08/19/14 17:41	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		08/19/14 17:41	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		08/19/14 17:41	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		08/19/14 17:41	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		08/19/14 17:41	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		08/19/14 17:41	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	80-120	1		08/19/14 17:41	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	80-120	1		08/19/14 17:41	17060-07-0	
Toluene-d8 (S)	96	%	80-120	1		08/19/14 17:41	2037-26-5	
Preservation pH	**3.0**		0.10	1		08/19/14 17:41		pH
4500S2D Sulfide, Total	Analytical Method: SM 4500-S-2 D							
Sulfide, Total	ND	mg/L	0.050	1		08/21/14 09:15	18496-25-8	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**169**	mg/L	20.0	20		08/26/14 10:25	16887-00-6	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	ND	mg/L	0.10	1		08/16/14 11:19		
Nitrogen, Nitrite	ND	mg/L	0.10	1		08/16/14 11:19		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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(913)599-5665

ANALYTICAL RESULTS

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

Sample: GMW-8S **Lab ID: 60175918002** Collected: 08/15/14 13:03 Received: 08/15/14 17:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	1		08/16/14 11:19		
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**1.0**	mg/L	1.0	1		08/20/14 20:48	7440-44-0	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

QC Batch: AIR/21111 Analysis Method: RSK 175
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 60175918001, 60175918002

METHOD BLANK: 1766711 Matrix: Water
Associated Lab Samples: 60175918001, 60175918002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	6.2	08/20/14 12:13	
Ethene	ug/L	ND	6.2	08/20/14 12:13	
Methane	ug/L	ND	6.6	08/20/14 12:13	

LABORATORY CONTROL SAMPLE & LCSD: 1766712 1766713

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	115	118	101	104	85-115	2	20	
Ethene	ug/L	106	107	110	101	103	85-115	2	20	
Methane	ug/L	60.7	60.6	62.1	100	102	85-115	2	20	

SAMPLE DUPLICATE: 1766714

Parameter	Units	208082001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	ND	4.8J		20	

SAMPLE DUPLICATE: 1766715

Parameter	Units	208098002 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	ND	3.4J		20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

QC Batch: MPRP/28603 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60175918001, 60175918002

METHOD BLANK: 1429248 Matrix: Water
Associated Lab Samples: 60175918001, 60175918002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron	ug/L	ND	50.0	08/21/14 11:14	

LABORATORY CONTROL SAMPLE: 1429249

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	10000	9960	100	85-115	

MATRIX SPIKE SAMPLE: 1429250

Parameter	Units	60176023002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	291	10000	10400	101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1429251 1429252

Parameter	Units	60175988002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	ug/L	138	10000	10000	9910	9810	98	97	70-130	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

QC Batch: MPRP/28637 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Dissolved
Associated Lab Samples: 60175918001, 60175918002

METHOD BLANK: 1430733 Matrix: Water
Associated Lab Samples: 60175918001, 60175918002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron, Dissolved	ug/L	ND	50.0	08/25/14 13:16	
Manganese, Dissolved	ug/L	ND	5.0	08/25/14 13:16	

LABORATORY CONTROL SAMPLE: 1430734

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Dissolved	ug/L	10000	10100	101	85-115	
Manganese, Dissolved	ug/L	1000	1020	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1430735 1430736

Parameter	Units	60175918001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron, Dissolved	ug/L	ND	10000	10000	10100	10100	101	101	70-130	0	10	
Manganese, Dissolved	ug/L	321	1000	1000	1330	1330	101	101	70-130	0	9	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

QC Batch: MSV/63706
QC Batch Method: EPA 5030B/8260
Analysis Method: EPA 5030B/8260
Analysis Description: 8260 MSV Water 10 mL Purge
Associated Lab Samples: 60175918001, 60175918002

METHOD BLANK: 1428121
Matrix: Water
Associated Lab Samples: 60175918001, 60175918002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	08/19/14 15:04	
1,1,1-Trichloroethane	ug/L	ND	1.0	08/19/14 15:04	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	08/19/14 15:04	
1,1,2-Trichloroethane	ug/L	ND	1.0	08/19/14 15:04	
1,1-Dichloroethane	ug/L	ND	1.0	08/19/14 15:04	
1,1-Dichloroethene	ug/L	ND	1.0	08/19/14 15:04	
1,1-Dichloropropene	ug/L	ND	1.0	08/19/14 15:04	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	08/19/14 15:04	
1,2,3-Trichloropropane	ug/L	ND	2.5	08/19/14 15:04	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	08/19/14 15:04	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	08/19/14 15:04	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.5	08/19/14 15:04	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	08/19/14 15:04	
1,2-Dichlorobenzene	ug/L	ND	1.0	08/19/14 15:04	
1,2-Dichloroethane	ug/L	ND	1.0	08/19/14 15:04	
1,2-Dichloroethene (Total)	ug/L	ND	1.0	08/19/14 15:04	
1,2-Dichloropropane	ug/L	ND	1.0	08/19/14 15:04	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	08/19/14 15:04	
1,3-Dichlorobenzene	ug/L	ND	1.0	08/19/14 15:04	
1,3-Dichloropropane	ug/L	ND	1.0	08/19/14 15:04	
1,4-Dichlorobenzene	ug/L	ND	1.0	08/19/14 15:04	
2,2-Dichloropropane	ug/L	ND	1.0	08/19/14 15:04	
2-Butanone (MEK)	ug/L	ND	10.0	08/19/14 15:04	
2-Chlorotoluene	ug/L	ND	1.0	08/19/14 15:04	
2-Hexanone	ug/L	ND	10.0	08/19/14 15:04	
4-Chlorotoluene	ug/L	ND	1.0	08/19/14 15:04	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	10.0	08/19/14 15:04	
Acetone	ug/L	ND	10.0	08/19/14 15:04	
Benzene	ug/L	ND	1.0	08/19/14 15:04	
Bromobenzene	ug/L	ND	1.0	08/19/14 15:04	
Bromochloromethane	ug/L	ND	1.0	08/19/14 15:04	
Bromodichloromethane	ug/L	ND	1.0	08/19/14 15:04	
Bromoform	ug/L	ND	1.0	08/19/14 15:04	
Bromomethane	ug/L	ND	5.0	08/19/14 15:04	
Carbon disulfide	ug/L	ND	5.0	08/19/14 15:04	
Carbon tetrachloride	ug/L	ND	1.0	08/19/14 15:04	
Chlorobenzene	ug/L	ND	1.0	08/19/14 15:04	
Chloroethane	ug/L	ND	1.0	08/19/14 15:04	
Chloroform	ug/L	ND	1.0	08/19/14 15:04	
Chloromethane	ug/L	ND	1.0	08/19/14 15:04	
cis-1,2-Dichloroethene	ug/L	ND	1.0	08/19/14 15:04	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

METHOD BLANK: 1428121 Matrix: Water
Associated Lab Samples: 60175918001, 60175918002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
cis-1,3-Dichloropropene	ug/L	ND	1.0	08/19/14 15:04	
Dibromochloromethane	ug/L	ND	1.0	08/19/14 15:04	
Dibromomethane	ug/L	ND	1.0	08/19/14 15:04	
Dichlorodifluoromethane	ug/L	ND	1.0	08/19/14 15:04	
Ethylbenzene	ug/L	ND	1.0	08/19/14 15:04	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	08/19/14 15:04	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	08/19/14 15:04	
Methyl-tert-butyl ether	ug/L	ND	1.0	08/19/14 15:04	
Methylene chloride	ug/L	ND	1.0	08/19/14 15:04	
n-Butylbenzene	ug/L	ND	1.0	08/19/14 15:04	
n-Propylbenzene	ug/L	ND	1.0	08/19/14 15:04	
Naphthalene	ug/L	ND	10.0	08/19/14 15:04	
p-Isopropyltoluene	ug/L	ND	1.0	08/19/14 15:04	
sec-Butylbenzene	ug/L	ND	1.0	08/19/14 15:04	
Styrene	ug/L	ND	1.0	08/19/14 15:04	
tert-Butylbenzene	ug/L	ND	1.0	08/19/14 15:04	
Tetrachloroethene	ug/L	ND	1.0	08/19/14 15:04	
Toluene	ug/L	ND	1.0	08/19/14 15:04	
trans-1,2-Dichloroethene	ug/L	ND	1.0	08/19/14 15:04	
trans-1,3-Dichloropropene	ug/L	ND	1.0	08/19/14 15:04	
Trichloroethene	ug/L	ND	1.0	08/19/14 15:04	
Trichlorofluoromethane	ug/L	ND	1.0	08/19/14 15:04	
Vinyl chloride	ug/L	ND	1.0	08/19/14 15:04	
Xylene (Total)	ug/L	ND	3.0	08/19/14 15:04	
1,2-Dichloroethane-d4 (S)	%	99	80-120	08/19/14 15:04	
4-Bromofluorobenzene (S)	%	102	80-120	08/19/14 15:04	
Toluene-d8 (S)	%	99	80-120	08/19/14 15:04	

LABORATORY CONTROL SAMPLE: 1428122

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	19.3	97	80-124	
1,1,1-Trichloroethane	ug/L	20	20.1	100	80-121	
1,1,2,2-Tetrachloroethane	ug/L	20	19.5	97	73-124	
1,1,2-Trichloroethane	ug/L	20	20.5	102	80-120	
1,1-Dichloroethane	ug/L	20	19.8	99	77-120	
1,1-Dichloroethene	ug/L	20	19.1	96	78-126	
1,1-Dichloropropene	ug/L	20	19.0	95	80-120	
1,2,3-Trichlorobenzene	ug/L	20	19.7	98	75-130	
1,2,3-Trichloropropane	ug/L	20	20.1	101	76-127	
1,2,4-Trichlorobenzene	ug/L	20	19.7	98	79-124	
1,2,4-Trimethylbenzene	ug/L	20	19.9	99	80-122	
1,2-Dibromo-3-chloropropane	ug/L	20	20.8	104	68-131	
1,2-Dibromoethane (EDB)	ug/L	20	20.1	100	80-127	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

LABORATORY CONTROL SAMPLE: 1428122

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	20	20.8	104	80-122	
1,2-Dichloroethane	ug/L	20	21.0	105	77-123	
1,2-Dichloroethene (Total)	ug/L	40	38.8	97	80-120	
1,2-Dichloropropane	ug/L	20	19.4	97	80-121	
1,3,5-Trimethylbenzene	ug/L	20	19.5	98	80-121	
1,3-Dichlorobenzene	ug/L	20	21.2	106	80-120	
1,3-Dichloropropane	ug/L	20	19.7	98	80-120	
1,4-Dichlorobenzene	ug/L	20	20.0	100	80-120	
2,2-Dichloropropane	ug/L	20	18.4	92	50-137	
2-Butanone (MEK)	ug/L	100	100	100	52-145	
2-Chlorotoluene	ug/L	20	20.8	104	80-120	
2-Hexanone	ug/L	100	97.5	97	57-139	
4-Chlorotoluene	ug/L	20	19.6	98	80-121	
4-Methyl-2-pentanone (MIBK)	ug/L	100	103	103	71-131	
Acetone	ug/L	100	105	105	32-155	
Benzene	ug/L	20	19.4	97	80-120	
Bromobenzene	ug/L	20	21.6	108	80-120	
Bromochloromethane	ug/L	20	21.0	105	77-123	
Bromodichloromethane	ug/L	20	21.5	108	80-120	
Bromoform	ug/L	20	20.3	102	73-124	
Bromomethane	ug/L	20	13.4	67	31-144	
Carbon disulfide	ug/L	20	20.0	100	65-125	
Carbon tetrachloride	ug/L	20	19.9	99	78-128	
Chlorobenzene	ug/L	20	21.0	105	80-120	
Chloroethane	ug/L	20	20.6	103	55-137	
Chloroform	ug/L	20	19.9	100	79-120	
Chloromethane	ug/L	20	15.7	79	22-138	
cis-1,2-Dichloroethene	ug/L	20	19.6	98	80-120	
cis-1,3-Dichloropropene	ug/L	20	20.0	100	80-120	
Dibromochloromethane	ug/L	20	20.7	103	80-120	
Dibromomethane	ug/L	20	19.8	99	80-122	
Dichlorodifluoromethane	ug/L	20	15.1	76	23-120	
Ethylbenzene	ug/L	20	20.9	104	80-121	
Hexachloro-1,3-butadiene	ug/L	20	19.9	100	77-129	
Isopropylbenzene (Cumene)	ug/L	20	20.9	104	80-136	
Methyl-tert-butyl ether	ug/L	20	19.7	98	74-125	
Methylene chloride	ug/L	20	20.2	101	73-126	
n-Butylbenzene	ug/L	20	20.5	102	83-123	
n-Propylbenzene	ug/L	20	20.0	100	80-122	
Naphthalene	ug/L	20	19.0	95	73-130	
p-Isopropyltoluene	ug/L	20	20.0	100	80-124	
sec-Butylbenzene	ug/L	20	19.1	95	80-129	
Styrene	ug/L	20	21.7	108	80-120	
tert-Butylbenzene	ug/L	20	19.7	98	80-126	
Tetrachloroethene	ug/L	20	20.4	102	80-121	
Toluene	ug/L	20	19.7	98	80-122	
trans-1,2-Dichloroethene	ug/L	20	19.2	96	79-121	

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QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

LABORATORY CONTROL SAMPLE: 1428122

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
trans-1,3-Dichloropropene	ug/L	20	19.9	99	80-127	
Trichloroethene	ug/L	20	20.3	101	80-120	
Trichlorofluoromethane	ug/L	20	21.4	107	67-120	
Vinyl chloride	ug/L	20	16.5	83	59-120	
Xylene (Total)	ug/L	60	61.4	102	80-121	
1,2-Dichloroethane-d4 (S)	%			104	80-120	
4-Bromofluorobenzene (S)	%			102	80-120	
Toluene-d8 (S)	%			98	80-120	

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QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

QC Batch: WET/49760 Analysis Method: SM 4500-S-2 D
QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total
Associated Lab Samples: 60175918001, 60175918002

METHOD BLANK: 1429396 Matrix: Water
Associated Lab Samples: 60175918001, 60175918002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfide, Total	mg/L	ND	0.050	08/21/14 09:11	

LABORATORY CONTROL SAMPLE: 1429397

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.5	0.50	99	80-120	

MATRIX SPIKE SAMPLE: 1429398

Parameter	Units	60175831002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	ND	.5	0.23	45	75-125	M1

SAMPLE DUPLICATE: 1429399

Parameter	Units	60175870001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

QC Batch: WETA/30711 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60175918001, 60175918002

METHOD BLANK: 1429779 Matrix: Water
Associated Lab Samples: 60175918001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	08/21/14 16:11	

METHOD BLANK: 1432517 Matrix: Water
Associated Lab Samples: 60175918002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	08/26/14 10:40	

LABORATORY CONTROL SAMPLE: 1429780

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	

LABORATORY CONTROL SAMPLE: 1432518

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1429781 1429782

Parameter	Units	60176275001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	143	100	100	238	238	95	95	80-120	0	15	

MATRIX SPIKE SAMPLE: 1429783

Parameter	Units	60175630001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	37.8	25	61.3	94	80-120	

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.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

QC Batch: WETA/30648 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, Unpres.
Associated Lab Samples: 60175918001, 60175918002

METHOD BLANK: 1426831 Matrix: Water
Associated Lab Samples: 60175918001, 60175918002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Nitrate	mg/L	ND	0.10	08/16/14 11:07	
Nitrogen, Nitrite	mg/L	ND	0.10	08/16/14 11:07	
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	08/16/14 11:07	

LABORATORY CONTROL SAMPLE: 1426832

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/L	1.6	1.7	108	85-115	
Nitrogen, Nitrite	mg/L	.4	0.40	100	90-110	
Nitrogen, NO2 plus NO3	mg/L	2	2.1	107	90-110	

MATRIX SPIKE SAMPLE: 1426833

Parameter	Units	60175841001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/L	ND	1.6	1.7	107	85-115	
Nitrogen, Nitrite	mg/L	ND	.4	0.41	103	90-110	
Nitrogen, NO2 plus NO3	mg/L	ND	2	2.1	106	90-110	

MATRIX SPIKE SAMPLE: 1426834

Parameter	Units	60175918001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/L	0.91	1.6	2.5	97	85-115	
Nitrogen, Nitrite	mg/L	ND	.4	0.40	101	90-110	
Nitrogen, NO2 plus NO3	mg/L	0.91	2	2.9	98	90-110	

SAMPLE DUPLICATE: 1426835

Parameter	Units	60175923001 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrogen, Nitrate	mg/L	ND	ND		20	
Nitrogen, Nitrite	mg/L	ND	ND		20	
Nitrogen, NO2 plus NO3	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.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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QUALITY CONTROL DATA

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

QC Batch: WETA/30679 Analysis Method: SM 5310C
QC Batch Method: SM 5310C Analysis Description: 5310C Total Organic Carbon
Associated Lab Samples: 60175918001, 60175918002

METHOD BLANK: 1428480 Matrix: Water
Associated Lab Samples: 60175918001, 60175918002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Organic Carbon	mg/L	ND	1.0	08/20/14 14:39	

LABORATORY CONTROL SAMPLE: 1428481

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	5	5.3	105	80-120	

MATRIX SPIKE SAMPLE: 1428482

Parameter	Units	60175754001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	1.1	5	6.3	105	80-120	

SAMPLE DUPLICATE: 1428483

Parameter	Units	60175407001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Organic Carbon	mg/L	0.88J	.87J		25	

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

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

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 (8270 listed analyte) decomposes to Azobenzene.

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-K	Pace Analytical Services - Kansas City
PASI-M	Pace Analytical Services - Minneapolis

BATCH QUALIFIERS

Batch: MSV/63706

[M5]	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
pH	Post-analysis pH measurement indicates insufficient VOA sample preservation.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 2nd & Kirby Remediation
Pace Project No.: 60175918

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60175918001	**TMW-2**	RSK 175	AIR/21111		
60175918002	**GMW-8S**	RSK 175	AIR/21111		
60175918001	**TMW-2**	EPA 200.7	MPRP/28603	EPA 200.7	ICP/21569
60175918002	**GMW-8S**	EPA 200.7	MPRP/28603	EPA 200.7	ICP/21569
60175918001	**TMW-2**	EPA 200.7	MPRP/28637	EPA 200.7	ICP/21595
60175918002	**GMW-8S**	EPA 200.7	MPRP/28637	EPA 200.7	ICP/21595
60175918001	**TMW-2**	EPA 5030B/8260	MSV/63706		
60175918002	**GMW-8S**	EPA 5030B/8260	MSV/63706		
60175918001	**TMW-2**	SM 4500-S-2 D	WET/49760		
60175918002	**GMW-8S**	SM 4500-S-2 D	WET/49760		
60175918001	**TMW-2**	EPA 300.0	WETA/30711		
60175918002	**GMW-8S**	EPA 300.0	WETA/30711		
60175918001	**TMW-2**	EPA 353.2	WETA/30648		
60175918002	**GMW-8S**	EPA 353.2	WETA/30648		
60175918001	**TMW-2**	SM 5310C	WETA/30679		
60175918002	**GMW-8S**	SM 5310C	WETA/30679		

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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: of

1777402

Section A
Required Client Information:

Company:	GSI ENGINEERING LLC
Address:	15012 W. 100TH STREET
	LENEXA, KS 66215
Email To:	jmellema@gsinetwork.com
Phone:	816-217-6413
Fax:	
Requested Due Date/TAT:	

Section B
Required Project Information:

Report To:	JOSH MELLEMA
Copy To:	BRIAN CONRAD
Purchase Order No.:	
Project Name:	2ND & KIRBY REMEDIATION
Project Number:	184032

Section C
Invoice Information:

Attention:	BRIAN CONRAD
Company Name:	GSI ENGINEERING LLC
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

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

Site Location STATE: KS

Section D
Required Client Information

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

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

Requested Analysis Filtered (Y/N): DISS. FE, MN – N

Analysis Test: CHLORIDE, NO2, NO3 | SULFIDE | RSK-175 | DISS. FE, MN | TOTAL FE | TOC | FULL RANGE ORGANICS 8260

Preservatives: Unpreserved, H_2SO_4, HNO_3, HCl, NaOH, $Na_2S_2O_3$, Methanol, Other

Pace Project No./ Lab I.D.: 60175918

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Containers / Pace Project No./ Lab I.D.
1	TMW-2	WT	G	8/15	1203				11	3(DG9H) 3(VG9H) 2(BP3N) 1(BP2N) 1(BP3Z) 1(AG3S) 001
2	GMW-4S	WT	G	8/15	1303				11	↓ 002
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	X [signature]	8/15	1720	[signature]	8/15/13	1720	2.2	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

ORIGINAL

*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.07, 15-May-2007

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

November 11, 2014

BRIAN CONRAD
GSI
15012 W. 106th Street
Lenexa, KS 66219

RE: Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Dear BRIAN CONRAD:
Enclosed are the analytical results for sample(s) received by the laboratory on October 29, 2014. 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,

Heather Wilson
heather.wilson@pacelabs.com
Project Manager

Enclosures

cc: Josh Mellema, GSI Engineering, LLC

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

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
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 13-012-0
Illinois Certification #: 003097
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60181402001	**TMW-1**	Water	10/28/14 15:30	10/29/14 10:10
60181402002	**TMW-2**	Water	10/28/14 18:05	10/29/14 10:10
60181402003	**GMW-8S**	Water	10/28/14 17:45	10/29/14 10:10
60181402004	**MW-27S**	Water	10/28/14 15:05	10/29/14 10:10
60181402005	**GMW-6S**	Water	10/28/14 16:30	10/29/14 10:10
60181402006	**MW-15**	Water	10/28/14 18:25	10/29/14 10:10
60181402007	**MW-21**	Water	10/28/14 17:25	10/29/14 10:10
60181402008	**GMW-5S**	Water	10/28/14 16:10	10/29/14 10:10
60181402009	**GMW-7S**	Water	10/28/14 17:05	10/29/14 10:10
60181402010	**GMW-9S**	Water	10/28/14 18:50	10/29/14 10:10
60181402011	**GMW-10S**	Water	10/28/14 11:30	10/29/14 10:10
60181402012	**GMW-1**	Water	10/28/14 13:20	10/29/14 10:10
60181402013	**GMW-2**	Water	10/28/14 13:40	10/29/14 10:10
60181402014	**GMW-4**	Water	10/28/14 12:55	10/29/14 10:10
60181402015	**GMW-6I**	Water	10/28/14 16:50	10/29/14 10:10
60181402016	**GMW-10S**	Water	10/28/14 12:05	10/29/14 10:10
60181402017	**MW-28S**	Water	10/28/14 12:25	10/29/14 10:10
60181402018	**DUP-1**	Water	10/28/14 18:50	10/29/14 10:10
60181402019	**TRIP BLANK**	Water		10/29/14 10:10

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SAMPLE ANALYTE COUNT

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60181402001	**TMW-1**	RSK 175	DL1	3	PASI-M
		EPA 200.7	NDJ	2	PASI-K
		EPA 200.7	NDJ	2	PASI-K
		EPA 5030B/8260	PRG	69	PASI-K
		SM 2320B	CRT	1	PASI-K
		SM 3500-Fe B#4	AJM	1	PASI-K
		SM 4500-S-2 D	JMC1	1	PASI-K
		EPA 300.0	OL	2	PASI-K
		EPA 353.2	JMC1	3	PASI-K
		SM 5310C	CRT	1	PASI-K
60181402002	**TMW-2**	RSK 175	DL1	3	PASI-M
		EPA 200.7	NDJ	2	PASI-K
		EPA 200.7	NDJ	2	PASI-K
		EPA 5030B/8260	PRG	69	PASI-K
		SM 2320B	CRT	1	PASI-K
		SM 3500-Fe B#4	AJM	1	PASI-K
		SM 4500-S-2 D	JMC1	1	PASI-K
		EPA 300.0	OL	2	PASI-K
		EPA 353.2	JMC1	3	PASI-K
		SM 5310C	CRT	1	PASI-K
60181402003	**GMW-8S**	RSK 175	DL1	3	PASI-M
		EPA 200.7	NDJ	2	PASI-K
		EPA 200.7	NDJ	2	PASI-K
		EPA 5030B/8260	PRG	69	PASI-K
		SM 2320B	CRT	1	PASI-K
		SM 3500-Fe B#4	AJM	1	PASI-K
		SM 4500-S-2 D	JMC1	1	PASI-K
		EPA 300.0	OL	2	PASI-K
		EPA 353.2	JMC1	3	PASI-K
		SM 5310C	JMC1	1	PASI-K
60181402004	**MW-27S**	RSK 175	DL1	3	PASI-M
		EPA 200.7	NDJ	2	PASI-K
		EPA 200.7	NDJ	2	PASI-K
		EPA 5030B/8260	PRG	69	PASI-K
		SM 2320B	CRT	1	PASI-K
		SM 3500-Fe B#4	AJM	1	PASI-K
		SM 4500-S-2 D	JMC1	1	PASI-K

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SAMPLE ANALYTE COUNT

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 300.0	OL	2	PASI-K
		EPA 353.2	JMC1	3	PASI-K
		SM 5310C	JMC1	1	PASI-K
60181402005	**GMW-6S**	RSK 175	DL1	3	PASI-M
		EPA 200.7	NDJ	2	PASI-K
		EPA 200.7	NDJ	2	PASI-K
		EPA 5030B/8260	PRG	69	PASI-K
		SM 2320B	CRT	1	PASI-K
		SM 3500-Fe B#4	AJM	1	PASI-K
		SM 4500-S-2 D	JMC1	1	PASI-K
		EPA 300.0	OL	2	PASI-K
		EPA 353.2	JMC1	3	PASI-K
		SM 5310C	JMC1	1	PASI-K
60181402006	**MW-15**	RSK 175	DL1	3	PASI-M
		EPA 200.7	NDJ	2	PASI-K
		EPA 200.7	NDJ	2	PASI-K
		EPA 5030B/8260	PRG	69	PASI-K
		SM 2320B	CRT	1	PASI-K
		SM 3500-Fe B#4	AJM	1	PASI-K
		SM 4500-S-2 D	JMC1	1	PASI-K
		EPA 300.0	OL	2	PASI-K
		EPA 353.2	JMC1	3	PASI-K
		SM 5310C	JMC1	1	PASI-K
60181402007	**MW-21**	RSK 175	DL1	3	PASI-M
		EPA 200.7	NDJ	2	PASI-K
		EPA 200.7	NDJ	2	PASI-K
		EPA 5030B/8260	PRG	69	PASI-K
		SM 2320B	CRT	1	PASI-K
		SM 3500-Fe B#4	AJM	1	PASI-K
		SM 4500-S-2 D	JMC1	1	PASI-K
		EPA 300.0	OL	2	PASI-K
		EPA 353.2	JMC1	3	PASI-K
		SM 5310C	JMC1	1	PASI-K
60181402008	**GMW-5S**	EPA 5030B/8260	PRG	69	PASI-K
60181402009	**GMW-7S**	EPA 5030B/8260	PRG	69	PASI-K
60181402010	**GMW-9S**	EPA 5030B/8260	PRG	69	PASI-K
60181402011	**GMW-10S**	EPA 5030B/8260	PRG	69	PASI-K

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SAMPLE ANALYTE COUNT

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60181402012	**GMW-1**	EPA 5030B/8260	PRG	69	PASI-K
60181402013	**GMW-2**	EPA 5030B/8260	PRG	69	PASI-K
60181402014	**GMW-4**	EPA 5030B/8260	PRG	69	PASI-K
60181402015	**GMW-6I**	EPA 5030B/8260	PRG	69	PASI-K
60181402016	**GMW-10S**	EPA 5030B/8260	PRG	69	PASI-K
60181402017	**MW-28S**	EPA 5030B/8260	PRG	69	PASI-K
60181402018	**DUP-1**	EPA 5030B/8260	PRG	69	PASI-K
60181402019	**TRIP BLANK**	EPA 5030B/8260	PRG	69	PASI-K

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(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: TMW-1 **Lab ID: 60181402001** Collected: 10/28/14 15:30 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	6.2	1		11/02/14 14:00	74-84-0	
Ethene	ND	ug/L	6.2	1		11/02/14 14:00	74-85-1	
Methane	**8.3**	ug/L	6.6	1		11/02/14 14:00	74-82-8	
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron	**7600**	ug/L	50.0	1	10/30/14 14:30	11/05/14 14:47	7439-89-6	
Manganese	**1150**	ug/L	5.0	1	10/30/14 14:30	11/05/14 14:47	7439-96-5	
200.7 Metals, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron, Dissolved	**7460**	ug/L	50.0	1	10/29/14 15:00	11/05/14 14:13	7439-89-6	
Manganese, Dissolved	**1130**	ug/L	5.0	1	10/29/14 15:00	11/05/14 14:13	7439-96-5	
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 14:41	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 14:41	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 14:41	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 14:41	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 14:41	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 14:41	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 14:41	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 14:41	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 14:41	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 14:41	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 14:41	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 14:41	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 14:41	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 14:41	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 14:41	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 14:41	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 14:41	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 14:41	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 14:41	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 14:41	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 14:41	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 14:41	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 14:41	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 14:41	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 14:41	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 14:41	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 14:41	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/30/14 14:41	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 14:41	107-06-2	
1,2-Dichloroethene (Total)	**3.0**	ug/L	1.0	1		10/30/14 14:41	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 14:41	75-35-4	
cis-1,2-Dichloroethene	**3.0**	ug/L	1.0	1		10/30/14 14:41	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 14:41	156-60-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: TMW-1 **Lab ID: 60181402001** Collected: 10/28/14 15:30 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 14:41	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 14:41	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 14:41	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 14:41	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 14:41	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 14:41	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 14:41	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 14:41	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 14:41	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 14:41	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 14:41	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 14:41	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 14:41	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 14:41	1634-04-4	
Naphthalene	ND	ug/L	10.0	1		10/30/14 14:41	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 14:41	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 14:41	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 14:41	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 14:41	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/30/14 14:41	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 14:41	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 14:41	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 14:41	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/30/14 14:41	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 14:41	79-00-5	
Trichloroethene	**21.3**	ug/L	1.0	1		10/30/14 14:41	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 14:41	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 14:41	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 14:41	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 14:41	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 14:41	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 14:41	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	80-120	1		10/30/14 14:41	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	80-120	1		10/30/14 14:41	17060-07-0	
Toluene-d8 (S)	96	%	80-120	1		10/30/14 14:41	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 14:41		
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**469**	mg/L	20.0	1		11/03/14 10:49		
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	ND	mg/L	0.20	1		10/31/14 14:53		H6
4500S2D Sulfide, Total	Analytical Method: SM 4500-S-2 D							
Sulfide, Total	**0.059**	mg/L	0.050	1		11/04/14 12:36	18496-25-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: TMW-1 **Lab ID: 60181402001** Collected: 10/28/14 15:30 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**187**	mg/L	10.0	10		11/09/14 18:26	16887-00-6	
Sulfate	**100**	mg/L	10.0	10		11/09/14 18:26	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	ND	mg/L	0.10	1		10/30/14 07:55		
Nitrogen, Nitrite	ND	mg/L	0.10	1		10/30/14 07:55		
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	1		10/30/14 07:55		
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**4.1**	mg/L	1.0	1		10/31/14 17:05	7440-44-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: TMW-2 **Lab ID: 60181402002** Collected: 10/28/14 18:05 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	6.2	1		11/02/14 14:11	74-84-0	
Ethene	ND	ug/L	6.2	1		11/02/14 14:11	74-85-1	
Methane	**19.8**	ug/L	6.6	1		11/02/14 14:11	74-82-8	
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron	**4200**	ug/L	50.0	1	10/30/14 14:30	11/05/14 14:49	7439-89-6	
Manganese	**2630**	ug/L	5.0	1	10/30/14 14:30	11/05/14 14:49	7439-96-5	
200.7 Metals, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron, Dissolved	**4350**	ug/L	50.0	1	10/29/14 15:00	11/05/14 14:20	7439-89-6	D9
Manganese, Dissolved	**2730**	ug/L	5.0	1	10/29/14 15:00	11/05/14 14:20	7439-96-5	D9
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 14:56	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 14:56	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 14:56	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 14:56	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 14:56	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 14:56	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 14:56	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 14:56	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 14:56	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 14:56	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 14:56	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 14:56	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 14:56	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 14:56	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 14:56	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 14:56	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 14:56	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 14:56	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 14:56	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 14:56	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 14:56	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 14:56	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 14:56	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 14:56	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 14:56	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 14:56	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 14:56	75-71-8	
1,1-Dichloroethane	**1.1**	ug/L	1.0	1		10/30/14 14:56	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 14:56	107-06-2	
1,2-Dichloroethene (Total)	**60.1**	ug/L	1.0	1		10/30/14 14:56	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 14:56	75-35-4	
cis-1,2-Dichloroethene	**59.7**	ug/L	1.0	1		10/30/14 14:56	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 14:56	156-60-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: TMW-2 **Lab ID: 60181402002** Collected: 10/28/14 18:05 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 14:56	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 14:56	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 14:56	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 14:56	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 14:56	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 14:56	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 14:56	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 14:56	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 14:56	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 14:56	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 14:56	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 14:56	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 14:56	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 14:56	1634-04-4	
Naphthalene	ND	ug/L	10.0	1		10/30/14 14:56	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 14:56	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 14:56	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 14:56	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 14:56	79-34-5	
Tetrachloroethene	**7.7**	ug/L	1.0	1		10/30/14 14:56	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 14:56	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 14:56	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 14:56	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/30/14 14:56	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 14:56	79-00-5	
Trichloroethene	**67.2**	ug/L	1.0	1		10/30/14 14:56	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 14:56	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 14:56	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 14:56	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 14:56	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 14:56	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 14:56	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	95	%	80-120	1		10/30/14 14:56	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	80-120	1		10/30/14 14:56	17060-07-0	
Toluene-d8 (S)	101	%	80-120	1		10/30/14 14:56	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 14:56		
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**405**	mg/L	20.0	1		11/03/14 11:01		
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	ND	mg/L	0.20	1		10/31/14 14:53		H6
4500S2D Sulfide, Total	Analytical Method: SM 4500-S-2 D							
Sulfide, Total	ND	mg/L	0.050	1		11/04/14 12:36	18496-25-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: TMW-2 **Lab ID: 60181402002** Collected: 10/28/14 18:05 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**157**	mg/L	20.0	20		11/10/14 07:29	16887-00-6	
Sulfate	**136**	mg/L	20.0	20		11/10/14 07:29	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	ND	mg/L	0.10	1		10/30/14 08:00		M1
Nitrogen, Nitrite	ND	mg/L	0.10	1		10/30/14 08:00		
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	1		10/30/14 08:00		M1
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**2.1**	mg/L	1.0	1		10/31/14 17:18	7440-44-0	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-8S **Lab ID: 60181402003** Collected: 10/28/14 17:45 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	6.2	1		11/02/14 14:22	74-84-0	
Ethene	ND	ug/L	6.2	1		11/02/14 14:22	74-85-1	
Methane	**16.7**	ug/L	6.6	1		11/02/14 14:22	74-82-8	
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron	ND	ug/L	50.0	1	10/30/14 14:30	11/05/14 14:51	7439-89-6	
Manganese	**249**	ug/L	5.0	1	10/30/14 14:30	11/05/14 14:51	7439-96-5	
200.7 Metals, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron, Dissolved	ND	ug/L	50.0	1	10/29/14 15:00	11/05/14 14:22	7439-89-6	
Manganese, Dissolved	**249**	ug/L	5.0	1	10/29/14 15:00	11/05/14 14:22	7439-96-5	
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	20.0	2		10/30/14 15:40	67-64-1	
Benzene	ND	ug/L	2.0	2		10/30/14 15:40	71-43-2	
Bromobenzene	ND	ug/L	2.0	2		10/30/14 15:40	108-86-1	
Bromochloromethane	ND	ug/L	2.0	2		10/30/14 15:40	74-97-5	
Bromodichloromethane	ND	ug/L	2.0	2		10/30/14 15:40	75-27-4	
Bromoform	ND	ug/L	2.0	2		10/30/14 15:40	75-25-2	
Bromomethane	ND	ug/L	10.0	2		10/30/14 15:40	74-83-9	
2-Butanone (MEK)	ND	ug/L	20.0	2		10/30/14 15:40	78-93-3	
n-Butylbenzene	ND	ug/L	2.0	2		10/30/14 15:40	104-51-8	
sec-Butylbenzene	ND	ug/L	2.0	2		10/30/14 15:40	135-98-8	
tert-Butylbenzene	ND	ug/L	2.0	2		10/30/14 15:40	98-06-6	
Carbon disulfide	ND	ug/L	10.0	2		10/30/14 15:40	75-15-0	
Carbon tetrachloride	ND	ug/L	2.0	2		10/30/14 15:40	56-23-5	L3
Chlorobenzene	ND	ug/L	2.0	2		10/30/14 15:40	108-90-7	
Chloroethane	ND	ug/L	2.0	2		10/30/14 15:40	75-00-3	
Chloroform	ND	ug/L	2.0	2		10/30/14 15:40	67-66-3	
Chloromethane	ND	ug/L	2.0	2		10/30/14 15:40	74-87-3	
2-Chlorotoluene	ND	ug/L	2.0	2		10/30/14 15:40	95-49-8	
4-Chlorotoluene	ND	ug/L	2.0	2		10/30/14 15:40	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	5.0	2		10/30/14 15:40	96-12-8	
Dibromochloromethane	ND	ug/L	2.0	2		10/30/14 15:40	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	2		10/30/14 15:40	106-93-4	
Dibromomethane	ND	ug/L	2.0	2		10/30/14 15:40	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	2		10/30/14 15:40	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.0	2		10/30/14 15:40	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.0	2		10/30/14 15:40	106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.0	2		10/30/14 15:40	75-71-8	
1,1-Dichloroethane	**4.6**	ug/L	2.0	2		10/30/14 15:40	75-34-3	
1,2-Dichloroethane	ND	ug/L	2.0	2		10/30/14 15:40	107-06-2	
1,2-Dichloroethene (Total)	**100**	ug/L	2.0	2		10/30/14 15:40	540-59-0	
1,1-Dichloroethene	ND	ug/L	2.0	2		10/30/14 15:40	75-35-4	
cis-1,2-Dichloroethene	**99.8**	ug/L	2.0	2		10/30/14 15:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.0	2		10/30/14 15:40	156-60-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-8S **Lab ID: 60181402003** Collected: 10/28/14 17:45 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
1,2-Dichloropropane	ND	ug/L	2.0	2		10/30/14 15:40	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.0	2		10/30/14 15:40	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	2		10/30/14 15:40	594-20-7	
1,1-Dichloropropene	ND	ug/L	2.0	2		10/30/14 15:40	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.0	2		10/30/14 15:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.0	2		10/30/14 15:40	10061-02-6	
Ethylbenzene	ND	ug/L	2.0	2		10/30/14 15:40	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2		10/30/14 15:40	87-68-3	
2-Hexanone	ND	ug/L	20.0	2		10/30/14 15:40	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	2.0	2		10/30/14 15:40	98-82-8	
p-Isopropyltoluene	ND	ug/L	2.0	2		10/30/14 15:40	99-87-6	
Methylene chloride	ND	ug/L	2.0	2		10/30/14 15:40	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20.0	2		10/30/14 15:40	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	2.0	2		10/30/14 15:40	1634-04-4	
Naphthalene	ND	ug/L	20.0	2		10/30/14 15:40	91-20-3	
n-Propylbenzene	ND	ug/L	2.0	2		10/30/14 15:40	103-65-1	
Styrene	ND	ug/L	2.0	2		10/30/14 15:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2		10/30/14 15:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2		10/30/14 15:40	79-34-5	
Tetrachloroethene	**8.1**	ug/L	2.0	2		10/30/14 15:40	127-18-4	
Toluene	ND	ug/L	2.0	2		10/30/14 15:40	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2		10/30/14 15:40	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2		10/30/14 15:40	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	2.0	2		10/30/14 15:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	2		10/30/14 15:40	79-00-5	
Trichloroethene	**150**	ug/L	2.0	2		10/30/14 15:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2		10/30/14 15:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	2		10/30/14 15:40	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	2.0	2		10/30/14 15:40	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	2.0	2		10/30/14 15:40	108-67-8	
Vinyl chloride	ND	ug/L	2.0	2		10/30/14 15:40	75-01-4	
Xylene (Total)	ND	ug/L	6.0	2		10/30/14 15:40	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	80-120	2		10/30/14 15:40	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	80-120	2		10/30/14 15:40	17060-07-0	
Toluene-d8 (S)	95	%	80-120	2		10/30/14 15:40	2037-26-5	
Preservation pH	**1.0**		0.10	2		10/30/14 15:40		
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**311**	mg/L	20.0	1		11/03/14 11:07		
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	ND	mg/L	0.20	1		10/31/14 14:53		H6
4500S2D Sulfide, Total	Analytical Method: SM 4500-S-2 D							
Sulfide, Total	ND	mg/L	0.050	1		11/04/14 12:38	18496-25-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-8S **Lab ID: 60181402003** Collected: 10/28/14 17:45 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**156**	mg/L	20.0	20		11/10/14 07:43	16887-00-6	
Sulfate	**244**	mg/L	20.0	20		11/10/14 07:43	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	ND	mg/L	0.10	1		10/30/14 07:57		
Nitrogen, Nitrite	ND	mg/L	0.10	1		10/30/14 07:57		
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	1		10/30/14 07:57		
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**1.5**	mg/L	1.0	1		11/06/14 11:41	7440-44-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: MW-27S **Lab ID: 60181402004** Collected: 10/28/14 15:05 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	6.2	1		11/02/14 14:34	74-84-0	
Ethene	ND	ug/L	6.2	1		11/02/14 14:34	74-85-1	
Methane	ND	ug/L	6.6	1		11/02/14 14:34	74-82-8	
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron	ND	ug/L	50.0	1	10/30/14 14:30	11/05/14 15:02	7439-89-6	
Manganese	**553**	ug/L	5.0	1	10/30/14 14:30	11/05/14 15:02	7439-96-5	
200.7 Metals, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron, Dissolved	ND	ug/L	50.0	1	10/29/14 15:00	11/05/14 14:25	7439-89-6	
Manganese, Dissolved	**545**	ug/L	5.0	1	10/29/14 15:00	11/05/14 14:25	7439-96-5	
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 15:11	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 15:11	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 15:11	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 15:11	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 15:11	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 15:11	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 15:11	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 15:11	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 15:11	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 15:11	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 15:11	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 15:11	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 15:11	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 15:11	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 15:11	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 15:11	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 15:11	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 15:11	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 15:11	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 15:11	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 15:11	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 15:11	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 15:11	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 15:11	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 15:11	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 15:11	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 15:11	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/30/14 15:11	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 15:11	107-06-2	
1,2-Dichloroethene (Total)	**2.1**	ug/L	1.0	1		10/30/14 15:11	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 15:11	75-35-4	
cis-1,2-Dichloroethene	**2.1**	ug/L	1.0	1		10/30/14 15:11	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 15:11	156-60-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: MW-27S **Lab ID: 60181402004** Collected: 10/28/14 15:05 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 15:11	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 15:11	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 15:11	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 15:11	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 15:11	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 15:11	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 15:11	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 15:11	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 15:11	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 15:11	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 15:11	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 15:11	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 15:11	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 15:11	1634-04-4	
Naphthalene	ND	ug/L	10.0	1		10/30/14 15:11	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 15:11	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 15:11	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 15:11	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 15:11	79-34-5	
Tetrachloroethene	**2.4**	ug/L	1.0	1		10/30/14 15:11	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 15:11	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 15:11	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 15:11	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/30/14 15:11	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 15:11	79-00-5	
Trichloroethene	**64.2**	ug/L	1.0	1		10/30/14 15:11	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 15:11	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 15:11	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 15:11	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 15:11	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 15:11	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 15:11	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	92	%	80-120	1		10/30/14 15:11	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	80-120	1		10/30/14 15:11	17060-07-0	
Toluene-d8 (S)	98	%	80-120	1		10/30/14 15:11	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 15:11		
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**294**	mg/L	20.0	1		11/03/14 11:11		
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	ND	mg/L	0.20	1		10/31/14 14:54		H6
4500S2D Sulfide, Total	Analytical Method: SM 4500-S-2 D							
Sulfide, Total	ND	mg/L	0.050	1		11/04/14 12:39	18496-25-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: MW-27S **Lab ID: 60181402004** Collected: 10/28/14 15:05 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**142**	mg/L	20.0	20		11/10/14 07:57	16887-00-6	
Sulfate	**229**	mg/L	20.0	20		11/10/14 07:57	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	ND	mg/L	0.10	1		10/30/14 07:51		
Nitrogen, Nitrite	ND	mg/L	0.10	1		10/30/14 07:51		
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	1		10/30/14 07:51		
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	ND	mg/L	1.0	1		11/06/14 14:01	7440-44-0	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-6S **Lab ID: 60181402005** Collected: 10/28/14 16:30 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	6.2	1		11/02/14 14:45	74-84-0	
Ethene	ND	ug/L	6.2	1		11/02/14 14:45	74-85-1	
Methane	**406**	ug/L	6.6	1		11/02/14 14:45	74-82-8	
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron	ND	ug/L	50.0	1	10/30/14 14:30	11/05/14 15:05	7439-89-6	
Manganese	**199**	ug/L	5.0	1	10/30/14 14:30	11/05/14 15:05	7439-96-5	
200.7 Metals, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron, Dissolved	ND	ug/L	50.0	1	10/29/14 15:00	11/05/14 14:27	7439-89-6	
Manganese, Dissolved	**194**	ug/L	5.0	1	10/29/14 15:00	11/05/14 14:27	7439-96-5	
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 15:26	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 15:26	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 15:26	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 15:26	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 15:26	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 15:26	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 15:26	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 15:26	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 15:26	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 15:26	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 15:26	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 15:26	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 15:26	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 15:26	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 15:26	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 15:26	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 15:26	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 15:26	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 15:26	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 15:26	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 15:26	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 15:26	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 15:26	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 15:26	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 15:26	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 15:26	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 15:26	75-71-8	
1,1-Dichloroethane	**1.5**	ug/L	1.0	1		10/30/14 15:26	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 15:26	107-06-2	
1,2-Dichloroethene (Total)	**48.9**	ug/L	1.0	1		10/30/14 15:26	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 15:26	75-35-4	
cis-1,2-Dichloroethene	**48.6**	ug/L	1.0	1		10/30/14 15:26	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 15:26	156-60-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-6S **Lab ID: 60181402005** Collected: 10/28/14 16:30 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 15:26	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 15:26	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 15:26	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 15:26	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 15:26	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 15:26	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 15:26	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 15:26	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 15:26	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 15:26	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 15:26	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 15:26	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 15:26	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 15:26	1634-04-4	
Naphthalene	ND	ug/L	10.0	1		10/30/14 15:26	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 15:26	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 15:26	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 15:26	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 15:26	79-34-5	
Tetrachloroethene	**1.6**	ug/L	1.0	1		10/30/14 15:26	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 15:26	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 15:26	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 15:26	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/30/14 15:26	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 15:26	79-00-5	
Trichloroethene	**17.3**	ug/L	1.0	1		10/30/14 15:26	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 15:26	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 15:26	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 15:26	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 15:26	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 15:26	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 15:26	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	104	%	80-120	1		10/30/14 15:26	460-00-4	
1,2-Dichloroethane-d4 (S)	107	%	80-120	1		10/30/14 15:26	17060-07-0	
Toluene-d8 (S)	97	%	80-120	1		10/30/14 15:26	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 15:26		
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**424**	mg/L	20.0	1		11/03/14 11:18		
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	ND	mg/L	0.20	1		10/31/14 14:54		H6
4500S2D Sulfide, Total	Analytical Method: SM 4500-S-2 D							
Sulfide, Total	ND	mg/L	0.050	1		11/04/14 12:42	18496-25-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-6S **Lab ID: 60181402005** Collected: 10/28/14 16:30 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**148**	mg/L	10.0	10		11/10/14 08:51	16887-00-6	
Sulfate	**75.7**	mg/L	10.0	10		11/10/14 08:51	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	ND	mg/L	0.10	1		10/30/14 07:56		
Nitrogen, Nitrite	ND	mg/L	0.10	1		10/30/14 07:56		
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	1		10/30/14 07:56		
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**1.0**	mg/L	1.0	1		11/06/14 14:40	7440-44-0	

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ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: MW-15 **Lab ID: 60181402006** Collected: 10/28/14 18:25 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	6.2	1		11/02/14 14:59	74-84-0	
Ethene	ND	ug/L	6.2	1		11/02/14 14:59	74-85-1	
Methane	ND	ug/L	6.6	1		11/02/14 14:59	74-82-8	
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron	ND	ug/L	50.0	1	10/30/14 14:30	11/05/14 15:07	7439-89-6	
Manganese	**188**	ug/L	5.0	1	10/30/14 14:30	11/05/14 15:07	7439-96-5	
200.7 Metals, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron, Dissolved	ND	ug/L	50.0	1	10/29/14 15:00	11/05/14 14:29	7439-89-6	
Manganese, Dissolved	**184**	ug/L	5.0	1	10/29/14 15:00	11/05/14 14:29	7439-96-5	
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 17:09	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 17:09	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 17:09	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 17:09	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 17:09	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 17:09	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 17:09	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 17:09	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 17:09	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 17:09	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 17:09	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 17:09	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 17:09	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 17:09	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 17:09	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 17:09	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 17:09	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 17:09	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 17:09	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 17:09	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 17:09	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 17:09	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 17:09	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:09	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:09	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:09	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 17:09	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/30/14 17:09	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 17:09	107-06-2	
1,2-Dichloroethene (Total)	**3.7**	ug/L	1.0	1		10/30/14 17:09	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 17:09	75-35-4	
cis-1,2-Dichloroethene	**3.7**	ug/L	1.0	1		10/30/14 17:09	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 17:09	156-60-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: MW-15 **Lab ID: 60181402006** Collected: 10/28/14 18:25 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 17:09	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 17:09	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 17:09	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 17:09	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 17:09	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 17:09	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 17:09	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 17:09	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 17:09	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 17:09	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 17:09	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 17:09	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 17:09	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 17:09	1634-04-4	
Naphthalene	ND	ug/L	10.0	1		10/30/14 17:09	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 17:09	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 17:09	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 17:09	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 17:09	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/30/14 17:09	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 17:09	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:09	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:09	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/30/14 17:09	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 17:09	79-00-5	
Trichloroethene	**24.6**	ug/L	1.0	1		10/30/14 17:09	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 17:09	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 17:09	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 17:09	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 17:09	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 17:09	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 17:09	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	80-120	1		10/30/14 17:09	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	80-120	1		10/30/14 17:09	17060-07-0	
Toluene-d8 (S)	95	%	80-120	1		10/30/14 17:09	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 17:09		
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**299**	mg/L	20.0	1		11/03/14 11:22		
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	ND	mg/L	0.20	1		10/31/14 14:54		H6
4500S2D Sulfide, Total	Analytical Method: SM 4500-S-2 D							
Sulfide, Total	ND	mg/L	0.050	1		11/04/14 12:43	18496-25-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
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(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: MW-15 **Lab ID: 60181402006** Collected: 10/28/14 18:25 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**160**	mg/L	20.0	20		11/10/14 09:05	16887-00-6	
Sulfate	**190**	mg/L	20.0	20		11/10/14 09:05	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**2.1**	mg/L	0.10	1		10/30/14 08:02		
Nitrogen, Nitrite	ND	mg/L	0.10	1		10/30/14 08:02		
Nitrogen, NO2 plus NO3	**2.1**	mg/L	0.10	1		10/30/14 08:02		
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	ND	mg/L	1.0	1		11/06/14 14:59	7440-44-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: MW-21 **Lab ID: 60181402007** Collected: 10/28/14 17:25 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	6.2	1		11/02/14 15:11	74-84-0	
Ethene	ND	ug/L	6.2	1		11/02/14 15:11	74-85-1	
Methane	ND	ug/L	6.6	1		11/02/14 15:11	74-82-8	
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron	ND	ug/L	50.0	1	10/30/14 14:30	11/05/14 15:09	7439-89-6	
Manganese	**798**	ug/L	5.0	1	10/30/14 14:30	11/05/14 15:09	7439-96-5	
200.7 Metals, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Iron, Dissolved	ND	ug/L	50.0	1	10/29/14 15:00	11/05/14 14:36	7439-89-6	
Manganese, Dissolved	**806**	ug/L	5.0	1	10/29/14 15:00	11/05/14 14:36	7439-96-5	D9
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 17:24	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 17:24	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 17:24	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 17:24	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 17:24	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 17:24	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 17:24	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 17:24	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 17:24	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 17:24	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 17:24	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 17:24	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 17:24	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 17:24	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 17:24	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 17:24	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 17:24	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 17:24	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 17:24	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 17:24	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 17:24	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 17:24	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 17:24	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:24	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:24	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:24	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 17:24	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/30/14 17:24	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 17:24	107-06-2	
1,2-Dichloroethene (Total)	**2.2**	ug/L	1.0	1		10/30/14 17:24	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 17:24	75-35-4	
cis-1,2-Dichloroethene	**2.2**	ug/L	1.0	1		10/30/14 17:24	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 17:24	156-60-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: MW-21 **Lab ID: 60181402007** Collected: 10/28/14 17:25 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 17:24	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 17:24	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 17:24	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 17:24	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 17:24	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 17:24	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 17:24	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 17:24	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 17:24	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 17:24	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 17:24	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 17:24	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 17:24	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 17:24	1634-04-4	
Naphthalene	ND	ug/L	10.0	1		10/30/14 17:24	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 17:24	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 17:24	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 17:24	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 17:24	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/30/14 17:24	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 17:24	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:24	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:24	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/30/14 17:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 17:24	79-00-5	
Trichloroethene	**3.3**	ug/L	1.0	1		10/30/14 17:24	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 17:24	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 17:24	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 17:24	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 17:24	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 17:24	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 17:24	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	80-120	1		10/30/14 17:24	460-00-4	
1,2-Dichloroethane-d4 (S)	107	%	80-120	1		10/30/14 17:24	17060-07-0	
Toluene-d8 (S)	99	%	80-120	1		10/30/14 17:24	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 17:24		
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**312**	mg/L	20.0	1		11/03/14 11:27		
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	ND	mg/L	0.20	1		10/31/14 14:54		H6
4500S2D Sulfide, Total	Analytical Method: SM 4500-S-2 D							
Sulfide, Total	ND	mg/L	0.050	1		11/04/14 12:43	18496-25-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: MW-21 **Lab ID: 60181402007** Collected: 10/28/14 17:25 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**178**	mg/L	20.0	20		11/10/14 09:19	16887-00-6	
Sulfate	**275**	mg/L	20.0	20		11/10/14 09:19	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**2.1**	mg/L	0.10	1		10/30/14 07:57		
Nitrogen, Nitrite	ND	mg/L	0.10	1		10/30/14 07:57		
Nitrogen, NO2 plus NO3	**2.1**	mg/L	0.10	1		10/30/14 07:57		
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	ND	mg/L	1.0	1		11/06/14 15:58	7440-44-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-5S **Lab ID: 60181402008** Collected: 10/28/14 16:10 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 17:39	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 17:39	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 17:39	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 17:39	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 17:39	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 17:39	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 17:39	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 17:39	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 17:39	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 17:39	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 17:39	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 17:39	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 17:39	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 17:39	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 17:39	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 17:39	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 17:39	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 17:39	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 17:39	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 17:39	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 17:39	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 17:39	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 17:39	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:39	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:39	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:39	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 17:39	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/30/14 17:39	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 17:39	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	1.0	1		10/30/14 17:39	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 17:39	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 17:39	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 17:39	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 17:39	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 17:39	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 17:39	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 17:39	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 17:39	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 17:39	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 17:39	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 17:39	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 17:39	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 17:39	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 17:39	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 17:39	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 17:39	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 17:39	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-5S **Lab ID: 60181402008** Collected: 10/28/14 16:10 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Naphthalene	ND	ug/L	10.0	1		10/30/14 17:39	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 17:39	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 17:39	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 17:39	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 17:39	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/30/14 17:39	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 17:39	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:39	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:39	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/30/14 17:39	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 17:39	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/30/14 17:39	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 17:39	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 17:39	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 17:39	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 17:39	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 17:39	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 17:39	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	80-120	1		10/30/14 17:39	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	80-120	1		10/30/14 17:39	17060-07-0	
Toluene-d8 (S)	93	%	80-120	1		10/30/14 17:39	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 17:39		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-7S **Lab ID: 60181402009** Collected: 10/28/14 17:05 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 17:53	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 17:53	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 17:53	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 17:53	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 17:53	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 17:53	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 17:53	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 17:53	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 17:53	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 17:53	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 17:53	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 17:53	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 17:53	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 17:53	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 17:53	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 17:53	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 17:53	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 17:53	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 17:53	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 17:53	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 17:53	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 17:53	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 17:53	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:53	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:53	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:53	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 17:53	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/30/14 17:53	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 17:53	107-06-2	
1,2-Dichloroethene (Total)	**2.8**	ug/L	1.0	1		10/30/14 17:53	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 17:53	75-35-4	
cis-1,2-Dichloroethene	**2.8**	ug/L	1.0	1		10/30/14 17:53	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 17:53	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 17:53	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 17:53	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 17:53	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 17:53	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 17:53	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 17:53	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 17:53	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 17:53	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 17:53	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 17:53	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 17:53	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 17:53	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 17:53	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 17:53	1634-04-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-7S **Lab ID: 60181402009** Collected: 10/28/14 17:05 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Naphthalene	ND	ug/L	10.0	1		10/30/14 17:53	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 17:53	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 17:53	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 17:53	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 17:53	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/30/14 17:53	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 17:53	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:53	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 17:53	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/30/14 17:53	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 17:53	79-00-5	
Trichloroethene	**9.0**	ug/L	1.0	1		10/30/14 17:53	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 17:53	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 17:53	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 17:53	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 17:53	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 17:53	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 17:53	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	93	%	80-120	1		10/30/14 17:53	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	80-120	1		10/30/14 17:53	17060-07-0	
Toluene-d8 (S)	96	%	80-120	1		10/30/14 17:53	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 17:53		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-9S **Lab ID: 60181402010** Collected: 10/28/14 18:50 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 18:08	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 18:08	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 18:08	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 18:08	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 18:08	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 18:08	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 18:08	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 18:08	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 18:08	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 18:08	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 18:08	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 18:08	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 18:08	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 18:08	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 18:08	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 18:08	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 18:08	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 18:08	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 18:08	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 18:08	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 18:08	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 18:08	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 18:08	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:08	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:08	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:08	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 18:08	75-71-8	
1,1-Dichloroethane	**6.1**	ug/L	1.0	1		10/30/14 18:08	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 18:08	107-06-2	
1,2-Dichloroethene (Total)	**18.3**	ug/L	1.0	1		10/30/14 18:08	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 18:08	75-35-4	
cis-1,2-Dichloroethene	**18.1**	ug/L	1.0	1		10/30/14 18:08	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 18:08	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 18:08	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 18:08	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 18:08	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 18:08	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 18:08	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 18:08	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 18:08	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 18:08	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 18:08	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 18:08	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 18:08	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 18:08	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 18:08	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 18:08	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-9S **Lab ID: 60181402010** Collected: 10/28/14 18:50 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Naphthalene	ND	ug/L	10.0	1		10/30/14 18:08	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 18:08	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 18:08	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 18:08	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 18:08	79-34-5	
Tetrachloroethene	**2.0**	ug/L	1.0	1		10/30/14 18:08	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 18:08	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:08	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:08	120-82-1	
1,1,1-Trichloroethane	**1.2**	ug/L	1.0	1		10/30/14 18:08	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 18:08	79-00-5	
Trichloroethene	**13.3**	ug/L	1.0	1		10/30/14 18:08	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 18:08	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 18:08	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 18:08	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 18:08	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 18:08	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 18:08	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	94	%	80-120	1		10/30/14 18:08	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	80-120	1		10/30/14 18:08	17060-07-0	
Toluene-d8 (S)	95	%	80-120	1		10/30/14 18:08	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 18:08		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-10S **Lab ID: 60181402011** Collected: 10/28/14 11:30 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 18:23	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 18:23	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 18:23	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 18:23	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 18:23	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 18:23	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 18:23	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 18:23	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 18:23	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 18:23	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 18:23	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 18:23	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 18:23	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 18:23	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 18:23	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 18:23	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 18:23	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 18:23	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 18:23	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 18:23	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 18:23	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 18:23	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 18:23	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:23	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:23	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:23	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 18:23	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/30/14 18:23	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 18:23	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	1.0	1		10/30/14 18:23	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 18:23	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 18:23	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 18:23	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 18:23	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 18:23	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 18:23	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 18:23	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 18:23	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 18:23	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 18:23	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 18:23	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 18:23	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 18:23	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 18:23	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 18:23	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 18:23	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 18:23	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-10S **Lab ID: 60181402011** Collected: 10/28/14 11:30 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Naphthalene	ND	ug/L	10.0	1		10/30/14 18:23	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 18:23	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 18:23	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 18:23	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 18:23	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/30/14 18:23	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 18:23	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:23	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:23	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/30/14 18:23	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 18:23	79-00-5	
Trichloroethene	**5.1**	ug/L	1.0	1		10/30/14 18:23	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 18:23	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 18:23	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 18:23	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 18:23	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 18:23	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 18:23	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	80-120	1		10/30/14 18:23	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	80-120	1		10/30/14 18:23	17060-07-0	
Toluene-d8 (S)	97	%	80-120	1		10/30/14 18:23	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 18:23		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-1 **Lab ID: 60181402012** Collected: 10/28/14 13:20 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 18:37	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 18:37	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 18:37	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 18:37	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 18:37	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 18:37	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 18:37	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 18:37	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 18:37	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 18:37	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 18:37	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 18:37	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 18:37	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 18:37	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 18:37	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 18:37	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 18:37	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 18:37	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 18:37	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 18:37	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 18:37	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 18:37	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 18:37	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:37	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:37	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:37	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 18:37	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/30/14 18:37	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 18:37	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	1.0	1		10/30/14 18:37	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 18:37	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 18:37	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 18:37	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 18:37	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 18:37	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 18:37	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 18:37	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 18:37	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 18:37	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 18:37	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 18:37	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 18:37	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 18:37	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 18:37	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 18:37	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 18:37	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 18:37	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-1 **Lab ID: 60181402012** Collected: 10/28/14 13:20 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Naphthalene	ND	ug/L	10.0	1		10/30/14 18:37	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 18:37	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 18:37	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 18:37	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 18:37	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/30/14 18:37	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 18:37	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:37	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:37	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/30/14 18:37	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 18:37	79-00-5	
Trichloroethene	**9.0**	ug/L	1.0	1		10/30/14 18:37	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 18:37	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 18:37	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 18:37	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 18:37	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 18:37	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 18:37	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	91	%	80-120	1		10/30/14 18:37	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	80-120	1		10/30/14 18:37	17060-07-0	
Toluene-d8 (S)	97	%	80-120	1		10/30/14 18:37	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 18:37		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-2 **Lab ID: 60181402013** Collected: 10/28/14 13:40 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 18:52	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 18:52	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 18:52	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 18:52	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 18:52	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 18:52	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 18:52	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 18:52	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 18:52	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 18:52	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 18:52	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 18:52	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 18:52	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 18:52	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 18:52	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 18:52	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 18:52	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 18:52	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 18:52	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 18:52	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 18:52	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 18:52	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 18:52	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:52	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:52	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:52	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 18:52	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/30/14 18:52	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 18:52	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	1.0	1		10/30/14 18:52	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 18:52	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 18:52	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 18:52	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 18:52	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 18:52	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 18:52	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 18:52	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 18:52	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 18:52	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 18:52	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 18:52	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 18:52	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 18:52	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 18:52	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 18:52	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 18:52	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 18:52	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-2 **Lab ID: 60181402013** Collected: 10/28/14 13:40 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Naphthalene	ND	ug/L	10.0	1		10/30/14 18:52	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 18:52	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 18:52	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 18:52	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 18:52	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/30/14 18:52	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 18:52	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:52	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 18:52	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/30/14 18:52	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 18:52	79-00-5	
Trichloroethene	**2.0**	ug/L	1.0	1		10/30/14 18:52	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 18:52	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 18:52	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 18:52	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 18:52	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 18:52	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 18:52	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	80-120	1		10/30/14 18:52	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	80-120	1		10/30/14 18:52	17060-07-0	
Toluene-d8 (S)	94	%	80-120	1		10/30/14 18:52	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 18:52		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-4 **Lab ID: 60181402014** Collected: 10/28/14 12:55 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 19:07	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 19:07	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 19:07	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 19:07	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 19:07	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 19:07	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 19:07	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 19:07	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 19:07	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 19:07	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 19:07	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 19:07	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 19:07	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 19:07	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 19:07	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 19:07	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 19:07	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 19:07	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 19:07	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 19:07	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 19:07	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 19:07	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 19:07	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:07	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 19:07	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/30/14 19:07	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 19:07	107-06-2	
1,2-Dichloroethene (Total)	**1.5**	ug/L	1.0	1		10/30/14 19:07	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 19:07	75-35-4	
cis-1,2-Dichloroethene	**1.5**	ug/L	1.0	1		10/30/14 19:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 19:07	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 19:07	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 19:07	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 19:07	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 19:07	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 19:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 19:07	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 19:07	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 19:07	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 19:07	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 19:07	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 19:07	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 19:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 19:07	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 19:07	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-4 **Lab ID: 60181402014** Collected: 10/28/14 12:55 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Naphthalene	ND	ug/L	10.0	1		10/30/14 19:07	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 19:07	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 19:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 19:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 19:07	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/30/14 19:07	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 19:07	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:07	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:07	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/30/14 19:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 19:07	79-00-5	
Trichloroethene	**4.2**	ug/L	1.0	1		10/30/14 19:07	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 19:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 19:07	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 19:07	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 19:07	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 19:07	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 19:07	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	111	%	80-120	1		10/30/14 19:07	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	80-120	1		10/30/14 19:07	17060-07-0	
Toluene-d8 (S)	96	%	80-120	1		10/30/14 19:07	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 19:07		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-6I **Lab ID: 60181402015** Collected: 10/28/14 16:50 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 19:22	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 19:22	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 19:22	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 19:22	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 19:22	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 19:22	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 19:22	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 19:22	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 19:22	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 19:22	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 19:22	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 19:22	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 19:22	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 19:22	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 19:22	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 19:22	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 19:22	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 19:22	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 19:22	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 19:22	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 19:22	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 19:22	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 19:22	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:22	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:22	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:22	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 19:22	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/30/14 19:22	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 19:22	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	1.0	1		10/30/14 19:22	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 19:22	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 19:22	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 19:22	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 19:22	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 19:22	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 19:22	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 19:22	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 19:22	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 19:22	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 19:22	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 19:22	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 19:22	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 19:22	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 19:22	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 19:22	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 19:22	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 19:22	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-6I **Lab ID: 60181402015** Collected: 10/28/14 16:50 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Naphthalene	ND	ug/L	10.0	1		10/30/14 19:22	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 19:22	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 19:22	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 19:22	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 19:22	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/30/14 19:22	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 19:22	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:22	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:22	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/30/14 19:22	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 19:22	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/30/14 19:22	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 19:22	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 19:22	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 19:22	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 19:22	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 19:22	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 19:22	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	96	%	80-120	1		10/30/14 19:22	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	80-120	1		10/30/14 19:22	17060-07-0	
Toluene-d8 (S)	99	%	80-120	1		10/30/14 19:22	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 19:22		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-10S **Lab ID: 60181402016** Collected: 10/28/14 12:05 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 19:36	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 19:36	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 19:36	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 19:36	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 19:36	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 19:36	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 19:36	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 19:36	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 19:36	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 19:36	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 19:36	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 19:36	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 19:36	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 19:36	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 19:36	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 19:36	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 19:36	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 19:36	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 19:36	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 19:36	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 19:36	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 19:36	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 19:36	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:36	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:36	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 19:36	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/30/14 19:36	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 19:36	107-06-2	
1,2-Dichloroethene (Total)	**2.5**	ug/L	1.0	1		10/30/14 19:36	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 19:36	75-35-4	
cis-1,2-Dichloroethene	**2.5**	ug/L	1.0	1		10/30/14 19:36	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 19:36	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 19:36	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 19:36	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 19:36	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 19:36	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 19:36	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 19:36	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 19:36	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 19:36	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 19:36	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 19:36	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 19:36	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 19:36	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 19:36	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 19:36	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: GMW-10S **Lab ID: 60181402016** Collected: 10/28/14 12:05 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Naphthalene	ND	ug/L	10.0	1		10/30/14 19:36	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 19:36	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 19:36	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 19:36	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 19:36	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/30/14 19:36	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 19:36	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:36	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:36	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/30/14 19:36	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 19:36	79-00-5	
Trichloroethene	**12.3**	ug/L	1.0	1		10/30/14 19:36	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 19:36	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 19:36	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 19:36	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 19:36	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 19:36	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 19:36	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	80-120	1		10/30/14 19:36	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	80-120	1		10/30/14 19:36	17060-07-0	
Toluene-d8 (S)	97	%	80-120	1		10/30/14 19:36	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 19:36		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: MW-28S **Lab ID: 60181402017** Collected: 10/28/14 12:25 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 19:51	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 19:51	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 19:51	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 19:51	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 19:51	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 19:51	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 19:51	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 19:51	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 19:51	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 19:51	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 19:51	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 19:51	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 19:51	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 19:51	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 19:51	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 19:51	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 19:51	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 19:51	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 19:51	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 19:51	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 19:51	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 19:51	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 19:51	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:51	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 19:51	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/30/14 19:51	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 19:51	107-06-2	
1,2-Dichloroethene (Total)	**1.4**	ug/L	1.0	1		10/30/14 19:51	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 19:51	75-35-4	
cis-1,2-Dichloroethene	**1.4**	ug/L	1.0	1		10/30/14 19:51	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 19:51	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 19:51	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 19:51	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 19:51	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 19:51	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 19:51	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 19:51	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 19:51	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 19:51	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 19:51	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 19:51	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 19:51	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 19:51	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 19:51	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 19:51	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: MW-28S **Lab ID: 60181402017** Collected: 10/28/14 12:25 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Naphthalene	ND	ug/L	10.0	1		10/30/14 19:51	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 19:51	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 19:51	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 19:51	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 19:51	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/30/14 19:51	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 19:51	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:51	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 19:51	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/30/14 19:51	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 19:51	79-00-5	
Trichloroethene	**11.3**	ug/L	1.0	1		10/30/14 19:51	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 19:51	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 19:51	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 19:51	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 19:51	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 19:51	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 19:51	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	96	%	80-120	1		10/30/14 19:51	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	80-120	1		10/30/14 19:51	17060-07-0	
Toluene-d8 (S)	92	%	80-120	1		10/30/14 19:51	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 19:51		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: DUP-1 **Lab ID: 60181402018** Collected: 10/28/14 18:50 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 20:06	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 20:06	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 20:06	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 20:06	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 20:06	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 20:06	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 20:06	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 20:06	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 20:06	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 20:06	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 20:06	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 20:06	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 20:06	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 20:06	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 20:06	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 20:06	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 20:06	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 20:06	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 20:06	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 20:06	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 20:06	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 20:06	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 20:06	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 20:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 20:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 20:06	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 20:06	75-71-8	
1,1-Dichloroethane	**6.8**	ug/L	1.0	1		10/30/14 20:06	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 20:06	107-06-2	
1,2-Dichloroethene (Total)	**20.1**	ug/L	1.0	1		10/30/14 20:06	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 20:06	75-35-4	
cis-1,2-Dichloroethene	**19.8**	ug/L	1.0	1		10/30/14 20:06	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 20:06	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 20:06	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 20:06	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 20:06	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 20:06	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 20:06	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 20:06	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 20:06	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 20:06	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 20:06	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 20:06	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 20:06	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 20:06	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 20:06	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 20:06	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: DUP-1 **Lab ID: 60181402018** Collected: 10/28/14 18:50 Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Naphthalene	ND	ug/L	10.0	1		10/30/14 20:06	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 20:06	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 20:06	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 20:06	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 20:06	79-34-5	
Tetrachloroethene	**2.1**	ug/L	1.0	1		10/30/14 20:06	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 20:06	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 20:06	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 20:06	120-82-1	
1,1,1-Trichloroethane	**1.5**	ug/L	1.0	1		10/30/14 20:06	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 20:06	79-00-5	
Trichloroethene	**14.3**	ug/L	1.0	1		10/30/14 20:06	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 20:06	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 20:06	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 20:06	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 20:06	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 20:06	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 20:06	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	80-120	1		10/30/14 20:06	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	80-120	1		10/30/14 20:06	17060-07-0	
Toluene-d8 (S)	100	%	80-120	1		10/30/14 20:06	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 20:06		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: TRIP BLANK **Lab ID: 60181402019** Collected: Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	10.0	1		10/30/14 16:54	67-64-1	
Benzene	ND	ug/L	1.0	1		10/30/14 16:54	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/30/14 16:54	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/30/14 16:54	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/30/14 16:54	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/30/14 16:54	75-25-2	
Bromomethane	ND	ug/L	5.0	1		10/30/14 16:54	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		10/30/14 16:54	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		10/30/14 16:54	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		10/30/14 16:54	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		10/30/14 16:54	98-06-6	
Carbon disulfide	ND	ug/L	5.0	1		10/30/14 16:54	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/30/14 16:54	56-23-5	L3
Chlorobenzene	ND	ug/L	1.0	1		10/30/14 16:54	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/30/14 16:54	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/30/14 16:54	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/30/14 16:54	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 16:54	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/30/14 16:54	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.5	1		10/30/14 16:54	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/30/14 16:54	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		10/30/14 16:54	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/30/14 16:54	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 16:54	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 16:54	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/30/14 16:54	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/30/14 16:54	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/30/14 16:54	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/30/14 16:54	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	1.0	1		10/30/14 16:54	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/30/14 16:54	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 16:54	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/30/14 16:54	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 16:54	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/30/14 16:54	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/30/14 16:54	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/30/14 16:54	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 16:54	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/30/14 16:54	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/30/14 16:54	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		10/30/14 16:54	87-68-3	
2-Hexanone	ND	ug/L	10.0	1		10/30/14 16:54	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		10/30/14 16:54	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/30/14 16:54	99-87-6	
Methylene chloride	ND	ug/L	1.0	1		10/30/14 16:54	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		10/30/14 16:54	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		10/30/14 16:54	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Sample: TRIP BLANK **Lab ID: 60181402019** Collected: Received: 10/29/14 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Naphthalene	ND	ug/L	10.0	1		10/30/14 16:54	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		10/30/14 16:54	103-65-1	
Styrene	ND	ug/L	1.0	1		10/30/14 16:54	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 16:54	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/30/14 16:54	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/30/14 16:54	127-18-4	
Toluene	ND	ug/L	1.0	1		10/30/14 16:54	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 16:54	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/30/14 16:54	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/30/14 16:54	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/30/14 16:54	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/30/14 16:54	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/30/14 16:54	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	1		10/30/14 16:54	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 16:54	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		10/30/14 16:54	108-67-8	
Vinyl chloride	ND	ug/L	1.0	1		10/30/14 16:54	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		10/30/14 16:54	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	92	%	80-120	1		10/30/14 16:54	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	80-120	1		10/30/14 16:54	17060-07-0	
Toluene-d8 (S)	97	%	80-120	1		10/30/14 16:54	2037-26-5	
Preservation pH	**1.0**		0.10	1		10/30/14 16:54		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

QC Batch: AIR/21717 Analysis Method: RSK 175
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

METHOD BLANK: 1833322 Matrix: Water
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	6.2	11/02/14 13:12	
Ethene	ug/L	ND	6.2	11/02/14 13:12	
Methane	ug/L	ND	6.6	11/02/14 13:12	

LABORATORY CONTROL SAMPLE & LCSD: 1833323 1833324

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	115	115	101	101	85-115	0	20	
Ethene	ug/L	106	106	106	100	100	85-115	0	20	
Methane	ug/L	60.7	60.0	60.2	99	99	85-115	0	20	

SAMPLE DUPLICATE: 1833325

Parameter	Units	60181303003 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	5280	5780	9	20	

SAMPLE DUPLICATE: 1833326

Parameter	Units	60181364001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<3.1	ND		20	
Ethene	ug/L	<3.1	ND		20	
Methane	ug/L	6980	6760	3	20	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

QC Batch: MPRP/29582 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

METHOD BLANK: 1470216 Matrix: Water
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron	ug/L	ND	50.0	11/05/14 14:40	
Manganese	ug/L	ND	5.0	11/05/14 14:40	

LABORATORY CONTROL SAMPLE: 1470217

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	10000	9630	96	85-115	
Manganese	ug/L	1000	986	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1470218 1470219

Parameter	Units	60181402003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	ug/L	ND	10000	10000	9750	9630	97	96	70-130	1	20	
Manganese	ug/L	249	1000	1000	1240	1240	99	99	70-130	0	20	

MATRIX SPIKE SAMPLE: 1470220

Parameter	Units	60181369001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	1120	10000	10800	96	70-130	
Manganese	ug/L	572	1000	1550	97	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.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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(913)599-5665

QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

QC Batch: MPRP/29565 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Dissolved
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

METHOD BLANK: 1469551 Matrix: Water
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron, Dissolved	ug/L	ND	50.0	11/05/14 14:11	
Manganese, Dissolved	ug/L	ND	5.0	11/05/14 14:11	

LABORATORY CONTROL SAMPLE: 1469552

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Dissolved	ug/L	10000	9970	100	85-115	
Manganese, Dissolved	ug/L	1000	1010	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1469553 1469554

Parameter	Units	60181402001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron, Dissolved	ug/L	7460	10000	10000	17400	16700	99	92	70-130	4	20	
Manganese, Dissolved	ug/L	1130	1000	1000	2130	2040	100	91	70-130	4	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

QC Batch: MSV/65435 Analysis Method: EPA 5030B/8260
QC Batch Method: EPA 5030B/8260 Analysis Description: 8260 MSV Water 10 mL Purge
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005

METHOD BLANK: 1470048 Matrix: Water
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	10/30/14 10:44	
1,1,1-Trichloroethane	ug/L	ND	1.0	10/30/14 10:44	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	10/30/14 10:44	
1,1,2-Trichloroethane	ug/L	ND	1.0	10/30/14 10:44	
1,1-Dichloroethane	ug/L	ND	1.0	10/30/14 10:44	
1,1-Dichloroethene	ug/L	ND	1.0	10/30/14 10:44	
1,1-Dichloropropene	ug/L	ND	1.0	10/30/14 10:44	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	10/30/14 10:44	
1,2,3-Trichloropropane	ug/L	ND	2.5	10/30/14 10:44	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	10/30/14 10:44	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	10/30/14 10:44	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.5	10/30/14 10:44	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	10/30/14 10:44	
1,2-Dichlorobenzene	ug/L	ND	1.0	10/30/14 10:44	
1,2-Dichloroethane	ug/L	ND	1.0	10/30/14 10:44	
1,2-Dichloroethene (Total)	ug/L	ND	1.0	10/30/14 10:44	
1,2-Dichloropropane	ug/L	ND	1.0	10/30/14 10:44	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	10/30/14 10:44	
1,3-Dichlorobenzene	ug/L	ND	1.0	10/30/14 10:44	
1,3-Dichloropropane	ug/L	ND	1.0	10/30/14 10:44	
1,4-Dichlorobenzene	ug/L	ND	1.0	10/30/14 10:44	
2,2-Dichloropropane	ug/L	ND	1.0	10/30/14 10:44	
2-Butanone (MEK)	ug/L	ND	10.0	10/30/14 10:44	
2-Chlorotoluene	ug/L	ND	1.0	10/30/14 10:44	
2-Hexanone	ug/L	ND	10.0	10/30/14 10:44	
4-Chlorotoluene	ug/L	ND	1.0	10/30/14 10:44	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	10.0	10/30/14 10:44	
Acetone	ug/L	ND	10.0	10/30/14 10:44	
Benzene	ug/L	ND	1.0	10/30/14 10:44	
Bromobenzene	ug/L	ND	1.0	10/30/14 10:44	
Bromochloromethane	ug/L	ND	1.0	10/30/14 10:44	
Bromodichloromethane	ug/L	ND	1.0	10/30/14 10:44	
Bromoform	ug/L	ND	1.0	10/30/14 10:44	
Bromomethane	ug/L	ND	5.0	10/30/14 10:44	
Carbon disulfide	ug/L	ND	5.0	10/30/14 10:44	
Carbon tetrachloride	ug/L	ND	1.0	10/30/14 10:44	
Chlorobenzene	ug/L	ND	1.0	10/30/14 10:44	
Chloroethane	ug/L	ND	1.0	10/30/14 10:44	
Chloroform	ug/L	ND	1.0	10/30/14 10:44	
Chloromethane	ug/L	ND	1.0	10/30/14 10:44	
cis-1,2-Dichloroethene	ug/L	ND	1.0	10/30/14 10:44	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

METHOD BLANK: 1470048 Matrix: Water
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
cis-1,3-Dichloropropene	ug/L	ND	1.0	10/30/14 10:44	
Dibromochloromethane	ug/L	ND	1.0	10/30/14 10:44	
Dibromomethane	ug/L	ND	1.0	10/30/14 10:44	
Dichlorodifluoromethane	ug/L	ND	1.0	10/30/14 10:44	
Ethylbenzene	ug/L	ND	1.0	10/30/14 10:44	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	10/30/14 10:44	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	10/30/14 10:44	
Methyl-tert-butyl ether	ug/L	ND	1.0	10/30/14 10:44	
Methylene chloride	ug/L	ND	1.0	10/30/14 10:44	
n-Butylbenzene	ug/L	ND	1.0	10/30/14 10:44	
n-Propylbenzene	ug/L	ND	1.0	10/30/14 10:44	
Naphthalene	ug/L	ND	10.0	10/30/14 10:44	
p-Isopropyltoluene	ug/L	ND	1.0	10/30/14 10:44	
sec-Butylbenzene	ug/L	ND	1.0	10/30/14 10:44	
Styrene	ug/L	ND	1.0	10/30/14 10:44	
tert-Butylbenzene	ug/L	ND	1.0	10/30/14 10:44	
Tetrachloroethene	ug/L	ND	1.0	10/30/14 10:44	
Toluene	ug/L	ND	1.0	10/30/14 10:44	
trans-1,2-Dichloroethene	ug/L	ND	1.0	10/30/14 10:44	
trans-1,3-Dichloropropene	ug/L	ND	1.0	10/30/14 10:44	
Trichloroethene	ug/L	ND	1.0	10/30/14 10:44	
Trichlorofluoromethane	ug/L	ND	1.0	10/30/14 10:44	
Vinyl chloride	ug/L	ND	1.0	10/30/14 10:44	
Xylene (Total)	ug/L	ND	3.0	10/30/14 10:44	
1,2-Dichloroethane-d4 (S)	%	96	80-120	10/30/14 10:44	
4-Bromofluorobenzene (S)	%	99	80-120	10/30/14 10:44	
Toluene-d8 (S)	%	97	80-120	10/30/14 10:44	

LABORATORY CONTROL SAMPLE: 1470049

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	21.5	108	80-124	
1,1,1-Trichloroethane	ug/L	20	21.4	107	80-121	
1,1,2,2-Tetrachloroethane	ug/L	20	20.5	102	73-124	
1,1,2-Trichloroethane	ug/L	20	18.9	94	80-120	
1,1-Dichloroethane	ug/L	20	20.4	102	77-120	
1,1-Dichloroethene	ug/L	20	20.6	103	78-126	
1,1-Dichloropropene	ug/L	20	19.1	96	80-120	
1,2,3-Trichlorobenzene	ug/L	20	20.2	101	75-130	
1,2,3-Trichloropropane	ug/L	20	20.4	102	76-127	
1,2,4-Trichlorobenzene	ug/L	20	20.6	103	79-124	
1,2,4-Trimethylbenzene	ug/L	20	21.0	105	80-122	
1,2-Dibromo-3-chloropropane	ug/L	20	20.6	103	68-131	
1,2-Dibromoethane (EDB)	ug/L	20	20.4	102	80-127	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

LABORATORY CONTROL SAMPLE: 1470049

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	20	20.1	101	80-122	
1,2-Dichloroethane	ug/L	20	19.2	96	77-123	
1,2-Dichloroethene (Total)	ug/L	40	40.5	101	80-120	
1,2-Dichloropropane	ug/L	20	20.7	103	80-121	
1,3,5-Trimethylbenzene	ug/L	20	21.2	106	80-121	
1,3-Dichlorobenzene	ug/L	20	20.5	103	80-120	
1,3-Dichloropropane	ug/L	20	20.5	103	80-120	
1,4-Dichlorobenzene	ug/L	20	20.1	101	80-120	
2,2-Dichloropropane	ug/L	20	20.9	105	50-137	
2-Butanone (MEK)	ug/L	100	100	100	52-145	
2-Chlorotoluene	ug/L	20	21.2	106	80-120	
2-Hexanone	ug/L	100	96.4	96	57-139	
4-Chlorotoluene	ug/L	20	20.3	101	80-121	
4-Methyl-2-pentanone (MIBK)	ug/L	100	95.5	95	71-131	
Acetone	ug/L	100	103	103	32-155	
Benzene	ug/L	20	21.2	106	80-120	
Bromobenzene	ug/L	20	20.5	103	80-120	
Bromochloromethane	ug/L	20	19.7	98	77-123	
Bromodichloromethane	ug/L	20	22.0	110	80-120	
Bromoform	ug/L	20	20.7	103	73-124	
Bromomethane	ug/L	20	15.6	78	31-144	
Carbon disulfide	ug/L	20	22.8	114	65-125	
Carbon tetrachloride	ug/L	20	29.0	145	78-128	L0
Chlorobenzene	ug/L	20	21.1	105	80-120	
Chloroethane	ug/L	20	18.7	94	55-137	
Chloroform	ug/L	20	20.7	104	79-120	
Chloromethane	ug/L	20	26.6	133	22-138	
cis-1,2-Dichloroethene	ug/L	20	20.1	101	80-120	
cis-1,3-Dichloropropene	ug/L	20	19.7	98	80-120	
Dibromochloromethane	ug/L	20	22.1	111	80-120	
Dibromomethane	ug/L	20	21.3	106	80-122	
Dichlorodifluoromethane	ug/L	20	19.0	95	23-120	
Ethylbenzene	ug/L	20	21.2	106	80-121	
Hexachloro-1,3-butadiene	ug/L	20	22.5	113	77-129	
Isopropylbenzene (Cumene)	ug/L	20	23.3	116	80-136	
Methyl-tert-butyl ether	ug/L	20	19.4	97	74-125	
Methylene chloride	ug/L	20	20.4	102	73-126	
n-Butylbenzene	ug/L	20	22.7	114	83-123	
n-Propylbenzene	ug/L	20	19.4	97	80-122	
Naphthalene	ug/L	20	20.3	101	73-130	
p-Isopropyltoluene	ug/L	20	21.6	108	80-124	
sec-Butylbenzene	ug/L	20	22.2	111	80-129	
Styrene	ug/L	20	21.1	105	80-120	
tert-Butylbenzene	ug/L	20	19.7	98	80-126	
Tetrachloroethene	ug/L	20	21.3	107	80-121	
Toluene	ug/L	20	20.4	102	80-122	
trans-1,2-Dichloroethene	ug/L	20	20.4	102	79-121	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

LABORATORY CONTROL SAMPLE: 1470049

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
trans-1,3-Dichloropropene	ug/L	20	21.7	109	80-127	
Trichloroethene	ug/L	20	19.6	98	80-120	
Trichlorofluoromethane	ug/L	20	21.4	107	67-120	
Vinyl chloride	ug/L	20	20.3	101	59-120	
Xylene (Total)	ug/L	60	62.3	104	80-121	
1,2-Dichloroethane-d4 (S)	%			95	80-120	
4-Bromofluorobenzene (S)	%			99	80-120	
Toluene-d8 (S)	%			101	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

QC Batch: MSV/65437 Analysis Method: EPA 5030B/8260
QC Batch Method: EPA 5030B/8260 Analysis Description: 8260 MSV Water 10 mL Purge
Associated Lab Samples: 60181402006, 60181402007, 60181402008, 60181402009, 60181402010, 60181402011, 60181402012, 60181402013, 60181402014, 60181402015, 60181402016, 60181402017, 60181402018, 60181402019

METHOD BLANK: 1470140 Matrix: Water
Associated Lab Samples: 60181402006, 60181402007, 60181402008, 60181402009, 60181402010, 60181402011, 60181402012, 60181402013, 60181402014, 60181402015, 60181402016, 60181402017, 60181402018, 60181402019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	10/30/14 16:39	
1,1,1-Trichloroethane	ug/L	ND	1.0	10/30/14 16:39	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	10/30/14 16:39	
1,1,2-Trichloroethane	ug/L	ND	1.0	10/30/14 16:39	
1,1-Dichloroethane	ug/L	ND	1.0	10/30/14 16:39	
1,1-Dichloroethene	ug/L	ND	1.0	10/30/14 16:39	
1,1-Dichloropropene	ug/L	ND	1.0	10/30/14 16:39	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	10/30/14 16:39	
1,2,3-Trichloropropane	ug/L	ND	2.5	10/30/14 16:39	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	10/30/14 16:39	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	10/30/14 16:39	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.5	10/30/14 16:39	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	10/30/14 16:39	
1,2-Dichlorobenzene	ug/L	ND	1.0	10/30/14 16:39	
1,2-Dichloroethane	ug/L	ND	1.0	10/30/14 16:39	
1,2-Dichloroethene (Total)	ug/L	ND	1.0	10/30/14 16:39	
1,2-Dichloropropane	ug/L	ND	1.0	10/30/14 16:39	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	10/30/14 16:39	
1,3-Dichlorobenzene	ug/L	ND	1.0	10/30/14 16:39	
1,3-Dichloropropane	ug/L	ND	1.0	10/30/14 16:39	
1,4-Dichlorobenzene	ug/L	ND	1.0	10/30/14 16:39	
2,2-Dichloropropane	ug/L	ND	1.0	10/30/14 16:39	
2-Butanone (MEK)	ug/L	ND	10.0	10/30/14 16:39	
2-Chlorotoluene	ug/L	ND	1.0	10/30/14 16:39	
2-Hexanone	ug/L	ND	10.0	10/30/14 16:39	
4-Chlorotoluene	ug/L	ND	1.0	10/30/14 16:39	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	10.0	10/30/14 16:39	
Acetone	ug/L	ND	10.0	10/30/14 16:39	
Benzene	ug/L	ND	1.0	10/30/14 16:39	
Bromobenzene	ug/L	ND	1.0	10/30/14 16:39	
Bromochloromethane	ug/L	ND	1.0	10/30/14 16:39	
Bromodichloromethane	ug/L	ND	1.0	10/30/14 16:39	
Bromoform	ug/L	ND	1.0	10/30/14 16:39	
Bromomethane	ug/L	ND	5.0	10/30/14 16:39	
Carbon disulfide	ug/L	ND	5.0	10/30/14 16:39	
Carbon tetrachloride	ug/L	ND	1.0	10/30/14 16:39	
Chlorobenzene	ug/L	ND	1.0	10/30/14 16:39	
Chloroethane	ug/L	ND	1.0	10/30/14 16:39	
Chloroform	ug/L	ND	1.0	10/30/14 16:39	
Chloromethane	ug/L	ND	1.0	10/30/14 16:39	

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QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

METHOD BLANK: 1470140 Matrix: Water

Associated Lab Samples: 60181402006, 60181402007, 60181402008, 60181402009, 60181402010, 60181402011, 60181402012, 60181402013, 60181402014, 60181402015, 60181402016, 60181402017, 60181402018, 60181402019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
cis-1,2-Dichloroethene	ug/L	ND	1.0	10/30/14 16:39	
cis-1,3-Dichloropropene	ug/L	ND	1.0	10/30/14 16:39	
Dibromochloromethane	ug/L	ND	1.0	10/30/14 16:39	
Dibromomethane	ug/L	ND	1.0	10/30/14 16:39	
Dichlorodifluoromethane	ug/L	ND	1.0	10/30/14 16:39	
Ethylbenzene	ug/L	ND	1.0	10/30/14 16:39	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	10/30/14 16:39	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	10/30/14 16:39	
Methyl-tert-butyl ether	ug/L	ND	1.0	10/30/14 16:39	
Methylene chloride	ug/L	ND	1.0	10/30/14 16:39	
n-Butylbenzene	ug/L	ND	1.0	10/30/14 16:39	
n-Propylbenzene	ug/L	ND	1.0	10/30/14 16:39	
Naphthalene	ug/L	ND	10.0	10/30/14 16:39	
p-Isopropyltoluene	ug/L	ND	1.0	10/30/14 16:39	
sec-Butylbenzene	ug/L	ND	1.0	10/30/14 16:39	
Styrene	ug/L	ND	1.0	10/30/14 16:39	
tert-Butylbenzene	ug/L	ND	1.0	10/30/14 16:39	
Tetrachloroethene	ug/L	ND	1.0	10/30/14 16:39	
Toluene	ug/L	ND	1.0	10/30/14 16:39	
trans-1,2-Dichloroethene	ug/L	ND	1.0	10/30/14 16:39	
trans-1,3-Dichloropropene	ug/L	ND	1.0	10/30/14 16:39	
Trichloroethene	ug/L	ND	1.0	10/30/14 16:39	
Trichlorofluoromethane	ug/L	ND	1.0	10/30/14 16:39	
Vinyl chloride	ug/L	ND	1.0	10/30/14 16:39	
Xylene (Total)	ug/L	ND	3.0	10/30/14 16:39	
1,2-Dichloroethane-d4 (S)	%	101	80-120	10/30/14 16:39	
4-Bromofluorobenzene (S)	%	101	80-120	10/30/14 16:39	
Toluene-d8 (S)	%	101	80-120	10/30/14 16:39	

LABORATORY CONTROL SAMPLE: 1470141

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.1	101	80-124	
1,1,1-Trichloroethane	ug/L	20	21.4	107	80-121	
1,1,2,2-Tetrachloroethane	ug/L	20	19.2	96	73-124	
1,1,2-Trichloroethane	ug/L	20	19.6	98	80-120	
1,1-Dichloroethane	ug/L	20	19.4	97	77-120	
1,1-Dichloroethene	ug/L	20	19.5	98	78-126	
1,1-Dichloropropene	ug/L	20	19.4	97	80-120	
1,2,3-Trichlorobenzene	ug/L	20	18.7	93	75-130	
1,2,3-Trichloropropane	ug/L	20	21.1	105	76-127	
1,2,4-Trichlorobenzene	ug/L	20	19.3	97	79-124	
1,2,4-Trimethylbenzene	ug/L	20	19.8	99	80-122	

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QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

LABORATORY CONTROL SAMPLE: 1470141

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	20	21.7	109	68-131	
1,2-Dibromoethane (EDB)	ug/L	20	20.0	100	80-127	
1,2-Dichlorobenzene	ug/L	20	19.8	99	80-122	
1,2-Dichloroethane	ug/L	20	20.7	103	77-123	
1,2-Dichloroethene (Total)	ug/L	40	39.4	99	80-120	
1,2-Dichloropropane	ug/L	20	20.7	103	80-121	
1,3,5-Trimethylbenzene	ug/L	20	20.1	101	80-121	
1,3-Dichlorobenzene	ug/L	20	19.6	98	80-120	
1,3-Dichloropropane	ug/L	20	19.9	99	80-120	
1,4-Dichlorobenzene	ug/L	20	19.4	97	80-120	
2,2-Dichloropropane	ug/L	20	17.5	87	50-137	
2-Butanone (MEK)	ug/L	100	104	104	52-145	
2-Chlorotoluene	ug/L	20	20.0	100	80-120	
2-Hexanone	ug/L	100	91.7	92	57-139	
4-Chlorotoluene	ug/L	20	20.0	100	80-121	
4-Methyl-2-pentanone (MIBK)	ug/L	100	103	103	71-131	
Acetone	ug/L	100	105	105	32-155	
Benzene	ug/L	20	20.8	104	80-120	
Bromobenzene	ug/L	20	19.6	98	80-120	
Bromochloromethane	ug/L	20	18.8	94	77-123	
Bromodichloromethane	ug/L	20	22.1	111	80-120	
Bromoform	ug/L	20	19.4	97	73-124	
Bromomethane	ug/L	20	11.6	58	31-144	
Carbon disulfide	ug/L	20	21.5	108	65-125	
Carbon tetrachloride	ug/L	20	28.6	143	78-128	L0
Chlorobenzene	ug/L	20	19.4	97	80-120	
Chloroethane	ug/L	20	18.2	91	55-137	
Chloroform	ug/L	20	20.1	100	79-120	
Chloromethane	ug/L	20	23.9	119	22-138	
cis-1,2-Dichloroethene	ug/L	20	20.2	101	80-120	
cis-1,3-Dichloropropene	ug/L	20	20.2	101	80-120	
Dibromochloromethane	ug/L	20	21.4	107	80-120	
Dibromomethane	ug/L	20	20.7	103	80-122	
Dichlorodifluoromethane	ug/L	20	18.0	90	23-120	
Ethylbenzene	ug/L	20	18.9	94	80-121	
Hexachloro-1,3-butadiene	ug/L	20	21.0	105	77-129	
Isopropylbenzene (Cumene)	ug/L	20	21.7	108	80-136	
Methyl-tert-butyl ether	ug/L	20	20.5	102	74-125	
Methylene chloride	ug/L	20	20.0	100	73-126	
n-Butylbenzene	ug/L	20	21.6	108	83-123	
n-Propylbenzene	ug/L	20	18.6	93	80-122	
Naphthalene	ug/L	20	18.6	93	73-130	
p-Isopropyltoluene	ug/L	20	20.5	103	80-124	
sec-Butylbenzene	ug/L	20	20.7	103	80-129	
Styrene	ug/L	20	19.9	99	80-120	
tert-Butylbenzene	ug/L	20	19.1	95	80-126	
Tetrachloroethene	ug/L	20	19.0	95	80-121	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

LABORATORY CONTROL SAMPLE: 1470141

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Toluene	ug/L	20	19.2	96	80-122	
trans-1,2-Dichloroethene	ug/L	20	19.2	96	79-121	
trans-1,3-Dichloropropene	ug/L	20	20.3	102	80-127	
Trichloroethene	ug/L	20	20.3	101	80-120	
Trichlorofluoromethane	ug/L	20	20.6	103	67-120	
Vinyl chloride	ug/L	20	19.8	99	59-120	
Xylene (Total)	ug/L	60	58.1	97	80-121	
1,2-Dichloroethane-d4 (S)	%			103	80-120	
4-Bromofluorobenzene (S)	%			98	80-120	
Toluene-d8 (S)	%			94	80-120	

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QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

QC Batch: WET/51286 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

METHOD BLANK: 1470760 Matrix: Water
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	20.0	11/03/14 09:54	

LABORATORY CONTROL SAMPLE: 1470761

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	531	106	90-110	

SAMPLE DUPLICATE: 1470762

Parameter	Units	60181544002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	116	116	0	10	

SAMPLE DUPLICATE: 1470763

Parameter	Units	60181402001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	469	477	2	10	

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QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

QC Batch: WET/51251 Analysis Method: SM 3500-Fe B#4
QC Batch Method: SM 3500-Fe B#4 Analysis Description: Iron, Ferrous
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

METHOD BLANK: 1469859 Matrix: Water
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron, Ferrous	mg/L	ND	0.20	10/31/14 14:53	H6

LABORATORY CONTROL SAMPLE: 1469860

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	2	2.1	107	90-110	H6

SAMPLE DUPLICATE: 1469861

Parameter	Units	60181402001 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	ND	.068J		10	H6

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QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

QC Batch: WET/51347 Analysis Method: SM 4500-S-2 D
QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

METHOD BLANK: 1472665 Matrix: Water
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfide, Total	mg/L	ND	0.050	11/04/14 12:33	

LABORATORY CONTROL SAMPLE: 1472666

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.5	0.53	105	80-120	

MATRIX SPIKE SAMPLE: 1472673

Parameter	Units	60181303008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	ND	.5	0.36	72	75-125	M1

SAMPLE DUPLICATE: 1472668

Parameter	Units	60181303003 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

QC Batch: WETA/31734 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

METHOD BLANK: 1475475 Matrix: Water
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	11/09/14 13:11	
Sulfate	mg/L	ND	1.0	11/09/14 13:11	

LABORATORY CONTROL SAMPLE: 1475476

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Sulfate	mg/L	5	4.8	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1475477 1475478

Parameter	Units	60181346001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	65.4	50	50	114	114	97	96	80-120	0	15	
Sulfate	mg/L	314	250	250	569	570	102	102	80-120	0	15	

MATRIX SPIKE SAMPLE: 1475479

Parameter	Units	60181476001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	1940	1000	2840	90	80-120	
Sulfate	mg/L	ND	1000	1040	87	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

QC Batch: WETA/31579 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, Unpres.
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

METHOD BLANK: 1469880 Matrix: Water
Associated Lab Samples: 60181402001, 60181402002, 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Nitrate	mg/L	ND	0.10	10/30/14 07:44	
Nitrogen, Nitrite	mg/L	ND	0.10	10/30/14 07:44	
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	10/30/14 07:44	

LABORATORY CONTROL SAMPLE: 1469881

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/L	1.6	1.7	107	85-115	
Nitrogen, Nitrite	mg/L	.4	0.38	96	90-110	
Nitrogen, NO2 plus NO3	mg/L	2	2.1	105	90-110	

MATRIX SPIKE SAMPLE: 1469882

Parameter	Units	60181395001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/L	32.3	32	59.7	86	85-115	
Nitrogen, Nitrite	mg/L	ND	8	8.2	102	90-110	
Nitrogen, NO2 plus NO3	mg/L	32.3	40	67.8	89	90-110	M1

MATRIX SPIKE SAMPLE: 1469884

Parameter	Units	60181402002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/L	ND	1.6	1.9	117	85-115	M1
Nitrogen, Nitrite	mg/L	ND	.4	0.42	105	90-110	
Nitrogen, NO2 plus NO3	mg/L	ND	2	2.3	114	90-110	M1

SAMPLE DUPLICATE: 1469883

Parameter	Units	60181334003 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrogen, Nitrate	mg/L	15.3	15.2	1	20	
Nitrogen, Nitrite	mg/L	ND	ND		20	
Nitrogen, NO2 plus NO3	mg/L	15.3	15.2	1	20	

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QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

QC Batch: WETA/31607 Analysis Method: SM 5310C
QC Batch Method: SM 5310C Analysis Description: 5310C Total Organic Carbon
Associated Lab Samples: 60181402001, 60181402002

METHOD BLANK: 1470863 Matrix: Water
Associated Lab Samples: 60181402001, 60181402002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Organic Carbon	mg/L	ND	1.0	10/31/14 11:26	

LABORATORY CONTROL SAMPLE: 1470864

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	5	4.7	93	80-120	

MATRIX SPIKE SAMPLE: 1470865

Parameter	Units	60181253003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	2.5	5	7.6	102	80-120	

SAMPLE DUPLICATE: 1470866

Parameter	Units	60181253005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Organic Carbon	mg/L	2.6	2.6	2	25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

QC Batch: WETA/31677 Analysis Method: SM 5310C
QC Batch Method: SM 5310C Analysis Description: 5310C Total Organic Carbon
Associated Lab Samples: 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

METHOD BLANK: 1472981 Matrix: Water
Associated Lab Samples: 60181402003, 60181402004, 60181402005, 60181402006, 60181402007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Organic Carbon	mg/L	ND	1.0	11/06/14 10:29	

LABORATORY CONTROL SAMPLE: 1472982

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	5	4.9	99	80-120	

MATRIX SPIKE SAMPLE: 1472983

Parameter	Units	60181544006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	5.0	5	9.3	87	80-120	

SAMPLE DUPLICATE: 1472984

Parameter	Units	60181402003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Organic Carbon	mg/L	1.5	.92J		25	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

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 (8270 listed analyte) decomposes to Azobenzene.

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-K	Pace Analytical Services - Kansas City
PASI-M	Pace Analytical Services - Minneapolis

BATCH QUALIFIERS

Batch: MSV/65435

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: MSV/65437

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

D9	Dissolved result is greater than the total. Data is within laboratory control limits.
H6	Analysis initiated outside of the 15 minute EPA recommended holding time.
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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60181402001	TMW-1	RSK 175	AIR/21717		
60181402002	TMW-2	RSK 175	AIR/21717		
60181402003	GMW-8S	RSK 175	AIR/21717		
60181402004	MW-27S	RSK 175	AIR/21717		
60181402005	GMW-6S	RSK 175	AIR/21717		
60181402006	MW-15	RSK 175	AIR/21717		
60181402007	MW-21	RSK 175	AIR/21717		
60181402001	TMW-1	EPA 200.7	MPRP/29582	EPA 200.7	ICP/22198
60181402002	TMW-2	EPA 200.7	MPRP/29582	EPA 200.7	ICP/22198
60181402003	GMW-8S	EPA 200.7	MPRP/29582	EPA 200.7	ICP/22198
60181402004	MW-27S	EPA 200.7	MPRP/29582	EPA 200.7	ICP/22198
60181402005	GMW-6S	EPA 200.7	MPRP/29582	EPA 200.7	ICP/22198
60181402006	MW-15	EPA 200.7	MPRP/29582	EPA 200.7	ICP/22198
60181402007	MW-21	EPA 200.7	MPRP/29582	EPA 200.7	ICP/22198
60181402001	TMW-1	EPA 200.7	MPRP/29565	EPA 200.7	ICP/22182
60181402002	TMW-2	EPA 200.7	MPRP/29565	EPA 200.7	ICP/22182
60181402003	GMW-8S	EPA 200.7	MPRP/29565	EPA 200.7	ICP/22182
60181402004	MW-27S	EPA 200.7	MPRP/29565	EPA 200.7	ICP/22182
60181402005	GMW-6S	EPA 200.7	MPRP/29565	EPA 200.7	ICP/22182
60181402006	MW-15	EPA 200.7	MPRP/29565	EPA 200.7	ICP/22182
60181402007	MW-21	EPA 200.7	MPRP/29565	EPA 200.7	ICP/22182
60181402001	TMW-1	EPA 5030B/8260	MSV/65435		
60181402002	TMW-2	EPA 5030B/8260	MSV/65435		
60181402003	GMW-8S	EPA 5030B/8260	MSV/65435		
60181402004	MW-27S	EPA 5030B/8260	MSV/65435		
60181402005	GMW-6S	EPA 5030B/8260	MSV/65435		
60181402006	MW-15	EPA 5030B/8260	MSV/65437		
60181402007	MW-21	EPA 5030B/8260	MSV/65437		
60181402008	GMW-5S	EPA 5030B/8260	MSV/65437		
60181402009	GMW-7S	EPA 5030B/8260	MSV/65437		
60181402010	GMW-9S	EPA 5030B/8260	MSV/65437		
60181402011	GMW-10S	EPA 5030B/8260	MSV/65437		
60181402012	GMW-1	EPA 5030B/8260	MSV/65437		
60181402013	GMW-2	EPA 5030B/8260	MSV/65437		
60181402014	GMW-4	EPA 5030B/8260	MSV/65437		
60181402015	GMW-6I	EPA 5030B/8260	MSV/65437		
60181402016	GMW-10S	EPA 5030B/8260	MSV/65437		
60181402017	MW-28S	EPA 5030B/8260	MSV/65437		
60181402018	DUP-1	EPA 5030B/8260	MSV/65437		
60181402019	TRIP BLANK	EPA 5030B/8260	MSV/65437		
60181402001	TMW-1	SM 2320B	WET/51286		
60181402002	TMW-2	SM 2320B	WET/51286		
60181402003	GMW-8S	SM 2320B	WET/51286		
60181402004	MW-27S	SM 2320B	WET/51286		
60181402005	GMW-6S	SM 2320B	WET/51286		
60181402006	MW-15	SM 2320B	WET/51286		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 2ND & KIRBY REMEDIATION
Pace Project No.: 60181402

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60181402007	**MW-21**	SM 2320B	WET/51286		
60181402001	**TMW-1**	SM 3500-Fe B#4	WET/51251		
60181402002	**TMW-2**	SM 3500-Fe B#4	WET/51251		
60181402003	**GMW-8S**	SM 3500-Fe B#4	WET/51251		
60181402004	**MW-27S**	SM 3500-Fe B#4	WET/51251		
60181402005	**GMW-6S**	SM 3500-Fe B#4	WET/51251		
60181402006	**MW-15**	SM 3500-Fe B#4	WET/51251		
60181402007	**MW-21**	SM 3500-Fe B#4	WET/51251		
60181402001	**TMW-1**	SM 4500-S-2 D	WET/51347		
60181402002	**TMW-2**	SM 4500-S-2 D	WET/51347		
60181402003	**GMW-8S**	SM 4500-S-2 D	WET/51347		
60181402004	**MW-27S**	SM 4500-S-2 D	WET/51347		
60181402005	**GMW-6S**	SM 4500-S-2 D	WET/51347		
60181402006	**MW-15**	SM 4500-S-2 D	WET/51347		
60181402007	**MW-21**	SM 4500-S-2 D	WET/51347		
60181402001	**TMW-1**	EPA 300.0	WETA/31734		
60181402002	**TMW-2**	EPA 300.0	WETA/31734		
60181402003	**GMW-8S**	EPA 300.0	WETA/31734		
60181402004	**MW-27S**	EPA 300.0	WETA/31734		
60181402005	**GMW-6S**	EPA 300.0	WETA/31734		
60181402006	**MW-15**	EPA 300.0	WETA/31734		
60181402007	**MW-21**	EPA 300.0	WETA/31734		
60181402001	**TMW-1**	EPA 353.2	WETA/31579		
60181402002	**TMW-2**	EPA 353.2	WETA/31579		
60181402003	**GMW-8S**	EPA 353.2	WETA/31579		
60181402004	**MW-27S**	EPA 353.2	WETA/31579		
60181402005	**GMW-6S**	EPA 353.2	WETA/31579		
60181402006	**MW-15**	EPA 353.2	WETA/31579		
60181402007	**MW-21**	EPA 353.2	WETA/31579		
60181402001	**TMW-1**	SM 5310C	WETA/31607		
60181402002	**TMW-2**	SM 5310C	WETA/31607		
60181402003	**GMW-8S**	SM 5310C	WETA/31677		
60181402004	**MW-27S**	SM 5310C	WETA/31677		
60181402005	**GMW-6S**	SM 5310C	WETA/31677		
60181402006	**MW-15**	SM 5310C	WETA/31677		
60181402007	**MW-21**	SM 5310C	WETA/31677		

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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: 1 of 2

Section A Required Client Information:

Company:	GSI Engineering
Address:	15012 W. 106th Street
	Lenexa, KS 66212
Email To:	bconrad@gsinetwork.com
Phone:	913-495-2360 Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Brian Conrad
Copy To:	Joshua Mellema (jmellema@gsinetwork.com)
Purchase Order No.:	
Project Name:	2nd & Kirby Remediation
Project Number:	148032

Section C Invoice Information:

Attention:	Brian Conrad
Company Name:	GSI Engineering LLC
Address:	Same as Section A
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson
Pace Profile #:	5655,5

REGULATORY AGENCY

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

Site Location STATE: KS

Requested Analysis Filtered (Y/N)

Section D Required Client Information

Valid Matrix Codes: MATRIX / CODE — DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS

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

Pace Project No./ Lab I.D.: 60181402

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	8260 VOCs	Ferrous Iron	2320B Alkalinity	RSK-175 MEE	Sulfide	5310C TOC	200.7 Total Fe & Mn	200.7 Dissolved Fe & Mn	300.0 Chloride & Sulfate	353.2 Nitrate & Nitrite		Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	TMW-1	WT	G			10/28	1530		11	4	1	2	3	3V	6G	4	1		X	X	X	X	X	X	X	X	X	X	1AG3S	1BP3N	1BP3S 1BP3Z 1BP2U 3DG9H 01
2	TMW-2	↓	↓			↓	1505		11	4	1	2	3				1		X	X	X	X	X	X	X	X	X	X			02
3	GMW-8S				1745		~~1505~~		11	4	1	2	3				1		X	X	X	X	X	X	X	X	X	X			03
4	MW-27S				1505		~~1630~~		11	4	1	2	3				1		X	X	X	X	X	X	X	X	X	X			04
5	GMW-6S				1630		~~1625~~		11	4	1	2	3				1		X	X	X	X	X	X	X	X	X	X			05
6	MW-15				1625		~~1725~~		11	4	1	2	3				1		X	X	X	X	X	X	X	X	X	X			06
7	MW-21				1725				11	4	1	2	3				1		X	X	X	X	X	X	X	X	X	X			07
8	GMW-5S						1610		3				3						X												08
9	GMW-7S						1705		3				3						X												09
10	GMW-9S						1850		3				3						X												010
11	CMW-10S						1130		3				3						X												011
12	GMW-1	↓	↓			↓	1320		3				3						X												012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	JOSH MELLEMA - GSI	10/29		[signature] PASI	10/29	1010	4.6	Y	Y	Y
							2.4	Y	Y	Y
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Joshua Mellema

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 10/29/14

*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

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CHAIN-OF-CUSTODY / Analytical Request Document

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	Lenexa, KS 66212
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Phone: 913-495-2360	Fax:
Requested Due Date/TAT:	

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Project Name:	2nd & Kirby Remediation
Project Number:	148032

Section C Invoice Information:

Attention:	Brian Conrad
Company Name:	GSI Engineering LLC
Address:	Same as Section A
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson
Pace Profile #:	5655, 5

REGULATORY AGENCY

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

Site Location STATE:

Section D Required Client Information

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

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test: 8260 VOCs	Ferrous Iron	2320B Alkalinity	RSK-175 MEE	Sulfide	5310C TOC	200.7 Total Fe & Mn	200.7 Dissolved Fe & Mn	300.0 Chloride & Sulfate	353.2 Nitrate & Nitrite	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	GMW-2	WT	G	10/28	1340				3				3						X										01
2	[redacted]																												
3	GMW-4				1255				3				3						X										04
4	GMW-6I				1650				3				3						X										05
5	GMW-10S				1205				3				3						X										06
6	MW-28S				1225				3				3						X										07
7	[redacted]																												-
8	[redacted]																												-
9	DUP-1				1850				3										X										08
10																													09
11																													
12																													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Joshua Mellema - GSI	10/29		GSI	10/29	1010	4.6	Y	X	X
							2.4	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Joshua Mellema

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 10/29/14

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

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

Chain of Custody

RUSH!

10287092

103014

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Workorder: 60181402 **Workorder Name:** 2ND & KIRBY REMEDIATION **Owner Received Date:** 10/29/2014 **Results Requested By:** 11/7/2014

Report To	Subcontract To
Heather Wilson Pace Analytical Services, Inc. 9608 Loiret Blvd. Lenexa, KS 66219 Phone (913)599-5665 Fax (913)599-1759	Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-1700

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: none	Requested Analysis: RSK-175 M/E/E	LAB USE ONLY
1	TMW-1	PS	10/28/2014 15:30	60181402001	Water	3	X	001
2	TMW-2	PS	10/28/2014 18:05	60181402002	Water	3	X	002
3	GMW-8S	PS	10/28/2014 17:45	60181402003	Water	3	X	003
4	MW-27S	PS	10/28/2014 15:05	60181402004	Water	3	X	004
5	GMW-6S	PS	10/28/2014 16:30	60181402005	Water	3	X	005
6	MW-15	PS	10/28/2014 18:25	60181402006	Water	3	X	006
7	MW-21	PS	10/28/2014 17:25	60181402007	Water	3	X	007

Transfers	Released By	Date/Time	Received By	Date/Time
1	[signature]	10/29/14 1700	[signature] TCST PACE	10-30-14
2				
3				

Comments: 945

Cooler Temperature on Receipt 3.8 °C Custody Seal (Y) or N Received on Ice (Y) or N Samples Intact (Y) or N

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