GeoDesign Inc

CONSTRUCTION COMPLETION REPORT

Proposed Development - Former Turnbull Landfill
Southeast of SR 500 and NE Fourth Plain Boulevard
Vancouver, Washington

For
Orchard Crossings, LLC
July 3, 2019

GeoDesign Project: Orchard-1-01

GeoDesign Inc

July 3, 2019

Washington State Department of Ecology
300 Desmond Drive SE
Lacey, WA 98503

Attention: Panjini Balaraju, P.E.

Construction Completion Report
Proposed Development - Former Turnbull Landfill
Southeast of SR 500 and NE Fourth Plain Boulevard
Vancouver, Washington
GeoDesign Project: Orchard-1-01

On behalf of Orchard Crossing, LLC, GeoDesign is pleased to submit this Construction Completion Report for the proposed development at the former Turnbull Landfill located southeast of SR 500 and NE Fourth Plain Boulevard in Vancouver, Washington (project site). This report summarizes GeoDesign's observations of the methane mitigation measures installed at the project site during construction. Based on our observations, the methane mitigation system was installed in general accordance with the Engineering Design Report[1].

Sincerely,

GeoDesign, Inc.

Jason O'Donnell, L.G.
Principal Geologist

cc: Bassel Ayoub (via email only)

SRV:MFC:JSO:kt
Attachments
One copy submitted
Document ID: Orchard-1-01-070319-envr-CCR.docx

[1] GeoDesign, Inc., 2017. *Engineering Design Report; Proposed Development – Former Turnbull Landfill; Southeast of SR 500 and NE Fourth Plain Boulevard; Vancouver, Washington*, dated January 27, 2017. GeoDesign Project: Orchard-1-01

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ACRONYMS AND ABBREVIATIONS

ABS	acrylonitrile-butadiene-styrene
ASI	Advanced Surface Innovations
ASTM	American Society for Testing and Materials
BGS	below ground surface
CCR	Construction Completion Report
CMMP	Contaminated Media Management Plan
EDR	Engineering Design Report
EPA	U.S. Environmental Protection Agency
HVAC	heating, ventilation, and air conditioning
ICP-MS	inductively coupled plasma mass spectrometry
I.D.	identification
inHg	inches mercury
iow	inches of water
mg/kg	milligrams per kilogram
MRL	method reporting limit
ND	not detected
NFA	no further action
Pa	pascal
pbv	percent by volume
PCB	polychlorinated biphenyl
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
SVOC	semi-volatile organic compound
TSCA	Toxic Substances Control Act
VOC	volatile organic compound

1.0 INTRODUCTION

On behalf of Orchard Crossings, LLC., GeoDesign is pleased to submit this CCR for the proposed development at the former Turnbull Landfill located southeast of SR 500 and NE Fourth Plain Boulevard in Vancouver, Washington (project site). The project site is bound by NE Fourth Plain Boulevard to the north, SR 500 to the west, a commercial and light industrial development to the south, and undeveloped former landfill property to the east. GeoDesign completed construction observation of the methane mitigation system and assisted with management of environmentally impacted soil during construction. Construction began in June 2017 and was substantially complete in March 2018. In March 2018 GeoDesign identified outstanding methane mitigation items that were subsequently resolved allowing for the completion and submittal of this CCR. The general contractor for earthwork, underground utilities, and foundation work was Green Construction of Washougal, Washington. The general contractor for aboveground construction (i.e., building pad and above) was NCD Builders of Cary, North Carolina. This CCR summarizes the implementation of the methane mitigation system as concurred by the Washington State Department of Ecology (Ecology).

The project site is comprised of approximately 2.55 acres on the western portion of the approximately 6.5-acre former Turnbull Landfill. The project site was redeveloped with an 11,100-square-foot, one-story structure and associated infrastructure, parking lot, and utilities. The project site is shown relative to surrounding physical features on Figure 1. The project site layout is shown on Figure 2.

Acronyms and abbreviations used herein are defined above, immediately following the Table of Contents.

2.0 BACKGROUND

Based on the review of readily available documentation, the former Turnbull Landfill (which includes the project site) was operated as a gravel quarry from the early 1900s through the early to mid-1960s. Following cessation of gravel mining, the former Turnbull Landfill operated as a permitted solid waste landfill beginning sometime in 1969 by Turnbull Construction Company, the former property owner. The landfill accepted construction debris and demolition debris, as well as municipal solid waste. The solid waste disposal permit was reportedly revoked by the Southwest Washington Health District in 1973 due to permit non-compliance. Some non-permitted solid waste disposal occurred at the project site through at least 1974.

The former Turnbull Landfill is a listed cleanup site in Ecology's cleanup site database. Sometime in the late 1990s surficial landfill refuse and debris were removed from the project site and an engineered protective soil cap was installed and graded to help minimize surface water infiltration and to help facilitate redevelopment of the project site. In 2000 Ecology determined the project site was eligible for an NFA determination, which included institutional controls in the form of a restrictive covenant.

Between 1983 and 2006 several geotechnical and environmental investigations were completed to evaluate the content and extent of the solid waste. Prior site explorations completed by

GeoDesign indicated the protective cap material consists of a 12- to 36-inch-thick layer of dense, brown sand with some gravel underlain by fill to depths between 8 and 18 feet BGS. The fill contains variable amounts of refuse, including concrete, lumber, and trash. Native sand and gravel deposits are present below the fill. Groundwater was reportedly encountered at depths between 15 and 20 feet BGS.

At the request of Ecology, GeoDesign completed a methane investigation at the project site in November 2016. The methane investigation was conducted to provide site-specific methane data to assist Ecology with their evaluation of the adequacy of the proposed methane mitigation system. Methane was detected at sustained concentrations of up to 3.4 pbv during readings. According to ASTM E2993-16[2], methane concentrations in shallow soil gas less than 5.0 pbv and pressures less than 2 iow (less than 500 Pa) do not warrant further action. Based on the results of the methane investigation, site conditions meet the no further action criteria of the ASTM standard. However, the methane mitigation system design was prepared for the project site as described in the EDR.

In addition, based on the presence of contaminated media (e.g., soil or groundwater) and solid waste at the project site, a CMMP was prepared and included in the EDR. The objectives of the CMMP were to (1) outline standard procedures for the evaluation of imported fill soil, (2) outline procedures for the identification, management, and disposal of solid waste or hazardous waste that may be encountered during portions of site earthwork, (3) provide the earthwork contractor with guidance related to the identification, notification, and handling of solid waste or hazardous waste, (4) provide the earthwork contractor guidance related to the proper handling and disposal of groundwater, if encountered, and (5) establish a decision structure supporting the management of contaminated media.

3.0 PROJECT SITE DEVELOPMENT

The project site development includes an approximately 11,100-square-foot, one-story building. The building is used as a restaurant. The foundation is slab o -grade supported by shallow footings and engineered aggregate piers. The remainder of the project site consists of a parking lot and landscaping. Underground utilities include water, sanitary, stormwater, and electrical. The project site is approximately 85 percent impervious. Stormwater runoff is collected and piped to the existing lateral on the east side of the project site. As a result, infiltration and potential leachate generation is significantly reduced. The restaurant and parking lot were constructed directly over the footprint of the former Turnbull Landfill. Methane mitigation measures were implemented at the project site to

- mitigate the potential for methane gas accumulation in on-site confined spaces at concentrations that could pose an explosive or asphyxiant hazard.
- mitigate the potential for methane gas to migrate off site via utility trenches entering or exiting the project site.

[2]ASTM, *Standard Guide for Evaluating Potential Hazard as a Result of Methane in the Vadose Zone.* Published May 2016.

GeoDesign submitted the EDR to Ecology, which presented the basis, concepts, and engineering design to mitigate methane and achieve the objectives for the project site. Based on the information provided, Ecology concurred with the concepts and design presented in the EDR.

Record drawings of the methane mitigation system and specifications are presented in Appendix A.

The methane mitigation system includes a sub-slab passive venting system and a low-permeable membrane placed below the slab of the building. In addition, the methane mitigation system includes trench dams to mitigate off-site methane migration through utility corridors and electrical conduit seals. Details of the methane mitigation system and other engineering design elements to protect human health and the environment are provided below.

4.0 PLANNED METHANE MITIGATION MEASURES AND PROJECT SITE IMPROVEMENTS

Based on GeoDesign's understanding of the project site and development requirements, methane mitigation measures were developed to mitigate potential methane accumulation and migration. The design also considered on-site features and worker and site safety. Methane mitigation measures and project site improvements included the following:

- A low-permeable membrane and sub-slab passive venting system underneath the building slab
- Trench dams along utility corridors that extend off site and adjacent to building footings
- Conduit seals to help prevent methane migration through electrical conduits
- Management of soil or solid waste encountered during project site development activities

During construction, GeoDesign periodically observed and documented the implementation of the methane mitigation measures. A summary of the observations is provided below. GeoDesign's field reports documenting our observations are presented in Appendix B and project site photographs are presented in Appendix C.

5.0 IMPLEMENTATION OF METHANE MITIGATION MEASURES AND PROJECT SITE IMPROVEMENTS

GeoDesign observed the implementation of the methane mitigation measures and project site improvements as summarized below.

5.1 SUB-SLAB PASSIVE VENTING SYSTEM AND LOW-PERMEABLE MEMBRANE

The methane mitigation measures for the building consisted of a sub-slab passive venting system overlain with a low-permeable membrane beneath the slab of the building. The design included a gravel blanket for the installation of the sub-slab passive venting system. The methane mitigation measures were installed in general accordance with the record drawings and specifications presented in Appendix A.

5.1.1 Sub-Slab Passive Venting System

The sub-slab passive venting system consists of flat, perforated vent pipe (Liquid Boot® Geovent) connected to vertical vent risers that extend above the roof line. The sub-slab vent piping was installed in the general locations shown on Figure H2.1 in Appendix A. Compared to the EDR design drawings, a section of the sub-slab vent piping on the east side of the building was re-routed to avoid conflicts with other utilities and footings. The sub-slab vent piping spacing requirements of the design were generally maintained. Four vertical vent risers penetrated through the floor in the general locations shown on the drawings. For the transition from flat, perforated pipe to the 3-inch-diameter vent riser, 2-inch-diameter ABS pipe was used due to space constraints between rebar and the edge of the concrete. The sections of 2-inch-diameter pipe were approximately 5 feet or less and will not significantly limit air flow through the pipe. Once above the floor slab, 3-inch-diameter PVC pipe was used to route the vent risers through the roof.

The two vent risers that vent the east side of the building were combined into a single vent riser prior to penetrating through the roof to avoid conflicts with previously installed plumbing and ductwork. The vent riser that was placed in the wall on the northwest side of the building was routed between the roof joists and penetrated the roof on the south side of the building. Each vent riser is equipped with a ventilation turbine to assist with passive ventilation and help prevent rain entrainment into the vent riser. GeoDesign did not observe placement of "methane gas in pipe" sticker for pipes located inside walls. Methane gas identification stickers were placed on pipes at exposed portions of the vent riser pipe above the roof line. GeoDesign provided additional stickers to the Golden Corral manager to place on exposed vent riser pipes in the interior of the building.

5.1.2 Low-Permeable Membrane

The installed low-permeable membrane is a Liquid Boot® spray-applied flexible membrane manufactured by CETCO of Santa Ana, California. The Liquid Boot® membrane was applied by Advanced Surface Innovations (ASI) of Portland, Oregon. ASI is a qualified installer as certified by the manufacturer.

The building subgrade was prepared with base rock meeting the sub-base and gravel blanket criteria for the methane mitigation system. The Liquid Boot® membrane was spray-applied over a carrier fabric (BASEFABRIC™ T-60 non-woven geotextile fabric). The fabric seams overlapped by approximately 4 to 8 inches. Based on our observations, the fabric seams generally met the design requirements and were adequately bonded together. The Liquid Boot® membrane was smoke tested using a smoke machine and an air blower. Areas where smoke was observed penetrating the membrane were sealed by spraying Liquid Boot® over the leak areas until smoke was not observed. GeoDesign observed the placement of the carrier fabric, the application of the membrane, and the smoke tests conducted on the Liquid Boot® membrane. Periodic thickness tests were conducted by GeoDesign to confirm the membrane thickness met the specifications. Coupon samples were cut from the Liquid Boot® membrane and measured for thickness in the field using a General® micrometer capable of measuring to 0.001 inch (1 mil). Areas not meeting the thickness specification were re-sprayed with Liquid Boot®. A total of six coupon samples were taken by GeoDesign at a frequency of approximately one sample per 1,850 square feet, which is in general accordance with project specifications. Based on this periodic testing,

the membrane appeared to meet the minimum specified thickness of 60 dry mils. The six coupon sample locations were repaired according to the procedures set forth in the specifications.

Membrane application began on September 6, 2017 and was complete by September 12, 2017. After the membrane was allowed to cure for a minimum of 24 hours, the low-permeable membrane was covered with Liquid Boot® Ultrashield P-150 protective sheeting. The P-150 protective sheeting has a thickness 15 mils and is designed to provide a puncture-resistant layer during utility and concrete slab installation. GeoDesign's field reports and photographs documenting the membrane application are presented in Appendices B and C, respectively.

5.1.3 Sub-Slab Monitoring Probes

During construction, three sub-slab monitoring probes were installed to assist in evaluating sub-slab conditions after construction. The probes consisted of 10-foot sections of ½-inch-diameter, Schedule 40 PVC slotted pipes connected to ½-inch-diameter, Schedule 40 PVC blank pipes. The probes were located underneath the low-permeable membrane and extended to the exterior of the building. Each probe was fitted with a sample port and valve and protected by a flush to grade vault.

The screened section of sub-slab probe SSP-1 was placed in the western portion of the building. The screened section of sub-slab probe SSP-2 was placed in the central portion of the building. The screened section of sub-slab probe SSP-3 was placed in the eastern portion of the building. The vault for sub-slab probe SSP-1 is located on the western side of the building. Vaults for sub-slab probes SSP-2 and SSP-3 are located on the north side of the building. The sub-slab probe locations are shown on Figure H2.1 in Appendix A. Representative photographs of the sub-slab monitoring probes are presented in Appendix C.

5.2 TRENCH DAMS

As part of the development, six trench dams were installed along the utility corridors in general accordance with the EDR dated January 27, 2017. Constructed trench dam locations are shown on Figure H1.1 in Appendix A.

Trench dams were installed at the following locations:

- Two trench dams were installed on the east side of the building where the sanitary sewer passes through the building foundation.
- One trench dam was installed on the south side of the building where the domestic water and fire lines pass through the building foundation.
- Three trench dams were installed on the east side of the project site where the storm, water, and sewer utilities leave the project site.

GeoDesign observed the placement of each trench dam. The trench dams were constructed by over-excavating the utility trenches to fully expose the pipe at the bottom by a minimum of 4 inches. Trench dam widths corresponded to the width of the excavator bucket and the number of utilities located in the trench and were generally 2 to 4 feet wide. The pipes were wrapped in black plastic prior to pouring the concrete mixture. Using pre-mixed concrete, Green

Construction encased the pipes to the full width and depth of the pipe bedding material. As installed, the trench dams will help prevent methane migration along the utility corridors. GeoDesign's field reports documenting the trench dam installation are presented in Appendix B and representative photographs of select trench dams are presented in Appendix C.

5.3 CONDUIT SEALS

Using a closed-cell polyurethane expanding foam, the electrical contractor placed conduit seals in the annular spaces of electrical conduits as they entered electrical panels from underground. GeoDesign observed the installed conduit seals or was provided photographic documentation of the installed conduit seals. Conduit seals were installed in the electrical panels in the interior and exterior of the building. Prior to completion of the conduit seal installation, GeoDesign observed four conduits without conduit seals in the outside electrical panel on the south side of the building. At the time of installation, the electrical contractor indicated that they were not able to access the panel because it was locked by Clark Public Utilities. Based on GeoDesign's observations, the panel is naturally ventilated and potential methane accumulation will most likely not occur. This location will be monitored as part of the proposed monitoring program described in Section 7.0. Photographic documentation is presented in Appendix C.

5.4 MANAGEMENT OF SOIL AND SOLID WASTE DURING SITE DEVELOPMENT

As part of the site development, Green Construction excavated utility trenches and completed site-wide grading and site improvements. In addition, GeoTech Foundation Company – West of Hillsboro, Oregon, augered several holes for the aggregate pier foundation system. These activities encountered solid waste and impacted soil.

In June 2017 GeoDesign characterized stockpiles containing soil and solid waste that were generated during site development. Two 10-point composite soil samples (Comp-1 and Comp-2) were collected from the stockpiles and submitted to Apex Laboratories of Tigard, Oregon, to be analyzed for the following:

- Gasoline-range hydrocarbons by Method NWTPH-Gx
- Diesel- and oil-range hydrocarbons by Method NWTPH-Dx
- VOCs by EPA Method 8260B
- RCRA 8 metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) by EPA Method 6020 (ICP-MS)
- SVOCs by EPA Method 8270D
- PCBs by EPA Method 8082A

The analytical results were compared to the RCRA Maximum Allowable Levels to evaluate disposal options.

Results for gasoline-range hydrocarbons, diesel-range hydrocarbons, and VOCs were less than the laboratory MRLs for both composite soil samples. Oil-range hydrocarbons were detected at concentrations of 145 mg/kg and 244 mg/kg in composite soil samples Comp-1 and Comp-2, respectively.

Concentrations of arsenic, barium, cadmium, chromium, lead, and mercury were detected in both composite samples. The detected metals concentrations ranged from 0.127 mg/kg (mercury) to 217 mg/kg (barium).

For SVOCs, dimethylphthalate was detected in composite soil sample Comp-2 at a concentration of 2.69 mg/kg.

For PCBs, Aroclor 1242 was detected in composite soil sample Comp-2 at a concentration of 3.73 mg/kg.

Based on the analytical results of composite soil samples Comp-1 and Comp-2 and the presence of debris in the stockpiles, the stockpiles were suitable for disposal at a RCRA Subtitle D landfill. Approximately 1,147 tons of soil and debris were removed from the project site and disposed of at the Wasco County Landfill located in The Dalles, Oregon.

Analytical results for the stockpile samples are presented in Tables 1 through 3. The chemical analytical laboratory report is presented in Appendix D. The landfill disposal tickets are presented in Appendix E.

5.5 CONFIRMATION OF METHANE MITIGATION MEASURES

GeoDesign observed the installation of the low-permeable membrane, sub-slab passive venting system, electrical conduit seals, and trench dams. Based on our observations, the methane mitigation measures were installed in general accordance with the EDR. In our professional opinion, the methane mitigation system is protective of the current and future occupants of the building.

5.6 INTERIOR SPACE AND SUB-SLAB PASSIVE SYSTEM VERIFICATION SCREENING

5.6.1 Interior Spaces

On March 14, 2018 GeoDesign conducted methane verification screening of interior spaces where methane could potentially accumulate inside the building. Ten locations were screened for methane using a calibrated Landtec GEM 2000+ methane meter. The selected locations consisted of floor drains, pipe penetrations through the floor slab, cupboards, and electrical outlets. Methane was not detected at the selected interior sampling points. Results of the verification screening are summarized in Table 4.

5.6.2 Sub-Slab Passive Venting System

On March 14, 2018 GeoDesign screened four vertical risers in presumed locations of the vent risers. At the time of verification screening, the vent risers were not labelled and the ventilation turbines were not installed. Using a calibrated Landtec GEM 2000+ methane meter, methane was not detected in the presumed vent risers. During this same site visit, GeoDesign attempted to complete verification screening from the sub-slab monitoring probes. However, GeoDesign was unable to locate the sub-slab monitoring probes.

On July 26, 2018 GeoDesign returned to the project site to complete the verification screening of the vent risers and sub-slab monitoring probes. NCD Builders confirmed that the vent risers were identified and the sub-slab monitoring probes were located. Using a calibrated Landtec

GEM 2000+ methane meter, GeoDesign screened for methane from the three vent risers (VR-1, VR-2, and VR-4) and three sub-slab monitoring probes (SSP-1 through SSP-3). As noted previously, the design included four vent risers. However, two vent risers on the east side of the building were combined into one. Details are provided in Section 6.0. Results of the methane screening from the vent risers are summarized in the table below.

Vent Riser	Methane (pbv)	Carbon Dioxide (pbv)	Oxygen (pbv)
VR-1	0.0	0.0	21.3
VR-2	0.0	0.0	21.3
VR-4	0.0	0.0	21.2

Barometric pressure: 30.08 inHg

The sub-slab monitoring probe sampling data is summarized in the table below.

Sub-Slab Probe	Static Pressure (iow)	Methane (pbv)	Carbon Dioxide (pbv)	Oxygen (pbv)
SSP-1	0.01	0.0	0.0	21.5
SSP-2	0.00	0.0	0.0.	21.7
SSP-3	0.00	0.0	0.0	21.7

The verification screening data indicate that methane is not accumulating under the building. Future monitoring is discussed in Section 7.0.

6.0 DESIGN MODIFICATIONS AND ADDITIONAL MEASURES IMPLEMENTED

During construction, design modifications were necessary to facilitate the construction process but still allow for a protective methane mitigation system. These design modifications did not change the function of the original design. The following modifications or additions were made during the course of construction:

- Two-inch diameter, Schedule 40 ABS pipes were used to transition from the sub-slab vent pipe to the vent risers through the floor slab. The design called for 3-inch-diameter PVC pipe. The smaller-diameter pipe was used because of space limitations between structural rebar and concrete forms for the footings and floor slab. After the pipes were routed through the floor slab, 3-inch-diameter PVC was used for the vent risers through the roof as specified. The lengths of the smaller-diameter pipes are approximately 5 feet or less and are not expected to constrict air flow.
- The sub-slab vent pipe on the east side of the building was re-routed to avoid conflicts with footings and other utilities.
- The lengths of three of the six trench dams were shorter than the specified length. Based on site observations, the trench dams were keyed into native soil and fully encased the pipe zone. As installed, the trench dams will mitigate the preferential pathway created by the more porous pipe zone material.

- The two vent risers on the east side of the building were combined into a single vent riser prior to penetrating the roof. This was done to avoid conflicts between the vent riser and ductwork. Two vent riser pipes are connected to the sub-slab ventilation system and are joined together in the roof joist area below the roof. The vent riser is equipped with the wind turbine as specified. Based on site observations, the vent riser is expected to effectively ventilate the sub-slab as intended.
- Four conduit seals were not installed in conduits entering the outdoor electrical panel on the south side of the building. The electrician was unable to access the lower compartment of the electrical panel because it was secured by the local utility company. The compartment is ventilated with openings in the access door and gaps between the concrete pad and the bottom of the electrical panel. In addition, the electrician reports that the joints of the conduit feeding the panel are glued. Based on this, it is our opinion that the potential for methane to migrate through the conduit and accumulate in the lower compartment of the panel is low. However, monitoring of this location will be incorporated into the proposed monitoring program as described in Section 7.0.

7.0 PROPOSED MONITORING PROGRAM

The methane mitigation system is intended to be protective of current and future occupants of the building. To evaluate the long-term protectiveness of the system, methane monitoring of the installed methane mitigation system is proposed on a semi-annual basis with the monitoring events corresponding with seasonal high and low barometric pressures (i.e., summer and winter). After two years of monitoring (four monitoring events), conditions will be evaluated based on the methane monitoring data to establish future monitoring requirements. If data indicates stable conditions, methane concentrations are within allowable limits, and methane mitigation measures remain protective, monitoring requirements may be discontinued with Ecology's concurrence.

Following the semi-annual monitoring events, a brief technical memorandum will be prepared and submitted to Ecology documenting the monitoring activities. After two years of monitoring, a compilation report will be prepared and submitted to Ecology summarizing the monitoring to date.

Specifically, the monitoring program will consist of the following:

- Monitor the three sub-slab monitoring probes (SSP-1 through and SSP-3) and the three vent risers (VR-1, VR-2, and VR-4). In addition, static pressure will be monitored in the sub-slab monitoring probes. The pbv of methane, oxygen, carbon dioxide, and static pressure (sub-slab monitoring probes only) will be measured and recorded. In addition, date, time, and atmospheric barometric pressure will be recorded during each monitoring event.
- Monitor the lower compartment of the outdoor electrical panel for methane accumulation until the conduits can be sealed.

A calibrated Landtec GEM 2000+ methane meter will be used to measure the parameters identified above, except for atmospheric barometric pressure. A hand-held barometer or online data will be used.

Semi-annual monitoring data will be evaluated for potential methane accumulation or unsafe conditions. In the event methane is detected, the following decision-making process to enhance the monitoring program is proposed to evaluate if the methane mitigation system remains protective.

Methane concentrations of 5 pbv or greater in the sub-slab monitoring probes and no methane detections in the vent risers will trigger additional monitoring. Under this condition, GeoDesign proposes monitoring the sub-slab monitoring probes and vent risers monthly for one quarter to evaluate if concentrations are sustained. If methane concentrations in the sub-slab monitoring probes continue to exceed 5 pbv, indoor confined space monitoring will be conducted with the Landtec GEM-2000+ methane meter. If methane is detected above 1.25 pbv during indoor air monitoring, Ecology and the designated project site contact person will be notified to discuss the possible remedial options. Initially, the source of the methane will be investigated using a flame ionization detector. If methane is entering through a breach in the methane mitigation system, the following options will be explored:

1. Locating the potential breach and repairing it
2. Activating the passive venting system
3. Adjusting the building HVAC system to increase the indoor air exchanges

Methane concentrations of 5 pbv or greater in the sub-slab monitoring probes and methane detected in the vent risers will also trigger additional monitoring. However, under this scenario, methane in the vent risers indicates ventilation is occurring. Therefore, monitoring will occur quarterly. If sub-slab methane concentrations increase, the indoor air monitoring and the measures described above will be implemented.

Potential options will be discussed with Ecology and implemented with Ecology's concurrence.

8.0 SUMMARY AND RECOMMENDATIONS

The methane mitigation system as described in the EDR are complete. Off-site soil disposal was managed in general accordance with the CMMP. The low-permeable membrane, sub-slab passive venting system, and conduit seals were completed according to the plans and specifications, unless noted otherwise in this report. GeoDesign was periodically present to observe the key activities pertinent to the design and noted discrepancies in field reports and in this report.

Based on observations and verification screening, the methane mitigation system is considered protective of human health and the environment. The proposed monitoring program described in Section 7.0 will provide data on potential methane accumulation under the building or within the sub-slab passive venting system. Maintenance of the system may be necessary to help ensure that the controls remain intact and functional in the long term.

GeoDesign recommends Orchard Crossings, LLC retain a qualified environmental professional to assist in completing the long-term monitoring activities and reporting. Furthermore, GeoDesign recommends sealing the remaining conduits in the outdoor electrical panel on the south side of the building the next time the panel is opened by an electrician or Clark Public Utilities. Lastly,

GeoDesign recommends posting signs in the electrical/mechanical rooms and in the project site's tenant manual (if available) to inform contractors or maintenance personnel of the installed methane mitigation system components prior to undertaking repairs or renovations that may impact the methane mitigation measures.

♦ ♦ ♦

GeoDesign appreciates Ecology's continued support on this project. Please contact us if you have any questions regarding this CCR.

Sincerely,

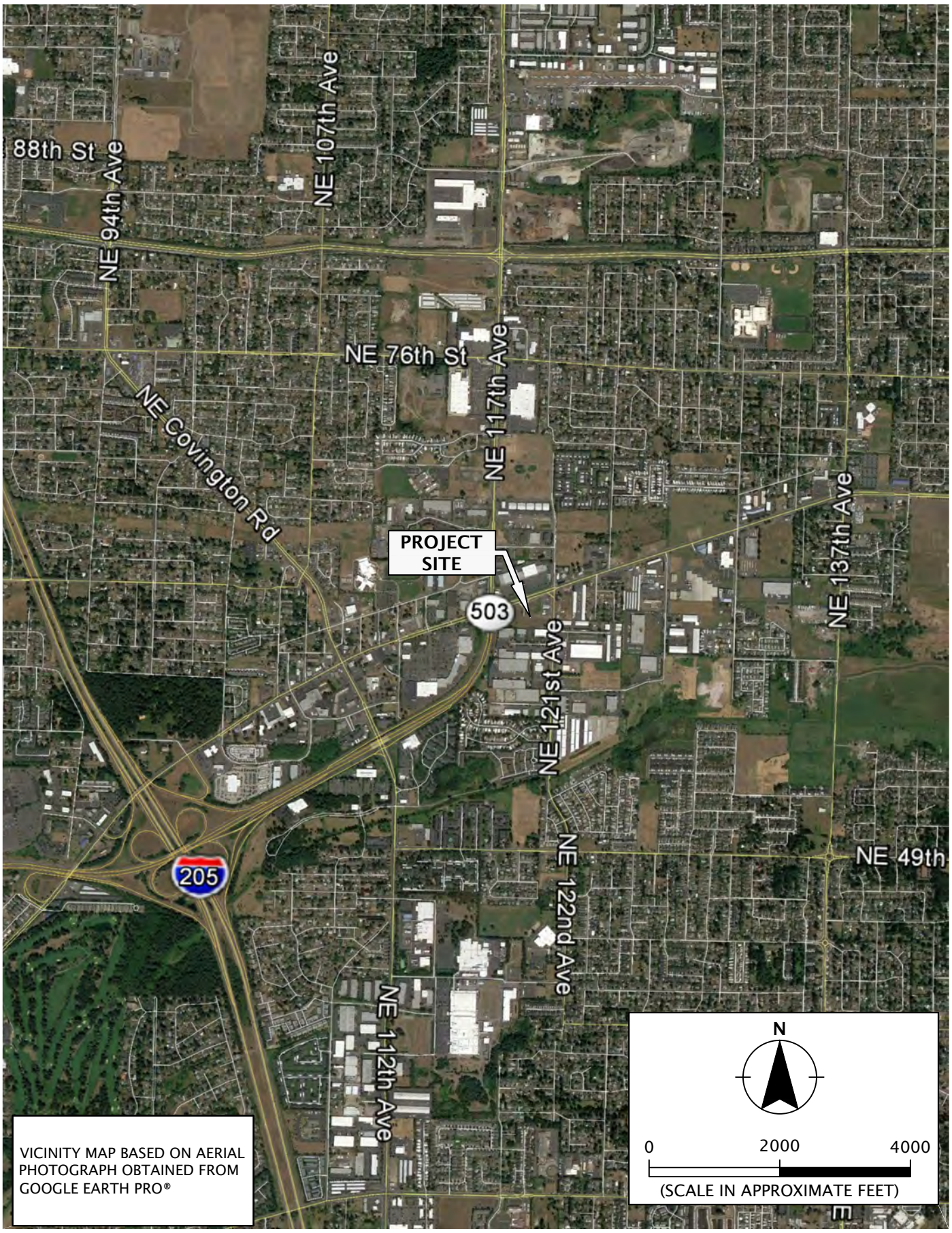
GeoDesign, Inc.

Mike F. Coenen, P.E.
Associate Engineer

Signed 07/03/2019

Jason O'Donnell, L.G.
Principal Geologist

FIGURES



GEODESIGN INC 9450 SW Commerce Circle - Suite 300 Wilsonville OR 97070 503.968.8787 www.geodesigninc.com	ORCHARD-1-01	**VICINITY MAP**
	JULY 2019	PROPOSED DEV. - FORMER TURNBULL LANDFILL VANCOUVER, WA
		FIGURE 1

Printed By: mmiller | Print Date: 7/1/2019 2:47:23 PM
File Name: J:\M-R\Orchard\Orchard-1\Orchard-1-01\Figures\CAD\CCR\Orchard-1-01-VM01.dwg | Layout: FIGURE 1

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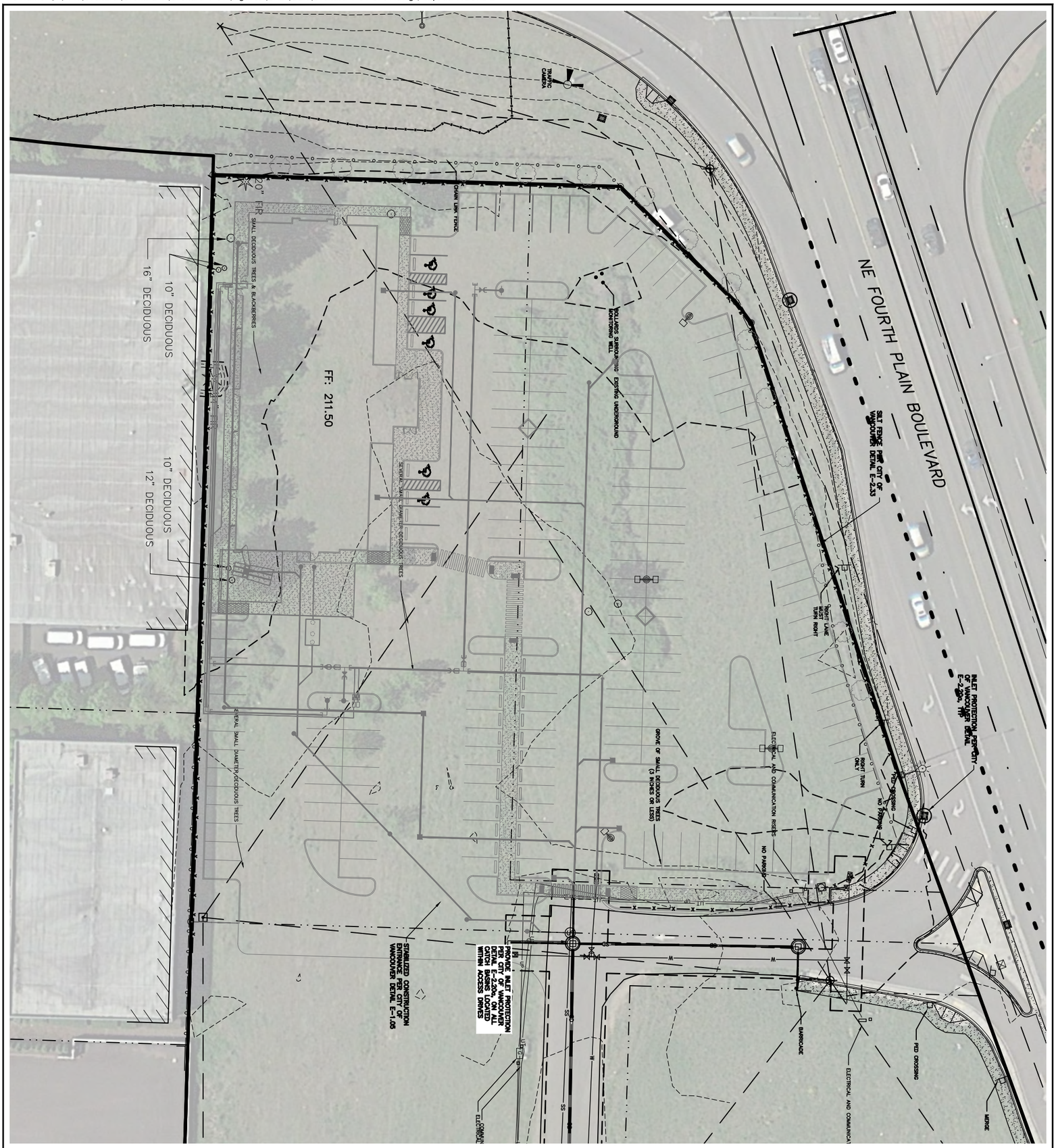
File Name: J:\M-R\Orchard\Orchard-1\Orchard-1-01\Figures\CAD\CCR\Orchard-1-01-SP01.dwg | Layout: FIGURE 2



SITE PLAN BASED ON DRAWING PROVIDED BY PACE AND IMAGE OBTAINED FROM GOOGLE EARTH PRO ON AUGUST 24, 2016

0 50 100
(SCALE IN FEET)

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GeoDesign Inc 9450 SW Commerce Circle - Suite 300 Wilsonville OR 97070 503.968.8787 www.geodesigninc.com	ORCHARD-1-01	**SITE PLAN**
	JULY 2019	PROPOSED DEV. - FORMER TURNBULL LANDFILL VANCOUVER, WA
		FIGURE 2

TABLES

TABLE 1
Summary of Soil Sample Chemical Analytical Results
Petroleum Hydrocarbons, VOCs, and SVOCs
Proposed Development - Former Turnbull Landfill
Southeast of SR 500 and NE Fourth Plain Boulevard
Vancouver, Washington

Sample I.D.	Sample Date	Gasoline-Range Hydrocarbons by Method NWTPH-Gx (mg/kg)	Diesel- and Oil-Range Hydrocarbons by Method NWTPH-Dx (mg/kg)		VOCs by EPA Method 8260B (mg/kg)	SVOCs by EPA Method 8270D (mg/kg)
			Diesel-Range	Oil-Range	Varies	Dimethylphthalate
Comp-1	06/16/17	5.75 U	25.0 U	**145**	ND	0.306 U
Comp-2	06/16/17	6.42 U	25.0 U	**244**	ND	**2.69**
RCRA Maximum Allowable Levels		Varies				

Notes:
U: not detected at concentrations greater than the laboratory MRL (shown)
Bolding indicates analyte detected at or above the laboratory MRL.

TABLE 2
Summary of Soil Sample Chemical Analytical Results
RCRA 8 Total Metals
Proposed Development - Former Turnbull Landfill
Southeast of SR 500 and NE Fourth Plain Boulevard
Vancouver, Washington

Sample I.D.	Sample Date	RCRA 8 Total Metals by EPA Method 6020 (ICP-MS) (mg/kg)							
		Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
Comp-1	06/16/17	**3.23**	**163**	**0.556**	**17.4**	**22.3**	**0.127**	1.26 U	0.253 U
Comp-2	06/16/17	**2.19**	**217**	**1.49**	**14.8**	**23.1**	**0.147**	1.17 U	0.234 U
RCRA Maximum Allowable Levels		100	2,000	20	100	100	4	20	100

Notes:
U: not detected at concentrations greater than the laboratory MRL (shown)
Bolding indicates analyte detected at or above the laboratory MRL.

TABLE 3
Summary of Soil Sample Chemical Analytical Results
PCBs
Proposed Development - Former Turnbull Landfill
Southeast of SR 500 and NE Fourth Plain Boulevard
Vancouver, Washington

Sample I.D.	Sample Date	PCBs by EPA Method 8082A (mg/kg)													
		Aroclor 1016		Aroclor 1221		Aroclor 1232		Aroclor 1242		Aroclor 1248		Aroclor 1254		Aroclor 1260	
Comp-1	06/16/17	0.0403	U	0.0112	U	0.0839	U	0.0515	U	0.0582	U	0.0235	U	0.0112	U
Comp-2	06/16/17	0.228	U	0.228	U	0.228	U	**3.73**		0.228	U	0.228	U	0.228	U
TSCA Maximum Allowable Levels[1]		50													

Notes:
1. TSCA Maximum Allowable Level is based on total PCBs.
U: not detected at concentrations greater than the laboratory MRL (shown)
Bolding indicates analyte detected at or above the laboratory MRL.

TABLE 4
Summary of Methane Verification Screening
Proposed Development - Former Turnbull Landfill
Southeast of SR 500 and NE Fourth Plain Boulevard
Vancouver, Washington

Date: 03/14/18

Begin Barometer: 29.9 inHg at 08:53

End Barometer: 29.9 inHg at 12:53

Location I.D.	Time	Concentration (pbv)			Comments
		Methane	Carbon Dioxide	Oxygen	
Interior Spaces					
ICS-1	9:17	0.0	0.1	20.6	Floor drain south of freezer
ICS-2	9:22	0.0	0.1	20.6	Floor drain below sink
ICS-3	9:25	0.0	0.0	20.6	Strip drain, washing area
ICS-4	9:27	0.0	0.1	20.6	Penetration below coffee maker, west
ICS-5	9:30	0.0	0.0	20.5	Drain by coffee maker, east
ICS-6	9:35	0.0	0.0	20.4	Men's restroom drain
ICS-7	9:40	0.0	0.0	20.4	Cabinet near drain
ICS-8	9:43	0.0	0.1	20.4	SE corner of refrigerator
ICS-9	9:48	0.0	0.4	19.4	Electrical outlet NW area of seating
ICS-10	9:51	0.0	0.1	20.4	Electrical outlet NE area of seating

APPENDIX A

PROPOSED DEV. - FORMER TURNBULL LANDFILL

SOUTHEAST OF SR 500 AND NE FOURTH PLAIN BOULEVARD
VANCOUVER, WA
METHANE MITIGATION SYSTEM

SHEET INDEX

GENERAL NOTES:

1. PERFORATED HORIZONTAL VENTILATION PIPES SHALL BE PLACED NO MORE THAN 25 FEET FROM THE BUILDING PERIMETER.
2. THE TOTAL PIPE PERFORATION AREA SHALL BE AT LEAST EQUAL TO OR GREATER THAN 5% OF THE PIPE SURFACE AREA.
3. LIQUID ROOT GEOVENT OR ENGINEER/WASHINGTON STATE DEPARTMENT OF ECOLOGY (DOE)-APPROVED EQUIVALENT SHALL BE CONNECTED TO VERTICAL VENTILATION RISER. THE VERTICAL VENTILATION RISER SHALL BE 3 INCHES IN DIAMETER, SCHEDULE 80 PVC PIPE. VENTILATION RISER PIPE SHALL BE PROTECTED WITH NAIL-GUARDED STUDS WHERE APPLICABLE.
4. VENTILATION RISER OUTLETS SHALL BE LOCATED AT LEAST:
   - 10 FEET ABOVE GRADE.
   - 10 FEET AWAY FROM ANY WINDOW, DOOR, ROOF HATCH, OR AIR INTAKE INTO THE BUILDING.
   - 3 FEET AWAY FROM ANY PARAPET.
   - 4 FEET AWAY FROM PROPERTY LINE.
   - 5 FEET AWAY FROM ANY ELECTRICAL DEVICE.
   - 3 FEET ABOVE HIGHEST POINT OF ROOF WITHIN A 10-FOOT RADIUS OF OUTLET (IF VENTED TO ROOF).
5. ANY VENTILATION RISER LOCATED WITHIN AN OPEN YARD SHALL TERMINATE AT A HEIGHT OF NOT LESS THAN 10 FEET ABOVE ADJACENT GRADE, UNLESS NOTED OTHERWISE.
6. CONTRACTOR SHALL VERIFY EXACT TYPE OF CONSTRUCTION AT EACH VENT RISER. RISERS MUST AVOID WINDOWS AND MUST NOT BE INSTALLED WHERE STRUCTURAL MEMBERS PROHIBIT.
7. THE TERMINATION OF ALL VENTILATION PIPES SHALL BE PROVIDED WITH A TEE CONNECTION OR OTHER APPROVED RAIN CAP TO HELP PREVENT THE INTRUSION OF RAIN WATER. RAIN GUARDS SHALL BE NON-RESTRICTING.
8. VENTILATION RISERS SHALL BE CLEARLY MARKED TO INDICATE THAT THE PIPE MAY CONTAIN COMBUSTIBLE GAS. PIPES SHALL BE MARKED 6 INCHES BELOW THEIR TERMINATION POINT AND AT 5-FOOT INTERVALS ALONG THE REMAINDER OF THE VENTILATION RISER. THIS INCLUDES SECTIONS ENCASED WITHIN THE WALLS OR OTHER ENCLOSURES. THE IDENTIFIER SHOULD INCLUDE THE WORDS "CAUTION METHANE GAS IN PIPE NO SMOKING OR ELECTRICAL EQUIPMENT WITHIN 10 FEET." THE PLACARD SIGN SHALL BE 3 INCHES HIGH BY 4 INCHES WIDE WITH 1/4-INCH-HIGH, BLACK LETTERS ON WHITE BACKGROUND AND BE PLASTIC WITH ADHESIVE BACKING, UNLESS OTHERWISE SPECIFIED BY ENGINEER.
9. ALL UNDERGROUND ELECTRICAL, PLUMBING, AND SIMILAR CONDUITS PENETRATING THE LOW-PERMEABLE MEMBRANE SHALL BE PROVIDED WITH A BOOT PER THE MANUFACTURER'S SPECIFICATIONS.
10. ALL ELECTRICAL CONDUITS ENTERING OR LEAVING THE INTERIOR BUILDING OR EXTERIOR ELECTRICAL BOXES SHALL BE COMPLETED IN ACCORDANCE WITH LOCAL ELECTRICAL CODES. ALL CONDUITS SHALL BE SEALED WITH A CLOSED CELL EXPANDING POLYURETHANE FOAM SEALANT OR EQUIVALENT.
11. ALL SHOWER OR TUB BOXES MUST BE SET ABOVE THE LOW-PERMEABLE MEMBRANE. IF NECESSARY, OVER-EXCAVATE SOIL BENEATH BOXES TO PROVIDE NECESSARY CLEARANCE FOR THE LOW-PERMEABLE MEMBRANE.
12. THE LOW-PERMEABLE MEMBRANE MUST MEET ASTM STANDARDS D 6392, D 4068-88, D 1434-82, D 543-87, AND D 1693-78. INSTALL THE LOW-PERMEABLE MEMBRANE PER MANUFACTURER'S SPECIFICATIONS. FINAL PRODUCT APPROVAL MAY BE SUBJECT TO DOE REVIEW AND APPROVAL.
13. CONCRETE FORMING, PLACEMENT, AND FINISHING SHALL BE CONDUCTED SUCH THAT THE INTEGRITY OF THE LOW-PERMEABLE MEMBRANE IS MAINTAINED. INTERNAL FORM STAKING SHALL BE COMPOSED OF STEEL AND SHALL BE BELOW THE SURFACE OF THE FINISHED CONCRETE. REPAIR SLAB AS NECESSARY WITH NON-SHRINK GROUT. UNDER NO CIRCUMSTANCES SHALL THE LOW-PERMEABLE MEMBRANE BE PENETRATED WITH FINISHING APPARATUS DURING CONCRETE PLACEMENT. IF THE LOW-PERMEABLE MEMBRANE IS DAMAGED, CONTRACTOR'S WORK SHALL STOP UNTIL THE APPROPRIATE REPAIRS TO THE LOW-PERMEABLE MEMBRANE ARE MADE. REINFORCING STEEL, PIPING, FORMS, ETC. SHALL NOT BE SUPPORTED DIRECTLY ON THE LOW-PERMEABLE MEMBRANE OR PROTECTIVE COVERING, AND EQUIPMENT SHALL NOT BE DRIVEN OVER THE LOW-PERMEABLE MEMBRANE OR ITS PROTECTIVE COVERING.
14. A QUALIFIED PROFESSIONAL KNOWLEDGEABLE IN THE INSTALLATION OF METHANE MITIGATION SYSTEMS SHALL BE PRESENT DURING CONSTRUCTION AND TESTING OF THE METHANE MITIGATION SYSTEM FOR THIS PROJECT. THE QUALIFIED PROFESSIONAL SHALL OBSERVE AND DOCUMENT THE DESIGN ELEMENTS AS DESCRIBED HEREIN WERE INSTALLED IN GENERAL ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS. DOCUMENTED OBSERVATIONS AND/OR REPORTS GENERATED BY THE QUALIFIED PROFESSIONAL MAY BE SUBJECT TO DOE REVIEW AND DOE APPROVAL OF THE METHANE MITIGATION SYSTEM INSTALLATION MAY BE NECESSARY BEFORE OCCUPANCY OF THE BUILDING IS ALLOWED.
15. COPIES OF THIS PLAN SET SHALL BE DISTRIBUTED TO AND RECEIVED BY BOTH THE EARTHWORK, ELECTRICAL, AND PLUMBING CONTRACTORS AT A MINIMUM. ALL ELECTRICAL AND PLUMBING INSTALLATIONS FOR BUILDINGS WITH SUB-SLAB VENTING SHALL COMPLY WITH NOTES 8, 9, AND 10 ABOVE.

VICINITY MAP

RECORD DRAWING - JUNE 28, 2019

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N

0 1500 3000

(SCALE IN FEET)

SITE PLAN BASED ON AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH PRO®, AUGUST 15, 2016

VICINITY MAP
SHEET INDEX
GENERAL NOTES

H0.1

PROPOSED DEV. - FORMER TURNBULL LANDFILL
VANCOUVER, WA

ORCHARD-1-01

JUNE 2019

DESIGNED BY: GDI ENG
DRAWN BY: GDI CAD
CHECKED BY:
APPROVED BY:

NO.	DATE	REVISION DESCRIPTION	BY	APPR.

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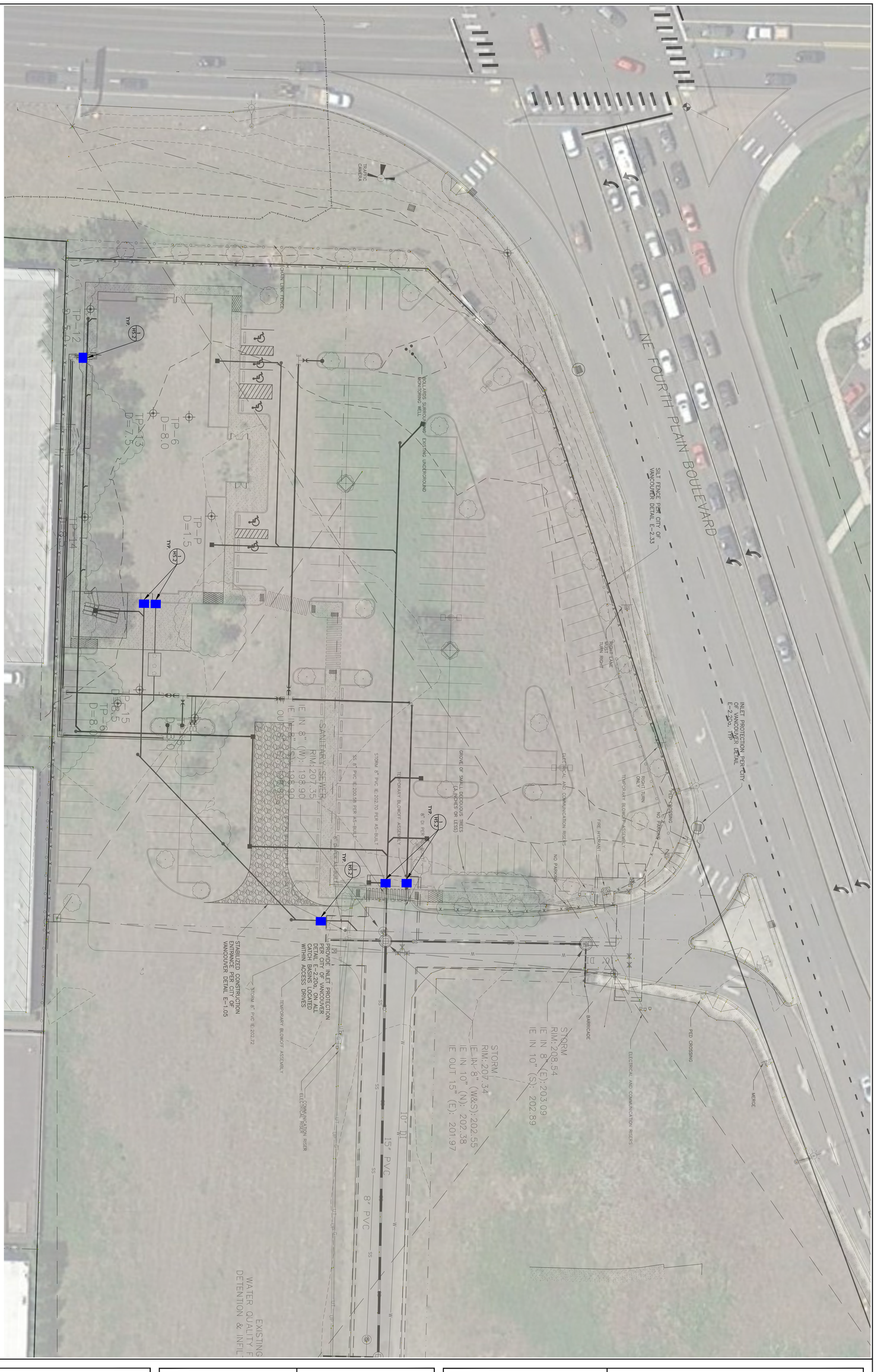

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NOTES:
1. AERIAL PHOTOGRAPH DATED JULY 23, 2016 OBTAINED FROM GOOGLE EARTH PRO.
2. SITE PLAN BASED ON DRAWING PROVIDED BY PACE ENGINEERS, INC. AUGUST 10, 2016.
3. SEE WORK ACTIVITY DETAILS AS SHOWN ON CIVIL DRAWINGS PREPARED BY PACE ENGINEERS, INC.

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DRAWN BY:	GDI CAD	APPROVED BY:	

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ORCHARD-1-01	**SITE PLAN - TRENCH DAMS**	
JUNE 2019	PROPOSED DEV. - FORMER TURNBULL LANDFILL VANCOUVER, WA	**H1.1**

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DRAWN BY: CDI CAD	APPROVED BY:

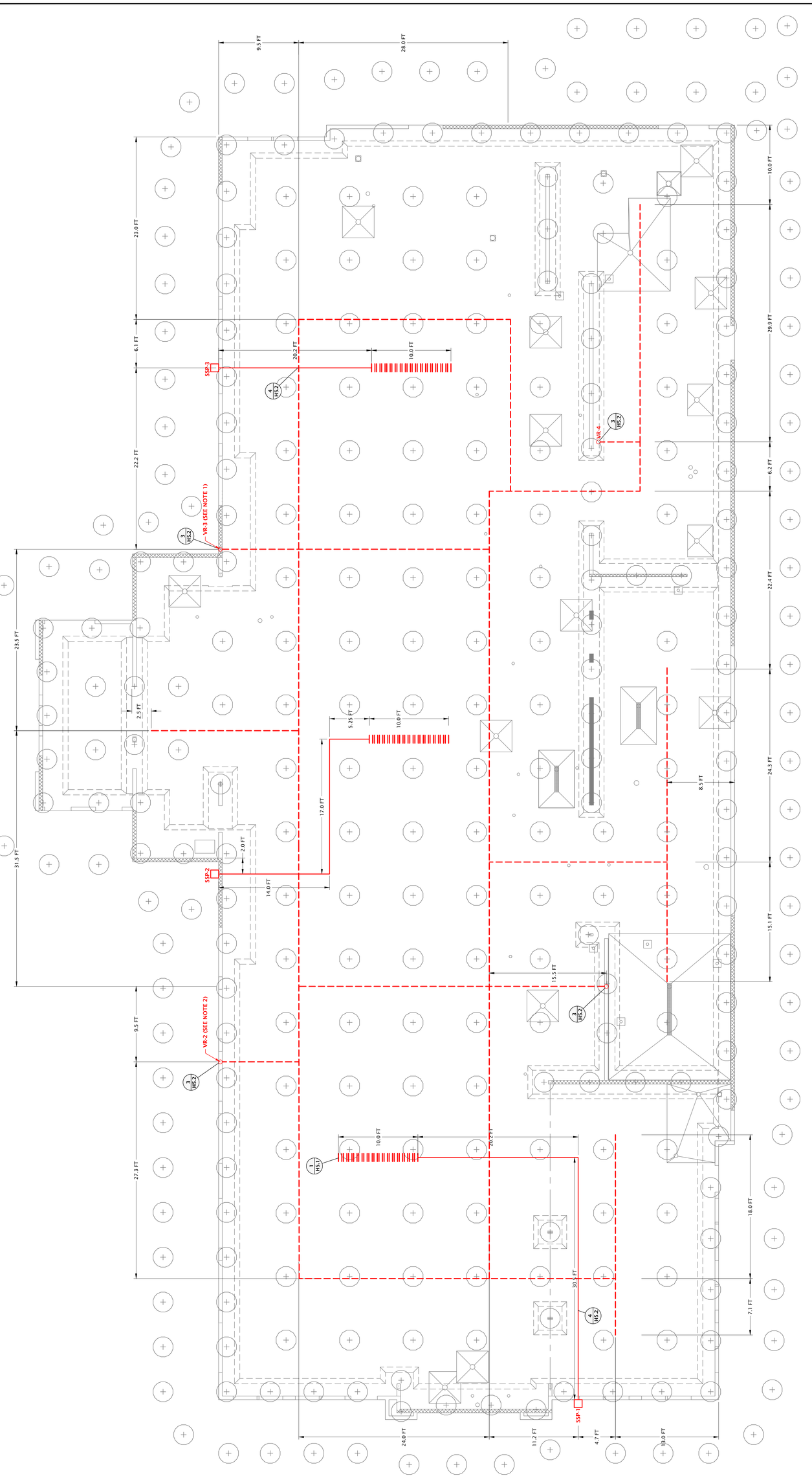
ORCHARD-1-01

METHANE MITIGATION SYSTEM - LOW-PERMEABLE MEMBRANE AND GRAVEL BLANKET

JUNE 2019

PROPOSED DEV. - FORMER TURNBULL LANDFILL
VANCOUVER, WA

H2.1



SITE PLAN BASED ON DRAWING PROVIDED BY LMHT ASSOCIATES, AUGUST 2, 2016

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LEGEND:

- SSP-1 — SUB-SLAB METHANE MONITORING PROBE
- SUB-SLAB VENT PIPE
- VR-1 — VENT RISER
- GEOPIER
- 1 / VES.1 — DETAIL NUMBER OR SECTION LETTER / REFERENCE NUMBER OF DRAWING WHERE DETAIL IS SHOWN/TAKEN

NOTES:

1. VR-3 WAS CONSOLIDATED WITH VR-4 PRIOR TO PENETRATING THE ROOF.
2. VR-2 PENETRATES THE ROOF ADJACENT TO VR-1.

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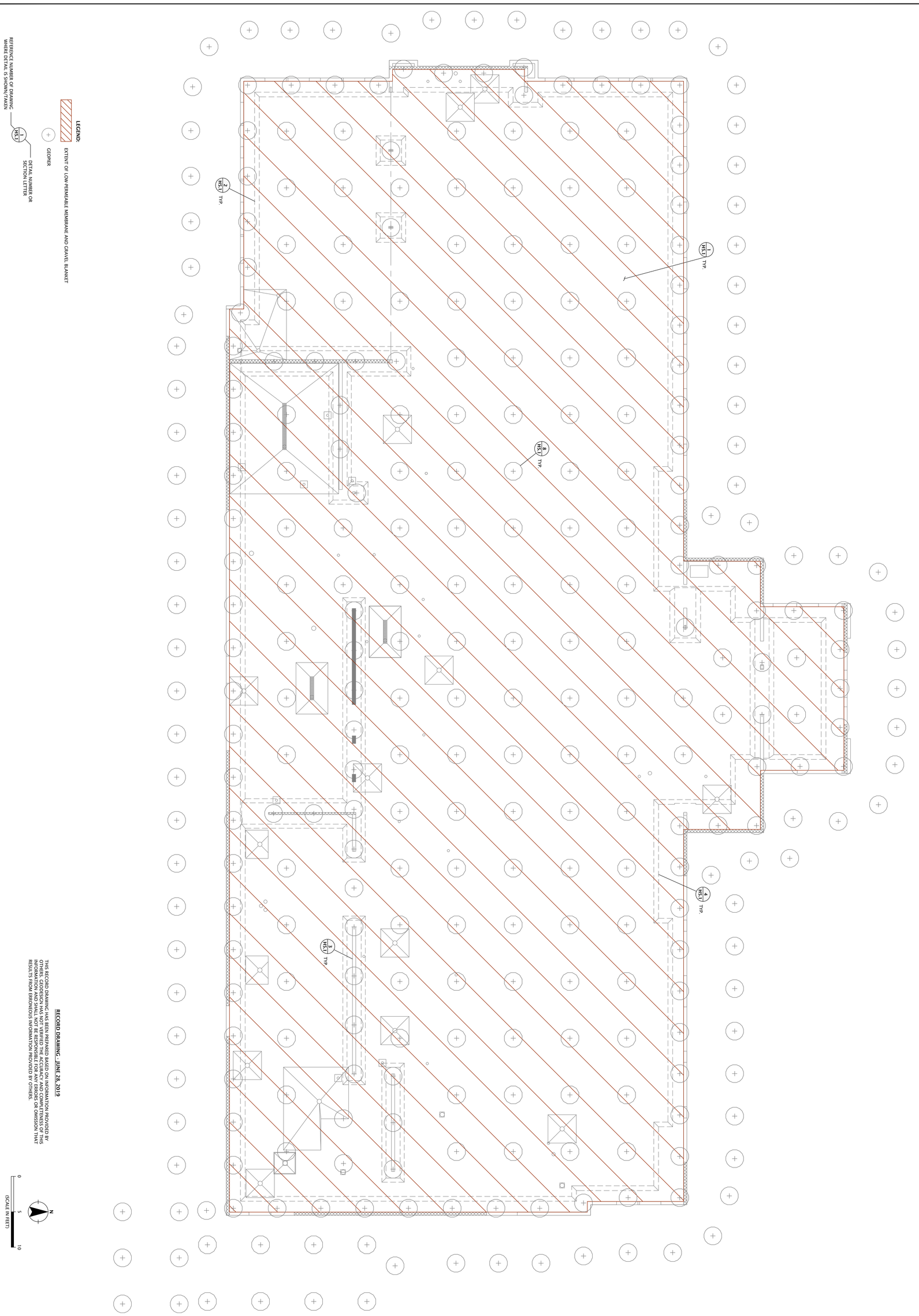

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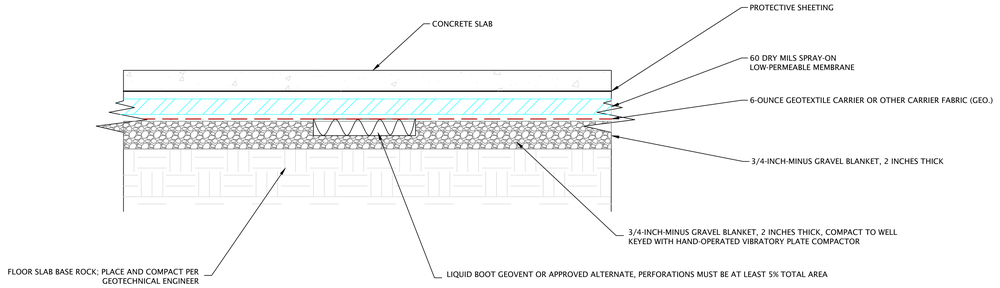
DESIGNED BY:	GDI ENG	CHECKED BY:	
DRAWN BY:	GDI CAD	APPROVED BY:	

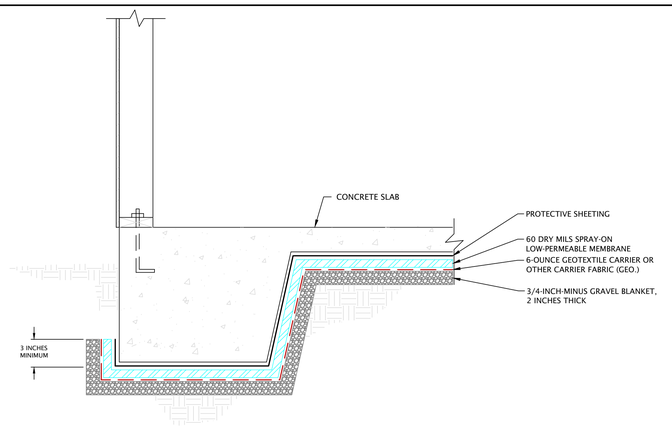
NO.	DATE	REVISION DESCRIPTION	BY	APPR.

ORCHARD-1-01	**METHANE MITIGATION SYSTEM - VENT PIPING**	
JUNE 2019	PROPOSED DEV. - FORMER TURNBULL LANDFILL VANCOUVER, WA	**H2.2**

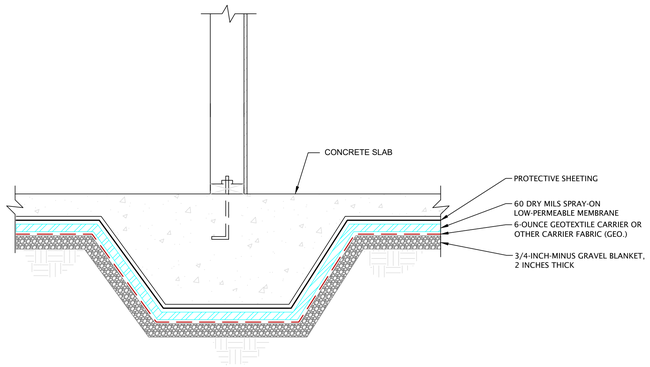


NOTE:
FLEXIBLE MEMBRANE SHALL COMPLETELY COVER FLOOR SLAB BASE ROCK WITHIN BUILDING FOOTPRINT. ATTACH TO FOOTINGS ACCORDING TO MANUFACTURER'S SPECIFICATIONS.

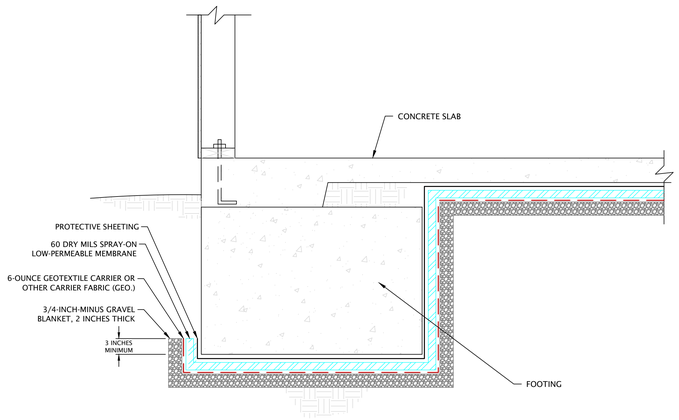
1 H5.1 **TYPICAL LOW-PERMEABLE MEMBRANE AND VENT PIPE DETAIL**



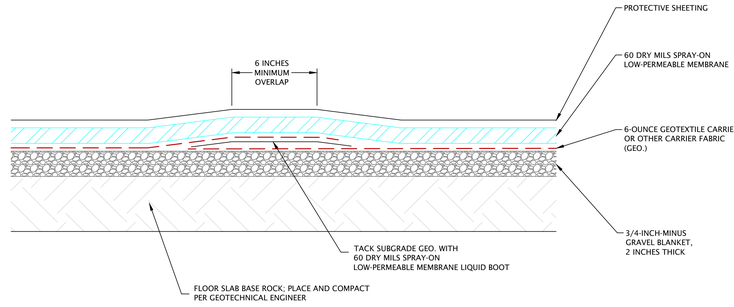
2 H5.1 **TYPICAL SPRAY-ON LOW-PERMEABLE MEMBRANE AT PERIMETER FOOTING**



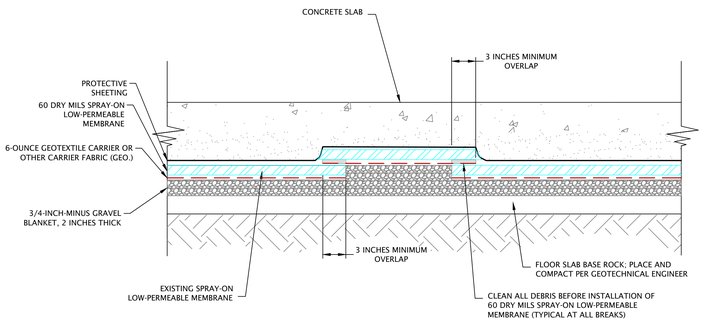
3 H5.1 **TYPICAL SPRAY-ON LOW-PERMEABLE MEMBRANE AT INTERIOR FOOTING/THICKENED SLAB**



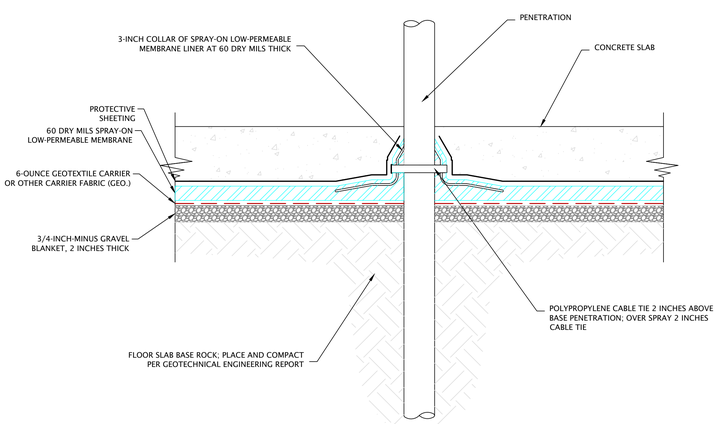
4 H5.1 **TYPICAL SPRAY-ON LOW-PERMEABLE MEMBRANE, FOOTING AT SHEAR WALL**



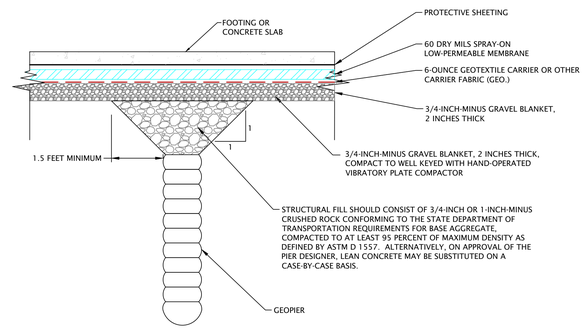
5 H5.1 **SPRAY-ON LOW-PERMEABLE MEMBRANE LAP JOINTS**



6 H5.1 **TYPICAL PATCH DETAIL**



7 H5.1 **TYPICAL SPRAY-ON LOW-PERMEABLE MEMBRANE PENETRATION DETAIL**



8 H5.1 **TYPICAL SPRAY-ON LOW-PERMEABLE MEMBRANE OVER GEOPIER**

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DETAILS

H5.1

PROPOSED DEV. - FORMER TURNBULL LANDFILL
VANCOUVER, WA

ORCHARD-1-01

JUNE 2019

CHECKED BY:
APPROVED BY:

NO.	DATE	REVISION DESCRIPTION	BY	APPR.

DESIGNED BY: GDI ENG
DRAWN BY: GDI CAD

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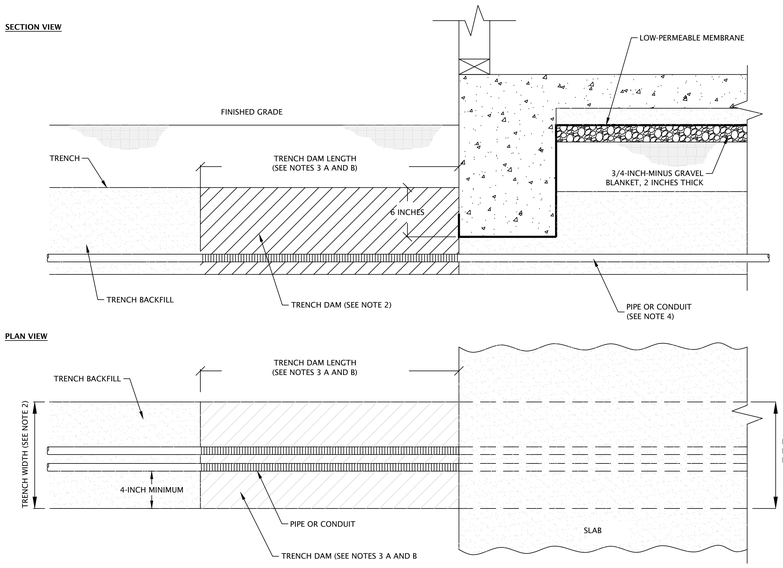
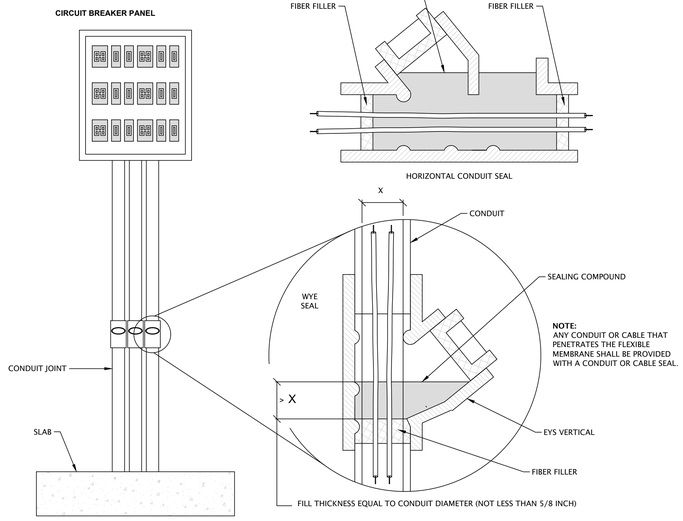


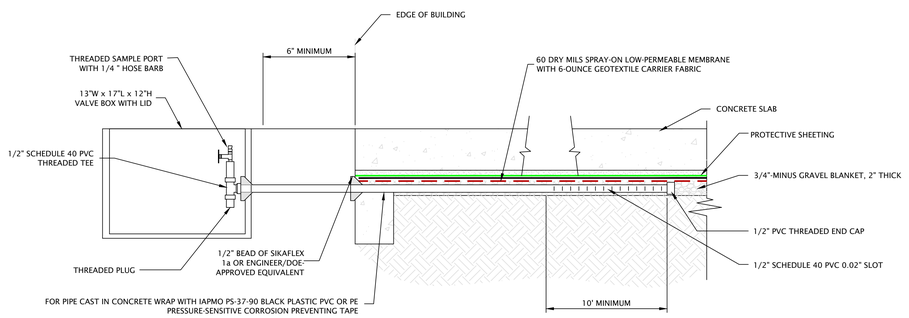
NOTES: TRENCH DAMS

1. ALL TRENCH DAMS SHALL BE INSTALLED IN TRENCHES CONTAINING PIPING AND CONDUIT THAT CONNECTS DIRECTLY FROM THE UTILITY LINES IN THE STREET.
2. THE WIDTH OF A TRENCH DAM SHALL BE ONE-HALF THE LENGTH.
3. TRENCH DAMS SHALL BE CONSTRUCTED OF ONE OF THE FOLLOWING:
   A. BENTONITE CEMENT SLURRY 3 FEET LONG: A MIXTURE OF 4% TYPE II CEMENT AND 2% POWDERED BENTONITE.
   B. CONCRETE MIXES OTHER THAN BENTONITE CEMENT SLURRY MAY BE USED PROVIDED CONDUIT OR PIPING IS WRAPPED WITH HIGH DENSITY PVC FOAM TAPE, CLOSED CELLS, ADHESIVE BACKED, 1/4-INCH THICK BY 1/2-INCH WIDE SHALL BE APPLIED TO CLEAR SURFACE WITH ENDS BUTTED TOGETHER AT MOST VISIBLE LOCATIONS IN TRENCH DAM.
4. PIPING AND CONDUIT SHALL BE PROTECTED FROM CORROSION AND STRUCTURAL SETTLEMENT AS FOLLOWS:
   A. TAPE SHALL BE APPLIED ON CONDUIT AND PIPING ENCASED IN CEMENT SLURRY OR CONCRETE.
   B. TAPE SHALL BE PS-37-90, BLACK PLASTIC PVC OR PE PRESSURE-SENSITIVE CORROSION PREVENTIVE TAPE.

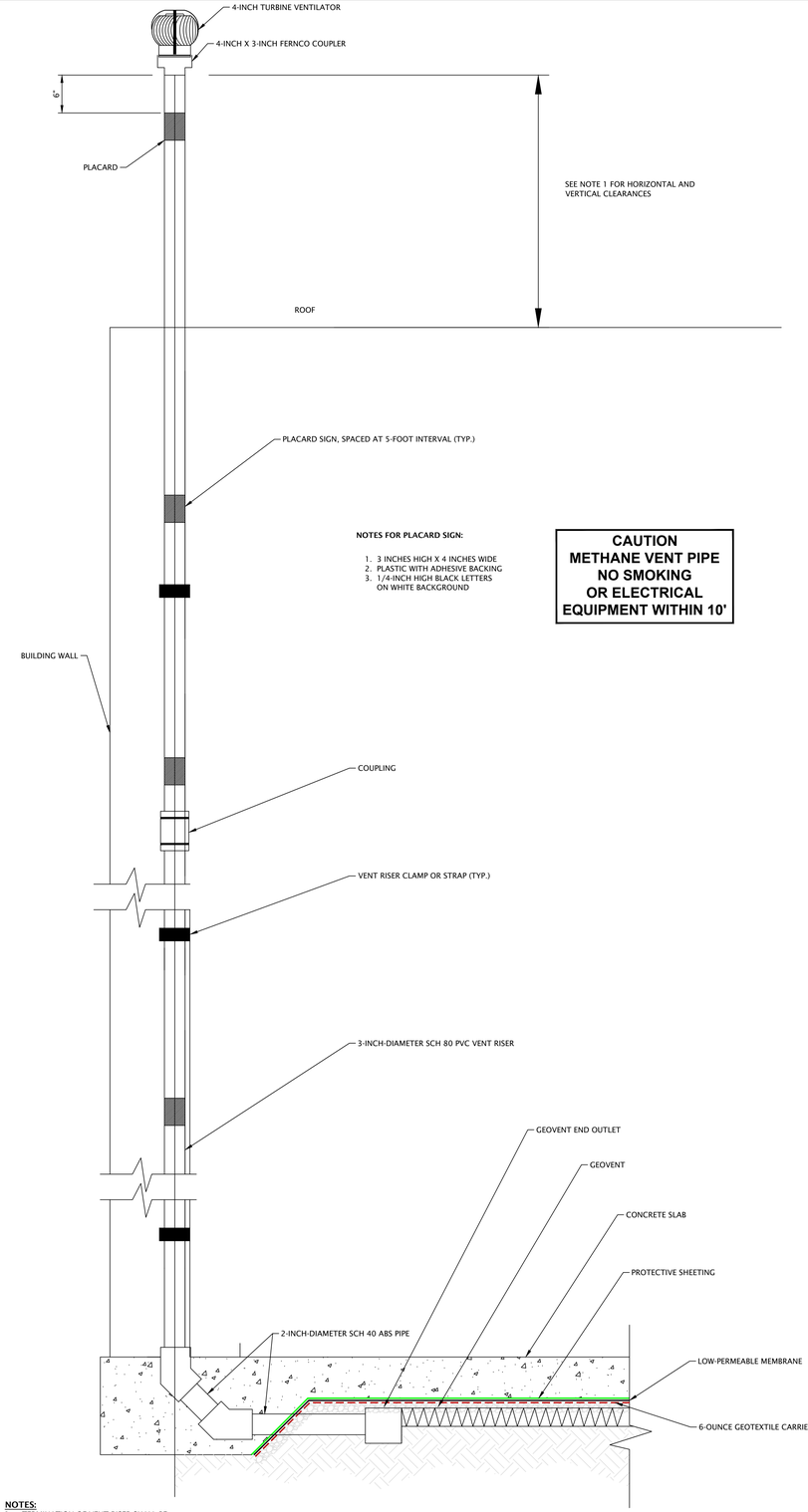
1 / H5.2 **UTILITY TRENCH DAM**



2 / H5.2 **CONDUIT SEAL**



4 / H5.2 **TYPICAL SUB-SLAB MONITORING PROBES**



NOTES FOR PLACARD SIGN:

1. 3 INCHES HIGH X 4 INCHES WIDE
2. PLASTIC WITH ADHESIVE BACKING
3. 1/4-INCH HIGH BLACK LETTERS ON WHITE BACKGROUND

CAUTION
METHANE VENT PIPE
NO SMOKING
OR ELECTRICAL
EQUIPMENT WITHIN 10'

NOTES:

1. TERMINATION OF VENT RISER SHALL BE:
   A. 10-FOOT MINIMUM ABOVE GRADE;
   B. 10-FOOT MINIMUM AWAY FROM ANY WINDOW, DOOR, DOOR HATCH, OPENING, OR AIR INTAKE INTO THE BUILDING;
   C. 3-FOOT MINIMUM ABOVE HIGHEST POINT OF ROOF WITHIN A 10-FOOT RADIUS OF OUTLET;
   D. 4-FOOT MINIMUM AWAY FROM PROPERTY LINE.
   E. 5-FOOT MINIMUM AWAY FROM ELECTRICAL DEVICES; AND
   F. 3-FOOT AWAY FROM ANY PARAPET.
2. WRAP AND PROTECT ALL PIPING THROUGH CONCRETE SLAB OR FLOOR.
3. SUPPORT ALL PIPING ACCORDING TO APPLICABLE CODES.
4. CONTRACTOR SHALL VERIFY EXACT TYPE OF CONSTRUCTION AT EACH VENT RISER CALLED OUT ON THE PLANS. RISER MUST AVOID WINDOWS AND MUST NOT BE INSTALLED WHERE STRUCTURAL MEMBERS PROHIBIT.

3 / H5.2 **VERTICAL VENT RISER**

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DETAILS — H5.2

PROPOSED DEV. - FORMER TURNBULL LANDFILL
VANCOUVER, WA

ORCHARD-1-01

JUNE 2019

DESIGNED BY: GDI ENG	CHECKED BY:
DRAWN BY: GDI CAD	APPROVED BY:

NO.	DATE	REVISION DESCRIPTION	BY	APPR.

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SPECIFICATIONS

SUB-SLAB VENTING AND
SPRAY-ON FLEXIBLE MEMBRANE/LINER

Signed 01/27/2017

Prepared for:

Orchard Crossings, LLC
Proposed Development - Former Turnbull Landfill
Southeast of SR 500 and NE Fourth Plain Boulevard
Vancouver, Washington

Prepared: January 2017

GeoDesign Project: Orchard-1-01

SECTION 1
SUB-SLAB VENTING SYSTEM INSTALLATION

PART 1 – GENERAL

1.01 DESCRIPTION

A. Work shall consist of furnishing and installing a sub-slab venting system as described herein and as shown on the Drawings.

B. Work in this section – principal items include:
   1. Installation of sub-slab venting Liquid Boot® GeoVent or approved equivalent
   2. Installation of 3-inch-diameter, Schedule 80 polyvinyl chloride (PVC) riser pipe

1.02 DEFINITIONS

A. Quality Assurance (QA) Observer – Party, independent from MANUFACTURER and INSTALLER, that is responsible for observing and documenting activities related to QA during the installation of the spray-on flexible membrane and sub-slab venting system. GeoDesign, Inc. shall provide QA observation services.

B. ENGINEER – The individual or firm responsible for the design and preparation of the project's Contract Drawings and Specifications. GeoDesign, Inc. is the responsible ENGINEER for this sub-slab venting and membrane project.

C. CONTRACTOR – The individual or firm responsible for contracting and overseeing the services provided by the installer and other subcontractors for the duration of construction at the site.

D. SUBGRADE – Surface that immediately underlies the base rock material (per geotechnical report) and spray-on flexible membrane system.

E. DOE – Washington Department of Ecology.

1.03 QUALITY ASSURANCE

A. Construction Quality Assurance (CQA) observation will be conducted by the QA Observer during the installation of the sub-slab venting system. The QA Observer should verify the dimensions and location of the vent piping, observe the covering or backfilling of the vent piping, and observe vent riser pipes prior to the pipes being covered within exterior or interior walls.

1.04 JOB CONDITIONS

A. The sub-slab vent piping shall only be installed on approved subgrade. The sub-slab vent piping shall not be installed if ponding water is present.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Vent Pipe – Liquid Boot® GeoVent pipe, or DOE/ENGINEER-approved equivalent. Connection pipe through concrete masonry unit walls are to be 3-inch-diameter Schedule 80 PVC or Geovent® sleeve.

B. BASE ROCK – shall meet the specifications in the geotechnical engineering report.

C. RISER PIPE – 3-inch-diameter Schedule 80 PVC.

D PIPE CONNECTORS – Universal Plumbing Code (UPC) approved.

E. GEOTEXTILE CARRIER FABRIC – BASEFABRIC™ T-60 non-woven geotextile shall be used, unless otherwise specified and approved by the Engineer.

PART 3 – EXECUTION

3.01 INSTALLATION

A. CONTRACTOR shall notify ENGINEER a minimum of one week prior to starting construction of sub-slab venting system and spray-on flexible membrane.

B. Base rock shall be placed per the geotechnical engineering report recommendations on a compacted subgrade. The subgrade shall be free of ponding water.

C. Roll out GeoVent pipe or approved equivalent as indicated on the Drawings. Sub-slab vent piping installation must be observed by the QA Observer prior to covering.

D. Install approved connectors where required. All connections shall be in accordance with the Manufacturer's instructions. No improvised joining methods are allowed.

E. CONTRACTOR shall exercise all due caution throughout the duration of construction to protect the vent pipe from damage or displacement. If displaced or damaged, it shall be restored to its original location and/or condition. Repaired or restored sub-slab vent piping shall be observed and documented as such by the QA Observer.

3.02 FIELD QUALITY CONTROL

A. The QA Observer must verify the dimensions and approximate location of the sub-slab vent piping before the pipe(s) are covered. Prior to covering the pipe(s), the QA Observer must also verify that ponding water is not present.

B. The QA Observer must document that the sub-slab vent piping is:
   1. placed as shown on the Drawings.
   2. connected at intersections, sleeves, and/or terminations using manufacturer-approved connectors or methods; fully engaged in the connectors; and is not glued at snap-on fittings.
   3. free of taping or other improvised joining methods.
   4. capped at dead-end lines.
   5. free of defects and not damaged.

C. The QA Observer must observe and document the vent riser pipe(s) prior to covering the vent riser pipe(s) with exterior or interior walls. The QA Observer shall observe and document that the vent riser pipe(s) are connected with UPC-approved connectors and methods.

LIQUID BOOT® or EQUIVALENT
SPRAY-ON FLEIXIBLE MEMBRANE/LINER

PART 1 – GENERAL

1.01 DESCRIPTION

General and Supplementary Conditions and Division 1 – General Requirements applies to this section. Provide spray-on flexible membrane as indicated, specified, and required.

A. Work in this section – principal items include:
   1. Spray-on flexible membrane providing protection from methane under site structures.

B. Related work not in this section:
   1. Excavation and backfilling
   2. Parge coat on masonry to receive spray-on flexible membrane
   3. Mortar beds or concrete toppings over spray-on flexible membrane
   4. Latex waterproofing
   5. Damp-proofing
   6. Flashing and sheet metal
   7. Joint sealers
   8. Soil sterilant
   9. Sub-slab venting system
   10. Drainage

1.02 DEFINITIONS

A. QA Observer – Party, independent from MANUFACTURER and INSTALLER that is responsible for observing and documenting activities related to QA during the installation of the spray-on flexible membrane and ventilation system. GeoDesign, Inc. shall provide QA observation services.

B. ENGINEER – The individual or firm responsible for the design and preparation of the project's Contract Drawings and Specifications. GeoDesign, Inc. is the responsible ENGINEER for this project.

C. MANUFACTURER – The manufacturer of the spray-on flexible membrane material. The material specified for this project is LIQUID BOOT® by Remediation Technologies (CETCO) or a DOE/ENGINEER-approved equivalent.

D. CONTRACTOR – The individual or firm responsible for contracting and overseeing the services provided by the INSTALLER and other subcontractors for the duration of construction at the site.

E. INSTALLER – Party responsible for field handling, transporting, storing, applying, and testing of the spray-on flexible membrane.

F. SUBGRADE – Surface that immediately underlies the base rock material (per geotechnical report) and spray-on flexible membrane system.

1.03 QUALITY ASSURANCE

A. QA observation will be conducted by the QA Observer during the installation of the spray-on flexible membrane. Spray-on flexible membrane INSTALLER shall be trained and approved by spray-on flexible membrane MANUFACTURER. For other vapor barrier materials, equivalent quality control is required.

B. A pre-installation meeting shall be held prior to application of spray-on flexible membrane to assure proper substrate and installation conditions. At a minimum, the CONTRACTOR, INSTALLER, and QA Observer shall be present at the meeting.

C. QA Observer shall observe subgrade prior to installing the spray-on flexible membrane.

D. QA Observer shall observe the condition of the spray-on flexible membrane prior to placement of the approved protective sheeting, on top of the spray-on flexible membrane (see Section 3.04.30).

1.04 SUBMITTALS

A. Product Data – Submit MANUFACTURER'S product data and installation instructions for specific application.

B. Samples – Submit representative samples of the following materials for approval by ENGINEER:

1. Spray-on flexible membrane material
2. Geotextile Carrier Fabric
3. Base rock – sieve analysis results for gravel (per geotechnical engineering report)

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in original unbroken packages bearing MANUFACTURER'S label showing brand, weight, volume, and batch number. Materials shall be stored at the site in strict compliance with the MANUFACTURER'S instructions.

1.06 JOB CONDITIONS

A. Protect all adjacent areas not to receive spray-on flexible membrane. Where necessary, apply masking to prevent staining of surfaces to remain exposed wherever the spray-on flexible membrane abuts to other finish surfaces.

B. Perform work only when existing and forecasted weather conditions are within MANUFACTURER'S recommendations for the material and product used.

C. Minimum clearances required for application of product:
- 90-degree spray wand – 2 feet
- Conventional spray wand – 4 feet

D. Ambient temperature shall be within MANUFACTURER'S specifications.

E. All plumbing, electrical, mechanical, and structural items underneath or passing through the spray-on flexible membrane shall be positively secured in their proper positions and appropriately protected prior to membrane application.

F. Spray-on flexible membrane shall be installed before placement of reinforcing steel. When not possible, all exposed reinforcing steel shall be masked prior to membrane application.

G. Expansion joints shall be filled with a conventional waterproof expansion joint material as specified by Architect or Structural Engineer.

H. Surface preparation shall be per MANUFACTURER'S specification.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Fluid applied spray-on flexible membrane – LIQUID BOOT® (manufactured CETCO of Santa Ana, CA, (714) 384-0111) or equivalent as approved by ENGINEER. The membrane shall be water-borne and spray-applied at ambient temperatures as specified herein. The applied membrane shall be a minimum thickness of 60 dry mils.

B. Protection – On horizontal surfaces, installation of geotextile carrier fabric and protective sheeting as specified. On vertical surfaces, no protection is required, provided the surface is formed and poured in a timely manner.

C. Geotextile Carrier Fabric – BASEFABRIC™ T-60 non-woven geotextile carrier fabric shall be used, unless otherwise specified and approved by MANUFACTURER and ENGINEER. The heat-rolled side shall be used as the application surface and placed face up.

D. Cold joints, cracks, form tie holes – Shall be covered with Hardcast CRT 1602 Tape 3 inches wide.

E. Spray-on flexible membrane protection: LIQUID BOOT® Ultrashield P-150 or approved protective layer on horizontal surfaces; LIQUID BOOT® Ultrashield P-150 or approved protective layer on vertical surfaces.

PART 3 – EXECUTION

3.01 EXAMINATION

All surfaces to receive spray-on flexible membrane shall be inspected and approved by the INSTALLER and observed and documented by the QA Observer at least 1 day prior to commencing work.

3.02 SURFACE PREPARATION

Provide 24-inch minimum clearance out from surfaces to receive the spray-on flexible membrane. The application surface shall be prepared and provided to the INSTALLER in accordance with MANUFACTURER'S specifications listed below.

A. Concrete/Shotcrete/Masonry

If applicable, where the membrane is applied to concrete/shotcrete/masonry surfaces, the surfaces shall be light broom-finished or smoother and free of any dirt, debris, loose material, release agents, or curing compounds. Fill all voids more than ¼-inch deep and ¼-inch wide. Voids shall be filled with a trowelable quickset mortar or other suitable material as approved by the MANUFACTURER and ENGINEER. Masonry joints, cold joints, and form joints shall be struck smooth.

All cracks or cold joints greater than ¼-inch shall be completely grouted with non-shrink grout as approved by ENGINEER.

Install Hardcast reinforcing tape over all cold joints, cracks, and form tie holes (after holes and cracks are grouted).

B. Subgrade, Gravel, Geotextile

The subgrade shall be moisture conditioned and compacted in accordance with the geotechnical engineering report. Natural soil shall be free of loose or otherwise unsuitable materials. The finished surface shall be smooth, uniform, and free of debris and standing water. Remove all stones or dirt clods greater than ½ inch.

The geotextile shall be placed over the compacted base rock (per the geotechnical report) in accordance with the MANUFACTURER'S specifications.

Trenches shall be cut oversize to accommodate spray-on flexible membrane and protection course with perpendicular to sloped sides and maximum obtainable compaction. Adjoining grade shall be finish graded and compacted. Excavated walls shall be vertical or sloped back and free of roots and protruding rocks.

All penetrations shall be prepared in accordance with MANUFACTURER'S specifications. All form stakes that penetrate the membrane shall be of rebar, which shall be bent over and left in the slab.

3.03 INSTALLATION

3.03.10 INSTALLATION OF SPRAY-ON FLEXIBLE MEMBRANE ON CONCRETE/SHOTCRETE/MASONRY (if necessary)

A. Refer to Section 3.03.30 "Sealing Around Penetrations" for procedures to seal around penetrations.

B. Provide a ¾-inch minimum cant of LIQUID BOOT®, or other suitable material as approved by MANUFACTURER, at all horizontal to vertical transitions and other inside corners of 120 degrees or less. **Allow to cure overnight before the application of LIQUID BOOT® or equivalent.**

C. Spray-apply LIQUID BOOT® or equivalent to a 60-mil minimum dry thickness. Increase thickness to 120 dry mils if shotcrete is to be applied directly to membrane. If a second coat is required, remove any standing water from the membrane before proceeding with the second application.

D. Do not penetrate membrane. Keep membrane free of dirt and debris and traffic until a protective cover is in place. **It is the responsibility of the CONTRACTOR to ensure that the membrane and the protection system are not penetrated.**

E. After membrane has cured and is checked for proper thickness and/or other flaws by the QA Observer, install protection material. The approved protective sheeting layer shall be spread across the entire membrane. The protective sheeting shall not be placed with equipment that may cause damage to the membrane.

NOTE: All tests or inspections shall be performed prior to placing protection course.

NON-HORIZONTAL SURFACES: Spray on non-horizontal surfaces shall begin at the bottom and work towards the top. This method allows the product to adhere to the surface before hitting catalyst runoff.

NOTE: Due to the nature of concrete as a substrate, it is normal for some blistering to occur. This is caused by either the concrete's tendency to off-gas or water that is temporarily trapped between the concrete and the membrane. With time and the applied pressure of backfill or over-slab, blisters will absorb into the concrete without detriment to the membrane.

As determined by the ENGINEER a small number of blister heads shall be sampled and checked for proper membrane thickness. If the samples have the minimum required membrane thickness, then the remaining blisters should not be punctured or cut. If the samples have less than the minimum required membrane thickness, then the area can either be re-sprayed to obtain the proper thickness or the blisters shall be cut out and the area re-sprayed or patched with LIQUID BOOT® Trowel Grade.

3.03.20 INSTALLATION ON GEOTEXTILE CARRIER FABRIC AND SPRAY-ON FLEXIBLE MEMBRANE ON GRAVEL SUBGRADE

A. Line trenches with geotextile carrier fabric extending at least 6 inches onto adjoining subgrade if slab and footings are to be sprayed separately. Overlap seams a minimum of 6 inches. Lay geotextile carrier fabric tight at all inside corners. Apply a thin (10-mil) tack coat of LIQUID BOOT® "A" side or equivalent without catalyst within the seam overlap.

B. Roll out geotextile carrier fabric on subgrade with the heat-rolled side facing up. Overlap seems a minimum of 6 inches. Lay geotextile carrier fabric tight at all inside corners. Apply a thin (10-mil) tack coat of LIQUID BOOT® "A" side or equivalent without catalyst within the seam overlap.

C. Minimize the use of nails to secure the geotextile carrier fabric to the subgrade. Remove all nails before spraying membrane, if possible. Nails that cannot be removed from the subgrade are to be patched with geotextile carrier fabric or Hardcast reinforcing tape overlapping the nail head by a minimum of 2 inches. Apply a thin tack coat of LIQUID BOOT® or equivalent under the geotextile patch when patching with geotextile carrier fabric.

D. Refer to Section 3.03.30 "Sealing Around Penetrations" for procedures to seal around penetrations.

E. Spray-apply LIQUID BOOT® or equivalent onto geotextile to a 60-mil minimum dry thickness. Increase thickness to 120 dry mils if shotcrete is to be applied directly to membrane. If a second coat is required, remove any standing water from the membrane before proceeding with the second application.

F. Do not penetrate membrane. Keep membrane free of dirt, debris, and traffic until a protective cover is in place.

G. After membrane has cured and checked for proper thickness and flaws by the QA Observer, install approved protective barrier across the entire membrane. The protective barrier shall not be placed with equipment that may cause damage to the membrane.

NOTE: All tests or inspections shall be performed prior to placing protection course.

3.03.30 SEALING AROUND PENETRATIONS

A. Clean all penetrations. All metal penetrations shall be sanded clean with emery cloth.

B. For applications requiring geotextile carrier fabric, roll out geotextile carrier fabric on subgrade with the heat-rolled side facing up, overlapping seams a minimum of 6 inches. Cut the geotextile carrier fabric around penetrations so that it lays flat on the subgrade. Lay geotextile carrier fabric tight at all inside corners. Apply a thin (10-mil) tack coat of LIQUID BOOT® "A" side or equivalent without catalyst within the seam overlap.

C. Spray-apply LIQUID BOOT® or equivalent to surrounding areas as specified for the particular application to a 60-mil minimum dry thickness. At the base of penetration install a minimum ¾-inch-thick membrane cant of LIQUID BOOT® or other suitable material as approved by manufacturer. Extend the membrane at a 60-mil thickness up the penetration a minimum of 3 inches. **Allow to cure overnight before proceeding to step D.**

D. Spray-apply LIQUID BOOT® or equivalent to the membrane at a 60-mil thickness three inches around the base of the penetration and up the penetration, completely encapsulating the collar assembly, to a height of 1 ½ inches minimum above the membrane as described in Section 3.03.30 C.

E. Allow LIQUID BOOT® or equivalent to cure completely before proceeding to step "F."

F. Wrap penetration with polypropylene cable tie at a point 2 inches above the base of the penetration. Tighten the cable tie firmly so as to squeeze, but not cut, the cured membrane collar.

3.04 FIELD QUALITY CONTROL

A. **INSTALLER should check their own work for coverage, thickness, and all around good workmanship before calling for inspections.** Areas suspected of being too thin to the touch should be measured with gauges to determine the exact thickness.

B. The membrane must be cured at least overnight before inspecting for dry thickness, holes, shadow shrinkage, and any other membrane damage. If water testing is to be performed, allow the membrane to cure at least 72 hours prior to the water test.

C. The membrane should meet specifications based on the observations of the QA Observer.

3.04.10 ON CONCRETE/SHOTCRETE/MASONRY AND OTHER HARD SURFACES

A. Membrane shall be checked for proper thickness with a blunt-nose depth gauge, taking one reading every 500 square feet. Record the readings. Mark the test area for repair, if necessary.

B. If necessary, test areas are to be patched over with LIQUID BOOT® or equivalent to a 60-mil minimum dry thickness, extending a minimum of 3 inches beyond the test perimeter.

C. Membrane thickness at repaired areas shall be checked for proper thickness with a blunt-nose depth gauge. If area does not meet the minimum thickness requirements, the areas shall be repaired in accordance with Section 3.04.10.B.

3.04.20 ON DIRECT AND OTHER SOFT SUBSTRATES

A. Destructive testing shall be performed as specified by the ENGINEER. Samples shall be cut from the membrane and geotextile sandwich to maximum area of 2 square inches. Measure the thickness with a mil-reading caliper at a minimum frequency of one reading per 500 square feet but no greater than one reading per 2,500 square feet. Deduct the plain geotextile carrier fabric thickness to determine the thickness of LIQUID BOOT® or equivalent membrane. Mark the test area for repair.

B. Voids left by sampling shall be patched with geotextile carrier fabric overlapping the void by a minimum of 2 inches. Apply a thin tack coat of LIQUID BOOT® under the geotextile patch, then spray or trowel-apply LIQUID BOOT® to a 60-mil minimum dry thickness, extending at least 3 inches beyond geotextile patch.

C. Membrane thickness at repaired areas shall be checked for proper thickness using a non-destructive tactile test. Additional cut samples may be collected at the discretion of the QA Observer. If area does not meet the minimum thickness requirements, the area shall be repaired in accordance with 3.04.20.B.

3.04.30 SMOKE TESTING FOR HOLES

A. All spray applied membranes shall be smoke tested in accordance with the following protocol:

1. The membrane shall be visually observed. Any apparent deficiencies and/or installation problems shall be corrected prior to smoke testing.
2. Smoke testing of the LIQUID BOOT® membrane to be conducted by Approved LIQUID BOOT® INSTALLER and observed by QA Observer.
3. The date, time, testing reference area, temperature, wind speed/direction, and cloud cover shall be recorded on the Smoke Testing Record. The ambient air temperature at the time of testing should be greater than 45 degrees F and the wind speed at ground level should be less than or equal to 15 miles per hour. (Note: visual identification of leaks becomes more difficult with increasing wind speed.)
4. Delineate a smoke testing area of 2,000 to 5,000 square feet (maximum). Assemble and situate smoke testing system to inject smoke beneath membrane. Only inert, non-toxic smoke is to be utilized for membrane Smoke Test.
5. Designate testing control areas by cutting openings in an “X” pattern (minimum 4 inches by 4 inches) in the membrane at selected locations. Mark testing control areas for identification prior to conducting the smoke test.
6. Activate smoke generator/blower system (nominal 150 to 950 cubic feet per minute). Apply sufficient pressure as to ensure that smoke will permeate the designated testing area. For verification, ensure that smoke is leaking through testing control areas.
7. Pump smoke beneath the membrane (minimum 1 to 2 minutes). Observe for leaks in the membrane. Reduce pressure/flow rate if excessive lifting of the membrane occurs.

8. Thoroughly inspect entire membrane surface within area delineated for testing. Use marking device as approved by MANUFACTURER to mark/label any leak locations. Mark/label locations on floor plan and corresponding testing reference area.
9. Repair leak locations marked in Step 7 by spraying LIQUID BOOT® or using trowel grade LIQUID BOOT®.
10. Repeat steps 7 and 8 as necessary to confirm integrity of the membrane.
11. Once the spray-on flexible membrane has passed the smoke test inspection, the successful completion should be documented and signed off by the QA Observer.

APPENDIX B

GDI Project:	Orchard-1-01	Prepared By:	AJB
Project Name:	Former Turnbull Landfill	Date:	11/11/16
Location:	SR 500 & NE 4th Plain Intersection	Report #:	1
Arrival:	0745	Departure:	1200
Weather:	Mostly cloudy (50s)	Permit #:	
Site Visit Requested By:		Met With (on site):	Collin Watson (driller), James (helper)
Purpose:	Soil-gas probes installation		
Outstanding Issues:			

0800 Met with Collin (driller) and James (helper) with Pacific Soil & Water (PS&W) to go over site-safety tailgate procedure (STP).

0815 Collin and James unload the track-mounted AMS 9500-VTR direct-push PowerProbe and positioned the drill rig at boring location SG-8. Boring locations are shown on the attached site plan.

0845 Installed soil-gas sampling point SG-8. The sampler was driven to a depth of 60 inches. Sample recovery was 48 inches; the top 36 inches represented the soil cap material, and the bottom 12 inches represented the solid waste material. The cap material consisted of brown sand with silt and gravel (SM); moist, sand is coarse-grained. The solid waste material generally consisted of dark gray to gray and black soil with rock. PS&W moved to boring location SG-7.

0900 PS&W attempted to install soil-gas sampling point SG-7 but encountered refusal at approximately 4 feet below ground surface (BGS). The sample point location was moved approximately 5 feet to the southwest where the soil gas sampling point was successfully installed. The sampler was driven to a depth of 60 inches. Sample recovery was 48 inches; the top 18 inches represented the cap material, and the bottom 30 inches represented the solid waste material. Based on visual observations, the cap material consisted of brown sand with silt and gravel (SM); moist, sand is coarse-grained. The solid waste material generally consisted of dark gray to gray and black soil with rock. PS&W moved to boring location SG-6.

0915 Installed soil-gas sampling point SG-6. The sampler was driven to a depth of 60 inches. Sample recovery was 32 inches; the top 12 inches represented the cap material, and the bottom 20 inches represented the solid waste material. Based on visual observations, the cap material consisted of brown sand with silt and gravel (SM); moist, sand is coarse-grained. The solid waste material generally consisted of dark gray to gray and black soil with rock. PS&W moved to boring location SG-9.

0930 Installed soil-gas sampling point SG-9. The sampler was driven to a depth of 60 inches. Sample recovery was 48 inches; the top 24 inches represented the cap material, and the bottom 24 inches represented the solid waste material. Based on visual observations, the cap material consisted of brown sand with silt and gravel (SM); moist, sand is coarse-grained. The solid waste material consisted of dark gray soil with fragments of wood and plastic. PS&W moved to boring location SG-1.

0940 Installed soil-gas sampling point SG-1. The sampler was driven to a depth of 60 inches. Sample recovery was 33 inches; the top 18 inches represented the cap material, and the bottom 15 inches represented the solid waste material. Based on visual observations, the cap material consisted of brown sand with silt and gravel (SM);

moist, sand is coarse-grained. The solid waste material generally consisted of dark gray to gray and black soil with rock. PS&W moved to boring location SG-2.

0950 Installed soil-gas sampling point SG-2. The sampler was driven to a depth of 60 inches. Sample recovery was 46 inches; the top 12 inches represented the cap material, and the bottom 34 inches represented the solid waste material. Based on visual observations, the cap material consisted of brown sand with silt and gravel (SM); moist, sand is coarse-grained. The solid waste material generally consisted of dark gray to gray and black soil with rock. PS&W moved to boring location SG-3.

1030 Installed soil-gas sampling point SG-3. The sampler was driven to a depth of 60 inches. Sample recovery was 33 inches; the top 18 inches represented the cap material, and the bottom 15 inches represented the solid waste material. Based on visual observations, the cap material consisted of brown sand with silt and gravel (SM); moist, sand is coarse-grained. The solid waste material generally consisted of dark gray to gray and black soil with rock. PS&W moved to boring location SG-5.

1100 Installed soil-gas sampling point SG-5. The sampler was driven to a depth of 60 inches. Sample recovery was 39 inches; the top 22 inches represented the cap material, and the bottom 17 inches represented the solid waste material. Based on visual observations, the cap material consisted of brown sand with silt and gravel (SM); moist, sand is coarse-grained. The solid waste material generally consisted of dark gray to gray and black soil with rock. PS&W moved to boring location SG-4.

1110 Installed soil-gas sampling point SG-4. The sampler was driven to a depth of 60 inches. Sample recovery was 25 inches; 25 inches represented the cap material. Solid waste was not observed in this boring. Based on visual observations, the cap material consisted of brown sand with silt and gravel (SM); moist, sand is coarse-grained. PS&W moved to boring location SG-10.

1125 Installed soil-gas sampling point SG-10. The sampler was driven to a depth of 60 inches. Sample recovery was 40 inches; the top 26 inches represented the cap material, and the bottom 14 inches represented the solid waste material. Based on visual observations, the cap material consisted of brown sand with silt and gravel (SM); moist, sand is coarse-grained. The solid waste material generally consisted of dark gray to gray and black soil with rock. PS&W moved to boring location SG-11.

1135 Installed soil-gas sampling point SG-11. The sampler was driven to a depth of 60 inches. Sample recovery was 38 inches; the top 29 inches represented the cap material, and the bottom 9 inches represented the solid waste material. Based on visual observations, the cap material consisted of brown sand with silt and gravel (SM); moist, sand is coarse-grained. The solid waste material generally consisted of dark gray to gray and black soil with rock.

1145 Collin and James loaded up the PowerProbe, and I reviewed and signed the PS&W daily report (see attached report).

The soil-gas sampling points were installed to a depth of 5 feet, BGS with a screened interval of 4- to 5-feet, BGS. A sand pack was placed from 3.5- to 5-feet, BGS. Bentonite was poured downhole over the sand pack from approximately 3.5 feet, BGS to the ground surface. The bentonite was hydrated with water for the required seal. Each soil-gas sampling point was fitted with a valve and a barbed fitting and allowed to stabilize with the valve closed for a minimum of 24 hours.

1200 AJB off site.

Distribution:

Attachments: PS&W Daily Report

Reviewed by: MLC

This report presents opinions formed as a result of our observation of activities relating to geotechnical engineering or environmental services. We rely on the contractor to comply with the plans and specifications throughout the duration of the project irrespective of the presence of our representative. Our work does not include supervision or direction of the contractor, the contractor's employees or agents. Our firm is not responsible for site safety. This field report is a **DRAFT** representation of our field observations, testing, and preliminary recommendations. The report can only be considered final upon review of the GeoDesign project manager, as indicated by initials in the "Reviewed By" section.

Signature: MLC FOR ANDREW BISBEE

Pacific Soil & Water – Daily Report

9790 SW Pembrook St. Tigard, OR 97224 (503)995-4463 Fax (503)486-5589

Date: 11/11/2016 Friday	**Client:** GeoDesign
Project #: Orchard-1-01	**Project Mgr:** Mike Coenen
Site Address: SR 500 + Fourth Plain Vancouver	**On Site:** 8:00
	Off Site: 12:00

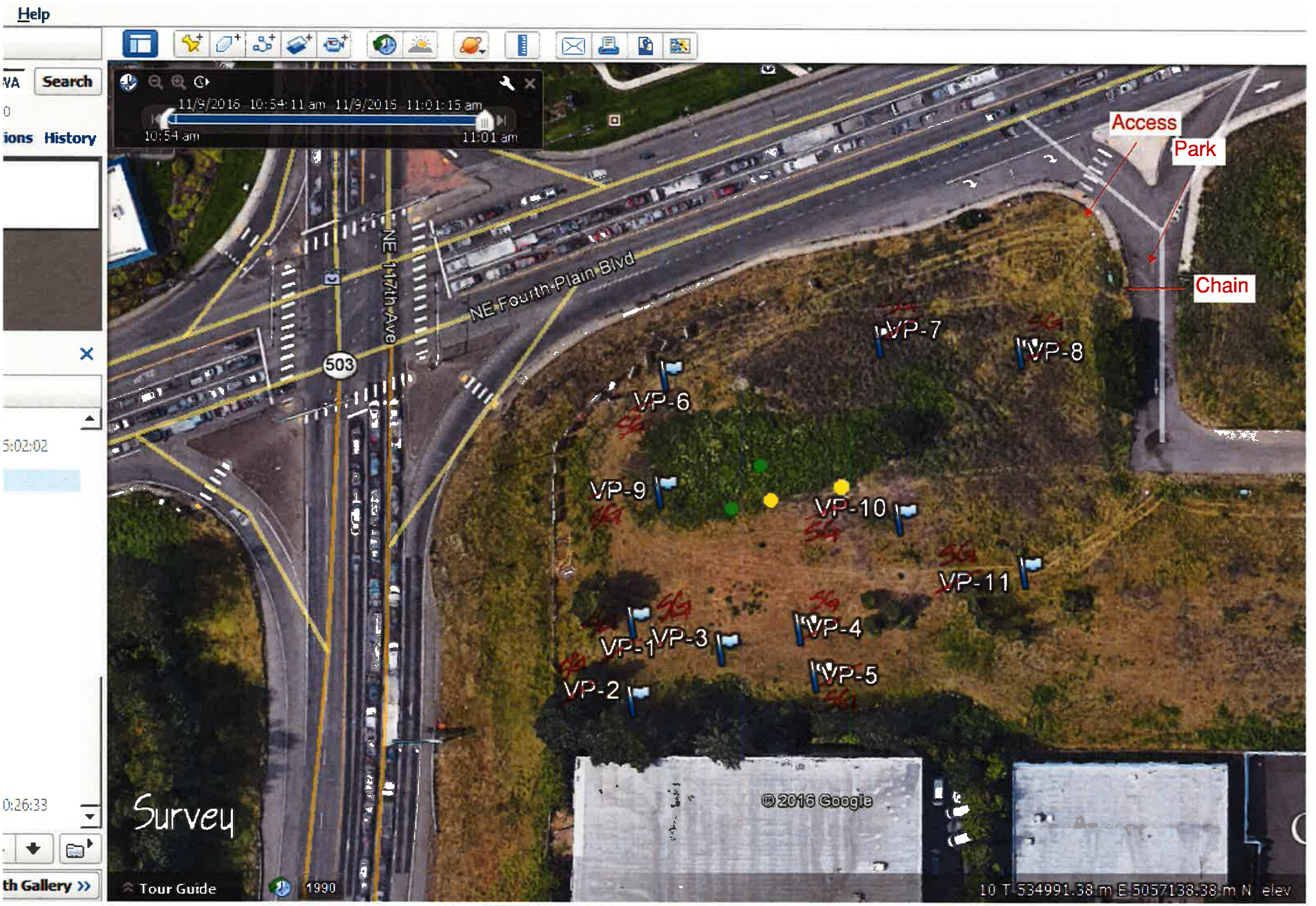
Boring/ Well ID	Total Depth	Description of Work
SG VP-8	5'	MC 0-5', install 3/4" sch 40 pvc well screen 4-5' sand to 3.5' granular to surface
SG VP-7	5'	
SG VP-6	5'	
SG VP-9	5	
SG VP-1	5'	
SG VP-2	5'	
SG VP-3	5'	
SG VP-5	5'	
SG VP-4	5'	
SG VP-10	5'	
SG VP-11	5'	

Well Materials	**3/4"**		**1"**		**2"**		**IDW Drums**	0	**Standby**		**Crew**	Colin
Riser	110'						**Concrete Core**		**Overnight**			James
Screen / Pre-pack	20						**Hand Sampling**		**Weekend**			

Additional Materials / Comments:

Driller Signature:

Client Signature: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GEODESIGN INC

FIELD REPORT

GDI Project:	Orchard-1-01	Prepared By:	AJB
Project Name:	Former Turnbull Landfill	Date:	11/14/16
Location:	SR 500 & NE 4th Plain Intersection	Report #:	2
Arrival:	1000	Departure:	1400
Weather:	Rain	Permit #:	
Site Visit Requested By:		Met With (on site):	
Purpose:	Methane monitoring and soil gas sampling		
Outstanding Issues:			

1000 Andrew Bisbee (AJB) and Kyle Haggart (KTH) arrive on-site and begin methane monitoring at soil gas sampling point SG-11. A calibrated GEM2000 methane meter was connected to soil-gas sampling point SG-11. During the purge, water entered the sampling tube. As a result, the GEM2000 filter was replaced. During the methane monitoring, the barometric pressure ranged between 29.98 and 29.99 inches Hg. For each soil-gas sampling point, the points were purged using the GEM2000 for approximately 2.5 minutes until soil-gas concentrations stabilized. Soil-gas data were recorded on the attached methane monitoring data sheet.

1130 Methane monitoring complete. The greatest detected concentrations of methane were recorded in SG-1, SG-8, and SG-10 (1.7 percent by volume pbv, 2.3 pbv, and 2.0 pbv respectively). Prepare to collect confirmation Summa canister samples from the soil-gas sampling points with the greatest detected methane concentrations within the building footprint (SG-1) and in the parking lot area (SG-8).

1230 AJB and KTH prepare to collect a soil-gas sample from soil-gas sampling point SG-1 using SUMMA canister ESC# 2237. After connecting the regulator, it was discovered that the SUMMA canister was unusable due to insufficient vacuum.

1300 AJB and KTH prepare to collect a soil-gas sample from soil-gas sampling point SG-1using SUMMA canister ESC# 1862. The sampling train was set up using decontaminated fittings and checked for tightness before placing the helium shroud over the soil-gas sampling point and sampling train. The shroud was charged with helium and SG-1 was purged for approximately 2.5 minutes. During the purge, methane concentrations up to 1.7 pbv were measured using the GEM2000. Additionally, helium concentrations of 99,999 parts per million (ppm) were measured in the shroud using a GasCheck helium detector.

1325 Soil-gas sample SG-1 was collected from soil-gas sampling point SG-1. The initial vacuum in the SUMMA canister was 28.25 inches Hg. Helium in the sampling train was detected at a concentration of 3,000 ppm using the the GasCheck helium detector indicating the sampling train was reasonably tight. The final vacuum in the SUMMA canister was 7 inches Hg.

1345 GeoDesign was unable to collect the second sample because two SUMMA canisters were ordered and one was defective as noted above. Another SUMMA canister will be delivered by the lab. Equipment cleaned and decontaminated.

1400 AJB and KTH off site.

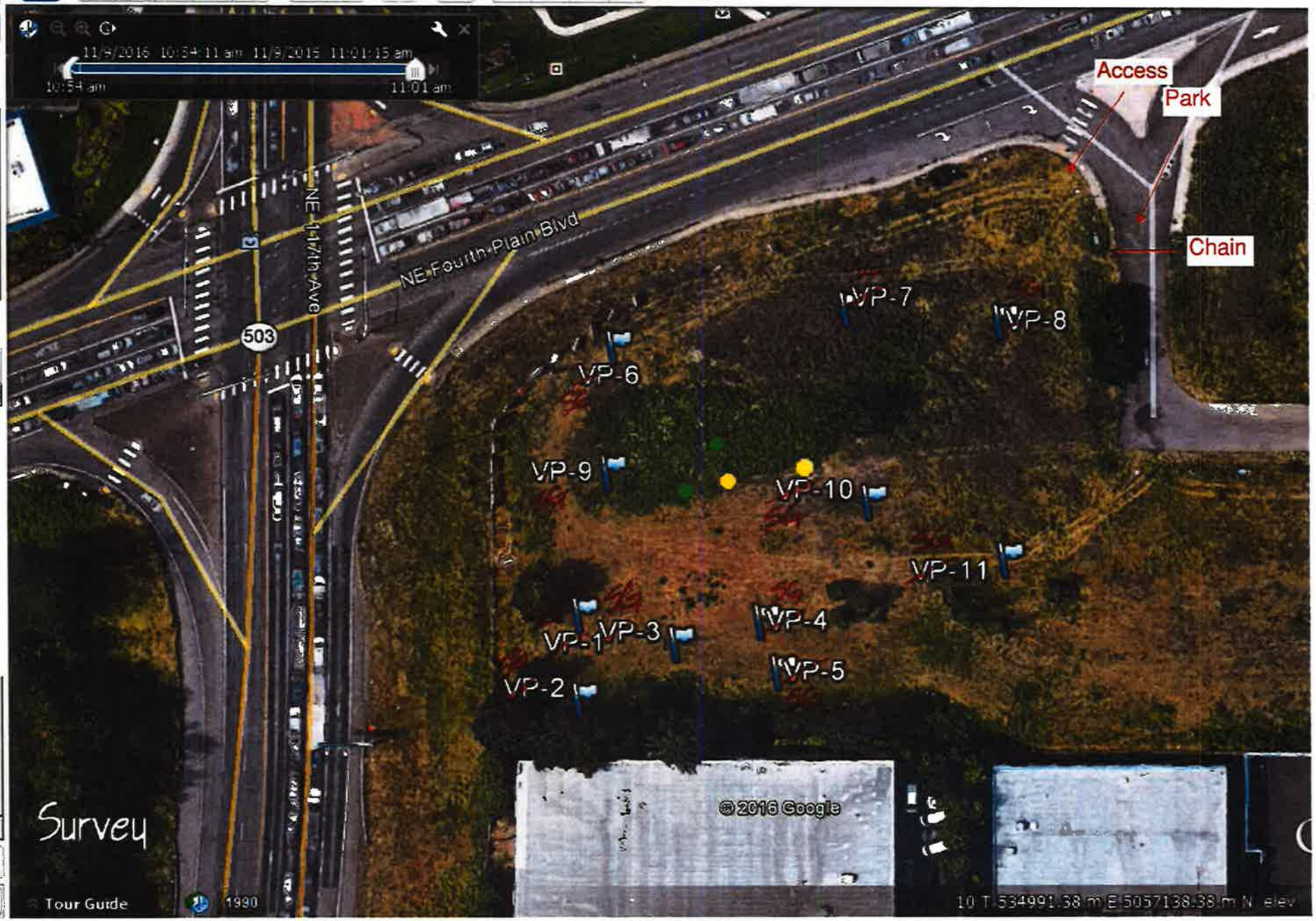
Distribution:

Attachments: Site plan, Methane monitoring data sheet, Soil vapor sampling data collection sheet

Reviewed by: MK

This report presents opinions formed as a result of our observation of activities relating to geotechnical engineering or environmental services. We rely on the contractor to comply with the plans and specifications throughout the duration of the project irrespective of the presence of our representative. Our work does not include supervision or direction of the contractor, the contractor's employees or agents. Our firm is not responsible for site safety. This field report is a **DRAFT** representation of our field observations, testing, and preliminary recommendations. The report can only be considered final upon review of the GeoDesign project manager, as indicated by initials in the "Reviewed By" section.

Signature: MK FOR ANDREW BISTBEE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Methane Monitoring Data Sheet

Project #:	ORCHARD-1-01
Project Name:	FORMER TURNBULL LANDFILL
Date:	11-14-16
Gem 2000 Cal:	YES
Purge time:	150 SECONDS

Well I.D.	Time	Baro. Press.	Static Pres.	CH4	CO2	O2	Balance	Peak CH4
SG-11	1026	29.99	0.0	0.0	0.5	20.6	78.9	0.0
SG-10	1036	29.98	0.0	1.1	5.8	10.6	82.5	2.0
SG-A	1044	29.98	0.0	0.0	0.2	19.5	80.3	0.0
SG-5	1050	29.98	-0.02	0.8	9.6	0.0	89.7	0.8
SG-3	1055	29.99	-0.05	0.7	11.6	0.0	87.7	0.7
SG-2	1100	29.99	0.0	0.0	6.5	10.0	83.6	0.0
SG-1	1107	29.99	0.0	1.7	13.3	0.0	85.0	1.7
SG-9	1112	29.98	0.0	0.1	12.6	0.0	87.2	0.1
SG-6	1118	29.98	0.0	0.0	3.0	11.8	85.2	0.0
SG-7	1124	29.98	0.0	0.0	9.7	0.0	90.3	0.0
SG-8	1130	29.98	0.0	2.3	9.4	0.8	87.3	2.3

SOIL VAPOR SAMPLING DATA COLLECTION

GeoDesign, Inc
CAN #1862

Project No: ORCHARD-1-01 Date: 11/14/16

Site: FORMER TURNBULL LANDFILL Weather: RAIN

Address: SR 500 VANCOUVER Personnel: AJB, KTH

Probe	Canister	Static Pressure	Start Vacuum	Start Time	End Time	End Vacuum	Helium Concentration
GEO	SUMMA	29.95	28.25	1326	1330	7.0	3,000 PPM

GEODESIGN INC

FIELD REPORT

GDI Project:	Orchard-1-01	Prepared By:	Kyle Haggart (KTH)
Project Name:	Former Turnbull Landfill	Date:	11/15/16
Location:	SR 500 & NE 4th Plain Intersection	Report #:	3
Arrival:	0900	Departure:	1030
Weather:	Rainy, 50's	Permit #:	--
Site Visit Requested By:	--	Met With (on site):	--
Purpose:	Soil gas sampling		
Outstanding Issues:	--		

0900 KTH arrives onsite and monitors soil-gas sampling point SG-8 using a calibrated GEM2000. Methane was measured at a concentration of 3.4 percent by volume (see attached well methane monitoring data sheet).

0920 KTH prepares to collect sample SG-8 using SUMMA canister ESC#1936 and decontaminated fittings. The SUMMA canister was checked for leaks for 5 minutes before placing the helium shroud over the sampling train. The shroud was charged with helium. Helium in the shroud was measured using a GasCheck helium detector at a concentrations greater than 99,999 parts per million.

1006 Soil-gas sample SG-8 was collected from soil-gas sampling point SG-8. The initial vacuum in the SUMMA canister was greater than 30 inches of mercury (inHg). The helium concentration within the sampling train as measured with the GasCheck helium detector was approximately 1,060 ppm, indicating a reasonably tight sampling train. Sample collection was stopped when water was observed entering the tubing. The final vacuum in the SUMMA canister was 8 inHg.

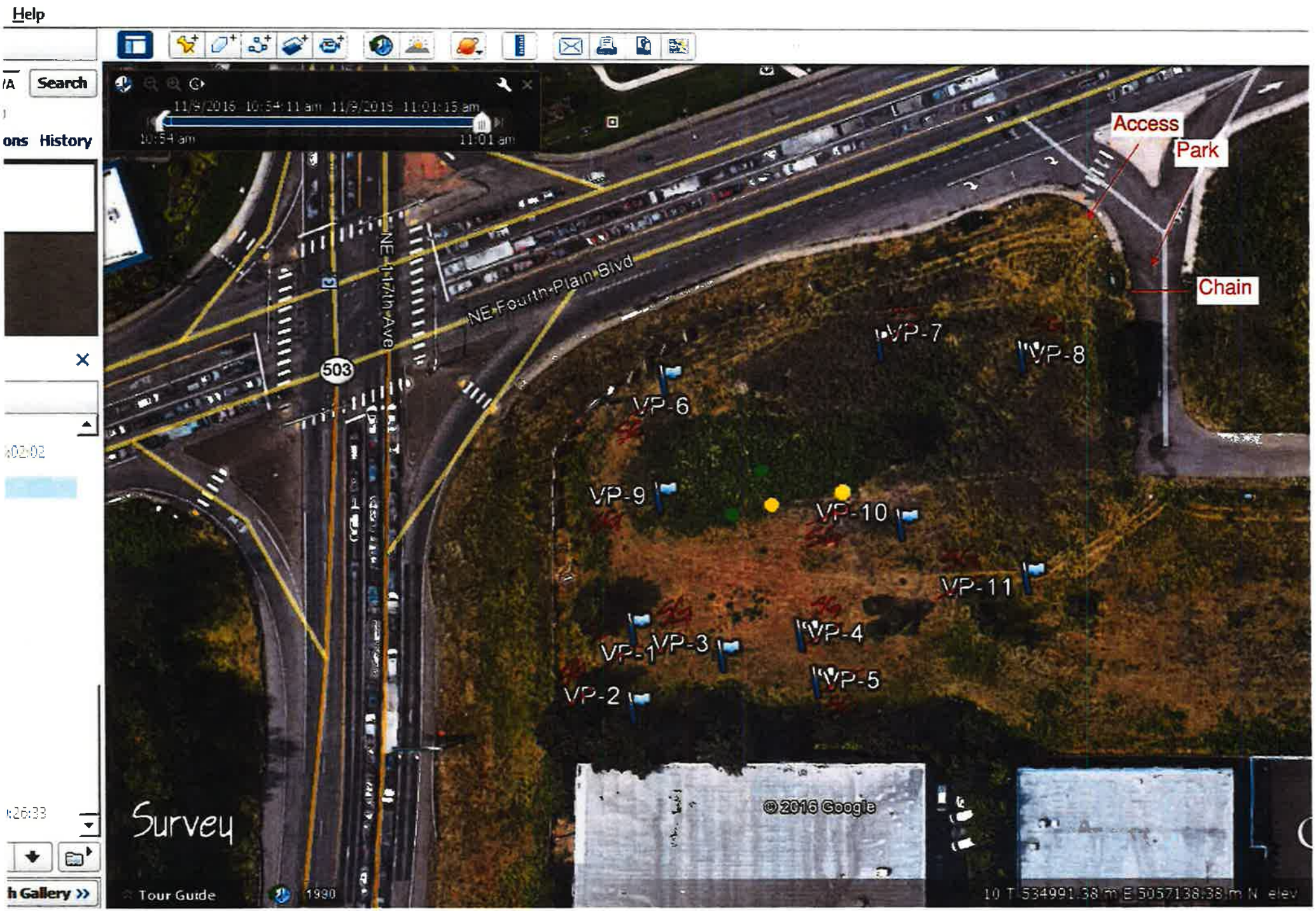
1030 Equipment cleaned, decontaminated, and GDI left site.

Distribution:

Attachments: Site Plan, soil-vapor sampling data collection sheet, well methane monitoring data sheet, COC

Reviewed by: MLC

Signature: MLC FOR KYLE HAGGART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SOIL VAPOR SAMPLING DATA COLLECTION

GeoDesign, inc

Project No: ORCHARD-1-01 Date: 11/15/16

Site: SR 500 Vancouver Weather: Cloudy 50's

Address: _____ Personnel: KTH

Probe	Canister	Static Pressure	Start Vacuum	Start Time	End Time	End Vacuum	Helium Concentration
SG-8	1936	29.81 inHg	30+	957	1006	8	1060

WELL METHANE MONITORING DATA SHEET

Date: 11/15/16 Section: ______ ORCHARD1-01 **PAGE 1 OF 1** Weather: Cloudy 50's

Well	Time	T (°C)	Baro. P ~~(mBars)~~ InHg	Static P (" H_2O)	Diff. P (" H_2O)	CH_4 (%)	CO_2 (%)	O_2 (%)	Ambient T (°C)	Comments
SG-8	0936		29.81	-0.65		3.4	8.7	1.7		200 seconds

GeoDesign, Inc.
15575 SW Sequoia Parkway Ste. 100
Portland, OR. 97224

Billing Information:
GeoDesign, Inc.
15575 SW Sequoia Parkway
Ste. 100
Portland, OR. 97224

Report to: ANDREW BASBEE
Email to: abasbee@geodesigninc

Project Description:
City/State Collected: VANCOUVER, WA

Phone: 503-968-8787
FAX:
Client Project #: ORCHARD-1-01
ESC Key:

Collected by: ANDREW BASBEE
Site/Facility ID#:
P.O.#:

Collected by (signature):
Immediately Packed on Ice N Y

Rush? (Lab MUST Be Notified)
____ Same Day.....200%
____ Next Day.....100%
____ Two Day.....50%
____ Three Day.....25%

Date Results Needed:
Email? __No__Yes
FAX? __No__Yes

No. of Cntrs

Analysis/Container/Preservative: METHANE 8015

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Remarks/Contaminant	Sample # (lab only)
SG-1	GRAB	GT	5'	11/14	1338	1 X		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
~~SG-2~~ SG-8 MEC 11/17/16		GT	5'	11/15	1006	1 X		

Chain of Custody Page 1 of 1

ESC LAB SCIENCES
12065 Lebanon Road
Mt Juliet, TN 37122
Phone: (800) 767-5859
Phone: (615) 758-5858
Fax: (615) 758-5859

CoCode GEODESPO (lab use only)
Template/Prelogin
Shipped Via:

*Matrix: **SS** - Soil/Solid **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other SOIL GAS

pH _____ Temp _____
Flow _____ Other _____

Remarks:

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____	Condition: (lab use only)
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: / Bottles Received:	CoC Seals Intact: ___ Y ___ N ___ NA
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: / Time:	pH Checked: / NCF:

GEODESIGN INC

FIELD REPORT

GDI Project:	Orchard-1-01	Prepared By:	Kyle Haggart (KTH)
Project Name:	Former Turnbull Landfill	Date:	06/16/17
Location:	SR 500 & NE 4th Plain Intersection	Report #:	4
Arrival:	1020	Departure:	1240
Weather:	Rainy, 60's	Permit #:	--
Site Visit Requested By:	--	Met With (on site):	--
Purpose:	Soil gas sampling		
Outstanding Issues:	--		

0920 I met Matt with GTCF West who showed me the locations of the stockpiles. Four stockpiles were located in the southwestern portion of the project site. The stockpiles ranged from approximately 20 cubic yards to 50 cubic yards. The material in the stockpiles was generally sand with gravel (30%) and cobbles (5-10%) and debris. The debris consisted of mainly wood with plastic, metal, glass and miscellaneous garbage.

Matt informed me that the Geo piers were being installed to a depth of 17 feet BGS, at which a perched water zone was encountered. Matt identified the material from 17 feet BGS as being the most contaminated and he previously identified a slight sheen. I calibrated a miniRAE 3000 (PID #7) and ~~begin~~ began field screening, which included visual ~~inspection~~ observation, olfactory observation, water sheen testing, and headspace vapor testing using PID #7. The material observed from 16 feet BGS did not exhibit field evidence of impact (see field screening log).

I used a calibrated GEM 2000 to ~~observed~~ screen for methane and hydrogen sulfide concentrations in the vicinity of the open geo pier holes as well as the stockpiles. Methane and hydrogen sulfide were not detected.

I began to collect two 10-point composite soil samples from the stockpiles. Comp-1 was collected from the eastern two stockpiles and Comp-2 was collected from the western two stockpiles (see site plan). The soil samples were collected following EPA Method 5035A and were put immediately on ice. Comp-2 exhibited a slight sheen and a PID reading of 3.8.

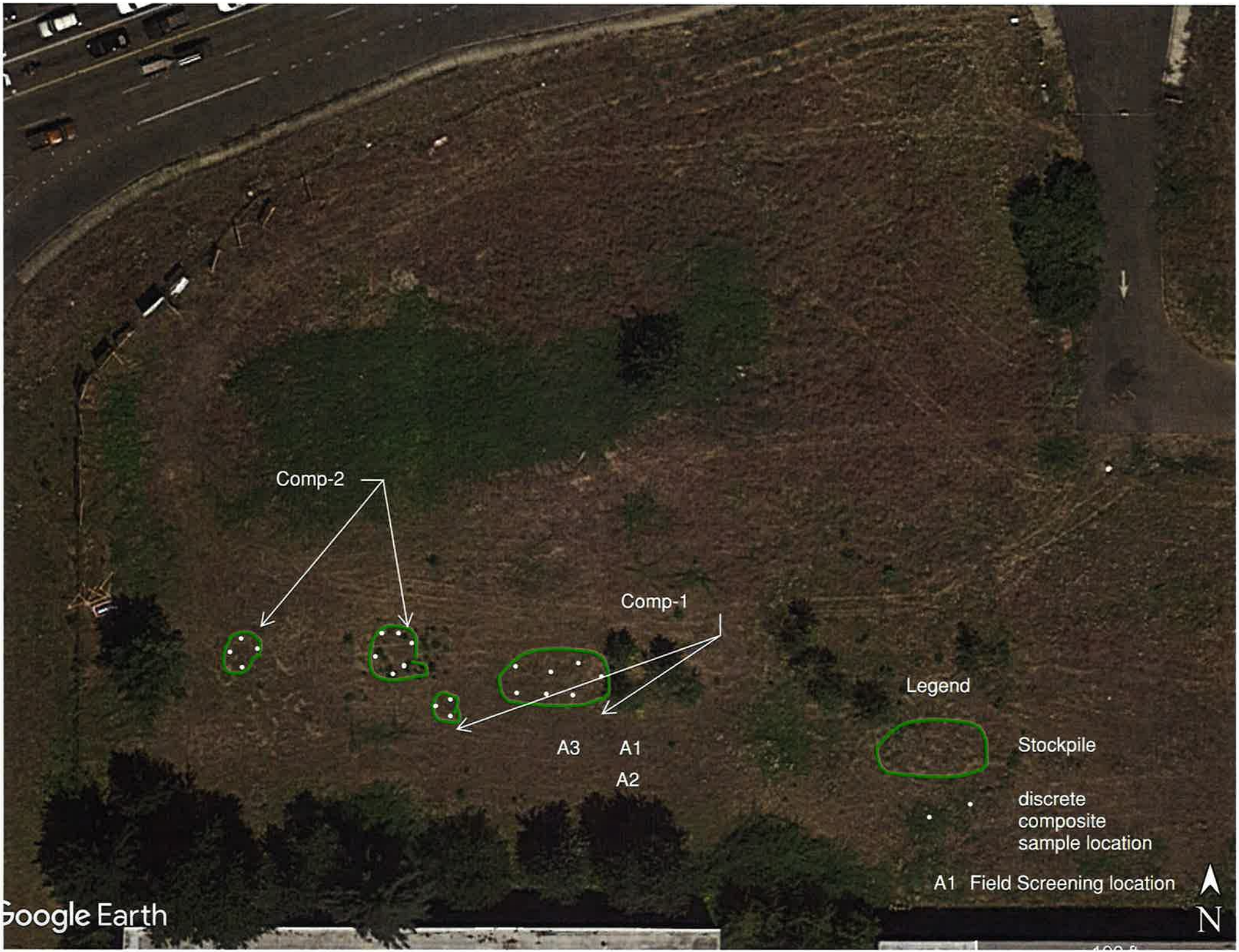
I informed Matt with GTFC West and Doug with Green Excavation that the stockpiles should be managed as outlined in the CMMP, therefore should be placed on a plastic sheet with a berm.

Distribution:

Attachments: Site Plan, field screening log, COC

Reviewed by: Mik Coen

Signature: Mik Coen FOR Kyle Haggart


Comp-2
Comp-1
A3
A1
A2
Legend
Stockpile
discrete
composite
sample location
A1 Field Screening location
N
Google Earth

APEX LABS

CHAIN OF CUSTODY

Lab # _____ COC ___ of ___

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

PO#

Company: GeoDesign Inc	Project Mgr:	Project Name:	Project # Orchard-1-01
Address:	Phone:	Fax:	Email:
Sampled by: Kyle Haggart			

Site Location: OR WA

Other: _____

	SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 VOCs Full List	8260 RBDM VOCs	8260 HVOCs	8260 BTEX VOCs	8270 SVOC	8270 SIM PAHs	8082 PCBs	600 TTO	RCRA Metals (8)	TCLP Metals (8)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Tl, V, Zn TOTAL DISS TCLP	1200- COLS	1200-Z							
							ANALYSIS REQUEST																						
1	Comp-1			1120		3	X	X	X				X	X		1		X										
2	Comp-2			1130		3	X	X	X				X	X		2		X										
3																												
4																												
5																												
6																												
7																												
8																												
9																												
10																												

Normal Turn Around Time (TAT) = 10 Business Days YES NO

TAT Requested (circle)

1 Day 2 Day 3 Day

4 DAY 5 DAY Other: _____

SAMPLES ARE HELD FOR 30 DAYS

SPECIAL INSTRUCTIONS:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature:	Signature:	Signature:	Signature:
Date: 5/16	Date: 5/16/11	Date:	Date:
Printed Name: Kyle Haggart	Printed Name: Khiem	Printed Name:	Printed Name:
Time: 1315	Time: 1315	Time:	Time:
Company: GDI	Company: Apex	Company:	Company:

GEODESIGN INC

Field Screening Log

GDI Project Orchard -1-01

Site Name:

GDI Personnel: EH

Location ID[1]	Date	Time	Field Screening				Pass/No Pass?	Destination of Soil	Other Remarks
			PID (ppm)	Sheen	Odor	Stain			
A1 (16)	6/6	1100	GH	NS	N			SP	Brown Sand with gravel + cobble + debris
A2 (5)	↓	1104	0.6	NS	N			↓	↓ ↓
A2 (15)		1107	1.0	NS	N				
Comp-1		1120	0.5	NS	N				
Comp-2		1130	3.5	SS	N				
A3 (7)	↓	1210	0.3	NS	N			↓	

Notes:
Sheen: SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen
1 Location ID should incorporate grid location and depth. Note all locations on site plan. Depths are measured from street level (which is between 30ft and 33ft elevation).
2 Indicate whether soil representing field screening result was stockpiled onsite for further evaluation, transported offsite as clean fill, etc.

GEODESIGN INC

FIELD REPORT

GDI Project:	Orchard-1-01	Prepared By:	Steven Vandecoevering
Project Name:	Former Turnbull Landfill/Golden Corral	Date:	09/05/17
Location:	Vancouver, WA	Report #:	5
Arrival:	1230	Departure:	1415
Weather:	Hazy, 80s	Permit #:	--
Site Visit Requested By:	--	Met With (on site):	Dan, Noe of ASI
Purpose:	Methane mitigation system install observation		
Outstanding Issues:	--		

1230 - Onsite for the above purpose. I observe the sub-slab probe and venting at the base of the project site structure location, and document the locations of the venting and probes. See the attached site plan for approximate measurements. I observe the following:

- The sub-grade consists of ¾" minus gravel, at least 2" thick.
- The sub-slab venting consists of 12" wide Geo-Vent laid on top of the sub-grade and connected to 2" diameter PVC vertical risers. At joints, the GeoVent is locked together and the outer fabric is duct-taped together. Dan indicates that 2" diameter PVC piping has been substituted for 3" diameter PVC (as called for on Drawing H5.2, Detail 3) because there is not enough room to fit 3" diameter PVC piping around utilities and rebar in the floor slab. He indicates that the 2" diameter piping will be plumbed to 3" diameter PVC piping where it leaves the slab. Mike Coenen indicates via phone call using 2" diameter PVC within the slab for the indicated purpose is acceptable.
- A portion of the sub-slab vent pipe at the eastern portion of the foundation was rerouted because the original routing could not fit between footings and utilities in that area. The rerouted section was located within 25 feet of the eastern edge of the foundation (see attached site plan).
- The sub-slab monitoring probes consist of ½" diameter PVC piping, with a 10' section of slotted ½" diameter PVC pipe at the end of each probe. During my site visit, the probe piping was not extended to the building perimeter, but a coupler has been placed on the end to allow future extension of the probe.
- During my site visit, I observed the sub-grade and sub-slab venting system being covered with Liquid Boot T-60 base fabric.

1415 - The installation of the methane mitigation membrane system appears to be in general accordance with our plans and recommendations. I depart the project site.

*note: After the site visit, GDI personnel noted that the GeoVent was placed on top of the sub-grade gravel instead of flush as shown on Detail 1, Sheet H5.1. GDI discussed this discrepancy with ASI. ASI indicated that they typically install the Geo-Vent in this manner and the installation is in accordance with the manufacturer's specifications.

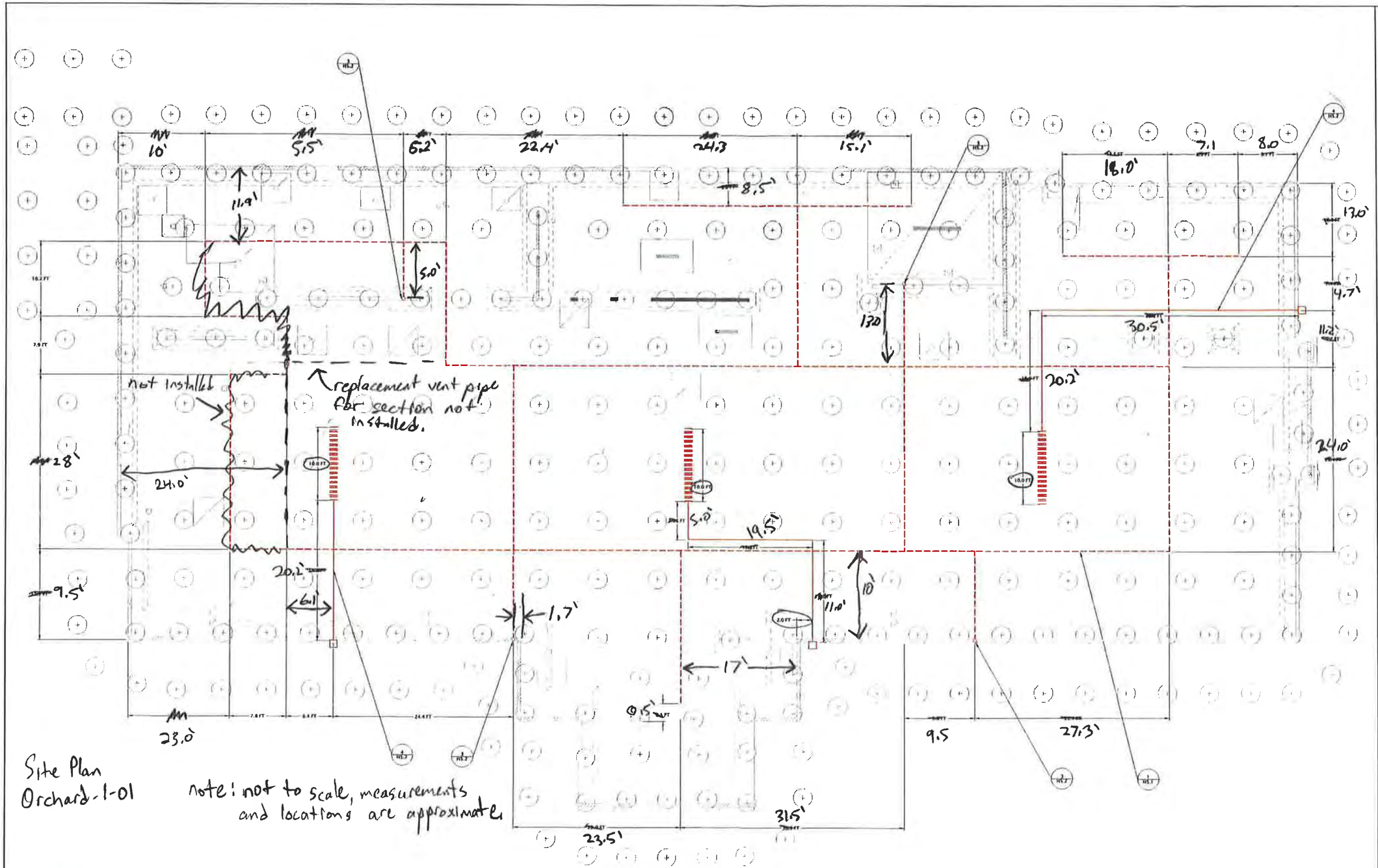
Distribution: Job File

Attachments: Site plan

Reviewed by: Mark C

or agents. Our firm is not responsible for site safety. This field report is a **DRAFT** representation of our field observations, testing, and preliminary recommendations. The report can only be considered final upon review of the GeoDesign project manager, as indicated by initials in the "Reviewed By" section.

Signature:



Site Plan
Orchard-1-01

note: not to scale, measurements and locations are approximate

LEGEND:

- SUB-SLAB METHANE MONITORING PROBE
- SUB-SLAB VENT PIPE
- VENT RISER
- GEOPIER
- DETAIL NUMBER OR SECTION LETTER
- REFERENCE NUMBER OF DRAWING WHERE DETAIL IS SHOWN/TAKEN (H2.1 TYP.)

NOTES:
1. FIELD ROUTE VENT RISER TO ROOF.
2. COORDINATE ROUTING AND ROOF PENETRATION WITH ARCHITECT.

N

0 5 10
(SCALE IN FEET)

SITE PLAN BASED ON DRAWING PROVIDED BY LMHT ASSOCIATES, AUGUST 2, 2016

METHANE MITIGATION SYSTEM - LOW-PERMEABLE MEMBRANE AND GRAVEL BLANKET

PROPOSED DEV. - FORMER TURNBULL LANDFILL
VANCOUVER, WA

ORCHARD-1-01

JANUARY 2017

H2.1

DESIGNED BY: GDI ENG
DRAWN BY: GDI CAD
CHECKED BY:
APPROVED BY:

NO	DATE	REVISION DESCRIPTION	BY	APPR.

GEODESIGN INC
9450 SW Commerce Circle - Suite 300
Wilsonville OR 97070
503.968.8787 www.geodesigninc.com

SIGNED 1/25/2017

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GEODESIGN INC

FIELD REPORT

GDI Project:	Orchard-1-01	Prepared By:	Steven Vandecoevering
Project Name:	Golden Corral	Date:	09/06/17
Location:	Vancouver, WA	Report #:	6
Arrival:	1205	Departure:	1335
Weather:	Hazy, 80s	Permit #:	--
Site Visit Requested By:	--	Met With (on site):	Dan of ASI, Patrick of National Consulting & Development, Inc.
Purpose:	Methane mitigation system install observation		
Outstanding Issues:	--		

I arrive onsite for the above purpose and observe the following:

- ASI personnel are sealing penetrations and attaching the membrane to the perimeter footing using Liquid Boot spray-on membrane material. According to Dan of ASI, the membrane will overlap footings by at least 3 inches.
- The carrier fabric, loosely placed, is observed to overlap 4 to 8 inches.
- The GeoVent sub-slab venting is oriented correctly.
- The gravel blanket below the membrane is observed to be 3 to 5 inches thick.
- Trench dams are not observed at the locations indicated on drawing H.1. I discuss the locations of the trench dams with Patrick Parr (project manager) of National Consulting and Development, Inc. According to Patrick,trench dams have not been placed yet. He reviews drawings and indicates that utilities leave the foundation at the following locations (see attached site plan):
    - Sewer pipes exit the foundation on the east side at two locations
    - Water and fire water mains exit the foundation near the southwest corner
    - Electrical conduits exit the foundation near the center of the south side of the foundation.
- A 2" diameter water main passes through the footing and under the structure near the southwest corner of the building. Dan of ASI indicates that he will seal the conduit similarly to how electrical conduits are sealed, as shown on drawing H5.2, detail 2.

I depart the project site by 1335.

Distribution: Job File

Attachments: Site plan

Reviewed by:

Signature:

Electrical Conduits exit here

Water, fire risers exit here

Sewer exits here

Site Plan
Orchard-1-01

LEGEND:
- SUB-SLAB METHANE MONITORING PROBE
- SUB-SLAB VENT PIPE
- VENT RISER
- GEOPIER
- DETAIL NUMBER OR SECTION LETTER
- REFERENCE NUMBER OF DRAWING WHERE DETAIL IS SHOWN/TAKEN
- TYP.

NOTES:
1. FIELD ROUTE VENT RISER TO ROOF.
2. COORDINATE ROUTING AND ROOF PENETRATION WITH ARCHITECT.

0 5 10
(SCALE IN FEET)

SITE PLAN BASED ON DRAWING PROVIDED BY LMHT ASSOCIATES, AUGUST 2, 2016

METHANE MITIGATION SYSTEM - LOW-PERMEABLE MEMBRANE AND GRAVEL BLANKET

PROPOSED DEV. - FORMER TURNBULL LANDFILL
VANCOUVER, WA

ORCHARD-1-01

JANUARY 2017

H2.1

DESIGNED BY: GDI ENG
DRAWN BY: GDI CAD
CHECKED BY:
APPROVED BY:

NO.	DATE	REVISION DESCRIPTION	BY	APPR.

GEODESIGN INC
9450 SW Commerce Circle - Suite 300
Wilsonville OR 97070
503.968.8787 www.geodesigninc.com

SIGNED 1/25/2017

GEODESIGN INC

FIELD REPORT

GDI Project:	Orchard-1-01	Prepared By:	Steven Vandecoevering
Project Name:	Former Turnbull Landfill/ Golden Corral	Date:	09/07/17
Location:	Vancouver, WA	Report #:	7
Arrival:	1200	Departure:	1215
Weather:	Hazy, 80s	Permit #:	--
Site Visit Requested By:	--	Met With (on site):	Noe of ASI
Purpose:	Methane mitigation system install observation		
Outstanding Issues:	--		

I arrive onsite for the above purpose and observe ASI personnel sealing penetrations, attaching the membrane to the footings, and tacking together the carrier fabric seams using Liquid Boot spray-on membrane material. The installation of the methane mitigation system appears to be in general accordance with our plans and ~~recommendations~~ SPECIFICATIONS.

I depart the project site by 1215.

Distribution: Job File

Attachments: --

Reviewed by: MK

This report presents opinions formed as a result of our observation of activities relating to geotechnical engineering or environmental services. We rely on the contractor to comply with the plans and specifications throughout the duration of the project irrespective of the presence of our representative. Our work does not include supervision or direction of the contractor, the contractor's employees or agents. Our firm is not responsible for site safety. This field report is a **DRAFT** representation of our field observations, testing, and preliminary recommendations. The report can only be considered final upon review of the GeoDesign project manager, as indicated by initials in the "Reviewed By" section.

Signature: Steven Vandecoevering

GeoDesign Inc

FIELD REPORT

GDI Project:	Orchard-1-01	Prepared By:	Steven Vandecoevering
Project Name:	Former Turnbull Landfill/ Golden Corral	Date:	09/08/17
Location:	Vancouver, WA	Report #:	8
Arrival:	1350	Departure:	1420
Weather:	Hazy, 80s	Permit #:	--
Site Visit Requested By:	--	Met With (on site):	Dan of ASI
Purpose:	Methane mitigation system install observation		
Outstanding Issues:	--		

I arrive onsite for the above purpose and observe ASI personnel sealing penetrations, attaching the membrane to the footings, and tacking together the carrier fabric seams using Liquid Boot spray-on membrane material. The installation of the methane mitigation system appears to be in general accordance with our plans and ~~recommendations~~ specifications. Dan arrives onsite at approximately 1415. He indicates that smoke testing will likely happen on Tuesday, 9/12.

I depart the project site by 1420.

Distribution: Job File

Attachments: --

Reviewed by: MTC

Signature: Steven Vandecoevering

GEODESIGN INC

FIELD REPORT

GDI Project:	Orchard-1-01	Prepared By:	Steven Vandecoevering
Project Name:	Former Turnbull Landfill/ Golden Corral	Date:	09/11/17
Location:	Vancouver, WA	Report #:	9
Arrival:	1250	Departure:	1325
Weather:	Sunny, 80s	Permit #:	--
Site Visit Requested By:	--	Met With (on site):	Dan of ASI, Patrick of NCD
Purpose:	Methane mitigation system install observation		
Outstanding Issues:	--		

I arrive onsite for the above purpose and meet with Dan of ASI. Dan indicates that smoke testing will occur on 9/12, and requests that I be onsite by 0730. I observe ASI personnel are spraying the membrane using Liquid Boot spray-on membrane material. The installation of the methane mitigation system appears to be in general accordance with our plans and ~~recommendations~~ SPECIFICATIONS WE. I meet with Patrick Parr of NCD (general contractor). I indicate to Patrick that the trench dam material can be made of native soil as an alternate to bentonite cement. I also indicate that trench dams are required where utility trenches leave the site in addition to where they enter the building. Patrick requests that I send him an electronic copy of our engineering design report for the project site.

I depart the project site by 1325, and email Patrick a copy of the Engineering Design Report for the project site dated January 27, 2017.

Distribution: Job File

Attachments: --

Reviewed by: MJL

Signature:

GEODESIGN INC

FIELD REPORT

GDI Project:	Orchard-1-01	Prepared By:	Steven Vandecoevering
Project Name:	Former Turnbull Landfill/ Golden Corral	Date:	09/12/17
Location:	Vancouver, WA	Report #:	10
Arrival:	0730	Departure:	~~1300~~ 1310 MW
Weather:	Sunny, 50s to 80s	Permit #:	--
Site Visit Requested By:	--	Met With (on site):	Dan of ASI
Purpose:	Smoke test observation		
Outstanding Issues:	--		

0730 - I arrive onsite for the above purpose and meet with ASI crew members, who indicate that smoke testing will begin in approximately 45 minutes.

0835 - I meet with Dan of ASI. I indicate that smoke tests should be performed at a minimum rate of one test for 5,000 square feet, and coupon tests should occur at least once every 2,500 square feet.

0850 - Smoke testing begins. See attached smoke testing log for details. See attached site plan for test locations. "Finger tests" are performed in the areas between coupons to test for approximate thickness, as needed. The coupons are tested for thickness using calipers that have a sensitivity of 1 mil. The T-60 carrier fabric measures at 20 mils thick. The ASI crew marks locations where smoke is coming through the membrane, and patches with Liquid Boot material until the leaks are resolved.

1015 - Coupon ID #3 is measured at 68 mils thickness (membrane is 48 mils when carrier fabric thickness is subtracted). This is below the specified 60 mil thickness. However, finger tests in the area of the coupon indicate that the membrane is generally equal to or greater than the specified thickness, and leaks indicated by the smoke test in the area of the coupon are resolved.

1245 - Smoke testing completed. Leaks observed during smoke testing were resolved, and holes cut for coupons and smoke testing were patched by tacking a carrier fabric patch to the membrane and respraying with liquid boot. The ASI crew breaks for lunch. Dan indicates that the protective fabric layer will be placed later today and tomorrow.

1310 - GDI offsite.

Distribution: Job File

Attachments: Smoke test log, site plan

Reviewed by: MJL

Signature: Steven Vandecoevering

SMOKE TESTING LOG

Observations by: Steven Vandecoevering
Date: 9/12/17
Project: Orchard-1-01

Date	Time	Temp	Weather/ Wind Speed	Coupon I.D.	Coupon Thickness (mils)	Leaks?	Resolved?	Finger Test	Comments
9/12/17	855	60	Clear, light breeze	1	82	Y	Y	Y	
	954	69	"	2	116	Y	Y	Y	
	1016	72	"	3	68	Y	Y	Y	Nearby thumb tests indicate membrane thickness adequate.
	1145	77	"	4	107	Y	Y	Y	
	1155	78	"	5	112	Y	Y	Y	
	1225	81	"	6	125	Y	Y	Y	

Notes; T-60 carrier fabric approx. 20 mils thick
Smoke machine is VEI V-929
Blower with Homelite electric leaf blower

METHANE MITIGATION SYSTEM - LOW-PERMEABLE MEMBRANE AND GRAVEL BLANKET

PROPOSED DEV. - FORMER TURNBULL LANDFILL
VANCOUVER, WA

ORCHARD-1-01

JANUARY 2017

H2.1

① smoke test hole/coupon ID

LEGEND:
- SUB-SLAB METHANE MONITORING PROBE
- SUB-SLAB VENT PIPE
- VENT RISER
- GEOPIER
- DETAIL NUMBER OR SECTION LETTER
- REFERENCE NUMBER OF DRAWING WHERE DETAIL IS SHOWN/TAKEN

NOTES:
1. FIELD ROUTE VENT RISER TO ROOF.
2. COORDINATE ROUTING AND ROOF PENETRATION WITH ARCHITECT.

SCALE IN FEET: 0, 5, 10

SITE PLAN BASED ON DRAWING PROVIDED BY LAHY ASSOCIATES, AUGUST 2, 2016

DESIGNED BY: GDI ENG
DRAWN BY: ~ GDI CAD
CHECKED BY:
APPROVED BY:

NO.	DATE	REVISION DESCRIPTION	BY	APPR.

GEODESIGN INC
9450 SW Commerce Circle - Suite 300
Wilsonville OR 97070
503.968.8787 www.geodesigninc.com

SIGNED 1/25/2017

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GEODESIGN INC

FIELD REPORT

GDI Project:	Orchard-1-01	Prepared By:	Andre DeJonge (ADD)
Project Name:	Former Turnbull Landfill	Date:	09/13/17
Location:	Vancouver, WA	Report #:	11
Arrival:	1330	Departure:	1430
Weather:	Sunny, 70's	Permit #:	
Site Visit Requested By:		Met With (on site):	ASI
Purpose:	Construction Observation		
Outstanding Issues:			

1330 - Arrived on site for above purpose, met on site with Pat (Site Superintendent) and the ASI crew. Pat and the ASI crew informed me that ASI troweled on liquid boot at an area where the plumber had to readjust a trough drain. ASI chose to trowel on the material instead of spraying it on after considering the small area of concern vs the work needed to hook up the compressor and spray lines. ASI then installed the P150 protective membrane (blue plastic sheeting) over the entirety of the building pad, bonding its seams with red adhesive tape.
The ASI crew informed me that their work on the site would be completed after the installation of the P150 protective membrane.
1430 - Departed site.

Distribution:MFC

Attachments:

Reviewed by:

Signature:

GDI Project:	Orchard-1-01	Prepared By:	Kyle Haggart
Project Name:	Former Turnbull Landfill/Golder Corral Project	Date:	12/7/17
Location:	SR 500 and NE Fourth Plains, Vancouver, Washington	Report #:	12
Arrival:	0945	Departure:	1310
Weather:	Sunny, 40s – 50s	Permit #:	
Site Visit Requested By:		Met With (on site):	Doug (Green Construction)
Purpose:	Trench Dam Installation		
Outstanding Issues:			

0945 Met Doug and Rick with Green Construction. Upon arrive Green Construction had excavated an approximately 4-foot by 4-foot area around the utility at trench dam location 1 (see site plan). I informed Doug that the excavation around the utilities and the dam locations needs to extend to native soil and be at least 4 inches below the utility. I also informed Doug that the length of the trench dam needs to be twice as long as the width of the dam. Green Construction began to further excavate location 1 to a length of 8 feet. The final extent of trench dam location 1 was approximately 8 feet long, 4 feet wide, and 3.5 - 4 feet deep (utility was located at approximately 3 feet BGS). Native soil was observed at the extent of the excavation and the excavation extended to at least four inches below the utility. I observed backfill material (crushed rock) to be approximately 2 to 3 inches above the utility.

I informed Doug and Rick with Green Construction that the concrete that we recommended was CDF, which was not being used. I informed them that if the utilities need to be reached in the future, they will likely have to remove this concrete with a jackhammer. The concrete listed on the attached invoice was poured into the excavation at location 1 and filled to approximately 4 – 5 inches above the utility.

Green Construction further excavated location 2 to approximately 2.5 feet wide, 3.5 feet long, and approximately 3.5 feet deep. Native soil was observed at the extent of the excavation and at least four inches were observed below the utility. I observed the utility at approximately 3 feet BGS and it was wrapped in plastic. Backfill material was observed approximately 2 – 3 inches above the utility. Green Construction poured concrete in the excavation to approximately 12 inches above the pipe.

Green Construction excavated location 3 to approximately 8 feet long, 4 feet wide, and 7 – 8 feet deep. Native soil was observed at the extent of the excavation and the excavation extended to at least four inches below the utility. The utility was observed at approximately 6 – 7 feet BGS and was covered in plastic. Backfill material was observed approximately 12 inches above the utility. Green Construction poured concrete in the excavation to approximately 13 to 15 inches above the utility.

Green Construction extended the excavations at locations 4, 5, and 6 to ensure that there was at least 4 inches below the utilities. The utilities at locations 4, 5, and 6 were placed directly in native material with no backfill.

Green Construction excavated location 4 to 2 feet wide, 4 feet long, and 2 – 3 feet deep. One pipe was observed at approximate 2 – 3 feet BGS and two PVC pipes were observed at 0.5 feet BGS. The PVC pipes

were observed going through the concrete footing of the building. Green Construction poured concrete in the excavation to approximately 1 foot on top of the bottom pipe and 2 – 3 inches on top of the PVC pipes.

Green Construction excavated location 5 to 3 feet wide, 4 feet long, and 3 – 4 feet deep. One utility was observed at approximately 2 – 3 feet BGS. Green Construction poured concrete in the excavation to approximately 1 to 1.5 feet on top of the utility.

Green Construction excavated location 6 to 2 feet wide, 3 feet long, and 3 – 4 feet deep. Location 6 had 2 metal pipes at approximately 3 feet BGS and 1 PVC pipe at 1-foot BGS. The PVC pipes were observed going through the concrete foundation of the building. Green Construction poured concrete to approximately 0.5 to 1.0 foot above the metal pipes.

I observed a monitoring well in the northwestern portion of the project site sticking approximately 3 feet above the ground surface. The monitoring well was constructed with 2-inch PVC piping and a 6.5-inch steel monument. The well extended to approximately 23.6 feet BGS and water was measured to be at 13.3 feet BGS. No other monitoring wells were observed on the project site.

Distribution:

Attachments: Site Plan, Concrete invoice

Reviewed by:

Signature: for Kyle Haggart

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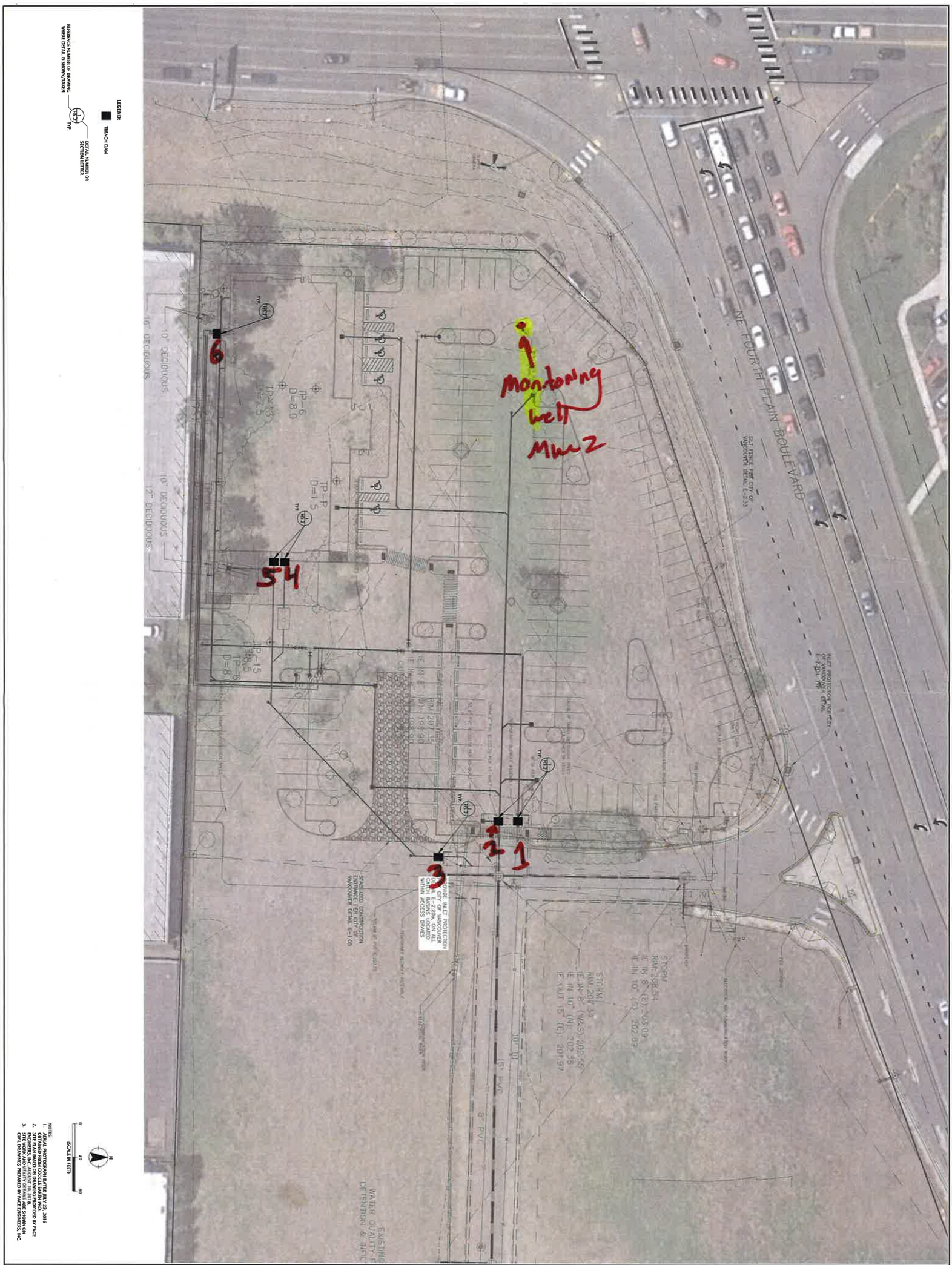


NOTES:
1. AERIAL PHOTOGRAPH DATED MAY 23, 2016
2. SITE PLAN BASED ON DRAWING PROVIDED BY PACE ENGINEERS, INC.
3. SITE WORK AND UTILITY DETAILS ARE SHOWN ON CIVIL DRAWINGS PREPARED BY PACE ENGINEERS, INC.

SIGNED / DATE 1/27/2017

GEODESIGN INC
9450 SW Commerce Circle - Suite 300
Wilsonville OR 97070
503.968.8787 www.geodesigninc.com

DESIGNED BY:	GDI ENG	CHECKED BY:	
DRAWN BY:	GDI CAD	APPROVED BY:	

NO.	DATE	REVISION DESCRIPTION	BY	APPR.

ORCHARD-1-01	SITE PLAN - TRENCH DAMS	
JANUARY 2017	PROPOSED DEV. - FORMER TURNBULL LANDFILL VANCOUVER, WA	H1.1

Sales/Delivery Ticket

CALPORTLAND

Troutdale
Admin Office: 1050 N. River St
Portland, OR 97227
800-452-0522

TICKET#: 1303935

Leave Plant	935
Arrive Job	1025
Start Pour	
Finish Pour	
Finish Wash	
Leave Job	
Arrive Plant	
Time Allowed	
Time Used	
Excess Time	

Warning: Irritation to Skin and Eyes

This product contains Portland Cement. Freshly mixed cement, mortar, grout or concrete may cause skin irritation and/or allergic reaction. Do not use without protective gear and clothing. Avoid any contact with skin. Wash exposed areas immediately with water. If cementitous materials get into the eye, rinse immediately and repeatedly with water and get prompt medical attention.

Keep Away From Children

WEIGHMASTER CERTIFICATE
California Only

THIS IS TO CERTIFY that the following described commodity was weighed, measured or counted by a weighmaster, whose signature is on this certificate who is a recognized authority of accuracy, as prescribed by Chapter 7 (commencing with Section 12700) of Division 5 of the California Business and Professions Code, administered by the Division of Measurement Standards of the California Department of Food and Agriculture.

Weighmaster:

Water added at customer's request	Rev Counter on Load:	This concrete is designed in accordance to American Concrete Institute Standards. Any water added to this design will be at purchasers risk. Materials hereby sold become property of purchaser at time of orgin. Calportland is not responsible for damages to property in the event that delivery is beyond curb line. Seller is not responsible for popouts or other imperfections resulting from reactive aggregates.	Reasons for Delay Time
Slump on arrival			Job not ready
Gals to full load	Test Cylinders Taken:		Lack of Help
Gals to 2/3 load			Wheel Barrow Job
Gals to 1/3 load			Pump Late/Problems
			Other

Date/Time: 12/7/2017 09:14	Superplasticer Amt Added:	Cust. Proj#: 32916	Ordered By: PAT (360) 798-8771	Phone #:	Map Page:

Customer: 1017602 PD BADERTSCHER CONSTRUCTION LLC	Order Type: Charge	P.O. Number	Driver Name: STEVE GLENDENN	Truck #: 7291 / Order #: 24

Scheduled Arrival:	Slump:	Load#:	Prev. Truck #:	Qty This Load:	Qty Delivered:	Qty Ordered:	Plant:	Alley:	Truck License #:
10:00	4.00	0001		7.00	7.00	7.00	11		

Delivery Address:

NE 117TH AVE & 4TH PLAIN BLVD
VANCOUVER, WA

Ticket Notes:

NEW GOLDEN CORRAL

Quantity	UOM	Product Code	Product Description	Unit Price	Amount	Changed
7.00	CY	0225FS	3000 PSI 1"			
7.00	CY	9990	ENVIRONMENTAL FE			
1.00	LD	9900	FUEL SURCHARGE			

Sales Tax:	Ticket Total:	Balance Forward:	Standing Time:	Order Total:

MATERIAL	DESCRIPTION	DESIGN	TARGET	ACTUAL	ERR	FREE WTR	MOISTURE
TYPE 1/2		376.00	2632.00	2640.00	0.3		
GGBFS		94.00	658.00	660.00	0.3		
1-25MM		1850.00	13014.75	13040.00	0.2	64.88	0.50%
CON SAND		1430.00	10847.84	10780.00	-0.6	832.60	8.37%
Water		270.00	703.68	700.98	-0.4		
WRDA-64		3.00	98.70	99.00	0.3		

Max Allowable Water: 14.94 gl

Actual W/C Ratio: 0.53
Design W/C Ratio: 0.57

I have read, understood and I agree to all the above, including the Terms and Conditions on the reverse of, or accompanying this document, and incorporated by refe

Signature _____

DL-04

GEODESIGN INC

FIELD REPORT

GDI Project:	Orchard-1-01	Prepared By:	Kyle Haggart
Project Name:	Former Turnbull Landfill/Golden Corral	Date:	12/11/17
Location:	SE of SR 500 and NE Fourth Plain Boulevard, Vancouver, WA	Report #:	13
Arrival:	0900	Departure:	1120
Weather:	Sunny - 30's	Permit #:	—
Site Visit Requested By:	—	Met With (on site):	Marty (ESN Northwest Inc)
Purpose:	Well Decommissioning		
Outstanding Issues:	—		

0900 Met Marty with ESN and showed him the location of MW-2. While ESN unloaded equipment I located MW-1 & MW-4. MW-3 could not be located. MW-1 & MW-4 appeared stick up wells with three bollards.

0930 ESN used a truck mounted Power Probe to remove the concrete around MW-2. ESN then proceeded to remove the monument using the Power Probe. During the remove of the monument sand entered the PVC piping so ESN removed the PVC using the power probe. ESN the filled the hole with bentonite chips.

1035 ESN informed me that they could not remove wells MW-1 & MW-4. However ESN informed me they could decommission the wells using bentonite, then a contractor could remove the monuments at a later date.

1045 ESN poured bentonite chips into wells MW-1 & MW-4.

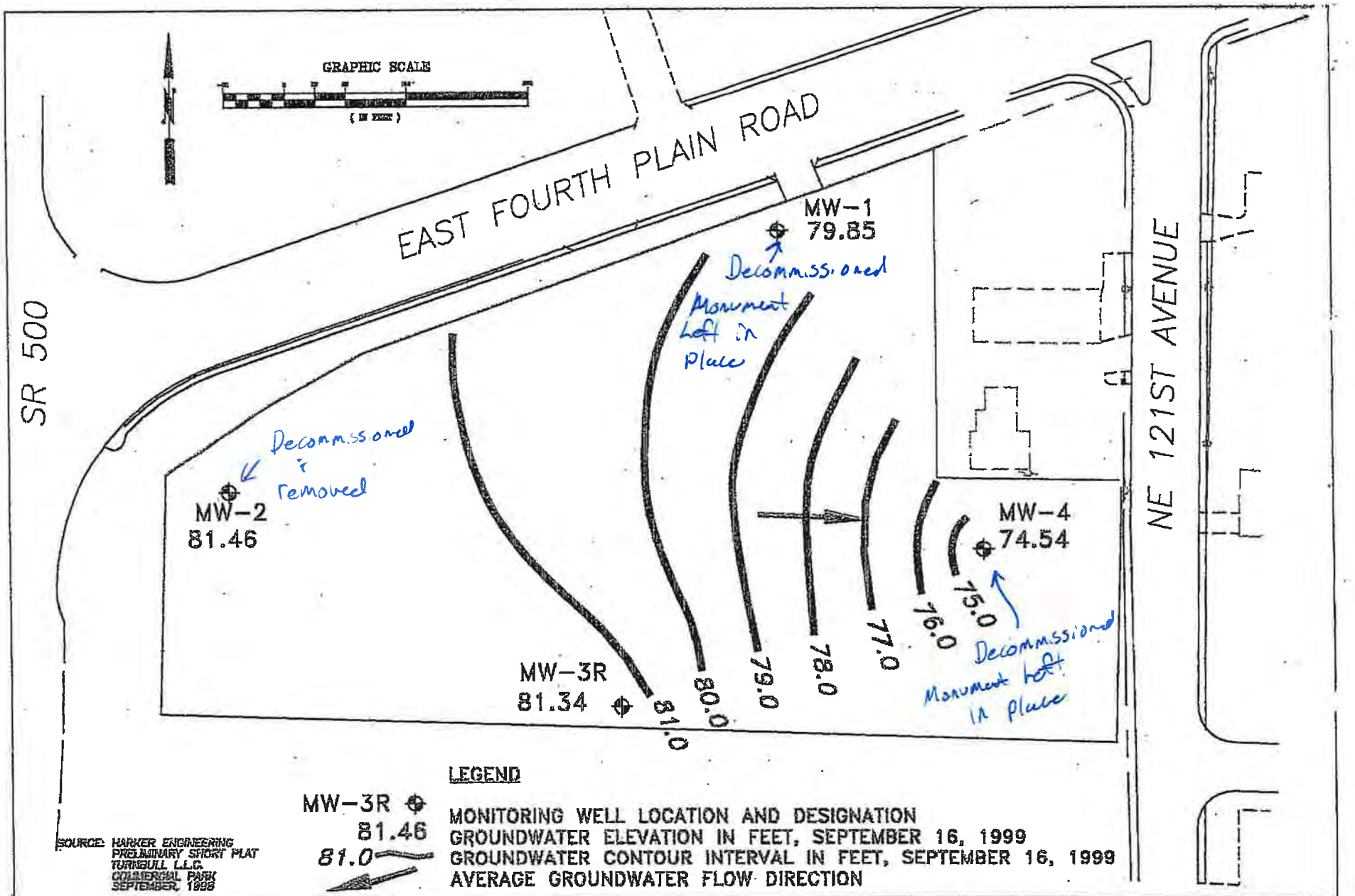
Distribution:

MW-1	
Depth to water	20.5
Depth to bottom	25.8

Attachments: Site Plan

Reviewed by: MH

Signature:



PNG Environmental, Inc. 1339 Commerce Avenue, Suite 308 (360) 414-0669 Longview, Washington 98632 FAX (360) 414-0663	CURRENT DATE: 9-27-99 CAD FILE NAME: 1999FIG1 DRAWN BY: SKB APPROVED BY: CH	GROUNDWATER MONITORING FORMER TURNBULL LANDFILL	GROUNDWATER ELEVATION CONTOURS SEPTEMBER 16, 1999	Project No. 690-01 Figure No. 1

GEODESIGN INC

FIELD REPORT

GDI Project:	Orchard-1-01	Prepared By:	Steven Vandecoevering
Project Name:	Former Turnbull Landfill/ Golden Corral	Date:	03/14/18
Location:	Vancouver, WA	Report #:	14
Arrival:	0825	Departure:	1220
Weather:	Sunny, 40s to 50s	Permit #:	--
Site Visit Requested By:	--	Met With (on site):	Onsite manager
Purpose:	Observation of engineering controls		
Outstanding Issues:	~ Conduit seals not observed ~ Vent risers not marked with signage ~ Vent riser caps not observed ~ Sub-slab probe vaults not observed ~ Sub-slab probes not observed		

0825 – I arrived onsite and met with the Golden Corral manager, who provided access to the project site structure interior, the electrical panel on the southern exterior wall, and the rooftop.

0850 - I observed electrical conduits within the interior and exterior electrical panels. Conduit seals were not observed within the electrical conduits as specified on the methane mitigation system design drawings.

0915 - I began interior confined space methane screening within the project site structure using a calibrated Landtec GEM-2000 landfill gas analyzer (GEM #2). Ten screening locations were selected, which included floor penetrations, cabinets, and electrical outlets. Methane was not detected by GEM #2 at the ten locations. The attached data sheet and site plan summarizes the screening results and screening locations, respectively.

1010 - I proceeded to the rooftop to observe the vent risers. I was unable to distinguish the methane vent risers from the other 3-inch diameter PVC risers observed penetrating roof. The observed vent risers were not labelled with methane signage or fitted with turbine ventilators as specified on the methane mitigation system drawings. I proceeded to the building interior to evaluate which pipes are likely the methane system vent risers. The exposed portions of the vent risers are constructed of 3-inch diameter PVC pipe. Methane signage as required by the methane mitigation system drawings was not observed on the exposed interior pipes.

1145 - Based on the evaluation of the interior pipes, I proceeded to the rooftop to screen for methane in the presumed vent riser locations. The sampling tube of GEM #2 was placed approximately 2.5 feet inside the vent risers. Methane was not detected by GEM #2 in four presumed vent riser locations. The attached data sheet and site plan summarizes the screening data and vent riser locations, respectively.

1205 - I proceeded to the approximate sub-slab probe (SSP) locations. Vaults were not observed at the SSP locations shown on the methane mitigation system design drawings. Using hand tools, I excavated in the landscaped area to locate the western and central SSPs. I excavated approximately 16 inches below ground surface but was unable to locate the SSPs. The landscaped areas were restored to pre-existing conditions.

1220 - I depart the project site.

Distribution: Job File

Attachments: Confirmation sampling log, site plan

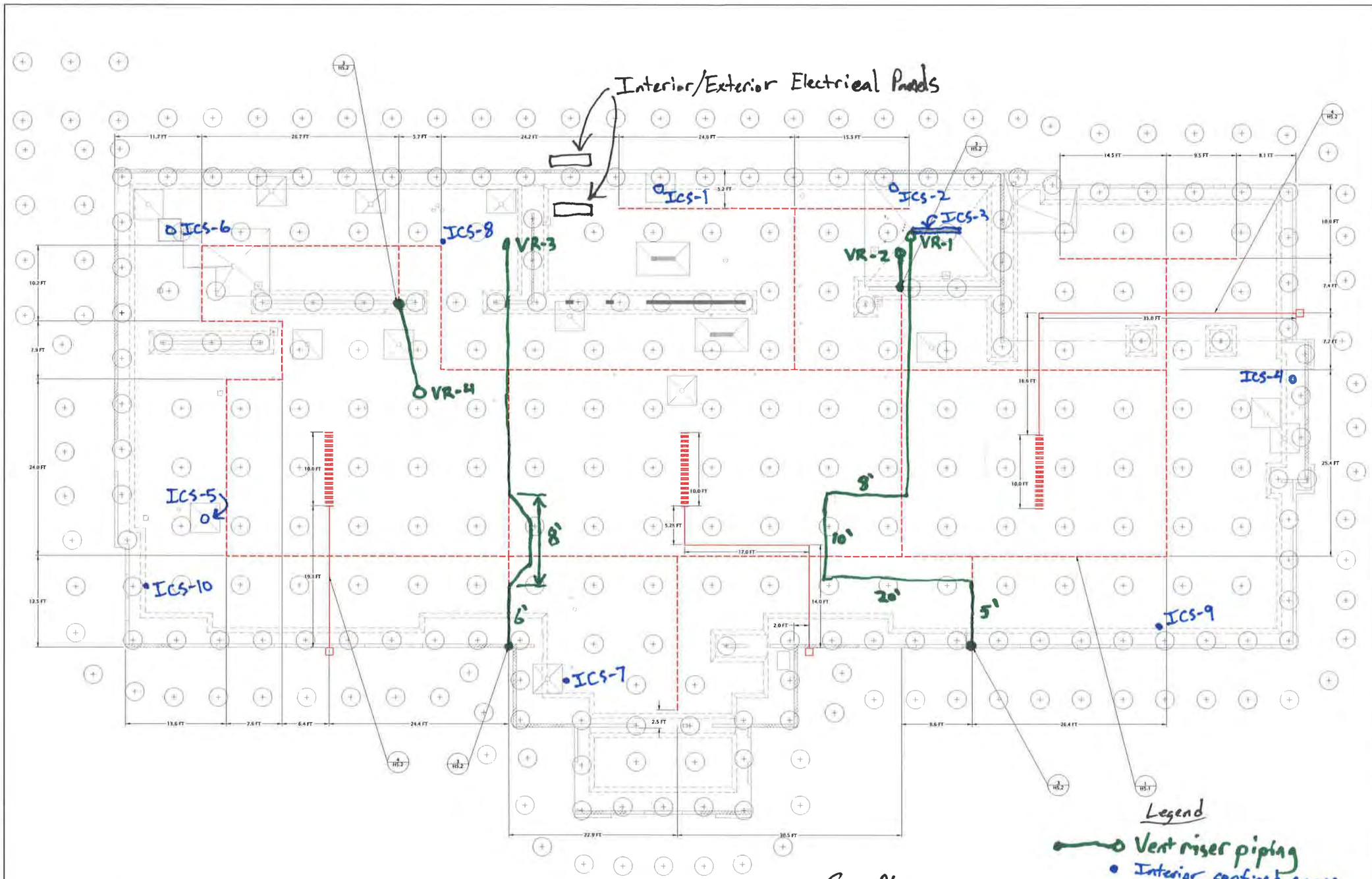
Reviewed by:

This report presents opinions formed as a result of our observation of activities relating to geotechnical engineering or environmental services. We rely on the contractor to comply with the plans and specifications throughout the duration of the project irrespective of the presence of our representative. Our work does not include supervision or direction of the contractor, the contractor's employees or agents. Our firm is not responsible for site safety. This field report is a **DRAFT** representation of our field observations, testing, and preliminary recommendations. The report can only be considered final upon review of the GeoDesign project manager, as indicated by initials in the "Reviewed By" section.

Signature: for Steven Vandecoevering

Confirmation Sampling Data — Orchard-1-01 — 3/14/18

Location	Time	Pressure (inH_2O)	CH_4 (%)	CO_2 (%)	O_2 (%)	Comments
ICS-1	0917	—	0.0	0.1	20.6	Floor drain S of freezer
ICS-2	0922	—	0.0	0.1	20.6	Floor drain below sink
ICS-3	0925	—	0.0	0.0	20.6	Strip drain, washing area
ICS-4	0927	—	0.0	0.1	20.6	Penetration below coffee W
ICS-5	0930	—	0.0	0.0	20.5	Drain by coffee E
ICS-6	0935	—	0.0	0.0	20.4	Mens RR drain
ICS-7	0940	—	0.0	0.0	20.4	Cabinet rear drain
ICS-8	0943	—	0.0	0.1	20.4	SE corner of refrigerator
ICS-9	0948	—	0.0	0.4	19.4	Electrical socket NW area, seating
ICS-10	0951	—	0.0	0.1	20.4	Electrical socket, NE area, seating
~~VR-2~~	~~1023~~	~~—~~	~~0.0~~	~~1.0~~	~~20.1~~	
~~VR-3~~	~~1025~~	~~—~~	0.0	~~0.1~~	~~20.7~~	
VR-1	1153		0.0	0.0	19.6	6' tall, 10' from wall, 12" to nearest inlet
VR-2	1155		0.0	12.6	2.1	6' tall, 14' from wall, 14' to nearest inlet
VR-3	1158		0.0	0.7	19.5	12' from wall, 6' tall, 15' to nearest inlet
VR-4	1200		0.0	0.1	19.9	6' tall, 30' from wall, 14' to nearest inlet



LEGEND:

- SUB-SLAB METHANE MONITORING PROBE
- SUB-SLAB VENT PIPE
- VENT RISER
- GEOPIER
- DETAIL NUMBER OR SECTION LETTER
- REFERENCE NUMBER OF DRAWING WHERE DETAIL IS SHOWN/TAKEN
- TYP.

NOTES:
1. FIELD ROUTE VENT RISER TO ROOF.
2. COORDINATE ROUTING AND ROOF PENETRATION WITH ARCHITECT.

Note: not to scale, measurements & locations are approximate

Site Plan
Orchard-1-01
3/14/18

Legend
- Vent riser piping
- Interior confined space

N

0 5 10
(SCALE IN FEET)

SITE PLAN BASED ON DRAWING PROVIDED BY LMHT ASSOCIATES, AUGUST 2, 2016

METHANE MITIGATION SYSTEM - LOW-PERMEABLE MEMBRANE AND GRAVEL BLANKET

PROPOSED DEV. - FORMER TURNBULL LANDFILL
VANCOUVER, WA

ORCHARD-1-01

JANUARY 2017

H2.1

CHECKED BY:
APPROVED BY:
DESIGNED BY: GDI ENG
DRAWN BY: GDI CAD

NO.	DATE	REVISION DESCRIPTION	BY	APPR.

GEODESIGN INC
9450 SW Commerce Circle - Suite 300
Wilsonville OR 97070
503.968.8787 www.geodesigninc.com

SIGNED 1/25/2017

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GEODESIGN INC

FIELD REPORT

GDI Project:	Orchard-1-01	Prepared By:	Steven Vandecoevering
Project Name:	Former Turnbull Landfill/ Golden Corral	Date:	07/26/18
Location:	Vancouver, WA	Report #:	15
Arrival:	0750	Departure:	1045
Weather:	Sunny, 60s to 70s	Permit #:	--
Site Visit Requested By:	--	Met With (on site):	Jerry Zawideh
Purpose:	Observation of engineering controls		
Outstanding Issues:	~ Conduit seals not observed ~ Vent risers not marked with signage		

0750 – I arrived onsite and met with the Golden Corral manager, Jerry Zawideh, who provided access to the electrical panels in the kitchen area and the rooftop. I observed pipe runs inside the building for methane signage. Methane signage as required by the methane mitigation system drawings was not observed on exposed pipes within the building. I observed electrical conduits within the interior and exterior electrical panels. Conduit seals were not observed within the electrical conduits as specified on the methane mitigation system design.

0835 - I proceeded to the rooftop to observe the vent risers. Three vent risers were observed on the roof with turbine ventilators, extended approximately 6 feet above the roof, and were greater than 10 feet from the closest air intakes. I applied "Methane Vent" stickers to the vent risers. I screened the vent risers for methane, placing the sampling tube of GEM #2 approximately 2.5 feet inside the vent risers. Methane was not detected by GEM #2 in the three methane vent risers. The attached data sheet and site plan summarizes the screening data and vent riser locations, respectively. I was unable to identify the fourth vent riser because the turbine ventilator was not installed.

[Subsequent to this field report, GeoDesign confirmed with the contractor that two vent risers were combined into one above the slab and prior to penetrating the roof.]

0920 - I proceeded to the sub-slab probe (SSP) locations. The three SSPs were constructed in general accordance with the methane mitigation system design drawings. I measured sub-slab pressure with a Fluke manometer and purged approximately two casing volumes of air from each probe using two Landtec GEM 2000+'s in parallel, then collected methane readings from each probe using GEM #2. Methane was not detected in the SSPs. The attached data sheet and site plan summarizes the screening data and SSP locations, respectively.

1020 – I indicated to Jerry Zawideh that conduit seals were not observed and should be placed in conduits where methane could accumulate and that vent riser pipe runs were not marked with signage and should be marked every 5 feet. I left approximately five "Methane Vent" stickers with Jerry before I left the project site.

1045 - I departed the project site.

Distribution: Job File

Attachments: Subslab monitoring form, site plan

Reviewed by:

This report presents opinions formed as a result of our observation of activities relating to geotechnical engineering or environmental services. We rely on the contractor to comply with the plans and specifications throughout the duration of the project irrespective of the presence of our representative. Our work does not include supervision or direction of the contractor, the contractor's employees or agents. Our firm is not responsible for site safety. This field report is a **DRAFT** representation of our field observations, testing, and preliminary recommendations. The report can only be considered final upon review of the GeoDesign project manager, as indicated by initials in the "Reviewed By" section.

Signature: for Steven Vandecoevering

4640

SUB-SLAB MONITORING FORM

GEODESIGN NZ

Project No: Orchard-1-01 Date: 7/26/18

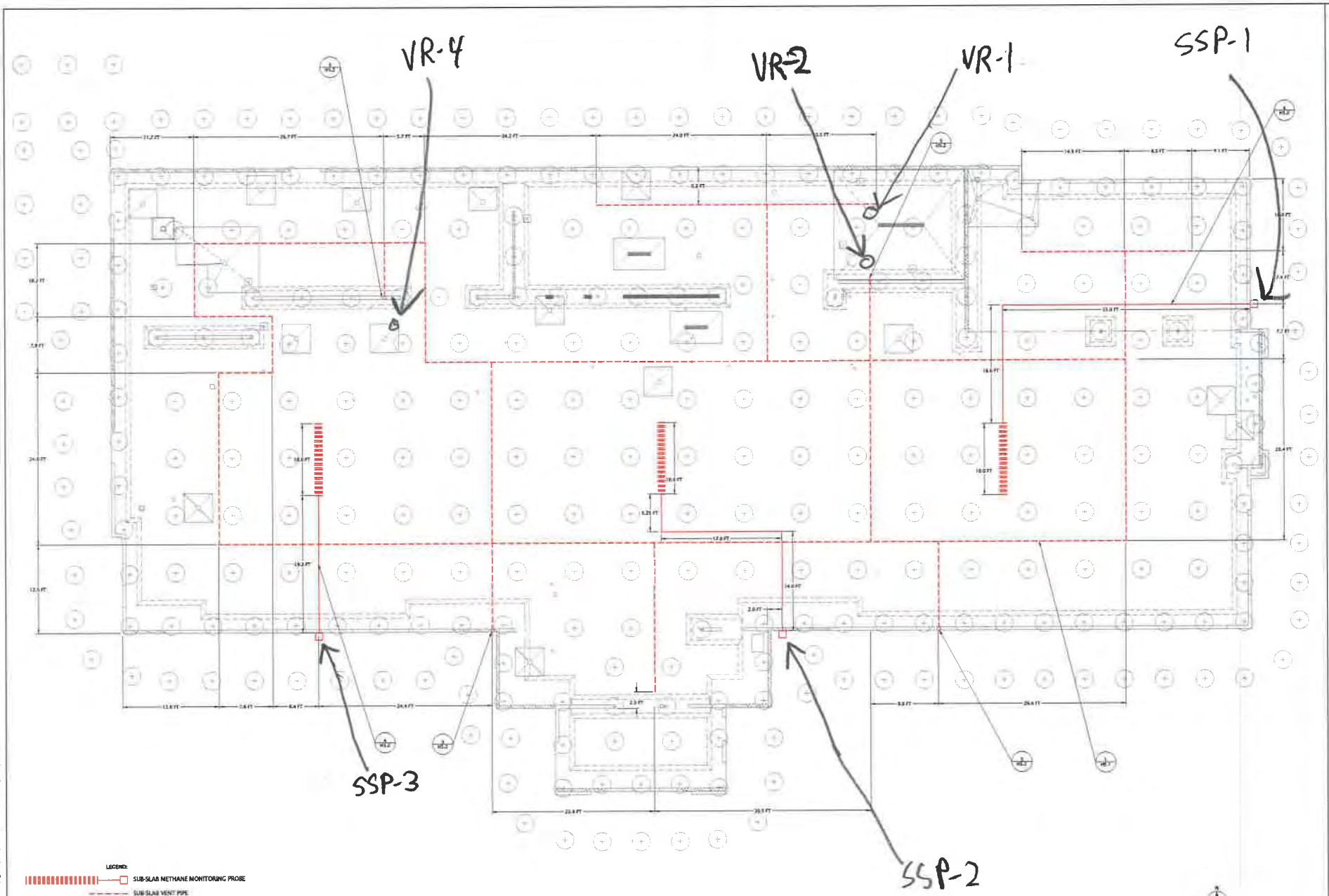
Site: Golden Corral Weather: Clear, 60s to 70s

Personnel: SRV Barometric Pressure (mbar): 30.08 inHg (1019 mbar)

Time	Probe ID	Location	Pressure (iow)	CH4 (pbv)	CO2 (pbv)	O2 (pbv)	Probe volume (ml)	Notes
0937	SSP-1	W side of building	-0.005	0.0	0.0	21.5	2320	5000 mL purged
0949	SSP-2	N side, W of front door	0.000	0.0	0.0	21.7	1740	4000 mL purged
0957	SSP-3	N side, E of front door	0.000	0.0	0.0	21.7	1160	2500 mL purged
VR-2@0842				0.0	0.0	21.3		Turbine present, methane vent sticker applied
VR-1@0846				0.0	0.0	21.3		
VR-4@0849				0.0	0.0	21.2		

Notes: Two probe volumes purged prior to collecting readings. Probes purged with two parallel GEM 2000+'s, which according to the manufacturer will pump approximately 300 ml/min at open flow. Readings taken w/ GEM #2, calibrated @ 0755 on 7/26/18

Pressure in probe while purging was approx -3.9 iow @ SSV-1
-0.12 iow @ SSV-2
-0.04 iow @ SSV-3



LEGEND:
- SUB-SLAB METHANE MONITORING PROBE
- SUB-SLAB VENT PIPE
- VENT RISER
- GEOPIER
- DETAIL NUMBER OR SECTION LETTER
- REFERENCE NUMBER OF DRAWING WHERE DETAIL IS SHOWN/TAKEN

NOTES:
1. FIELD ROUTE VENT RISER TO ROOF
2. COORDINATE ROUTING AND ROOF PENETRATION WITH ARCHITECT.

(SCALE IN FEET)

SITE PLAN BASED ON DRAWING PROVIDED BY LMHT ASSOCIATES, AUGUST 2, 2016

METHANE MITIGATION SYSTEM - LOW-PERMEABLE MEMBRANE AND GRAVEL BLANKET

PROPOSED DEV. - FORMER TURNBULL LANDFILL
VANCOUVER, WA

ORCHARD-1-01

JANUARY 2017

H2.1

DESIGNED BY: GDI ENG
DRAWN BY: GDI CAD
CHECKED BY:
APPROVED BY:

NO.	DATE	REVISION DESCRIPTION	BY	APP'D

GEODESIGN INC
9450 SW Commerce Circle - Suite 300
Wilsonville OR 97070
503.968.8787 www.geodesigninc.com

SIGNED 1/25/2017

APPENDIX C

STAKING FOR ENGINEERED AGGREGATE PIERS. PHOTOGRAPH TAKEN FACING SOUTHWEST.

AUGER FOR ENGINEERED AGGREGATE PIERS. PHOTOGRAPH TAKEN FACING NORTH.

GEODESIGN INC
9450 SW Commerce Circle - Suite 300
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ORCHARD-1-01	**PROJECT SITE PHOTOGRAPHS**	
JULY 2019	PROPOSED DEV. - FORMER TURNBULL LANDFILL VANCOUVER, WA	**FIGURE C-1**

SUB-SLAB VENT PIPE LAYOUT. PHOTOGRAPH TAKEN FACING SOUTHEAST.

CLEARANCE FOR VENT RISER.

APPLICATION OF LOW-PERMEABLE MEMBRANE. PHOTOGRAPH TAKEN FACING EAST.

APPLICATION OF LOW-PERMEABLE MEMBRANE AND SMOKE TEST SETUP. PHOTOGRAPH TAKEN FACING SOUTHWEST.

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ORCHARD-1-01	**PROJECT SITE PHOTOGRAPHS**	
JULY 2019	PROPOSED DEV. - FORMER TURNBULL LANDFILL VANCOUVER, WA	**FIGURE C-3**

LOW-PERMEABLE MEMBRANE AND SMOKE TEST SETUP. PHOTOGRAPH TAKEN FACING NORTHEAST.

PROTECTIVE SHEETING OVER LOW-PERMEABLE MEMBRANE. PHOTOGRAPH TAKEN FACING SOUTHWEST.

PROTECTIVE SHEETING OVER LOW-PERMEABLE MEMBRANE. PHOTOGRAPH TAKEN FACING NORTH.

ABANDONMENT OF MONITORING WELL MW-2. PHOTOGRAPH TAKEN FACING NORTH.

TYPICAL TRENCH DAM.

CONDUIT SEALS IN INTERIOR ELECTRICAL PANEL.

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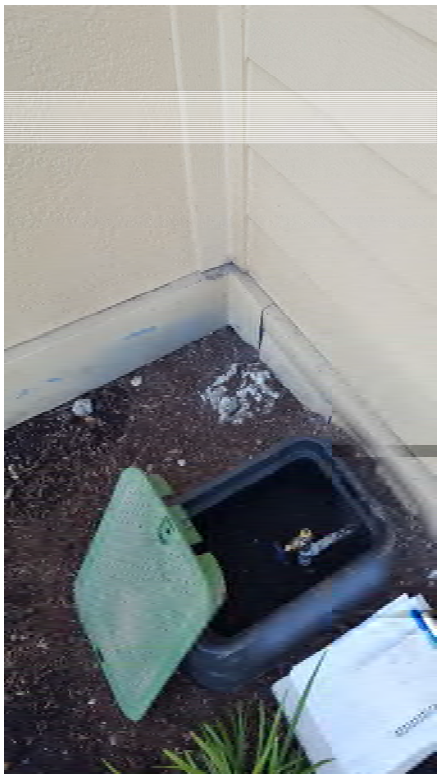
ORCHARD-1-01	**PROJECT SITE PHOTOGRAPHS**	
JULY 2019	PROPOSED DEV. - FORMER TURNBULL LANDFILL VANCOUVER, WA	**FIGURE C-6**

VENT RISERS WITH WIND TURBINES ON WEST SIDE OF BUILDING. PHOTOGRAPH TAKEN FACING SOUTH.

VENT RISER WITH WIND TURBINE ON EAST SIDE OF BUILDING. PHOTOGRAPH TAKEN FACING SOUTHEAST.



TYPICAL SUB-SLAB MONITORING PROBE.

METHANE VERIFICATION SCREENING IN FLOOR DRAIN.

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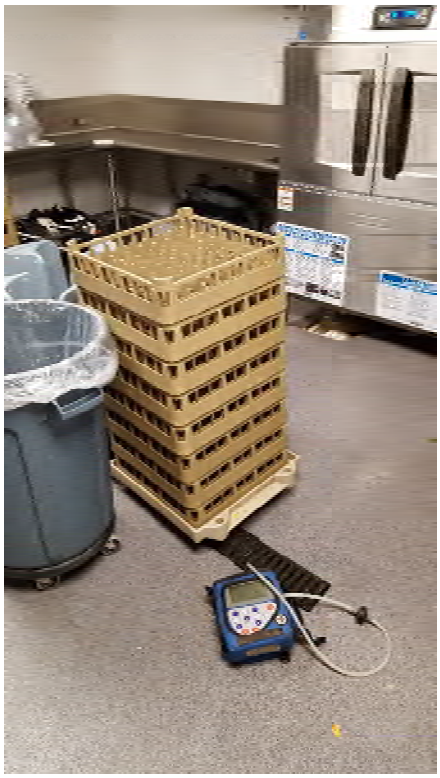
ORCHARD-1-01	**PROJECT SITE PHOTOGRAPHS**	
JULY 2019	PROPOSED DEV. - FORMER TURNBULL LANDFILL VANCOUVER, WA	**FIGURE C-8**



METHANE VERIFICATION SCREENING IN TRENCH DRAIN.

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ORCHARD-1-01	**PROJECT SITE PHOTOGRAPHS**	
JULY 2019	PROPOSED DEV. - FORMER TURNBULL LANDFILL VANCOUVER, WA	**FIGURE C-9**

APPENDIX D

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Monday, July 3, 2017

Mike Coenen
GeoDesign, Inc.
9450 SW Commerce Circle
Wilsonville, OR 97070

RE: Orchard-1-01 / [none]

Enclosed are the results of analyses for work order A7F0504, which was received by the laboratory on 6/16/2017 at 1:15:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: pnerenberg@apex-labs.com, or by phone at 503-718-2323.

Apex Laboratories

Philip Nerenberg, Lab Director

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Comp-1	A7F0504-01	Soil	06/16/17 11:20	06/16/17 13:15
Comp-2	A7F0504-02	Soil	06/16/17 11:30	06/16/17 13:15

Apex Laboratories

Philip Nerenberg, Lab Director

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503-718-0333 Fax

GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Comp-1 (A7F0504-01)			**Matrix: Soil**		**Batch: 7060765**			
Diesel	ND	---	25.0	mg/kg dry	1	06/19/17 21:15	NWTPH-Dx	
Oil	**145**	---	50.0	"	"	"	"	
Surrogate: o-Terphenyl (Surr)			*Recovery: 91 %*	*Limits: 50-150 %*	"	"	"	
Comp-2 (A7F0504-02)			**Matrix: Soil**		**Batch: 7060765**			
Diesel	ND	---	25.0	mg/kg dry	1	06/19/17 21:35	NWTPH-Dx	
Oil	**244**	---	50.0	"	"	"	"	
Surrogate: o-Terphenyl (Surr)			*Recovery: 87 %*	*Limits: 50-150 %*	"	"	"	

Apex Laboratories

Philip Nerenberg, Lab Director

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

ANALYTICAL SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Comp-1 (A7F0504-01)			**Matrix: Soil**		**Batch: 7060825**			
Gasoline Range Organics	ND	---	5.75	mg/kg dry	50	06/21/17 12:45	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)			*Recovery: 106 %*	*Limits: 50-150 %*	1	"	"	
1,4-Difluorobenzene (Sur)			*97 %*	*Limits: 50-150 %*	"	"	"	
Comp-2 (A7F0504-02)			**Matrix: Soil**		**Batch: 7060825**			
Gasoline Range Organics	ND	---	6.42	mg/kg dry	50	06/21/17 13:38	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)			*Recovery: 107 %*	*Limits: 50-150 %*	1	"	"	
1,4-Difluorobenzene (Sur)			*97 %*	*Limits: 50-150 %*	"	"	"	

Apex Laboratories

Philip Nerenberg, Lab Director

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Comp-1 (A7F0504-01)			**Matrix: Soil**		**Batch: 7060825**			
Acetone	ND	---	1.15	mg/kg dry	50	06/21/17 12:45	5035A/8260B	
Benzene	ND	---	0.0115	"	"	"	"	
Bromobenzene	ND	---	0.0287	"	"	"	"	
Bromochloromethane	ND	---	0.0575	"	"	"	"	
Bromodichloromethane	ND	---	0.115	"	"	"	"	
Bromoform	ND	---	0.115	"	"	"	"	
Bromomethane	ND	---	0.575	"	"	"	"	
2-Butanone (MEK)	ND	---	0.575	"	"	"	"	
n-Butylbenzene	ND	---	0.0575	"	"	"	"	
sec-Butylbenzene	ND	---	0.0575	"	"	"	"	
tert-Butylbenzene	ND	---	0.0575	"	"	"	"	
Carbon tetrachloride	ND	---	0.0575	"	"	"	"	
Chlorobenzene	ND	---	0.0287	"	"	"	"	
Chloroethane	ND	---	0.575	"	"	"	"	
Chloroform	ND	---	0.0575	"	"	"	"	
Chloromethane	ND	---	0.287	"	"	"	"	
2-Chlorotoluene	ND	---	0.0575	"	"	"	"	
4-Chlorotoluene	ND	---	0.0575	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	---	0.287	"	"	"	"	
Dibromochloromethane	ND	---	0.115	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	---	0.0575	"	"	"	"	
Dibromomethane	ND	---	0.0575	"	"	"	"	
1,2-Dichlorobenzene	ND	---	0.0287	"	"	"	"	
1,3-Dichlorobenzene	ND	---	0.0287	"	"	"	"	
1,4-Dichlorobenzene	ND	---	0.0287	"	"	"	"	
Dichlorodifluoromethane	ND	---	0.115	"	"	"	"	
1,1-Dichloroethane	ND	---	0.0287	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	---	0.0287	"	"	"	"	
1,1-Dichloroethene	ND	---	0.0287	"	"	"	"	
cis-1,2-Dichloroethene	ND	---	0.0287	"	"	"	"	
trans-1,2-Dichloroethene	ND	---	0.0287	"	"	"	"	
1,2-Dichloropropane	ND	---	0.0287	"	"	"	"	
1,3-Dichloropropane	ND	---	0.0575	"	"	"	"	
2,2-Dichloropropane	ND	---	0.0575	"	"	"	"	
1,1-Dichloropropene	ND	---	0.0575	"	"	"	"	

Apex Laboratories

Philip Nerenberg, Lab Director

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Comp-1 (A7F0504-01)			**Matrix: Soil**		**Batch: 7060825**			
cis-1,3-Dichloropropene	ND	---	0.0575	mg/kg dry	50	"	5035A/8260B	
trans-1,3-Dichloropropene	ND	---	0.0575	"	"	"	"	
Ethylbenzene	ND	---	0.0287	"	"	"	"	
Hexachlorobutadiene	ND	---	0.115	"	"	"	"	
2-Hexanone	ND	---	0.575	"	"	"	"	
Isopropylbenzene	ND	---	0.0575	"	"	"	"	
4-Isopropyltoluene	ND	---	0.0575	"	"	"	"	
4-Methyl-2-pentanone (MiBK)	ND	---	0.575	"	"	"	"	
Methyl tert-butyl ether (MTBE)	ND	---	0.0575	"	"	"	"	
Methylene chloride	ND	---	0.287	"	"	"	"	
Naphthalene	ND	---	0.115	"	"	"	"	
n-Propylbenzene	ND	---	0.0287	"	"	"	"	
Styrene	ND	---	0.0575	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	---	0.0287	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	---	0.0575	"	"	"	"	
Tetrachloroethene (PCE)	ND	---	0.0287	"	"	"	"	
Toluene	ND	---	0.0575	"	"	"	"	
1,2,3-Trichlorobenzene	ND	---	0.287	"	"	"	"	
1,2,4-Trichlorobenzene	ND	---	0.287	"	"	"	"	
1,1,1-Trichloroethane	ND	---	0.0287	"	"	"	"	
1,1,2-Trichloroethane	ND	---	0.0287	"	"	"	"	
Trichloroethene (TCE)	ND	---	0.0287	"	"	"	"	
Trichlorofluoromethane	ND	---	0.115	"	"	"	"	
1,2,3-Trichloropropane	ND	---	0.0575	"	"	"	"	
1,2,4-Trimethylbenzene	ND	---	0.0575	"	"	"	"	
1,3,5-Trimethylbenzene	ND	---	0.0575	"	"	"	"	
Vinyl chloride	ND	---	0.0287	"	"	"	"	
m,p-Xylene	ND	---	0.0575	"	"	"	"	
o-Xylene	ND	---	0.0287	"	"	"	"	
Surrogate: 1,4-Difluorobenzene (Surr)			*Recovery: 105 %*	*Limits: 70-130 %*	1	"	"	
Toluene-d8 (Surr)			*99 %*	*Limits: 70-130 %*	"	"	"	
4-Bromofluorobenzene (Surr)			*101 %*	*Limits: 70-130 %*	"	"	"	

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Comp-2 (A7F0504-02)			**Matrix: Soil**		**Batch: 7060825**			
Acetone	ND	---	1.28	mg/kg dry	50	06/21/17 13:38	5035A/8260B	
Benzene	ND	---	0.0128	"	"	"	"	
Bromobenzene	ND	---	0.0321	"	"	"	"	
Bromochloromethane	ND	---	0.0642	"	"	"	"	
Bromodichloromethane	ND	---	0.128	"	"	"	"	
Bromoform	ND	---	0.128	"	"	"	"	
Bromomethane	ND	---	0.642	"	"	"	"	
2-Butanone (MEK)	ND	---	0.642	"	"	"	"	
n-Butylbenzene	ND	---	0.0642	"	"	"	"	
sec-Butylbenzene	ND	---	0.0642	"	"	"	"	
tert-Butylbenzene	ND	---	0.0642	"	"	"	"	
Carbon tetrachloride	ND	---	0.0642	"	"	"	"	
Chlorobenzene	ND	---	0.0321	"	"	"	"	
Chloroethane	ND	---	0.642	"	"	"	"	
Chloroform	ND	---	0.0642	"	"	"	"	
Chloromethane	ND	---	0.321	"	"	"	"	
2-Chlorotoluene	ND	---	0.0642	"	"	"	"	
4-Chlorotoluene	ND	---	0.0642	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	---	0.321	"	"	"	"	
Dibromochloromethane	ND	---	0.128	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	---	0.0642	"	"	"	"	
Dibromomethane	ND	---	0.0642	"	"	"	"	
1,2-Dichlorobenzene	ND	---	0.0321	"	"	"	"	
1,3-Dichlorobenzene	ND	---	0.0321	"	"	"	"	
1,4-Dichlorobenzene	ND	---	0.0321	"	"	"	"	
Dichlorodifluoromethane	ND	---	0.128	"	"	"	"	
1,1-Dichloroethane	ND	---	0.0321	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	---	0.0321	"	"	"	"	
1,1-Dichloroethene	ND	---	0.0321	"	"	"	"	
cis-1,2-Dichloroethene	ND	---	0.0321	"	"	"	"	
trans-1,2-Dichloroethene	ND	---	0.0321	"	"	"	"	
1,2-Dichloropropane	ND	---	0.0321	"	"	"	"	
1,3-Dichloropropane	ND	---	0.0642	"	"	"	"	
2,2-Dichloropropane	ND	---	0.0642	"	"	"	"	
1,1-Dichloropropene	ND	---	0.0642	"	"	"	"	

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Comp-2 (A7F0504-02)			**Matrix: Soil**		**Batch: 7060825**			
cis-1,3-Dichloropropene	ND	---	0.0642	mg/kg dry	50	"	5035A/8260B	
trans-1,3-Dichloropropene	ND	---	0.0642	"	"	"	"	
Ethylbenzene	ND	---	0.0321	"	"	"	"	
Hexachlorobutadiene	ND	---	0.128	"	"	"	"	
2-Hexanone	ND	---	0.642	"	"	"	"	
Isopropylbenzene	ND	---	0.0642	"	"	"	"	
4-Isopropyltoluene	ND	---	0.0642	"	"	"	"	
4-Methyl-2-pentanone (MiBK)	ND	---	0.642	"	"	"	"	
Methyl tert-butyl ether (MTBE)	ND	---	0.0642	"	"	"	"	
Methylene chloride	ND	---	0.321	"	"	"	"	
Naphthalene	ND	---	0.128	"	"	"	"	
n-Propylbenzene	ND	---	0.0321	"	"	"	"	
Styrene	ND	---	0.0642	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	---	0.0321	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	---	0.0642	"	"	"	"	
Tetrachloroethene (PCE)	ND	---	0.0321	"	"	"	"	
Toluene	ND	---	0.0642	"	"	"	"	
1,2,3-Trichlorobenzene	ND	---	0.321	"	"	"	"	
1,2,4-Trichlorobenzene	ND	---	0.321	"	"	"	"	
1,1,1-Trichloroethane	ND	---	0.0321	"	"	"	"	
1,1,2-Trichloroethane	ND	---	0.0321	"	"	"	"	
Trichloroethene (TCE)	ND	---	0.0321	"	"	"	"	
Trichlorofluoromethane	ND	---	0.128	"	"	"	"	
1,2,3-Trichloropropane	ND	---	0.0642	"	"	"	"	
1,2,4-Trimethylbenzene	ND	---	0.0642	"	"	"	"	
1,3,5-Trimethylbenzene	ND	---	0.0642	"	"	"	"	
Vinyl chloride	ND	---	0.0321	"	"	"	"	
m,p-Xylene	ND	---	0.0642	"	"	"	"	
o-Xylene	ND	---	0.0321	"	"	"	"	
Surrogate: 1,4-Difluorobenzene (Surr)			*Recovery: 105 %*	*Limits: 70-130 %*	1	"	"	
Toluene-d8 (Surr)			*99 %*	*Limits: 70-130 %*	"	"	"	
4-Bromofluorobenzene (Surr)			*102 %*	*Limits: 70-130 %*	"	"	"	

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Philip Nerenberg, Lab Director

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

ANALYTICAL SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Comp-1 (A7F0504-01)			**Matrix: Soil**		**Batch: 7060742**			**C-07**
Aroclor 1016	ND	---	0.0403	mg/kg dry	1	06/19/17 16:44	EPA 8082A	R-02
Aroclor 1221	ND	---	0.0112	"	"	"	"	
Aroclor 1232	ND	---	0.0839	"	"	"	"	R-02
Aroclor 1242	ND	---	0.0515	"	"	"	"	R-02
Aroclor 1248	ND	---	0.0582	"	"	"	"	R-02
Aroclor 1254	ND	---	0.0235	"	"	"	"	R-02
Aroclor 1260	ND	---	0.0112	"	"	"	"	
Surrogate: Decachlorobiphenyl (Surr)			*Recovery: 97 %*	*Limits: 72-126 %*	"	"	"	
Comp-2 (A7F0504-02RE1)			**Matrix: Soil**		**Batch: 7060742**			**C-07**
Aroclor 1016	ND	---	0.228	mg/kg dry	20	06/21/17 10:14	EPA 8082A	
Aroclor 1221	ND	---	0.228	"	"	"	"	
Aroclor 1232	ND	---	0.228	"	"	"	"	
Aroclor 1242	**3.73**	---	0.228	"	"	"	"	
Aroclor 1248	ND	---	0.228	"	"	"	"	
Aroclor 1254	ND	---	0.228	"	"	"	"	
Aroclor 1260	ND	---	0.228	"	"	"	"	
Surrogate: Decachlorobiphenyl (Surr)			*Recovery: 107 %*	*Limits: 72-126 %*	"	"	"	*S-05*

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

ANALYTICAL SAMPLE RESULTS

Semivolatile Organic Compounds by EPA 8270D

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Comp-1 (A7F0504-01RE2)			**Matrix: Soil**		**Batch: 7060752**			
Acenaphthene	ND	---	0.306	mg/kg dry	1	06/19/17 17:49	EPA 8270D	
Acenaphthylene	ND	---	0.306	"	"	"	"	
Aniline	ND	---	0.306	"	"	"	"	
Anthracene	ND	---	0.306	"	"	"	"	
Azobenzene (1,2-DPH)	ND	---	0.306	"	"	"	"	
Benz(a)anthracene	ND	---	0.306	"	"	"	"	
Benzo(a)pyrene	ND	---	0.306	"	"	"	"	
Benzo(b)fluoranthene	ND	---	0.306	"	"	"	"	
Benzo(k)fluoranthene	ND	---	0.306	"	"	"	"	
Benzo(g,h,i)perylene	ND	---	0.306	"	"	"	"	
Benzoic acid	ND	---	1.53	"	"	"	"	
Benzyl alcohol	ND	---	0.306	"	"	"	"	
Bis(2-Chloroethoxy) methane	ND	---	0.306	"	"	"	"	
Bis(2-Chloroethyl) ether	ND	---	0.306	"	"	"	"	
Bis(2-Chloroisopropyl) ether	ND	---	0.306	"	"	"	"	
Bis(2-Ethylhexyl) adipate	ND	---	0.306	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	---	0.306	"	"	"	"	
4-Bromophenyl phenyl ether	ND	---	0.306	"	"	"	"	
Butyl benzyl phthalate	ND	---	0.306	"	"	"	"	
Carbazole	ND	---	0.306	"	"	"	"	
4-Chloroaniline	ND	---	0.306	"	"	"	"	
4-Chloro-3-methylphenol	ND	---	0.306	"	"	"	"	
2-Chloronaphthalene	ND	---	0.306	"	"	"	"	
2-Chlorophenol	ND	---	0.306	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	---	0.306	"	"	"	"	
Chrysene	ND	---	0.306	"	"	"	"	
Dibenz(a,h)anthracene	ND	---	0.306	"	"	"	"	
Dibenzofuran	ND	---	0.306	"	"	"	"	
1,2-Dichlorobenzene	ND	---	0.306	"	"	"	"	
1,3-Dichlorobenzene	ND	---	0.306	"	"	"	"	
1,4-Dichlorobenzene	ND	---	0.306	"	"	"	"	
2,4-Dichlorophenol	ND	---	0.306	"	"	"	"	
Di-n-butylphthalate	ND	---	0.306	"	"	"	"	
Diethylphthalate	ND	---	0.306	"	"	"	"	
Dimethylphthalate	ND	---	0.306	"	"	"	"	

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

ANALYTICAL SAMPLE RESULTS

Semivolatile Organic Compounds by EPA 8270D

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Comp-1 (A7F0504-01RE2)			**Matrix: Soil**		**Batch: 7060752**			
2,4-Dimethylphenol	ND	---	0.306	mg/kg dry	1	"	EPA 8270D	
1,2-Dinitrobenzene	ND	---	0.306	"	"	"	"	
1,3-Dinitrobenzene	ND	---	0.306	"	"	"	"	
1,4-Dinitrobenzene	ND	---	0.306	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	---	0.735	"	"	"	"	
2,4-Dinitrophenol	ND	---	0.306	"	"	"	"	
2,4-Dinitrotoluene	ND	---	0.306	"	"	"	"	
2,6-Dinitrotoluene	ND	---	0.306	"	"	"	"	
Di-n-octyl phthalate	ND	---	0.306	"	"	"	"	
Fluoranthene	ND	---	0.306	"	"	"	"	
Fluorene	ND	---	0.306	"	"	"	"	
Hexachlorobenzene	ND	---	0.306	"	"	"	"	
Hexachlorobutadiene	ND	---	0.306	"	"	"	"	
Hexachlorocyclopentadiene	ND	---	0.306	"	"	"	"	
Hexachloroethane	ND	---	0.306	"	"	"	"	
Indeno(1,2,3-cd)pyrene	ND	---	0.306	"	"	"	"	
Isophorone	ND	---	0.306	"	"	"	"	
1-Methylnaphthalene	ND	---	0.306	"	"	"	"	
2-Methylnaphthalene	ND	---	0.306	"	"	"	"	
2-Methylphenol	ND	---	0.306	"	"	"	"	
3+4-Methylphenol(s)	ND	---	0.306	"	"	"	"	
Naphthalene	ND	---	0.306	"	"	"	"	
2-Nitroaniline	ND	---	0.306	"	"	"	"	
3-Nitroaniline	ND	---	0.306	"	"	"	"	
4-Nitroaniline	ND	---	0.306	"	"	"	"	
Nitrobenzene	ND	---	0.306	"	"	"	"	
2-Nitrophenol	ND	---	0.306	"	"	"	"	
4-Nitrophenol	ND	---	0.306	"	"	"	"	
N-Nitrosodimethylamine	ND	---	0.306	"	"	"	"	
N-Nitroso-di-n-propylamine	ND	---	0.306	"	"	"	"	
N-Nitrosodiphenylamine	ND	---	0.306	"	"	"	"	
Pentachlorophenol (PCP)	ND	---	0.306	"	"	"	"	
Phenanthrene	ND	---	0.306	"	"	"	"	
Phenol	ND	---	0.306	"	"	"	"	
Pyrene	ND	---	0.306	"	"	"	"	

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

ANALYTICAL SAMPLE RESULTS

Semivolatile Organic Compounds by EPA 8270D

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Comp-1 (A7F0504-01RE2)			**Matrix: Soil**		**Batch: 7060752**			
Pyridine	ND	---	0.613	mg/kg dry	1	"	EPA 8270D	
2,3,4,6-Tetrachlorophenol	ND	---	0.306	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	---	0.306	"	"	"	"	
1,2,4-Trichlorobenzene	ND	---	0.306	"	"	"	"	
2,4,5-Trichlorophenol	ND	---	0.306	"	"	"	"	
2,4,6-Trichlorophenol	ND	---	0.306	"	"	"	"	
Surrogate: Nitrobenzene-d5 (Surr)			*Recovery: 73 %*	*Limits: 37-122 %*	"	"	"	
2-Fluorobiphenyl (Surr)			*75 %*	*Limits: 44-115 %*	"	"	"	
Phenol-d6 (Surr)			*72 %*	*Limits: 33-122 %*	"	"	"	
p-Terphenyl-d14 (Surr)			*81 %*	*Limits: 54-127 %*	"	"	"	
2-Fluorophenol (Surr)			*73 %*	*Limits: 35-115 %*	"	"	"	
2,4,6-Tribromophenol (Surr)			*84 %*	*Limits: 39-132 %*	"	"	"	
Comp-2 (A7F0504-02RE1)			**Matrix: Soil**		**Batch: 7060752**			
Acenaphthene	ND	---	1.18	mg/kg dry	4	06/19/17 19:01	EPA 8270D	
Acenaphthylene	ND	---	1.18	"	"	"	"	
Aniline	ND	---	1.18	"	"	"	"	
Anthracene	ND	---	1.18	"	"	"	"	
Azobenzene (1,2-DPH)	ND	---	1.18	"	"	"	"	
Benz(a)anthracene	ND	---	1.18	"	"	"	"	
Benzo(a)pyrene	ND	---	1.18	"	"	"	"	
Benzo(b)fluoranthene	ND	---	1.18	"	"	"	"	
Benzo(k)fluoranthene	ND	---	1.18	"	"	"	"	
Benzo(g,h,i)perylene	ND	---	1.18	"	"	"	"	
Benzoic acid	ND	---	5.91	"	"	"	"	
Benzyl alcohol	ND	---	1.18	"	"	"	"	
Bis(2-Chloroethoxy) methane	ND	---	1.18	"	"	"	"	
Bis(2-Chloroethyl) ether	ND	---	1.18	"	"	"	"	
Bis(2-Chloroisopropyl) ether	ND	---	1.18	"	"	"	"	
Bis(2-Ethylhexyl) adipate	ND	---	1.18	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	---	1.18	"	"	"	"	
4-Bromophenyl phenyl ether	ND	---	1.18	"	"	"	"	
Butyl benzyl phthalate	ND	---	1.18	"	"	"	"	
Carbazole	ND	---	1.18	"	"	"	"	
4-Chloroaniline	ND	---	1.18	"	"	"	"	
4-Chloro-3-methylphenol	ND	---	1.18	"	"	"	"	

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

ANALYTICAL SAMPLE RESULTS

Semivolatile Organic Compounds by EPA 8270D

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Comp-2 (A7F0504-02RE1)			**Matrix: Soil**		**Batch: 7060752**			
2-Chloronaphthalene	ND	---	1.18	mg/kg dry	4	"	EPA 8270D	
2-Chlorophenol	ND	---	1.18	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	---	1.18	"	"	"	"	
Chrysene	ND	---	1.18	"	"	"	"	
Dibenz(a,h)anthracene	ND	---	1.18	"	"	"	"	
Dibenzofuran	ND	---	1.18	"	"	"	"	
1,2-Dichlorobenzene	ND	---	1.18	"	"	"	"	
1,3-Dichlorobenzene	ND	---	1.18	"	"	"	"	
1,4-Dichlorobenzene	ND	---	1.18	"	"	"	"	
2,4-Dichlorophenol	ND	---	1.18	"	"	"	"	
Di-n-butylphthalate	ND	---	1.18	"	"	"	"	
Diethylphthalate	ND	---	1.18	"	"	"	"	
Dimethylphthalate	**2.69**	---	1.18	"	"	"	"	Q-42
2,4-Dimethylphenol	ND	---	1.18	"	"	"	"	
1,2-Dinitrobenzene	ND	---	1.18	"	"	"	"	
1,3-Dinitrobenzene	ND	---	1.18	"	"	"	"	
1,4-Dinitrobenzene	ND	---	1.18	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	---	2.84	"	"	"	"	Q-42
2,4-Dinitrophenol	ND	---	1.18	"	"	"	"	
2,4-Dinitrotoluene	ND	---	1.18	"	"	"	"	
2,6-Dinitrotoluene	ND	---	1.18	"	"	"	"	
Di-n-octyl phthalate	ND	---	1.18	"	"	"	"	
Fluoranthene	ND	---	1.18	"	"	"	"	
Fluorene	ND	---	1.18	"	"	"	"	
Hexachlorobenzene	ND	---	1.18	"	"	"	"	
Hexachlorobutadiene	ND	---	1.18	"	"	"	"	
Hexachlorocyclopentadiene	ND	---	1.18	"	"	"	"	
Hexachloroethane	ND	---	1.18	"	"	"	"	
Indeno(1,2,3-cd)pyrene	ND	---	1.18	"	"	"	"	
Isophorone	ND	---	1.18	"	"	"	"	
1-Methylnaphthalene	ND	---	1.18	"	"	"	"	
2-Methylnaphthalene	ND	---	1.18	"	"	"	"	
2-Methylphenol	ND	---	1.18	"	"	"	"	
3+4-Methylphenol(s)	ND	---	1.18	"	"	"	"	
Naphthalene	ND	---	1.18	"	"	"	"	

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

ANALYTICAL SAMPLE RESULTS

Semivolatile Organic Compounds by EPA 8270D

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Comp-2 (A7F0504-02RE1)			**Matrix: Soil**		**Batch: 7060752**			
2-Nitroaniline	ND	---	1.18	mg/kg dry	4	"	EPA 8270D	
3-Nitroaniline	ND	---	1.18	"	"	"	"	
4-Nitroaniline	ND	---	1.18	"	"	"	"	
Nitrobenzene	ND	---	1.18	"	"	"	"	
2-Nitrophenol	ND	---	1.18	"	"	"	"	
4-Nitrophenol	ND	---	1.18	"	"	"	"	
N-Nitrosodimethylamine	ND	---	1.18	"	"	"	"	
N-Nitroso-di-n-propylamine	ND	---	1.18	"	"	"	"	
N-Nitrosodiphenylamine	ND	---	1.18	"	"	"	"	
Pentachlorophenol (PCP)	ND	---	1.18	"	"	"	"	
Phenanthrene	ND	---	1.18	"	"	"	"	
Phenol	ND	---	1.18	"	"	"	"	
Pyrene	ND	---	1.18	"	"	"	"	
Pyridine	ND	---	2.36	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	---	1.18	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	---	1.18	"	"	"	"	
1,2,4-Trichlorobenzene	ND	---	1.18	"	"	"	"	
2,4,5-Trichlorophenol	ND	---	1.18	"	"	"	"	
2,4,6-Trichlorophenol	ND	---	1.18	"	"	"	"	
Surrogate: Nitrobenzene-d5 (Surr)			*Recovery: 75 %*	*Limits: 37-122 %*	"	"	"	
2-Fluorobiphenyl (Surr)			*72 %*	*Limits: 44-115 %*	"	"	"	
Phenol-d6 (Surr)			*73 %*	*Limits: 33-122 %*	"	"	"	
p-Terphenyl-d14 (Surr)			*78 %*	*Limits: 54-127 %*	"	"	"	
2-Fluorophenol (Surr)			*76 %*	*Limits: 35-115 %*	"	"	"	
2,4,6-Tribromophenol (Surr)			*69 %*	*Limits: 39-132 %*	"	"	"	

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Comp-1 (A7F0504-01)			**Matrix: Soil**					
Batch: 7060834								
Arsenic	**3.23**	---	1.26	mg/kg dry	10	06/27/17 14:12	EPA 6020A	
Barium	**163**	---	1.26	"	"	"	"	
Cadmium	**0.556**	---	0.253	"	"	"	"	
Chromium	**17.4**	---	1.26	"	"	"	"	
Lead	**22.3**	---	0.253	"	"	"	"	
Mercury	**0.127**	---	0.101	"	"	"	"	
Selenium	ND	---	1.26	"	"	"	"	
Silver	ND	---	0.253	"	"	"	"	
Comp-2 (A7F0504-02)			**Matrix: Soil**					
Batch: 7060834								
Arsenic	**2.19**	---	1.17	mg/kg dry	10	06/27/17 14:15	EPA 6020A	
Barium	**217**	---	1.17	"	"	"	"	
Cadmium	**1.49**	---	0.234	"	"	"	"	
Chromium	**14.8**	---	1.17	"	"	"	"	
Lead	**23.1**	---	0.234	"	"	"	"	
Mercury	**0.147**	---	0.0937	"	"	"	"	
Selenium	ND	---	1.17	"	"	"	"	
Silver	ND	---	0.234	"	"	"	"	

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Comp-1 (A7F0504-01)			**Matrix: Soil**		**Batch: 7060761**			
% Solids	**79.5**	---	1.00	% by Weight	1	06/20/17 07:25	EPA 8000C	
Comp-2 (A7F0504-02)			**Matrix: Soil**		**Batch: 7060761**			
% Solids	**82.1**	---	1.00	% by Weight	1	06/20/17 07:25	EPA 8000C	

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060765 - EPA 3546 (Fuels)									Soil			
Blank (7060765-BLK1)					Prepared: 06/19/17 13:39 Analyzed: 06/19/17 20:35							
NWTPH-Dx												
Diesel	ND	---	25.0	mg/kg wet	1	---	---	---	---	---	---	
Oil	ND	---	50.0	"	"	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)			*Recovery: 78 %*	*Limits: 50-150 %*			*Dilution: 1x*					
LCS (7060765-BS1)					Prepared: 06/19/17 13:39 Analyzed: 06/19/17 20:55							
NWTPH-Dx												
Diesel	109	---	25.0	mg/kg wet	1	125	---	87	76-115%	---	---	
Surr: o-Terphenyl (Surr)			*Recovery: 96 %*	*Limits: 50-150 %*			*Dilution: 1x*					
Duplicate (7060765-DUP2)					Prepared: 06/19/17 13:39 Analyzed: 06/19/17 21:55							
QC Source Sample: Comp-2 (A7F0504-02)												
NWTPH-Dx												
Diesel	ND	---	25.0	mg/kg dry	1	---	ND	---	---	---	30%	
Oil	**258**	---	50.0	"	"	---	244	---	---	5	30%	
Surr: o-Terphenyl (Surr)			*Recovery: 87 %*	*Limits: 50-150 %*			*Dilution: 1x*					

Apex Laboratories

Philip Nerenberg, Lab Director

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503-718-2323 Phone
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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060825 - EPA 5035A									**Soil**			
Blank (7060825-BLK1)					Prepared: 06/21/17 09:00 Analyzed: 06/21/17 12:18							
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	3.33	mg/kg wet	50	---	---	---	---	---	---	
Surr: 4-Bromofluorobenzene (Sur)			*Recovery: 95 %*	*Limits: 50-150 %*			*Dilution: 1x*					
1,4-Difluorobenzene (Sur)			*94 %*	*50-150 %*			*"*					
LCS (7060825-BS2)					Prepared: 06/21/17 09:00 Analyzed: 06/21/17 11:51							
NWTPH-Gx (MS)												
Gasoline Range Organics	24.8	---	5.00	mg/kg wet	50	25.0	---	99	70-130%	---	---	
Surr: 4-Bromofluorobenzene (Sur)			*Recovery: 99 %*	*Limits: 50-150 %*			*Dilution: 1x*					
1,4-Difluorobenzene (Sur)			*96 %*	*50-150 %*			*"*					
Duplicate (7060825-DUP1)					Prepared: 06/16/17 11:20 Analyzed: 06/21/17 13:12							
QC Source Sample: Comp-1 (A7F0504-01)												
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	5.50	mg/kg dry	50	---	ND	---	---	---	30%	
Surr: 4-Bromofluorobenzene (Sur)			*Recovery: 105 %*	*Limits: 50-150 %*			*Dilution: 1x*					
1,4-Difluorobenzene (Sur)			*97 %*	*50-150 %*			*"*					

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060825 - EPA 5035A							**Soil**					
Blank (7060825-BLK1)					Prepared: 06/21/17 09:00 Analyzed: 06/21/17 12:18							
5035A/8260B												
Acetone	ND	---	0.667	mg/kg wet	50	---	---	---	---	---	---	
Benzene	ND	---	0.00667	"	"	---	---	---	---	---	---	
Bromobenzene	ND	---	0.0167	"	"	---	---	---	---	---	---	
Bromochloromethane	ND	---	0.0333	"	"	---	---	---	---	---	---	
Bromodichloromethane	ND	---	0.0667	"	"	---	---	---	---	---	---	
Bromoform	ND	---	0.0667	"	"	---	---	---	---	---	---	
Bromomethane	ND	---	0.333	"	"	---	---	---	---	---	---	
2-Butanone (MEK)	ND	---	0.333	"	"	---	---	---	---	---	---	
n-Butylbenzene	ND	---	0.0333	"	"	---	---	---	---	---	---	
sec-Butylbenzene	ND	---	0.0333	"	"	---	---	---	---	---	---	
tert-Butylbenzene	ND	---	0.0333	"	"	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	0.0333	"	"	---	---	---	---	---	---	
Chlorobenzene	ND	---	0.0167	"	"	---	---	---	---	---	---	
Chloroethane	ND	---	0.333	"	"	---	---	---	---	---	---	
Chloroform	ND	---	0.0333	"	"	---	---	---	---	---	---	
Chloromethane	ND	---	0.167	"	"	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	0.0333	"	"	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	0.0333	"	"	---	---	---	---	---	---	
1,2-Dibromo-3-chloropropane	ND	---	0.167	"	"	---	---	---	---	---	---	
Dibromochloromethane	ND	---	0.0667	"	"	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.0333	"	"	---	---	---	---	---	---	
Dibromomethane	ND	---	0.0333	"	"	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.0167	"	"	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.0167	"	"	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.0167	"	"	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	0.0667	"	"	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	0.0167	"	"	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.0167	"	"	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	0.0167	"	"	---	---	---	---	---	---	
cis-1,2-Dichloroethene	ND	---	0.0167	"	"	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	0.0167	"	"	---	---	---	---	---	---	
1,2-Dichloropropane	ND	---	0.0167	"	"	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	0.0333	"	"	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	0.0333	"	"	---	---	---	---	---	---	

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Philip Nerenberg, Lab Director

Apex Labs

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060825 - EPA 5035A							**Soil**					
Blank (7060825-BLK1)					Prepared: 06/21/17 09:00 Analyzed: 06/21/17 12:18							
5035A/8260B												
1,1-Dichloropropene	ND	---	0.0333	mg/kg wet	"	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	0.0333	"	"	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	0.0333	"	"	---	---	---	---	---	---	
Ethylbenzene	ND	---	0.0167	"	"	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	0.0667	"	"	---	---	---	---	---	---	
2-Hexanone	ND	---	0.333	"	"	---	---	---	---	---	---	
Isopropylbenzene	ND	---	0.0333	"	"	---	---	---	---	---	---	
4-Isopropyltoluene	ND	---	0.0333	"	"	---	---	---	---	---	---	
4-Methyl-2-pentanone (MiBK)	ND	---	0.333	"	"	---	---	---	---	---	---	
Methyl tert-butyl ether (MTBE)	ND	---	0.0333	"	"	---	---	---	---	---	---	
Methylene chloride	ND	---	0.167	"	"	---	---	---	---	---	---	
Naphthalene	ND	---	0.0667	"	"	---	---	---	---	---	---	
n-Propylbenzene	ND	---	0.0167	"	"	---	---	---	---	---	---	
Styrene	ND	---	0.0333	"	"	---	---	---	---	---	---	
1,1,1,2-Tetrachloroethane	ND	---	0.0167	"	"	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.0333	"	"	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.0167	"	"	---	---	---	---	---	---	
Toluene	ND	---	0.0333	"	"	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	0.167	"	"	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	0.167	"	"	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.0167	"	"	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.0167	"	"	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.0167	"	"	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	0.0667	"	"	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	0.0333	"	"	---	---	---	---	---	---	
1,2,4-Trimethylbenzene	ND	---	0.0333	"	"	---	---	---	---	---	---	
1,3,5-Trimethylbenzene	ND	---	0.0333	"	"	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.0167	"	"	---	---	---	---	---	---	
m,p-Xylene	ND	---	0.0333	"	"	---	---	---	---	---	---	
o-Xylene	ND	---	0.0167	"	"	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 102 %*		*Limits: 70-130 %*				*Dilution: 1x*			
Toluene-d8 (Surr)			*101 %*		*70-130 %*				*"*			
4-Bromofluorobenzene (Surr)			*103 %*		*70-130 %*				*"*			
LCS (7060825-BS1)					Prepared: 06/21/17 09:00 Analyzed: 06/21/17 11:24							

Apex Laboratories

Philip Nerenberg, Lab Director

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060825 - EPA 5035A							**Soil**					
LCS (7060825-BS1)					Prepared: 06/21/17 09:00 Analyzed: 06/21/17 11:24							
5035A/8260B												
Acetone	1.88	---	1.00	mg/kg wet	50	2.00	---	94	65-135%	---	---	
Benzene	1.08	---	0.0100	"	"	1.00	---	108	"	---	---	
Bromobenzene	0.998	---	0.0250	"	"	"	---	100	"	---	---	
Bromochloromethane	1.07	---	0.0500	"	"	"	---	107	"	---	---	
Bromodichloromethane	1.13	---	0.100	"	"	"	---	113	"	---	---	
Bromoform	0.916	---	0.100	"	"	"	---	92	"	---	---	
Bromomethane	1.08	---	0.500	"	"	"	---	108	"	---	---	
2-Butanone (MEK)	1.91	---	0.500	"	"	2.00	---	96	"	---	---	
n-Butylbenzene	1.11	---	0.0500	"	"	1.00	---	111	"	---	---	
sec-Butylbenzene	1.16	---	0.0500	"	"	"	---	116	"	---	---	
tert-Butylbenzene	1.10	---	0.0500	"	"	"	---	110	"	---	---	
Carbon tetrachloride	0.998	---	0.0500	"	"	"	---	100	"	---	---	
Chlorobenzene	1.01	---	0.0250	"	"	"	---	101	"	---	---	
Chloroethane	1.12	---	0.500	"	"	"	---	112	"	---	---	
Chloroform	1.11	---	0.0500	"	"	"	---	111	"	---	---	
Chloromethane	1.06	---	0.250	"	"	"	---	106	"	---	---	
2-Chlorotoluene	1.08	---	0.0500	"	"	"	---	108	"	---	---	
4-Chlorotoluene	1.06	---	0.0500	"	"	"	---	106	"	---	---	
1,2-Dibromo-3-chloropropane	0.993	---	0.250	"	"	"	---	99	"	---	---	
Dibromochloromethane	0.960	---	0.100	"	"	"	---	96	"	---	---	
1,2-Dibromoethane (EDB)	1.10	---	0.0500	"	"	"	---	110	"	---	---	
Dibromomethane	1.05	---	0.0500	"	"	"	---	105	"	---	---	
1,2-Dichlorobenzene	1.05	---	0.0250	"	"	"	---	105	"	---	---	
1,3-Dichlorobenzene	1.01	---	0.0250	"	"	"	---	101	"	---	---	
1,4-Dichlorobenzene	0.982	---	0.0250	"	"	"	---	98	"	---	---	
Dichlorodifluoromethane	1.13	---	0.100	"	"	"	---	113	"	---	---	
1,1-Dichloroethane	1.08	---	0.0250	"	"	"	---	108	"	---	---	
1,2-Dichloroethane (EDC)	1.03	---	0.0250	"	"	"	---	103	"	---	---	
1,1-Dichloroethene	1.04	---	0.0250	"	"	"	---	104	"	---	---	
cis-1,2-Dichloroethene	1.08	---	0.0250	"	"	"	---	108	"	---	---	
trans-1,2-Dichloroethene	1.04	---	0.0250	"	"	"	---	104	"	---	---	
1,2-Dichloropropane	1.10	---	0.0250	"	"	"	---	110	"	---	---	
1,3-Dichloropropane	1.06	---	0.0500	"	"	"	---	106	"	---	---	
2,2-Dichloropropane	1.21	---	0.0500	"	"	"	---	121	"	---	---	

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060825 - EPA 5035A							**Soil**					
LCS (7060825-BS1)					Prepared: 06/21/17 09:00 Analyzed: 06/21/17 11:24							
5035A/8260B												
1,1-Dichloropropene	1.11	---	0.0500	mg/kg wet	"	"	---	111	"	---	---	
cis-1,3-Dichloropropene	0.995	---	0.0500	"	"	"	---	100	"	---	---	
trans-1,3-Dichloropropene	1.02	---	0.0500	"	"	"	---	102	"	---	---	
Ethylbenzene	1.05	---	0.0250	"	"	"	---	105	"	---	---	
Hexachlorobutadiene	1.11	---	0.100	"	"	"	---	111	"	---	---	
2-Hexanone	2.08	---	0.500	"	"	2.00	---	104	"	---	---	
Isopropylbenzene	1.16	---	0.0500	"	"	1.00	---	116	"	---	---	
4-Isopropyltoluene	1.18	---	0.0500	"	"	"	---	118	"	---	---	
4-Methyl-2-pentanone (MiBK)	2.15	---	0.500	"	"	2.00	---	107	"	---	---	
Methyl tert-butyl ether (MTBE)	1.09	---	0.0500	"	"	1.00	---	109	"	---	---	
Methylene chloride	0.998	---	0.250	"	"	"	---	100	"	---	---	
Naphthalene	1.03	---	0.100	"	"	"	---	103	"	---	---	
n-Propylbenzene	1.05	---	0.0250	"	"	"	---	105	"	---	---	
Styrene	0.974	---	0.0500	"	"	"	---	97	"	---	---	
1,1,1,2-Tetrachloroethane	1.05	---	0.0250	"	"	"	---	105	"	---	---	
1,1,2,2-Tetrachloroethane	0.964	---	0.0500	"	"	"	---	96	"	---	---	
Tetrachloroethene (PCE)	1.06	---	0.0250	"	"	"	---	106	"	---	---	
Toluene	0.976	---	0.0500	"	"	"	---	98	"	---	---	
1,2,3-Trichlorobenzene	1.10	---	0.250	"	"	"	---	110	"	---	---	
1,2,4-Trichlorobenzene	1.09	---	0.250	"	"	"	---	109	"	---	---	
1,1,1-Trichloroethane	1.14	---	0.0250	"	"	"	---	114	"	---	---	
1,1,2-Trichloroethane	1.05	---	0.0250	"	"	"	---	105	"	---	---	
Trichloroethene (TCE)	1.13	---	0.0250	"	"	"	---	113	"	---	---	
Trichlorofluoromethane	0.994	---	0.100	"	"	"	---	99	"	---	---	
1,2,3-Trichloropropane	1.04	---	0.0500	"	"	"	---	104	"	---	---	
1,2,4-Trimethylbenzene	1.16	---	0.0500	"	"	"	---	116	"	---	---	
1,3,5-Trimethylbenzene	1.12	---	0.0500	"	"	"	---	112	"	---	---	
Vinyl chloride	1.16	---	0.0250	"	"	"	---	116	"	---	---	
m,p-Xylene	2.18	---	0.0500	"	"	2.00	---	109	"	---	---	
o-Xylene	1.15	---	0.0250	"	"	1.00	---	115	"	---	---	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 102 %*		*Limits: 70-130 %*			*Dilution: 1x*				
Toluene-d8 (Surr)			*98 %*		*70-130 %*			*"*				
4-Bromofluorobenzene (Surr)			*101 %*		*70-130 %*			*"*				
Duplicate (7060825-DUP1)					Prepared: 06/16/17 11:20 Analyzed: 06/21/17 13:12							

Apex Laboratories

Philip Nerenberg, Lab Director

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060825 - EPA 5035A							**Soil**					
Duplicate (7060825-DUP1)					Prepared: 06/16/17 11:20 Analyzed: 06/21/17 13:12							
QC Source Sample: Comp-1 (A7F0504-01)												
5035A/8260B												
Acetone	ND	---	1.10	mg/kg dry	50	---	ND	---	---	---	30%	
Benzene	ND	---	0.0110	"	"	---	ND	---	---	---	30%	
Bromobenzene	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
Bromochloromethane	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
Bromodichloromethane	ND	---	0.110	"	"	---	ND	---	---	---	30%	
Bromoform	ND	---	0.110	"	"	---	ND	---	---	---	30%	
Bromomethane	ND	---	0.550	"	"	---	ND	---	---	---	30%	
2-Butanone (MEK)	ND	---	0.550	"	"	---	ND	---	---	---	30%	
n-Butylbenzene	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
sec-Butylbenzene	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
tert-Butylbenzene	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
Carbon tetrachloride	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
Chlorobenzene	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
Chloroethane	ND	---	0.550	"	"	---	ND	---	---	---	30%	
Chloroform	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
Chloromethane	ND	---	0.275	"	"	---	ND	---	---	---	30%	
2-Chlorotoluene	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
4-Chlorotoluene	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
1,2-Dibromo-3-chloropropane	ND	---	0.275	"	"	---	ND	---	---	---	30%	
Dibromochloromethane	ND	---	0.110	"	"	---	ND	---	---	---	30%	
1,2-Dibromoethane (EDB)	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
Dibromomethane	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
1,2-Dichlorobenzene	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
1,3-Dichlorobenzene	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
1,4-Dichlorobenzene	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
Dichlorodifluoromethane	ND	---	0.110	"	"	---	ND	---	---	---	30%	
1,1-Dichloroethane	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
1,2-Dichloroethane (EDC)	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
1,1-Dichloroethene	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
cis-1,2-Dichloroethene	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
trans-1,2-Dichloroethene	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
1,2-Dichloropropane	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
1,3-Dichloropropane	ND	---	0.0550	"	"	---	ND	---	---	---	30%	

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Philip Nerenberg, Lab Director

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503-718-2323 Phone
503-718-0333 Fax

GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060825 - EPA 5035A							**Soil**					
Duplicate (7060825-DUP1)					Prepared: 06/16/17 11:20 Analyzed: 06/21/17 13:12							
QC Source Sample: Comp-1 (A7F0504-01)												
5035A/8260B												
2,2-Dichloropropane	ND	---	0.0550	mg/kg dry	"	---	ND	---	---	---	30%	
1,1-Dichloropropene	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
cis-1,3-Dichloropropene	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
trans-1,3-Dichloropropene	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
Ethylbenzene	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
Hexachlorobutadiene	ND	---	0.110	"	"	---	ND	---	---	---	30%	
2-Hexanone	ND	---	0.550	"	"	---	ND	---	---	---	30%	
Isopropylbenzene	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
4-Isopropyltoluene	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
4-Methyl-2-pentanone (MiBK)	ND	---	0.550	"	"	---	ND	---	---	---	30%	
Methyl tert-butyl ether (MTBE)	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
Methylene chloride	ND	---	0.275	"	"	---	ND	---	---	---	30%	
Naphthalene	ND	---	0.110	"	"	---	ND	---	---	---	30%	
n-Propylbenzene	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
Styrene	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
1,1,1,2-Tetrachloroethane	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
1,1,2,2-Tetrachloroethane	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
Tetrachloroethene (PCE)	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
Toluene	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
1,2,3-Trichlorobenzene	ND	---	0.275	"	"	---	ND	---	---	---	30%	
1,2,4-Trichlorobenzene	ND	---	0.275	"	"	---	ND	---	---	---	30%	
1,1,1-Trichloroethane	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
1,1,2-Trichloroethane	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
Trichloroethene (TCE)	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
Trichlorofluoromethane	ND	---	0.110	"	"	---	ND	---	---	---	30%	
1,2,3-Trichloropropane	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
1,2,4-Trimethylbenzene	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
1,3,5-Trimethylbenzene	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
Vinyl chloride	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
m,p-Xylene	ND	---	0.0550	"	"	---	ND	---	---	---	30%	
o-Xylene	ND	---	0.0275	"	"	---	ND	---	---	---	30%	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 104 %*		*Limits: 70-130 %*				*Dilution: 1x*			
Toluene-d8 (Surr)			*100 %*		*70-130 %*				*"*			

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Philip Nerenberg, Lab Director

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060825 - EPA 5035A												**Soil**
Duplicate (7060825-DUP1)												
Prepared: 06/16/17 11:20 Analyzed: 06/21/17 13:12												
QC Source Sample: Comp-1 (A7F0504-01)												
5035A/8260B												
Surr: 4-Bromofluorobenzene (Surr)	*Recovery: 101 %*		*Limits: 70-130 %*		*Dilution: 1x*							

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060742 - EPA 3546								**Soil**				
Blank (7060742-BLK1)					Prepared: 06/19/17 07:10		Analyzed: 06/19/17 16:05					C-07
EPA 8082A												
Aroclor 1016	ND	---	0.00833	mg/kg wet	1	---	---	---	---	---	---	
Aroclor 1221	ND	---	0.00833	"	"	---	---	---	---	---	---	
Aroclor 1232	ND	---	0.00833	"	"	---	---	---	---	---	---	
Aroclor 1242	ND	---	0.00833	"	"	---	---	---	---	---	---	
Aroclor 1248	ND	---	0.00833	"	"	---	---	---	---	---	---	
Aroclor 1254	ND	---	0.00833	"	"	---	---	---	---	---	---	
Aroclor 1260	ND	---	0.00833	"	"	---	---	---	---	---	---	
Surr: Decachlorobiphenyl (Surr)			*Recovery: 101 %*	*Limits: 72-126 %*			*Dilution: 1x*					
LCS (7060742-BS1)					Prepared: 06/19/17 07:10		Analyzed: 06/19/17 16:23					C-07
EPA 8082A												
Aroclor 1016	0.176	---	0.0100	mg/kg wet	1	0.250	---	71	47-134%	---	---	
Aroclor 1260	0.224	---	0.0100	"	"	"	---	90	53-140%	---	---	
Surr: Decachlorobiphenyl (Surr)			*Recovery: 94 %*	*Limits: 72-126 %*			*Dilution: 1x*					
Matrix Spike (7060742-MS2)					Prepared: 06/19/17 07:10		Analyzed: 06/21/17 10:49					C-07, Q-43
QC Source Sample: Comp-2 (A7F0504-02RE1)												
EPA 8082A												
Aroclor 1016	3.60	---	0.213	mg/kg dry	20	0.266	ND	1350	47-134%	---	---	
Aroclor 1260	0.353	---	0.213	"	"	"	ND	132	53-140%	---	---	
Surr: Decachlorobiphenyl (Surr)			*Recovery: 114 %*	*Limits: 72-126 %*			*Dilution: 20x*					*S-05*

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Philip Nerenberg, Lab Director

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Semivolatile Organic Compounds by EPA 8270D

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060752 - EPA 3546							**Soil**					
Blank (7060752-BLK2)					Prepared: 06/19/17 10:13 Analyzed: 06/19/17 14:42							
EPA 8270D												
Acenaphthene	ND	---	0.227	mg/kg wet	1	---	---	---	---	---	---	
Acenaphthylene	ND	---	0.227	"	"	---	---	---	---	---	---	
Aniline	ND	---	0.227	"	"	---	---	---	---	---	---	
Anthracene	ND	---	0.227	"	"	---	---	---	---	---	---	
Azobenzene (1,2-DPH)	ND	---	0.227	"	"	---	---	---	---	---	---	
Benz(a)anthracene	ND	---	0.227	"	"	---	---	---	---	---	---	
Benzo(a)pyrene	ND	---	0.227	"	"	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	---	0.227	"	"	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	---	0.227	"	"	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	---	0.227	"	"	---	---	---	---	---	---	
Benzoic acid	ND	---	1.14	"	"	---	---	---	---	---	---	
Benzyl alcohol	ND	---	0.227	"	"	---	---	---	---	---	---	
Bis(2-Chloroethoxy) methane	ND	---	0.227	"	"	---	---	---	---	---	---	
Bis(2-Chloroethyl) ether	ND	---	0.227	"	"	---	---	---	---	---	---	
Bis(2-Chloroisopropyl) ether	ND	---	0.227	"	"	---	---	---	---	---	---	
Bis(2-Ethylhexyl) adipate	ND	---	0.227	"	"	---	---	---	---	---	---	
Bis(2-ethylhexyl)phthalate	ND	---	0.227	"	"	---	---	---	---	---	---	
4-Bromophenyl phenyl ether	ND	---	0.227	"	"	---	---	---	---	---	---	
Butyl benzyl phthalate	ND	---	0.227	"	"	---	---	---	---	---	---	
Carbazole	ND	---	0.227	"	"	---	---	---	---	---	---	
4-Chloroaniline	ND	---	0.227	"	"	---	---	---	---	---	---	
4-Chloro-3-methylphenol	ND	---	0.227	"	"	---	---	---	---	---	---	
2-Chloronaphthalene	ND	---	0.227	"	"	---	---	---	---	---	---	
2-Chlorophenol	ND	---	0.227	"	"	---	---	---	---	---	---	
4-Chlorophenyl phenyl ether	ND	---	0.227	"	"	---	---	---	---	---	---	
Chrysene	ND	---	0.227	"	"	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	---	0.227	"	"	---	---	---	---	---	---	
Dibenzofuran	ND	---	0.227	"	"	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.227	"	"	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.227	"	"	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.227	"	"	---	---	---	---	---	---	
2,4-Dichlorophenol	ND	---	0.227	"	"	---	---	---	---	---	---	
Di-n-butylphthalate	ND	---	0.227	"	"	---	---	---	---	---	---	
Diethylphthalate	ND	---	0.227	"	"	---	---	---	---	---	---	

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Philip Nerenberg, Lab Director

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Semivolatile Organic Compounds by EPA 8270D

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060752 - EPA 3546							**Soil**					
Blank (7060752-BLK2)					Prepared: 06/19/17 10:13 Analyzed: 06/19/17 14:42							
EPA 8270D												
Dimethylphthalate	ND	---	0.227	mg/kg wet	"	---	---	---	---	---	---	
2,4-Dimethylphenol	ND	---	0.227	"	"	---	---	---	---	---	---	
1,2-Dinitrobenzene	ND	---	0.227	"	"	---	---	---	---	---	---	
1,3-Dinitrobenzene	ND	---	0.227	"	"	---	---	---	---	---	---	
1,4-Dinitrobenzene	ND	---	0.227	"	"	---	---	---	---	---	---	
4,6-Dinitro-2-methylphenol	ND	---	0.545	"	"	---	---	---	---	---	---	
2,4-Dinitrophenol	ND	---	0.227	"	"	---	---	---	---	---	---	
2,4-Dinitrotoluene	ND	---	0.227	"	"	---	---	---	---	---	---	
2,6-Dinitrotoluene	ND	---	0.227	"	"	---	---	---	---	---	---	
Di-n-octyl phthalate	ND	---	0.227	"	"	---	---	---	---	---	---	
Fluoranthene	ND	---	0.227	"	"	---	---	---	---	---	---	
Fluorene	ND	---	0.227	"	"	---	---	---	---	---	---	
Hexachlorobenzene	ND	---	0.227	"	"	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	0.227	"	"	---	---	---	---	---	---	
Hexachlorocyclopentadiene	ND	---	0.227	"	"	---	---	---	---	---	---	
Hexachloroethane	ND	---	0.227	"	"	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	---	0.227	"	"	---	---	---	---	---	---	
Isophorone	ND	---	0.227	"	"	---	---	---	---	---	---	
1-Methylnaphthalene	ND	---	0.227	"	"	---	---	---	---	---	---	
2-Methylnaphthalene	ND	---	0.227	"	"	---	---	---	---	---	---	
2-Methylphenol	ND	---	0.227	"	"	---	---	---	---	---	---	
3+4-Methylphenol(s)	ND	---	0.227	"	"	---	---	---	---	---	---	
Naphthalene	ND	---	0.227	"	"	---	---	---	---	---	---	
2-Nitroaniline	ND	---	0.227	"	"	---	---	---	---	---	---	
3-Nitroaniline	ND	---	0.227	"	"	---	---	---	---	---	---	
4-Nitroaniline	ND	---	0.227	"	"	---	---	---	---	---	---	
Nitrobenzene	ND	---	0.227	"	"	---	---	---	---	---	---	
2-Nitrophenol	ND	---	0.227	"	"	---	---	---	---	---	---	
4-Nitrophenol	ND	---	0.227	"	"	---	---	---	---	---	---	
N-Nitrosodimethylamine	ND	---	0.227	"	"	---	---	---	---	---	---	
N-Nitroso-di-n-propylamine	ND	---	0.227	"	"	---	---	---	---	---	---	
N-Nitrosodiphenylamine	ND	---	0.227	"	"	---	---	---	---	---	---	
Pentachlorophenol (PCP)	ND	---	0.227	"	"	---	---	---	---	---	---	
Phenanthrene	ND	---	0.227	"	"	---	---	---	---	---	---	

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503-718-2323 Phone
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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Semivolatile Organic Compounds by EPA 8270D

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060752 - EPA 3546									Soil			
Blank (7060752-BLK2)					Prepared: 06/19/17 10:13 Analyzed: 06/19/17 14:42							
EPA 8270D												
Phenol	ND	---	0.227	mg/kg wet	"	---	---	---	---	---	---	
Pyrene	ND	---	0.227	"	"	---	---	---	---	---	---	
Pyridine	ND	---	0.455	"	"	---	---	---	---	---	---	
2,3,4,6-Tetrachlorophenol	ND	---	0.227	"	"	---	---	---	---	---	---	
2,3,5,6-Tetrachlorophenol	ND	---	0.227	"	"	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	0.227	"	"	---	---	---	---	---	---	
2,4,5-Trichlorophenol	ND	---	0.227	"	"	---	---	---	---	---	---	
2,4,6-Trichlorophenol	ND	---	0.227	"	"	---	---	---	---	---	---	
Surr: Nitrobenzene-d5 (Surr)			*Recovery: 85 %*	*Limits: 37-122 %*			*Dilution: 1x*					
2-Fluorobiphenyl (Surr)			*90 %*	*44-115 %*			*"*					
Phenol-d6 (Surr)			*79 %*	*33-122 %*			*"*					
p-Terphenyl-d14 (Surr)			*94 %*	*54-127 %*			*"*					
2-Fluorophenol (Surr)			*83 %*	*35-115 %*			*"*					
2,4,6-Tribromophenol (Surr)			*64 %*	*39-132 %*			*"*					
LCS (7060752-BS2)					Prepared: 06/19/17 10:13 Analyzed: 06/19/17 15:18							
EPA 8270D												
Acenaphthene	0.661	---	0.250	mg/kg wet	1	0.800	---	83	40-122%	---	---	
Acenaphthylene	0.645	---	0.250	"	"	"	---	81	32-132%	---	---	
Aniline	0.479	---	0.250	"	"	"	---	60	7-120%	---	---	
Anthracene	0.681	---	0.250	"	"	"	---	85	47-123%	---	---	
Azobenzene (1,2-DPH)	0.694	---	0.250	"	"	"	---	87	39-125%	---	---	
Benz(a)anthracene	0.654	---	0.250	"	"	"	---	82	49-126%	---	---	
Benzo(a)pyrene	0.727	---	0.250	"	"	"	---	91	45-129%	---	---	
Benzo(b)fluoranthene	0.698	---	0.250	"	"	"	---	87	45-132%	---	---	
Benzo(k)fluoranthene	0.687	---	0.250	"	"	"	---	86	47-132%	---	---	
Benzo(g,h,i)perylene	0.684	---	0.250	"	"	"	---	85	43-134%	---	---	
Benzoic acid	0.548	---	0.500	"	"	1.60	---	34	5-140%	---	---	
Benzyl alcohol	0.611	---	0.250	"	"	0.800	---	76	29-122%	---	---	
Bis(2-Chloroethoxy) methane	0.636	---	0.250	"	"	"	---	80	36-121%	---	---	
Bis(2-Chloroethyl) ether	0.599	---	0.250	"	"	"	---	75	31-120%	---	---	
Bis(2-Chloroisopropyl) ether	0.627	---	0.250	"	"	"	---	78	33-131%	---	---	
Bis(2-Ethylhexyl) adipate	0.638	---	0.250	"	"	"	---	80	60-121%	---	---	
Bis(2-ethylhexyl)phthalate	0.667	---	0.250	"	"	"	---	83	51-133%	---	---	
4-Bromophenyl phenyl ether	0.645	---	0.250	"	"	"	---	81	46-124%	---	---	

Apex Laboratories

Philip Nerenberg, Lab Director

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Semivolatile Organic Compounds by EPA 8270D

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060752 - EPA 3546							**Soil**					
LCS (7060752-BS2)					Prepared: 06/19/17 10:13 Analyzed: 06/19/17 15:18							
EPA 8270D												
Butyl benzyl phthalate	0.688	---	0.250	mg/kg wet	"	"	---	86	48-132%	---	---	
Carbazole	0.696	---	0.250	"	"	"	---	87	50-122%	---	---	
4-Chloroaniline	0.471	---	0.250	"	"	"	---	59	16-120%	---	---	
4-Chloro-3-methylphenol	0.664	---	0.250	"	"	"	---	83	45-122%	---	---	
2-Chloronaphthalene	0.635	---	0.250	"	"	"	---	79	41-120%	---	---	
2-Chlorophenol	0.635	---	0.250	"	"	"	---	79	34-121%	---	---	
4-Chlorophenyl phenyl ether	0.652	---	0.250	"	"	"	---	81	45-121%	---	---	
Chrysene	0.674	---	0.250	"	"	"	---	84	50-124%	---	---	
Dibenz(a,h)anthracene	0.644	---	0.250	"	"	"	---	80	45-134%	---	---	
Dibenzofuran	0.644	---	0.250	"	"	"	---	80	44-120%	---	---	
1,2-Dichlorobenzene	0.612	---	0.250	"	"	"	---	76	33-120%	---	---	
1,3-Dichlorobenzene	0.620	---	0.250	"	"	"	---	78	30-120%	---	---	
1,4-Dichlorobenzene	0.629	---	0.250	"	"	"	---	79	31-120%	---	---	
2,4-Dichlorophenol	0.676	---	0.250	"	"	"	---	84	40-122%	---	---	
Di-n-butylphthalate	0.738	---	0.250	"	"	"	---	92	51-128%	---	---	
Diethylphthalate	0.723	---	0.250	"	"	"	---	90	50-124%	---	---	
Dimethylphthalate	0.665	---	0.250	"	"	"	---	83	48-124%	---	---	
2,4-Dimethylphenol	0.701	---	0.250	"	"	"	---	88	30-127%	---	---	
1,2-Dinitrobenzene	0.628	---	0.250	"	"	"	---	78	44-120%	---	---	
1,3-Dinitrobenzene	0.640	---	0.250	"	"	"	---	80	42-127%	---	---	
1,4-Dinitrobenzene	0.633	---	0.250	"	"	"	---	79	37-132%	---	---	
4,6-Dinitro-2-methylphenol	0.625	---	0.600	"	"	"	---	78	29-132%	---	---	
2,4-Dinitrophenol	0.533	---	0.250	"	"	"	---	67	5-137%	---	---	
2,4-Dinitrotoluene	0.653	---	0.250	"	"	"	---	82	48-126%	---	---	
2,6-Dinitrotoluene	0.665	---	0.250	"	"	"	---	83	46-124%	---	---	
Di-n-octyl phthalate	0.684	---	0.250	"	"	"	---	86	44-140%	---	---	
Fluoranthene	0.661	---	0.250	"	"	"	---	83	50-127%	---	---	
Fluorene	0.681	---	0.250	"	"	"	---	85	43-125%	---	---	
Hexachlorobenzene	0.622	---	0.250	"	"	"	---	78	44-122%	---	---	
Hexachlorobutadiene	0.649	---	0.250	"	"	"	---	81	32-123%	---	---	
Hexachlorocyclopentadiene	0.486	---	0.250	"	"	"	---	61	5-140%	---	---	
Hexachloroethane	0.680	---	0.250	"	"	"	---	85	28-120%	---	---	
Indeno(1,2,3-cd)pyrene	0.620	---	0.250	"	"	"	---	77	45-133%	---	---	
Isophorone	0.683	---	0.250	"	"	"	---	85	30-122%	---	---	

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Philip Nerenberg, Lab Director

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Semivolatile Organic Compounds by EPA 8270D

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060752 - EPA 3546							**Soil**					
LCS (7060752-BS2)					Prepared: 06/19/17 10:13 Analyzed: 06/19/17 15:18							
EPA 8270D												
1-Methylnaphthalene	0.644	---	0.250	mg/kg wet	"	"	---	81	40-120%	---	---	
2-Methylnaphthalene	0.655	---	0.250	"	"	"	---	82	38-122%	---	---	
2-Methylphenol	0.619	---	0.250	"	"	"	---	77	32-122%	---	---	
3+4-Methylphenol(s)	0.642	---	0.250	"	"	"	---	80	34-120%	---	---	
Naphthalene	0.651	---	0.250	"	"	"	---	81	35-123%	---	---	
2-Nitroaniline	0.664	---	0.250	"	"	"	---	83	44-127%	---	---	
3-Nitroaniline	0.546	---	0.250	"	"	"	---	68	33-120%	---	---	
4-Nitroaniline	0.631	---	0.250	"	"	"	---	79	35-120%	---	---	
Nitrobenzene	0.623	---	0.250	"	"	"	---	78	34-122%	---	---	
2-Nitrophenol	0.639	---	0.250	"	"	"	---	80	36-123%	---	---	
4-Nitrophenol	0.629	---	0.250	"	"	"	---	79	30-132%	---	---	
N-Nitrosodimethylamine	0.566	---	0.250	"	"	"	---	71	23-120%	---	---	
N-Nitroso-di-n-propylamine	0.638	---	0.250	"	"	"	---	80	36-120%	---	---	
N-Nitrosodiphenylamine	0.708	---	0.250	"	"	"	---	88	38-127%	---	---	
Pentachlorophenol (PCP)	0.610	---	0.250	"	"	"	---	76	25-133%	---	---	
Phenanthrene	0.643	---	0.250	"	"	"	---	80	50-121%	---	---	
Phenol	0.604	---	0.250	"	"	"	---	76	34-120%	---	---	
Pyrene	0.662	---	0.250	"	"	"	---	83	47-127%	---	---	
Pyridine	0.539	---	0.500	"	"	"	---	67	5-120%	---	---	
2,3,4,6-Tetrachlorophenol	0.667	---	0.250	"	"	"	---	83	44-125%	---	---	
2,3,5,6-Tetrachlorophenol	0.654	---	0.250	"	"	"	---	82	40-120%	---	---	
1,2,4-Trichlorobenzene	0.627	---	0.250	"	"	"	---	78	34-120%	---	---	
2,4,5-Trichlorophenol	0.655	---	0.250	"	"	"	---	82	41-124%	---	---	
2,4,6-Trichlorophenol	0.648	---	0.250	"	"	"	---	81	39-126%	---	---	
Surr: Nitrobenzene-d5 (Surr)			*Recovery: 75 %*	*Limits: 37-122 %*			*Dilution: 1x*					
2-Fluorobiphenyl (Surr)			*80 %*	*44-115 %*			*"*					
Phenol-d6 (Surr)			*74 %*	*33-122 %*			*"*					
p-Terphenyl-d14 (Surr)			*80 %*	*54-127 %*			*"*					
2-Fluorophenol (Surr)			*74 %*	*35-115 %*			*"*					
2,4,6-Tribromophenol (Surr)			*86 %*	*39-132 %*			*"*					
Duplicate (7060752-DUP2)					Prepared: 06/19/17 10:13 Analyzed: 06/19/17 18:25							
QC Source Sample: Comp-1 (A7F0504-01RE2)												
EPA 8270D												
Acenaphthene	ND	---	0.306	mg/kg dry	1	---	ND	---	---	---	30%	

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Philip Nerenberg, Lab Director

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Semivolatile Organic Compounds by EPA 8270D

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060752 - EPA 3546							**Soil**					
Duplicate (7060752-DUP2)					Prepared: 06/19/17 10:13 Analyzed: 06/19/17 18:25							
QC Source Sample: Comp-1 (A7F0504-01RE2)												
EPA 8270D												
Acenaphthylene	ND	---	0.306	mg/kg dry	"	---	ND	---	---	---	30%	
Aniline	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Anthracene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Azobenzene (1,2-DPH)	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Benz(a)anthracene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Benzo(a)pyrene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Benzo(b)fluoranthene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Benzo(k)fluoranthene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Benzo(g,h,i)perylene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Benzoic acid	ND	---	1.53	"	"	---	ND	---	---	---	30%	
Benzyl alcohol	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Bis(2-Chloroethoxy) methane	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Bis(2-Chloroethyl) ether	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Bis(2-Chloroisopropyl) ether	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Bis(2-Ethylhexyl) adipate	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Bis(2-ethylhexyl)phthalate	ND	---	0.306	"	"	---	0.253	---	---	30	30%	
4-Bromophenyl phenyl ether	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Butyl benzyl phthalate	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Carbazole	ND	---	0.306	"	"	---	ND	---	---	---	30%	
4-Chloroaniline	ND	---	0.306	"	"	---	ND	---	---	---	30%	
4-Chloro-3-methylphenol	ND	---	0.306	"	"	---	ND	---	---	---	30%	
2-Chloronaphthalene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
2-Chlorophenol	ND	---	0.306	"	"	---	ND	---	---	---	30%	
4-Chlorophenyl phenyl ether	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Chrysene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Dibenz(a,h)anthracene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Dibenzofuran	ND	---	0.306	"	"	---	ND	---	---	---	30%	
1,2-Dichlorobenzene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
1,3-Dichlorobenzene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
1,4-Dichlorobenzene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
2,4-Dichlorophenol	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Di-n-butylphthalate	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Diethylphthalate	ND	---	0.306	"	"	---	ND	---	---	---	30%	

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Philip Nerenberg, Lab Director

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Semivolatile Organic Compounds by EPA 8270D

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060752 - EPA 3546							**Soil**					
Duplicate (7060752-DUP2)					Prepared: 06/19/17 10:13 Analyzed: 06/19/17 18:25							
QC Source Sample: Comp-1 (A7F0504-01RE2)												
EPA 8270D												
Dimethylphthalate	ND	---	0.306	mg/kg dry	"	---	ND	---	---	---	30%	
2,4-Dimethylphenol	ND	---	0.306	"	"	---	ND	---	---	---	30%	
1,2-Dinitrobenzene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
1,3-Dinitrobenzene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
1,4-Dinitrobenzene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
4,6-Dinitro-2-methylphenol	ND	---	0.735	"	"	---	ND	---	---	---	30%	
2,4-Dinitrophenol	ND	---	0.306	"	"	---	ND	---	---	---	30%	
2,4-Dinitrotoluene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
2,6-Dinitrotoluene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Di-n-octyl phthalate	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Fluoranthene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Fluorene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Hexachlorobenzene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Hexachlorobutadiene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Hexachlorocyclopentadiene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Hexachloroethane	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Indeno(1,2,3-cd)pyrene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Isophorone	ND	---	0.306	"	"	---	ND	---	---	---	30%	
1-Methylnaphthalene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
2-Methylnaphthalene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
2-Methylphenol	ND	---	0.306	"	"	---	ND	---	---	---	30%	
3+4-Methylphenol(s)	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Naphthalene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
2-Nitroaniline	ND	---	0.306	"	"	---	ND	---	---	---	30%	
3-Nitroaniline	ND	---	0.306	"	"	---	ND	---	---	---	30%	
4-Nitroaniline	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Nitrobenzene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
2-Nitrophenol	ND	---	0.306	"	"	---	ND	---	---	---	30%	
4-Nitrophenol	ND	---	0.306	"	"	---	ND	---	---	---	30%	
N-Nitrosodimethylamine	ND	---	0.306	"	"	---	ND	---	---	---	30%	
N-Nitroso-di-n-propylamine	ND	---	0.306	"	"	---	ND	---	---	---	30%	
N-Nitrosodiphenylamine	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Pentachlorophenol (PCP)	ND	---	0.306	"	"	---	ND	---	---	---	30%	

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Philip Nerenberg, Lab Director

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Semivolatile Organic Compounds by EPA 8270D

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060752 - EPA 3546									Soil			
Duplicate (7060752-DUP2)					Prepared: 06/19/17 10:13 Analyzed: 06/19/17 18:25							
QC Source Sample: Comp-1 (A7F0504-01RE2)												
EPA 8270D												
Phenanthrene	ND	---	0.306	mg/kg dry	"	---	ND	---	---	---	30%	
Phenol	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Pyrene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Pyridine	ND	---	0.612	"	"	---	ND	---	---	---	30%	
2,3,4,6-Tetrachlorophenol	ND	---	0.306	"	"	---	ND	---	---	---	30%	
2,3,5,6-Tetrachlorophenol	ND	---	0.306	"	"	---	ND	---	---	---	30%	
1,2,4-Trichlorobenzene	ND	---	0.306	"	"	---	ND	---	---	---	30%	
2,4,5-Trichlorophenol	ND	---	0.306	"	"	---	ND	---	---	---	30%	
2,4,6-Trichlorophenol	ND	---	0.306	"	"	---	ND	---	---	---	30%	
Surr: Nitrobenzene-d5 (Surr)			*Recovery: 77 %*		*Limits: 37-122 %*				*Dilution: 1x*			
2-Fluorobiphenyl (Surr)			*74 %*		*44-115 %*				*"*			
Phenol-d6 (Surr)			*75 %*		*33-122 %*				*"*			
p-Terphenyl-d14 (Surr)			*80 %*		*54-127 %*				*"*			
2-Fluorophenol (Surr)			*77 %*		*35-115 %*				*"*			
2,4,6-Tribromophenol (Surr)			*82 %*		*39-132 %*				*"*			
Matrix Spike (7060752-MS2)					Prepared: 06/19/17 10:13 Analyzed: 06/19/17 19:38							
QC Source Sample: Comp-2 (A7F0504-02RE1)												
EPA 8270D												
Acenaphthene	0.761	---	0.591	mg/kg dry	4	0.945	ND	80	40-122%	---	---	
Acenaphthylene	0.728	---	0.591	"	"	"	ND	77	32-132%	---	---	
Aniline	0.488	---	0.473	"	"	"	ND	52	7-120%	---	---	
Anthracene	0.792	---	0.591	"	"	"	ND	84	47-123%	---	---	
Azobenzene (1,2-DPH)	0.791	---	0.591	"	"	"	ND	84	39-125%	---	---	
Benz(a)anthracene	0.791	---	0.591	"	"	"	ND	84	49-126%	---	---	
Benzo(a)pyrene	0.880	---	0.591	"	"	"	ND	93	45-129%	---	---	
Benzo(b)fluoranthene	0.848	---	0.591	"	"	"	ND	90	45-132%	---	---	
Benzo(k)fluoranthene	0.763	---	0.591	"	"	"	ND	81	47-132%	---	---	
Benzo(g,h,i)perylene	0.750	---	0.591	"	"	"	ND	79	43-134%	---	---	
Benzoic acid	2.09	---	1.89	"	"	1.89	ND	111	5-140%	---	---	
Benzyl alcohol	0.706	---	0.591	"	"	0.945	ND	75	29-122%	---	---	
Bis(2-Chloroethoxy) methane	0.691	---	0.591	"	"	"	ND	73	36-121%	---	---	
Bis(2-Chloroethyl) ether	0.675	---	0.591	"	"	"	ND	71	31-120%	---	---	

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503-718-2323 Phone
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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Semivolatile Organic Compounds by EPA 8270D

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060752 - EPA 3546							**Soil**					
Matrix Spike (7060752-MS2)					Prepared: 06/19/17 10:13 Analyzed: 06/19/17 19:38							
QC Source Sample: Comp-2 (A7F0504-02RE1)												
EPA 8270D												
Bis(2-Chloroisopropyl) ether	0.758	---	0.591	mg/kg dry	"	"	ND	80	33-131%	---	---	
Bis(2-Ethylhexyl) adipate	0.949	---	0.591	"	"	"	ND	100	60-121%	---	---	
Bis(2-ethylhexyl)phthalate	1.22	---	1.18	"	"	"	ND	129	51-133%	---	---	
4-Bromophenyl phenyl ether	0.741	---	0.591	"	"	"	ND	78	46-124%	---	---	
Butyl benzyl phthalate	0.938	---	0.591	"	"	"	ND	99	48-132%	---	---	
Carbazole	0.873	---	0.591	"	"	"	ND	92	50-122%	---	---	
4-Chloroaniline	0.358	---	0.236	"	"	"	ND	38	16-120%	---	---	
4-Chloro-3-methylphenol	0.791	---	0.591	"	"	"	ND	84	45-122%	---	---	
2-Chloronaphthalene	0.719	---	0.591	"	"	"	ND	76	41-120%	---	---	
2-Chlorophenol	0.762	---	0.591	"	"	"	ND	81	34-121%	---	---	
4-Chlorophenyl phenyl ether	0.723	---	0.591	"	"	"	ND	77	45-121%	---	---	
Chrysene	0.804	---	0.591	"	"	"	ND	85	50-124%	---	---	
Dibenz(a,h)anthracene	0.753	---	0.591	"	"	"	ND	80	45-134%	---	---	
Dibenzofuran	0.732	---	0.591	"	"	"	ND	77	44-120%	---	---	
1,2-Dichlorobenzene	0.690	---	0.591	"	"	"	ND	73	33-120%	---	---	
1,3-Dichlorobenzene	0.677	---	0.591	"	"	"	ND	72	30-120%	---	---	
1,4-Dichlorobenzene	0.689	---	0.591	"	"	"	ND	73	31-120%	---	---	
2,4-Dichlorophenol	0.772	---	0.591	"	"	"	ND	82	40-122%	---	---	
Di-n-butylphthalate	0.900	---	0.591	"	"	"	ND	95	51-128%	---	---	
Diethylphthalate	0.797	---	0.591	"	"	"	ND	84	50-124%	---	---	
Dimethylphthalate	0.741	---	0.591	"	"	"	2.69	-206	48-124%	---	---	Q-01
2,4-Dimethylphenol	0.779	---	0.591	"	"	"	ND	82	30-127%	---	---	
1,2-Dinitrobenzene	0.607	---	0.591	"	"	"	ND	64	44-120%	---	---	
1,3-Dinitrobenzene	0.599	---	0.591	"	"	"	ND	63	42-127%	---	---	
1,4-Dinitrobenzene	0.673	---	0.591	"	"	"	ND	71	37-132%	---	---	
4,6-Dinitro-2-methylphenol	0.263	---	0.236	"	"	"	ND	28	29-132%	---	---	Q-01
2,4-Dinitrophenol	0.408	---	0.378	"	"	"	ND	43	5-137%	---	---	
2,4-Dinitrotoluene	0.696	---	0.591	"	"	"	ND	74	48-126%	---	---	
2,6-Dinitrotoluene	0.681	---	0.591	"	"	"	ND	72	46-124%	---	---	
Di-n-octyl phthalate	1.01	---	0.591	"	"	"	ND	107	44-140%	---	---	
Fluoranthene	0.827	---	0.591	"	"	"	ND	87	50-127%	---	---	
Fluorene	0.764	---	0.591	"	"	"	ND	81	43-125%	---	---	
Hexachlorobenzene	0.713	---	0.591	"	"	"	ND	75	44-122%	---	---	

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Philip Nerenberg, Lab Director

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Semivolatile Organic Compounds by EPA 8270D

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060752 - EPA 3546							**Soil**					
Matrix Spike (7060752-MS2)					Prepared: 06/19/17 10:13 Analyzed: 06/19/17 19:38							
QC Source Sample: Comp-2 (A7F0504-02RE1)												
EPA 8270D												
Hexachlorobutadiene	0.715	---	0.591	mg/kg dry	"	"	ND	76	32-123%	---	---	
Hexachlorocyclopentadiene	0.278	---	0.236	"	"	"	ND	29	5-140%	---	---	
Hexachloroethane	0.683	---	0.591	"	"	"	ND	72	28-120%	---	---	
Indeno(1,2,3-cd)pyrene	0.728	---	0.591	"	"	"	ND	77	45-133%	---	---	
Isophorone	0.772	---	0.591	"	"	"	ND	82	30-122%	---	---	
1-Methylnaphthalene	0.743	---	0.591	"	"	"	ND	79	40-120%	---	---	
2-Methylnaphthalene	0.752	---	0.591	"	"	"	ND	80	38-122%	---	---	
2-Methylphenol	0.770	---	0.591	"	"	"	ND	81	32-122%	---	---	
3+4-Methylphenol(s)	0.780	---	0.591	"	"	"	ND	82	34-120%	---	---	
Naphthalene	0.731	---	0.591	"	"	"	ND	77	35-123%	---	---	
2-Nitroaniline	0.764	---	0.591	"	"	"	ND	81	44-127%	---	---	
3-Nitroaniline	0.582	---	0.473	"	"	"	ND	62	33-120%	---	---	
4-Nitroaniline	0.658	---	0.591	"	"	"	ND	70	35-120%	---	---	
Nitrobenzene	0.729	---	0.591	"	"	"	ND	77	34-122%	---	---	
2-Nitrophenol	0.712	---	0.591	"	"	"	ND	75	36-123%	---	---	
4-Nitrophenol	0.672	---	0.591	"	"	"	ND	71	30-132%	---	---	
N-Nitrosodimethylamine	0.604	---	0.591	"	"	"	ND	64	23-120%	---	---	
N-Nitroso-di-n-propylamine	0.752	---	0.591	"	"	"	ND	80	36-120%	---	---	
N-Nitrosodiphenylamine	0.751	---	0.591	"	"	"	ND	79	38-127%	---	---	
Pentachlorophenol (PCP)	0.340	---	0.331	"	"	"	ND	36	25-133%	---	---	
Phenanthrene	0.789	---	0.591	"	"	"	ND	83	50-121%	---	---	
Phenol	0.719	---	0.591	"	"	"	ND	76	34-120%	---	---	
Pyrene	0.815	---	0.591	"	"	"	ND	86	47-127%	---	---	
Pyridine	0.649	---	0.473	"	"	"	ND	69	5-120%	---	---	
2,3,4,6-Tetrachlorophenol	0.644	---	0.591	"	"	"	ND	68	44-125%	---	---	
2,3,5,6-Tetrachlorophenol	0.586	---	0.473	"	"	"	ND	62	40-120%	---	---	
1,2,4-Trichlorobenzene	0.692	---	0.591	"	"	"	ND	73	34-120%	---	---	
2,4,5-Trichlorophenol	0.754	---	0.591	"	"	"	ND	80	41-124%	---	---	
2,4,6-Trichlorophenol	0.737	---	0.591	"	"	"	ND	78	39-126%	---	---	
Surr: Nitrobenzene-d5 (Surr)			*Recovery: 76 %*		*Limits: 37-122 %*		*Dilution: 4x*					
2-Fluorobiphenyl (Surr)			*76 %*		*44-115 %*		*"*					
Phenol-d6 (Surr)			*76 %*		*33-122 %*		*"*					
p-Terphenyl-d14 (Surr)			*80 %*		*54-127 %*		*"*					

Apex Laboratories

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Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Semivolatile Organic Compounds by EPA 8270D

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060752 - EPA 3546												**Soil**
Matrix Spike (7060752-MS2)						Prepared: 06/19/17 10:13 Analyzed: 06/19/17 19:38						
QC Source Sample: Comp-2 (A7F0504-02RE1)												
EPA 8270D												
Surr: 2-Fluorophenol (Surr)			*Recovery: 76 %*			*Limits: 35-115 %*					*Dilution: 4x*	
2,4,6-Tribromophenol (Surr)			*83 %*			*39-132 %*					*"*	

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060834 - EPA 3051A							Soil					
Blank (7060834-BLK1)					Prepared: 06/21/17 12:33 Analyzed: 06/26/17 17:30							
EPA 6020A												
Arsenic	ND	---	1.00	mg/kg wet	10	---	---	---	---	---	---	
Barium	ND	---	1.00	"	"	---	---	---	---	---	---	
Cadmium	ND	---	0.200	"	"	---	---	---	---	---	---	
Chromium	ND	---	1.00	"	"	---	---	---	---	---	---	
Lead	ND	---	0.200	"	"	---	---	---	---	---	---	
Mercury	ND	---	0.0800	"	"	---	---	---	---	---	---	
Selenium	ND	---	1.00	"	"	---	---	---	---	---	---	
Silver	ND	---	0.200	"	"	---	---	---	---	---	---	
LCS (7060834-BS1)					Prepared: 06/21/17 12:33 Analyzed: 06/26/17 17:55							
EPA 6020A												
Arsenic	51.8	---	1.00	mg/kg wet	10	50.0	---	104	80-120%	---	---	
Barium	52.2	---	1.00	"	"	"	---	104	"	---	---	
Cadmium	51.6	---	0.200	"	"	"	---	103	"	---	---	
Chromium	52.8	---	1.00	"	"	"	---	106	"	---	---	
Lead	53.9	---	0.200	"	"	"	---	108	"	---	---	
Mercury	1.03	---	0.0800	"	"	1.00	---	103	"	---	---	
Selenium	27.3	---	1.00	"	"	25.0	---	109	"	---	---	
Silver	26.3	---	0.200	"	"	"	---	105	"	---	---	

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7060761 - Total Solids (Dry Weight)												**Soil**

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

SAMPLE PREPARATION INFORMATION

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Prep: EPA 3546 (Fuels)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7060765							
A7F0504-01	Soil	NWTPH-Dx	06/16/17 11:20	06/19/17 13:39	10.38g/5mL	10g/5mL	0.96
A7F0504-02	Soil	NWTPH-Dx	06/16/17 11:30	06/19/17 13:39	10.7g/5mL	10g/5mL	0.94

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Prep: EPA 5035A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7060825							
A7F0504-01	Soil	NWTPH-Gx (MS)	06/16/17 11:20	06/16/17 11:20	7.06g/5mL	5g/5mL	0.71
A7F0504-02	Soil	NWTPH-Gx (MS)	06/16/17 11:30	06/16/17 11:30	5.72g/5mL	5g/5mL	0.87

Volatile Organic Compounds by EPA 8260B

Prep: EPA 5035A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7060825							
A7F0504-01	Soil	5035A/8260B	06/16/17 11:20	06/16/17 11:20	7.06g/5mL	5g/5mL	0.71
A7F0504-02	Soil	5035A/8260B	06/16/17 11:30	06/16/17 11:30	5.72g/5mL	5g/5mL	0.87

Polychlorinated Biphenyls by EPA 8082A

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7060742							
A7F0504-01	Soil	EPA 8082A	06/16/17 11:20	06/19/17 07:10	11.25g/5mL	10g/5mL	0.89
A7F0504-02RE1	Soil	EPA 8082A	06/16/17 11:30	06/19/17 07:10	10.69g/5mL	10g/5mL	0.94

Semivolatile Organic Compounds by EPA 8270D

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7060752							
A7F0504-01RE2	Soil	EPA 8270D	06/16/17 11:20	06/19/17 10:16	10.27g/5mL	10g/5mL	0.97
A7F0504-02RE1	Soil	EPA 8270D	06/16/17 11:30	06/19/17 10:16	10.31g/5mL	10g/5mL	0.97

Total Metals by EPA 6020 (ICPMS)

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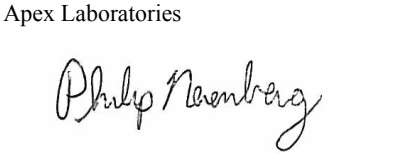

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

SAMPLE PREPARATION INFORMATION

Total Metals by EPA 6020 (ICPMS)

Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7060834							
A7F0504-01	Soil	EPA 6020A	06/16/17 11:20	06/21/17 12:33	0.498g/50mL	0.5g/50mL	1.00
A7F0504-02	Soil	EPA 6020A	06/16/17 11:30	06/21/17 12:33	0.52g/50mL	0.5g/50mL	0.96

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7060761							
A7F0504-01	Soil	EPA 8000C	06/16/17 11:20	06/19/17 12:39	1N/A/1N/A	1N/A/1N/A	NA
A7F0504-02	Soil	EPA 8000C	06/16/17 11:30	06/19/17 12:39	1N/A/1N/A	1N/A/1N/A	NA

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GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

Notes and Definitions

Qualifiers:

C-07	Extract has undergone Sulfuric Acid Cleanup by EPA 3665A, Sulfur Cleanup by EPA 3660B, and Florisil Cleanup by EPA 3620B in order to minimize matrix interference.
Q-01	Spike recovery and/or RPD is outside acceptance limits.
Q-42	Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report.)
Q-43	Matrix Spike recovery is not applicable due to interfering Aroclor(s) in source sample.
R-02	The Reporting Limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
S-05	Surrogate recovery is estimated due to sample dilution required for high analyte concentration and/or matrix interference.

Notes and Conventions:

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry'designation are not dry weight corrected.
RPD	Relative Percent Difference
MDL	If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
WMSC	Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
Batch QC	Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
Blank Policy	Apex assesses blank data for potential high bias down to a level equal to ½ the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses. For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor. Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
---	QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
***	Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Apex Laboratories

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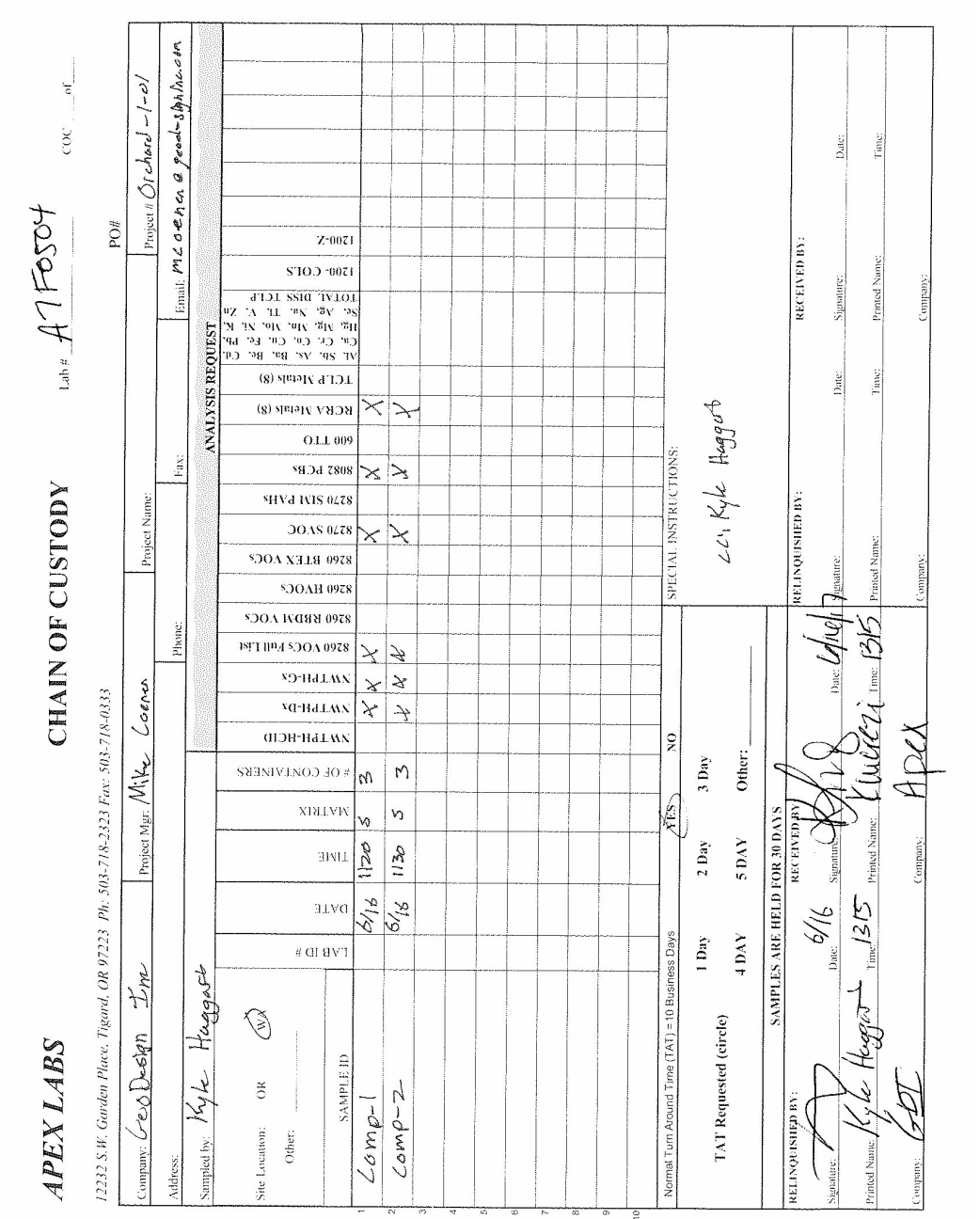
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59



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503-718-0333 Fax

GeoDesign, Inc.	Project: **Orchard-1-01**	
9450 SW Commerce Circle	Project Number: [none]	**Reported:**
Wilsonville, OR 97070	Project Manager: Mike Coenen	07/03/17 12:59

APEX LABS COOLER RECEIPT FORM

Client: GeoDesign Element WO#: A7 F0504

Project/Project #: Orchard-1-01

Delivery info:

Date/Time Received: 6/16/17 @ 1315 By: KMR

Delivered by: Apex___ Client X ESS___ FedEx___ UPS___ Swift___ Senvoy___ SDS___ Other___

Cooler Inspection Inspected by: KMR : 6/16/17 @ 1315

Chain of Custody Included? Yes X No___ Custody Seals? Yes___ No X

Signed/Dated by Client? Yes X No___

Signed/Dated by Apex? Yes X No___

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)	0.8						
Received on Ice? (Y/N)							
Temp. Blanks? (Y/N)							
Ice Type: (Gel/Real/Other)							
Condition:	good						

Cooler out of temp? (Y/N) Possible reason why:

If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA

Samples Inspection: Inspected by: [illegible] : 6/17/17 @ 915

All Samples Intact? Yes X No___ Comments:

Bottle Labels/COCs agree? Yes X No___ Comments:

Containers/Volumes Received Appropriate for Analysis? Yes X No___ Comments:

Do VOA Vials have Visible Headspace? Yes___ No___ NA X

Comments

Water Samples: pH Checked and Appropriate (except VOAs): Yes___ No___ NA F

Comments:

Additional Information:

Labeled by: [illegible] Witness: [illegible] Cooler Inspected by: MK See Project Contact Form: Y

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APPENDIX E

WASCO COUNTY LANDFILL
2550 Steele Road
The Dalles, OR 97058
(541) 296-4082

INVOICE

Printed 07/31/17

DATE	PAGE
07/31/17	1

INVOICE NUMBER 10767

AMUNT DUE	AMOUNT PAID
[redacted]	$

PAID
8-24-17
BP

MICHAEL GREEN CONSTRUCTION INC
MICHAEL GREEN
PO BOX 142
WASHOUGAL WA 98671

ACCOUNT NO.
855

DETACH AND RETURN TOP PORTION WITH REMITTANCE

DATE	TICKET	VEHICLE	REFERENCE	DESCRIPTION	QUANTITY	AMOUNT
/ /				Previous amount due		0.00
/ /				Last payment received		0.00
07/18/17	01-00224502	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	31.81	[redacted]
07/18/17	01-00224576	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	33.75	[redacted]
07/19/17	01-00224632	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	33.38	[redacted]
07/19/17	01-00224684	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	34.31	[redacted]
07/20/17	01-00224733	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	34.77	[redacted]
07/20/17	01-00224734	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	19.73	[redacted]
07/20/17	01-00224735	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	33.40	[redacted]
07/20/17	01-00224737	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	32.39	[redacted]
07/20/17	01-00224745	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	33.20	[redacted]
07/20/17	01-00224757	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	29.64	[redacted]
07/21/17	01-00224882	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	31.42	[redacted]
07/24/17	01-00225002	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	31.68	[redacted]
07/24/17	01-00225013	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	30.30	[redacted]
07/24/17	01-00225015	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	31.45	[redacted]
07/24/17	01-00225079	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	33.71	[redacted]
07/24/17	01-00225083	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	31.16	[redacted]
07/24/17	01-00225084	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	30.43	[redacted]
07/24/17	01-00225096	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	34.18	[redacted]
07/25/17	01-00225119	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	30.04	[redacted]
07/25/17	01-00225150	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	34.49	[redacted]
07/25/17	01-00225153	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	31.21	[redacted]
07/25/17	01-00225226	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	34.20	[redacted]
07/25/17	01-00225230	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	30.99	[redacted]
07/26/17	01-00225304	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	34.09	[redacted]
07/26/17	01-00225305	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	30.04	[redacted]
07/26/17	01-00225306	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	31.73	[redacted]
07/26/17	01-00225313	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	32.63	[redacted]
07/26/17	01-00225314	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	31.10	[redacted]
		CL144				

FORM #WW611

INVOICE

WASCO COUNTY LANDFILL
2550 Steele Road
The Dalles, OR 97058
(541) 296-4082

Printed 07/31/17

DATE	PAGE
07/31/17	2

INVOICE NUMBER
10767

AMOUNT DUE	AMOUNT PAID
[redacted]	$

MICHAEL GREEN CONSTRUCTION INC
MICHAEL GREEN
PO BOX 142
WASHOUGAL WA 98671

ACCOUNT NO.
855

DETACH AND RETURN TOP PORTION WITH REMITTANCE

DATE	TICKET	VEHICLE	REFERENCE	DESCRIPTION	QUANTITY	AMOUNT
07/26/17	01-00225317	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	33.66	[redacted]
07/26/17	01-00225372	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	33.44	[redacted]
07/26/17	01-00225379	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	31.20	[redacted]
07/26/17	01-00225387	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	31.15	[redacted]
07/27/17	01-00225404	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	30.91	[redacted]
07/27/17	01-00225431	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	33.39	[redacted]
07/27/17	01-00225461	TRAIL	GOLDEN COR	PETR CONT SOIL - OUT	30.75	[redacted]
07/27/17	01-00225470	TRAIL	GOLDERN CO	PETR CONT SOIL - OUT	30.77	[redacted]
	Net weight	1146.50		Invoice total		[redacted]
				Total amount due		[redacted]

FORM #WW611

DIETRICH TRUCKING, LLC

7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

17-130

Customer's Order No.	Phone	Date
12670		7-20-17

Sold To: Green Construction Van-WA

Address:

City: Wasco - The Dalles OR

Driver: Ravens

Truck & Trailer: 8508-8908

Qty.	Description	Price	Amount	
323	Con. Soil			
	Wt. 224737			
	>			
	Not Responsible for Damage Behind Curb Line			

All claims and returned goods MUST be accompanied by this bill.

Rec'd By

Tax

Total

248115 / 4055211

161187

Thank You

DIETRICH TRUCKING, LLC
7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

17-130

r No.	Phone	Date 7-20-17
2(?)700		

Green Construction Van·WA

Wasco - The Dalles - OR

Driver	Truck & Trailer
Owens	8508-8908

Description	Price	Amount	
Con. Soil			
W# 224737			
Not Responsible for Damage Behind Curb Line			
...d returned goods MUST be accompanied by this bill.	Tax		
	Total		

187

Thank You

DIETRICH TRUCKING, LLC
7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

Customer's Order No.	Phone	Date
176700		7/20/17

Sold To: Green Construction
Address: 4th Plain
City: Vancouver WA

Driver	Truck & Trailer
Michael Schor	8528 8936

Qty.	Description	Price	Amount	
	4th Plain Hill to Wasco			
3320	00224745			
	17-130			
	Not Responsible for Damage Behind Curb Line			
All claims and returned goods MUST be accompanied by this bill.		Tax		
Rec'd By		Total		

248115 / 4055211

161944

Thank You

DIETRICH TRUCKING, LLC

7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

r No.	Phone	Date
17c7nd		7/21/17

Schoen Construction
4th Plain
Vancouver wa

Richard Schoen | Truck & Trailer 8528 8730

Description	Price	Amount
Dirt @ Wasco		
00224882		
17-130		
>		
Not Responsible for Damage Behind Curb Line		
nd returned goods MUST be accompanied by this bill.	Tax	
	Total	

L946

Thank You

DIETRICH TRUCKING, LLC

7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

Customer's Order No.	Phone	Date
176700		7-26-17

Sold To: Schoen Construction
Address: 4th Plain
City: Vancouver Wa

Driver: Reid Allen Works | Truck & Trailer 8525 8525

Qty.	Description	Price	Amount
31	Tons of Contaminated Soil To Wasco Landfill Ticket # 225314		
	>		
	Not Responsible for Damage Behind Curb Line		
	All claims and returned goods MUST be accompanied by this bill.	Tax	
	Rec'd By	Total	

248115 / 4055211

167827

Thank You

DIETRICH TRUCKING, LLC

7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

Customer's Order No.	Phone	Date 7/26/10
Sold To Green Construction		
Address SR 500 / 4th Plain		
City Vancouver WA		

Driver Michael Schoen	Truck & Trailer 8528 8930

Qty.	Description	Price	Amount	
	Dirt to			
3366	00225317			
	> 17-130			
	Not Responsible for Damage Behind Curb Line			
All claims and returned goods MUST be accompanied by this bill.		Tax		
Rec'd By		Total		

248115 / 4055211

168001

Thank You

DIETRICH TRUCKING, LLC
7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

No.	Phone	Date 7/26/17
een Construction		
SR 500 / 4th Plain		
Vancouver WA		

	Truck & Trailer 8528 8930

Description	Price	Amount	
Dirt to			
00225317			
17-130			
lot Responsible for Damage Behind Curb Line			
d returned goods MUST be accompanied by this bill.	Tax		
	Total		

001 **Thank You**

DIETRICH TRUCKING, LLC
7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

Customer's Order No. 176700	Phone	Date 7-27-17
Sold To Green Con.		
Address		
City Vancouver WA		

Driver Holloway	Truck & Trailer 8527-8902

Qty.	Description	Price	Amount	
1	Dirt from Vancouver			
	To WaSco			
30.75	WaSco # 225461			
	>			
	Not Responsible for Damage Behind Curb Line			
All claims and returned goods MUST be accompanied by this bill.		Tax		
Rec'd By		Total		

248115 / 4055211

169260 **Thank You**

DIETRICH TRUCKING, LLC

7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

Customer's Order No.	Phone	Date
126740		7-20-17
Sold To	Green Cons	
Address		
City		

Driver	Truck & Trailer
Eric Daly	8526 / 8403

Qty.	Description	Price	Amount	
	D.I.T from 4" plant			
	to Wasco Landfill			
2961	#00224757			
	>			
	Not Responsible for Damage Behind Curb Line			
All claims and returned goods MUST be accompanied by this bill.		Tax		
Rec'd By		Total		

248115 / 4055211

169301

Thank You

DIETRICH TRUCKING, LLC
7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

r No.	Phone	Date 7-20-17
	Green Const	

Truck & Trailer 8526 / 8903

Description	Price	Amount	
Dirt from 4th Plain to Wasco Landfill			
#00224757			
Not Responsible for Damage Behind Curb Line			
d returned goods MUST be accompanied by this bill.	Tax		
	Total		

0301 **Thank You**

DIETRICH TRUCKING, LLC
7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

Customer's Order No. 176700	Phone	Date 7-24-17
Sold To Green Const		
Address VANCOUVER TO WASCO LANDFILL		
City		

Driver Eric Ondy Truck & Trailer 8526 / 8903

Qty.	Description	Price	Amount	
	Dirt from 4th Plain to Wasco Landfill			
31.68	#00225002			
	>			
	Not Responsible for Damage Behind Curb Line			
	All claims and returned goods MUST be accompanied by this bill.	Tax		
	Rec'd By	Total		

248115 / 4055211

169305 **Thank You**

DIETRICH TRUCKING, LLC

7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

Customer's Order No.	Phone	Date
176700		7-25-17
Sold To	Green Coast	
Address		
City		

Driver	Truck & Trailer
Eric DAX	K-26 8903

Qty.	Description	Price	Amount	
	D.I.T from Vancouver			
	TC WASCO County, OR			
30.4	# 0022519			
	>			
	Not Responsible for Damage Behind Curb Line			
All claims and returned goods MUST be accompanied by this bill.		Tax		
Rec'd By		Total		

248115 / 4055211

169306

Thank You

DIETRICH TRUCKING, LLC

7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

r No.	Phone	Date
26700		7-25-17
green cond		

Truck & Trailer: 8526 8903

Description	Price	Amount
D.I.T from 47th plain		
To wheeler landfill		
Ft 00225119		
>		
Not Responsible for Damage Behind Curb Line		
d returned goods MUST be accompanied by this bill.	Tax	
	Total	

1306

Thank You

DIETRICH TRUCKING, LLC

7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

Customer's Order No.	Phone	Date
		7-26-17
Sold To: green cond		
Address:		
City:		

Driver: Eric Daly
Truck & Trailer: 8526 8903

Qty.	Description	Price	Amount
	D.I.T from 47th plain		
	To wheeler landfill		
31.20	Ft00225379		
	>		
	Not Responsible for Damage Behind Curb Line		
	All claims and returned goods MUST be accompanied by this bill.	Tax	
	Rec'd By	Total	

248115 / 4055211

169311

Thank You

DIETRICH TRUCKING, LLC

7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

Customer's Order No.	Phone	Date
176700		7/26/17

Sold To: GREEN CONSTRUCTION

Address: 4TH PLAIN

City: VANCOUVER, WA

Driver: KENNEL R

Truck & Trailer: 8535 8905

Qty.	Description	Price	Amount	
	HAUL DIRT TO			
	WASCO LANDFILL			
	#275313 37.63 TON			
	>			
	Not Responsible for Damage Behind Curb Line			

All claims and returned goods MUST be accompanied by this bill.

Rec'd By

Tax

Total

248115 / 4055211

169769

Thank You

DIETRICH TRUCKING, LLC

7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

No. 76700	Phone	Date 7/26/17

EN CONSTRUCTION
PLAIN
PULLMAN, WA

Truck & Trailer 8535 9905

Description	Price	Amount
HAUL DIRT TO		
WASCO LANDFILL		
1225313 32.13 TON		

Not Responsible for Damage Behind Curb Line

d returned goods MUST be accompanied by this bill.

Tax	
Total	

1769

Thank You

DIETRICH TRUCKING, LLC

7211-A NE 43rd Ave.
VANCOUVER, WASHINGTON 98661
(360) 892-3881
Fax (360) 883-1898

Customer's Order No.	Phone	Date 7-20-17

Sold To Green Construction
Address
City

Driver Jerry Ferguson
Truck & Trailer 8530 8932

Qty.	Description	Price	Amount
33.40	DIRT # 00224735		
	>		

Not Responsible for Damage Behind Curb Line

All claims and returned goods MUST be accompanied by this bill.

Tax	
Total	

Rec'd By

248115 / 4055211

169863

Thank You

DIETRICH TRUCKING, LLC

7211-A NE 43RD AVE.
VANCOUVER WA 98661
(360) 892-3881
FAX (360) 883-1898

CUSTOMER'S ORDER NO.	PHONE	DATE
176700	.	7/24/2017

NAME: GREEN CONSTRUCTION

ADDRESS:

DRIVER	TRUCK NO.
CELORIE	11

QTY.	DESCRIPTION	PRICE	AMOUNT
30.3	TON CONT DIRT 225013		
31.16	TON CONT DIRT 225083		
61.46	Total		
	Not Responsible For Damage Behind Curb Line	Tax	
Received By		TOTAL	

S 5920

DIETRICH TRUCKING, LLC
(360) 892-3881

DIETRICH TRUCKING, LLC

7211-A NE 43RD AVE.
VANCOUVER WA 98661
(360) 892-3881
FAX (360) 883-1898

CUSTOMER'S ORDER NO.	PHONE	DATE
176700	.	7/24/2017

NAME: GREEN CONSTRUCTION

ADDRESS:

DRIVER	TRUCK NO.
CELORIE	21

QTY.	DESCRIPTION	PRICE	AMOUNT
31.45	TON CONT DIRT 225015		
30.43	TON CONT DIRT 225084		
61.88	Total		
	Not Responsible For Damage Behind Curb Line	Tax	
Received By		TOTAL	

S 5921

DIETRICH TRUCKING, LLC
(360) 892-3881

DIETRICH TRUCKING, LLC

7211-A NE 43RD AVE.
VANCOUVER WA 98661
(360) 892-3881
FAX (360) 883-1898

CUSTOMER'S ORDER NO.	PHONE	DATE
176700	.	7/25/2017

NAME: GREEN CONSTRUCTION

ADDRESS:

DRIVER	TRUCK NO.
CELORIE	21

QTY.	DESCRIPTION	PRICE	AMOUNT
31.21	TON CONT DIRT 225153		
30.99	TON CONT DIRT 225230		
62.2	Total		
	Not Responsible For Damage Behind Curb Line	Tax	
Received By		TOTAL	

S 5922

DIETRICH TRUCKING, LLC
(360) 892-3881

DIETRICH TRUCKING, LLC

7211-A NE 43RD AVE.
VANCOUVER WA 98661
(360) 892-3881
FAX (360) 883-1898

CUSTOMER'S ORDER NO.	PHONE	DATE
176700	.	7/26/2017

NAME: GREEN CONSTRUCTION

ADDRESS:

DRIVER	TRUCK NO.
CELORIE	11

QTY.	DESCRIPTION	PRICE	AMOUNT
30.04	TON CONT DIRT 225305		
30.04	Total		
	Not Responsible For Damage Behind Curb Line	Tax	
Received By		TOTAL	

S 5923

DIETRICH TRUCKING, LLC
(360) 892-3881

DIETRICH TRUCKING, LLC

7211-A NE 43RD AVE.
VANCOUVER WA 98661
(360) 892-3881
FAX (360) 883-1898

CUSTOMER'S ORDER NO.	PHONE	DATE
176700	.	7/26/2017

NAME: GREEN CONSTRUCTION

ADDRESS:

DRIVER	TRUCK NO.
CELORIE	21

QTY.	DESCRIPTION	PRICE	AMOUNT
31.73	TON CONT DIRT 225306		
31.15	TON CONT DIRT 225368		
62.88	Total		
	Not Responsible For Damage Behind Curb Line	Tax	
Received By		TOTAL	

S 5924

DIETRICH TRUCKING, LLC
(360) 892-3881

DIETRICH TRUCKING, LLC

7211-A NE 43RD AVE.
VANCOUVER WA 98661
(360) 892-3881
FAX (360) 883-1898

CUSTOMER'S ORDER NO.	PHONE	DATE
176700	.	7/27/2017

NAME: GREEN CONSTRUCTION

ADDRESS:

DRIVER	TRUCK NO.
CELORIE	11

QTY.	DESCRIPTION	PRICE	AMOUNT
30.91	TON CONT DIRT 225404		
30.77	TON CONT DIRT 225470		
61.68	Total		
	Not Responsible For Damage Behind Curb Line	Tax	
Received By		TOTAL	

S 5925

DIETRICH TRUCKING, LLC
(360) 892-3881

DIETRICH TRUCKING, LLC

7211-A NE 43RD AVE.
VANCOUVER WA 98661
(360) 892-3881
FAX (360) 883-1898

CUSTOMER'S ORDER NO.	PHONE	DATE
176700	.	7/27/2017

NAME: GREEN CONSTRUCTION

ADDRESS:

DRIVER	TRUCK NO.
CELORIE	21

QTY.	DESCRIPTION	PRICE	AMOUNT
33.39	TON CONT DIRT 225431		
30.57	TON CONT DIRT 225499		
63.96	Total		
	Not Responsible For Damage Behind Curb Line	Tax	
Received By		TOTAL	

S 5926

DIETRICH TRUCKING, LLC
(360) 892-3881

DIETRICH TRUCKING, LLC

7211-A NE 43RD AVE.
VANCOUVER WA 98661
(360) 892-3881
FAX (360) 883-1898

CUSTOMER'S ORDER NO.	PHONE	DATE
176700	.	7/24/2017

NAME: GREEN CONSTRUCTION

ADDRESS:

DRIVER	TRUCK NO.
POTTER	58

QTY.	DESCRIPTION	PRICE	AMOUNT
34.18	TON CONT DIRT 225006		
33.71	TON CONT DIRT 225079		
67.89	Total		
	Not Responsible For Damage Behind Curb Line	Tax	
Received By		TOTAL	

S 5933

DIETRICH TRUCKING, LLC
(360) 892-3881

DIETRICH TRUCKING, LLC

7211-A NE 43RD AVE.
VANCOUVER WA 98661
(360) 892-3881
FAX (360) 883-1898

CUSTOMER'S ORDER NO.	PHONE	DATE
176700	.	7/25/2017

NAME: GREEN CONSTRUCTION

ADDRESS:

DRIVER	TRUCK NO.
POTTER	58

QTY.	DESCRIPTION	PRICE	AMOUNT
34.49	TON CONT DIRT 225150		
34.2	TON CONT DIRT 225226		
68.69	Total		
	Not Responsible For Damage Behind Curb Line	Tax	
Received By		TOTAL	

S 5934

DIETRICH TRUCKING, LLC
(360) 892-3881

DIETRICH TRUCKING, LLC

7211-A NE 43RD AVE.
VANCOUVER WA 98661
(360) 892-3881
FAX (360) 883-1898

CUSTOMER'S ORDER NO.	PHONE	DATE
176700	.	7/26/2017

NAME: GREEN CONSTRUCTION

ADDRESS:

DRIVER	TRUCK NO.
POTTER	58

QTY.	DESCRIPTION	PRICE	AMOUNT
34.09	TON CONT DIRT 225304		
33.44	TON CONT DIRT 225372		
67.53	Total		
	Not Responsible For Damage Behind Curb Line	Tax	
Received By		TOTAL	

S 5935

DIETRICH TRUCKING, LLC
(360) 892-3881