

Methane Assessment Work Plan

Mill Pond Crossing Development
1701 Chapel Drive
Philomath, Oregon
DEQ ECSI Site 6296

Prepared for:
Mill Pond Crossing, LLC
16017 288th Street E
Graham, Washington 98338

August 2021
PBS Project 24159.000



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1 INTRODUCTION

PBS Engineering and Environmental Inc. (PBS) has prepared this work plan on behalf of Mill Pond Crossing, LLC (Client), to conduct additional assessment of subsurface methane concentrations across the Mill Pond Crossing Development in Philomath, Oregon (site; Figures 1 and 2). This work plan documents the planning, implementation, and procedures for assessment and has been designed to address comments from the Oregon Department of Environmental Quality (DEQ) provided in a Consent Order dated July 27, 2021.

Modifications to the work plan scope of work, if necessary, will be presented and approved by DEQ staff via email prior to implementation.

2 PROJECT MANAGEMENT

Personnel involved in the project and their respective roles include the following:

Personnel	Organization	Role
Dennis Terzian	PBS	Project Manager
Toby Scott	PBS	Technical Specialist
Samantha Eckes	PBS	Field Operations Manager
David Rukki	PBS	Field Staff
Samantha Vega	PBS	Field Staff
Nikos Tzetos	Pacific Geophysics	Geophysical Survey Subconsultant
Neil Kranz	Pacific Soil and Water	Driller for Methane Point Installation
Cody Keyser	Alpha Locates	Private Utility Locates
Various Staff	Cascade Drilling	Driller for Methane Point Installation
Various Staff	Mill Pond LLC	Auger Installation for Methane Point (if needed)

The scope of work detailed in the following sections will result in a methane investigation report to be completed four weeks following the completion of proposed monitoring point sampling. The following assumes additional assessment or investigation will be determined unnecessary following implementation of the proposed scope of work.

A methane investigation risk assessment and feasibility report will be prepared that will meet the requirements for both format and observance of applicable guidance as noted in the Consent Order. This report will be completed six weeks following submittal of the methane investigation report and receipt of any comments or implementation of additional site assessment activities requested by DEQ.

3 SITE LOCATION AND DESCRIPTION

The site consists of an approximate 30-acre square-shaped property distributed across multiple tax lots on portions of Sections 12 and 13 of Township 12 South, Range 6 West of the Willamette Base and Meridian (Figure 1) and a street address of 1701 Chapel Drive, Philomath, Oregon. The site is bounded by Chapel Drive to the south, S 15th Street to the west, and residential properties to the north and east.

A new housing development has been constructed on the western perimeter, and aside from a former log pond in the southern portion, the remainder of the site is vacant (Figure 2).

The site elevation is approximately 275 feet above mean sea level, and the Marys River is located approximately 0.25-mile to the south as it flows to the east toward the confluence with the Willamette River.

3.1 Site Ownership and History

The Client is redeveloping the property as a residential affordable housing community. Redevelopment has already occurred on the western portion of the property, but the central and eastern portions remain vacant.

The site was formerly occupied by the Hoban Lumber Company and used as a sawmill and lumber processing facility from the 1950s until approximately 1998. Two large log ponds were historically present, one elongated pond on the western portion of the property and a larger pond on the northeast portion. Milling operations were in the southeast corner of the property. Documented activities have included lumber milling, wood waste incineration using two "wigwam" style burners, log loading, and equipment fueling. Reportedly, wood treatment did not occur at the site. The operations were dismantled from 1998 to 2000 and the ponds were reportedly filled with wood waste.

4 REGIONAL GEOLOGY AND HYDROGEOLOGY

Based on previous investigations, the eastern log pond was filled primarily with silty- and clayey-sand and gravel with wood debris and organic material to depths as much as 15 feet below ground surface (bgs). The western log pond was reportedly filled with silty sand with wood debris and organic material overlying a low plasticity clay. In the western pond, the contact between the fill material and clay ranges from 4.5 to 12 feet bgs. The fill in both ponds is often water-bearing, with perched groundwater at various depths depending on fill dynamics. The fill material is assumed to be the source of elevated methane concentrations that have been observed in soil gas measurements.

Based on topography and local surface hydrology, it is likely that groundwater in the region flows to the south-southeast, toward the Marys River.

A domestic groundwater well, BENT 54885, is located approximately 650 feet to the east of the log chain area. The well is installed to a depth of 120 feet bgs. A well report is available for a wellhead extension; however, details of the specific construction of the well is not known. The static water level in the well in 2014 was reported to be 13 feet bgs.

5 KNOWN OR SUSPECTED ENVIRONMENTAL CONDITIONS

The fill material is believed to be the source of elevated methane concentrations that have been observed in the subsurface. In preparation for site development, fill material beneath existing residential buildings in the western portion of the site (lots 1 through 64) was excavated to depths ranging from 5 to 7 feet bgs. Additionally, fill within a north-south trending stormwater bioswale in the western portion of the site was excavated to approximately 5 feet bgs. Fill was not excavated beneath backyard areas.

In October 2018, the site was enrolled into DEQ's Voluntary Cleanup Program (VCP) and assigned ECSI Site Number 6296. DEQ requested work to assess for impacts to soil and groundwater from previous site operations, including potential underground storage tanks (USTs), and impacts to shallow soil from former wood waste incinerators, the log chain area, drainage ditches, and fueling areas.

Previous work determined the suspect UST was a buried large, open section of corrugated pipe. Incremental sampling methodology (ISM) sampling of the former wood waste burners and log chain area indicated no unacceptable soil concentrations. A groundwater sample in the log chain area indicated a concentration of diesel-range total petroleum hydrocarbons (TPH) above the respective residential ingestion/inhalation risk-based concentration; however, this receptor pathway was determined to be incomplete. Ditch areas near former mill operations were also evaluated. No unacceptable soil concentrations were identified.

In June 2020, Aerotech Environmental Consulting (AEC) measured methane in 13 borings (SG-1 through SG-13) and concentrations ranging from zero to 14.2% by volume (pbv) were detected at the site. The measurements were made using a Landtec GEM 2000-Plus (GEM) portable gas meter and the mean concentration was 3.83 pbv. In general, the elevated concentrations were detected at depths of 4 to 5 feet bgs¹ and equivalent to the depth of organic materials that have been observed within the former ponds. The tabulated results are included in Table 1, and sample point locations are indicated on Figure 3.

On February 3, 2021, PBS measured ambient air in crawl spaces and garages of nine existing residences (lots 32–38 and lot 11) using a GEM that was calibrated prior to use. Garage measurements were made in both ambient air and immediately adjacent to any cracks observed in the floor slab. No methane concentrations were detected to a level of 0.1 pbv.

On February 17 and 18, 2021, PBS installed nine temporary borings (MB-1 through MB-9) across the west and east log ponds using a direct push drilling rig and Geoprobe System post-run tooling (PRT) system equipped with expendable vapor points. The points were installed at depths within the fill material of the log ponds. Following installation, the points were monitored using a GEM. Results of the investigation indicated concentrations of methane ranging from 5.9 pbv (MB-5) to 84.3 pbv (MB-7). A strong odor was encountered emanating from the borehole at MB-4. The tabulated results are included in Table 1, and sample point locations are indicated on Figure 3. A description of this work and results are to be documented in a future report.

In April 2021, PBS installed monitoring points MP-1 through MP-12 (Figure 3) and began collecting weekly subsurface methane readings from the former log ponds using a GEM through the end of May 2021. Limitations on access to private properties due to incomplete site access agreements and physical barriers (such as fences and stormwater swale excavation) resulted in several planned locations proposed in PBS' April 2021 work plan either being moved or not completed. Those locations included the following:

- The proposed location in the southwest corner of the site in the center of 791 15th Street/lot 1. Because of the presence of a fence, access could not be obtained. As well, the presence of the stormwater swale did not allow for installation of a boring immediately east of this property. Monitoring point MP-4 was installed due east of the planned location, on the other side of the stormwater swale (in lot 62).
- The proposed location adjacent to previously completed Aerotech sample SG05 (previous reading of 12.9 pbv at 4 feet bgs). Because of the presence of a fence, access could not be obtained. As well, the presence of the stormwater swale did not allow for installation of a boring immediately east of this property (771 15th Street/lot 6). Although a monitoring point was not specifically installed to address this location, monitoring points MP-2 and MP-7 are southeast and northeast, respectively, of this location. As the proposed location and these locations are in the same general area and within the

¹ Aerotech Environmental Consulting Inc. June 10, 2020. *Landfill Gas Survey, Philomath Mill Site, 1701 Chapel Drive, Philomath, Oregon 98442.*

footprint of the former pond, these two points appear to provide monitoring coverage representative of the area.

- The proposed location along the northern backyard boundary (623 15 Street/lot 18) and in the general vicinity of previously completed Aerotech sample SG07 (previous reading of 3.1 pbv at 4 feet bgs). Because of the presence of a fence, access could not be obtained. Monitoring point MP-1 was located immediately east of this lot along the west side of the stormwater swale.
- Three locations proposed in the northeast corner of the site (lots 120, 151, and 156). Site conditions (soil piles, unstable ground) only allowed sufficient access to install one of these locations, MP-12, which was installed immediately west of lot 120.

Four monitoring points (MP-6, MP-9, MP-10, and MP-12) were determined to be either damaged beyond repair or nonfunctional due to multiple events where standing water in the monitoring point made methane sample measurements not possible. Additionally, monitoring point MP-3 could not be located (likely covered in soil) during initial sampling events but was subsequently located and sampled during the last two events of May 2021. The highest concentrations in PBS-installed monitoring points were detected in MP-5 with methane ranging from 22.4 to 45.3 pbv. This monitoring point generally exhibited the highest concentrations, followed by MP-11, which contained 21.6 to 30.6 pbv. In the other monitoring points, concentrations were indicative of lower methane concentrations, generally by a magnitude of order. Results are included on Table 2.

6 PURPOSE AND OBJECTIVES

The purpose of this scope of work is to complete necessary components of a Remedial Investigation, Risk Assessment, and Feasibility Study (RI/RA/FS) by determining the nature, extent, distribution, and movement of methane in site soil, groundwater, and air, and the risks to people exposed to methane at or adjacent to the property. Development and evaluation of remedial alternatives will be conducted in a later scope once sufficient RI has been completed. This work plan addresses comments provided by DEQ in the Consent Order dated July 27, 2021, which requested:

1. Modifications to the DEQ-approved work plan dated March 23, 2021, that occurred during initial methane monitoring on April 13–14, 2021.
2. Installation of additional methane monitoring points, including those described as confined spaces (i.e., utility vaults, transformer boxes, electrical panels, etc.).
3. Preliminary methane mitigation options and planning, including coordination with local utility companies.

7 HEALTH AND SAFETY

A site-specific health and safety plan (HASP) will be reviewed and updated as necessary before commencing fieldwork. Information to ensure safe working practices will be included in the HASP. Special considerations for toxic gases and explosion hazards will be incorporated, with detailed procedures for how to monitor workspaces and explosion mitigation procedures when they are warranted. In all cases, pertinent safety information will be relayed to field personnel, including subcontractors, to communicate mandatory elements from the federal code for hazardous waste operations and emergency response (29 CFR 1910.120(b)(4)).

7.1 Jobsite Safety During COVID-19

At PBS, we are committed to keeping our employees, clients, contractors, and communities healthy. We are following federal, state, and local guidelines and recommendations in response to COVID-19 as we strive to balance public health concerns and delivery of our projects.

8 FIELD PREPARATIONS

PBS will contact the Oregon Utility Notification Center to file a public utility locate request at least two business days in advance of drilling activities to locate underground utility-owned lines up to the meter (for example, water, gas, electric), and underground public utilities within the public right-of-way. Discrete sampling points will be uploaded into a GPS unit for use in the field.

9 PROPOSED SCOPE OF WORK

PBS has developed a scope of work to provide further definition of subsurface methane concentrations both on the western portion of the site where completed residences are located and the eastern portion of the site where future construction will occur. The scope of work also includes an objective to further define the volume and location of buried organic material and fill material within the former log ponds at the site. Since the sampling activities in this scope of work is limited to field processes and measurements, a separate Sampling and Analysis Plan (SAP) has not been prepared and the following narrative will act in implementation as the site SAP.

9.1 Geophysical Survey of Log Pond Areas

PBS will arrange for a geophysical survey contractor to evaluate the structure and nature of fill material within the large logging pond on the eastern portion of the site as well as the smaller logging pond on the western portion of the site. PBS has discussed implementation with our contractor, Pacific Geophysics, and they are optimistic that they will be able to obtain good resolution of the pond fill material using ground penetrating radar (GPR) with various antennas. The focus of the survey will be to identify and define thicknesses for intervals of fill material in the pond structures to the apparent bottom of the pond, estimated to be up to 15 feet bgs in the eastern log pond area.

Directional survey lines will include:

- Two to three east-west trending lines across the eastern log pond structure
- One or more north-south trending line across the eastern log pond structure
- One north-south trending line across the western log pond structure adjacent to the existing stormwater swale
- Additional lines as necessary based on preliminary results

The GPR survey is anticipated to be successful in characterizing depth to groundwater in the shallow organic zones as PBS' contractor will be utilizing a specialized antenna that can distinguish different materials (soil, gravel, wood waste) due to their signal response, and groundwater typically improves radar resolution.

The results of the survey will be summarized in a separate report by Pacific Geophysics and combined with stratigraphy data previously collected at the site during drilling events to model the lateral and vertical extent of the pond's fill and groundwater conditions. This information will be presented to DEQ for review along with proposed changes and additions for methane point locations and depths.

9.2 Methane Point Installation

PBS has designed additional methane sampling points at the site to both replace previously completed sampling points that were determined to be nonfunctional due to water intrusion/damage as well as to provide definition of the nature and extent of subsurface methane. These locations are presented on Figure 3 and include the following:

- MP-13 through MP-16 along the western property boundary to provide lateral definition
- MP-17 through MP-19 along the northwestern property boundary to provide lateral definition
- MP-20 through MP-27 to provide monitoring points within and bounding the northern portion of the eastern log pond
- MP-28 through MP-32 to provide monitoring points within and bounding the southern portion of the eastern log pond
- MP-6A, MP-9A, MP-10A, and MP-12A to replace previously installed methane points that have failed or are damaged
- MH-1 and MH-2 to evaluate backfill material adjacent to a stormwater utility as a preferential pathway

PBS and the selected drilling contractor will mobilize to the site to install the above-listed points. This includes near existing occupied residences in the western portion of the site to assess the potential for methane generation/accumulation and along the northeastern perimeter of the site to confirm the absence of off-site methane migration. Locations (see Figure 2) will target areas where elevated methane concentrations have been observed and will be dispersed to adequately characterize overall soil gas conditions in the existing housing development.

To evaluate the potential explosive or toxic vapor hazards during drilling activities, the following air monitoring will be conducted:

- The breathing zone and boreholes will be monitored for methane, hydrogen sulfide, carbon dioxide, and oxygen. The duration and frequency of monitoring will be detailed in the site-specific HASP.

The points will be installed by advancing boreholes using either a drill rig or excavator equipped with an auger or post hole attachment capable of generating a small diameter borehole (anticipated to be 2 to 6 inches in diameter, depending on equipment availability and drilling conditions) to a depth of 7 feet bgs. A standard installation consisting of 5 feet of 1-inch-diameter schedule 40 polyvinyl chloride (PVC) machine slotted 40-slot or 20-slot screened casing with 2 feet of blank casing capped with a shut-off valve will be installed in each location. The resulting annular space will be backfilled with pea gravel to approximately 2 feet bgs and silica sand to approximately 1.5 feet bgs. The point will be sealed with hydrated bentonite from approximately 0.5 to 1.5 feet bgs, overlain by a concrete seal for stability of the point and completed with a flush mount monument. The monitoring point locations will be recorded on a GPS unit. Ambient air temperature within the borehole will be measured within any borings exhibiting steam during completion or overly warm soil cuttings utilizing a field temperature probe.

Points MH-1 and MH-2, and possibly MP-18 and MP-19 (depending on locations of existing utilities and final point placement), may require an alternative method of installation, such as air knife excavation, to ensure integrity of the existing sewer utility.

If significant methane concentrations are measured during drilling activities, the field work will be temporarily halted until methane concentrations return to acceptable levels. The subsurface borings/excavations will be inerted with nitrogen gas if methane concentrations exceed 20% of the lower explosive limit (LEL) (or 1 pbv methane) and sustained for at least 30 seconds. Drilling or excavation activities will not resume until readings are sufficiently reduced below the action level of 20% LEL.

Previously installed and proposed monitoring points confirmed to be functional will be finished with permanent flush mount monuments.

9.3 Hot Spot Delineation

PBS evaluated the need for additional temporary methane sampling points at the site to provide localized delineation of three previously installed points with high methane concentrations (MP-3, MP-5, and MP-11). Review of data from previously installed PRT and methane point installation concluded the following:

- Location MP-3 is already sufficiently bounded to the north (proposed point MP-6A), south (existing point MP-7), and west (proposed point MP-14). An additional data point is needed to the east of MP-3 for sufficient delineation. To address this, PBS has added temporary methane point TMP-1 located immediately east of the 748 15th Street parcel tax lot line.
- Location MP-5 is already sufficiently bounded to the north (previous PRT point MB-8 and existing point MP-8), south (existing point MP-1), and west (proposed point MP-16). An additional data point is needed to the east of MP-5 for sufficient delineation. To address this, PBS has added temporary methane point TMP-2 located immediately east of the 610 15th Street parcel tax lot line.
- Location MP-11 is already sufficiently bounded to the east (proposed point MP-10A), north (proposed point MP-18), south (proposed point MH-1 and existing point MP-8), and west (proposed point MP-17).

Temporary points TMP-1 and TMP-2 will be installed by advancing boreholes using either a drill rig or excavator equipped with an auger or post hole attachment capable of generating a small diameter (anticipated to be 2 to 6 inches in diameter, depending on equipment availability and drilling conditions) borehole to a depth of 7 feet bgs. A standard installation consisting of 5 feet of 1-inch-diameter schedule 40 PVC machine slotted 40-slot or 20-slot screened casing with 2 feet of blank casing capped with a shut-off valve will be installed in each location. The resulting annular space will be backfilled with pea gravel to approximately 2 feet bgs and silica sand to approximately 1.5 feet bgs. The point will be surface sealed with hydrated bentonite from approximately 0 to 1.5 feet bgs and sampled for the presence of methane. If methane concentrations exceed 5%, points will be converted to permanent monitoring points. Otherwise, the points will be removed following initial sampling. The monitoring point locations will be recorded on a GPS unit.

9.4 Comprehensive Inventory of Confined Spaces

PBS will complete a comprehensive observation of the site and adjacent right-of-way property to identify all features that have the potential to act as a confined space for collection of methane including but not limited to public and private utility vaults, utility (water, electric, gas, phone, internet) feed boxes and panels attached to or adjacent to residences that come into contact with the ground surface. Information collected at each location will include:

- Initial landfill gas measurement if the confined space is accessible for measurement without modification
- Collection of latitude/longitude of the feature
- Photographic documentation of each feature
- Owner (public/private) of the feature

Confined spaces surveyed above will be compiled in a figure and data table that includes the data collected above as well as a determination for either low or high priority for further monitoring defined by field measurements, proximity to known "hot spots" of methane, and size and construction of the feature.

9.5 Confined Space Methane Monitoring Point Installation

Utilizing data collected during the inventory process described above and in consultation with DEQ, PBS will identify and add monitoring points to at least six confined spaces at the site along S 15th Street that have the potential to collect concentrations of methane.

In addition to the six points described above and in consultation with DEQ, PBS will identify and modify (as needed) confined space features for collection of landfill gas measurements at locations adjacent to homes near hot spots at MP-3, MP-5, and MP-11.

Point installation is likely to be defined by the type of equipment or feature being monitored but at a minimum will consist of tubing that allows for methane measurement without disturbing the feature, opening lids, or similar.

9.6 Methane Point Monitoring

After installation, the points will be purged and monitored using a GEM to measure peak and static methane, oxygen, carbon dioxide, barometric pressure, and downhole pressure. Purging of the point will be conducted using a GEM or similar equipment to assure the readings are representative of subsurface soil-gas concentrations and other subsurface conditions. Each point will be purged of approximately two borehole volumes unless methane concentrations reach steady state before two volumes are purged. In every circumstance, at least one complete volume will be purged. Confined space methane monitoring points will not be purged prior to monitoring.

The points will initially be monitored on a weekly basis for up to four weeks after installation. At that time, PBS will determine key methane points for further monitoring. Results will be communicated to DEQ by email after each monitoring event using a formatted table.

9.7 Methane Point Decommissioning

The points will be retained for future use until DEQ and other stakeholders agree decommissioning is warranted. The points will be removed and if any void space remains it will be filled with granular bentonite and hydrated in place. The surface of each point will be matched to its surrounding material.

9.8 Preliminary Methane Mitigation Options, Planning, and Coordination

Results of the investigations will be used to develop a preliminary methane mitigation plan to prevent general human health exposure and explosion hazards at the property. Results will be evaluated to determine hot spot or high-risk areas near the property perimeter for initial in situ methane mitigation design, feasibility testing, and installation.

Results of confined space monitoring will be shared with utility providers to develop an operations and maintenance plan to prevent inadvertent occupational exposures and mitigate explosion hazards. This may include site-specific training, signage, additional lockout/tagout procedures, vapor block dams for utility trenches, air monitoring, and potentially explosion-proof tools and instruments.

All underground electrical conduits at electrical service boxes and all above-ground or underground connections of underground conduit to electrical boxes will be sealed in a manner acceptable to DEQ and electrical utility to prevent preferential migration of landfill gas. This portion of the scope of work will be completed as soon as possible.

9.9 Instrument/Equipment Testing, Inspection, and Maintenance

Field equipment for the baseline assessment will include the following:

- Drill rig/excavator
- Hand tools
- GEM portable gas meter
- Disposable tubing

Maintenance of the drill rig or excavator is the responsibility of the drilling/excavation contractor. Hand tools will be visually inspected and decontaminated prior to use. PBS routinely services the GEM unit through QED of Dexter, Michigan, or equivalent. QED performs an annual calibration according to the instrument manufacturer's directions.

9.10 Inspection/Acceptance of Supplies and Consumables

Materials used in the execution of work will be appropriate and approved for intended uses. The procurement and handling of quality-affecting materials will be controlled to ensure initial and continued conformance with applicable technical requirements and acceptance criteria. These items will be visually inspected before shipment to the field and again before use. Inspection elements will include, as appropriate, a review of physical condition, expiration dates, limitations of use, size and quantity, and quality grade. Materials that do not meet performance specifications will be segregated and labeled to preclude use.

Disposable gloves for project use will be obtained directly from the box provided by the manufacturer. The boxes will be kept clean prior to and during on-site use.

9.11 Quality Assurance/Quality Control

The quality assurance/quality control procedures utilized in completing the scopes of work include the following:

- Annual factory servicing and calibration of portable methane meter(s).
- Field calibration of methane meter(s) prior to each use.
- Utilization of a hydrophobic filter in the connection train to ensure water that may be present in probes is not brought into the meter.
- Ensuring proper connections to probes, valve settings, and sufficient purging of probes prior to sample reading.
- Purging of fresh air through meter(s) after each testing event and before proceeding to the next monitoring location
- Ensuring that all required parameters are collected including peak and steady state gas levels

9.12 Data Management and Documentation

Project documents and records will be prepared, generated, reviewed, approved, and controlled in accordance with PBS' internal quality assurance and quality control procedures. Hard copies of these records will be provided to the PBS project manager by technical staff and subcontractors in a timely fashion, stored in the PBS project files, and summarized, as needed, for inclusion in reports. The PBS project manager is responsible for maintaining the project files and keeping copies of all generated data in the project files.

10 DELIVERABLES

PBS will provide an electronic copy of the project report to Mill Pond Crossing, LLC. The report will summarize field activities and include figures showing sample locations, tabulated laboratory results compared to applicable screening levels, a discussion of the conceptual site model including current and future receptors, beneficial water use and land use survey, boring logs, and photographs. With Mill Pond Crossing, LLC's,

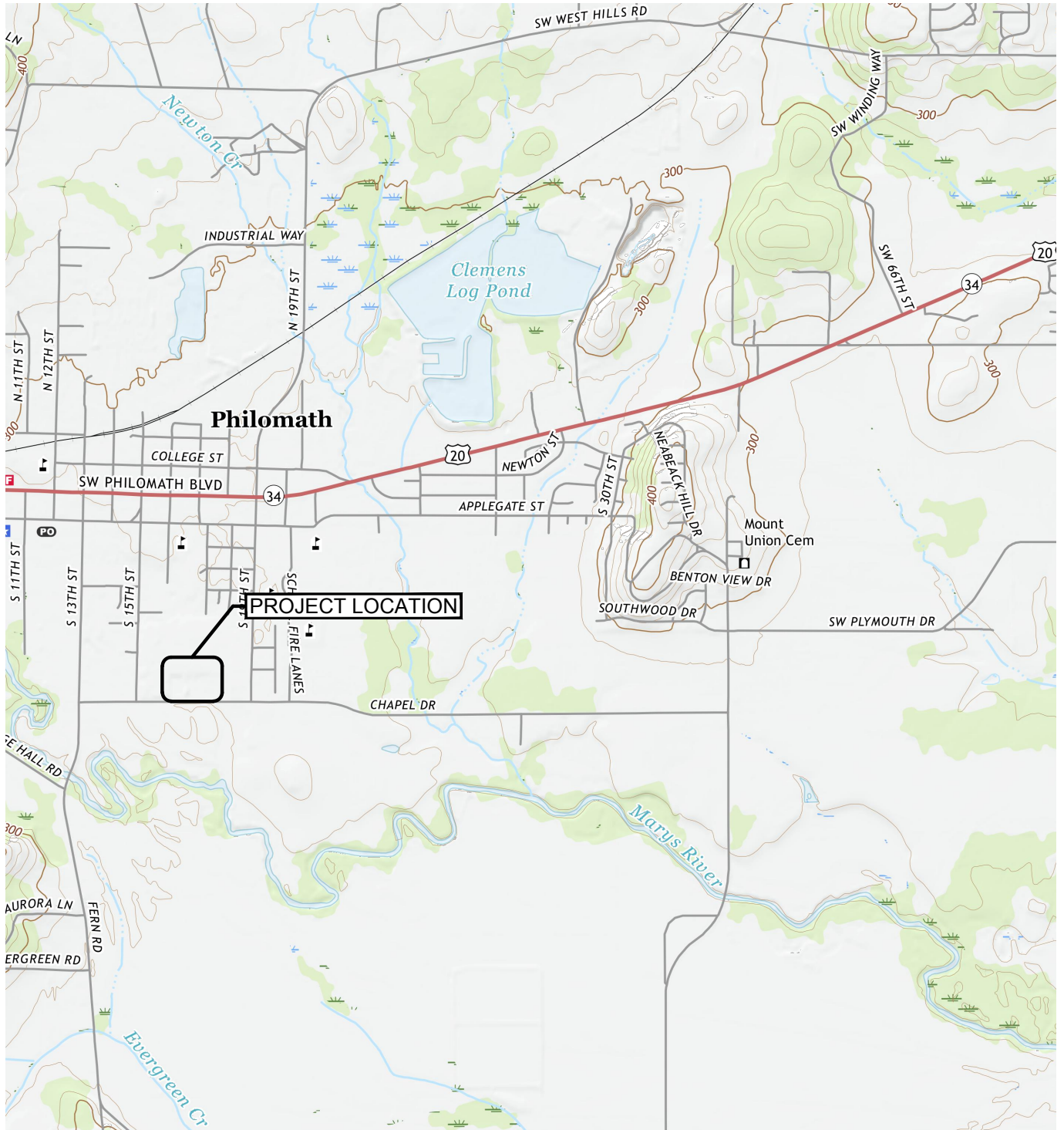
Figures

Figure 1. Vicinity Map

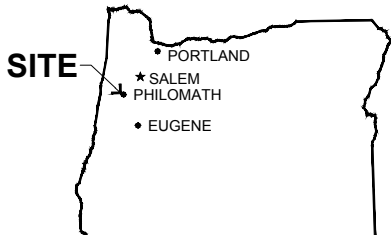
Figure 2. Site Plan

Figure 3. Previously Completed Sampling Points

Figure 4. Proposed Methane Monitoring Points



SOURCE: USGS CORVALLIS, OR QUADRANGLE 2020.



OREGON



Scale 1" = 2000'



PREPARED FOR: MILL POND CROSSING LLC

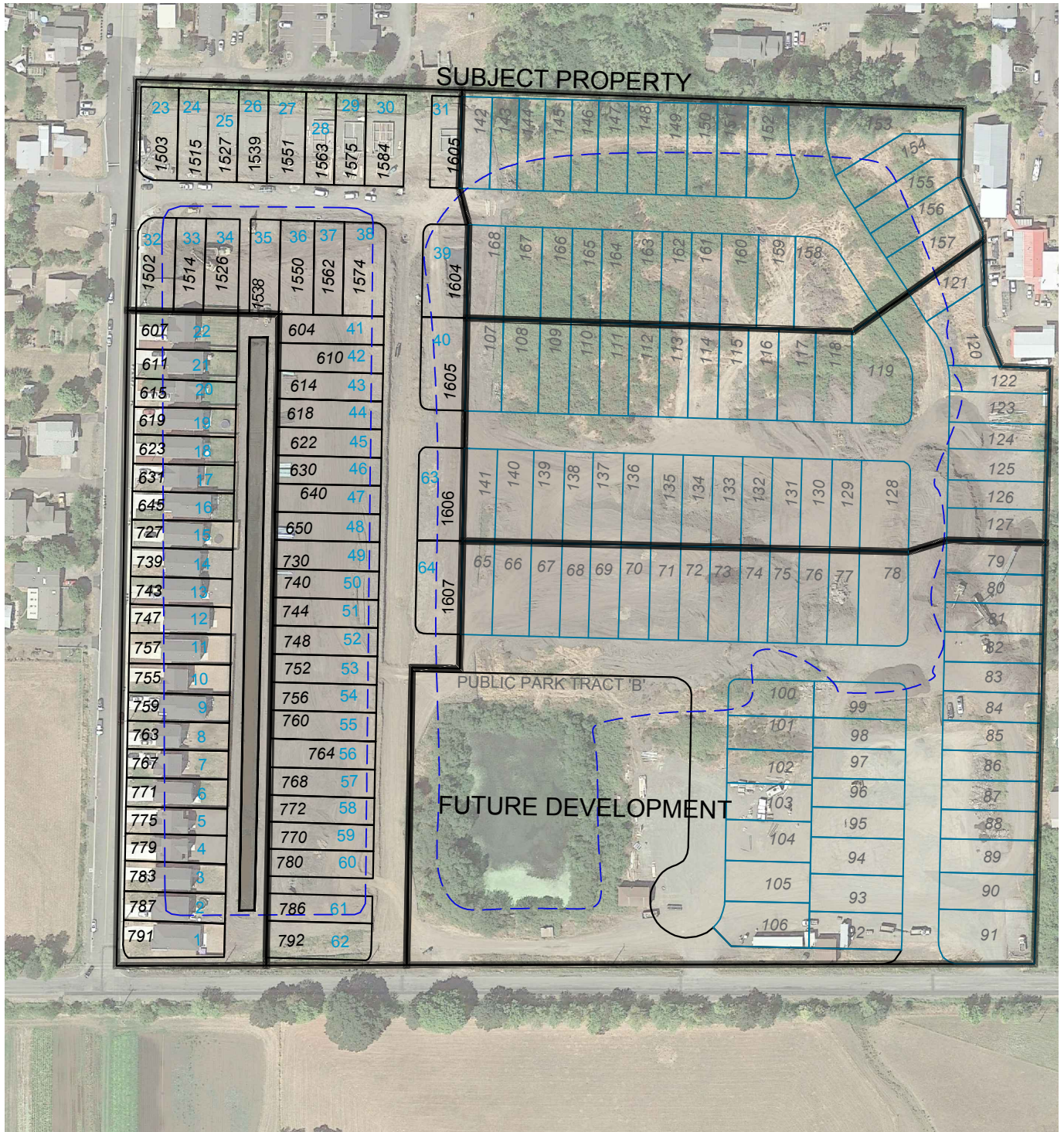


VICINITY MAP
 1701 CHAPEL DRIVE
 PHILOMATH, OREGON

JUL 2021
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


FIGURE

1



SOURCE: © 2019 GOOGLE EARTH PRO

LEGEND

-  HISTORICAL LOG POND FILLED WITH CLAY & ORGANIC MATERIAL
-  PLAT OF COMPLETED HOUSE WITH HOUSE NUMBER & LOT NUMBER
-  FUTURE DEVELOPMENT PLAT WITH LOT NUMBER
-  STORMWATER SWALE



Scale 1" = 200'



PREPARED FOR: MILL POND CROSSING LLC



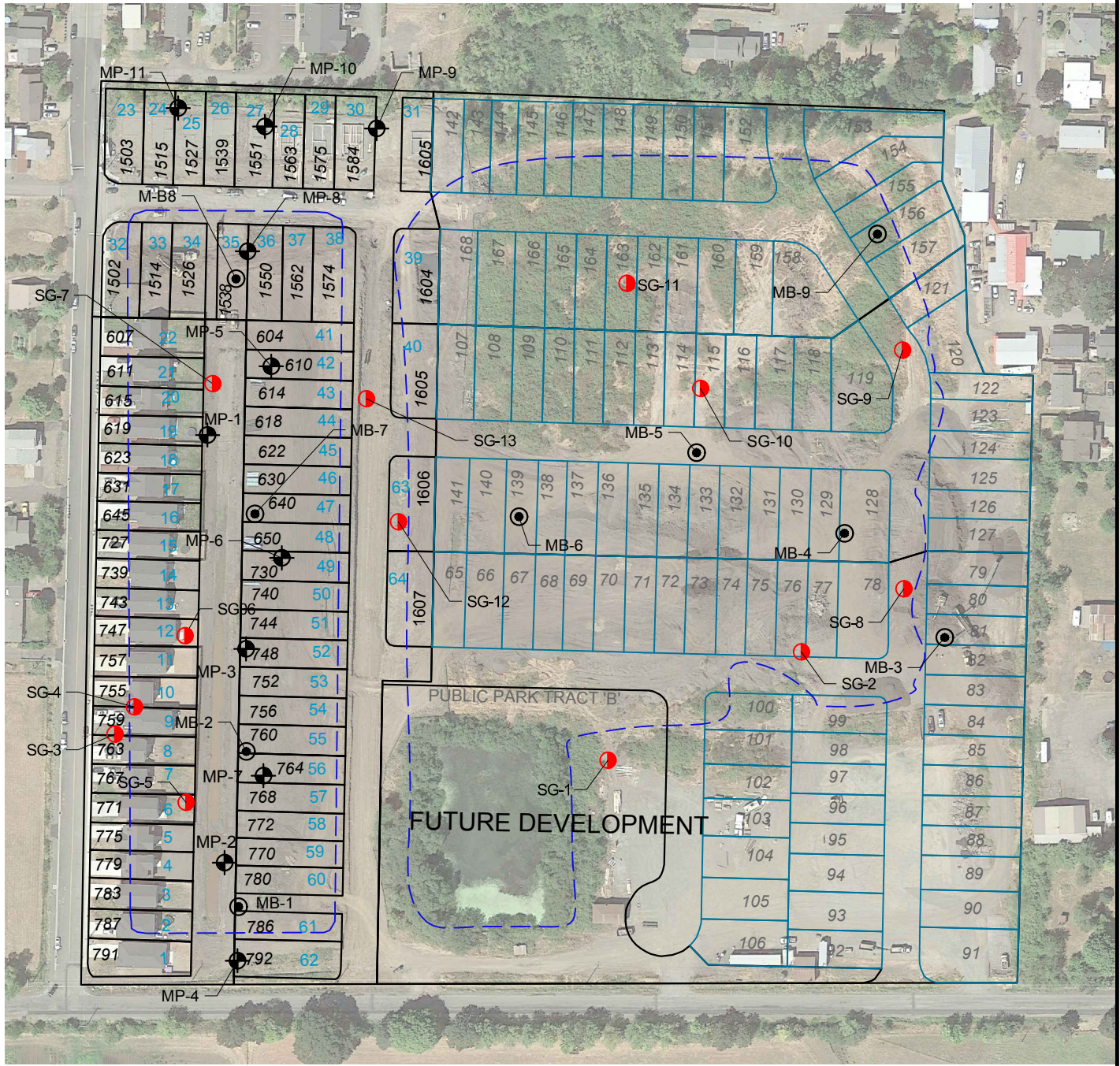
SITE PLAN

1701 CHAPEL DRIVE
PHILOMATH, OREGON

JUL 2021
24159.000

FIGURE

2



SOURCE: © 2019 GOOGLE EARTH PRO

LEGEND

- MB-1 FEBRUARY 2021 PRT TEMPORARY BORINGS
- ⊕ MP1 METHANE MONITORING LOCATION
- HISTORICAL LOG POND FILLED WITH CLAY & ORGANIC MATERIAL
- ▭ PLAT OF COMPLETED HOUSE WITH HOUSE NUMBER & LOT NUMBER
- ▭ FUTURE DEVELOPMENT PLAT WITH LOT NUMBER
- SG01 AEROTECH SOIL BORING LOCATION (2020)



Scale 1" = 200'



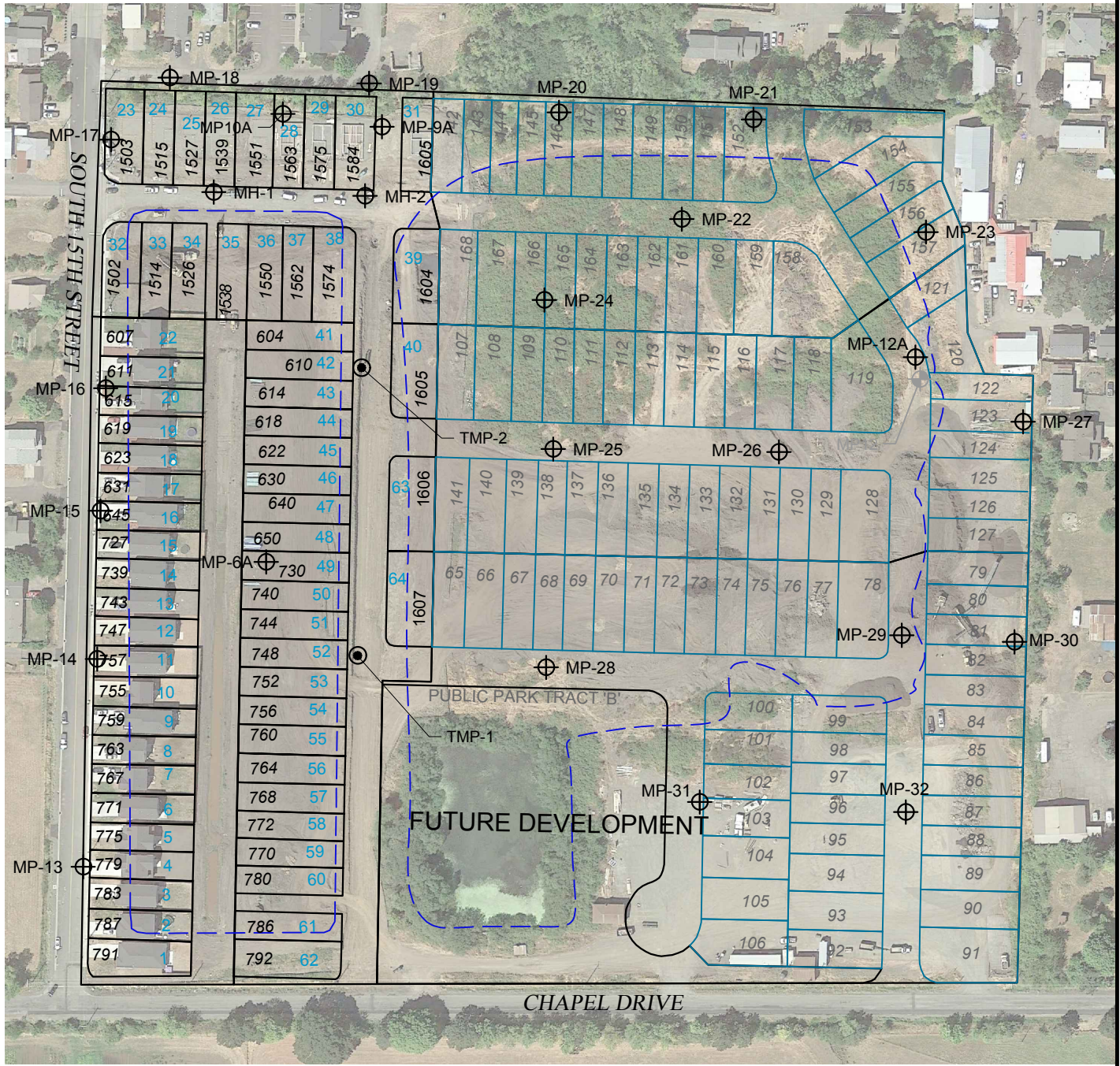
PREPARED FOR: MILL POND CROSSING LLC



PREVIOUSLY COMPLETED SAMPLING POINTS

1701 CHAPEL DRIVE
PHILOMATH, OREGON

JUL 2021 24159.000
FIGURE
3



SOURCE: © 2019 GOOGLE EARTH PRO

LEGEND

- ⊕ MP-13 PROPOSED PERMANENT METHANE MONITORING LOCATIONS
- TMP-1 TEMPORARY METHANE MONITORING POINTS
- - - HISTORICAL LOG POND FILLED WITH CLAY & ORGANIC MATERIAL
- ▭ PLAT OF COMPLETED HOUSE WITH HOUSE NUMBER & LOT NUMBER
- ▭ FUTURE DEVELOPMENT PLAT WITH LOT NUMBER



Scale 1" = 200'



PREPARED FOR: MILL POND CROSSING LLC



PROPOSED METHANE MONITORING POINTS

1701 CHAPEL DRIVE
 PHILOMATH, OREGON

AUG 2021
 24159.000

FIGURE

4

Tables

Table 1. Temporary Methane Monitoring Summary

Table 2. Permanent Methane Point Monitoring Summary

Table 1. Temporary Methane Monitoring Summary

Mill Pond Crossing

1701 Chapel Drive, Philomath, Oregon

Monitoring Point	Depth	Date	Time	Duration	Peak Methane	Methane	Carbon Dioxide	Oxygen	Balance Gas	Baro Pressure (Inches H2O)	Static Pressure (Inches H2O)
					pbv	pbv	pbv	pbv	pbv		
Aerotech June 2020											
SG1	10	6/1/2020	NA	NA	0	1.1	20.5	6	NA	NA	NA
SG2	6	6/1/2020	NA	NA	0	6.4	9.7	16	NA	NA	NA
SG3	2	6/1/2020	NA	NA	0	0.2	4.0	15.9	NA	NA	NA
SG3	4	6/1/2020	NA	NA	0	6.9	9.7	16	NA	NA	NA
SG4	2	6/1/2020	NA	NA	0	0.6	10.3	17.3	NA	NA	NA
SG4	4	6/1/2020	NA	NA	0	14.2	25.1	10.9	NA	NA	NA
SG5	4	6/1/2020	NA	NA	0	12.9	28.0	1.3	NA	NA	NA
SG6	4	6/1/2020	NA	NA	0	0.1	23.3	2.7	NA	NA	NA
SG7	4	6/1/2020	NA	NA	0	3.1	7.3	13	NA	NA	NA
SG8	4	6/1/2020	NA	NA	0	6.4	9.3	11.7	NA	NA	NA
SG9	5	6/1/2020	NA	NA	0	9.3	6.6	14.9	NA	NA	NA
SG10	5	6/1/2020	NA	NA	0	5.4	4.8	17.8	NA	NA	NA
SG11	5	6/1/2020	NA	NA	0	0	7.3	13.7	NA	NA	NA
SG12	5	6/1/2020	NA	NA	0	1.7	2.2	20	NA	NA	NA
SG13	5	6/1/2020	NA	NA	0	2.6	6.0	16.6	NA	NA	NA
PBS February 2021											
MB-1	8	2/17/2021	1333	120	78.6	0	1.3	20.1	NA	407.99	0.00
MB-2	2	2/17/2021	1337	120	36.6	35.6	26.4	10.1	NA	407.71	0.00
MB-3	1.5	2/18/2021	1339	120	58.5	58	40.8	0.8	NA	362.71	0.14
MB-4	1.3*	2/18/2021	1341	120	62.3	62.2	37.1	0.2	NA	402.55	0.41
MB-5	1	2/18/2021	1345	120	5.9	5.9	0.1	9.7	NA	375.36	-14.14
MB-6	2.5	2/18/2021	1347	120	59.5	59.3	40.6	0.1	NA	402.55	-27.19
MB-7	4	2/17/2021	1351	120	84.3	0.9	14.6	0.2	NA	407.44	0.00
MB-8	3	2/17/2021	1353	120	79.3	0.2	0.8	20.1	NA	407.71	0.00

*: Due to intense odors emanating from borehole, this reading was taken from the open borehole, rather than a PRT sampler

pbv : percent by volume

Table 2. Permanent Methane Point Monitoring Summary

Mill Pond Crossing

1701 Chapel Drive, Philomath, Oregon

Monitoring Point	Depth of Screen	Date	Time	Duration	Peak Methane	Methane	Carbon Dioxide	Oxygen	Balance Gas	Baro Pressure (Inches H2O)	Static Pressure (Inches H2O)	Notes
					pbv	pbv	pbv	pbv	pbv			
MP1	4	4/14/2021	1204	268	0.9	0.4	3.6	7.6	--	404.72	0.00	
		4/23/2021	1305	200	1.7	1.7	13.2	0.3	87.9	403.91	0.00	
		4/28/2021	1449	121	2.1	2.1	12.8	1.4	83.6	407.99	0.00	
		5/6/2021	1325	120	2.3	2.3	16.3	0.3	81.2	404.18	0.00	
		5/12/2021	1242	120	2.3	2.2	15.8	0.2	81.8	406.49	0.00	
		5/19/2021	1138	120	2.1	2.1	17.1	0.7	80.1	405.00	0.00	
		5/26/2021	1135	120	2.6	2.6	18	0.4	79	405.00	0.00	
MP2	2.5	4/15/2021	1515	200	14.8	14.8	18.4	1.7	65	407.31	2.18	
		4/23/2021	1220	200	3.9	3.9	21.4	0.4	74.3	403.91	0.00	
		4/28/2021	1215	160	2	1.6	18.9	0.7	78.5	407.03	0.00	
		5/6/2021	1425	120	7.9	7.7	19.8	0.3	72	404.59	0.00	
		5/12/2021	1215	120	5.5	5.4	17.6	0.4	76.5	405.40	0.00	
		5/19/2021	1204	120	10.8	10.7	18.8	0.6	69.9	405.00	0.00	
		5/26/2021	1149	120	7.3	7.1	18.9	0.4	73.6	405.00	0.00	
MP3	3.5	4/14/2021	1529	312	34.7	33.8	33.8	0.5	--	405.13	0.14	
		4/23/2021	--	--	--	--	--	--	--	--	--	missing
		5/19/2021	1156	120	6.8	6.5	27.3	0.9	65.1	405.00	0.00	located
		5/26/2021	1143	120	10.5	10.3	29.3	0.4	60	405.00		
MP4	4	4/15/2021	1527	200	1.1	0.2	1.4	18.1	80.3	407.31	1.77	
		4/23/2021	1212	200	0.03	0.1	4.5	14.4	80.9	403.91	0.00	
		4/28/2021	1221	140	0	0	8	10.4	81.6	407.03	0.00	
		5/6/2021	1427	120	1.1	0.8	15.7	2.3	81	404.59	0.00	
		5/12/2021	1218	120	0.9	0	15.3	2.9	81.9	405.40	0.00	
		5/19/2021	1208	40	0.1	0.1	18.6	1.5	79.7	405.00	0.00	
		5/26/2021	1153	35	0.2	0	15.7	4.5	79.6	405.00	0.00	

Table 2. Permanent Methane Point Monitoring Summary

Mill Pond Crossing

1701 Chapel Drive, Philomath, Oregon

Monitoring Point	Depth of Screen	Date	Time	Duration	Peak Methane	Methane	Carbon Dioxide	Oxygen	Balance Gas	Baro Pressure (Inches H2O)	Static Pressure (Inches H2O)	Notes
					pbv	pbv	pbv	pbv	pbv			
MP5	4	4/14/2021	1617	400	45.2	29.2	14.6	5.2	--	405.00	0.00	
		4/23/2021	1250	200	45.6	45.3	24	0.4	30.3	403.91	0.00	
		4/28/2021	1300	130	45.3	45.2	24.7	0.4	29.6	407.99	0.00	
		5/6/2021	1309	120	23.5	22.4	14.5	9.9	52.8	404.18	0.00	
		5/12/2021	1144	120	33.8	33.7	22.2	4.1	39.9	405.40	0.00	
		5/19/2021	1148	120	33.9	33.8	25.2	2.9	37.9	405.00	0.00	
		5/26/2021	1138	120	36.8	36.5	29	0.9	33.6	405.00	0.00	
MP6	6.5	4/14/2021	--	--	--	--	--	--	--	--	--	water in point
		4/23/2021	--	--	--	--	--	--	--	--	--	water in point
		4/28/2021	--	--	--	--	--	--	--	--	--	water in point
		5/6/2021	point nonfunctional									
MP7	5	4/14/2021	1445	200	0.6	0.4	15.4	3.7	80.3	407.31	2.18	
		4/23/2021	1227	200	0	0	21.4	0.05	78.1	403.91	0.00	
		4/28/2021	1210	122	0.4	0.1	22.9	0.5	76.6	407.03	0.54	
		5/6/2021	1421	120	0.2	0.1	23.5	1.3	75.1	404.59	0.00	
		5/12/2021	1208	120	0.3	0.2	23.3	0.4	76.1	405.40	0.00	
		5/19/2021	1200	120	0.7	0.3	24.6	0.7	74.4	405.00	0.00	
		5/26/2021	1147	120	0.4	0.3	24.5	0.4	74.9	405.00	0.00	
MP8	4	4/14/2021	1703	200	5.9	5.7	7.5	2.6	77.8	405.27	0.00	
		4/23/2021	1313	200	2	2	13	3.2	81.8	403.91	0.00	
		4/28/2021	1420	220	3	2.7	15.1	1.7	80.2	407.99	0.00	
		5/6/2021	1330	120	2.5	1.8	14.7	4.4	78.8	404.18	0.00	
		5/12/2021	1245	120	2.9	2.3	14.9	2.3	80.1	406.49	0.00	
		5/19/2021	1020	120	2.5	2.2	15.8	2.3	79.6	404.72	0.00	
		5/26/2021	1132	120	2.8	2.8	16.4	2.4	78.4	405.00	0.00	

Table 2. Permanent Methane Point Monitoring Summary

Mill Pond Crossing

1701 Chapel Drive, Philomath, Oregon

Monitoring Point	Depth of Screen	Date	Time	Duration	Peak Methane	Methane	Carbon Dioxide	Oxygen	Balance Gas	Baro Pressure (Inches H2O)	Static Pressure (Inches H2O)	Notes	
					pbv	pbv	pbv	pbv	pbv				
MP9	6	4/15/2021	1400	330	5.3	0.5	3.6	18.3	--	407.31	2.18		
		4/23/2021	1056	200	0.04	0	7.55	17.5	74.92	403.91	0.27		
		4/28/2021	1425	220	2.1	2	13.9	1.5	82.5	407.99	0.00		
		5/6/2021	1239	50	4.9	4.9	17.7	3.2	74	404.04	0.00	FLOW ERROR	
		5/12/2021	--	--	--	--	--	--	--	--	--	--	FLOW ERROR
		5/19/2021	--	--	--	--	--	--	--	--	--	--	FLOW ERROR
		5/26/2021	1122	120	0.2	0	0.4	19.3	80.2	404.9951	0		
MP10	4	4/15/2021	1410	75	6.7	0.3	1.8	19.3	77.1	407.31	2.18		
		4/23/2021	--	--	--	--	--	--	--	--	--	water in line	
		4/28/2021	1351	20	0.7	0.6	7.3	17.7	72.5	407.99	--	water in line	
		5/6/2021	--	--	--	--	--	--	--	--	--	water in line	
		5/12/2021	--	--	--	--	--	--	--	--	--	water in line	
		5/19/2021	point nonfunctional (removed from ground by unknown party)										
MP11	5	4/15/2021	1420	220	28	28	36.8	1.6	33.4	407.31	2.18		
		4/23/2021	1328	200	22.1	21.6	44	0.9	33.3	403.91	0.00		
		4/28/2021	1408	200	25.5	25.3	46.4	0.3	28.1	407.99	0.00		
		5/6/2021	1255	120	30.1	29.9	52.4	0.3	17.4	404.04	0.00		
		5/12/2021	1250	120	30.5	29.9	52.4	0.3	16.8	406.49	0.00		
		5/19/2021	1115	120	30.7	30.5	54.5	0.6	14.2	404.72	0.00		
		5/26/2021	1125	120	31.2	30.6	56	0.8	12.5	405.00	0.00		
MP12	7	4/15/2021	1600	370	12.7	0.7	1.6	18.1	79.6	407.31	2.18		
		4/23/2021	1405	200	0	0	7.4	15.3	77.4	403.91	0.00		
		4/28/2021	--	--	--	--	--	--	--	--	--	water in point	
		5/6/2021	--	--	--	--	--	--	--	--	--	water in point	
		5/12/2021	-	-	-	-	-	-	-	-	-	water in point	
		5/19/2021	point nonfunctional										water in point

pbv : percent by volume