Michigan Department of Environment, Great Lakes, and Energy
Remediation & Redevelopment Division

Location 61000066 Request for Review - Response Activity Plan - 7/28/2025

NEW: EQP4028 - Request for EGLE Review - Response Activity Plan - 61000066-RAP-2

This form is required for submittal of a request for EGLE to review a Response Activity Plan, under Section 20114b, Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

Site Information

Site Name: S.D. Warren #1 (Sappi)
Facility Id: 61000066
Street Address:
2400 Lakeshore Drive
City: Muskegon **State:** Michigan **Zip Code:** 49441 **County:** Muskegon
Latitude: 43.21632414 **Longitude:** -86.30424545

Status of Submitter Relative to the Property (check all that apply): Prospective Owner, Prospective Operator

Property Tax Ids

1. **Property Tax Id:** 61-24-205-598-0001-00

Organization/Contacts

Organization Name: Parkland Acquisition Six, LLC **Address:** 75 West Walton Avenue, Suite A, Muskegon, MI, 49440

Contact Type: Business Owner
Address: 75 West Walton Avenue, Suite A, Muskegon, MI, 49440
Full Name: Charron, Rory
Phone: (616) 522-8220 **Email:** rory@parklandgr.com

Submittal Information

1. **Type of Response Activity Plan being submitted**

Type of Response Activity Completed:
Other, Specify

Other: Plan for Due Care measures for proposed development structures

The Response Activity Plan addresses the entire facility (entire facility as defined by Part 201, all releases, hazardous substances, and environmental media): No

Please specify the release(s), hazardous substance(s), environmental media, and/or portions of the facility addressed by the Response Activity Plan:
The Response Activity Plan addresses potential exposures associated with the soil and groundwater volatilization to indoor air pathways as a result of historical releases of volatile organic constituents on the Property. The ResAP also addresses potential fire and explosivity hazards associated with the presence of methane and soil and groundwater on the property. The VIAP and fire/ex concerns will be addressed for structures in the Phase 1 area using engineering controls as described.

2. **Contaminant Source**

Facility regulated under Part 201, other source, or source unknown: Yes **Leaking Underground Storage Tank regulated pursuant to Part 213:** No

Part 201 Site ID, if known: 61000066

Oil or gas production and development regulated pursuant to Part 615 or 625:
No

Licensed landfill regulated pursuant to Part 115:
No

Licensed hazardous waste treatment, storage, or disposal facility regulated pursuant to Part 111:
No

Consent Agreement or other legal agreement with EGLE: Yes

3. **Are/were the following present at the facility (Check all that apply)**

Mobile or Migrating Non-Aqueous Phase Liquids (NAPL):
Previous

Soil contamination above any residential criteria:
Both Current & Previous

Soil contamination above any non-residential criteria:
Both Current & Previous

Soil aesthetic impacts:
Both Current & Previous

Groundwater contamination above any residential criteria:
Both Current & Previous

Groundwater contamination above any non-residential criteria:
Both Current & Previous

Groundwater contamination above the Acute Inhalation Screening Level:
Not Applicable

Groundwater aesthetic impacts:
Both Current & Previous

Soil Gas contamination above residential vapor intrusion (VI) screening levels:
Both Current & Previous

Soil Gas contamination above non-residential VI screening levels:
Both Current & Previous

Conditions immediately dangerous to life or health (IDLH):
Unknown

Fire & Explosion hazards related to releases:
Both Current & Previous

Contamination existing in drinking water supply:
Not Applicable

Imminent threat to drinking water supply:
Not Applicable

Impact to Surface Water:
Unknown

Impact to surface water sediments above screening levels:
Unknown

4. **The following questions assist EGLE in evaluating this request**

Known or Suspected Contaminant(s) Type:
Petroleum, Volatile Organic Compounds, Metals, Other

Other: Per-and polyfluoroalkyl substances

Current Site Status: Undergoing property transfer, Inactive operation

Current Property Use: Nonresidential

Anticipated Property Use: Residential

Estimated Area of Contamination Addressed in Response Action Plan (Cumulative): > 0.5 acre

Migration:

Has contamination migrated beyond the property boundaries?:
Unknown

Has the Notice of Migration been submitted?: No

Facility Investigation Status: Ongoing

Facility Response Activity Status: IR Implemented, Response Activity Ongoing

Drinking Water Supply for Facility: No Current Water Supply, Municipal Available

On-site Well(s): No well on-site

Approximate Depth of Well: 0

Local Drinking Water Supply:

Is facility in a designated Wellhead Protection Area: No

Distance (in feet) to nearest off-site drinking water well

Private: 3000

Municipal: 67000

Surface Water Bodies on or Adjacent to Facility (Select all that apply): Wetlands, Ditch, Lake/Pond

Local Surface Water Bodies:

Distance (in feet) from release to nearest Wetland: 0

Distance (in feet) from release to nearest Ditch: 0

Distance (in feet) from release to nearest Stream/River: 3500

Distance (in feet) from release to nearest Lake/Pond: 0

Have other plans or reports, BEAs, DDCCs, NFAs, etc. been submitted for this facility?: Yes

Certifications

Primary Certifier

Role: Environmental Professional
Certification Status: In Progress
First Name: Allen
Last Name: Prince
Organization/Company: Barr Engineering Company
Work Phone: (616) 512-7013
Email: APrince@barr.com
Address:
3033 Orchard Vista Drive SE, Suite 200, Grand Rapids, MI, 49546
Date:
7/28/2025 7:24:25 PM

Secondary Certifier

Role: Submitter
Certification Status: Administrative Review
First Name: Allen
Last Name: Prince
Organization/Company: Barr Engineering Company
Work Phone: (616) 512-7013
Email: APrince@barr.com
Address:
3033 Orchard Vista Drive SE, Suite 200, Grand Rapids, MI, 49546
Date:
7/28/2025 7:27:46 PM

EGLE

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Remediation and Redevelopment Division

Remediation Information Data Exchange (Ride) Secondary Certification Authorization

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Michigan Department of Environment, Great Lakes, and Energy
Remediation & Redevelopment Division
PO Box 30426
Lansing, MI 48909-7926

By completing the following information and signing this form, I affirm that I am an authorized representative of the regulated entity providing this submittal and that, to the best of my knowledge and belief, all information, data, documents, and reports provided in this submittal are true, accurate, and complete.

Submittal Information:

Report Title: Vapor Intrusion and Methane Mitigation Report Completion Date: 07/28/2025

Organization Certifying Submittal on my behalf: Barr Engineering Company

Name And Signature Of Authorized Representative Of The Regulated Entity Providing The Submittal:

Email: rory@parklandmi.com Phone Number: (616) 522-8220

Organization/Company: Parkland Acquisition Six, LLC

Signature	Rory Charron	07/25/2025
	Print Name	Date

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This form and its contents are subject to the Freedom of Information Act and may be released to the public.

Response Activity Plan

Vapor Intrusion and Methane Mitigation
2400 Lakeshore Drive
Muskegon, Michigan

Prepared for
Parkland Acquisition Six, LLC.

Prepared by
Barr Engineering Co.

July 2025

3033 Orchard Vista Drive SE, Suite 200
Grand Rapids, MI 49546
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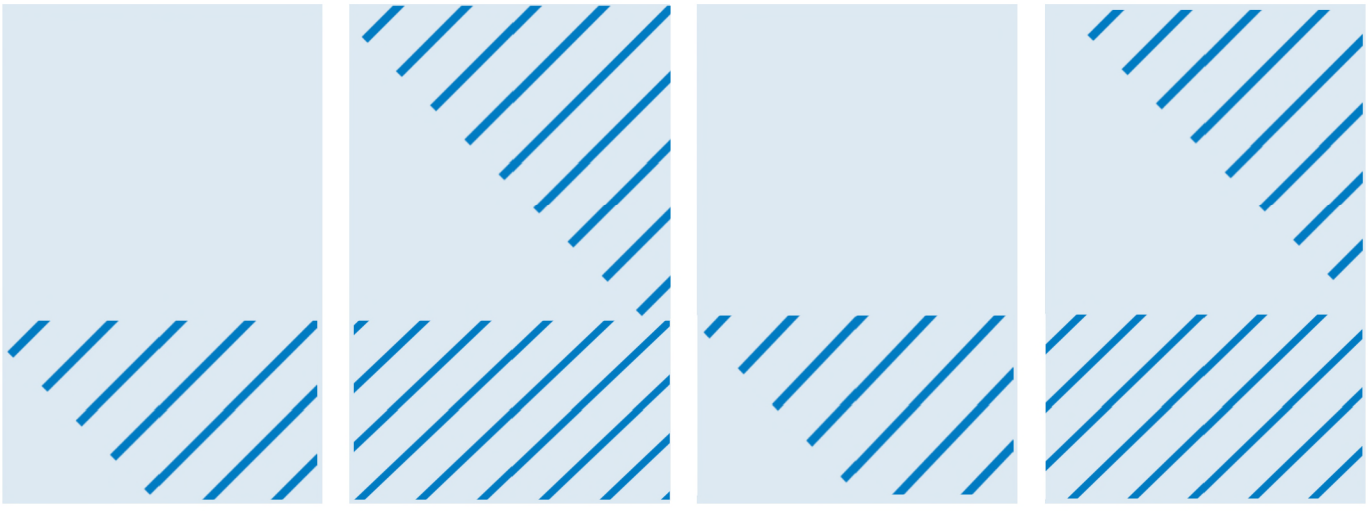

Response Activity Plan
Vapor Intrusion and Methane Mitigation

July 2025

Contents

Tables

Large Tables

Figures

Appendices

Abbreviations

Barr	Barr Engineering Co.
bgs	below ground surface
cm/s	centimeters per second
CQA	construction quality assurance
CSM	conceptual site model
EGLE	Michigan Department of the Environment, Great Lakes, and Energy
HDPE	high density polyethylene
MDEQ	Michigan Department of Environmental Quality
Parkland	Parkland Acquisition Six, LLC
PVC	polyvinylchloride
ResAP	response activity plan
SESC	soil erosion and sedimentation control

Executive Summary

Parkland Acquisition Six, LLC ("Parkland") is under contract to purchase property located at 2400 Lakeshore Drive in Muskegon, Michigan (the "Property") from Pure Muskegon, LLC ("Pure Muskegon"). Parkland seeks to acquire the Property and redevelop the Phase 1 portion of the Property with approximately 190 to 220 single-family residences, spaces for recreational/public use, including multiple points of public access to Muskegon Lake, and supporting roadways and infrastructure. Parkland is in the process of seeking an amendment to its approved Planned Unit Development ("PUD") from the City of Muskegon that reduces the density of the Phase 1 redevelopment provides for the phased development approach, and otherwise provides for differences in construction methods outlined in this Response Activity Plan ("ResAP"). The proposed redevelopment will also fulfill Pure Muskegon's obligations under the 2015 Administrative Order by Consent ("AOC") for Response Activities between the Michigan Department of Environmental Quality [MDEQ; now the Michigan Department of Environment, Great Lakes, and Energy ("EGLE")], the Michigan Department of Attorney General, Melching, Inc., Melcor, LLC, S.D. Warren Company d/b/a Sappi North America, and Pure Muskegon (AOC-RRD-15-009). Parkland's purchase of the Property is contingent upon approval of this ResAP.

Soil and groundwater on the Property are environmentally impacted as a result of releases associated with historical paper manufacturing activities. Soil and groundwater on the Property contain volatile organic constituents ("VOCs"), semi-volatile organic constituents ("SVOCs"), metals, per- and polyfluoroalkyl substances ("PFAS"), and other contaminants regulated under Part 201 ("Environmental Remediation") of 1994 Michigan PA 451, as amended ("Part 201").

Methane is present in soils and groundwater on the Property derived from biological degradation of underground organic materials. Methane concentrations are generally highest near the groundwater table and dissipate significantly at depths closer to the ground surface. Generally recognized guidance for development on sites where methane is of concern suggests that high concentrations of methane in soil gas must be present with significant differential pressures between the soil and atmosphere to present a risk of fire/explosion in the indoor airspace of overlying structures[1]. Significant subsurface pressure associated with methane has not been observed on the Property, and advective/pressure-driven flow of methane in the subsurface is not considered likely on the Property as a result. Explosivity or fire issues associated with subsurface methane are known or documented to have occurred throughout the 100-year period of industrial use of the Property, despite the known use of common ignition sources such as hot work, welding, smoking, and building fires.

This ResAP describes due care measures that Parkland proposes to implement pursuant to the requirements of Section 20107a of Part 201 to mitigate potential exposures to VOCs via the volatilization to indoor air inhalation pathway and the potential for fire and explosivity hazards associated with the presence of methane in soil and groundwater for the Phase 1 redevelopment of the Property. As described herein, Parkland proposes to construct the residential buildings in Phase 1 using a podium style construction concept to prevent VOCs, including methane, from potentially entering the buildings' indoor airspace. Through this use of podium-style construction, potential exposures to VOCs in the subsurface and fire/explosivity issues associated with methane in the subsurface in the Phase 1 portion

[1] For future development, as is being considered in this ResAP, no further action (e.g investigation, mitigation, ect.) is recommended if the shallow soil gas concentration of methane is less than 30 % v/v and differential pressures is less than 2 inches water as outlined in American Society of Testing and Materials International. E2993 – 23: Standard Guide for Evaluating Potential Hazard as a Result of Methane in the Vadose Zone. November 2023.

of the Property will be mitigated. Conceptual designs regarding proposed buildings to be constructed in the Phase 1 redevelopment are presented in this ResAP.

Generally accepted guidance for podium style construction calls for a sufficiently open space to be present below the structure such that soil gas from soils underlying the structure is sufficiently diluted or directed away prior to potentially entering the indoor airspace of the structure through cracks or imperfections in the building floors or walls. The efficacy of podium style construction as described is not dependent on the rate of methane generation (methanogenesis) in the subsurface on the Property, in the absence of observable subsurface pressure and the associated potential for advective methane flow, because the podium space will prevent soil gas from entering the buildings' indoor airspace.

Approximately eighty percent (80%) of the Phase 1 portion of the Property will remain devoid of slab-on-grade structures, pavement, or other impermeable surfaces after construction of the proposed development, which will allow methane dissipation to occur in a manner that is generally consistent with prior industrial use and current conditions (i.e., vacant land).

Finally, this ResAP presents a proposed framework by which operation and maintenance ("O&M") of the proposed engineering controls will be accomplished and funded. A draft Declaration of Restrictive Covenant ("RC") intended to be recorded on the Phase 1 Property is enclosed as a proposed institutional control to assure that the engineering controls are: (a) constructed in accordance with best engineering practices; and (b) consistently and perpetually operated and maintained.[2]

Parkland proposes to create a non-profit business entity that will be responsible for carrying out the O&M obligations associated with the proposed engineering controls. This dedicated business entity will be put in place prior to the sale of any portions of the Property by Parkland and will generate funds through collection of dues from the owners of the Property to fund the O&M activities, including, but not limited to, routine system maintenance, repair and replacement of equipment, and reporting obligations. This nonprofit business entity will have the authority to implement the requirements of the RC, and place and enforce liens against owners' interest in the Property, to ensure the adequate and timely collection of dues from the property owners to support its activities under this paragraph.

O&M activities will be completed by an appropriately qualified and experienced service provider retained by the non-profit business entity. Individual homeowners will not be relied upon to complete O&M activities associated with engineering controls. The RC will run with the Property and be applicable to subdivision of the Property, thereby creating an enforceable mechanism by which future Property owners are bound to fund and otherwise allow completion of the O&M activities described in this ResAP and in the RC.

[2] The RC will be further refined based on detailed engineering design and consultation with EGLE until it is recorded.

1 Introduction

Purpose

Barr Engineering Co. ("Barr") has prepared this Response Activity Plan ("ResAP") on behalf of Parkland Acquisition Six, LLC ("Parkland") related to environmental conditions on a portion of the Property located at 2400 Lakeshore Drive in the City of Muskegon, Muskegon County, Michigan, as more particularly depicted in the attached Figure 1and Figure 2 (the "Phase 1 Property" or the "Phase 1 redevelopment"). Figure 1 depicts existing conditions at the Property. Figure 2 depicts Parkland's site plan for redevelopment of the Property and the Phase 1 redevelopment. The scope of this ResAP is limited to the Phase 1 Property only.

This ResAP seeks approval from the Michigan Department of Environment, Great Lakes, and Energy ("EGLE"), Remediation and Redevelopment Division ("RRD") for proposed response activities to mitigate two potential risks in the Phase 1 Property: 1) potential for exposures associated with the volatilization to indoor air and inhalation ("VI") exposure pathway; and 2) potential fire and explosivity hazards associated with the presence of methane in soil gas and groundwater. This ResAP describes generally accepted construction guidelines, construction methods, and engineering and institutional controls for the Phase 1 redevelopment that collectively will mitigate potential exposures to VOCs, including methane, SVOCs, hydrogen sulfide, and ammonia, via the VI pathway, and potential fire and explosivity hazards associated with the presence of methane in soil gas and groundwater. The construction methods include podium style construction and installation of combustible gas detectors for residential buildings in the Phase I redevelopment area.

This ResAP is being submitted on behalf of Parkland to obtain formal approval from EGLE that the response activities proposed herein for the Phase 1 Property are consistent with Parkland's and successor property owners' and/or operators' "due care" obligations pursuant to Section 20107a(1)(b) of Part 201 of 1994 Michigan PA 451, as amended ("Part 201"), for the contaminants and exposure pathways outlined above. In this ResAP, Parkland is not seeking EGLE approval under Section 20107a(1)(b) of Part 201 for contaminants or response activities other than as outlined above[3].

Background

Parkland executed an agreement to purchase the approximately 123-acre Property from Pure Muskegon, LLC ("Pure Muskegon"). The Phase 1 Property area constitutes approximately 50 acres of the Property. The Property was historically used for industrial purposes, including paper manufacturing for approximately 100 years. Historic paper and other manufacturing operations on the Property have resulted in organic and inorganic impacts to groundwater and soil.

A former owner and occupant of the Property recorded a Declaration of Restrictive Covenant on the Property that prohibited environmental investigation activities on the Property and significantly limited available options for redevelopment of the Property. That party subsequently amended the Restrictive Covenant to remove certain restrictions in exchange for a release of liability provided by the State of Michigan [EGLE – at that time the Michigan Department of Environmental Quality – and the Michigan Department of Attorney General) as set forth in an Administrative Order by Consent ("AOC") in 2015]. Pure Muskegon, as a non-liable party, was a signatory to the AOC for limited purposes, including the State of Michigan's requirement to use "reasonable best efforts to pursue construction of a mixed-use development

[3] The response activities proposed herein are not intended to constitute a final remedy under Part 201 for any regulated constituent or exposure pathway, although they may serve as a component of a final remedy for the Property in the future.

on the Property consisting of residential uses, commercial uses, and public uses." Pure Muskegon subsequently purchased the Property. Since its purchase, Pure Muskegon has used and continues to exert reasonable best efforts to pursue the mixed-use development described in the AOC. Pure Muskegon intends through its sale to Parkland to fulfil its obligations under the AOC, including the redevelopment of the Phase 1 Property as described in this ResAP.

Parkland seeks to acquire and redevelop the Property in a manner consistent with Pure Muskegon's obligations under the AOC and Parkland's amended Planned Unit Development ("PUD"), to be approved by the City of Muskegon, that includes residential, commercial and retail spaces, spaces for recreational/public use, multiple points of public access to Muskegon Lake, and supporting infrastructure throughout the Property The proposed redevelopment will be constructed in phases, with the Phase 1 redevelopment consisting of the construction of approximately 190 to 220 single-family residences and supporting infrastructure on the Phase 1 Property. Parkland is in the process of seeking an amendment to its approved Planned Unit Development ("PUD") from the City of Muskegon that reduces the density of the Phase 1 redevelopment, provides for the phased development approach, and otherwise provides for differences in construction methods outlined in this ResAP.

1.1 Report Organization

This ResAP is organized as follows:

Section 2: Conceptual Site Model (CSM): This section includes a summary of the current CSM, describing the site history, geologic setting, hydrogeologic conditions, the nature and location of known releases on the Property during historical use, and the resultant distribution of VOCs, including methane and other volatile constituents, in soil, soil gas and groundwater at the Property. This section also describes how the proposed location and construction methods for buildings and utilities in the Phase 1 redevelopment relate to the VI exposure pathway.

Section 2 also discusses the nature and extent of organic materials in the subsurface on the Property, because the organic materials are the putative source of methane in soil and groundwater at the Property.

The following documents are included as appendices to this ResAP to support the CSM:

- Appendix A – A soil gas methane evaluation prepared for Parkland by Environmental Resources Group ("ERG") in October 2023. The report summarizes the distribution of methane in soil gas on select areas of the Property as evaluated at a depth of approximately 5 feet below ground surface (bgs).

- Appendix B – A supplemental methane investigation technical memorandum prepared for Pure Muskegon and Parkland by Barr in May 2024. The technical memorandum summarizes the distribution of methane in soil gas, subsurface pressure data, and other soil gas quality data regarding environmental risks associated with methane in soil gas.

- Appendix C – A second supplemental soil gas investigation technical memorandum prepared for Pure Muskegon and Parkland by Barr in June 2025. The technical memorandum summarizes the distribution of methane and VOCs in soil gas, subsurface pressure data and other soil gas quality data regarding environmental risks associated with methane in soil gas.

- Appendix D – A technical memorandum prepared for Pure Muskegon by Barr in December 2022 regarding geologic modeling of subsurface conditions on the Property. The memorandum summarizes subsurface geotechnical conditions related to the presence of organic material on the Property. Soil boring logs used to develop the geologic model are also presented in Appendix D.

- Appendix E – Figure from a supplemental environmental investigation summary report prepared for Pure Muskegon by Barr in December 2022. The figure in this appendix summarizes current information regarding the groundwater elevations at the Property.

- Appendix F – Conceptual plan views and cross-sections for buildings proposed to be constructed on the Property.

- Appendix G – Conceptual design plans for typical residential home with a podium style construction concept, where the podium style construction is the response activity proposed herein.

- Appendix H – Draft Declaration of Restrictive Covenant.

Section 3: Design Summary: This section summarizes the options assessment and discusses the content of Appendix G which presents conceptual design plans for the proposed response activity.

Section 4: Implementation Overview: This section provides a summary of the key steps for response activity implementation and post-construction operation and maintenance of the response activity.

Section 5: Implementation Schedule: This section provides a high-level overview of the schedule for implementing the response activity, which is generally based on the proposed development construction schedule.

2 Conceptual Site Model

This section summarizes relevant Property background information, geologic and hydrogeologic conditions, soil and groundwater quality, and constraints for response activity implementation.

2.1 Background

The Property has been used for manufacturing for over 120 years. Tanning, manufacture of tanning extract, and sawmill operations on portions of the Property preceded paper manufacturing by the S.D. Warren Company and its predecessors d/b/a Sappi North America ("Sappi"), which began in approximately 1900 and lasted until 2009. Sappi imported raw wood materials to the Property, which were chemically treated and bleached to create paper pulp, which was used in the paper-making process. Paper was dried, cut, and coated on the Property to create a finished product. Additional activities such as coal storage for boilers, lime storage, above-ground chemical storage, and wastewater treatment supported the manufacturing of paper on the Property.

The northern portion of the Property was created by placement of fill into Muskegon Lake during early periods of paper manufacturing. Based on soil boring logs from the Property and available information, fill materials included by-products from paper production, lime, wood debris, sand, concrete debris, and other industrial fill. Fill materials were placed onto naturally occurring lake-bottom sediments to create made land that extends beyond the naturally occurring shoreline of Muskegon Lake. Historical aerial photographs in Figure 3 - Figure 7 show the progressive filling of Muskegon Lake to create the northern portions of the Property (ERM, 2016a) during a period from prior to 1938 until approximately 1981.

In 2011, Melching Inc. ("Melching") purchased the Property from Sappi and demolished most structures associated with the former Sappi operations. In 2016, MDEQ (now EGLE) approved the import of lime-amended sand fill to an area on the eastern portion of the Property. This fill was used to backfill certain areas of the Property following demolition activities. In July 2016, Pure Muskegon purchased the Property from Melching. In 2023, Parkland executed a purchase agreement to acquire the Property from Pure Muskegon for the purpose of mixed-use redevelopment. Parkland's closing on the Property is contingent upon approval of this ResAP.

Figure 8 shows certain prominent features of the Property in 2005 when paper production was occurring. Figure 1 shows the present-day features at the Property.

2.2 Geology

The Property is located on the south shore of Muskegon Lake in a physiographic region known as the Michigan Lake Border Plain, which is characterized by land of relatively low relief and low altitude. The relatively low relief and altitude are the result of glacial erosion followed by post glacial deposition of lacustrine (lake) clay and sand in several large glacial lakes. As such, absent imported fill materials, the geology of the Property is composed of predominantly lacustrine sand and gravel (LEI, 2012). Previous studies along the southern portion of Muskegon Lake – and prior investigations at the Property – have indicated that much of the soil near the shoreline consists of industrial or construction fill materials, lumbering wastes, lime, and brick (ERM, 2016). Soil borings completed by Barr in April 2022 indicate approximately 8.5 to 20 ft of fill and debris underlain by organic materials and brown to gray, fine- to medium-grained poorly graded sands (see boring logs in Appendix D). The lithology fines downward from the poorly graded sands to silty sands interbedded with thin (approximately 1-inch) layers of silt and clay to the top of a lean silty clay at a depth of approximately 50 to 70 ft bgs (Barr, 2022b).

The organic layer, relevant to this ResAP and the VI mitigation activities proposed herein, consists of peat or organic silt, and is generally laterally continuous across the Property underlying the fill material. The organics range in thickness up to 30 feet, with the thickest deposits toward the northeast portion of the Property, and are generally thicker in northern portions of the Property (see Figure 3 in Appendix D). Samples collected during Barr's geotechnical investigation in 2022 indicated that the organic content is consistent with naturally occurring peats and organic soils. The measured water contents of the peat and organic silt in this organic layer were between 61 and 259 percent, and averaged 76 percent, respectively (Barr, 2022b).

2.3 Hydrogeology

Groundwater is present at the Property at varying depths that generally do not exceed 10 ft bgs. Groundwater elevations vary with the water elevation of Muskegon Lake and Lake Michigan, including seasonal variations and variations attributed to precipitation events. Groundwater elevations range from 585.5 to 580 ft above mean sea level (asml). Groundwater flows generally to the north and vents to Muskegon Lake, as shown on Figure 2 in Appendix E. Based on investigations by Barr and others, a single unconfined water bearing formation is identified at the Property underlain by an extensive clay aquitard (Section 2.2). Aquifer thickness across the Property ranges from 27 feet to 42 feet thick from east to west, respectively. Vertical gradients were calculated as upward (discharge), indicating that groundwater from elevated recharge areas to the south is migrating downward to the clay and then upwelling at the Property before discharging across the groundwater/surface water interface (GSI) seepage face along Muskegon Lake (LEI, 2012). Previous pneumatic falling head tests and grain size analyses conducted at the Property indicate a hydraulic conductivity of 46 ft/day and a porosity of 0.4, resulting in a calculated groundwater flow rate of 0.7 feet per day (LEI, 2012). The horizontal and vertical groundwater flow directions and gradients are consistent with those expected in this geologic setting.

2.4 Snow Accumulation

The City of Muskegon has an average of 80 days per year with snow cover[4].

The National Oceanic and Atmospheric Administration (NOAA) has a weather monitoring station at the Muskegon County airport that is approximately 5 miles from the Property. Daily snow depth data from this station was queried from the National Centers for Environmental Information (NCEI). A total of 47,114 records were returned. A subset of 6,972 records was generated by removing records without snow depth data and snow depth data recorded as 0 inches from the years 1925 to 2025. The resulting record subset represents days on which snow was recorded as being present on the ground at the Muskegon County airport weather monitoring station during the last 100 years. The mean, median, and maximum snow depths were approximately 7 inches, 5 inches and 34 inches[5], respectively. The standard deviation is approximately 6 inches, with 19 inches and 25 inches representing two and three standard deviations from the mean, respectively. Over 99% of total days in the last 100 years had snow depths of less than 23". The maximum snowfall in the last 25 years at the Muskegon County airport weather monitoring station was approximately 27 inches. At the same monitoring station, the maximum snowfall in the last 10 years was approximately 20 inches, which clearly demonstrates a trend of decreasing maximum snowfall over time. This ongoing trend in reduced overall maximum snowfall accumulation was considered in the development of the proposed podium height presented in this document. Given the proximity of the Muskegon County airport weather monitoring station to the Property and the proximity of the Phase 1 redevelopment area to Muskegon Lake, accumulated snow on the Property is reliably expected to be at a depth of less than the planned 24-inch height of the residential podiums.

2.5 Distribution of VOCs, SVOCs, and other Constituents in Soil and Groundwater

Large Table 1, Large Table 2, Large Table 3, and Large Table 4 present soil and groundwater characterization data collected by Barr and other consultants during previous environmental investigations on the Property from 2002 to 2022[6]. In response to a request from Barr on behalf of the project stakeholders, residential and non-residential site-specific volatilization to indoor air criteria ("SSVIAC") were established for the Property by EGLE on December 9, 2024. The SSVIAC were established based on conceptual site models ("CSMs") developed by Barr that were based on Parkland's approved PUD from the city of Muskegon which proposed slab-on-grade style construction of buildings on the Property at that time. Based on the proposed use of podium-style construction in the Phase 1 Property, the vapor intrusion pathway is not complete and SSVIAC established pursuant to Part 201 are not relevant to the redevelopment activities proposed herein. Soil and shallow groundwater data are therefore presented in this section and screened against SSVIAC to improve the overall site CSM and for completeness, but are not relevant to the proposed response activity.

Soil and shallow groundwater data are summarized in Large Table 1 and Large Table 2, respectively. Soil and shallow groundwater data are summarized in Large Table 3 and Large Table 4.

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4 2023 Muskegon County Community Profile. https://co.muskegon.mi.us/DocumentCenter/View/16145/2023-Muskegon-County-COMMUNITY-PROFILE. Accessed June 2025.

5 This snowfall event occurred in December 1963 and snow was present at the Muskegon County airport weather monitoring station at a depth of over 24" for six consecutive days.

6 The soil data set includes soil data from references 3 - 10 in Section 7 for which locations are documented. The groundwater data set represents the most recent groundwater data collected from the Property (2019 – 2022).

2.6 Distribution of Methane in Soil Gas

Parkland's current proposed redevelopment plan, shown in Figure 2, involves constructing single-family residences in the Phase 1 Property using podium style construction. As noted above, SSVIAC developed by EGLE in December 2024 are not applicable to residential buildings constructed using podium style construction methods because the presence of an appropriately constructed podium underlying a structure renders the VI pathway to the indoor airspace of that structure incomplete thereby preventing impacts to receptors in the indoor airspace. Volatilization to indoor air pathway screening levels ("VIAP SLs") developed by EGLE are not applicable to residential buildings constructed using podium style construction methods for the same reason. However, data presented in this section were screened against VIAP SLs to provide context to the VI pathway CSM for the Property.

The letter report contained in Appendix A presents results from a soil-gas investigation carried out on the Phase 1 Property and other select areas by ERG on behalf of Parkland in October 2023. Twenty-five (25) soil gas wells were constructed to a depth of 5-feet and sampled for methane. The sample results were screened against VIAP SLs for soil gas developed by EGLE. Figure 3 in Appendix A shows the soil gas well locations, and Table 2 in Appendix A summarizes the analytical results of soil gas sampling.

Methane concentrations in soil gas at a depth of approximately five feet bgs generally exceeded VIAP SLs in the investigation area, with the exception of the former wastewater treatment plant area (see Appendix A - Figure 3). Based on the results of the initial investigation, additional data needs were identified that were relevant to the implementation of presumptive engineering controls to address potential VI exposures and fire/explosivity issues associated with methane and other VOCs in soils and groundwater on the Property. These data needs included: 1) methane concentration data for soil gas on the Property at lesser depths; and 2) differential pressure data to assess the advective flow potential of methane and fire and explosivity risk posed by methane.[7] In response to these data needs, a follow-up investigation was carried out by Barr on behalf of Parkland in February 2024. Figure 1 in Appendix B shows the soil gas well locations, and Table 1 in Appendix B summarizes the analytical soil gas data associated with Barr's February 2024 investigation. The soil gas data in Appendix B were screened against the residential VIAP SL for methane. Key findings from Barr's 2024 supplemental methane investigation are below:

- Methane concentrations in soil gas at 2 ft bgs were below the residential VIAP SLs except for two samples from VP-3-24 and VP-6-24, both located near the eastern shore of the Property.
- At every nested soil gas well sampled, methane concentrations in the soil gas at 2 ft bgs were less than methane concentrations in soil gas at 5 ft bgs indicating methane concentrations in soil gas are lower closer to the surface and increase with soil depth.
- The combined concentrations of methane and carbon dioxide in soil gas wells at 5 ft bgs are less than 90% and therefore do not suggest the presence of "undiluted" biogas as defined in the ASTM E2993 -23[8] risk assessment framework.
- Generally recognized guidance for methane supports that high concentrations of methane in soil gas (> 30% v/v) must be present with high differential pressures (> 2 inches water) between the soil and atmosphere to present a risk of fire/explosion in the indoor airspace of overlying

[7] American Society of Testing and Materials International. E2993 – 23: Standard Guide for Evaluating Potential Hazard as a Result of Methane in the Vadose Zone. November 2023.

[8] Ibid.

structures. All differential pressures collected were substantially below the ASTM E2993-23 risk threshold value of 2 inches water. Negative differential pressure values are attributed to the variable barometric pressure between measuring events, variable changes in temperature through the investigation, and spring snow melt conditions. Differential pressures in soils at the Property are therefore not expected to substantially drive methane in soil gas into the indoor airspace of overlying structures.

A second supplemental soil gas investigation was carried out by Barr in March 2025 to further refine the VI CSM for the Phase 1 redevelopment. Specifically, existing soil gas wells were sampled and analyzed for VOCs in addition to methane, differential pressure and other constituents that were initially analyzed in Barr's February 2024 Investigation. Figure 1 in Appendix C shows the soil gas well locations, Figure 2 and Table 1 in Appendix C summarize the analytical soil gas data associated with Barr's March 2025 investigation.

Soil gas data in Appendix C were screened against residential and non-residential SSVIAC in the interest of providing a more complete VI CSM for the Property. The residential and non-residential SSVIAC criteria discussed in Section 2.5 for methane against which the data in Appendix C were screened have the same numerical value (8,400,000 ug/m^3 or approximately 1.3% v/v) as the residential VIAP SL for methane. The proposed use of podium-style construction in the Phase 1 Property renders the vapor intrusion pathway incomplete and therefore neither SSVIAC established pursuant to Part 201 nor VIAP SLs are relevant to the redevelopment activities proposed herein. Notwithstanding, key findings from the 2025 supplemental soil gas investigation are presented below:

- Non-methane VOC concentrations in soil gas from all locations sampled were below all SSVIAC for the Property.
- Methane concentrations in soil gas at 2 ft bgs were below all SSVIAC in the Phase 1 Property except in five locations:
    - VP-3-24S, VP-4-24S, VP-6-24S within the eastern side of the Phase 1 Property
    - VP-9-24S within the northern portion of the Phase 1 Property
    - VP-22-24S within the western portion of the Phase 2 Property
- Methane concentrations in soil gas at 5 ft bgs were below all SSVIAC except for one location:
    - VP-9-23D within the northern portion of the Phase 1 Property
- Of the nine locations where both of the nested wells were sampled, methane concentrations were generally similar at the 2-foot and 5-foot depth intervals.
  Of the 19 wells sampled in both 2024 and 2025, observed methane concentrations were only greater in 2025 at VP-24S and VP-4S. The variability observed in subsurface methane concentrations is expected and assessment of that variability was a primary goal of the additional sampling reported here. The observed variations do not change the conceptual site model for this area of the Property nor do they lead to additional requirements related to proposed redevelopment of the Property.
- All differential pressures collected were substantially below the ASTM E2993-23 risk threshold value of 2 inches water which indicates that differential pressures in soils at the Property are not expected to substantially drive methane in soil gas into the indoor airspace of overlying structures. Negative differential pressure values are attributed to changes in temperature through the investigation, and spring snow melt conditions at the time of sample collection.

These findings are generally consistent with the results of prior investigations of methane in the vadose zone in the Phase 1 Property. Based on discussions with EGLE, and in Barr's professional opinion, the

proposed podium style construction breaks/interrupts the VI pathway and mitigates the potential for methane fire/explosivity issues.

2.7 Distribution of Organic Material

As discussed in Sections 2.1 and 2.2, industrial and organic fill materials were brought to the Property and overlie naturally occurring lake bottom sediments thereby creating the a large portion of the Property. As part of Barr's evaluative work in relation to the Property on behalf of Pure Muskegon, Barr completed a preliminary evaluation of geotechnical conditions on the Property (Barr, 2022b). Of particular interest at the time of investigation was the presence of subsurface organic materials, primarily because of their poor geotechnical properties and the ramifications of their presence on foundation design for proposed development features. The technical memorandum in Appendix D used Earth Volumetric Studio™ ("EVS") to model the areal extent, depth, and thickness of organic materials in the subsurface on the Property, based on soil boring logs and other information garnered from prior environmental and geotechnical investigations of the Property.

While the EVS modeling was completed primarily to facilitate assessment of geotechnical conditions on the Property, the EVS model also has the capability to be used to estimate the volume of organic material present in the subsurface on the property. Figure 3 in Appendix D presents the spatial distribution and thickness of organic materials in soils on the Property and indicates that organic materials are generally distributed throughout the Property, with the thickest layers in the northeast and little to no organic materials in the southwest. Conservative estimates of densities of typical organic soils of materials of approximately 100 lbs per cubic foot[9] were applied to the volumetric estimates of organic materials predicted by the EVS model to obtain an estimate of the total mass of organic material on the Property[10].

Methane in soil gas on the Property, as discussed in Section 2.6, appears to be derived from anerobic breakdown of organic materials through methanogenesis[11]. The distribution of organic materials in site soils, as derived from soil boring data and presented in the EVS model, suggests that methane is being generated at various depths in site soils over a significant portion of the Property, including in the saturated zone. As discussed in Sections 2.1 and 2.2, methane appears to be derived from multiple sources on the Property including fill materials which were placed to create land and naturally occurring lake bottom materials upon which fill materials were placed.

When the Phase 1 redevelopment buildout in Figure 2 is complete approximately eighty percent (80%) of the Phase 1 Property area will be devoid of slab-on-grade structures, pavement, or other impermeable surfaces which will allow methane dissipation to occur in manner that is generally consistent with prior industrial use and current conditions (i.e., vacant land).

In addition, ongoing subsurface methane attenuation processes will generally continue in the areas of the Property where impermeable surfaces are not constructed. As noted in ASTM E2993-23, soil gas concentrations of methane typically decrease as depth below ground surface decreases in aerobic soils

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9 100 lbs/ft^3 as a density for organic soils represents the high end of estimates found in *Geotechnical Engineering (*Holtz and Kovacs 1981) and *Muskeg Engineering Handbook* (MacFarlane 1969).

10 Based on boring logs in Appendix D, certain layers in the EVS model were represented as wood or wood chip material. For these layers, a density of 50 lbs/ft^3 was used. 50 lbs/ft^3 represents the upper range found in *Specific Gravity and Other Properties of Wood and Bark for 156 Tree Species Found in North America* (Miles and Smith, 2009)

11 Sepich, J. *Hazard Assessment by Methane CVP (Concentration/Volume/Pressure):(Everything You Knew about Methane Action Levels is Wrong).* 2008. Paper A-008, in: Bruce M. Sass (Conference Chair), Remediation of Chlorinated and Recalcitrant Compounds—2008. Proceedings of the Sixth International Conference on Remediation of Chlorinated and Recalcitrant Compounds (Monterey, CA; May 2008). ISBN 1-57477-163-9, published by Battelle, Columbus, OH, www.battelle.org/chlorcon.

(e.g., sandy soils such as those covering most of the Property). The attenuation of methane in soil gas under these conditions is primarily attributed to aerobic methane biodegradation.

2.8 Proposed Redevelopment Plans (Phase 1)

Parkland seeks to redevelop the Property in a manner consistent with approximately 190 to 220 single-family residences, spaces for recreational/public use, including multiple points of public access to Muskegon Lake, and supporting roadways and infrastructure.

Parkland is in the process of seeking an amendment to its approved Planned Unit Development ("PUD") from the City of Muskegon that reduces the density of the Phase 1 redevelopment, provides for the phased development approach, and otherwise provides for differences in construction methods outlined in this ResAP.

Figure 2 depicts Parkland's site plan for redevelopment of the Property and the Phase 1 redevelopment[12].

2.8.1 Proposed Residential Buildings (Receptors)

As depicted on Figure 2, Parkland is proposing to construct the following type and approximate quantity of proposed dwellings on the Property in the Phase 1 redevelopment[13]:

- 0 to 40 single-family dwellings with podium-style construction on staggered lots (designated "2" on Figure 2)[14]
- 157 to 220 single-family dwellings with podium-style construction on aligned lots (designated "3" on Figure 2)

Figure 2 describes the allowable uses, maximum building heights, separations, and setbacks for each building type under the approved PUD from the City of Muskegon. Although Figure 2 states that the single-family homes to be constructed on the Property may have basements under the City of Muskegon's zoning, no subterranean basements are planned by Parkland and podium style construction will be required through the Restrictive Covenant (Section 5) for all single-family homes constructed on the Phase 1 Property.

Appendix F provides conceptual plan views and cross-sections for the residential buildings. All conceptual drawings presented in Appendix F are intended to represent how buildings are planned to be constructed on the Property based on currently available information, with the understanding that detailed building design has not been completed. Certain elements of the building design such as the building footprint, specific floorplan layout, the number of floors, configuration and orientation of the building roof, and the existence of attached or appurtenant structures (e.g. open-air decks or patios, but not including enclosed outbuildings), among other architectural and design considerations, are subject to market forces and may change prior to and/or during the design and construction of the Phase 1 redevelopment. The podium style construction concept will be kept consistent, and any changes to building design from the

[12] The total number of residential lots, lot sizes and lot configurations depicted on Figure 2 are subject to change based on market forces and individual homeowner preference (e.g. it is anticipated that some homeowners may prefer to purchase and consolidate multiple lots for a single residence).

[13] Exact unit quantities may change as Parkland works through its regulatory review.

[14] Parkland is still evaluating the marketability of the lot configurations.

conceptual views presented here will not limit the effectiveness of the podiums to mitigate the potential for vapor intrusion to indoor airspace.

Parkland intends to mitigate the potential for methane fire/explosivity hazards and the potential for vapor intrusion into the indoor airspace of the residences proposed to be constructed in the Phase 1 redevelopment by the use of podium style construction methods. Podium style construction is intended to create a sufficiently open space below the floor systems of the residences such that any potential soil gas from soils underlying the buildings does not pose a hazard to the indoor airspace. The residences will also be provided with redundant methane monitors (or similar multi-gas monitors capable of monitoring for methane) to assess potential combustible atmosphere in the podium space underlying the residences as well as within the residential indoor airspace.

The podium style construction method for the Phase 1 redevelopment is the primary engineering control for which Parkland is seeking approval under this ResAP. Detail regarding the proposed design and the structures proposed to be constructed on the Property in support of this CSM are presented in Sections 3 and 4 below.

2.8.1.1 Single Family Dwellings

The following describes general anticipated construction information for the single-family dwellings:

- General Construction Style – podium style construction
- Floor Construction Method – metal, wood truss, wood joist, cast-in-place or precast concrete
- Depth Below Grade of Lowest Floor – At least 2 feet above grade
- Building Layout - as shown in Appendix F
- Building Height – maximum of 3 stories
- Foundation Drains – not applicable

Single-family dwellings, including any attached garages, will be constructed using a podium style construction method with a minimum of 2 feet of open space between the ground surface and the flooring system underlying the dwelling. Where necessary based on geotechnical conditions in specific areas of the Phase 1 redevelopment, foundations for the podiums will be supported by a pile system[15] that is anticipated to extend to a depth of approximately 15 to 40 feet bgs.

The single-family dwellings will be provided with heating, ventilation and air-conditioning (HVAC) systems typical of residential homes.

2.8.2 Utilities

Figure 10 summarizes a conceptual utility schematic for the proposed Phase 1 redevelopment. Storm sewer piping is shown in green, potable water piping is shown in blue, and sanitary sewer piping is shown in red. Primary underground utilities servicing the development are still being designed, but are estimated to be installed to the following depths below grade:

- Storm sewer: approximately 5-8 feet below grade

[15] Foundations for single-family dwellings may also be supported by rigid inclusions if/where appropriate based on geotechnical conditions in the Phase 1 area of the Property.

- Potable water supply: approximately 5-7 feet below grade
- Sanitary sewer: approximately 9 - 12 feet below grade

Underground utilities servicing individual buildings will be smaller and shallower than the utilities outlined above. As shown in Appendix F, utilities entering the residential buildings in the Phase 1 redevelopment will enter through a common chase and will be provided with a trench dam or other comparable engineering control to prevent the utilities from acting as preferential pathways for vapor flow from the subsurface to indoor airspace.

2.8.3 Other Site Development Features (without Indoor Airspace)

Parkland proposes to construct the following other site development features in the Phase 1 redevelopment, which will not have indoor airspace:

- Public parklet with waterfront access; and
- Approximately 7,600 feet of roadway;

While not relevant to the exposure pathway addressed in this ResAP, we note the above proposed development features here for completeness.

3 Response Activity Design Summary

Section 3.1 provides a summary of the proposed response activity design.

3.1 Response Activity Intent

The intent of the response activity proposed herein is to mitigate the potential for migration of volatile contaminants into the indoor airspace of buildings proposed to be constructed on the Phase 1 Property using a podium style construction method. The response activity design presented in this ResAP is intended to mitigate the potential for exposures via the VI exposure pathway, and the potential for fire and explosivity risks associated with methane in soil and groundwater on the Phase 1 Property. Appendix G includes conceptual design drawings depicting podium style construction for a typical residential building to be constructed on the Phase 1 Property.

Section 3.1.1 presents the design details for the podium style construction concept for a typical residential building and attached garage proposed to be constructed in the Phase 1 redevelopment. The design will be further evaluated and refined during detailed design, and modest deviations may occur from the design presented that do not impact the design elements described in Section 3.1.1 below. Potential deviations may be informed by additional data collection and through evaluating constraints that affect the constructability of the proposed response activity. The design is intended to be adequately developed that, when used in concert with EGLE's experience and with the assumption of good engineering design practice, it will allow for EGLE to complete critical review and evaluation of the concept with certainty that key elements of the proposed response action will be generally implemented as represented.

3.1.1 Podium Design

Podium style construction of the residential buildings on the Phase 1 Property will generally be composed of the following main elements:

- Foundations for the residential buildings and attached garages constructed at a height above grade such that the bottom of the flooring system of the building is a minimum of 2' from grade;
- Openings to ventilate the podium:
    - Located less than 6 inches below the bottom of the floor system
    - Evenly distributed along the length of opposite sides of the building joists
    - The larger of 1.5 square feet for each 25 linear feet of wall or 1% of the underfloor area
    - Covered with corrosion-resistant wire mesh screens with openings between ¼ inch and ½ inch in dimension
- Combustible gas detectors in the podium area and in the indoor airspace above the floor; and
- Plumbing and other utilities placed in trenches sealed with appropriately sized trench dams constructed using a bentonite cement slurry mixture or equivalent.

Podium style construction of residential buildings involves constructing the foundation and flooring system of the buildings to create an open-air space at least 2 feet in height between the bottom of the flooring system and the surrounding grade under the entire footprint of the building, including the garage. Utilities will enter the residential building through a common trench which will be sealed with a trench dam.

Externally mounted instrument enclosures will be provided to house combustible gas detectors. Remote sensing elements from the combustible gas detectors will be located in the podiums and the indoor airspace of the residential buildings and attached garages. Combustible gas detectors will generate audio/visual alarms in the indoor airspace and communicate alarm information to the instrument enclosures.

The instrument enclosures are intended to keep the instruments in operation by preventing access by unauthorized individuals, including individual homeowners. The instrument enclosures will provide a single access point for instrument maintenance. The instrument enclosures will also be provided with the ability to communicate alarm information externally to the third-party O&M service provider, as discussed in Section 4.5.

A conceptual design based on a preliminary building footprint provided by Parkland is depicted in the drawings presented in Appendix G to this ResAP. The approximate location of the remote sensing elements is shown on sheets ENVE-01 and ENVE-02 in Appendix G. Appendix G also includes a cutsheet for an example combustible gas detector that is expected to be similar to the combustible gas meter that would eventually be selected for use in the residential buildings on the Phase 1 Property. The podium style residential buildings will be designed and constructed in accordance with all applicable state and local building codes.

4 Implementation Overview

This section summarizes the implementation plan, including anticipated permits and approvals that will be obtained prior to construction; construction sequencing; due care obligations during construction; construction quality assurance measures; and post-construction monitoring. Observations from implementation, including changes to the design and implementation described in this ResAP, will be included in a Construction Summary Report submitted to EGLE.

4.1 Permit Requirements

All required permits will be obtained by Parkland or on their behalf prior to construction. Necessary permits are anticipated to include soil erosion and sedimentation control permits, building permits and demolition permits (for the water pump house), and, potentially, other permits issued pursuant to Act 451.

4.2 Construction Sequencing

Construction of the proposed response activity will coincide with the sale and wider redevelopment of the Property. Full buildout of the Phase 1 Property as depicted in Figure 2 is anticipated to occur over an approximately 4-to-7-year construction period.

The podium style construction concept in the residential buildings will be designed such that they will be effective at mitigating potential exposures via the VI exposure pathway and potential fire and explosivity risks associated with methane in soil and groundwater on the Property regardless of the overall construction sequencing, and the presence or absence of nearby buildings constructed in the same manner.

4.3 Due Care Obligations During Construction

Construction activities on the Property will comply with applicable health and safety regulations, including the HAZWOPER requirements of 29 CFR 1910,120 and the due care requirements of Section 20107a of Part 201, as applicable to construction workers, residents of adjacent properties, and the general public. Health and safety plans will be developed and implemented during construction, which will include air monitoring as necessary and appropriate to assess potential exposures to VOCs, including methane, and other volatile compounds that may be encountered during subsurface construction. Where necessary and appropriate, engineering or other controls will be implemented to mitigate potential hazards encountered during construction.

An Environmental Management Plan (“EMP”) will be developed for the management of construction residuals and groundwater encountered during construction. Construction residuals and groundwater will be managed in accordance with the applicable requirements of Act 451, including, as appropriate Parts 111 (Hazardous Waste Management), 115 (Solid Waste Management), and Part 201, as well as the requirements of the Toxic Substances Control Act (TSCA; 15 U.S.C. §2601 et. Seq. (1976), as applicable.

4.4 Construction Quality Assurance Measures

Parkland will be the owner and developer of the Property until individual parcels of the Property are sold to third-party buyers. Parkland will assure that all engineering controls associated with the response activity are constructed in a manner that is consistent with the finalized ResAP through the use of qualified third-party construction companies and/or environmental professionals authorized by Parkland to perform work at the site. CQA measures will be specified as part of the final design and detail a process to document that the response activity is being implemented in accordance with the approved project plans and specifications.

CQA measures will be consistent with guidance provided in EGLE's April 2025 Guidance Document for Development on or Near Methane Generating Sources, P/BC 2012-102[16], EGLE's May 2013 EGLE Guidance Document for the Vapor Intrusion Pathway, and EGLE's January 2025 Guidance Document for the Volatilization to the Indoor Air Pathway (VIAP) Volume 5: Response Activity for the VIAP, (as amended).

CQA measures will include construction oversight in the form of documentation of daily work progress through field notes and photographs, documentation of relevant certifications/qualifications for certain products (e.g. combustible gas meter).

CQA oversight will include, but not be limited to, the following components of the response activity:

- Height above ground surface and openings in the podium for residential buildings in accordance with guidance documents cited in this section;
- Sealing of utility conduits in accordance with guidance documents cited in this section;
- Placement and physical installation of instruments and remote sensors in accordance with the instrument manufacturer's recommendations;
- Installation of back-up power systems for the combustible gas detectors; and
- Labeling of system components as applicable.

4.5 Post-Construction Operation and Maintenance

A post-construction operation and maintenance ("O&M") plan for the response activities presented herein will be developed and submitted to EGLE for review within six months of commencement of construction on the Phase 1 Property. The O&M plan will include, but will not be limited to the following:

- As-built documents for the response activity design for the buildings discussed in Section 2.8.1;
- Preventative and routine maintenance requirements ;
- Recommended inspection and calibration frequencies for instrumentation based on the instrument manufacturer's recommendations;
- Documentation for completing maintenance and inspections; and
- Procedures for handling alarms from the combustible gas meters including for conditions that require building evacuation and notification of the local fire department or other first responders.

A draft Declaration of Restrictive Covenant ("RC") intended to be recorded on the Phase 1 Property is also enclosed as a proposed institutional control to assure that the engineering controls are consistently and perpetually constructed, operated, maintained, and monitored. The draft RC will be further refined and recorded prior to the closing of the sale of any portion of the Phase 1 Property by Parkland. The RC will run with the Phase 1 Property and will be applicable to each parcel of property as the Phase 1 Property is subdivided. The RC will be one of the mechanisms by which future property owners of the Phase 1 Property are made aware of environmental contamination on the Phase 1 Property and the existence and necessity of the podium style construction for residential buildings on the Phase 1 Property in addition to the disclosures within the Buyer's purchasing documents and general materials distributed by the Developer during the development phase of the Phase 1 Property. The RC is intended to create an enforceable mechanism by which future Phase 1 Property owners are bound to fund and otherwise allow completion of the O&M activities for the podium style construction described in this ResAP and in the RC.

[16] Los Angeles Department of Building and Safety. *Methane Hazard Mitigation Standard Plan: Simplified Method for Small Additions*. P/BC 2014-102. 2014.

Parkland proposes to create a non-profit business entity that will be responsible for carrying out O&M obligations associated with the proposed engineering controls in this ResAP. This dedicated business entity will be put in place prior to the closing of the sale of any portions of the Phase 1 Property and it will generate funds through collection of dues from the owners of the Phase 1 Property to fund O&M activities, including but not limited to routine system maintenance, repair and replacement of equipment, and reporting obligations. This nonprofit business entity shall have the ability to implement regulations among the owners of the Property consistent with the requirements of the RC, and the entity shall have the ability to place and enforce liens against owners' interest in the Phase 1 Property to ensure the adequate and timely collection of dues. O&M activities will be completed by an appropriately qualified and experienced service provider retained by the non-profit business entity created for this purpose. Individual homeowners will not be relied upon to complete O&M activities associated with engineering controls. Any service providers retained by the non-profit business entity will be qualified and licensed to the extent necessary under applicable Michigan law.

4.5.1 O&M Activities

O&M activities will include, but will not be limited to, the following:

- Preparation and issuance of annual reports to EGLE summarizing construction progress, and the status of all podium style construction in the Phase 1 Property,
- Physical inspection of instrumentation relevant to the response activity in every residential home in the Phase 1 Property on a not less than an annual basis;
- Timely completion of necessary preventative maintenance in accordance with manufacturers' recommendations for instruments associated with the residences;
- Routine calibration of instrument sensors and other instrument components in accordance with the instrument manufacturer's recommendations; and
- Prompt response to alarms received from the combustible gas detectors and completion of associated system repairs and maintenance, as applicable.

4.5.1.1 O&M Alarm Levels for Combustible Gas Detectors

Preliminary alarm levels for the combustible gas detectors are summarized in Table 1 below. As discussed in Section 3.1, alarms from the combustible gas detectors in every residential home will be transferred via telemetry to experienced service providers retained by the non-profit business entity to perform O&M. The service provider will receive an email, text-alert, and/or phone call depending on the type of alarm. In the event that an alarm from a combustible gas detector is greater than 10% LEL, the combustible gas detectors will sound audio and visual alarms in the indoor airspace, and a service provider will be alerted and contractually obligated to promptly respond - regardless of the time of day or day of the year.

Table 1 O&M Alarm Levels for Combustible Gas Detectors

Instrumentation	Communicated Information	Alarm Level[3]	Action
Combustible Gas Detectors	Combustible Atmosphere (%LEL[2])	4%	O&M service provider is notified, data for notifying system is reviewed.
		8%	O&M service provider is notified and investigation of notifying system is scheduled
		Greater than 10%	Audio/visual alarm sounds in the indoor airspace Owner/occupant is immediately notified by O&M service provider, structure evacuated, local fire department notified

Notes:
1) Inches water column (W.C.)
2) Percent of the lower explosive limit (LEL)
3) The alarm levels for the combustible gas detectors are based on a conservative indoor air action level of 10% of the LEL. A typical combustible gas detector may have a sensitivity of 1% LEL with an accuracy of +/- 2% LEL.

4.5.1.2 O&M Long-Term Monitoring Frequency for Combustible Gas Detectors

A long-term monitoring frequency will be adopted and is summarized in Table 2. During the long-term monitoring period, combustible gas detector alarms discussed in Section 4.5.1.1 will continue to be evaluated by service providers retained by the non-profit business entity to perform O&M.

Table 2 Long-Term Monitoring Frequency for Combustible Gas Detectors

Monitored Information	Long-Term Monitoring Frequency
Visual Inspection of Equipment and Labels	Yearly

5 Draft Declaration of Restrictive Covenant

A draft RC proposed to be recorded for the Phase 1 Property is presented as Appendix H. The draft RC is intended to supplement the existing Declaration of Restrictive Covenant (Liber 4095, Page 639, Muskegon County Register of Deeds) on the Phase 1 Property to address the due care measures described in this ResAP. The draft RC will be further refined and recorded prior to the closing of the sale of any portion of the Phase 1 Property by Parkland. The RC, once recorded, will run with the Phase 1 Property and be applicable to subdivision of the Phase 1 Property, thereby creating an enforceable mechanism by which future Phase 1 Property owners are bound to complete and fund performance of the O&M activities described in this ResAP. The RC, together with the response activity proposed in this ResAP, establishes legally-enforceable use restrictions and engineering controls that, subject to EGLE review and approval, meet the requirements of Part 201 and, in particular, further support the allowance for deed restrictions or “alternative instruments” as provided under Section 20121 of Part 201.

6 Implementation Schedule

The schedule for implementing the response activity is dependent on the timing of approval of this ResAP and timing for construction of the proposed development features. While the schedule is subject to change based on these known constraints, Table 3 details Parkland's currently aspirational schedule.

Table 3 Implementation Schedule

Anticipated Timeframe	Implementation Component
July 2025	Submittal of ResAP to EGLE
August 2025	Receive EGLE Response to ResAP/ResAP Approval
September 2025	Public Participation (if required)
November 2025	EGLE approval of ResAP (if public participation required)
December to April 2026	Detailed design of development features

Parkland and Pure Muskegon seek to consummate their transaction of the Property by their September date. The aspirational schedule presented above reflects that intent.

Specific timing of development construction will be determined based on market conditions and, as noted in Section 4.2, is expected to occur over a four-to-seven-year period. Parkland will provide periodic updates to EGLE regarding proposed construction timing and associated implementation of the response activities described here.

7 References

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LEI, 2012. Baseline Assessment and Response Plan, Melching, Inc., 2400 Lakeshore Drive, Muskegon, Michigan. Prepared for Michigan Department of Environmental Quality. Dated May 2012.

ERM, 2016a. Phase I Environmental Site Assessment, 2400 Lakeshore Drive, Muskegon, Michigan 49441. Prepared on behalf of Pure Muskegon, LLC. Dated July 2016.

ERM, 2016b. Baseline Environmental Assessment, 2400 Lakeshore Drive, Muskegon, Michigan 49441. ERM, September 2016.

Replacement Declaration of Environmental Covenants, Release and Indemnity dated July 29, 2016, and recorded in the Muskegon County Register of Deeds on August 8, 2016, in L 4095, P 639 (Declaration).

ERM, 2018. Documentation of Due Care Compliance, Windward Pointe/ Former Sappi Fine Paper Property. 2400 Lakeshore Drive, Muskegon Michigan. ERM, May 16, 2017, Revision 1 – April 4, 2018.

Barr, 2022a. 2022 Supplemental Environmental Investigation Summary Report – 2400 Lakeshore Drive. Prepared for Pure Muskegon, LLC. Barr Engineering, December 2022.

Barr, 2022b. Draft Preliminary Geotechnical Investigation Report, 2400 Lakeshore Drive, Muskegon, Michigan. Prepared for Pure Muskegon, LLC. Barr Engineering, December 2022.

Barr, 2024. 2024 Supplemental Methane Investigation Results. Prepared for Pure Muskegon, LLC. Barr Engineering, May 2024.

Large Tables

Large Table 1
Summary of Analytical Results for Soil Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

Legend

Site-specific volatilization to indoor air criteria (VIAC) developed under Part 201 or site-specific target levels (SSTLs) developed under Part 213 of the Natural Resources and Environmental Protection Act, 1994 PA 451 as amended, which represent EGLE's determination of values that reflect best available information regarding the toxicity and exposure risks posed by the hazardous substances present at the 2400 Lakeshore Drive, Muskegon (Muskegon County), Michigan (61000066) facility.

Footnotes

N Sample Type: Normal
FD Sample Type: Field Duplicate
J Estimated detected value. Either certain QC criteria were not met or the concentration is between the laboratory's detection and quantitation limits.

J- The result is an estimated quantity and may be biased low.
J+ The result is an estimated quantity and may be biased high.
U The analyte was analyzed for, but was not detected.

								Location	DS-1	DS-2	GLC-BS-1	GLC-BS-2	GLC-BS-3	GLC-SW-1	GLC-SW-2	GLC-SW-3
								Date	3/01/2017	3/01/2017	12/09/2002	12/09/2002	12/09/2002	12/09/2002	12/09/2002	12/09/2002
								Depth								
								Sample Type	N	N	N	N	N	N	N	N
Parameter	CAS #	Units	MDEQ Soil Target Detection Limits	Statewide Default Background Levels	Table 1 - Nonresidential 12-hour Soil (SSVIAC)	Table 2 - Nonresidential 12-hour Soil (SSVIAC)	Table 3 - Residential Soil (SSVIAC)	Table 4 - Residential Soil (SSVIAC)								
Last Updated			03/01/2016	12/30/2013	12/09/2024	12/09/2024	12/09/2024	12/09/2024								
Exceedance Key					**Bold**	Underline	Shade	Border								
Metals																
Mercury	7439-97-6	ug/kg	50	130 B,Z	1200 nc	790 nc	22 (M)nc	55 nc	--	--	--	--	--	--	--	--
Semivolatile Organic Compounds																
2-Methylnaphthalene	91-57-6	ug/kg	330		90000 nc	60000 nc	1700 nc	4200 nc	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	330		5700 ca	3800 ca	67 (M)ca	160 (M)ca	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	ug/kg	330		88000 nc	58000 nc	1700 nc	4100 nc	--	--	--	--	--	--	--	--
Volatile Organic Compounds																
1,2,4-Trimethylbenzene	95-63-6	ug/kg	100		7800 (JT)nc	5200 (JT)nc	150 (JT)nc	360 (JT)nc	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	108-67-8	ug/kg	100		5400 (JT)nc	3600 (JT)nc	100 (JT)nc	250 (JT)nc	--	--	--	--	--	--	--	--
2-Methylnaphthalene	91-57-6	ug/kg	330		90000 nc	60000 nc	1700 nc	4200 nc	--	--	--	--	--	--	--	--
Benzene	71-43-2	ug/kg	50		**140 ca**	94 ca	1.7 (M)ca	4.1 (M)ca	--	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	50		29000 nc	20000 nc	560 nc	1400 nc	--	--	--	--	--	--	--	--
Ethyl benzene	100-41-4	ug/kg	50		1000 ca	680 ca	12 (M)ca	30 (M)ca	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	330		5700 ca	3800 ca	67 (M)ca	160 (M)ca	--	--	--	--	--	--	--	--
Trichlorofluoromethane (Freon-11)	75-69-4	ug/kg	100		1000 nc	670 nc	19 (M)nc	47 (M)nc	--	--	--	--	--	--	--	--
Xylene, total	1330-20-7	ug/kg	150		15000 (J)nc	9900 (J)nc	280 (J)nc	690 (J)nc	--	--	--	--	--	--	--	--

Large Table 1
Summary of Analytical Results for Soil Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			GLC-SW-4	GLC-SW-5	Lime-SB-01	Lime-SB-01	Lime-SB-02	Lime-SB-02	Lime-SB-03	Lime-SB-03	LM-1	LM-2	LM-3	LS-1 SS	LS-2 SS	LSB-1	LSB-2 SS	LSB-3 SS	LSB-4 SS	RR-1	RR-2	RR-3
			12/09/2002	12/09/2002	4/10/2019	4/10/2019	4/10/2019	4/10/2019	4/10/2019	4/10/2019	3/01/2017	3/01/2017	3/01/2017	1/19/2012	1/19/2012	4/03/2014	4/03/2014	4/03/2014	4/03/2014	2/28/2017	2/28/2017	3/01/2017
																				1.5 - 2.5 ft	0.5 - 1.5 ft	0.5 - 1.5 ft
			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	CAS #	Units																				
Last Updated																						
Exceedance Key																						
Metals																						
Mercury	7439-97-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	ND	ND	< 50	< 50	< 50	< 50	ND	ND	59
Semivolatile Organic Compounds																						
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	550	950	390
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	470	810	ND
Phenanthrene	85-01-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
Volatile Organic Compounds																						
1,2,4-Trimethylbenzene	95-63-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
1,3,5-Trimethylbenzene	108-67-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
Benzene	71-43-2	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
Butylbenzene	104-51-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
Ethyl benzene	100-41-4	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
Trichlorofluoromethane (Freon-11)	75-69-4	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
Xylene, total	1330-20-7	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND

Large Table 1
Summary of Analytical Results for Soil Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			SB-22-01	SB-22-01	SB-22-02	SB-22-02	SB-22-03	SB-22-04	SB-22-04	SB-22-05	SB-22-05	SB-22-06	SB-22-06	SB-22-07	SB-22-07	SB-22-08	SB-22-08		SB-22-09	SB-22-09	SB-22-10	SB-22-10	SB-22-11	SB-22-11
			6/13/2022	6/13/2022	6/13/2022	6/13/2022	6/13/2022	6/13/2022	6/13/2022	6/13/2022	6/13/2022	6/13/2022	6/13/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022		6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022
			1 - 2 ft	2 - 3 ft	0 - 1 ft	2 - 3 ft	0 - 1 ft	1 - 2 ft	2 - 3 ft	1 - 2 ft	3 - 4 ft	0 - 1 ft	5 - 6 ft	0 - 1 ft	2 - 3 ft	1.5 - 2.5 ft	2.5 - 3.5 ft	2.5 - 3.5 ft	0 - 1 ft	2 - 3 ft	1 - 2 ft	3 - 4 ft	1 - 2 ft	3 - 4 ft
			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N
Parameter	CAS #	Units																						
Last Updated																								
Exceedance Key																								
Metals																								
Mercury	7439-97-6	ug/kg	54	< 50 U	114	< 50 U	< 50 U	< 50 U	1195	< 50 U	< 50 J	< 50 U	< 50 U	148	130	104	102	191	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	116
Semivolatile Organic Compounds																								
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Volatile Organic Compounds																								
1,2,4-Trimethylbenzene	95-63-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	108-67-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	71-43-2	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethyl benzene	100-41-4	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichlorofluoromethane (Freon-11)	75-69-4	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Xylene, total	1330-20-7	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Large Table 1
Summary of Analytical Results for Soil Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			SB-22-12	SB-22-12	SB-22-13	SB-22-13	SB-22-14	SB-22-15	SB-22-15		SB-22-16	SB-22-16	SB-22-17	SB-22-17	SB-22-18		SB-22-18	SB-22-19	SB-22-19	SB-22-20	SB-22-20	SB-22-21		SB-22-21	SB-22-22
			6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022		6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022		6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022		6/14/2022	6/15/2022
			0 - 1 ft	2 - 3 ft	0 - 1 ft	4 - 5 ft	4 - 5 ft	0 - 1 ft	3 - 4 ft	3 - 4 ft	0 - 1 ft	3 - 4 ft	1.5 - 2.5 ft	3.5 - 4.5 ft	0.5 - 1.5 ft	0.5 - 1.5 ft	3.5 - 4.5 ft	1 - 2 ft	4 - 4.8 ft	3 - 4 ft	4.2 - 5 ft	0.5 - 1.5 ft	0.5 - 1.5 ft	4.2 - 5 ft	2 - 3 ft
			N	N	N	N	N	N	N	FD	N	N	N	N	N	FD	N	N	N	N	N	N	FD	N	N
Parameter	CAS #	Units																							
Last Updated																									
Exceedance Key																									
Metals																									
Mercury	7439-97-6	ug/kg	< 50 U	< 50 U	< 50 U	205	< 50 U	< 50 U	< 50 U	72	< 50 U	< 50 U	< 50 U	66	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
Semivolatile Organic Compounds																									
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Volatile Organic Compounds																									
1,2,4-Trimethylbenzene	95-63-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	108-67-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	71-43-2	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethyl benzene	100-41-4	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichlorofluoromethane (Freon-11)	75-69-4	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Xylene, total	1330-20-7	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Large Table 1
Summary of Analytical Results for Soil Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			SB-22-22	SB-22-23	SB-22-23		SB-22-24	SB-22-24	SB-22-25	SB-22-25	SB-22-26	SB-22-26	SB-22-27	SB-22-27	SB-22-28	SB-22-28	SB-22-29	SB-22-29	SB-22-30	SB-22-30	SB-22-31	SB-22-31		SB-22-32	SB-2
			6/15/2022	6/15/2022	6/15/2022		6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/13/2022	6/13/2022	6/13/2022	6/13/2022	6/13/2022	6/13/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022		6/14/2022	6/14/
			4 - 5 ft	0 - 1 ft	3.5 - 4.5 ft	3.5 - 4.5 ft	0 - 1 ft	3 - 4 ft	0 - 1 ft	3.5 - 4.5 ft	0 - 1 ft	2.5 - 3.5 ft	1 - 2 ft	3 - 4 ft	0 - 1 ft	1 - 2 ft	1 - 2 ft	3 - 4 ft	0 - 1 ft	1 - 2 ft	1 - 2 ft	4 - 5 ft	4 - 5 ft	0 - 1 ft	3.5 - 4.5 ft
			N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N
Parameter	CAS #	Units																							
Last Updated																									
Exceedance Key																									
Metals																									
Mercury	7439-97-6	ug/kg	< 50 U	< 50 U	72	< 50 U	< 50 U	72	92	< 50 U	76	< 50 U	95	54	126	94	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	74	108	< 50 U	< 50 U
Semivolatile Organic Compounds																									
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Volatile Organic Compounds																									
1,2,4-Trimethylbenzene	95-63-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	108-67-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	71-43-2	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethyl benzene	100-41-4	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichlorofluoromethane (Freon-11)	75-69-4	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Xylene, total	1330-20-7	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Large Table 1
Summary of Analytical Results for Soil Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			2-32	SS-1	SS-1	SS-2	SS-2	SS-3	SS-3	SS-4	SS-4	SS-5	SS-5	SS-6	SS-6	SS-7	SS-7	SS-8	SS-8	SS-9	SS-9	SS-10	SS-10	SS-11
			2022	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	3/01/2017	3/01/2017	3/01/2017	3/01/2017	3/01/2017
			3.5 - 4.5 ft	0 - 1 ft	3 - 4 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1.5 - 2.5 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft		0 - 1 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft
			FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	CAS #	Units																						
Last Updated																								
Exceedance Key																								
Metals																								
Mercury	7439-97-6	ug/kg	< 50 U	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	--	--	ND	--
Semivolatile Organic Compounds																								
2-Methylnaphthalene	91-57-6	ug/kg	--	--	ND	--	ND	--	ND	--	410	--	ND	--	ND	--	ND	--	ND	ND	--	--	2100	--
Naphthalene	91-20-3	ug/kg	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	--	--	1400	--
Phenanthrene	85-01-8	ug/kg	--	--	ND	--	ND	--	330	--	610	--	ND	--	ND	--	ND	--	ND	ND	--	--	410	--
Volatile Organic Compounds																								
1,2,4-Trimethylbenzene	95-63-6	ug/kg	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	--	--	220	--
1,3,5-Trimethylbenzene	108-67-8	ug/kg	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	--	--	ND	--
2-Methylnaphthalene	91-57-6	ug/kg	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	--	--	ND	--
Benzene	71-43-2	ug/kg	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	--	--	**290**	--
Butylbenzene	104-51-8	ug/kg	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	--	--	ND	--
Ethyl benzene	100-41-4	ug/kg	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	--	--	130	--
Naphthalene	91-20-3	ug/kg	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	--	--	ND	--
Trichlorofluoromethane (Freon-11)	75-69-4	ug/kg	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	100	--	ND	--	ND	ND	--	--	ND	--
Xylene, total	1330-20-7	ug/kg	--	--	ND	--	ND	--	ND	--	350	--	ND	--	ND	--	ND	--	ND	ND	--	--	840	--

Large Table 1
Summary of Analytical Results for Soil Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			SS-11 3/01/2017 1 - 2 ft N	SS-12 3/01/2017 0 - 1 ft N	SS-12 3/01/2017 1 - 2 ft N	SS-13 3/01/2017 0 - 1 ft N	SS-13 3/01/2017 1 - 2 ft N	SS-14 3/01/2017 0 - 1 ft N	SS-14 3/01/2017 1 - 2 ft N	SS-15 3/01/2017 0 - 1 ft N	SS-15 3/01/2017 1 - 2 ft N	SS-16 3/01/2017 0 - 1 ft N	SS-16 3/01/2017 1 - 2 ft N	SS-17 3/01/2017 0 - 1 ft N	SS-17 3/01/2017 1 - 2 ft N	SS-18 3/01/2017 0 - 1 ft N	SS-18 3/01/2017 1 - 2 ft N	SS-19 3/01/2017 0 - 1 ft N	SS-19 3/01/2017 1 - 2 ft N	SS-20 3/01/2017 0 - 1 ft N	SS-20 3/01/2017 1 - 2 ft N	SSB-2/UT-2 11/18/2011 1.5 - 2.5 ft N	T-8 7/26/2017 N	TB-3 7/25/2017 5 ft N
Parameter	CAS #	Units																							
Last Updated																									
Exceedance Key																									
Metals																									
Mercury	7439-97-6	ug/kg	ND	--	ND	--	ND	--	1100	--	ND	--	ND	--	84	--	ND	--	85	--	280	120	390	ND	
Semivolatile Organic Compounds																									
2-Methylnaphthalene	91-57-6	ug/kg	890	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	
Naphthalene	91-20-3	ug/kg	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	--	--	
Phenanthrene	85-01-8	ug/kg	430	--	ND	--	1600	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	ND	ND	
Volatile Organic Compounds																									
1,2,4-Trimethylbenzene	95-63-6	ug/kg	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	170	--	ND	--	ND	--	ND	ND	
1,3,5-Trimethylbenzene	108-67-8	ug/kg	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	
2-Methylnaphthalene	91-57-6	ug/kg	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	
Benzene	71-43-2	ug/kg	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	--	--	
Butylbenzene	104-51-8	ug/kg	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	
Ethyl benzene	100-41-4	ug/kg	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	
Naphthalene	91-20-3	ug/kg	560	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	
Trichlorofluoromethane (Freon-11)	75-69-4	ug/kg	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	--	--	
Xylene, total	1330-20-7	ug/kg	200	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	

Large Table 1
Summary of Analytical Results for Soil Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			TB-4 7/24/2017 5 ft N	TB-5 7/25/2017 5 ft N	TB-6 7/25/2017 2 ft N	TB-9 7/26/2017 5 ft N	TB-10 7/26/2017 7 ft N	TB-13 7/27/2017 5 ft N	TB-15 7/28/2017 5 ft N	TB-18 7/28/2017 5 ft N	TP-1 1/09/2017 2 - 4 ft N	TP-1 1/09/2017 6 ft N	TP-1 1/09/2017 9 - 9.5 ft N	TP-2 1/09/2017 2 ft N	TP-2 1/09/2017 12 ft N	TP-3 1/09/2017 6 ft N	TP-4 1/09/2017 2 ft N	TP-4 1/09/2017 6 ft N	TP-5 1/09/2017 8 ft N	TP-6 1/09/2017 2 ft N	TP-6 1/09/2017 12 ft N	TP-7 1/09/2017 2 ft N	TP-7 1/09/2017 6.5 ft N	TP-8 1/09/2017 2 ft N
Parameter	CAS #	Units																							
Last Updated																									
Exceedance Key																									
Metals																									
Mercury	7439-97-6	ug/kg	520	ND	ND	68	61	ND	71	440	--	ND	ND	ND	340	ND	ND	ND	ND	ND	--	ND	77	ND
Semivolatile Organic Compounds																									
2-Methylnaphthalene	91-57-6	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	ug/kg	1100	ND	ND	ND	ND	ND	730	ND	--	ND	ND	ND	ND	ND	ND	2800	ND	ND	510	ND	ND	ND	
Volatile Organic Compounds																									
1,2,4-Trimethylbenzene	95-63-6	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	108-67-8	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	91-57-6	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	600	1000	ND	ND	ND	ND	ND	ND
Benzene	71-43-2	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	100-41-4	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	91-20-3	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3600	1400	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane (Freon-11)	75-69-4	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Xylene, total	1330-20-7	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Large Table 1
Summary of Analytical Results for Soil Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			TP-8 1/09/2017 4 ft N	TP-8 1/09/2017 12 ft N	TP-9 1/09/2017 4 ft N	TP-10 1/10/2017 3.5 ft N	TP-11 1/10/2017 2.5 ft N	TP-11 1/10/2017 8 ft N	TP-12 1/10/2017 3.5 ft N	TP-12 1/10/2017 7 ft N	TP-13 1/10/2017 2.5 ft N	TP-13 1/10/2017 8 ft N	TP-14 1/10/2017 10 ft N	TP-15 1/10/2017 2.5 ft N	TP-16 1/10/2017 1 ft N	TP-16 1/23/2017 8 ft N	TP-17 1/11/2017 2.5 ft N	TP-17 1/11/2017 7 ft N	TP-18 1/11/2017 5 ft N	TP-18 1/11/2017 7 ft N	TP-18 1/11/2017 9.5 ft N	TP-18 1/11/2017 11 ft N	TP-19 1/11/2017 2 ft N	TP-19 1/11/2017 5.5 ft N
Parameter	CAS #	Units																							
Last Updated																									
Exceedance Key																									
Metals																									
Mercury	7439-97-6	ug/kg	91	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	800	220	ND	ND	ND	ND	77	ND	59
Semivolatile Organic Compounds																									
2-Methylnaphthalene	91-57-6	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6900	2300	ND	ND	ND
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4300	2100	ND	ND	ND
Volatile Organic Compounds																									
1,2,4-Trimethylbenzene	95-63-6	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	140	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	108-67-8	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	140	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	91-57-6	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1500	ND	ND	ND	ND	ND	ND	1200	ND	ND	ND
Benzene	71-43-2	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	100-41-4	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	91-20-3	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	360	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane (Freon-11)	75-69-4	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Xylene, total	1330-20-7	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	380	380	ND	ND	ND	ND	ND	ND	ND	ND	ND

Large Table 1
Summary of Analytical Results for Soil Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			TP-19 1/11/2017 12 ft N	TP-20 1/11/2017 2.5 ft N	TP-20 1/11/2017 9 ft N	TP-20 1/11/2017 15 ft N	TP-21 1/11/2017 2.5 ft N	TP-21 1/11/2017 13 ft N	TP-22 1/11/2017 2 ft N	TP-22 1/11/2017 6.5 ft N	TP-23 1/11/2017 3 ft N	TP-23 1/11/2017 5.5 ft N	TP-24 1/11/2017 2 ft N	TP-24 1/11/2017 15 ft N	TP-25 1/12/2017 2 ft N	TP-25 1/12/2017 13 ft N	TP-26 1/12/2017 2 ft N	TP-26 1/12/2017 16 ft N	TP-27 1/12/2017 11 ft N	TP-28 1/12/2017 2 ft N	TP-28 1/12/2017 7 ft N	TP-29 1/12/2017 2 ft N	TP-29 1/12/2017 10 ft N	TP-30 1/12/2017 2 ft N
Parameter	CAS #	Units																							
Last Updated																									
Exceedance Key																									
Metals																									
Mercury	7439-97-6	ug/kg	200	ND	ND	ND	ND	ND	1000	--	ND	81	ND	ND	0.092	0.14	0.13	ND	0.14	0.053	0.062	0.076	ND	0.052
Semivolatile Organic Compounds																									
2-Methylnaphthalene	91-57-6	ug/kg	ND	ND	940	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	750	ND	ND	ND	ND	ND
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	ug/kg	ND	ND	990	ND	ND	ND	27000	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	440
Volatile Organic Compounds																									
1,2,4-Trimethylbenzene	95-63-6	ug/kg	690	ND	850	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	3700	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	108-67-8	ug/kg	410	ND	250	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	1000	ND	ND	ND	ND	ND
2-Methylnaphthalene	91-57-6	ug/kg	2100	ND	4600	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	580	ND	ND	10000	ND	ND	ND	ND	ND
Benzene	71-43-2	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	ND	ND	160	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	2400	ND	ND	ND	ND	ND
Ethyl benzene	100-41-4	ug/kg	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	240	ND	ND	ND	ND	ND
Naphthalene	91-20-3	ug/kg	ND	ND	830	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	2800	ND	ND	ND	ND	ND
Trichlorofluoromethane (Freon-11)	75-69-4	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Xylene, total	1330-20-7	ug/kg	ND	ND	530	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	680	ND	ND	ND	ND	ND

Large Table 1
Summary of Analytical Results for Soil Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			TP-30	TP-31	TP-31 Sidewall	TP-32	TP-32	TP-32	TP-33	TP-33	TP-34	TP-34	TWVP-19-E-SS	TWVP-19-W-SS	TWVP-20-E-SS	TWVP-20-W-SS	TWVP-21-E-SS	TWVP-21-W-SS	TWVP-22-E-SS
			1/12/2017	1/12/2017	1/12/2017	1/12/2017	1/12/2017	1/12/2017	1/12/2017	1/12/2017	1/12/2017	1/12/2017	4/10/2019	4/10/2019	4/10/2019	4/10/2019	4/10/2019	4/10/2019	4/10/2019
			8 ft	10 ft		2.5 ft	9 ft	15 ft	2 ft	11 ft	3 ft	9 ft	0.5 ft	0.5 ft	0.5 ft	0.5 ft	0.5 ft	0.5 ft	0.5 ft
			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	CAS #	Units																	
Last Updated																			
Exceedance Key																			
Metals																			
Mercury	7439-97-6	ug/kg	ND	ND	0.075	0.17	0.11	ND	ND	ND	ND	ND	56	67	80	55	120	130	< 50.0 U
Semivolatile Organic Compounds																			
2-Methylnaphthalene	91-57-6	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 590.0 U	< 330.0 U	< 1100.0 U	< 1100.0 U	< 450.0 U	< 450.0 U	< 330.0 U
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	< 590.0 U	< 330.0 U	< 1100.0 U	< 1100.0 U	< 450.0 U	< 450.0 U	< 330.0 U
Phenanthrene	85-01-8	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	590	< 330.0 U	< 420.0 U	< 450.0 U	480	520	< 330.0 U
Volatile Organic Compounds																			
1,2,4-Trimethylbenzene	95-63-6	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	108-67-8	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
2-Methylnaphthalene	91-57-6	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Benzene	71-43-2	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Ethyl benzene	100-41-4	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Trichlorofluoromethane (Freon-11)	75-69-4	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Xylene, total	1330-20-7	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--

Large Table 1
Summary of Analytical Results for Soil Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			TWVP-22-W-SS 4/10/2019 0.5 ft N	TWVP-23-E-SS 4/10/2019 0.5 ft N	TWVP-23-W-SS 4/10/2019 0.5 ft N
Parameter	CAS #	Units			
Last Updated					
Exceedance Key					
Metals					
Mercury	7439-97-6	ug/kg	< 50.0 U	110	< 50.0 U
Semivolatile Organic Compounds					
2-Methylnaphthalene	91-57-6	ug/kg	< 430.0 U	< 540.0 U	< 330.0 U
Naphthalene	91-20-3	ug/kg	< 430.0 U	< 540.0 U	< 330.0 U
Phenanthrene	85-01-8	ug/kg	< 330.0 U	720	< 330.0 U
Volatile Organic Compounds					
1,2,4-Trimethylbenzene	95-63-6	ug/kg	--	--	--
1,3,5-Trimethylbenzene	108-67-8	ug/kg	--	--	--
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--
Benzene	71-43-2	ug/kg	--	--	--
Butylbenzene	104-51-8	ug/kg	--	--	--
Ethyl benzene	100-41-4	ug/kg	--	--	--
Naphthalene	91-20-3	ug/kg	--	--	--
Trichlorofluoromethane (Freon-11)	75-69-4	ug/kg	--	--	--
Xylene, total	1330-20-7	ug/kg	--	--	--

Large Table 2
Summary of Analytical Results for Groundwater Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

Parameter	CAS #	Units	MDEQ Water Target Detection Limits	Table 1 - Nonresidential 12-hour Shallow Groundwater (SSVIAC)	Table 2 - Nonresidential 12-hour Shallow Groundwater (SSVIAC)	Table 3 - Residential Shallow Groundwater (SSVIAC)	Table 4 - Residential Shallow Groundwater (SSVIAC)	Location	MW-01I	MW-01I	MW-01I	MW-01I	MW-01I	MW-01S	MW-01S	MW-01S
								Date	5/02/2019	9/13/2019	12/09/2019	3/17/2020	4/21/2022	5/02/2019	9/13/2019	12/09/2019
								Sample Type	N	N	N	N	N	N	N	N
Last Updated			03/01/2016	12/09/2024	12/09/2024	12/09/2024	12/09/2024									
Exceedance Key				**Bold**	Underline	Shade	Border									
General Parameters																
Methane	74-82-8	ug/l	500	**10000 (AA)**	10000 (AA)	10000 (AA)	10000 (AA)		--	--	--	**44000**	--	--	--	--
Nitrogen, ammonia, as N	7664-41-7	ug/l	25	**5900 (FF)st**	4600 (FF)st	1900 (FF)st	2100 (FF)st		5900	5000	5200	--	--	**18000**	**13000**	**11000**
Total Metals																
Mercury	7439-97-6	ug/l	0.001	0.79 nc	0.61 nc	0.088 nc	0.095 nc		< 0.20 U	--	< 0.20 U	--	< 0.2 U	< 0.20 U	--	< 0.20 U

Legend

Site-specific volatilization to indoor air criteria (VIAC) developed under Part 201 or site-specific target levels (SSTLs) developed under Part 213 of the Natural Resources and Environmental Protection Act, 1994 PA 451 as amended, which represent EGLE's determination of values that reflect best available information regarding the toxicity and exposure risks posed by the hazardous substances present at the 2400 Lakeshore Drive, Muskegon (Muskegon County), Michigan (61000066) facility.

Footnotes

N Sample Type: Normal
FD Sample Type: Field Duplicate
ND Not detected
J Estimated detected value. Either certain QC criteria were not met or the concentration is between the laboratory's detection and quantitation limits.
J+ The result is an estimated quantity and may be biased high.
PR Present
U The analyte was analyzed for, but was not detected.

Large Table 2
Summary of Analytical Results for Groundwater Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			MW-01S	MW-01S	MW-02I	MW-02I	MW-02I	MW-02I	MW-02I	MW-02S	MW-02S	MW-02S	MW-02S	MW-02S	MW-03D	MW-03D	MW-03D	MW-03D	MW-03I	MW-03I	MW-03I	MW-03I		MW-03S	MW-03S	MW-03S
			3/17/2020	4/21/2022	5/02/2019	9/13/2019	12/10/2019	3/17/2020	4/21/2022	5/02/2019	9/13/2019	12/10/2019	3/17/2020	4/21/2022	5/03/2019	3/16/2020	7/29/2020	4/22/2022	5/02/2019	3/16/2020	7/29/2020	4/22/2022		5/02/2019	3/16/2020	7/29/2020
			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N
Parameter	CAS #	Units																								
Last Updated																										
Exceedance Key																										
General Parameters																										
Methane	74-82-8	ug/l	**350000**	--	--	--	--	**100000**	--	--	--	--	**360000**	--	--	**240000**	10000	--	--	100	53	--	--	--	5200	3600
Nitrogen, ammonia, as N	7664-41-7	ug/l	--	--	5500	4100	3400	--	--	**11000**	**10000**	**8800**	--	--	3300	3000	--	--	3500	990	--	--	--	**13000**	**6700**	--
Total Metals																										
Mercury	7439-97-6	ug/l	--	< 0.2 U	< 0.20 U	--	< 0.20 U	--	< 0.2 U	< 0.20 U	--	< 0.20 J	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.2 U	< 0.20 U	< 0.20 U	--

Large Table 2
Summary of Analytical Results for Groundwater Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			MW-03S 4/22/2022 N	MW-04D 5/03/2019 N	MW-04D 3/17/2020 N	MW-04D 7/29/2020 N	MW-04D 4/22/2022 N	MW-04I 5/03/2019 N	MW-04I 3/17/2020 N	MW-04I 7/29/2020 N	MW-04I 4/22/2022 N	MW-04S 5/03/2019 N	MW-04S 3/17/2020 N	MW-04S 7/29/2020 N	MW-04S 4/22/2022 N	MW-05D 5/08/2019 N	MW-05D 3/18/2020 N	MW-05D 7/29/2020 N	MW-05D 4/20/2022 N	MW-05I 5/08/2019 N	MW-05I 3/18/2020 N	MW-05I 7/29/2020 N	MW-05I 4/20/2022 N	MW-05S 5/08/2019 N	MW-05S 3/18/2020 N
Parameter	CAS #	Units																							
Last Updated																									
Exceedance Key																									
General Parameters																									
Methane	74-82-8	ug/l	--	--	290	1100	--	--	87	140	--	--	**360000**	**17000**	--	--	14	43 J	--	--	4200	52	--	--	1300
Nitrogen, ammonia, as N	7664-41-7	ug/l	--	**7400**	**6500**	--	--	1400	1100	--	--	1800	**16000**	--	--	310	180	--	--	2400	2000	--	--	310	220
Total Metals																									
Mercury	7439-97-6	ug/l	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U

Large Table 2
Summary of Analytical Results for Groundwater Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			MW-05S	MW-05S	MW-06D	MW-06D	MW-06I	MW-06I		MW-06S	MW-06S	MW-07D	MW-07D	MW-07I	MW-07I	MW-08D	MW-08D	MW-08D	MW-08D	MW-08I	MW-08I	MW-08I	MW-08I	MW-08S	MW-08S	MW-08S
			7/29/2020	4/21/2022	5/08/2019	4/22/2022	5/08/2019	4/22/2022		5/09/2019	4/22/2022	5/09/2019	4/20/2022	5/09/2019	4/20/2022	5/09/2019	3/19/2020	7/30/2020	4/21/2022	5/09/2019	3/19/2020	7/30/2020	4/21/2022	5/09/2019	3/19/2020	7/30/2020
			N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	CAS #	Units																								
Last Updated																										
Exceedance Key																										
General Parameters																										
Methane	74-82-8	ug/l	78	--	--	--	--	--	--	--	--	--	--	--	--	--	17 J	17	--	--	6900	3400	--	--	**800000**	**17000**
Nitrogen, ammonia, as N	7664-41-7	ug/l	--	--	1600	--	870	--	--	3900	--	1000	--	**6000**	--	600	180	--	--	780	610	--	--	3400	2500	--
Total Metals																										
Mercury	7439-97-6	ug/l	--	< 0.2 U	< 0.20 U	< 0.2 U	< 0.20 U	< 0.2 U	< 0.2 U	< 0.20 U	< 0.2 U	< 0.20 U	< 0.2 U	< 0.20 U	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--

Large Table 2
Summary of Analytical Results for Groundwater Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			MW-08S		MW-09D	MW-09D	MW-09D	MW-09D	MW-09I	MW-09I	MW-09I	MW-09I	MW-09S	MW-09S	MW-09S	MW-09S	MW-10D	MW-10D	MW-10D	MW-10D	MW-10I	MW-10I	MW-10I	MW-10I	MW-10S	MW-10S
			4/21/2022		5/10/2019	3/19/2020	7/30/2020	4/21/2022	5/10/2019	3/19/2020	7/30/2020	4/21/2022	5/10/2019	3/19/2020	7/30/2020	4/21/2022	5/17/2019	3/20/2020	7/31/2020	4/25/2022	5/17/2019	3/20/2020	7/30/2020	4/25/2022	5/17/2019	3/20/2020
			N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	CAS #	Units																								
Last Updated																										
Exceedance Key																										
General Parameters																										
Methane	74-82-8	ug/l	--	--	--	1300	100	--	--	1300	720	--	--	< 1.0 U	120	--	--	51	80	--	--	4300	520	--	--	380000
Nitrogen, ammonia, as N	7664-41-7	ug/l	--	--	630	750	--	--	27	750	--	--	130	310	--	--	1700	1500	--	--	560	620	--	--	30000	20000
Total Metals																										
Mercury	7439-97-6	ug/l	< 0.2 U	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U

Large Table 2
Summary of Analytical Results for Groundwater Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			MW-10S	MW-10S	MW-11D	MW-11I	MW-11S	MW-12D	MW-12I		MW-12S	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I	MW-14S	MW-15D	MW-15I	MW-15S	TMW-1		TMW-2	TW-01	TW-01	TW-01	TW-01
			7/30/2020	4/25/2022	4/25/2022	4/25/2022	4/25/2022	4/26/2022	4/26/2022		4/26/2022	4/26/2022	4/26/2022	4/26/2022	4/26/2022	4/25/2022	4/26/2022	4/25/2022	4/25/2022	4/25/2022	6/27/2022		6/27/2022	10/10/2018	9/13/2019	12/10/2019	3/16/2020
			N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N
Parameter	CAS #	Units																									
Last Updated																											
Exceedance Key																											
General Parameters																											
Methane	74-82-8	ug/l	6400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	71000
Nitrogen, ammonia, as N	7664-41-7	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16000	14000	--
Total Metals																											
Mercury	7439-97-6	ug/l	--	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	0.3	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	--	--	--	< 0.20 U	--	< 0.20 U	--

Large Table 2
Summary of Analytical Results for Groundwater Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			TW-01	TW-01		TW-02	TW-02	TW-02	TW-02	TW-03	TW-03	TW-03	TW-03	TW-03	TW-07	TW-07	TW-08	TW-08	TW-09	TW-10	TWVP-19-MW	TWVP-20-MW	TWVP-21-MW
			7/29/2020	4/25/2022		10/10/2018	9/13/2019	12/10/2019	3/16/2020	10/10/2018	12/10/2019	3/16/2020	7/31/2020	4/21/2022	10/11/2018	4/22/2022	10/11/2018	4/25/2022	4/21/2022	4/21/2022	4/12/2019	4/12/2019	4/12/2019
			N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	CAS #	Units																					
Last Updated																							
Exceedance Key																							
General Parameters																							
Methane	74-82-8	ug/l	18000	--	--	--	--	--	82000	--	--	250000	12000	--	--	--	--	--	--	--	< 0.20 U	< 0.20 U	< 0.20 U
Nitrogen, ammonia, as N	7664-41-7	ug/l	--	--	--	--	5000	3400	--	--	42000	--	--	--	--	--	--	--	--	--	--	--	--
Total Metals																							
Mercury	7439-97-6	ug/l	--	< 0.2 U	< 0.2 U	< 0.20 U	--	< 0.20 U	--	< 0.20 U	< 0.20 U	--	--	< 0.2 U	0.27	< 0.2 U	< 0.20 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.20 U	< 0.20 U	< 0.20 U

Large Table 2
Summary of Analytical Results for Groundwater Samples Screened Against SSVIAC
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			TWVP-22-MW 4/12/2019 N	TWVP-23-MW 4/12/2019 N
Parameter	CAS #	Units		
Last Updated				
Exceedance Key				
General Parameters				
Methane	74-82-8	ug/l	< 0.20 U	< 0.20 U
Nitrogen, ammonia, as N	7664-41-7	ug/l	--	--
Total Metals				
Mercury	7439-97-6	ug/l	< 0.20 U	< 0.20 U

Large Table 3
Summary of Analytical Results for Soil Samples
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

Legend

Cleanup criteria shown are from EGLE RRD rules effective December 30, 2013; R 299.46 Generic soil cleanup criteria for residential category (Table 2).

Footnotes

N Sample Type: Normal
FD Sample Type: Field Duplicate
J Estimated detected value. Either certain QC criteria were not met or the concentration is between the laboratory's detection and quantitation limits.

J- The result is an estimated quantity and may be biased low.
J+ The result is an estimated quantity and may be biased high.
U The analyte was analyzed for, but was not detected.

Where applicable a hardness value of 200 mg CaCO3/L was used.
Where applicable the X footnote was applied for a protected water source.

											Location	DS-1	DS-2	GLC-BS-1	GLC-BS-2
											Date	3/01/2017	3/01/2017	12/09/2002	12/09/2002
											Depth				
											Sample Type	N	N	N	N
Parameter	CAS #	Units	MDEQ Soil Target Detection Limits	Statewide Default Background Levels	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Infinite Source Volatile Soil Inhalation Criteria (42%)	Particulate Soil Inhalation Criteria (42%)	Direct Contact Criteria	Soil Saturation Screening Levels					
Last Updated			03/01/2016	12/30/2013	12/30/2013	06/25/2018	12/30/2013	12/30/2013	12/30/2013	12/30/2013					
Exceedance Key					**Bold**	Underline	No Exceedance	Shade	Border	No Exceedance					
General Parameters															
Sulfate, as SO4	14808-79-8	ug/kg	50000		**5000000**	NA	NLV	ID	ID	NA		--	--	950000	550000
Metals															
Arsenic	7440-38-2	ug/kg	2000	5800	**4600**	4600	NLV	302400	7600	NA		--	--	--	--
Barium	7440-39-3	ug/kg	1000	75000 B	1300000 B	600000 B,G	NLV	138600000 B	37000000 B	NA		--	--	--	--
Cadmium	7440-43-9	ug/kg	200	1200 B	**6000 B**	3000 B,G,X	NLV	714000 B	550000 B	NA		--	--	--	--
Chromium	7440-47-3	ug/kg	2000	NA	**30000 (1)**	3300 (1)	NLV	109200 (1)	2500000 (1)	NA		--	--	--	--
Chromium, hexavalent	18540-29-9	ug/kg	2000	NA	30000	3300	NLV	109200	2500000	NA		--	--	--	--
Copper	7440-50-8	ug/kg	1000	32000 B	5800000 B	93000 B,G	NLV	54600000 B	20000000 B	NA		--	--	--	--
Lead	7439-92-1	ug/kg	1000	21000 B	**700000 B**	2500000 B,G,X	NLV	42000000 B	400000 B	NA		--	--	--	--
Manganese	7439-96-5	ug/kg	1000	440000 B	**1000 B**	26000 B,G,X	NLV	1386000 B	25000000 B	NA		--	--	--	--
Mercury	7439-97-6	ug/kg	50	130 B,Z	1700 B,Z	50 B,M,Z	21840 B,Z	8400000 B,Z	160000 B,Z	NA		--	--	--	--
Selenium	7782-49-2	ug/kg	200	410 B	**4000 B**	400 B	NLV	54600000 B	2600000 B	NA		--	--	--	--
Silver	7440-22-4	ug/kg	100	1000 B	4500 B	100 B,M	NLV	2814000 B	2500000 B	NA		--	--	--	--
Sodium	7440-23-5	ug/kg	10000		**4600000**	NA	NLV	ID	1000000000 D	NA		--	--	3700000	4400000
Zinc	7440-66-6	ug/kg	1000	47000 B	2400000 B	210000 B,G	NLV	ID	170000000 B	NA		--	--	--	--
Semivolatile Organic Compounds															
2-Methylnaphthalene	91-57-6	ug/kg	330		57000	4200	630000	281400000	8100000	NA		--	--	--	--
4-Chloro-3-methylphenol	59-50-7	ug/kg	280		5800	280	NLV	ID	4500000	NA		--	--	--	--
Benzo(a)pyrene	50-32-8	ug/kg	330		NLL	NLL	NLV	630000 Q	2000 Q	NA		--	--	--	--
Fluoranthene	206-44-0	ug/kg	330		730000	5500	310800000	3906000000	46000000	NA		--	--	--	--
Naphthalene	91-20-3	ug/kg	330		35000	730	126000	84000000	16000000	NA		--	--	--	--
Phenanthrene	85-01-8	ug/kg	330		56000	2100	67200	2814000	1600000	NA		--	--	--	--
Volatile Organic Compounds															
1,2,4-Trimethylbenzene	95-63-6	ug/kg	100		**2100 I**	570 I	8820000 I	34440000000 I	32000000 C,I	110000 I		--	--	--	--
2-Methylnaphthalene	91-57-6	ug/kg	330		57000	4200	630000	281400000	8100000	NA		--	--	--	--
Benzene	71-43-2	ug/kg	50		**100 I**	240 I,X	5460 I	159600000 I	180000 I	400000 I		--	--	--	--
Butylbenzene	104-51-8	ug/kg	50		**1600**	ID	ID	840000000	2500000	10000000		--	--	--	--
Naphthalene	91-20-3	ug/kg	330		35000	730	126000	84000000	16000000	NA		--	--	--	--
Chlorinated Dioxins / Furans															
Toxicity equivalence factor summation		ug/kg			NLL	NLL	NLV	29.82 O	0.09 O	NA		0.00115	0.00076	--	--

Large Table 3
Summary of Analytical Results for Soil Samples
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			GLC-BS-3 12/09/2002 N	GLC-SW-1 12/09/2002 N	GLC-SW-2 12/09/2002 N	GLC-SW-3 12/09/2002 N	GLC-SW-4 12/09/2002 N	GLC-SW-5 12/09/2002 N	Lime-SB-01 4/10/2019 N	Lime-SB-01 4/10/2019 N	Lime-SB-02 4/10/2019 N	Lime-SB-02 4/10/2019 N	Lime-SB-03 4/10/2019 N	Lime-SB-03 4/10/2019 N	LM-1 3/01/2017 N	LM-2 3/01/2017 N	LM-3 3/01/2017 N	LS-1 SS 1/19/2012 N	LS-2 SS 1/19/2012 N	LSB-1 4/03/2014 N	LSB-2 SS 4/03/2014 N	LSB-3 SS 4/03/2014 N
Parameter	CAS #	Units																				
Last Updated																						
Exceedance Key																						
General Parameters																						
Sulfate, as SO4	14808-79-8	ug/kg	180000	**8500000**	810000	1100000	**5500000**	68000	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals																						
Arsenic	7440-38-2	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	330	360	300
Barium	7440-39-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	51000	59000	30000	45000	28000
Cadmium	7440-43-9	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	310	320	630	< 200
Chromium	7440-47-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium, hexavalent	18540-29-9	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4900	3600	3400
Copper	7440-50-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4900	21000	6300	11000	8400
Lead	7439-92-1	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	12000	17000	6200	5300	11000
Manganese	7439-96-5	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mercury	7439-97-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	< 50	< 50	< 50
Selenium	7782-49-2	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	200	< 200	250
Silver	7440-22-4	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	< 100	< 100	< 100
Sodium	7440-23-5	ug/kg	**6500000**	**7300000**	**15000000**	2400000	2100000	120000	--	--	--	--	--	--	--	--	--	3900000	240000	--	--	--
Zinc	7440-66-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	42000	180000	46000	51000	74000
Semivolatile Organic Compounds																						
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	59-50-7	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	50-32-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	206-44-0	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Volatile Organic Compounds																						
1,2,4-Trimethylbenzene	95-63-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	71-43-2	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorinated Dioxins / Furans																						
Toxicity equivalence factor summation		ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00057	0.00016	0.00025	--	--	--	--	--

Large Table 3
Summary of Analytical Results for Soil Samples
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

Parameter	CAS #	Units	LSB-4 SS 4/03/2014 N	RR-1 2/28/2017 1.5 - 2.5 ft N	RR-2 2/28/2017 0.5 - 1.5 ft N	RR-3 3/01/2017 0.5 - 1.5 ft N	SB-22-01 6/13/2022 1 - 2 ft N	SB-22-01 6/13/2022 2 - 3 ft N	SB-22-02 6/13/2022 0 - 1 ft N	SB-22-02 6/13/2022 2 - 3 ft N	SB-22-03 6/13/2022 0 - 1 ft N	SB-22-04 6/13/2022 1 - 2 ft N	SB-22-04 6/13/2022 2 - 3 ft N	SB-22-05 6/13/2022 1 - 2 ft N	SB-22-05 6/13/2022 3 - 4 ft N	SB-22-06 6/13/2022 0 - 1 ft N	SB-22-06 6/13/2022 5 - 6 ft N	SB-22-07 6/14/2022 0 - 1 ft N	SB-22-07 6/14/2022 2 - 3 ft N	SB-22-08 6/14/2022 1.5 - 2.5 ft N	SB-22-08 6/14/2022 2.5 - 3.5 ft N	SB-22-08 6/14/2022 2.5 - 3.5 ft FD	SB-22-09 6/14/2022 0 - 1 ft N	SB-22-09 6/14/2022 2 - 3 ft N
Last Updated																									
Exceedance Key																									
General Parameters																									
Sulfate, as SO4	14808-79-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals																									
Arsenic	7440-38-2	ug/kg	1100	3000	4200	**24000**	**6790**	**7280**	3590	1420	2490	1260	1700	920	1380	700	600	4670	4730	4270	4030 J	**14000 J**	540	220
Barium	7440-39-3	ug/kg	41000	24000	17000	51000	87100	22100	54400	11200	31000	22700	6460	9610	9190	7240	16300	110000	129000	95900	11700 J	29500 J	6890	3470
Cadmium	7440-43-9	ug/kg	460	680	780	800	1280	210	470	< 200 U	430	220	500	< 200 U	< 200 U	280	< 200 U	3610	1300	310	< 200 U	< 200 U	< 200 U	< 200 U
Chromium	7440-47-3	ug/kg	--	5400	5300	4600	9800	7930	10500	20000	**40800**	10300	23900	3600	15000	3860	12000	16700	21000	18000	4200	6050	8640	< 500 U
Chromium, hexavalent	18540-29-9	ug/kg	< 600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	7440-50-8	ug/kg	4800	13000	19000	760000	15800	9700	17600	32200	50500	10200	87900	4730	19900	3150	2670	27300	25500	15600	5800 J	12500 J	2530	< 500 U
Lead	7439-92-1	ug/kg	6700	32000	47000	68000	22000	93300	34900	24900	47000	18900	17300	6020	8840	5380	22200	83000	88600	48900	7980	7820	3360	440
Manganese	7439-96-5	ug/kg	--	26000	110000	21000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mercury	7439-97-6	ug/kg	< 50	ND	ND	59	54	< 50 U	114	< 50 U	< 50 U	< 50 U	1195	< 50 U	< 50 U	< 50 U	< 50 U	148	130	104	102	191	< 50 U	< 50 U
Selenium	7782-49-2	ug/kg	590	1000	720	1400	510	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 J	< 400 U	< 400 U	< 400 U	990	< 400 U	< 400 U
Silver	7440-22-4	ug/kg	< 100	ND	ND	220	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 J	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U
Sodium	7440-23-5	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	ug/kg	43000	37000	120000	71000	66600	39600	149000	36300	99500	52300	30800	16900	19000	11300	21800	207000	246000	79100	23000	17300	12200	950
Semivolatile Organic Compounds																									
2-Methylnaphthalene	91-57-6	ug/kg	--	550	950	390	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	59-50-7	ug/kg	--	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	50-32-8	ug/kg	--	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	206-44-0	ug/kg	--	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	--	470	810	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	ug/kg	--	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Volatile Organic Compounds																									
1,2,4-Trimethylbenzene	95-63-6	ug/kg	--	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	91-57-6	ug/kg	--	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	71-43-2	ug/kg	--	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	--	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	--	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorinated Dioxins / Furans																									
Toxicity equivalence factor summation		ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Large Table 3
Summary of Analytical Results for Soil Samples
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			SB-22-10	SB-22-10	SB-22-11	SB-22-11	SB-22-12	SB-22-12	SB-22-13	SB-22-13	SB-22-14	SB-22-15	SB-22-15		SB-22-16	SB-22-16	SB-22-17	SB-22-17	SB-22-18		SB-22-18	SB-22-19	SB-22-19	SB-22-20
			6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022		6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022		6/14/2022	6/14/2022	6/14/2022	6/14/2022
			1 - 2 ft	3 - 4 ft	1 - 2 ft	3 - 4 ft	0 - 1 ft	2 - 3 ft	0 - 1 ft	4 - 5 ft	4 - 5 ft	0 - 1 ft	3 - 4 ft	3 - 4 ft	0 - 1 ft	3 - 4 ft	1.5 - 2.5 ft	3.5 - 4.5 ft	0.5 - 1.5 ft	0.5 - 1.5 ft	3.5 - 4.5 ft	1 - 2 ft	4 - 4.8 ft	3 - 4 ft
			N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	FD	N	N	N	N
Parameter	CAS #	Units																						
Last Updated																								
Exceedance Key																								
General Parameters																								
Sulfate, as SO4	14808-79-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals																								
Arsenic	7440-38-2	ug/kg	1180	2410	3630	**7320**	690	5280	650	2190	2820	2000	**24900 J**	**11700 J**	1550	790	710	1110	1010	870	530	800	510	440
Barium	7440-39-3	ug/kg	23200	28200	91600	127000	4010	69600	42500	34800	78300	37800	95200 J	54200 J	64200	12600	8280	44200	21900 J	35100 J	53400	7360	5910	5160
Cadmium	7440-43-9	ug/kg	< 200 U	< 200 U	220	470	< 200 U	200	230	< 200 U	260	< 200 U	< 200 U	< 200 U	540	< 200 U	< 200 U	250	250	400	< 200 U	< 200 U	< 200 U	< 200 U
Chromium	7440-47-3	ug/kg	14300	10700	20100	17800	680	12800	14400	9960	6630	7970	4270 J	9050 J	**75500**	3220	3090	**48500**	**64300 J**	**185000 J**	4660	3460	2570	1590
Chromium, hexavalent	18540-29-9	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	7440-50-8	ug/kg	7740	26700	21100	86400	1400	10500	4380	21100	16900	6800	20700	28400	5720	4210	3270	8560	6150	5800	4210	2940	4810	940
Lead	7439-92-1	ug/kg	11700	20100	20800	219000	690	15800	12200	36800	26900	20900	10100 J	16400 J	8030	8120	7040	15700	7430	5880	7480	3350	7510	1750
Manganese	7439-96-5	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mercury	7439-97-6	ug/kg	< 50 U	< 50 U	< 50 U	116	< 50 U	< 50 U	< 50 U	205	< 50 U	< 50 U	< 50 U	72	< 50 U	< 50 U	< 50 U	66	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
Selenium	7782-49-2	ug/kg	< 400 U	< 400 U	440	730	1020	2040	< 400 U	< 400 U	< 400 U	< 400 U	2590	2400	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U
Silver	7440-22-4	ug/kg	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U
Sodium	7440-23-5	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	ug/kg	36800	52400	54700	146000	2270	35400	58800	44000	259000	38600	26000 J	41700 J	40400	14700	14500	35900	26000	29200	19500	8180	15700	3920
Semivolatile Organic Compounds																								
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	59-50-7	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	50-32-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	206-44-0	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Volatile Organic Compounds																								
1,2,4-Trimethylbenzene	95-63-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	71-43-2	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorinated Dioxins / Furans																								
Toxicity equivalence factor summation		ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Large Table 3
Summary of Analytical Results for Soil Samples
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			SB-22-20	SB-22-21		SB-22-21	SB-22-22	SB-22-22	SB-22-23	SB-22-23		SB-22-24	SB-22-24	SB-22-25	SB-22-25	SB-22-26	SB-22-26	SB-22-27	SB-22-27	SB-22-28	SB-22-28	SB-22-29	SB-22-29	SB-22-30
			6/14/2022	6/14/2022		6/14/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022		6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/13/2022	6/13/2022	6/13/2022	6/13/2022	6/13/2022	6/13/2022	6/14/2022
			4.2 - 5 ft	0.5 - 1.5 ft	0.5 - 1.5 ft	4.2 - 5 ft	2 - 3 ft	4 - 5 ft	0 - 1 ft	3.5 - 4.5 ft	3.5 - 4.5 ft	0 - 1 ft	3 - 4 ft	0 - 1 ft	3.5 - 4.5 ft	0 - 1 ft	2.5 - 3.5 ft	1 - 2 ft	3 - 4 ft	0 - 1 ft	1 - 2 ft	1 - 2 ft	3 - 4 ft	0 - 1 ft
			N	N	FD	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	CAS #	Units																							
Last Updated																									
Exceedance Key																									
General Parameters																									
Sulfate, as SO4	14808-79-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals																									
Arsenic	7440-38-2	ug/kg	1020	2170 J	620 J	760	**7020**	1580	630	1700	770	1560	1570	2760	670	2790	630	**6160**	**53000**	3520	5450	480	330	850
Barium	7440-39-3	ug/kg	14900	34800 J	6610 J	12200	28400	145000	3920	14500	12200	21900	22200	46200	8770	49700	5870	367000	111000	102000	129000	3680	2660	19000
Cadmium	7440-43-9	ug/kg	< 200 U	350	< 200 U	< 200 U	< 200 U	1620	< 200 U	< 200 U	< 200 U	240	320	450	< 200 U	530	< 200 U	710	200	420	500	< 200 U	< 200 U	< 200 U
Chromium	7440-47-3	ug/kg	**92700**	**33500 J**	2580 J	3970	**44000**	**77900**	1470	6490	4380	8180	6990	11400	3630	10100	1240	23000	14500	17300	17100	2290	1120	**150000**
Chromium, hexavalent	18540-29-9	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	7440-50-8	ug/kg	4640	14100 J	3330 J	3420	10200	15300	1760	6540	5430	8340	6600	17400	4190	16000	3050	58900	25000	38200	30200	1190	710	6310
Lead	7439-92-1	ug/kg	10100	30200 J	5810 J	9790	19000	13800	2630	10400	9730	25300	21000	44800	1160	47400	2730	211000	59800	94100	70900	1940	1670	7080
Manganese	7439-96-5	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mercury	7439-97-6	ug/kg	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	72	< 50 U	< 50 U	72	92	< 50 U	76	< 50 U	95	54	126	94	< 50 U	< 50 U	< 50 U
Selenium	7782-49-2	ug/kg	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	< 400 U	480	3380	< 400 U	440	< 400 U	< 400 U	< 400 U
Silver	7440-22-4	ug/kg	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U
Sodium	7440-23-5	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	ug/kg	14600	62000 J	14900 J	17600	24500	80900	7170	31800 J	21000 J	47200	62600	161000	6750	166000	5840	447000	163000	160000	116000	4190	3270	25300
Semivolatile Organic Compounds																									
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	59-50-7	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	50-32-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	206-44-0	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Volatile Organic Compounds																									
1,2,4-Trimethylbenzene	95-63-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	71-43-2	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorinated Dioxins / Furans																									
Toxicity equivalence factor summation		ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Large Table 3
Summary of Analytical Results for Soil Samples
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			SB-22-30	SB-22-31	SB-22-31		SB-22-32	SB-22-32		SS-1	SS-1	SS-2	SS-2	SS-3	SS-3	SS-4	SS-4	SS-5	SS-5	SS-6	SS-6	SS-7	SS-7	SS-8
			6/14/2022	6/14/2022	6/14/2022		6/14/2022	6/14/2022		2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017	2/28/2017
			1 - 2 ft	1 - 2 ft	4 - 5 ft	4 - 5 ft	0 - 1 ft	3.5 - 4.5 ft	3.5 - 4.5 ft	0 - 1 ft	3 - 4 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1.5 - 2.5 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft
			N	N	N	FD	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	CAS #	Units																						
Last Updated																								
Exceedance Key																								
General Parameters																								
Sulfate, as SO4	14808-79-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals																								
Arsenic	7440-38-2	ug/kg	3150	2530	**7090 J**	**12200 J**	1000	1230	1040	--	3300	--	2500	--	**11000**	--	**9000**	--	2400	--	1100	--	550	--
Barium	7440-39-3	ug/kg	37200	38500	66300 J+	142000 J	13800	32600	24700	--	20000	--	38000	--	24000	--	14000	--	19000	--	14000	--	3900	--
Cadmium	7440-43-9	ug/kg	630	520	400	770	< 200 U	340	< 200 U	--	470	--	580	--	680	--	ND	--	420	--	570	--	ND	--
Chromium	7440-47-3	ug/kg	20300	9900	**88900 J+**	**74900**	5410	6760	6900	--	6000	--	**70000**	--	19000	--	6500	--	3400	--	4700	--	ND	--
Chromium, hexavalent	18540-29-9	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	7440-50-8	ug/kg	11500	16000	31600 J	45000	5120	7820	6550	--	10000	--	10000	--	10000	--	5100	--	22000	--	6300	--	ND	--
Lead	7439-92-1	ug/kg	12600	32400	30600 J	148000 J	10000	5410	4560	--	12000	--	14000	--	20000	--	38000	--	14000	--	5500	--	ND	--
Manganese	7439-96-5	ug/kg	--	--	--	--	--	--	--	--	98000	--	170000	--	40000	--	2000	--	67000	--	49000	--	16000	--
Mercury	7439-97-6	ug/kg	< 50 U	< 50 U	74	108	< 50 U	< 50 U	< 50 U	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
Selenium	7782-49-2	ug/kg	< 400 U	< 400 U	840	1830	< 400 U	< 400 U	< 400 U	--	1000	--	1000	--	1500	--	2200	--	760	--	440	--	230	--
Silver	7440-22-4	ug/kg	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
Sodium	7440-23-5	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	ug/kg	104000	125000	52100 J+	84200 J	29800	27200 J	14100 J	--	23000	--	39000	--	30000	--	9800	--	31000	--	30000	--	2000	--
Semivolatile Organic Compounds																								
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--	--	ND	--	ND	--	ND	--	410	--	ND	--	ND	--	ND	--
4-Chloro-3-methylphenol	59-50-7	ug/kg	--	--	--	--	--	--	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
Benzo(a)pyrene	50-32-8	ug/kg	--	--	--	--	--	--	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
Fluoranthene	206-44-0	ug/kg	--	--	--	--	--	--	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
Phenanthrene	85-01-8	ug/kg	--	--	--	--	--	--	--	--	ND	--	ND	--	330	--	610	--	ND	--	ND	--	ND	--
Volatile Organic Compounds																								
1,2,4-Trimethylbenzene	95-63-6	ug/kg	--	--	--	--	--	--	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
Benzene	71-43-2	ug/kg	--	--	--	--	--	--	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
Butylbenzene	104-51-8	ug/kg	--	--	--	--	--	--	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
Chlorinated Dioxins / Furans																								
Toxicity equivalence factor summation		ug/kg	--	--	--	--	--	--	--	0.00021	--	0.00097	--	0.00198	--	0.00016	--	0.00019	--	0.04493	--	0.00031	--	0.00169

Large Table 3
Summary of Analytical Results for Soil Samples
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

Parameter	CAS #	Units	SS-8 2/28/2017 1 - 2 ft N	SS-9 3/01/2017 N	SS-9 3/01/2017 0 - 1 ft N	SS-10 3/01/2017 0 - 1 ft N	SS-10 3/01/2017 1 - 2 ft N	SS-11 3/01/2017 0 - 1 ft N	SS-11 3/01/2017 1 - 2 ft N	SS-12 3/01/2017 0 - 1 ft N	SS-12 3/01/2017 1 - 2 ft N	SS-13 3/01/2017 0 - 1 ft N	SS-13 3/01/2017 1 - 2 ft N	SS-14 3/01/2017 0 - 1 ft N	SS-14 3/01/2017 1 - 2 ft N	SS-15 3/01/2017 0 - 1 ft N	SS-15 3/01/2017 1 - 2 ft N	SS-16 3/01/2017 0 - 1 ft N	SS-16 3/01/2017 1 - 2 ft N	SS-17 3/01/2017 0 - 1 ft N	SS-17 3/01/2017 1 - 2 ft N	SS-18 3/01/2017 0 - 1 ft N	SS-18 3/01/2017 1 - 2 ft N	SS-19 3/01/2017 0 - 1 ft N
Last Updated																								
Exceedance Key																								
General Parameters																								
Sulfate, as SO4	14808-79-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals																								
Arsenic	7440-38-2	ug/kg	1100	1100	--	--	2400	--	3000	--	1700	--	1700	--	**8900**	--	4300	--	1500	--	**52000**	--	2800	--
Barium	7440-39-3	ug/kg	8300	13000	--	--	73000	--	14000	--	680	--	15000	--	81000	--	21000	--	10000	--	75000	--	16000	--
Cadmium	7440-43-9	ug/kg	210	230	--	--	310	--	280	--	ND	--	480	--	2400	--	540	--	250	--	2100	--	420	--
Chromium	7440-47-3	ug/kg	2600	**39000**	--	--	3900	--	6000	--	2100	--	3700	--	**51000**	--	17000	--	6100	--	**45000**	--	4900	--
Chromium, hexavalent	18540-29-9	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	7440-50-8	ug/kg	2100	3100	--	--	4400	--	4000	--	1600	--	7200	--	120000	--	18000	--	5200	--	26000	--	8400	--
Lead	7439-92-1	ug/kg	3600	5500	--	--	5300	--	6400	--	2400	--	10000	--	88000	--	22000	--	6700	--	46000	--	15000	--
Manganese	7439-96-5	ug/kg	40000	53000	--	--	40000	--	30000	--	14000	--	100000	--	210000	--	71000	--	38000	--	180000	--	92000	--
Mercury	7439-97-6	ug/kg	ND	ND	--	--	ND	--	ND	--	ND	--	ND	--	1100	--	ND	--	ND	--	84	--	ND	--
Selenium	7782-49-2	ug/kg	310	530	--	--	1100	--	660	--	460	--	560	--	2300	--	880	--	560	--	3800	--	ND	--
Silver	7440-22-4	ug/kg	ND	ND	--	--	ND	--	ND	--	ND	--	ND	--	610	--	ND	--	ND	--	ND	--	ND	--
Sodium	7440-23-5	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	ug/kg	12000	13000	--	--	12000	--	27000	--	7200	--	42000	--	250000	--	47000	--	13000	--	59000	--	30000	--
Semivolatile Organic Compounds																								
2-Methylnaphthalene	91-57-6	ug/kg	ND	ND	--	--	2100	--	890	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
4-Chloro-3-methylphenol	59-50-7	ug/kg	ND	ND	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
Benzo(a)pyrene	50-32-8	ug/kg	ND	ND	--	--	ND	--	ND	--	ND	--	930	--	ND	--	ND	--	ND	--	ND	--	ND	--
Fluoranthene	206-44-0	ug/kg	ND	ND	--	--	ND	--	ND	--	ND	--	2700	--	ND	--	ND	--	ND	--	ND	--	ND	--
Naphthalene	91-20-3	ug/kg	ND	ND	--	--	1400	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
Phenanthrene	85-01-8	ug/kg	ND	ND	--	--	410	--	430	--	ND	--	1600	--	ND	--	ND	--	ND	--	ND	--	ND	--
Volatile Organic Compounds																								
1,2,4-Trimethylbenzene	95-63-6	ug/kg	ND	ND	--	--	220	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	170	--
2-Methylnaphthalene	91-57-6	ug/kg	ND	ND	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
Benzene	71-43-2	ug/kg	ND	ND	--	--	**290**	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
Butylbenzene	104-51-8	ug/kg	ND	ND	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
Naphthalene	91-20-3	ug/kg	ND	ND	--	--	ND	--	560	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
Chlorinated Dioxins / Furans																								
Toxicity equivalence factor summation		ug/kg	--	--	0.0007	0.00115	--	0.00329	--	0.00033	--	0.00705	--	0.2014	--	0.01163	--	0.00895	--	0.1051	--	0.00382	--	0.00459

Large Table 3
Summary of Analytical Results for Soil Samples
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

Parameter	CAS #	Units	SS-19 3/01/2017 1 - 2 ft N	SS-20 3/01/2017 0 - 1 ft N	SS-20 3/01/2017 1 - 2 ft N	SSB-2/UT-2 11/18/2011 1.5 - 2.5 ft N	T-8 7/26/2017 N	TB-3 7/25/2017 5 ft N	TB-4 7/24/2017 5 ft N	TB-5 7/25/2017 5 ft N	TB-6 7/25/2017 2 ft N	TB-9 7/26/2017 5 ft N	TB-10 7/26/2017 7 ft N	TB-13 7/27/2017 5 ft N	TB-15 7/28/2017 5 ft N	TB-18 7/28/2017 5 ft N	TP-1 1/09/2017 2 - 4 ft N	TP-1 1/09/2017 6 ft N	TP-1 1/09/2017 9 - 9.5 ft N	TP-2 1/09/2017 2 ft N	TP-2 1/09/2017 12 ft N	TP-3 1/09/2017 6 ft N	TP-4 1/09/2017 2 ft N	TP-4 1/09/2017 6 ft N
Last Updated																								
Exceedance Key																								
General Parameters																								
Sulfate, as SO4	14808-79-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals																								
Arsenic	7440-38-2	ug/kg	2300	--	4400	3200	1300	560	3100	1200	4300	4500	1900	1900	4900	2500	--	3400	**11000**	1200	960	840	1100	600
Barium	7440-39-3	ug/kg	56000	--	23000	40000	9500	8600	33000	25000	12000	11000	12000	17000	55000	28000	--	17000	15000	7700	12000	6600	18000	120000
Cadmium	7440-43-9	ug/kg	880	--	430	1000	200	320	960	290	480	250	340	560	560	690	--	870	1900	200	260	ND	300	ND
Chromium	7440-47-3	ug/kg	**120000**	--	4000	--	3300	9900	16000	2500	9500	2900	5100	7400	12000	6000	--	19000	**37000**	4100	**35000**	2600	**150000**	2600
Chromium, hexavalent	18540-29-9	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	7440-50-8	ug/kg	13000	--	170000	40000	30000	4200	78000	5800	76000	5200	4700	8500	29000	19000	--	160000	610000	3000	6800	3600	4700	2400
Lead	7439-92-1	ug/kg	17000	--	60000	55000	11000	11000	32000	13000	6500	800	8700	5900	55000	160000	--	300000	**1400000**	7500	18000	6500	9100	7000
Manganese	7439-96-5	ug/kg	230000	--	58000	--	36000	76000	140000	110000	62000	36000	51000	77000	91000	99000	--	60000	110000	61000	58000	32000	130000	25000
Mercury	7439-97-6	ug/kg	85	--	280	120	390	ND	520	ND	ND	68	61	ND	71	440	--	ND	ND	ND	340	ND	ND	ND
Selenium	7782-49-2	ug/kg	980	--	530	450	ND	ND	ND	230	ND	ND	ND	ND	490	240	--	550	200	300	220	ND	960	ND
Silver	7440-22-4	ug/kg	ND	--	ND	120	ND	ND	ND	ND	580	ND	ND	ND	ND	ND	--	ND	290	ND	ND	ND	ND	ND
Sodium	7440-23-5	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	ug/kg	61000	--	55000	100000	12000	21000	89000	57000	15000	13000	22000	27000	69000	87000	--	120000	250000	8700	23000	10000	23000	9500
Semivolatile Organic Compounds																								
2-Methylnaphthalene	91-57-6	ug/kg	ND	--	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol	59-50-7	ug/kg	ND	--	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	50-32-8	ug/kg	ND	--	ND	ND	ND	ND	460	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	870
Fluoranthene	206-44-0	ug/kg	ND	--	ND	ND	ND	ND	1400	ND	ND	ND	ND	ND	740	ND	--	ND	ND	ND	ND	ND	ND	2800
Naphthalene	91-20-3	ug/kg	ND	--	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	ug/kg	ND	--	ND	ND	ND	ND	1100	ND	ND	ND	ND	ND	730	ND	--	ND	ND	ND	ND	ND	ND	2800
Volatile Organic Compounds																								
1,2,4-Trimethylbenzene	95-63-6	ug/kg	ND	--	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	91-57-6	ug/kg	ND	--	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	600
Benzene	71-43-2	ug/kg	ND	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	ND	--	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	91-20-3	ug/kg	ND	--	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3600
Chlorinated Dioxins / Furans																								
Toxicity equivalence factor summation		ug/kg	--	0.0209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Large Table 3
Summary of Analytical Results for Soil Samples
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

Parameter	CAS #	Units	TP-5 1/09/2017 8 ft N	TP-6 1/09/2017 2 ft N	TP-6 1/09/2017 12 ft N	TP-7 1/09/2017 2 ft N	TP-7 1/09/2017 6.5 ft N	TP-8 1/09/2017 2 ft N	TP-8 1/09/2017 4 ft N	TP-8 1/09/2017 12 ft N	TP-9 1/09/2017 4 ft N	TP-10 1/10/2017 3.5 ft N	TP-11 1/10/2017 2.5 ft N	TP-11 1/10/2017 8 ft N	TP-12 1/10/2017 3.5 ft N	TP-12 1/10/2017 7 ft N	TP-13 1/10/2017 2.5 ft N	TP-13 1/10/2017 8 ft N	TP-14 1/10/2017 10 ft N	TP-15 1/10/2017 2.5 ft N	TP-16 1/10/2017 1 ft N	TP-16 1/23/2017 8 ft N	TP-17 1/11/2017 2.5 ft N	TP-17 1/11/2017 7 ft N
Last Updated																								
Exceedance Key																								
General Parameters																								
Sulfate, as SO4	14808-79-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals																								
Arsenic	7440-38-2	ug/kg	830	710	810	1400	1600	**6700**	5500	870	980	620	870	790	950	3200	1400	1000	2200	2200	880	**53000**	**100000**	1400
Barium	7440-39-3	ug/kg	22000	17000	9600	28000	26000	13000	88000	15000	29000	6300	16000	16000	4300	65000	30000	4300	850000	20000	21000	35000	65000	6500
Cadmium	7440-43-9	ug/kg	310	270	ND	400	1300	1100	1200	270	460	ND	330	ND	--	720	280	ND	810	1200	230	1900	2300	ND
Chromium	7440-47-3	ug/kg	18000	**160000**	15000	**43000**	11000	3900	8000	4100	**160000**	ND	**190000**	4900	ND	**71000**	**89000**	**60000**	**48000**	14000	7900	11000	18000	ND
Chromium, hexavalent	18540-29-9	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	7440-50-8	ug/kg	4700	4600	4300	12000	42000	6000	25000	6900	6000	1500	3900	7300	2000	14000	6100	2300	20000	73000	3300	23000	28000	ND
Lead	7439-92-1	ug/kg	6000	4500	7800	16000	30000	2800	24000	9600	9000	2100	4300	4600	2000	5400	6000	1500	50000	11000	11000	44000	120000	ND
Manganese	7439-96-5	ug/kg	73000	130000	35000	110000	120000	14000	210000	46000	200000	20000	160000	140000	61000	160000	180000	190000	**900000**	140000	47000	79000	100000	45000
Mercury	7439-97-6	ug/kg	ND	ND	--	ND	77	ND	91	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	800	220	ND
Selenium	7782-49-2	ug/kg	ND	720	--	840	440	370	570	ND	1000	250	1100	450	950	1600	1100	1800	2100	450	370	**8600**	**9300**	210
Silver	7440-22-4	ug/kg	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	160	200	240	ND	ND	ND	160	ND
Sodium	7440-23-5	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	ug/kg	22000	18000	10000	36000	1600000	8400	90000	20000	34000	5300	27000	12000	6400	41000	22000	12000	180000	190000	14000	74000	89000	2900
Semivolatile Organic Compounds																								
2-Methylnaphthalene	91-57-6	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol	59-50-7	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	50-32-8	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	206-44-0	ug/kg	ND	ND	860	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	ug/kg	ND	ND	510	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds																								
1,2,4-Trimethylbenzene	95-63-6	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	140	ND	ND	ND
2-Methylnaphthalene	91-57-6	ug/kg	1000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1500	ND	ND	ND	ND
Benzene	71-43-2	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	91-20-3	ug/kg	1400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	360	ND	ND	ND	ND
Chlorinated Dioxins / Furans																								
Toxicity equivalence factor summation		ug/kg	0.00144	--	--	--	0.0156	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0245	--	--

Large Table 3
Summary of Analytical Results for Soil Samples
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

Parameter	CAS #	Units	TP-18 1/11/2017 5 ft N	TP-18 1/11/2017 7 ft N	TP-18 1/11/2017 9.5 ft N	TP-18 1/11/2017 11 ft N	TP-19 1/11/2017 2 ft N	TP-19 1/11/2017 5.5 ft N	TP-19 1/11/2017 12 ft N	TP-20 1/11/2017 2.5 ft N	TP-20 1/11/2017 9 ft N	TP-20 1/11/2017 15 ft N	TP-21 1/11/2017 2.5 ft N	TP-21 1/11/2017 13 ft N	TP-22 1/11/2017 2 ft N	TP-22 1/11/2017 6.5 ft N	TP-23 1/11/2017 3 ft N	TP-23 1/11/2017 5.5 ft N	TP-24 1/11/2017 2 ft N	TP-24 1/11/2017 15 ft N	TP-25 1/12/2017 2 ft N	TP-25 1/12/2017 13 ft N	TP-26 1/12/2017 2 ft N	TP-26 1/12/2017 16 ft N
Last Updated																								
Exceedance Key																								
General Parameters																								
Sulfate, as SO4	14808-79-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals																								
Arsenic	7440-38-2	ug/kg	1100	1100	1100	790	2900	**13000**	5200	1500	1700	3300	2400	4700	**7800**	--	**33000**	4300	4000	**100000**	4.6	3.4	5.6	1.1
Barium	7440-39-3	ug/kg	7800	5900	57000	20000	50000	26000	51000	300000	46000	230000	36000	30000	150000	--	53000	73000	61000	44000	70	42	53	8
Cadmium	7440-43-9	ug/kg	ND	330	980	350	520	630	1200	**8400**	620	4500	--	690	**6800**	--	1900	1800	930	1800	1.8	0.85	--	0.24
Chromium	7440-47-3	ug/kg	8200	6900	**82000**	**44000**	15000	6100	**310000**	28000	8400	22000	6200	**100000**	**110000**	--	**38000**	**160000**	**43000**	14000	250	160	260	4.8
Chromium, hexavalent	18540-29-9	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	7440-50-8	ug/kg	3600	6200	25000	8600	6200	7400	48000	62000	13000	54000	12000	8600	480000	--	33000	50000	20000	21000	60	33	68	4.5
Lead	7439-92-1	ug/kg	6200	2400	10000	8000	20000	28000	14000	31000	21000	12000	17000	17000	**750000**	--	39000	17000	20000	46000	26	25	22	3.1
Manganese	7439-96-5	ug/kg	29000	44000	290000	100000	120000	120000	230000	**1700000**	130000	**2000000**	--	180000	440000	--	140000	**500000**	200000	71000	480	160	300	67
Mercury	7439-97-6	ug/kg	ND	ND	ND	77	ND	59	200	ND	ND	ND	ND	ND	1000	--	ND	81	ND	ND	0.092	0.14	0.13	ND
Selenium	7782-49-2	ug/kg	ND	ND	ND	ND	ND	630	ND	ND	280	1900	--	1500	1600	--	2500	1100	1300	**4300**	0.91	0.9	--	0.59
Silver	7440-22-4	ug/kg	ND	ND	ND	ND	ND	ND	140	390	ND	320	ND	ND	1700	--	ND	210	ND	ND	0.17	0.11	0.2	ND
Sodium	7440-23-5	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	ug/kg	9800	9500	78000	46000	27000	29000	190000	500000	45000	350000	36000	31000	760000	--	82000	240000	120000	60000	240	110	210	9.9
Semivolatile Organic Compounds																								
2-Methylnaphthalene	91-57-6	ug/kg	ND	6900	2300	ND	ND	ND	ND	ND	940	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol	59-50-7	ug/kg	ND	ND	ND	ND	ND	ND	290	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	50-32-8	ug/kg	ND	350	350	ND	ND	ND	ND	ND	ND	ND	ND	ND	6100	--	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	206-44-0	ug/kg	ND	ND	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	10000	--	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	ug/kg	ND	4300	2100	ND	ND	ND	ND	ND	990	ND	ND	ND	27000	--	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds																								
1,2,4-Trimethylbenzene	95-63-6	ug/kg	ND	ND	ND	ND	ND	ND	690	ND	850	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	91-57-6	ug/kg	ND	ND	1200	ND	ND	ND	2100	ND	4600	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	580	ND	ND
Benzene	71-43-2	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	160	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	91-20-3	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	830	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND
Chlorinated Dioxins / Furans																								
Toxicity equivalence factor summation		ug/kg	0.00963	--	0.00626	--	--	--	0.1387	--	--	0.00099	--	0.00433	--	82.722	--	0.0886	--	--	--	--	--	--

Large Table 3
Summary of Analytical Results for Soil Samples
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

Parameter	CAS #	Units	TP-27 1/12/2017 11 ft N	TP-28 1/12/2017 2 ft N	TP-28 1/12/2017 7 ft N	TP-29 1/12/2017 2 ft N	TP-29 1/12/2017 10 ft N	TP-30 1/12/2017 2 ft N	TP-30 1/12/2017 8 ft N	TP-31 1/12/2017 10 ft N	TP-31 Sidewall 1/12/2017 N	TP-32 1/12/2017 2.5 ft N	TP-32 1/12/2017 9 ft N	TP-32 1/12/2017 15 ft N	TP-33 1/12/2017 2 ft N	TP-33 1/12/2017 11 ft N	TP-34 1/12/2017 3 ft N	TP-34 1/12/2017 9 ft N	TWVP-19-E-SS 4/10/2019 0.5 ft N	TWVP-19-W-SS 4/10/2019 0.5 ft N	TWVP-20-E-SS 4/10/2019 0.5 ft N
Last Updated																					
Exceedance Key																					
General Parameters																					
Sulfate, as SO4	14808-79-8	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals																					
Arsenic	7440-38-2	ug/kg	5.3	2.9	21	4.4	0.92	5.9	77	2.5	10	48	26	0.82	38	7.6	1.8	26	4700	3700 J	**7400**
Barium	7440-39-3	ug/kg	41	28	37	31	1.6	37	38	14	39	47	35	2.4	80	23	4	27	86000	120000 J	61000
Cadmium	7440-43-9	ug/kg	2.2	0.56	1.2	0.8	ND	1.5	2.2	--	0.84	1.2	1.1	ND	1.5	0.61	0.43	1.9	1000	950	1800
Chromium	7440-47-3	ug/kg	420	16	13	13	ND	9.6	25	11	17	16	14	ND	11	5.4	14	12	20000	**54000 J**	27000
Chromium, hexavalent	18540-29-9	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	7440-50-8	ug/kg	57	15	16	16	ND	11	21	3.2	15	28	15	ND	17	5.7	31	23	22000	23000	33000
Lead	7439-92-1	ug/kg	25	21	34	26	ND	21	56	3.5	24	42	30	ND	35	16	7.6	27	35000	25000	54000
Manganese	7439-96-5	ug/kg	300	76	86	95	7.8	170	64	67	150	130	87	10	430	52	57	31	--	--	--
Mercury	7439-97-6	ug/kg	0.14	0.053	0.062	0.076	ND	0.052	ND	ND	0.075	0.17	0.11	ND	ND	ND	ND	ND	56	67	80
Selenium	7782-49-2	ug/kg	0.89	0.89	1.6	1.1	0.31	0.86	4.5	--	1.2	1.9	2.1	0.44	2.9	1	0.36	1.7	1200	1300 J	1200
Silver	7440-22-4	ug/kg	0.23	ND	ND	ND	ND	ND	0.12	ND	ND	0.11	ND	ND	ND	ND	ND	ND	< 110.0 U	< 100.0 U	< 100.0 U
Sodium	7440-23-5	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	ug/kg	290	43	91	72	1.5	62	62	15	51	62	79	1.9	66	20	8.8	370	110000	110000	180000
Semivolatile Organic Compounds																					
2-Methylnaphthalene	91-57-6	ug/kg	750	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 590.0 U	< 330.0 U	< 1100.0 U
4-Chloro-3-methylphenol	59-50-7	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 590.0 U	< 290.0 U	< 1100.0 U
Benzo(a)pyrene	50-32-8	ug/kg	ND	ND	ND	ND	ND	870	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	420	< 330.0 U	920
Fluoranthene	206-44-0	ug/kg	ND	340	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1000	< 330.0 U	1000
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 590.0 U	< 330.0 U	< 1100.0 U
Phenanthrene	85-01-8	ug/kg	ND	ND	ND	ND	ND	440	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	590	< 330.0 U	< 420.0 U
Volatile Organic Compounds																					
1,2,4-Trimethylbenzene	95-63-6	ug/kg	**3700**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
2-Methylnaphthalene	91-57-6	ug/kg	10000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
Benzene	71-43-2	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	**2400**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
Naphthalene	91-20-3	ug/kg	2800	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
Chlorinated Dioxins / Furans																					
Toxicity equivalence factor summation		ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Large Table 3
Summary of Analytical Results for Soil Samples
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			TWVP-20-W-SS 4/10/2019 0.5 ft N	TWVP-21-E-SS 4/10/2019 0.5 ft N	TWVP-21-W-SS 4/10/2019 0.5 ft N	TWVP-22-E-SS 4/10/2019 0.5 ft N	TWVP-22-W-SS 4/10/2019 0.5 ft N	TWVP-23-E-SS 4/10/2019 0.5 ft N	TWVP-23-W-SS 4/10/2019 0.5 ft N
Parameter	CAS #	Units							
Last Updated									
Exceedance Key									
General Parameters									
Sulfate, as SO4	14808-79-8	ug/kg	--	--	--	--	--	--	--
Metals									
Arsenic	7440-38-2	ug/kg	3800	4200	3900	1000	1000	**7600**	1000
Barium	7440-39-3	ug/kg	56000	62000	79000	8900	6900	54000	10000
Cadmium	7440-43-9	ug/kg	1200	1000	830	230	210	1100	250
Chromium	7440-47-3	ug/kg	25000	15000	**120000**	8700	6600	26000	6700
Chromium, hexavalent	18540-29-9	ug/kg	--	--	--	--	--	--	--
Copper	7440-50-8	ug/kg	25000	17000	39000	4500	2600	26000	6000
Lead	7439-92-1	ug/kg	26000	58000	44000	6600	6900	60000	6600
Manganese	7439-96-5	ug/kg	--	--	--	--	--	--	--
Mercury	7439-97-6	ug/kg	55	120	130	< 50.0 U	< 50.0 U	110	< 50.0 U
Selenium	7782-49-2	ug/kg	970	700	600	340	290	1000	240
Silver	7440-22-4	ug/kg	< 100.0 U	< 100.0 U	< 100.0 U	< 100.0 U	< 100.0 U	< 100.0 U	< 100.0 U
Sodium	7440-23-5	ug/kg	--	--	--	--	--	--	--
Zinc	7440-66-6	ug/kg	210000	100000	110000	24000	12000	130000	51000
Semivolatile Organic Compounds									
2-Methylnaphthalene	91-57-6	ug/kg	< 1100.0 U	< 450.0 U	< 450.0 U	< 330.0 U	< 430.0 U	< 540.0 U	< 330.0 U
4-Chloro-3-methylphenol	59-50-7	ug/kg	< 1100.0 U	< 450.0 U	< 450.0 U	< 280.0 U	< 430.0 U	< 540.0 U	< 280.0 U
Benzo(a)pyrene	50-32-8	ug/kg	1500	500	370	< 330.0 U	< 330.0 U	1000	< 330.0 U
Fluoranthene	206-44-0	ug/kg	1800	930	900	400	< 330.0 U	2000	< 330.0 U
Naphthalene	91-20-3	ug/kg	< 1100.0 U	< 450.0 U	< 450.0 U	< 330.0 U	< 430.0 U	< 540.0 U	< 330.0 U
Phenanthrene	85-01-8	ug/kg	< 450.0 U	480	520	< 330.0 U	< 330.0 U	720	< 330.0 U
Volatile Organic Compounds									
1,2,4-Trimethylbenzene	95-63-6	ug/kg	--	--	--	--	--	--	--
2-Methylnaphthalene	91-57-6	ug/kg	--	--	--	--	--	--	--
Benzene	71-43-2	ug/kg	--	--	--	--	--	--	--
Butylbenzene	104-51-8	ug/kg	--	--	--	--	--	--	--
Naphthalene	91-20-3	ug/kg	--	--	--	--	--	--	--
Chlorinated Dioxins / Furans									
Toxicity equivalence factor summation		ug/kg	--	--	--	--	--	--	--

Large Table 4
Summary of Analytical Results for Groundwater
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

Legend

Cleanup criteria shown are from EGLE RRD rules effective December 30, 2013; R 299.44 Generic groundwater cleanup criteria (Table 1). The criteria related to the GSI and PFAS have been updated as recently as October 12, 2023 consistent with

Data were compared to but did not exceed the following criteria:
- Water Solubility

Footnotes

N Sample Type: Normal
FD Sample Type: Field Duplicate
ND Not detected
J Estimated detected value. Either certain QC criteria were not met or the concentration is between the laboratory's detection and quantitation limits.
J+ The result is an estimated quantity and may be biased high.
U The analyte was analyzed for, but was not detected.

Where applicable a hardness value of 200 mg CaCO3/L was used.
Where applicable the X footnote was applied for a protected water source.

							Location	MW-01I	MW-01I	MW-01I	MW-01I	MW-01I	MW-01S	MW-01S	MW-01S	MW-01S
							Date	5/02/2019	9/13/2019	12/09/2019	3/17/2020	4/21/2022	5/02/2019	9/13/2019	12/09/2019	3/17/2020
							Sample Type	N	N	N	N	N	N	N	N	N
Parameter	CAS #	Units	MDEQ Water Target Detection Limits	Residential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Flammability and Explosivity Screening Level										
Last Updated			03/01/2016	12/21/2020	10/12/2023	12/21/2020										
Exceedance Key				**Bold**	Underline	Shade										
General Parameters																
Chloride	16887-00-6	ug/l	10000	**250000 E**	125000 FF	ID		190000	190000	190000	--	--	11000	19000	20000	--
Methane	74-82-8	ug/l	500	ID	NA	28000 AA		--	--	--	44000	--	--	--	--	350000
Nitrogen, ammonia, as N	7664-41-7	ug/l	25	**10000 N**	CC	ID		5900	5000	5200	--	--	**18000**	**13000**	**11000**	--
Solids, total dissolved		ug/l	10000	**500000 E**	500000 EE	NA		320000	**670000**	**820000**	--	--	**740000**	**920000**	**1200000**	--
Sulfate, as S04	14808-79-8	ug/l	1000	**250000 E**	NA	ID		10000	< 3000 U	< 3000 U	< 3000 U	--	1700	< 3000 U	18000	< 3000 UJ
Field Parameters																
pH		pH units		**6.5 - 8.5 E**	6.5 - 9.0	NA		--	--	--	--	7.16	--	--	--	--
Total Metals																
Arsenic	7440-38-2	ug/l	5	**10 A**	10	ID		< 5.0 U	**11**	**12**	--	**15**	< 5.0 U	< 5.0 U	< 5.0 U	--
Chromium	7440-47-3	ug/l	10	**100 A(1)**	11 (1)	ID		< 10.0 U	--	< 10.0 U	--	< 5 U	< 10.0 U	--	< 10.0 U	--
Chromium, trivalent	16065-83-1	ug/l	10	**100 A,H**	120 B,G,H,X	ID		< 10.0 U	--	--	--	--	< 10.0 U	--	--	--
Copper	7440-50-8	ug/l	4	1000 E	16 G	ID		< 4.0 U	--	< 4.0 U	--	< 5 U	< 4.0 U	--	< 4.0 U	--
Iron	7439-89-6	ug/l	200	**300 E**	NA	ID		270	**3900**	**4500**	--	--	**9200**	**16000**	**30000**	--
Lead	7439-92-1	ug/l	3	**4.0 L**	14 G,X	ID		< 3.0 U	--	< 3.0 U	--	< 3 U	< 3.0 UJ	--	< 3.0 U	--
Magnesium	7439-95-4	ug/l	1000	**400000**	NA	ID		30000	29000	34000	--	--	27000	15000	19000	--
Manganese	7439-96-5	ug/l	50	**50 E**	1300 G,X	ID		**380**	**87**	**51**	--	--	**2900**	**1800**	**2900**	--
Mercury	7439-97-6	ug/l	0.001	2.0 A,Z	0.200 Z	ID		< 0.20 U	--	< 0.20 U	--	< 0.2 U	< 0.20 U	--	< 0.20 U	--
Selenium	7782-49-2	ug/l	5	50 A	5.0	ID		< 5.0 U	--	< 5.0 U	--	< 5 U	< 5.0 U	--	< 5.0 U	--
Sodium	7440-23-5	ug/l	1000	**230000 HH**	NA	ID		--	--	96000	--	--	--	--	25000	--
Vanadium	7440-62-2	ug/l	4	**4.5**	27	ID		< 4.0 U	--	--	--	--	< 4.0 U	--	--	--
Per- and Polyfluoroalkyl Substances																
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ug/l		**0.051 A**	0.059 X	NA		< 0.00200 U	--	< 0.00863 U	--	< 0.0021 U	< 0.00200 U	--	< 0.00933 U	--
Perfluorononanoic acid (PFNA)	375-95-1	ug/l		**0.006 A**	0.019 X	NA		< 0.01000 U	--	< 0.00863 U	--	< 0.0021 U	< 0.01000 U	--	< 0.00933 U	--
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ug/l		**0.016 A,DD**	0.011 X	NA		< 0.00200 U	--	< 0.00863 U	--	< 0.0021 U	< 0.00200 U	--	< 0.00933 U	--
Perfluorooctanoic acid (PFOA)	335-67-1	ug/l		**0.008 A,DD**	0.066 X	NA		< 0.00200 U	--	< 0.00863 U	--	< 0.0021 U	< 0.00200 U	--	< 0.00933 U	--

Large Table 4
Summary of Analytical Results for Groundwater
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			MW-01S	MW-02I	MW-02I	MW-02I	MW-02I	MW-02I	MW-02S	MW-02S	MW-02S	MW-02S	MW-02S	MW-03D	MW-03D	MW-03D	MW-03D	MW-03I	MW-03I	MW-03I	MW
			4/21/2022	5/02/2019	9/13/2019	12/10/2019	3/17/2020	4/21/2022	5/02/2019	9/13/2019	12/10/2019	3/17/2020	4/21/2022	5/03/2019	3/16/2020	7/29/2020	4/22/2022	5/02/2019	3/16/2020	7/29/2020	4/22/
			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	CAS #	Units																			
Last Updated																					
Exceedance Key																					
General Parameters																					
Chloride	16887-00-6	ug/l	--	140000	120000	190000	--	--	18000	25000	18000	--	--	150000	130000	--	--	130000	100000	--	--
Methane	74-82-8	ug/l	--	--	--	--	100000	--	--	--	--	360000	--	--	240000	10000	--	--	100	53	--
Nitrogen, ammonia, as N	7664-41-7	ug/l	--	5500	4100	3400	--	--	**11000**	10000	8800	--	--	3300	3000	--	--	3500	990	--	--
Solids, total dissolved		ug/l	--	420000	**870000**	**690000 J**	--	--	**650000**	**1200000**	**1200000**	--	--	330000	**640000**	**640000**	--	340000	**680000**	500000	--
Sulfate, as SO4	14808-79-8	ug/l	47000	40000	45000	47000	< 3000 U	--	120000	< 3000 U	< 3000 U	51000	< 15000 U	< 1000 U	< 3000 U	< 3000 U	--	19000	80000	36000	--
Field Parameters																					
pH		pH units	**6.39**	--	--	--	--	7.12	--	--	--	--	**6.43**	--	--	--	6.95	--	--	--	7.04
Total Metals																					
Arsenic	7440-38-2	ug/l	3	< 5.0 U	5.5	5.4	--	**13**	**28**	**23**	**18**	--	**30**	8.6	9.1	--	**11**	< 5.0 U	< 5.0 U	--	< 2 U
Chromium	7440-47-3	ug/l	< 5 U	< 10.0 U	--	< 10.0 U	--	< 5 U	< 10.0 U	--	< 10.0 U	--	< 5 U	< 10.0 U	< 10.0 U	--	6	< 10.0 U	< 10.0 U	--	< 5 U
Chromium, trivalent	16065-83-1	ug/l	--	< 10.0 U	--	--	--	--	< 10.0 U	--	--	--	--	< 10.0 U	--	--	--	< 10.0 U	--	--	--
Copper	7440-50-8	ug/l	< 5 U	< 4.0 U	--	< 4.0 U	--	< 5 U	< 4.0 U	--	< 4.0 U	--	< 5 U	< 4.0 U	< 5.0 U	--	< 5 U	< 4.0 U	< 5.0 U	--	< 5 U
Iron	7439-89-6	ug/l	--	**1200**	**1600**	**1100**	--	--	**17000**	**18000**	**27000**	--	--	**8000**	**7900**	--	--	**2700**	**4000**	--	--
Lead	7439-92-1	ug/l	< 3 U	< 3.0 U	--	< 3.0 U	--	< 3 U	< 3.0 U	--	< 3.0 U	--	< 3 U	< 3.0 U	< 3.0 U	--	< 3 U	< 3.0 U	< 3.0 U	--	< 3 U
Magnesium	7439-95-4	ug/l	--	35000	35000	34000	--	--	70000	63000	53000	--	--	23000	22000	--	--	19000	19000	--	--
Manganese	7439-96-5	ug/l	--	**440**	**350**	**300**	--	--	**4100**	**2700**	**2400**	--	--	**280**	**280**	--	--	**560**	**420**	--	--
Mercury	7439-97-6	ug/l	< 0.2 U	< 0.20 U	--	< 0.20 U	--	< 0.2 U	< 0.20 U	--	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U
Selenium	7782-49-2	ug/l	< 5 U	< 5.0 U	--	< 5.0 U	--	< 5 U	< 5.0 U	--	< 5.0 U	--	< 5 U	< 5.0 U	< 5.0 U	--	< 5 U	< 5.0 U	< 5.0 U	--	< 5 U
Sodium	7440-23-5	ug/l	--	--	--	160000	--	--	--	--	49000	--	--	--	--	--	--	--	--	--	--
Vanadium	7440-62-2	ug/l	--	< 4.0 U	--	--	--	--	< 4.0 U	--	--	--	--	**28**	--	--	--	< 4.0 U	--	--	--
Per- and Polyfluoroalkyl Substances																					
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ug/l	< 0.0021 U	0.01271	--	< 0.00727 U	--	< 0.0019 U	**0.06419**	--	< 0.00794 U	--	< 0.0020 U	< 0.00341 U	--	--	0.0091	< 0.00319 U	0.05063	0.03657	0.036
Perfluorononanoic acid (PFNA)	375-95-1	ug/l	< 0.0021 U	< 0.02097 U	--	< 0.00727 U	--	< 0.0019 U	< 0.01000 U	--	< 0.00794 U	--	< 0.0020 U	< 0.01703 U	--	--	< 0.0020 U	< 0.01594 U	**0.00768**	**0.01054**	**0.015 J**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ug/l	< 0.0021 U	< 0.00419 U	--	< 0.00727 U	--	< 0.0019 U	**0.95865 J**	--	< 0.00794 U	--	0.0023	< 0.00341 U	--	--	**0.024**	< 0.00319 U	**0.82544**	**0.58845**	**0.54**
Perfluorooctanoic acid (PFOA)	335-67-1	ug/l	**0.0091**	**0.32794**	--	< 0.00727 U	--	< 0.0019 U	**1.19185**	--	< 0.00794 U	--	0.0031	< 0.00341 U	--	--	**0.25**	**0.02322**	**1.04763**	**1.07225**	**0.88**

Large Table 4
Summary of Analytical Results for Groundwater
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			-03I	MW-03S	MW-03S	MW-03S	MW-03S	MW-04D	MW-04D	MW-04D	MW-04D	MW-04I	MW-04I	MW-04I	MW-04I	MW-04S	MW-04S	MW-04S	MW-04S	MW-05D
			2022	5/02/2019	3/16/2020	7/29/2020	4/22/2022	5/03/2019	3/17/2020	7/29/2020	4/22/2022	5/03/2019	3/17/2020	7/29/2020	4/22/2022	5/03/2019	3/17/2020	7/29/2020	4/22/2022	5/08/2019
			FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	CAS #	Units																		
Last Updated																				
Exceedance Key																				
General Parameters																				
Chloride	16887-00-6	ug/l	--	68000	31000	--	--	**270000**	240000	--	--	110000	90000	--	--	120000	**290000**	--	--	230000
Methane	74-82-8	ug/l	--	--	5200	3600	--	--	290	1100	--	--	87	140	--	--	360000	17000	--	--
Nitrogen, ammonia, as N	7664-41-7	ug/l	--	**13000**	6700	--	--	7400	6500	--	--	1400	1100	--	--	1800	**16000**	--	--	310
Solids, total dissolved		ug/l	--	**1300000**	**2500000**	**2600000**	--	**1700000**	**3000000**	**3600000**	--	500000	**860000**	**900000**	--	**570000**	**1900000**	**1800000**	--	**670000**
Sulfate, as SO4	14808-79-8	ug/l	--	**560000**	**940000**	**880000**	**460000**	**1500000**	**1500000**	**2800000**	--	**310000**	**360000**	**350000**	--	7600	< 3000 U	< 3000 U	< 30000 U	58000
Field Parameters																				
pH		pH units	--	--	--	--	6.98	--	--	--	**6.39**	--	--	--	7.29	--	--	--	6.71	--
Total Metals																				
Arsenic	7440-38-2	ug/l	< 2 U	< 5.0 U	< 5.0 U	--	3	< 5.0 U	5.8	--	5	6.5	9.2	--	**12**	< 5.0 U	< 5.0 U	--	2	< 5.0 U
Chromium	7440-47-3	ug/l	< 5 U	< 10.0 U	< 10.0 U	--	13	< 10.0 U	< 10.0 U	--	6	< 10.0 U	< 10.0 U	--	< 5 U	< 10.0 U	< 10.0 U	--	5	< 10.0 U
Chromium, trivalent	16065-83-1	ug/l	--	< 10.0 U	--	--	--	< 10.0 U	--	--	--	< 10.0 U	--	--	--	< 10.0 U	--	--	--	< 10.0 U
Copper	7440-50-8	ug/l	< 5 U	< 4.0 U	< 5.0 U	--	< 5 U	< 4.0 U	< 5.0 U	--	< 5 U	< 4.0 U	29	--	< 5 U	< 4.0 U	< 5.0 U	--	< 5 U	< 4.0 U
Iron	7439-89-6	ug/l	--	**6900**	**47000**	--	--	**54000**	**64000**	--	--	**31000**	**33000**	--	--	**2700**	**52000**	--	--	**420**
Lead	7439-92-1	ug/l	**25**	< 3.0 U	< 3.0 U	--	< 3 U	< 3.0 U	< 3.0 U	--	< 3 U	< 3.0 U	< 3.0 U	--	< 3 U	< 3.0 U	< 3.0 U	--	< 3 U	< 3.0 U
Magnesium	7439-95-4	ug/l	--	120000	74000	--	--	180000	160000	--	--	22000	22000	--	--	37000	53000	--	--	23000
Manganese	7439-96-5	ug/l	--	**850**	**1100**	--	--	**2600**	**2400**	--	--	**710**	**520**	--	--	**830**	**1200**	--	--	**190**
Mercury	7439-97-6	ug/l	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U
Selenium	7782-49-2	ug/l	< 5 U	< 5.0 U	< 5.0 U	--	< 5 U	< 5.0 U	< 5.0 U	--	< 5 U	< 5.0 U	< 5.0 U	--	< 5 U	< 5.0 U	< 5.0 U	--	< 5 U	< 5.0 U
Sodium	7440-23-5	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	7440-62-2	ug/l	--	< 4.0 U	--	--	--	**22**	--	--	--	< 4.0 U	--	--	--	< 4.0 U	--	--	--	< 4.0 U
Per- and Polyfluoroalkyl Substances																				
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ug/l	0.033	0.01217	< 0.00800 U	< 0.00617 U	< 0.0019 U	< 0.00202 U	--	--	< 0.0021 U	< 0.00200 U	0.01011	0.01121	0.0092	0.02015	< 0.00779 U	< 0.00644 U	< 0.0020 U	0.04021
Perfluorononanoic acid (PFNA)	375-95-1	ug/l	**0.01 J**	< 0.01559 U	< 0.00800 U	< 0.00617 U	< 0.0019 U	< 0.01011 U	--	--	< 0.0021 U	< 0.01000 U	< 0.00675 U	< 0.00434 U	0.0026	< 0.01025 U	< 0.00779 U	< 0.00644 U	0.0032	**0.01293**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ug/l	**0.52**	**0.14376**	< 0.00800 U	< 0.00617 U	0.0053	**0.01781**	--	--	< 0.0021 U	0.00204	**0.11019**	**0.11046**	**0.063**	**0.16833**	< 0.00779 U	0.01531	0.01	**0.90056**
Perfluorooctanoic acid (PFOA)	335-67-1	ug/l	**0.83**	**0.29101**	**0.01029**	**0.02573**	**0.036**	**0.04326**	--	--	**0.027**	< 0.00200 U	**0.29822**	**0.36752**	**0.24**	**0.19987**	**0.06551**	**0.08797**	**0.08**	**0.56968**

Large Table 4
Summary of Analytical Results for Groundwater
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			MW-05D	MW-05D	MW-05D	MW-05I	MW-05I	MW-05I	MW-05I	MW-05S	MW-05S	MW-05S	MW-05S	MW-06D	MW-06D	MW-06I	MW-06I		MW-06S	MW-06S
			3/18/2020	7/29/2020	4/20/2022	5/08/2019	3/18/2020	7/29/2020	4/20/2022	5/08/2019	3/18/2020	7/29/2020	4/21/2022	5/08/2019	4/22/2022	5/08/2019	4/22/2022		5/09/2019	4/22/2022
			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N
Parameter	CAS #	Units																		
Last Updated																				
Exceedance Key																				
General Parameters																				
Chloride	16887-00-6	ug/l	< 10000 U	--	--	100000	86000	--	--	31000	22000	--	--	76000	--	100000	--	--	200000	--
Methane	74-82-8	ug/l	14	43 J	--	--	4200	52	--	--	1300	78	--	--	--	--	--	--	--	--
Nitrogen, ammonia, as N	7664-41-7	ug/l	180	--	--	2400	2000	--	--	310	220	--	--	1600	--	870	--	--	3900	--
Solids, total dissolved		ug/l	**580000**	**520000**	--	**1700000**	**1400000**	290000	--	**1000000**	**680000**	310000	--	500000	--	**640000**	--	--	**2100000**	--
Sulfate, as SO4	14808-79-8	ug/l	57000	49000	--	**690000**	< 3000 U	78000	--	**400000**	150000	42000	47000	54000	--	9500	--	--	**620000**	**270000**
Field Parameters																				
pH		pH units	--	--	7.89	--	--	--	8.33	--	--	--	8.20	--	7.73	--	7.13	--	--	7.16
Total Metals																				
Arsenic	7440-38-2	ug/l	< 5.0 U	--	< 2 U	< 5.0 U	< 5.0 U	--	< 2 U	< 5.0 U	< 5.0 U	--	< 2 U	5.6	**14**	< 5.0 U	< 2 U	< 2 U	6	**12**
Chromium	7440-47-3	ug/l	< 10.0 U	--	< 5 U	17	< 10.0 U	--	< 5 U	< 10.0 U	< 10.0 U	--	< 5 U	< 10.0 U	< 5 U	< 10.0 U	< 5 U	< 5 U	< 10.0 U	< 5 U
Chromium, trivalent	16065-83-1	ug/l	--	--	--	17	--	--	--	< 10.0 U	--	--	--	< 10.0 U	--	< 10.0 U	--	--	< 10.0 U	--
Copper	7440-50-8	ug/l	< 5.0 U	--	< 5 U	< 4.0 U	< 5.0 U	--	< 5 U	< 4.0 U	6.8	--	< 5 U	< 4.0 U	< 5 U	< 4.0 U	< 5 U	< 5 U	< 4.0 U	< 5 U
Iron	7439-89-6	ug/l	**580**	--	--	< 200.0 U	280	--	--	260	< 200.0 U	--	--	**500**	--	**2200**	--	--	**5200**	--
Lead	7439-92-1	ug/l	< 3.0 U	--	< 3 U	< 3.0 U	< 3.0 U	--	< 3 U	< 3.0 U	< 3.0 U	--	< 3 U	< 3.0 U	< 3 U	< 3.0 U	< 3 U	< 3 U	< 3.0 U	< 3 U
Magnesium	7439-95-4	ug/l	22000	--	--	3000	4700	--	--	22000	16000	--	--	19000	--	21000	--	--	48000	--
Manganese	7439-96-5	ug/l	**240**	--	--	< 50 U	< 50 U	--	--	**150**	**94**	--	--	**53**	--	**550**	--	--	**130**	--
Mercury	7439-97-6	ug/l	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.2 U	< 0.20 U	< 0.2 U	< 0.2 U	< 0.20 U	< 0.2 U
Selenium	7782-49-2	ug/l	< 5.0 U	--	< 5 U	< 5.0 U	< 5.0 U	--	< 5 U	< 5.0 U	< 5.0 U	--	< 5 U	< 5.0 U	< 5 U	< 5.0 U	< 5 U	< 5 U	< 5.0 U	< 5 U
Sodium	7440-23-5	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	7440-62-2	ug/l	--	--	--	**13**	--	--	--	< 4.0 U	--	--	--	**21**	--	< 4.0 U	--	--	< 4.0 U	--
Per- and Polyfluoroalkyl Substances																				
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ug/l	--	--	< 0.0020 U	0.00241	0.02118	< 0.00489 U	0.017	0.0071	0.01803	0.00735	0.014	0.0123	< 0.0021 U	< 0.00493 U	0.0054	0.0057	< 0.00200 U	0.012
Perfluorononanoic acid (PFNA)	375-95-1	ug/l	--	--	< 0.0020 U	< 0.01023 U	< 0.00713 U	< 0.00489 U	0.0021	< 0.01034 U	< 0.00472 U	0.00329	< 0.0019 U	< 0.01543 U	< 0.0021 U	< 0.02465 U	< 0.0020 U	< 0.0020 U	< 0.01000 U	0.0022
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ug/l	--	--	< 0.0020 U	< 0.00205 U	**0.1969**	**0.16698**	**0.14**	0.00667	**0.48975**	**0.34115**	**0.097**	**0.06733**	0.0055	< 0.00493 U	0.0083	0.0064	< 0.00200 U	**0.035**
Perfluorooctanoic acid (PFOA)	335-67-1	ug/l	--	--	< 0.0020 U	0.00241	**0.20635**	**0.07194**	**0.086**	**0.01664**	**0.24388**	**0.09921**	**0.072**	**0.09752**	0.0043	< 0.00493 U	**0.014**	**0.016**	< 0.00200 U	**0.085**

Large Table 4
Summary of Analytical Results for Groundwater
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			MW-07D 5/09/2019 N	MW-07D 4/20/2022 N	MW-07I 5/09/2019 N	MW-07I 4/20/2022 N	MW-08D 5/09/2019 N	MW-08D 3/19/2020 N	MW-08D 7/30/2020 N	MW-08D 4/21/2022 N	MW-08I 5/09/2019 N	MW-08I 3/19/2020 N	MW-08I 7/30/2020 N	MW-08I 4/21/2022 N	MW-08S 5/09/2019 N	MW-08S 3/19/2020 N	MW-08S 7/30/2020 N	MW-08S 4/21/2022 N	MW-08S 4/21/2022 FD	MW-09D 5/10/2019 N
Parameter	CAS #	Units																		
Last Updated																				
Exceedance Key																				
General Parameters																				
Chloride	16887-00-6	ug/l	55000	--	29000	--	63000	39000	--	--	**380000**	**600000**	--	--	67000	43000	--	--	--	100000
Methane	74-82-8	ug/l	--	--	--	--	--	17 J	17	--	--	6900	3400	--	--	800000	17000	--	--	--
Nitrogen, ammonia, as N	7664-41-7	ug/l	1000	--	6000	--	600	180	--	--	780	610	--	--	3400	2500	--	--	--	630
Solids, total dissolved		ug/l	**1300000**	--	**1300000**	--	**620000**	120000	300000	--	**1100000**	**1300000**	**680000**	--	**3200000**	**2600000**	**1800000**	--	--	**1500000**
Sulfate, as SO4	14808-79-8	ug/l	35000	--	60000	--	50000	50000	42000	--	95000	120000	--	--	15000	88000	83000	57000	46000	**740000**
Field Parameters																				
pH		pH units	--	**9.30**	--	**12.27**	--	--	--	7.96	--	--	--	8.34	--	--	--	7.70	--	--
Total Metals																				
Arsenic	7440-38-2	ug/l	7.7	3	< 5.0 U	< 2 U	6	< 5.0 U	--	5	< 5.0 U	< 5.0 U	--	< 2 U	**28**	**31**	--	**19**	**18**	< 5.0 U
Chromium	7440-47-3	ug/l	16	< 5 U	< 10.0 U	< 5 U	< 10.0 U	< 10.0 U	--	< 5 U	< 10.0 U	< 10.0 U	--	< 5 U	**130**	70	--	51	50	< 10.0 U
Chromium, trivalent	16065-83-1	ug/l	16	--	< 10.0 U	--	< 10.0 U	--	--	--	< 10.0 U	--	--	--	**123.4**	--	--	--	--	< 10.0 U
Copper	7440-50-8	ug/l	15	< 5 U	< 4.0 U	< 5 U	9.3	< 5.0 U	--	< 5 U	< 4.0 U	< 5.0 U	--	< 5 U	< 4.0 U	< 5.0 U	--	< 5 U	< 5 U	< 4.0 U
Iron	7439-89-6	ug/l	**47000**	--	< 200.0 U	--	**12000**	**390**	--	--	**540**	240	--	--	**2000**	**1600**	--	--	--	**1800**
Lead	7439-92-1	ug/l	**14**	< 3 U	< 3.0 U	< 3 U	**5.3**	< 3.0 U	--	< 3 U	< 3.0 U	< 3.0 U	--	< 3 U	3	**4.5**	--	< 3 U	< 3 U	< 3.0 U
Magnesium	7439-95-4	ug/l	34000	--	< 1000 U	--	23000	8700	--	--	25000	18000	--	--	19000	12000	--	--	--	140000
Manganese	7439-96-5	ug/l	**150**	--	< 50 U	--	**130**	**78**	--	--	**250**	**120**	--	--	**100**	**100**	--	--	--	**280**
Mercury	7439-97-6	ug/l	< 0.20 U	< 0.2 U	< 0.20 U	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.2 U	< 0.20 U
Selenium	7782-49-2	ug/l	5.4	< 5 U	< 5.0 U	< 5 U	< 5.0 U	< 5.0 U	--	< 5 U	< 5.0 U	< 5.0 U	--	< 5 U	< 5.0 U	< 5.0 U	--	< 5 U	< 5 U	< 5.0 U
Sodium	7440-23-5	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	7440-62-2	ug/l	**22**	--	**17**	--	**9.9**	--	--	--	< 4.0 U	--	--	--	**89**	--	--	--	--	< 4.0 U
Per- and Polyfluoroalkyl Substances																				
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ug/l	< 0.00423 U	0.0025	0.00787	< 0.0020 U	0.01925	--	--	< 0.0020 U	< 0.00325 U	< 0.00733 U	0.00948	0.0085	0.00555	0.01214	0.01454	0.01	0.0076	0.0105
Perfluorononanoic acid (PFNA)	375-95-1	ug/l	< 0.02115 U	< 0.0021 U	< 0.01000 U	< 0.0020 U	< 0.02338 U	--	--	< 0.0020 U	< 0.01623 U	< 0.00733 U	< 0.00629 U	< 0.0019 U	< 0.01018 U	< 0.01009 U	< 0.00927 U	**0.0080**	**0.0076**	< 0.01000 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ug/l	0.00908	< 0.0021 U	**0.0707**	< 0.0020 U	**0.50866**	--	--	< 0.0020 U	< 0.00325 U	**0.09257**	**0.40101**	**0.12**	**0.02687**	**6.95393**	**1.86262**	**0.78**	**0.74**	**0.1371**
Perfluorooctanoic acid (PFOA)	335-67-1	ug/l	< 0.00423 U	< 0.0021 U	**0.09717**	0.0020	**0.3249**	--	--	< 0.0020 U	< 0.00325 U	**0.06249**	**0.24858**	**0.032**	**0.01613**	**0.43136**	**0.7006**	**0.29**	**0.27**	**0.04489**

Large Table 4
Summary of Analytical Results for Groundwater
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			MW-09D	MW-09D	MW-09D	MW-09I	MW-09I	MW-09I	MW-09I	MW-09S	MW-09S	MW-09S	MW-09S	MW-10D	MW-10D	MW-10D	MW-10D	MW-10I	MW-10I	MW-10I	MW-10I
			3/19/2020	7/30/2020	4/21/2022	5/10/2019	3/19/2020	7/30/2020	4/21/2022	5/10/2019	3/19/2020	7/30/2020	4/21/2022	5/17/2019	3/20/2020	7/31/2020	4/25/2022	5/17/2019	3/20/2020	7/30/2020	4/25/2022
			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	CAS #	Units																			
Last Updated																					
Exceedance Key																					
General Parameters																					
Chloride	16887-00-6	ug/l	160000	--	--	130000	160000	--	--	78000	82000	--	--	100000	95000	--	--	91000	76000	--	--
Methane	74-82-8	ug/l	1300	100	--	--	1300	720	--	--	< 1.0 U	120	--	--	51	80	--	--	4300	520	--
Nitrogen, ammonia, as N	7664-41-7	ug/l	750	--	--	27	750	--	--	130	310	--	--	1700	1500	--	--	560	620	--	--
Solids, total dissolved		ug/l	**3500000**	**15000000**	--	**610000**	**3500000**	**1900000**	--	**830000**	**670000**	450000	--	**5500000**	**4000000**	**3400000**	--	**720000**	**820000**	**1200000**	--
Sulfate, as SO4	14808-79-8	ug/l	**2200000**	**17400000**	--	120000	**2200000**	**1100000**	--	**300000**	**270000**	59000	160000	**2900000**	**2200000**	**1800000**	--	180000	230000	**610000**	--
Field Parameters																					
pH		pH units	--	--	6.90	--	--	--	7.89	--	--	--	7.65	--	--	--	**6.19**	--	--	--	6.99
Total Metals																					
Arsenic	7440-38-2	ug/l	< 5.0 U	--	7	< 5.0 U	< 5.0 U	--	< 2 U	< 5.0 U	< 5.0 U	--	2	< 5.0 U	< 5.0 U	--	3	5.8	8.4	--	9
Chromium	7440-47-3	ug/l	< 10.0 U	--	< 5 U	< 10.0 U	< 10.0 U	--	< 5 U	< 10.0 U	< 10.0 U	--	< 5 U	< 10.0 U	< 10.0 U	--	< 5 U	< 10.0 U	< 10.0 U	--	< 5 U
Chromium, trivalent	16065-83-1	ug/l	--	--	--	< 10.0 U	--	--	--	< 10.0 U	--	--	--	< 10.0 U	--	--	--	< 10.0 U	--	--	--
Copper	7440-50-8	ug/l	< 5.0 U	--	< 5 U	< 4.0 U	< 5.0 U	--	< 5 U	< 4.0 U	< 5.0 U	--	< 5 U	< 4.0 U	< 5.0 U	--	< 5 U	< 4.0 U	< 5.0 U	--	< 5 U
Iron	7439-89-6	ug/l	**13000**	--	--	< 200.0 U	**13000**	--	--	< 200.0 U	300	--	--	**9000**	**13000**	--	--	**8700**	**11000**	--	--
Lead	7439-92-1	ug/l	< 3.0 U	--	< 3 U	< 3.0 U	< 3.0 U	--	< 3 U	< 3.0 U	< 3.0 U	--	< 3 U	< 3.0 U	< 3.0 U	--	< 3 U	< 3.0 U	< 3.0 U	--	< 3 U
Magnesium	7439-95-4	ug/l	400000	--	--	5000	400000	--	--	10000	18000	--	--	**580000**	360000	--	--	14000	18000	--	--
Manganese	7439-96-5	ug/l	**540**	--	--	< 50 U	**540**	--	--	**63**	**78**	--	--	**1700**	**1700**	--	--	**110**	**180**	--	--
Mercury	7439-97-6	ug/l	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.20 U	< 0.20 U	--	< 0.2 U
Selenium	7782-49-2	ug/l	< 5.0 U	--	< 5 U	< 5.0 U	< 5.0 U	--	< 5 U	< 5.0 U	< 5.0 U	--	< 5 U	< 5.0 U	< 5.0 U	--	< 5 U	< 5.0 U	< 5.0 U	--	< 5 U
Sodium	7440-23-5	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	7440-62-2	ug/l	--	--	--	< 4.0 U	--	--	--	< 4.0 U	--	--	--	< 4.0 U	--	--	--	< 4.0 U	--	--	--
Per- and Polyfluoroalkyl Substances																					
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ug/l	--	--	< 0.0021 U	< 0.00229 U	0.00317	--	0.0027	0.01978	0.00279	--	< 0.0021 U	< 0.00229 U	--	--	< 0.0021 U	0.01978	0.01857	0.00816	0.0098
Perfluorononanoic acid (PFNA)	375-95-1	ug/l	--	--	< 0.0021 U	< 0.01147 U	< 0.00205 U	--	< 0.0020 U	< 0.01671 U	< 0.00206 U	--	< 0.0021 U	< 0.01147 U	--	--	< 0.0021 U	< 0.00334 U	**0.01647**	**0.00749**	**0.0071**
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ug/l	--	--	< 0.0021 U	0.01361 J	**0.02918**	--	**0.074**	**0.41101 J**	**0.02453**	--	**0.079**	0.01361	--	--	< 0.0021 U	**0.41101**	**1.25395**	**0.48951**	**0.4**
Perfluorooctanoic acid (PFOA)	335-67-1	ug/l	--	--	< 0.0021 U	< 0.00229 U	**0.00836**	--	**0.018**	**0.36981**	0.00798	--	**0.019**	< 0.00229 U	--	--	< 0.0021 U	**0.36981**	**0.4233**	**0.18643**	**0.21**

Large Table 4
Summary of Analytical Results for Groundwater
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			MW-10S	MW-10S	MW-10S	MW-10S	MW-11D	MW-11I	MW-11S	MW-12D	MW-12I		MW-12S	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I	MW-14S	MW-15D	MW-15I
			5/17/2019	3/20/2020	7/30/2020	4/25/2022	4/25/2022	4/25/2022	4/25/2022	4/26/2022	4/26/2022		4/26/2022	4/26/2022	4/26/2022	4/26/2022	4/26/2022	4/25/2022	4/26/2022	4/25/2022	4/25/2022
			N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N
Parameter	CAS #	Units																			
Last Updated																					
Exceedance Key																					
General Parameters																					
Chloride	16887-00-6	ug/l	220000	140000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Methane	74-82-8	ug/l	--	380000	6400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, ammonia, as N	7664-41-7	ug/l	**30000**	**20000**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Solids, total dissolved		ug/l	**1800000**	**1300000**	**1400000**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfate, as SO4	14808-79-8	ug/l	3900	< 3000 U	< 3000 U	< 30000 U	--	--	170000	--	--	--	< 30000 U	--	--	64000	--	--	36000	--	--
Field Parameters																					
pH		pH units	--	--	--	**6.38**	7.87	7.46	7.08	7.96	7.69	--	7.83	8.01	7.97	**11.5**	7.99	7.93	7.49	7.64	7.51
Total Metals																					
Arsenic	7440-38-2	ug/l	< 5.0 U	< 5.0 U	--	2	3	< 2 U	6	2	< 2 U	< 2 U	5	2	3	9	2	< 2 U	< 2 U	10	< 2 U
Chromium	7440-47-3	ug/l	60	20	--	25	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	25	< 5 U	< 5 U	5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Chromium, trivalent	16065-83-1	ug/l	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	7440-50-8	ug/l	14	7.1	--	8	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	56	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Iron	7439-89-6	ug/l	**19000**	**27000**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	7439-92-1	ug/l	**8**	< 3.0 U	--	4	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	**8**	< 3 U	< 3 U	**47**	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U
Magnesium	7439-95-4	ug/l	56000	37000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese	7439-96-5	ug/l	**950**	**870**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mercury	7439-97-6	ug/l	< 0.20 U	< 0.20 U	--	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	0.3	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
Selenium	7782-49-2	ug/l	< 5.0 U	< 5.0 U	--	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Sodium	7440-23-5	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	7440-62-2	ug/l	**13**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Per- and Polyfluoroalkyl Substances																					
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ug/l	0.02908	0.02803	0.03178	0.023	< 0.0020 U	< 0.0020 U	< 0.0020 U	< 0.0020 U	< 0.0020 U	< 0.0020 U	< 0.0019 U	< 0.0020 U	0.0046	0.035	< 0.0021 U	< 0.0021 U	0.0028	< 0.0020 U	0.0020
Perfluorononanoic acid (PFNA)	375-95-1	ug/l	**0.01717**	< 0.00784 U	**0.01286**	**0.0083**	< 0.0020 U	< 0.0020 U	< 0.0020 U	< 0.0020 U	< 0.0020 U	< 0.0020 U	< 0.0019 U	< 0.0020 U	< 0.0019 U	**0.0079**	< 0.0021 U	< 0.0021 U	< 0.0021 U	< 0.0020 U	< 0.0019 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ug/l	**1.17948 J**	**0.89051**	**0.99306**	**0.69**	< 0.0020 U	0.0052	0.0061	< 0.0020 U	0.0030	0.0029	**0.025**	0.0044	0.0056	**0.35**	< 0.0021 U	< 0.0021 U	0.015	< 0.0020 U	< 0.0019 U
Perfluorooctanoic acid (PFOA)	335-67-1	ug/l	**0.72993**	**0.58121**	**0.68474**	**0.4**	< 0.0020 U	< 0.0020 U	**0.0092**	< 0.0020 U	0.0027	0.0022	**0.017**	< 0.0020 U	0.0033	**0.16**	< 0.0021 U	< 0.0021 U	**0.014**	< 0.0020 U	< 0.0019 U

Large Table 4
Summary of Analytical Results for Groundwater
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			MW-15S	TMW-1		TMW-2	TW-01	TW-01	TW-01	TW-01	TW-01	TW-01		TW-02	TW-02	TW-02	TW-02	TW-03	TW-03	TW-03	TW-03	TW-03
			4/25/2022	6/27/2022		6/27/2022	10/10/2018	9/13/2019	12/10/2019	3/16/2020	7/29/2020	4/25/2022		10/10/2018	9/13/2019	12/10/2019	3/16/2020	10/10/2018	12/10/2019	3/16/2020	7/31/2020	4/21/2022
			N	N	FD	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N
Parameter	CAS #	Units																				
Last Updated																						
Exceedance Key																						
General Parameters																						
Chloride	16887-00-6	ug/l	--	--	--	--	--	210000	210000	--	--	--	--	--	13000	10000	--	--	25000	--	--	--
Methane	74-82-8	ug/l	--	--	--	--	--	--	--	71000	18000	--	--	--	--	--	82000	--	--	250000	12000	--
Nitrogen, ammonia, as N	7664-41-7	ug/l	--	--	--	--	--	**16000**	**14000**	--	--	--	--	--	5000	3400	--	--	**42000**	--	--	--
Solids, total dissolved		ug/l	--	--	--	--	**860000**	**960000**	**920000**	--	**920000**	--	--	**1200000**	**1200000**	**1200000**	--	**2200000**	**1600000**	--	**2200000**	--
Sulfate, as SO4	14808-79-8	ug/l	< 30000 U	--	--	--	1600	< 3000 U	19000	17000	< 3000 U	< 30000 U	< 30000 U	**500000**	< 3000 U	< 3000 U	< 3000 U	36000	120000	120000	69000	110000
Field Parameters																						
pH		pH units	6.80	7.27	--	**11.82**	--	--	--	--	--	**6.41**	--	--	--	--	--	--	--	--	--	6.81
Total Metals																						
Arsenic	7440-38-2	ug/l	< 2 U	--	--	--	< 5.0 U	8.4	< 5.0 U	--	--	4	4	< 5.0 U	< 5.0 U	< 5.0 U	--	< 5.0 U	< 10.0 U	--	--	3
Chromium	7440-47-3	ug/l	< 5 U	--	--	--	< 10.0 U	--	< 10.0 U	--	--	< 5 U	< 5 U	< 10.0 U	--	< 10.0 U	--	< 10.0 U	< 10.0 U	--	--	10
Chromium, trivalent	16065-83-1	ug/l	--	--	--	--	< 10.0 U	--	--	--	--	--	--	--	--	--	--	< 10.0 U	--	--	--	--
Copper	7440-50-8	ug/l	< 5 U	--	--	--	< 4.0 U	--	< 4.0 U	--	--	< 5 U	< 5 U	< 4.0 U	--	< 4.0 U	--	< 4.0 U	< 8.0 U	--	--	< 5 U
Iron	7439-89-6	ug/l	--	--	--	--	--	**34000**	**32000**	--	--	--	--	--	**9300**	**6300**	--	--	**590**	--	--	--
Lead	7439-92-1	ug/l	< 3 U	--	--	--	< 3.0 U	--	< 3.0 U	--	--	< 3 U	< 3 U	< 3.0 U	--	< 3.0 U	--	< 3.0 U	< 4.0 U	--	--	< 3 U
Magnesium	7439-95-4	ug/l	--	--	--	--	--	23000	27000	--	--	--	--	--	39000	48000	--	--	49000	--	--	--
Manganese	7439-96-5	ug/l	--	--	--	--	--	**810**	**590**	--	--	--	--	--	**1900**	**1800**	--	--	**190**	--	--	--
Mercury	7439-97-6	ug/l	< 0.2 U	--	--	--	< 0.20 U	--	< 0.20 U	--	--	< 0.2 U	< 0.2 U	< 0.20 U	--	< 0.20 U	--	< 0.20 U	< 0.20 U	--	--	< 0.2 U
Selenium	7782-49-2	ug/l	< 5 U	--	--	--	< 5.0 U	--	< 5.0 U	--	--	< 5 U	< 5 U	< 5.0 U	--	< 5.0 U	--	< 5.0 U	< 8.7 U	--	--	< 5 U
Sodium	7440-23-5	ug/l	--	--	--	--	--	--	150000	--	--	--	--	--	--	43000	--	--	**600000**	--	--	--
Vanadium	7440-62-2	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Per- and Polyfluoroalkyl Substances																						
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ug/l	0.0063	< 0.0020 U	< 0.0020 U	0.019	--	--	**0.05731**	--	--	**0.13**	**0.12**	--	--	< 0.00830 U	--	--	< 0.00960 U	--	--	0.013
Perfluorononanoic acid (PFNA)	375-95-1	ug/l	< 0.0020 U	< 0.0020 U	< 0.0020 U	**0.0072**	--	--	< 0.00888 U	--	--	0.0024	0.0027	--	--	< 0.00830 U	--	--	< 0.00960 U	--	--	< 0.0020 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ug/l	0.0074	0.014	0.014	**0.47**	0.01436	--	< 0.00888 U	--	--	**0.018**	**0.017**	0.01138	--	< 0.00830 U	--	**0.05526**	< 0.00960 U	--	--	**0.099**
Perfluorooctanoic acid (PFOA)	335-67-1	ug/l	**0.012**	0.0057	0.0062	**0.13**	**0.13835**	--	**1.14101**	--	--	**1.7**	**1.8**	**0.01631**	--	< 0.00830 U	--	**0.11009**	< 0.00960 U	--	--	**0.18**

Large Table 4
Summary of Analytical Results for Groundwater
(Exceedances Only)
2400 Lakeshore Drive
Muskegon County, Michigan

			TW-07 10/11/2018 N	TW-07 4/22/2022 N	TW-08 10/11/2018 N	TW-08 4/25/2022 N	TW-09 4/21/2022 N	TW-10 4/21/2022 N	TWVP-19-MW 4/12/2019 N	TWVP-20-MW 4/12/2019 N	TWVP-21-MW 4/12/2019 N	TWVP-22-MW 4/12/2019 N	TWVP-23-MW 4/12/2019 N
Parameter	CAS #	Units											
Last Updated													
Exceedance Key													
General Parameters													
Chloride	16887-00-6	ug/l	--	--	--	--	--	--	--	--	--	--	--
Methane	74-82-8	ug/l	--	--	--	--	--	--	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
Nitrogen, ammonia, as N	7664-41-7	ug/l	--	--	--	--	--	--	--	--	--	--	--
Solids, total dissolved		ug/l	500000	--	**9300000**	--	--	--	--	--	--	--	--
Sulfate, as SO4	14808-79-8	ug/l	24000	37000	**1200000**	**290000**	< 15000 U	< 15000 U	--	--	--	--	--
Field Parameters													
pH		pH units	--	**10.20**	--	**12.71**	6.58	6.53	--	--	--	--	--
Total Metals													
Arsenic	7440-38-2	ug/l	< 5.0 U	5	< 10.0 U	4	5	< 2 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	6.4
Chromium	7440-47-3	ug/l	< 10.0 U	7	**110**	< 5 U	< 5 U	< 5 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Chromium, trivalent	16065-83-1	ug/l	--	--	**110**	--	--	--	--	--	--	--	--
Copper	7440-50-8	ug/l	32	14	< 8.0 U	< 5 U	< 5 U	< 5 U	6	< 4.0 U	< 4.0 U	9.6	< 4.0 U
Iron	7439-89-6	ug/l	--	--	--	--	--	--	--	--	--	--	--
Lead	7439-92-1	ug/l	3.9	< 3 U	**18**	< 3 U	< 3 U	< 3 U	3.2	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U
Magnesium	7439-95-4	ug/l	--	--	--	--	--	--	--	--	--	--	--
Manganese	7439-96-5	ug/l	--	--	--	--	--	--	--	--	--	--	--
Mercury	7439-97-6	ug/l	0.27	< 0.2 U	< 0.20 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
Selenium	7782-49-2	ug/l	< 5.0 U	< 5 U	< 8.7 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Sodium	7440-23-5	ug/l	--	--	--	--	--	--	--	--	--	--	--
Vanadium	7440-62-2	ug/l	--	--	--	--	--	--	--	--	--	--	--
Per- and Polyfluoroalkyl Substances													
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ug/l	--	0.0064	--	< 0.0021 U	0.0031	0.0029	--	--	--	--	--
Perfluorononanoic acid (PFNA)	375-95-1	ug/l	--	0.0029	--	< 0.0021 U	< 0.0020 U	< 0.0020 U	--	--	--	--	--
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ug/l	**1.32582**	**0.29**	0.00218	0.0027	0.0081	0.0073	--	--	--	--	--
Perfluorooctanoic acid (PFOA)	335-67-1	ug/l	**0.14514**	**0.037**	**0.00957**	0.0069	**0.057**	**0.074**	--	--	--	--	--

Figures

Property Boundary

0 300 600
Feet

Imagery: Nearmap 4/27/2025

Existing Conditions
Pure Muskegon, LLC
Muskegon County, Michigan

FIGURE 1

BARR

LEGEND

1. SITE ENTRANCE
2. SINGLE FAMILY STAGGERED LOT (26'-32' X 205' TYP.) - MAY BE COMBINED TO CREATE LARGER WATERFRONT LOTS
3. SINGLE FAMILY ALIGNED LOT (54' X 150' TYP.) - MAY BE COMBINED TO CREATE LARGER WATERFRONT LOTS
4. 10-12 UNIT FRONT-LOADED CONDO OR APARTMENT "MANSION" LOTS (100' X 150' TYP.)
5. 10-12 UNIT REAR-LOADED CONDO OR APARTMENT "MANSION" LOTS (100' X 115' TYP.)
6. 4 TO 6-STORY APARTMENT OR CONDO BUILDING WITH GROUND FLOOR PARKING OR POSSIBLE FUTURE GROUND FLOOR RETAIL [BUILDINGS A1-A4]
7. 4 TO 6-STORY APARTMENT OR CONDO BUILDING WITH GROUND FLOOR PARKING [BUILDINGS A5-A22]
8. REAR LOAD ROWHOUSES (18' X 40' TYP.) [R1-R3]
9. MIXED-USE BUILDING (GROUND FLOOR RETAIL, APARTMENTS ABOVE) [MU1-MU4]
10. IN-OUT DRY BOAT STORAGE (155' X 73'# BUILDING WITH APPROXIMATELY 350 STORAGE SPACES)
11. MARINA RESTROOMS
12. CLUBHOUSES WITH POOLS AND SPORT COURTS
13. CLUBHOUSE WITH RESTAURANT, EVENT SPACE, POOL, AND PUBLIC RESTROOMS
14. RETAIL BUILDING
15. PUBLIC NATURE VIEW BOARDWALK
16. PUBLIC PARKLET WITH WATERFRONT ACCESS AND FISHING DOCK
17. PUBLIC PARKLET WITH BOARDWALK, FISHING PLATFORM, AND KAYAK LAUNCH
18. MULTI-MODAL TRAIL CONNECTOR
19. POOL AND RESTROOM BUILDING FOR WINDWARD POINTE RESIDENTS
20. BOAT HOIST/WASH STATION AREA
21. STAGING SLIPS FOR IN/OUT SERVICE AND GAS DOCK / PUMP OUT DOCK
22. FENCED DOG PARK AND POLLINATOR GARDEN AREA
23. PLAYGROUND
24. WOODLAND PRESERVATION AREA AND ON-LEASH DOG PARK
25. FUTURE RESTAURANT
26. BREAKWALL/WAVE ATTENUATOR WITH PUBLIC WALKING PATH, FISHING PLATFORM AND TRANSIENT/VISITOR/SHOPPER DOCKING ON NORTH AND SOUTH SIDES OF PIER
27. POSSIBLE FUTURE 1 TO 3-STORY RETAIL/OFFICE STACK, WHICH MAY INCLUDE COFFEE SHOP, SANDWICH SHOP, CONVENIENCE STORE, SHIP STORE, MARINA OFFICE, AND/OR ROOFTOP DECK.
28. GAS DOCK AND SERVICE OFFICE
29. TRAFFIC CALMING STREET TREATMENTS (E.G. ROUNDABOUT, SIGNALIZED BIKE/PEDESTRIAN CROSSING) TO BE COORDINATED WITH CITY OF MUSKEGON

SUMMARY OF LAND USE

SITE LOCATION:		2400 & 2950 LAKESHORE DR. MUSKEGON, MICHIGAN
SITE AREA	=	122.94 AC.
ZONING OF PROPERTY	=	PUD (PLANNED UNIT DEVELOPMENT)
PROPOSED DWELLINGS		
34'X150' LOTS	=	157 DWELLINGS
32' STAGGER LOTS	=	49 DWELLINGS
10-12 UNIT "MANSION" LOT DWELLINGS	=	570-684 DWELLINGS (57 BLDGS)
APT/CONDO BUILDINGS	=	750-1,120 DWELLINGS (22 BLDGS)
18' X 40' TOWNHOMES	=	35 UNITS (10 BLDGS)
MIXED-USE APARTMENTS	=	55 DWELLINGS (4 BLDGS)
PROPOSED DENSITY	=	10.64 D.U./AC.
RETAIL/OFFICE SPACE (MU1-MU4) (NOT INCLUDING FUTURE IMPROVEMENTS)	=	42,700 SQ.FT.
BOAT STORAGE	=	111,600 SQ.FT. (350 SPACES)
BOAT DOCKING SPACES	=	251
71'-0" SLIP	=	1 SLIP
160' SLIP	=	1 SLIP
90' SLIP	=	1 SLIP
80' SLIPS	=	1 SLIP
60' SLIPS	=	24 SLIPS
50' SLIPS	=	77 SLIPS
45' SLIPS	=	54 SLIPS
40' SLIPS	=	56 SLIPS
TRANSIENT/VISITOR/SHOPPER DOCKING SPACES	=	1400 LINEAR FEET

SITE REGULATING STANDARDS

MULTIPLE FAMILY BUILDINGS (A1-A22)
1. ALLOWABLE USES: MULTIPLE FAMILY DWELLINGS (APARTMENTS OF CONDOMINIUMS), SENIOR LIVING FACILITY, AND PERMITTED USES WITHIN THE B-2 DISTRICT AT GROUND FLOOR OF BUILDINGS A1-A4
2. MAXIMUM BUILDING HEIGHT = 6 STORIES OR 90 FT., WHICHEVER IS LESS
3. MINIMUM BUILDING TO BUILDING SEPARATION (FOUNDATION WALL TO FOUNDATION WALL) = 25 FT.
4. MINIMUM DISTANCE TO ADJACENT ROADS (EXCLUDES PARKING DRIVE AISLES) = 25 FT.

ROWHOUSES (R1-R3)
1. ALLOWABLE USES: ATTACHED SINGLE FAMILY DWELLINGS
2. MAXIMUM BUILDING HEIGHT = 3 STORIES OR 50 FT., WHICHEVER IS LESS
3. MINIMUM BUILDING TO BUILDING SEPARATION (FOUNDATION WALL TO FOUNDATION WALL) = 16 FT.
4. MINIMUM DISTANCE TO ADJACENT ROAD OR SIDEWALK = 10 FT.

FRONT-LOADED MANSION LOTS (M1-M10 & M41-M57)
1. ALLOWABLE USES: MULTIPLE FAMILY DWELLING
2. MAXIMUM BUILDING HEIGHT = 5 STORIES OR 80 FT., WHICHEVER IS LESS
3. SETBACKS
   FRONT YARD = 22 FT. MIN. (15 FT. MIN. ON SECONDARY FRONT YARD OF CORNER LOTS)
   SIDE YARD = 5 FT. MIN.
   REAR YARD = 15 FT. MIN.

REAR-LOADED MANSION LOTS (M11-M40)
1. ALLOWABLE USES: MULTIPLE FAMILY DWELLING
2. MAXIMUM BUILDING HEIGHT = 5 STORIES OR 80 FT., WHICHEVER IS LESS
3. SETBACKS
   FRONT YARD = 12 FT. TO 20 FT. MIN. BUILD-TO-LINE (15 FT. MIN. SETBACK ON SECONDARY FRONT YARD OF CORNER LOTS)
   SIDE YARD = 5 FT. MIN.
   REAR YARD = 1 FT. MIN.

ALIGNED LOTS (54' X 150' TYP.)
1. ALLOWABLE USES: DETACHED SINGLE FAMILY DWELLING
2. MAXIMUM BUILDING HEIGHT = 3 STORIES PLUS BASEMENT
3. SETBACKS
   FRONT YARD = 22 FT. MIN.
   SIDE YARD = 5 FT. MIN.
   REAR YARD = 15 FT. MIN. FROM O.H.W.M.

STAGGERED LOTS (32'-26' X 205' TYP.)
1. ALLOWABLE USES: DETACHED SINGLE FAMILY DWELLING
2. MAXIMUM BUILDING HEIGHT = 3 STORIES PLUS BASEMENT
3. SETBACKS
   FRONT YARD = 22 FT. MIN.
   SIDE YARD = 5 FT. MIN.
   REAR YARD = 15 FT. MIN. FROM O.H.W.M.

CLUBHOUSE (SITE FEATURES 12 AND 13 ON THE PLAN)
1. ALLOWABLE USES: COMMUNITY CENTER; EVENT CENTER RECREATION CENTER; RESTAURANT, COCKTAIL LOUNGE, AND BREWPUB; AND MUSIC VENUE (INDOOR AND OUTDOOR)
2. MAXIMUM BUILDING HEIGHT = 3 STORIES OR 50 FT., WHICHEVER IS LESS
3. MINIMUM DISTANCE TO OHWM = 15 FT.
4. MINIMUM DISTANCE FROM ADJACENT LOT LINES = 15 FT.

MIXED USE (MU1-MU4)
1. ALLOWABLE USES: GROUND FLOOR - PERMITTED USES IN THE B-2 DISTRICT, UPPER LEVELS - MULTIPLE FAMILY DWELLINGS
2. MAXIMUM BUILDING HEIGHT = 3 STORIES OR 50 FT., WHICHEVER IS LESS
3. MINIMUM DISTANCE FROM ADJACENT LOT LINES = 15 FT.

BOAT STORAGE BUILDING
1. ALLOWABLE USES: BOAT STORAGE AND SIMILAR OR ACCESSORY USE, PERMITTED USES WITHIN THE B-2 DISTRICT
2. MAXIMUM BUILDING HEIGHT = 50 FT.

GENERAL NOTES

1. SPEED LIMIT STHROUGHOUT THE PROPOSED DEVELOPMENT WILL BE A MAXIMUM OF 15 MPH.
2. TYPICAL STREET TREE SPACING WILL BE 35 FT. TO 45 FT. ON CENTER, DEPENDING ON SPECIES AND SITE CONSTRAINTS (E.G. CONFLICTS WITH UTILITIES, STREET LIGHTS, DRIVEWAYS, ETC.)
3. WAYFINDING SIGNAGE WILL BE STRATEGICALLY PLACED THROUGHOUT THE DEVELOPMENT TO DIRECT PEDESTRIANS TO SITE FEATURES INCLUDING KAYAK LAUNCHES, NATURAL FEATURES, TRAILS, FISHING PLATFORMS, PARKS, CLUBHOUSES, BIKE PATHS, RETAIL CORRIDOR(S), DOG PARKS, ETC.
4. OUTDOOR ENTERTAINMENT AT THE RESTAURANT AND OTHER PUBLIC SPACES WILL BE ALLOWED BETWEEN THE HOURS OF 10 A.M. AND 11 P.M AND NOT PERMITTED BETWEEN 11PM AND 10AM.
5. THERE WILL BE NO GATES OR FENCES WITHIN THE DEVELOPMENT EXCEPT FOR PIERS 2, 3, 4, AND 5; DOG PARKS; SPORT COURTS; PLAYGROUNDS, POOLS; DUMPSTER ENCLOSURES; AND ABOVE GROUND UTILITY SCREENING.
6. ALL PUBLIC AMENITY AREAS WILL BE OWNED AND MAINTAINED BY THE DEVELOPMENT ASSOCIATION IN PERPETUITY AS A MEANS OF MAINTAINING A HIGH LEVEL OF CARE AND LESSENING THE BURDEN ON PUBLICLY FUNDED CITY AGENCIES.
7. FINAL DUMPSTER ENCLOSURE LOCATIONS SHALL BE REVIEWED AND APPROVED BY CITY OF MUSKEGON STAFF.
8. SNOW SHALL BE STORED IN DESIGNATED AREAS, AS SPECIFIED BY CITY OF MUSKEGON MAINTENANCE PERSONNEL OR REMOVED FROM THE SITE AS NEEDED.
9. BIKE PARKING SHALL BE PROVIDED AT RETAIL CORRIDOR(S), CLUBHOUSES, AND VARIOUS PUBLIC SPACES THROUGHOUT THE DEVELOPMENT. FINAL LOCATIONS AND DESIGN OF BIKE PARKING FACILITIES TO BE COORDINATED WITH CITY OF MUSKEGON STAFF.
10. PROPOSED LIGHTING SHALL CONSIST OF WALL-MOUNTED LIGHTS AND LIGHT POLES BOTH FITTED WITH DOWN CAST TYPE FIXTURES TO BE SPECIFIED BY LIGHTING CONSULTANT. LIGHTING SHALL BE COORDINATED WITH CITY STAFF TO CLUSTER IN DESIRED HIGH TRAFFIC PUBLIC AREAS. ALL LIGHTING SHALL BE SHIELDED FROM ADJACENT PROPERTIES.
11. GROUND FLOOR LEVELS OF BUILDINGS A1-A4 ARE INTENDED TO BE REPURPOSED AS ADDITIONAL RETAIL OR OFFICE SPACE AS NEEDED PER MARKET CONDITIONS. THE CONVERSION OF GROUND FLOOR USES WILL BEGIN AT BUILDING A1 AND EXTEND TO THE EAST SEQUENTIALLY ENDING AT BUILDING A4
12. AREAS PT AND PR WILL NOT ALLOW FOR FISHING IF ADJACENT WATERS ARE FOUND TO BE UNSUITABLE BY ENVIRONMENTAL SPECIALISTS.
13. TOPOGRAPHICAL REQUIREMENT PER 2101.3.E, EXISTING TOPOGRAPHY IS DEPICTED WITH CONTOURS AT 1-FT INTERVALS ON THE EXISTING CONDITIONS PLAN. FINAL TOPOGRAPHIC CHANGES SHALL BE IN COMPLIANCE WITH EGLE DUE CARE PLAN CRITERIA. AREAS OF FILL MUST BE COMPACTED TO DENSITY SPECIFIED BY GEOTECH CONSULTANT.
14. THE PROJECT WILL BE SERVED BY PUBLIC WATERMAIN, PUBLIC SANITARY SEWER, AND PUBLIC AND PRIVATE STORMWATER MANAGEMENT SYSTEMS. WATERMAIN, SANITARY SEWER, AND STORMWATER MANAGEMENT MEASURES SHALL MEET CITY, COUNTY, AND STATE OF MICHIGAN REQUIREMENTS. "DRY UTILITIES," WHICH INCLUDE ELECTRIC SERVICE, TELECOMMUNICATIONS, AND NATURAL GAS, WILL BE WILL BE INSTALLED UNDERGROUND AND WILL BE PROVIDED TO EACH SITE.
15. A TRAFFIC STUDY SHALL BE CONDUCTED AND REVIEWED BY THE PUBLIC WORKS DIRECTOR PRIOR TO CONSTRUCTION.
16. A STORMWATER PERMIT SHALL BE OBTAINED FROM THE ENGINEERING DEPARTMENT PRIOR TO CONSTRUCTION.
17. A LANDSCAPE MANAGEMENT PLAN FOR A NATIVE VEGETATION PLANTING ZONE SHALL BE SUBMITTED AND APPROVED BY THE PUBLIC WORKS DIRECTOR PRIOR TO CONSTRUCTION.
18. A PROPOSED UTILITIES PLAN SHALL SUBMITTED TO AND APPROVED BY THE PUBLIC WORKS DIRECTOR PRIOR TO CONSTRUCTION.
19. ALL MARINA SLIPS WILL HAVE FIRE ACCESS.
20. ALL APPLICABLE CITY, STATE, AND FEDERAL PERMITS SHALL BE GRANTED PRIOR TO CONSTRUCTION OF IMPACTED SITE FEATURES.

July 17, 2025 — North — 0' 75' 150' 300' — Scale: 1"=150'

WINDWARD POINTE

FINAL PUD PLAN - PHASING PLAN

project number: 23201208

NEDERVELD

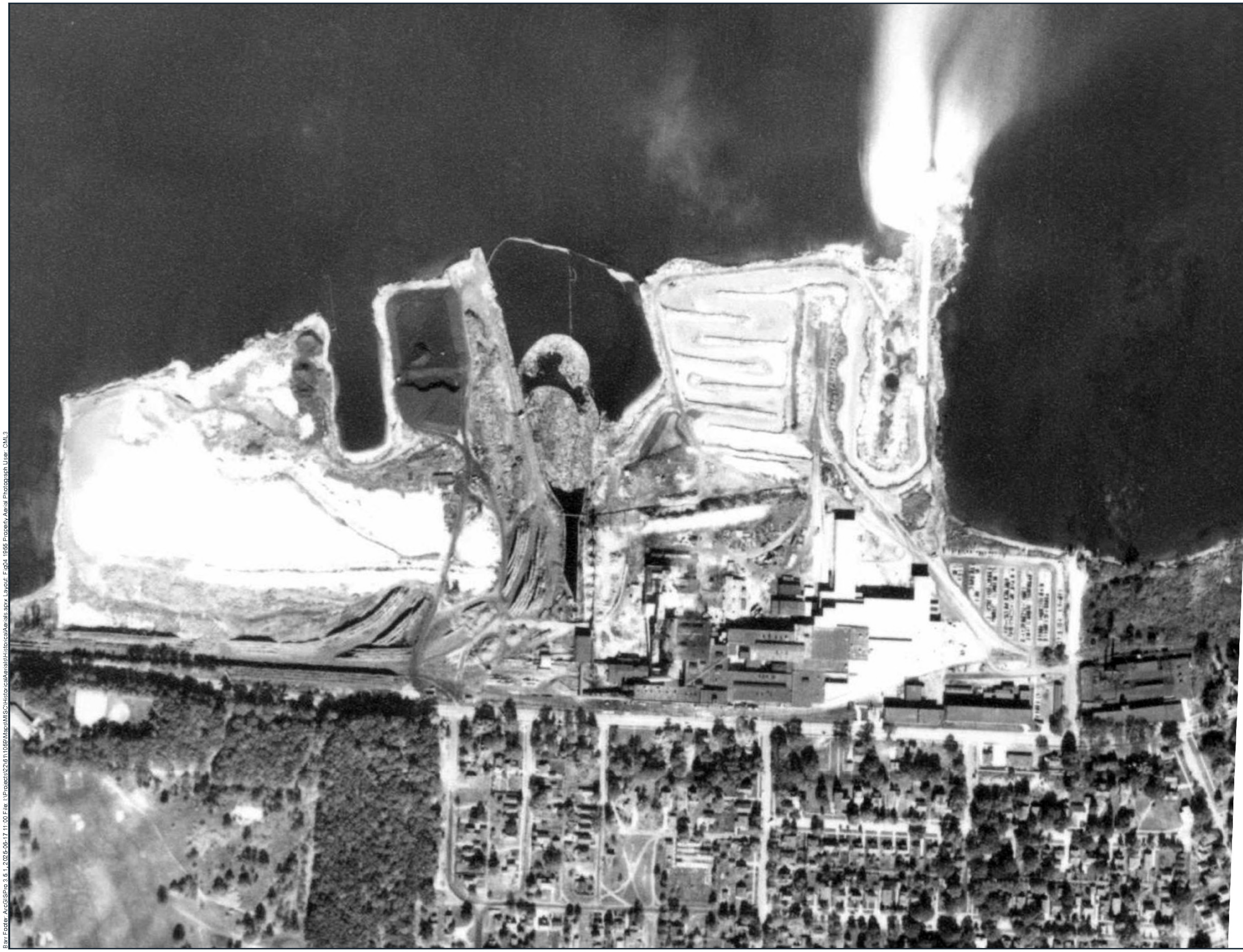
0 300 600
Feet

Imagery: 1938 Aerial Photography from EDR

1938 Property
Aerial Photograph
Pure Muskegon, LLC
Muskegon County, Michigan

FIGURE 3

BARR



0 300 600

Feet

Imagery: 1955 Aerial Photography from EDR

1955 Property
Aerial Photograph
Pure Muskegon, LLC
Muskegon County, Michigan

FIGURE 4

BARR

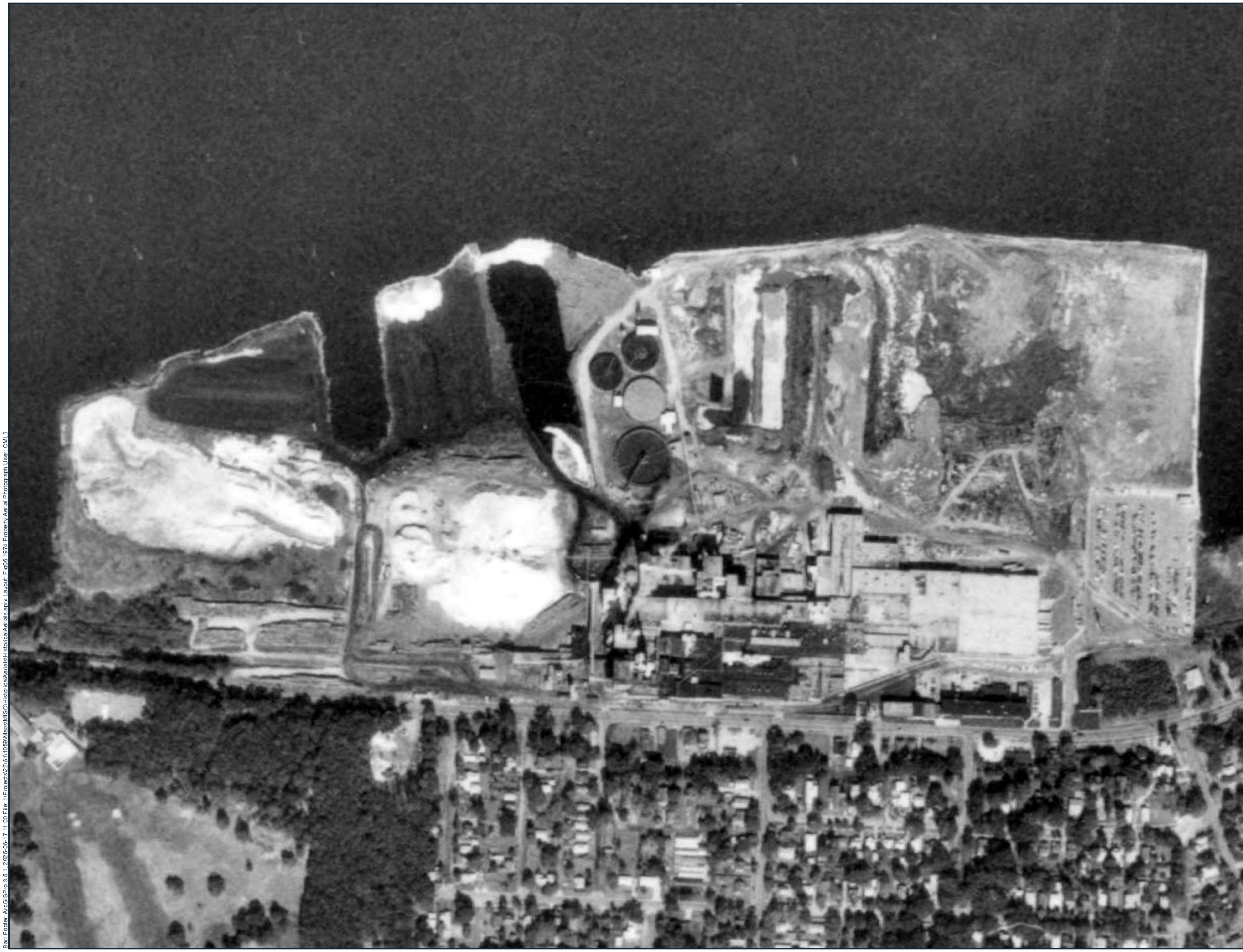
0 300 600
Feet

Imagery: 1968 Aerial Photography from EDR

1968 Property
Aerial Photograph
Pure Muskegon, LLC
Muskegon County, Michigan

FIGURE 5

BARR



0 300 600
Feet

Imagery: 1974 Aerial Photography from EDR

1974 Property
Aerial Photograph
Pure Muskegon, LLC
Muskegon County, Michigan

FIGURE 6

BARR

N

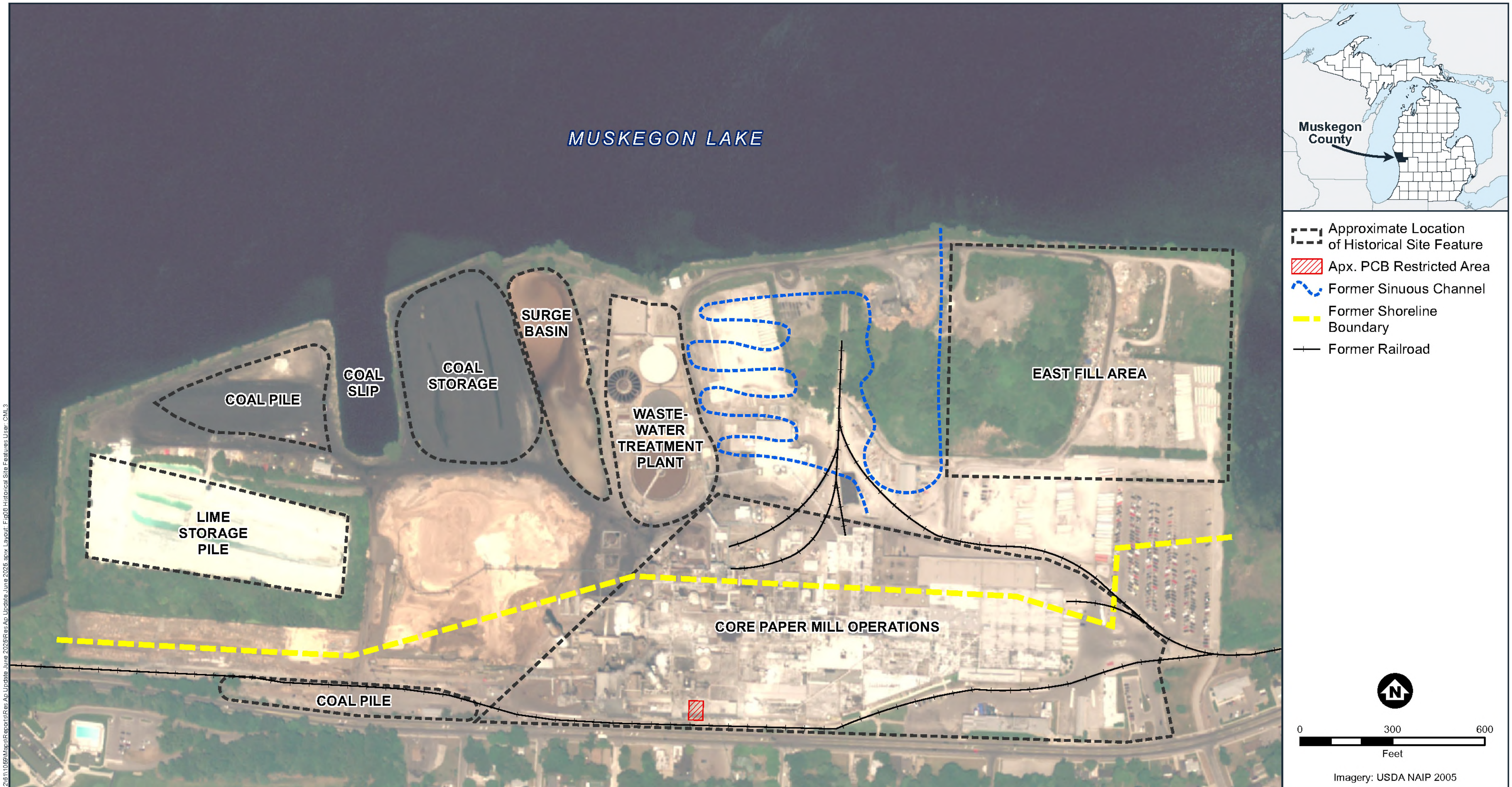
0 300 600
Feet

Imagery: 1981 Aerial Photography from EDR

1981 Property
Aerial Photograph
Pure Muskegon, LLC
Muskegon County, Michigan

FIGURE 7

BARR



Historical Site Features
Pure Muskegon, LLC
Muskegon County, Michigan

FIGURE 8

BARR

Notes:

1. Residential and nonresidential site-specific volatilization to indoor air criteria (SSVIAC) were established for the Property by EGLE on December 9, 2024.
2. The residential and nonresidential SSVIAC were established for the Property by EGLE under assumptions which include but are not limited to slab-on-grade foundations for all structures, a depth to groundwater of 3.5 ft and fill underlying all structures being classified as the USDA soil type of sand.

○ Soil Sample Location

□ Groundwater Sample Location

Exceedance Information

- Does not exceed criteria
- Exceeds Residential Soil/ Residential Shallow Groundwater SSVIAC for Residential High-Rise with Six or More Floors
- Exceeds Residential Soil/ Residential Shallow Groundwater SSVIAC for Residential Structure with Less Than Six Floors
- Exceeds Nonresidential Soil/ Nonresidential Shallow Groundwater SSVIAC for Nonresidential Structure with Areas of <50,000 ft[2] of Continuously Open Space
- Exceeds Nonresidential Soil/ Nonresidential Shallow Groundwater SSVIAC for Nonresidential Structure with Areas of >50,000 ft[2] of Continuously Open Space and no Areas <50,000 ft[2] of Continuously Open Space

N

0 300 600

Feet

Imagery: Nearmap 4/27/2025

Exceedances of Residential and Nonresidential SSVIAC

Pure Muskegon, LLC

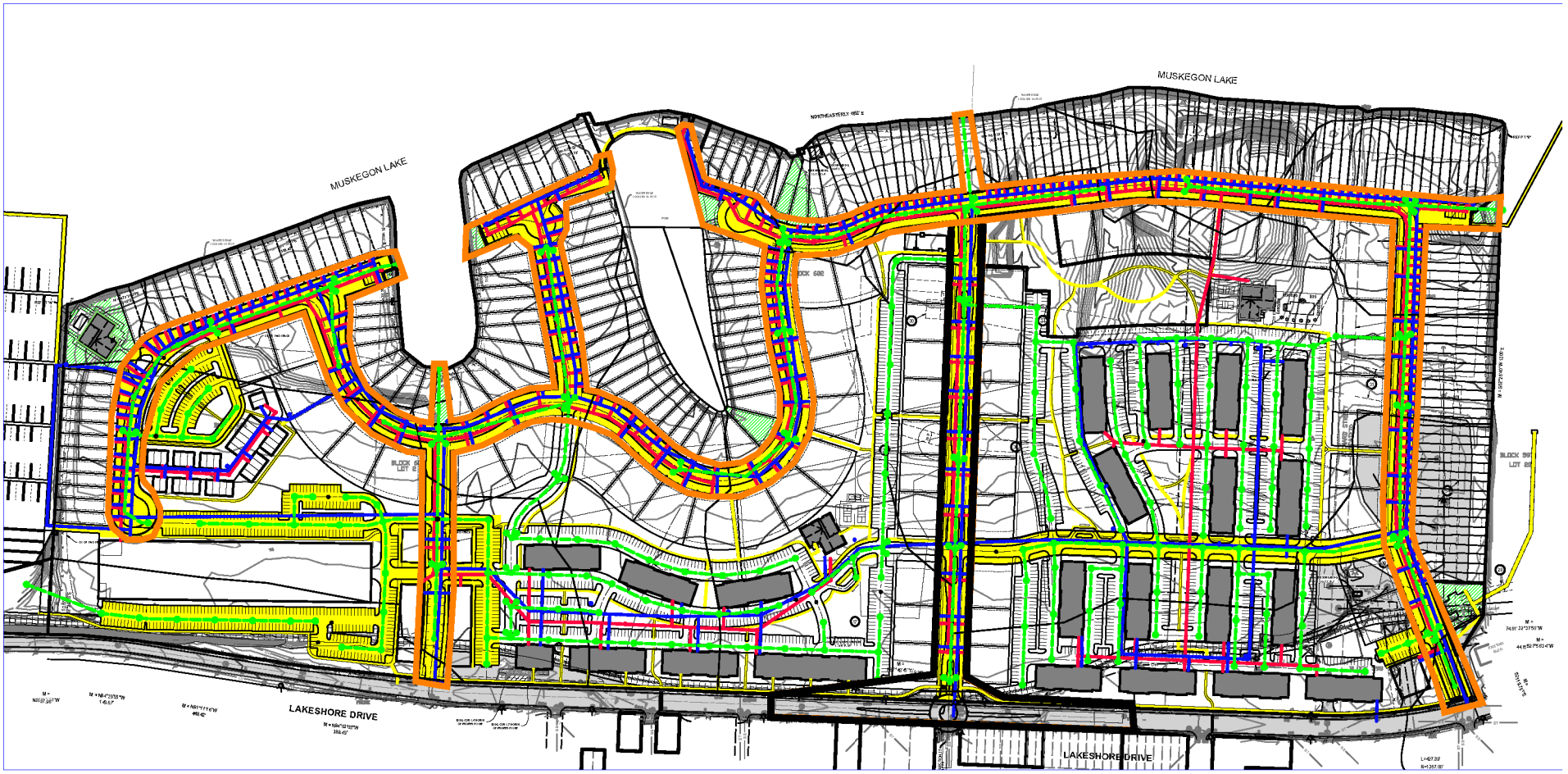
Muskegon County, Michigan

FIGURE 9

BARR

Windward Pointe
March 4, 2024

Nederveld Project 23201268
Utility and Road Schematic Plan
(Phase One outlined in orange)



Appendices

Appendix A

Environmental Resources Group October 2023 Soil Gas Methane Evaluation

Environmental Resources Group
75 W. Walton Avenue • Suite C • Muskegon, MI 49440
Phone: 231-747-8556 • Fax: 231-747-8558

October 31, 2023

Mr. Jon Rooks
Parkland Acquisition Six, LLC
75 W. Walton Avenue, Suite A
Muskegon, MI 49440

RE: Soil Gas Methane Evaluation
Windward Pointe
2400 Lakeshore Drive, Muskegon, Michigan
ERG Project Number: 10179

Dear Mr. Rooks,

Environmental Resources Group, LLC (ERG) is pleased to provide this summary letter presenting the results of a methane investigation to provide a preliminary understanding of the presence of subsurface methane (CH_4) and its potential impacts on construction and redevelopment activities proposed at Windward Pointe, Muskegon, Michigan (Site).

Supplemental Sampling Locations and Sampling

From September 25 through 29, 2023, ERG installed 25 soil gas wells across the property. The soil gas wells were installed with a vapor screen set at five (5) feet below grade level (bgl). The sampling locations were selected after reviewing the locations of the residences to be constructed in Phase I of the redevelopment process. ERG collected soil gas field screening data and samples for laboratory analyses at the 25 soil gas well locations on October 3 and 4, 2023. ERG collected the soil gas samples following standard soil gas collection guidelines. The soil gas samples were submitted to Merit Laboratories, Inc. for analytical testing but were analyzed by Trace Laboratories, Inc. of Muskegon, Michigan. Figure 1 presents the sampling locations.

Subsurface Methane Concentrations

During installation of the soil gas wells and as part of the soil gas well sampling, ERG field screened the locations for the Lower Explosive Limit (LEL) percentage using a 5-gas / photoionization detector (PID) meter calibrated for CH_4 in ambient air and also used a GEM meter to directly read CH_4 concentrations, as well as other soil gas indicators, including volatile organic compounds (VOCs), carbon dioxide (CO_2), and oxygen (O_2) in the soil gas wells. The field measured CH_4 concentrations in soil gas at these locations ranged from 0% to 62.7% by volume. Table 1 presents detected CH_4 concentrations in the soil gas wells as well as select LEL readings when a 5-gas / PID meter was utilized to detect VOCs rather than a standard PID. The LEL of the sample locations screened with the 5-gas / PID ranged from 0% to overlimit (i.e., > 100%). When LEL is greater than 100%, the sample contains more than 5% of CH_4 by volume. Also, 100%

LEL (5% of CH_4 by volume) presents the lower flammable limit. Industry practice uses the 10% LEL monitoring reading as the initial response action threshold with more aggressive response actions triggered with increasing LEL readings.

In general, a CH_4 concentration between 5% and 17% by volume is considered the explosive range where it will support ignition and is highly flammable. The concentrations over 17% are not explosive as the air is too rich in CH_4. However, once the environment is altered such that subsurface concentrations are exposed to the atmosphere (e.g., through construction activities), CH_4-rich concentrations may be readily and unpredictably diluted to explosive concentrations.

In addition to field screening measurements, ERG evaluated the laboratory analytical results. Based on the analytical results, the maximum CH_4 concentrations in soil gas was 430,000,000 µg/m^3. The results also indicated the presence of subsurface CH_4 over 100% LEL. Analytical data is included as Table 2.

Active Methane Source

As presented in Table 1, percent CO_2 is also high in the samples with high CH4 concentrations. Therefore, the subsurface locations with high CH_4 concentrations could indicate the presence of methanogenesis (an anaerobic digestion process), a reductive process which occurs under anaerobic conditions. Anaerobic digestion is an organic matter decomposition process in the absence of oxygen. The concentration of CH_4 usually stays below 0.1% in the soil gas when there is no active source.

Due to the presence of buried organic material and anaerobic subsurface conditions, the site requires design and implementation of long-term mitigation strategies.

Methane Risk Considerations – During Construction

CH_4 appears to be abundant in subsurface locations largely due to anaerobic decomposition of the known buried organic material. It is an odorless and colorless gas that is lighter than air. Methane can migrate underground or accumulate in pockets depending on the soil properties. Methane is known to cause accidents and fatalities at construction sites when it is not adequately acknowledged and prepared for properly. For example, CH_4 can combust when an excavator strikes a rock or other hard objects, causing a spark, in a CH_4-rich location (over 5% by volume). In addition to potential explosions and fire, CH_4 can asphyxiate workers as it readily displaces oxygen in the air.

The detection of elevated subsurface CH_4 concentrations throughout the Site represents significant explosive and oxygen depletion hazards during the proposed redevelopment construction activities. Therefore, ERG recommends the following considerations:

1. Develop and implement a comprehensive Site-wide strategy for CH_4-related Site safety procedures, including, but not limited to: gas detection and monitoring, personal protective equipment (PPE) including breathing apparatus, active ventilation within any subsurface work zones, use of non-spark equipment, and emergency response procedures. Strategies and

procedures must be identified and implemented to eliminate any source of ignition at all times and cover all hot work, site excavation, electrical, and combustion engine operation.

2. Monitoring for CH_4 should be required prior to and throughout construction work. Use of gas detectors throughout the Site (especially where high CH_4 concentrations were detected) should be required for both personnel and equipment. Portable gas detectors that provide sound and light indications at elevated LELs are used at construction sites with elevated CH_4 concerns. Typically, these detectors are placed and or used at the work breathing zone at all times. In addition, they are placed throughout finished excavation depths (bottom, middle, top, etc.) and monitored frequently for methane accumulation. Subsurface methane monitoring in the vicinity is required to eliminate potential hazards during excavation activities. This could be accomplished by monitoring methane at a borehole(s) near the excavation activity.
3. Work task procedures and precautions should be clearly identified in and strictly enforced for trenching, excavation, and confined spaces (at, near to or below grade).

Methane Risk Considerations - Mitigation of Buildings/Open Areas

Currently, in an undeveloped Site status, the only mechanism available for subsurface CH_4 transport into the atmosphere is changes in the atmospheric pressure. When the atmospheric pressure increases, air flows into the ground and dilutes CH_4. When the atmospheric pressure decreases, soil gas expands and CH_4 will be emitted to the atmosphere. According to Intergovernmental Panel on Climate Change (IPCC), high groundwater levels could reduce the pore space available for CH_4 increasing its concentration in the soil. The proposed construction site is located near a large water body with a high water table. Therefore, the shallow and fluctuating groundwater table could be a potential additional cause for CH_4 accumulation at the site in the shallow soil gas. However, potential dewatering and below grade construction activities could alter groundwater movements and gas pressure in the pore spaces, leading to CH_4 migration to buildings or underground utilities. Also, during construction work, new routes for CH_4 migration (or venting routes) could occur. Therefore, ERG recommends the following considerations for the new development:

1. Design all buildings to prevent CH_4 intrusion into indoor air and minimize concentration buildup around foundations and beneath floor slabs (via Sub-slab depressurization, cut off trenches, etc.).
2. Design all subsurface utility corridors to prevent CH_4 intrusion into trenches and piping.
3. Monitor CH_4 emissions (i.e., soil CH_4 flux) from the ground at the proposed open space areas utilizing a flux chamber technique. Areas with marginal or unacceptable soil flux measurements will require a passive and/or active mitigation system or systems to confidently control emissions such as:
    - Oxidize CH_4 prior to venting to the atmosphere to control and reduce fugitive CH_4 emissions. An effective option available to treat diffusive sources of CH_4 is biocovers. It is a passive method used to mitigate fugitive CH_4 emissions and typically consists of a porous geofabric and an organic material such as compost. Methanotrophic bacteria in the

compost layer is utilized to oxidize CH_4 into carbon dioxide. Biocovers could be incorporated into the site landscaping and other green spaces.

- Active methane soil gas venting to control soil gas movement, capture and management away from buildings and infrastructure.

4. Mitigation alternatives may likely need to undergo a pilot study or other field demonstrations to further evaluate and confirm effectiveness for the various proposed structures and infrastructure at the corresponding areas of the Site.

These discussions, conclusions, and recommendations are based on available project information and data obtained as indicated. Variations in soil gas, soil and groundwater conditions will commonly occur between or away from sampling locations. The nature and extent of variations may not become evident until additional testing is performed, until the time of construction, or later. If significant variations are observed, the conclusions and recommendations presented herein must be reevaluated.

Implementation of the conclusions and recommendations contained in this report may affect the design, construction, and performance of the proposed improvements, along with the potential inherent risks involved with the proposed construction. The client and key members of the design team, including ERG, should discuss the issues covered in this report so these issues are understood and applied in a manner consistent with the Owner's budget, tolerance of risk, and expectations for performance and maintenance. ERG should be retained to review design details, project plans, and specifications to verify those documents are consistent with conclusions and recommendations contained in this and possible future reports.

We appreciate this opportunity to provide this evaluation for you. Should you have questions or need additional information feel free to contact us.

Sincerely,

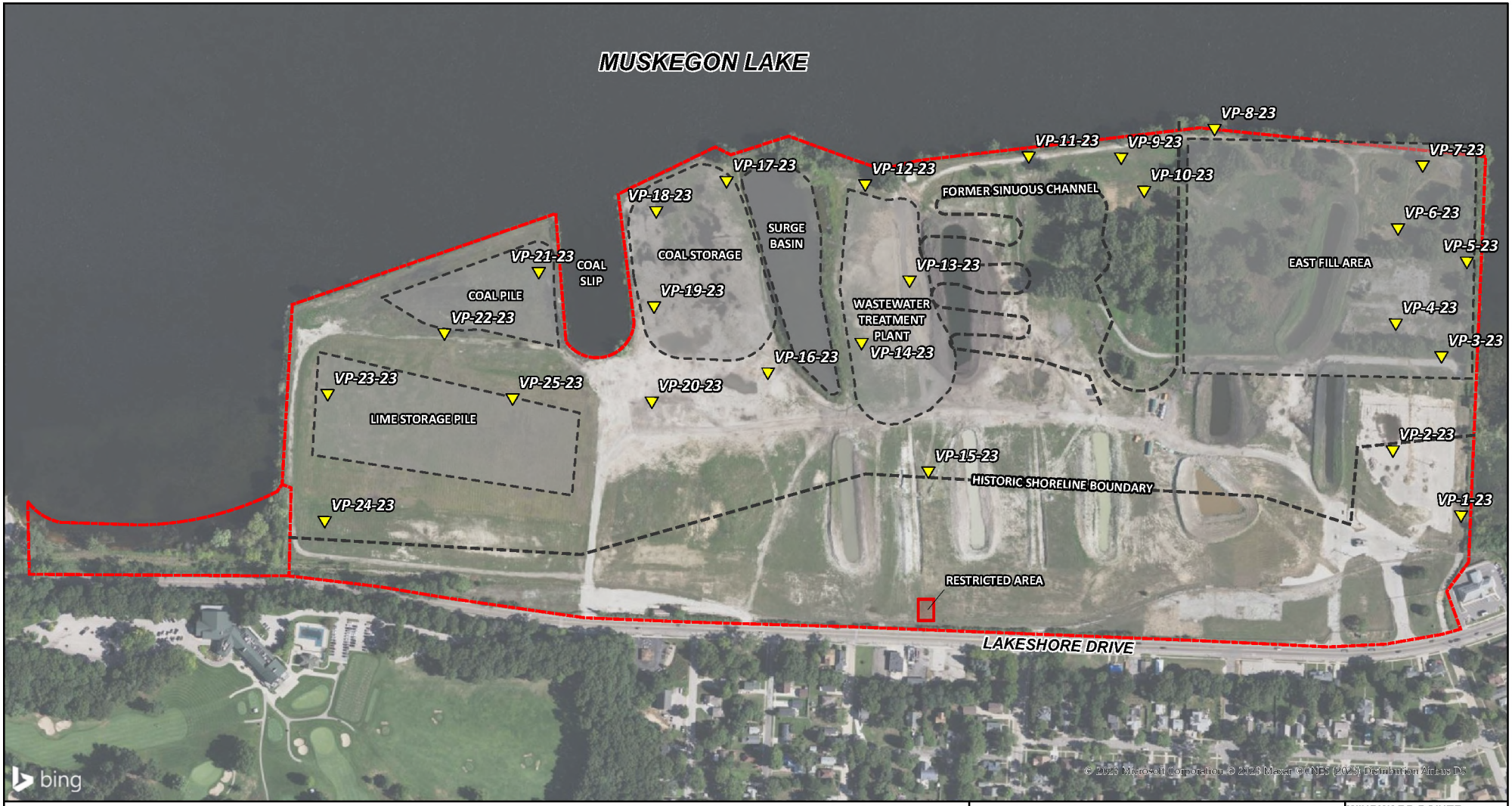
ENVIRONMENTAL RESOURCES GROUP, LLC

Mala C. Hettiarachchi, PE, PhD
Senior Engineer

Duncan R. Mein, PE
Senior Engineer

Alfred J. Jordan II, CPG
Executive Vice President

Attachments



LEGEND

- Site Parcel Boundary
- Former Site Feature
- Vapor Point

Feet

300 150 0 300 600 900

1 INCH = 300 FEET

N

ERG Environmental Resources Group
75 W. Walton Avenue • Suite C • Muskegon, MI 49440
Phone: 231-747-8556 • Fax: 231-747-8558

WINDWARD POINTE
2400 LAKESHORE DRIVE, MUSKEGON, MI
VAPOR POINT LOCATION MAP
JOB NO.: 10179
BY: HJK DATE: 10/31/2023
FIGURE 3

TABLE 1
Field Screening Data
Windward Pointe
2400 Lakeshore Drive, Muskegon, MI

Sample Location	Date	Time	VOCs (ppm)	% LEL	CO (ppm)	CH4 (%BV)	CO2 (%BV)	O2 (%BV)
VP-1-23	9/28/2023	11:26	0.0	-	0.0	0.1%	11.8%	5.9%
	9/29/2023	14:39	0.0	0.0%	1.0	0.0%	11.1%	6.1%
	10/3/2023	14:18	0.0	-	4.0	0.0%	9.9%	0.0%
VP-2-23	9/28/2023	12:11	14.3	-	1.0	2.3%	6.4%	<<<<
	9/29/2023	14:57	9.0	34.0%	2.0	2.0%	6.1%	0.0%
	10/3/2023	14:59	13.6	-	10	1.3%	5.7%	0.0%
VP-3-23	9/28/2023	12:44	0.0	-	2.0	59.8%	36.8%	<<<<
	9/29/2023	15:34	0.0	>100%	4.0	57.3%	36.6%	0.0%
	10/3/2023	15:28	0.0	-	10.0	53.8%	36.6%	0.0%
VP-4-23	9/28/2023	13:12	0.0	-	3.0	63.2%	36.8%	<<<<
	9/29/2023	16:04	0.0	>100%	0.0	62.7%	37.3%	0.0%
	10/3/2023	16:10	0.0	-	8.0	59.6%	38.6%	0.0%
VP-5-23	9/28/2023	13:46	0.0	-	3.0	59.4%	38.8%	<<<<
	9/29/2023	16:28	0.0	>100%	0.0	57.9%	38.8%	1.2%
	10/3/2023	16:45	0.0	-	1.0	28.8%	39.0%	0.0%
VP-6-23	9/28/2023	14:27	0.9	-	1.0	4.6%	21.8%	0.0%
	9/29/2023	16:46	0.0	95.0%	0.0	5.2%	22.5%	0.0%
	10/3/2023	17:28	0.5	-	6.0	8.2%	23.0%	0.0%
VP-7-23	9/28/2023	14:55	0.2	-	1.0	0.0%	15.5%	6.0%
	10/2/2023	9:41	0.0	0.0%	1.0	0.0%	15.4%	6.5%
	10/4/2023	8:40	0.0	-	1.0	0.0%	15.5%	6.7%
VP-8-23	9/28/2023	15:39	0.0	-	4.0	31.5%	20.4%	8.0%
	10/2/2023	10:50	0.0	-	6.0	51.3%	28.3%	0.0%
	10/4/2023	8:55	0.2	-	1.0	60.2%	30.8%	0.0%
VP-9-23	9/28/2023	16:07	2.0	-	0.0	0.1%	17.3%	<<<<
	10/2/2023	11:22	1.4	-	2.0	0.0%	17.1%	<<<<
	10/4/2023	9:05	0.9	-	1.0	0.1%	17.9%	0.0%
VP-10-23	9/28/2023	16:44	0.1	-	1.0	0.0%	9.9%	8.9%
	10/2/2023	11:48	0.0	-	3.0	0.0%	9.2%	9.3%
	10/4/2023	9:30	0.0	-	0.0	0.0%	9.9%	9.9%
VP-11-23	9/28/2023	17:12	0.3	-	3.0	3.7%	17.7%	2.8%
	10/2/2023	13:06	0.3	-	4.0	5.0%	20.3%	0.1%
	10/4/2023	9:45	0.2	-	0.0	8.2%	23.1%	0.0%
VP-12-23	9/28/2023	18:57	0.0	-	0.0	0.1%	16.5%	2.9%
	10/2/2023	14:06	0.0	-	0.0	0.1%	16.5%	2.8%
	10/2/2023	14:21	0.0	-	0.0	0.0%	14.4%	3.7%
	10/4/2023	10:00	0.0	-	0.0	0.1%	15.9%	4.1%
VP-13-23	9/28/2023	19:26	0.0	-	0.0	0.1%	0.8%	19.5%
	10/2/2023	14:37	0.0	-	2.0	0.0%	0.5%	10.6%
	10/2/2023	14:48	0.0	-	0.0	0.0%	6.1%	18.0%
	10/4/2023	10:15	0.0	-	0.0	0.0%	0.7%	19.6%
VP-14-23	9/29/2023	8:18	0.0	-	0.0	0.1%	1.7%	18.7%
	10/2/2023	15:46	0.0	-	0.0	0.0%	1.2%	18.8%
	10/4/2023	10:30	0.0	-	0.0	0.0%	1.4%	19.0%
VP-15-23	9/29/2023	8:51	7.0	-	42.0	20.2%	0.1%	10.9%
	10/2/2023	16:23	2.9	-	85.0	44.0%	0.0%	0.0%
	10/4/2023	10:45	3.5	-	33.0	46.0%	0.0%	0.0%
VP-16-23	9/29/2023	9:18	1.0	-	1.0	0.3%	0.5%	19.7%
	10/2/2023	17:15	0.0	-	0.0	2.4%	1.7%	18.6%
	10/4/2023	11:00	0.0	-	37.0	8.5%	4.4%	15.3%
VP-17-23	9/29/2023	9:45	0.3	-	0.0	0.1%	9.7%	7.8%
	10/2/2023	17:57	0.1	-	0.0	0.0%	9.6%	7.4%
	10/4/2023	11:25	0.2	-	2.0	0.0%	10.3%	6.7%
VP-18-23	9/29/2023	010:16	0.4	-	24.0	0.8%	6.8%	9.8%
	10/3/2023	8:20	0.2	-	2.0	1.8%	13.4%	1.5%
VP-19-23	9/29/2023	10:40	0.6	-	0.0	0.1%	1.6%	15.0%
	10/3/2023	8:57	0.0	-	1.0	0.0%	2.8%	0.0%
VP-20-23	9/29/2023	11:05	0.0	-	0.0	0.0%	0.1%	17.0%
	10/3/2023	9:45	0.0	-	1.0	0.0%	0.2%	17.0%
VP-21-23	9/29/2023	11:32	0.3	-	35.0	0.4%	14.4%	0.0%
	10/3/2023	10:24	0.2	-	6.0	0.1%	15.1%	0.0%
VP-22-23	9/29/2023	11:57	0.0	-	9.0	29.3%	20.9%	<<<<
	10/3/2023	11:07	0.0	-	5.0	31.0%	22.9%	0.0%
VP-23-23	9/29/2023	12:20	0.0	-	0.0	0.3%	1.8%	17.2%
	10/3/2023	11:33	0.0	-	2.0	0.3%	1.7%	16.2%
VP-24-23	9/29/2023	12:46	0.1	-	2.0	20.4%	25.4%	<<<<
	10/3/2023	12:30	0.0	-	10.0	19.8%	25.0%	0.0%
VP-25-23	9/29/2023	13:17	0.0	-	0.0	0.0%	0.3%	18.0%
	10/3/2023	13:27	0.0	-	5.0	0.0%	0.3%	18.0%

TABLE 2
Methane Analytical Data
Windward Pointe
2400 Lakeshore Drive, Muskegon, MI

LAB ID	SAMPLE ID	ERG SAMPLE ID	DATE SAMPLED	PARAMETER	RESULTS	UNITS
23J0346-12	S54173.12	Field Blank	10/3/2023	Methane	<6,600	ug/m³
23J0346-27	S54173.27	M-DUP1A	10/4/2023	Methane	**85,000**	ug/m³
23J0346-09	S54173.09	SG-VP-1-23	10/3/2023 2:15:00 PM	Methane	<6,600	ug/m³
23J0346-10	S54173.10	SG-VP-2-23	10/3/2023 3:30:00 PM	Methane	**14,000,000**	ug/m³
23J0346-11	S54173.11	SG-VP-3-23	10/3/2023 3:50:00 PM	Methane	**410,000,000**	ug/m³
23J0346-13	S54173.13	SG-VP-4-23	10/3/2023 4:25:00 PM	Methane	**430,000,000**	ug/m³
23J0346-14	S54173.14	SG-VP-5-23	10/3/2023 5:15:00 PM	Methane	**420,000,000**	ug/m³
23J0346-15	S54173.15	SG-VP-6-23	10/3/2023 5:45:00 PM	Methane	**50,000,000**	ug/m³
23J0346-16	S54173.16	SG-VP-7-23	10/4/2023 8:40:00 AM	Methane	**8,300**	ug/m³
23J0346-17	S54173.17	SG-VP-8-23	10/4/2023 8:55:00 AM	Methane	**320,000,000**	ug/m³
23J0346-18	S54173.18	SG-VP-9-23	10/4/2023 9:05:00 AM	Methane	**100,000**	ug/m³
23J0346-19	S54173.19	SG-VP-10-23	10/4/2023 9:30:00 AM	Methane	<6,600	ug/m³
23J0346-20	S54173.20	SG-VP-11-23	10/4/2023 9:45:00 AM	Methane	**86,000,000**	ug/m³
23J0346-21	S54173.21	SG-VP-12-23	10/4/2023 10:00:00 AM	Methane	<6,600	ug/m³
23J0346-22	S54173.22	SG-VP-13-23	10/4/2023 10:15:00 AM	Methane	<6,600	ug/m³
23J0346-23	S54173.23	SG-VP-14-23	10/4/2023 10:30:00 AM	Methane	<6,600	ug/m³
23J0346-24	S54173.24	SG-VP-15-23	10/4/2023 10:45:00 AM	Methane	**300,000,000**	ug/m³
23J0346-25	S54173.25	SG-VP-16-23	10/4/2023 11:00:00 AM	Methane	**12,000,000**	ug/m³
23J0346-26	S54173.26	SG-VP-17-23	10/4/2023 11:25:00 AM	Methane	**9,900**	ug/m³
23J0346-01	S54173.01	SG-VP-18-23	10/3/2023 11:30:00 AM	Methane	**11,000,000**	ug/m³
23J0346-02	S54173.02	SG-VP-19-23	10/3/2023 11:40:00 AM	Methane	<6,600	ug/m³
23J0346-06	S54173.06	SG-VP-20-23	10/3/2023 12:30:00 PM	Methane	<6,600	ug/m³
23J0346-03	S54173.03	SG-VP-21-23	10/3/2023 11:50:00 AM	Methane	**3,000,000**	ug/m³
23J0346-04	S54173.04	SG-VP-22-23	10/3/2023 11:55:00 AM	Methane	**220,000,000**	ug/m³
23J0346-05	S54173.05	SG-VP-23-23	10/3/2023 12:05:00 PM	Methane	**2,600,000**	ug/m³
23J0346-07	S54173.07	SG-VP-24-23	10/3/2023 12:50:00 PM	Methane	**170,000,000**	ug/m³
23J0346-08	S54173.08	SG-VP-25-23	10/3/2023 1:20:00 PM	Methane	<6,600	ug/m³

Residential / Non-Residential Volatilization to Indoor Air (VIAP) Screening Level (SL) (2020) for methane is 8,400,000 ug/m3.
Highlighted values indicate concentration exceeding VIAP SL.

Appendix B

2024 Supplemental Methane Investigation

Technical Memorandum

To: Larry Hines, Pure Muskegon LLC (Pure Muskegon)
From: Allen Prince, Barr Engineering Co. (Barr)
Subject: 2024 Supplemental Methane Investigation Results
Date: May 9, 2024
c: Trip Johnson & Steve Olson, Pure Muskegon
Mary Jane Rhoades & Scott Steiner, Rhoades McKee
J. Scott Timmer, Gielow, Groom, Terpstra, & McEvoy
Chris Miron, Barr

At the request of Pure Muskegon, LLC (Pure Muskegon) and in consultation with Parkland Properties of Michigan (Parkland), Barr Engineering Co. (Barr) completed a supplemental methane and hydrogen sulfide investigation of a property located at 2400 Lakeshore Drive in the City of Muskegon, Michigan (Property). The purpose of this technical memorandum is to summarize the results of that investigation to accompany a Response Activity Plan (ResAP) which will describe "due care" obligations under Section 20107a of Part 201 of the 1994 Michigan PA 451, as amended (Act 451), for the vapor intrusion pathway associated with the redevelopment of the Property.

The investigation was conducted to: (a) assess the potential for advective flow of methane in the subsurface by measurement of subsurface pressures relative to atmospheric pressure; and (b) further define a vertical profile of soil gas quality for methane, hydrogen sulfide and certain other constituents at locations previously sampled by Environmental Resources Group, LLC (ERG) in October 2023 on behalf of Parkland. The investigation was also intended to assess whether and to what extent methane concentrations in soil gas may decrease as a result of active soil gas extraction and the quality of off-gasses from a pilot-scale soil gas extraction test. More specifically, the investigation services included:

- Installation of soil gas wells near locations of wells previously installed by ERG to more fully define a vertical profile of soil gas quality for methane and other soil gas constituents;
- Sampling of soil gas for methane, hydrogen sulfide, oxygen, nitrogen, carbon monoxide, and carbon dioxide to develop a vertical profile of soil gas quality;
- Field measurement of differential pressures between soil gas and the atmosphere at the installed soil gas wells and accessible wells previously installed by ERG to assess the potential for advective (pressure-driven) flow of methane at the Property; and
- Installation of four (4) soil-gas extraction wells, extraction piping, soil gas wells and a soil gas extraction fan to allow for pilot-scale testing to assess methane concentrations in soil gas and the quality of off-gasses produced during active soil gas extraction.

Detailed results of the investigative activities are summarized in the sections below.

1 Soil Borings, Construction of Soil Gas Wells and Construction of Soil Gas Extraction Wells

A total of thirty-five (35) new soil gas wells were constructed on the Property to more fully develop a vertical profile of concentrations of methane, oxygen, carbon dioxide, carbon monoxide, and hydrogen

sulfide as well as differential pressures between soil gas and the atmosphere. Four (4) soil gas extraction wells were also installed as part of a pilot-scale soil gas extraction test, and sampling of extracted soil gas for methane and volatile organic compounds (VOCs). Twenty-five (25) of the thirty-five (35) soil gas wells were installed as close as practical to the twenty-five (25) soil gas wells installed by ERG in October 2023. The remaining ten (10) soil gas wells were installed in nested clusters of two (2) wells, with shallow and intermediate depth intervals. The nested soil gas wells and four (4) soil gas extraction wells used for pilot-scale soil gas testing were installed in the west/central portion of the Property. Figure 1 shows the locations of the soil gas and soil gas extraction wells.

Soil Gas and Soil Gas Extraction Wells

A Barr geologist was on site from January 22 to January 24, 2024, to oversee construction of the soil gas and soil gas extraction wells. Soil borings for the soil gas wells were constructed at each soil gas well location using direct-push drilling techniques (Figure 1). Barr's field geologist logged soil stratigraphy and completed environmental field screening of each of the soil borings, including documentation of visual and olfactory observations as well as photoionization detector (PID) measurements. Soils encountered at the boring locations typically included sandy soils with gravel and silt, with sporadic organics and fill materials, including demolition debris and lime. Soil boring logs with stratigraphy, environmental screening and well construction details are included in Appendix A.

Soil gas wells were constructed at each soil boring location. Each well was constructed with a 6-inch long stainless steel screen and Teflon tubing, with a 2-inch protective polyvinyl chloride (PVC) cover and cap. The total depths of the wells ranged from 6 to 10 feet (ft) of blow ground surface (bgs). Twenty-five (25) soil gas wells were screened at 2 ft bgs. Ten (10) soil gas wells were screened as nested clusters of two (2) wells with shallow and intermediate screened intervals set at 2 ft and 5 ft bgs respectively. In every location where soil gas wells were constructed, an additional nested soil gas well was planned to be installed at a deep interval of approximately 8 – 10 ft bgs, just above a previously documented elevation of the groundwater table at the Property. The depth to groundwater at the time of well construction on the Property was shallower than expected at approximately 6 feet bgs, which precluded the installation of soil gas wells screens set at 8 – 10 ft bgs.

Soil borings for soil gas extraction wells were drilled at the locations shown in Figure 1 using hollow-steam auger drilling techniques. Barr's field geologist logged soil stratigraphy and completed environmental field screening of each of the soil borings, including documentation of visual and olfactory observations as well as PID measurements. Soils encountered at the boring locations typically included fine silty sands with some gravel and sporadic demolition debris.

Soil gas extraction wells were constructed at each boring location. Each well was constructed with a 2-inch diameter PVC casing, with a 2.5 ft long 10-slot PVC screen. The total depths of the wells were approximately 10 ft bgs and were screened from 2.5 – 5 ft bgs.

Soil Gas Extraction Pilot

A Barr geologist was on site to construct a pilot-scale soil gas extraction system from January 31 to February 1 in the western central portion of the Property (Figure 1). The pilot-scale soil gas extraction system was comprised of four (4) soil gas extraction wells and ten (10) soil gas wells, in nested clusters of two (2) wells. The four (4) soil gas extraction wells were installed in a spatial arrangement that approximated the locations of sub-slab depressurization suction points that would be installed below a

typical residential home foundation proposed to be constructed on the Property by Parkland. The five (5) nested clustered of (2) soil gas wells were installed at variable distances from the soil gas extraction wells both inside and outside of the hypothetical footprint of a typical residential home foundation proposed to be constructed on the Property by Parkland. Figure 1 shows a general arrangement of the soil gas and soil gas extraction wells.

Each of the four (4) soil gas extraction wells was installed with a 2.5-ft open-ended piece of 2-inch PVC pipe above the ground surface. These pipes were manifolded together with 2-inch diameter PVC pipe to create two 2-inch PVC lines, which were further manifolded together in a single 4-inch diameter PVC pipe connected to a centrifugal fan. The fan was an OBAR model GBR-89, with an integrated variable-frequency drive (VFD). The fan was powered by existing 120-volt electrical power supply at the site. The soil gas extraction pilot was started on February 27 with the fan operating at a flowrate of approximately 150 cubic feet per minute (CFM) and 7 inches of water static pressure. The fan was increased to a rate of 200 CFM at 10 inches of water and left to run before the pilot-scale test was discontinued on March 1, 2024.

2 Soil-Gas Sampling and Analytical Results

Barr collected soil gas samples from thirty-one (31) soil gas wells from February 8 to February 14, 2024. At the time of sampling, groundwater had infiltrated the intermediate depths of four (4) of the five (5) nested soil gas wells installed for the soil gas extraction pilot, precluding the collecting of soil gas samples from these wells.

On February 27, prior to starting the soil gas extraction pilot, Barr attempted to collect samples from the nearby nested soil gas wells at intermediate depths. Only one (1) soil gas sample was collected from a soil gas well at the intermediate depth interval of five (5) ft because high groundwater conditions precluded collecting samples from the remaining four (4) soil gas wells installed at intermediate depths. Immediately following the pilot-scale test startup, two off-gas samples were taken from the pilot exhaust.

On March 1, prior to discontinuing the soil gas extraction pilot-scale test, Barr collected two off-gas samples from the fan exhaust. After shutting down the pilot-scale test, Barr collected soil gas samples from eight (8) wells installed for the pilot. At the time of sampling, groundwater elevations had reduced sufficiently to allow the collection of soil gas samples from three (3) wells at the intermediate depth interval of five (5) ft.

Forty (40) total soil gas samples were collected following soil gas sample collection methods recommended by the Michigan Department of Environment, Great Lakes, and Energy (EGLE). Soil gas samples were field screened for methane, carbon dioxide and oxygen using a GEM™ 5000 landfill gas meter. Soil gas samples were also screened using a PID. Field measurements of differential pressure between the screened interval of the soil gas well and the atmosphere were taken from each installed soil gas well and accessible soil gas wells installed by ERG on the Property in October 2023 using an Alnor®

micromanometer[1]. Differential pressure measurements were screened against indoor risk values in ASTM E2993 – 16[2]. Barometric pressure and temperature were also recorded.

All soil gas samples were analyzed for methane, oxygen, nitrogen, carbon dioxide, carbon monoxide and hydrogen sulfide. Samples of off-gasses from the soil gas extraction pilot were analyzed for the same constituents as the soil gas samples and were also analyzed for VOCs. Soil gas results were screened against Residential Volatilization to Indoor Air Pathway Screening Levels (VIAP SLs) developed by EGLE[3]. Field and analytical soil gas results are summarized in Table 1. Analytical off-gas results are summarized in Table 2. Differential pressure results are summarized in Table 3.

The soil gas and off-gas samples were shipped to Air Technology Laboratories, Inc. in City of Industry, California for analysis. All samples delivered to the lab were analyzed within the holding time of seven (7) days. Laboratory analytical reports for the soil gas and off-gas samples are included in Appendix B.

2.1 Methane, Hydrogen Sulfide and Other Atmospheric Gas Results in Soil Gas

Soil gas samples were analyzed for methane, oxygen, nitrogen, carbon dioxide, carbon monoxide and hydrogen sulfide. Every sample was below the detection limit for hydrogen sulfide. Methane was detected in 17 of the 40 soil gas samples collected as part of this scope of work. The remaining 23 samples did not contain detectable concentrations of methane. Methane exceeded the residential VIAP SLs in five samples: VP-3-24, VP-6-24, VP Pilot N (5 ft), and from VP Pilot C (5 ft) during two different sampling events. Concentrations of oxygen, nitrogen and carbon dioxide approximated typical atmospheric concentrations in soil gas samples taken from soil gas wells at 2 ft bgs. In soil gas samples taken from soil gas wells at 5 ft bgs that had detections of methane, oxygen concentrations were markedly less than typical atmospheric conditions at 1 – 12 %(v/v) and carbon dioxide concentrations were elevated at 2 – 12 %(v/v), suggesting an anoxic environment which is consistent with the presence/generation of methane. Figure 2 shows the soil gas methane sampling results with exceedances highlighted. Table 1 summarizes the analytical results from soil gas sampling.

The nature of the residential and non-residential structures proposed to be constructed on the Property by Parkland would preclude the use of residential VIAP SLs as site-specific volatilization to indoor air criteria (SSVIAC) for activities related to “due care” obligations under Section 20107a of Part 201. However, existing soil gas data developed in October 2023 indicates methane concentrations significantly in excess of the residential VIAP SL for methane. A SSVIAC for methane, if developed for the Property, would likely not be materially less stringent than the VIAP SL, in the context of the methane concentrations that have been observed in the subsurface. As a result, the current residential VIAP SL for methane was used to screen soil gas methane data from the Property.

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1 Soil gas wells were constructed with caps on the soil gas well tubing to allow pressure in the soil gas wells to accumulate prior to the collection of field measurements. At each soil gas well, differential pressure field measurements were collected prior to other field measurements.

2 American Society of Testing and Materials International. E2993 – 16: Standard Guide for Evaluating Potential Hazard as a Result of Methane in the Vadose Zone. May 2016.

3 Michigan Department of Environment, Great Lakes and Energy. *Guidance Document for the Vapor Intrusion Pathway.* May 2013. Appendix D.1 – Revised February 2024.

2.2 Methane, Hydrogen Sulfide and VOC Results in Soil Gas Extraction Pilot-Scale Testing Off-Gases

Off-gases from the soil gas extraction pilot-scale test were analyzed for methane, oxygen, nitrogen, carbon dioxide, carbon monoxide, hydrogen sulfide and VOCs. The off-gas samples taken immediately after startup of the soil gas extraction pilot-scale test were below the detection limit for hydrogen sulfide. Methane was detected in the off-gases at a concentration of 0.023 %(v/v). The VOCs carbon disulfide, acetone and 2-butanone (i.e., methyl ethyl ketone) were also detected in the off-gases.

The off-gas samples taken immediately prior to discontinuation of the soil gas extraction pilot-scale test were below the detection limit for hydrogen sulfide. Methane was detected in the final off-gas sample at a concentration of 0.013 % (v/v); approximately 56% of the concentration in the initial off-gas sample. The VOCs toluene and carbon disulfide were also detected in the off-gases. Table 2 shows the analytical results from the pilot-scale testing off-gas sampling.

The off-gas sampling results were used to develop a preliminary estimate of air emissions for the soil gas extraction activities. R 336.1290 (i.e., "Rule 290") of the administrative rules promulgated pursuant to Part 55 (Air Pollution Control) of Act 451, establishes threshold limits for air emissions of constituents under which the emitting system is exempt from the requirement to obtain an air quality permit to install. Estimated uncontrolled emissions rates for detected constituents and operational data are presented in Appendix C.

Based on the analysis in Appendix C, the exhaust from the soil gas extraction system was exempt from the requirement to obtain an air quality permit to install at the time of sampling.

2.3 Field Sampling Results

Field-collected oxygen and carbon dioxide data generally agree with laboratory analytical data for soil gas samples. Field-collected methane data reflect analytical data much more accurately for higher methane concentrations in soil gas samples, such as those collected from VP-3-24 and VP-6-24. This suggests that the methane values for soil gas samples from the other wells were too close to the GEM™ 5000s detection limit to effectively distinguish samples from noise. Table 1 summarizes collected field data.

Differential pressure was collected at the time of sampling, prior to sampling of each soil gas well. Two additional field events were conducted on March 14 and March 18 to measure differential pressures in the 35 installed soil gas wells and accessible soil gas wells installed by ERG on the Property in October 2023. The absolute values of all differential pressure values collected are significantly below the ASTM E2993-16[4] risk threshold value of 2 inches water, including from wells previously installed by ERG. The highest observed differential pressure was 0.353 from VP-6-23 (5 ft). Approximately 47% of the measured differential pressure value were negative, which is suggestive of air flowing from the atmosphere into the soil gas. Approximately 53% of the measured differential pressure values were positive, which is suggestive of soil gas flowing from the soil to the atmosphere. The remaining differential pressure values were measured as 0. Table 3 summarizes differential pressure data.

[4] Ibid

3 Conclusions and Recommendations

Barr conducted the supplemental methane and hydrogen sulfide investigation at the Property to further define a vertical profile of soil gas quality for methane, hydrogen sulfide and other constituents at locations previously sampled in October 2023. The investigation also assessed whether and to what extent methane concentrations in soil gas decreased as a result of active soil gas extraction and the quality of off-gasses from a soil gas extraction pilot test. The findings and conclusions from the above sections are summarized below.

3.1 Methane, Hydrogen Sulfide and Other Atmospheric Gases Results in Soil Gas

- Hydrogen sulfide was not detected in soil gas in any of the samples collected as part of this supplemental investigation.
- Methane concentrations in soil gas at 2 ft bgs were below the residential VIAP SLs except for two samples from VP-3-24 and VP-6-24, both located near the eastern shore of the Property.
- At every nested soil gas well sampled, methane concentrations in the soil gas at 2 ft bgs were less than methane concentrations in soil gas at 5 ft bgs.
- The combined concentrations of methane and carbon dioxide in soil gas wells at 5 ft bgs are less than 90% and therefore do not suggest the presence of "undiluted" biogas as defined in the ASTM 2993 -16[5] risk assessment framework.
- Methane in soil gas decreased as a result of the soil gas extraction pilot in soil gas wells installed at 5 ft bgs.
- Methane in soil gas increased slightly between some samples taken before starting the pilot-scale soil gas extraction test and samples taken after the test in soil gas wells installed at 2 ft bgs. Methane concentrations in these samples remain low and significantly below the residential VIAP SL for methane.
- All differential pressures collected were substantially below the ASTM E2993-16 risk threshold value of 2 inches water. Negative differential pressure values are attributed to the variable barometric pressure between measuring events, variable changes in temperature through the investigation, and spring snow melt conditions.

3.2 Methane, Hydrogen Sulfide and VOC Results in Soil Gas Extraction Pilot-Scale Test Off-Gases

- Hydrogen sulfide was not detected in the off-gases from pilot-scale soil gas extraction.
- Methane in the pilot-scale test off-gases decreased over the course of the test.
- All VOCs in the pilot-scale test off-gases decreased over the course of the test, except for toluene.
- The off-gases from the pilot-scale soil gas extraction system was exempt from the requirement to obtain an air quality permit to install at the time of sampling. Estimated VOC emission rates from the pilot-scale testing, extrapolated to a full month of operation, are 0.5 lb/month, well below the R290 exemption emissions threshold for non-carcinogenic compounds of 1,000 lb/month.
- The off-gases from the pilot-scale test is likely representative of off-gases that would be expected from a typical sub-slab depressurization system installed underlying a structure in this area of the Property as part of Parkland's proposed redevelopment of the Property. Off-gases from the

5 Ibid

proposed sub-slab depressurization systems are considered likely to constitute R290 exempt sources of air emissions, as a result.

Attachments:

Table 1 – Summary of Soil Gas Field and Analytical Data
Table 2 – Summary of Soil Gas Extraction Pilot Off-Gas Results
Table 3 – Summary of Differential Pressure Results
Figure 1 – Soil Gas and Pilot Extraction Well Locations
Figure 2 – Soil Gas Methane Results
Appendix A - Soil Boring Logs
Appendix B – Lab Data
Appendix C – Preliminary Air Emissions Estimate

Tables

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Table 1
Summary of Soil Gas Field and Analytical Data
2024 Supplemental Methane Investigation - 2400 Lakeshore Drive, Muskegon, Michigan
Pure Muskegon, LLC

					Location	VP Pilot 15 E	VP Pilot 15 E	VP Pilot 20 N	VP Pilot 20 N	VP Pilot 20 N	VP Pilot 20 N	VP Pilot C	VP Pilot C	VP Pilot C
					Date	2/13/2024	3/01/2024	2/13/2024	2/13/2024	3/01/2024	3/01/2024	2/14/2024	2/27/2024	3/01/2024
					Depth	2 ft	2 ft	5 ft	2 ft	5 ft	2 ft	2 ft	5 ft	5 ft
					Sample Type	N	N	N	N	N	N	N	N	N
Parameter	Total or Dissolved	Analysis Location	Residential VIAP Screening Level	Units										
Gereral Parameters														
Carbon dioxice (CO2)	NA	Lab		% v/v	0.22	0.23	2.0	0.40	1.3	0.40	0.18	12	9.6
Carbon monoxide	NA	Lab		% v/v	< 0.0027 U	< 0.0025 U	< 0.0025 U	< 0.0025 U	< 0.0024 U	< 0.0027 U	< 0.0024 U	< 0.0027 U	< 0.0024 U
Methane	NA	Lab	1.3	% v/v	< 0.0027 U	< 0.0025 U	0.010	< 0.0025 U	< 0.0024 U	< 0.0027 U	< 0.0024 U	76	61
Nitrogen, gas (N2)	NA	Lab		% v/v	79	79	86	79	78	79	79	11	24
Oxygen + Argon	NA	Lab		% v/v	20	21	12	21	20	21	21	1.4	4.8
Field Parameters														
Ambient temperature	NA	Field		deg F	35	47	35	35	47	47	34	62	47
Barometric pressure	NA	Field		in Hg	--	30.15	29.36	29.36	30.15	30.15	--	--	30.15
Carbon Dioxide (CO2), background	NA	Field		%	0.1	0.1	0.1	0.1	0	0	0.1	0.1	--
Carbon Dioxide (CO2), in hose	NA	Field		%	0.4	0.3	2.8	0.7	2.9	0.5	0.3	10.0	11.4
Methane (CH4), background	NA	Field		%	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0
Methane (CH4), in hose	NA	Field		%	0.1	0.1	0.4	0.1	0.1	0.1	0.1	39.0	68.4
Oxygen (O2), background	NA	Field		%	21.1	20.6	21.0	--	20.9	20.5	20.4	20.5	20.5
Oxygen (O2), in hose	NA	Field		%	20.5	20.7	12.4	20.5	18.5	20.3	20.3	10.7	2.2
PID, background	NA	Field		ppm	0	0	0	0	0	0	0	0	0
PID, in hose	NA	Field		ppm	0	0	0	0	0	0	0	0	0
Semivolatile Organic Compounds														
Hydrogen sulfide	NA	Lab		ppmv	< 0.53 U	< 0.51 U	< 0.49 U	< 0.51 U	< 0.48 U	< 0.53 U	< 0.48 U	< 0.55 U	< 0.48 U

Footnotes

N Sample Type: Normal

U The analyte was analyzed for, but was not detected.

-- Not analyzed/Not available.

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Table 1
Summary of Soil Gas Field and Analytical Data
2024 Supplemental Methane Investigation - 2400 Lakeshore Drive, Muskegon, Michigan
Pure Muskegon, LLC

				Location	VP Pilot C	VP Pilot N	VP Pilot N	VP Pilot N	VP Pilot S	VP Pilot S	VP-1-24	VP-2-24	VP-3-24	VP-4-24	VP-5-24	VP-6-24
				Date	3/01/2024	2/13/2024	3/01/2024	3/01/2024	2/14/2024	3/01/2024	2/08/2024	2/08/2024	2/08/2024	2/08/2024	2/08/2024	2/08/2024
				Depth	2 ft	2 ft	5 ft	2 ft	2 ft	2 ft	2 ft	2 ft	2 ft	2 ft	2 ft	2 ft
				Sample Type	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	Total or Dissolved	Analysis Location	Residential VIAP Screening Level	Units												
General Parameters																
Carbon dioxide (CO2)	NA	Lab		% v/v	**0.16**	**0.52**	**7.6**	**0.099**	**1.7**	**0.12**	**2.6**	**1.2**	**9.0**	**0.63**	**1.3**	**22**
Carbon monoxide	NA	Lab		% v/v	< 0.0025 U	< 0.0027 U	< 0.0028 U	< 0.0025 U	< 0.0022 U	< 0.0023 U	< 0.0024 U	< 0.0027 U	< 0.0024 U	< 0.0027 U	< 0.0024 U	< 0.0025 U
Methane	NA	Lab	1.3	% v/v	**0.0078**	< 0.0027 U	**22**	**0.0028**	< 0.0022 U	< 0.0023 U	< 0.0024 U	**0.011**	**12**	**1.1**	**1.1**	**25**
Nitrogen, gas (N2)	NA	Lab		% v/v	**79**	**79**	**63**	**79**	**82**	**79**	**85**	**81**	**77**	**81**	**78**	**52**
Oxygen + Argon	NA	Lab		% v/v	**20**	**20**	**7.6**	**21**	**17**	**21**	**12**	**18**	**2.0**	**17**	**20**	< 1.3 U
Field Parameters																
Ambient temperature	NA	Field		deg F	--	--	**47**	**47**	**34**	**47**	--	**40**	**40**	**46**	**53**	--
Barometric pressure	NA	Field		in Hg	--	--	**30.15**	**30.15**	**29.61**	**30.15**	**29.26**	--	**29.26**	**29.25**	--	**29.18**
Carbon Dioxide (CO2), background	NA	Field		%	--	**0.1**	--	--	**0.1**	**0**	**0.2**	**0.2**	**0.2**	**0.1**	--	**0.1**
Carbon Dioxide (CO2), in hose	NA	Field		%	--	**0.3**	**1.1**	**0.2**	**1.8**	**0.1**	**4.3**	**1.8**	**10.4**	**1.0**	**1.4**	**22.6**
Methane (CH4), background	NA	Field		%	--	**0.1**	**0.1**	**0**	**0.1**	**0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Methane (CH4), in hose	NA	Field		%	--	**0.1**	**0.4**	**0**	**0.1**	**0.1**	**0.1**	**0.1**	**12.8**	**1.3**	**0.9**	**25.3**
Oxygen (O2), background	NA	Field		%	--	**20.5**	**20.5**	**20.5**	**20.4**	**20.8**	**20.5**	**20.6**	**21.0**	**21.1**	**21.2**	**21.2**
Oxygen (O2), in hose	NA	Field		%	--	**19.5**	**19.6**	**20.3**	**17.0**	**20.8**	**9.0**	**17.1**	**0.5**	**13.3**	**19.9**	**0.3**
PID, background	NA	Field		ppm	--	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PID, in hose	NA	Field		ppm	--	**0**	**0**	**0**	**0**	**0**	**0.1**	**0**	**0**	**0**	**0**	**0.4**
Semivolatile Organic Compounds																
Hydrogen sulfide	NA	Lab		ppmv	< 0.51 U	< 0.55 U	< 0.56 U	< 0.51 U	< 0.44 U	< 0.46 U	< 0.48 U	< 0.53 U	< 0.48 U	< 0.53 U	< 0.48 U	< 0.51 U

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Table 1
Summary of Soil Gas Field and Analytical Data
2024 Supplemental Methane Investigation - 2400 Lakeshore Drive, Muskegon, Michigan
Pure Muskegon, LLC

				Location	VP-7-24	VP-8-24	VP-9-24	VP-10-24	VP-11-24	VP-12-24	VP-13-24	VP-14-24	VP-15-24	VP-16-24	VP-17-24	VP-18-24
				Date	2/08/2024	2/08/2024	2/09/2024	2/09/2024	2/09/2024	2/09/2024	2/09/2024	2/09/2024	2/13/2024	2/09/2024	2/09/2024	2/12/2024
				Depth	2 ft	2 ft	2 ft	2 ft	2 ft	2 ft	2 ft	2 ft	2 ft	2 ft	2 ft	2 ft
				Sample Type	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	Total or Dissolved	Analysis Location	Residential VIAP Screening Level	Units												
General Parameters																
Carbon dioxide (CO2)	NA	Lab		% v/v	**2.3**	**1.4**	**9.2**	**6.9**	**0.32**	**3.0**	**0.094**	**0.41**	< 0.024 U	< 0.025 U	**4.4**	**0.60**
Carbon monoxide	NA	Lab		% v/v	< 0.0025 U	< 0.0025 U	< 0.0027 U	< 0.0027 U	< 0.0026 U	< 0.0025 U	< 0.0025 U	< 0.0028 U	< 0.0024 U	< 0.0025 U	< 0.0027 U	< 0.0024 U
Methane	NA	Lab	1.3	% v/v	< 0.0025 U	**0.0060**	**1.1**	< 0.0027 U	< 0.0026 U	< 0.0025 U	**0.0059**	< 0.0028 U	**0.037**	< 0.0025 U	< 0.0027 U	**0.0045**
Nitrogen, gas (N2)	NA	Lab		% v/v	**78**	**79**	**88**	**83**	**79**	**80**	**79**	**79**	**79**	**79**	**84**	**79**
Oxygen + Argon	NA	Lab		% v/v	**19**	**20**	**1.6**	**9.5**	**21**	**17**	**21**	**21**	**21**	**21**	**12**	**20**
Field Parameters																
Ambient temperature	NA	Field		deg F	**53**	**56**	**43**	**43**	**46**	**46**	**46**	**46**	**34**	**48**	**47**	**31**
Barometric pressure	NA	Field		in Hg	**29.23**	**29.18**	**29.12**	**29.15**	**29.15**	**29.14**	**29.16**	**29.14**	**29.35**	**29.13**	**29.13**	**29.30**
Carbon Dioxide (CO2), background	NA	Field		%	**0.1**	--	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Carbon Dioxide (CO2), in hose	NA	Field		%	**2.5**	**1.7**	**9.5**	**7.5**	**0.4**	**3.1**	**0.2**	**0.5**	**0.2**	**0.1**	**4.7**	**0.9**
Methane (CH4), background	NA	Field		%	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Methane (CH4), in hose	NA	Field		%	**0.1**	**0.1**	**1.3**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.5**	**0.2**	**0.1**	**0.1**
Oxygen (O2), background	NA	Field		%	**20.9**	--	**20.8**	**20.8**	**21.6**	**21.5**	**20.8**	**21.1**	**20.5**	**21.3**	**21.0**	**19.6**
Oxygen (O2), in hose	NA	Field		%	**18.7**	**19.4**	**0.7**	**9.4**	**21.5**	**16.8**	**21.1**	**21.5**	**17.6**	**20.9**	**11.4**	**18.6**
PID, background	NA	Field		ppm	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PID, in hose	NA	Field		ppm	**0**	**0**	**0**	**0.2**	**0**	**0**	**0**	**0**	**0**	**0.1**	**0**	**0**
Semivolatile Organic Compounds																
Hydrogen sulfide	NA	Lab		ppmv	< 0.49 U	< 0.49 U	< 0.53 U	< 0.53 U	< 0.52 U	< 0.49 U	< 0.51 U	< 0.56 U	< 0.48 U	< 0.51 U	< 0.53 U	< 0.48 U

Table 1
Summary of Soil Gas Field and Analytical Data
2024 Supplemental Methane Investigation - 2400 Lakeshore Drive, Muskegon, Michigan
Pure Muskegon, LLC

				Location	VP-19-24	VP-20-24	VP-21-24	VP-22-24	VP-23-24	VP-24-24	VP-25-24
				Date	2/12/2024	2/12/2024	2/12/2024	2/12/2024	2/12/2024	2/12/2024	2/12/2024
				Depth	2 ft	2 ft	2 ft	2 ft	2 ft	2 ft	2 ft
				Sample Type	N	N	N	N	N	N	N
Parameter	Total or Dissolved	Analysis Location	Residential VIAP Screening Level	Units							
General Parameters											
Carbon dioxide (CO2)	NA	Lab		% v/v	**0.083**	< 0.024 U	**0.43**	**2.9**	**2.0**	**1.3**	**0.40**
Carbon monoxide	NA	Lab		% v/v	< 0.0024 U	< 0.0024 U	< 0.0024 U	< 0.0024 U	< 0.0025 U	< 0.0024 U	< 0.0025 U
Methane	NA	Lab	1.3	% v/v	< 0.0024 U	< 0.0024 U	< 0.0024 U	< 0.0024 U	< 0.0025 U	< 0.0024 U	**0.0028**
Nitrogen, gas (N2)	NA	Lab		% v/v	**81**	**80**	**88**	**83**	**78**	**78**	**79**
Oxygen + Argon	NA	Lab		% v/v	**19**	**20**	**12**	**14**	**20**	**20**	**21**
Field Parameters											
Ambient temperature	NA	Field		deg F	--	**32**	**34**	**34**	**36**	**36**	**35**
Barometric pressure	NA	Field		in Hg	--	**29.26**	**29.26**	**29.26**	**29.26**	**29.26**	**29.26**
Carbon Dioxide (CO2), background	NA	Field		%	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Carbon Dioxide (CO2), in hose	NA	Field		%	**0.3**	**0.2**	**0.6**	**3.3**	**2.0**	**1.5**	**0.6**
Methane (CH4), background	NA	Field		%	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Methane (CH4), in hose	NA	Field		%	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Oxygen (O2), background	NA	Field		%	**19.8**	**21.1**	**21.2**	**21.1**	**21.4**	**21.5**	**20.8**
Oxygen (O2), in hose	NA	Field		%	**16.1**	**20.1**	**10.6**	**14.3**	**19.9**	**20.5**	**20.5**
PID, background	NA	Field		ppm	**0**	**0**	**0.1**	**0**	**0**	**0**	**0**
PID, in hose	NA	Field		ppm	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Semivolatile Organic Compounds											
Hydrogen sulfide	NA	Lab		ppmv	< 0.48 U	< 0.48 U	< 0.48 U	< 0.48 U	< 0.51 U	< 0.48 U	< 0.51 U

Table 2

Summary of Soil Gas Extraction Pilot Off-Gas Results

2024 Supplemental Methane Investigation - 2400 Lakeshore Drive, Muskegon, Michigan

Pure Muskegon, LLC

Location		Pilot Effluent #1	Pilot Effluent #2	Pilot Effluent #1	Pilot Effluent #2
Container					
Date		2/27/2024	2/27/2024	3/01/2024	3/01/2024
Sample Type		N	N	N	N
Parameter	Units				
General Parameters					
Carbon dioxide (CO2)	% v/v	--	**0.21**	--	**0.085**
Carbon monoxide	% v/v	--	< 0.0025 U	--	< 0.0022 U
Methane	% v/v	**0.023**	**0.023**	**0.013**	**0.012**
Nitrogen, gas (N2)	% v/v	--	**79**	--	**79**
Oxygen + Argon	% v/v	--	**21**	--	**21**
Semivolatile Organic Compounds					
Hydrogen sulfide	ppmv	--	< 0.49 U	--	< 0.44 U
Volatile Organic Compounds					
1,1,1-Trichloroethane	ppbv	< 2.4 U	--	< 2.5 U	--
1,1,2,2-Tetrachloroethane	ppbv	< 2.4 U	--	< 2.5 U	--
1,1,2-Trichloroethane	ppbv	< 2.4 U	--	< 2.5 U	--
1,1-Dichloroethane	ppbv	< 2.4 U	--	< 2.5 U	--
1,1-Dichloroethylene	ppbv	< 2.4 U	--	< 2.5 U	--
1,2,4-Trichlorobenzene	ppbv	< 4.8 U	--	< 5.1 U	--
1,2,4-Trimethylbenzene	ppbv	< 2.4 U	--	< 2.5 U	--
1,2-Dibromoethane (EDB)	ppbv	< 2.4 U	--	< 2.5 U	--
1,2-Dichlorobenzene	ppbv	< 2.4 U	--	< 2.5 U	--
1,2-Dichloroethane	ppbv	< 2.4 U	--	< 2.5 U	--
1,2-Dichloroethylene, cis	ppbv	< 2.4 U	--	< 2.5 U	--
1,2-Dichloroethylene, trans	ppbv	< 2.4 U	--	< 2.5 U	--
1,2-Dichloropropane	ppbv	< 2.4 U	--	< 2.5 U	--
1,2-Dichlorotetrafluoroethane (Freon 114)	ppbv	< 2.4 U	--	< 2.5 U	--
1,3,5-Trimethylbenzene	ppbv	< 2.4 U	--	< 2.5 U	--
1,3-Dichlorobenzene	ppbv	< 2.4 U	--	< 2.5 U	--
1,3-Dichloropropene, cis	ppbv	< 2.4 U	--	< 2.5 U	--
1,3-Dichloropropene, trans	ppbv	< 4.8 U	--	< 5.1 U	--
1,4-Dichlorobenzene	ppbv	< 2.4 U	--	< 2.5 U	--
2-Hexanone	ppbv	< 2.4 U	--	< 2.5 U	--
4-Ethyltoluene	ppbv	< 2.4 U	--	< 2.5 U	--
Acetone	ppbv	**65**	--	< 13 U	--
Benzene	ppbv	< 2.4 U	--	< 2.5 U	--
Benzyl chloride	ppbv	< 2.4 U	--	< 2.5 U	--
Bromodichloromethane	ppbv	< 2.4 U	--	< 2.5 U	--
Bromoform	ppbv	< 2.4 U	--	< 2.5 U	--
Bromomethane	ppbv	< 2.4 U	--	< 2.5 U	--
Carbon disulfide	ppbv	**13**	--	**4.3**	--
Carbon tetrachloride	ppbv	< 2.4 U	--	< 2.5 U	--
Chlorobenzene	ppbv	< 2.4 U	--	< 2.5 U	--
Chlorodibromomethane	ppbv	< 2.4 U	--	< 2.5 U	--
Chloroethane	ppbv	< 12 U	--	< 13 U	--
Chloroform	ppbv	< 2.4 U	--	< 2.5 U	--
Chloromethane	ppbv	< 2.4 U	--	< 2.5 U	--
Dichlorodifluoromethane (Freon-12)	ppbv	< 2.4 U	--	< 2.5 U	--
Ethyl benzene	ppbv	< 2.4 U	--	< 2.5 U	--
Hexachlorobutadiene	ppbv	< 2.4 U	--	< 2.5 U	--
Methyl ethyl ketone (2-butanone)	ppbv	**220**	--	< 13 U	--
Methyl isobutyl ketone (MIBK)	ppbv	< 2.4 U	--	< 2.5 U	--
Methyl tertiary butyl ether (MTBE)	ppbv	< 2.4 U	--	< 2.5 U	--
Methylene chloride	ppbv	< 2.4 U	--	< 2.5 U	--
Styrene	ppbv	< 2.4 U	--	< 2.5 U	--
Tetrachloroethylene	ppbv	< 2.4 U	--	< 2.5 U	--
Toluene	ppbv	< 2.4 U	--	**7.0**	--
Trichloroethylene (TCE)	ppbv	< 2.4 U	--	< 2.5 U	--
Trichlorofluoromethane (Freon-11)	ppbv	< 2.4 U	--	< 2.5 U	--
Trichlorotrifluoroethane (Freon 113)	ppbv	< 2.4 U	--	< 2.5 U	--
Vinyl acetate	ppbv	< 2.4 U	--	< 2.5 U	--
Vinyl chloride	ppbv	< 2.4 U	--	< 2.5 U	--
Xylene, m & p	ppbv	< 4.8 U	--	< 5.1 U	--
Xylene, o	ppbv	< 2.4 U	--	< 2.5 U	--

Footnotes

N Sample Type: Normal

U The analyte was analyzed for, but was not detected.

-- Not analyzed/Not available.

Table 3

Summary of Differential Pressure Results

2024 Supplemental Methane Investigation - 2400 Lakeshore Drive, Muskegon, Michigan

Pure Muskegon, LLC

Footnotes

N Sample Type: Normal

U The analyte was analyzed for, but was not detected.

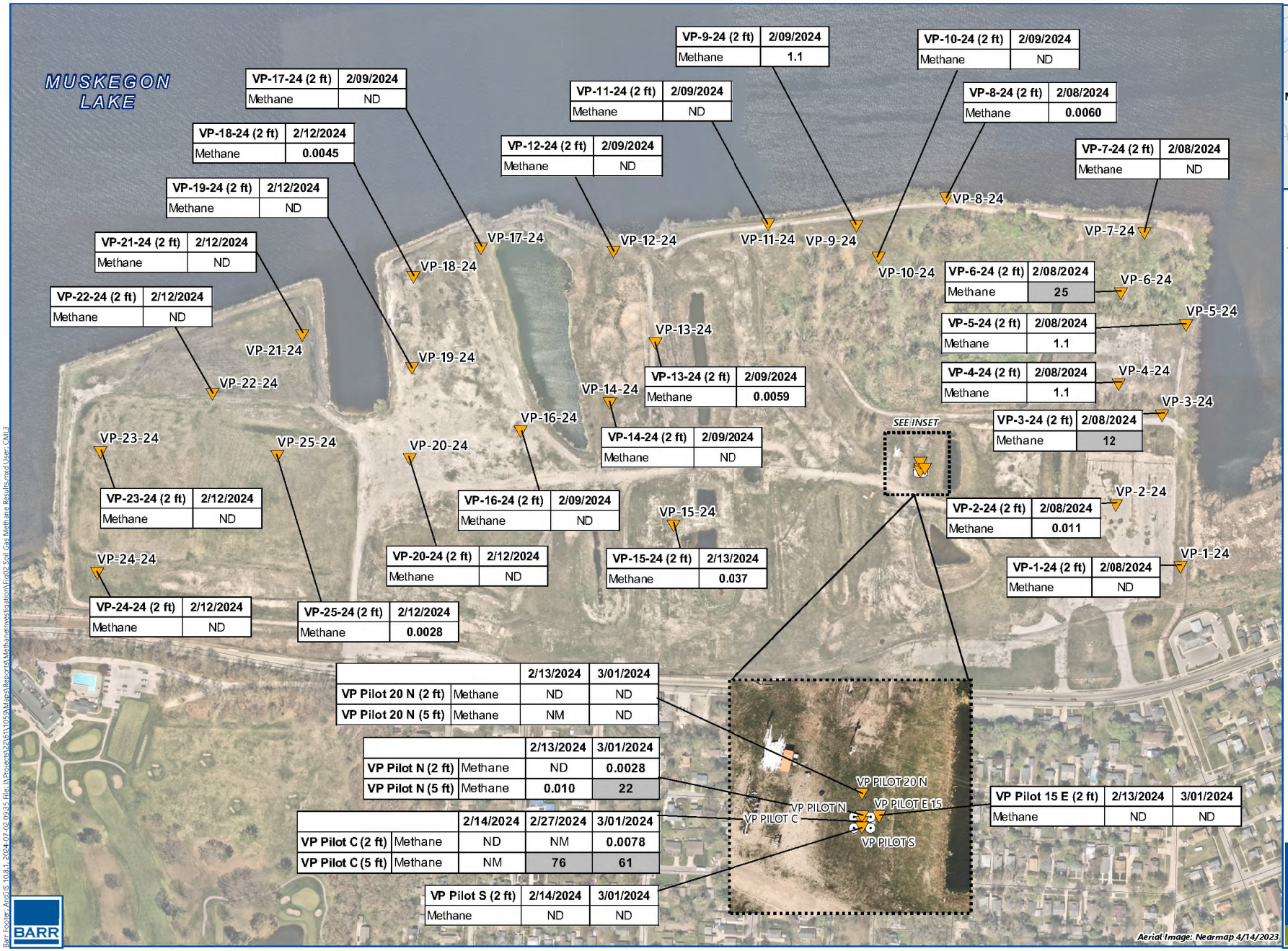
NM - Not measured / Unable to measure

-- Not measured

Parameter			Differential pressure	Barometric pressure	Ambient temperature
Analysis			Field	Field	Field
Location			Units	in H2O	in Hg	deg F
Location	Date	Depth			
VP-1-24	2/8/2024	2 ft	**0.006**	**29.26**	--
VP-2-24	2/8/2024	2 ft	**-0.004**	--	**40**
VP-3-23	2/8/2024	5 ft	**0.023**	--	--
VP-3-24	2/8/2024	2 ft	**0.009**	**29.26**	**40**
VP-4-24	2/8/2024	2 ft	**0.002**	**29.25**	**46**
VP-5-23	2/8/2024	5 ft	**0.346**	--	--
VP-5-24	2/8/2024	2 ft	**0.001**	--	**53**
VP-6-23	2/8/2024	5 ft	**0.353**	--	--
VP-6-24	2/8/2024	2 ft	**0.016**	**29.18**	--
VP-7-23	2/8/2024	5 ft	**0.001**	--	--
VP-7-24	2/8/2024	2 ft	**0.002**	**29.23**	**53**
VP-8-23	2/8/2024	5 ft	**0.340**	--	--
VP-8-24	2/8/2024	2 ft	**0.292**	**29.18**	**56**
VP-9-24	2/9/2024	2 ft	**0.006**	**29.12**	**43**
VP-10-23	2/9/2024	5 ft	NM	NM	NM
VP-10-24	2/9/2024	2 ft	**-0.004**	**29.15**	**43**
VP-11-23	2/9/2024	5 ft	NM	NM	NM
VP-11-24	2/9/2024	2 ft	**-0.001**	**29.15**	**46**
VP-12-23	2/9/2024	5 ft	**0.004**	--	--
VP-12-24	2/9/2024	2 ft	**-0.006**	**29.14**	**46**
VP-13-23	2/9/2024	5 ft	**0.010**	--	--
VP-13-24	2/9/2024	2 ft	**-0.002**	**29.16**	**46**
VP-14-23	2/9/2024	5 ft	**0.001**	--	--
VP-14-24	2/9/2024	2 ft	**-0.002**	**29.14**	**46**
VP-15-23	2/13/2024	5 ft	NM	NM	NM
VP-15-24	2/13/2024	2 ft	**0.005**	**29.35**	**34**
VP-16-24	2/9/2024	2 ft	**-0.001**	**29.13**	**48**
VP-17-23	2/9/2024	5 ft	**-0.003**	--	--
VP-17-24	2/9/2024	2 ft	**0.008**	**29.13**	**47**
VP-18-23	2/12/2024	5 ft	**0.028**	--	--
VP-18-24	2/12/2024	2 ft	**-0.001**	**29.30**	**31**
VP-19-23	2/12/2024	5 ft	NM	NM	NM
VP-19-24	2/12/2024	2 ft	**-0.003**	--	--
VP-20-23	2/12/2024	5 ft	**-0.006**	--	--
VP-20-24	2/12/2024	2 ft	**0.004**	**29.26**	**32**
VP-21-23	2/12/2024	5 ft	**-0.009**	--	--
VP-21-24	2/12/2024	2 ft	**-0.018**	**29.26**	**34**
VP-22-23	2/12/2024	5 ft	NM		
VP-22-24	2/12/2024	2 ft	**-0.002**	**29.26**	**34**
VP-23-23	2/12/2024	5 ft	NM	NM	NM
VP-23-24	2/12/2024	2 ft	**-0.002**	**29.26**	**36**
VP-24-23	2/12/2024	5 ft	**0.009**	--	--
VP-24-24	2/12/2024	2 ft	**-0.002**	**29.26**	**36**
VP-25-23	2/12/2024	5 ft	NM	NM	NM
VP-25-24	2/12/2024	2 ft	**-0.002**	**29.26**	**35**
VP Pilot 15 E	2/13/2024	2 ft	**-0.003**	--	**35**
VP Pilot 15 E	3/1/2024	2 ft	**0.008**	**30.15**	**47**
VP Pilot 20 N	2/13/2024	2 ft	**-0.001**	**29.36**	**35**
VP PILOT 20 N	2/13/2024	5 ft	**-0.084**	**29.36**	**35**
VP Pilot 20 N	3/1/2024	2 ft	**0.001**	**30.15**	**47**
VP Pilot 20 N	3/1/2024	5 ft	**0.007**	**30.15**	**47**
VP Pilot C	2/14/2024	2 ft	**-0.002**	--	**34**
VP Pilot C	2/27/2024	5 ft	**0.045**	--	**62**
VP Pilot C	3/1/2024	5 ft	**0.213**	**30.15**	**47**
VP Pilot N	2/13/2024	2 ft	**-0.006**	--	--
VP Pilot N	3/1/2024	5 ft	**-0.068**	**30.15**	**47**
VP Pilot N	3/1/2024	2 ft	**-0.004**	**30.15**	**47**
VP Pilot S	2/14/2024	2 ft	NM	**29.61**	**34**
VP Pilot S	3/1/2024	2 ft	**0.002**	**30.15**	**47**

Figures

Barr Footer: ArcGIS 10.8.1, 2024-07-02 09:25 File: I:\Projects\23\6511\059\Maps\Report\MethaneInvestigationVis\01 Soil Gas and Pilot Extraction Well Locations.mxd User: CM3



Soil Gas Well

Soil Gas Extraction Well

NOTES:

- Values in callout boxes are methane results [%(v/v)].
- Shaded values exceed Residential VIAP Screening Level for Methane.
- ND = Non-Detect
- NM = Not Measured

N

0 300

Feet

SOIL GAS METHANE RESULTS

Pure Muskegon, LLC

Muskegon County, MI

FIGURE 2

BARR

Appendix A

Soil Boring Logs

Barr Engineering Co.
3033 Orchard Vista Drive SE, Suite 200
Grand Rapids, MI 49546
Telephone: 616-512-7000

LOG OF GEOPROBE Pilot Study Extraction Wells (4)

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**15%/ 70%/ 15%	SP		POORLY GRADED SAND (SP): fine grained; brown; dry; debris.	Bentonite 0 - 2.0'	
2.5		1	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; tan; dry.	PVC, 10 Slot 2" Soil Gas Extraction Well 2.5' Sand Pack 2 - 5'	
5.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**20%/ 65%/ 15%	SM		SILTY SAND (SM): fine grained; gray dark brown; dry; debris. Wet; water in open borehole @ 6.4' bgs.	Single well screen 2.5' - 5.5' Soil Gas Extraction Well 5' PVC, 10 Slot 2"	
7.5		2						
10.0						End of geoprobe 10.0 feet		
12.5								
15.0								

Date Boring Started: 1/24/24
Date Boring Completed: 1/24/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Extraction wells installed via hollow stem auger. Well stick up left at 2.5' above ground surface and capped with a PVC slip cap.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

C:\USERS\JPR\DOCUMENTS\ALLEN PRINCE\PURE MUSKEGON GINT LOGS\PUREMUSKEGON_SGWELLINTSALL.GPJ BARRLIBRARY 1.GLB ENVIRO LOG BARR TEMPLATE.GDT

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3033 Orchard Vista Drive SE, Suite 200
Grand Rapids, MI 49546
Telephone: 616-512-7000

LOG OF GEOPROBE SG Well VP Pilot C

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441
Coordinates:
Datum:

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**15%/ 70%/ 15%	SP		POORLY GRADED SAND (SP): fine grained; brown; dry; debris (brick gravel).	Bentonite 0 - 1.4'	
2.5		1	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; tan; dry.	Sandpack 1.4 - 2.2' 6" stainless steel soil gas screen set at 2' bgs. Bentonite 2' - 4.2'	
5.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**20%/ 65%/ 15%	SM		SILTY SAND (SM): fine grained; gray dark brown; dry; debris. Wet; water in open borehole @ 6.4' bgs.	Sand Pack 4.2 - 5' 6" stainless steel soil gas screen set at 5' bgs.	
7.5		2						
10.0						End of geoprobe 10.0 feet		
12.5								
15.0								

Date Boring Started: 1/24/24
Date Boring Completed: 1/24/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Due to the proximity of the soil gas wells within the pilot test area one boring was completed to 10' bgs to determine lithology. Subsequent borings were completed to 5' to confirm lithology and install soil gas wells.A one foot long section of 2" schedule 40 PVC with slip on cap was placed over each gas well. A driveway marker was installed to mark the location. See the Investigation. Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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Grand Rapids, MI 49546
Telephone: 616-512-7000

LOG OF GEOPROBE SG Well VP Pilot E 15'

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**15%/ 70%/ 15%	SP		POORLY GRADED SAND (SP): fine grained; brown; dry; debris (brick gravel).	Bentonite 0 - 1.4'	
2.5		1	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; tan; dry.	Sandpack 1.4 - 2.2' 6" stainless steel soil gas screen set at 2' bgs. Bentonite 2' - 4.2'	
5.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**20%/ 65%/ 15%	SM		SILTY SAND (SM): fine grained; gray dark brown; dry; debris. Wet; water in open borehole @ 6.4' bgs.	Sand Pack 4.2 - 5' 6" stainless steel soil gas screen set at 5' bgs.	
7.5		2						
10.0						End of geoprobe 10.0 feet		
12.5								
15.0								

Date Boring Started: 1/24/24
Date Boring Completed: 1/24/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Due to the proximity of the soil gas wells within the pilot test area one boring was completed to 10' bgs to determine lithology. Subsequent borings were completed to 5' to confirm lithology and install soil gas wells.A one foot long section of 2" schedule 40 PVC with slip on cap was placed over each gas well. A driveway marker was installed to mark the location. See the Investigation. Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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Telephone: 616-512-7000

LOG OF GEOPROBE SG Well VP Pilot N

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**15%/ 70%/ 15%	SP		POORLY GRADED SAND (SP): fine grained; brown; dry; debris (brick gravel).	Bentonite 0 - 1.4'	
2.5		1	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; tan; dry.	Sandpack 1.4 - 2.2' 6" stainless steel soil gas screen set at 2' bgs. Bentonite 2' - 4.2'	
5.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**20%/ 65%/ 15%	SM		SILTY SAND (SM): fine grained; gray dark brown; dry; debris. Wet; water in open borehole @ 6.4' bgs.	Sand Pack 4.2 - 5' 6" stainless steel soil gas screen set at 5' bgs.	
7.5		2						
10.0						End of geoprobe 10.0 feet		
12.5								
15.0								

Date Boring Started: 1/24/24
Date Boring Completed: 1/24/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Due to the proximity of the soil gas wells within the pilot test area one boring was completed to 10' bgs to determine lithology. Subsequent borings were completed to 5' to confirm lithology and install soil gas wells.A one foot long section of 2" schedule 40 PVC with slip on cap was placed over each gas well. A driveway marker was installed to mark the location. See the Investigation. Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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LOG OF GEOPROBE SG Well VP Pilot N 20'

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**15%/ 70%/ 15%	SP		POORLY GRADED SAND (SP): fine grained; brown; dry; debris (brick gravel).	Bentonite 0 - 1.4'	
2.5		1	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; tan; dry.	Sandpack 1.4 - 2.2' 6" stainless steel soil gas screen set at 2' bgs. Bentonite 2' - 4.2'	
5.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**20%/ 65%/ 15%	SM		SILTY SAND (SM): fine grained; gray dark brown; dry; debris. Wet; water in open borehole @ 6.4' bgs.	Sand Pack 4.2 - 5' 6" stainless steel soil gas screen set at 5' bgs.	
7.5		2						
10.0						End of geoprobe 10.0 feet		
12.5								
15.0								

Date Boring Started: 1/24/24
Date Boring Completed: 1/24/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Due to the proximity of the soil gas wells within the pilot test area one boring was completed to 10' bgs to determine lithology. Subsequent borings were completed to 5' to confirm lithology and install soil gas wells.A one foot long section of 2" schedule 40 PVC with slip on cap was placed over each gas well. A driveway marker was installed to mark the location. See the Investigation. Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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LOG OF GEOPROBE SG Well VP Pilot

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**15%/ 70%/ 15%	SP		POORLY GRADED SAND (SP): fine grained; brown; dry; debris (brick gravel).	Bentonite 0 - 1.4'	
2.5		1	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; tan; dry.	Sandpack 1.4 - 2.2' 6" stainless steel soil gas screen set at 2' bgs. Bentonite 2' - 4.2'	
5.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**20%/ 65%/ 15%	SM		SILTY SAND (SM): fine grained; gray dark brown; dry; debris. Wet; water in open borehole @ 6.4' bgs.	Sand Pack 4.2 - 5' 6" stainless steel soil gas screen set at 5' bgs.	
7.5		2						
10.0						End of geoprobe 10.0 feet		
12.5								
15.0								

Date Boring Started: 1/24/24
Date Boring Completed: 1/24/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Due to the proximity of the soil gas wells within the pilot test area one boring was completed to 10' bgs to determine lithology. Subsequent borings were completed to 5' to confirm lithology and install soil gas wells.A one foot long section of 2" schedule 40 PVC with slip on cap was placed over each gas well. A driveway marker was installed to mark the location. See the Investigation. Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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LOG OF GEOPROBE VP-10-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0						POORLY GRADED SAND (SP): fine to medium grained; brown grey; dry.	Bentonite 0-1.4'	
2.5		1	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**30%/ 55%/ 15%	SP		Moist.	Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
5.0						POORLY GRADED SAND (SP): fine to medium grained; brown grey; moist.		
	▼					Wet; @ 6'.		
7.5		2	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**30%/ 55%/ 15%	SP				
10.0						End of geoprobe 10.0 feet		
12.5								
15.0								

Date Boring Started: 1/22/24
Date Boring Completed: 1/22/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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LOG OF GEOPROBE VP-11-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 5.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**30%/ 70%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; brown; dry; little gravel, debris.	Bentonite 0-1.4'	
2.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**25%/ 45%/ 30%	SM		SILTY SAND (SM): fine grained; brown; dry; little gravel.	Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
4.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 70%/ 30%	SM		SILTY SAND (SM): fine grained; brown; moist to wet.		
5.0						Wet; @ 5'. End of geoprobe 5.0 feet		
10.0								

Date Boring Started: 1/22/24
Date Boring Completed: 1/22/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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Grand Rapids, MI 49546
Telephone: 616-512-7000

LOG OF GEOPROBE VP-12-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 5.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**20%/ 80%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; brown; dry; little debris.	Bentonite 0-1.4'	
1.5			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**10%/ 60%/ 30%	SM		SILTY SAND (SM): fine grained; brown; dry; trace gravel.	Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
3.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 60%/ 40%	SM		SILTY SAND (SM): fine grained; brown; moist to wet.		
5.0						Wet; @ 5'. End of geoprobe 5.0 feet		
10.0								

Date Boring Started: 1/22/24
Date Boring Completed: 1/22/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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Telephone: 616-512-7000

LOG OF GEOPROBE VP-1-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): light brown; dry.	Bentonite 0-1.4'	
			D/O/S: None/ None/ None **G/S/F:**40%/ 60%/ 0%	SW		WELL GRADED SAND (SW): fine to medium grained; brown; dry; gravel, wood.	Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
2.5		1						
			D/O/S: None/ None/ None **G/S/F:**10%/ 90%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; dark brown; dry; trace gravel.		
			D/O/S: None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; tan; dry to moist.		
5.0			**D/O/S:**None/ None/ None **G/S/F:**20%/ 70%/ 10%	SP		POORLY GRADED SAND (SP): fine grained; dark brown; wet; gravel, trace organics.		
			D/O/S: None/ None/ None **G/S/F:**20%/ 80%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; dark brown; wet; little gravel, brick, wood.		
7.5		2						
10.0						End of geoprobe 10.0 feet		
12.5								
15.0								

Date Boring Started: 1/22/24
Date Boring Completed: 1/22/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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3033 Orchard Vista Drive SE, Suite 200
Grand Rapids, MI 49546
Telephone: 616-512-7000

LOG OF GEOPROBE VP-13-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 7.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0						POORLY GRADED SAND (SP): fine to medium grained; tan; dry.	Bentonite 0-1.4'	
0.5								
1.0								
1.5							Sandpack interval 1.4' - 2.2'	
2.0							6" stainless steel soil gas screen set at 2' bgs.	
2.5								
3.0								
3.5				SP				
4.0								
4.5		1	PID:0.0 D/O/S:None/ None/ None G/S/F:0%/ 100%/ 0%					
5.0								
5.5								
6.0								
6.5						Wet; @ 6.5'.		
7.0						End of geoprobe 7.0 feet		
7.5								
8.0								
8.5								
9.0								
9.5								
10.0								

Date Boring Started: 1/23/24
Date Boring Completed: 1/23/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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LOG OF GEOPROBE VP-14-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 5.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0						POORLY GRADED SAND (SP): fine to medium grained; tan; dry.	Bentonite 0-1.4'	
2.5		1	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP			Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
5.0						Wet; @ 5'. End of geoprobe 5.0 feet		

Date Boring Started: 1/23/24
Date Boring Completed: 1/23/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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LOG OF GEOPROBE VP-15-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; brown; dry.	Bentonite 0-1.4'	
2.5		1	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 0%/ 100%			LIME: white; dry.	Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
5.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; brown; moist.		
7.5		2	**PID:**4.6 **D/O/S:**Yes/ Yes/ No **G/S/F:**25%/ 75%/ 0%	SP		POORLY GRADED SAND (SP): fine grained; black; wet; little gravel.		
10.0						End of geoprobe 10.0 feet		
12.5								
15.0								

Date Boring Started: 1/23/24
Date Boring Completed: 1/23/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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LOG OF GEOPROBE VP-16-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 6.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0						DEBRIS: brown; dry; brick, wood, concrete.	Bentonite 0-1.4'	
3.0		1	**PID:**0.0 **D/O/S:**None/ None/ None				Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
5.0	▼					Wet; @ 5' bgs.		
6.0						End of geoprobe 6.0 feet		
10.0								

Date Boring Started: 1/23/24
Date Boring Completed: 1/23/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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LOG OF GEOPROBE VP-17-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 5.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; gray; dry.	Bentonite 0-1.4'	
2.0			**PID:**0.0 **D/O/S:**None/ None/ None			COAL: black; dry; brick and wood.	Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
4.5			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; brown; moist to wet.		
5.0						Wet; @ 5'. End of geoprobe 5.0 feet		

Date Boring Started: 1/23/24
Date Boring Completed: 1/23/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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LOG OF GEOPROBE VP-18-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**60%/ 40%/ 0%	GW		WELL GRADED GRAVEL (GW): fine to medium grained; gray; dry; sand.	Bentonite 0-1.4'	
			PID:0.0 **D/O/S:**None/ None/ None			COAL: black; dry; ash.	Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
2.5		1						
			PID:0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; tan; moist.		
5.0						POORLY GRADED SAND (SP): fine to medium grained; tan; moist to wet.		
			PID:0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		Wet; @ 6'.		
7.5		2						
			PID:0.0 **D/O/S:**None/ None/ None			WOOD: tan; wet; fine to medium sand.		
10.0						End of geoprobe 10.0 feet		
12.5								
15.0								

Date Boring Started: 1/23/24
Date Boring Completed: 1/23/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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LOG OF GEOPROBE VP-19-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 5.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**40%/ 60%/ 0%			TOPSOIL: brown; dry; gravel.		
1.0			**PID:**0.0 **D/O/S:**None/ None/ None			COAL: black; dry; ash.	Bentonite 0-1.4'	
2.0		1					Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
3.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 90%/ 10%	SP		POORLY GRADED SAND (SP): tan; moist to wet; trace marl.		
5.0						Wet; @ 5' bgs. End of geoprobe 5.0 feet		
10.0								

Date Boring Started: 1/23/24
Date Boring Completed: 1/23/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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LOG OF GEOPROBE VP-20-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 6.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0						POORLY GRADED SAND (SP): brown; dry; gravel.		
0.5			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**40%/ 60%/ 0%	SP			Bentonite 0-1.4'	
1.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%			POORLY GRADED SAND (SP): fine to medium grained; tan; dry.		
1.5							Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
2.0								
2.5				SP				
3.0								
3.5		1						
4.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%			POORLY GRADED SAND (SP): fine grained; dark gray; dry.		
4.5				SP				
5.0								
5.5			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine grained; dark gray; dry.		
6.0						End of geoprobe 6.0 feet		
6.5								
7.0								
7.5								
8.0								
8.5								
9.0								
9.5								
10.0								

Date Boring Started: 1/23/24
Date Boring Completed: 1/23/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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LOG OF GEOPROBE VP-21-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0						POORLY GRADED SAND (SP): fine grained; dark brown; dry; debris.	Bentonite 0-1.4'	
2.5		1	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**10%/ 90%/ 0%	SP			Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
5.0						WOOD: tan; moist to wet.		
7.5			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0% **PID:**0.0 **D/O/S:**None/ None/ None **PID:**0.0 **D/O/S:**None/ None/ None	SP		POORLY GRADED SAND (SP): fine grained; gray; wet. WOOD: tan; wet.		
10.0						End of geoprobe 10.0 feet		
12.5								
15.0								

Date Boring Started: 1/23/24
Date Boring Completed: 1/23/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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LOG OF GEOPROBE VP-22-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0						POORLY GRADED SAND (SP): fine grained; dark brown; dry; coal, ash, slag.	Bentonite 0-1.4'	
2.5		1	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**20%/ 80%/ 0%	SP			Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
5.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**20%/ 80%/ 0%	SP		POORLY GRADED SAND (SP): fine grained; dark brown; dry; coal, ash, slag.		
			PID:0.0 **D/O/S:**None/ None/ None			WOOD: moist.		
			PID:0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine grained; gray; moist to wet.		
7.5 ▼		2	**PID:**0.0 **D/O/S:**None/ None/ None			WOOD.		
10.0						End of geoprobe 10.0 feet		
12.5								
15.0								

Date Boring Started: 1/23/24
Date Boring Completed: 1/23/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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LOG OF GEOPROBE VP-2-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 6.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0						ASPHALT: dry; asphalt.		
0.5			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**40%/ 50%/ 10% **PID:**0.0 **D/O/S:**None/ None/ None	SP		POORLY GRADED SAND (SP): fine to medium grained; brown; dry; gravel, debris.	–Bentonite 0-1.4'	
1.0								
1.5			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**40%/ 60%/ 0%			POORLY GRADED SAND (SP): fine grained; dark brown; dry; slog, brick, gravel.	–Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
2.0								
2.5				SP				
3.0								
3.5		1						
4.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%			POORLY GRADED SAND (SP): fine to medium grained; brown; moist.		
4.5				SP				
5.0	▼		**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%			POORLY GRADED SAND (SP): fine to medium grained; brown; wet.		
5.5				SP				
6.0						End of geoprobe 6.0 feet		
6.5								
7.0								
7.5								
8.0								
8.5								
9.0								
9.5								
10.0								

Date Boring Started: 1/22/24
Date Boring Completed: 1/22/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF GEOPROBE VP-23-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 5.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 60%/ 0%			TOPSOIL: brown; dry.		
1.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 60%/ 0%			TOPSOIL: brown; dry; cinders, wood.	Bentonite 0-1.4' Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
2.5		1	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 0%/ 100%			LIME: white; moist to wet.		
5.0						End of geoprobe 5.0 feet		

Date Boring Started: 1/23/24
Date Boring Completed: 1/23/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

C:\USERS\JPR\DOCUMENTS\ALLEN PRINCE\PURE MUSKEGON GINT LOGS\PUREMUSKEGON_SGWELLINTSALL.GPJ BARRLIBRARY 1.GLB ENVIRO LOG BARR TEMPLATE.GDT

Barr Engineering Co.
3033 Orchard Vista Drive SE, Suite 200
Grand Rapids, MI 49546
Telephone: 616-512-7000

LOG OF GEOPROBE VP-24-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 80%/ 20%			SILTY SAND (SM): fine grained; brown; dry; debris (wood, lime) and silt.	Bentonite 0-1.4'	
2.5		1		SM			Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
5.0								
7.5		2	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 0%/ 100%			LIME: white; wet.		
10.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 0%/ 100%			CLAY: dark gray; wet; mucky. End of geoprobe 10.0 feet		
12.5								
15.0								

Date Boring Started: 1/23/24
Date Boring Completed: 1/23/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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Barr Engineering Co.
3033 Orchard Vista Drive SE, Suite 200
Grand Rapids, MI 49546
Telephone: 616-512-7000

LOG OF GEOPROBE VP-25-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 50%/ 50%			TOPSOIL: brown; dry.	Bentonite 0-1.4'	
			PID:0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; tan; dry.	Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
2.5		1	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 0%/ 100%			LIME: white; moist.		
5.0						LIME: white; wet.		
7.5		2	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 0%/ 100%					
10.0						End of geoprobe 10.0 feet		
12.5								
15.0								

Date Boring Started: 1/23/24
Date Boring Completed: 1/23/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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Barr Engineering Co.
3033 Orchard Vista Drive SE, Suite 200
Grand Rapids, MI 49546
Telephone: 616-512-7000

LOG OF GEOPROBE VP-3-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 6.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**50%/ 50%/ 0%	GW		WELL GRADED GRAVEL (GW): fine grained; tan; dry; sand.		
0.5			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; tan; dry.	Bentonite 0-1.4'	
1.0								
1.5							Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
2.0			**PID:**0.0 **D/O/S:**None/ None/ None			WOOD: brown; moist; sand.		
2.5								
3.0								
3.5		1						
4.0								
4.5			**PID:**0.0 **D/O/S:**None/ None/ None			WOOD: brown; moist; sand.		
5.0								
5.5								
6.0						End of geoprobe 6.0 feet		
6.5								
7.0								
7.5								
8.0								
8.5								
9.0								
9.5								
10.0								

Date Boring Started: 1/22/24
Date Boring Completed: 1/22/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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Barr Engineering Co.
3033 Orchard Vista Drive SE, Suite 200
Grand Rapids, MI 49546
Telephone: 616-512-7000

LOG OF GEOPROBE VP-4-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 6.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 70%/ 30%			TOPSOIL: brown; dry.		
0.5			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**10%/ 80%/ 10%	SP		POORLY GRADED SAND (SP): fine grained; dark brown; dry; Trace Gravel, Silt.	–Bentonite 0-1.4'	
1.0								
1.5							–Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
2.0			**PID:**0.0 **D/O/S:**None/ None/ None			WOOD: gray brown; dry; Clay.		
2.5								
3.0								
3.5		1						
4.0								
4.5								
5.0								
5.5						Wet; @ 5.5.		
6.0						End of geoprobe 6.0 feet		
6.5								
7.0								
7.5								
8.0								
8.5								
9.0								
9.5								
10.0								

Date Boring Started: 1/22/24
Date Boring Completed: 1/22/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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Barr Engineering Co.
3033 Orchard Vista Drive SE, Suite 200
Grand Rapids, MI 49546
Telephone: 616-512-7000

LOG OF GEOPROBE VP-5-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 6.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 80%/ 20%			TOPSOIL: brown; dry.		
1.0			**D/O/S:**None/ None/ None	GW		WELL GRADED GRAVEL (GW): fine to medium grained; brown; dry.	Bentonite 0-1.4'	
2.0			**D/O/S:**None/ None/ None			MARL: gray; moist.	Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
3.0			**D/O/S:**None/ None/ None			WOOD: brown; moist; little fine to medium sand.		
3.5		1						
5.0						Moist to wet; @ 5' bgs.		
5.5	▼					Wet; @ 5.5'.		
6.0						End of geoprobe 6.0 feet		
10.0								

Date Boring Started: 1/22/24
Date Boring Completed: 1/22/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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Barr Engineering Co.
3033 Orchard Vista Drive SE, Suite 200
Grand Rapids, MI 49546
Telephone: 616-512-7000

LOG OF GEOPROBE VP-6-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 6.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**100%/ 0%/ 0%	GW		WELL GRADED GRAVEL (GW): gray; dry.		
0.5						WOOD: brown; dry; little fine to medium sand.	–Bentonite 0-1.4'	
1.0								
1.5							–Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
2.0								
2.5								
3.0		1	**PID:**0.0 **D/O/S:**None/ None/ None					
3.5								
4.0								
4.5								
5.0								
5.5						Wet; @ 5.5'.		
6.0						End of geoprobe 6.0 feet		
6.5								
7.0								
7.5								
8.0								
8.5								
9.0								
9.5								
10.0								

Date Boring Started: 1/22/24
Date Boring Completed: 1/22/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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Barr Engineering Co.
3033 Orchard Vista Drive SE, Suite 200
Grand Rapids, MI 49546
Telephone: 616-512-7000

LOG OF GEOPROBE VP-7-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 6.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; dark brown; dry.	Bentonite 0-1.4' Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
4.0			**PID:**5.5 **D/O/S:**None/ None/ None **G/S/F:**70%/ 30%/ 0%	GW		WELL GRADED GRAVEL (GW): tan; dry; some fine to medium sand. Moist; @ 5.5'.		
6.0						Wet; @ 6'. End of geoprobe 6.0 feet		

Date Boring Started: 1/22/24
Date Boring Completed: 1/22/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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Barr Engineering Co.
3033 Orchard Vista Drive SE, Suite 200
Grand Rapids, MI 49546
Telephone: 616-512-7000

LOG OF GEOPROBE VP-8-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 7.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; brown; dry.	Bentonite 0-1.4'	
2.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine grained; bark gray; dry.	Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
4.0		1	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%	SP		POORLY GRADED SAND (SP): fine to medium grained; tan; moist.		
5.5			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 70%/ 30%	SM		SILTY SAND (SM): fine grained; dark gray; wet.		
7.0						End of geoprobe 7.0 feet		
10.0								

Date Boring Started: 1/22/24
Date Boring Completed: 1/22/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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Barr Engineering Co.
3033 Orchard Vista Drive SE, Suite 200
Grand Rapids, MI 49546
Telephone: 616-512-7000

LOG OF GEOPROBE VP-9-24

Project: Pure Muskegon
Project No.: 22611059.09
Location: 2400 Lakeshore Drive, Muskegon, MI, 49441

Drilling Method: Geoprobe
Sampling Method: Macrocore
Completion Depth: 7.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**30%/ 70%/ 0%			POORLY GRADED SAND (SP): fine to medium grained; tan; dry.	Bentonite 0-1.4'	
2.0				SP			Sandpack interval 1.4' - 2.2' 6" stainless steel soil gas screen set at 2' bgs.	
4.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 100%/ 0%			POORLY GRADED SAND (SP): fine to medium grained; dark gray; moist.		
4.5		1		SP				
6.0			**PID:**0.0 **D/O/S:**None/ None/ None			WOOD: brown; moist.		
6.5						Wet; @ 6.5'.		
7.0						End of geoprobe 7.0 feet		
10.0								

Date Boring Started: 1/22/24
Date Boring Completed: 1/22/24
Logged By: AWB
Drilling Contractor: Job Site Services
Drill Rig: Geoprobe 7822DT

Remarks: Soil boring was completed to collect lithology information and then abandoned with bentonite chips. Soil gas well was installed in a new boring adjacent to the original boring. A one foot long section of 2" schedule 40 PVC with slip on cap was placed over the soil gas well. A driveway marker was installed to mark the location. See the Investigation Location Figure for location detail.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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Appendix B

Analytical Lab Reports

Air TECHNOLOGY
Laboratories, Inc.

February 19, 2024

LA Cert #04140
EPA Methods TO3, TO14A, TO15, 25C/3C, ASTM D1946, RSK-175

TX Cert T104704450-14-6
EPA Methods TO14A, TO15

UT Cert CA0133332015-3
EPA Methods TO3, TO14A, TO15, RSK-175

Barr Engineering
ATTN: Allen Prince
3033 Orchard Vista
Grand Rapid, MI 49546

LABORATORY TEST RESULTS

Project Reference: Pure Muskegon – Methane Investigation
Project Number: 22611059.09
Lab Number: R020902-01/08

Enclosed are results for sample(s) received 2/09/24 by Air Technology Laboratories. Samples were received intact. Analyses were performed according to specifications on the chain of custody provided with the sample(s).

Report Narrative:

- Unless otherwise noted in the report, sample analyses were performed within method performance criteria and meet all requirements of the TNI Standards.
- The enclosed results relate only to the sample(s).

Preliminary results were e-mailed to Allen Prince on 2/16/24.

ATL appreciates the opportunity to provide testing services to your company. If you have any questions regarding these results, please call me at (626) 964-4032.

Sincerely,

Mark Johnson
Operations Manager
MJohnson@AirTechLabs.com

Note: The cover letter is an integral part of this analytical report.

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Ave., Suite 130
City of Industry, CA 91748
Ph: 626-964-4032
Fx: 626-964-5832

CHAIN OF CUSTODY RECORD

TURNAROUND TIME: Standard ☐ 48 hours ☐ Same Day ☐ 72 hours ☐ 24 hours ☐ 96 hours ☐ Other:

DELIVERABLES: EDD ☐ EDF ☐ LEVEL 3 ☐ LEVEL 4 ☐

PAGE: OF

Condition upon receipt: Sealed Yes ☐ No ☐ Intact Yes ☐ No ☐ Chilled ______ deg C

Project No.: 22611059.09
Project Name: Pure Muskegon - Methane Investigation
Report To: Allen Prince
Company: Barr Engineering
Street: 3033 Orchard Vista
City/State/Zip: Grand Rapids, MI
Phone& Fax: 616-512-7013
e-mail: aprince@barr.com

BILLING
P.O. No.:
Bill to:

ANALYSIS REQUEST

LAB USE ONLY	SAMPLE IDENTIFICATION	SAMPLE DATE	SAMPLE TIME	MATRIX	CONTAINER TYPE	* ASTM D1946 Methane + CO	* EPA 15/16 - H2S			Canister #	Flow Reg #
R020902-01	VP-1-24 (2')	2-8-24	0837	SG		X	X			1616	3645
-02	VP-2-24 (2')		0902	SG		X	X			R4335	3603
-03	VP-3-24 (2')		0945	SG		X	X			R1164	3653
-04	VP-4-24 (2')		1030	SG		X	X			R2494	3555
-05	VP-5-24 (2')		1144	SG		X	X			R2205	3637
-06	VP-7-24 (2')		1210	SG		X	X			R1158	3573
-07	VP-6-24 (2')		1326	SG		X	X			R2484	3601
-08	VP-8-24 (2')		1427	SG		X	X			R5203	3260

AUTHORIZATION TO PERFORM WORK	COMPANY		DATE/TIME
SAMPLED BY Al Bruggeman	COMPANY Barr		DATE/TIME 2/8/24
RELINQUISHED BY [signature]	DATE/TIME 2/8/24 @ 1520	RECEIVED BY	DATE/TIME
RELINQUISHED BY FEDEX	DATE/TIME 2/9/24 9:50	RECEIVED BY [signature]	DATE/TIME 2/9/24 9:50
RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME

COMMENTS
* Analyses conf'd via email from A. Prince go 2/9/24

METHOD OF TRANSPORT (circle one): Walk-In FedEx UPS Courier ATLI Other ______

DISTRIBUTION: White & Yellow - Lab Copies / Pink - Customer Copy

Preservation: **H**=HCL **N**=None / Container: **B**=Bag **C**=Can **V**=VOA **O**=Other

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 02/09/24
Matrix: Air
Reporting Units: % v/v

ASTM D1946

Lab No.:	R020902-01		R020902-02		R020902-03		R020902-04	
Client Sample I.D.:	VP-1-24 (2')		VP-2-24 (2')		VP-3-24 (2')		VP-4-24 (2')	
Date/Time Sampled:	2/8/24 8:37		2/8/24 9:02		2/8/24 9:45		2/8/24 10:30	
Date/Time Analyzed:	2/12/24 11:15		2/12/24 11:29		2/12/24 11:44		2/12/24 11:58	
QC Batch No.:	240212GC8A1		240212GC8A1		240212GC8A1		240212GC8A1	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.4		2.7		2.4		2.7	
ANALYTE	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v
Carbon Dioxide	**2.6**	0.024	**1.2**	0.027	**9.0**	0.024	**0.63**	0.027
Oxygen/Argon	**12**	1.2	**18**	1.3	**2.0**	1.2	**17**	1.3
Nitrogen	**85**	2.4	**81**	2.7	**77**	2.4	**81**	2.7
Methane	**ND**	0.0024	**0.011**	0.0027	**12**	0.0024	**1.1**	0.0027
Carbon Monoxide	**ND**	0.0024	**ND**	0.0027	**ND**	0.0024	**ND**	0.0027

Results normalized including non-methane hydrocarbons

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ **Date** 02-16-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 02/09/24
Matrix: Air
Reporting Units: % v/v

ASTM D1946

Lab No.:	R020902-05		R020902-06		R020902-07		R020902-08	
Client Sample I.D.:	VP-5-24 (2')		VP-7-24 (2')		VP-6-24 (2')		VP-8-24 (2')	
Date/Time Sampled:	2/8/24 11:44		2/8/24 12:20		2/8/24 13:26		2/8/24 14:27	
Date/Time Analyzed:	2/12/24 12:13		2/12/24 12:27		2/12/24 12:42		2/12/24 13:28	
QC Batch No.:	240212GC8A1		240212GC8A1		240212GC8A1		240212GC8A1	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.4		2.5		2.5		2.5	
ANALYTE	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v
Carbon Dioxide	**1.3**	0.024	**2.3**	0.025	**22**	0.025	**1.4**	0.025
Oxygen/Argon	**20**	1.2	**19**	1.2	ND	1.3	**20**	1.2
Nitrogen	**78**	2.4	**78**	2.5	**52**	2.5	**79**	2.5
Methane	**1.1**	0.0024	ND	0.0025	**25**	0.0025	**0.0060**	0.0025
Carbon Monoxide	ND	0.0024	ND	0.0025	ND	0.0025	ND	0.0025

Results normalized including non-methane hydrocarbons

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: *Annika Sotelo Sanchez for*
Mark Johnson
Operations Manager

Date *02-16-24*

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

QC Batch No: 240212GC8A1
Matrix: Air
Reporting Units: % v/v

ASTM D1946
LABORATORY CONTROL SAMPLE SUMMARY

Lab No.:	METHOD BLANK			LCS		LCSD					
Date Analyzed:	2/12/24 9:47			2/12/24 8:49		2/12/24 9:04					
Analyst Initials:	RC			RC		RC					
Dilution Factor:	1.0			1.0		1.0			Limits		
ANALYTE	Result % v/v	RL % v/v	SPIKE AMT. % v/v	Result % v/v	% Rec.	Result % v/v	% Rec.	RPD %	Low %Rec	High %Rec	Max. RPD
Carbon Dioxide	ND	0.010	10	9.96	99	10.0	100	0.5	70	130	30
Oxygen/Argon	ND	0.50	15	14.0	93	14.0	93	0.3	70	130	30
Nitrogen	ND	1.0	70	67.9	97	67.8	97	0.2	70	130	30
Methane	ND	0.0010	0.10	0.107	106	0.106	105	0.4	70	130	30
Carbon Monoxide	ND	0.0010	0.10	0.110	109	0.110	109	0.3	70	130	30

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 02-16-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 02/09/24
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	R020902-01		R020902-02		R020902-03		R020902-04	
Client Sample I.D.:	VP-1-24 (2')		VP-2-24 (2')		VP-3-24 (2')		VP-4-24 (2')	
Date/Time Sampled:	2/8/24 8:37		2/8/24 9:02		2/8/24 9:45		2/8/24 10:30	
Date/Time Analyzed:	2/9/24 15:37		2/9/24 15:52		2/9/24 16:08		2/9/24 16:24	
QC Batch No.:	240209GC3A1		240209GC3A1		240209GC3A1		240209GC3A1	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.4		2.7		2.4		2.7	
ANALYTE	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv
Hydrogen Sulfide	ND	0.48	ND	0.53	ND	0.48	ND	0.53

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 02-16-24
Mark Johnson
Operations Manager

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AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 02/09/24
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	R020902-05		R020902-06		R020902-07		R020902-08	
Client Sample I.D.:	VP-5-24 (2')		VP-7-24 (2')		VP-6-24 (2')		VP-8-24 (2')	
Date/Time Sampled:	2/8/24 11:44		2/8/24 12:20		2/8/24 13:26		2/8/24 14:27	
Date/Time Analyzed:	2/9/24 16:39		2/9/24 16:55		2/9/24 17:10		2/9/24 17:26	
QC Batch No.:	240209GC3A1		240209GC3A1		240209GC3A1		240209GC3A1	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.4		2.5		2.5		2.5	
ANALYTE	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv
Hydrogen Sulfide	ND	0.48	ND	0.49	ND	0.51	ND	0.49

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: Annika Sotelo Sanchez for
Mark Johnson
Operations Manager

Date 02-16-24

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

QC Batch No.: 240209GC3A1
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	METHOD BLANK			LCS		LCSD					
Date/Time Analyzed:	2/9/24 7:57			2/9/24 7:27		2/9/24 7:42					
Analyst Initials:	RC			RC		RC					
Dilution Factor:	1.0			1.0		1.0			Limits		
ANALYTE	Result ppmv	RL ppmv	SPIKE AMT. ppmv	Result ppmv	% Rec.	Result ppmv	% Rec.	% RPD	Low %Rec	High %Rec	Max. RPD
Hydrogen Sulfide	ND	0.20	1.14	0.979	86	0.990	87	1.1	70	130	30

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: Mark Johnson
Operations Manager

Date 02-16-24

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Air TECHNOLOGY
Laboratories, Inc.

February 20, 2024

LA Cert #04140
EPA Methods TO3, TO14A, TO15, 25C/3C, ASTM D1946, RSK-175

TX Cert T104704450-14-6
EPA Methods TO14A, TO15

UT Cert CA0133332015-3
EPA Methods TO3, TO14A, TO15, RSK-175

Barr Engineering
ATTN: Allen Prince
3033 Orchard Vista
Grand Rapid, MI 49546

LABORATORY TEST RESULTS

Project Reference: Pure Muskegon – Methane Investigation
Project Number: 22611059.09
Lab Number: R021307-01/08

Enclosed are results for sample(s) received 2/13/24 by Air Technology Laboratories. Samples were received intact. Analyses were performed according to specifications on the chain of custody provided with the sample(s).

Report Narrative:

- Unless otherwise noted in the report, sample analyses were performed within method performance criteria and meet all requirements of the TNI Standards.
- The enclosed results relate only to the sample(s).

Preliminary results were e-mailed to Allen Prince and Dana Pasi on 2/19/24.

ATL appreciates the opportunity to provide testing services to your company. If you have any questions regarding these results, please call me at (626) 964-4032.

Sincerely,

Mark Johnson
Operations Manager
MJohnson@AirTechLabs.com

Note: The cover letter is an integral part of this analytical report.

CHAIN OF CUSTODY RECORD

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Ave., Suite 130
City of Industry, CA 91748
Ph: 626-964-4032
Fx: 626-964-5832

TURNAROUND TIME: Standard ☐ 48 hours ☐ | Same Day ☐ 72 hours ☐ | 24 hours ☐ 96 hours ☐ | Other:

DELIVERABLES: EDD ☐ EDF ☐ LEVEL 3 ☐ LEVEL 4 ☐

PAGE: | **OF**

Condition upon receipt: Sealed Yes ☐ No ☐ | Intact Yes ☐ No ☐ | Chilled _____ deg C

Project No.:	22611059.09
Project Name:	Pine Muskegon - Methane Investigation
Report To:	Allen Prince
Company:	Barr Engineering
Street:	3033 Orchard Vista
City/State/Zip:	Grand Rapids, MI
Phone& Fax:	616-517-7013
e-mail:	aprince@barr.com

BILLING

P.O. No.:

Bill to:

ANALYSIS REQUEST

LAB USE ONLY	SAMPLE IDENTIFICATION	SAMPLE DATE	SAMPLE TIME	MATRIX	CONTAINER TYPE	Fixed Gases ASTM D1946 (CH4, CO2, CO, O2, N2)	H2S EPA 15/16			Canister #	Regulator #
R021307-01	VP-9-24 (2')	2/9/24	0819	SG	Silocan	X	X			R4341	3258
-02	VP-10-24 (2')		0906							R4326	3252
-03	VP-11-24 (2')		0955							R4339	3524
-04	VP-13-24 (2')		1046							R4336	3557
-05	VP-14-24 (2')		1137							R4328	3182
-06	VP-12-24 (2')		1224							R2207	3696
-07	VP-17-24 (2')		1335							R1346	3580
-08	VP-16-24 (2')		1405							R1159	3651

AUTHORIZATION TO PERFORM WORK	COMPANY	DATE/TIME
SAMPLED BY: Ab Braponnix	COMPANY: Barr	DATE/TIME: 2/12/24
RELINQUISHED BY	DATE/TIME: 2/12/24 1520	RECEIVED BY / DATE/TIME
RELINQUISHED BY: FED EX	DATE/TIME: 2/13/24	RECEIVED BY: DMM / DATE/TIME: 2/13/24 0946
RELINQUISHED BY	DATE/TIME	RECEIVED BY / DATE/TIME

METHOD OF TRANSPORT (circle one): Walk-In FedEx UPS Courier ATLI Other _____

COMMENTS

DISTRIBUTION: White & Yellow - Lab Copies / Pink - Customer Copy

Preservation: **H**=HCL **N**=None / Container: **B**=Bag **C**=Can **V**=VOA **O**=Other

Rev. 03 - 5/7/09

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 02/13/24
Matrix: Air
Reporting Units: % v/v

ASTM D1946

Lab No.:	R021307-01		R021307-02		R021307-03		R021307-04	
Client Sample I.D.:	VP-9-24 (2')		VP-10-24 (2')		VP-11-24 (2')		VP-13-24 (2')	
Date/Time Sampled:	2/9/24 8:19		2/9/24 9:06		2/9/24 9:55		2/9/24 10:46	
Date/Time Analyzed:	2/14/24 12:51		2/14/24 13:05		2/14/24 13:20		2/14/24 13:34	
QC Batch No.:	240214GC8A1		240214GC8A1		240214GC8A1		240214GC8A1	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.7		2.7		2.6		2.5	
ANALYTE	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v
Carbon Dioxide	**9.2**	0.027	**6.9**	0.027	**0.32**	0.026	**0.094**	0.025
Oxygen/Argon	**1.6**	1.3	**9.5**	1.3	**21**	1.3	**21**	1.3
Nitrogen	**88**	2.7	**83**	2.7	**79**	2.6	**79**	2.5
Methane	**1.1**	0.0027	**ND**	0.0027	**ND**	0.0026	**0.0059**	0.0025
Carbon Monoxide	**ND**	0.0027	**ND**	0.0027	**ND**	0.0026	**ND**	0.0025

Results normalized including non-methane hydrocarbons

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ **Date** 02-16-24

Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 02/13/24
Matrix: Air
Reporting Units: % v/v

ASTM D1946

Lab No.:	R021307-05		R021307-06		R021307-07		R021307-08	
Client Sample I.D.:	VP-14-24 (2')		VP-12-24 (2')		VP-17-24 (2')		VP-16-24 (2')	
Date/Time Sampled:	2/9/24 11:37		2/9/24 12:24		2/9/24 13:35		2/9/24 14:05	
Date/Time Analyzed:	2/14/24 13:49		2/14/24 14:03		2/14/24 14:17		2/14/24 14:32	
QC Batch No.:	240214GC8A1		240214GC8A1		240214GC8A1		240214GC8A1	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.8		2.5		2.7		2.5	
ANALYTE	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v
Carbon Dioxide	0.41	0.028	3.0	0.025	4.4	0.027	ND	0.025
Oxygen/Argon	21	1.4	17	1.2	12	1.3	21	1.3
Nitrogen	79	2.8	80	2.5	84	2.7	79	2.5
Methane	ND	0.0028	ND	0.0025	ND	0.0027	ND	0.0025
Carbon Monoxide	ND	0.0028	ND	0.0025	ND	0.0027	ND	0.0025

Results normalized including non-methane hydrocarbons

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 02-16-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

QC Batch No: 240214GC8A1
Matrix: Air
Reporting Units: % v/v

ASTM D1946
LABORATORY CONTROL SAMPLE SUMMARY

Lab No.:	METHOD BLANK			LCS		LCSD					
Date Analyzed:	2/14/24 10:50			2/14/24 9:09		2/14/24 9:23					
Analyst Initials:	RC			RC		RC					
Dilution Factor:	1.0			1.0		1.0			Limits		
ANALYTE	Result % v/v	RL % v/v	SPIKE AMT. % v/v	Result % v/v	% Rec.	Result % v/v	% Rec.	RPD %	Low %Rec	High %Rec	Max. RPD
Carbon Dioxide	ND	0.010	10	9.86	98	9.94	99	0.8	70	130	30
Oxygen/Argon	ND	0.50	15	14.0	93	14.0	93	0.4	70	130	30
Nitrogen	ND	1.0	70	68.0	98	68.1	98	0.2	70	130	30
Methane	ND	0.0010	0.10	0.105	104	0.103	102	1.4	70	130	30
Carbon Monoxide	ND	0.0010	0.10	0.104	103	0.103	102	1.1	70	130	30

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 02-16-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 02/13/24
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	R021307-01		R021307-02		R021307-03		R021307-04	
Client Sample I.D.:	VP-9-24 (2')		VP-10-24 (2')		VP-11-24 (2')		VP-13-24 (2')	
Date/Time Sampled:	2/9/24 8:19		2/9/24 9:06		2/9/24 9:55		2/9/24 10:46	
Date/Time Analyzed:	2/14/24 10:17		2/14/24 10:23		2/14/24 10:29		2/14/24 10:35	
QC Batch No.:	240213GC3A2		240213GC3A2		240213GC3A2		240213GC3A2	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.7		2.7		2.6		2.5	
ANALYTE	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv
Hydrogen Sulfide	ND	0.53	ND	0.53	ND	0.52	ND	0.51

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: Annika Stelle Smiley for
Mark Johnson
Operations Manager

Date 02-19-24

The cover letter is an integral part of this analytical report

18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 02/13/24
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	R021307-05		R021307-06		R021307-07		R021307-08	
Client Sample I.D.:	VP-14-24 (2')		VP-12-24 (2')		VP-17-24 (2')		VP-16-24 (2')	
Date/Time Sampled:	2/9/24 11:37		2/9/24 12:24		2/9/24 13:35		2/9/24 14:05	
Date/Time Analyzed:	2/14/24 10:41		2/14/24 10:47		2/14/24 10:53		2/14/24 10:59	
QC Batch No.:	240213GC3A2		240213GC3A2		240213GC3A2		240213GC3A2	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.8		2.5		2.7		2.5	
ANALYTE	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv
Hydrogen Sulfide	ND	0.56	ND	0.49	ND	0.53	ND	0.51

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: Annika Stellpflug for
Mark Johnson
Operations Manager

Date 02-19-24

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

QC Batch No.: 240213GC3A2
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	METHOD BLANK			LCS		LCSD					
Date/Time Analyzed:	2/13/24 15:32			2/13/24 15:01		2/13/24 15:17					
Analyst Initials:	RC			RC		RC					
Dilution Factor:	1.0			1.0		1.0			Limits		
ANALYTE	Result ppmv	RL ppmv	SPIKE AMT. ppmv	Result ppmv	% Rec.	Result ppmv	% Rec.	% RPD	Low %Rec	High %Rec	Max. RPD
Hydrogen Sulfide	ND	0.20	1.14	1.06	93	1.06	93	0.3	70	130	30

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: Annika Stehl Smutz
Mark Johnson
Operations Manager

Date 2-19-24

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Air TECHNOLOGY
Laboratories, Inc.

February 22, 2024

Barr Engineering
ATTN: Allen Prince
3033 Orchard Vista
Grand Rapid, MI 49546

LA Cert #04140
EPA Methods TO3, TO14A, TO15, 25C/3C, ASTM D1946, RSK-175

TX Cert T104704450-14-6
EPA Methods TO14A, TO15

UT Cert CA0133332015-3
EPA Methods TO3, TO14A, TO15, RSK-175

LABORATORY TEST RESULTS

Project Reference: Pure Muskegon – Methane Investigation
Project Number: 22611059.09
Lab Number: R021408-01/08

Enclosed are results for sample(s) received 2/14/24 by Air Technology Laboratories. Samples were received intact. Analyses were performed according to specifications on the chain of custody provided with the sample(s).

Report Narrative:

- Unless otherwise noted in the report, sample analyses were performed within method performance criteria and meet all requirements of the TNI Standards.
- The enclosed results relate only to the sample(s).

Preliminary results were e-mailed to Allen Prince and Dana Pasi on 2/21/24.

ATL appreciates the opportunity to provide testing services to your company. If you have any questions regarding these results, please call me at (626) 964-4032.

Sincerely,

Mark Johnson
Operations Manager
MJohnson@AirTechLabs.com

Note: The cover letter is an integral part of this analytical report.

CHAIN OF CUSTODY RECORD

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Ave., Suite 130
City of Industry, CA 91748
Ph: 626-964-4032
Fx: 626-964-5832

TURNAROUND TIME

Standard ☐ 48 hours ☐
Same Day ☐ 72 hours ☐
24 hours ☐ 96 hours ☐
Other:

DELIVERABLES

EDD ☐
EDF ☐
LEVEL 3 ☐
LEVEL 4 ☐

PAGE: 1 **OF** 1

Condition upon receipt:
Sealed Yes ☐ No ☐
Intact Yes ☐ No ☐
Chilled _____ deg C

Project No.:	22611059.09
Project Name:	PURE MUSKEGON - METHANE INVESTIGATION
Report To:	ALLEN PRINCE
Company:	BARR ENGINEERING
Street:	3033 ORCHARD VISTA
City/State/Zip:	GRAND RAPIDS, MI
Phone& Fax:	616-512-7013
e-mail:	aprince@barr.com

BILLING

P.O. No.:
Bill to:

ANALYSIS REQUEST

LAB USE ONLY	SAMPLE IDENTIFICATION	SAMPLE DATE	SAMPLE TIME	MATRIX	CONTAINER TYPE	Fixed Gases (CH_4, CO_2, CO, O_2, N_2) ASTM D1946	H_2S EPA 15/16			CANISTER #	REGULATOR #
R021408-01	VP-18-24(2')	2/12/24	0825	SG	Silonite	X	X			R5207	3570
-02	VP-19-24(2')		0910							R5215	3654
-03	VP-20-24(2')		0946							R1351	3655
-04	VP-21-24(2')		1041							R2496	3508
-05	VP-22-24(2')		1143							R4343	3529
-06	VP-25-24(2')		1243							R4331	3509
-07	VP-23-24(2')		1344							R2477	3507
-08	VP-24-24(2')		1436							R2491	3504

AUTHORIZATION TO PERFORM WORK	**COMPANY**		**DATE/TIME**
SAMPLED BY AJ BRASPENNINX	**COMPANY** BARR		**DATE/TIME** 2/12/24
RELINQUISHED BY	**DATE/TIME** 2/12/24 0158	**RECEIVED BY**	**DATE/TIME**
RELINQUISHED BY FEDEX	**DATE/TIME** 2/14/24 10:20	**RECEIVED BY**	**DATE/TIME** 2/14/24 10:20
RELINQUISHED BY	**DATE/TIME**	**RECEIVED BY**	**DATE/TIME**

METHOD OF TRANSPORT (circle one): Walk-In FedEx UPS Courier ATLI Other _____

COMMENTS

DISTRIBUTION: White & Yellow - Lab Copies / Pink - Customer Copy

Preservation: **H**=HCL **N**=None / Container: **B**=Bag **C**=Can **V**=VOA **O**=Other

Rev. 03 - 5/7/09

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 02/14/24
Matrix: Air
Reporting Units: % v/v

ASTM D1946

Lab No.:	R021408-01		R021408-02		R021408-03		R021408-04	
Client Sample I.D.:	VP-18-24 (2')		VP-19-24 (2')		VP-20-24 (2')		VP-21-24 (2')	
Date/Time Sampled:	2/12/24 8:25		2/12/24 9:10		2/12/24 9:46		2/12/24 10:41	
Date/Time Analyzed:	2/15/24 11:36		2/15/24 11:51		2/15/24 12:05		2/15/24 12:20	
QC Batch No.:	240215GC8A1		240215GC8A1		240215GC8A1		240215GC8A1	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.4		2.4		2.4		2.4	
ANALYTE	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v
Carbon Dioxide	**0.60**	0.024	**0.083**	0.024	**ND**	0.024	**0.43**	0.024
Oxygen/Argon	**20**	1.2	**19**	1.2	**20**	1.2	**12**	1.2
Nitrogen	**79**	2.4	**81**	2.4	**80**	2.4	**88**	2.4
Methane	**0.0045**	0.0024	**ND**	0.0024	**ND**	0.0024	**ND**	0.0024
Carbon Monoxide	**ND**	0.0024	**ND**	0.0024	**ND**	0.0024	**ND**	0.0024

Results normalized including non-methane hydrocarbons

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: Annika Sotelo Sanchez Jr **Date** 02-21-24

Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 02/14/24
Matrix: Air
Reporting Units: % v/v

ASTM D1946

Lab No.:	R021408-05		R021408-06		R021408-07		R021408-08	
Client Sample I.D.:	VP-22-24 (2')		VP-25-24 (2')		VP-23-24 (2')		VP-24-24 (2')	
Date/Time Sampled:	2/12/24 11:43		2/12/24 12:43		2/12/24 13:44		2/12/24 14:36	
Date/Time Analyzed:	2/15/24 12:34		2/15/24 12:49		2/15/24 13:03		2/15/24 13:17	
QC Batch No.:	240215GC8A1		240215GC8A1		240215GC8A1		240215GC8A1	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.4		2.5		2.5		2.4	
ANALYTE	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v
Carbon Dioxide	2.9	0.024	0.40	0.025	2.0	0.025	1.3	0.024
Oxygen/Argon	14	1.2	21	1.3	20	1.3	20	1.2
Nitrogen	83	2.4	79	2.5	78	2.5	78	2.4
Methane	ND	0.0024	0.0028	0.0025	ND	0.0025	ND	0.0024
Carbon Monoxide	ND	0.0024	ND	0.0025	ND	0.0025	ND	0.0024

Results normalized including non-methane hydrocarbons

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: Mark Johnson
Operations Manager

Date 02-21-24

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AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

QC Batch No: 240215GC8A1
Matrix: Air
Reporting Units: % v/v

ASTM D1946
LABORATORY CONTROL SAMPLE SUMMARY

Lab No.:	METHOD BLANK			LCS		LCSD					
Date Analyzed:	2/15/24 9:55			2/15/24 10:10		2/15/24 10:24					
Analyst Initials:	RC			RC		RC					
Dilution Factor:	1.0			1.0		1.0			Limits		
ANALYTE	Result % v/v	RL % v/v	SPIKE AMT. % v/v	Result % v/v	% Rec.	Result % v/v	% Rec.	RPD %	Low %Rec	High %Rec	Max. RPD
Carbon Dioxide	ND	0.010	10	9.70	97	9.66	96	0.4	70	130	30
Oxygen/Argon	ND	0.50	15	14.2	94	14.2	94	0.2	70	130	30
Nitrogen	ND	1.0	70	68.5	98	68.5	98	0.1	70	130	30
Methane	ND	0.0010	0.10	0.116	115	0.114	113	1.7	70	130	30
Carbon Monoxide	ND	0.0010	0.10	0.105	104	0.103	102	1.7	70	130	30

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ **Date** 02-21-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 02/14/24
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	R021408-01		R021408-02		R021408-03		R021408-04	
Client Sample I.D.:	VP-18-24 (2')		VP-19-24 (2')		VP-20-24 (2')		VP-21-24 (2')	
Date/Time Sampled:	2/12/24 8:25		2/12/24 9:10		2/12/24 9:46		2/12/24 10:41	
Date/Time Analyzed:	2/15/24 12:03		2/15/24 12:09		2/15/24 12:50		2/15/24 12:56	
QC Batch No.:	240215GC3A2		240215GC3A2		240215GC3A2		240215GC3A2	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.4		2.4		2.4		2.4	
ANALYTE	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv
Hydrogen Sulfide	ND	0.48	ND	0.48	ND	0.48	ND	0.48

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 02-19-24
Mark Johnson
Operations Manager

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AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 02/14/24
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	R021408-05		R021408-06		R021408-07		R021408-08	
Client Sample I.D.:	VP-22-24 (2')		VP-25-24 (2')		VP-23-24 (2')		VP-24-24 (2')	
Date/Time Sampled:	2/12/24 11:43		2/12/24 12:43		2/12/24 13:44		2/12/24 14:36	
Date/Time Analyzed:	2/15/24 13:02		2/15/24 13:08		2/15/24 13:14		2/15/24 13:23	
QC Batch No.:	240215GC3A2		240215GC3A2		240215GC3A2		240215GC3A2	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.4		2.5		2.5		2.4	
ANALYTE	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv
Hydrogen Sulfide	ND	0.48	ND	0.51	ND	0.51	ND	0.48

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 02-19-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

QC Batch No.: 240215GC3A2
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	METHOD BLANK			LCS		LCSD					
Date/Time Analyzed:	2/15/24 11:10			2/15/24 10:39		2/15/24 10:54					
Analyst Initials:	RC			RC		RC					
Dilution Factor:	1.0			1.0		1.0			Limits		
ANALYTE	Result ppmv	RL ppmv	SPIKE AMT. ppmv	Result ppmv	% Rec.	Result ppmv	% Rec.	% RPD	Low %Rec	High %Rec	Max. RPD
Hydrogen Sulfide	ND	0.20	1.14	1.11	97	1.13	99	1.6	70	130	30

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 02-19-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Air TECHNOLOGY
Laboratories, Inc.

February 22, 2024

LA Cert #04140
EPA Methods TO3, TO14A, TO15, 25C/3C, ASTM D1946, RSK-175

TX Cert T104704450-14-6
EPA Methods TO14A, TO15

UT Cert CA0133332015-3
EPA Methods TO3, TO14A, TO15, RSK-175

Barr Engineering
ATTN: Allen Prince
3033 Orchard Vista
Grand Rapid, MI 49546

LABORATORY TEST RESULTS

Project Reference: Pure Muskegon – Methane Investigation
Project Number: 22611059.09
Lab Number: R021606-01/07

Enclosed are results for sample(s) received 2/16/24 by Air Technology Laboratories. Samples were received intact. Analyses were performed according to specifications on the chain of custody provided with the sample(s).

Report Narrative:

- Unless otherwise noted in the report, sample analyses were performed within method performance criteria and meet all requirements of the TNI Standards.
- The enclosed results relate only to the sample(s).

Preliminary results were e-mailed to Allen Prince and Dana Pasi on 2/21/24.

ATL appreciates the opportunity to provide testing services to your company. If you have any questions regarding these results, please call me at (626) 964-4032.

Sincerely,

Mark Johnson
Operations Manager
MJohnson@AirTechLabs.com

Note: The cover letter is an integral part of this analytical report.

CHAIN OF CUSTODY RECORD

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Ave., Suite 130
City of Industry, CA 91748
Ph: 626-964-4032
Fx: 626-964-5832

TURNAROUND TIME
Standard ☐ 48 hours ☐
Same Day ☐ 72 hours ☐
24 hours ☐ 96 hours ☐
Other:

DELIVERABLES
EDD ☐
EDF ☐
LEVEL 3 ☐
LEVEL 4 ☐

PAGE: 1 **OF** 1

Condition upon receipt:
Sealed Yes ☐ No ☐
Intact Yes ☐ No ☐
Chilled _____ deg C

Project No.: 22611059.09
Project Name: Pine Muskegon - Methane Investigation
Report To: Allen Prince
Company: Barr Engineering
Street: 3033 Orchard Vista
City/State/Zip: Grand Rapids MI
Phone& Fax: 616-514-7013
e-mail: aprince@barr.com

BILLING
P.O. No.:
Bill to:

ANALYSIS REQUEST

LAB USE ONLY	SAMPLE IDENTIFICATION	SAMPLE DATE	SAMPLE TIME	MATRIX	CONTAINER TYPE	Fixed Gases ASTM D1946 (CH_4, CO_2, CO, O_2, N_2)	H_2S EPA 15/16			Canister #	Regulator #
R021606-01	VP-15-24 (2')	2/13/24	1026*	SG	Silcan	X	X			R1071	3098
-02	VP Pilot N 20' (5')		1230							1614	3551
-03	VP Pilot 20'N (2')		1259							J1725	3211
-04	VP Pilot 15'E (2')		1338							R2492	3252
-05	VP Pilot NC (2')		1420							1618	3512
-06	VP Pilot C (2')	2/14/24	1036							R1374	3259
-07	VP Pilot S (2')	2/14/24	1112							R2488	3140

AUTHORIZATION TO PERFORM WORK	COMPANY	DATE/TIME
SAMPLED BY: AJ Bergsteinsson	COMPANY: Barr	DATE/TIME: 2/14/24
RELINQUISHED BY: [signature]	DATE/TIME: 2/14/24 0	RECEIVED BY	DATE/TIME
RELINQUISHED BY: FEDEX	DATE/TIME: 2/15/24 16:31	RECEIVED BY: [signature]	DATE/TIME: 2/15/24 16:31
RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME

METHOD OF TRANSPORT (circle one): Walk-In FedEx UPS Courier ATLI Other _____

COMMENTS
* COOLING PER SAMPLING SOP 2/14/24

DISTRIBUTION: White & Yellow - Lab Copies / Pink - Customer Copy

Preservation: **H**=HCL **N**=None / Container: **B**=Bag **C**=Can **V**=VOA **O**=Other

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 02/15/24
Matrix: Air
Reporting Units: % v/v

ASTM D1946

Lab No.:	R021606-01		R021606-02		R021606-03		R021606-04	
Client Sample I.D.:	VP-15-24 (2')		VP Pilot N 20' (5')		VP Pilot 20' N (2')		VP Pilot 15' E (2')	
Date/Time Sampled:	2/13/24 10:26		2/13/24 12:30		2/13/24 12:59		2/13/24 13:38	
Date/Time Analyzed:	2/19/24 20:02		2/19/24 20:16		2/19/24 20:30		2/19/24 20:45	
QC Batch No.:	240219GC8A1		240219GC8A1		240219GC8A1		240219GC8A1	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.4		2.5		2.5		2.7	
ANALYTE	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v
Carbon Dioxide	ND	0.024	2.0	0.025	0.40	0.025	0.22	0.027
Oxygen/Argon	21	1.2	12	1.2	21	1.3	20	1.3
Nitrogen	79	2.4	86	2.5	79	2.5	79	2.7
Methane	0.037	0.0024	0.010	0.0025	ND	0.0025	ND	0.0027
Carbon Monoxide	ND	0.0024	ND	0.0025	ND	0.0025	ND	0.0027

Results normalized including non-methane hydrocarbons

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ **Date** 02-21-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 02/15/24
Matrix: Air
Reporting Units: % v/v

ASTM D1946

Lab No.:	R021606-05		R021606-06		R021606-07			
Client Sample I.D.:	VP Pilot NC (2')		VP Pilot C (2')		VP Pilot S (2')			
Date/Time Sampled:	2/13/24 14:20		2/14/24 10:36		2/14/24 11:12			
Date/Time Analyzed:	2/19/24 20:59		2/19/24 21:14		2/19/24 21:28			
QC Batch No.:	240219GC8A1		240219GC8A1		240219GC8A1			
Analyst Initials:	RC		RC		RC			
Dilution Factor:	2.7		2.4		2.2			
ANALYTE	**Result % v/v**	**RL % v/v**	**Result % v/v**	**RL % v/v**	**Result % v/v**	**RL % v/v**		
Carbon Dioxide	**0.52**	0.027	**0.18**	0.024	**1.7**	0.022		
Oxygen/Argon	**20**	1.4	**21**	1.2	**17**	1.1		
Nitrogen	**79**	2.7	**79**	2.4	**82**	2.2		
Methane	**ND**	0.0027	**ND**	0.0024	**ND**	0.0022		
Carbon Monoxide	**ND**	0.0027	**ND**	0.0024	**ND**	0.0022		

Results normalized including non-methane hydrocarbons

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ **Date** 02-21-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

QC Batch No: 240219GC8A1
Matrix: Air
Reporting Units: % v/v

ASTM D1946
LABORATORY CONTROL SAMPLE SUMMARY

Lab No.:	METHOD BLANK			LCS		LCSD					
Date Analyzed:	2/19/24 14:13			2/19/24 14:44		2/19/24 14:58					
Analyst Initials:	RC			RC		RC					
Dilution Factor:	1.0			1.0		1.0			Limits		
ANALYTE	Result % v/v	RL % v/v	SPIKE AMT. % v/v	Result % v/v	% Rec.	Result % v/v	% Rec.	RPD %	Low %Rec	High %Rec	Max. RPD
Carbon Dioxide	ND	0.010	10	10.1	101	9.65	96	4.4	70	130	30
Oxygen/Argon	ND	0.50	15	13.9	93	14.1	94	1.4	70	130	30
Nitrogen	ND	1.0	70	67.9	97	68.2	98	0.5	70	130	30
Methane	ND	0.0010	0.10	0.110	109	0.107	106	2.7	70	130	30
Carbon Monoxide	ND	0.0010	0.10	0.106	105	0.103	102	2.8	70	130	30

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 02-21-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 02/15/24
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	R021606-01		R021606-02		R021606-03		R021606-04	
Client Sample I.D.:	VP-15-24 (2')		VP Pilot N 20' (5')		VP Pilot 20' N (2')		VP Pilot 15' E (2')	
Date/Time Sampled:	2/13/24 10:26		2/13/24 12:30		2/13/24 12:59		2/13/24 13:38	
Date/Time Analyzed:	2/20/24 11:28		2/20/24 11:34		2/20/24 11:40		2/20/24 11:46	
QC Batch No.:	240220GC3A1		240220GC3A1		240220GC3A1		240220GC3A1	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.4		2.5		2.5		2.7	
ANALYTE	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv
Hydrogen Sulfide	ND	0.48	ND	0.49	ND	0.51	ND	0.53

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 02-21-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 02/15/24
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	R021606-05		R021606-06		R021606-07			
Client Sample I.D.:	VP Pilot NC (2')		VP Pilot C (2')		VP Pilot S (2')			
Date/Time Sampled:	2/13/24 14:20		2/14/24 10:36		2/14/24 11:12			
Date/Time Analyzed:	2/20/24 11:51		2/20/24 11:57		2/20/24 12:03			
QC Batch No.:	240220GC3A1		240220GC3A1		240220GC3A1			
Analyst Initials:	RC		RC		RC			
Dilution Factor:	2.7		2.4		2.2			
ANALYTE	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv		
Hydrogen Sulfide	ND	0.55	ND	0.48	ND	0.44		

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 02-21-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

QC Batch No.: 240220GC3A1
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	METHOD BLANK			LCS		LCSD					
Date/Time Analyzed:	2/20/24 9:23			2/20/24 8:52		2/20/24 9:07					
Analyst Initials:	RC			RC		RC					
Dilution Factor:	1.0			1.0		1.0			Limits		
ANALYTE	Result ppmv	RL ppmv	SPIKE AMT. ppmv	Result ppmv	% Rec.	Result ppmv	% Rec.	% RPD	Low %Rec	High %Rec	Max. RPD
Hydrogen Sulfide	ND	0.20	1.14	1.19	104	1.19	104	0.3	70	130	30

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 02/21/24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Air TECHNOLOGY
Laboratories, Inc.

March 18, 2024

LA Cert #04140
EPA Methods TO3, TO14A, TO15, 25C/3C, ASTM D1946, RSK-175

TX Cert T104704450-14-6
EPA Methods TO14A, TO15

UT Cert CA0133332015-3
EPA Methods TO3, TO14A, TO15, RSK-175

Barr Engineering
ATTN: Allen Prince
3033 Orchard Vista
Grand Rapid, MI 49546

LABORATORY TEST RESULTS

Project Reference: Pure Muskegon – Methane Investigation
Project Number: 22611059.09
Lab Number: R030108-01/03

Enclosed are results for sample(s) received 3/01/24 by Air Technology Laboratories. Samples were received intact. Analyses were performed according to specifications on the chain of custody provided with the sample(s).

Report Narrative:

- Modification to EPA Method TO15 – 2-Hexanone required quadratic regression calibration.
- Unless otherwise noted in the report, sample analyses were performed within method performance criteria and meet all requirements of the TNI Standards.
- The enclosed results relate only to the sample(s).

Preliminary results were e-mailed to Allen Prince and Dana Pasi on 3/15/24.

ATL appreciates the opportunity to provide testing services to your company. If you have any questions regarding these results, please call me at (626) 964-4032.

Sincerely,

Mark Johnson
Operations Manager
MJohnson@AirTechLabs.com

Note: The cover letter is an integral part of this analytical report.

R030108-01/03

Barr Engineering Co. Chain of Custody

Sample Origination State: ☐ KS ☐ MO ☐ UT ☐ MI ☐ ND ☐ WI ☐ MN ☐ SD Other: ____

☐ Ann Arbor ☐ Duluth ☐ Hibbing ☐ Minneapolis
☐ Bismarck ☐ Grand Rapids ☐ Jefferson City ☐ Salt Lake City

COC Number: 56679
COC 1 of 1

REPORT TO	INVOICE TO
Company: Barr	Company:
Address: 3033 Orchard Vista	Address:
Name: Allen Prince	Name:
email: aprince@barr.com	email:
Copy to: datamgt@barr.com	P.O.
Project Name: Dow Muskegon	Barr Project No: 22611059.09 @ 3/4/24

Matrix Code: GW = Groundwater, SW = Surface Water, WW = Waste Water, DW = Drinking Water, S = Soil/Solid, SD = Sediment, O = Other

Preservative Code: A = None, B = HCl, C = HNO_3, D = H_2SO_4, E = NaOH, F = MeOH, G = $NaHSO_4$, H = $Na_2S_2O_3$, I = Ascorbic Acid, J = NH_4Cl, K = Zn Acetate, O = Other

	Location	Sample Depth Start	Stop	Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix Code	Perform MS/MSD Y / N	Total Number Of Containers	Analysis Requested: Water: Fixed Gases ASTM D1946 + CO @ 3/4/24	Water: H_2S EPA 15/16	Water: TO-15 Methane	Soil: Canister	% Solids	Preservative Code	Field Filtered Y/N
1.	VP Pilot C (5')				2/27/24	1120	SG	N	1	X	X				Canister: R2209	Regulator: 3585
2.	Pilot Effluent				2/27/2024	1302	Ar	N	1			XX			A8063	3525
3.	Pilot Effluent (8)				2/27/24	1345	Ar	N	1	X	X				R4339	3540
4.																
5.																
6.																
7.																
8.																
9.																
10.																

*Incl CO per A. Prince 3/4/24

BARR USE ONLY

Sampled by: AMB
Barr Proj. Manager: AP
Barr DQ Manager:
Lab Name: Air Technology, Inc.
Lab Location: City of Industry, CA

Relinquished by: _____ On Ice? Y (N) Date 2/29/24 Time _____ Received by: _____ Date _____ Time _____

Relinquished by: FEDEX On Ice? Y (N) Date 3/1/24 Time 11:39 Received by: _____ Date 3/1/24 Time 11:39

Samples Shipped VIA: ☐ Courier ☐ Federal Express ☐ Sampler ☐ Other: _____ Air Bill Number: _____

Lab WO: _____ Temperature on Receipt (°C): _____ Custody Seal Intact? ☐ Y ☐ N ☐ None

Requested Due Date: ☐ Standard Turn Around Time ☐ Rush _____ (mm/dd/yyyy)

Distribution - White-Original: Accompanies Shipment to Laboratory; Yellow Copy: Include in Field Documents; Pink Copy: Send to Data Management Administrators.

H:\RLG\STDFORMS\Chain Of Custody Form 2015 RLG Rev. 01/02/18

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 03/01/24
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	R030108-01		R030108-03					
Client Sample I.D.:	VP Pilot C (5')		Pilot Effluent (8)					
Date/Time Sampled:	2/27/24 11:20		2/27/24 13:45					
Date/Time Analyzed:	3/4/24 11:48		3/4/24 12:19					
QC Batch No.:	240304GC3A1		240304GC3A1					
Analyst Initials:	RC		RC					
Dilution Factor:	2.7		2.5					
ANALYTE	Result ppmv	RL ppmv	Result ppmv	RL ppmv				
Hydrogen Sulfide	ND	0.55	ND	0.49				

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 03-14-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

QC Batch No.: 240304GC3A1
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	METHOD BLANK			LCS		LCSD			Limits		
Date/Time Analyzed:	3/4/24 8:09			3/4/24 8:24		3/4/24 8:39					
Analyst Initials:	RC			RC		RC					
Dilution Factor:	1.0			1.0		1.0					
ANALYTE	Result ppmv	RL ppmv	SPIKE AMT. ppmv	Result ppmv	% Rec.	Result ppmv	% Rec.	% RPD	Low %Rec	High %Rec	Max. RPD
Hydrogen Sulfide	ND	0.20	1.14	1.17	103	1.19	105	1.9	70	130	30

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: ____________________
Mark Johnson
Operations Manager

Date 03-14-24

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 03/01/24
Matrix: Air
Reporting Units: % v/v

ASTM D1946

Lab No.:	R030108-01		R030108-02		R030108-03			
Client Sample I.D.:	VP Pilot C (5')		Pilot Effluent		Pilot Effluent (8)			
Date/Time Sampled:	2/27/24 11:20		2/27/24 13:02		2/27/24 13:45			
Date/Time Analyzed:	3/5/24 15:38		3/5/24 15:53		3/5/24 16:07			
QC Batch No.:	240305GC8A1		240305GC8A1		240305GC8A1			
Analyst Initials:	RC		RC		RC			
Dilution Factor:	2.7		2.4		2.5			
ANALYTE	**Result % v/v**	**RL % v/v**	**Result % v/v**	**RL % v/v**	**Result % v/v**	**RL % v/v**		
Carbon Dioxide	12	0.027			0.21	0.025		
Oxygen/Argon	1.4	1.4			21	1.2		
Nitrogen	11	2.7			79	2.5		
Methane	76	0.0027	0.023	0.0024	0.023	0.0025		
Carbon Monoxide	ND	0.0027			ND	0.0025		

Results normalized including non-methane hydrocarbons

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 03-14-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

QC Batch No: 240305GC8A1
Matrix: Air
Reporting Units: % v/v

ASTM D1946
LABORATORY CONTROL SAMPLE SUMMARY

Lab No.:	METHOD BLANK			LCS		LCSD					
Date Analyzed:	3/5/24 11:14			3/5/24 15:09		3/5/24 15:24					
Analyst Initials:	RC			RC		RC					
Dilution Factor:	1.0			1.0		1.0			Limits		
ANALYTE	Result % v/v	RL % v/v	SPIKE AMT. % v/v	Result % v/v	% Rec.	Result % v/v	% Rec.	RPD %	Low %Rec	High %Rec	Max. RPD
Carbon Dioxide	ND	0.010	10	9.96	99	9.86	98	1.0	70	130	30
Oxygen/Argon	ND	0.50	15	14.1	94	14.1	94	0.1	70	130	30
Nitrogen	ND	1.0	70	68.3	98	68.3	98	0.0	70	130	30
Methane	ND	0.0010	0.10	0.101	100	0.0988	98	1.8	70	130	30
Carbon Monoxide	ND	0.0010	0.10	0.101	100	0.0990	98	1.7	70	130	30

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ **Date** 03-14-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 03/01/24
Matrix: Air
Reporting Units: ppbv

EPA Method TO15

Lab No.:	R030108-02
Client Sample I.D.:	Pilot Effluent
Date/Time Sampled:	2/27/24 13:02
Date/Time Analyzed:	3/11/24 22:57
QC Batch No.:	240311MS2A1
Analyst Initials:	VM
Dilution Factor:	2.4

ANALYTE	Result ppbv	RL ppbv
Dichlorodifluoromethane (12)	ND	2.4
Chloromethane	ND	2.4
1,2-Cl-1,1,2,2-F ethane (114)	ND	2.4
Vinyl Chloride	ND	2.4
Bromomethane	ND	2.4
Chloroethane	ND	12
Trichlorofluoromethane (11)	ND	2.4
1,1-Dichloroethene	ND	2.4
Carbon Disulfide	13	2.4
1,1,2-Cl 1,2,2-F ethane (113)	ND	2.4
Acetone	65	12
Methylene Chloride	ND	2.4
t-1,2-Dichloroethene	ND	2.4
1,1-Dichloroethane	ND	2.4
Vinyl Acetate	ND	2.4
c-1,2-Dichloroethene	ND	2.4
2-Butanone	220	12
t-Butyl Methyl Ether (MTBE)	ND	2.4
Chloroform	ND	2.4
1,1,1-Trichloroethane	ND	2.4
Carbon Tetrachloride	ND	2.4
Benzene	ND	2.4
1,2-Dichloroethane	ND	2.4
Trichloroethene	ND	2.4
1,2-Dichloropropane	ND	2.4
Bromodichloromethane	ND	2.4
c-1,3-Dichloropropene	ND	2.4
4-Methyl-2-Pentanone	ND	2.4
Toluene	ND	2.4
t-1,3-Dichloropropene	ND	4.8

18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 03/01/24
Matrix: Air
Reporting Units: ppbv

EPA Method TO15

Lab No.:	R030108-02
Client Sample I.D.:	Pilot Effluent
Date/Time Sampled:	2/27/24 13:02
Date/Time Analyzed:	3/11/24 22:57
QC Batch No.:	240311MS2A1
Analyst Initials:	VM
Dilution Factor:	2.4

ANALYTE	Result ppbv	RL ppbv
1,1,2-Trichloroethane	ND	2.4
Tetrachloroethene	ND	2.4
2-Hexanone	ND	2.4
Dibromochloromethane	ND	2.4
1,2-Dibromoethane	ND	2.4
Chlorobenzene	ND	2.4
Ethylbenzene	ND	2.4
p,&m-Xylene	ND	4.8
o-Xylene	ND	2.4
Styrene	ND	2.4
Bromoform	ND	2.4
1,1,2,2-Tetrachloroethane	ND	2.4
Benzyl Chloride	ND	2.4
4-Ethyl Toluene	ND	2.4
1,3,5-Trimethylbenzene	ND	2.4
1,2,4-Trimethylbenzene	ND	2.4
1,3-Dichlorobenzene	ND	2.4
1,4-Dichlorobenzene	ND	2.4
1,2-Dichlorobenzene	ND	2.4
1,2,4-Trichlorobenzene	ND	4.8
Hexachlorobutadiene	ND	2.4

RL = Reporting Limit
ND = Not Detected (below RL)

Reviewed/Approved By: _____ Date 03-15-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 03/01/24
Matrix: Air
Reporting Units: ppbv

EPA Method TO15

Lab No.:	METHOD BLANK							
Client Sample I.D.:	--							
Date/Time Sampled:	--							
Date/Time Analyzed:	3/11/24 13:40							
QC Batch No.:	240311MS2A1							
Analyst Initials:	VM							
Dilution Factor:	0.20							

ANALYTE	Result ppbv	RL ppbv						
Dichlorodifluoromethane (12)	ND	0.20						
Chloromethane	ND	0.20						
1,2-Cl-1,1,2,2-F ethane (114)	ND	0.20						
Vinyl Chloride	ND	0.20						
Bromomethane	ND	0.20						
Chloroethane	ND	1.0						
Trichlorofluoromethane (11)	ND	0.20						
1,1-Dichloroethene	ND	0.20						
Carbon Disulfide	ND	0.20						
1,1,2-Cl 1,2,2-F ethane (113)	ND	0.20						
Acetone	ND	1.0						
Methylene Chloride	ND	0.20						
t-1,2-Dichloroethene	ND	0.20						
1,1-Dichloroethane	ND	0.20						
Vinyl Acetate	ND	0.20						
c-1,2-Dichloroethene	ND	0.20						
2-Butanone	ND	1.0						
t-Butyl Methyl Ether (MTBE)	ND	0.20						
Chloroform	ND	0.20						
1,1,1-Trichloroethane	ND	0.20						
Carbon Tetrachloride	ND	0.20						
Benzene	ND	0.20						
1,2-Dichloroethane	ND	0.20						
Trichloroethene	ND	0.20						
1,2-Dichloropropane	ND	0.20						
Bromodichloromethane	ND	0.20						
c-1,3-Dichloropropene	ND	0.20						
4-Methyl-2-Pentanone	ND	0.20						
Toluene	ND	0.20						
t-1,3-Dichloropropene	ND	0.40						

18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 03/01/24
Matrix: Air
Reporting Units: ppbv

EPA Method TO15

Lab No.:	METHOD BLANK							
Client Sample I.D.:	--							
Date/Time Sampled:	--							
Date/Time Analyzed:	3/11/24 13:40							
QC Batch No.:	240311MS2A1							
Analyst Initials:	VM							
Dilution Factor:	0.20							

ANALYTE	Result ppbv	RL ppbv						
1,1,2-Trichloroethane	ND	0.20						
Tetrachloroethene	ND	0.20						
2-Hexanone	ND	0.20						
Dibromochloromethane	ND	0.20						
1,2-Dibromoethane	ND	0.20						
Chlorobenzene	ND	0.20						
Ethylbenzene	ND	0.20						
p,&m-Xylene	ND	0.40						
o-Xylene	ND	0.20						
Styrene	ND	0.20						
Bromoform	ND	0.20						
1,1,2,2-Tetrachloroethane	ND	0.20						
Benzyl Chloride	ND	0.20						
4-Ethyl Toluene	ND	0.20						
1,3,5-Trimethylbenzene	ND	0.20						
1,2,4-Trimethylbenzene	ND	0.20						
1,3-Dichlorobenzene	ND	0.20						
1,4-Dichlorobenzene	ND	0.20						
1,2-Dichlorobenzene	ND	0.20						
1,2,4-Trichlorobenzene	ND	0.40						
Hexachlorobutadiene	ND	0.20						

RL = Reporting Limit
ND = Not Detected (below RL)

Reviewed/Approved By: _____ Date 03-15-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

LCS/LCSD Recovery and RPD Summary Report

QC Batch #: 240311MS2A1

Matrix: Air

Reporting Units: ppbv

EPA Method TO15
LABORATORY CONTROL SAMPLE SUMMARY

Lab No.:	METHOD BLANK			LCS		LCSD					
Date/Time Analyzed:	3/11/24 13:40			3/11/24 11:53		3/11/24 12:29					
Analyst Initials:	VM			VM		VM					
Dilution Factor:	0.20			1.0		1.0					
ANALYTE	Result ppbv	RL ppbv	AMT. ppbv	Result ppbv	% Rec.	Result ppbv	% Rec.	RPD	Low %Rec	High %Rec	Max. RPD
1,1-Dichloroethene	ND	0.20	10	9.53	95.3	9.34	93.4	1.9	70	130	30.0
Methylene Chloride	ND	0.20	10	8.99	89.9	8.88	88.8	1.3	70	130	30.0
Trichloroethene	ND	0.20	10	8.75	87.5	8.39	83.9	4.2	70	130	30.0
Toluene	ND	0.20	10	9.12	91.2	9.34	93.4	2.5	70	130	30.0
1,1,2,2-Tetrachloroethane	ND	0.20	10	8.46	84.6	8.70	87.0	2.8	70	130	30.0

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ **Date:** 03-15-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Air TECHNOLOGY Laboratories, Inc.

March 20, 2024

LA Cert #04140
EPA Methods TO3, TO14A, TO15, 25C/3C, ASTM D1946, RSK-175

TX Cert T104704450-14-6
EPA Methods TO14A, TO15

UT Cert CA0133332015-3
EPA Methods TO3, TO14A, TO15, RSK-175

Barr Engineering
ATTN: Allen Prince
3033 Orchard Vista
Grand Rapid, MI 49546

LABORATORY TEST RESULTS

Project Reference: Pure Muskegon – Methane Investigation
Project Number: 22611059.09
Lab Number: R030511-01/10

Enclosed are results for sample(s) received 3/05/24 by Air Technology Laboratories. Samples were received intact. Analyses were performed according to specifications on the chain of custody provided with the sample(s).

Report Narrative:

- Modification to EPA Method TO15 –2-Hexanone required quadratic regression calibration.
- Unless otherwise noted in the report, sample analyses were performed within method performance criteria and meet all requirements of the TNI Standards.
- The enclosed results relate only to the sample(s).

Preliminary results were e-mailed to Allen Prince and Dana Pasi on 3/19/24.

ATL appreciates the opportunity to provide testing services to your company. If you have any questions regarding these results, please call me at (626) 964-4032.

Sincerely,

Mark Johnson
Operations Manager
MJohnson@AirTechLabs.com

Note: The cover letter is an integral part of this analytical report.

R030511-01/10

Barr Engineering Co. Chain of Custody

BARR ☐ Ann Arbor ☐ Bismarck ☐ Duluth ☐ Grand Rapids ☐ Hibbing ☐ Jefferson City ☐ Minneapolis ☐ Salt Lake City

Sample Origination State: ☐ KS ☐ MI ☐ MN ☐ MO ☐ ND ☐ SD ☐ UT ☐ WI Other: ____

COC Number: 56604
COC 1 of 1

REPORT TO	INVOICE TO
Company: Barr	Company:
Address: 3033 Orchard Vista	Address:
Name: Allen Prince	Name:
email: aprince@barr.com	email:
Copy to: datamgt@barr.com	P.O.
Project Name: Pure Muskegon	Barr Project No: 22611059.09 per 3/6/24

Matrix Code: GW = Groundwater, SW = Surface Water, WW = Waste Water, DW = Drinking Water, S = Soil/Solid, SD = Sediment, O = Other

Preservative Code: A = None, B = HCl, C = HNO_3, D = H_2SO_4, E = NaOH, F = MeOH, G = $NaHSO_4$, H = $Na_2S_2O_3$, I = Ascorbic Acid, J = NH_4Cl, K = Zn Acetate, O = Other

• Incl CO per A. Prince 3/15/24

Location	Sample Depth Start	Stop	Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix Code	Perform MS/MSD Y / N	Total Number Of Containers	Analysis Requested: Water: TO-15 Methane Fixed Gases + CO per 3/15/24 H2S	Soil: % Solids	Preservative Code	Field Filtered Y/N	Canister / Regulator
1. Pilot Effluent TO15				3/1/2024	0845	Air	N	1	X X				A8066 / 3210
2. Pilot Effluent SC				3/1/2024	0855	Air			X X X				R5203 / 3504
3. VP Pilot 20'N (5')				3/1/2024	1045	SG							R1162 / 3603
4. VP Pilot 20'N (2')				3/1/2024	1055	SG							1534 / 3572
5. VP Pilot 15'E (2')				3/1/2024	1116	SG							R1345 / 3501
6. VP Pilot N (5')				3/1/2024	1137	SG							R5201 / 3580
7. VP Pilot N (2')				3/1/2024	1158	SG							R1155 / 3264
8. VP Pilot C (5')				3/1/2024	1338	SG							R5210 / 3534
9. VP Pilot C (2')				3/1/2024	1348	SG							R5208 / 3532
10. VP Pilot S (2')				3/1/2024	1401	SG							R2206 / 3590

BARR USE ONLY	Relinquished by:	On Ice? Y (N)	Date	Time	Received by:	Date	Time
Sampled by: AWB			3/4/24	1440			
Barr Proj. Manager: AP	Relinquished by: FEDEX	On Ice? Y (N)	3/5/24	9:43	Received by:	3/5/24	9:43
Barr DQ Manager:	Samples Shipped VIA: ☐ Courier ☐ Federal Express ☐ Sampler ☐ Other:				Air Bill Number:		
Lab Name: Air Technology Lab						Requested Due Date: ☐ Standard Turn Around Time ☐ Rush ____ (mm/dd/yyyy)	
Lab Location: City of Industry, CA	Lab WO:	Temperature on Receipt (°C):			Custody Seal Intact? ☐ Y ☐ N ☐ None		

Distribution - White-Original: Accompanies Shipment to Laboratory; Yellow Copy: Include in Field Documents; Pink Copy: Send to Data Management Administrators.

H:RLG\STDFORMS\Chain Of Custody Form 2015 RLG Rev. 01/02/18

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 03/05/24
Matrix: Air
Reporting Units: % v/v

ASTM D1946

Lab No.:	R030511-01		R030511-02		R030511-03		R030511-04	
Client Sample I.D.:	Pilot Effluent TO15		Pilot Effluent SC		VP Pilot 20' N (5')		VP Pilot 20' N (2')	
Date/Time Sampled:	3/1/24 8:45		3/1/24 8:55		3/1/24 10:45		3/1/24 10:55	
Date/Time Analyzed:	3/13/24 9:50		3/13/24 10:04		3/13/24 10:19		3/13/24 10:33	
QC Batch No.:	240313GC8A1		240313GC8A1		240313GC8A1		240313GC8A1	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.5		2.2		2.4		2.7	
ANALYTE	**Result % v/v**	**RL % v/v**	**Result % v/v**	**RL % v/v**	**Result % v/v**	**RL % v/v**	**Result % v/v**	**RL % v/v**
Carbon Dioxide			0.085	0.022	1.3	0.024	0.40	0.027
Oxygen/Argon			21	1.1	20	1.2	21	1.3
Nitrogen			79	2.2	78	2.4	79	2.7
Methane	0.013	0.0025	0.012	0.0022	ND	0.0024	ND	0.0027
Carbon Monoxide			ND	0.0022	ND	0.0024	ND	0.0027

Results normalized including non-methane hydrocarbons

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 03-6-24
Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 03/05/24
Matrix: Air
Reporting Units: % v/v

ASTM D1946

Lab No.:	R030511-05		R030511-06		R030511-07		R030511-08	
Client Sample I.D.:	VP Pilot 15' E (2')		VP Pilot N (5')		VP Pilot N (2')		VP Pilot C (5')	
Date/Time Sampled:	3/1/24 11:16		3/1/24 11:37		3/1/24 11:58		3/1/24 13:38	
Date/Time Analyzed:	3/13/24 11:00		3/13/24 11:15		3/13/24 11:29		3/13/24 11:59	
QC Batch No.:	240313GC8A1		240313GC8A1		240313GC8A1		240313GC8A1	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.5		2.8		2.5		2.4	
ANALYTE	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v
Carbon Dioxide	0.23	0.025	7.6	0.028	0.099	0.025	9.6	0.024
Oxygen/Argon	21	1.3	7.6	1.4	21	1.3	4.8	1.2
Nitrogen	79	2.5	63	2.8	79	2.5	24	2.4
Methane	ND	0.0025	22	0.0028	0.0028	0.0025	61	0.0024
Carbon Monoxide	ND	0.0025	ND	0.0028	ND	0.0025	ND	0.0024

Results normalized including non-methane hydrocarbons

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 03-16-24
Mark Johnson
Operations Manager

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Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 03/05/24
Matrix: Air
Reporting Units: % v/v

ASTM D1946

Lab No.:	R030511-09		R030511-10					
Client Sample I.D.:	VP Pilot C (2')		VP Pilot S (2')					
Date/Time Sampled:	3/1/24 13:48		3/1/24 14:01					
Date/Time Analyzed:	3/13/24 12:14		3/13/24 12:28					
QC Batch No.:	240313GC8A1		240313GC8A1					
Analyst Initials:	RC		RC					
Dilution Factor:	2.5		2.3					
ANALYTE	Result % v/v	RL % v/v	Result % v/v	RL % v/v				
Carbon Dioxide	0.16	0.025	0.12	0.023				
Oxygen/Argon	20	1.3	21	1.1				
Nitrogen	79	2.5	79	2.3				
Methane	0.0078	0.0025	ND	0.0023				
Carbon Monoxide	ND	0.0025	ND	0.0023				

Results normalized including non-methane hydrocarbons

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 03/18/24
Mark Johnson
Operations Manager

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18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

QC Batch No: 240313GC8A1
Matrix: Air
Reporting Units: % v/v

ASTM D1946
LABORATORY CONTROL SAMPLE SUMMARY

Lab No.:	METHOD BLANK			LCS		LCSD					
Date Analyzed:	3/13/24 9:06			3/13/24 8:09		3/13/24 8:23					
Analyst Initials:	RC			RC		RC					
Dilution Factor:	1.0			1.0		1.0			Limits		
ANALYTE	Result % v/v	RL % v/v	SPIKE AMT. % v/v	Result % v/v	% Rec.	Result % v/v	% Rec.	RPD %	Low %Rec	High %Rec	Max. RPD
Carbon Dioxide	ND	0.010	10	9.96	99	9.99	100	0.3	70	130	30
Oxygen/Argon	ND	0.50	15	14.0	93	14.0	93	0.2	70	130	30
Nitrogen	ND	1.0	70	68.0	97	68.1	98	0.2	70	130	30
Methane	ND	0.0010	0.10	0.103	102	0.102	101	0.8	70	130	30
Carbon Monoxide	ND	0.0010	0.10	0.105	104	0.104	103	0.8	70	130	30

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ **Date** 03-18-24

Mark Johnson
Operations Manager

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Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 03/05/24
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	R030511-06		R030511-07		R030511-08		R030511-09	
Client Sample I.D.:	VP Pilot N (5')		VP Pilot N (2')		VP Pilot C (5')		VP Pilot C (2')	
Date/Time Sampled:	3/1/24 11:37		3/1/24 11:58		3/1/24 13:38		3/1/24 13:48	
Date/Time Analyzed:	3/7/24 14:31		3/7/24 14:46		3/7/24 15:02		3/7/24 15:18	
QC Batch No.:	240307GC3A1		240307GC3A1		240307GC3A1		240307GC3A1	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.8		2.5		2.4		2.5	
ANALYTE	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv
Hydrogen Sulfide	ND	0.56	ND	0.51	ND	0.48	ND	0.51

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 03-18-24
Mark Johnson
Operations Manager

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Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 03/05/24
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	R030511-02		R030511-03		R030511-04		R030511-05	
Client Sample I.D.:	Pilot Effluent SC		VP Pilot 20' N (5')		VP Pilot 20' N (2')		VP Pilot 15' E (2')	
Date/Time Sampled:	3/1/24 8:55		3/1/24 10:45		3/1/24 10:55		3/1/24 11:16	
Date/Time Analyzed:	3/7/24 10:24		3/7/24 10:30		3/7/24 13:59		3/7/24 14:15	
QC Batch No.:	240307GC3A1		240307GC3A1		240307GC3A1		240307GC3A1	
Analyst Initials:	RC		RC		RC		RC	
Dilution Factor:	2.2		2.4		2.7		2.5	
ANALYTE	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv	Result ppmv	RL ppmv
Hydrogen Sulfide	ND	0.44	ND	0.48	ND	0.53	ND	0.51

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 03/6/24
Mark Johnson
Operations Manager

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Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 03/05/24
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	R030511-10							
Client Sample I.D.:	VP Pilot S (2')							
Date/Time Sampled:	3/1/24 14:01							
Date/Time Analyzed:	3/7/24 15:34							
QC Batch No.:	240307GC3A1							
Analyst Initials:	RC							
Dilution Factor:	2.3							
ANALYTE	**Result ppmv**	**RL ppmv**						
Hydrogen Sulfide	ND	0.46						

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date 03-18-24
Mark Johnson
Operations Manager

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QC Batch No.: 240307GC3A1
Matrix: Air
Reporting Units: ppmv

EPA Methods 15/16

Lab No.:	METHOD BLANK			LCS		LCSD			Limits		
Date/Time Analyzed:	3/7/24 7:50			3/7/24 8:05		3/7/24 8:20					
Analyst Initials:	RC			RC		RC					
Dilution Factor:	1.0			1.0		1.0					
ANALYTE	Result ppmv	RL ppmv	SPIKE AMT. ppmv	Result ppmv	% Rec.	Result ppmv	% Rec.	% RPD	Low %Rec	High %Rec	Max. RPD
Hydrogen Sulfide	ND	0.20	1.14	1.11	98	1.15	101	2.9	70	130	30

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: ______________
Mark Johnson
Operations Manager

Date 03-18-24

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AirTECHNOLOGY Laboratories, Inc.
18501 E. Gale Avenue, Suite 130 ♦ City of Industry, CA 91748 ♦ Ph: (626) 964-4032 ♦ Fx: (626) 964-5832

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 03/05/24
Matrix: Air
Reporting Units: ppbv

EPA Method TO15

Lab No.:	R030511-01
Client Sample I.D.:	Pilot Effluent TO15
Date/Time Sampled:	3/1/24 8:45
Date/Time Analyzed:	3/14/24 18:04
QC Batch No.:	240314MS2A1
Analyst Initials:	VM
Dilution Factor:	2.5

ANALYTE	Result ppbv	RL ppbv
Dichlorodifluoromethane (12)	ND	2.5
Chloromethane	ND	2.5
1,2-Cl-1,1,2,2-F ethane (114)	ND	2.5
Vinyl Chloride	ND	2.5
Bromomethane	ND	2.5
Chloroethane	ND	13
Trichlorofluoromethane (11)	ND	2.5
1,1-Dichloroethene	ND	2.5
Carbon Disulfide	4.3	2.5
1,1,2-Cl 1,2,2-F ethane (113)	ND	2.5
Acetone	ND	13
Methylene Chloride	ND	2.5
t-1,2-Dichloroethene	ND	2.5
1,1-Dichloroethane	ND	2.5
Vinyl Acetate	ND	2.5
c-1,2-Dichloroethene	ND	2.5
2-Butanone	ND	13
t-Butyl Methyl Ether (MTBE)	ND	2.5
Chloroform	ND	2.5
1,1,1-Trichloroethane	ND	2.5
Carbon Tetrachloride	ND	2.5
Benzene	ND	2.5
1,2-Dichloroethane	ND	2.5
Trichloroethene	ND	2.5
1,2-Dichloropropane	ND	2.5
Bromodichloromethane	ND	2.5
c-1,3-Dichloropropene	ND	2.5
4-Methyl-2-Pentanone	ND	2.5
Toluene	7.0	2.5
t-1,3-Dichloropropene	ND	5.1

Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 03/05/24
Matrix: Air
Reporting Units: ppbv

EPA Method TO15

Lab No.:	R030511-01
Client Sample I.D.:	Pilot Effluent TO15
Date/Time Sampled:	3/1/24 8:45
Date/Time Analyzed:	3/14/24 18:04
QC Batch No.:	240314MS2A1
Analyst Initials:	VM
Dilution Factor:	2.5

ANALYTE	Result ppbv	RL ppbv
1,1,2-Trichloroethane	ND	2.5
Tetrachloroethene	ND	2.5
2-Hexanone	ND	2.5
Dibromochloromethane	ND	2.5
1,2-Dibromoethane	ND	2.5
Chlorobenzene	ND	2.5
Ethylbenzene	ND	2.5
p,&m-Xylene	ND	5.1
o-Xylene	ND	2.5
Styrene	ND	2.5
Bromoform	ND	2.5
1,1,2,2-Tetrachloroethane	ND	2.5
Benzyl Chloride	ND	2.5
4-Ethyl Toluene	ND	2.5
1,3,5-Trimethylbenzene	ND	2.5
1,2,4-Trimethylbenzene	ND	2.5
1,3-Dichlorobenzene	ND	2.5
1,4-Dichlorobenzene	ND	2.5
1,2-Dichlorobenzene	ND	2.5
1,2,4-Trichlorobenzene	ND	5.1
Hexachlorobutadiene	ND	2.5

RL = Reporting Limit
ND = Not Detected (below RL)

Reviewed/Approved By: _____ Date 03-19-24
Mark Johnson
Operations Manager

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Client: Barr Engineering
Attn: Allen Prince
Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 03/05/24
Matrix: Air
Reporting Units: ppbv

EPA Method TO15

Lab No.:	METHOD BLANK
Client Sample I.D.:	--
Date/Time Sampled:	--
Date/Time Analyzed:	3/14/24 11:51
QC Batch No.:	240314MS2A1
Analyst Initials:	VM
Dilution Factor:	0.20

ANALYTE	Result ppbv	RL ppbv
Dichlorodifluoromethane (12)	ND	0.20
Chloromethane	ND	0.20
1,2-Cl-1,1,2,2-F ethane (114)	ND	0.20
Vinyl Chloride	ND	0.20
Bromomethane	ND	0.20
Chloroethane	ND	1.0
Trichlorofluoromethane (11)	ND	0.20
1,1-Dichloroethene	ND	0.20
Carbon Disulfide	ND	0.20
1,1,2-Cl 1,2,2-F ethane (113)	ND	0.20
Acetone	ND	1.0
Methylene Chloride	ND	0.20
t-1,2-Dichloroethene	ND	0.20
1,1-Dichloroethane	ND	0.20
Vinyl Acetate	ND	0.20
c-1,2-Dichloroethene	ND	0.20
2-Butanone	ND	1.0
t-Butyl Methyl Ether (MTBE)	ND	0.20
Chloroform	ND	0.20
1,1,1-Trichloroethane	ND	0.20
Carbon Tetrachloride	ND	0.20
Benzene	ND	0.20
1,2-Dichloroethane	ND	0.20
Trichloroethene	ND	0.20
1,2-Dichloropropane	ND	0.20
Bromodichloromethane	ND	0.20
c-1,3-Dichloropropene	ND	0.20
4-Methyl-2-Pentanone	ND	0.20
Toluene	ND	0.20
t-1,3-Dichloropropene	ND	0.40

Client: Barr Engineering
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Project Name: Pure Muskegon - Methane Investigation
Project No.: 22611059.09
Date Received: 03/05/24
Matrix: Air
Reporting Units: ppbv

EPA Method TO15

Lab No.:	METHOD BLANK
Client Sample I.D.:	--
Date/Time Sampled:	--
Date/Time Analyzed:	3/14/24 11:51
QC Batch No.:	240314MS2A1
Analyst Initials:	VM
Dilution Factor:	0.20

ANALYTE	Result ppbv	RL ppbv
1,1,2-Trichloroethane	ND	0.20
Tetrachloroethene	ND	0.20
2-Hexanone	ND	0.20
Dibromochloromethane	ND	0.20
1,2-Dibromoethane	ND	0.20
Chlorobenzene	ND	0.20
Ethylbenzene	ND	0.20
p,&m-Xylene	ND	0.40
o-Xylene	ND	0.20
Styrene	ND	0.20
Bromoform	ND	0.20
1,1,2,2-Tetrachloroethane	ND	0.20
Benzyl Chloride	ND	0.20
4-Ethyl Toluene	ND	0.20
1,3,5-Trimethylbenzene	ND	0.20
1,2,4-Trimethylbenzene	ND	0.20
1,3-Dichlorobenzene	ND	0.20
1,4-Dichlorobenzene	ND	0.20
1,2-Dichlorobenzene	ND	0.20
1,2,4-Trichlorobenzene	ND	0.40
Hexachlorobutadiene	ND	0.20

RL = Reporting Limit
ND = Not Detected (below RL)

Reviewed/Approved By: _____ Date 03-19-24
Mark Johnson
Operations Manager

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LCS/LCSD Recovery and RPD Summary Report

QC Batch #: 240314MS2A1

Matrix: Air

Reporting Units: ppbv

EPA Method TO15
LABORATORY CONTROL SAMPLE SUMMARY

Lab No.:	METHOD BLANK			LCS		LCSD					
Date/Time Analyzed:	3/14/24 11:51			3/14/24 10:33		3/14/24 11:12					
Analyst Initials:	VM			VM		VM					
Dilution Factor:	0.20			1.0		1.0					
ANALYTE	Result ppbv	RL ppbv	AMT. ppbv	Result ppbv	% Rec.	Result ppbv	% Rec.	RPD	Low %Rec	High %Rec	Max. RPD
1,1-Dichloroethene	ND	0.20	10	10.2	102	10.3	103	1.7	70	130	30.0
Methylene Chloride	ND	0.20	10	10.8	108	10.2	102	5.4	70	130	30.0
Trichloroethene	ND	0.20	10	10.6	106	10.5	105	0.7	70	130	30.0
Toluene	ND	0.20	10	10.9	109	10.9	109	0.5	70	130	30.0
1,1,2,2-Tetrachloroethane	ND	0.20	10	10.7	107	10.6	106	0.6	70	130	30.0

ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____ Date: 03-19-24
Mark Johnson
Operations Manager

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Appendix C

Preliminary Air Emissions Estimate

Appendix C
Preliminary Air Emissions Estimate
2024 Supplemental Methane Investigation
2400 Lakeshore Drive, Muskegon, MI
Pure Muskegon, LLC

A. GENERAL:

(1).	Discharge Pipe Diameter	4	INCH
(2).	Flow Velocity	2292	FPM
(3).	Extraction Rate	200	SCFM
(4).	Blower Developed Pressure	10.0	"W.C.

B. ESTIMATED COMPOSITION OF EXTRACTED SOIL VAPOR AND MASS EMISSION RATES:

	Constituent	CAS #	Measured Laboratory Off-Gas Concentration (ug/m^3)	ITSL	IRSL	VOC/TAC Estimated Mass Emission Rate (lb/mon) ITSL > 2	VOC/TAC Estimated Mass Emission Rate (lb/mon) ITSL >/= 0.04 and <=2.0	VOC/TAC Estimated Mass Emission Rate (lb/mon) IRSL >/= 0.04	VOC/TAC Estimated Mass Emission Rate (lb/mon) IRSL <0.04
(1).	Acetone	67-64-1	154.4	5900		0.08	0.0	0.0	0.0
(2).	Carbon Disulfide	75-15-0	40.5	700		0.02	0.0	0.00	0.0
(3).	Methyl Ethyl Ketone (2-Butanone)	78-93-3	648.8	5000		0.4	0.0	0.00	0.0
(4).	Toluene	108-88-3	26.38	5000		0.01	0.0	0.00	0.0
					Total VOC/TAC Estimated Mass Emission Rate (lb/mon)	0.5	0.00	0.00	0.0
					Uncontrolled Exemption Threshold (lb/mon)	1000	20	20	0

Notes:
1. Emissions estimates were based on maximum flowrate observed during pilot. Concentrations of constituents based on maximum values from soil gas sampling results in "Table 2 - Summary of Soil Gas Extraction Pilot Off-Gas Results", converted to ug/m^3 at 25 degrees C and 1 atm.
2. Blower pressure was estimated from the extraction rate, VFD setting, and fan curve for the OBAR GBR-89 (120-V).