STATE OF MICHIGAN
CIRCUIT COURT FOR THE 30TH JUDICIAL CIRCUIT
INGHAM COUNTY

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY,

Plaintiff,

v

ARBOR HILLS LANDFILL, INC.,

Defendant.

No. 2020-0593-CE

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CONSENT JUDGMENT

The Plaintiff in this case is the Michigan Department of Environment, Great Lakes, and Energy (EGLE). The Defendant is Arbor Hills Landfill, Inc. (AHL). AHL owns and operates the Arbor Hills Landfill (Landfill), which is located at 10690 West Six Mile Road in Salem Township, Michigan.

In the Complaint, EGLE alleges that AHL violated Rule 901 of the Michigan Air Pollution Control Rules, Mich Admin Code, R 336.1901, at various times from January 2018 through November 2019, by emitting odors that caused an unreasonable interference with the comfortable enjoyment of life and property and created a public nuisance by emitting odors from the Landfill that unreasonably interfered with the public's right to use their property. The Complaint also alleges that AHL violated, among other things:

(A) the New Source Performance Standards for Municipal Solid Waste Landfills, 40 CFR 60.751 *et seq.*, by failing to install and operate a gas collection and control system such that gas is collected from each active area in the Landfill in which solid waste has been placed for five years or more and by failing to construct gas collection devices that address the occurrence of water within the Landfill.

(B) Rule 432(1), Mich Admin Code, R 299.4432(1), of the administrative rules promulgated under Part 115, Solid Waste Management, of the NREPA, MCL 324.11501 *et seq.* (Part 115 of the NREPA), by failing to remove leachate from a disposal unit at the Arbor Hills Landfill as frequently

as necessary to ensure that the leachate depth on the liner, excluding the sump, is not more than one foot.

(C) Rule 433(1)(b) of the administrative rules promulgated under Part 115 of the NREPA, Mich Admin Code, R 299.433(1)(b), by failing to ensure that the concentration of methane gas is not more than the lower explosive limit at or beyond the facility property boundary.

(D) The General Provisions for National Emission Standards for Hazardous Air Pollutants for Municipal Solid Waste Landfills, 40 CFR 63.1930 *et seq.*, the Standards of Performance for Municipal Solid Waste Landfills, 40 CFR 60.750 *et seq.*, Rule 902 of Part 55 of the NREPA, Mich Admin Code, R 336.1902, and Renewable Operating Permit MI-ROP-N2688-2011a due to wells at the Landfill having a landfill gas temperature that exceeded 55°C.

AHL denies all allegations in the Complaint and specifically denies that its operations created a public nuisance or unreasonably interfered with the public's right to use their property.

EGLE and AHL (the Parties) agree that settlement of this action is in the public interest and that entry of this Consent Judgment, without further litigation, is the most appropriate means of resolving the issues raised herein. The Parties agree to and shall be bound by the terms and conditions of this Consent Judgment.

The entry of this Consent Judgment by AHL is not an admission of liability with respect to any issue raised in the Complaint, nor is it an admission of any fact

alleged therein. AHL maintains that it is not liable for civil fines or injunctive relief and is agreeing to the terms and conditions of this Consent Judgment solely to settle disputed claims without incurring the time and expense of contested litigation.

NOW, THEREFORE, before the taking of any testimony, and without trial of any issue of fact or law, and upon the consent of the Parties, by their attorneys in this case, it is ORDERED:

I. JURISDICTION AND VENUE

1.1 This Court has jurisdiction over the subject matter of this action pursuant to Sections 5530(1) and 11546(1) of the NREPA, MCL 324.5530(1) and MCL 324.11546, and Section 605 of the Revised Judicature Act (RJA), MCL 600.605. This Court has personal jurisdiction over AHL pursuant to Section 711 of the RJA, MCL 600.711.

1.2 Venue in this Court is proper pursuant to Section 5530(5) of the NREPA, MCL 324.5530(5), and Section 1631(a) of the RJA, MCL 600.1631(a).

1.3 The Court has determined that the terms and conditions of this Consent Judgment are reasonable, adequately resolve the environmental issues raised herein, and properly protect the interests of the people of the State of Michigan.

II. APPLICATION

2.1 The terms and conditions of this Consent Judgment shall be binding on the Parties to this action and their successors and assigns. No change or changes in the ownership or corporate status or other legal status of AHL, including, but not limited to, any transfer of assets or of real or personal property, shall in any way alter AHL's responsibilities under this Consent Judgment.

2.2. In the event AHL sells or transfers the Landfill during the term of this Consent Judgment, AHL shall advise any purchaser or transferee of the existence of this Consent Judgment in connection with such sale or transfer. AHL shall also notify EGLE in writing within 10 calendar days after such sale or transfer, provide the identity and address of any purchaser or transferee, and confirm the fact that notice of this Consent Judgment has been given to the purchaser or transferee.

2.3 The signatories to this Consent Judgment certify that they are authorized to execute this Consent Judgment and to legally bind the Parties they represent.

III. OBJECTIVES OF THIS CONSENT JUDGMENT

3.1. The Parties' objectives of this Consent Judgment are to settle the violations alleged in the Complaint in a manner and under terms satisfactory to the Parties.

IV. DEFINITIONS

4.1 Terms used in this Consent Judgment that are defined in Part 55 of the NREPA, MCL 324.5501 *et seq*., Part 115 of the NREPA, the administrative rules promulgated pursuant to Part 55 and Part 115, the Clean Air Act, 42 USC 7401 *et seq*., and regulations promulgated under the Clean Air Act shall have the meaning assigned to them in those statutes, administrative rules, and regulations unless otherwise provided in this Consent Judgment.

4.2 Whenever the terms set forth below are used in this Consent Judgment, including attached appendices, the following definitions shall apply:

A. "Active Portion" means that part of the Landfill that has received or is receiving wastes and that has not been partially or finally closed in accordance with the rules promulgated under Part 115 of the NREPA. Active Portion does not include areas that have interim cover which complies with Mich Admin Code, R 299.4429(7).

B. "AHL" means Arbor Hills Landfill, Inc.

C. "AHL Operations Plan" means the engineering plans and engineering reports for the Landfill required by Mich Admin Code, R 299.4911.

D. "Arbor Hills East" means the portion of the Landfill that is a 131-acre unlined, closed Type II sanitary landfill located at Napier and 6 Mile Road, in Salem Township, Michigan. Arbor Hills East is depicted in Appendix A.

E. "Arbor Hills West" means the 210.5-acre Type II sanitary landfill with double composite liner bordering Arbor Hills East on the west. Arbor Hills West is depicted in Appendix A.

F. "Business Day" means Monday through Friday from 6:00 a.m. to 5:00 p.m. and Saturday from 7:00 a.m. to 12:00 p.m.

G. "Composting Facility" means the land area north of 6 Mile Road adjacent to the Landfill that is used by AHL to manage compostable material. The Composting Facility is depicted in Appendix A.

H. "Cover Penetrations" means a Wellhead, a part of the Landfill gas collection or operations system, and/or any other object that completely passes through the landfill cover. The Landfill cover includes that portion which covers the waste, as well as the portion which borders the waste extended to the point where it is sealed with the Landfill liner or the surrounding land mass. Examples of what is not a penetration include, but are not limited to: survey stakes, fencing including litter fences, flags, signs, utility posts, and trees so long as these items do not pass through the Landfill cover.

I. "Drone SEM" means surface emission monitoring for methane using a drone.

J. "Effective Date" means the date of entry of this Consent Judgment by the Court as recorded on the Court docket or, if the Court

instead issues an order approving this Consent Judgment, the date such order is recorded on the Court docket, whichever occurs first.

K. "EGLE" means the Michigan Department of Environment, Great Lakes, and Energy.

L. "Flare System" means the three separate flares at the Landfill that AHL uses to combust landfill gas generated by the Landfill. The Flare System includes an Enclosed Flare 1 (also known as the East flare or Zink flare), Enclosed Flare 2 (also known as the West flare or McGill Flare), an open candle stick style flare, and associated blowers/compressors and other equipment used to convey landfill gas to the flares. The total capacity of the Flare System is 11,200 scfm.

M. "Gas Collection Well" means a well that collects landfill gas that can be either a vertical well, including a caisson well, or a horizontal well.

N. "H_2S" means hydrogen sulfide.

O. "H_2S Action Level" means a hydrogen sulfide concentration of 122 parts per billion.

P. "Landfill" means the municipal solid waste landfill owned and operated by AHL located at 10690 West Six Mile Road in Salem Township, Michigan. The Landfill is depicted in Appendix A.

Q. "Operating Record" means the operating record required by Mich Admin Code, R 299.4438.

R. "Paragraph" means a portion of this Consent Judgment identified by an Arabic number.

S. "Parties" means the Michigan Department of Environment, Great Lakes, and Energy and Arbor Hills Landfill, Inc.

T. "Perimeter H_2S Action Level" means a hydrogen sulfide concentration of 30 parts per billion measured as a rolling average over a 15-minute period.

U. "Perimeter Methane Action Level" means a methane concentration of 40 parts per million measured as a rolling average over a 15-minute period.

V. "Quarterly SEM" means the surface emission monitoring for methane identified in 40 CFR 63.1958(d).

W. "Rule 429" means Rule 429 of the administrative rules promulgated under Part 115 of the NREPA, Mich Admin Code, R 299.4429.

X. "Rule 901" means Rule 901 of the Michigan Air Pollution Control Rules, Mich Admin Code, R 336.1901.

Y. "Section" means a portion of this Consent Judgment identified by a Roman numeral.

Z. "SEM" means surface emission monitoring.

AA. "Subparagraph" means a portion of this Consent Judgment identified by an upper-case letter.

BB. "TS-01R" means a leachate collection sump with a Wellhead located on the southcentral side of the Landfill with the identifier of TS-01R. TS-01R is depicted in Appendix A.

CC. "Wellhead" means the location where buried Gas Collection Wells exit the Landfill surface and are connected to the landfill gas extraction system piping. The wellhead itself consists of piping, hoses, valves, and monitoring ports that allow a landfill operator to regulate the flow of gas extracted from the buried gas well and to monitor gas conditions (temperature, pressure, flow, and chemical composition).

DD. "Wells of Interest" means VGC Wells for which a higher operating value for temperature has been requested by AHL and approved by EGLE and any redrills of those wells.

EE. "Working Face" means the location at the Landfill where solid waste is actively being unloaded from waste vehicles, moved to the desired location, compacted in place with heavy equipment, and covered with daily cover.

FF. "Vertical Gas Collection Well" and "VGC Well" mean vertically drilled gas collection wells that are component(s) of a landfill gas collection and control system.

V. OPERATING REQUIREMENTS

5.1 Gas Collection Wells – Wellhead Inspections and Repairs.

A. AHL shall conduct two visual inspections of each Wellhead monthly separated by at least 12 days. Each Business Day, AHL shall conduct visual inspections for each caisson well that is within 250 feet of the Working Face. AHL shall conduct the inspections using a standard checklist (current checklist attached as Appendix B, which AHL shall include in the AHL Operations Plan within 10 days after the Effective Date). The standard checklist may from time to time be modified subject to EGLE's review and approval pursuant to Section IX (Review and Approval of Submittals).

B. The person(s) performing the inspections shall transmit the completed inspection checklists to AHL management for review within one Business Day after completing the inspections.

C. AHL shall train the inspectors in the field by experienced personnel prior to the inspectors conducting inspections so that inspections are conducted in a consistent and rigorous manner. AHL shall include this training requirement and a description of the inspection process in the AHL Operations Plan within 10 days after the Effective Date.

D. AHL shall create and retain records of the inspector training, including the date of the training, who was trained, and who performed the training.

E. AHL shall obtain a date-tagged photograph of each Gas Collection Well Wellhead monthly during an inspection. Photographs will be transmitted to site management within one Business Day for review.

F. AHL shall repair Wellhead deficiencies identified during an inspection the same day using equipment and an inventory of Wellhead components that it maintains at the Landfill. Repairs that cannot be completed on the same day as an inspection shall be documented by AHL, including the reason for the additional time needed, and repaired within five Business Days after the inspection. If AHL cannot complete the repairs within five Business Days because such repairs are impractical or unsafe due to weather conditions, parts, contractor availability, or equipment shortages, then it may submit a notice to EGLE pursuant to Section X (Notices) that it is extending the time for such repairs by up to five additional Business Days. If AHL cannot complete the repairs within the additional five Business Days, then AHL may submit a request for an extension to EGLE pursuant to Paragraph 16.4. If EGLE denies the request for an extension, then AHL may submit the matter for dispute resolution pursuant to Section XII (Dispute Resolution).

G. AHL shall record the H_2S concentrations in each Gas Collection Well at the Landfill by June 30th of each year and shall create and retain records of the concentrations.

5.2 Limiting Liquid Infiltration and Minimizing Leachate Generation.

A. Modifications to Section 4.3 of the AHL Operations Plan.

1. Within 10 days after the Effective Date, AHL shall modify section 4.3 of the Operations Plan by including the provisions in Appendix C, which describe AHL's approach to minimizing leachate generation during the operating life of the Landfill.

2. AHL shall comply with the Operations Plan as modified pursuant to this Subparagraph 5.2(A)(1).

B. Expansion of areas under final cover and enhanced interim cover.

1. By May 15, 2022, AHL shall place additional soil to ensure a minimum thickness of four feet of soil that meets the soil classification requirements of Mich Admin Code, R 229.4429 in the area identified in blue in Appendix D.

2. By October 15, 2023, AHL shall expand the area of the Landfill under final cover to include the identified in orange in Appendix D.

C. Quarterly third-party engineering evaluation and actions to minimize liquid infiltration and leachate generation.

1. AHL shall hire and direct a third-party firm to conduct a topographic field survey of the Landfill and to also prepare a topographic map based on the survey on a quarterly basis.

2. AHL shall hire and direct an independent third-party engineer to commence, within 10 days after the completion of each

topographic field survey (and before the receipt of the topographical map), an engineering evaluation to address minimizing liquid infiltration and leachate generation. As part of the evaluation, AHL shall direct the third-party engineer to review information regarding precipitation and leachate extraction trends at the Landfill, cover conditions and any recent changes to these items, the current survey compared to the previous calendar quarter, and other data that they deem relevant. Based on their evaluation and professional judgement, the third-party engineer shall address, as appropriate, the following questions:

a. Is the current grading and cover status capable of minimizing stormwater run-on into the Active Portion and maximizing runoff from the landfill to the extent practical?

b. Are there any areas of the Landfill, particularly on top, that appear to be able to pond water?

c. How do current conditions compare to the prior quarter with respect to precipitation infiltration potential?

d. What, if any, improvements are needed to the grading, stormwater control features and cover status that would improve stormwater runoff?

e. Will the current stormwater diversion provisions adequately divert stormwater away from the Active Portion during the upcoming quarter?

f. Does the current topographic survey, when compared to the previous topographic survey, indicate settlement may result in slope flattening or grade reversal before the next quarterly engineering evaluation?

3. AHL shall direct the third-party engineer to submit to AHL, within two weeks after the engineer receives the quarterly topographic map, a report that includes their evaluation, the information they reviewed, recommended actions based on their evaluation, and the latest topographic map.

4. Within 30 days after the third-party engineer's report is submitted to AHL, AHL shall develop an action plan that includes a schedule and specific steps to implement any recommended actions in the third-party engineer's report and shall submit the action plan, along with a copy of the third-party engineer's report, to EGLE for review. EGLE may provide written comments on the action plan or the third-party engineer's report to AHL.

5. Within 10 days after receipt of EGLE's comments, AHL shall provide a written response to EGLE addressing its written comments.

6. AHL shall implement the action plan and submit a report to EGLE in the following quarter describing AHL's implementation of the action plan.

7. Within 45 days after receipt of the third-party engineer's report for the fourth quarter in each calendar year, AHL shall develop and submit to EGLE for review and approval pursuant to Section IX (Review and Approval of Submittals) a separate annual report that

identifies the recommended actions that AHL implemented during the previous calendar year and identifies the future actions AHL will take to minimize liquid infiltration and minimize leachate generation at the Landfill and address recommendations of the third party engineer in its quarterly reports for the prior year that have not been completed. AHL shall implement the EGLE-approved annual report and document the implementation to EGLE.

5.3 Vertical Gas Collection Wells – Liquid Monitoring and Management.

A. Quarterly VGC Well reports. Within 30 days after the end of each calendar quarter, AHL shall submit to EGLE quarterly reports containing the information specified in Subparagraph 5.3(B) for the Vertical Gas Collection Wells at the Landfill prepared by an independent third-party engineer hired by AHL.

B. The reports required by Subparagraph 5.3(A) shall be submitted to EGLE with the well data in Excel format and shall include the following information as measured and recorded during the quarter:

1. For each VGC Well:

a. As-constructed well elevations and depths.

b. Solid and perforated pipe lengths.

c. Sounded depth (*i.e.*, the measured length of the well) as measured from the top of the well with a weighted tape measure or water level meter.

d. Liquid level (*i.e.*, the depth from the top of the well to the top of the liquid in the well) as measured from the top of the well with a water level meter.

e. Calculated percent of the perforated pipe that is submerged with liquid.

f. Calculated length of the perforated pipe below any obstruction such as a pinched well or a stuck pump which prevents measurements below the obstruction point.

g. The landfill gas composition, including methane, carbon dioxide, oxygen and balance gas.

h. Landfill gas temperature at the Wellhead.

i. Gas flow rate.

j. Available vacuum.

k. Applied vacuum.

l. The estimated valve open percentage.

2. Identification of all VGC Wells that contain existing dewatering pumps, their functionality, and their estimated daily average pump rate volume based on pump cycle counters, if known, expressed as gallons per day.

3. Pump cycles recorded twice monthly and pump maintenance records.

4. Details of any loss of pressure in the air-line system or any other events that occurred during the quarter that may have significantly affected liquid levels in the VGC Wells.

5. An evaluation of the cumulative data from previous quarters to determine trends in VGC Well data.

6. If the quarterly-reported information in Subparagraphs 5.3(B)(1) through (5) identifies VGC Wells requiring corrective action

based on the criteria in Subparagraph 5.3(C), then the quarterly report shall also identify the corrective action to be taken pursuant to Subparagraphs 5.3(C)(1) through (5) and a schedule for completion. Subsequent quarterly reports shall identify the corrective action taken and actual completion dates.

C. Based upon the results of the quarterly VGC Well reports required pursuant to Subparagraph 5.3(A), AHL shall take the corrective actions, if any, identified in Subparagraphs 5.3(C)(1) through (5) within the timeframes recommended in the quarterly report, which shall not exceed 120 days. If AHL believes that more than 120 days is necessary to implement a corrective action, then it may submit a request for an extension to EGLE pursuant to Paragraph 16.4. If EGLE denies the request for an extension, then AHL may submit the matter for dispute resolution pursuant to Section XII (Dispute Resolution).

1. For each VGC Well where the perforated pipe is greater than 50 percent open (*i.e.*, less than 50 percent of the perforated pipe is submerged with liquid) and there is less than 30 feet of solid pipe above the perforated pipe, no corrective action is required.

2. For each VGC Well where the perforated pipe is less than 50 percent open and no dewatering pump is present, install a new dewatering pump, provided the evaluation indicated that a pump could

be installed to a depth that would allow the perforated pipe to be greater than 50 percent open.

3. For each VGC Well where the perforated pipe is less than 50 percent open and a dewatering pump is present, review pump operation and achieve 50 percent open by taking the corrective actions recommended by the third-party engineer that prepares the quarterly report, unless corrective actions are not warranted based on the evaluation approach described in Subparagraph 5.3(C)(5). The corrective actions may include:

a. Pump inspection and cleaning.

b. Pump/forcemain evaluation (compare pumping rate connected to forcemain with pumping rate not connected to forcemain, to determine if forcemain blockage is the cause of low pumping rate).

c. Pump, cycle counter, airline, or forcemain repairs or replacement.

d. Installation of pump with greater liquid removal capacity, unless AHL demonstrates that increased pumping rates will lead to well stone/pack fouling.

e. Installation of additional VGC Wells based on factors such as increasing liquid levels or inability to reduce liquid levels despite pump optimization.

f. Lowering existing pump where an evaluation indicates potential for additional drawdown.

4. For each VGC Well where the perforated pipe is less than 50 percent open and the well is obstructed, has a stuck dewatering pump, or has greater than 30 feet of solid pipe, replace the VGC Well

unless replacement is not warranted based on the determination of the third-party engineer evaluation approach described in Subparagraph 5.3(C)(5).

5. For each VGC Well where the perforated pipe is less than 50 percent open or the well has more than 30 feet of solid pipe, but VGC Well replacement is not warranted as determined by the third-party engineer that prepares the quarterly report based on well-specific information, no replacement is required. The well-specific factors the third-party engineer shall consider in evaluating whether VGC Well replacement is warranted include whether the well is in a final cap area, the age of waste, the benefit achieved by increased footage or perforations, wells to be abandoned with future cell construction, radius of influence of surrounding wells, and history of surface emissions of methane greater than 500 parts per million in the area.

D. AHL shall create and retain records of the corrective actions it performs pursuant to Subparagraph 5.3(C).

5.4 Surface Emission Monitoring.

A. In addition to performing Quarterly SEM, AHL shall perform the following:

1. Quarterly SEM for methane at all Cover Penetrations.

2. At all locations where the Quarterly SEM that AHL performs identifies methane greater than 500 ppm, AHL shall measure H_2S surface concentrations at 5 to 10 centimeters using a Jerome meter or equivalent, weather permitting, prior to implementing actions pursuant to 40 CFR 63.1960(c)(4).

3. Conduct a root cause analysis of exceedances of 500 ppm methane and the H_2S Action Level and, pursuant to the schedule in 40 CFR 63.1960(c), implement actions to meet those concentrations and re-monitor.

4. AHL shall create and retain records of the actions it performs pursuant to Subparagraphs 5.4(A)(1) through (3).

B. Drone SEM. AHL was one of the first in the state of Michigan to voluntarily use a specially equipped drone (known as a Sniffer Drone) to measure surface emissions in areas and at times not required by the New Source Performance Standards for Municipal Solid Waste Landfills, 40 CFR 60.750 *et seq*. AHL shall continue to perform Drone SEM in accordance with the following:

1. During the months when the Quarterly SEM is not performed, AHL shall perform Drone SEM, weather permitting, as follows:

a. Along a pattern of approximately 30-meter intervals that traverses Landfill areas with final cover or a geomembrane temporary cover.

b. Along a pattern of approximately 15-meter intervals that traverses Landfill areas with daily and interim cover outside of the Working Face.

2. AHL shall perform Drone SEM once per quarter along a pattern of approximately 15 meters that traverses the Working Face after the Landfill has stopped receiving waste for the day and daily cover has been applied.

3. AHL shall submit the results of the Drone SEM to EGLE in map format in a quarterly report within 30 days after the end of each calendar quarter.

4. At all locations where Drone SEM identifies methane greater than 500 ppm, AHL shall measure methane and use a Jerome 631-X meter or equivalent to measure H_2S surface concentrations.

5. AHL shall include all locations where it measures methane greater than 500 ppm or H_2S greater than the H_2S Action Level in the next Quarterly SEM it performs pursuant to Subparagraph 5.4(A).

C. AHL shall perform the actions in Subparagraph 5.4(B) for four quarters after the Effective Date, after which it will submit a report to EGLE for review and approval pursuant to Section IX (Review and Approval of Submittals) with findings and recommendations regarding the value of continuing, or how best to refine, this targeted approach to surface emission monitoring.

5.5 Perimeter Emissions Monitoring and Response.

A. AHL shall implement a program to monitor emissions of H_2S and methane from the Landfill (Perimeter Emissions Monitoring Program). The Perimeter Emissions Monitoring Program shall include six Scentroid CTair monitoring stations placed at the locations along the eastern and northern perimeter of the Landfill as depicted in Appendix E.

B. Each monitoring station shall be equipped with H_2S and methane sensors and provide continuous measurement of H_2S and methane (using a sampling rate of approximately once per minute), GPS coordinates, temperature, relative humidity, barometric pressure, wind speed, and wind direction. Each monitoring station shall include a solar panel and be mounted to a pole. The specifications for the Scentroid CTair monitoring stations (or similar monitoring station as approved by EGLE) are included in Appendix F.

C. AHL shall operate the Perimeter Emissions Monitoring Program in conjunction with the Perimeter Emissions Monitoring Supplemental Environmental Project identified in Section VIII (Supplemental Environmental Projects) and Appendix G.

D. During waste excavation and relocation activities for Cells 6 and 4F, if any of the monitoring stations detect H_2S or methane above the respective action level, then AHL shall implement the monitoring activities

in Section 3.6 of the Cell 6/4F Waste Relocation and Odor Control Plan required in Subparagraph 5.6(B).

E. At all times other than during waste excavation and relocation activities for Cells 6 and 4F, if any of the monitoring stations detects H_2S or methane above the respective action level, then AHL shall conduct a root cause analysis of the exceedance(s) and implement corrective actions, as necessary, to correct the exceedance(s) and prevent the exceedance(s) from recurring, which may include:

1. Placing additional cover materials;
2. Repairing Gas Collection Wells; and
3. Adjusting Gas Collection Wells, including increasing the vacuum.

Within 48 hours after such detection, AHL shall correct the exceedance(s) and meet the Perimeter H_2S Action Level and the Perimeter Methane Action Level. If AHL believes that it cannot correct the exceedance(s) within 48 hours after detection, then AHL may submit a request for an extension to EGLE pursuant to Paragraph 16.4. If EGLE denies the request for an extension, then AHL may submit the matter for dispute resolution pursuant to Section XII (Dispute Resolution).

F. AHL shall create and retain records of operating the Perimeter Emissions Monitoring Program that include the following:

1. The H_2S and methane concentrations measured at the monitoring stations;

2. All exceedances of the Perimeter H_2S Action Level and the Perimeter Methane Action Level;

3. The root cause analysis of each exceedance of the Perimeter H_2S Action Level and the Perimeter Methane Action Level;

4. If applicable, the actions taken, including the date implemented, to correct each exceedance of the Perimeter H_2S Action Level and the Perimeter Methane Action Level; and

5. Each exceedance for which no action was taken and the reason no action was taken.

5.6 Odor Management in Construction Areas.

A. Management Practices. AHL shall use the following management practices, as appropriate, for managing waste and odors in all Landfill construction areas where previously landfilled municipal solid waste will be exposed due to grading, excavation, drilling, or liner installation/repair activities:

1. Exposed waste in construction areas shall be minimized during the operating day by providing cover material.

2. Application of daily cover meeting the requirements of Rule 429 to all exposed waste in construction areas as soon as practicable, but by no later than the end of the operating day.

3. Prompt removal of any excavated waste from construction areas to the Active Portion for disposal except if the excavated waste is being re-used as backfill material in construction-area excavations such as occurs during the trenching for and installation of horizontal Gas Collection Wells. If the excavated waste has the potential to cause nuisance odors, AHL shall manage it using the procedures for management of odorous waste streams in Paragraph 5.7.

4. Application of adequate interim cover and maintain active gas collection, to the extent practicable, in all construction areas; and

5. Vacuum boxes shall be available at the Landfill and used for Gas Collection Well drilling activities, as necessary to control waste and gas odors.

B. Odor Control Plan for Cell 6 Construction. AHL shall implement the Cell 6/4F Waste Relocation and Odor Control Plan–Arbor Hills Landfill, which is attached to this Consent Judgment as Appendix H. AHL shall create and retain records of its implementation of the Cell 6/4F Waste Relocation and Odor Control Plan.

5.7 Management of Odorous Waste Streams.

A. The semi-annual reports that AHL shall submit to EGLE pursuant to Section VI (Reporting Requirements) shall include a list of waste streams, if any, with the potential to cause nuisance odors, handling procedures for each type of such odorous waste accepted for disposal, and any

waste streams that AHL rejected for disposal due to the potential to cause nuisance odors. The handling procedures shall, at a minimum, include expediting the acceptance and unloading of odorous waste loads and isolation and cover of the waste load(s) with soils, less odorous wastes, or other approved cover as soon as practicable, but not longer than 60 minutes after the waste load(s) enters the Landfill.

B. AHL shall update the Operations Plan for new waste streams with the potential to cause nuisance odors and the handling procedures for those waste streams prior to acceptance.

5.8 Gas Collection in Future Landfill Cells.

A. In any future landfill cells to be constructed and operated at the Landfill, AHL shall install gas collection infrastructure within six months after initial waste placement. This gas collection infrastructure shall include:

1. Extensions of gas conveyance headers along the exterior perimeter of the new cell to the furthest point of the constructed liner.

2. Unless an alternative option is approved by EGLE, a minimum 3-foot diameter column of stone through the initial waste lift at the VGC well locations to connect the tip of the Gas Collection Well to the granular drainage layer to promote vertical drainage of liquids and improve the extraction of landfill gas.

3. Unless an alternative option is approved by EGLE, a 25-foot by 25-foot stone pad two feet thick placed on top of the initial

waste lift centered over the stone column to serve as a target for Gas Collection Well drilling operations.

B. AHL shall install Gas Collection Wells within 18 months after initial waste placement, or upon detection of methane in excess of 500 ppm based on results of Quarterly SEM or Drone SEM, whichever is earlier.

C. AHL shall commence active gas collection in future landfill cells, with a landfill gas collection infrastructure designed to ensure compliance with the National Emission Standards for Hazardous Air Pollutants for Municipal Solid Waste Landfills, 40 CFR.63.1930, *et seq.,* within 18 months after initial waste placement or upon detection of methane in excess of 500 ppm based on results of Quarterly SEM or Drone SEM, whichever is earlier.

D. AHL shall create and retain records of the actions it performs pursuant to Subparagraphs 5.8(A) through (C).

5.9 Compost Operations Management Plan.

A. AHL shall manage the composting operations at the Composting Facility pursuant to the following requirements:

1. Incoming materials received by AHL shall be limited to yard clippings;

2. Yard clippings and compost shall be placed in accordance with the site map included with the Compost Facility Registration Renewal Form received by EGLE on February 20, 2020, and granted on March 3, 2020, a copy of which is attached as Appendix I;

3. The maximum volume of yard clippings and compost combined at the Composting Facility shall not exceed 5,000 cubic yards per acre;

4. No more than 1,000 cubic yards of yard clippings can accumulate at the Composting Facility without processing into windrows (grinding and windrow formation); and

5. Yard clippings shall be processed within 48 hours (even if accumulation is less than 1,000 cubic yards) of arrival at the Composting Facility unless weather conditions are likely to contribute to nuisance odors. In such case, processing shall be completed upon the first opportunity of favorable conditions.

B. Within 30 days after the Effective Date, AHL shall install and maintain a windsock to provide immediate on-site visuals of wind direction within the Composting Facility.

C. AHL shall comply with Part 31 of the NREPA, MCL 324.3101 et seq., for any discharge of composting wastewater and/or runoff.

D. By September 30, 2022, AHL shall employ two full-time Compost Operators who have completed the U.S. Composting Council's Compost Operators Training Course to oversee operations within the Composting Facility.

E. AHL shall create and retain all records required of a registered composting facility pursuant to Section 11521(4)(d) of Part 115 of the NREPA, MCL 324.11521(4)(d).

5.10 Daily and Interim Cover.

A. AHL shall apply daily cover (including alternate daily cover approved in the Operating License or as otherwise approved by EGLE under Rule 429) at a minimum loose lift thickness of 9 to 12 inches (or equivalent protection for alternate daily cover, as approved by EGLE under Rule 429) and cover all the daily waste receipts, except for construction and demolition waste destined for beneficial reuse. AHL shall inspect and document the adequacy of the daily cover at the end of each workday. Documentation of this activity shall be kept in the Landfill's Operating Record and made available to EGLE upon request.

B. AHL shall place interim cover meeting the requirements of Rule 429(7) for any part of the Active Portion that is not expected to receive waste within 45 days. Documentation of this activity shall be kept in the Landfill's Operating Record and made available to EGLE upon request.

5.11 Cover Repairs. AHL shall comply with 40 CFR 63.1960(c)(5).

5.12 Lower Explosive Limit.

A. To address subsurface methane detection exceedances east of Napier Road, AHL shall install and operate the vertical gas extraction wells and horizontal gas extraction infrastructure on the west side of Napier Road

identified in AHL's submittal to EGLE dated June 11, 2021, a copy of which is attached is Appendix J.

B. AHL shall comply with Rule 433, Mich Admin Code, 299.4433.

C. AHL shall monitor gas probes AHMP0014/14R, AHMP015R/15R2, AHMP016R, AHMP28R2, and AHMP0013 on a weekly basis until such time as each probe achieves one year with no methane concentration exceedances of Rule 433(1)(b), at which time monitoring for that probe will revert to quarterly. AHL shall monitor the remaining probes at the Landfill on a quarterly basis. If methane concentrations exceed Rule 433(1)(b) in any probe during quarterly monitoring, then AHL shall revert to monitoring that probe weekly.

D. AHL shall submit a report to EGLE within 30 days after the end of each calendar quarter with the results of monitoring for all gas probes. The report shall include a description of any actions taken based on identified methane concentration exceedances of Rule 433(1)(b).

5.13 Leachate Levels, Leachate Level Monitoring and Recording, Leachate Management, Leachate Reporting, and Odor Control for Leachate and Gas Well Liquid Storage.

A. Leachate Levels. AHL shall comply with Rule 432(1), Mich Admin Code, R 299.4432(1).

B. Leachate Monitoring and Recording. AHL shall comply with Rule 432(2) and (3).

C. Leachate Management. AHL shall implement the Leachate Operations, Maintenance and Inspection Plan dated February 2022, which is attached as Appendix K.

D. Reporting. AHL shall submit quarterly reports within 30 days after the end of each calendar quarter providing the following information:

1. The amount of leachate generated each month of the quarter from Arbor Hills West, Arbor Hills East, and TS-01R.

2. The amount of leachate pumped each month of the quarter by the primary leachate liner pumps and the secondary leachate liner pumps.

3. The amount of leachate pumped each month of the quarter by the VGC Well dewatering pumps.

4. The results of any analytical sampling of leachate obtained during the reporting period.

5. Leachate depths and level monitoring demonstrating compliance with Rule 432(1), Mich Admin Code, R 299.4432(1).

E. Odor Control for Leachate and Gas Well Liquid Storage.

1. Leachate from the Landfill is stored at a storage tank farm that includes a 926,000-gallon storage tank, a 540,000-gallon storage tank, and two 50,000-gallon "bullet" tanks. The 926,000-gallon and 540,000-gallon storage tanks include aeration systems. All four

tanks have carbon filtration systems. The tanks are depicted on Appendix L.

2. AHL operates the Arbor Hills West Pump Station (depicted on Appendix L), which has a carbon filtration system.

3. AHL operates a Gas Collection Well liquid sump with a carbon filtration system that is depicted on Appendix L.

4. AHL shall implement the Operation and Maintenance Manual for the aeration system and carbon filtration systems. The cover page of the Operation and Maintenance Manual is attached as Appendix M, and AHL has provided EGLE with a complete copy of the manual.

5.14 Flare System.

A. AHL shall perform a monthly check of the Flare System by running each flare separately at least once a month for at least one hour. While each flare is running, AHL shall check to ensure that:

1. The flare lights without incident.

2. The louvers are functioning (enclosed flares only).

3. The thermocouples are functioning properly.

4. The flare achieves and maintains minimum temperature as determined by the most recent flare performance tests.

5. The fail-safe actuating valves are functioning properly.

B. AHL shall create and retain records of the actions it performs pursuant to Subparagraph 5.14(A).

C. AHL may submit a request to modify the Flare System to EGLE for review and approval pursuant to Section IX (Review and Approval of Submittals).

5.15 Asbestos. AHL shall comply with the National Emission Standard for Asbestos, 40 CFR Part 61, Subpart M, 61.140 *et seq.,* and the provisions of the EGLE-approved AHL Operations Plan for asbestos waste disposal. A copy of the provisions is attached as Appendix N.

5.16 Wells of Interest. AHL shall comply with the EGLE approval, dated June 2, 2021, of an extension for higher operating values for temperature for Wells of Interest, a copy of which is attached as Appendix O. AHL shall comply with any future EGLE approvals for extensions of higher operating values for temperature for Wells of Interest.

5.17 Evaluation of Operating Requirements if EGLE sends future Violation Notices regarding Rule 901 or Rule 433(1)(c).

A. EGLE and AHL agree that the intention of this Paragraph 5.17 is to assist both AHL and EGLE in investigating and identifying the underlying conditions at the Landfill leading to odors and to provide AHL with the opportunity to address these conditions in a timely and effective manner. Nothing in this Paragraph 5.17 shall limit or supplant EGLE's right to enforce this Consent Judgment, AHL's permits or operating license, or applicable law.

B. If EGLE determines AHL has violated Rule 901 or Rule 433(1)(c), Mich Admin Code, R 299.4433(1)(c), at any time after the Effective Date of the Consent Judgment, then EGLE may send AHL a Violation Notice identifying the alleged violation under this Paragraph 5.17 (Notice). The Notice will include reasonable detail to permit AHL to identify the date of the alleged violation.

C. Immediately following receipt of the Notice, AHL shall commence an investigation into the cause of the alleged violation set out in the Notice. As part of its investigation, AHL shall utilize a checklist of suspected causes of odorous conditions based upon past operating experience. AHL shall also regularly update the checklist based upon experience gained through its ongoing investigative efforts. Within 72 hours after AHL's receipt of the Notice, AHL shall submit to EGLE a report with the results of its investigation and any evidence gathered by AHL in the conduct of its investigation supporting its findings, including but not limited to H_2S monitoring data, olfactory device readings, and meteorological data. If such investigation identifies one or more underlying site conditions that are the cause of the alleged violation, then AHL shall include with the report a plan to remediate the identified site condition(s) that are the cause of the alleged violations including any changes to processes or procedures and/or capital expenditures required and the time frame to implement such remedial actions.

D. AHL shall within such 72-hour period commence such remedial actions identified in AHL's report to EGLE to address such underlying conditions and will expeditiously pursue completion of such remedial actions in accordance with the plan submitted to EGLE.

E. Immediately following completion of the remedial actions, AHL shall provide documentation to EGLE that the underlying site condition has been rectified along with reasonable supporting evidence of completion of its remedial plan. If, as a result of such investigation, AHL concludes that activities at the Landfill site are not the source or cause of the alleged violation, it will provide EGLE with the evidence relied on by AHL to supports its conclusion.

F. Within 10 days after receipt of AHL's report, EGLE may provide written comments on the adequacy of the remedial actions to AHL, including whether additional remedial actions are necessary. Within 10 days after receipt of EGLE's comments, AHL shall provide a written response to EGLE addressing them. EGLE shall send AHL written acknowledgement if EGLE determines that AHL has demonstrated either (a) the Landfill was not the source of the alleged odor; or (b) the odor referenced in the Notice has been rectified.

VI. REPORTING REQUIREMENTS

6.1 All plans and reports that AHL is required to submit to EGLE under this Consent Judgment shall be submitted to the persons and in the manner designated in Section X (Notices).

6.2 Within 30 days after the end of each calendar quarter (*i.e.*, January 30, April 30, July 30, and October 30), AHL shall submit a quarterly report that contains the reports required pursuant to Subparagraphs 5.3(A), 5.4(B)(3), 5.12(D), and 5.13(D). AHL shall submit the first quarterly report 30 days after the end of the next full quarter following Effective Date.

6.3 AHL shall submit semi-annual reports no later than March 15 and September 15 of each year. AHL shall submit the first semi-annual report by the first March 30 or September 30 that occurs more than 90 days after the Effective Date. Each semi-annual report shall contain the following information for, respectively, the half-year between July 1 and December 31, or the half-year between January 1 and June 30:

A. The records that AHL shall create and retain pursuant to Subparagraphs 5.1(G), 5.3(D), 5.4(A)(4), 5.5(F), 5.6(B), 5.8(D), 5.9(E), and 5.14(B); and

B. The information identified in Paragraph 5.7 that AHL shall include in the semi-annual reports.

6.4 Each report that AHL is required to submit to EGLE under this Consent Judgment under this Section shall be signed by the Landfill Manager or Regional Landfill Manager and shall include the following certification:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. I further certify that Arbor Hills Landfill, Inc. has not purposefully or intentionally failed or refused to undertake or maintain any recordkeeping or reporting required pursuant to this Consent Judgment for the purpose of avoiding fines, penalties or enforcement. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for knowingly or intentionally submitting false information, including the possibility of fine and imprisonment for knowing violations.

VII. CIVIL FINE

7.1 Within 30 days after the Effective Date of this Consent Judgment, AHL shall pay a civil fine of $355,109.00 to EGLE. Payment shall be made in the form of a certified check or cashier's check and made payable to the "State of Michigan." Payment shall be sent to:

> Michigan Department of Environment, Great Lakes, and Energy
> Accounting Services Division, Cashier's Office
> P.O. Box 30657
> Lansing, MI 48909-8157

To ensure proper credit, the check shall reference *Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc.*, and Payment Identification Number MUL40006.

7.2 Interest. If any portion of the civil fine due to EGLE is not paid when due, then AHL shall pay interest on the amount past due, accruing from the Effective Date through the date of payment, at the rate specified in MCL 600.6013(8).

VIII. SUPPLEMENTAL ENVIRONMENTAL PROJECTS

8.1 AHL shall implement three supplemental environmental projects (SEPs), the Perimeter Monitoring SEP, the Household Hazardous Waste SEP, and the Vegetative Buffer SEP, in accordance with this Section and all provisions of Appendix G.

8.2 AHL is responsible for the satisfactory completion of the SEPs in accordance with the requirements of this Consent Judgment. If AHL elects to complete any SEP by third-party contracting, the funds used to pay for the third-party contracting services shall be included in the entire amount allotted to spend on the SEP so long as AHL demonstrates that the funds have been actually spent by either AHL or the person or entity receiving them in carrying out the SEP, and that such expenditures met all requirements of this Consent Judgment.

8.3 Certification. For each SEP, AHL certifies the truth and accuracy of each of the following:

A. That all cost information provided to EGLE in connection with EGLE's approval of the SEPs is complete and accurate and that AHL in good faith estimates that the cost to implement the SEPs is as set forth in Appendix G.

B. That, as of the date of executing this Consent Judgment, AHL is not required to perform or develop any of the SEPs by any federal, state, or local law or regulation and is not required to perform or develop any of the SEPs by agreement, grant, or as injunctive relief awarded in any other action in any forum.

C. That none of the SEPs are a project that AHL was planning or intending to construct, perform, or implement other than in settlement of the claims resolved in this Consent Judgment.

D. That AHL has not received and will not receive credit for the SEPs in any other enforcement action.

E. That AHL will not receive reimbursement for any portion of the SEPs from another person or entity.

F. That AHL is not a party to any state or federal financial assistance that is funding or could be used to fund the SEPs.

G. That for state and federal income tax purposes, AHL shall neither capitalize into inventory or basis nor deduct any costs or expenditures incurred in performing the SEPs.

8.4 For each SEP, AHL shall submit to EGLE an annual SEP report by February 1 of each year after the Effective Date. Each annual SEP report must be certified by an appropriate corporate official and shall contain:

A. A detailed description of the SEP as implemented;

B. A description of any problems encountered in implementing the SEP during the prior year and solutions thereto;

C. An itemized list of all SEP costs expended during the prior year, and documentation of all expenditures; and

D. A certificate stating:

> I certify that the project has been implemented pursuant to the provisions of the Consent Judgment entered in *Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc.*, Case No. 2020-0593-CE (Ingham County Circuit Court), that I am familiar with the information in this document, and that, based on my inquiry of those individuals responsible for obtaining the information, it is true and complete to the best of my knowledge. I know that there are significant penalties for knowingly or intentionally submitting false information, including the possibility of fines and imprisonment for knowing violations.

8.5 For each SEP, AHL shall submit to EGLE a SEP Completion Report no later than 30 days after the SEP's completion. Each SEP Completion Report must be certified by an appropriate corporate official and shall contain:

A. A detailed description of the SEP as implemented;

B. A description of any problems encountered in completing the SEP and solutions thereto;

C. An itemized list of all SEP costs expended, and documentation of all expenditures;

D. Evidence of the SEP completion (which may include, but is not limited to, photos, vendor invoices or receipts, correspondence from SEP recipients etc.);

E. To the extent possible, documentation supporting the quantification of benefits associated with each SEP and an explanation of how such benefits were measured or estimated; and

F. A certificate stating:

> I certify that the project has been fully implemented pursuant to the provisions of the Consent Judgment entered in *Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc.*, Case No. 2020-0593-CE (Ingham County Circuit Court), that I am familiar with the information in this document, and that, based on my inquiry of those individuals responsible for obtaining the information, it is true and complete to the best of my knowledge. I know that there are significant penalties for knowingly or intentionally submitting false information, including the possibility of fines and imprisonment for knowing violations.

8.6 Following receipt of any SEP Completion Report described in the preceding Paragraph, EGLE will notify AHL in writing that:

A. AHL has satisfactorily completed the SEP and the SEP Completion Report; or

B. AHL has not satisfactorily completed the SEP and/or the SEP Completion Report and EGLE will seek stipulated penalties under Section XIV (Stipulated Penalties), as applicable.

8.7 Any public statement, oral or written in print, film, or other media, made by AHL making reference to any SEP under this Consent Judgment shall include the following language: "This project was undertaken in connection with the settlement of an enforcement action in Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc. to enforce state and federal laws."

IX. REVIEW AND APPROVAL OF SUBMITTALS

9.1 Initial Submissions. Whenever AHL is required to submit a document for review or approval pursuant to this Consent Judgment, EGLE shall, within 30 days after the submittal, in writing: (1) approve, in whole or in part, the submission; (2) approve, in whole or in part, the submission upon specified conditions; (3) disapprove, in whole or in part, the submission, requiring AHL to correct the deficiencies; or (4) any combination of the foregoing.

9.2 Resubmissions.

A. Upon receipt of a notice of approval in part; approval, in whole or in part, upon specified conditions; disapproval in whole or in part; or any combination of the foregoing, AHL shall, within 30 days or such longer time as specified by EGLE in such notice, either correct the deficiencies and resubmit the plan, report, or other deliverable for approval, or submit the matter for dispute resolution, including the period of informal negotiations, under Section XII (Dispute Resolution) of this Consent Judgment.

B. After review of the resubmitted plan, report, or other deliverable, EGLE shall within 30 days or such longer time as EGLE specified to AHL: (1) approve, in whole or in part, the resubmission; (2) approve the resubmission upon specified conditions; (3) disapprove, in whole or in part, the resubmission, requiring AHL to correct the deficiencies; or (4) any combination of the foregoing.

C. Upon receipt of a notice of approval in part, approval, in whole or in part, upon specified conditions, disapproval in whole or in part, or any combination of the foregoing, of the resubmission under this Paragraph, AHL shall, within 30 days or such longer time as specified by EGLE in such notice, either correct the deficiencies and resubmit the plan, report, or other deliverable for approval, or submit the matter for dispute resolution, including the period of informal negotiations, under Section XII (Dispute Resolution) of this Consent Judgment.

9.3 Implementation. Upon approval by EGLE under Paragraph 9.1 (Initial Submissions) or Paragraph 9.2 (Resubmissions), of any plan, report, or other submittal, or any portion thereof: (a) such plan, report, or other deliverable, or portion thereof, shall be incorporated into and enforceable under this Consent Judgment; and (b) AHL shall take any action required by such plan, report, or other deliverable in accordance with the schedules and requirements specified therein. If the submission is conditionally approved or approved only in part, pursuant to Paragraphs 9.1 or 9.2, then AHL shall, upon written direction from EGLE, take all actions required by the approved plan, report, or other deliverable that EGLE determines are severable from any disapproved portions unless AHL invokes its right to dispute the specified conditions or the disapproved portions under Section XII (Dispute Resolution).

X. NOTICES

10.1 Any submittal, notice, report, or documentation required by this Consent Judgment shall be submitted to the attention of:

For EGLE: Scott Miller, District Supervisor
Michigan Department of Environment, Great Lakes, and Energy
Air Quality Division, Jackson District Office
301 East Louis Glick Highway
Jackson, MI 49201-1556
millers@michigan.gov

Jenine Camilleri, Enforcement Unit Manager
Michigan Department of Environment, Great Lakes, and Energy
Air Quality Division
Constitution Hall
525 West Allegan
P.O. Box 30260
Lansing, MI 48909-7760
camillerij@michigan.gov

Larry Bean, District Supervisor
Michigan Department of Environment, Great Lakes, and Energy
Materials Management Division
Jackson District Office
301 East Louis Glick Highway
Jackson, MI 49201-1556
beanl@michigan.gov

and

Alexandra Clark, Enforcement Unit Manager
Michigan Department of Environment, Great Lakes, and Energy
Materials Management Division
Constitution Hall
525 West Allegan Street
P.O. Box 30241
Lansing, MI 48909-7741
clarka37@michigan.gov

For AHL:

David Seegert
Landfill Manager
Arbor Hills Landfill, Inc.
10599 West Five Mile Road
Northville, MI 48168-9402
david.seegert@gflenv.com

and

Clarke Lundell
Regional Landfill Manager
Arbor Hills Landfill, Inc.
10599 West Five Mile Road
Northville, MI 48168-9402
clarke.lundell@gflenv.com

with a copy to:

Attn: General Counsel
Arbor Hills Landfill, Inc.
100 New Park Place, Suite 500
Vaughan, Ontario, Canada L4K 0J3
mgilbert@gflenv.com

Either party may substitute for those designated to receive such notices by providing prior written notice to the other party.

XI. FORCE MAJEURE

11.1 "Force majeure," for purposes of this Consent Judgment, is defined as any event arising from causes beyond the control of AHL that delays or prevents the performance of any obligation under this Consent Judgment despite AHL's best efforts to fulfill the obligation. A "force majeure" event shall include: an Act of God; untimely review of permit applications or submissions by EGLE or other applicable authority; malfunctions; power outages; labor strikes; and acts or omissions of third parties that could not have been avoided or overcome by AHL's due diligence and

that delay the performance of an obligation under this Consent Judgment. "Force Majeure" does not include unanticipated or increased costs, changed financial circumstances, intentional or negligent failure to maintain equipment, or failure to obtain a permit or license as a result of AHL's actions or omissions.

11.2 If any event occurs or has occurred that may delay the performance of any obligation under this Consent Judgment, whether or not caused by a force majeure event, AHL shall provide notice by telephone or by email to EGLE within 72 hours after AHL discovered the event. Within seven days thereafter, AHL shall provide in writing to EGLE an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; AHL's rationale for attributing such delay to a force majeure event if it intends to assert such a claim; and a statement whether, in the opinion of AHL, such event may cause or contribute to an endangerment to public health, welfare or the environment. AHL shall include with any notice all available documentation supporting the claim that the delay was attributable to a force majeure event. Failure to comply with the above requirements shall preclude AHL from asserting any claim of force majeure for that event for the period of time of such failure to comply, and for any additional delay caused by such failure.

11.3 If EGLE agrees that the delay or anticipated delay is attributable to a force majeure event, the time for performance of the obligations under this Consent

Judgment that are affected by the force majeure event will be extended by EGLE for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the force majeure event shall not, of itself, extend the time for performance of any other obligation. EGLE will notify AHL in writing of the length of the extension, if any, for performance of the obligations affected by the force majeure event.

11.4 If EGLE does not agree that the delay or anticipated delay has been or will be caused by a force majeure event, then EGLE will notify AHL in writing of its decision.

11.5 If AHL elects to invoke the dispute resolution procedures set forth in Section XII (Dispute Resolution), then it shall do so no later than 15 days after receipt of EGLE's notice. In any such proceeding, AHL shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a force majeure event, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that AHL complied with the requirements of Paragraphs 11.1 and 11.2. If AHL carries this burden, the delay at issue shall be deemed not to be a violation by AHL of the affected obligation of this Consent Judgment identified to EGLE and the Court.

XII. DISPUTE RESOLUTION

12.1 The dispute resolution procedures of this Section XII shall be the exclusive mechanism to resolve disputes arising under this Consent Judgment and shall apply to all provisions of this Consent Judgment.

12.2 Informal Dispute Resolution. Any dispute that arises under this Consent Judgment shall in the first instance be the subject of informal negotiations between the Parties. The dispute shall be considered to have arisen when AHL sends EGLE a written Notice of Dispute describing the matter in dispute. The period of informal negotiations shall not exceed 20 days from the date the dispute arises, but it may be extended by a written agreement of the Parties. If the Parties cannot resolve a dispute by informal negotiations, then EGLE shall provide a written statement of its position regarding the dispute to AHL. EGLE's position shall be considered binding unless, within 10 days after AHL's receipt of EGLE's written statement of its position, AHL invokes the formal dispute resolution procedures set forth in the following Paragraph.

12.3 Formal Dispute Resolution. AHL shall invoke formal dispute procedures, within the time period provided in the preceding Paragraph, by serving on EGLE a written Statement of Position regarding the matter in dispute. The Statement of Position shall include, but need not be limited to, any factual data, analysis, or opinion supporting AHL's position and any supporting documentation relied upon by AHL.

12.4 EGLE shall serve its Statement of Position within 45 days after receiving AHL's Statement of Position. EGLE's Statement of Position shall include, but need not be limited to, any factual data, analysis, or opinion supporting EGLE's position and any supporting documentation relied upon by EGLE. EGLE's Statement of Position shall be binding on AHL unless AHL files a motion for judicial review of the dispute in accordance with the following Paragraph.

12.5 AHL may seek judicial review of the dispute by filing with the Court and serving on EGLE, in accordance with Section X (Notices), a motion requesting judicial resolution of the dispute. The motion must be filed within 10 days after receipt of EGLE's Statement of Position pursuant to the preceding Paragraph. The motion shall contain a written statement of AHL's position on the matter in dispute, including any supporting factual data, analysis, opinion, or documentation, and shall set forth the relief requested, and any schedule within which the dispute must be resolved to ensure orderly implementation of this Consent Judgment.

12.6 EGLE shall respond to AHL's motion within the time period allowed by the Michigan Court Rules.

12.7 Standard of Review. In any dispute brought under this Section XII (Dispute Resolution), AHL shall bear the burden of proof pursuant to applicable principles of law.

12.8 The invocation of dispute resolution procedures under this Section XII (Dispute Resolution) shall not of itself extend or postpone any obligation of AHL under this Consent Judgment, unless and until final resolution of the dispute so provides.

Notwithstanding the invocation of the dispute resolution procedures, stipulated penalties, with any applicable interest, shall accrue from the first day of any failure or refusal to comply with any term or condition of this Consent Judgment, but payment shall be stayed pending resolution of the dispute. In the event, and to the extent, that AHL does not prevail on the disputed issue, stipulated penalties and any applicable interest shall be paid within 10 calendar days in the manner provided for in Paragraph 13.11 of this Consent Judgment. AHL shall not be assessed stipulated penalties for disputes resolved in its favor.

12.9 Notwithstanding this Section XII (Dispute Resolution), AHL shall pay that portion of a demand for reimbursement of costs or payment of stipulated penalties that is not subject to good faith resolution in accordance with and in the manner provided in Section XIII (Stipulated Penalties), as appropriate.

XIII. STIPULATED PENALTIES

13.1 AHL shall be subject to stipulated penalties for violations of this Consent Judgment (including its appendices) as specified below, unless excused under Section XI (Force Majeure). Stipulated penalties that accrue per day of violation of a Paragraph's requirements shall accrue as a single violation for all violations of that Paragraph's requirements that occur in one calendar day.

13.2 Late Payment of Civil Fine. If AHL fails to pay the civil fine required to be paid under Paragraph 7.1 when due, then AHL shall pay a stipulated penalty of $500 per day for each day that the payment is late.

13.3 The following stipulated penalties shall accrue per day of violation of each of the requirements identified in Subparagraphs 5.1(A), 5.1(F), 5.2(A)(1), 5.2(B)(1) and (B)(2), 5.3(A), 5.4(A), 5.5(A), 5.5(D) through (F), 5.7(A), and 5.10(B):

Penalty Per Day of Violation	Period of Noncompliance
$1,000	Days 1 through 5
$1,500	Days 6 through 10
$2,000	Day 11 and beyond

13.4 The following stipulated penalties shall accrue per day of violation of each of the requirements identified in Subparagraphs 5.1(G), 5.2(C)(1) through (4), 5.2(C)(7), 5.3(C), 5.4(B)(5), 5.6(B), 5.8(D), 5.9(A) through (E), 5.12(B) and (C), 5.13(A) through (D), and 5.17(C) through (E):

Penalty Per Day of Violation	Period of Noncompliance
$750	Days 1 through 5
$1,000	Days 6 through 10
$1,500	Day 11 and beyond

13.5 The following stipulated penalties shall accrue per day of violation of each of the requirements identified in Subparagraphs 5.2(C)(6), 5.3(D), 5.6(A), 5.7(B), 5.10(A), 5.12(D), and 5.14(A) and (B):

Penalty Per Day of Violation	Period of Noncompliance
$500	Days 1 through 5
$750	Days 6 through 10
$1,000	Day 11 and beyond

13.6 A stipulated penalty of $500 per day shall accrue for each violation of Paragraph 6.2 and Subparagraphs 6.3(A) and (B), 9.2(A), and 9.2(C).

13.7 Stipulated Penalties for Supplemental Environmental Projects.

A. A stipulated penalty of $500 per violation shall accrue for each violation of Paragraph 8.1.

B. If AHL fails to expend the entire amount of the required expenditures for the three supplemental environmental projected identified in Paragraph 8.1 but has completed them, then AHL shall pay a stipulated penalty equal to the difference between the required expenditures and any eligible project dollar amounts expended to implement the projects in accordance with Section VIII (Supplemental Environmental Projects) and Appendix G. Alternatively, AHL may submit to EGLE for review and approval pursuant to Section IX (Review and Approval of Submittals) a proposal to spend the difference on an additional supplemental environmental project or a revision(s) to the supplemental environmental projects identified in Paragraph 8.1.

13.8 Demand for Stipulated Penalties. EGLE may seek stipulated penalties under this Section XIII (Stipulated Penalties) by sending a written demand for the payment of stipulated penalties to AHL. A written demand by EGLE for the payment of stipulated penalties will identify the particular violation(s) to which the stipulated penalty relates; the stipulated penalty amount that EGLE is demanding for each violation; the calculation method underlying the demand; and the grounds upon which the demand is based. EGLE may waive stipulated penalties or reduce the amount of stipulated penalties it seeks in the unreviewable exercise of its discretion.

13.9 Stipulated Penalty Accrual. Stipulated penalties shall begin to accrue on the day after performance is due or the day a violation occurs, whichever is

applicable, and will continue to accrue until performance is satisfactorily completed or the violation ceases, whichever is applicable. Stipulated penalties shall accrue simultaneously for separate violations of this Consent Judgment.

13.10 Stipulated Penalty Due Date. AHL shall pay stipulated penalties no later than 30 days after receipt of a written demand by EGLE unless the demand is subject to Section XII (Dispute Resolution).

13.11 Manner of Payment of Stipulated Penalties. AHL shall pay stipulated penalties in the manner set forth in Paragraph 7.1. All transmittal correspondence shall state that the payment is for stipulated penalties and shall identify the violations for which the stipulated penalties are being paid.

13.12 Disputes over Stipulated Penalties. By no later than 30 days after receipt of a written demand for stipulated penalties, AHL may dispute liability for any or all stipulated penalties demanded by invoking the dispute resolution procedures of Section XII (Dispute Resolution). In the event of a dispute over stipulated penalties, stipulated penalties shall continue to accrue as provided in Paragraphs 13.2 through 13.7 during any dispute resolution, but need not be paid until the following:

A. If the dispute is resolved by agreement or a decision of EGLE that is not appealed to the Circuit Court, then AHL shall pay accrued penalties determined to be owing, together with interest, to EGLE within 15 days after the effective date of the agreement or the receipt of EGLE's decision.

B. If the dispute is appealed to the Circuit Court and EGLE prevails in whole or in part, then AHL shall pay all accrued stipulated penalties determined by the Circuit Court to be owing, together with interest, within 30 days after receiving the Circuit Court's decision or order, except as provided in subparagraph c below.

C. If either AHL or EGLE appeals the Circuit Court's decision, then AHL shall pay all accrued stipulated penalties determined to be owing, together with interest, within 15 days after receiving the final appellate court decision.

13.13 To ensure timely payment of any stipulated fines that become due pursuant to this Section XIII (Stipulated Penalties), AHL shall pay an interest penalty to EGLE each time it fails to make a complete or timely payment. This interest penalty shall be based on a rate that is one percent plus the average interest rate paid at auctions of 5-year United States treasury notes during the six months immediately preceding July 1 and January 1, as certified by the state treasurer, compounded annually, and using the full increment of the amount due as principal, calculated from the due date specified in this Consent Judgment until the date that the delinquent payment is finally paid in full. Payment of an interest penalty by AHL shall be made to the "State of Michigan" in accordance with Paragraph 7.1. Interest payments shall be applied first towards the most overdue amounts or outstanding interest penalty owed by AHL before any remaining balance is applied to a subsequent payment amount or interest penalty.

13.14 The provisions of this Section XIII (Stipulated Penalties) shall not bar EGLE from seeking any additional remedies or sanctions available to them for any violation of this Consent Judgment, or any other provision of applicable law.

13.15 EGLE, at its discretion, may seek stipulated fines or statutory civil fines for any violation of this Consent Judgment which is also a violation of any provision of applicable federal and state law, rule, regulation, permit, or EGLE Administrative Order. However, EGLE is precluded from seeking both a stipulated fine under this Consent Judgment and a statutory civil fine for the same violation.

XIV. RECORD RETENTION

14.1 Until five years after the termination of this Consent Judgment, AHL shall obtain and retain all non-identical copies of records, documents, or other information (including records, documents, or other information in electronic form) in its or its contractors', agents', or representatives' possession or control that relate to AHL's performance of its obligations under this Consent Judgment.

XV. RIGHT OF ENTRY

15.1. AHL shall allow any authorized representative and/or contractor of EGLE, upon representation of proper credentials, to enter upon the premises of the Landfill at all reasonable times for the purpose of monitoring compliance with the provisions of this Consent Judgment. This paragraph in no way limits the authority of EGLE to conduct tests and inspections and collect samples pursuant to

Part 55 of the NREPA and Part 115 of the NREPA, their rules, or any other applicable law.

XVI. GENERAL PROVISIONS

16.1 Third Parties. This Consent Judgment does not limit or affect the rights of AHL or EGLE against any third parties.

16.2 Severability. Should any provision of this Consent Judgment be declared by a court of competent jurisdiction to be inconsistent with state or federal law and, therefore, unenforceable, the remaining provisions shall remain in full force and effect.

16.3 Modification. The terms of this Consent Judgment may be modified only by a subsequent written agreement signed by EGLE and AHL. Where the modification constitutes a material change to this Consent Judgment, it shall be effective only upon approval by the Court. Any party to this Consent Judgment may petition the Court for modification of this Consent Judgment prior to expiration of the effective period. No party may petition the Court for a modification of this Consent Judgment without first having made a good faith effort to reach agreement with the other party on the terms of any such modification.

16.4 Request for Extension. AHL may submit a request for an extension pursuant to Subparagraphs 5.1(F), 5.3(C), or 5.5(E) by submitting the request in writing by email to EGLE pursuant to Section X (Notices). The request shall identify the Subparagraph for which the extension is requested and shall include the length of the extension, the reason(s) for the extension, and supporting

documentation for the request. EGLE shall approve or deny the request within 10 calendar days after receiving it.

16.5 Other Laws. This Consent Judgment in no way affects AHL's responsibility to comply with any other applicable state, federal, or local laws or regulations, or with any order of this or any other court, including without limitation, any amendments to Part 55 of the NREPA, Part 115 of the NREPA, or their rules.

16.6 Settlement. This Consent Judgment is in full settlement and satisfaction of all matters alleged in the Complaint.

XVII. TERMINATION

17.1 The Paragraphs in Section V (Operating Requirements) other than Paragraph 5.5 shall terminate five years after the Effective Date provided that AHL submits to EGLE a written request to terminate those Paragraphs. This written request shall include a summary of the activities performed to comply with the Paragraphs in Section V other than Paragraph 5.5 and shall certify that the civil fine and any stipulated penalties owed to EGLE under Section VII (Civil Fine) and Section XIII (Stipulated Penalties) of this Consent Judgment have been paid in full and that AHL has complied with the reporting requirements in Section VI (Reporting Requirements) for those Paragraphs. Thereafter, provided full compliance with the Paragraphs in Section V other than Paragraph 5.5 and the reporting requirements in Section VI for those Paragraphs has been achieved,

EGLE shall file with the clerk a Satisfaction of Judgment pursuant to MCR 2.620(1) as to those Paragraphs.

17.2 The provisions of this Consent Judgment other than those terminated pursuant to Paragraph 17.1 (Remaining Consent Judgment Provisions) shall terminate 10 years after the Effective Date provided that AHL submits to EGLE a written request to terminate the Consent Judgment. This written request shall include a summary of the activities performed to comply with the Remaining Consent Judgment Provisions and shall certify that any stipulated penalties owed to EGLE under Section XIII of this Consent Judgment have been paid in full and that AHL has fully complied with the Remaining Consent Judgment Provisions. Thereafter provided full compliance with the Remaining Consent Judgment Provisions has been achieved, EGLE shall file with the clerk a Satisfaction of Judgment pursuant to MCR 2.620(1) as to the Remaining Consent Judgment Provisions.

XVIII. RETENTION OF JURISDICTION

18.1 Prior to the termination of this Consent Judgment under Paragraph 17.2, this Court shall retain jurisdiction over this action to modify or enforce the terms of this Consent Judgment, to assess stipulated fines, to resolve disputes arising under its terms, or to take any action necessary or appropriate for construction or implementation of this Consent Judgment.

XIX. APPENDICES

19.1 The following Appendices are attached to and part of this Consent Judgment:

Appendix A — Maps of Arbor Hills Landfill

Appendix B — Wellhead Inspection Checklist

Appendix C — Modifications to Section 4.3 of the AHL Operations Plan

Appendix D — Map identifying Expansion of Landfill Areas for Enhanced Interim Cover (in Blue) and for Final Cover (in Orange)

Appendix E — Map identifying location of Scentroid CTair monitoring stations

Appendix F — Specifications for Scentroid CTair monitoring stations

Appendix G — Supplemental Environmental Projects

Appendix H — Cell 6/4F Waste Relocation and Odor Control Plan– Arbor Hills Landfill

Appendix I — Site map for Composting Facility

Appendix J — AHL submittal dated June 11, 2021 addressing methane detection exceedances east of Napier Road

Appendix K — Leachate Operations, Maintenance and Inspection Plan dated February 2022

Appendix L — Map identifying 926,000-gallon storage tank, 540,000-gallon storage tank, two 50,000 gallon "bullet" tanks, Arbor Hills West Pump Station, and Gas Collection Well liquid sump

Appendix M — Cover page of Operation and Maintenance Manual for the aeration system and carbon filtration systems

Appendix N — Section 6.2 of AHL Operations Plan for Asbestos

Appendix O — EGLE approval, dated June 2, 2021, of an extension for higher operating values for temperature for Wells of Interest

IT IS SO ORDERED THIS 7 day of March, 2022.

Wanda M. Stokes
Honorable Wanda M. Stokes
Circuit Court Judge

STIPULATION

The Parties hereby stipulate to the entry of this Consent Judgment.

FOR PLAINTIFF Michigan Department of Environment, Great Lakes, and Energy

By: _____ Dated: 3/7/22, 2022
Liesl Eichler Clark, Director
Michigan Department of Environment,
Great Lakes, and Energy

By: _____ Dated: March 7, 2022
Neil D. Gordon (P56374)
Assistant Attorney General
Environment, Natural Resources
and Agriculture Division
Michigan Department of Attorney General

FOR DEFENDANT Arbor Hills Landfill, Inc.,

By: _____ Dated: March 4, 2022

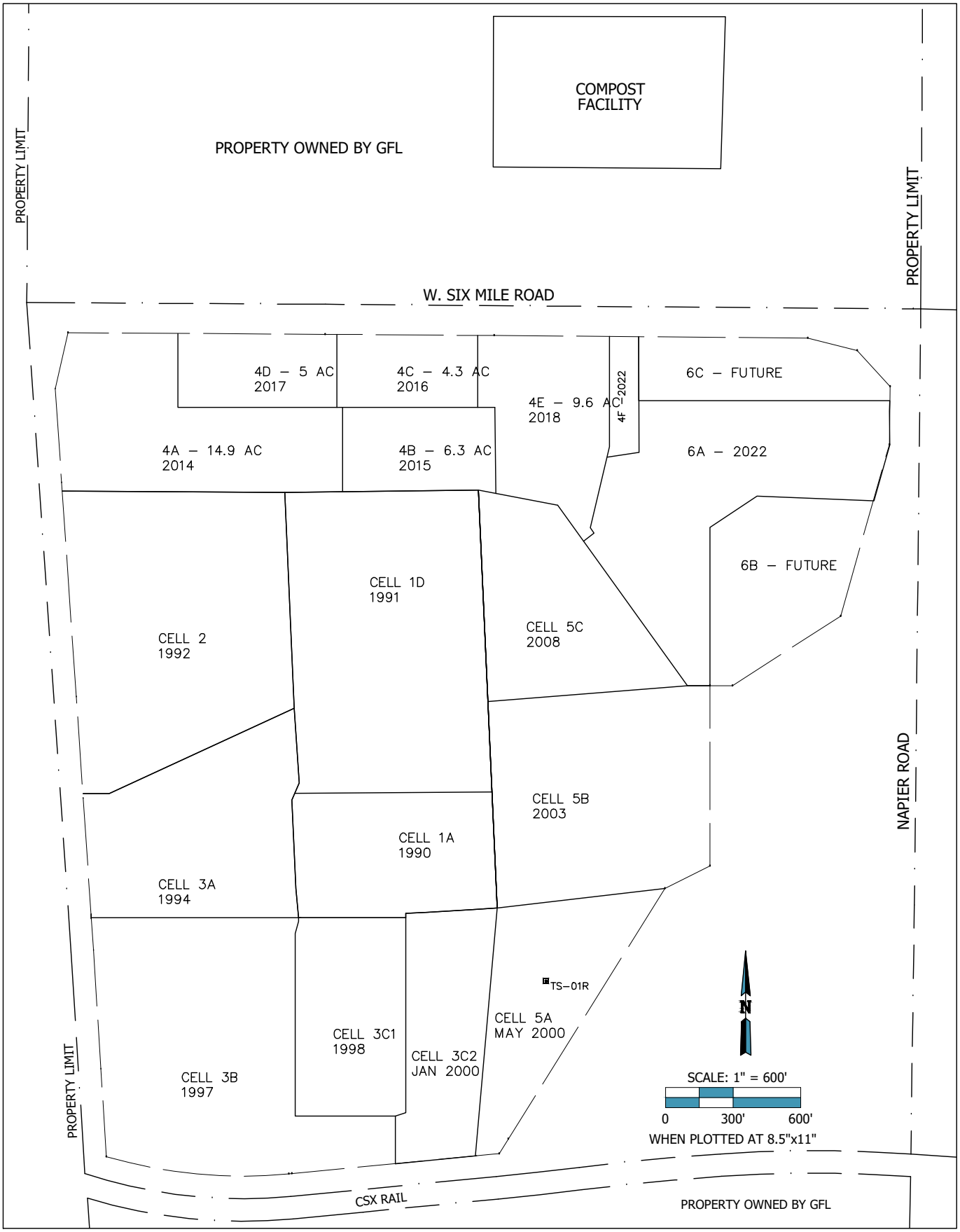
Clarke Lundell
Authorized Signing Officer
Arbor Hills Landfill, Inc.

LF: Advanced Disposal Services Arbor Hills (EGLE v)/AG# 2019-0242474-B/Consent Judgment 2022-03-02

APPENDIX A

Maps of Arbor Hills Landfill

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE



PREPARED FOR:

GFL GREEN FOR LIFE

ARBOR HILLS LANDFILL

CELL CONSTRUCTION HISTORY
10599 W. FIVE MILE ROAD
NORTHVILLE, MI 48168

Weaver Consultants Group
400 ANN ST NW. SUITE 201A
GRAND RAPIDS, MI 48158

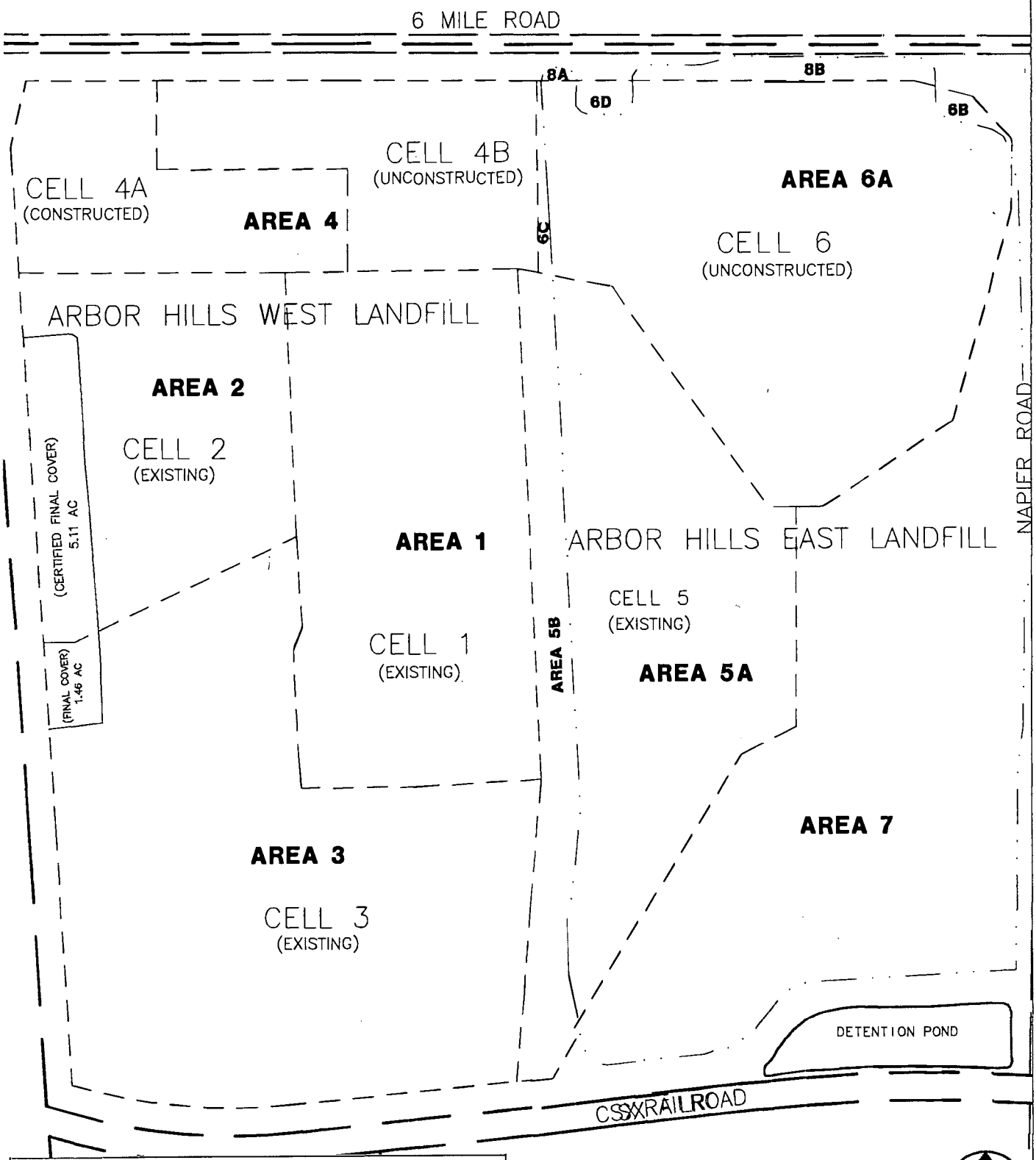
DRAWN BY: BAC
REVIEWED BY: BAC
DATE: 02/28/2022
FILE: 9001-311-10
CAD: AHL CELL-History.dwg

FIGURE 1

C:\Users\bcouglin\Desktop\Projects\Arbor files\2022\Consent Order\AHL CELL-History.dwg;WCGv19b5;bcoughlin;February 28, 2022

ARBOR HILLS WEST EXPANDED SANITARY LANDFILL

FACILITY AREA SUMMARY MAP



LEGEND

- SOLID WASTE DISPOSAL AREA (ARBOR HILLS WEST EXPANDED)
- APPROXIMATE ARBOR HILLS EAST WASTE LIMITS

MIDWESTERN CONSULTING
Civil Engineers
Environmental Engineers
Planners, Surveyors
3815 Plaza Drive
Ann Arbor, Michigan 48108
734-995-0200 Fax 734-995-0599

1" = 600'

7/12/13

FILE: 0141B\ACAD\DWGS\ATTACHMENTA\2013FAS-MAP.DWG

APPENDIX B

Wellhead Inspection Checklist

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 202-0593-CE

Well ID: _____

Date: _____ Technician : _____

Wellhead Inspection Form - Arbor Hills Landfill

Well, Wellhead, and Labeling							
Well Condition	Excellent	Good	Fair	Poor			
Type of wellhead installed?	Circle 1 →		2" OP	2" Pitot	3" OP	3" Pitot	Other
	If other, detail:						
Is the wellhead valve in good condition?	Yes	No	Comments:				
Is the wellhead damaged?	Yes	No	Comments:				
Is the well clearly labeled?	Yes	No	Comments:				
Evidence of gas or leachate odor at the well?	Yes	No	Comments:				
Hoses, Fittings, and Piping							
Does the flex hose need repair or replaced?	Yes	No	Comments:				
Are the hose clamps in good condition?	Yes	No	Comments:				
Are the sample ports securely covered and in good condition?	Yes	No	Comments:				
Are dust caps in place?	Yes	No	Comments:				
Are there any leaks at the well?	Yes	No	Comments:				
Does the well fernco need to be replaced?	Yes	No	Comments:				
Are there any missing or loose bolts?	Yes	No	Comments:				
Surface Condition and Cover Integrity							
Surface seal integrity is good?	Yes	No	Comments:				
Evidence of ponding around the well?	Yes	No	Comments:				
Pumps							
Does the well have a pump?	Yes	No	Comments:				
Do the camlock fittings have pins?	Yes	No	Comments:				
Did the pump cycle during your inspection?	Yes	No	Comments:				
Is there air pressure at the pump?	Yes	No	Comments: PSI =				
Are the air fittings leaking?	Yes	No	Comments:				
Is the pump working?	Yes	No	Comments:				
Is the discharge/exhaust leaking?	Yes	No	Comments:				
Evidence of leachate leak?	Yes	No	Comments:				

Additional Notes / Repairs Made:

APPENDIX C

Modifications to Section 4.3 of the AHL Operations Plan

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE

Appendix C

Modifications to Section 4.3 of the AHL Operations Plan

Leachate minimization is a key component of landfill operations. Preventing stormwater from contacting waste, and thereby becoming leachate, shall be accomplished in several ways as described below.

For newly constructed cells (e.g., Cell 6), when filling below surrounding grade, one or more of the following shall be implemented as appropriate prior to waste placement:

- Temporary separator berms or flaps installed during liner construction interior to the new cell to isolate storm water from the waste and allow it to be removed prior to contacting waste and becoming leachate. The need for and location of these temporary berms or flaps will be determined by the third-party engineering evaluation based on filling sequence and timing.
- Diversion berms constructed on existing landfill slopes above the active cell area to divert storm water away from the cell to existing storm water management infrastructure when determined beneficial by the third-party engineering evaluation.
- Temporary geomembrane rain cover on portions of the leachate collection layer of the new cell when determined beneficial by the third-party engineering evaluation based on filling sequence and timing.

As the fill progresses above surrounding grade, it will become necessary to shed stormwater off interim and final-covered areas to minimize infiltration. To accomplish this AHL shall take one or more of the following actions as determined by the third-party engineering evaluation:

- Construct and maintain grades that promote stormwater drainage to engineered control features.
- Outside of the active filling area, if settlement results in slope flattening or reversal that reduces drainage or leads to ponding, then AHL shall correct it before the next quarterly third-party engineering evaluation.
- Prevent the development of areas on top of the landfill that can collect and pond water and lead to increased liquid infiltration into the waste mass.
- Ensure that stockpiling, outside of the active filling area, of soils or other materials intended for beneficial reuse is conducted in a controlled manner such that the development of areas of ponding or interference with stormwater drainage does not occur.
- Apply interim or final cover within 60 days after last waste placement to allow for seed/mulch/fertilizer placement between April 15 and October 15.
- Consider the use of geomembrane for interim cover in lieu of soil when determined beneficial by the third-party engineering evaluation.

• Seed/mulch/fertilize soil covered slopes between April 15 and October 15 of the same, but no later than the following calendar year of the interim or final cover soil placement and maintain such to promote healthy vegetation for erosion control and evapotranspiration.

During daily operations, AHL will minimize stormwater infiltration by focusing on:

• Effective waste compaction.

• Constructing and maintaining grading features such as berms or ditches that will minimize stormwater run-on to the working area.

• Prompt application of daily cover.

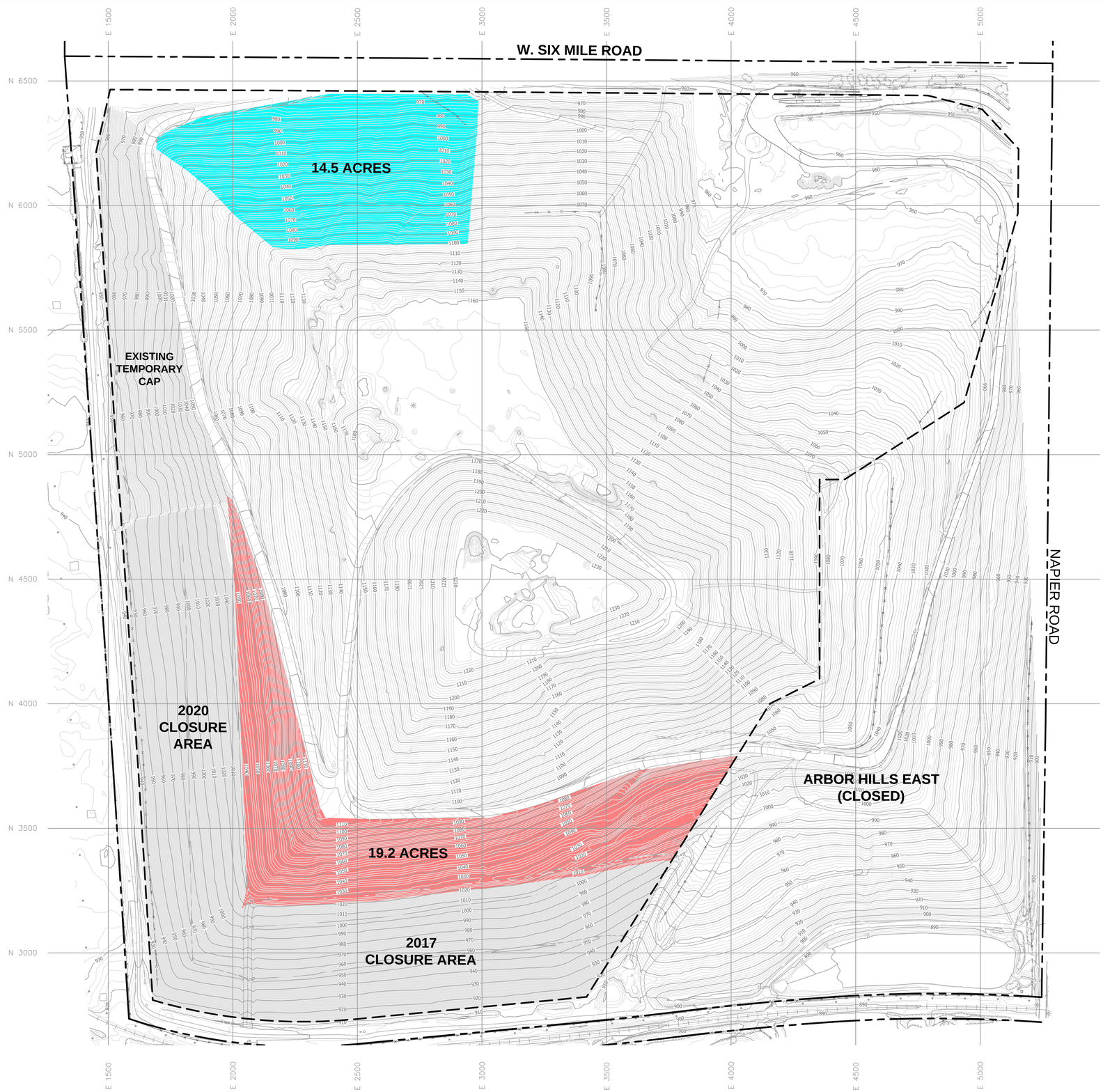
• Minimizing the size of the working face.

• Locating and repairing erosion rills and gullies

APPENDIX D

Map identifying expansion of Landfill areas for enhanced interim cover (in blue) and for final cover (in orange)

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE



ATTACHMENT B

N

SCALE: 1" = 200'

0 100' 200' 400'

LEGEND

- PROPERTY BOUNDARY
- PERMITTED SOLID WASTE BOUNDARY
- CONSTRUCTED BOUNDARY
- EXISTING CONTOUR, MARCH 2021
- EXISTING TEMPORARY CAP AREA
- EXISTING FINAL CLOSURE AREA
- PROPOSED FINAL COVER
- PROPOSED ENHANCED INTERIM COVER

NOTES:

1. 2021 TOPOGRAPHIC MAP PROVIDED BY COOPER AERIAL SURVEYS. DATE OF SURVEY 03/13/2021.

DRAFT

DRAFT
RELEASED FOR BID
APPROVED FOR CONSTRUCTION
CLIENT APPROVAL BY:

PREPARED FOR: GFL

ATTACHMENT B:
PROPOSED EXPANSION OF COVER AREAS
ARBOR HILLS LANDFILL
SALEM TOWNSHIP, WASHTENAW COUNTY, MICHIGAN

NO.	DATE	REVISION DESCRIPTION	BY

Weaver Consultants Group

WEAVER CONSULTANTS GROUP
400 ANN STREET, NW SUITE 201A
GRAND RAPIDS, MICHIGAN 49504
(616) 458-8052
www.wcgrp.com

DRAWN BY:	JDA
REVIEWED BY:	BC
DATE:	06/04/2021
PRJ:	9001-311-10-
FILE:	COVER-AREA-ENHANCE

SHEET 1

APPENDIX E

Map identifying location of Scentroid CTair monitoring stations

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE

Location of Scentroid Ctair monitoring stations

APPENDIX F

Specifications for Scentroid CTair monitoring stations

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE

SCENTROID

CTair

Continuous Urban Air Quality Monitor

Product Brochure

9001 ISO CERTIFIED

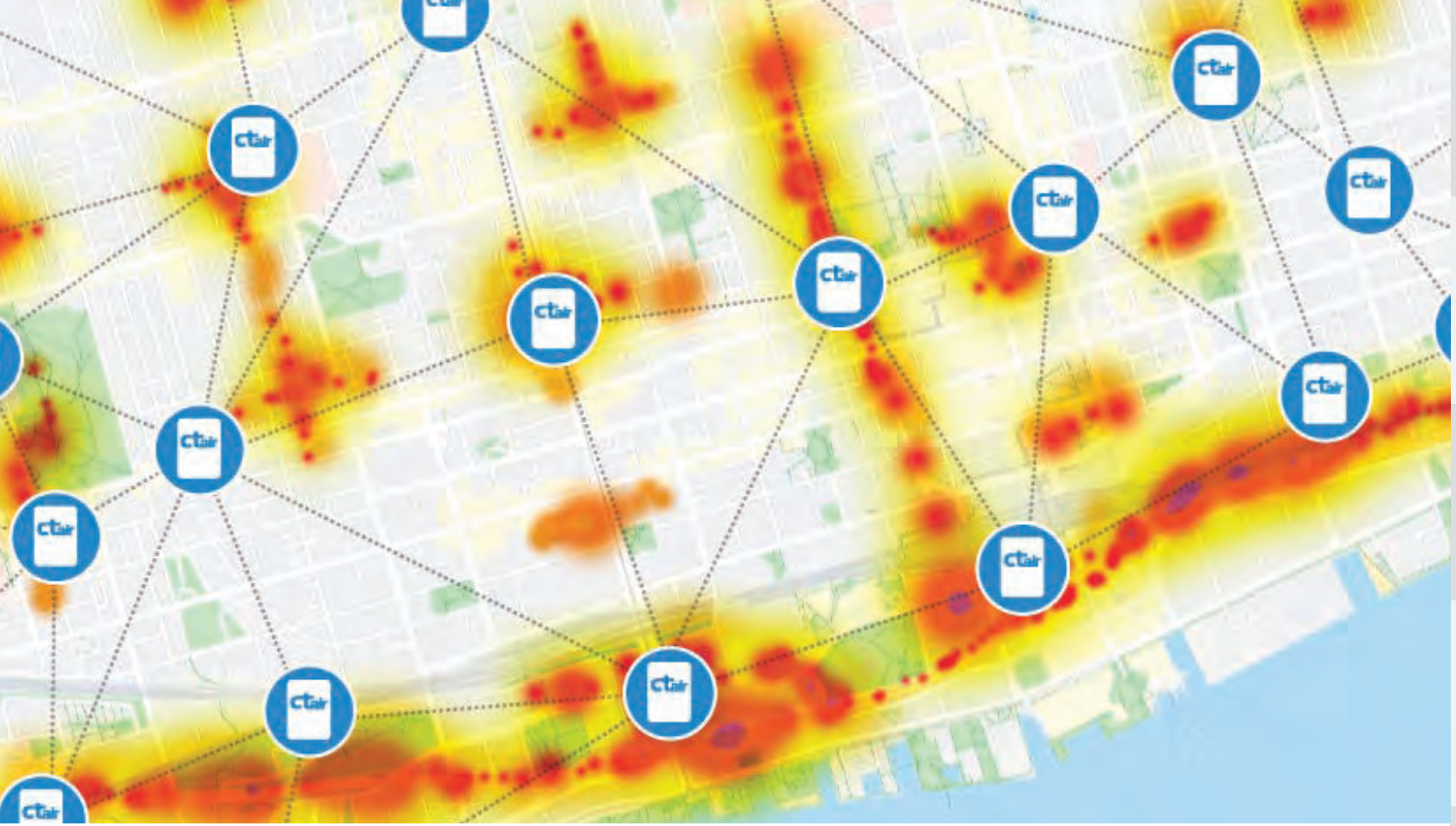
Letter from Scentroid's CEO

Scentroid's mission is to empower our clients with vast in-depth knowledge, state-of-the-art instruments, and the most extensive customer support. To this end, we strive in every aspect of our operation to put our client first and to use our research expertise to develop the most innovative and effective products and services in the sensory industry. We envision a future were environmental impacts will be easily and accurately measured and mitigated.

Dr. Ardevan Bakhtari
CEO, Scentroid

SCENTROID
Future of Sensory Technology

INTRODUCING THE CTAIR



Compact, cordless, easy to use, high accuracy sensing. The CTair revolutionizes the air quality monitoring network industry. Understanding urban air pollution and the potential impact on health is fundamental to both city structure and planning.

The CTair+ monitoring station is a fixed unit that collects information from a variety of sensors and presents the data in an easy to understand graphical interface. By applying information collected from multiple data points, the CTair allows the user to gain a complete understanding of the chemical compounds being monitored. It has been designed to be dispatched into a network of CTair units. Due to its lightweight design the CTair unit can easily be installed and mounted to a light fixture or utility pole.

The CTair has been designed to monitor target gases (which can be specified at the time of ordering). A full list of sensors is available on our website.

Please contact us for any questions or clarifications at info@scentroid.com OR call us at +1.416.479.0078

Solar Powered Option

No power? No problem! The Ctair features an optional solar power generating system. Just angle the panel and turn on your unit!

Powerful Dust Analysis

High accuracy dust analysis (PM1, 2.5, and 10) using a patented multi-beam laser counter and heated sampler.

Small and Lightweight

The CTair is smaller than comparable analysers minimizing cost and spatial real estate.

Smart Networking

CTair units work in tandem to predict and collect data for an accurate air quality assessment in a large urban landscape.

AI Compensation

The temperature and humidity compensation utilized by our AI modeller is able to predict pollutant levels to 96% of true concentration

Wide Variety of Sensors

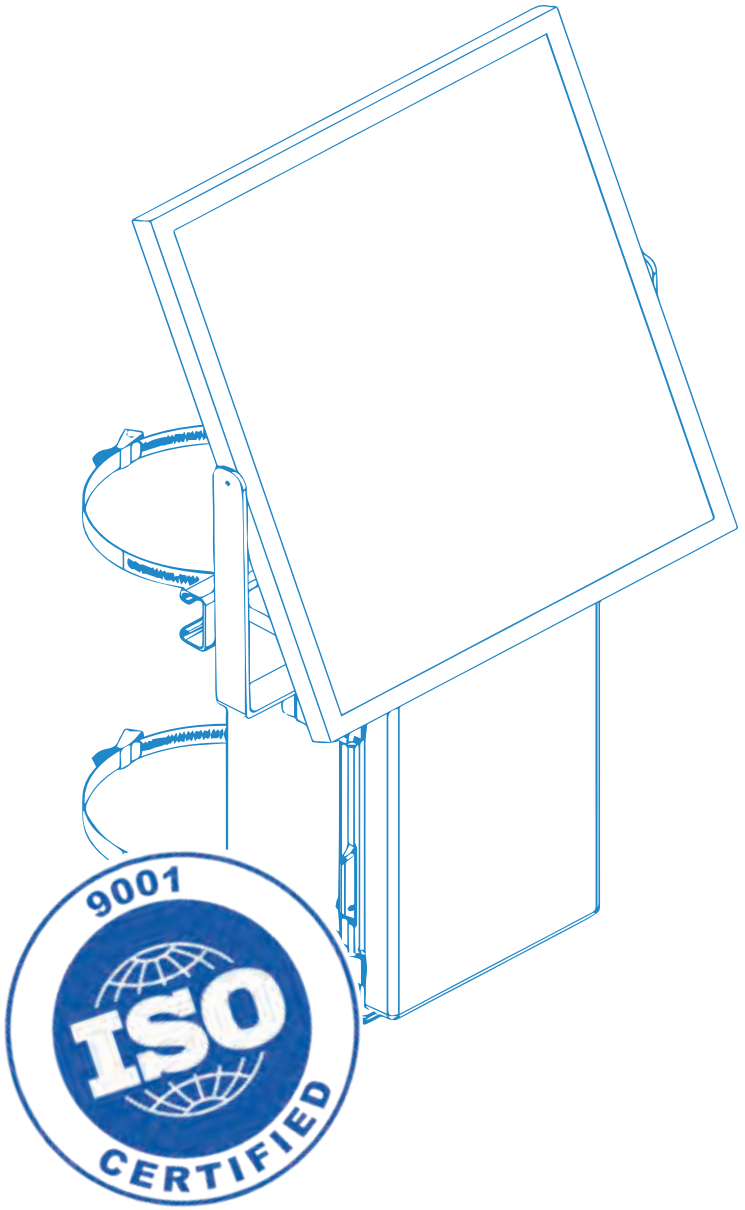
With over 300 million different sensor combinations available, no application is too big or too small. Scentroid has you covered!

A New Method of Sensing

The CTAIR uses new technology in electrochemical sensing. Each sensor is equipped with a novel ASIC chip that provides a wide range of functions such as digital signal filtration, adaptive amplification, re-zeroing, and impedance spectroscopy. Scentroid's patented technology uses impedance spectroscopy to effectively compensate for temperature and humidity changes in the environment.

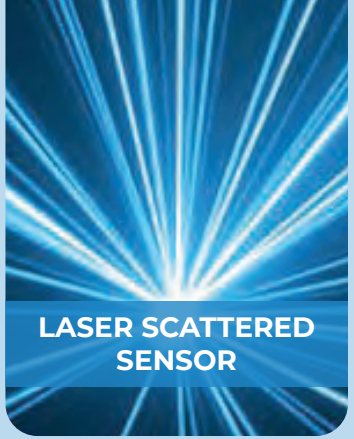
This technology works so well, that **independent studies have shown a 98% accuracy retention** even in extreme weather conditions.

CTAIR OVERVIEW



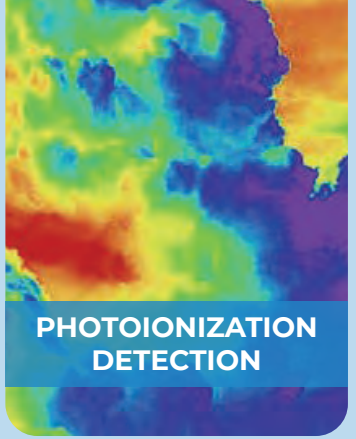
Specifications

Product name	Scentroid CTair
Maximum # of sensors	11 (4xEC, 1xCO2, 1xPID, 1xCH4, 1xPM, T, RH, Barometer)
Type of sensors	PID, NDIR, EC, Laser Particulate Counter, Temperature and Relative Humidity, and Barometric Pressure
Sampling rate	Approximately 1/m
Weight	4.5kg with solar panel
Size	19 x 29 x 14cm CTair unit, 37 x 34cm for solar panel mounted on top
LED Indicator	Color-changing LED Light displaying unit status
Communication	WiFi, 3G, 4G, LoRa
Power Requirement	Solar power and AC power, 110 - 240 VAC
Cloud server	Data logging, analysis, alarms, remote management
Alarm Equipped	On cloud, not on the unit itself
Temperature range	-40 to 40 °C
Operating R. Humidity	10 - 90%
Device Health	Daily sensor health checks and provides sensor replacement reminders
Warranty	24 months full warranty to all parts including sensors
Sensor replacement	Sensor dependent – first 2 years covered by warranty
Mounting	Configurable for wall or pole mount
Battery Only Runtime	36 hours (base model)
Traffic Information	Vision-based traffic classification and count
Design Rating	IP53
Local Storage	SD card - long term continuous logging
Internal Access	Securable by cable/pad lock
Calibration	Factory calibration to fully documented procedures in accordance with our ISO 9001 quality management system


LASER SCATTERED SENSOR


METAL OXIDE SENSOR


ELECTROCHEMICAL SENSOR


PHOTOIONIZATION DETECTION


NON DISPERSION INFRARED


GEIGER RADIATION

AIR CONTAMINANTS	HYDROGEN CHLORIDE	PARTICULATE MATTER 2.5	HYDROGEN
AMMONIA	HYDROGEN CYANIDE	PARTICULATE MATTER 10	OZONE
BENZENE, ETHYLBENZENE	HYDROGEN SULFIDE	PHOSPHINE	VOCS
CARBON DIOXIDE	METHANE	RADIATION	HYDROCARBON
CARBON MONOXIDE	METHANE (LEL)	RADON GAS	OXYGEN
CARBON DISULFIDE	METHANOL & ETHANOL	SULFUR DIOXIDE	TSP (PM REQUIRED)
CHLORINE	METHYL MERCAPTAN	TERT BUTYLTHIOL	FORMALDEHYDE
CHLORINE DIOXIDE	NITRIC OXIDE	TETRAHYDROTHIOPENE	ORGANIC SOLVENTS
ELECTROMAGNETIC FIELD	NITROGEN DIOXIDE	TOULENE	TRS AND AMINES
ETHYLENE	NITROUS OXIDE	XYLENE	....PLUS MORE! SEE OUR WEBSITE

A Sensor for Every Situation!

The CTair can be equipped with up to 12 sensor varieties, including pressure, temperature, relative humidity, dust (PM1, 2.5, and 10), noise, radiation, traffic, wind, and more. As a matter of fact, you can create up to 300 million different sensor combinations! No application is too big or small. Scentroid has you covered!

Traffic Counters

Upon request, our CTair units will be equipped with a full, non-contact vehicle counter. A proprietary target tracking algorithm allows simultaneous tracking of multiple vehicles traveling in adjacent lanes, further facilitating accurate counting.

Our sensors offer the greatest value in traffic counting and speed detection available. These sensor systems are easy to install and priced right for any budget. They will allow you to collect and view traffic details in real time from anywhere.

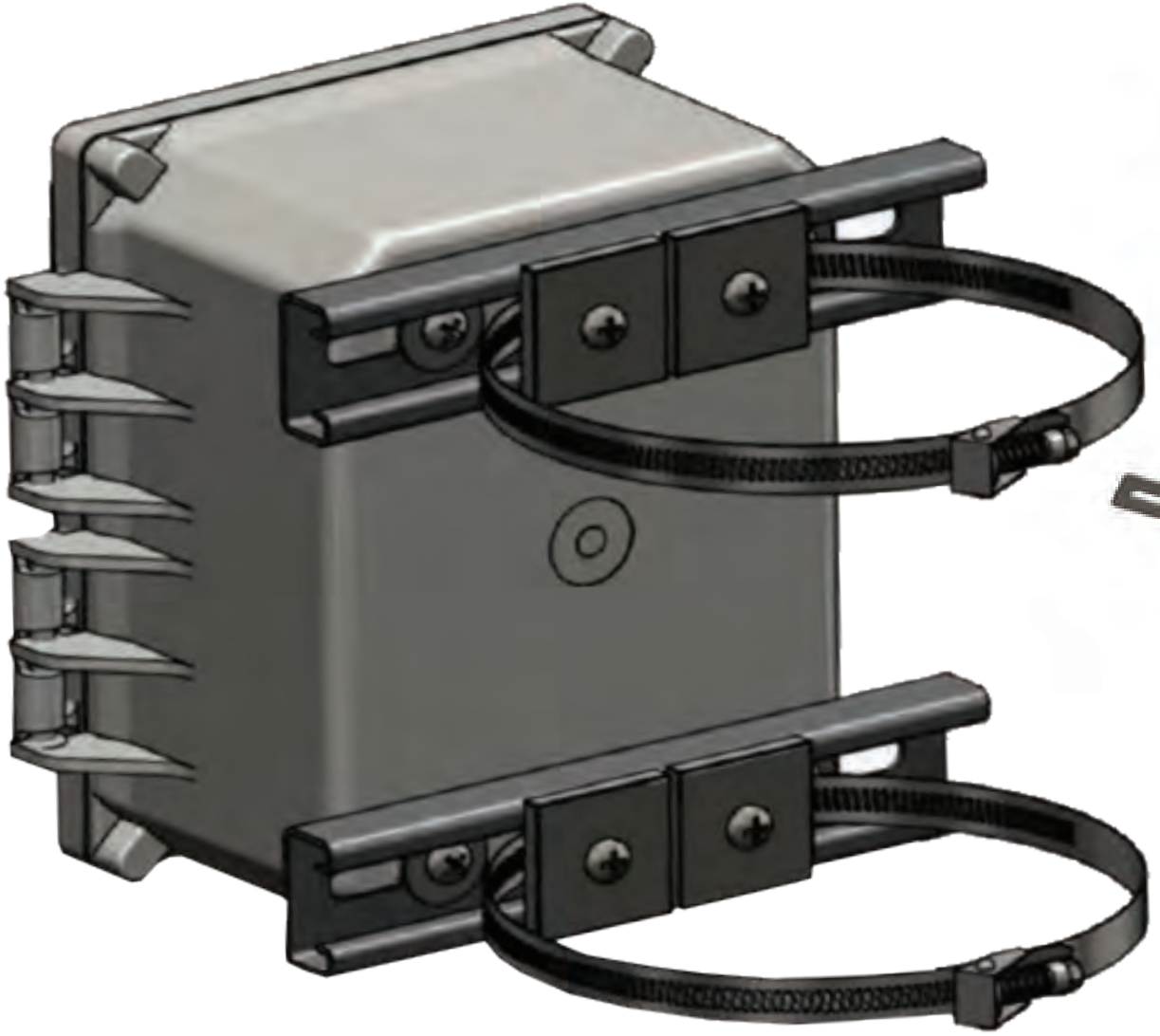
Our counter also features a passerby, bicycle, and scooter counter resulting in accurate direct speed measurement and readings. The built in vehicle classification system recognizes more than 4 vehicle size classes. A counter in conjuction with our AI system will provide you with a direct correlation between traffic and pollution.

Technical Specs

Ambient Operational Temperature of Traffic Camera:
-40°C to 60°C degrees celcius

Ambient Relative Humidity:
0% to 100% relative humidity

Ideal Weather Conditions:
All, including snow, rain, and other inclement weather.



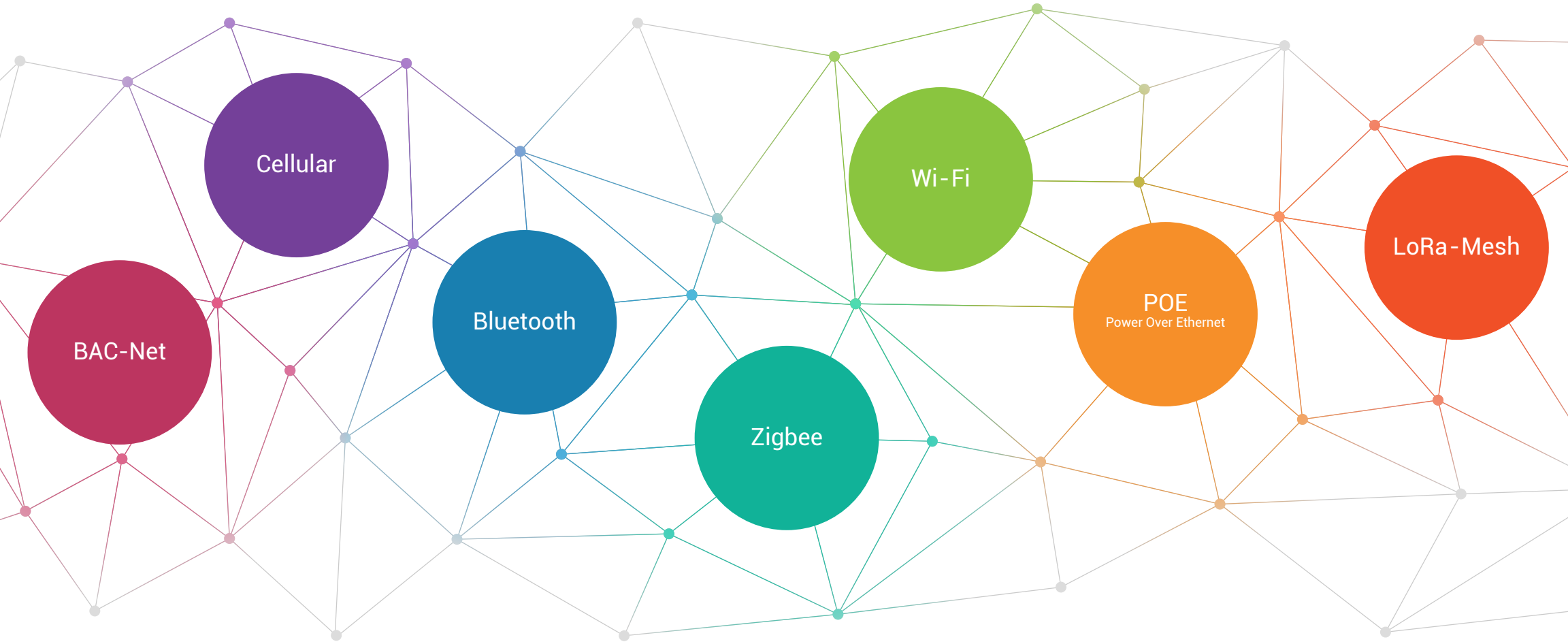
Easy to Install and Operate

The CTair is smaller and lighter than comparable analyzers minimizing both costs and spatial real estate. Each unit is equipped with four mounting feet used to mount it to a wall or post. These mounts are shown as illustrated here. Should you require a different method of mounting the units, Scentroid can assist you and provide new and innovative solutions.

Advanced Reporting

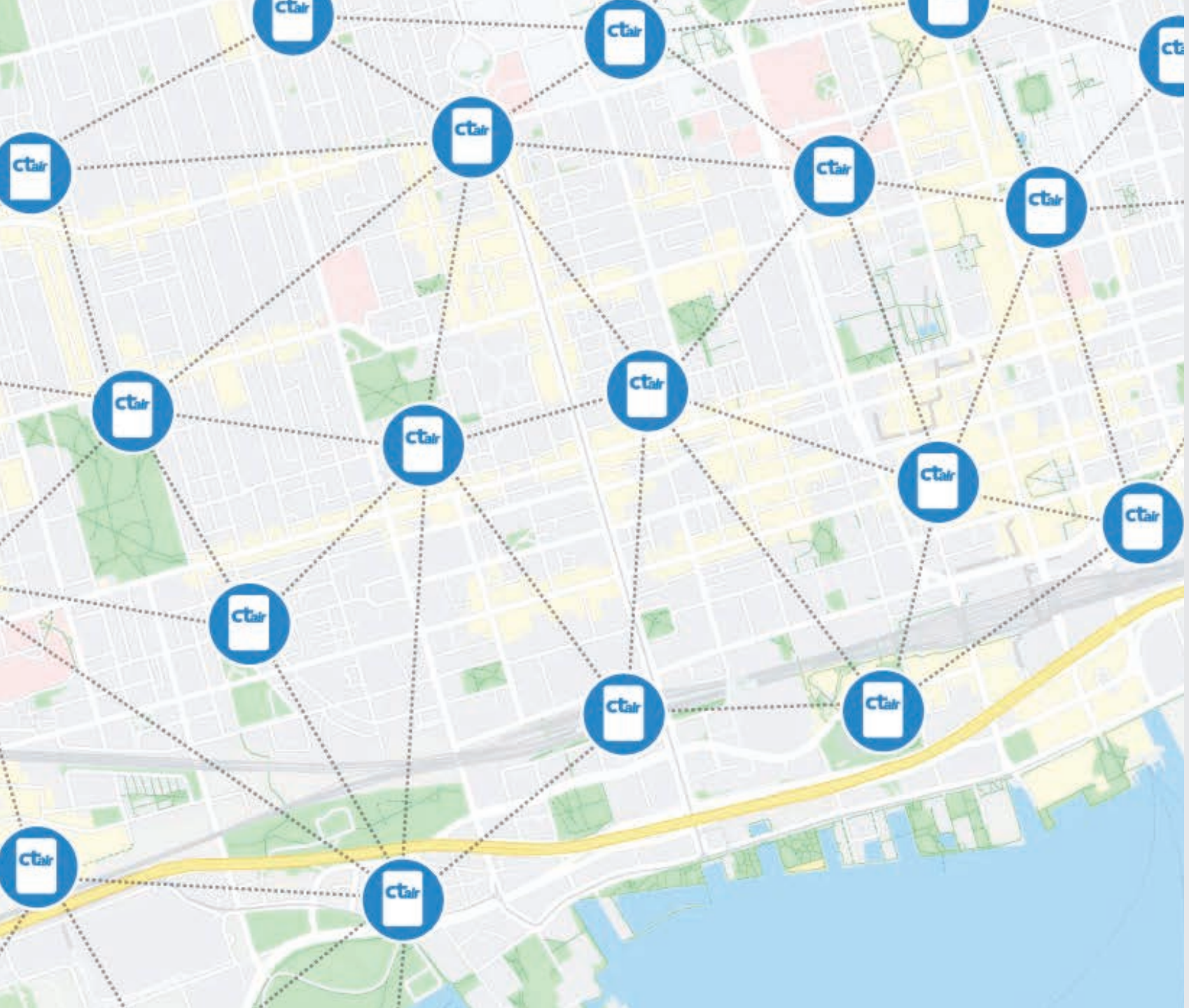
Our advanced reporting module found within our SIMS2 system will provide you with the tools you need to make informed decisions regarding your monitoring projects. Generated with the click of a button, our document will provide you with averages along with a thorough individual sensor report.

COMMUNICATION CAPABILITIES



Communication Methods

The Scentroid CTair will arrive pre-configured to work with multiple communication protocols. We can easily integrate it into your system, whether it's through bluetooth, cellular, or wifi. Cross product integration has never been easier! If you required a connection between multiple CTair units, or if your facility required some form of communication between a different Scentroid Analyzer, for instance, the AQSafe or the Scentinal SL50, Scentroid has you covered!



Mesh Networking

If you happen to purchase multiple Ctair units, they can be deployed as a network mesh. This allows you to monitor an entire perimeter or a facility as a singular, coherent unit. Each individual CTair form a mesh based connection with one another through a LoRa network.

Individual communication protocols can be costly with the required purchase of multiple modems and operational SIM cards. By utilizing a LoRa-Mesh network, you eliminate costs associated with having each unit communicate with our cloud server independently.

Each analyzer network will only require 1 or 2 gateways, and the gateway will communicate directly with our cloud service, SIMS2. As mesh networking encourages multi node hopping, if any node were to be disabled or if a communication path were to be broken, the CTair units will automatically communicate with one another in order to find a different pathway to a gateway.

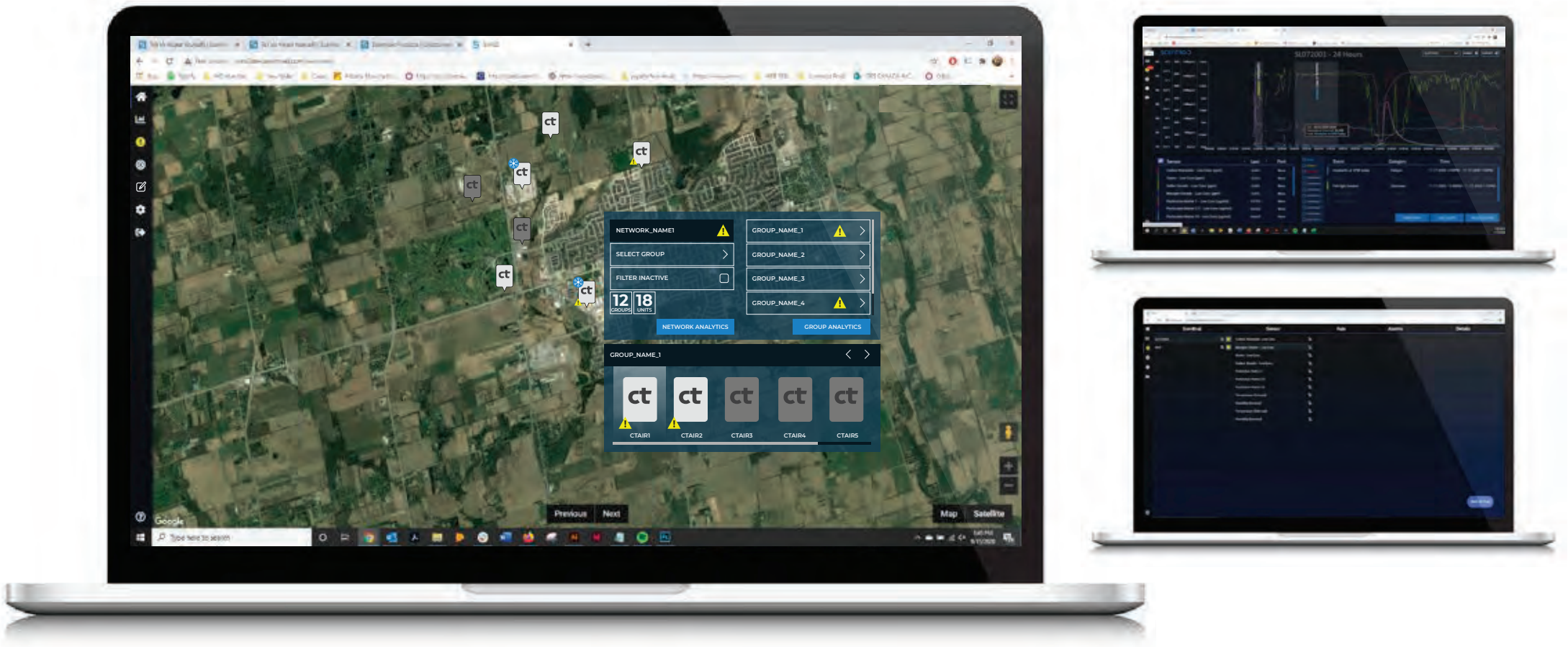
This robust and sophisticated system ensures your data is always live and frequently updated. When the encrypted LoRa-mesh data reaches SIMS2, we can then visualize data, and apply AI to determine patterns, heat maps, and trends.


SL111601
Unknown Sensor 0.000
Unknown Sensor 16.970
Ext/Int Temp. 17.70C/24.70C
Ext/Int Humid. 38.70%/10.10%
Sensor
Last
1 Hour
8 Hours
24 Hours
AQI
PID
NH3
NO2
SO2-LC
O3-NO2
NO
HCl
H2S-LC
Particulate Matter 1
Particulate Matter 2.5
Particulate Matter 10
CO-LC
Search Company
Search Scentroid
SCENTROID
SL111601
Previous
Next
Map
Satellite
SIMS2

SIMS2 Overview

The Scentroid Sensor Information Management System, SIMS2, is our all-inclusive software used to view historical data, run diagnostics, and configure various settings for the CTair. Provided as part of the CTair continuous air quality monitoring package, the software can be accessed with any stable internet connection.

Plus, as a valued Scentroid customer, you will receive a free one-year subscription to our SIMS2 cloud software.



User Interface

SIMS2 provides easy analysis tools for an operator to determine pollutant threats, air quality alarms, historical data, sampled areas, and much more. The easy to use graphical interface allows anyone to run complicated data analytics without being a GIS expert.

Easy Analysis

SIMS2 is capable of displaying data from multiple CTair units in the same network. Users can analyze data and monitor progress remotely from a single platform. Here you can select a date and time range for an assessment of your device's recordings, and export your results.

Settings Page

Scentroid has recently developed our SIMS2 settings page – giving you an easy to use environment to easily adjust any of your analyzer's notification thresholds, all of their calibration parameters and more. The built-in AQI interface provides information regarding the current air quality index.

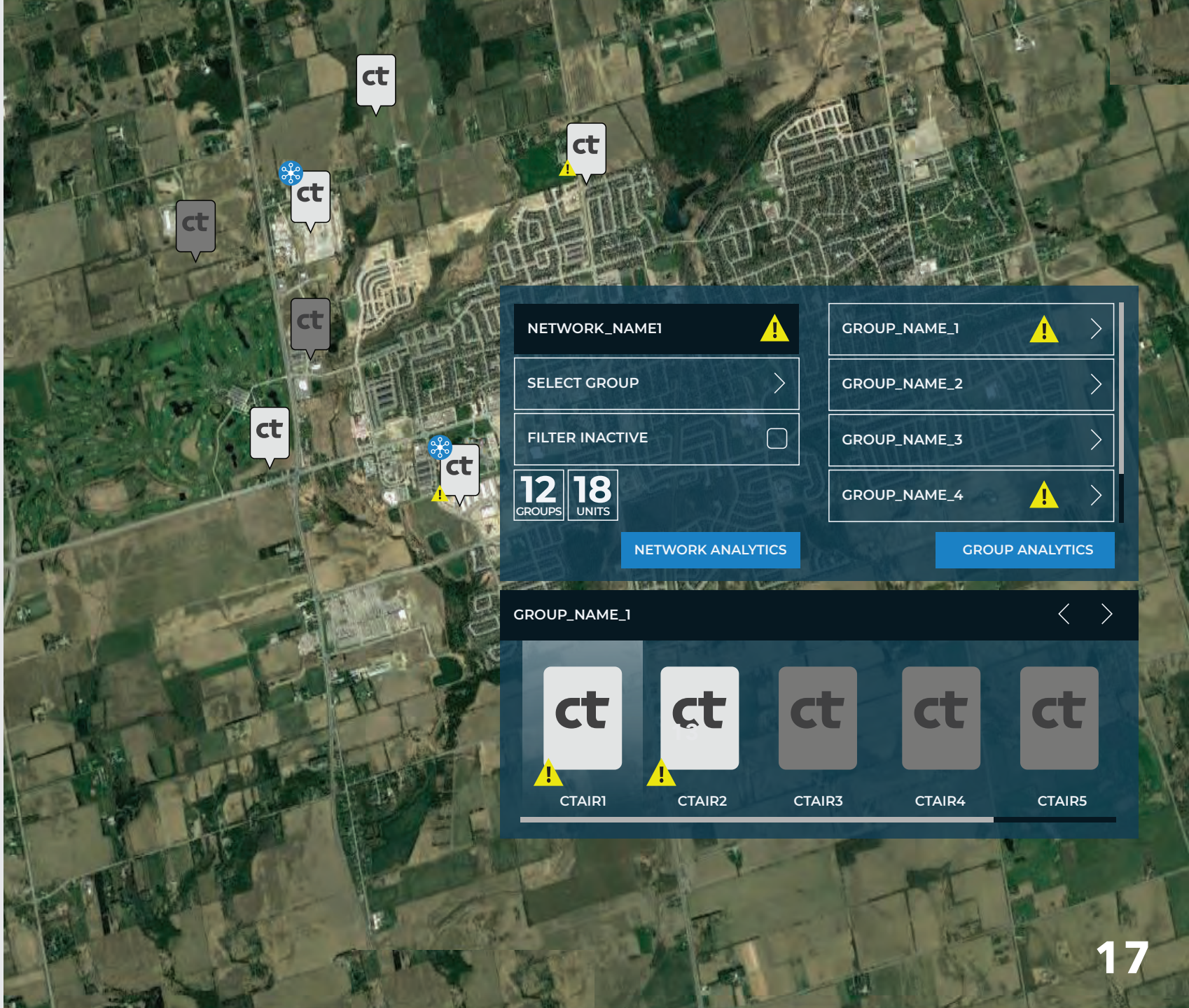
Notifications

Our revamped SIMS2 notification center allows you to quickly view your analyzer's activity, health, and alarms through a clean and organized interface. Here, you can access your CTair, look up a specific sensor, display all of your established alarms/alarm rules, and detailed alarm status.

Setup of New Facilities & Networks

An intelligent air quality monitoring system must work efficiently with any network size. Having an organized and easy to understand software solution is essential. The CTair SIMS2 platform has you covered. Regardless of network size, you are now able to organize every CTair subgroup, and rename them as you see fit.

Recalling a previous CTair unit / group has never been easier! With a friendly, user-intuitive naming system and built-in search functionality, finding any CTair within your network can be completed within a matter of seconds.



SIMS2: commitment free structure

	Pro	Lite
Number of guest users per account	15	0
Secure data storage	Unlimited	Previous 2 Years
Graphing of multiple sensors per individual equipment	○	○
Equipment error notifications	○	○
Over-the-air firmware upgrades	○	○
Export of raw data to Excel	○	○
Setup of new facilities and networks (AQSafe only)	○	○
Email and SMS alarm system	○	✕
Zone of influence calculation (SL50 + CTair only)	○	✕
Radar plotting (SL50 + CTair only)	○	✕
Graphed sensor comparison mode	○	✕
Automatic event detection	○	✕
Automatic report generation	○	✕
API for external data retrieval and 3rd party integrations	○	✕

As a special thank you for being a Scentroid customer, our SIMS2 Pro service is **FREE** for 1 year from the date of initialization!

CALIBRATING YOUR CTAIR

METHOD 1: Change your sensors

Factory Calibrated Sensors

Calibrating your CTAir can now be completed in under 10 minutes! By anually removing your sensor and replacing it with a brand new factory calibrated sensor. The new calibrration factors will be automatically updated on the cloud. Not only will this keep your CTair calibrated, but will also ensure you always have a fresh sensor installed. SIMS2 can even be setup to remind you to order your new sensors before calibration is due.

METHOD 2: Co-location using a USEPA approved reference station

Step 1: CTAIRS are brought to the location of a fixed reference station which measures the same parameters. The station must output data at least once every 5 min.

Step 2: Collect data for 24 hours or more.

Step 3: Upload data from the reference station (in CSV format) to SIMS calibration module. SIMS powerful AI algorithm will conduct a full calibration of all sensors and provide you with accuracy and confidence of the new calibration parameter.

Step 4: Reinstall CTAIR back at location.

METHOD 3: Using calibration gas and GD600 (If a reference station is not available)

Step 1: Install the inlet connector to the CTAIR being calibrated and connect it to the GD600 automated calibration module.

Step 2: Connect calibration gas to the GD600.

Step 3: Program the GD600 to output 3 concentrations of the gas along with zero air.

Step 4: In SIMS calibration module select the calibration time/date range and provide the gas concentrations used. The parameters are automatically created, and the instruments are updated by SIMS.

AFTER-SALES SUPPORT

Training

Training is the key of using any instrument, and Scentroid provides worldwide training programs for our clients and distributors. Training can be conducted by Scentroid or your local distributor. Scentroid training tools include: online training, videos, brochure, operation manual and on-site workshops. We also offer a hands-on training program using our high-tech simulation room. Scentroid's state of the art simulation room is located at our headquarters in Toronto, Canada. You are more than welcome to visit us and meet with the people behind these products

Warranty

We are so confident of the reliability of our products, that we are glad to offer our clients a comprehensive 24 month warranty for every CTair. Additionally, warranties can be extended for the 3rd, 4th and 5th year. For more information about our extended warranties, speak to us today.

Technical Support

We are responsible for any products that exit from our manufacturing warehouse! Our support team offers different ways to help you. Choose the one most convenient for you below!

Local Support
We have developed a vast growing network of distributors and repair facilities. To find your local support please check our distributors map.

Phone Support
Our highly professional customer services are here to serve you, for any technical issue reach them easily via phone: 416.479.0078 – Ext 210

SME Support
Connecting you to the Subject Matter Experts! Our customer support is unique in that you can talk directly to the designer or programmer of each product.

Live Chat
If you feel it more convenient to solve your technical issue via chat, No problem! Reach our highly professional customer services through our website-hosted Live Chat.

Email Support
For any technical issue you may encounter, our engineers are happy to assist via email. For fast and efficient support, simply email our team at support@scentroid.com

LET'S BUILD OUR NETWORK

linkedin.com/company/scentroid

DO YOU FOLLOW US YET?

@Scentroid

GET THE FULL PICTURE

@Scentroid

LIKE SHARE COMMENT

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youtube.com/scentroid

SCENTROID

Future of Sensory Technology

Scentroid (Division of IDES Canada Inc.)
70 Innovator Avenue, Units #6-8 | Toronto, ON, L4A 0Y2
T: 416. 479.0078 or 1.888.988.IDES (4337)
info@scentroid.com | www.scentroid.com

Scentroid Sensor List - Technical Information

#	Sensor ID	Type	Formula	Chemical	Maximum Detection Limit	Lowest Detection Threshold	Resolution	Cross sensitivity		Industry	Expected Life (years)	Warmup Time (Sec)	Response Time (Sec)
								Required	Recommended				
1	CD1	NDIR	CO2	Carbon Dioxide - High Concentration	5%	100 ppm	20 ppm	–	–	Safety/Combustion/ process control	1	120	120
2	CD2	NDIR	CO2	Carbon Dioxide - Low Concentration	2000 ppm	1 ppm	0.6 ppm	–	–	Urban, Industrial, IAQ	1	120	120
3	CM1	EC	CO	Carbon Monoxide (Low Concentration)	100 ppm	0.03 ppm	0.01 ppm		H2, C2H4	Urban, Industrial, IAQ	2	40	40
4	CM3	EC	CO	Carbon Monoxide (Medium Concentration)	1000 ppm	1 ppm	1 ppm	–	–	Urban, Industrial, IAQ	5	40	20
5	CM2	EC	CO	Carbon Monoxide (high concentration)	10000 ppm	30 ppm	3 ppm	–	–	Safety/Combustion/ process control	2	45	40
6	CL2	EC	CL2	Chlorine (High Concentration)	2000	1 ppm	1 ppm	NO2	BR2	Safety/Combustion/ process control	2	45	40
7	CL1	EC	Cl2	Chlorine (Low Concentration)	10 ppm	0.05 ppm	0.01 ppm	NO2	NO2	Industrial, Safety	2	120	60
8	H1	EC	H2	Hydrogen	10000 ppm	100 ppm	10 ppm		CO	Industrial, Safety, IAQ	2	120	40
9	HCL1	EC	HCl	Hydrogen Chloride	20 ppm	0.5 ppm	0.2 ppm	H2S	HBr	Industrial, Safety	2	120	60
10	HCY1	EC	HCN	Hydrogen Cyanide	50 ppm	0.1 ppm	0.1 ppm	H2S, NO2, SO2	–	Industrial, Safety	2	120	30
11	PH1	EC	PH3	Phosphine (low Concentration)	5 ppm	50 ppb	30 ppb	NO2	SO2, H2S	Industrial, safety	2	60	20
12	PH2	EC	PH3	Phosphine (high Concentration)	2000 ppm	5 ppm	2 ppm	NO2	SO2, H2S	Industrial, safety	2	60	25
13	HS1	EC	H2S	Hydrogen Sulfide (low Concentration - ppb)	3 ppm	7 ppb	1 ppb	–	–	WWTP, Odour, IAQ, Urban, Industrial	2	180	35
14	HS2	EC	H2S	Hydrogen Sulfide (high Concentration - ppm)	2000 ppm	15 ppm	2 ppm	–	–	Safety, WWTP	2	180	25
15	HS3	EC	H2S	Hydrogen Sulfide (medium Concentration - ppm)	200 ppm	2 ppm	0.2 ppm	–	–	Safety, WWTP	2	180	60
16	E2	MOS	C2H6O, H2, C4H10	Organic solvents (Ethanol, Iso-Butane, H2)	500 ppm	25 ppm	1 ppm	–	Benzines <20%	Industrial, Odour, Compost	1	30	10
17	MT1	NDIR	CH4	Methane (LEL)	20,000 ppm	10 ppm	10 ppm	–	Propane	Safety/Combustion/Inprocess control, Industrial	>3 years	45	12
18	NC1	EC	NO	Nitric Oxide (Low Concentration)	1 ppm	0.01 ppm	0.001 ppm	–	–	Urban, IAQ, Industrial	2	120	60
19	NC2	EC	NO	Nitric Oxide (Medium Concentration)	25 ppm	0.2 ppm	0.1 ppm	–	–	Urban, IAQ, Industrial	2	120	60
20	NC3	EC	NO	Nitric Oxide (High Concentration)	5000 ppm	2 ppm	2 ppm	–	–	Industrial, safety, Process control	3	120	10
21	ND1	EC	NO2	Nitrogen Dioxide (Low Concentration)	1 ppm	0.01	0.001 ppm	–	–	Urban, IAQ, Industrial	>5 years	120	60
22	ND2	EC	NO2	Nitrogen Dioxide (Med Concentration)	20 ppm	0.1 ppm	0.1 ppm	–	–	Urban, IAQ, Industrial	>5 years	120	60
23	ND3	EC	NO2	Nitrogen Dioxide (high Concentration)	1000 ppm	2 ppm	1 ppm	–	–	Industrial, safety, Process control	2	120	60
24	NS1	NDIR	N2O	Nitrous Oxide	10,000 ppm	100 ppm	1 ppm	–	Negligible	Urban, Industrial, Process control	5	30	30
25	O2	EC	O2	Oxygen (high Concentration)	250,000 ppm	5000 ppm	200 ppm	–	–	Process control, Safety	1	60	15
26	PD3	PID	VOCs	Total VOCs 10.0 eV	100 ppm	5 ppb	5 ppb%	–	Aromatioc Carbons	WWTP, **Odour**, IAQ, Urban, Industrial	5*	5	3
27	PD1	PID	VOCs	Total VOCs (Low Concentration) - PID 10.7 eV	50 ppm (isobutylene)	1 ppb	1 ppb	–	All VOCs	WWTP, Odour, IAQ, Urban, Industrial	5*	5	3
28	PD2	PID	VOCs	Total VOCs (High Concentration) - PID 10.7 eV	300 ppm (isobutylene)	1 ppm	50 ppb	–	All VOCs	Safety, Industrial	5*	5	3
29	SD1	EC	SO2	Sulfur Dioxide (high Concentration)	2000 ppm	2 ppm	1 ppm	NO2	–	Safety, Industrial	2	120	25
30	SD2	EC	SO2	Sulfur Dioxide (low Concentration)	1 ppm	0.01 ppm	0.001 ppm	NO2	–	Urban, IAQ, Industrial	2	120	20

Scentroid Sensor List - Technical Information

#	Sensor ID	Type	Formula	Chemical	Maximum Detection Limit	Lowest Detection Threshold	Resolution	Cross sensitivity		Industry	Expected Life (years)	Warmup Time (Sec)	Response Time (Sec)
								Required	Recommended				
31	SD3	EC	SO2	Sulfur Dioxide (medium Concentration)	100 ppm	0.4 ppm	0.2 ppm	NO2	–	Urban, IAQ, Industrial	2	120	20
32	FM1	EC	CH2O	Formaldehyde	5 ppm	10 ppb	10 ppb	–	Ethanol	IAQ, Safety, Industrial,	2	180	60
33	PM 2.5-10	Laser Scattered	PM	Particulate PM 2.5, 10 (simultanous)	1000 µg/m3	1 µg/m3	1 µg/m3	–	NA	Urban, IAQ, Industrial	>5 years	NA	NA
34	TS1	Laser Scattered	TSP	TSP - PM Required	20000 µg/m3	1 µg/m3	1 µg/m3	–	NA	Urban, IAQ, Industrial	>5 years	NA	NA
35	NMH	EC	NMHC	Non-methane Hydrocarbon	25 ppm	0.1 ppm	0.1 ppm	–	NA	Industrial, Process, Combustion	2	180	55
36	MS2	MOS	TRS	TRS and Amines	10 ppm	10 ppb	2 ppb	–	Trimethal Amine, Methyl Mercaptans, H2S, other	Odours, WWTP	1	30	10
37	MS3	MOS	NH3-C2H6O-C7H8	Air Contaminants (Ammonia, Ethanol, Toulene)	30 ppm	1 ppm	4 ppb	–	(ammonia, Ethanol, Toulene)	Odours, WWTP, Industrial	1	30	10
38	AM2	EC	NH3	Ammonia (High concentration)	100 ppm	3 ppm	1 ppm	CL2	H2S, NO2	Agricultural, Industrial	2	30	40
39	AM1	EC	NH3	Ammonia (Low Concentration)	10 ppm	0.005 ppm	0.001 ppm	CL2	H2S	Agricultural, Industrial	2	30	50
40	OZ1	EC	O3	Ozone (low Concentration)	0.5 ppm	1 ppb	1 ppb	CL2	H2S, NO2	Urban, Industrial	>5 years	60	30
41	OZ2	EC	O3	Ozone (High Concentration)	5 ppm	20 ppb	20 ppb	CL2	H2S, NO2	Urban, Industrial	>5 years	60	30
42	RD1	Geiger Counter	α-, β-, γ, X	Radiation Monitor (α-, β-, γ- and x- radiation)	1000 µSv / h	0.01 µSv / h	0.01 µSv / h	-	-	Mining, Industrial, Nuclear Energy, Security	>3 years	0	0
43	CIO21	EC	ClO2	Chlorine Dioxide	50 ppm	0.01 ppm	0.05 ppm	-	CL2	Odour, Industrial	2	180	60
44	CH4L	TDLS	CH4	Methane - ppb	100 ppm	0.4 ppm	0.01 ppm	-	-	Greenhouse gases, industrial	10+	20	1
45	ET1	EC	C2H4	Ethylene - Low Concentartion	10	0.05 ppm	0.01 ppm	CO	-	Greenhouse gases, industrial	2	120	30
46	ET2	EC	C2H4	Ethylene - Medium Concetration	200	1 ppm	0.5 ppm	CO	--	Greenhouse gases, industrial	2	120	30
47	ET3	EC	C2H4	Ethylene - High Concentration	1500	5 ppm	2 ppm	CO	-	Greenhouse gases, industrial	2	120	30
48	MM	EC	CH3SH	Methyl Mercaptan	10 ppm	0.05 ppm	0.01 ppm	H2S		Odours, WWTP, Leak Detection, Industrial	2	120	35
49	EMF	EMF	EMF	Electro Magnetic Flield	200 mGauss	0.1 mGauss	0.1 mGauss	-	-	Urban, Industrial, power plants	3	<1	<1
50	CS	EC	CS2	Carbon Disulfide	100 ppm	1 ppm	0.1 ppm	-	-	Odour, WWTP, Industrial	2	120	30
51	TBM	EC	C4H10S	Tert Butylthiol	14 ppm	0 ppm	0.1 ppm	-	-	Odour, Leak detection, Industrial	2	120	30
52	THT	EC	C4H8S	Tetrahydrothiophene	14 ppm	0 ppm	0.1 ppm	-	-	Odour, Leak detection, Industrial	2	120	30
53	RDN	Pulsed Ion	RN	Radon gas	99.9 pCi/l (3,700Bq/m³)	0.2 pCi/l (700Bq/m³)	0.2 pCi/l (350Bq/m³)	-	-	IAQ, Safety, Industrial,	2	10	<1
54	AL1	EC	CH3OH - C2H5OH	Methanol & Ethanol	100 ppm	0.1 ppm	0.05 ppm	CO		Industrial, Odour	2	120	<25
55	BTX	EC	BTEX	benzene, toluene, ethylbenzene and xylene.	10 ppm	7 ppb	1 ppb	H2S, Ethanol (C2H5OH)	-	industrial, Urban	2	120	<100s

SCENTROID
Future of Sensory Technology

* CH4L : TLDS (Tunable Laser Diode Spectroscopy) - Some Restriction applies when integrating this sensor, Contact us for more detail

APPENDIX G

Supplemental Environmental Projects

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE

Appendix G

SUPPLEMENTAL ENVIRONMENTAL PROJECTS

AHL shall comply with the requirements of this Appendix in fulfilling its obligations under Section VIII of the Consent Judgment with regard to supplemental environmental projects (SEPs).

I. Perimeter Emissions Monitoring SEP

A. Project Description. The objective of the Perimeter Emissions Monitoring SEP is: (1) to identify concentrations of H_2S and methane at the Landfill perimeter that exceed the Perimeter H_2S Action Level and the Perimeter Methane Action Level; (2) to identify source(s) of Landfill emissions that need corrective action to ensure the Perimeter H_2S Action Level and the Perimeter Methane Action Level are not exceeded; and (3) to operate a public website to provide information to the public about Landfill emissions. AHL shall operate the Perimeter Emissions Monitoring SEP in conjunction with the Perimeter Emissions Monitoring Program required pursuant to Paragraph 5.5 of the Consent Judgment.

B. Scope of Work. The Perimeter Emissions Monitoring SEP shall include the following:

1. Mobile Monitoring Station. In addition to the six Scentroid CTair stationary monitoring stations that AHL shall operate pursuant to the Perimeter Emissions Monitoring Program, AHL shall operate an additional mobile Scentroid CTair monitoring station as a temporary replacement for a stationary monitoring station if one of the stationary monitoring stations is

not operating because of maintenance or repairs. Like each of the six stationary monitoring stations, the mobile monitoring station shall be equipped with H_2S and methane sensors and provide continuous measurement of H_2S and methane (using a sampling rate of approximately once per minute), GPS coordinates, temperature, relative humidity, barometric pressure, wind speed, and wind direction.

2. Meteorological Tower. AHL shall install and operate a meteorological tower 10 meters tall and accompanying equipment. The 10-meter meteorological tower and accompanying equipment are identified in Exhibit 1.

3. Meteorological data collection equipment for the monitoring stations. AHL shall install and operate an ultrasonic wind sensor on each of the monitoring stations and equip each monitoring station with an accompanying mounting bracket. Details are included in Exhibit 2.

4. Calibration equipment for the monitoring stations. AHL shall have available and operate the Scentroid GD600 Gas Dilution system, according to manufacturer's recommendation, to calibrate the H_2S and methane sensors on the monitoring stations as needed. Details are included in Exhibit 3.

5. SIMS2 Pro Software. AHL shall install and operate the Scentroid Sensor Information Management System Pro (SIMS2 Pro) software (or similar software as approved by EGLE), which, among other things,

analyzes data collected from the Scentroid CTair monitoring stations and the 10-meter meteorological station, provides notifications and alarms of an exceedance of the Perimeter H_2S Action Level and the Perimeter Methane Action Level at a monitoring station, generates wind roses, and estimates the travel path of the H_2S and methane detected. The SIMS2 Pro software, using meteorological data from the 10-meter meteorological tower and the monitoring stations, analyzes site-specific conditions (including wind direction and speed) to enable AHL to perform a detailed back-trajectory analysis to assist in identifying the probable cause of an exceedance and perform prompt corrective action. The SIMS2 Pro Software is described in Exhibit 4.

6. Public website. Within 60 days after the Effective Date, AHL shall operate a public website at www.arborhillsmonitoring.com to provide information to the public about Landfill conditions. The information shall include H_2S and methane data from the monitoring stations and meteorological data from the monitoring stations and the 10-meter meteorological tower. The website shall include a user-friendly dashboard to allow users to review near real-time data as well as historic data for each of the monitoring stations and the 10-meter meteorological tower and to allow users to select a date and time range for historical data for any of them. Users shall also have the option of exporting the results. AHL shall notify the Salem and Northville Township Supervisors, The Conservancy Initiative,

and the State Representative from District 20 of the Michigan House of Representatives about the website.

C. Recordkeeping. AHL shall create and retain records of the Perimeter Monitoring SEP that include the following:

1. AHL's use of the mobile monitoring station a temporary replacement for a stationary monitoring station if one of the stationary monitoring stations is not operating because of maintenance or repairs.

2. The meteorological data collected by the 10-meter meteorological tower, including wind speed, wind direction, temperature, barometric pressure, and relative humidity.

3. Calibration of the H_2S and methane sensors on the monitoring stations.

4. Notifications and alarms of exceedances of the Perimeter H_2S Action Level and the Perimeter Methane Action Level at a monitoring station.

D. Schedule and duration. Within 45 days after the Effective Date or within 15 days after delivery of the monitoring stations, whichever is earlier, AHL shall install and commence operation of the Perimeter Emissions Monitoring SEP. AHL shall implement the Perimeter Emissions Monitoring SEP for 10 years after the Effective Date.

E. Cost. AHL shall expend at least $799,200 to implement the Perimeter Monitoring SEP.

II. Household Hazardous Waste SEP

A. Project Description. The objective of the Household Hazardous Waste SEP is to construct and operate a collection facility for household hazardous waste (HHW) to remove HHW (which includes paints, solvents, automotive fluids, batteries, and fluorescent bulbs) from municipal solid waste so it is not disposed in a landfill. AHL shall make the HHW collection facility available to residents of Washtenaw County, the City of Northville, and Northville Township, and other persons to whom AHL chooses to make it available. The HHW collection facility shall be operated by Washtenaw County with financial assistance provided by AHL, as described in Paragraph B below. The HHW collection facility shall be a free service to users.

B. Scope of Work. The Household Hazardous Waste SEP shall include the following:

1. Design and location. AHL shall construct the HHW collection facility depicted in Exhibit 5 (or as modified at the request of Washtenaw County and approved by EGLE).

2. Operation. AHL shall ensure the HHW collection facility is operated and made available to users at least four days each week and at least four hours each day. AHL shall pay at least $75,000 each year to Washtenaw County to help fund operation of the facility, including staffing and waste disposal. AHL shall pay for the operation and maintenance of the facility itself, including utilities and general maintenance. The HHW

collected at the facility shall be managed at a treatment facility, storage facility, or disposal facility pursuant to Part 111 of the Natural Resources and Environmental Protection Act, MCL 324.11101 *et seq*.

C. Recordkeeping Requirements. AHL shall create and retain records of the Household Hazardous Waste SEP that include the following:

1. The hours of operation of the HHW collection facility;

2. The amount and type of HHW collected;

3. The treatment, storage, or disposal of the HHW; and

4. The annual payments to Washtenaw County.

D. Schedule and duration. Within 300 days after the Effective Date, AHL commence operation of the HHW collection facility. AHL shall implement the Household Hazardous Waste SEP for 10 years after the Effective Date.

E. Cost. AHL shall expend at least $305,000 to design and construct the HHW collection facility. AHL shall pay at least $75,000 each year to Washtenaw County to operate the HHW collection facility.

III. Vegetative Buffer SEP

A. Project Description. The objective of the Vegetative Buffer SEP is to reduce the transport of particulate matter and odors from the Composting Facility and the Landfill.

B. Scope of Work. AHL shall create a vegetative buffer of spruce trees on the eastern borders of the Composting Facility and the Landfill. The spruce trees shall be Norway Spruce, White Spruce, Serbian Spruce, and/or Black Hills Spruce.

AHL shall plant at least 72 spruce trees in a 600-foot row on the eastern border of the Composting Facility and at least 60 spruce trees in a 500-foot row on the eastern border of the Landfill. The location of the Vegetative Buffer SEP is shown in Exhibit 6. The height of the planted trees shall vary between eight and ten feet tall, with each 100-foot length of each row containing at least 12 trees, six of which are eight-feet tall and six of which are ten-feet tall. Additional details for the Vegetative Buffer SEP are included in Exhibit 7.

C. Schedule. AHL shall plant at least 72 spruce trees in a 600-foot row on the eastern border of the Composting Facility by November 15, 2022, and at least 60 spruce trees in a 500-foot row on the eastern border of the Landfill by June 15, 2023. By June 15, 2025, AHL shall replace any trees that fail to survive. AHL shall complete the Vegetative Buffer SEP by July 1, 2025.

D. Cost. AHL shall expend at least $100,000 to construct the Vegetative Buffer SEP.

EXHIBIT 1

to Appendix G – Supplemental Environmental Projects

Meteorological tower and accompanying equipment

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE

Attachment A - 10-meter tower invoice

Campbell Scientific Inc
815 West 1800 North • Logan, Utah 84321-1784
Phone 435.227.9092 • Fax 435.227.9091
Fed. I.D. #87-0305157 • DUNS#06-798-0730

P.O. Number	060921/B/MMK2
Invoice Number	286038
Shipment Number	367781-1
Invoice / Ship Date	15 Jun 2021
Due Date	15 Jul 2021
Customer Number	33018
Page	1

Invoice

BILL TO	SHIP TO
Accounts Payable Barr Engineering Co 4300 MarketPointe Dr Ste 200 Minneapolis, MN 55435	Attn Barr Engineering AHL Maintenance Bldg 10655 W Six Mile Rd Northville, MI 48168

Buyer Contact	Matt Kistner	Payment Terms	N30
Phone	952-832-2606	Ship Via	TForce Freight
Email	mkistner@barr.com	Freight Terms	PP&A
User Name	Matt Kistner	Incoterms	FOB Destination

Li	Model	Part/UID	Description	CO	Qty	UM	Unit Price	Ext. Price
1	UT30	16614	30ft Universal Tower w/Adjustable Mast	US	1	EA	990.00	990.00
2	B18	6140	Concrete Mounting Base for UT20 & UT30	US	1	EA	180.00	180.00
3	UTGND	6128	Universal Tower Grounding Kit	US	1	EA	74.00	74.00
4	UTGUY	6129	Universal Tower Guy Kit	US	1	EA	210.00	210.00
5	UTEYE	6137	3 Eyebolt Anchors for UTGUY	US	1	EA	59.00	59.00
							Subtotal	1,513.00
							Sales Tax	110.81
							Freight	333.86
							Total	1,957.67

Attachment A - 10-meter tower instruments invoice

Campbell Scientific Inc
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Phone 435.227.9092 • Fax 435.227.9091
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P.O. Number	060921/A/MMK2
Invoice Number	287153
Shipment Number	367778-1
Invoice / Ship Date	16 Jul 2021
Due Date	15 Aug 2021
Customer Number	33018
Page	1

Invoice

BILL TO

Accounts Payable
Barr Engineering Co
4300 MarketPointe Dr Ste 200
Minneapolis, MN 55435

SHIP TO

Matt Kistner
Barr Engineering Co
5150 W 76th St
Edina, MN 55439

Buyer Contact	Matt Kistner	Payment Terms	N30
Phone	952-832-2606	Ship Via	FEDEX GROUND
Email	mkistner@barr.com	Freight Terms	PP&A
User Name	Matt Kistner	Incoterms	FOB Destination

Li	Model	Part/UID	Description	CO	Qty	UM	Unit Price	Ext. Price
1	WINDSONIC4-L20-PW	18456-84	2-D Sonic Wind Sensor with SDI-12 Output 20ft cable per sensor -PW w/Pre-Wire Connector	GB	1	EA	1,375.00	1,375.00
2	WINDSONIC4-L50-PW	18456-217	2-D Sonic Wind Sensor with SDI-12 Output 50ft cable per sensor -PW w/Pre-Wire Connector	GB	1	EA	1,397.50	1,397.50
3	HygroVUE5-17-PW	35352-8	CSL Digital Temperature /RH Sensor -17 w/17ft per sensor -PW w/Pre-Wire Connector	GB	1	EA	371.75	371.75
4	RAD06	31543	METSPEC 6-Plate Solar Radiation Shield	GB	1	EA	125.00	125.00

Continued

Total

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Shipment Number	367778-1
Invoice / Ship Date	16 Jul 2021
Due Date	15 Aug 2021
Customer Number	33018
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Invoice

BILL TO	SHIP TO
Accounts Payable Barr Engineering Co 4300 MarketPointe Dr Ste 200 Minneapolis, MN 55435	Matt Kistner Barr Engineering Co 5150 W 76th St Edina, MN 55439

Buyer Contact	Matt Kistner	Payment Terms	N30
Phone	952-832-2606	Ship Via	FEDEX GROUND
Email	mkistner@barr.com	Freight Terms	PP&A
User Name	Matt Kistner	Incoterms	FOB Destination

Li	Model	Part/UID	Description	CO	Qty	UM	Unit Price	Ext. Price
5	CS320-17-PW	33243-13	Apogee Digital Thermopile Pyranometer -17 w/17ft per sensor -PW w/Pre-Wire Connector	US	1	EA	505.50	505.50
6	CM226	34375	Apogee Solar Sensor Mounting Stand w/Level & Base	US	1	EA	60.00	60.00
7	BaroVUE10	39204	Digital Barometer (-40 TO +60C)	AU	1	EA	690.00	690.00
8	ASYMFG	SA-69	Special Apogee ST-300-SS-L-10 Precision PRT (1/10 DIN) for Aspirated Radiation Shield, Unamplified w/SS Connector on Sensor end, w/20ft Cable w/-PW	US	1	EA	628.00	628.00

Continued

Total

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P.O. Number	060921/A/MMK2
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Invoice

BILL TO	SHIP TO
Accounts Payable Barr Engineering Co 4300 MarketPointe Dr Ste 200 Minneapolis, MN 55435	Matt Kistner Barr Engineering Co 5150 W 76th St Edina, MN 55439

Buyer Contact	Matt Kistner	Payment Terms	N30
Phone	952-832-2606	Ship Via	FEDEX GROUND
Email	mkistner@barr.com	Freight Terms	PP&A
User Name	Matt Kistner	Incoterms	FOB Destination

Li	Model	Part/UID	Description	CO	Qty	UM	Unit Price	Ext. Price
			Connector NOT CANCELABLE OR RETURNABLE PRODUCT					
9	ASYMFG	SA-70	Special Apogee ST-300-SS-L-20 Precision PRT (1/10 DIN) for Aspirated Radiation Shield, Unamplified w/SS Connector on Sensor end, w/50ft Cable w/-PW Connector NOT CANCELABLE OR RETURNABLE PRODUCT	US	1	EA	665.00	665.00
10	SPECBUY	SB-608	Special Apogee ST-300-SS Adaptor to be used w/TS100SS NOT CANCELABLE OR RETURNABLE		2	EA	18.00	36.00
							Continued	
							Total	

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P.O. Number	060921/A/MMK2
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Invoice

BILL TO	SHIP TO
Accounts Payable Barr Engineering Co 4300 MarketPointe Dr Ste 200 Minneapolis, MN 55435	Matt Kistner Barr Engineering Co 5150 W 76th St Edina, MN 55439

Buyer Contact	Matt Kistner	Payment Terms	N30
Phone	952-832-2606	Ship Via	FEDEX GROUND
Email	mkistner@barr.com	Freight Terms	PP&A
User Name	Matt Kistner	Incoterms	FOB Destination

Li	Model	Part/UID	Description	CO	Qty	UM	Unit Price	Ext. Price
Adaptor for			PRODUCT Apogee ST-300-SS so it can be inserted into TS100SS Aspirated Shield					
11	TS100SS-U-L20-PW	35733-12	Apogee Aspirated Radiation Shield -U w/User Defined Length 20ft cable per sensor -PW w/Pre-Wire Connector	US	1	EA	548.80	548.80
12	TS100SS-50-PW	35733-8	Apogee Aspirated Radiation Shield -50 w/50ft per sensor -PW w/Pre-Wire Connector	US	1	EA	527.00	527.00
13		SPECIAL-SERVICES	Special Apogee Custom Calibration Cert attesting to "paired	US	1	EA	50.00	50.00

Continued

Total

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Phone 435.227.9092 • Fax 435.227.9091
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P.O. Number	060921/A/MMK2
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Invoice / Ship Date	16 Jul 2021
Due Date	15 Aug 2021
Customer Number	33018
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Invoice

BILL TO
Accounts Payable Barr Engineering Co 4300 MarketPointe Dr Ste 200 Minneapolis, MN 55435

SHIP TO
Matt Kistner Barr Engineering Co 5150 W 76th St Edina, MN 55439

Buyer Contact	Matt Kistner	Payment Terms	N30
Phone	952-832-2606	Ship Via	FEDEX GROUND
Email	mkistner@barr.com	Freight Terms	PP&A
User Name	Matt Kistner	Incoterms	FOB Destination

Li	Model	Part/UID	Description	CO	Qty	UM	Unit Price	Ext. Price
			calibration" of (2) ST-300s					
14	CR1000X-NA -ST-SW-CC	33268-2	Measurement & Control Datalogger -NA No Additional Coms -ST -40 to +70C -SW Standard 3yr Warranty -CC Campbell Calibration	US	1	EA	1,895.00	1,895.00
15		32262	4G/3G Omni 2dBd Antenna w/Type N Female & CSI Mounting Hardware	US	1	EA	101.00	101.00
16		31315	Bulkhead Surge Protection Installed in Enclosure, Type N to SMA, 700-2700MHz, 18 inches	US	1	EA	250.75	250.75
							Continued	
							Total	

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P.O. Number	060921/A/MMK2
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Due Date	15 Aug 2021
Customer Number	33018
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Invoice

BILL TO	SHIP TO
Accounts Payable Barr Engineering Co 4300 MarketPointe Dr Ste 200 Minneapolis, MN 55435	Matt Kistner Barr Engineering Co 5150 W 76th St Edina, MN 55439

Buyer Contact	Matt Kistner	Payment Terms	N30
Phone	952-832-2606	Ship Via	FEDEX GROUND
Email	mkistner@barr.com	Freight Terms	PP&A
User Name	Matt Kistner	Incoterms	FOB Destination

Li	Model	Part/UID	Description	CO	Qty	UM	Unit Price	Ext. Price
17	COAXNTN-L30	16112-7	Antenna Cable RG8 w/2 Type N Male Connectors 30ft per antenna cable	US	1	EA	168.80	168.80
18	CELL210-VS-250-Y1	34283-10	4G LTE Cat1 Cellular Module for Verizon (-40 to +80C) -VS Verizon US Static IP -250 250MB/Mon Data Plan For 1 Year(s) whip goes on diversity jack	US	1	EA	787.00	787.00
19		32256	4G/3G/2G Cellular Dipole 0dBd Whip Antenna, Hinged w/SMA Connector	TW	1	EA	25.00	25.00
20		NOTE	-BP84, AC/DC Converter,	US	1	EA	0.00	0.00

Continued

Total

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Invoice

BILL TO	SHIP TO
Accounts Payable Barr Engineering Co 4300 MarketPointe Dr Ste 200 Minneapolis, MN 55435	Matt Kistner Barr Engineering Co 5150 W 76th St Edina, MN 55439

Buyer Contact	Matt Kistner	Payment Terms	N30
Phone	952-832-2606	Ship Via	FEDEX GROUND
Email	mkistner@barr.com	Freight Terms	PP&A
User Name	Matt Kistner	Incoterms	FOB Destination

Li	Model	Part/UID	Description	CO	Qty	UM	Unit Price	Ext. Price
			& CH200, in a Prewired Enclosure w/Power & COM Cabling					
21	PWENC16/18-C2-NP-SC-NE-SB-TM	30712-647	Pre-Wired Weather-Resistant 16 x 18 inch Enclosure 2 Connectors per ENC -NP No 9-Pin Ports -SC 1 Conduit -NE No Cable Entry Seal -SB Standard Backplate -TM Tower Mounting NOT CANCELABLE OR RETURNABLE PRODUCT	US	1	EA	1,230.00	1,230.00
22	BP84-CC	25945-1	12V Sealed Rechargeable Battery, 84Ah -CC w/cable to PS/CH Chrg	US	1	EA	515.00	515.00

Continued

Total

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Invoice

BILL TO	SHIP TO
Accounts Payable Barr Engineering Co 4300 MarketPointe Dr Ste 200 Minneapolis, MN 55435	Matt Kistner Barr Engineering Co 5150 W 76th St Edina, MN 55439

Buyer Contact	Matt Kistner	Payment Terms	N30
Phone	952-832-2606	Ship Via	FEDEX GROUND
Email	mkistner@barr.com	Freight Terms	PP&A
User Name	Matt Kistner	Incoterms	FOB Destination

Li	Model	Part/UID	Description	CO	Qty	UM	Unit Price	Ext. Price
23	CH200-SW	22240-1	12V Charging Regulator (-40 to +60C) -SW Standard 1yr Warranty	US	1	EA	355.00	355.00
24		20769	PS200 or CH200 SDI-12 Interface Cable, 2ft	US	1	EA	39.00	39.00
25	28370-SK	28370-1	24Vdc 3.8A NEC Class 2 Power Supply Kit (Battery Not Included) -SK Standard Kit	US	1	EA	285.00	285.00
26	CABLE2CBL-L10-PW	21970-2	2-Conductor 22AWG Cable w/Drain 10ft per cable -PW w/Pre-Wire Connector	US	1	EA	85.30	85.30
27	CABLEPCBL-	21969-132	2-Conductor 16AWG Power	US	1	EA	91.00	91.00

Continued

Total

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P.O. Number	060921/A/MMK2
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Due Date	15 Aug 2021
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BILL TO	SHIP TO
Accounts Payable Barr Engineering Co 4300 MarketPointe Dr Ste 200 Minneapolis, MN 55435	Matt Kistner Barr Engineering Co 5150 W 76th St Edina, MN 55439

Buyer Contact	Matt Kistner	Payment Terms	N30
Phone	952-832-2606	Ship Via	FEDEX GROUND
Email	mkistner@barr.com	Freight Terms	PP&A
User Name	Matt Kistner	Incoterms	FOB Destination

Li	Model	Part/UID	Description	CO	Qty	UM	Unit Price	Ext. Price
	L10-PW		Cable 10ft per cable -PW w/Pre-Wire Connector					
28	CM206	17905	Sensor Crossarm w/one CM210 Mounting Kit, 6ft	US	2	EA	130.00	260.00
29	CM210	17767	Crossarm-To-Pole Mounting Kit	US	3	EA	54.00	162.00
30	PWENC16/18-C10-NP-SC-NE-SB-TM	30712-805	Pre-Wired Weather-Resistant 16 x 18 inch Enclosure 10 Connectors per ENC -NP No 9-Pin Ports -SC 1 Conduit -NE No Cable Entry Seal -SB Standard Backplate -TM Tower Mounting	US	1	EA	1,814.00	1,814.00
							Continued	
							Total	

Campbell Scientific Inc
815 West 1800 North • Logan, Utah 84321-1784
Phone 435.227.9092 • Fax 435.227.9091
Fed. I.D. #87-0305157 • DUNS#06-798-0730

P.O. Number	060921/A/MMK2
Invoice Number	287153
Shipment Number	367778-1
Invoice / Ship Date	16 Jul 2021
Due Date	15 Aug 2021
Customer Number	33018
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Invoice

BILL TO

Accounts Payable
Barr Engineering Co
4300 MarketPointe Dr Ste 200
Minneapolis, MN 55435

SHIP TO

Matt Kistner
Barr Engineering Co
5150 W 76th St
Edina, MN 55439

Buyer Contact	Matt Kistner	Payment Terms	N30
Phone	952-832-2606	Ship Via	FEDEX GROUND
Email	mkistner@barr.com	Freight Terms	PP&A
User Name	Matt Kistner	Incoterms	FOB Destination

Li	Model	Part/UID	Description	CO	Qty	UM	Unit Price	Ext. Price
			NOT CANCELABLE OR RETURNABLE PRODUCT					
31		NOTE	-POWER & SDI-12 DISTRIBUTION TERMINAL BLOCKS	US	1	EA	0.00	0.00
32		15909	Horizontal Jumper for 15920, 21329, or 21330 DIN-Rail Terminal Block	DE	8	EA	0.95	7.60
33		39086	6-inch (15.24cm) DIN-Rail Mounting Kit	US	1	EA	10.50	10.50
34		33672	CON TRM BLOCK 3 CONDUCTOR DIN-RAIL GRAY WAGO 280-681	DE	4	EA	2.83	11.32
							Continued	
							Total	

Campbell Scientific Inc
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Invoice

BILL TO	SHIP TO
Accounts Payable Barr Engineering Co 4300 MarketPointe Dr Ste 200 Minneapolis, MN 55435	Matt Kistner Barr Engineering Co 5150 W 76th St Edina, MN 55439

Buyer Contact	Matt Kistner	Payment Terms	N30
Phone	952-832-2606	Ship Via	FEDEX GROUND
Email	mkistner@barr.com	Freight Terms	PP&A
User Name	Matt Kistner	Incoterms	FOB Destination

Li	Model	Part/UID	Description	CO	Qty	UM	Unit Price	Ext. Price
35		33673	CON TRM BLOCK 3 CONDUCTOR DIN-RAIL RED WAGO 280-653	DE	3	EA	3.47	10.41
36		33674	CON TRM BLOCK 3 CONDUCTOR DIN-RAIL BLACK WAGO 280-671	DE	5	EA	3.06	15.30
37		33675	CON TRM BLOCK 3 CONDUCTOR DIN-RAIL GROUND WAGO 280-687	DE	1	EA	8.36	8.36
38		38273	CON TRM BLOCK ACC DIN-RAIL END PLATE ORANGE WAGO 280-326 FOR 280-650, 280-653, 280-671, 280-681, & 280-687 DIN-RAIL TERMINAL BLOCKS		3	EA	1.21	3.63
							Continued	
							Total	

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Buyer Contact	Matt Kistner	Payment Terms	N30
Phone	952-832-2606	Ship Via	FEDEX GROUND
Email	mkistner@barr.com	Freight Terms	PP&A
User Name	Matt Kistner	Incoterms	FOB Destination

Li	Model	Part/UID	Description	CO	Qty	UM	Unit Price	Ext. Price
39	SYSPROGRAM -CC	38996-4	System Programming &/or Configuing (1hr) -CC w/Comms Configuration NOT CANCELABLE OR RETURNABLE PRODUCT	US	3	HR	200.00	600.00
							Subtotal	15,710.52
							Sales Tax	1,197.81
							Freight	207.16
							Total	17,115.49

EXHIBIT 2

to Appendix G – Supplemental Environmental Projects

Meteorological data collection equipment for the monitoring stations

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 202-0593-CE

Scentroid
70 Innovator Ave. Unit 6-8
Whitchurch-Stouffville ON L4A 0Y2
Canada

Barr Engineering Co., Teresa L. Kinder
4771 50th Street SE
Grand Rapids, MI 49512
United States

Quotation # SO7518

Quotation Date:	Expiration:	Salesperson:
10/26/2021	11/25/2021	Craig Loucks

Description	Quantity	Unit Price	Disc.%	Taxes	Amount
[CT20] CTAir CTair provides a continuous measurement of key pollutants. In addition to GPS coordinates, temperature, relative humidity, and atmospheric pressure, CTair measures pollutants such as H2S and CH4. The CTair unit is meticulously designed to be installed in minutes – only requiring physical mounting to a pole or wall and an 8-24 V power supply. Each unit has the capability of being equipped with internal batteries and powered directly with a 20W solar panel. Specifications: - CTair is equipped with T, RH, Barometer - Geo-tagging of all data points - Forced-air active sampling - Data transmission to dedicated cloud server though Lora network and 3G/4G gatway (gateway supply separately) - Secondary WiFi connectivity - Sampling rate of 1 per second - Averaging of data ranging from 1 second up to 24 hours. - Self-diagnosing and auto-zero calibrating - Remote data access through a dedicated cloud server - Temperature Range: -40 °C to 40 °C - Power input 8-24V (universal AC adapter included for power of 110-240V 50/60Hz)	4.000 Unit(s)	7800.0000	0.00		US$ 31200.00

Scentroid
70 Innovator Ave. Unit 6-8
Whitchurch-Stouffville ON L4A 0Y2
Canada

[08-007] Hydrogen Sulfide (H2S) LC Sensor ONLY Name: Hydrogen Sulfide (H2S) Low Concentration Sensor Type: Electro Chemical Sensor (EC) Maximum Detection Limit: 3 ppm Lowest Detection: 7 ppb Resolution: 1 ppb	4.000 Unit(s)	910.0000	100.00	US$ 0.00
[CH4L] Methane - TLDS (CH4) Name: Methane - TLDS (CH4) Type: Tunable Laser Diode Spectroscopy Maximum Detection Limit: 100 ppm Lowest Detection: 0.4 ppm Resolution: 0.01 ppm	4.000 Unit(s)	9800.0000	100.00	US$ 0.00
[CT20-SL] CTAIR Solar Module Solar module provides the 200W solar cell, rechargeable batteries, mounting bracket and the electronics required for CTAIR to operate purely on solar energy.	4.000 Unit(s)	850.0000	0.00	US$ 3400.00
[02-026] Pole Mount Kit (for CTAir)	4.000 Unit(s)	450.0000	0.00	US$ 1800.00
CTAir 3G/4G Modem The modem allows a CTAIR to securely send all data to the Scentroid Cloud server using cellular connectivity. Will accept standard micro SIM card (Not included)	4.000 Unit(s)	3800.0000	0.00	US$ 15200.00
Customization Extended battery pack Internal heater Upgrade to 200W Solar panels	1.000 Unit(s)	1700.0000	100.00	US$ 0.00

Scentroid
70 Innovator Ave. Unit 6-8
Whitchurch-Stouffville ON L4A 0Y2
Canada

SIMS2 Pro Subscription (Annual) SIMS 2 Pro Cloud Based Solution includes all features from SIMS2 lite such as data collection, graphing and export plus the following features: - Unlimited guest accounts that can be shared to view data and export results - Email and SMS notification for user defined exceedance alarm - Email and SMS notification for system errors, calibration reminders, and firmware upgrades - Unlimited data storage (SIMS2 Free stores up to 2 years of historical data) - Automated comparison of sensors from multiple equipment - Radar plot for source identification (SL50 and CTAIR ONLY) - AI based event detection - Automated report generation - API for data retrieval and support for 3rd party software - Zone of influence mapping (SL50 and CTAIR ONLY) - setup of facility and network groups (AQSAFE) ** First year is complementary, annual cost after first year is $1200 USD for up to 2 instrument. Each additional instrument costs $250 per year. For example annual cost for 4 units is : 1200 + 250 + 250 = $1700.	4.000 Unit(s)	1200.0000	100.00	US$ 0.00
[SL50 - UWS] Ultrasonic Wind Sensor Ultrasonic Wind Sensor is a robust ultrasonic wind speed and direction sensor with aluminium alloy construction . The sensor is solid-state with no moving parts, using ultrasonic measurement technology to detect wind speed and direction at speeds up to 60m/s (134mph). This item is recommended: Mounting Bracket for Ultrasonic Wind Sensor	4.000 Unit(s)	3900.0000	0.00	US$ 15600.00
[SL50-UWS- MB] Mounting Bracket for Ultrasonic Wind Sensor Anodized aluminium mounting bracket able to be installed on any pole from 1.2-2.3" (30-58 mm) in diameter or a flat wall. Comes with all mounting hardware including bolts, mounting plate, and multiple earth points	4.000 Unit(s)	700.0000	0.00	US$ 2800.00
CALIBRATION				

Scentroid
70 Innovator Ave. Unit 6-8
Whitchurch-Stouffville ON L4A 0Y2
Canada

[GD-600A] Automated Portable Gas Dilution Device Package Automated Gas Dilution Device for calibration of chemical Analyzers - Built in zero air generator provides 7000 ml/min - Inlet for 0-10,000 ml/min diluting N2 or Zero air from external source - Standard gas range 0-600cc - Dilution range of 2 to 5,000 - Fully automated dilution requires no manual adjustment - Medical grade Mass Flow Controllers with 99.5% dilution accuracy. - Continuous dilution monitoring feedback for 100% reliability and accuracy - Automated dilution calculation for ease of use. User only required to provide desired dilution and minimum output flow rate required - 3 stage scrubber on the exhaust of unused diluted gas - System is controlled through any android device via Bluetooth connectivity - System built into a Pelican case for ease of transportation and operation - Built-in battery for total portability. - 120-240V charger	1.000 Unit(s)	4700.0000	0.00	US$ 4700.00
[SE-EX] Sensor Exchange - H2S Sensor The H2S sensor is replaced by a new original, calibrated H2S sensor of same type and range (same detection/resolution). The H2S sensor will be supplied with a calibration file to be entered into the SD card. Cost: 50% of sensor price Recommended H2S sensor replacement minimum 1/year The system will no longer require additional calibration	4.000 Unit(s)	450.0000	0.00	US$ 1800.00
Shipping and Handling	1.000 Unit(s)	782.0000	0.00	US$ 782.00

Subtotal US$ 77282.00

Subtotal	US$ 77282.00
Total	US$ 77282.00

The complete system as described here will be shipped in 6 - 8 weeks from receipt of PO and initial payment. Payment terms are as follows: 100% of the purchase price including any applicable taxes on placing a purchase order for orders less

Scentroid
70 Innovator Ave. Unit 6-8
Whitchurch-Stouffville ON L4A 0Y2
Canada

than $10,000 . For orders equal to or greater than $10,000 the payment schedule will be 50% with PO, 50% prior to shipment. All above payment(s) are due upon receipt. This order is subject to our standard terms and conditions which can be found at http://www.scentroid.com/standard-terms-and-conditions. This document and our standard terms and conditions embody the entire agreement among Scentroid and the buyer, and supersede all prior agreements and understandings, oral or written, if any, relating to the subject matter hereof.

EXHIBIT 3

to Appendix G – Supplemental Environmental Projects

Calibration equipment for the monitoring stations

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE

SCENTROID

FUTURE OF SENSORY TECHNOLOGY

GD600 GAS DILUTION SYSTEM

AUTOMATED CALIBRATION SOLUTION

70 Innovator Avenue, unit 7
Stouffville, ON, L4A 0Y2

416-479-0078
1-888-988-IDES (4337)

info@scentroid.com
www.scentroid.com

SCENTROID
Future of Sensory Technology

GD600 GAS DILUTION SYSTEM
PRODUCT SPECIFICATIONS

Easy and Affordable Calibration With a Portable Gas Diluter

The Scentroid GD600 Gas Dilution System provides an easy solution to simplify calibrating chemical analyzers. GD600 generates its own zero-air by scrubbing the ambient air using its 3-stage filter. Calibration gases are diluted using zero air or optionally N2 to provide a reference gas of any concentration allowing the operator to easily conduct multi-point calibration. By controlling the mass flow of the reference gas, GD600 not only simplifies the calibration process but also reduces the consumption of reference gases. Through the user-friendly android app, the user can command the GD600 to perform single or multiple point calibrations simply by entering the desired gas concentrations and time between sampling for each point.

No More Sample Bags!
The dilution system eliminates the need for sample bags

Less Downtime
There is no longer a need to remove equipment to send to a lab for recalibration. All processes are now infield

Zero Air Generator
Built in zero air generator provides 7000 ml / min

Accuracy
Continuous dilution monitoring feedback for 100% reliability and accuracy

Mass Flow Controllers
Medical grade mass flow controllers with 99.5% dilution accuracy

Incredible Efficiency
Normally, 3 gas canisters are required per sensor. With this system, 1 bottle will last multiple calibrations

Power Supply
Built in battery for total portability. Packaged with 120 - 240v charger

Ease of Use
Fully automated dilution. User only required to provide desired dilution and minimum output flow rate

System
Controlled through any android device via Bluetooth connectivity

Durability
Built into a Pelican case for ease of transportation and operation

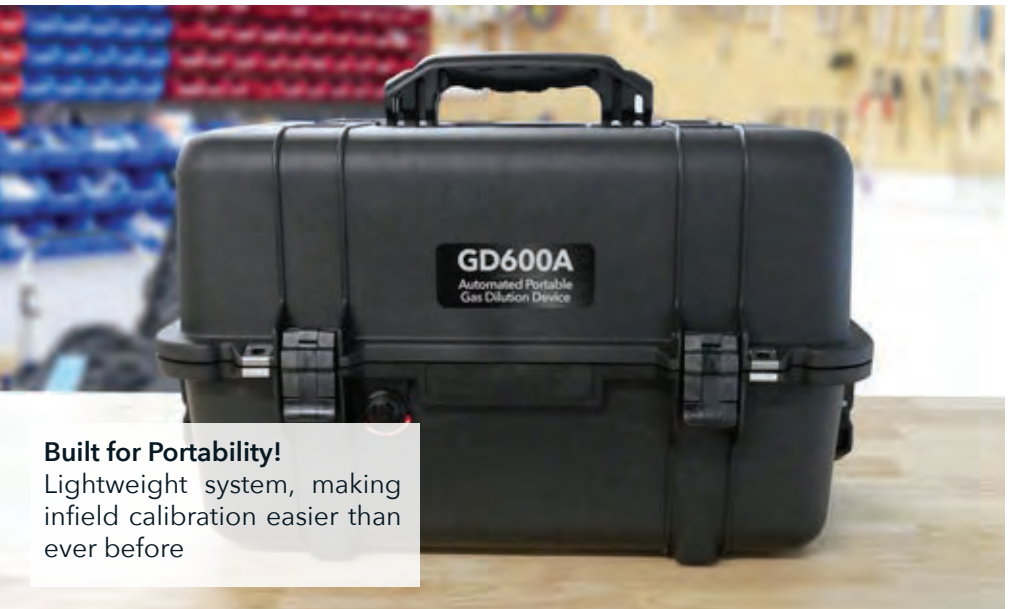
Inlet Capabilities
Inlet for 0 - 10,000 ml / min diluting N2/zero air from external sources

Live Monitoring
Android device displays environmental variables including temp & humidity

Filtration Capabilities
Scrubbers with patented porous pellets for removing contaminants

Exhaust Filter
Scrubs out potentially harmful gases and odors that may be emitted during calibration

Dilution Range
Dilution range of 2 to 5,000



Built for Portability!
Lightweight system, making infield calibration easier than ever before

Save on Gas!
Reduce calibration gas consumption significantly with the GD600 dilution system

EXHIBIT 4

to Appendix G – Supplemental Environmental Projects

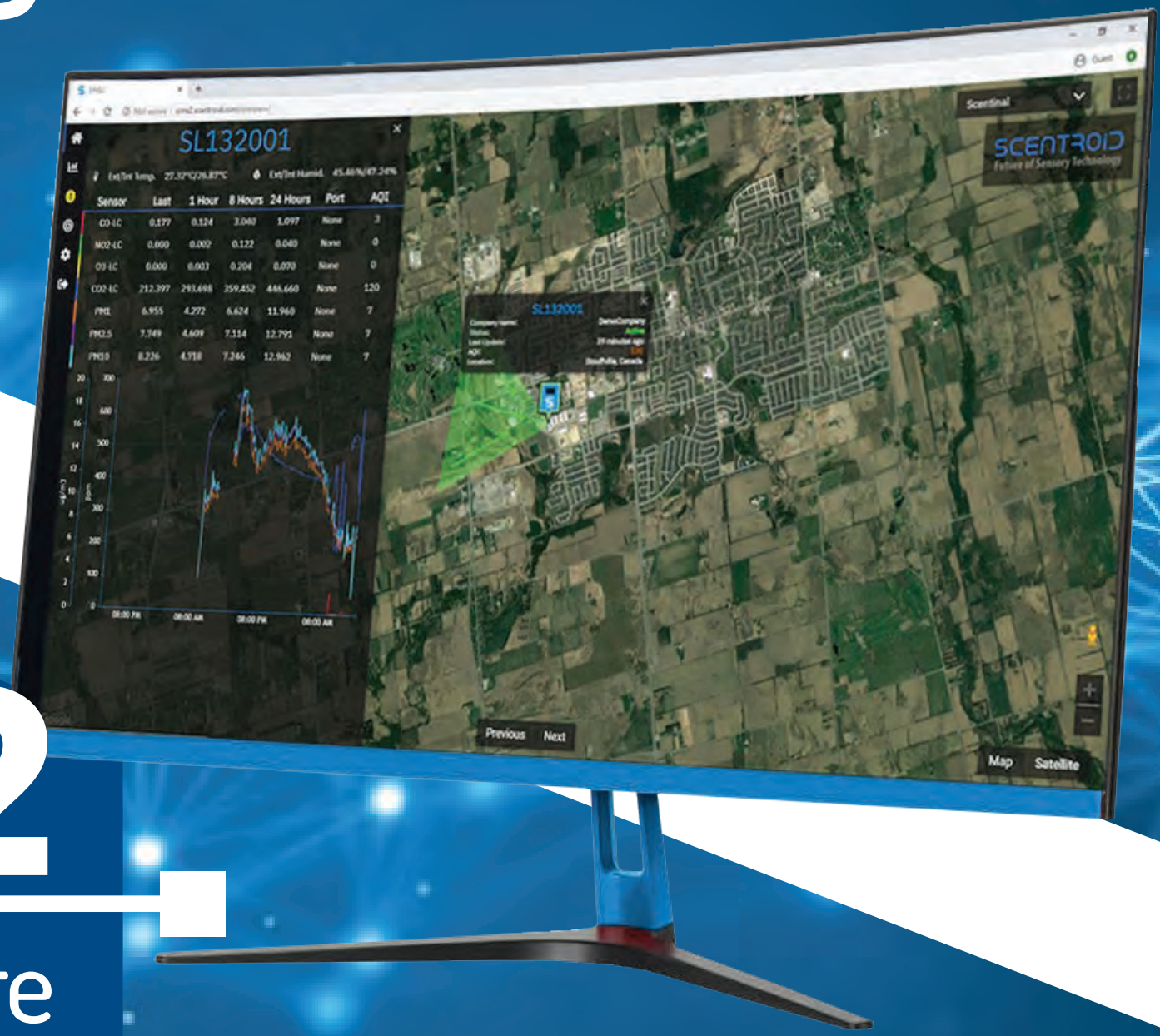
Description of SIMS2 Pro Software

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE

SCENTROID

SIMS2

Software Brochure



Letter from Scentroid's CEO

Scentroid's mission is to empower our clients with vast in-depth knowledge, state-of-the-art instruments, and the most extensive customer support. To this end, we strive in every aspect of our operation to put our client first and to use our research expertise to develop the most innovative and effective products and services in the sensory industry. We envision a future were environmental impacts will be easily and accurately measured and mitigated.

Dr. Ardevan Bakhtari
CEO, Scentroid

INTRODUCING SIMS2

SIMS2

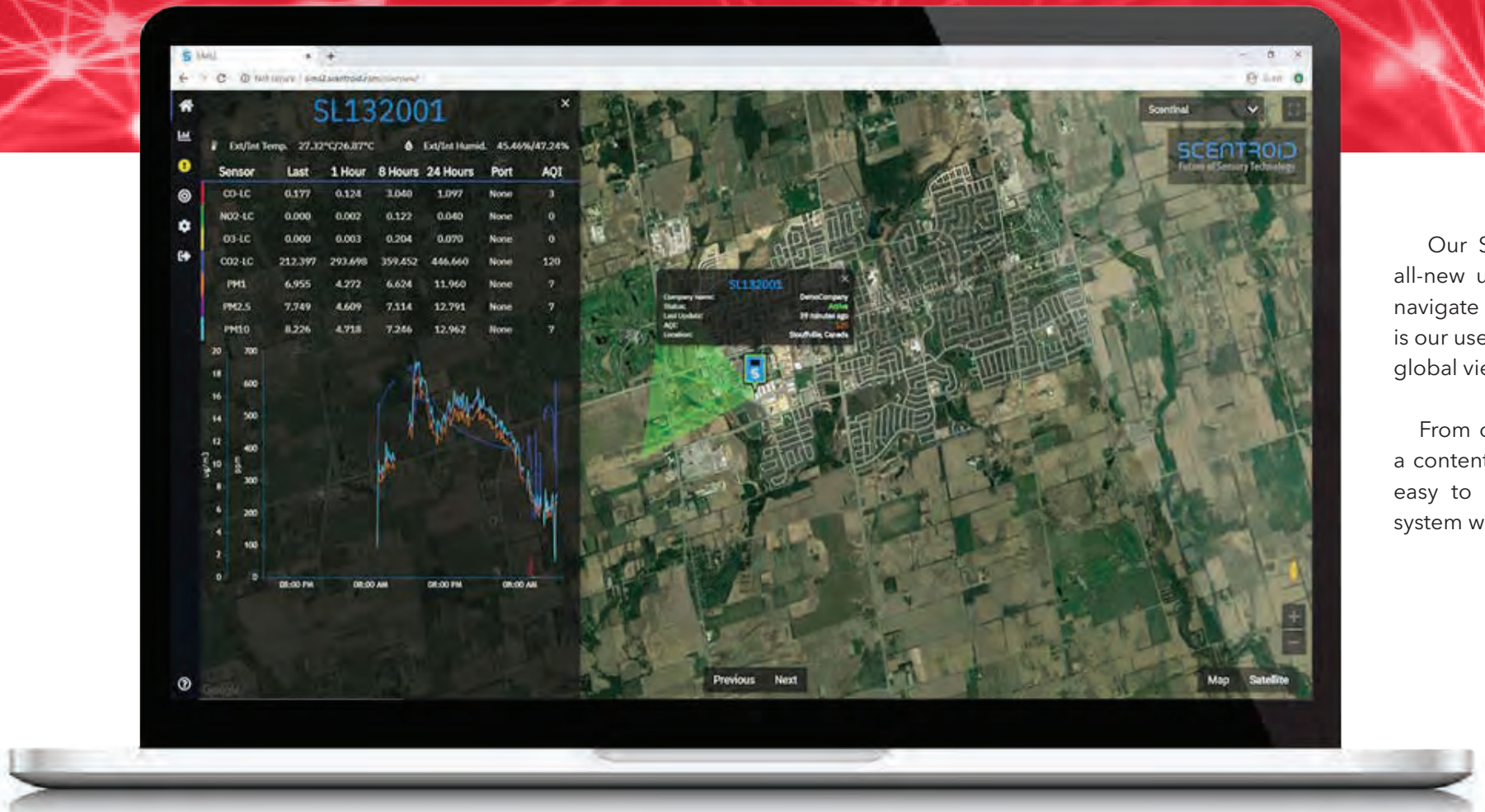
Sensor Information Management System

The Scentroid Sensor Information Management System, SIMS2, is our all-inclusive software used to view and analyze historical data, run diagnostics, and configure various settings for your supported instrument. Provided as part of our Scentroid continuous air quality monitoring package, the software can be accessed with any stable internet connection.

SIMS2 provides easy analysis tools for an operator to determine pollutant threats, air quality alarms, historical data, sampled areas, and much more. The easy to use graphical interface allows anyone to run complicated data analytics without being an air quality expert.

SIMS2 is capable of displaying data from multiple analyzer devices within the same network. Users can analyze data and monitor progress remotely from a single platform.

NEW USER INTERFACE



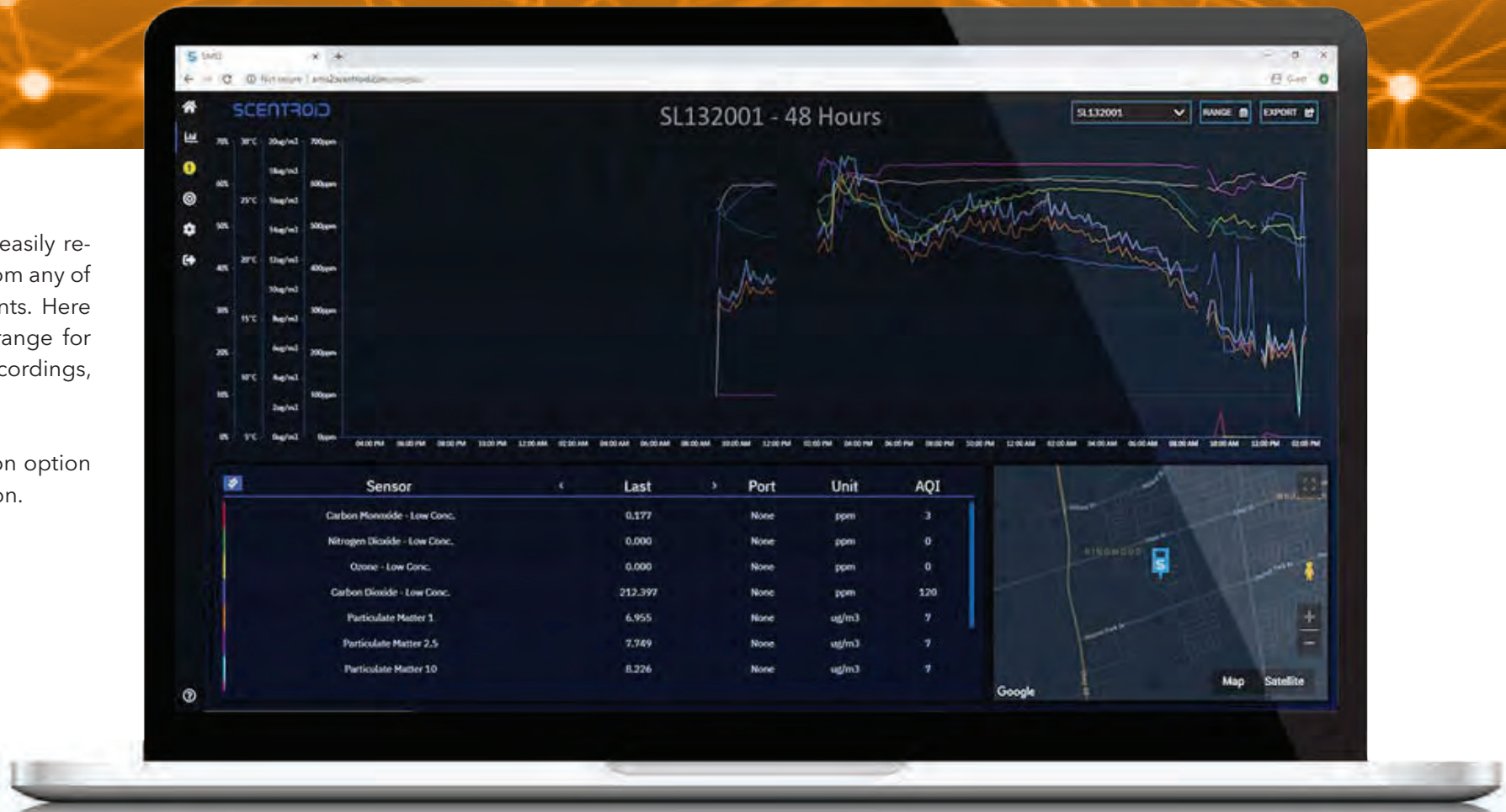
Our SIMS2 system boasts a stunning, all-new user interface, designed to easily navigate and interact with. The image here is our user homepage, where you will find a global view of your instruments.

From opening your software to viewing a content rich analysis page, a simple and easy to grasp user intuitive navigational system was our main design priority.

ANALYSIS MADE EASY

The new analysis page lets you easily review and analyze historical data from any of your active (or inactive) instruments. Here you can select a date and time range for an assessment of your device's recordings, and export your results.

Furthermore, a data re-calibration option is available with the click of a button.

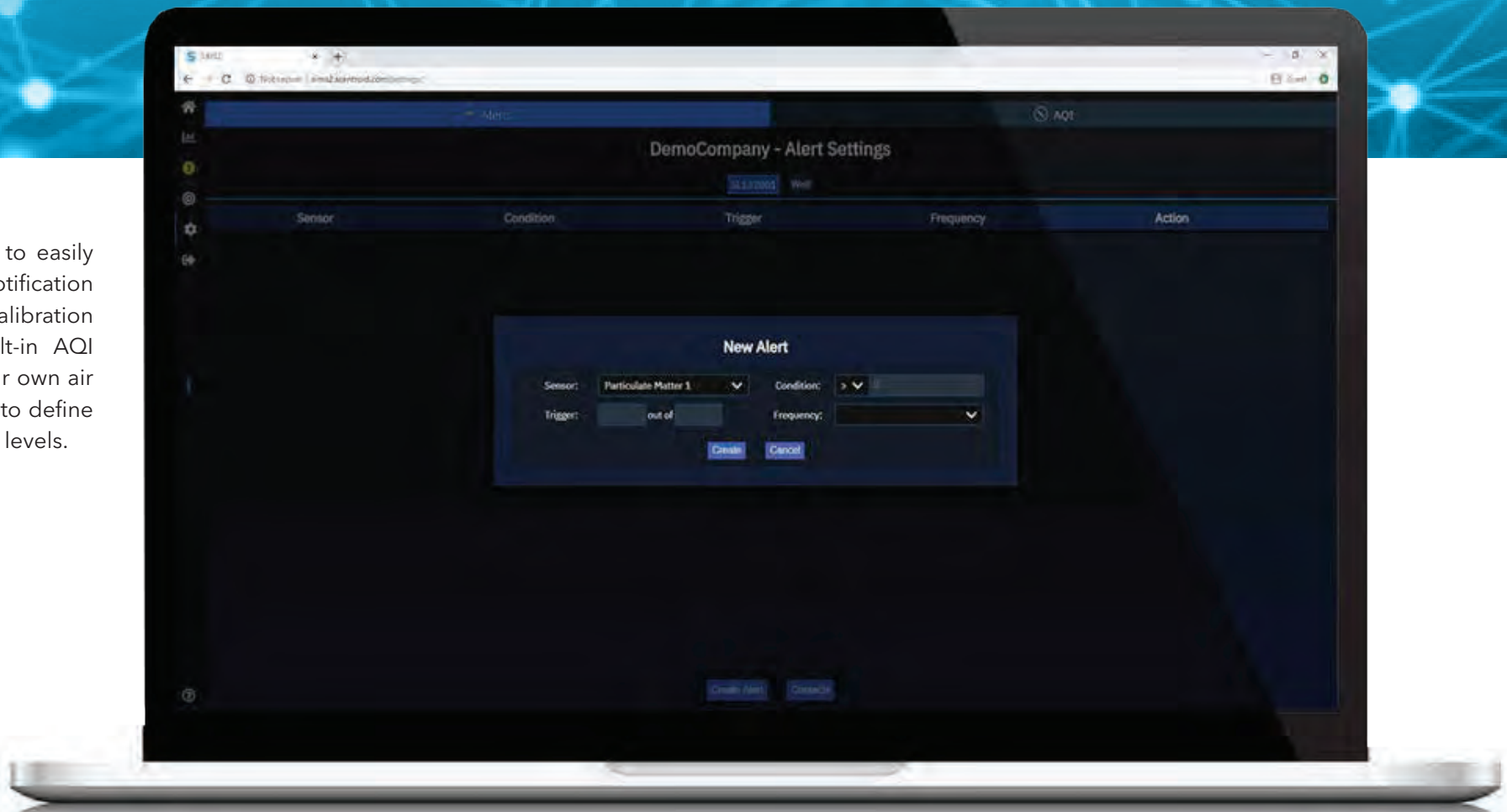


SMART NOTIFICATIONS

Our revamped SIMS2 notification center allows you to quickly view your instrument's activity, health, and alarms through a clean and organized interface. Here, you can access your device, look up a specific sensor, display all of your established alarms/alarm rules, and obtain a detailed breakdown of your alarm status.

ADVANCED SETTINGS

The settings page allows you to easily adjust any of your analyzer's notification thresholds, all of their calibration parameters and more. The built-in AQI interface allows you to create your own air quality index rules for any sensor to define healthy, unhealthy and dangerous levels.

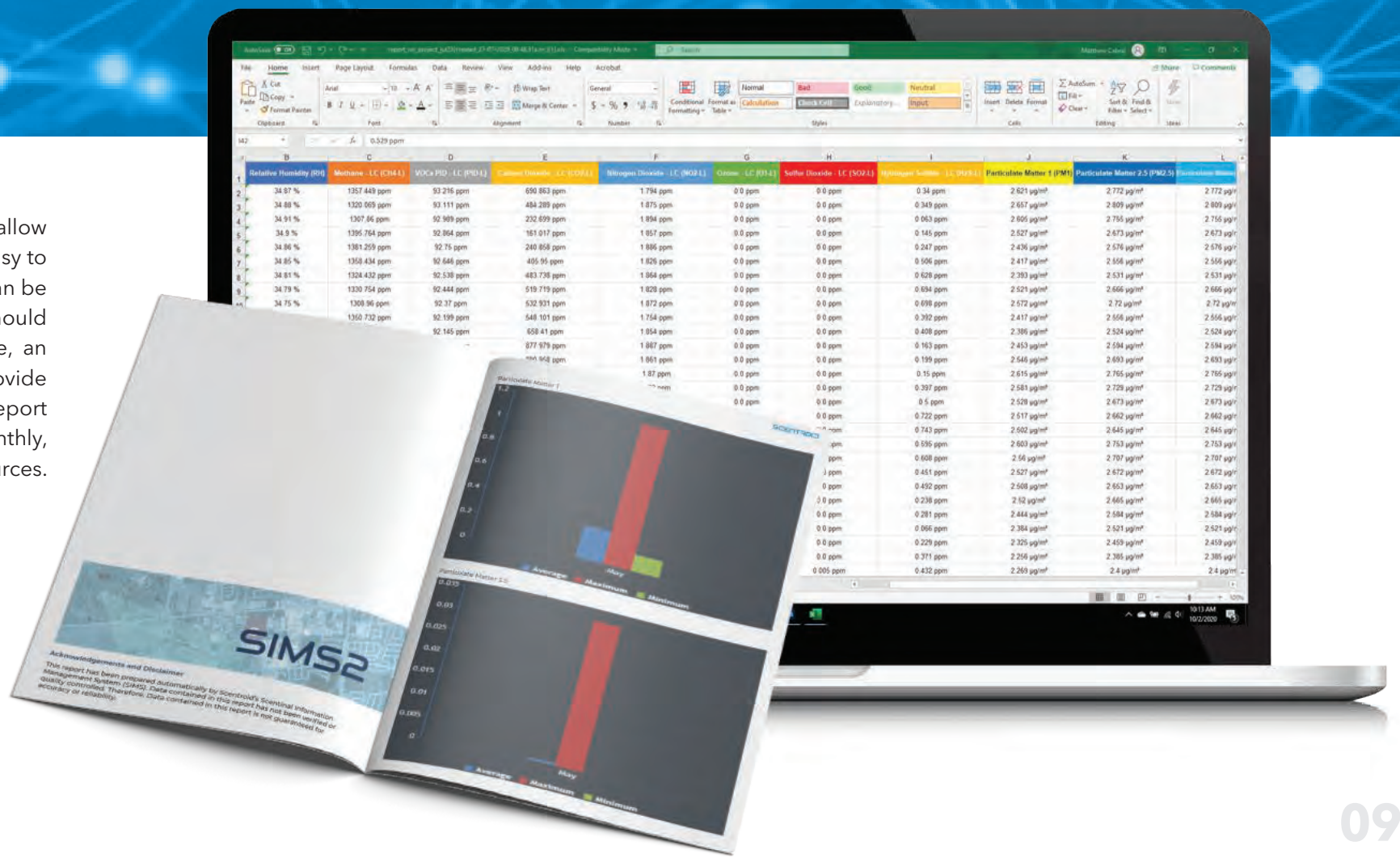


ALL-NEW RADAR MODE

The intelligent radar mode conducts and automatically analyzes collected data to display where each pollutant traveled from. By overlaying this information on a map, the user can easily identify the source of all pollutants detected. Additional information such as a wind rose is also presented for further analysis.

EXPORT YOUR REPORTS

Our SIMS2 Software will not only allow you to see project data through our easy to read graphs, but all raw sensor data can be exported into an Excel document. Should you register for our SIM2 Pro service, an automatic report generator will provide you with a professional analysis report highlighting exceedances, daily, monthly, and annual averages, and pollution sources.



SMS AND EMAIL ALERTS

We understand that you may not always have access to your computer to view in-app notifications on sensor alarms and alerts. Should you be monitoring a potential air quality hazard, an immediate notification may be necessary. Scentroid has you covered! Our SIMS2 Pro system is capable of notifying you via SMS or email should any sensors report an exceedance of a pre-determined value within our alarm settings page.

COMPATIBLE DEVICES

AQSAFE INDOOR AIR QUALITY MONITOR

AQSafe indoor air quality monitor observes indoor air quality with up to 12 sensor varieties, including pressure, temperature, relative humidity, and GPS. Our sensor detection ranges from dust (PM1, 2.5, and 10), noise, radiation, and many other chemical compounds found indoors.

The AQSafe features a compact, low profile design. It is both easy to install and operate. Not only has it been proven for long term stability, but all sensors have been calibrated and prepared for your space. The AQSafe is your new companion for indoor air quality monitoring, built with labor saving, cost-effective, and health and comfort measures in mind.

The AQSafe features built in software for graphical representation, statistical data, and alarm systems. The touch screen incorporates control over a variety of advanced gas sensor technologies, designed to monitor the target gases (which can be specified at the time of ordering). A full list of sensors is available on our website.

RELIABLE, STABLE, ENHANCED

Conducts automatic health check of all sensors daily and sends reminders when any sensor requires a replacement

WIRELESS CONNECTIVITY

Easily connects to any WI-Fi network to transmit data to the cloud server. Also capable of bluetooth connectivity with any smart device for initial network setup

CLOUD BASED MONITORING

The AQSafe monitors sensor readings and checks the health of each unit from the easy to use cloud based software, SIMS2.

Setup of New Facilities and Networks

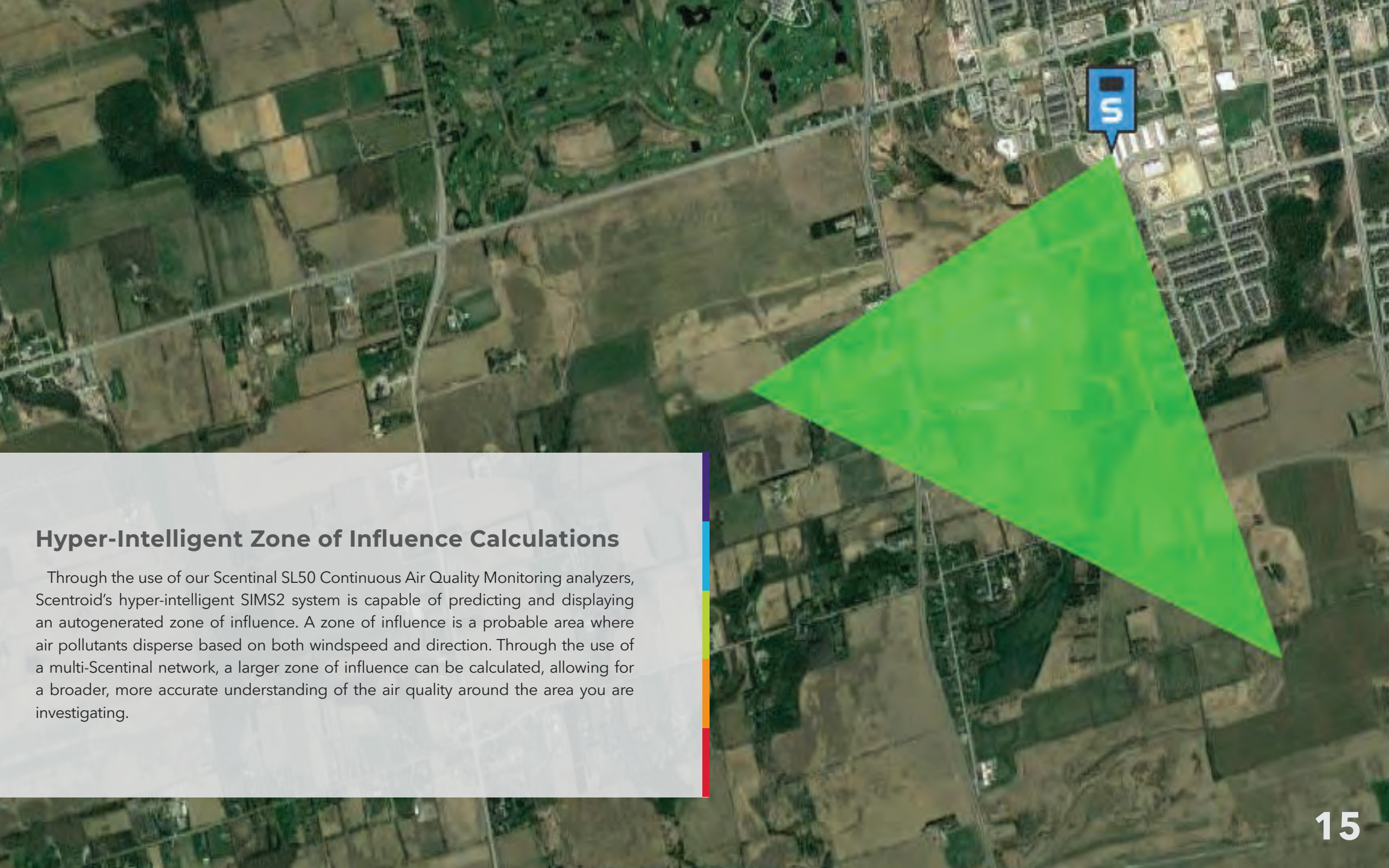
An intelligent air quality monitoring system must work efficiently with any facility size. As you may not be an air quality expert, you require an organized and easy to understand software solution. The AQSafe SIMS2 platform has you covered. Regardless of facility size, you are now able to organize every AQSafe within a network by subgroups, and rename them as you see fit.

Recalling a previous AQSafe unit / group has never been easier! With a friendly user-intuitive naming system and built-in search functionality, finding any AQSafe within your network can be completed within a matter of seconds.

SL50
SCENTINAL

Scentinal is a continuous ambient pollutant and odour emission monitoring system which operates through high accuracy (ppb level) sensing technology. Scentinal can provide simultaneous monitoring of odorous and non-odorous gases such as Hydrogen Sulfide (H2S), Sulfur Dioxide (SO2), Ammonia (NH3), Methane (CH4), Carbon Dioxide (CO2), and many other Volatile Organic Compounds (VOCs).

Scentinal uses up to 20 sensing modules ranging from Photo-Ionization Detectors, Non-Dispersive Infrared Detectors, Electro-Chemical Cells, Laser Scattered counters and Metal Oxide sensors. The data collected from sampling is stored locally and is also transmitted to the cloud server, providing easy accessibility. The Sensor Information Management System (SIMS) is used to store and display the results from monitoring and sampling campaigns while also providing capabilities for remote configuration, calibration, and diagnosis of multiple Scentinal units.



Hyper-Intelligent Zone of Influence Calculations

Through the use of our Scentinal SL50 Continuous Air Quality Monitoring analyzers, Scentroid's hyper-intelligent SIMS2 system is capable of predicting and displaying an autogenerated zone of influence. A zone of influence is a probable area where air pollutants disperse based on both windspeed and direction. Through the use of a multi-Scentinal network, a larger zone of influence can be calculated, allowing for a broader, more accurate understanding of the air quality around the area you are investigating.

SIMS2: UPGRADE OPTIONS

SIMS2: commitment free structure

	Pro	Lite
Number of guest users per account	15	0
Secure data storage	Unlimited	Previous 2 Years
Graphing of multiple sensors per individual equipment	○	○
Equipment error notifications	○	○
Over-the-air firmware upgrades	○	○
Export of raw data to Excel	○	○
Setup of new facilities and networks (AQSafe only)	○	○
Email and SMS alarm system	○	✕
Zone of influence calculation (SL50 only)	○	✕
Radar plotting (SL50 only)	○	✕
Graphed sensor comparison mode	○	✕
Automatic event detection	○	✕
Automatic report generation	○	✕
API for external data retrieval and 3rd party integrations	○	✕

As a special thank you for being a Scentroid customer, our SIMS2 Pro service is **FREE** for 1 year from the date of initialization!

AFTER-SALES SUPPORT

Training

Training is the key of using any instrument, and Scentroid provides worldwide training programs for our clients and distributors. Training can be conducted by Scentroid or your local distributor. Scentroid training tools include: online training, videos, brochure, operation manual and on-site workshops. We also offer a hands-on training program using our high-tech simulation room. Scentroid's state of the art simulation room is located at our headquarters in Toronto, Canada. You are more than welcome to visit us and meet with the people behind these products

Warranty

We are so confident of the reliability of our products, that we are glad to offer our clients a comprehensive 24 month warranty for your equipment. Additionally, warranties can be extended for the 3rd, 4th and 5th year. For more information about our extended warranties, speak to us today.

Technical Support

We are responsible for any products that exit from our manufacturing warehouse! Our support team offers different ways to help you. Choose the one most convenient for you below!

Local Support

We have developed a vast growing network of distributors and repair facilities. To find your local support please check our distributors map.

Phone Support

Our highly professional customer services are here to serve you, for any technical issue reach them easily via phone: 416.479.0078 – Ext 210

SME Support

Connecting you to the Subject Matter Experts! Our customer support is unique in that you can talk directly to the designer or programmer of each product.

Live Chat

If you feel more convenient to solve your technical issue via chat, No problem! Reach our highly professional customer services through our website-hosted Live Chat.

Email Support

For any technical issue you our engineers are happy to assist via email. For fast and efficient support, simply email our team at support@scentroid.com

LET'S BUILD OUR NETWORK

linkedin.com/company/scentroid

DO YOU FOLLOW US YET?

@Scentroid

GET THE FULL PICTURE

@Scentroid

LIKE SHARE COMMENT

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WATCH FOLLOW SUBSCRIBE

youtube.com/scentroid

SCENTROID

Future of Sensory Technology

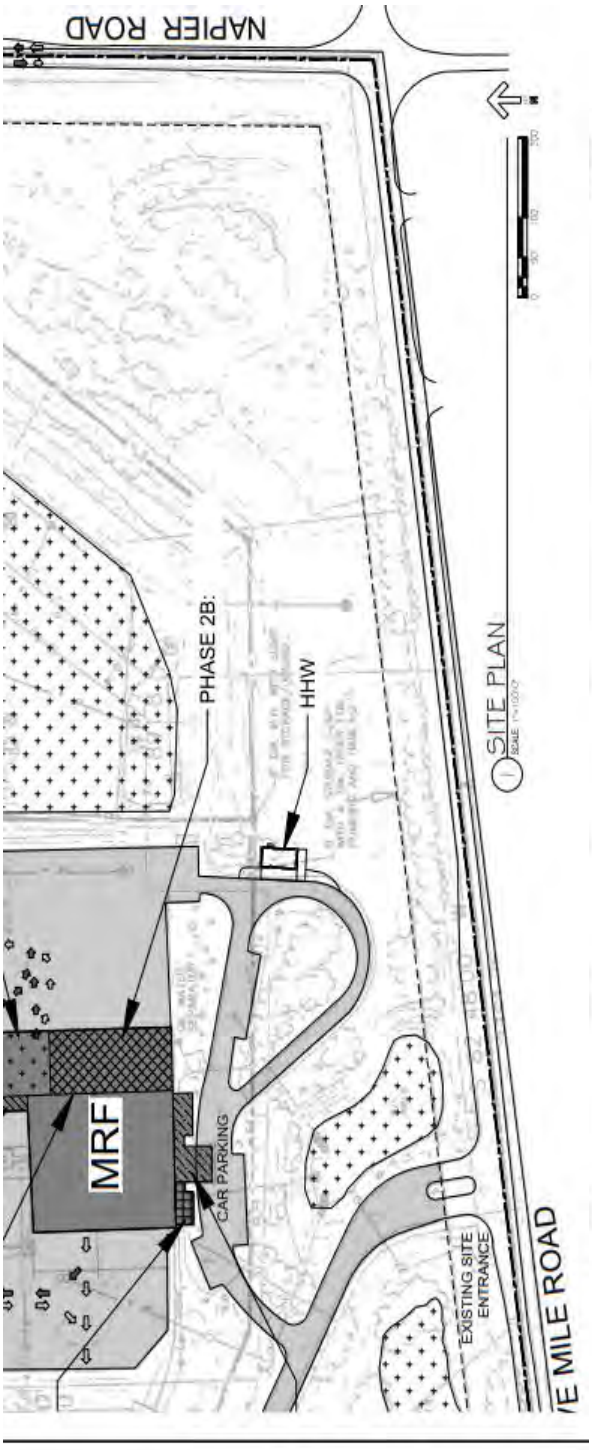
Scentroid (Division of IDES Canada Inc.)
70 Innovator Avenue, Units #6-8 | Toronto, ON, L4A 0Y2
T: 416. 479.0078 or 1.888.988.IDES (4337)
info@scentroid.com | www.scentroid.com

EXHIBIT 5

to Appendix G – Supplemental Environmental Projects

Design and location of household hazardous waste collection facility

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE



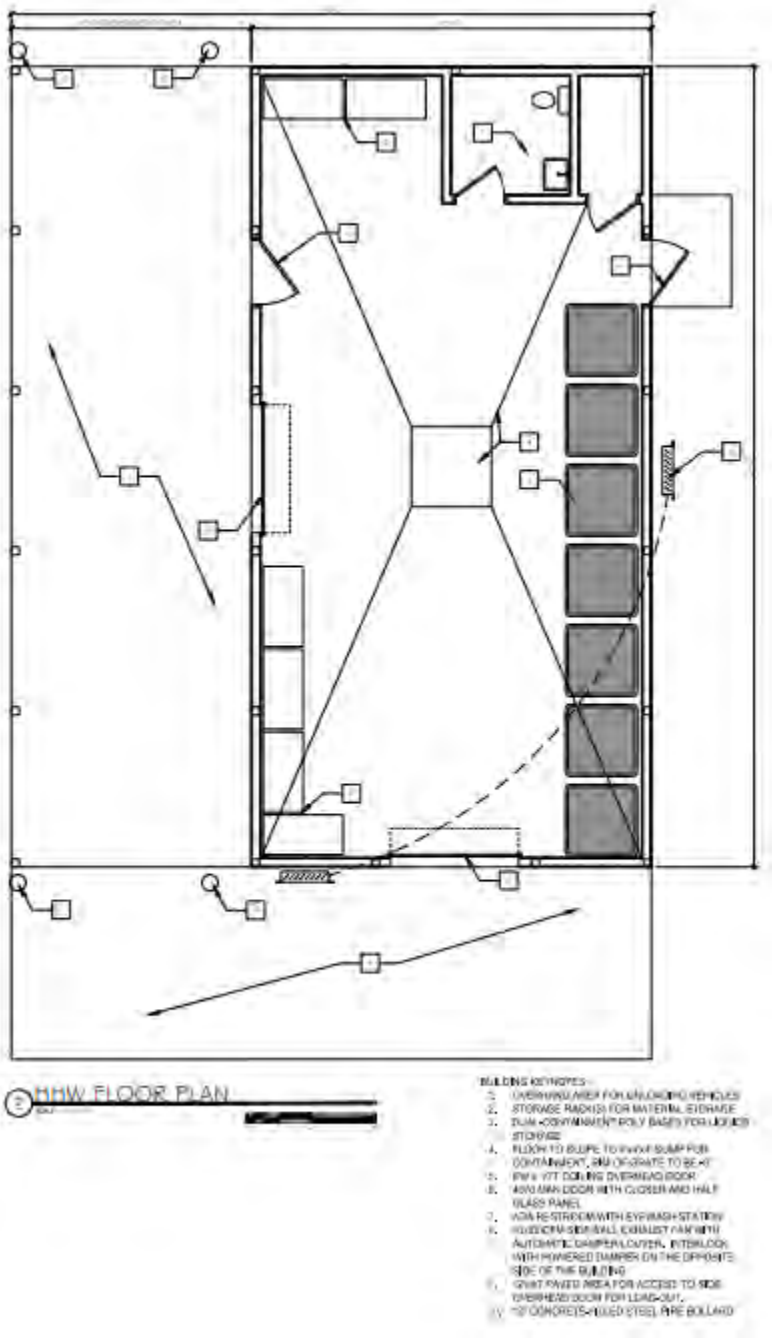


Exhibit 1 – Conceptual layout of a Household Hazardous Waste Drop Off Facility at Arbor Hills

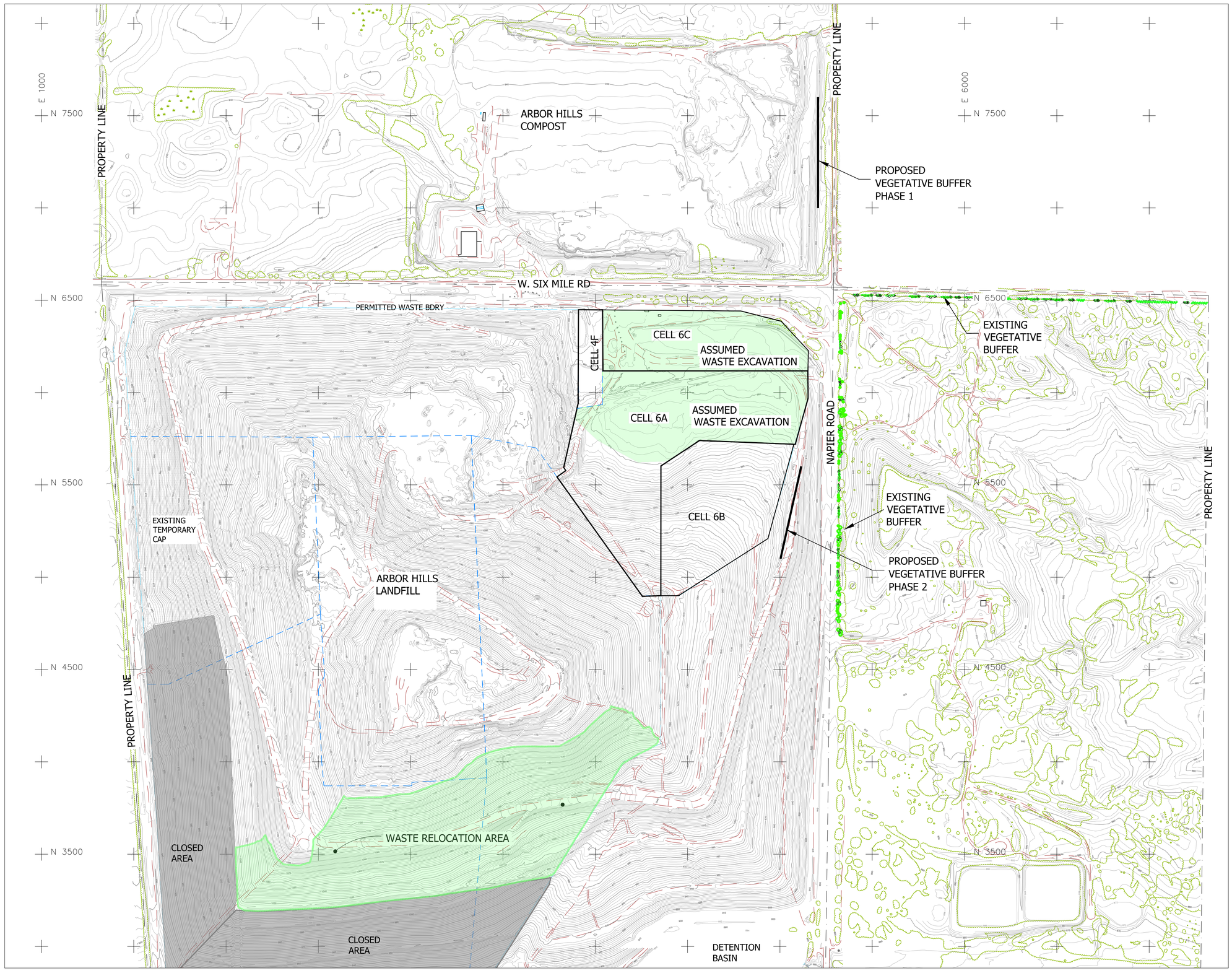
Note: This is conceptual only and will be modified as determined necessary by AHL and Washtenaw County during final design and construction.

EXHIBIT 6

to Appendix G – Supplemental Environmental Projects

Vegetative buffer location

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE



NOTE: AERIAL TOPOGRAPHY PROVIDED BY SOUTHERN MAPPING RESOURCES, DATED MARCH 2020

DRAFT
RELEASED FOR BID
APPROVED FOR CONSTRUCTION
CLIENT APPROVAL BY: _____

PREPARED FOR:

CELL 6 CONSTRUCTION
VEGETATIVE BUFFER LANDSCAPING

ARBOR HILLS LANDFILL, INC.
NORTHVILLE, MICHIGAN

NO.	DATE	REVISION DESCRIPTION	BY

Weaver Consultants Group

WEAVER CONSULTANTS GROUP
1316 BOND STREET, SUITE 108
NAPERVILLE, ILLINOIS 60563
(630) 717-4848
www.wcgrp.com

DRAWN BY:	bac
REVIEWED BY:	bac
DATE:	11/10/2021
PRJ:	9001-311-10-31
FILE:	AH-2022-WASTE_RELOCATE

SHEET 1 OF 1

C:\Users\bcoughlin\Desktop\Projects\Arbor Hills\2021\AH-2022-WASTE_RELOCATE.dwg, WGSv1965,bcoughlin, January 25, 2022

EXHIBIT 7

to Appendix G – Supplemental Environmental Projects

Vegetative buffer 100-ft segments and details

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE

LANDSCAPE ARCHITECTURE
CONTRACTORS
HORTICULTURAL SERVICES
NURSERY
ALL SEASON MAINTENANCE

GREAT OAKS
LANDSCAPE

January 24, 2022

GFL Environmental
10833 West 5 Mile Rd.
Northville, MI 48168
Attn: Clarke Lundell

RE: ARBOR HILLS LANDFILL
LANDSCAPE TREATMENT
PRELIMINARY BUDGET COSTS

Clarke-

Here is the revised preliminary cost estimate for the typical landscape treatment for (1) module – 100 ft. long for the evergreen installation for the screening at Arbor Hills Landfill.

We would propose 12 Spruce trees, of various species, at approx. 10' spacing, for each 100 ft. module.

We would propose Norway Spruce - Picea abies, also White Spruce – Picea glauca, also Serbian Spruce – Picea omorika and Black Hills Spruce – Picea glauca "Densata"

We would also vary the height of the Spruce between 8ft. and 10 ft.

-Remove existing vegetation / prep: 2 hr. for a 3 man crew with equipment @ $250 / hr. = $500.00

-6 Spruce Evergreen trees, 8 ft. ht. @ $525.00 / ea. = $3,150.00

-6 Spruce Evergreen trees, 10 ft. ht. @ $650.00 / ea. = $3,900.00

-10 cu. yds. Topsoil for planting @ $45.00 / cu. yd. = $450.00

-20 cu. yds. Hardwood Mulch @ $65.00 / cu. yd. = $1,300.00

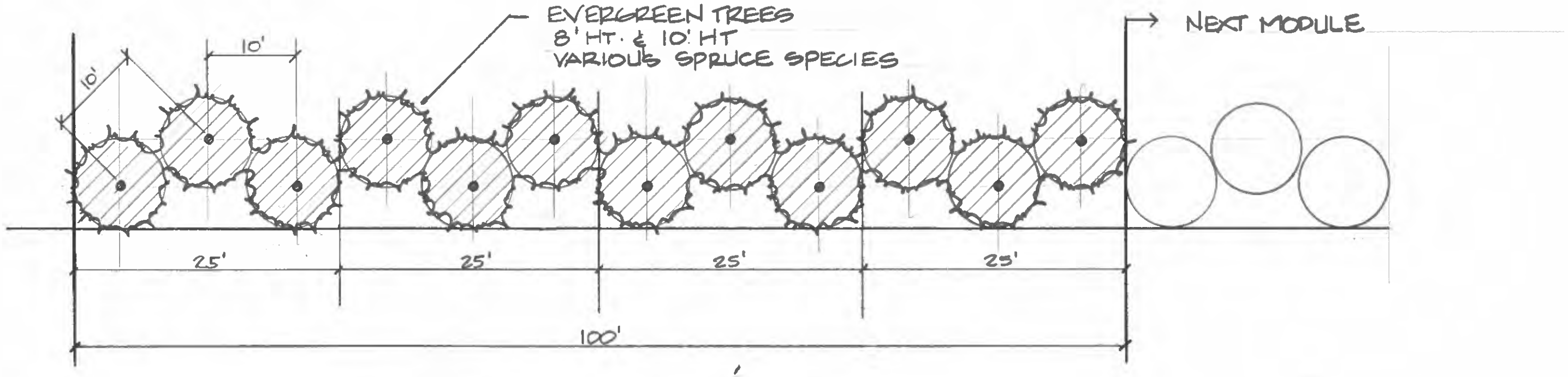
Total preliminary cost for 1 module: **$9,300.00**

Please review the above cost and feel free to contact me if you have any questions or desire additional information.

Regards,

Richard S. Tuttle
Licensed Landscape Architect
Vice President
Great Oaks Landscape

GREAT OAKS LANDSCAPE
ASSOCIATES, INC.
28025 SAMUEL LINDEN COURT
NOVI, MICHIGAN 48377
PH 248.349.8555
FAX 248.349.8556
www.greatoakslandscape.com



TYPICAL MODULE - 100' LONG

LANDSCAPE ARCHITECTURE
HORTICULTURAL SERVICES
CONTRACTORS
ALL SEASON MAINTENANCE
NURSERY

GREAT OAKS
LANDSCAPE

28025 SAMUEL LINDEN COURT NOVI, MICHIGAN 48377
PHONE 248.349.8555 ■ FAX 248.349.8556
greatoakslandscape.com

PROJECT: ARBOR HILLS LANDFILL

SUBJECT: TYPICAL LANDSCAPE MODULE

Client: GFL ENVIRONMENTAL

APPENDIX H

Cell 6/4F Waste Relocation and Odor Control Plan – Arbor Hills Landfill

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE

Cell 6/4F Waste Relocation and Odor Control Plan

Arbor Hills Landfill

January 2022

Arbor Hills Landfill, Inc.
10690 W. Six Mile Road
Northville, MI 48168

TABLE OF CONTENTS

1 INTRODUCTION

Arbor Hills Landfill, Inc (AHL) owns and operates a Type II, Municipal Solid Waste (MSW), landfill located in Salem Township, Michigan. The Arbor Hills facility consists of 337.24 acres and includes Arbor Hills East (AHE), a certified closed landfill, and Arbor Hills West Expanded Sanitary Landfill (AHW) and operates under License Number 9531.

AHW was approved for a horizontal and vertical expansion on December 11, 2009 (Solid Waste Disposal Area Construction Permit Number 4108) and modified on June 10, 2013 (Permit Number 4133). The horizontal portion of the expansion includes Cell 4 and Cell 6, located along the north and northeast portion of the landfill Cell 6 will replace a portion of and overlay the north slope of AHE. As part of the cell construction existing waste will be exhumed from AHE, which is unlined, and relocated to AHW which has an engineered liner.

AHW is surrounded by agricultural, commercial and residential areas. The properties to the north and east are primarily residential. The adjacent properties to the west are businesses. Salem Township offices are located about 0.5 miles to the west.

The purpose of this Waste Relocation and Odor Control Plan is to define measures to be implemented to mitigate the frequency, intensity, and duration of odors that may result from the waste relocation.

2 WASTE RELOCATION

Arbor Hills East (AHE) was an unregulated landfill, and the waste mass is expected to include municipal solid waste (MSW) and construction demolition (C&D). AHE was closed in 1990 under current landfill regulations. Since that time, the landfill gas, generated by waste decomposition, has been collected through gas extraction wells, vacuum laterals, and header piping. As part of the construction of Cell 6/4F a significant amount of waste will be excavated from AHE under the cell footprint. Excavated waste will be relocated and placed within the lined footprint of AHW. For the construction of Cell 6A/4F, Arbor Hills has identified an area with sufficient capacity to contain the relocated waste on the south slope of the landfill near the current haul road. Cell 6B will not require any excavation nor waste relocation as this Cell is strictly an over-liner. Cell 6C will be much like Cell 6A in which excavation and waste relocation will take place. However, AHL anticipates that the waste excavated from Cell 6C will be relocated in Cell 6A/4F and 6B as they will be active at the time and adjacent to the excavation activities anticipated for Cell 6B. See the attached Sheet 1 for the general locations of the planned activities.

The key parties responsible for the activities involved with the relocation of existing waste for Cell 6/4F construction include AHL management, third party Contractor (Contractor), Construction Quality Assurance (CQA), and third-party odor monitoring personnel. The Contractor will be given specific direction regarding procedures to be followed during waste excavation and relocation, and CQA personnel along with AHL management will be present during excavation and will be empowered to direct the Contractor to adjust activities as necessary to minimize potential off site odor impacts. Section 3 describes details regarding the odor monitoring and mitigation efforts that will be applied to this project.

The Contractor that will conduct this waste relocation effort was chosen in part based on their successful experience completing other waste relocation projects. They understand, and AHL management will continue to stress during this project, the importance of minimizing the area of exposed waste. In addition, this experienced Contractor understands the importance of completing all waste relocation activities as quickly as possible to minimize the duration of potential odor impacts. For Cell 6A/4F, the Contractor anticipates working from 6 AM to 6 PM daily with a goal of relocating an average of 6,000 to 9,000 CY of waste daily. The total amount of waste to be relocated is estimated to be 570,000 CY, so a duration of four to five months is estimated. For Cell 6C the rate of waste relocation will likely change due to different haul distances. Each day the excavation and fill areas will be managed to minimize the active/open area for that day. Waste is expected to be removed in 5- to 20-foot-thick benched lifts, progressing across the cell area. In general, lifts will be excavated from west to east within the cell footprint, unless unforeseen circumstances dictate otherwise. This will allow mobile and fixed odor neutralizer equipment to be stationed immediately east of and above the excavation area. Once excavated the waste will be hauled to the designated landfill area and will be placed, spread, compacted and covered. It is anticipated that the

Contractor moving the waste will use a combination of common earthmoving equipment to complete the work.

The equipment to be used will consist of hydraulic excavators, off-road articulated dump trucks and bulldozers as well as other support pieces of equipment. The excavator will be responsible for digging the material out of the excavation and placing the material into the dump trucks. The dump trucks will travel the landfill roads to the south slope area and will deposit the material into an active face dedicated for this activity. The excavator operator will ensure that the dump trucks are not overfilled so that debris is not scattered around the site. Additionally, the dump trucks may be equipped with tailgates or liners if the waste is found to have a high liquid content in an effort to containerize and limit the potential for liquid to spill out of the dump truck during transit. Dump trucks will also be used to haul daily and intermediate cover materials to the excavation and fill areas. Bulldozers will be used to police the work areas, bring waste materials to the excavator or compactor, maintain roadways, and spread the daily and interim cover. The support equipment may include pick-up trucks, service trucks, road graders, rollers, compactors, hydraulic application equipment (i.e., hydroseeder), and pumps.

All exposed waste in the excavation and fill areas will receive a minimum loose lift thickness of 9-12 inches of daily cover soil materials at the end of each working day unless odor monitoring, as described in Section 3.6, indicates concerns during the day in which case exposed waste creating the concern will be promptly covered. The daily cover applied will be monitored by CQA personnel and AHL management to ensure compliance with Arbor Hills Landfill requirements. Waste excavation slopes will be covered with controlled backfill upon completion in order to achieve designed liner grades. Slopes that reach final design grades in the south slope fill area will be covered with interim cover. After waste relocation has been completed compost and seed will be applied to the south slope fill area slopes to establish vegetation and minimize erosion of the interim cover.

Waste excavation and relocation for Cell 6A/4F construction will commence in January or February of 2022 and as noted previously, is expected to continue for four to five months. It is desirable to conduct waste relocation during colder months whenever possible in order to minimize potential impacts to neighbors. Cell 6B is currently anticipated to commence in 2023. However, as described earlier in this Plan, there is no excavation or waste relocation anticipated for this Cell construction as it is strictly over-liner. Lastly, Cell 6C is currently anticipated to commence in late 2024 or early 2025.

3 ODOR CONTROL PLAN

The following sections detail the odor control plan for use during waste relocation from Cell 6/4F construction. The plan includes identification of potential sources of odors and associated odor management practices.

3.1 Potential Sources of Odors

The waste in the excavation areas is old (pre-1990) and some decomposition is expected to have already occurred. Earlier borings encountered moist to wet waste with less decomposition than expected given the age of the waste. However, during the excavation of Cell 4E (which took place in 2018), the saturation of the waste was minimal, and the waste was very decomposed. For planning purposes, the waste is anticipated to be wet or saturated, and it is expected that released liquids may also have an odor. Based on the age of the waste, the landfill gas generation rate is expected to be variable. However, the waste is in a closed portion of the landfill under anaerobic conditions and therefore has the potential to be odorous when excavated and exposed to the atmosphere.

It is expected that odors will be most noticeable the more frequently the waste is handled or turned over during the relocation process. For that reason, waste handling will be kept to a minimum.

Given the mixed information gathered from exploratory efforts and field experience, AHL is planning to implement a program of odor monitoring and mitigation, as described below, that will be able to deal with the actual conditions encountered during the work.

3.2 Minimization of Open Waste Areas

During waste relocation, the open face of the work areas will be minimized as much as practical. Daily cover will only be removed from an area sized to accommodate the day's work, and whenever practical, daily cover stripping will only occur immediately ahead of the excavation or filling activities. The balance of the areas will remain covered to control odors and prevent stormwater infiltration into the waste. Should an area be identified by the Contractor, CQA, or AHL personnel to be generating odors of concern upon stripping of the daily cover, the Contractor will deploy odor mitigating measures.

Upon excavation, waste will be directly loaded into haul trucks for deposition into AHW. No waste will be stockpiled either at the excavation area or the relocation disposal area.

At the end of each operating day, or earlier if directed by CQA or AHL personnel, daily cover will be placed on any exposed waste in both the excavation and fill work areas. The daily cover applied will be monitored by CQA personnel and AHL management to ensure compliance with Arbor Hills Landfill requirements.

3.3 Liquid Management

During excavation, controls will be implemented to collect liquids within the work area and transfer them to temporary storage tanks or directly to the leachate collection system. As noted in Section 2, excavation activities will generally move west to east as each lift of waste is removed. At the beginning of each lift a temporary sump will be located at the west end of the cell to remove liquids encountered during the lift removal. This will allow liquid removal capability to be established at the start of waste excavation and be continually maintained throughout the waste relocation effort. It will also keep any leachate handling activities as far as practical from residents east of the landfill. Liquid control includes the creation of temporary collection sumps with pumps and hoses to remove collected leachate from the excavation areas and discharge it into the existing leachate collection/forcemain system or temporarily store it in frac tanks (if necessary) and pump it directly into tanker trucks to be hauled to a disposal location. The liquid disposal provisions and pumps will be available prior to work commencing so that they are available for liquid management on day one.

Stormwater management will be installed before commencement of the waste relocation. Surface runoff will be directed away from the excavation and fill areas to minimize leachate generation. Liquid that comes in contact with the waste will be collected and disposed as leachate. Stormwater management will include diversion berms and silt fence as shown on the attached Sheet 2.

3.4 Maintaining the Gas Collection Control System

Both AHE and AHW currently have operating landfill gas extraction systems. During the excavation and relocation of the AHE waste AHL will perform the wellhead inspection and repair process outlined in the final approved Consent Judgement. Temporary "jumper" connections will be installed as needed to maintain service to the landfill gas wells in affected areas until they are no longer needed or are replaced with more permanent gas management infrastructure. Gas management infrastructure will be operated in compliance with regulatory requirements until it is no longer functional. AHL management will determine the best course of action on a case-by-case basis to maintain gas collection for effective odor control. Much of the anticipated gas construction associated with this project was completed during the Phase 1 2020 GCCS construction project. During the Phase 1 2020 GCCS construction, existing gas wells that were located in the excavation area were abandoned. Existing gas wells that were located in the over-liner area were connected to remote wellheads so that gas collection can be maintained for the longest time possible given the disruptive nature of the cell construction activities. Information and well identification regarding the wells that were abandoned and the wells that were converted to remote collectors can be found in the June 29, 2020 letter submitted to EGLE which is included as an attachment to this plan. However, if additional landfill gas construction efforts are needed, they will be completed during excavation.

In the active waste relocation fill area existing gas collection system infrastructure will be extended or reconstructed as needed.

During cell construction nearby gas probes will be monitored weekly. For Cells 6A/4F and 6B this will involve probes 13 and 28R2, both of which have been read weekly throughout 2021. For Cell 6C this will involve probes 11 and 12R. All gas probes are located such that they are not expected to impacted by construction activities, however if damage does occur any affected probe will be replaced.

3.5 Odor Neutralization

Fixed vapor phase odor neutralization systems (ONS) will be installed along the east side of the waste relocation excavation and filling areas prior to the start of waste relocation activities. In addition, mobile ONS will be placed and operated as needed at the waste excavation and filling areas. The main mobile ONS will be a trailer-mounted spray-on system. Portable 275-gallon misting totes will also be available and will be used to supplement the trailer mounted system as needed. AHL has found the use of a portable ONS to be the most effective approach to targeting specific areas of exposed waste during gas well drilling and trenching at the landfill and is confident it will be the most effective approach to directly deal with odors during the waste relocation process. However, given the temperature conditions that may be encountered during some of the waste relocation process AHL has determined that the addition of the vapor phase system, which is less affected by cold temperatures, is a prudent approach.

During all times that waste excavation and placement activities are being conducted the vapor phase system and mobile devices will be located nearby and will be ready to be activated when necessary. In general, the vapor phase and mobile ONS will be staged east of the working areas in anticipation of prevailing winds from the west. However, the staging location may be adjusted, if necessary, based on weather forecast information. The need for implementation of the temporary ONS will be determined by either AHL or CQA personnel based on the results of monitoring activities described in Section 3.6. Either AHL or CQA personnel will be empowered to direct the Contractor to activate the ONS at any time. The duration of the ONS use will be determined by AHL or CQA personnel – if odor impacts are no longer present, the system will be shut off.

3.6 Monitoring Activities

Arbor Hills Landfill promotes a "Smell It- Tell It" program at the site that encourages all employees to immediately report to their supervisor any unusual odors that they encounter at the landfill. The idea is to benefit from a team effort to identify and then quickly follow up on any emerging odor issues before they become significant. This program will be expanded to all CQA and Contractor employees during waste relocation. This collective effort is

expected to identify opportunities to potentially make useful adjustments during construction to minimize odor impacts both on and off site.

During recent years AHL has engaged a third-party company to conduct odor monitoring at consistent locations around the perimeter of the landfill and in the nearby community. The individuals conducting this monitoring are trained in odor identification and use a Scentometer and a Jerome meter to perform measurements at any location where odors are detected. Results are reported to AHL management the same day. This odor monitoring program will continue during waste relocation with the frequency being adjusted during the project to reflect the frequency and intensity of impacts being encountered during the monitoring process.

Odor complaints from the public are evaluated when received to understand the nature of impacts being experienced by landfill neighbors. Complaints are logged and follow up takes place to identify odor sources whenever possible and quickly remediate them. During this process the status of the waste relocation activities and other relevant conditions present at the time of the odor complaint will be considered to judge if it is necessary to adjust ongoing activities.

Perimeter air monitoring focused on detecting H2S and CH4 will be in place along the east side of Cell 6/4F during waste relocation efforts. In addition, an onsite meteorological station with 2-meter and 10-meter instrumentation will also be in place. The readings from the H2S and CH4 detection devices combined with the real time local meteorological information will be used to identify adjustments to waste relocation activities that may be useful in mitigating off site impacts of these constituents. During waste relocation activities if either the "Perimeter H2S Action Level" or "Perimeter Methane Action Level" (as defined in the final approved Consent Judgment) is exceeded, excavation will cease and cover will be placed until all exceedance(s) are corrected. If ceasing excavation and placing cover do not correct the exceedance(s), then AHL shall conduct a root cause analysis of the exceedance(s) and implement additional corrective actions, as necessary, to correct the exceedance(s) and prevent the exceedance(s) from recurring, which may include:

1. Placing additional cover materials;
2. Repairing Gas Collection Wells; and
3. Adjusting Gas Collection Wells, including increasing the vacuum.

Within 48 hours after detection of an exceedance by a monitoring station, AHL shall correct the exceedance(s) and meet the Perimeter H_2S Action Level and the Perimeter Methane Action Level. If AHL believes that it cannot correct the exceedance(s) within 48 hours after detection, then AHL may submit a request for an extension to EGLE pursuant to Subparagraph 16.4 of the final approved Consent Judgment. If EGLE denies the request for

an extension, then AHL may submit the matter for dispute resolution pursuant to Section XII (Dispute Resolution) of the final approved Consent Judgment.

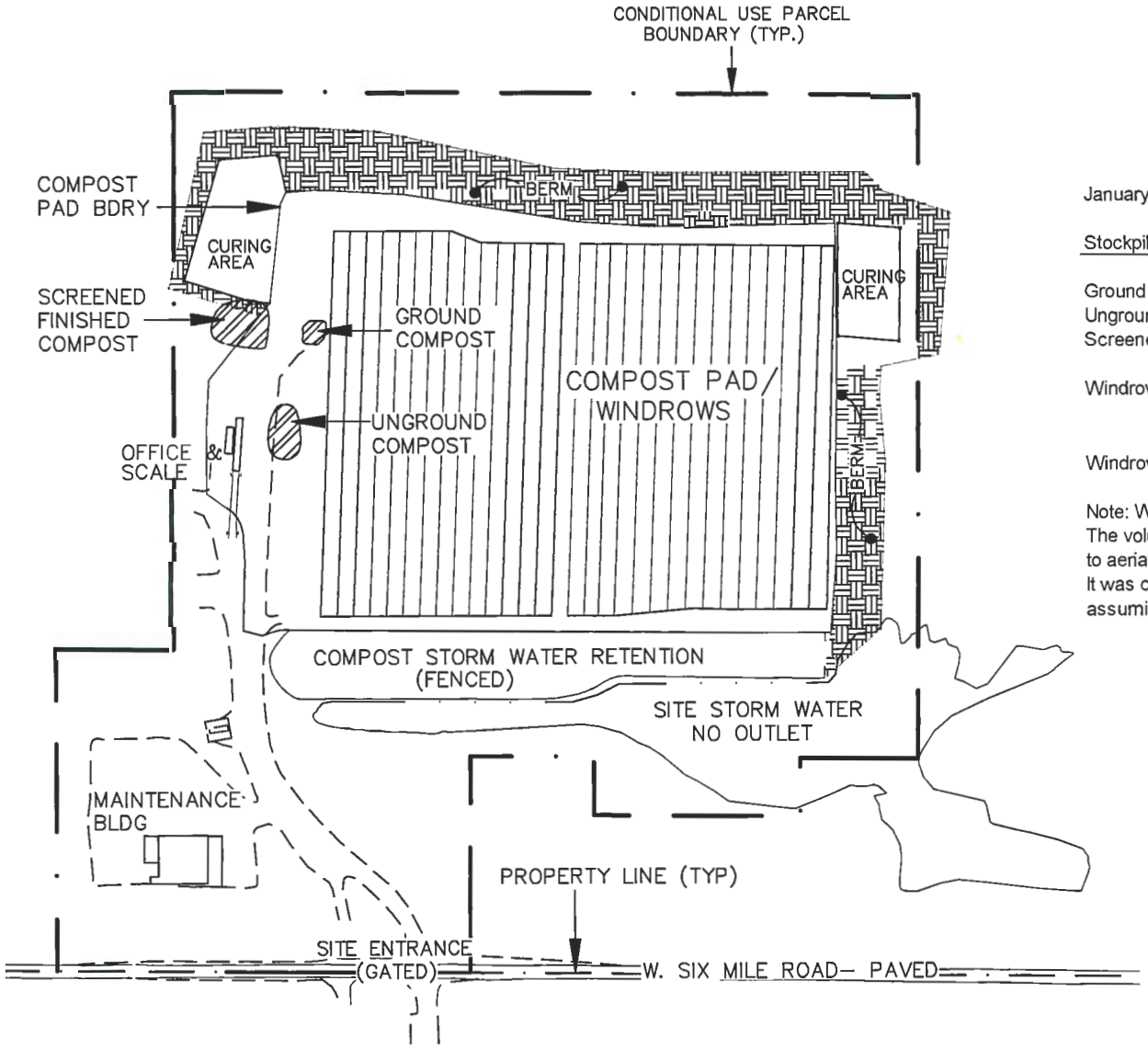
Drone SEMs performed during waste relocation activities will be conducted in accordance with the procedures outlined in the final approved Consent Judgement. Areas actively a part of the waste relocation process will be treated as "Working Face".

Based on these various monitoring program components, AHL management and CQA personnel will direct the Contractor as necessary to perform waste relocation activities or apply mitigation techniques in a manner that will minimize potential off-site impacts as much as practical.

APPENDIX I

Site Map for Composting Facility

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE



SCALE: 1" = 300'

0 300

January 2020 Volumes:

Stockpile	Quantity	Height (ft)	Area (Avg) (sf)	Volume cy	Method Calculated
Ground Compost	1	4		100	computer generated
Unground Compost	1	8		521	computer generated
Screened Compost	1	14.5		1,100	computer generated
		Length			
Windrows	28	640	35	23,230	V = A (cross sectional) x L
				24,951	

Windrow Cross Sectional Area: bottom width 24ft; top width 4ft: 1/2 (24ft+4ft) * 2.5ft high

Note: Windrow volume was calculated using computer generation.
The volume calculated was 15,000cy when comparing base compost grades to aerial contour elevations.
It was chosen to report the conservative number listed by basic trapezoidal formula above, assuming all rows are of uniform height and width.

MIDWESTERN CONSULTING

2020\COMPOST–LICENSE 2020.dwg

ADVANCED ARBOR HILLS COMPOST FACILITY

OVERALL SITE MAP

SALEM TOWNSHIP, WASHTENAW COUNTY, MICHIGAN

Advanced Disposal

APPENDIX J

AHL submittal dated June 11, 2021 addressing methane detection exceedances east of Napier Road

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE

June 11, 2021

Mr. Brett W. Coulter, CPG
District Geologist
Materials Management Division/Jackson District Office
Michigan Department of Environment, Great Lakes, and Energy
301 East Louis Glick Highway
Jackson, Michigan 49201-1556

Re: Proposed Supplemental Methane Collector Well Installation
GFL Arbor Hills East Landfill [1]

Dear Mr. Coulter:

GFL Environmental, Inc. (GFL) proposes to install eight supplemental methane collector wells along the east side of the Arbor Hills East Landfill to address stray methane at GMW15R2 as described below.

March 2021 Subsurface Exploration and Methane Detections

EIL performed a subsurface investigation along the east side of the Arbor Hills East Landfill in March 2021 to identify stray methane and soil textures within the Upper Till. Exploration borings PWEX01 - PWEX07 and PWEX09 – PWEX12 were completed at the locations shown on Drawing 1 between March 15 and 18, 2021.

Cabeno Environmental Field Services, LLC advanced the borings and sampled soils continuously under the direction of an EIL engineering geologist. The borings were drilled and sampled using a Geoprobe Model 7822 track-mounted rig and 2.25" MC5 Macro-Core tooling. The soil samples were retrieved in 5-foot long, clear plastic barrels. The soil samples were classified in accordance with the Unified Soil Classification System and their density, color, texture, and moisture content were described using objective terminology. The sequence of penetrated units was recorded on the boring logs provided in Attachment 1. EIL monitored the top of the drill rods for subsurface methane using a Gem2000 calibrated to 15% methane. Methane concentrations detected at the exploration borings are shown on the geologic logs and Table 1. Weaver Consultants Group surveyed the horizontal coordinates and ground surface elevations of the borings following their completion.

Methane Collector Well Design and Installation

GFL proposes to install supplemental collector wells PWT01 – PWT08 at the locations shown on Drawing 1 to intercept methane detected at the exploration borings. The position of non-cohesive soils identified at the exploration borings and the screen intervals for the collector wells are shown on Drawing 2.

The borings for the wells will be drilled using sonic methods. The upper 8-feet of each boring will be drilled to a 10-inch diameter; the borings will be drilled to a 6-inch diameter below that point.

The collector wells will be constructed with 2-inch inner and 3.5-inch outer diameter screens, pre-packed with 40/60 gradation filter sand, as shown on Drawing 3. The screens will extend from the completion depth of each boring to 15-feet below ground surface. Solid 2-inch diameter pipe will extend from the top of the screen to 5-feet below ground surface. The collectors will be finished with solid 6-inch diameter pipe to above ground surface.

Silica sand with a 10/20 gradation will be placed around the outside of the pre-packed well screens to 14.5-feet below ground surface. The annular space above the filter pack will be sealed with 3/8-inch bentonite chips, placed and hydrated in 2-foot lifts. Each well will be equipped with a 2-inch diameter, compressed air-actuated pump to collect groundwater. Vacuum from the existing landfill gas header pipe that runs parallel to the alignment of the wells will be connected to each well. Groundwater collected from the wells will discharge to the above-grade forcemain. Condensate will be discharged with collected methane to the vacuum header.

Pipe connections between the new wells and the vacuum header, air supply line, and liquid forcemain will be constructed and documented in accordance with the approved construction quality assurance plan.

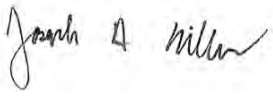
Schedule

Installation of the eight new supplemental methane collectors is scheduled to begin in early July 2021. Installing the wells, placing the pumps, and completing the vacuum, groundwater discharge, and air supply connections to the wells is expected to require about one month.

Closing

GFL is committed to addressing stray methane at the Arbor Hills East Landfill and complying with its permits to operate the site to protect public health and welfare. Please contact the undersigned at 630.750.6556 should you have questions regarding this plan to intercept stray methane.

Sincerely,
Environmental Information Logistics



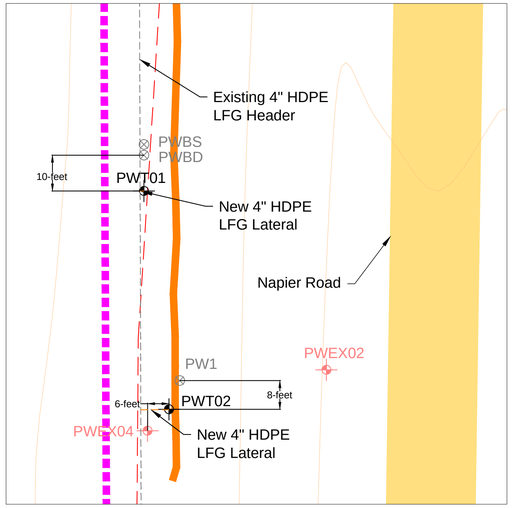
Joseph D. Miller
Project Manager

Attachments

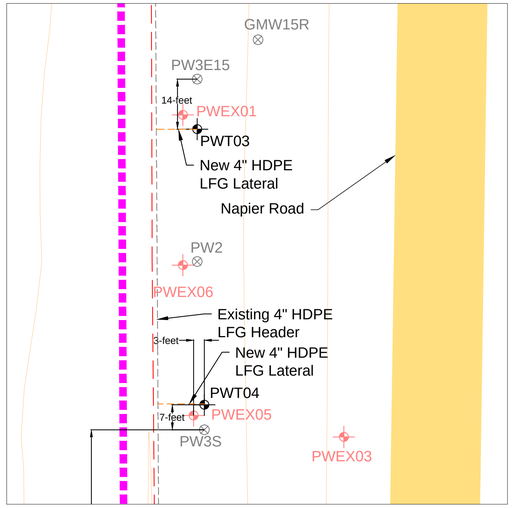
cc: Mr. Lawrence Bean - Michigan Department of Environment, Great Lakes, and Energy
Mr. Anthony Testa – GFL Arbor Hills Landfill
Mr. Randy Frank, P.E. – GFL Environmental, Inc.

Table 1
Maximum Concentration Detected Methane
March 2021 Exploration Borings

Boring	Maximum Detected Methane Concentration
PWEX01	0.5%
PWEX02	0.5%
PWEX03	60.0%
PWEX04	3.5%
PWEX05	12.0%
PWEX06	0.1%
PWEX07	65.0%
PWEX09	65.0%
PWEX10	33.0%
PWEX11	38.0%
PWEX12	0.0%



1-Inch = 20-Feet



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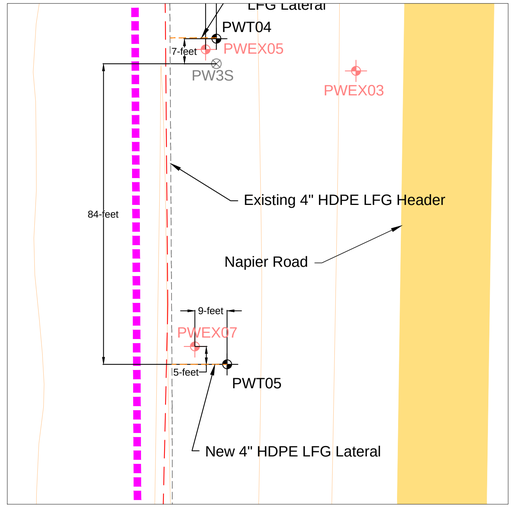

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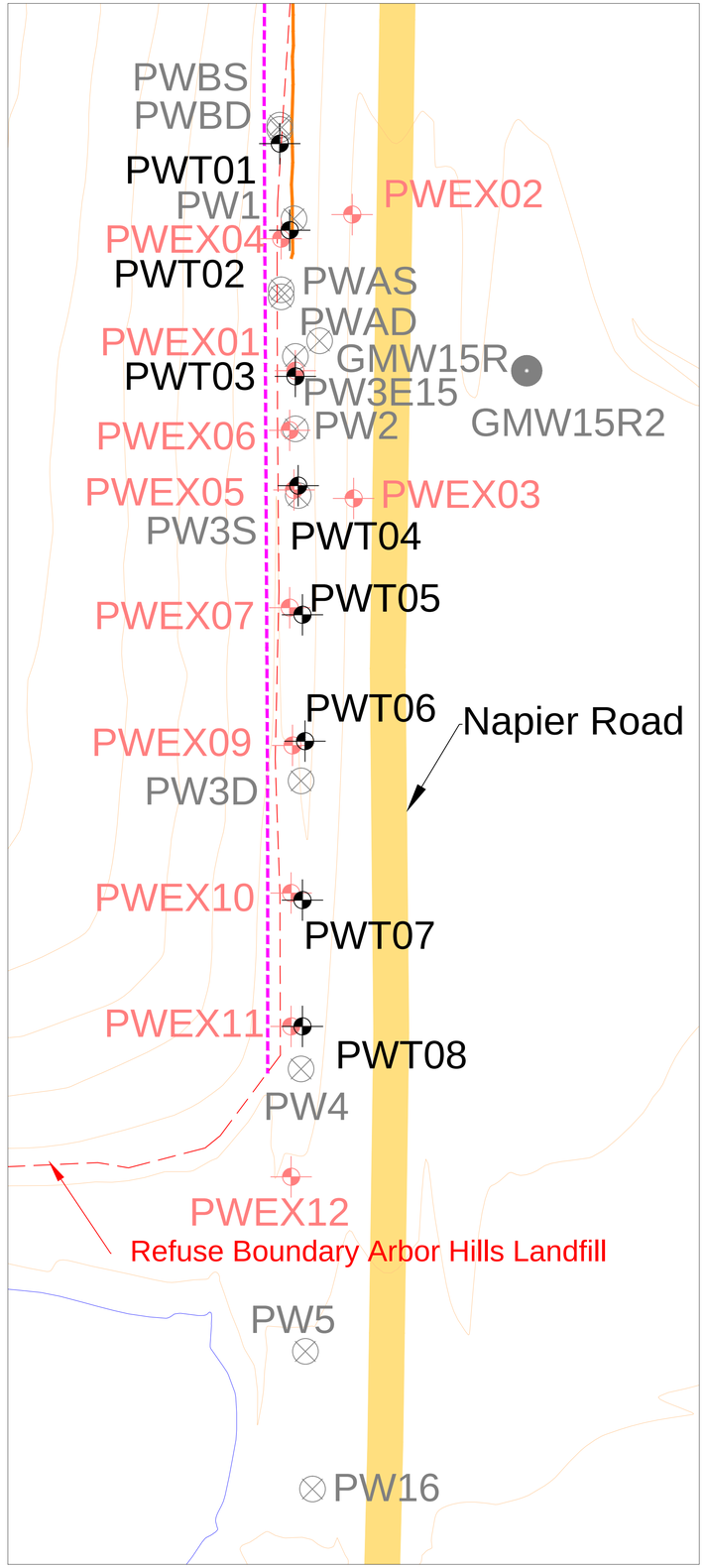
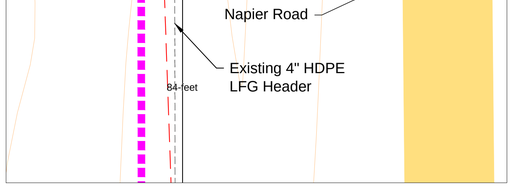
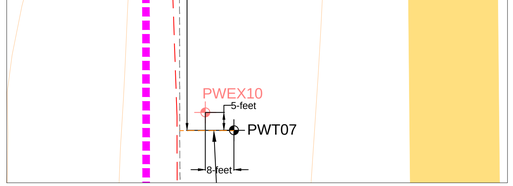


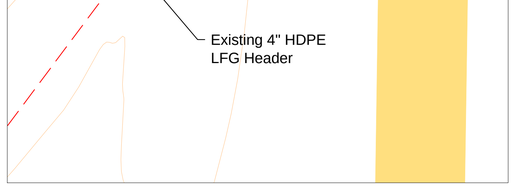
1-Inch = 50-Feet



1-Inch = 20-Feet



1-Inch = 20-Feet



1-Inch = 20-Feet

Legend:

- Property Boundary
- Waste Boundary
- Existing 4" LFG Header
- New 4" LFG Lateral
- Slurry Wall
- Groundwater Gradient Control Trench
- PW3E15 — Existing Perimeter Landfill Gas Collection Well
- GMW15R2 — Existing Perimter Methane Monitoring Probe
- PWEX07 — Existing Soil Boring for Stratigraphic Control March 2021
- PWT05 — Proposed Groundwater/Methane Collector Well

DRN	JDM	JDM			2021-06-07
DES					
CHK					
APP					
INITIAL					DATE

REVISIONS

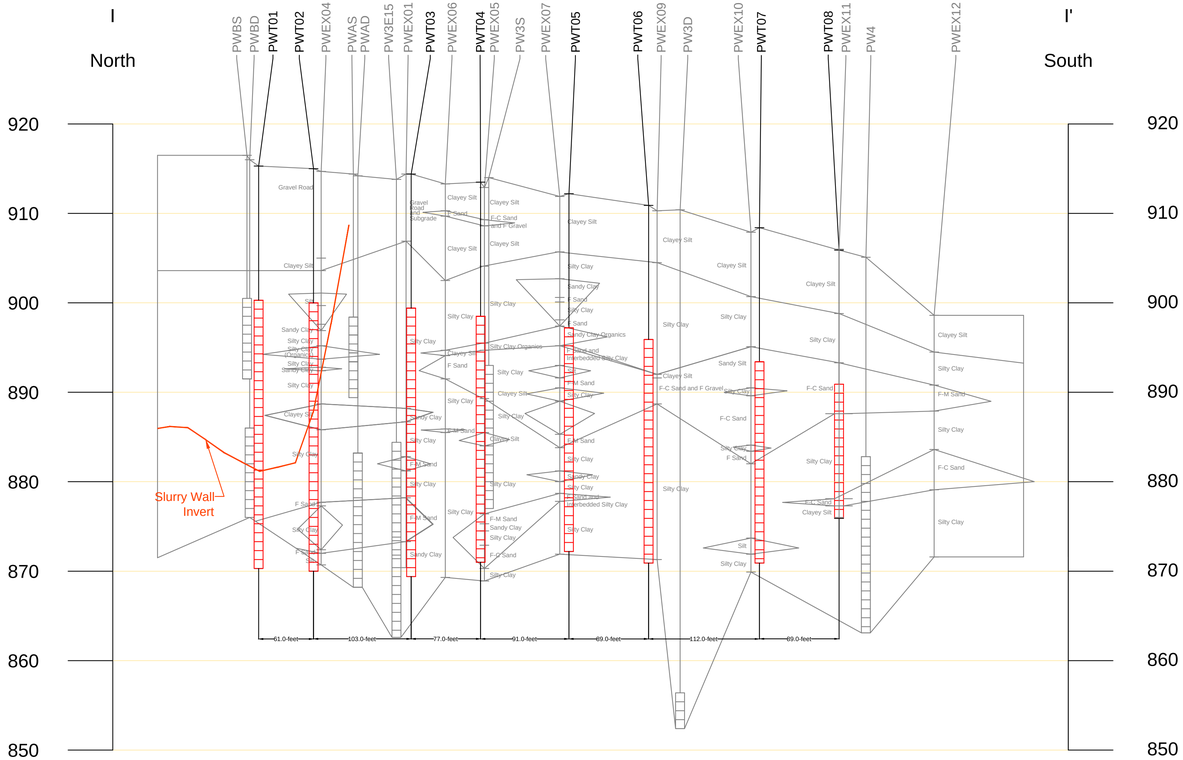
PREPARED FOR

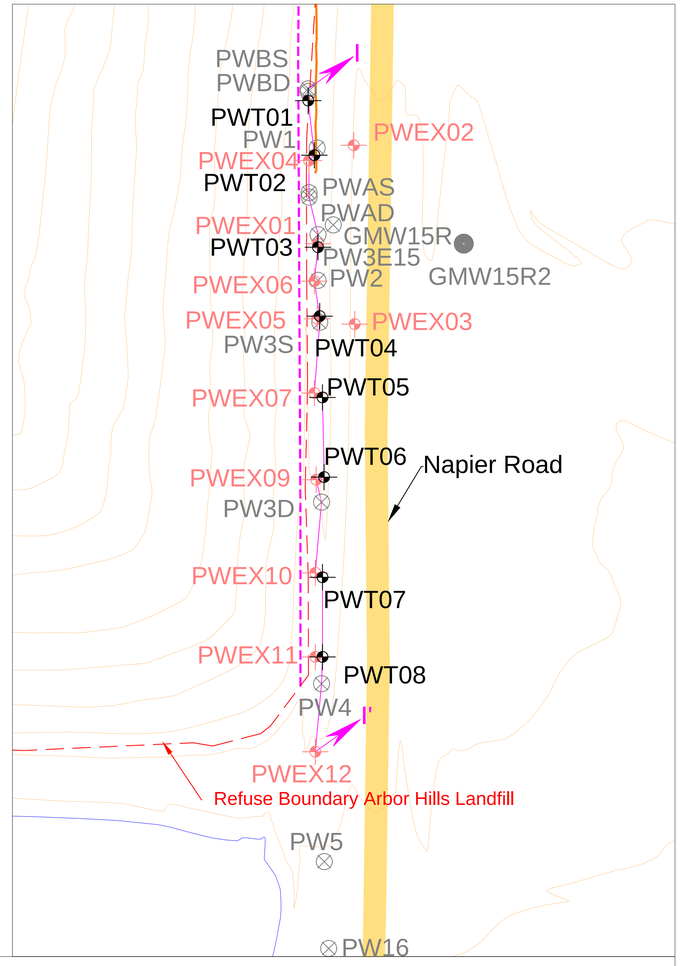
PREPARED BY

GFL Environmental
Arbor Hills Landfill
Northfield, Michigan

Replacement
Perimeter Groundwater and Methane
Collector Design

DATE	2021-06-07
PROJECT NO	200402
FILENAME	Base Map
LAYERSTATE	Design 00 MS
DRAWING NO	1





Legend:

- PWT03 — Proposed Replacement Perimeter Landfill Gas Collection Well
- PWEX03 — Replacement Perimeter Landfill Gas Collection Well Test Boring (March 2021)
- PW3E15 — Existing Perimeter Landfill Gas Collection Well
- GMW14R — Decommissioned Perimeter Methane Monitoring Probe
- GMW15R2 — Existing Perimter Methane Monitoring Probe
- Existing Perimeter Collector Well Screen
- Proposed Perimeter Collector Well Screen
- Projected Key Elevation Slurry Wall
- Property Boundary
- Groundwater Gradient Control Trench
- Slurry Wall

Notes:
1.) The geometry of geologic and manmade materials shown on the cross section has been interpreted based on the soil boring logs and landfill construction records.
2.) The cross sections include interpretations of soil conditions based on previously drilled borings. In these cases, the interpreted soil conditions are based on the logged USCS classification and material descriptions.
3.) The soil descriptions shown on the cross sections consist of the major component. The boring logs provide complete soil descriptions.
4.) The cross sections have been prepared based on the sequence of penetrated materials identified at the deepest completed soil boring for each location.
5.) The vertical positions of geologic materials are based on ground surface elevations shown on the boring logs.
6.) Topographic base map based on aerial photography performed April 2020.
7.) Indicated dimensions between new groundwater/methane collector wells are in the north-south direction.
8.) Indicated methane concentrations measured in headspaces of March 2021 test borings.

Methane/Groundwater Collector Well Construction Details

Collector Well Designation	Northing (ft)	Easting (ft)	Elevation Ground Surface (ft msl)	Borehole Depth (ft)	Screen Length (ft)	Filter Pack Length (ft)	Chipped Bentonite Seal Length (ft)	Number of 10-Long Screens	Number 5-Foot Long Screens	Number of 2.5-Foot Long Screens
PWT01	3,881	5,180	915.3	45.0	30.0	30.0	14.5	3.0		
PWT02	3,820	5,187	915.0	45.0	30.0	30.0	14.5	3.0		
PWT03	3,717	5,191	914.4	45.0	30.0	30.0	14.5	3.0		
PWT04	3,640	5,193	913.5	42.5	27.5	27.5	14.5	2.0	1.0	1.0
PWT05	3,549	5,196	912.2	40.0	25.0	25.0	14.5	2.0	1.0	
PWT06	3,460	5,198	910.9	40.0	25.0	25.0	14.5	2.0	1.0	
PWT07	3,348	5,196	908.4	37.5	22.5	22.5	14.5	2.0		1.0
PWT08	3,259	5,196	905.9	30.0	15.0	15.0	14.5	1.0	1.0	
				325.0	205.0	205.0	116.0	18	4	2

0 40 80 120 160
Horizontal Scale: 1" = 80'
Vertical Scale: 1" = 8'
Cross Sections

0 40 80 120 160
Horizontal Scale: 1" = 80'
Cross Section Location Map

DATE	BY	CHK	REVISIONS
2021-06-07	JDM	CHK	
	JDM	DRN	

DRN	JDM	2021-06-07
DES		
CHK		
APP		
INITIAL		DATE

PREPARED FOR: GFL

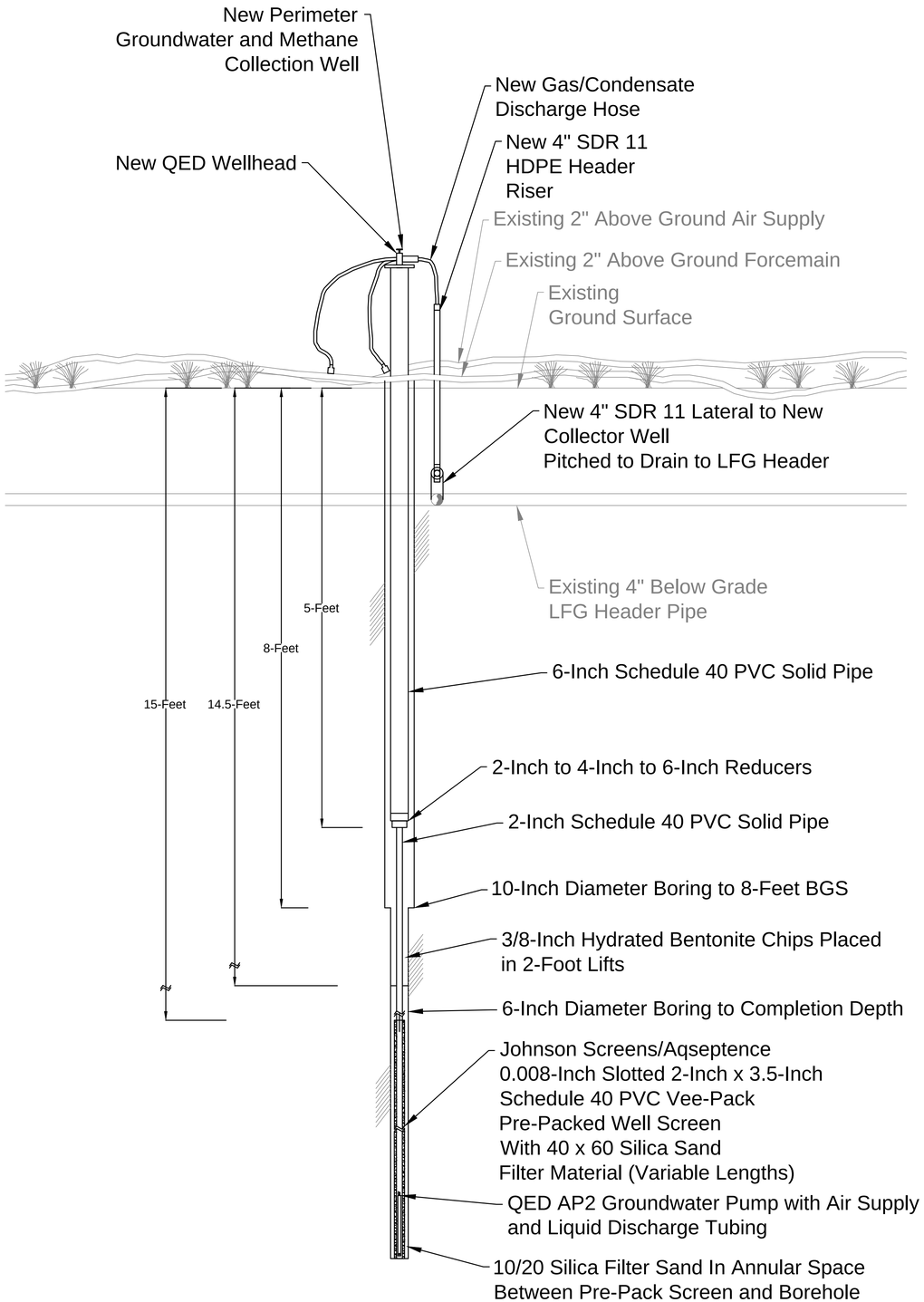
PREPARED BY: Environmental Information Logistics, LLC

GFL Environmental
Arbor Hills Landfill
Northfield, Michigan

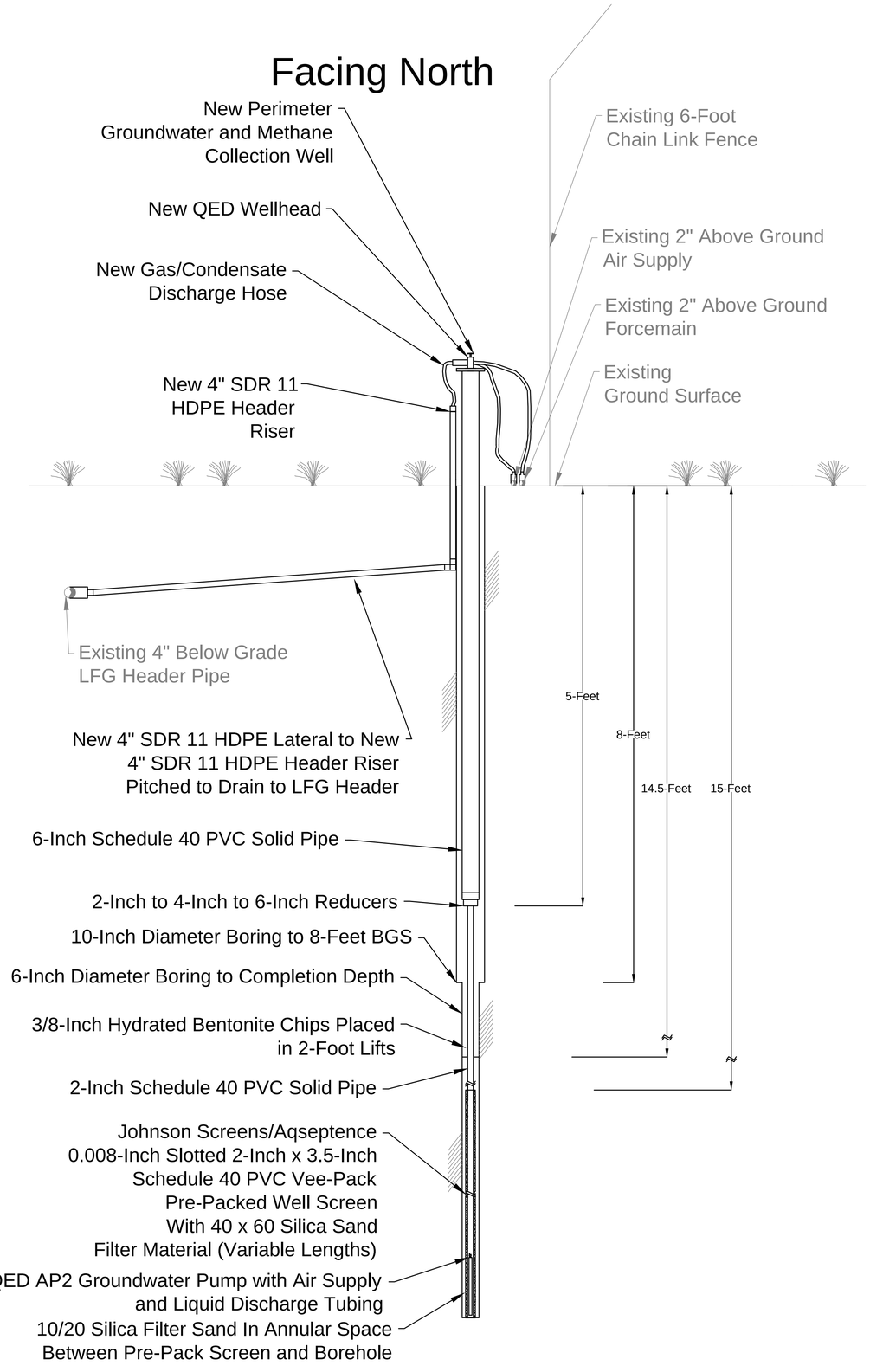
Replacement Perimeter Groundwater and Methane Collector Cross Section

DATE	2021-06-07
PROJECT NO	200402
FILENAME	Base Map
LAYERSTATE	Design 00 MS
DRAWING NO	2

Facing East



Facing North



DRN	JDM				
DES	JDM				
CHK	JDM				
APP	JDM				
INITIAL	DRN				
DATE	CHK				
	DATE	2021-06-07	2021-06-07	2021-06-07	

REVISIONS

PREPARED FOR: GFL

PREPARED BY: EIL Environmental Information Logistics

GFL Environmental
Arbor Hills Landfill
Northfield, Michigan

Replacement
Perimeter Groundwater and Methane
Collector Design

DATE	2021-06-07
PROJECT NO	200402
FILENAME	Base Map
LAYERSTATE	Design 00 MS
DRAWING NO	3

Attachment 1

March 2021 Borings Logs
PWT01
PWT02
PWT03
PWT04
PWT05
PWT06
PWT07
PWT09
PWT10
PWT11
PWT12

DEPTH HOLE	44.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX01		
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	1	OF	3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core				
SURFACE ELEV.	914.4' MSL 3,721 N 5,191 E	STARTED	2021-03-16 11:00	COMPLETED	2021-03-16 12:20		

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
1	(0.0' - 7.5') Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, some f sand and f gravel, dry, (ML)							Hand auger to 2.2-feet, gravel road subgrade 2.2' - 5.0' Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, some f sand and f gravel, dry, (ML)
2								
3			1	MC	NA	2.8' / 2.8'	NA	
4								
5								5.6' - 7.5' Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, some f sand and f gravel, dry, (ML)
6								
7								
8	(7.5' - 26.2') Stiff, dark yellowish brown (10YR 4/2) and moderate yellowish brown (10YR 5/4) and light olive gray (5Y 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)		2	MC	NA	4.4' / 5.0'	NA	7.5' - 10.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
9								
10								
11								
12								
13			3	MC	NA	1.9' / 5.0'	NA	13.1' - 15.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL) Rock Wedged in Sampler
14								

DEPTH HOLE	44.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX01
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	2 OF 3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	914.4' MSL 3,721 N 5,191 E	STARTED	2021-03-16 11:00	COMPLETED	2021-03-16 12:20

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
16	(7.5' - 26.2') Stiff, dark yellowish brown (10YR 4/2) and moderate yellowish brown (10YR 5/4) and light olive gray (5Y 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)		4	MC	NA	2.5'/5.0'	NA	17.5' - 20.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL) Sampler Shredded
17								
18								
19								
20								
21			5	MC	NA	1.9'/5.0'	NA	23.1' - 24.4' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL) 24.4' - 25.0' Stiff, moderate yellowish brown (10YR 5/4) to light olive gray (5Y 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)
22								
23								
24								
25								
26			6	MC	NA	4.2'/5.0'	NA	25.8' - 26.2' Stiff, moderate yellowish brown (10YR 5/4) and light olive gray (5Y 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL) 26.2' - 27.7' Stiff, moderate yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/2), SANDY CLAY, trace f gravel, moist, (CL) 27.7' - 30.0' Very stiff, moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)
27	(26.2' - 27.7') Stiff, moderate yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/2), SANDY CLAY, trace f gravel, moist, (CL)							
28	(27.7' - 31.6') Very stiff, moderate yellowish brown (10YR 5/4) and dusky brown (5YR 2/2), SILTY CLAY, trace to little f sand and f gravel, moist to wet, (CL)							
29								

DEPTH HOLE	44.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX01
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	3 OF 3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	914.4' MSL 3,721 N 5,191 E	STARTED	2021-03-16 11:00	COMPLETED	2021-03-16 12:20

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
31	(27.7' - 31.6') Very stiff, moderate yellowish brown (10YR 5/4) and dusky brown (5YR 2/2), SILTY CLAY, trace to little f sand and f gravel, moist to wet, (CL)							30.0' - 30.7' Very stiff, moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL) 30.7' - 31.6' Firm, moderate yellowish brown (10YR 5/4) and dusky brown (5YR 2/2), SILTY CLAY, little f sand, trace f gravel, wet, (CL)
32	(31.6' - 33.2') Compact, moderate yellowish brown (10YR 5/4), F-M SAND, trace silt, wet, (SP)		7	MC	NA	5.0'/5.0'	NA	31.6' - 33.2' Compact, moderate yellowish brown (10YR 5/4), F-M SAND, trace silt, wet, (SP)
33								33.2' - 35.0' Very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
34	(33.2' - 36.2') Very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)							
35								35.4' - 36.2' Very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
36								36.2' - 40.0' Compact, moderate yellowish brown (10 YR 5/4), F-M SAND, trace clay and silt, clay interbeds, wet, (SP)
37	(36.2' - 41.1') Compact, moderate yellowish brown (10YR 5/4), F-M SAND, trace clay and silt, clay interbeds, wet, (SP)		8	MC	NA	4.6'/5.0'	NA	
38								
39								
40								
41								
42	(41.1' - 44.0') Firm, dark yellowish brown (10YR 4/2), SANDY CLAY, trace silt and f gravel, f sand interbeds, moist, (CL)		9	MC	NA	3.9'/4.0'	NA	41.1' - 43.4' Firm, dark yellowish brown (10YR 4/2), SANDY CLAY, trace silt and f gravel, moist, (CL) 43.4' - 44.0' Firm, dark yellowish brown (10YR 4/2), SANDY CLAY, trace silt and f gravel, f sand interbeds, moist, (CL)
43								
44		0.5%						2021-03-16 12:20 CH4 = 0.5% On Completion Of Boring.
	End of Borehole at 44.0'							

DEPTH HOLE	30.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX02
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	1 OF 2
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	898.8' MSL 3,831 N 5,231 E	STARTED	2021-03-15 15:35	COMPLETED	2021-03-15 16:10

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
1	(0.0' - 1.8') Firm, dark yellowish brown (10YR 4/2), SANDY CLAY, little silt, organics, moist, (CL)							1.0' - 1.8' Firm, dark yellowish brown (10 YR 4/2), SANDY CLAY, little silt, organics, moist, (CL)
2	(1.8' - 3.9') Stiff, dark yellowish brown (10YR 4/2) and brownish black (5YR 2/1), SILTY CLAY, trace f gravel, organics, moist, (CL)		1	MC	NA	4.0' / 5.0'	NA	1.8' - 3.9' Stiff, dark yellowish brown (10 YR 4/2) and brownish black (5YR 2/1), SILTY CLAY, trace f gravel, moist, (CL)
3								
4	(3.9' - 5.0') Stiff, dusky brown (5YR 2/2), CLAY, trace silt and f sand, moist, (CL)							3.9' - 5.0' Stiff, dusky brown (5YR 2/2), CLAY, trace silt and f sand, moist, (CL)
5	(5.0' - 8.1') Stiff, dark greenish gray (5GY 4/1), CLAY, trace silt and f sand, moist, (CL)		2	MC	NA	5.0' / 5.0'	NA	5.0' - 8.1' Stiff, dark greenish gray (5GY 4/1), CLAY, trace silt and f sand, moist, (CL)
6								8.1' - 10.0' Stiff, mderate yellowish brown (10 YR 5/4) and light olive gray (5Y 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)
7								
8	(8.1' - 12.3') Stiff, moderate yellowish brown (10YR 5/4) and light olive gray (5Y 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)							
9								
10								11.2' - 12.3' Stiff, mderate yellowish brown (10 YR 5/4) and light olive gray (5Y 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)
11								12.3' - 15.0' Very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, little f gravel, moist, (CL)
12								
13	(12.3' - 16.4') Very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, little f gravel, moist, (CL)		3	MC	NA	3.8' / 5.0'	NA	
14								

DEPTH HOLE	30.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX02	
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	2	OF 2
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core			
SURFACE ELEV.	898.8' MSL 3,831 N 5,231 E	STARTED	2021-03-15 15:35	COMPLETED	2021-03-15 16:10	

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
16	(12.3' - 16.4') Very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, little f gravel, moist, (CL)		4	MC	NA	4.3' / 5.0'	NA	15.7' - 16.4' Very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, little f gravel, moist, (CL)
17	(16.4' - 17.7') Loose, dark yellowish brown (10YR 4/2), F-M SAND, little clay, wet, (SP)							16.4' - 17.7' Loose, dark yellowish brown (10YR 4/2), F-M SAND, little clay, wet, (SP)
18	(17.7' - 19.8') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f gravel, moist, (CL)							17.7' - 19.8' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f gravel, moist, (CL)
19								19.8' - 20.0' Dense, olive gray (5Y 4/1), F-C SAND, little f gravel, moist, (SP)
20	(19.8' - 22.4') Dense, olive gray (5Y 4/1), F-C SAND, little f gravel, moist to wet, (SP)		5	MC	NA	3.4' / 5.0'	NA	21.6' - 22.4' Dense, olive gray (5Y 4/1), F-C SAND, little f gravel, wet, (SP)
21								22.4' - 23.6' Dense, olive gray (5Y 4/1), F-C SAND and F GRAVEL, trace silt, wet, (SP/GP)
22								23.6' - 24.6' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f gravel, moist, (CL)
23	(22.4' - 23.6') Dense, olive gray (5Y 4/1), F-C SAND and F GRAVEL, trace silt, wet, (SP/GP)							24.6' - 25.0' Compact, pale yellowish brown (10YR 6/2), F SAND, laminated, moist, (SW)
24	(23.6' - 24.6') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f gravel, moist, (CL)							
25	(24.6' - 26.9') Compact, pale yellowish brown (10YR 6/2), F SAND, laminated, moist, (SW)		6	MC	NA	3.1' / 5.0'	NA	26.9' - 28.5' Compact, dark yellowish brown (10YR 4/2), F-C SAND and F GRAVEL, trace clay and silt, wet, (SP/GP)
26								28.5' - 30.0' Dense and Stiff, dark yellowish brown (10YR 4/2), F SAND and SILTY CLAY, trace f gravel, interbedded, moist-wet, (SP/CL)
27								
28	(26.9' - 28.5') Compact, dark yellowish brown (10YR 4/2), F-C SAND and F GRAVEL, trace clay and silt, wet, (SP/GP)							
29	(28.5' - 30.0') Dense and stiff, dark yellowish brown (10YR 4/2), F SAND and SILTY CLAY, trace f gravel, interbedded, moist-wet, (SP/CL)							
	End of Borehole at 30.0'	0.5%						2021-03-15 16:10 CH4 = 0.5% On Completion Of Boring.

DEPTH HOLE	25.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX03		
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	1	OF	2
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core				
SURFACE ELEV.	897.4' MSL 3,631 N 5,232 E	STARTED	2021-03-15 16:25	COMPLETED	2021-03-15 17:30		

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
1	(0.0' - 5.8') Compact, moderate brown (5YR 3/4), SILT, some f sand, trace clay, moist, (ML)		1	MC	NA	0.5' / 5.0'	NA	4.5' - 5.0' Compact, moderate brown (5YR 3/4), SILT, some f sand, trace clay, moist, (ML)
2								
3								
4								
5								
6	(5.8' - 10.7') Stiff, moderate yellowish brown (10YR 5/4) and light olive gray (5Y 6/1), CLAYEY SILT, trace f gravel, moist, (CL)		2	MC	NA	4.2' / 5.0'	NA	5.8' - 9.1' Stiff, moderate yellowish brown (10YR 5/4) and light olive gray (5Y 6/1), CLAYEY SILT, trace f gravel, moist, (CL)
7								9.1' - 10.0' Stiff, moderate yellowish brown (10YR 5/4), CLAYEY SILT, trace f gravel, moist, (CL)
8								
9								
10								
11	(10.7' - 11.8') Stiff, moderate yellowish brown (10YR 5/4) and dusky brown (5YR 2/2), SILTY CLAY, trace f sand, moist, (CL)		3	MC	NA	4.3' / 5.0'	NA	10.7' - 11.8' Stiff, moderate yellowish brown (10YR 5/4) and dusky brown (5YR 2/2), SILTY CLAY, trace f sand, moist, (CL)
12	(11.8' - 13.4') Stiff, moderate yellowish brown (10YR 5/4), CLAYEY SILT, trace f gravel, moist, (ML)							11.8' - 13.4' Stiff, moderate yellowish brown (10YR 5/4), CLAYEY SILT, trace f gravel, moist, (ML)
13								13.4' - 15.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f gravel, (CL)
14	(13.4' - 18.2') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f gravel, moist, (CL)							

DEPTH HOLE	25.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX03
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	2 OF 2
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	897.4' MSL 3,631 N 5,232 E	STARTED	2021-03-15 16:25	COMPLETED	2021-03-15 17:30

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
16	(13.4' - 18.2') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f gravel, moist, (CL)		4	MC	NA	2.9' / 5.0'	NA	17.1' - 18.2' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f gravel, (CL)
17								18.2' - 19.0' Firm, moderate yellowish brown (10YR 5/4) and dusky brown (5YR 2/2), SANDY CLAY, trace f gravel, moist, (CL)
18								19.0' - 19.3' Dense, moderate yellowish brown (10YR 5/4), SILT, trace clay and f gravel, moist, (ML)
19	(18.2' - 19.0') Firm, moderate yellowish brown (10YR 5/4) and dusky brown (5YR 2/2), SANDY CLAY, trace f gravel, moist, (CL)							19.3' - 20.0' Dense, moderate yellowish brown (10YR 5/4), F-M SAND and SILT, interbedded, moist, (SM)
20	(19.0' - 19.3') Dense, moderate yellowish brown (10YR 5/4), SILT, trace clay and f gravel, moist, (ML)	60%						CH4 = 60%
21	(19.3' - 22.3') Dense, moderate yellowish brown (10YR 5/4), F-M SAND and SILT, interbedded, moist to wet, (SM)							20.9' - 22.3' Dense, moderate yellowish brown (10YR 5/4), F-M SAND and SILT, wet, (SM)
22								22.3' - 25.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f gravel, moist, (CL)
23	(22.3' - 25.0') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f gravel, moist, (CL)		5	MC	NA	4.1' / 5.0'	NA	
24								2021-03-15 17:30 CH4 = 60% On Completion Of Boring.
25		60%						
26	End of Borehole at 25.0'							
27								
28								
29								

DEPTH HOLE	44.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX04		
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	1	OF	3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core				
SURFACE ELEV.	914.7' MSL 3,814 N 5,181 E	STARTED	2021-03-16 09:20	COMPLETED	2021-03-16 10:20		

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
1	(0.0' - 9.7') Gravel Road and Subgrade		1	MC	NA	0.0' / 5.0'	NA	No Recovery - gravel road and subgrade; driller reported hard soil to 10-feet
2								
3								
4								
5								
6			2	MC	NA	0.3' / 5.0'	NA	
7								
8								
9								9.7' - 10.0' Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f gravel, moist, (ML)
10	(9.7' - 11.1') Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f gravel, moist, (ML)							
11								11.1' - 13.6' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
12	(11.1' - 13.6') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)		3	MC	NA	3.9' / 5.0'	NA	13.6' - 15.0' Dense, moderate yellowish brown (10YR 5/4), SILT, trace clay and f gravel, dry to moist, (ML)
13								
14	(13.6' - 15.0') Dense, moderate yellowish brown (10YR 5/4), SILT, trace clay and f gravel, dry to moist, (ML)							

DEPTH HOLE	44.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX04		
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	2	OF	3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core				
SURFACE ELEV.	914.7' MSL 3,814 N 5,181 E	STARTED	2021-03-16 09:20	COMPLETED	2021-03-16 10:20		

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
16	(15.0' - 17.1') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)							15.0' - 17.1' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
17	(17.1' - 17.8') Stiff, olive gray (5Y 4/1) and brownish black (5YR 2/1), SANDY CLAY, trace f gravel, moist to wet, (CL)		4	MC	NA	5.0' / 5.0'	NA	17.1' - 17.8' Stiff, olive gray (5Y 4/1) and brownish black (5YR 2/1), SANDY CLAY, trace f gravel, moist to wet, (CL)
18	(17.8' - 19.5') Stiff, moderate yellowish brown (10YR 5/4) and light olive gray (5Y 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)							17.8' - 19.5' Stiff, moderate yellowish brown (10YR 5/4) and light olive gray (5Y 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)
19								
20	(19.5' - 21.0') Stiff, brownish black (5YR 2/1), SILTY CLAY, organic, moist, (OL)							19.5' - 20.0' Stiff, brownish black (5YR 2/1), SILTY CLAY, organic, moist, (OL)
21	(21.0' - 21.9') Stiff, moderate yellowish brown (10YR 5/4) and olive gray (5Y 4/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)							21.0' - 21.9' Stiff, moderate yellowish brown (10YR 5/4) and olive gray (5Y 4/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)
22	(21.9' - 22.3') Stiff, dusky yellowish brown (10YR 2/2), SANDY CLAY, trace f gravel, moist, (CL)		5	MC	NA	4.0' / 5.0'	NA	21.9' - 22.3' Stiff, dusky yellowish brown (10YR 2/2), SANDY CLAY, trace f gravel, moist, (CL)
23	(22.3' - 26.0') Stiff, olive gray (5Y 4/1) and moderate yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/2), SILTY CLAY, trace to little f sand and f gravel, moist, (CL)							22.3' - 24.7' Stiff, olive gray (5Y 4/1) and moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)
24								24.7' - 25.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, little f sand, trace f gravel, moist, (CL)
25								
26	(26.0' - 28.9') Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f gravel, moist, (ML)							25.0' - 26.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, little f sand, trace f gravel, moist, (CL)
27			6	MC	NA	5.0' / 5.0'	NA	26.0' - 28.9' Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f gravel, moist, (ML)
28								28.9' - 30.0' Very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
29	(28.9' - 37.0') Stiff to very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)							

DEPTH HOLE	44.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX04	
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	3	OF 3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core			
SURFACE ELEV.	914.7' MSL 3,814 N 5,181 E	STARTED	2021-03-16 09:20	COMPLETED	2021-03-16 10:20	

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
31	(28.9' - 37.0') Stiff to very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)		7	MC	NA	4.8' / 5.0'	NA	30.2' - 35.0' Very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
32								
33								
34								
35								
36			8	MC	NA	4.6' / 5.0'	NA	35.4' - 37.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
37	(37.0' - 37.4') Compact, dark yellowish brown (10YR 4/2), F SAND, trace silt, moist, (SW)							37.0' - 37.4' Compact, dark yellowish brown (10YR 4/2), F SAND, trace silt, moist, (SW)
38	(37.4' - 42.3') Stiff, dark yellowish brown (10YR 4/2) and moderate olive brown (5Y 4/4) and dusky brown (5YR 2/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)							37.4' - 38.6' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
39								38.6' - 40.0' Stiff, dark yellowish brown (10YR 4/2), moderate olive brown (5Y 4/4) and dusky brown (5YR 2/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
40								
41			9	MC	NA	2.8' / 4.0'	NA	41.2' - 42.3' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
42								42.3' - 42.7' Compact, moderate yellowish brown (10YR 5/4), F SAND, wet, (SW)
43	(42.3' - 42.7') Compact, moderate yellowish brown (10YR 5/4), F SAND, wet, (SW)							42.7' - 44.0' Dense, dark yellowish brown (10YR 4/2), SILT, laminated, wet, (ML)
	(42.7' - 44.0') Dense, dark yellowish brown (10YR 4/2), SILT, laminated, wet, (ML)	3.5%						2021-03-16 10:20 CH4 = 3.5% On Completion Of Boring.
44	End of Borehole at 44.0'							

DEPTH HOLE	44.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX05		
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	1	OF	3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core				
SURFACE ELEV.	912.9' MSL 3,637 N 5,190 E	STARTED	2021-03-16 13:35	COMPLETED	2021-03-16 14:35		

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
1	(0.0' - 3.6') Very stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)		1	MC	NA	2.5' / 5.0'	NA	2.5' - 3.6' Very stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)
2								3.6' - 4.3' Dense, light olive gray (5Y 6/1), F-C SAND and F GRAVEL, dry, (SP/GP)
3								4.3' - 5.0' Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)
4	(3.6' - 4.3') Dense, light olive gray (5Y 6/1), F-C SAND and F GRAVEL, dry, (SP/GP)							
5	(4.3' - 8.8') Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)		2	MC	NA	4.7' / 5.0'	NA	5.3' - 8.8' Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)
6								8.8' - 10.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
7								
8								
9	(8.8' - 17.4') Firm to stiff, dark yellowish brown (10YR 4/2) and light olive gray (5Y 6/1) and moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)							
10								11.1' - 12.6' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
11								12.6' - 15.0' Firm, light olive gray (5Y 6/1) and moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)
12			3	MC	NA	3.9' / 5.0'	NA	
13								
14								

DEPTH HOLE	44.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX05	
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	2	OF 3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core			
SURFACE ELEV.	912.9' MSL 3,637 N 5,190 E	STARTED	2021-03-16 13:35	COMPLETED	2021-03-16 14:35	

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
16	(8.8' - 17.4') Firm to stiff, dark yellowish brown (10YR 4/2) and light olive gray (5Y 6/1) and moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)							15.0' - 16.5' Firm, light olive gray (5Y 6/1) and moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)
17								16.5' - 17.4' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
18	(17.4' - 18.2') Stiff, brownish gray (5YR 4/1) and brownish black (5YR 2/1), SILTY CLAY, organic, moist, (OL)		4	MC	NA	5.0' / 5.0'	NA	17.4' - 18.2' Stiff, brownish gray (5YR 4/1) and brownish black (5YR 2/1), SILTY CLAY, organic, moist, (OL)
19	(18.2' - 22.5') Stiff, moderate yellowish brown (10YR 5/4) and light olive brown (5Y 5/6), SILTY CLAY, trace f gravel, moist, (CL)							18.2' - 20.0' Stiff, moderate yellowish brown (10YR 5/4) and light olive brown (5Y 5/6), SILTY CLAY, trace f gravel, moist, (CL)
20								
21								22.0 - 22.5' Stiff, moderate yellowish brown (10YR 5/4) and light olive brown (5Y 5/6), SILTY CLAY, trace f gravel, moist, (CL)
22								22.5' - 23.6' Stiff, moderate yellowish brown (10YR 5/4) and light olive gray (5Y 6/1), CLAYEY SILT, little f sand, trace f gravel, moist, (CL)
23	(22.5' - 23.6') Stiff, moderate yellowish brown (10YR 5/4) and light olive gray (5Y 6/1), CLAYEY SILT, little f sand, trace f gravel, moist, (CL)		5	MC	NA	3.0' / 5.0'	NA	23.6' - 25.0' Stiff, moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)
24	(23.6' - 27.4') Stiff, moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)							
25								26.2' - 27.4' Stiff, moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)
26								27.4' - 28.9' Very stiff, moderate yellowish brown (10YR 5/4), CLAYEY SILT, trace f sand and f gravel, moist, (CL)
27								28.9' - 30.0' Very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
28	(27.4' - 28.9') Very stiff, moderate yellowish brown (10YR 5/4), CLAYEY SILT, trace f sand and f gravel, moist, (CL)		6	MC	NA	3.8' / 5.0'	NA	
29	(28.9' - 36.5') Stiff to very stiff, dark yellowish brown (10YR 4/2) and moderate yellowish brown (10YR 5/4), SILTY CLAY, trace to little f sand and f gravel, moist, (CL)							

DEPTH HOLE	44.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX05
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	3 OF 3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	912.9' MSL 3,637 N 5,190 E	STARTED	2021-03-16 13:35	COMPLETED	2021-03-16 14:35

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
31	(28.9' - 36.5') Stiff to very stiff, dark yellowish brown (10YR 4/2) and moderate yellowish brown (10YR 5/4), SILTY CLAY, trace to little f sand and f gravel, moist, (CL)		7	MC	NA	3.9' / 5.0'	NA	31.1' - 33.5' Stiff, moderate yellowish brown (10YR 5/4), SILTY CLAY, little f gravel, trace f sand, moist, (CL) 33.5' - 35.0' Very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
32								
33								
34								
35								Driller Reports Landfill Gas Odor
36								35.8' - 36.5' Very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
37	(36.5' - 37.6') Dense, dark yellowish brown (10YR 4/2), F-M SAND, trace f gravel, wet, (SP)		8	MC	NA	4.2' / 5.0'	NA	36.5' - 37.6' Dense, dark yellowish brown (10YR 4/2), F-M SAND, trace f gravel, wet, (SP) 37.6' - 38.4' Firm, dark yellowish brown (10YR 4/2), SANDY CLAY, trace f gravel, moist, (CL)
38	(37.6' - 38.4') Firm, dark yellowish brown (10YR 4/2), SANDY CLAY, trace f gravel, moist, (CL)							38.4' - 40.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
39	(38.4' - 40.0') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)							
40	(40.0' - 42.6') Compact, dark yellowish brown (10YR 4/2), F-C SAND, little f gravel, trace silt, wet, (SP)		9	MC	NA	4.0' / 4.0'	NA	40.0' - 42.6' Compact, dark yellowish brown (10YR 4/2), F-C SAND, little f gravel, trace silt, wet, (SP) 42.6' - 44.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, f-c sand interbeds, moist, (CL)
41								
42								
43	(42.6' - 44.0') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, f-c sand interbeds, moist, (CL)	12%						2021-03-16 14:35 CH4 = 12% On Completion Of Boring.
44	End of Borehole at 44.0'							

DEPTH HOLE	44.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX06		
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	1	OF	3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core				
SURFACE ELEV.	913.3' MSL 3,679 N 5,187 E	STARTED	2021-03-18 07:40	COMPLETED	2021-03-18 08:40		

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
1	(0.0' - 3.0') Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)		1	MC	NA	3.9' / 5.0'	NA	1.1' - 3.0' Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)
2								3.0' - 3.6' Dense, light olive gray (5Y 6/1), F SAND, little f gravel, dry, (SP)
3	(3.0' - 3.6') Dense, light olive gray (5Y 6/1), F SAND, little f gravel, dry, (SP)							3.6' - 5.0' Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)
4	(3.6' - 10.8') Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)							
5			2	MC	NA	5.0' / 5.0'	NA	5.0' - 10.0' Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)
6								
7								
8								
9								
10			3	MC	NA	5.0' / 5.0'	NA	10.0' - 10.8' Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)
11	(10.8' - 18.6') Stiff, moderate yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/2) and olive gray (5Y 4/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)							10.8' - 15.0' Stiff, moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)
12								
13								
14								

DEPTH HOLE	44.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX06
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	2 OF 3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	913.3' MSL 3,679 N 5,187 E	STARTED	2021-03-18 07:40	COMPLETED	2021-03-18 08:40

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
16	(10.8' - 18.6') Stiff, moderate yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/2) and olive gray (5Y 4/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)		4	MC	NA	5.0' / 5.0'	NA	15.0' - 16.7' Stiff, moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL) 16.7' - 18.6' Stiff, dark yellowish brown (10YR 4/2) and olive gray (5Y 4/1), SILTY CLAY, trace f sand and f gravel, moist, (CL) 18.6' - 19.2' Stiff, dusky brown (5YR 2/2), CLAYEY SILT, moist, (ML) 19.2' - 20.0' Dense, pale yellowish brown (10YR 6/2), F SAND, little silt, moist, (SW)
17								
18								
19	(18.6' - 19.2') Stiff, dusky brown (5YR 2/2), CLAYEY SILT, moist, (ML)							
20	(19.2' - 21.8') Dense, pale yellowish brown (10YR 6/2), F SAND, little silt, moist, (SW)	0.0%						CH4 = 0.0%
21								21.4' - 21.8' Dense, pale yellowish brown (10YR 6/2), F SAND, little silt, moist, (SW) 21.8' - 25.0' Very stiff, moderate yellowish brown (10YR 5/4) and light olive gray (5YR 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)
22	(21.8' - 27.4') Very stiff, moderate yellowish brown (10YR 5/4) and light olive gray (5YR 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)		5	MC	NA	3.6' / 5.0'	NA	
23								
24								
25		0.0%						CH4 = 0.0%
26								25.4' - 27.4' Very stiff, moderate yellowish brown (10YR 5/4) and light olive gray (5YR 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL) 27.4' - 27.8' Compact, moderate yellowish brown (10YR 5/4), F-M SAND, little f gravel, wet, (SP)
27								27.8' - 30.0' Very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
28	(27.4' - 27.8') Compact, moderate yellowish brown (10YR 5/4), F-M SAND, little f gravel, wet, (SP) (27.8' - 44.0') Stiff to very stiff, dark yellowish brown (10YR 4/2) and olive gray (5Y 4/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)		6	MC	NA	4.6' / 5.0'	NA	
29								
		0.0%						CH4 = 0.0%

DEPTH HOLE	44.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX06
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	3 OF 3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	913.3' MSL 3,679 N 5,187 E	STARTED	2021-03-18 07:40	COMPLETED	2021-03-18 08:40

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
31	(27.8' - 44.0') Stiff to very stiff, dark yellowish brown (10YR 4/2) and olive gray (5Y 4/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)							30.9' - 31.6' Very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
								31.6' - 35.0' Stiff, olive gray (5Y 4/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)
32			7	MC	NA	4.1'/5.0'	NA	
33								
34								
35		0.1%						CH4 = 0.1%
								36.3' - 40.0' Stiff, olive gray (5Y 4/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)
36								
37			8	MC	NA	3.7'/5.0'	NA	
38								
39								
40		0.1%						CH4 = 0.1%
								40.9' - 44.0' Stiff, olive gray (5Y 4/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)
41								
42			9	MC	NA	3.1'/4.0'	NA	
43								
		0.1%						2021-03-18 08:40 CH4 = 0.1% On Completion Of Boring.
44	End of Borehole at 44.0'							

DEPTH HOLE	40.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX07
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	1 OF 3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	911.9' MSL 3,554 N 5,187 E	STARTED	2021-03-17 13:55	COMPLETED	2021-03-17 15:00

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
1	(0.0' - 6.2') Stiff, dark yellowish brown(10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)		1	MC	NA	3.2' / 5.0'	NA	1.8' - 5.0' Stiff, dark yellowish brown(10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)
2								
3								
4								
5								
6			2	MC	NA	5.0' / 5.0'	NA	5.0' - 6.2' Stiff, dark yellowish brown(10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML) 6.2' - 9.2' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL) 9.2' - 10.0' Stiff, olive gray (5Y 4/1) and brownish black (5YR 2/1), SANDY CLAY, trace f gravel, moist, (CL)
7	(6.2' - 9.2') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)							
8								
9								
10	(9.2' - 11.3') Stiff, olive gray (5Y 4/1) and brownish black (5YR 2/1), SANDY CLAY, trace f gravel, moist, (CL)		3	MC	NA	4.2' / 5.0'	NA	10.8' - 11.3' Stiff, olive gray (5Y 4/1) and brownish black (5YR 2/1), SANDY CLAY, trace f gravel, moist, (CL) 11.3' - 11.8' Compact, moderate yellowish brown (10YR 5/4), F SAND, trace f gravel, moist, (SP) 11.8' - 13.8' Stiff, dark yellowish brown (10YR 4/2) and light olive gray (5Y 6/1) and grayish olive (10Y 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL) 13.8' - 14.5' Compact, dark yellowish brown (10YR 4/2), F SAND, moist, (SW) 14.5' - 15.0' Stiff, brownish black (5YR 2/1), SANDY CLAY, organic, moist, (OL)
11								
12	(11.3' - 11.8') Compact, moderate yellowish brown (10YR 5/4), F SAND, trace f gravel, moist, (SP)							
13	(11.8' - 13.8') Stiff, dark yellowish brown (10YR 4/2) and light olive gray (5Y 6/1) and grayish olive (10Y 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)							
14	(13.8' - 14.5') Compact, dark yellowish brown (10YR 4/2), F SAND, moist, (SW)							

DEPTH HOLE	40.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX07
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	2 OF 3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	911.9' MSL 3,554 N 5,187 E	STARTED	2021-03-17 13:55	COMPLETED	2021-03-17 15:00

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
16	(14.5' - 16.7') Stiff, brownish black (5YR 2/1), SANDY CLAY, organic, moist, (OL)							16.2' - 16.7' Stiff, brownish black (5YR 2/1), SANDY CLAY, organic, moist, (OL)
17	(16.7' - 18.9') Compact, pale yellowish brown (10 YR 6/2) F SAND, little f gravel, moist, laminated, (SP) and interbedded Firm, dusky brown (5YR 2/2), SANDY CLAY, trace f gravel, moist, (CL)		4	MC	NA	3.8' / 5.0'	NA	16.7' - 18.9' Compact, pale yellowish brown (10 YR 6/2) F SAND, little f gravel, moist, laminated, (SP) Interbedded With: Firm, dusky brown (5YR 2/2), SANDY CLAY, trace f gravel, moist, (CL)
18								
19	(18.9' - 20.3') Dense, pale yellowish brown (10YR 6/2), SILT, trace f gravel, interbedded f sand, moist, (CL)	0.6%						18.9' - 20.0' Dense, pale yellowish brown (10YR 6/2), SILT, trace f gravel, interbedded f sand, moist, (CL) CH4 = 0.6%
20								
21	(20.3' - 21.4') Compact, olive gray (5Y 4/1), F-M SAND, little f gravel, trace clay, wet, (SP)							20.0' - 20.3' Dense, pale yellowish brown (10YR 6/2), SILT, trace f gravel, interbedded f sand, moist, (CL) 20.3' - 21.4' Compact, olive gray (5Y 4/1), F-M SAND, little f gravel, trace clay, wet, (SP)
22	(21.4' - 22.9') Stiff, moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)		5	MC	NA	5.0' / 5.0'	NA	21.4' - 22.9' Stiff, moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL) 22.9' - 25.0' Very stiff, moderate yellowish brown (10YR 5/4), CLAYEY SILT, dry-moist, (ML)
23	(22.9' - 26.6') Very stiff, moderate yellowish brown (10YR 5/4), CLAYEY SILT, dry-moist, (ML)							
24								
25		3.6%						CH4 = 3.6%
26								26.6' - 28.1' Dense, olive gray (5Y 4/1), F-M SAND, little f gravel, trace clay, wet, (SP) 28.1' - 30.0' Very stiff, dark yellowish brown (10YR 4/2) and light brown (5YR 6/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)
27	(26.6' - 28.1') Dense, olive gray (5Y 4/1), F-M SAND, little f gravel, trace clay, wet, (SP)		6	MC	NA	3.4' / 5.0'	NA	
28								
29	(28.1' - 30.7') Very stiff, dark yellowish brown (10YR 4/2) and light brown (5YR 6/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)	5.4%						CH4 = 5.4%

DEPTH HOLE	40.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX07
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	3 OF 3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	911.9' MSL 3,554 N 5,187 E	STARTED	2021-03-17 13:55	COMPLETED	2021-03-17 15:00

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
	See Previous Page For Description							30.0' - 30.7' Very stiff, dark yellowish brown (10YR 4/2) and light brown (5YR 6/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)
31	(30.7' - 31.9') Soft, pale yellowish brown (10YR 6/2), SANDY CLAY, some silt, trace f gravel, wet, (CL)							30.7' - 31.9' Soft, pale yellowish brown (10YR 6/2), SANDY CLAY, some silt, trace f gravel, wet, (CL)
32	(31.9' - 33.2') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)		7	MC	NA	5.0' / 5.0'	NA	31.9' - 33.2' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
33	(33.2' - 34.1') Compact, pale yellowish brown (10YR 6/2), F-M SAND, moist, (SP) and interbedded Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)							33.2' - 34.1' Compact, pale yellowish brown (10YR 6/2), F-M SAND, moist, (SP) Interbedded With: Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
34								34.1' - 35.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
35		65%						CH4 = 65%
	(34.1' - 40.0') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)							35.0' - 40.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
36								
37			8	MC	NA	5.0' / 5.0'	NA	
38								
39								2021-03-17 15:00 CH4 = 64% On Completion Of Boring.
40		64%						
	End of Borehole at 40.0'							
41								
42								
43								
44								

DEPTH HOLE	39.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX09		
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	1	OF	3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core				
SURFACE ELEV.	910.3' MSL 3,457 N 5,189 E	STARTED	2021-03-18 09:30	COMPLETED	2021-03-18 10:30		

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
1	(0.0' - 5.8') Stiff, dark yellowish brown (10 YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)		1	MC	NA	4.0' / 5.0'	NA	1.0' - 5.0' Stiff, dark yellowish brown (10 YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)
2								
3								
4								
5								
6	(5.8' - 18.3') Stiff, dark yellowish brown (10YR 4/2) and light olive gray (5Y 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)		2	MC	NA	4.2' / 5.0'	NA	5.8' - 10.0' Stiff, dark yellowish brown (10YR 4/2) and light olive gray (5Y 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)
7								
8								
9								
10								10.0' - 15.0' Stiff, dark yellowish brown (10YR 4/2) and light olive gray (5Y 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)
11								
12								
13			3	MC	NA	5.0' / 5.0'	NA	
14		0.0%						CH4 = 0.0%

DEPTH HOLE	39.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX09
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	2 OF 3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	910.3' MSL 3,457 N 5,189 E	STARTED	2021-03-18 09:30	COMPLETED	2021-03-18 10:30

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
16	(5.8' - 18.3') Stiff, dark yellowish brown (10YR 4/2) and light olive gray (5Y 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)		4	MC	NA	2.8' / 5.0'	NA	17.2' - 18.3' Stiff, dark yellowish brown (10YR 4/2) and light olive gray (5Y 6/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)
17								18.3' - 18.7' Stiff, moderate yellowish brown (10YR 5/4) and light olive gray (5Y 6/1), CLAYEY SILT, wet, (ML)
18								18.7' - 20.0' Dense, light olive gray (5Y 6/1), F-C SAND and F GRAVEL, dry, (SP/GP)
19	(18.3' - 18.7') Stiff, moderate yellowish brown (10YR 5/4) and light olive gray (5Y 6/1), CLAYEY SILT, wet, (ML)							
20	(18.7' - 21.6') Dense, light olive gray (5Y 6/1), F-C SAND and F GRAVEL, dry, (SP/GP)	65%						CH4 = 65%
21								20.3' - 21.6' Dense, light olive gray (5Y 6/1), F-C SAND and F GRAVEL, dry, (SP/GP)
22	(21.6' - 39.0') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)		5	MC	NA	4.7' / 5.0'	NA	21.6' - 25.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
23								
24								
25		66%						CH4 = 66%
26			6	MC	NA	4.1' / 5.0'	NA	25.9' - 30.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
27								
28								
29		66%						CH4 = 66%

DEPTH HOLE	39.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX09
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	3 OF 3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	910.3' MSL 3,457 N 5,189 E	STARTED	2021-03-18 09:30	COMPLETED	2021-03-18 10:30

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
31	(21.6' - 39.0') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)							31.1' - 35.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel in 0.1' to 0.3' interbeds, moist, (CL)
32			7	MC	NA	3.9' / 5.0'	NA	
33								
34								
35		65%						CH4 = 65%
36								35.5' - 39.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL) sampler shredded
37			8	MC	NA	3.5' / 4.0'	NA	
38								
39		65%						2021-03-18 10:30 CH4 = 65% On Completion Of Boring.
	End of Borehole at 39.0'							
40								
41								
42								
43								
44								

DEPTH HOLE	38.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX10		
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	1	OF	3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core				
SURFACE ELEV.	907.9' MSL 3,353 N 5,188 E	STARTED	2021-03-18 11:15	COMPLETED	2021-03-18 12:15		

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
1	(0.0' - 7.2') Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)		1	MC	NA	4.1' / 5.0'	NA	0.9' - 5.0' Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)
2								
3								
4								
5								
6			2	MC	NA	4.0' / 5.0'	NA	6.0' - 7.2' Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML) 7.2' - 10.0' Stiff, olive gray (5Y 4/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)
7								
8	(7.2' - 12.8') Stiff, olive gray (5Y 4/1), SILTY CLAY, trace f sand and f gravel, moist, (CL)							
9								
10			3	MC	NA	2.5' / 5.0'	NA	12.5' - 12.8' Stiff, olive gray (5Y 4/1), SILTY CLAY, trace f sand and f gravel, moist, (CL) 12.8' - 15.0' Compact, grayish black (N2), SANDY SILT, little clay, trace f gravel, moist, (SM)
11								
12								
13	(12.8' - 17.4') Compact, grayish black (N2), SANDY SILT, little clay, trace f gravel, moist, (SM)							
14		0.5%						CH4 = 0.5%

DEPTH HOLE	38.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX10
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	2 OF 3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	907.9' MSL 3,353 N 5,188 E	STARTED	2021-03-18 11:15	COMPLETED	2021-03-18 12:15

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
16	(12.8' - 17.4') Compact, grayish black (N2), SANDY SILT, little clay, trace f gravel, moist, (SM)							16.9' - 17.4' Compact, grayish black (N2), SANDY SILT, little clay, trace f gravel, moist, (SM)
								17.4' - 18.3' Stiff, moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)
								18.3' - 20.0' Dense, pale yellowish brown (10YR 6/2), F-C SAND, little f gravel, moist to wet, (SP)
17								
	(17.4' - 18.3') Stiff, moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)		4	MC	NA	3.1' / 5.0'	NA	
18								
	(18.3' - 23.8') Dense, pale yellowish brown (10YR 6/2), F-C SAND, little f gravel, moist to wet, (SP)							
19								
		31%						CH4 = 31%
20								21.6' - 23.8' Dense, pale yellowish brown (10YR 6/2), F-C SAND, little f gravel, moist to wet, (SP)
								23.8' - 24.5' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
21								24.5' - 25.0' Compact, pale yellowish brown (10YR 6/2), F SAND, little silt, wet, (SP)
22			5	MC	NA	3.4' / 5.0'	NA	
23								
24	(23.8' - 24.5') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)							
	(24.5' - 25.9') Compact, pale yellowish brown (10YR 6/2), F SAND, little silt, wet, (SP)	28%						CH4 = 28%
25								25.9' - 27.4' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, some f sand and f gravel, moist to wet, (CL)
								27.4' - 30.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
26	(25.9' - 34.2') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace to some f sand and f gravel, moist to wet, (CL)							
27								
			6	MC	NA	4.1' / 5.0'	NA	
28								
29								
								CH4 = 21%
		21%						

DEPTH HOLE	38.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX10
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	3 OF 3
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	907.9' MSL 3,353 N 5,188 E	STARTED	2021-03-18 11:15	COMPLETED	2021-03-18 12:15

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
31	(25.9' - 34.2') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace to some f sand and f gravel, moist to wet, (CL)		7	MC	NA	2.9' / 5.0'	NA	32.1' - 34.2' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
32								34.2' - 35.0' Dense, pale yellowish brown (10YR 6/2), SILT, laminated, dry, (ML)
33								Sampler Shredded
34								
35	(34.2' - 36.0') Dense, pale yellowish brown (10YR 6/2), SILT, laminated, dry, (ML)	33%						CH4 = 33%
36			8	MC	NA	2.0' / 3.0'	NA	36.0' - 38.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
37	(36.0' - 38.0') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)							Sampler Shredded
38		27%						2021-03-18 12:15 CH4 = 27% On Completion Of Boring.
39	End of Borehole at 38.0'							
40								
41								
42								
43								
44								

DEPTH HOLE	30.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX11
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	1 OF 2
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	906.0' MSL 3,259 N 5,188 E	STARTED	2021-03-18 13:45	COMPLETED	2021-03-18 14:15

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
1	(0.0' - 7.2') Stiff, moderate yellowish brown (10YR 5/4), CLAYEY SILT, trace f sand and f gravel, dry, (ML)		1	MC	NA	3.1' / 5.0'	NA	1.9' - 5.0' Stiff, moderate yellowish brown (10YR 5/4), CLAYEY SILT, trace f sand and f gravel, dry, (ML)
2								
3								
4								
5								
6			2	MC	NA	2.4' / 5.0'	NA	7.6' - 10.0' Stiff, olive gray (5Y 4/1) and dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
7								
8	(7.6' - 12.7') Stiff, olive gray (5Y 4/1) and dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)							
9								
10								
11			3	MC	NA	2.3' / 5.0'	NA	12.7' - 15.0' Dense, pale yellowish brown (10YR 6/2), F-C SAND, little f gravel, dry, (SP)
12								
13	(12.7' - 18.4') Dense, pale yellowish brown (10YR 6/2), F-C SAND, little f gravel, dry, (SP)							
14		35%						CH4 = 35%

DEPTH HOLE	30.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX11
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	2 OF 2
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	906.0' MSL 3,259 N 5,188 E	STARTED	2021-03-18 13:45	COMPLETED	2021-03-18 14:15

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
16	(12.7' - 18.4') Dense, pale yellowish brown (10YR 6/2), F-C SAND, little f gravel, dry, (SP)		4	MC	NA	3.0' / 5.0'	NA	17.0' - 18.4' Dense, pale yellowish brown (10YR 6/2), F-C SAND, little f gravel, dry, (SP)
17								18.4' - 20.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
18								
19	(18.4' - 27.9') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)							
20		34%						CH4 = 34%
21			5	MC	NA	3.6' / 5.0'	NA	21.4' - 25.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
22								
23								
24								
25		38%						CH4 = 38%
26			6	MC	NA	2.1' / 5.0'	NA	27.9' - 28.7' Compact, dark yellowish brown (10YR 4/2), F-C SAND, little clay and f gravel, wet, (SP)
27								28.7' - 30.0' Stiff, olive gray (5Y 4/1), CLAYEY SILT, trace f gravel, moist, (ML)
28	(27.9' - 28.7') Compact, dark yellowish brown (10YR 4/2), F-C SAND, little clay and f gravel, wet, (SP)							
29	(28.7' - 30.0') Stiff, olive gray (5Y 4/1), CLAYEY SILT, trace f gravel, moist, (ML)							2021-03-18 14:15 CH4 = 38% On Completion Of Boring.
	End of Borehole at 30.0'	38%						

DEPTH HOLE	27.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX12
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	1 OF 2
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	898.6' MSL 3,153 N 5,188 E	STARTED	2021-03-18 15:15	COMPLETED	2021-03-18 15:50

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
1	(0.0' - 4.1') Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)		1	MC	NA	5.0' / 5.0'	NA	0.0' - 4.1' Stiff, dark yellowish brown (10YR 4/2), CLAYEY SILT, trace f sand and f gravel, dry, (ML)
2								4.1' - 5.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
3								
4								
5	(4.1' - 7.8') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)							
6								7.8' - 10.0' Compact, pale yellowish brown (10YR 6/2), F-M SAND, little f gravel, dry to moist, (SP)
7			2	MC	NA	2.2' / 5.0'	NA	Becoming Moist At 9.6'
8	(7.8' - 10.7') Compact, pale yellowish brown (10YR 6/2), F-M SAND, little silt and f gravel, dry to moist, (SP)							
9								
10		0.0%						CH4 = 0.0%
11	(10.7' - 15.0') Very stiff, moderate yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)							10.0' - 10.7' Compact, pale yellowish brown (10YR 6/2), F-M SAND, little silt and f gravel, dry to moist, (SP)
12								10.7' - 11.9' Very stiff, moderate yellowish brown (10YR 5/4), SILTY CLAY, trace f sand and f gravel, moist, (CL)
13			3	MC	NA	5.0' / 5.0'	NA	11.9' - 15.0' Very stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
14								
		0.0%						CH4 = 0.0%

DEPTH HOLE	27.0'	PROJECT	Stray Methane Transport Pathway Investigations	BORING NO.	PWEX12
GEOLOGIST	A. Michael Hirt	DRILLING RIG	Geoprobe 7822	SHEET	2 OF 2
DRILLING CO.	Cabeno	DRILLING METHOD	2.25" MC5 Macro-Core		
SURFACE ELEV.	898.6' MSL 3,153 N 5,188 E	STARTED	2021-03-18 15:15	COMPLETED	2021-03-18 15:50

DEPTH	DESCRIPTION	CH4 (%)	SAMPLES NO.	TYPE	BLOWS	REC.	UCS	SOIL SAMPLE DESCRIPTIONS
16	(15.0' - 19.5') Compact, moderate yellowish brown (10YR 5/4), F-C SAND, little clay and f gravel, wet, (SP)		4	MC	NA	5.0' / 5.0'	NA	15.0' - 19.5' Compact, moderate yellowish brown (10YR 5/4), F-C SAND, little clay and f gravel, wet, (SP)
17								19.5' - 20.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
18								
19								
20	(19.5' - 27.0') Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)	0.0%						CH4 = 0.0%
21			5	MC	NA	3.1' / 5.0'	NA	2.9' - 25.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
22								
23								
24		0.0%						CH4 = 0.0%
25			6	MC	NA	0.8' / 2.0'	NA	26.2' - 27.0' Stiff, dark yellowish brown (10YR 4/2), SILTY CLAY, trace f sand and f gravel, moist, (CL)
26		0.0%						2021-03-18 15:50 CH4 = 0.0% On Completion Of Boring.
27	End of Borehole at 27.0'							
28								
29								

APPENDIX K

Leachate Operations, Maintenance and Inspection Plan dated February 2022

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE

February 2022

ARBOR HILLS LANDFILL

LEACHATE OPERATIONS, MAINTENANCE & INSPECTION PLAN

PREPARED FOR:
ARBOR HILLS LANDFILL
10599 WEST FIVE MILE ROAD
NORTHVILLE, MI 48168

PREPARED BY

Weaver Consultants Group

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1 INTRODUCTION

1.1 Purpose

This document serves as the operation, maintenance and inspection plan and presents the requirements and operational practices necessary to maintain the leachate collection and management system within the Arbor Hills Landfill located in Salem Township, Washtenaw County, Michigan (the "Site"). This plan presents an operations, maintenance plan and schedule that conforms to Michigan Admin Code R 299.432(5) (Rule 432(5)) and Michigan Admin Code R 299.4426(1) (Rule 426(1)).

1.2 Leachate System Overview

The site is composed of two landfill areas designated as Arbor Hills East and Arbor Hills West. The Site's leachate collection system infrastructure is described in the site liquids management plan and the main components are briefly summarized below for information.

Arbor Hills East (AHE) Landfill is a closed landfill with a permitted solid waste boundary of 93.6 acres. AHE was closed in the early 1990's and does not have a modern leachate collection system. The leachate collection system consists of a series of leachate extraction wells on the east side of the landfill that are pumped via force main, then gravity sewer to a manhole in the southwest corner of the AHE landfill where leachate is extracted. This manhole is referred to as the Arbor East Manhole.

Liquids extracted from the Arbor East Manhole are pumped to a 321,000-gallon above-ground storage tank located south of the railroad tracks by means of a 4-inch dual contained force main. The liquids in this tank are loaded onto tanker trucks and disposed of at an appropriate treatment facility. Controls in the tank shut off the pump in the Arbor East Manhole if a high level is reached in the tank.

Arbor Hills West (AHW) is an active landfill with a permitted solid waste boundary of 242.4 acres which is composed of an existing constructed landfill footprint of 205.6 acres and a future permitted area to be constructed of 36.9 acres (Cell 4F and Cell 6). AHW consists of five cells and four primary leachate collection sumps. The primary sumps are for Cells 2, 1/3, 4 & 5. Note that leachate from Cell 1 and Cell 3 discharge to a common primary sump and is referred to as the Cell 1/3 sump. In addition, each of the five cells has a separate secondary collection sump.

All primary sumps have two 18-inch riser pipes that extend into the sump and have pumps placed in the bottom of the risers to pump leachate out of the sump. Each of the pumps has a liquid level sensor located in the sump that controls the pump on-off operation. At each riser there is a control panel that has the pump starters and controls the level-sensing equipment. Currently Cells 2 and 4 have flow meters on both the primary and secondary systems.

Cell 4, located in the northwest corner of the landfill, discharges to a 4”/8” dual contained force main. The force main travels south approximately 1,300-feet before discharging into an 8” gravity sewer. This sewer runs south along the west side of the landfill where Cell 2 leachate is discharged. As the sewer turns to the east it becomes a 10-inch sewer that extends along the southern side of the landfill, collecting leachate from Cells 1/3 & 5. The sewer discharges to a double-contained pump station named the Arbor Hills West Pump Station (AHWPS). The AHWPS is controlled by means of float switches that control the two pumps in the station. The float switches turn the pumps off at low level and turn both pumps on at high level. If the level of liquids in the pump station exceed the high level, an alarm will activate and the control system will turn off all the cell leachate pumps (primary and secondary).

The AHWPS discharges the liquid to a 926,000-gallon above-ground storage tank located south of the railroad tracks by means of a 4-inch dual-contained force main. This tank accepts other liquids from the site (see following sections) and provides aerating, mixing and equalization of flow. The 926,000-gallon tank discharges to a 540,000-gallon above-ground storage tank where additional aeration can occur. The liquid level in each of these tanks can be controlled by pumping to tanker trucks and disposing of the liquid at an appropriate treatment facility. Controls in the tank will shut off the AHWPS if a high level is reached in the tank. Depending on the constituents of the leachate, additional treatments can be used prior to discharging the liquids to the local municipality. Currently the site is using dissolved air flotation (DAF) clarifier to remove solids before pumping it through carbon filtration. After which it leaves the tank area via a 4-inch dual-contained force main. This force main increases to a 6-inch dual-contained before discharging into an 8-inch sanitary sewer that leaves the property. The discharge into Northville Township sewer system occurs at a structure on the west side of Napier Road, just north of the railroad tracks.

See **Appendix A** for a diagram of the current and proposed leachate collection system components.

Along with the leachate collected from Cells 1-5, a separate sump located on the slope of southside of AHW is for TS-01R leachate. This sump has two pneumatic pumps that are controlled by a float switch to keep liquid levels down. This liquid is then pumped into a 8” gravity line that

slopes to the AHWPS. Once it reaches the bottom of the slope it is collected in two frac tanks that have an aeration system. The liquid level in the frac tanks is controlled by a float system that drain the tanks when it reaches a high level and stops draining the tanks at a low level by an automatic valve. The tanks drain into the AHWPS which discharges to a 926,000 gallon above-ground storage tank.

The final leachate stream is the Arbor Hills West Gas Well Leachate. Every gas well located on AHW that has a pneumatic pump is pumping liquid to the Arbor Hills West Gas Well Leachate Pump Station (AHWGWLPS). This pump station is controlled by means of float switches that control two pumps. The floats turn the pumps off at low level and on at high level. The lift station then discharges the liquid to a 4-inch dual-contained force main that travels east, under the railroad, and discharges into the 926,000 gallon above-ground storage tank.

2 INSPECTIONS AND MAINTENANCE

The Arbor Hills West (AHW) Leachate Collection System (LCS) has been designed and constructed to meet current state requirements and the Michigan Department of Environment, Great Lakes, and Energy (EGLE) solid waste landfill regulations. However, it is a complex mechanical and electrical system having many components subject to severe environmental conditions in normal operating mode.

Even the most robust systems operating in these conditions require consistent maintenance to ensure satisfactory operation and performance. Regular maintenance includes removing the submersible pumps to inspect and clean or repair the pumps and level monitoring transducers as necessary. The LCS and force main pipes may also need to be cleaned and jetted periodically to maintain functionality. The leachate collection storage tanks and transfer systems also need to be inspected and cleaned if necessary on a periodic basis. This plan provides inspection and maintenance schedules for each LCS component.

The following sections summarize the maintenance and inspection requirements for the Site.

2.1 Leachate Collection Sump Operation and Maintenance Requirements

The landfill cell floor and liner system are sloped to terminate at a series of low points for gravity collection known as sumps. The locations of the current and proposed sumps at Arbor Hills Landfill are presented in **Appendix A**. Appendix A also contains drawings which provide the as-built design details and compliance levels for each sump.

An electrical submersible pump is located in each sump. Many sumps have redundant pumps installed for reliable operation. Each sump has a control panel which provides an hour and/or flow readout and a liquid level reading. Pumps will be set to turn on and pump at an elevation below the compliance elevation so that leachate levels are maintained below compliance e elevations whenever possible. Inspections of the leachate sumps and components will be performed regularly to ensure proper operation of the collection system as detailed in **Table 1**.

Michigan rule R 299.4432 requires that leachate system inspections are performed as often as necessary to maintain compliance with the rule. AHLF sumps will be inspected daily (days when the landfill is operating) for general operation. Each primary leachate collections sump will be operated to maintain leachate levels below the compliance elevations listed in **Appendix A**. In the event that the leachate collection system is not operational or leachate levels are exceeded and the facility is non-compliant, the Site must initiate the

leachate contingency plan presented in **Appendix B** which details the procedures for diagnosing and implementing appropriate repairs to achieve compliance promptly.

AHW LCS contains a system of perforated pipes which collect leachate from the leachate collection layer and transmit it via gravity to the cell sump. In general, each collection line has a cleanout riser. If necessary, the collection lines will be cleaned by jetting, flushing and/or vacuuming by a qualified contractor to perform the leachate collection pipe cleaning. Site personnel may also clean the lines if jetting equipment is available. The leachate collection system inspection frequency schedule is outlined in **Table 1**.

Since some leachate collection system components have potentially long lead times for replacements, spare leachate collection pumps and components will be maintained in the site inventory for use as replacements in the event of failure. In general, one operable spare of each leachate sump electric submersible pump type will be maintained in inventory. Other spare components such as fuses, relays, motor starters and transducers will be maintained on site as deemed appropriate by the site general manager.

2.2 Leachate Transmission Line Maintenance Requirements

The site is currently serviced by two main perimeter leachate gravity/ force main lines as noted on Figure 1 in **Appendix A.** Starting from the Northwest corner of the landfill, leachate from the collection system in Cell 4, located in the northwest corner of the landfill, discharges to a 4”/8” dual contained force main. The force main travels south approximately 1,300-feet before discharging into an 8” gravity sewer. This sewer runs south along the west side of the landfill where Cell 2 leachate is discharged. As the sewer turns to the east it becomes a 10-inch sewer that extends along the southern side of the landfill, collecting leachate from Cells 1/3 & 5. The sewer discharges to a double-contained pump station named the Arbor Hills West Pump Station (AHWPS). The AHWPS is controlled by means of float switches that control the two pumps in the station. The float switches turn the pumps off at low level and turn both pumps on at high level. If the level of liquids in the pump station exceed the high level, an alarm will activate and the control system will turn off all the cell leachate pumps (primary and secondary).

The AHWPS discharges the liquid to a 926,000-gallon above-ground storage tank located south of the railroad tracks by means of a 4-inch force dual contained force main. This force main will be extended in the future for the installation of a sump in Cell 6.

Liquids extracted from the Arbor East Manhole are pumped to a 321,000-gallon above-ground storage tank located south of the railroad tracks by means of a 4-inch dual contained force main.

The force main and gravity main lines contain above grade cleanout access risers/manholes so that the system can be inspected and cleaned/jetted if necessary. The leachate transmission lines will be inspected on an annual basis and cleaned if necessary. See **Table 1** for the leachate collection system inspection frequency.

2.3 Leachate Storage Tank Maintenance Requirements

The site presently operates three above-ground leachate storage tanks. A 926,000-gallon and 540,000-gallon for Arbor Hills West leachate, and a 321,000-gallon tank for Arbor Hills East leachate. All tanks are located south of the railroad tracks within a secondary containment area to contain potential spills or leaks. The facility also has two 50,000 gallon above-ground horizontal steel storage tanks (bullet tanks) for additional liquids storage and pretreatment.

The storage tanks and associated systems, including transfer piping, will be inspected for operation on a monthly basis. Deterioration of the tank system or malfunction of equipment or structures, or any other problems identified by the inspection must be promptly corrected. Where a deficiency already occurred, remedial action must be taken to correct or repair the tank system. Inspections and maintenance forms, including any corrective actions as well will be retained in the facility's operating record for at least five years. The storage tanks are subject to inspection and certification requirements as outlined in the facility EERP (Spill Plan). The current EERP should be consulted for those requirements.

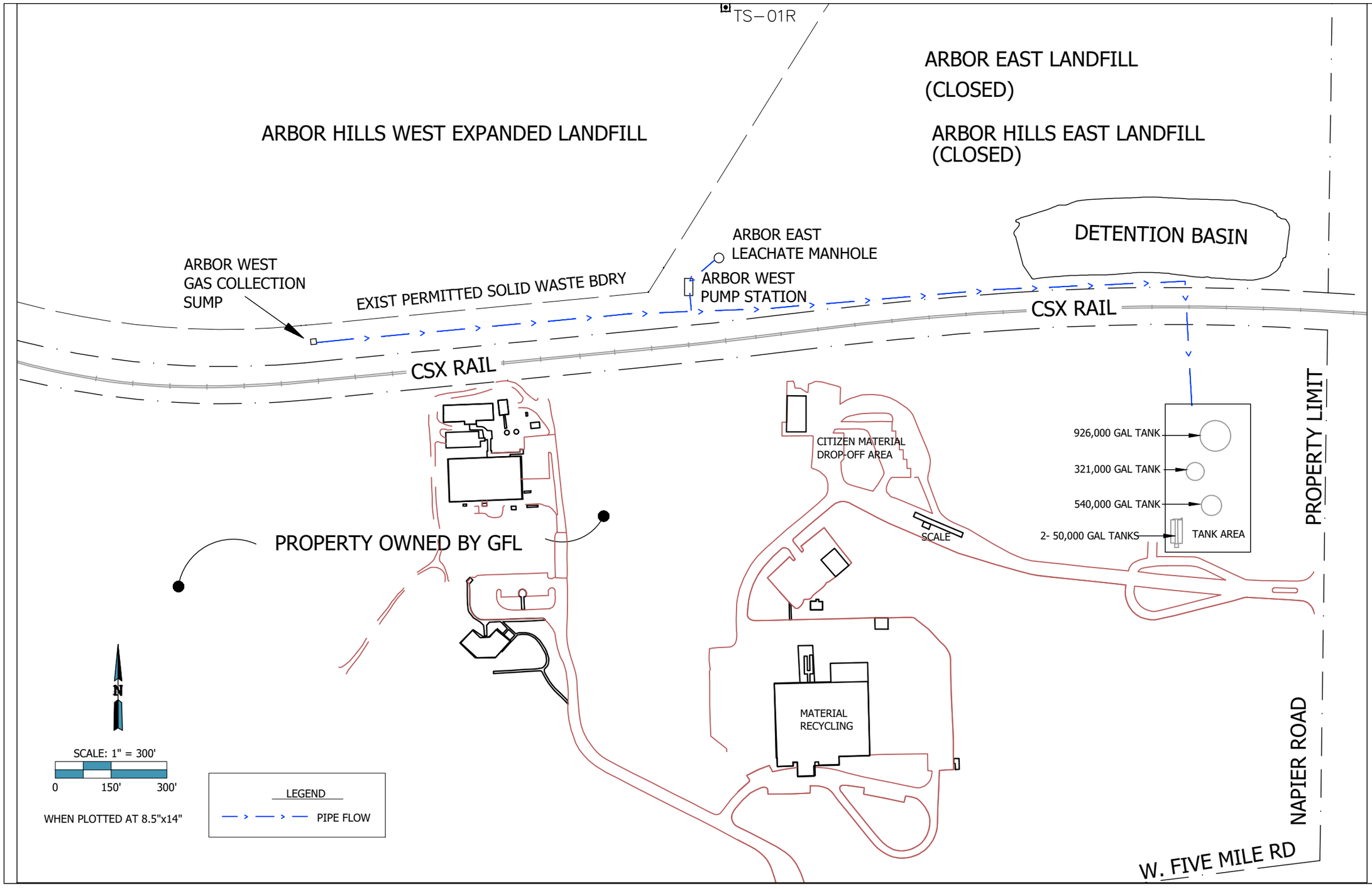
Table 1 – Inspection Frequency Schedule for the Leachate Collection System

Item or Conditions to Be Inspected	Approximate Inspection Frequency	Inspection Procedure	Criteria for Acceptance
Leachate System Sumps/Lift Stations	Daily	Perform general inspection and document in the site operating record.	No malfunctions observed.
Leachate Collection Pipes	Annual	Inspect accessible pipes by camera other means for flow blockage. If necessary Jet-clean or flush pipelines to remove foreign material.	No flow blockage or damage observed.
Leachate Transmission Lines	Annual	Inspect accessible pipes by camera other means for flow blockage. If necessary Jet-clean or flush pipelines to remove foreign material.	No flow blockage/restriction or damage observed. Flow restrictions minimized.
Lift Station and Tank Valves	Quarterly	Inspect and exercise valves by opening and closing the valve twice thru entire valve cycle.	No stress, excessive binding or damage observed.
Lift Station and Tank Transducers	Quarterly	Inspect floats or transducers. Remove as necessary. Verify operation and reinstall.	No stress or damage observed. Levels transmitted accurately.
Pump Intake Screens	Quarterly	Inspect leachate submersible pumps for adequate function (including leachate lift stations). Remove & clean intake screens as required.	No blockage or damage observed.
Flow Meters	Quarterly	Inspect flowmeters for function. Remove and clean if required.	Flowmeter is clean, clear of obstructions and operating properly.
Leachate Storage Tanks	Monthly	Perform tank inspection as outlined in EERP.	No malfunctions observed.

APPENDIX A

Figures

Arbor Hills Liquid Management Schematic
As-Built Sump Drawings



DRAWN BY: BAC
DESIGNED BY:
REVIEWED BY: BAC
DATE: 02/7/2022
FILE: 9001-311-10-13
CAD: AHLTANK-SCHEMATIC
SHEET 1 OF 1

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LIQUIDS MANAGEMENT
ARBOR HILLS LANDFILL
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NORTHVILLE, MI 48168

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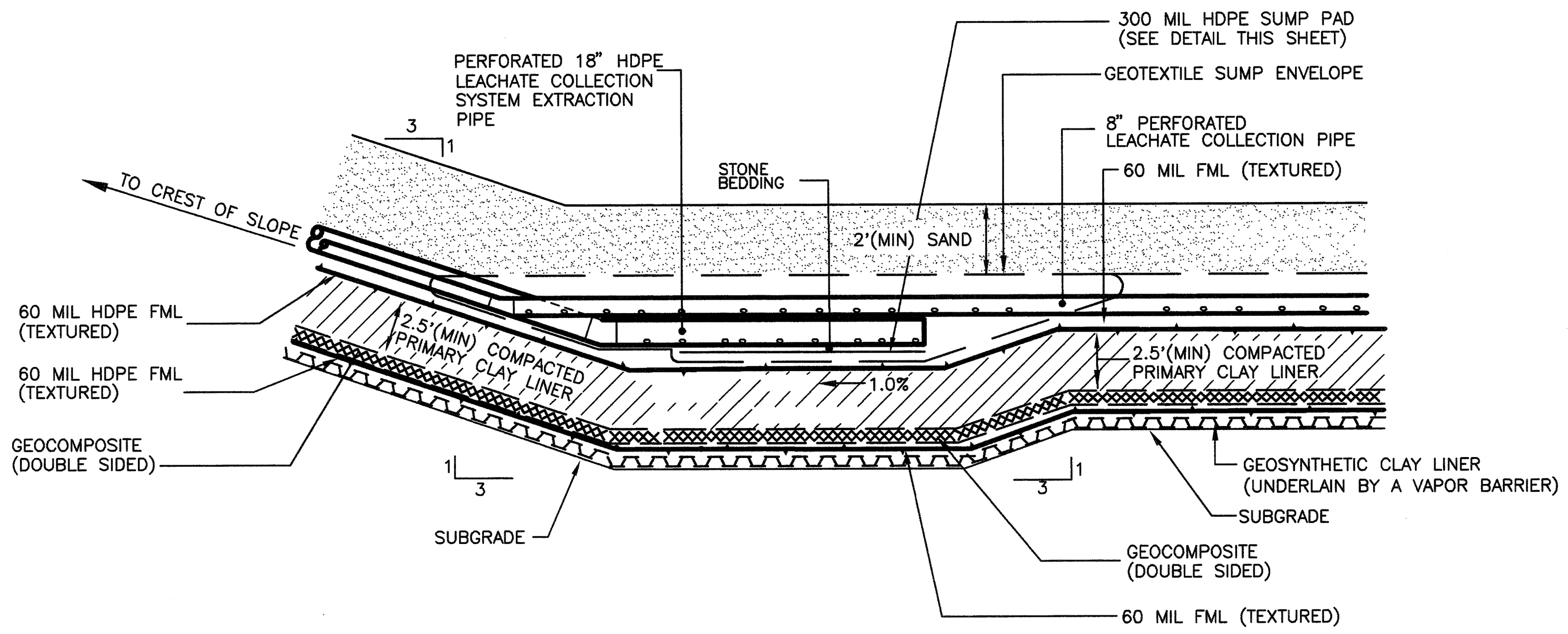
GFL GREEN FOR LIFE



SUMP CROSS SECTION A–A

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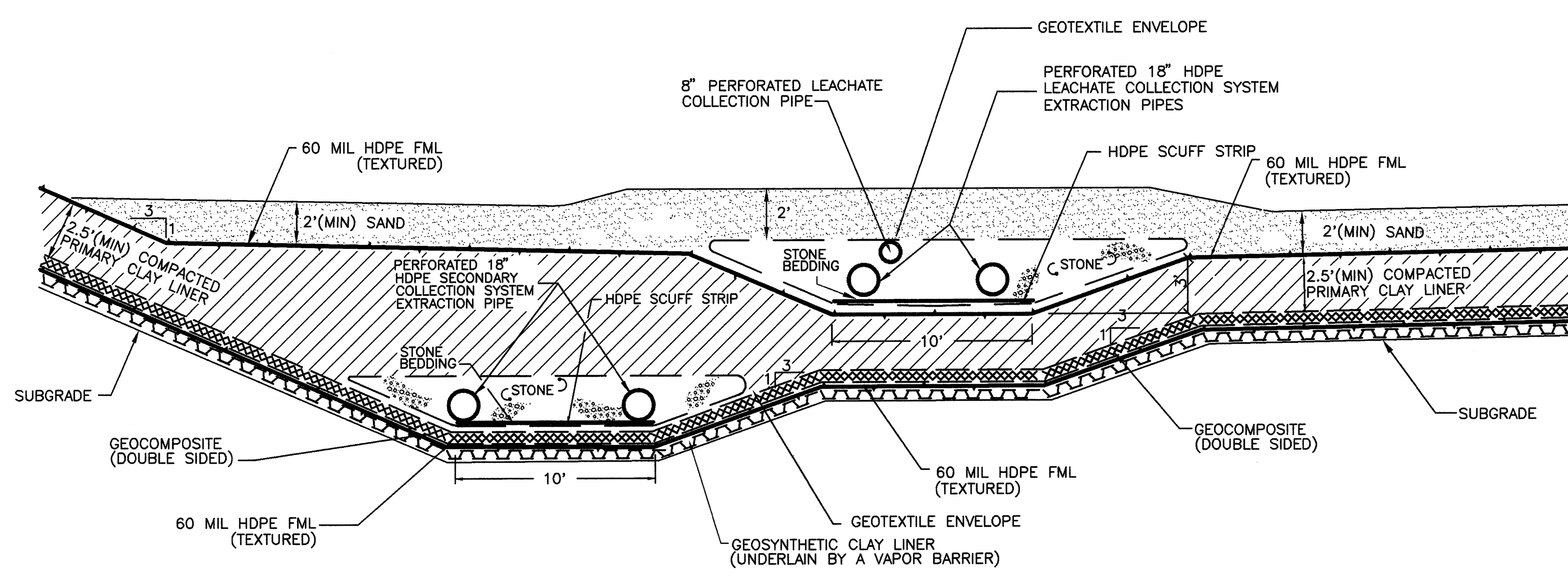

SUMP CROSS SECTION B–B

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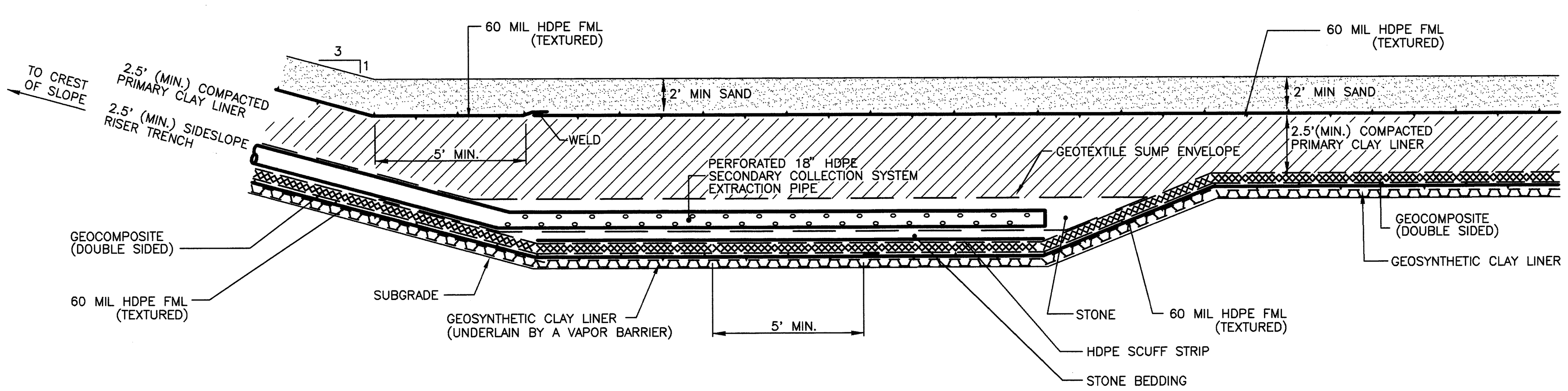
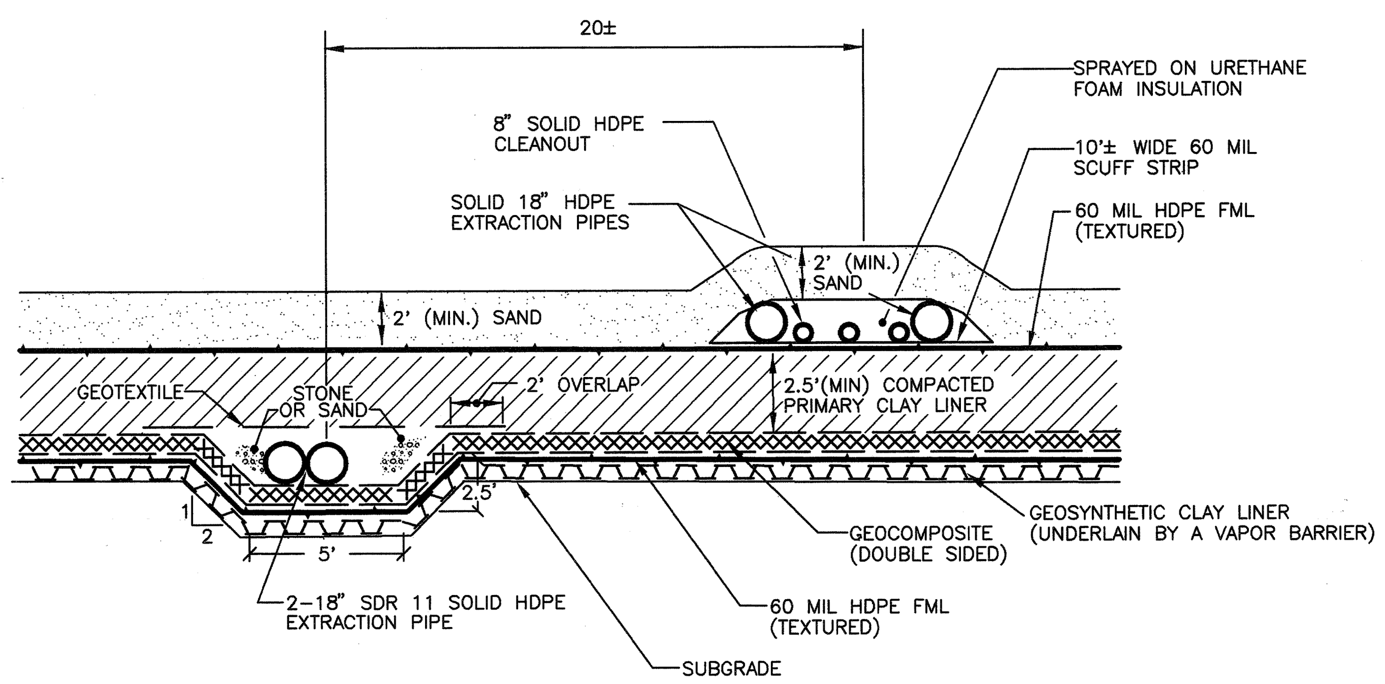


SUMP CROSS–SECTION C–C

NOT TO SCALE



SECTION D–D
SIDE SLOPE RISER TRENCH DETAIL

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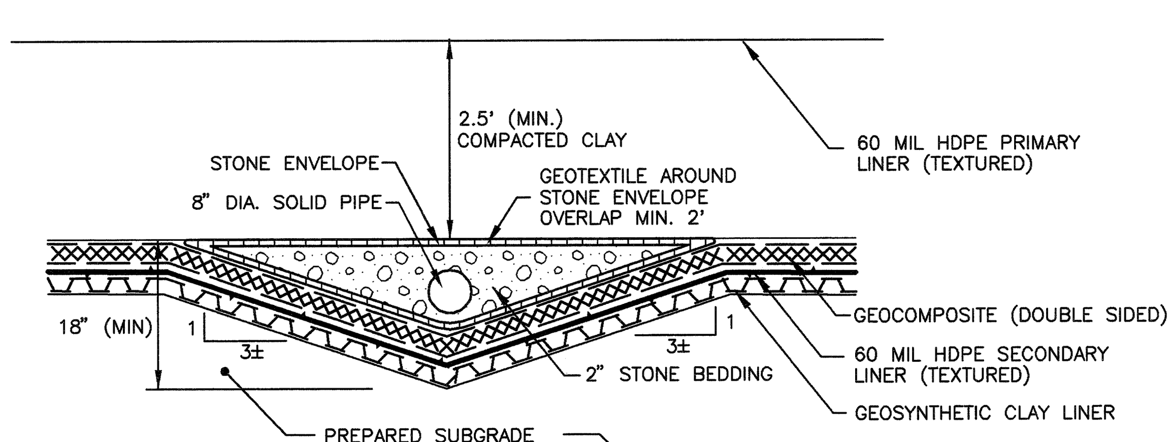
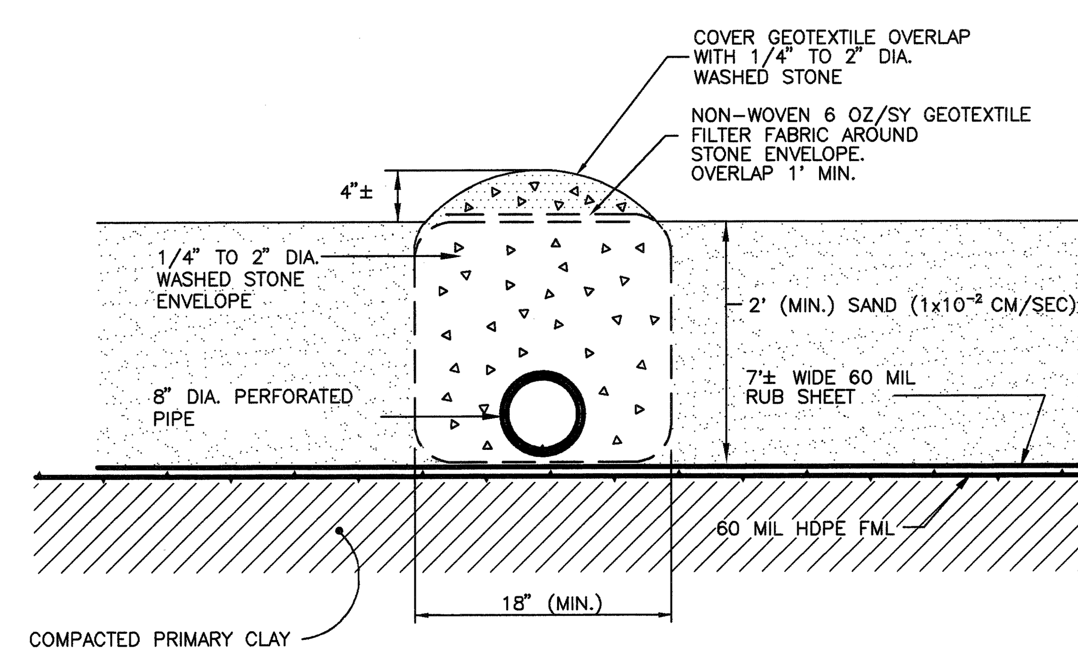


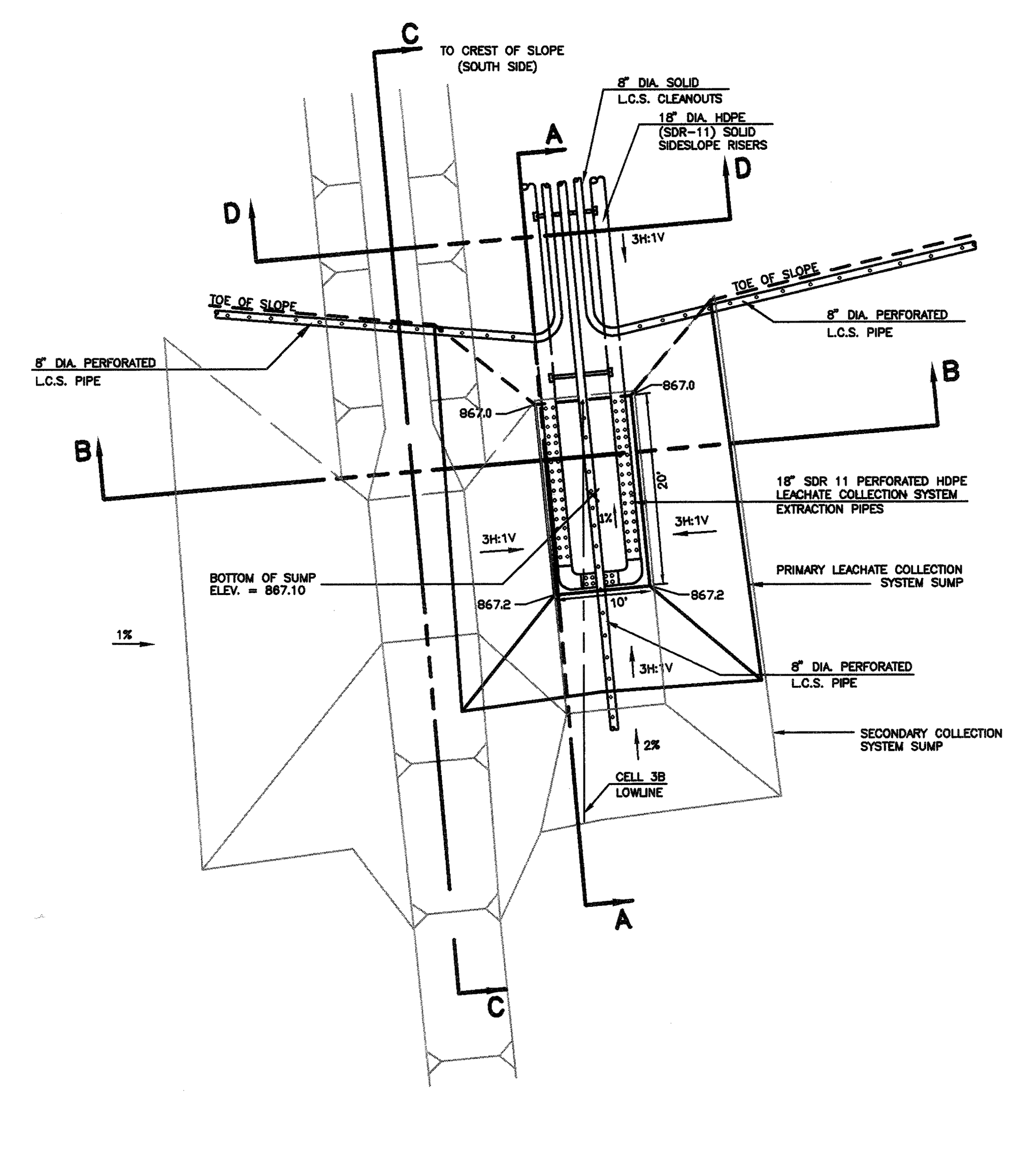
SECTION E–E
CELL 1D SECONDARY COLLECTION TRENCH

NOT TO SCALE



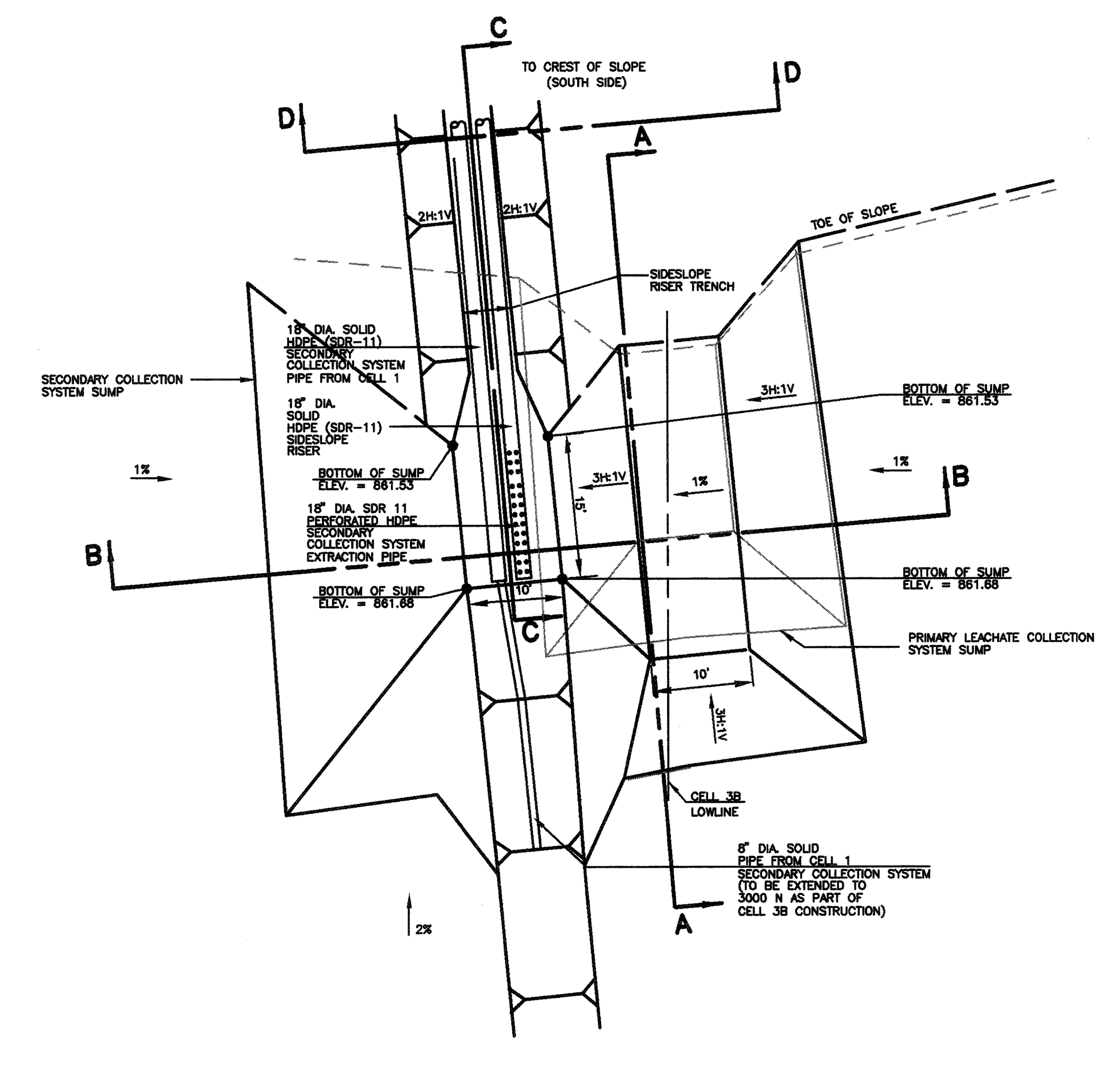
PRIMARY LEACHATE COLLECTION PIPE SYSTEM DETAIL

NOT TO SCALE



CELL 3B PRIMARY LEACHATE COLLECTION SYSTEM SUMP PLAN

NOT TO SCALE



CELL 3B SECONDARY COLLECTION SYSTEM SUMP PLAN

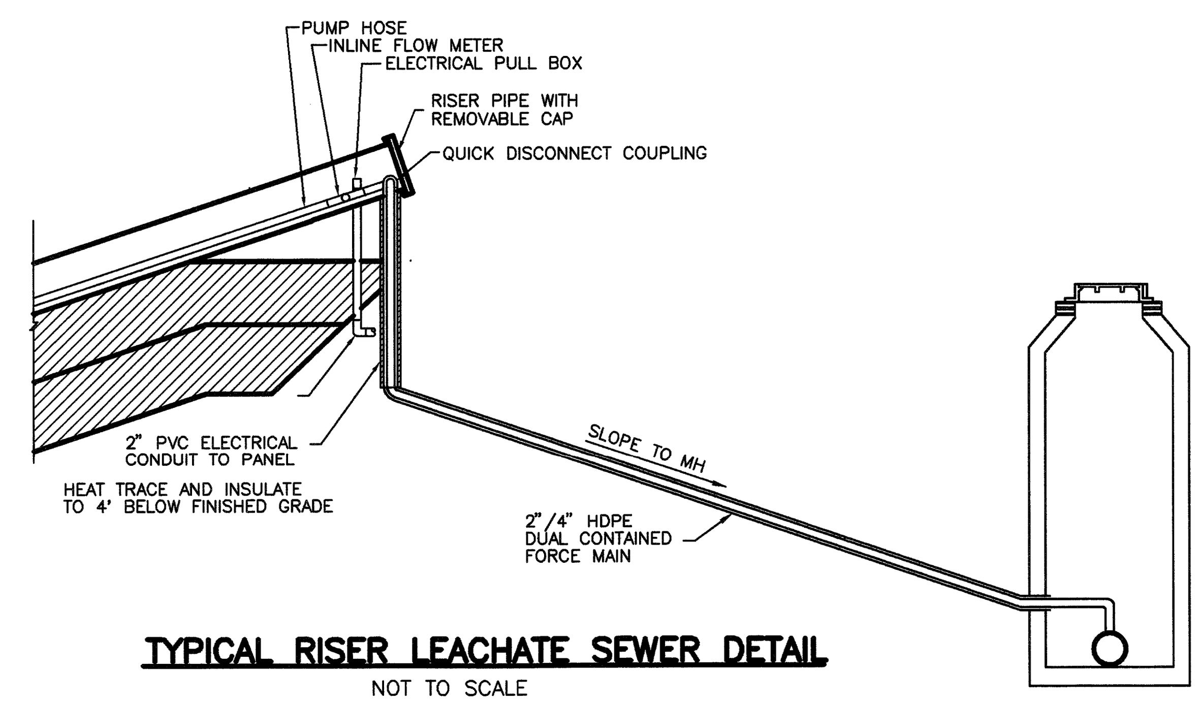
NOT TO SCALE

LEGEND

- FML (SMOOTH)
- FML (TEXTURED)
- GEOCOMPOSITE (SINGLE SIDED)
- GEOCOMPOSITE (DOUBLE SIDED)
- GEONET WITH GEOTEXTILE ON TOP (NOT BONDED)
- GEOSYNTHETIC CLAY LINER (UNDERLAIN BY A VAPOR BARRIER)
- GEOTEXTILE FILTER
- EXISTING REFUSE

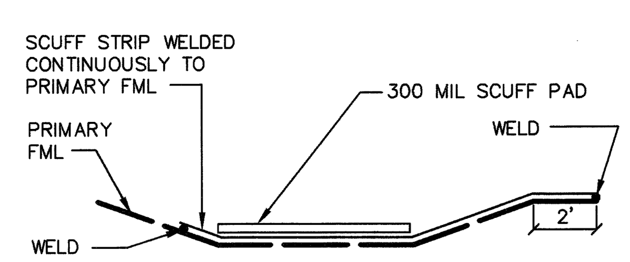
NOTE: NO WELDS ON PRIMARY OR SECONDARY FML TO OCCUR WITHIN SUMP OR WITHIN 5' OF SUMP CREST.

WELDS FOR SCUFF STRIPS TO BE MIN. OF 2' FROM SUMP CREST.



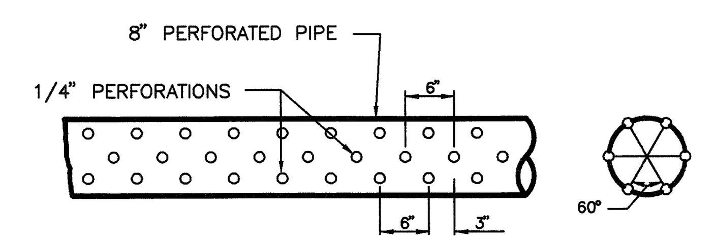
TYPICAL RISER LEACHATE SEWER DETAIL

NOT TO SCALE



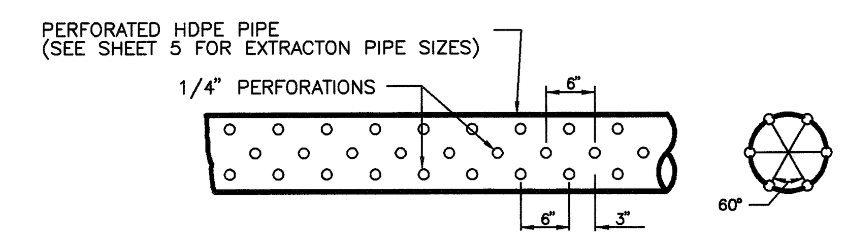
TYPICAL SUMP PAD/ SCUFF STRIP CROSS SECTION

NOT TO SCALE



LEACHATE COLLECTION SYSTEM PIPE PERFORATION DETAIL

NOT TO SCALE



PIPE PERFORATION DETAIL FOR HDPE EXTRACTION PIPE

NOT TO SCALE

RELEASED FOR CONSTRUCTION	4/11/95
RELEASED FOR BID	2/1/95

MIDWESTERN CONSULTING

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NORTHVILLE, MICHIGAN 48167
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ARBOR HILLS WEST EXPANDED SANITARY LANDFILL

CELL 3B
DETAILS

10

JOB No. 94273

DATE: 10-17-94
SHEET 10 OF 12

REVISIONS:
UPDATED FOR CONSTRUCTION 1/24/95

R:\94273\DWG\94273012 Fri Mar 1 13:15:08 1996

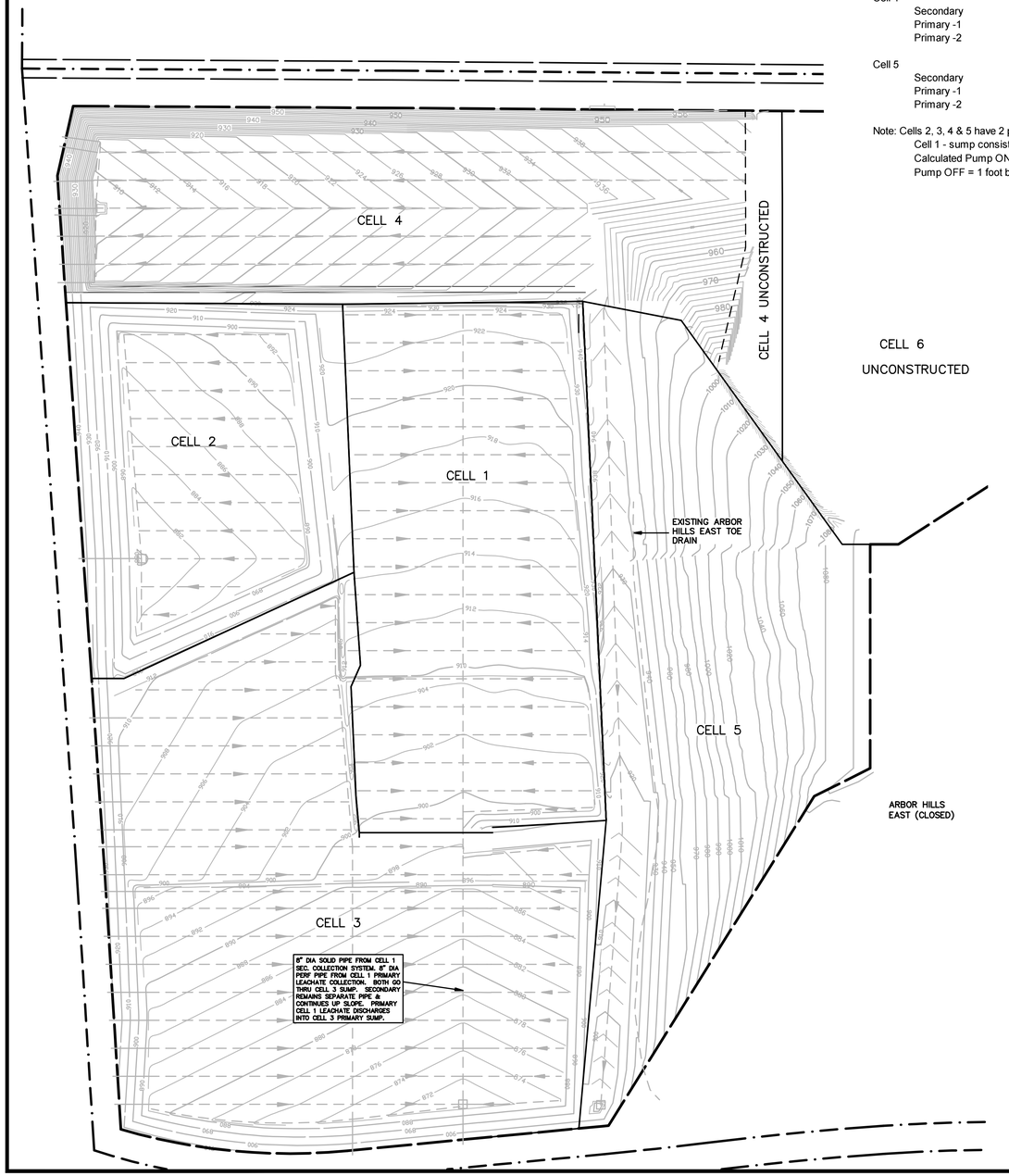
SCALE: 1" = 240'

0 240 480 720

LEGEND

950 — LANDFILL BASE CONTOURS

EXISTING 8" PERF. LEACHATE COLLECTION PIPE

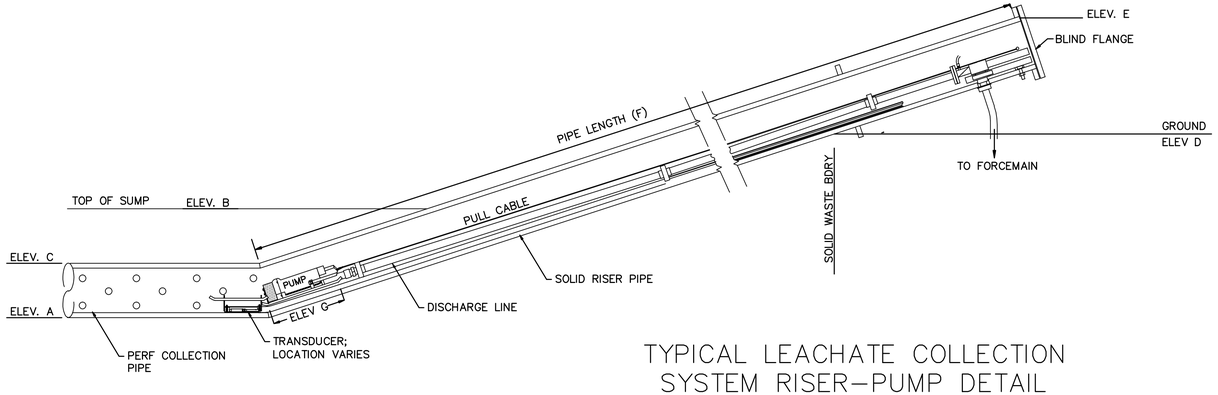


CELL 6

UNCONSTRUCTED

Detail Location:	Pump HP	Bottom of Sump Elevation (ft) A	Top of Sump Elevation (ft) B	Top of pipe in Sump (ft) C	Liner elev at Refuse Limit Bdry (ft) D	Top of Riser Elevation (ft) E	Delta of sump vs. riser elev (ft)	Length of Riser Pipe (ft) F	Dist. of transducer from pump bottom (ft) G	Elevation of Transducer (ft)	Pump ON elev (ft)	Calculated Pump ON above tranducer (in)	Pump OFF elev (ft)	Calculated Pump OFF above tranducer (in)
Cell 1														
Secondary*	0.5	861.5	864.45	863.3	908.15	911.6	50.0	150	0.0	861.8	865.3	3.5	862.8	
Cell 1 Primary is combined with Cell 3			n/a	n/a	n/a	n/a								
Cell 2														
Secondary	0.5	869.6	872.6	871.0	944.37	946.2	76.6	230	0.0	869.9	873.6	45	871.6	21
Primary -1	1.5	876.7	880.2	878.4	944.37	950.2	73.5	221	3.9	878.3	881.2	36	879.2	12
Primary -2	1.5	876.7	880.2	878.4	944.37	950.2	73.5	221	3.9	878.3	881.2	36	879.2	12
Cell 3														
Secondary	0.5	861.5	864.45	863.2	908.15	911.6	50.2	150	0.0	861.7	865.5	45	863.5	21
Cell 1/3 Primary -1	1.5	867.1	870.7	868.9	908.15	915.0	47.9	144	3.9	868.7	871.7	37	869.7	13
Cell 1/3 Primary -2	3	867.1	870.7	868.9	908.15	915.0	47.9	144	4.7	868.9	871.7	34	869.7	10
Cell 4														
Secondary	0.5	901.5	904.5	903.3	950.52	953.4	51.9	156	0.0	901.8	905.5	45	903.5	21
Primary -1	1.5	904.5	907.5	906.3	950.52	955.5	51.0	153	3.9	906.1	908.5	29	906.5	5
Primary -2	2	904.5	907.5	906.3	950.52	955.5	51.0	153	1.6	905.3	908.5	39	906.5	15
Cell 5														
Secondary	0.5	883.0	886	884.8	908.15	914.0	31.0	93	0.0	883.3	887.0	45	885.0	21
Primary -1	1.5	888.4	891.3	890.2	908.15	913.1	24.7	74	3.9	890.0	892.3	28	890.3	4
Primary -2	3	888.4	891.3	890.2	908.15	913.1	24.7	74	4.7	890.2	892.3	25	890.3	1

Note: Cells 2, 3, 4 & 5 have 2 primary riser pipes; data assumed to be relatively equal for both
Cell 1 - sump consists of an 8-inch pipe
Calculated Pump ON elevation = Top of Sump +1 ft
Pump OFF = 1 foot below top of sump



TYPICAL LEACHATE COLLECTION SYSTEM RISER–PUMP DETAIL

NOT TO SCALE

MIDWESTERN CONSULTING
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Landscape Architects

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ADVANCED ARBOR HILLS LANDFILL
SALEM TOWNSHIP, WASHTENAW COUNTY, MICHIGAN
EXISTING LEACHATE COLLECTION SYSTEM PUMPS

1

DATE: 4/28/20
SHEET 1 OF 1
CADD: BAC
ENG: BAC
PM: AJG
TECH:
01418\2020\LEACHATE-EX.PWF

JOB No. 01418
REVISIONS:
REV. DATE

APPENDIX B

Leachate Contingency Plan

FEBRUARY 2022

ARBOR HILLS LANDFILL

LEACHATE CONTINGENCY PLAN

PREPARED FOR:
ARBOR HILLS LANDFILL
10599 WEST FIVE MILE ROAD
NORTHVILLE, MI 48168

PREPARED BY

Weaver Consultants Group

INVESTIGATION MEASURES

Purpose

This document serves as the contingency plan and presents the additional requirements and operational practices for the leachate collection and management system within the Arbor Hills Landfill located in Salem Township, Washtenaw County, Michigan (the "Site").

Investigation Measures

Arbor Hills Landfill (AHLF) has been designed with a leachate collection system and has been designed to operate to maintain the level of leachate less than one (1) foot over the liner. If the level of leachate at the base of the liner system is greater than one (1) foot AHLF will attempt to determine the cause of the exceedance. Possible causes for exceedance may include:

- Temporary shutdown of leachate collection system for operational maintenance;
- Loss of authorization to discharge leachate to WWTP or temporary shutdown of direct discharge;
- Loss of authorization to haul leachate;
- Inoperable sump pump or controls;
- Inoperable submersible liquid level transmitter or float switch;
- High tank or lift station liquid levels causing system shutdown;
- Blockage in leachate discharge piping or forcemain;
- Breaches in landfill cover system allowing excessive infiltration; and/or
- Heavy rainfall or multiple precipitation events causing higher than normal leachate generation within the landfill. Typically these events would be in excess of .1 inches of precipitation in 24 Hours.

An evaluation of the system to determine the cause will be completed as soon as possible after detection of an exceedance. The initial evaluation performed by facility personnel will be completed within one business day (24 hours). Investigations requiring outside contractors to be mobilized may take longer but will be completed as soon as practicable.

The following will be considered when investigating mechanical or physical breakdowns:

1. The sump, located in the cell in which the exceedance was detected, will be checked to determine if it is of working order. If this cannot be done while the pump is installed in the sump, it shall be removed either by pulling it up or by removing the entire interior riser pipe from the exterior sleeve. The pump will be checked for electrical problems or hydraulic blockage.
2. The automatic liquid-level indicator will be programmed to provide an automatic pump response and alarm system. If the pump is not operating, the indicator will be checked to determine if it is the cause of the malfunction.
3. In the event of pump or liquid indicator failure, the light or readout on top of the pump electrical panel will typically signal that the system has malfunctioned. If there is a need to remove the pump and liquid level indicator, the landfill operator will proceed as follows:
    a. Disconnect the electrical supply to the pump and transducer.
    b. Disconnect the leachate transfer piping at the union in front of the sampling spigot and valve.
    c. Remove the pump/transducer from the side slope (or vertical) riser.
4. If blockages of liquid flow appear to be the cause of the malfunction, the leachate collection pipes may be cleaned by jetting or vacuum truck (introducing a pressurized water stream in the cleanout or sump and evacuating the solids). This cleaning will be provided by an outside contractor.

If the leachate head exceedance is not caused by one of the possible causes listed in this section, additional remedial investigation measures will be implemented. The site may consult with outside consultants or contractors to determine additional investigation options. If the issue is identified and repairs can be initiated promptly (typically within 7 days), the corrective measures section guidelines and timetable should be implemented.

CORRECTIVE MEASURES

Once the cause of the leachate head exceedance is determined, action will be taken as soon as practical to restore the leachate head to less than one (1) foot. Specific measures to be taken may include:

1. If interruption is caused by temporary shutdown of the leachate system, a temporary shutdown of the WWTP, or a temporary loss of hauling capability, the leachate will be pumped into on-site storage tanks or arrangements will be made to transport leachate to another WWTP.
2. If the volume of leachate generated during the shutdown is expected to exceed available on-site storage capacity, alternate disposal methods will be investigated or additional temporary storage will be sought. If leachate hauling is the problem, nearby hauling companies will be contacted regarding their availability to haul leachate. If leachate disposal is the problem, other WWTP's will be contacted regarding their availability to accept leachate.
3. If a submersible leachate sump pump is inoperable, the pump will be removed and the service representative contacted. A spare pump and pump parts will be stored on-site, and this pump will be installed as a replacement for the inoperable pump.
4. If submersible liquid-level indicator is inoperable, the indicator will be removed and a service representative will be contacted for service and repair.
5. Blockages in the leachate collection piping will be cleared by inserting a water pressure driven nozzle into and through the pipe. A contractor capable of performing high pressure cleaning will be contacted for service.
6. If leachate generation rates exceed pumping capacity, additional cover may be placed over the active landfill area to reduce infiltration or the capacity of the pumping system will be increased to accommodate higher flows. Additional pumps may be added or existing pumps replaced with higher capacity units to accommodate temporary increases in flow rates.

It will typically take several days to several weeks after a repair is made to monitor and measure if remedial measures are correcting head level exceedances caused by unexpected maintenance or excessive flow issues. If the leachate head exceedance is not corrected by

the procedures listed in this plan within 30 days, EGLE will be notified. Additional corrective measures will be initiated as recommended through consultation with EGLE.

REPORTING REQUIREMENTS

If the implemented corrective measures are successful and are completed within thirty (30) days of the initial detection of leachate head exceedances (over 1 foot), the corrective measures taken and the results of those measures will be noted in the site operating record for future review but will not submitted separately to EGLE.

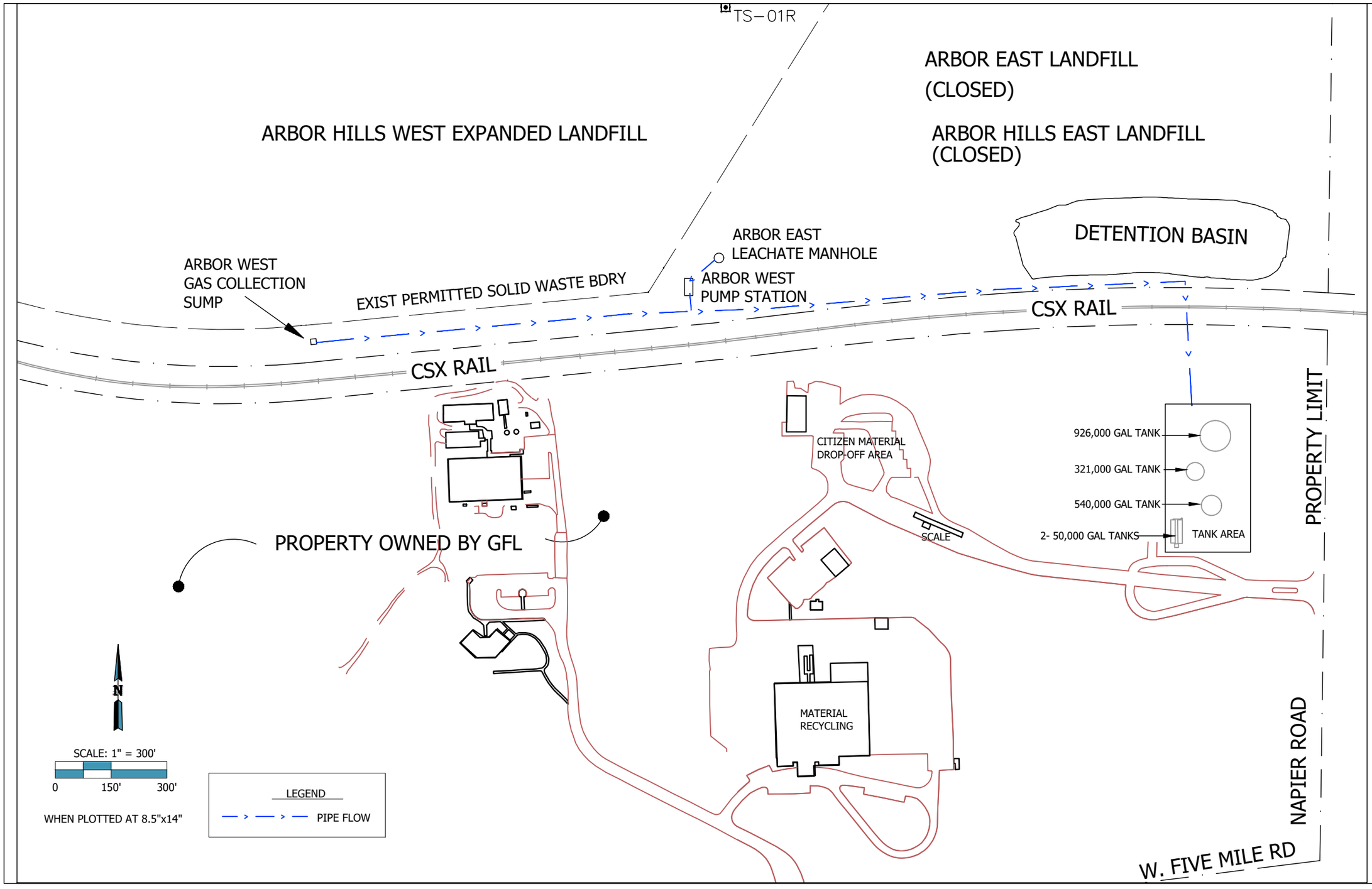
If a leachate head exceedance cannot be corrected by the measures above, EGLE will be notified of the inability to correct the exceedance within two business (2) days of the determination that corrective measures have been unsuccessful.

If the implemented corrective measures are unsuccessful, EGLE will be consulted and a leachate collection remediation plan will be developed and implemented. EGLE will be notified that the plan has been implemented and a copy of the plan will be placed in the facility operating record.

APPENDIX L

Map identifying 970,000-gallon storage tank, 540,000-gallon storage tank, two 50,000 gallon "bullet" tanks, Arbor Hills West Pump Station, and Gas Collection Well liquid sump

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE



DRAWN BY: BAC
DESIGNED BY:
REVIEWED BY: BAC
DATE: 02/7/2022
FILE: 9001-311-10-13
CAD: AHLTANK-SCHEMATIC
SHEET 1 OF 1

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LIQUIDS MANAGEMENT
ARBOR HILLS LANDFILL
10599 W. FIVE MILE RD
NORTHVILLE, MI 48168

PREPARED FOR:
GFL GREEN FOR LIFE

APPENDIX M

Cover page of Operation and Maintenance Manual for the aeration system and carbon filtration systems

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE

OPERATIONAL & MAINTENANCE MANUAL

926K Leachate Jet Mix
Aeration and Carbon
Filtration Systems

PREPARED FOR:

Arbor Hills Landfill
10599 West Five Mile Rd
Northville, MI 48168

LANDMARC
ENVIRONMENTAL SYSTEMS, LLC
3516 OGDEN DR. SPRINGFIELD, IL 62702

APPENDIX N

Section 6.2 of AHL Operations Plan for Asbestos

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE

6.2 Asbestos Waste Disposal

The primary health objective in handling asbestos waste for disposal is the prevention of the release of asbestos-containing particles. Such waste may be accepted by Arbor Hills and must be handled in accordance with applicable regulations of the National Emission Standards for Hazardous Air Pollutants (NESHAP) and this Operating Plan. Some procedures implemented by Arbor Hills include:

- Friable asbestos waste must be in a wetted condition and in minimum 6 mil bags or other tight containers containing warning labels.
- To dispose, a pit is dug in existing refuse; asbestos placed in it and promptly covered with refuse and daily cover.
- The Operations Manager and/or Operations Supervisor, and/or Designated Individual shall supervise all unloading and disposal of asbestos waste and certify that it is immediately covered with soil after disposal into the pit. This individual also collects site coordinate location of the pit.
- Delivered waste must be manifested, and upon arrival may be inspected for conformance to Arbor Hills and regulatory standards.
- Careful off-loading and immediate covering of the asbestos waste, with no compaction equipment operating directly on top of the asbestos waste.
- Water or other wetting agent available in the event of container breakage or spills.
- No asbestos waste within 15 feet of final grade.
- Maintain accurate records of the location, depth, area and quantity of asbestos waste in the Facility Operating Record.

APPENDIX O

EGLE approval, dated June 2, 2021, of an extension for higher operating values for temperature for Wells of Interest

Consent Judgment
Michigan Department of Environment, Great Lakes, and Energy v Arbor Hills Landfill, Inc., Ingham County Circuit Court, Case No. 2020-0593-CE

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
JACKSON DISTRICT OFFICE

GRETCHEN WHITMER
GOVERNOR

LIESL EICHLER CLARK
DIRECTOR

June 2, 2021

Mr. Anthony Testa
Green for Life Environmental, Arbor Hills Landfill Inc.
10599 West Five Mile Road
Northville, MI 48168

SRN: N2688, Washtenaw County

Dear Mr. Testa:

SUBJECT: Arbor Hills Landfill, Washtenaw County
Renewal of Higher Operating Value Temperature Waivers

The Michigan Department of Environment, Great Lakes and Energy, Air Quality Division (AQD), in 2019 letters dated May 6, June 3, June 21, August 1, October 17, December 6, and 2020, letters dated January 16, January 30, May 6 (corrected July 9), September 1, 2, 11, 23, and December 8, granted waiver approvals to Green for Life Environmental, Arbor Hills Landfill, Inc. (AHL), for higher operating value (HOV) temperatures for twenty-four vertical gas extraction wells designated as Wells of Interest (WOI) and one leachate collection sump (TS01R).

The existing HOV waiver approvals lapsed on May 6, 2021. On May 14, 2021, AQD received AHL's request of a one-year extension of the HOVs for twenty-two wells and one leachate collection sump (TS01R). Two of the wells, AHWW310R2 and AHWW284R, do not currently have an approved HOV. Also, in their letter AHL is requesting an Alternate Operating Temperature, HOV, and the removal of the WOI designation for wells AHW206R3 and AHW251R2.

The current HOV waiver extension request covers the following twenty-two vertical gas extraction WOI: AHWW207R, AHW237R3, AHWW0258R, AHW259R4, AHW264R2, AHW272R3, AHWW0279, AHWW0284R, AHWW0285R, AHWW0286R, AHWW0290, AHWW0297, AHWW0299R, AHWW0300, AHWW0301, AHWW0302, AHWW0306R, AHWW0310R2, AHWW0311R, AHWW0312, AHWW0315, AHWW0503, and one leachate collection sump AHWTS01R.

The Arbor Hills Landfill included a summary Table of the current WOI wells and associated HOV temperatures for which they are requesting the one-year extension. This Table is copied below:

TABLE 1
Requested Alternate Operating Conditions for Temperature (WOI)

Well ID	Requested Temp F
AHWW207R	145
AHW237R3	145
AHWW258R	150
AHW259R4	170
AHW264R2	145
AHW272R3	170
AHWW0279	160
AHWW284R	145
AHWW285R	170
AHWW286R	180
AHWW0290	170
AHWW0297	160
AHWW299R	160
AHWW0300	160
AHWW0301	160
AHWW0302	160
AHWW0306R	145
AHW310R2	145
AHWW311R	150
AHWW0312	180
AHWW0315	150
AHWW0503	145
AHWTS0IR	145

The New Source Performance Standard (NSPS) for Municipal Solid Waste Landfills, Subpart WWW requires AHL to monitor its well field monthly in accordance with 40 CFR 60.755(a). Operating requirements for gas collection and control systems (GCCS) are promulgated at 40 CFR Sec. 60.753(b), (c), and (d). These requirements are also contained in AHL Renewable Operating Permit MI-ROP-N2688-2011a.

The Arbor Hills Landfill stated the reason for the requested HOVs for WOI locations remains consistent with that outlined in the initial HOV request dated March 28, 2019 and approved by EGLE on May 6, 2019: However; there is a requested change to the currently approved waiver. AHL proposes to conduct downhole temperature profiles

utilizing data loggers (new) spaced approximately evenly throughout the extent of the well (i.e., 100-foot well; four (4) data loggers spaced 20-feet apart) on a quarterly basis for each WOI location. AHWTS01R will continue to be exempt from downhole temperature profiles per EGLE correspondence dated February 25, 2020 and May 6, 2020 WOI HOV waiver extension.

Finally, it is important to note that AHL included a WOI Management Plan section in their letter referencing heat extraction, installing a new bentonite or foam seal around the base of the affected wells that will also include a 5'x5' geomembrane curtain, and other actions to manage the WOI wells. AHL states their intent is to work with Fortistar (Arbor Hills Energy) to move operation & maintenance (O & M) control of all WOI locations to the Arbor Hills (Landfill) team. This move is anticipated to occur on or around June 1, 2021.

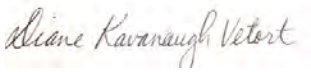
The AQD approves of AHL's request for the HOVs for temperature for AHW206R3 and AHW251R2 of 145 deg. F. for one year. AHL will need to reassess the status of the wells at the end of one year and resubmit a request as needed. AQD approves of the removal of these well WOI designations, based on the detailed information provided in the request.

The AQD approves of AHL's proposal to conduct downhole temperature profiles utilizing data loggers spaced approximately evenly throughout the extent of the well. AHL's Bi-monthly (March/April 2021) WOI Report states the 2nd quarter 2021 event is anticipated to be the final vertical temperature profile event completed by MCC.

The AQD approves the waiver extension of the specified 23 WOI HOV temperatures for one year until May 6, 2022, provided that AHL implement the WOI Management Plan identified in the May 14, 2021, request. The HOV waivers allow AHL to operate these wells in excess of the NSPS limit of 131 ^{0} F, at the temperature stipulated in the waiver. The Arbor Hills Landfill requested the WOI Status Report continue to be submitted every other month during the one year extension. Under the terms of the conditional waiver, AHL is required to submit a WOI progress report by the 15th of the months, July 2021, September 2021, November 2021, January 2022, March 2022, and May 2022, containing the pertinent well head gas data and other requested data from the prior two months for a total of 6 reports.

Thank you for your cooperation. If you have any questions pertaining to this response, please contact me at the number listed below.

Sincerely,



Diane Kavanaugh Vetort
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cc.
Mr. David Seegert, GFL
Mr. Randy Frank, GFL
Mr. Anthony Falbo, Fortistar
Mr. Eric Kataja, Fortistar
Ms. Dana Oleniacz, EIL LLC
Mr. Larry Bean, EGLE
Mr. Greg Morrow, EGLE
Mr. Gary Schwerin, EGLE
Mr. Scott Miller, EGLE
Ms. Jenine Camilleri, EGLE