HYDROGEOLOGICAL INVESTIGATION
PROPOSED DEVELOPMENT AT 127 1ST LINE, ELORA
TOWNSHIP OF CENTRE WELLINGTON, ONTARIO

Client

Elora Greens Inc.
120 Matheson Blvd. E., Unit 3
Mississauga, ON L4Z 1X1

Prepared by:

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Project No. 2501179DH

August 5, 2026

PLANET ENGINEERING Inc.
Consulting Engineers

August 5, 2026 Reference No.: 2501179DH

Elora Greens Inc.
120 Matheson Blvd. E., Unit 3
Mississauga, ON L4Z 1X1

Attention: Farhan Kamali Siddiqui
Email: farhan@eloragreens.com

RE: Hydrogeological Investigation for the Proposed Development
127 1st Line, Elora, Township of Centre Wellington, ON

Dear Mr. Siddiqui,

Planet Engineering Inc. (PLANET) is pleased to provide the Hydrogeological Investigation Report for the above-mentioned project. The report presents PLANET's understanding of the hydrogeological setting of the study area based on exploratory drilling, data collection, analyses, and review.

We trust that this information meets your present requirements. If we can be of additional assistance in this regard, please contact this office.

For and on behalf of Planet Engineering Inc.,

Kourosh Mohammadi, Ph.D., P.Eng.
President and Principal Engineer

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LIST OF ACRONYMS AND DEFINITIONS

BH	Borehole
EASR	Environmental Activity and Sector Registry
K	Hydraulic Conductivity
GPM	Gallon per Minute
mbgs	Metres Below Ground Surface
MECP	Ontario Ministry of the Environment, Conservation and Parks
O.Reg.903	Ontario's Wells Regulation
PTTW	Permit To Take Water
PHCs	Petroleum Hydrocarbons
VOCs	Volatile Organic Compounds
PAHs	Polycyclic Aromatic Hydrocarbons
WWIS	Water Well Information System
WWR	Water Well Record

1 INTRODUCTION

1.1 General

PLANET Engineering Inc. (PLANET) was retained by Elora Greens Inc. (the Client) to complete a hydrogeological investigation for the proposed development at 127 1st Line, Elora, Township of Centre Wellington, Ontario (the Site). The Site location is shown on **Figure 1**. Based on information provided by the Client, the proposed land uses for the Site are understood to include approximately:

- 8.53 hectares for single-detached, semi-detached, and street townhouse units;
- 3.19 hectares for multiple residential uses, including apartments, cluster townhouses, and stacked townhouses;
- 3.10 hectares for mixed-use development incorporating similar residential forms;
- 1.25 hectares for park and trail purposes; and
- 1.50 hectares for a stormwater management (SWM) facility.

It is assumed that the houses will have one level of basement.

1.2 Purpose

The purpose of the hydrogeological investigation was to characterize the existing hydrogeological conditions at and in the vicinity of the Site, assess the need for, and options for, groundwater control in association with the proposed construction, evaluate potential impacts to the local groundwater regime resulting from the proposed construction, and identify appropriate mitigative measures, as warranted.

1.3 Applicable Legislation

Groundwater extraction and management are governed provincially by the Environmental Protection Act (EPA), the Ontario Water Resources Act (OWRA), and Ontario Regulation 387/04 (O. Reg. 387/04, as amended), the Water Taking Regulation. This legislation is intended to protect and manage the quality and quantity of surface water and groundwater resources in Ontario. This hydrogeological assessment was prepared in accordance with the OWRA and O. Reg. 387/04, as amended.

This hydrogeological study may be used to support registration on the Environmental Activity and Sector Registry (EASR) or an application for a Permit to Take Water (PTTW), as applicable. Construction dewatering exceeding 50,000 L/day and not exceeding 400,000 L/day under normal conditions may be eligible for EASR registration. A PTTW is generally required for construction water taking exceeding 400 m³/day and for non-construction groundwater taking exceeding 50 m³/day. Regulatory requirements should be confirmed with the Ministry of the Environment, Conservation and Parks (MECP) based on the final design, construction phasing, and anticipated combined pumping rates.

The Township of Centre Wellington Sewer By-law (By-law 2022-66) requires a discharge permit before establishing any temporary or permanent connection to a municipal sanitary and/or storm sewer system for construction or post-construction operations.

2 METHOD OF INVESTIGATION

2.1 General

This hydrogeological investigation was based on review of previously completed and published information for the study area, including previously published regional physiographic and geologic mapping and watershed planning reports. Many of these documents are referred to throughout various sections of this report and the relevant details can be found in the References section following the text of the report.

In particular, the work completed in association with this hydrogeological study consisted of the following tasks:

- Reviewing and interpreting available reports and published data;
- Developing Health & Safety and Sampling and Analysis Plans for work at the Site;
- Assessing the current Site conditions, areas of interest and to confirm the previous borehole locations;
- Drilling ten (10) boreholes and installing five (5) monitoring wells;
- Developing the monitoring wells by removing at least three well volumes of groundwater, or purging the wells to dryness twice, whichever occurred first;
- Collecting groundwater samples from selected monitoring wells;
- Measuring groundwater levels in each of the monitoring wells located at the Site;
- Conducting in-situ hydraulic conductivity tests in monitoring wells containing sufficient water;
- Reviewing water well records available from the Ministry of the Environment, Conservation and Parks (MECP);
- Evaluating proposed construction dewatering requirements;
- Estimation of the underfloor and perimeter drainage flow for permanent dewatering; and
- Preparing a report documenting the findings of the investigation.

2.2 Boreholes and Monitoring Wells

As part of the geotechnical investigation conducted by PLANET, ten (10) boreholes were advanced to depths ranging from approximately 6.1 m to 7.6 m below ground surface (mbgs) on June 10, 11, and 16, 2025. Monitoring wells were installed in BH1, BH4, BH6, BH7, and BH10. Well construction details and borehole logs are provided in Appendix A and summarized in **Table 1**.

Geodetic ground-surface elevations for the monitoring wells were obtained by PLANET's survey crew using a Trimble Catalyst DA2 GNSS Receiver and TDC600 Model 2 Data Collector. The results are provided on the borehole logs. Borehole and monitoring-well coordinates are referenced to Universal Transverse Mercator (UTM) Zone 17, North American Datum 1983 (NAD83). Approximate borehole locations are shown on **Figure 2**.

The ground-surface elevations shown on the borehole logs are approximate and were used to relate the encountered soil stratigraphy to elevation. They should not be relied upon for other design or construction purposes.

Table 1: Information on Groundwater Monitoring Wells

Verification note: Table 1 reports a BH10 borehole bottom depth of 6.4 mbgs and a screen interval extending to 6.8 mbgs. The BH10 borehole log and field installation record should be checked, and Table 1 and Table 3 should be reconciled before the report is finalized.

MW ID	Estimated Ground Surface Elevation (m)	Borehole Bottom		Well Screen Interval Depth (mbgs)		Well Screen Interval Elevation (mASL)	
		Depth (mbgs)	Elevation (m)	from	to	from	To
BH1	397.44	6.1	391.3	2.9	6.0	394.5	391.5
BH4	395.39	7.6	387.8	4.5	7.5	390.9	387.9
BH6	390.41	6.1	384.3	2.9	6.0	387.5	384.5
BH7	392.23	6.1	386.1	2.9	6.0	389.3	386.3
BH10	398.74	6.4	392.3	3.7	6.8	395.0	392.0

2.3 Groundwater Monitoring and Sampling

On June 23, 2025, PLANET collected an unfiltered groundwater sample from monitoring well BH7. The analytical results were compared with the sanitary and storm sewer discharge limits in the Township of Centre Wellington Sewer By-law (By-law 2022-66). PLANET also collected an unfiltered groundwater sample from BH4 for analysis of general chemical parameters; those results were compared with the Provincial Water Quality Objectives (PWQOs).

Prior to sampling, the well was developed. The development of the monitoring well was conducted by purging and surging the well water to stress the formation around the well screen so that mobile particulates were removed. The purpose of the well development is to improve the hydraulic connection between the well and the geologic materials in the vicinity of the well, and to subsequently obtain a groundwater sample representative of the in-situ conditions. The groundwater level was measured in the monitoring wells and wells were developed by removing at least three well volumes of groundwater.

The collected samples were submitted to ALS Environmental Laboratories in Mississauga, a member of the Canadian Association for Laboratory Accreditation (CALA), for chemical analysis. Copies of the laboratory certificates of analysis and the chain of custody form are provided in **Appendix B**.

2.4 In-Situ Hydraulic Conductivity Testing

Rising-head hydraulic conductivity (slug) tests were conducted in five (5) monitoring wells (BH1, BH4, BH6, BH7, and BH10) to assess the hydraulic conductivity of the screened subsurface materials.

A summary of the hydraulic conductivity test (slug test) methodology is as follows:

The static groundwater level in each monitoring well was initially measured and recorded;

For the rising head test, a known volume of water was removed from each tested well using an inertial pump and low density tubing; and,

The water level in each well was then measured and recorded at regular time intervals until the water level had recovered to a level close to the static water level measured before the start of the test;

The water level data from the monitoring wells were analysed by PLANET using AQTESOLV Professional V4.5 and the Bouwer-Rice equation to estimate the hydraulic conductivity (K) of the soil adjacent to the screened portion of the well.

3 SITE CONDITIONS

3.1 Physical Setting

The site is predominantly undeveloped agricultural land with a few nearby residential, commercial, and industrial properties. The Site is bordered by scattered trees and adjacent cornfields. The Grand River is located approximately 2.2 km to the north-northeast of the Site and flows west and southward. Swan Creek is approximately 1.8 km south-southwest of the Site and flows westward.

According to the Oak Ridges Moraine Atlas which is available online at (https://www.ontario.ca/page/oak-ridges-moraine-maps) and the Niagara Escarpment Plan (NEP) Maps available online at (https://escarpment.org/planning/interactivemap), the Site is not located within an area where either the Oak Ridges Moraine Conservation Plan or the Niagara Escarpment Plan would be applicable.

3.2 Climatic Conditions

Average monthly climate data from an Environment Canada climate station located at the FERGUS SHAND DAM (Station ID 6142400), approximately 9.0 km northeast of the Site, for the period between 1981 and 2010 is provided in **Table 2**, below (Environment Canada, 2024). The data indicates that the climate in the study area is typical continental with cold winters and warm summers and precipitation records showing local seasonal variation. As shown in **Table 2** below, the mean annual precipitation is 945.7 mm/year, with annual mean rainfall of 797.8 mm/year (84.4% of total precipitation). Average monthly precipitation ranged from 55.9 mm in February to 96.6 mm in August. The mean annual daily temperature is 6.7 degrees Celsius (°C), ranging from -7.4 °C in January to 20.0 °C in July.

Table 2: Climate Data Summary (1981 – 2010) – FERGUS SHAND DAM (Station ID 6142400)

MONTH	Daily Average Temperature (°C)	Average Rainfall (mm)	Average Snow (cm)	Average Precipitation (mm)
January	-7.4	27.8	40.1	67.9
February	-6.3	25.3	30.6	55.9
March	-1.9	36.7	22.9	59.6
April	5.7	67.9	6.2	74.1
May	12.2	86.8	0.1	86.9
June	17.5	83.8	0.0	83.8
July	20.0	89.2	0.0	89.2
August	19.0	96.6	0.0	96.6
September	14.9	93.1	0.0	93.1

October	8.3	75.6	1.6	77.2
November	2.1	80.5	12.5	93.0
December	-3.9	34.7	33.9	68.6
Year	**6.7**	**797.8**	**147.8**	**945.7**

3.3 Physiography and Drainage

A review of the topographic map provided online by Natural Resources Canada depicts the Site located within an area that is generally at an approximate elevation of 390 m to 400 m.

The Site is located within Grand River watershed. This watershed covers approximately 6,800 square kilometers of land and drains into Lake Erie. Surface elevation in the watershed ranges from 173 m geodetic at the mouth of the Grand River on Lake Erie to 535 m in the northern headwaters (LESPR, 2008). The physiographic region of the site is Guelph Drumlin Field consisting of drumlinized till plains. (Chapman and Putnam, 2007). The Guelph Drumlin Field is a physiographic region characterized by numerous oval-shaped hills called drumlins, aligned with the direction of past glacial ice flow. These drumlins are composed of glacial till and were formed beneath a glacier.

3.4 Surficial Geology

A regional description of the Quaternary geology of the project area can be found in the Surficial Geology of Southern Ontario Map 2153 (OGS, 2010). A section of this map showing surficial geology of the study site and the surrounding areas is presented in **Figure 3**.

As shown on **Figure 3**, the Site is located within Wentworth Till deposits consisting of buff to pink sandy diamicton. The overburden consists mainly of sandy silt till to silty sand till. Regional glacial sediments, including till, glaciolacustrine deposits, and glaciofluvial deposits, were formed during successive glacial advances and retreats.

The bedrock geology in the Elora area is primarily characterized by dolostone of the Guelph Formation, which is well exposed in the Elora Gorge. Older dolostone of the Amabel Formation underlies the Guelph Formation. Bedrock was not encountered in the boreholes advanced at the Site; based on nearby MECP water well records, it is expected at an approximate depth of 25 mbgs.

3.5 Subsurface Soil Conditions

The subsurface soil conditions encountered during boreholes advanced at the Site are shown on the borehole logs in **Appendix A**. A summary of the soil conditions is provided below. Reference should be made to the geotechnical report (PLANET, 2025) for a detailed description of the soil conditions at the Site.

In general, the Site is underlain by topsoil and localized fill or disturbed native material over native silty sand till to sandy silt till. Topsoil was encountered at all borehole locations and extended to a maximum depth of approximately 0.30 mbgs. Fill or disturbed native material beneath the topsoil ranged in thickness from approximately 0.30 m to 0.95 m. Native silty sand till to sandy silt till was encountered beneath these materials and extended to the maximum explored depth.

It should be noted that the inferred soil layer thicknesses are approximate and were identified at the borehole locations only and may vary between and beyond the boreholes.

4 GROUNDWATER CONDITIONS

4.1 Regional Groundwater Recharge

Groundwater recharge is the process through which water infiltrates vertically from the surface through soil and geologic layers, eventually reaching the saturated zone. The rate and volume of recharge in a given area are influenced by factors such as surface geology, topography, and the degree of land development. Regionally, groundwater recharge tends to vary both spatially and seasonally, depending on local climate conditions, geological characteristics, and land use. The Site is currently used for agricultural purposes, with primary recharge sources in the study area being precipitation and seasonal freshet events. Following construction, groundwater recharge is expected to occur primarily through open and unpaved areas. It is recommended that a groundwater balance assessment be conducted to evaluate post-development recharge conditions and compare them with pre-development recharge volumes.

4.2 Groundwater Level Fluctuations

Groundwater level data obtained from the monitoring wells are summarized in **Table 3**. Monitoring-well screen elevations are presented in **Table 1**, and construction details are illustrated on the borehole logs provided in **Appendix A**.

PLANET monitored groundwater levels from June 19, 2025 to July 31, 2026 to characterize seasonal fluctuations and identify the seasonal high groundwater condition at the Site. Across the monitoring network, recorded depths to groundwater ranged from approximately 0.10 mbgs in BH6 on April 9, 2026 to 5.77 mbgs in BH6 on December 5, 2025. The corresponding minimum groundwater elevation was approximately 384.64 m in BH6 on December 5, 2025, while the maximum groundwater elevation was approximately 397.99 m in BH10 on April 9, 2026. The shallowest groundwater condition and the highest groundwater elevation therefore occurred in different wells because ground-surface elevations vary across the Site.

Figure 4 shows the groundwater elevation contours measured on April 9, 2026. Based on observed declining groundwater levels following April 9, 2026, this event likely represents the seasonal groundwater high for the monitoring period. Groundwater elevations ranged from approximately 398 m in the northern portion of the site to 390.5 m in the southern portion, indicating that groundwater flow is generally directed from north toward the south-southwest.

It is important to note that groundwater conditions are subject to change due to various factors, including temperature, seasonal variation, precipitation, and nearby construction activity. These conditions may differ from those observed during the monitoring period. Therefore, potential groundwater level fluctuations should be considered during the design and development phases of the proposed construction.

Regional groundwater flow in the area generally follows the natural topography, moving from higher to lower elevations. Based on the site topography and groundwater elevations observed in the monitoring wells, the groundwater flow direction is inferred to be from north to south-southwest, toward Swan Creek.

Table 3. Summary of Groundwater Level Observations in Monitoring Wells

BH ID	BH1		BH4		BH6		BH7		BH10	
X Coordinate	547648.964		547802.539		548158.856		548265.109		547949.989	
Y Coordinate	4836223.994		4835934.566		4835573.928		4835614.314		4836018.364	
Well Depth (m bgs)	6.1		7.6		6.1		6.1		6.4	
Ground Elevation (m)	397.44		395.39		390.41		392.23		398.74	
	Depth (mbgs)	Elevation (m)	Depth (mbgs)	Elevation (m)	Depth (mbgs)	Elevation (m)	Depth (mbgs)	Elevation (m)	Depth (mbgs)	Elevation (m)
19-Jun-25	0.65	396.79	2.03	393.36	1.07	389.34	1.27	390.96	1.87	396.87
20-Jun-25	0.94	396.50	2.10	393.29	1.11	389.30	1.30	390.93	1.85	396.89
23-Jun-25	0.73	396.71	2.03	393.36	1.16	389.25	1.35	390.88	2.02	396.72
3-Jul-25	0.58	396.86	2.05	393.34	1.14	389.27	1.25	390.98	2.05	396.69
15-Aug-25	1.59	395.85	-	-	2.00	388.41	2.11	390.12	2.81	395.93
2-Sep-25	2.19	395.25	-	-	2.65	387.76	2.77	389.46	3.45	395.29
15-Sep-25	2.47	394.97	4.04	391.35	3.24	387.17	3.35	388.88	4.02	394.72
1-Oct-25	2.38	395.06	4.74	390.65	3.45	386.96	3.57	388.66	4.55	394.19
15-Oct-25	2.23	395.21	4.90	390.49	4.10	386.31	3.78	388.45	4.82	393.92
31-Oct-25	2.18	395.26	5.08	390.31	4.83	385.58	3.97	388.26	5.03	393.71
13-Nov-25	2.17	395.27	5.25	390.14	5.27	385.14	4.24	387.99	5.25	393.49
5-Dec-25	1.82	395.62	5.44	389.95	5.77	384.64	4.62	387.61	5.60	393.14
15-Dec-25	1.16	396.28	5.52	389.87	1.90	388.51	3.19	389.04	3.80	394.94
5-Jan-26	0.38	397.06	5.48	389.91	0.81	389.60	2.21	390.02	2.28	396.46

BH ID	BH1		BH4		BH6		BH7		BH10	
X Coordinate	547648.964		547802.539		548158.856		548265.109		547949.989	
Y Coordinate	4836223.994		4835934.566		4835573.928		4835614.314		4836018.364	
Well Depth (m bgs)	6.1		7.6		6.1		6.1		6.4	
Ground Elevation (m)	397.44		395.39		390.41		392.23		398.74	
	Depth (mbgs)	Elevation (m)	Depth (mbgs)	Elevation (m)	Depth (mbgs)	Elevation (m)	Depth (mbgs)	Elevation (m)	Depth (mbgs)	Elevation (m)
19-Jan-26	0.26	397.18	4.90	390.49	0.71	389.70	1.33	390.90	1.11	397.63
4-Feb-26	0.65	396.79	4.45	390.94	0.56	389.85	0.99	391.24	1.34	397.40
13-Feb-26	0.63	396.81	4.49	390.90	0.78	389.63	1.13	391.10	1.54	397.20
5-Mar-26	0.38	397.06	3.25	392.14	0.46	389.95	0.97	391.26	1.36	397.38
9-Apr-26	0.26	397.18	0.74	394.65	0.10	390.31	0.22	392.01	0.75	397.99
29-Apr-26	0.32	397.12	0.82	394.57	0.27	390.14	0.33	391.90	1.01	397.74
15-May-26	0.57	396.87	1.20	394.20	0.75	389.66	0.51	391.72	1.11	397.63
29-May-26	0.48	396.96	1.33	394.06	0.73	389.68	1.22	391.01	1.31	397.44
15-Jun-26	0.68	396.76	2.10	393.29	1.15	389.26	1.56	390.67	2.17	396.57
30-Jun-26	0.43	397.01	1.88	393.51	1.02	389.39	1.46	390.77	2.00	396.74
16-Jul-26	0.88	396.56	2.16	393.23	1.31	389.10	1.49	390.74	2.31	396.43
31-Jul-26	1.21	396.23	2.77	392.62	1.55	388.86	1.74	390.49	2.66	396.08

4.3 Inferred Hydrostratigraphy

Based on the findings of the subsurface investigation, the stratigraphy beneath the site generally consists of surficial topsoil or fill material underlain by native glacial deposits, predominantly composed of Silty Sand Till to Sandy Silt Till. These glacial tills are typical of the region and are characterized by low to moderate permeability due to their compact nature and fine-grained matrix.

Bedrock was not encountered in any of the boreholes drilled as part of this study, indicating that the overburden thickness exceeds the depth of investigation. The absence of shallow bedrock suggests a significant thickness of unconsolidated deposits, which plays an important role in controlling groundwater storage and movement in the area.

The saturated zone was encountered within the Sandy Silt Till unit, indicating that this layer serves as the primary water-bearing formation at the site. Given the composition and structure of the material, groundwater within this unit is likely stored in the pore spaces between silt and fine sand particles, with limited transmissivity due to the fine-grained nature of the till.

Groundwater level measurements and lithologic observations suggest that the groundwater system in the vicinity of the Site is unconfined, meaning it is directly recharged by infiltration from the surface and is not confined by an overlying impermeable layer. This unconfined condition allows groundwater levels to fluctuate in response to precipitation events, seasonal variation, and nearby surface or subsurface activities.

Groundwater flow is interpreted to be predominantly horizontal, consistent with the stratified nature of the till units and the relatively flat-lying geologic setting. Vertical groundwater movement is expected to be limited due to the low vertical permeability of the fine-grained till. The direction of groundwater flow is discussed in Section 4.2 and aligns with the regional gradient, generally moving from higher elevations in the north toward lower elevations to the south-southwest, in the direction of Swan Creek.

The hydrostratigraphic interpretation is based on soil descriptions from borehole logs, groundwater elevation data, and stratigraphic correlations between monitoring well locations. This interpretation should be revisited and refined as additional subsurface or hydrogeological data become available during future phases of the project.

4.4 Results of In-Situ Hydraulic Conductivity Tests

Table 4 below summarizes the results of the hydraulic conductivity testing conducted in the monitoring wells along with the corresponding hydrostratigraphic units in which these wells are screened. Detailed hydraulic conductivity data and analysis sheets are provided in **Appendix C**.

Table 4: Summary of In-Situ Hydraulic Conductivity Test Results

MW ID	Hydraulic Conductivity (cm/s)	Hydraulic Conductivity (m/day)	Stratigraphic Unit
BH1	8.3×10^{-6}	7.1×10^{-3}	Sandy Silt Till
BH4	2.9×10^{-4}	2.5×10^{-1}	Sandy Silt Till
BH6	4.7×10^{-4}	4.0×10^{-1}	Sandy Silt Till
BH7	6.5×10^{-4}	5.6×10^{-1}	Sandy Silt Till
BH10	1.4×10^{-5}	1.2×10^{-2}	Sandy Silt Till

4.5 Groundwater Quality for Temporary Dewatering

A groundwater sample collected from monitoring well BH7 was analyzed, and the results were compared to the sanitary and storm sewer discharge limits outlined in the Township of Centre Wellington Sewer By-law (By-law 2022-66). The laboratory certificate of analysis is provided in **Appendix B**. Analytical results indicated that the concentration of Total Suspended Solids (TSS) in the groundwater sample was 117 mg/L, exceeding the discharge limit of 15 mg/L for storm sewers.

Based on these findings, groundwater removed during dewatering may be discharged into the municipal sanitary or storm sewer system, provided that:

- A discharge permit is obtained from the Township of Centre Wellington;
- Appropriate filtration or treatment measures are implemented to reduce TSS concentrations to levels below the by-law limit prior to discharge.

Additionally, a groundwater sample was collected from BH4 and analyzed for general water quality parameters. The results were compared to the Provincial Water Quality Objectives (PWQOs). The detection limit for total phosphorus in the laboratory analysis was 0.05 mg/L, whereas the PWQO limit for total phosphorus in surface water discharge is 0.01 mg/L. Due to the detection limit exceeding the regulatory guideline, it remains unclear whether phosphorus concentrations in the sample meet the required standard.

If discharge to surface water bodies (e.g., creeks or stormwater outlets) is considered during construction, it is recommended that additional sampling and laboratory analysis be conducted with a lower detection limit for total phosphorus to confirm compliance with PWQO criteria.

Careful consideration should be given to the final discharge location and applicable regulatory requirements to ensure compliance and avoid potential environmental impacts during dewatering activities.

4.6 Groundwater Use in the Study Area

As part of this hydrogeological assessment, PLANET conducted a search of the MECP Water Well Information System (WWIS) to identify known water wells located within a 500-metre radius of the Site. The search yielded records for 26 wells in the surrounding area.

Figure 5 illustrates the locations and identified water use categories of these wells relative to the Site. A detailed summary of each well record is provided in **Appendix D**. The classification of the wells is as follows:

- 4 wells were not identified;
- 17 wells are identified as water supply wells;
- 5 wells were classified as monitoring and test hole;

Among the 17 identified domestic water supply wells, drilling dates range from 1947 to 2005, with well depths ranging from 16.8 metres to 56.4 metres. All of these wells are reported to be completed in bedrock formations.

The proposed development includes the construction of a single basement level. Based on the depth of excavation and the separation from the bedrock aquifer, it is unlikely that the proposed excavation or associated dewatering activities will impact these water supply wells.

5 SOURCE PROTECTION AREA

The Clean Water Act, 2006 requires municipalities, businesses, and residents to work together to protect municipal drinking-water sources through local Source Protection Plans. Vulnerable areas include Wellhead Protection Areas (WHPAs) around municipal wells and Intake Protection Zones near surface water intakes. WHPAs are delineated partly on the basis of groundwater travel time to a municipal well. The principal WHPA categories are summarized below:

WHPA – A: 100 m radius circle around the municipal well

WHPA – B: 2-year time of travel

WHPA – C: 5-year time of travel

WHPA – D: 25 year time of travel

WHPA – E: Municipal wells that are under the direct influence of surface water.

WHPA-Q: Significant Groundwater Quantity Threat Areas

Figure 6 shows the Site and nearby WHPAs. The Site is located within WHPA-A, WHPA-B, and WHPA-C but is not mapped within a Significant Groundwater Recharge Area (SGRA). Reference should be made to the current Grand River Source Protection Plan, Volume II, Chapter 7 (LESPR, 2025), and the applicable municipal screening process.

WHPA-A is the area closest to the municipal well, where water takes the shortest time to reach the well, making it the most vulnerable to contamination.

If a proposed residential development falls within a Wellhead Protection Area A (WHPA-A) – the most vulnerable zone around a municipal well – it will likely require a Restricted Land Use (RLU) Notice or a Section 59 Notice under the Clean Water Act. These notices indicate whether the development complies with the local Source Water Protection Plan and may require a Risk Management Plan to mitigate potential threats to the drinking water supply. Depending on the nature of the development and the potential threats identified, a Risk Management Plan (RMP) may be required to outline measures to minimize the risk to the drinking water source.

6 GROUNDWATER DEWATERING ESTIMATES

6.1 Introduction

At the time of this investigation, the engineering drawings were not available. However, it is understood that the proposed development includes one level of basement for each residential unit, with an approximate depth of 3 mbgs. It is anticipated that the base of the footings will extend approximately 2 metres below the basement floor, resulting in an estimated total excavation depth of 5 mbgs.

The existing ground surface elevation across the Site ranges from approximately 400 m in the north to 390 m in the south. Assuming that site grading will not significantly alter existing elevations, the base of excavation is expected to be at approximately 395 m in the north and 385 m in the south.

For the purposes of this assessment, a rectangular excavation footprint of 15 metres in length and 6 metres in width was assumed for each house.

Groundwater level monitoring conducted on-site recorded the highest groundwater levels at 0.6 mbgs (elevation 397.2 m) in borehole BH1 (north); and 0.1 mbgs (elevation 390.3 m) in the southern part of the Site.

6.2 Short-Term Dewatering (During Construction)

To estimate dewatering requirements, the excavation was modeled as an open excavation with steady-state flow conditions, using equations from "*Construction Dewatering and Groundwater Control: New Methods and Applications – Third Edition*" by Powers et al. (2007), which are applicable to a rectangular system of closely spaced wells. The groundwater inflow rate (QR) was calculated using the following equation:

$$Q_R = \frac{\pi K (H^2 - h^2)}{ln\left(\frac{R}{r_e}\right)}$$

Where,

K – Hydraulic conductivity [m/d]

H – Distance from static water level to bottom of aquifer [m];

h – Distance from lowered water level to bottom of the aquifer [m];

R – Radius of the cone of depression [m];

R = r_e + 3000 * (H – h) * $K^{0.5}$ (K must be in [m/s]);

r_e – equivalent radius [m]

r_e=((w *l)/π)$^{0.5}$

w – excavation width and l – excavation length

Hydraulic conductivity values measured at the Site ranged from 8.3 × 10^{-6} to 6.5 × 10^{-4} cm/s. The maximum value of 6.5 × 10^{-4} cm/s is equivalent to approximately 0.56 m/day. The previously used conversion of 0.056 m/day was understated by a factor of 10; consequently, the construction dewatering rates and zone of

influence presented below are preliminary and must be recalculated using the verified hydraulic conductivity and final excavation geometry before they are used for permitting or design.

Based on these parameters, the estimated daily dewatering requirements are:

- Approximately 16 m³/day for an excavation at the north end of the Site; and
- Approximately 45 m³/day for an excavation at the south end of the Site.

To account for variability in hydraulic conductivity, potential rainfall, and site conditions, a 100% contingency (Safety factor = 2) was applied. This results in an estimated maximum dewatering rate of **90 m³/day** for a single excavation.

The zone of influence (R) was calculated to extend up to 60 metres from the edge of the excavation.

The preliminary estimated maximum dewatering rate of 90 m³/day exceeds the MECP threshold of 50 m³/day. EASR registration is therefore anticipated for an individual excavation, subject to confirmation using revised calculations. If multiple excavations are dewatered simultaneously, combined pumping rates must be evaluated against applicable EASR and PTTW limits, and the appropriate authorization must be obtained before dewatering begins.

6.3 Estimating Long-Term Drainage Requirement

If the below-grade structures are not designed and constructed as watertight systems, perimeter and underfloor drainage may be required to maintain groundwater below the subgrade. The preliminary long-term drainage estimate is approximately 46 m³/day for each house with 50% contingency and assuming the average dewatering rate. A minimum pump-system capacity of 57 L/min (approximately 15 GPM or 82 m³/day) was proposed to allow intermittent operation; this design capacity is not equivalent to the estimated average drainage rate. The final long-term discharge rate and applicable MECP approval requirements must be confirmed during detailed design, particularly where combined or continuous post-construction groundwater taking may exceed 50 m³/day.

Analytical results indicated that the concentration of Total Suspended Solids (TSS) in the groundwater sample was 117 mg/L, exceeding the discharge limit of 15 mg/L for storm sewers.

Based on these findings, groundwater removed during dewatering may be discharged into the municipal sanitary or storm sewer system, provided that a discharge permit is obtained from the Township of Centre Wellington and appropriate filtration or treatment measures are implemented to reduce TSS concentrations to levels below the by-law limit prior to discharge.

If discharge to surface water bodies (e.g., creeks or stormwater outlets) is considered during construction, it is recommended that additional sampling and laboratory analysis be conducted with a lower detection limit for total phosphorus to confirm compliance with PWQO criteria.

Careful consideration should be given to the final discharge location and applicable regulatory requirements to ensure compliance and avoid potential environmental impacts during dewatering activities.

7 PREDICTED EFFECTS

Based on the hydrogeological information and analyses presented in this report, the potential effects of excavation dewatering for the proposed residential development on nearby groundwater and surface water resources are discussed below.

7.1 Groundwater Use

As noted in Section 4.6, a review of the MECP Water Well Information System identified a total of 17 domestic water wells within a 500-metre radius of the Site. According to the available records, these wells are reportedly completed in the bedrock aquifer, with drilling depths ranging from approximately 16.8 to 56.4 metres. Given the depth of these wells and the hydrostratigraphic conditions observed during the investigation, it is anticipated that they draw water from a deeper, confined groundwater zone.

The proposed development may involve shallow dewatering during the excavation of foundations and utility services (e.g., sewers), particularly in areas where the groundwater table is intersected. However, since the planned excavation depths are significantly shallower than the depth of the identified bedrock wells, no measurable impact on these private water wells is expected under typical construction and dewatering conditions.

Nevertheless, in recognition of the Site's location within a Wellhead Protection Area (WHPA) and the importance of protecting local groundwater resources, it is recommended that a door-to-door well survey be conducted. This proactive measure will help ensure that any unforeseen issues related to dewatering impacts on private wells are identified early and addressed appropriately. If warranted, follow-up actions such as water level monitoring or mitigation measures (e.g., temporary water supply) can be implemented to minimize risks to existing groundwater users.

7.2 Surface Water Resources

The only surface water features in the vicinity of the Site are the Grand River, located approximately 2.2 kilometres to the north, and Swan Creek, situated approximately 1.8 kilometres to the south. These watercourses represent the closest potential surface water receptors to the Site.

The preliminary dewatering assessment indicates that the zone of influence may extend up to approximately 60 m from an excavation. This value must be confirmed when the dewatering estimate is recalculated using the verified hydraulic conductivity and final excavation geometry. Even at the preliminary extent, the nearest surface water features are well beyond the anticipated zone of influence; therefore, adverse effects on the Grand River or Swan Creek are not expected.

As such, construction dewatering at the Site is not anticipated to influence the hydrology or water quality of nearby surface water bodies. No additional mitigation measures specific to surface water protection are deemed necessary at this time. However, as a precaution, standard erosion and sediment control (ESC) practices should be implemented during construction to prevent any off-site migration of suspended solids via overland flow pathways.

7.3 Impact on Municipal Wells

The Site is located within Wellhead Protection Areas (WHPA) A, B, and C, indicating a high to moderate vulnerability to potential contaminants that could affect municipal groundwater sources. As such, specific measures must be implemented throughout the planning, design, and construction phases of the proposed development to protect both groundwater and surface water quality and quantity.

The following mitigation strategies are recommended to support source water protection objectives:

- All contractors, consultants, and site personnel involved in development activities should be informed of the Site's location within the WHPA and the proximity to municipal water supply wells.

- A comprehensive Spill Prevention and Response Plan should be developed and implemented. This plan should designate specific areas for the safe storage and handling of fuels, lubricants, and chemicals to minimize the risk of spills or leaks.

- Any fill material imported to the Site must comply with applicable provincial standards, regulations, and guidelines, such as the MECP's "Management of Excess Soil – A Guide for Best Management Practices (2014)" and Ontario Regulation 153/04 and 406/19. This ensures that the imported soil does not pose a risk to groundwater or surface water quality.

- Site grading should be designed to maintain or enhance pre-development groundwater recharge. Infill soils, whether existing or imported, should have similar grain size distribution and permeability characteristics to native soils to maintain infiltration capacity. A soil sampling and analysis program led by a qualified Geotechnical Engineer is recommended to ensure compatibility and effectiveness.

- Stormwater management systems should address both quantity control and water-quality protection and may incorporate oil/grit separators, infiltration basins, and vegetated swales where feasible. Sanitary sewer and stormwater management design should comply with the applicable policies in the current Grand River Source Protection Plan, including policies WC-CW-3.1 to WC-CW-3.8, as applicable.

- All existing water wells and monitoring wells not intended for future use must be properly decommissioned by a licensed water well contractor, in accordance with O. Reg. 903 (as amended), under the Ontario Water Resources Act.

- Future residents should be informed that the Site is located within WHPA-A, WHPA-B, and WHPA-C and is near municipal supply wells. Educational materials should encourage responsible practices, including minimizing fertilizer and pesticide use and preventing releases of fuels or chemicals.

These measures are essential to ensure the long-term protection of drinking water sources and the sustainable management of local hydrogeological conditions.

8 DEWATERING MONITORING AND MITIGATION PLAN

Based on site groundwater conditions and the proposed excavation depths, dewatering will likely be required during construction to maintain dry and stable working conditions. Dewatering activities must be carefully planned and executed to ensure regulatory compliance and avoid adverse environmental or infrastructure impacts.

Discharge Options and Permitting:

Pumped groundwater may be discharged into the Township's sanitary or storm sewer systems, provided that these systems are accessible from the Site and that appropriate discharge permits are obtained from the local municipality or applicable regulatory authority. In the absence of suitable municipal infrastructure, the water may need to be contained, treated, and managed on-site through approved practices such as temporary storage tanks, infiltration galleries, or surface dispersion areas, depending on site-specific constraints.

Prior to any discharge, the contractor must obtain all necessary authorizations, including:

- A discharge permit or agreement from the Township of Centre Wellington or other relevant jurisdiction, outlining discharge locations, quality parameters, and allowable flow rates;
- MECP registration through the Environmental Activity and Sector Registry (EASR) if the total dewatering volume exceeds 50 m³/day;
- Water Quality Considerations

Analytical results from groundwater sampling indicate elevated concentrations of total suspended solids (TSS), exceeding the discharge limits set by applicable municipal sewer-use by-laws. Therefore, pre-treatment is required to meet discharge criteria. At a minimum, the following water quality control measures are recommended:

- Sediment tanks (e.g., settling basins or weir tanks) to allow for gravity settling of suspended solids;
- Filtration systems, such as filter bags or geotextile socks, particularly in areas with fine-grained soils;
- In cases of high turbidity or fine particulates, use of cartridge filters, flocculants, or multi-stage filtration systems may be necessary.
- Selection of Dewatering Methods

The required dewatering approach and discharge volume will depend on several factors, including:

- Excavation dimensions (length, width, depth);
- Local hydrostratigraphy, especially hydraulic conductivity and soil grain size;
- Groundwater level fluctuations (seasonal and short-term);
- Construction phasing and duration of dewatering;
- Soil and groundwater contaminant risks, if applicable.

Dewatering options may include:

- Sump pumping for shallow, low-flow conditions;
- Wellpoints or eductor systems for moderate depths and confined layers;

- Deep wells for deeper excavations or high-volume scenarios.

A site-specific dewatering plan should be prepared by the contractor in consultation with qualified hydrogeological and geotechnical professionals, and it should incorporate:

- Detailed methodology;
- Estimated flow volumes and duration;
- Filtration/treatment design;
- Discharge routing and monitoring protocols.
- Monitoring and Adaptive Management

Effective monitoring during dewatering is critical to ensure system performance, regulatory compliance, and environmental protection. The following measures are recommended:

- Daily visual inspections of discharge locations to identify signs of erosion, sedimentation, or water quality issues;
- Flow monitoring using a calibrated digital in-line flow meter, capable of recording real-time discharge volumes;
- Water quality sampling, if required by permit conditions, to verify that discharge parameters (e.g., TSS, pH, temperature, hydrocarbons) remain within acceptable limits;
- If adverse effects (e.g., increased turbidity, off-site flooding, drawdown effects) are observed, immediate corrective actions must be implemented. These may include:
    - Increasing filtration capacity;
    - Rerouting discharge;
    - Adjusting pumping rates;
    - Implementing erosion control measures (e.g., check dams, straw bales).

Protection of Sensitive Receptors:

Given the Site's location within WHPA-A, -B, and -C, and the presence of nearby private domestic wells and municipal water supply wells, dewatering must be conducted in a manner that avoids potential drawdown impacts on surrounding wells or natural features. If multiple dewatering systems are operated simultaneously or for extended periods, groundwater levels in nearby areas should be monitored to identify and mitigate potential interference with existing groundwater users.

9 SUMMARY AND CONCLUSION

A hydrogeological assessment was completed in support of the proposed residential development. The investigation included review of borehole information, groundwater monitoring from June 2025 to July 2026, groundwater-quality sampling, hydraulic conductivity testing, a preliminary dewatering assessment, review of nearby water well records, and consideration of source-water protection requirements. Key findings and recommendations are summarized below:

- The Site is currently used for agricultural purposes, and groundwater recharge occurs primarily through precipitation and seasonal snowmelt. Post-development recharge will occur mainly through landscaped and other pervious areas. A pre- and post-development water-balance assessment is recommended to quantify potential recharge losses and identify appropriate mitigation measures. Groundwater flow is inferred to be generally from north to south-southwest toward Swan Creek, following the local topographic gradient.
- Groundwater monitoring between June 19, 2025 and July 31, 2026 recorded depths ranging from approximately 0.10 to 5.77 mbgs. Groundwater elevations ranged from approximately 384.64 to 397.99 m. The shallowest depth to groundwater was recorded in BH6 on April 9, 2026, while the highest groundwater elevation was recorded in BH10 on the same date. Groundwater occurs primarily within the sandy silt till to silty sand till and is interpreted as an unconfined system. Bedrock was not encountered during the investigation.
- The monitoring period captured substantial seasonal fluctuation, including shallow groundwater conditions in April 2026. These data should be considered in grading, basement, foundation-drainage, and utility design. Additional monitoring may be warranted if the grading plan, excavation depths, or construction phasing changes materially from the assumptions used in this report.
- Measured hydraulic conductivity values ranged from 8.3×10^{-6} to 6.5×10^{-4} cm/s (approximately 7.1×10^{-3} to 5.6×10^{-1} m/day). The BH10 conversion has been corrected to approximately 1.2×10^{-2} m/day. The maximum conductivity is approximately 0.56 m/day, rather than 0.056 m/day as previously used in the dewatering assessment.
- Dewatering is anticipated for excavations that extend below the groundwater table. The report's preliminary estimates of approximately 16 m³/day in the north, 45 m³/day in the south, and 90 m³/day with contingency. The dewatering rates and zone of influence must therefore be verified by a qualified engineer and performed by a licensed dewatering contractor using the verified conductivity, final excavation geometry, grading, and construction phasing before regulatory authorization or dewatering-system design. EASR registration is anticipated where pumping exceeds 50 m³/day.
- Groundwater may be discharged to the sanitary or storm sewer system, if available, only after the necessary municipal approvals are obtained. The BH7 sample contained TSS at 117 mg/L, exceeding the reported storm sewer limit of 15 mg/L; sedimentation, filtration, or other treatment will therefore be required before storm sewer discharge. If discharge to surface water is proposed, additional analysis using a sufficiently low total-phosphorus detection limit is required to assess compliance with the applicable PWQO. Discharge flow and quality should be monitored throughout dewatering.

- The MECP WWIS review identified 26 well records within 500 m of the Site, including 17 water-supply wells reported to be completed in bedrock. Because the proposed excavations and dewatering are shallow relative to these wells, measurable impacts are not anticipated under typical conditions. A door-to-door well survey is nevertheless recommended to confirm the location, use, and condition of nearby private wells and to establish baseline information before dewatering.
- The Site is located within WHPA-A, WHPA-B, and WHPA-C. Development and construction should therefore comply with the current Source Protection Plan and municipal screening requirements. Recommended measures include obtaining any required Section 59/RLU clearance, implementing spill-prevention and response procedures, controlling imported fill, protecting infiltration and groundwater quality through stormwater design, and properly decommissioning unused wells.
- The nearest surface water features are the Grand River, approximately 2.2 km north-northeast of the Site, and Swan Creek, approximately 1.8 km south-southwest. The preliminary zone of influence is reported as up to approximately 60 m and requires confirmation through revised dewatering calculations. Even at this preliminary extent, adverse effects on these surface water features are not expected. Standard erosion and sediment controls should be implemented during construction.
- Monitoring wells that are no longer required should be decommissioned by a licensed well contractor in accordance with O. Reg. 903 under the Ontario Water Resources Act. Any monitoring well that may be damaged or destroyed by construction should be properly decommissioned before that work begins.

In conclusion, the proposed development is considered hydrogeologically feasible in principle, provided that the dewatering assessment is recalculated using the corrected hydraulic conductivity and final design information, applicable EASR/PTTW and municipal discharge approvals are obtained, and the recommended groundwater, source-protection, water-quality, erosion and sediment control, and nearby-well mitigation measures are implemented. The final water-balance assessment should also demonstrate how post-development recharge will be maintained or mitigated to the extent practical.

10 STATEMENT OF LIMITATIONS

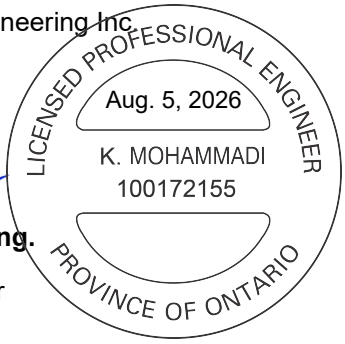
The contents of this report are subject to the attached '***Statement of Limitation***' sheet. The reader's attention is specifically drawn to these conditions as it is considered essential that they be followed for proper use and interpretation of this report. The Statement of Limitations is not intended to reduce the level of responsibility accepted by PLANET, but rather to ensure that all parties who have been given reliance for this report are aware of the responsibilities each assumes in so doing.

This report was prepared by PLANET for the account of Elora Greens Inc. (the CLIENT). Other than the CLIENT and its employees, any copying or distribution of this report, or use of or reliance on the information contained herein, in whole or in part, is the sole responsibility of the other party.

11 CLOSURE

We trust that this information is satisfactory for your present requirements. Should you have any questions or require additional information, please do not hesitate to contact this office.

For and on behalf of PLANET Engineering Inc.



Kourosh Mohammadi, PhD., P.Eng.

Principal Hydrogeological Engineer

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Planet Engineering Inc.

STATEMENT OF LIMITATIONS

Your report has been developed based on your unique project specific requirements as understood by PLANET Engineering Inc. (PLANET) and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking PLANET to assess how factors that changed subsequent to the date of the report affect the report's recommendations. PLANET cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions, which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult PLANET to be advised how time may have impacted on the project.

The findings derived from this investigation were based on information collected and/or provided by the Client. It may become apparent that soil and groundwater conditions differ between and beyond the testing locations examined during future investigations or other work that could not be detected or anticipated at the time of this study. As such, PLANET cannot be held liable for environmental conditions that were not apparent from the available information. The conclusions presented represent the best judgment of the assessors based on limited investigations.

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature, external data source review, sampling, and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions, which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of PLANET through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report is based on the assumption that he site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only PLANET, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and PLANET cannot be held responsible for such misinterpretation.

To avoid misuse of the information contained in your report it is recommended that you confer with PLANET before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

Planet Engineering Inc.

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain PLANET to work with other project design professionals who are affected by the report. Have PLANET explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way.

Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment.

Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact PLANET for information relating to geoenvironmental issues.

PLANET is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with PLANET to develop alternative approaches to problems that may be of genuine benefit both in time and in cost.

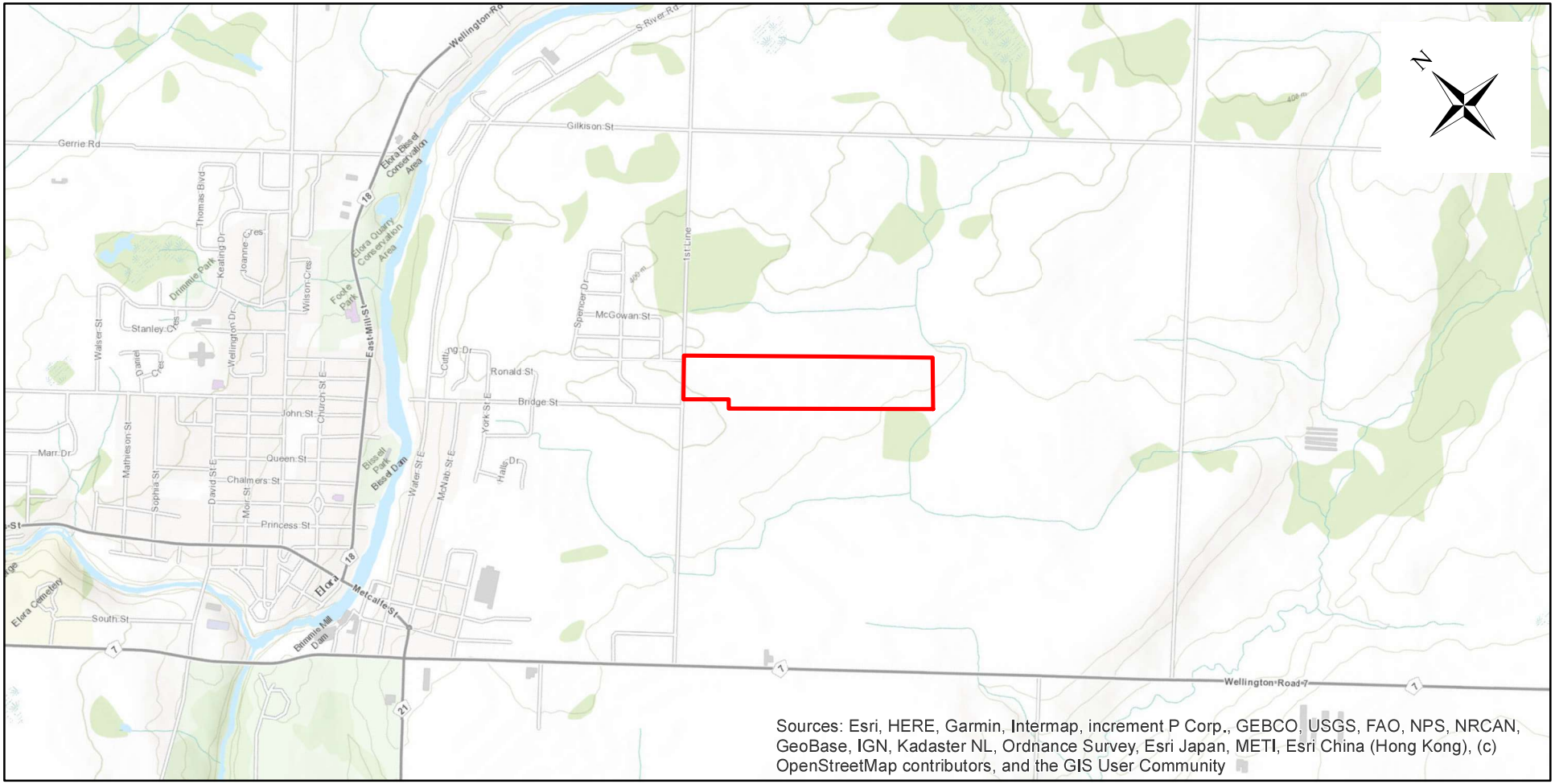
Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from PLANET to other parties but are included to identify where PLANET's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from PLANET closely and do not hesitate to ask any questions you may have.

Third party information reviewed and used to formulate this report is assumed to be complete and correct. PLANET used this information in good faith and will not accept any responsibility for deficiencies, misinterpretation or incompleteness of the information contained in documents prepared by third parties.

Nothing in this report is intended to constitute or provide a legal opinion.

Should additional information become available, PLANET requests that this information be brought to our attention so that we may re-assess the conclusions presented herein.

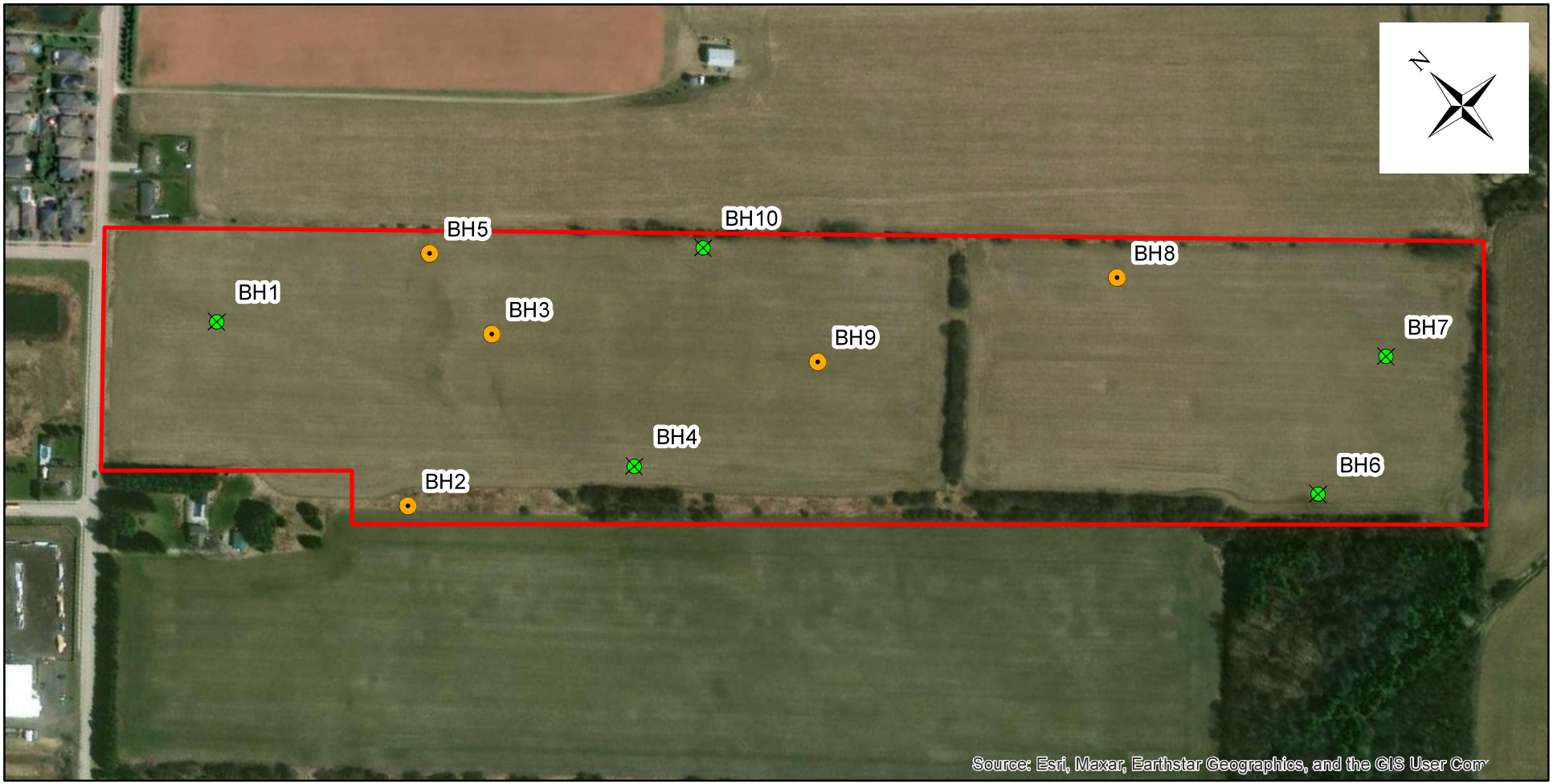
FIGURES



Legend

Approx. Site Boundary

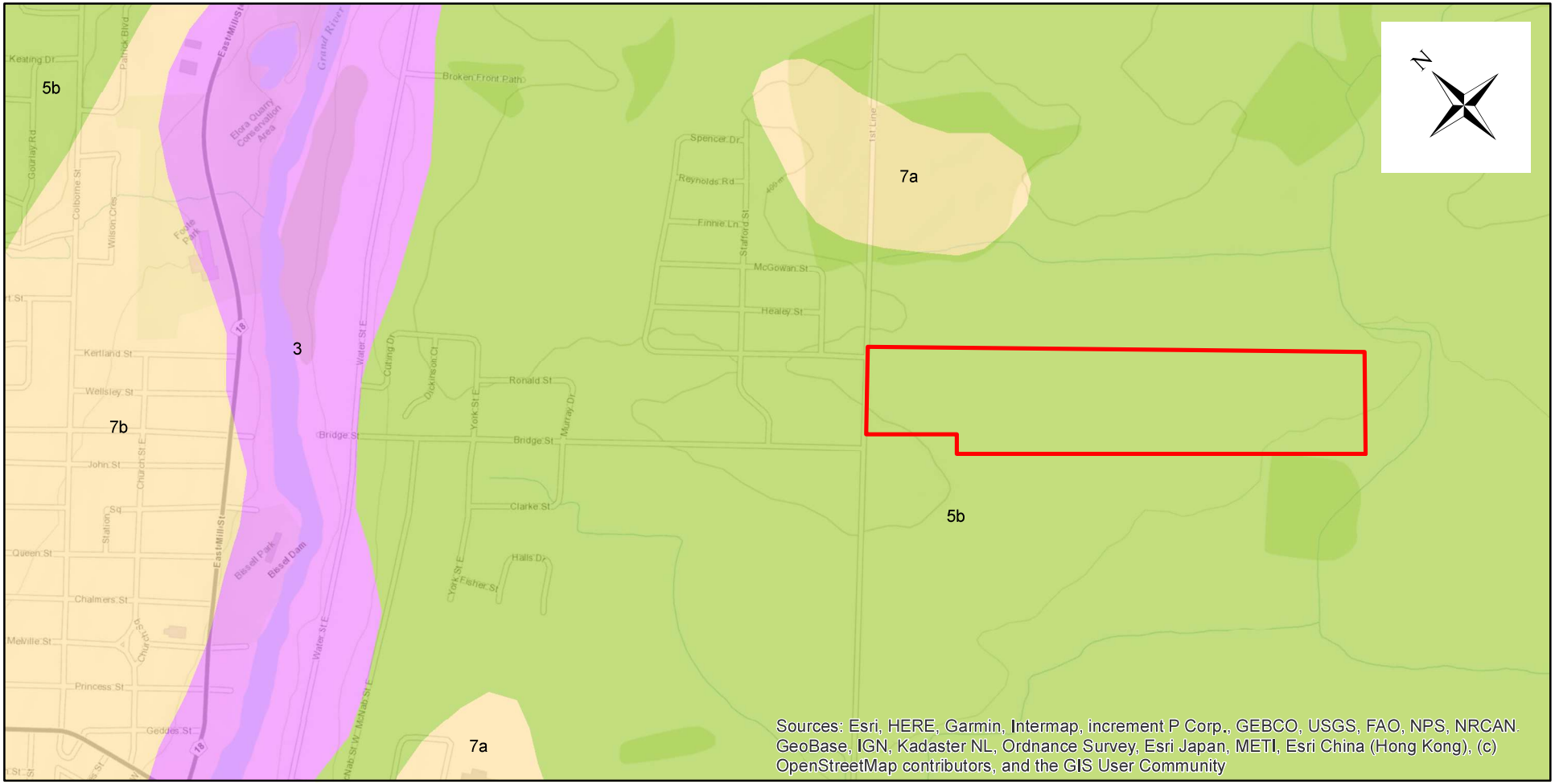
Drawn: AP	Title: **Site Location and Topographic Map**
Approved: KM	Project: **HYDROGEOLOGICAL INVESTIGATION** **127 1st Line, Elora, Ontario**
Date: JUL. 2025	
Project No.: 2501179DH	
	Client: ELORA GREENS INC.
PLANET ENGINEERING Inc. Consulting Engineers	0 250 500 1,000 Meters
	FIGURE 1



Legend

- Approx. Site Boundary
- Borehole
- Monitoring Well

Drawn: AP	Title: **Borehole/Monitoring Well Location Plan**
Approved: KM	Project: **HYDROGEOLOGICAL INVESTIGATION** **127 1st Line, Elora, Ontario**
Date: JUL. 2025	
Project No.: 2501179DH	
	Client: ELORA GREENS INC.
PLANET ENGINEERING Inc. Consulting Engineers	0 45 90 180 Meters
	FIGURE 2

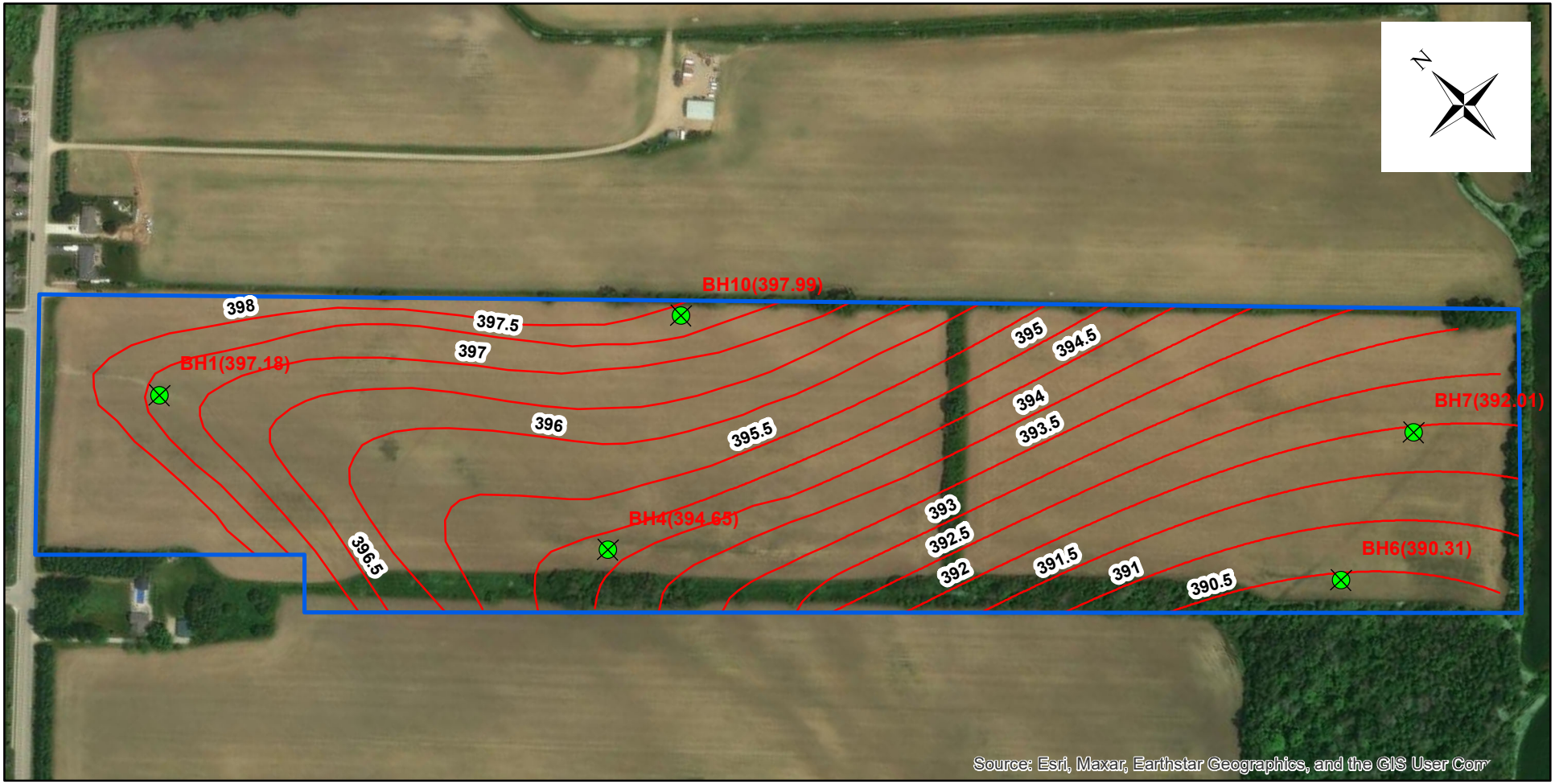


Legend

- Approx. Site Boundary
- 3: Paleozoic bedrock
- 5b: Stone-poor, carbonate-derived silty to sandy till
- 7a: Sandy deposits
- 7b: Gravelly deposits

Drawn: AP	Title: **Surficial Geology**
Approved: KM	Project: **HYDROGEOLOGICAL INVESTIGATION** **127 1st Line, Elora, Ontario**
Date: JUL. 2025	
Project No.: 2501179DH	
	Client: ELORA GREENS INC.
PLANET ENGINEERING Inc. Consulting Engineers	0 125 250 500 Meters

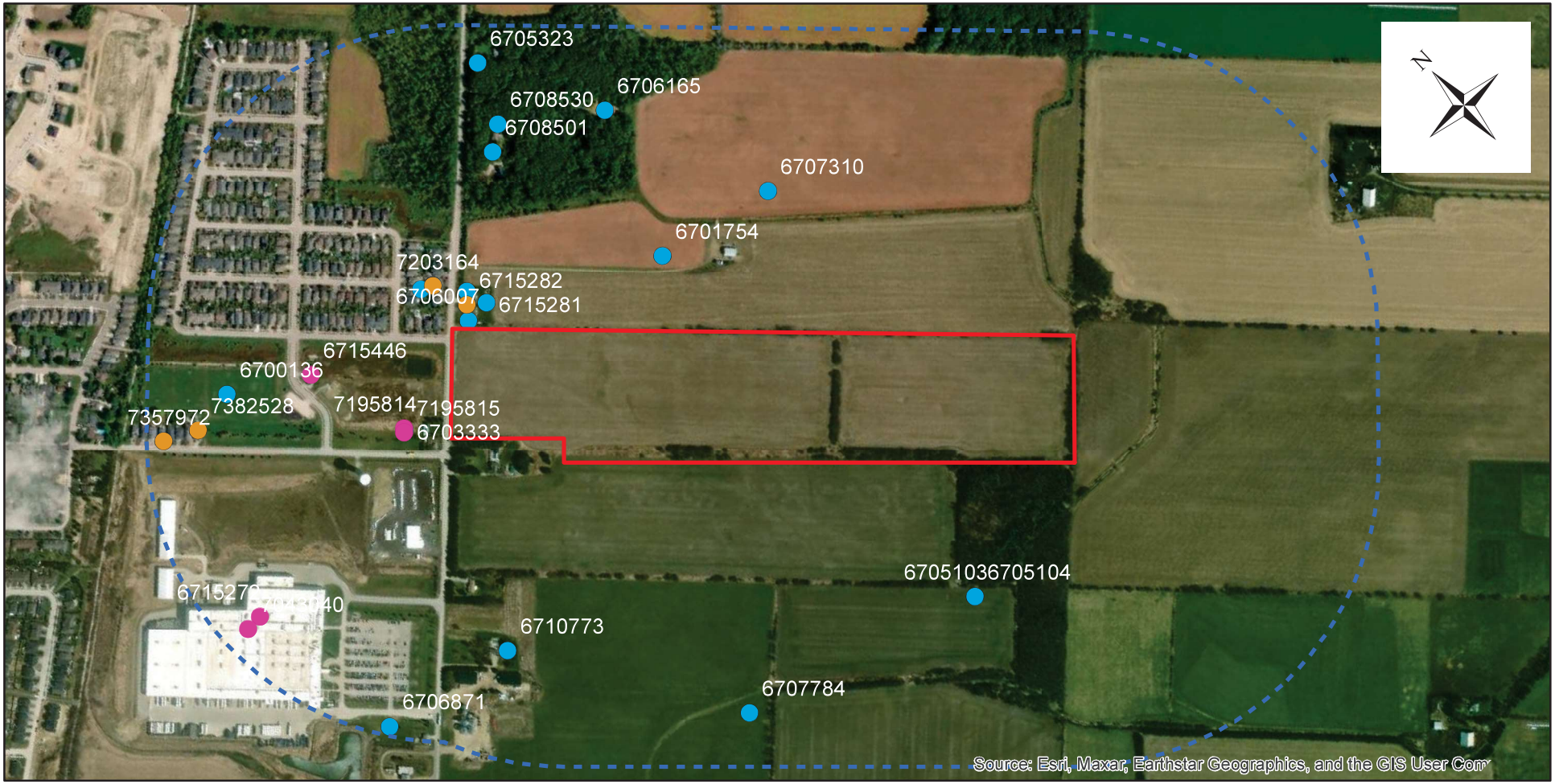
FIGURE 3



Legend

- Approx. Site Boundary
- Monitoring Well
- Groundwater Contours (April 9, 2026)

Drawn: AP	Title: **Groundwater Elevation Contours**
Approved: KM	Project: **HYDROGEOLOGICAL INVESTIGATION** **127 1st Line, Elora, Ontario**
Date: JUL. 2026	
Project No.: 2501179DH	
	Client: ELORA GREENS INC.
PLANET ENGINEERING Inc. Consulting Engineers	0 40 80 160 Meters
	FIGURE 4



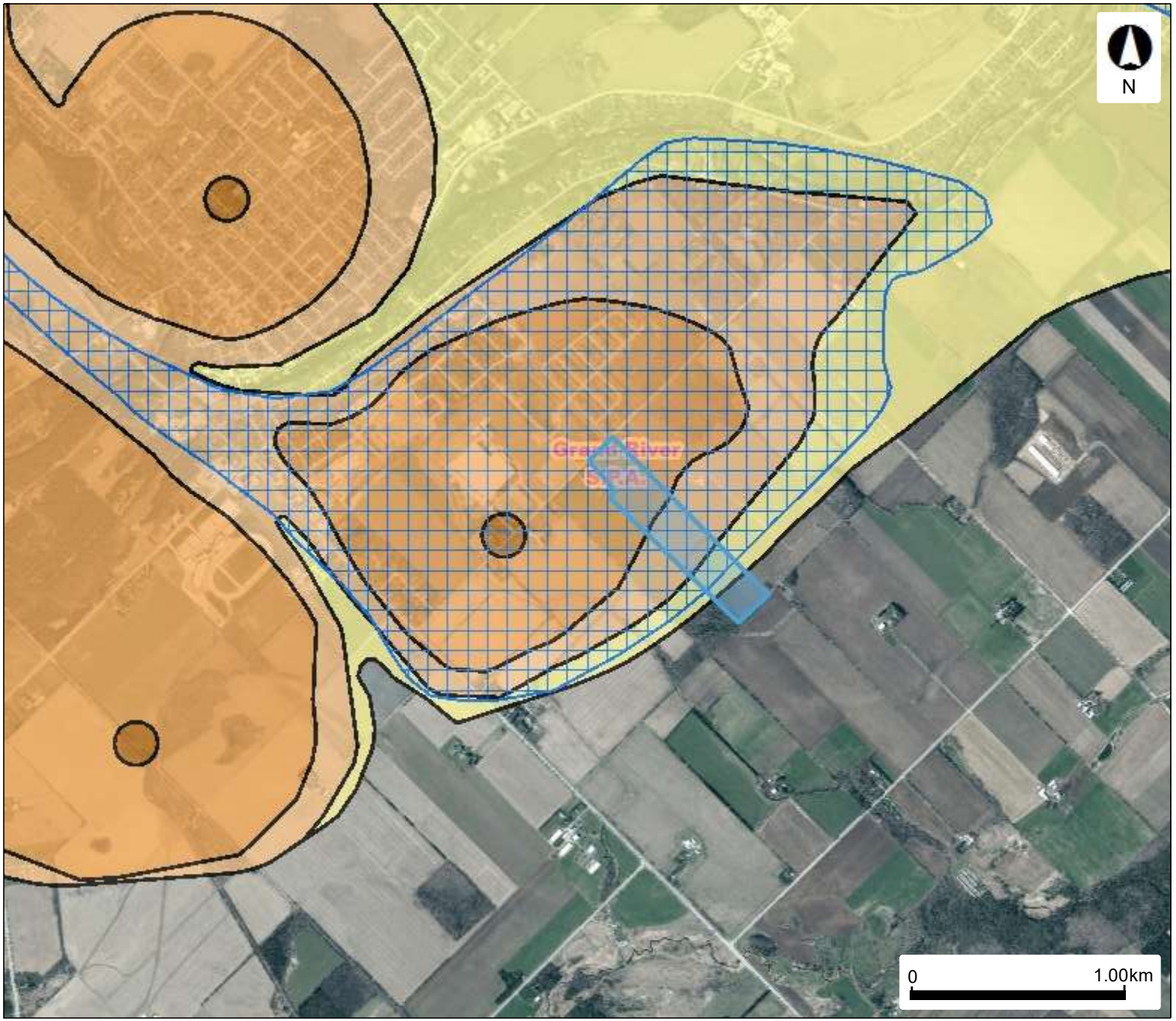
Legend

- 500m Radius
- Approx. Site Boundary
- Abandoned-Other
- Monitoring and Test Hole
- Water Supply

6710773 Well ID

Drawn: AP	Title: **Water Well Records within 500 m Radius**
Approved: KM	Project: **HYDROGEOLOGICAL INVESTIGATION** **127 1st Line, Elora, Ontario**
Date: JUL. 2025	
Project No.: 2501179DH	
	Client: ELORA GREENS INC.
PLANET ENGINEERING Inc. Consulting Engineers	0 100 200 400 Meters
	FIGURE 5

Figure 6 - Source Protection Area



Legend

- Issue Contributing Areas
- WHPA-E
- Wellhead Protection Area
  - A
  - B
  - C
  - C1
  - D
  - F
- Intake Protection Zone 1
- Event Based Areas
- Intake Protection Zone 2
- Source Protection Areas

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Environment, Conservation and Parks (MECP) shall not be liable in any way for the use or any information on this map. of, or reliance upon, this map.

Ontario

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THIS IS NOT A PLAN OF SURVEY.

Map Created: 7/10/2025
Map Center: 43.67535 N, -80.41043 W

APPENDIX A

Borehole Logs

PLANET ENGINEERING Inc. Consulting Engineers

RECORD OF BOREHOLE BH1

PROJECT: 2501179BG

LOCATION: 127 1st Line, Elora, Township of Centre Wellington, ON

CLIENT: Elora Greens Inc.

BH LOCATION: E 547648.964 N 4836223.994

DRILLING DATA

METHOD: Solid Stem Auger

DIAMETER: 150 mm

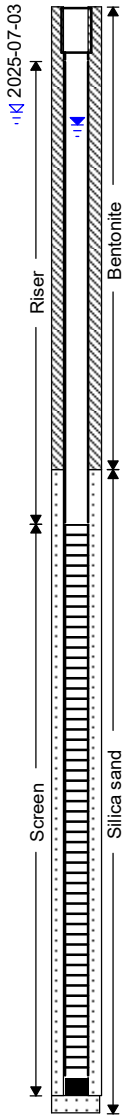
DATE: 2025-06-10

Ground Elevation: 397.4 m

SHEET 1 of 1

DATUM: Geodetic

DEPTH (m)	DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS	Grain size Distribution (%) GR SA	Grain size Distribution (%) SI CL	SHEAR STRENGTH kPa 20 40 60 80	WATER CONTENT (%) 10 20 30 40	WELL INSTALLATION
0	**Groundsurface:**		397.44								
	Topsoil: 150 mm		397.29								
	Disturbed natve / Fill: sandy silt till, trace to some gravel, trace to some clay, brown to grey, oxidized, very moist, loose to very loose			1		5					
			396.54								
1	**Silty Sand Till to Sandy Silt Till:** trace to some gravel, trace to some clay, brown to grey, oxidized, very moist to moist, very loose to very dense			2		2	10 39	42 9			
				3		7					
2				4		59					
3				5		60					
4											
				6		39					
5											
6				7		49					
			390.73								
7	**Upon completion:** borehole terminated at 6.7 m. Monitoring well installed upon completion.										



Upon completion:

1) Cave-in : Open

2) Water : 1.7 m

WATER LEVEL (1st) : 0.65 m (2025-06-19)

WATER LEVEL (2nd) : 0.58 m (2025-07-03)

LOGGED BY: A.P

REVIEWED BY : H.H

PLANET ENGINEERING Inc. Consulting Engineers

RECORD OF BOREHOLE BH2

PROJECT: 2501179BG

LOCATION: 127 1st Line, Elora, Township of Centre Wellington, ON

CLIENT: Elora Greens Inc.

BH LOCATION: E 547659.437 N 4836027.374

DRILLING DATA

METHOD: Solid Stem Auger

DIAMETER: 150 mm

DATE: 2025-06-10

Ground Elevation: 396.9 m

SHEET 1 of 1

DATUM: Geodetic

DEPTH (m)	DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS	Grain size Distribution (%) GR SA	Grain size Distribution (%) SI CL	SHEAR STRENGTH kPa (20 40 60 80)	WATER CONTENT (%) (10 20 30 40)	WELL INSTALLATION
0	**Groundsurface:**		396.94								
	Topsoil: 150 mm		396.79								
	Disturbed Native / Fill: silty sand till, trace to some gravel, trace to some clay, brown to grey, wet, loose to very loose			1		5				○	
1			395.84	2		3				○	
	Silty Sand Till to Sandy Silt Till: trace to some gravel, trace to some clay, oxidized, brown to grey, wet to moist, very loose to very dense			3		19				○	
2				4		2	22 37	34 7		○	
3				5		30				○	
4											
				6		50 / 100 mm	18 36	36 10		○	
5											
6				7		61				○	
			390.23								
	Upon completion: borehole terminated at 6.7 m.										
7											

Upon completion:

1) Cave-in : Open

2) Water : 1.1 m

WATER LEVEL (1st) : N/A

WATER LEVEL (2nd) : N/A

LOGGED BY: A.P

REVIEWED BY : H.H

PLANET ENGINEERING Inc. Consulting Engineers

RECORD OF BOREHOLE BH3

PROJECT: 2501179BG

LOCATION: 127 1st Line, Elora, Township of Centre Wellington, ON

CLIENT: Elora Greens Inc.

BH LOCATION: E 547791.666 N 4836078.004

DRILLING DATA

METHOD: Solid Stem Auger

DIAMETER: 150 mm

DATE: 2025-06-10

Ground Elevation: 396.7 m

SHEET 1 of 1

DATUM: Geodetic

DEPTH (m)	DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS	Grain size Distribution (%) GR SA	Grain size Distribution (%) SI CL	SHEAR STRENGTH kPa (20 40 60 80)	WATER CONTENT (%) (10 20 30 40)	WELL INSTALLATION
0	**Groundsurface:**		396.66								
	Topsoil: 300 mm		396.36	1		9					
	Disturbed Native / Fill : silty sand till, trace to some gravel, trace to some clay, brown to grey, oxidized, wet to very moist, loose		395.59	2		5					
1	**Silty Sand Till to Sandy Silt Till:** trace to some gravel, trace to some clay, brown to grey, oxidized, very moist to wet, loose to very dense			3		7	16 34	41 9			
2				4		87					
3				5		50 / 150 mm					
4				6		50 / 125 mm					
5				7		36					
6			389.95								
7	**Upon completion:** borehole terminated at 6.7 m.										

Upon completion:

1) Cave-in : Open

2) Water : 2.4 m

WATER LEVEL (1st) : N/A

WATER LEVEL (2nd) : N/A

LOGGED BY: A.P

REVIEWED BY : H.H

PLANET ENGINEERING Inc. Consulting Engineers

RECORD OF BOREHOLE BH4

PROJECT: 2501179BG

LOCATION: 127 1st Line, Elora, Township of Centre Wellington, ON

CLIENT: Elora Greens Inc.

BH LOCATION: E 547802.539 N 4835934.566

DRILLING DATA

METHOD: Solid Stem Auger

DIAMETER: 150 mm

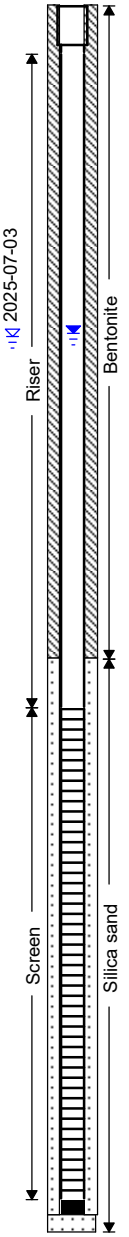
DATE: 2025-06-10

Ground Elevation: 395.4 m

SHEET 1 of 1

DATUM: Geodetic

DEPTH (m)	DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS	Grain size Distribution (%) GR SA	Grain size Distribution (%) SI CL	SHEAR STRENGTH kPa (20 40 60 80)	WATER CONTENT (%) (10 20 30 40)	WELL INSTALLATION
0	**Groundsurface:**		395.39								
	Topsoil: 200 mm		395.19								
	Disturbed native / Fill: silty sand till, trace to some gravel, trace to some clay, brown to grey, wet to very moist, loose			1		5					
			394.39								
1	**Silty Sand Till to Sandy Silt Till:** trace to some gravel, trace to some clay, oxidized, brown to grey, very moist to moist, loose to very dense			2		7					
				3		19					
2				4		59					
3				5		50 / 150 mm					
4											
				6		50 / 150 mm					
5											
6				7		50 / 150 mm					
			388.98								
7											
			387.77								
8	**Upon completion**: borehole terminated at 7.6 m. Monitoring well installed upon completion.										



Upon completion:

1) Cave-in : Open

2) Water : 2.4 m

WATER LEVEL (1st) : 2.03 m (2025-06-19)

WATER LEVEL (2nd) : 2.05 m (2025-07-03)

LOGGED BY: A.P

REVIEWED BY : H.H

PLANET ENGINEERING Inc. Consulting Engineers

RECORD OF BOREHOLE BH5

PROJECT: 2501179BG

LOCATION: 127 1st Line, Elora, Township of Centre Wellington, ON

CLIENT: Elora Greens Inc.

BH LOCATION: E 547798.781 N 4836153.102

DRILLING DATA

METHOD: Solid Stem Auger

DIAMETER: 150 mm

DATE: 2025-06-10

Ground Elevation: 398.2 m

SHEET 1 of 1

DATUM: Geodetic

DEPTH (m)	DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS	Grain size Distribution (%) GR SA	Grain size Distribution (%) SI CL	SHEAR STRENGTH kPa (20 40 60 80)	WATER CONTENT (%) (10 20 30 40)	WELL INSTALLATION
0	**Groundsurface:**		398.16								
	Topsoil: 150 mm		398.01								
	Disturbed Native / Fill: silty sand till, trace to some gravel, trace to some clay, oxidized, brown to grey, very moist to moist, loose to compact			1		6				○	
			397.16	2		11				○	
1	**Silty Sand Till to Sandy Silt Till:** trace to some gravel, trace to some clay, oxidized, brown to grey, moist to very moist, loose to very dense			3		9				○	
2				4		70	7 36	46 11		○	
3				5		91				○	
4				6		50 / 150 mm				○	
5				7		71				○	
6			391.45								
	Upon completion: borehole terminated at 6.7 m.										
7											

Upon completion:

1) Cave-in : Open

2) Water : 2.4 m

WATER LEVEL (1st) : N/A

WATER LEVEL (2nd) : N/A

LOGGED BY: A.P

REVIEWED BY : H.H

PLANET ENGINEERING Inc. Consulting Engineers

RECORD OF BOREHOLE BH6

PROJECT: 2501179BG

LOCATION: 127 1st Line, Elora, Township of Centre Wellington, ON

CLIENT: Elora Greens Inc.

BH LOCATION: E 548158.856 N 4835573.928

DRILLING DATA

METHOD: Solid Stem Auger

DIAMETER: 150 mm

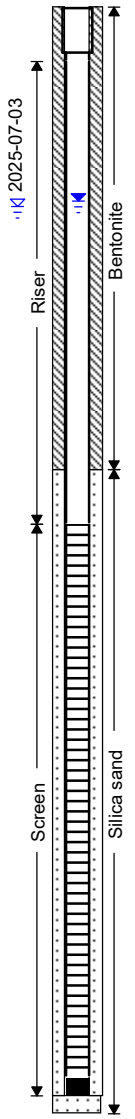
DATE: 2025-06-11

Ground Elevation: 390.4 m

SHEET 1 of 1

DATUM: Geodetic

DEPTH (m)	DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS	Grain size Distribution (%) GR SA	Grain size Distribution (%) SI CL	SHEAR STRENGTH kPa 20 40 60 80	WATER CONTENT (%) 10 20 30 40	WELL INSTALLATION
0	**Groundsurface:**		390.41								
	Topsoil: 250 mm		390.16								
	Fill / Disturbed natve: silty sand till, trace to some gravel, trace to some clay, brown to grey, very moist, loose to very loose		389.51	1		5					
1	**Silty Sand Till to Sandy Silt Till:** trace to some gravel, trace to some clay, oxidized, brown to grey, very moist to moist, very loose to very dense			2		1					
				3		15					
2				4		50					
3				5		50 150 mm	6 34	46 14			
4				6		50 150 mm					
5				7		50 150 mm					
6			384.01								
	Upon completion: borehole terminated at 6.4 m. Monitoring well installed upon completion.										
7											



Upon completion:

1) Cave-in : Open

2) Water : 2.4 m

WATER LEVEL (1st) : 1.07 m (2025-06-19)

WATER LEVEL (2nd) : 1.10 m (2025-07-03)

LOGGED BY: A.P

REVIEWED BY : H.H

PLANET ENGINEERING Inc. Consulting Engineers

RECORD OF BOREHOLE BH7

PROJECT: 2501179BG

LOCATION: 127 1st Line, Elora, Township of Centre Wellington, ON

CLIENT: Elora Greens Inc.

BH LOCATION: E 548265.109 N 4835614.314

DRILLING DATA

METHOD: Solid Stem Auger

DIAMETER: 150 mm

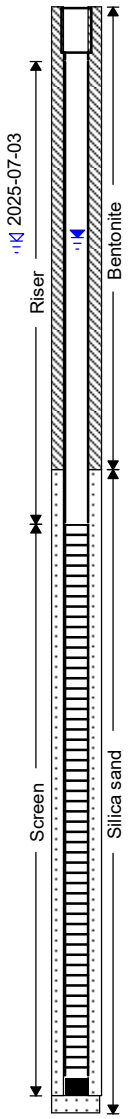
DATE: 2025-06-16

Ground Elevation: 392.2 m

SHEET 1 of 1

DATUM: Geodetic

DEPTH (m)	DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS	Grain size Distribution (%) GR SA	Grain size Distribution (%) SI CL	SHEAR STRENGTH kPa (20 40 60 80)	WATER CONTENT (%) (10 20 30 40)	WELL INSTALLATION
0	**Groundsurface:**		392.23								
	Topsoil: 150 mm		392.08								
	Disturbed Native / Fill: silty sand till, trace to some gravel, trace to some clay, brown to grey, very moist, loose		391.77	1		9					
1	**Silty Sand Till to Sandy Silt Till:** trace to some gravel, trace to some clay, brown to grey, very moist to moist, loose to very dense			2		13					
2				3		9					
				4		34					
3				5		36					
4											
				6		50 / 150 mm					
5											
6				7		50 / 150 mm					
			385.83								
7	**Upon completion:** borehole terminated at 6.4 m. Monitoring well installed upon completion.										



Upon completion:

1) Cave-in : Open

2) Water : 2.4 m

WATER LEVEL (1st) : 1.27 m (2025-06-19)

WATER LEVEL (2nd) : 1.29 m (2025-07-03)

LOGGED BY: A.P

REVIEWED BY : H.H

PLANET ENGINEERING Inc. Consulting Engineers

RECORD OF BOREHOLE BH8

PROJECT: 2501179BG

LOCATION: 127 1st Line, Elora, Township of Centre Wellington, ON

CLIENT: Elora Greens Inc.

BH LOCATION: E 548159.068 N 4835792.755

DRILLING DATA

METHOD: Solid Stem Auger

DIAMETER: 150 mm

DATE: 2025-06-10

Ground Elevation: 395.4 m

SHEET 1 of 1

DATUM: Geodetic

DEPTH (m)	DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS	Grain size Distribution (%) GR SA	Grain size Distribution (%) SI CL	SHEAR STRENGTH kPa (20 40 60 80)	WATER CONTENT (%) (10 20 30 40)	WELL INSTALLATION
0	**Groundsurface:**		395.44								
	Topsoil: 200 mm		395.24								
	Disturbed Native / Fill: silty sand till, trace to some gravel, trace to some clay, brown to grey, wet to very moist, loose			1		5				○	
			394.53								
1	**Silty Sand Till to Sandy Silt Till:** trace to some gravel, trace to some clay, brown to dark grey, very moist to moist, loose to very dense			2		4				○	
				3		9				○	
2				4		10	3 39	47 11		○	
3				5		68				○	
4											
				6		50 / 150 mm				○	
5											
6				7		50 / 150mm				○	
			389.04								
	Upon completion: borehole terminated at 6.4 m.										
7											

Upon completion:

1) Cave-in : Open

2) Water : 1.8 m

WATER LEVEL (1st) : N/A

WATER LEVEL (2nd) : N/A

LOGGED BY: A.P

REVIEWED BY : H.H

PLANET ENGINEERING Inc. Consulting Engineers

RECORD OF BOREHOLE BH9

PROJECT: 2501179BG

LOCATION: 127 1st Line, Elora, Township of Centre Wellington, ON

CLIENT: Elora Greens Inc.

BH LOCATION: E 547954.136 N 4835898.164

DRILLING DATA

METHOD: Solid Stem Auger

DIAMETER: 150 mm

DATE: 2025-06-16

Ground Elevation: 396.4 m

SHEET 1 of 1

DATUM: Geodetic

DEPTH (m)	DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS	Grain size Distribution (%) GR SA	Grain size Distribution (%) SI CL	SHEAR STRENGTH kPa (20 40 60 80)	WATER CONTENT (%) (10 20 30 40)	WELL INSTALLATION
0	**Groundsurface:**		396.40								
	Topsoil: 150 mm		396.25								
	Disturbed Native / Fill: silty sand till, trace to some gravel, trace to some clay, brown to blackish grey, very moist, loose to compact			1		6				○	
			395.40	2		29				○	
1	**Silty Sand Till to Sandy Silt Till:** trace to some gravel, trace to some clay, oxidized, brown to grey, very moist to moist, compact to very dense			3		20				○	
2				4		33				○	
3				5		86				○	
4				6		90				○	
5				7		50 150mm				○	
6			389.85								
	Upon completion: borehole terminated at 6.6 m.										
7											

Upon completion:

1) Cave-in : Open

2) Water : N/A

WATER LEVEL (1st) : N/A

WATER LEVEL (2nd) : N/A

LOGGED BY: A.P

REVIEWED BY : H.H

PLANET ENGINEERING Inc. Consulting Engineers

RECORD OF BOREHOLE BH10

PROJECT: 2501179BG

LOCATION: 127 1st Line, Elora, Township of Centre Wellington, ON

CLIENT: Elora Greens Inc.

BH LOCATION: E 547949.989 N 4836018.364

DRILLING DATA

METHOD: Solid Stem Auger

DIAMETER: 150 mm

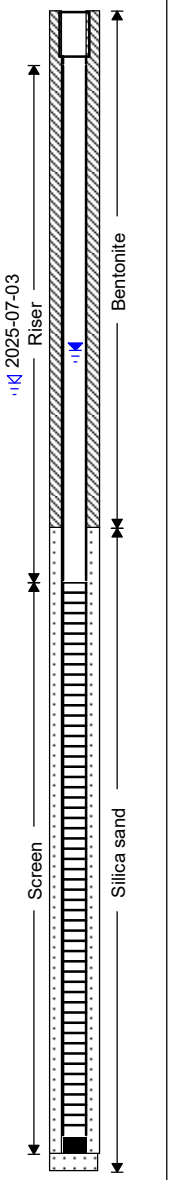
DATE: 2025-06-16

Ground Elevation: 398.7 m

SHEET 1 of 1

DATUM: Geodetic

DEPTH (m)	DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS	Grain size Distribution (%) GR SA	Grain size Distribution (%) SI CL	SHEAR STRENGTH kPa 20 40 60 80	WATER CONTENT (%) 10 20 30 40	WELL INSTALLATION
0	**Groundsurface:**		398.74								
	Topsoil: 200 mm		398.54								
	Disturbed natve / Fill: silty sand till, trace to some gravel, trace to some clay, brown to grey, very moist, loose			1		5					
1			397.67	2		8					
	Silty Sand Till to Sandy Silt Till: trace to some gravel, trace to some clay, brown to grey, very moist to moist, loose to very dense			3		12	11 30	49 10			
2				4		75					
3				5		50 / 150 mm					
4											
				6		50 / 150 mm					
5											
6				7		50 / 150 mm					
			392.34								
7	**Upon completion:** borehole terminated at 6.4 m. Monitoring well installed upon completion.										



Upon completion:

1) Cave-in : Open

2) Water : N/A

WATER LEVEL (1st) : 1.87 m (2025-06-19)

WATER LEVEL (2nd) : 2.05 m (2025-07-03)

LOGGED BY: A.P

REVIEWED BY : H.H

APPENDIX B

Water Quality Certificates of Analysis

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	:	**WT2516476**		
Client	:	**Planet Engineering Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	:	Aayush Panchal	Account Manager	: Amanda Overholster
Address	:	2179 Dunwin Drive Unit 4 Mississauga Ontario Canada L5L 1X2	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	:	----	Telephone	: 1 416 817 2944
Project	:	2501179DH	Date Samples Received	: 24-Jun-2025 10:45
PO	:	----	Date Analysis Commenced	: 25-Jun-2025
C-O-C number	:	23-1124447	Issue Date	: 30-Jun-2025 21:40
Sampler	:	AP		
Site	:	----		
Quote number	:	2025 SOA		
No. of samples received	:	1		
No. of samples analysed	:	1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Amaninder Dhillon		Organics, Waterloo, Ontario
Anthony Calero		Inorganics, Calgary, Alberta
David Tremblett		VOC, Waterloo, Ontario
Nik Perkio		Metals, Waterloo, Ontario
Nik Perkio		Inorganics, Waterloo, Ontario
Rachel Cameron		Organics, Waterloo, Ontario

Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
BH7	Water	Solids, total suspended [TSS]		OCWSUB	STM	117 mg/L	15 mg/L

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key: LOR: Limit of Reporting (detection limit).

Unit	*Description*
mg/L	milligrams per litre
pH units	pH units
µg/L	micrograms per litre

>: greater than.

<: less than.

Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).
For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.

Qualifiers

Qualifier	Description
BODL	Limit of Reporting for BOD was increased to account for the largest volume of sample tested.
SFPR	Suspected False Positive Result, based on detection in Lab Blanks and/or Field Blanks, or other known issues.

Analytical Results Evaluation

Matrix: Water			Client sample ID	BH7	----	----	----	----	----	----
			Client sampling date / time	23-Jun-2025 16:50	----	----	----	----	----	----
			Sub-Matrix	Groundwater	----	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit	WT2516476-001	----	----	----	----	----	----
				Result	----	----	----	----	----	----
Physical Tests										
pH	----	E108/WT	pH units	8.16	----	----	----	----	----	----
Solids, total suspended [TSS]	----	E160/WT	mg/L	117	----	----	----	----	----	----
Anions and Nutrients										
Chloride	16887-00-6	E235.Cl/WT	mg/L	25.3	----	----	----	----	----	----
Fluoride	16984-48-8	E235.F/WT	mg/L	0.096	----	----	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/WT	mg/L	0.568	----	----	----	----	----	----
Phosphorus, total	7723-14-0	E372-U/WT	mg/L	0.0050	----	----	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	mg/L	5.17	----	----	----	----	----	----
Cyanides										
Cyanide, strong acid dissociable (Total)	----	E333/WT	mg/L	<0.0020	----	----	----	----	----	----
Total Sulfides										
Sulfide, total (as S)	18496-25-8	E395/CG	mg/L	<0.0015	----	----	----	----	----	----
Sulfide, total (as H2S)	7783-06-4	E395/CG	mg/L	<0.0016	----	----	----	----	----	----
Total Metals										
Aluminum, total	7429-90-5	E420/WT	mg/L	0.0050	----	----	----	----	----	----
Antimony, total	7440-36-0	E420/WT	mg/L	<0.00010	----	----	----	----	----	----
Arsenic, total	7440-38-2	E420/WT	mg/L	0.00017	----	----	----	----	----	----
Bismuth, total	7440-69-9	E420/WT	mg/L	<0.000050	----	----	----	----	----	----
Cadmium, total	7440-43-9	E420/WT	mg/L	<0.0000050	----	----	----	----	----	----
Chromium, total	7440-47-3	E420/WT	mg/L	<0.00050	----	----	----	----	----	----

Matrix: Water				Client sample ID	BH7	----	----	----	----	----	----
				Client sampling date / time	23-Jun-2025 16:50	----	----	----	----	----	----
				Sub-Matrix	Groundwater	----	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit		WT2516476-001	----	----	----	----	----	----
					Result	----	----	----	----	----	----
Total Metals											
Cobalt, total	7440-48-4	E420/WT	mg/L		0.00013	----	----	----	----	----	----
Copper, total	7440-50-8	E420/WT	mg/L		<0.00050	----	----	----	----	----	----
Iron, total	7439-89-6	E420/WT	mg/L		<0.010	----	----	----	----	----	----
Lead, total	7439-92-1	E420/WT	mg/L		<0.000050	----	----	----	----	----	----
Manganese, total	7439-96-5	E420/WT	mg/L		0.00928	----	----	----	----	----	----
Mercury, total	7439-97-6	E508/WT	mg/L		<0.0000050	----	----	----	----	----	----
Molybdenum, total	7439-98-7	E420/WT	mg/L		0.000882	----	----	----	----	----	----
Nickel, total	7440-02-0	E420/WT	mg/L		0.00077	----	----	----	----	----	----
Selenium, total	7782-49-2	E420/WT	mg/L		0.000299	----	----	----	----	----	----
Silver, total	7440-22-4	E420/WT	mg/L		<0.000010	----	----	----	----	----	----
Tin, total	7440-31-5	E420/WT	mg/L		<0.00010	----	----	----	----	----	----
Titanium, total	7440-32-6	E420/WT	mg/L		<0.00030	----	----	----	----	----	----
Vanadium, total	7440-62-2	E420/WT	mg/L		<0.00050	----	----	----	----	----	----
Zinc, total	7440-66-6	E420/WT	mg/L		<0.0030	----	----	----	----	----	----
Aggregate Organics											
Biochemical oxygen demand [BOD]	----	E550/WT	mg/L		<3.0 BODL	----	----	----	----	----	----
Chemical oxygen demand [COD]	----	E559-L/WT	mg/L		<10	----	----	----	----	----	----
Oil & grease (gravimetric)	----	E567/WT	mg/L		<5.0	----	----	----	----	----	----
Oil & grease, animal/vegetable (gravimetric)	----	EC567A.SG/WT	mg/L		<5.0	----	----	----	----	----	----
Oil & grease, mineral (gravimetric)	----	E567SG/WT	mg/L		<5.0	----	----	----	----	----	----

Matrix: Water				Client sample ID	BH7	----	----	----	----	----	----
				Client sampling date / time	23-Jun-2025 16:50	----	----	----	----	----	----
				Sub-Matrix	Groundwater	----	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit		WT2516476-001	----	----	----	----	----	----
					Result	----	----	----	----	----	----
Aggregate Organics											
Phenols, total (4AAP)	----	E562/WT	mg/L		0.0023	----	----	----	----	----	----
Volatile Organic Compounds											
Benzene	71-43-2	E611D/WT	µg/L		<0.50	----	----	----	----	----	----
Chloroform	67-66-3	E611D/WT	µg/L		<0.50	----	----	----	----	----	----
Dichlorobenzene, 1,2-	95-50-1	E611D/WT	µg/L		<0.50	----	----	----	----	----	----
Dichlorobenzene, 1,4-	106-46-7	E611D/WT	µg/L		<0.50	----	----	----	----	----	----
Dichloromethane	75-09-2	E611D/WT	µg/L		<3.0 SFPR	----	----	----	----	----	----
Ethylbenzene	100-41-4	E611D/WT	µg/L		<0.50	----	----	----	----	----	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D/WT	µg/L		<0.50	----	----	----	----	----	----
Tetrachloroethylene	127-18-4	E611D/WT	µg/L		<0.50	----	----	----	----	----	----
Toluene	108-88-3	E611D/WT	µg/L		2.64	----	----	----	----	----	----
Trichloroethylene	79-01-6	E611D/WT	µg/L		<0.50	----	----	----	----	----	----
Xylene, m+p-	179601-23-1	E611D/WT	µg/L		<0.40	----	----	----	----	----	----
Xylene, o-	95-47-6	E611D/WT	µg/L		<0.30	----	----	----	----	----	----
Xylenes, total	1330-20-7	E611D/WT	µg/L		<0.50	----	----	----	----	----	----
Volatile Organic Compounds Surrogates											
Bromofluorobenzene, 4-	460-00-4	E611D/WT	%		105	----	----	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611D/WT	%		98.6	----	----	----	----	----	----
Polychlorinated Biphenyls											
Aroclor 1016	12674-11-2	E687/WT	µg/L		<0.020	----	----	----	----	----	----

Matrix: Water

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	BH7	----	----	----	----	----	----
				Client sampling date / time	23-Jun-2025 16:50	----	----	----	----	----	----
				Sub-Matrix	Groundwater	----	----	----	----	----	----
					WT2516476-001	----	----	----	----	----	----
					Result	----	----	----	----	----	----
Polychlorinated Biphenyls											
Aroclor 1221	11104-28-2	E687/WT	µg/L		<0.020	----	----	----	----	----	----
Aroclor 1232	11141-16-5	E687/WT	µg/L		<0.020	----	----	----	----	----	----
Aroclor 1242	53469-21-9	E687/WT	µg/L		<0.020	----	----	----	----	----	----
Aroclor 1248	12672-29-6	E687/WT	µg/L		<0.020	----	----	----	----	----	----
Aroclor 1254	11097-69-1	E687/WT	µg/L		<0.020	----	----	----	----	----	----
Aroclor 1260	11096-82-5	E687/WT	µg/L		<0.020	----	----	----	----	----	----
Aroclor 1262	37324-23-5	E687/WT	µg/L		<0.020	----	----	----	----	----	----
Aroclor 1268	11100-14-4	E687/WT	µg/L		<0.020	----	----	----	----	----	----
Polychlorinated biphenyls [PCBs], total	n/a	E687/WT	µg/L		<0.060	----	----	----	----	----	----
Polychlorinated Biphenyls Surrogates											
Decachlorobiphenyl	2051-24-3	E687/WT	%		105	----	----	----	----	----	----
Tetrachloro-m-xylene	877-09-8	E687/WT	%		105	----	----	----	----	----	----
Organochlorine Pesticides											
Hexachlorobenzene	118-74-1	E660F/WT	µg/L		<0.0080	----	----	----	----	----	----
Organochlorine Pesticides Surrogates											
Decachlorobiphenyl	2051-24-3	E660F/WT	%		111	----	----	----	----	----	----
Tetrachloro-m-xylene	877-09-8	E660F/WT	%		100	----	----	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Summary of Guideline Limits

Analyte	CAS Number	Unit	OCWSUB STM	OCWSUB SAN					
Physical Tests									
pH	----	pH units	**6.5 - 8.5 pH units**	**6 - 8.49999 pH units**	----	----	----	----	----
Solids, total suspended [TSS]		mg/L	**15 mg/L**	**350 mg/L**	----	----	----	----	----
Anions and Nutrients									
Chloride	16887-00-6	mg/L	----	**1500 mg/L**	----	----	----	----	----
Fluoride	16984-48-8	mg/L	----	**10 mg/L**	----	----	----	----	----
Kjeldahl nitrogen, total [TKN]		mg/L	----	**50 mg/L**	----	----	----	----	----
Phosphorus, total	7723-14-0	mg/L	----	**10 mg/L**	----	----	----	----	----
Sulfate (as SO4)	14808-79-8	mg/L	----	**1500 mg/L**	----	----	----	----	----
Cyanides									
Cyanide, strong acid dissociable (Total)	----	mg/L	----	**1.2 mg/L**	----	----	----	----	----
Total Sulfides									
Sulfide, total (as S)	18496-25-8	mg/L	----	----	----	----	----	----	----
Sulfide, total (as H2S)	7783-06-4	mg/L	----	**1 mg/L**	----	----	----	----	----
Total Metals									
Aluminum, total	7429-90-5	mg/L	----	**50 mg/L**	----	----	----	----	----
Antimony, total	7440-36-0	mg/L	----	**5 mg/L**	----	----	----	----	----
Arsenic, total	7440-38-2	mg/L	----	**1 mg/L**	----	----	----	----	----
Bismuth, total	7440-69-9	mg/L	----	**5 mg/L**	----	----	----	----	----
Cadmium, total	7440-43-9	mg/L	**0.001 mg/L**	**0.7 mg/L**	----	----	----	----	----
Chromium, total	7440-47-3	mg/L	**0.08 mg/L**	**3 mg/L**	----	----	----	----	----
Cobalt, total	7440-48-4	mg/L	----	**5 mg/L**	----	----	----	----	----
Copper, total	7440-50-8	mg/L	**0.005 mg/L**	**2 mg/L**	----	----	----	----	----
Iron, total	7439-89-6	mg/L	----	**50 mg/L**	----	----	----	----	----
Lead, total	7439-92-1	mg/L	**0.03 mg/L**	**0.7 mg/L**	----	----	----	----	----

Manganese, total	7439-96-5	mg/L	----	**5 mg/L**	----	----	----	----	----
Mercury, total	7439-97-6	mg/L	----	**0.1 mg/L**	----	----	----	----	----
Molybdenum, total	7439-98-7	mg/L	----	**5 mg/L**	----	----	----	----	----
Nickel, total	7440-02-0	mg/L	**0.03 mg/L**	**2 mg/L**	----	----	----	----	----
Selenium, total	7782-49-2	mg/L	----	**2 mg/L**	----	----	----	----	----
Silver, total	7440-22-4	mg/L	----	**1 mg/L**	----	----	----	----	----
Tin, total	7440-31-5	mg/L	----	**5 mg/L**	----	----	----	----	----
Titanium, total	7440-32-6	mg/L	----	**5 mg/L**	----	----	----	----	----
Vanadium, total	7440-62-2	mg/L	----	**5 mg/L**	----	----	----	----	----
Zinc, total	7440-66-6	mg/L	**0.03 mg/L**	**2 mg/L**	----	----	----	----	----
Aggregate Organics									
Biochemical oxygen demand [BOD]		mg/L	**15 mg/L**	**300 mg/L**	----	----	----	----	----
Chemical oxygen demand [COD]		mg/L	----	**600 mg/L**	----	----	----	----	----
Oil & grease (gravimetric)		mg/L	----	----	----	----	----	----	----
Oil & grease, animal/vegetable (gravimetric)		mg/L	----	**150 mg/L**	----	----	----	----	----
Oil & grease, mineral (gravimetric)		mg/L	----	**15 mg/L**	----	----	----	----	----
Phenols, total (4AAP)		mg/L	----	**0.1 mg/L**	----	----	----	----	----
Volatile Organic Compounds									
Benzene	71-43-2	µg/L	----	**10 µg/L**	----	----	----	----	----
Chloroform	67-66-3	µg/L	----	**40 µg/L**	----	----	----	----	----
Dichlorobenzene, 1,2-	95-50-1	µg/L	----	**50 µg/L**	----	----	----	----	----
Dichlorobenzene, 1,4-	106-46-7	µg/L	----	**80 µg/L**	----	----	----	----	----
Dichloromethane	75-09-2	µg/L	----	**90 µg/L**	----	----	----	----	----
Ethylbenzene	100-41-4	µg/L	----	**60 µg/L**	----	----	----	----	----
Tetrachloroethane, 1,1,2,2-	79-34-5	µg/L	----	**60 µg/L**	----	----	----	----	----
Tetrachloroethylene	127-18-4	µg/L	----	**60 µg/L**	----	----	----	----	----
Toluene	108-88-3	µg/L	----	**20 µg/L**	----	----	----	----	----

Trichloroethylene	79-01-6	µg/L	----	**50 µg/L**	----	----	----	----	----
Xylene, m+p-	179601-23-1	µg/L	----	----	----	----	----	----	----
Xylene, o-	95-47-6	µg/L	----	----	----	----	----	----	----
Xylenes, total	1330-20-7	µg/L	----	**300 µg/L**	----	----	----	----	----
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	%	----	----	----	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	%	----	----	----	----	----	----	----
Polychlorinated Biphenyls									
Aroclor 1016	12674-11-2	µg/L	----	----	----	----	----	----	----
Aroclor 1221	11104-28-2	µg/L	----	----	----	----	----	----	----
Aroclor 1232	11141-16-5	µg/L	----	----	----	----	----	----	----
Aroclor 1242	53469-21-9	µg/L	----	----	----	----	----	----	----
Aroclor 1248	12672-29-6	µg/L	----	----	----	----	----	----	----
Aroclor 1254	11097-69-1	µg/L	----	----	----	----	----	----	----
Aroclor 1260	11096-82-5	µg/L	----	----	----	----	----	----	----
Aroclor 1262	37324-23-5	µg/L	----	----	----	----	----	----	----
Aroclor 1268	11100-14-4	µg/L	----	----	----	----	----	----	----
Polychlorinated biphenyls [PCBs], total	n/a	µg/L	----	**4 µg/L**	----	----	----	----	----
Decachlorobiphenyl	2051-24-3	%	----	----	----	----	----	----	----
Tetrachloro-m-xylene	877-09-8	%	----	----	----	----	----	----	----
Organochlorine Pesticides									
Hexachlorobenzene	118-74-1	µg/L	----	**0.1 µg/L**	----	----	----	----	----
Decachlorobiphenyl	2051-24-3	%	----	----	----	----	----	----	----
Tetrachloro-m-xylene	877-09-8	%	----	----	----	----	----	----	----

Key:

OCWSUB		Ontario Center Wellington Wastewater and Storm Sewer By-Law (2022-66)
	SAN	Centre Wellington Sanitary Sewer By-Law (2022-66)
	STM	Center Wellington Storm Sewer By-Law (2022-66)

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2516476**	Page	: 1 of 11
Client	: **Planet Engineering Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Aayush Panchal	Account Manager	: Amanda Overholster
Address	: 2179 Dunwin Drive Unit 4 Mississauga ON Canada L5L 1X2	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 2501179DH	Date Samples Received	: 24-Jun-2025 10:45
PO	: ----	Issue Date	: 30-Jun-2025 21:39
C-O-C number	: 23-1124447		
Sampler	: AP		
Site	: ----		
Quote number	: 2025 SOA		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Method Blank value outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Method Blank (MB) Values								
Anions and Nutrients	QC-2077021-001	----	Kjeldahl nitrogen, total [TKN]	----	E318	0.203 B mg/L	0.05 mg/L	Blank result exceeds permitted value

Result Qualifiers

Qualifier	Description
B	*Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.*

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-4d]										
BH7	E550	23-Jun-2025	----	----	----		25-Jun-2025	4 days	1 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) [ON MECP]										
BH7	E559-L	23-Jun-2025	----	----	----		26-Jun-2025	28 days	3 days	✓
Aggregate Organics : Mineral Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid)										
BH7	E567SG	23-Jun-2025	25-Jun-2025	28 days	2 days	✓	25-Jun-2025	28 days	2 days	✓
Aggregate Organics : Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid)										
BH7	E567	23-Jun-2025	25-Jun-2025	28 days	2 days	✓	25-Jun-2025	28 days	2 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) [ON MECP]										
BH7	E562	23-Jun-2025	27-Jun-2025	28 days	4 days	✓	27-Jun-2025	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP]										
BH7	E235.Cl	23-Jun-2025	26-Jun-2025	28 days	3 days	✓	27-Jun-2025	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP]										
BH7	E235.F	23-Jun-2025	26-Jun-2025	28 days	3 days	✓	27-Jun-2025	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP]										
BH7	E235.SO4	23-Jun-2025	26-Jun-2025	28 days	3 days	✓	27-Jun-2025	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) [ON MECP]										
BH7	E318	23-Jun-2025	27-Jun-2025	28 days	4 days	✓	27-Jun-2025	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) [ON MECP]										
BH7	E372-U	23-Jun-2025	27-Jun-2025	28 days	4 days	✓	30-Jun-2025	28 days	4 days	✓
Cyanides : Total Cyanide										
Opaque HDPE - total (sodium hydroxide)										
BH7	E333	23-Jun-2025	25-Jun-2025	14 days	2 days	✓	25-Jun-2025	14 days	2 days	✓
Organochlorine Pesticides : OCP Analysis by GC-MS-MS										
Amber glass/Teflon lined cap [ON MECP]										
BH7	E660F	23-Jun-2025	26-Jun-2025	14 days	2 days	✓	30-Jun-2025	40 days	5 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP]										
BH7	E108	23-Jun-2025	26-Jun-2025	14 days	3 days	✓	27-Jun-2025	14 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE [ON MECP]										
BH7	E160	23-Jun-2025	----	----	----		26-Jun-2025	7 days	3 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Amber glass/Teflon lined cap [ON MECP]										
BH7	E687	23-Jun-2025	26-Jun-2025	14 days	2 days	✓	26-Jun-2025	40 days	0 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) [ON MECP]										
BH7	E508	23-Jun-2025	27-Jun-2025	28 days	4 days	✓	30-Jun-2025	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
BH7	E420	23-Jun-2025	25-Jun-2025	180 days	2 days	✓	25-Jun-2025	180 days	2 days	✓
Total Sulfides : Total Sulfide by Colourimetry (Automated Flow)										
HDPE total (zinc acetate+sodium hydroxide)										
BH7	E395	23-Jun-2025	----	----	----		26-Jun-2025	7 days	3 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
BH7	E611D	23-Jun-2025	25-Jun-2025	14 days	2 days	✓	25-Jun-2025	14 days	2 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
pH by Meter	E108	2076658	1	12	8.3	5.0	✓
TSS by Gravimetry	E160	2076810	1	20	5.0	4.7	✓
Chloride in Water by IC	E235.Cl	2076651	1	17	5.8	5.0	✓
Fluoride in Water by IC	E235.F	2076656	1	6	16.6	5.0	✓
Sulfate in Water by IC	E235.SO4	2076653	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	2077021	1	16	6.2	5.0	✓
Total Cyanide	E333	2073086	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	2077022	1	19	5.2	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395	2076734	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	2072728	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	2078265	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	2073881	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	2075681	1	19	5.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	2078380	1	19	5.2	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	2073985	1	18	5.5	5.0	✓
Laboratory Control Samples (LCS)							
pH by Meter	E108	2076658	1	12	8.3	5.0	✓
TSS by Gravimetry	E160	2076810	1	20	5.0	4.7	✓
Chloride in Water by IC	E235.Cl	2076651	1	17	5.8	5.0	✓
Fluoride in Water by IC	E235.F	2076656	1	6	16.6	5.0	✓
Sulfate in Water by IC	E235.SO4	2076653	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	2077021	1	16	6.2	5.0	✓
Total Cyanide	E333	2073086	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	2077022	1	19	5.2	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395	2076734	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	2072728	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	2078265	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	2073881	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	2075681	1	19	5.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	2078380	1	19	5.2	5.0	✓
Oil & Grease by Gravimetry	E567	2072743	1	16	6.2	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	2072744	1	11	9.0	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	2073985	1	18	5.5	5.0	✓
OCP Analysis by GC-MS-MS	E660F	2075349	1	2	50.0	5.0	✓
PCB Aroclors by GC-MS	E687	2075348	1	10	10.0	4.7	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB)							
TSS by Gravimetry	E160	2076810	1	20	5.0	4.7	✓
Chloride in Water by IC	E235.Cl	2076651	1	17	5.8	5.0	✓
Fluoride in Water by IC	E235.F	2076656	1	6	16.6	5.0	✓
Sulfate in Water by IC	E235.SO4	2076653	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	2077021	1	16	6.2	5.0	✓
Total Cyanide	E333	2073086	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	2077022	1	19	5.2	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395	2076734	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	2072728	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	2078265	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	2073881	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	2075681	1	19	5.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	2078380	1	19	5.2	5.0	✓
Oil & Grease by Gravimetry	E567	2072743	1	16	6.2	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	2072744	1	11	9.0	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	2073985	1	18	5.5	5.0	✓
OCP Analysis by GC-MS-MS	E660F	2075349	1	2	50.0	5.0	✓
PCB Aroclors by GC-MS	E687	2075348	1	10	10.0	4.7	✓
Matrix Spikes (MS)							
Chloride in Water by IC	E235.Cl	2076651	1	17	5.8	5.0	✓
Fluoride in Water by IC	E235.F	2076656	1	6	16.6	5.0	✓
Sulfate in Water by IC	E235.SO4	2076653	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	2077021	1	16	6.2	5.0	✓
Total Cyanide	E333	2073086	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	2077022	1	19	5.2	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395	2076734	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	2072728	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	2078265	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	2075681	1	19	5.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	2078380	1	19	5.2	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	2073985	1	18	5.5	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter	E108 ALS Environmental - Waterloo	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 ALS Environmental - Waterloo	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Chloride in Water by IC	E235.Cl ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 ALS Environmental - Waterloo	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Cyanide	E333 ALS Environmental - Waterloo	Water	ISO 14403 (mod)	Total or Strong Acid Dissociable (SAD) Cyanide is determined by Continuous Flow Analyzer (CFA) with in-line UV digestion followed by colourmetric analysis. Method Limitation: High levels of thiocyanate (SCN) may cause positive interference (up to 0.5% of SCN concentration).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Waterloo	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Sulfide by Colourimetry (Automated Flow)	E395 ALS Environmental - Calgary	Water	APHA 4500 -S E-Auto-Colorimetry	Sulfide is determined using the gas dialysis automated methylene blue colourimetric method. Results expressed "as H2S" if reported represent the maximum possible H_2S concentration based on the total sulfide concentration in the sample. The H_2S calculation converts Total Sulfide as (S2-) and reports it as Total Sulfide as (H2S).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Waterloo	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 ALS Environmental - Waterloo	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Biochemical Oxygen Demand - 5 day	E550 ALS Environmental - Waterloo	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L ALS Environmental - Waterloo	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Phenols (4AAP) in Water by Colorimetry	E562 ALS Environmental - Waterloo	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide ($K_3Fe(CN)_6$) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
Oil & Grease by Gravimetry	E567 ALS Environmental - Waterloo	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane and the extract is evaporated to dryness. The residue is then weighed to determine Oil and Grease.
Mineral Oil & Grease by Gravimetry	E567SG ALS Environmental - Waterloo	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane, followed by silica gel treatment after which the extract is evaporated to dryness. The residue is then weighed to determine Mineral Oil and Grease.
VOCs (Eastern Canada List) by Headspace GC-MS	E611D ALS Environmental - Waterloo	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
OCP Analysis by GC-MS-MS	E660F ALS Environmental - Waterloo	Water	EPA 8270E (mod)	Pesticides are analyzed by GC-MS-MS
PCB Aroclors by GC-MS	E687 ALS Environmental - Waterloo	Water	EPA 8270E (mod)	PCB Aroclors are analyzed by GC-MS

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Animal & Vegetable Oil & Grease by Gravimetry	EC567A.SG ALS Environmental - Waterloo	Water	APHA 5520 (mod)	Animal & vegetable oil and grease is calculated as follows: Oil & Grease (gravimetric) minus Mineral Oil & Grease (gravimetric)

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for TKN in water	EP318 ALS Environmental - Waterloo	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Waterloo	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Oil & Grease Extraction for Gravimetry	EP567 ALS Environmental - Waterloo	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane by liquid-liquid extraction.
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Waterloo	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into a GC-MS-FID.
Pesticides, PCB, and Neutral Extractable Chlorinated Hydrocarbons Extraction	EP660 ALS Environmental - Waterloo	Water	EPA 3511 (mod)	Samples are extracted from aqueous sample using an organic solvent liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: **WT2516476**	Page	: 1 of 12
Client	: Planet Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Aayush Panchal	Account Manager	: Amanda Overholster
Address	: 2179 Dunwin Drive Unit 4 Mississauga ON Canada L5L 1X2	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 2501179DH	Date Samples Received	: 24-Jun-2025 10:45
PO	: ----	Date Analysis Commenced	: 25-Jun-2025
C-O-C number	: 23-1124447	Issue Date	: 30-Jun-2025 21:39
Sampler	: AP		
Site	: ----		
Quote number	: 2025 SOA		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Amaninder Dhillon	Team Lead - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Anthony Calero	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
David Tremblett	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Metals, Waterloo, Ontario
Rachel Cameron	Supervisor - Semi-Volatile Extractions	Waterloo Organics, Waterloo, Ontario

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 2076658)											
WT2516435-001	Anonymous	pH	----	E108	0.10	pH units	7.71	7.74	0.388%	4%	----
Physical Tests (QC Lot: 2076810)											
WT2516368-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	20.2	20.4	0.2	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2076651)											
WT2516582-001	Anonymous	Chloride	16887-00-6	E235.Cl	2.50	mg/L	247	246	0.246%	20%	----
Anions and Nutrients (QC Lot: 2076653)											
WT2516582-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	19.4	19.2	0.971%	20%	----
Anions and Nutrients (QC Lot: 2076656)											
WT2516582-001	Anonymous	Fluoride	16984-48-8	E235.F	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2077021)											
BF2500085-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.191	0.102	0.089	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2077022)											
BF2500084-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.122	0.121	0.156%	20%	----
Cyanides (QC Lot: 2073086)											
WT2516466-001	Anonymous	Cyanide, strong acid dissociable (Total)	----	E333	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Total Sulfides (QC Lot: 2076734)											
EO2505276-008	Anonymous	Sulfide, total (as S)	18496-25-8	E395	0.0015	mg/L	<0.0015	<0.0015	0	Diff <2x LOR	----
Total Metals (QC Lot: 2072728)											
WT2516362-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0300	mg/L	0.0958	0.0935	0.0023	Diff <2x LOR	----
		Antimony, total	7440-36-0	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000500	mg/L	<0.0000500	<0.0000500	0	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		Lead, total	7439-92-1	E420	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		Manganese, total	7439-96-5	E420	0.00100	mg/L	0.0832	0.0822	1.30%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 2072728) - continued											
WT2516362-001	Anonymous	Molybdenum, total	7439-98-7	E420	0.000500	mg/L	0.00295	0.00270	0.000253	Diff <2x LOR	----
		Nickel, total	7440-02-0	E420	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		Silver, total	7440-22-4	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00300	mg/L	<0.00300	<0.00300	0	Diff <2x LOR	----
		Vanadium, total	7440-62-2	E420	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0300	mg/L	<0.0300	<0.0300	0	Diff <2x LOR	----
Total Metals (QC Lot: 2078265)											
HA2501964-001	Anonymous	Mercury, total	7439-97-6	E508	0.0000050	mg/L	0.0000076	0.0000080	0.0000004	Diff <2x LOR	----
Aggregate Organics (QC Lot: 2073881)											
WT2516450-001	Anonymous	Biochemical oxygen demand [BOD]	----	E550	3.0	mg/L	<3.0	<3.0	0.0%	30%	----
Aggregate Organics (QC Lot: 2075681)											
HA2501964-001	Anonymous	Chemical oxygen demand [COD]	----	E559-L	10	mg/L	50	51	1	Diff <2x LOR	----
Aggregate Organics (QC Lot: 2078380)											
TY2506761-001	Anonymous	Phenols, total (4AAP)	----	E562	0.0500	mg/L	0.479	0.497	0.0175	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 2073985)											
TY2506487-002	Anonymous	Benzene	71-43-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611D	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611D	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 2076810)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 2076651)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 2076653)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 2076656)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2077021)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	# 0.203	B
Anions and Nutrients (QCLot: 2077022)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Cyanides (QCLot: 2073086)						
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	<0.0020	----
Total Sulfides (QCLot: 2076734)						
Sulfide, total (as S)	18496-25-8	E395	0.0015	mg/L	<0.0015	----
Total Metals (QCLot: 2072728)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 2072728) - continued						
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Total Metals (QCLot: 2078265)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Aggregate Organics (QCLot: 2072743)						
Oil & grease (gravimetric)	----	E567	5	mg/L	<5.0	----
Aggregate Organics (QCLot: 2072744)						
Oil & grease, mineral (gravimetric)	----	E567SG	5	mg/L	<5.0	----
Aggregate Organics (QCLot: 2073881)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 2075681)						
Chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 2078380)						
Phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Volatile Organic Compounds (QCLot: 2073985)						
Benzene	71-43-2	E611D	0.5	µg/L	<0.50	----
Chloroform	67-66-3	E611D	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	<0.50	----
Dichloromethane	75-09-2	E611D	1	µg/L	<1.0	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	<0.50	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611D	0.5	µg/L	<0.50	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611D	0.3	µg/L	<0.30	----
Polychlorinated Biphenyls (QCLot: 2075348)						
Aroclor 1016	12674-11-2	E687	0.02	µg/L	<0.020	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	<0.020	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	<0.020	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	<0.020	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	<0.020	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	<0.020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polychlorinated Biphenyls (QCLot: 2075348) - continued						
Aroclor 1260	11096-82-5	E687	0.02	µg/L	<0.020	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	<0.020	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	<0.020	----
Organochlorine Pesticides (QCLot: 2075349)						
Hexachlorobenzene	118-74-1	E660F	0.008	µg/L	<0.0080	----

Qualifiers

Qualifier	Description
B	*Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.*

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 2076658)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 2076810)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 2076651)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 2076653)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	96.4	90.0	110	----
Anions and Nutrients (QCLot: 2076656)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.3	90.0	110	----
Anions and Nutrients (QCLot: 2077021)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	115	75.0	125	----
Anions and Nutrients (QCLot: 2077022)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.333 mg/L	100	80.0	120	----
Cyanides (QCLot: 2073086)									
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	0.25 mg/L	93.0	80.0	120	----
Total Sulfides (QCLot: 2076734)									
Sulfide, total (as S)	18496-25-8	E395	0.0015	mg/L	0.08 mg/L	93.1	80.0	120	----
Total Metals (QCLot: 2072728)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	103	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	0.05 mg/L	106	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	108	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	0.05 mg/L	103	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	102	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.012 mg/L	103	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.012 mg/L	101	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.012 mg/L	99.7	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	0.05 mg/L	101	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	104	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.012 mg/L	102	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 2072728) - continued									
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.012 mg/L	104	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.025 mg/L	101	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	102	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.005 mg/L	102	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.025 mg/L	104	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.012 mg/L	102	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.025 mg/L	103	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	104	80.0	120	----
Total Metals (QCLot: 2078265)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0 mg/L	95.2	80.0	120	----
Aggregate Organics (QCLot: 2072743)									
Oil & grease (gravimetric)	----	E567	5	mg/L	200 mg/L	90.9	70.0	130	----
Aggregate Organics (QCLot: 2072744)									
Oil & grease, mineral (gravimetric)	----	E567SG	5	mg/L	100 mg/L	93.0	70.0	130	----
Aggregate Organics (QCLot: 2073881)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	97.1	85.0	115	----
Aggregate Organics (QCLot: 2075681)									
Chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	107	85.0	115	----
Aggregate Organics (QCLot: 2078380)									
Phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	102	85.0	115	----
Volatile Organic Compounds (QCLot: 2073985)									
Benzene	71-43-2	E611D	0.5	µg/L	100 µg/L	96.7	70.0	130	----
Chloroform	67-66-3	E611D	0.5	µg/L	100 µg/L	108	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	100 µg/L	103	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	100 µg/L	106	70.0	130	----
Dichloromethane	75-09-2	E611D	1	µg/L	100 µg/L	109	70.0	130	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	100 µg/L	93.7	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	100 µg/L	98.0	70.0	130	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	100 µg/L	93.6	70.0	130	----
Toluene	108-88-3	E611D	0.5	µg/L	100 µg/L	96.3	70.0	130	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	100 µg/L	105	70.0	130	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	200 µg/L	94.7	70.0	130	----
Xylene, o-	95-47-6	E611D	0.3	µg/L	100 µg/L	94.1	70.0	130	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Polychlorinated Biphenyls (QCLot: 2075348)									
Aroclor 1016	12674-11-2	E687	0.02	µg/L	0.2 µg/L	99.5	60.0	140	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	0.2 µg/L	99.5	60.0	140	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	0.2 µg/L	99.5	60.0	140	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	0.2 µg/L	99.5	60.0	140	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	0.2 µg/L	86.0	60.0	140	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	0.2 µg/L	97.7	60.0	140	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	0.2 µg/L	111	60.0	140	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	0.2 µg/L	111	60.0	140	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	0.2 µg/L	111	60.0	140	----
Organochlorine Pesticides (QCLot: 2075349)									
Hexachlorobenzene	118-74-1	E660F	0.008	µg/L	0.2 µg/L	75.3	50.0	150	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 2076651)										
WT2516582-001	Anonymous	Chloride	16887-00-6	E235.Cl	496 mg/L	500 mg/L	99.3	75.0	125	----
Anions and Nutrients (QCLot: 2076653)										
WT2516582-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	475 mg/L	500 mg/L	94.9	75.0	125	----
Anions and Nutrients (QCLot: 2076656)										
WT2516582-001	Anonymous	Fluoride	16984-48-8	E235.F	4.91 mg/L	5 mg/L	98.2	75.0	125	----
Anions and Nutrients (QCLot: 2077021)										
BF2500085-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.98 mg/L	2.5 mg/L	119	70.0	130	----
Anions and Nutrients (QCLot: 2077022)										
BF2500084-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	ND mg/L	----	ND	70.0	130	----
Cyanides (QCLot: 2073086)										
WT2516466-001	Anonymous	Cyanide, strong acid dissociable (Total)	----	E333	0.233 mg/L	0.25 mg/L	93.2	75.0	125	----
Total Sulfides (QCLot: 2076734)										
EO2505276-012	Anonymous	Sulfide, total (as S)	18496-25-8	E395	0.110 mg/L	0.1 mg/L	110	75.0	125	----
Total Metals (QCLot: 2072728)										
WT2516365-001	Anonymous	Aluminum, total	7429-90-5	E420	ND mg/L	----	ND	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0524 mg/L	0.05 mg/L	105	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0559 mg/L	0.05 mg/L	112	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.0461 mg/L	0.05 mg/L	92.3	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00481 mg/L	0.005 mg/L	96.1	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0127 mg/L	0.012 mg/L	102	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0124 mg/L	0.012 mg/L	99.3	70.0	130	----
		Copper, total	7440-50-8	E420	ND mg/L	----	ND	70.0	130	----
		Iron, total	7439-89-6	E420	ND mg/L	----	ND	70.0	130	----
		Lead, total	7439-92-1	E420	0.0238 mg/L	0.025 mg/L	95.4	70.0	130	----
		Manganese, total	7439-96-5	E420	ND mg/L	----	ND	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0133 mg/L	0.012 mg/L	106	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0241 mg/L	0.025 mg/L	96.4	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0508 mg/L	0.05 mg/L	102	70.0	130	----
		Silver, total	7440-22-4	E420	0.00476 mg/L	0.005 mg/L	95.3	70.0	130	----
		Tin, total	7440-31-5	E420	0.0255 mg/L	0.025 mg/L	102	70.0	130	----
		Titanium, total	7440-32-6	E420	ND mg/L	----	ND	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.0270 mg/L	0.025 mg/L	108	70.0	130	----
		Zinc, total	7440-66-6	E420	0.0239 mg/L	0.025 mg/L	95.8	70.0	130	----
Total Metals (QCLot: 2078265)										
HA2501964-002	Anonymous	Mercury, total	7439-97-6	E508	0.0000983 mg/L	0 mg/L	98.3	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Aggregate Organics (QCLot: 2075681)										
HA2501964-001	Anonymous	Chemical oxygen demand [COD]	----	E559-L	100 mg/L	100 mg/L	100	75.0	125	----
Aggregate Organics (QCLot: 2078380)										
TY2506761-001	Anonymous	Phenols, total (4AAP)	----	E562	ND mg/L	----	ND	75.0	125	----
Volatile Organic Compounds (QCLot: 2073985)										
TY2506487-002	Anonymous	Benzene	71-43-2	E611D	102 µg/L	100 µg/L	102	60.0	140	----
		Chloroform	67-66-3	E611D	114 µg/L	100 µg/L	114	60.0	140	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	105 µg/L	100 µg/L	105	60.0	140	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	107 µg/L	100 µg/L	107	60.0	140	----
		Dichloromethane	75-09-2	E611D	116 µg/L	100 µg/L	116	60.0	140	----
		Ethylbenzene	100-41-4	E611D	96.0 µg/L	100 µg/L	96.0	60.0	140	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	103 µg/L	100 µg/L	103	60.0	140	----
		Tetrachloroethylene	127-18-4	E611D	94.8 µg/L	100 µg/L	94.8	60.0	140	----
		Toluene	108-88-3	E611D	98.9 µg/L	100 µg/L	98.9	60.0	140	----
		Trichloroethylene	79-01-6	E611D	110 µg/L	100 µg/L	110	60.0	140	----
		Xylene, m+p-	179601-23-1	E611D	194 µg/L	200 µg/L	97.3	60.0	140	----
		Xylene, o-	95-47-6	E611D	97.3 µg/L	100 µg/L	97.3	60.0	140	----

GC-306 OGG-573
MM-120 VW-052
CN-073
N-951

Chain of Custody (COC) / Analytical Request Form

COC Number: 23 - 11?

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Environmental Division Waterloo

Work Order Reference WT2516476

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Report To	Contact and company name below will appear on the final report
Company:	Planet Eng Inc
Contact:	Kayush Panchali
Phone:	289-600-2791
Company address below will appear on the final report	
Street:	
City/Province:	
Postal Code:	
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Project Information	
ALS Client Code / QUOTE #:	
Job / Project #:	2501179 DH
PO / AFE:	
LSD:	
ALS Lab Work Order # (ALS use only):	JD

Reports / Recipients	
Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Merge QC/QCI Reports with COA	☑ YES ☐ NO ☐ N/A
☑ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	lab COA@planeteng.ca
Email 2	kourosh.mahdi.monabi@planeteng.ca
Email 3	kayush.panchali@planeteng.ca

Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	Invoice@planeteng.ca
Email 2	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact:	Sampler: AP

Turnaround Time (TAT) Requested

- ☐ Routine [R] if received by 3pm M-F - no surcharges apply
- ☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
- ☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
- ☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
- ☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
- ☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, st

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

Analysis Request

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Centre Welling ton	Storm + San Sewer	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	BH 7	23-6-25	4:50pm	G.W.	1	✓				

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	Centre welling ton Storm + San sewer by law,
Are samples for human consumption/ use? ☐ YES ☑ NO	

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☑ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C				
				3.5				

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: AP	Date: 23/6/2025	Time: 8:20	Received by:	Date:	Time:	Received by: AP	Date: 24-Jun-25	Time: 10:45

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JAN 2023 FRONT

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	:	**WT2516470**		
Client	:	**Planet Engineering Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	:	Aayush Panchal	Account Manager	: Amanda Overholster
Address	:	2179 Dunwin Drive Unit 4 Mississauga Ontario Canada L5L 1X2	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	:	----	Telephone	: 1 416 817 2944
Project	:	2501179DH	Date Samples Received	: 24-Jun-2025 11:45
PO	:	----	Date Analysis Commenced	: 25-Jun-2025
C-O-C number	:	23-1124445	Issue Date	: 02-Jul-2025 16:45
Sampler	:	AP		
Site	:	127 Line 1, Elora		
Quote number	:	2025 SOA		
No. of samples received	:	1		
No. of samples analysed	:	1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Nik Perkio		Metals, Waterloo, Ontario
Nik Perkio		Inorganics, Waterloo, Ontario
Nik Perkio		Centralized Prep, Waterloo, Ontario
Walt Kippenhuck		Inorganics, Waterloo, Ontario

Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
BH4	Water	Phosphorus, total		ONPWQO	IPWQOT2<100	<0.050 mg/L	0.01 mg/L
	Water	Phosphorus, total		ONPWQO	IPWQOT2>100	<0.050 mg/L	0.01 mg/L

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key: LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units
µS/cm	microsiemens per centimetre

>: greater than.
<: less than.

Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).
For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.

Lavender shading is applied where the LOR itself is greater than the Guideline Upper Limit (or Lower than the Guideline Lower Limit, if applicable).

Qualifiers

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.

Analytical Results Evaluation

Matrix: Water				Client sample ID	BH4	----	----	----	----	----	----
				Client sampling date / time	23-Jun-2025 16:00	----	----	----	----	----	----
				Sub-Matrix	Groundwater	----	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit		WT2516470-001	----	----	----	----	----	----
					Result	----	----	----	----	----	----
Sample Preparation											
Dissolved carbon filtration location	----	EP358/WT	-		lab	----	----	----	----	----	----
Physical Tests											
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/WT	mg/L		302	----	----	----	----	----	----
Alkalinity, carbonate (as CO3)	3812-32-6	E290/WT	mg/L		<0.6	----	----	----	----	----	----
Alkalinity, hydroxide (as OH)	14280-30-9	E290/WT	mg/L		<0.3	----	----	----	----	----	----
Alkalinity, total (as CaCO3)	----	E290/WT	mg/L		248	----	----	----	----	----	----
Colour, apparent	----	E330/WT	CU		3.3	----	----	----	----	----	----
Conductivity	----	E100/WT	µS/cm		608	----	----	----	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/WT	mg/L		332	----	----	----	----	----	----
pH	----	E108/WT	pH units		8.17	----	----	----	----	----	----
Solids, total dissolved [TDS]	----	E162/WT	mg/L		367 DLDS	----	----	----	----	----	----
Solids, total dissolved [TDS], calculated	----	EC103A/WT	mg/L		395	----	----	----	----	----	----
Turbidity	----	E121/WT	NTU		0.78	----	----	----	----	----	----
Langelier index (@ 20°C)	----	EC105A/WT	-		0.970	----	----	----	----	----	----
Langelier index (@ 4°C)	----	EC105A/WT	-		0.723	----	----	----	----	----	----
pH, saturation (@ 20°C)	----	EC105A/WT	pH units		7.20	----	----	----	----	----	----
pH, saturation (@ 4°C)	----	EC105A/WT	pH units		7.45	----	----	----	----	----	----
Anions and Nutrients											
Ammonia, total (as N)	7664-41-7	E298/WT	mg/L		0.0212	----	----	----	----	----	----

Matrix: Water				Client sample ID	BH4	----	----	----	----	----	----
				Client sampling date / time	23-Jun-2025 16:00	----	----	----	----	----	----
				Sub-Matrix	Groundwater	----	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit		WT2516470-001	----	----	----	----	----	----
					Result	----	----	----	----	----	----
Anions and Nutrients											
Bromide	24959-67-9	E235.Br/WT	mg/L		<0.10	----	----	----	----	----	----
Chloride	16887-00-6	E235.Cl/WT	mg/L		18.6	----	----	----	----	----	----
Fluoride	16984-48-8	E235.F/WT	mg/L		0.103	----	----	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3/WT	mg/L		9.40	----	----	----	----	----	----
Nitrate + Nitrite (as N)	----	EC235.N+N/WT	mg/L		9.43	----	----	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2/WT	mg/L		0.034	----	----	----	----	----	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/WT	mg/L		0.0026	----	----	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	mg/L		23.0	----	----	----	----	----	----
Organic / Inorganic Carbon											
Carbon, dissolved organic [DOC]	----	E358-L/WT	mg/L		1.53	----	----	----	----	----	----
Metals											
Sodium adsorption ratio [SAR]	----	EC102/WT	-		0.16	----	----	----	----	----	----
Ion Balance											
Anion sum	----	EC101A/WT	meq/L		6.64	----	----	----	----	----	----
Cation sum (total)	----	EC101A/WT	meq/L		7.02	----	----	----	----	----	----
Ion balance (APHA)	----	EC101A/WT	%		2.78	----	----	----	----	----	----
Ion balance (cations/anions)	----	EC101A/WT	%		106	----	----	----	----	----	----
Total Metals											
Aluminum, total	7429-90-5	E420/WT	mg/L		0.0067	----	----	----	----	----	----
Antimony, total	7440-36-0	E420/WT	mg/L		0.00013	----	----	----	----	----	----

Matrix: Water				Client sample ID	BH4	----	----	----	----	----	----
				Client sampling date / time	23-Jun-2025 16:00	----	----	----	----	----	----
				Sub-Matrix	Groundwater	----	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit		WT2516470-001	----	----	----	----	----	----
					Result	----	----	----	----	----	----
Total Metals											
Arsenic, total	7440-38-2	E420/WT	mg/L		0.00048	----	----	----	----	----	----
Barium, total	7440-39-3	E420/WT	mg/L		0.0475	----	----	----	----	----	----
Beryllium, total	7440-41-7	E420/WT	mg/L		<0.000020	----	----	----	----	----	----
Bismuth, total	7440-69-9	E420/WT	mg/L		<0.000050	----	----	----	----	----	----
Boron, total	7440-42-8	E420/WT	mg/L		0.026	----	----	----	----	----	----
Cadmium, total	7440-43-9	E420/WT	mg/L		<0.0000050	----	----	----	----	----	----
Calcium, total	7440-70-2	E420/WT	mg/L		71.0	----	----	----	----	----	----
Cesium, total	7440-46-2	E420/WT	mg/L		<0.000010	----	----	----	----	----	----
Chromium, total	7440-47-3	E420/WT	mg/L		<0.00050	----	----	----	----	----	----
Cobalt, total	7440-48-4	E420/WT	mg/L		0.00010	----	----	----	----	----	----
Copper, total	7440-50-8	E420/WT	mg/L		0.00063	----	----	----	----	----	----
Iron, total	7439-89-6	E420/WT	mg/L		<0.010	----	----	----	----	----	----
Lead, total	7439-92-1	E420/WT	mg/L		<0.000050	----	----	----	----	----	----
Lithium, total	7439-93-2	E420/WT	mg/L		0.0047	----	----	----	----	----	----
Magnesium, total	7439-95-4	E420/WT	mg/L		37.5	----	----	----	----	----	----
Manganese, total	7439-96-5	E420/WT	mg/L		0.0193	----	----	----	----	----	----
Molybdenum, total	7439-98-7	E420/WT	mg/L		0.00268	----	----	----	----	----	----
Nickel, total	7440-02-0	E420/WT	mg/L		0.00060	----	----	----	----	----	----
Phosphorus, total	7723-14-0	E420/WT	mg/L		<0.050	----	----	----	----	----	----
Potassium, total	7440-09-7	E420/WT	mg/L		3.82	----	----	----	----	----	----

Matrix: Water

Analyte	CAS Number	Method/Lab	Unit	Client sample ID: BH4	----	----	----	----	----	----
				Client sampling date / time: 23-Jun-2025 16:00	----	----	----	----	----	----
				Sub-Matrix: Groundwater	----	----	----	----	----	----
				WT2516470-001	----	----	----	----	----	----
				Result	----	----	----	----	----	----
Total Metals										
Rubidium, total	7440-17-7	E420/WT	mg/L	0.00090	----	----	----	----	----	----
Selenium, total	7782-49-2	E420/WT	mg/L	0.000351	----	----	----	----	----	----
Silicon (as SiO2), total	7631-86-9	EC420.SiO2/WT	mg/L	16.4	----	----	----	----	----	----
Silicon, total	7440-21-3	E420/WT	mg/L	7.69	----	----	----	----	----	----
Silver, total	7440-22-4	E420/WT	mg/L	<0.000010	----	----	----	----	----	----
Sodium, total	7440-23-5	E420/WT	mg/L	6.86	----	----	----	----	----	----
Strontium, total	7440-24-6	E420/WT	mg/L	0.199	----	----	----	----	----	----
Sulfur, total	7704-34-9	E420/WT	mg/L	9.48	----	----	----	----	----	----
Tellurium, total	13494-80-9	E420/WT	mg/L	<0.00020	----	----	----	----	----	----
Thallium, total	7440-28-0	E420/WT	mg/L	<0.000010	----	----	----	----	----	----
Thorium, total	7440-29-1	E420/WT	mg/L	<0.00010	----	----	----	----	----	----
Tin, total	7440-31-5	E420/WT	mg/L	<0.00010	----	----	----	----	----	----
Titanium, total	7440-32-6	E420/WT	mg/L	<0.00030	----	----	----	----	----	----
Tungsten, total	7440-33-7	E420/WT	mg/L	<0.00010	----	----	----	----	----	----
Uranium, total	7440-61-1	E420/WT	mg/L	0.000940	----	----	----	----	----	----
Vanadium, total	7440-62-2	E420/WT	mg/L	0.00073	----	----	----	----	----	----
Zinc, total	7440-66-6	E420/WT	mg/L	<0.0030	----	----	----	----	----	----
Zirconium, total	7440-67-7	E420/WT	mg/L	<0.00020	----	----	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Summary of Guideline Limits

Analyte	CAS Number	Unit	ONPWQO IPWQOT2<100	ONPWQO IPWQOT2>100	ONPWQO PWQOT2<100	ONPWQO PWQOT2>100			
Sample Preparation									
Dissolved carbon filtration location	----	-	----	----	----	----	----	----	----
Physical Tests									
Alkalinity, bicarbonate (as HCO3)	71-52-3	mg/L	----	----	----	----	----	----	----
Alkalinity, carbonate (as CO3)	3812-32-6	mg/L	----	----	----	----	----	----	----
Alkalinity, hydroxide (as OH)	14280-30-9	mg/L	----	----	----	----	----	----	----
Alkalinity, total (as CaCO3)		mg/L	----	----	----	----	----	----	----
Colour, apparent		CU	----	----	----	----	----	----	----
Conductivity	----	µS/cm	----	----	----	----	----	----	----
Hardness (as CaCO3), from total Ca/Mg		mg/L	----	----	----	----	----	----	----
pH	----	pH units	----	----	**6.5 - 8.5 pH units**	**6.5 - 8.5 pH units**	----	----	----
Solids, total dissolved [TDS]		mg/L	----	----	----	----	----	----	----
Solids, total dissolved [TDS], calculated		mg/L	----	----	----	----	----	----	----
Turbidity	----	NTU	----	----	----	----	----	----	----
Langelier index (@ 20°C)		-	----	----	----	----	----	----	----
Langelier index (@ 4°C)		-	----	----	----	----	----	----	----
pH, saturation (@ 20°C)	----	pH units	----	----	----	----	----	----	----
pH, saturation (@ 4°C)	----	pH units	----	----	----	----	----	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	mg/L	----	----	----	----	----	----	----
Bromide	24959-67-9	mg/L	----	----	----	----	----	----	----
Chloride	16887-00-6	mg/L	----	----	----	----	----	----	----
Fluoride	16984-48-8	mg/L	----	----	----	----	----	----	----
Nitrate (as N)	14797-55-8	mg/L	----	----	----	----	----	----	----

Nitrate + Nitrite (as N)		mg/L	----	----	----	----	----	----	----
Nitrite (as N)	14797-65-0	mg/L	----	----	----	----	----	----	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	mg/L	----	----	----	----	----	----	----
Sulfate (as SO4)	14808-79-8	mg/L	----	----	----	----	----	----	----
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]		mg/L	----	----	----	----	----	----	----
Metals									
Sodium adsorption ratio [SAR]		-	----	----	----	----	----	----	----
Ion Balance									
Anion sum		meq/L	----	----	----	----	----	----	----
Cation sum (total)	----	meq/L	----	----	----	----	----	----	----
Ion balance (APHA)	----	%	----	----	----	----	----	----	----
Ion balance (cations/anions)	----	%	----	----	----	----	----	----	----
Total Metals									
Aluminum, total	7429-90-5	mg/L	**0.075 mg/L**	**0.075 mg/L**	----	----	----	----	----
Antimony, total	7440-36-0	mg/L	**0.02 mg/L**	**0.02 mg/L**	----	----	----	----	----
Arsenic, total	7440-38-2	mg/L	**0.005 mg/L**	**0.005 mg/L**	**0.1 mg/L**	**0.1 mg/L**	----	----	----
Barium, total	7440-39-3	mg/L	----	----	----	----	----	----	----
Beryllium, total	7440-41-7	mg/L	----	----	**1.1 mg/L**	**0.011 mg/L**	----	----	----
Bismuth, total	7440-69-9	mg/L	----	----	----	----	----	----	----
Boron, total	7440-42-8	mg/L	----	----	----	----	----	----	----
Cadmium, total	7440-43-9	mg/L	**0.0001 mg/L**	**0.0005 mg/L**	**0.0002 mg/L**	**0.0002 mg/L**	----	----	----
Calcium, total	7440-70-2	mg/L	----	----	----	----	----	----	----
Cesium, total	7440-46-2	mg/L	----	----	----	----	----	----	----
Chromium, total	7440-47-3	mg/L	----	----	----	----	----	----	----
Cobalt, total	7440-48-4	mg/L	**0.0009 mg/L**	**0.0009 mg/L**	----	----	----	----	----
Copper, total	7440-50-8	mg/L	**0.001 mg/L**	**0.005 mg/L**	**0.005 mg/L**	**0.005 mg/L**	----	----	----
Iron, total	7439-89-6	mg/L	----	----	**0.3 mg/L**	**0.3 mg/L**	----	----	----

Lead, total	7439-92-1	mg/L	**0.001 mg/L**	**0.005 mg/L**	**0.005 mg/L**	**0.025 mg/L**	----	----	----
Lithium, total	7439-93-2	mg/L	----	----	----	----	----	----	----
Magnesium, total	7439-95-4	mg/L	----	----	----	----	----	----	----
Manganese, total	7439-96-5	mg/L	----	----	----	----	----	----	----
Molybdenum, total	7439-98-7	mg/L	**0.04 mg/L**	**0.04 mg/L**	----	----	----	----	----
Nickel, total	7440-02-0	mg/L	**0.025 mg/L**	**0.025 mg/L**	**0.025 mg/L**	**0.025 mg/L**	----	----	----
Phosphorus, total	7723-14-0	mg/L	**0.01 mg/L**	**0.01 mg/L**	----	----	----	----	----
Potassium, total	7440-09-7	mg/L	----	----	----	----	----	----	----
Rubidium, total	7440-17-7	mg/L	----	----	----	----	----	----	----
Selenium, total	7782-49-2	mg/L	**0.1 mg/L**	----	**0.1 mg/L**	**0.1 mg/L**	----	----	----
Silicon (as SiO2), total	7631-86-9	mg/L	----	----	----	----	----	----	----
Silicon, total	7440-21-3	mg/L	----	----	----	----	----	----	----
Silver, total	7440-22-4	mg/L	**0.0001 mg/L**	**0.0001 mg/L**	**0.0001 mg/L**	**0.0001 mg/L**	----	----	----
Sodium, total	7440-23-5	mg/L	----	----	----	----	----	----	----
Strontium, total	7440-24-6	mg/L	----	----	----	----	----	----	----
Sulfur, total	7704-34-9	mg/L	----	----	----	----	----	----	----
Tellurium, total	13494-80-9	mg/L	----	----	----	----	----	----	----
Thallium, total	7440-28-0	mg/L	**0.0003 mg/L**	**0.0003 mg/L**	----	----	----	----	----
Thorium, total	7440-29-1	mg/L	----	----	----	----	----	----	----
Tin, total	7440-31-5	mg/L	----	----	----	----	----	----	----
Titanium, total	7440-32-6	mg/L	----	----	----	----	----	----	----
Tungsten, total	7440-33-7	mg/L	**0.03 mg/L**	**0.03 mg/L**	----	----	----	----	----
Uranium, total	7440-61-1	mg/L	**0.005 mg/L**	**0.005 mg/L**	----	----	----	----	----
Vanadium, total	7440-62-2	mg/L	**0.006 mg/L**	**0.006 mg/L**	----	----	----	----	----
Zinc, total	7440-66-6	mg/L	**0.02 mg/L**	**0.02 mg/L**	**0.03 mg/L**	**0.03 mg/L**	----	----	----
Zirconium, total	7440-67-7	mg/L	**0.004 mg/L**	**0.004 mg/L**	----	----	----	----	----

Key:

ONPWQO		Ontario PWQO (Provincial Water Quality Objectives, JULY, 1994)
	IPWQOT2<100	Surface Water T2 Interim PWQOs (Hardness < 100 mg/L)
	IPWQOT2>100	Surface Water T2 Interim PWQOs (Hardness > 100 mg/L)
	PWQOT2<100	Surface Water T2 PWQOs (Hardness < 100 mg/L)
	PWQOT2>100	Surface Water T2 PWQOs (Hardness > 100 mg/L)

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2516470**	Page	: 1 of 10
Client	: **Planet Engineering Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Aayush Panchal	Account Manager	: Amanda Overholster
Address	: 2179 Dunwin Drive Unit 4 Mississauga ON Canada L5L 1X2	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 2501179DH	Date Samples Received	: 24-Jun-2025 11:45
PO	: ----	Issue Date	: 02-Jul-2025 16:41
C-O-C number	: 23-1124445		
Sampler	: AP		
Site	: 127 Line 1, Elora		
Quote number	: 2025 SOA		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP]										
BH4	E298	23-Jun-2025	26-Jun-2025	28 days	3 days	✓	27-Jun-2025	28 days	3 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE [ON MECP]										
BH4	E235.Br	23-Jun-2025	30-Jun-2025	28 days	7 days	✓	30-Jun-2025	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP]										
BH4	E235.Cl	23-Jun-2025	30-Jun-2025	28 days	7 days	✓	30-Jun-2025	28 days	7 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE [ON MECP]										
BH4	E378-U	23-Jun-2025	26-Jun-2025	7 days	3 days	✓	27-Jun-2025	7 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP]										
BH4	E235.F	23-Jun-2025	30-Jun-2025	28 days	7 days	✓	30-Jun-2025	28 days	7 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP]										
BH4	E235.NO3	23-Jun-2025	30-Jun-2025	7 days	7 days	✓	30-Jun-2025	7 days	7 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE [ON MECP]										
BH4	E235.NO2	23-Jun-2025	30-Jun-2025	7 days	7 days	✓	30-Jun-2025	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP]										
BH4	E235.SO4	23-Jun-2025	30-Jun-2025	28 days	7 days	✓	30-Jun-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
HDPE [ON MECP]										
BH4	E358-L	23-Jun-2025	26-Jun-2025	3 days	3 days	✓	27-Jun-2025	28 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE [ON MECP]										
BH4	E290	23-Jun-2025	26-Jun-2025	14 days	3 days	✓	27-Jun-2025	14 days	3 days	✓
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE [ON MECP]										
BH4	E330	23-Jun-2025	----	----	----		02-Jul-2025	48 hrs	211 hrs	× EHT
Physical Tests : Conductivity in Water										
HDPE [ON MECP]										
BH4	E100	23-Jun-2025	26-Jun-2025	28 days	3 days	✓	27-Jun-2025	28 days	3 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP]										
BH4	E108	23-Jun-2025	26-Jun-2025	14 days	3 days	✓	27-Jun-2025	14 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE [ON MECP]										
BH4	E162	23-Jun-2025	----	----	----		27-Jun-2025	7 days	4 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE [ON MECP]										
BH4	E121	23-Jun-2025	----	----	----		25-Jun-2025	48 hrs	48 hrs	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
BH4	E420	23-Jun-2025	25-Jun-2025	180 days	2 days	✓	25-Jun-2025	180 days	2 days	✓

Legend & Qualifier Definitions

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Conductivity in Water	E100	2075606	1	11	9.0	5.0	✓
pH by Meter	E108	2075605	1	17	5.8	5.0	✓
Turbidity by Nephelometry	E121	2074622	1	1	100.0	5.0	✓
TDS by Gravimetry	E162	2078372	1	18	5.5	5.0	✓
Bromide in Water by IC	E235.Br	2075603	1	3	33.3	5.0	✓
Chloride in Water by IC	E235.Cl	2075599	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	2075600	1	7	14.2	5.0	✓
Nitrite in Water by IC	E235.NO2	2075601	1	16	6.2	5.0	✓
Nitrate in Water by IC	E235.NO3	2075598	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	2075602	1	9	11.1	5.0	✓
Alkalinity Species by Titration	E290	2075607	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	2077023	1	20	5.0	5.0	✓
Colour (Apparent) by Spectrometer	E330	2084849	1	17	5.8	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	2076766	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	2075604	1	13	7.6	5.0	✓
Total Metals in Water by CRC ICPMS	E420	2072728	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Conductivity in Water	E100	2075606	1	11	9.0	5.0	✓
pH by Meter	E108	2075605	1	17	5.8	5.0	✓
Turbidity by Nephelometry	E121	2074622	1	1	100.0	5.0	✓
TDS by Gravimetry	E162	2078372	1	18	5.5	5.0	✓
Bromide in Water by IC	E235.Br	2075603	1	3	33.3	5.0	✓
Chloride in Water by IC	E235.Cl	2075599	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	2075600	1	7	14.2	5.0	✓
Nitrite in Water by IC	E235.NO2	2075601	1	16	6.2	5.0	✓
Nitrate in Water by IC	E235.NO3	2075598	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	2075602	1	9	11.1	5.0	✓
Alkalinity Species by Titration	E290	2075607	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	2077023	1	20	5.0	5.0	✓
Colour (Apparent) by Spectrometer	E330	2084849	1	17	5.8	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	2076766	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	2075604	1	13	7.6	5.0	✓
Total Metals in Water by CRC ICPMS	E420	2072728	1	20	5.0	5.0	✓
Method Blanks (MB)							
Conductivity in Water	E100	2075606	1	11	9.0	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
Turbidity by Nephelometry	E121	2074622	1	1	100.0	5.0	✓
TDS by Gravimetry	E162	2078372	1	18	5.5	5.0	✓
Bromide in Water by IC	E235.Br	2075603	1	3	33.3	5.0	✓
Chloride in Water by IC	E235.Cl	2075599	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	2075600	1	7	14.2	5.0	✓
Nitrite in Water by IC	E235.NO2	2075601	1	16	6.2	5.0	✓
Nitrate in Water by IC	E235.NO3	2075598	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	2075602	1	9	11.1	5.0	✓
Alkalinity Species by Titration	E290	2075607	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	2077023	1	20	5.0	5.0	✓
Colour (Apparent) by Spectrometer	E330	2084849	1	17	5.8	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	2076766	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	2075604	1	13	7.6	5.0	✓
Total Metals in Water by CRC ICPMS	E420	2072728	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Bromide in Water by IC	E235.Br	2075603	1	3	33.3	5.0	✓
Chloride in Water by IC	E235.Cl	2075599	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	2075600	1	7	14.2	5.0	✓
Nitrite in Water by IC	E235.NO2	2075601	1	16	6.2	5.0	✓
Nitrate in Water by IC	E235.NO3	2075598	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	2075602	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	2077023	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	2076766	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	2075604	1	13	7.6	5.0	✓
Total Metals in Water by CRC ICPMS	E420	2072728	1	20	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Waterloo	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Waterloo	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 ALS Environmental - Waterloo	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TDS by Gravimetry	E162 ALS Environmental - Waterloo	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC	E235.Br ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Alkalinity Species by Titration	E290 ALS Environmental - Waterloo	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 ALS Environmental - Waterloo	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Colour (Apparent) by Spectrometer	E330 ALS Environmental - Waterloo	Water	APHA 2120 C (mod)	Colour (Apparent) is measured in an unfiltered sample spectrophotometrically using the single wavelength method. The colour contribution of settleable solids are not included in the result. This method is intended for potable waters. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Waterloo	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Waterloo	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Hardness (Calculated) from Total Ca/Mg	EC100A ALS Environmental - Waterloo	Water	APHA 2340B	“Hardness (as CaCO3), from total Ca/Mg” is calculated from the sum of total Calcium and Magnesium concentrations, expressed as CaCO3 equivalents. “Total Hardness” refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because hardness is a property of water due to dissolved divalent cations. In non-turbid waters, Hardness from total Ca/Mg is normally comparable to Dissolved Hardness, but may be biased high if particulate forms of Ca or Mg are present.
Ion Balance using Total Metals	EC101A ALS Environmental - Waterloo	Water	APHA 1030E	Cation Sum (using total metals), Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Sodium Adsorption Ratio [SAR] from Total Metals	EC102 ALS Environmental - Waterloo	Water	CCME Sodium Adsorption Ratio (SAR)	The Sodium Adsorption Ratio (SAR) for a water sample is calculated from the Sodium, Calcium, and Magnesium concentrations of the water, using the same calculations as would be used for a sediment paste extract.
TDS calculated from conductivity	EC103A ALS Environmental - Waterloo	Water	APHA 1030 E	Total dissolved solids (as mg/L) can be estimated by multiplying electrical conductance (in umhos/cm) by 0.65.
Saturation Index using Laboratory pH (Ca-T)	EC105A ALS Environmental - Waterloo	Water	APHA 2330B	Langelier Index provides an indication of scale formation potential at a given pH and temperature, and is calculated as per APHA 2330B Saturation Index. Positive values indicate oversaturation with respect to CaCO3. Negative values indicate undersaturation of CaCO3. This calculation uses laboratory pH measurements and provides estimates of Langelier Index at temperatures of 4, 15, 20, 25, 66, and 77°C. Ryznar Stability Index is an alternative index used for scale formation and corrosion potential.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Waterloo	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Total Silicon as Silica (Calculation)	EC420.SiO2 ALS Environmental - Waterloo	Water	N/A	Total Silicon (as SiO2) is a calculated parameter. Total Silicon (as SiO2 mg/L) = 2.139 x Total Silicon (mg/L).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Waterloo	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon

QUALITY CONTROL REPORT

Work Order	: **WT2516470**	Page	: 1 of 13
Client	: Planet Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Aayush Panchal	Account Manager	: Amanda Overholster
Address	: 2179 Dunwin Drive Unit 4 Mississauga ON Canada L5L 1X2	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 1 416 817 2944
Project	: 2501179DH	Date Samples Received	: 24-Jun-2025 11:45
PO	: ----	Date Analysis Commenced	: 25-Jun-2025
C-O-C number	: 23-1124445	Issue Date	: 02-Jul-2025 16:41
Sampler	: AP		
Site	: 127 Line 1, Elora		
Quote number	: 2025 SOA		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Nik Perkio	Senior Analyst	Waterloo Centralized Prep, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Metals, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 2074622)											
WT2516470-001	BH4	Turbidity	----	E121	0.10	NTU	0.78	0.77	0.007	Diff <2x LOR	----
Physical Tests (QC Lot: 2075605)											
WT2516447-001	Anonymous	pH	----	E108	0.10	pH units	7.61	7.64	0.393%	4%	----
Physical Tests (QC Lot: 2075606)											
WT2516447-001	Anonymous	Conductivity	----	E100	1.0	µS/cm	729	715	1.94%	10%	----
Physical Tests (QC Lot: 2075607)											
WT2516447-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	396	396	0.101%	20%	----
Physical Tests (QC Lot: 2078372)											
WT2516723-001	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	268	261	2.46%	20%	----
Physical Tests (QC Lot: 2084849)											
CG2508558-001	Anonymous	Colour, apparent	----	E330	2.0	CU	5.8	5.4	0.4	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2075598)											
WT2516470-001	BH4	Nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	9.40	9.41	0.126%	20%	----
Anions and Nutrients (QC Lot: 2075599)											
WT2516470-001	BH4	Chloride	16887-00-6	E235.Cl	0.50	mg/L	18.6	18.6	0.0207%	20%	----
Anions and Nutrients (QC Lot: 2075600)											
WT2516470-001	BH4	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.103	0.101	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2075601)											
WT2516470-001	BH4	Nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	0.034	0.035	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2075602)											
WT2516470-001	BH4	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	23.0	23.1	0.275%	20%	----
Anions and Nutrients (QC Lot: 2075603)											
WT2516470-001	BH4	Bromide	24959-67-9	E235.Br	0.10	mg/L	<0.10	<0.10	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2075604)											
HA2501829-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0105	0.0096	9.06%	20%	----
Anions and Nutrients (QC Lot: 2077023)											
BF2500084-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.116	0.116	0.516%	20%	----
Organic / Inorganic Carbon (QC Lot: 2076766)											
TY2506613-008	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Total Metals (QC Lot: 2072728)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 2072728) - continued											
WT2516362-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0300	mg/L	0.0958	0.0935	0.0023	Diff <2x LOR	----
		Antimony, total	7440-36-0	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00100	mg/L	0.0250	0.0253	1.24%	20%	----
		Beryllium, total	7440-41-7	E420	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000500	mg/L	<0.0000500	<0.0000500	0	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.500	mg/L	41.7	41.9	0.562%	20%	----
		Cesium, total	7440-46-2	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		Lead, total	7439-92-1	E420	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0500	mg/L	11.6	11.5	0.0492%	20%	----
		Manganese, total	7439-96-5	E420	0.00100	mg/L	0.0832	0.0822	1.30%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000500	mg/L	0.00295	0.00270	0.000253	Diff <2x LOR	----
		Nickel, total	7440-02-0	E420	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		Phosphorus, total	7723-14-0	E420	0.500	mg/L	<0.500	<0.500	0	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.500	mg/L	17.2	17.4	0.791%	20%	----
		Rubidium, total	7440-17-7	E420	0.00200	mg/L	0.00703	0.00657	0.00046	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	1.00	mg/L	1.78	1.81	0.03	Diff <2x LOR	----
		Silver, total	7440-22-4	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.500	mg/L	302	304	0.615%	20%	----
		Strontium, total	7440-24-6	E420	0.00200	mg/L	0.408	0.407	0.336%	20%	----
		Sulfur, total	7704-34-9	E420	5.00	mg/L	20.0	19.7	0.29	Diff <2x LOR	----
		Tellurium, total	13494-80-9	E420	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		Thallium, total	7440-28-0	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Thorium, total	7440-29-1	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00300	mg/L	<0.00300	<0.00300	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 2072728) - continued											
WT2516362-001	Anonymous	Tungsten, total	7440-33-7	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Vanadium, total	7440-62-2	E420	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0300	mg/L	<0.0300	<0.0300	0	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 2074622)						
Turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 2075606)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 2075607)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 2078372)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 2084849)						
Colour, apparent	----	E330	2	CU	<2.0	----
Anions and Nutrients (QCLot: 2075598)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2075599)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 2075600)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2075601)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 2075602)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 2075603)						
Bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 2075604)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 2077023)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 2076766)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 2072728)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 2072728) - continued						
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 2074622)									
Turbidity	----	E121	0.1	NTU	200 NTU	101	85.0	115	----
Physical Tests (QCLot: 2075605)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 2075606)									
Conductivity	----	E100	1	µS/cm	1410 µS/cm	96.9	90.0	110	----
Physical Tests (QCLot: 2075607)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	150 mg/L	99.6	85.0	115	----
Physical Tests (QCLot: 2078372)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	100	85.0	115	----
Physical Tests (QCLot: 2084849)									
Colour, apparent	----	E330	2	CU	25 CU	97.0	85.0	115	----
Anions and Nutrients (QCLot: 2075598)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 2075599)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 2075600)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 2075601)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 2075602)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 2075603)									
Bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 2075604)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.05 mg/L	98.9	80.0	120	----
Anions and Nutrients (QCLot: 2077023)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	100	85.0	115	----
Organic / Inorganic Carbon (QCLot: 2076766)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	96.2	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 2072728)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	103	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	0.05 mg/L	106	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	108	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.012 mg/L	108	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.005 mg/L	101	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	0.05 mg/L	103	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	0.05 mg/L	96.7	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	102	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	2.5 mg/L	102	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.002 mg/L	104	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.012 mg/L	103	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.012 mg/L	101	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.012 mg/L	99.7	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	0.05 mg/L	101	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	104	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.012 mg/L	97.6	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	2.5 mg/L	104	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.012 mg/L	102	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.012 mg/L	104	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.025 mg/L	101	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	0.5 mg/L	106	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	2.5 mg/L	104	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.005 mg/L	108	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	102	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	0.5 mg/L	107	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.005 mg/L	102	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	2.5 mg/L	101	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.012 mg/L	104	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	2.5 mg/L	105	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.005 mg/L	102	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	0.05 mg/L	104	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.005 mg/L	102	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.025 mg/L	104	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.012 mg/L	102	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.005 mg/L	105	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0 mg/L	104	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 2072728) - continued									
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.025 mg/L	103	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	104	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.005 mg/L	103	80.0	120	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 2075598)										
WT2516470-001	BH4	Nitrate (as N)	14797-55-8	E235.NO3	ND mg/L	----	ND	75.0	125	----
Anions and Nutrients (QCLot: 2075599)										
WT2516470-001	BH4	Chloride	16887-00-6	E235.Cl	97.2 mg/L	100 mg/L	97.2	75.0	125	----
Anions and Nutrients (QCLot: 2075600)										
WT2516470-001	BH4	Fluoride	16984-48-8	E235.F	0.919 mg/L	1 mg/L	91.9	75.0	125	----
Anions and Nutrients (QCLot: 2075601)										
WT2516470-001	BH4	Nitrite (as N)	14797-65-0	E235.NO2	0.491 mg/L	0.5 mg/L	98.1	75.0	125	----
Anions and Nutrients (QCLot: 2075602)										
WT2516470-001	BH4	Sulfate (as SO4)	14808-79-8	E235.SO4	97.0 mg/L	100 mg/L	97.0	75.0	125	----
Anions and Nutrients (QCLot: 2075603)										
WT2516470-001	BH4	Bromide	24959-67-9	E235.Br	0.52 mg/L	0.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 2075604)										
HA2501829-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0183 mg/L	0.02 mg/L	93.5	70.0	130	----
Anions and Nutrients (QCLot: 2077023)										
BF2500084-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	ND mg/L	----	ND	75.0	125	----
Organic / Inorganic Carbon (QCLot: 2076766)										
TY2506613-008	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	4.69 mg/L	5 mg/L	93.8	70.0	130	----
Total Metals (QCLot: 2072728)										
WT2516365-001	Anonymous	Aluminum, total	7429-90-5	E420	ND mg/L	----	ND	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0524 mg/L	0.05 mg/L	105	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0559 mg/L	0.05 mg/L	112	70.0	130	----
		Barium, total	7440-39-3	E420	ND mg/L	----	ND	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.00496 mg/L	0.005 mg/L	99.3	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.0461 mg/L	0.05 mg/L	92.3	70.0	130	----
		Boron, total	7440-42-8	E420	ND mg/L	----	ND	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00481 mg/L	0.005 mg/L	96.1	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	----	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.00259 mg/L	0.002 mg/L	104	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0127 mg/L	0.012 mg/L	102	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0124 mg/L	0.012 mg/L	99.3	70.0	130	----
		Copper, total	7440-50-8	E420	ND mg/L	----	ND	70.0	130	----
		Iron, total	7439-89-6	E420	ND mg/L	----	ND	70.0	130	----
		Lead, total	7439-92-1	E420	0.0238 mg/L	0.025 mg/L	95.4	70.0	130	----
		Lithium, total	7439-93-2	E420	0.0120 mg/L	0.012 mg/L	96.2	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 2072728) - continued										
WT2516365-001	Anonymous	Magnesium, total	7439-95-4	E420	ND mg/L	----	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	ND mg/L	----	ND	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0133 mg/L	0.012 mg/L	106	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0241 mg/L	0.025 mg/L	96.4	70.0	130	----
		Phosphorus, total	7723-14-0	E420	0.628 mg/L	0.5 mg/L	126	70.0	130	----
		Potassium, total	7440-09-7	E420	ND mg/L	----	ND	70.0	130	----
		Rubidium, total	7440-17-7	E420	ND mg/L	----	ND	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0508 mg/L	0.05 mg/L	102	70.0	130	----
		Silicon, total	7440-21-3	E420	ND mg/L	----	ND	70.0	130	----
		Silver, total	7440-22-4	E420	0.00476 mg/L	0.005 mg/L	95.3	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	----	ND	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	----	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	ND mg/L	----	ND	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.00460 mg/L	0.005 mg/L	92.0	70.0	130	----
		Thallium, total	7440-28-0	E420	0.0474 mg/L	0.05 mg/L	94.8	70.0	130	----
		Thorium, total	7440-29-1	E420	0.00403 mg/L	0.005 mg/L	80.5	70.0	130	----
		Tin, total	7440-31-5	E420	0.0255 mg/L	0.025 mg/L	102	70.0	130	----
		Titanium, total	7440-32-6	E420	ND mg/L	----	ND	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.00520 mg/L	0.005 mg/L	104	70.0	130	----
		Uranium, total	7440-61-1	E420	ND mg/L	----	ND	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.0270 mg/L	0.025 mg/L	108	70.0	130	----
		Zinc, total	7440-66-6	E420	0.0239 mg/L	0.025 mg/L	95.8	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.00459 mg/L	0.005 mg/L	91.9	70.0	130	----

GC-306
MM-120
N-951

Chain of Custody (COC) / Analytical Request Form

COC Number: 23 - 1124445

Page 1 of 1

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

Environmental Division
Waterloo
Work Order Reference
WT2516470

Telephone : +1 519 886 6910

Report To	Contact and company name below will appear on the final report
Company:	Planet eng. Inc
Contact:	Aayush Panchal
Phone:	289-600-2791
Company address below will appear on the final report	
Street:	
City/Province:	
Postal Code:	
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☑ YES ☐ NO ☐ N/A
☑ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: lab COA@planeteng.ca
Email 2: Kavosh.mohammadi@planeteng.ca
Email 3: aayush.panchal@planeteng.ca

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: Invoice@planeteng.ca
Email 2: Pouriatoo.mohammadi@planeteng.ca

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minin
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minir
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minin
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minin
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge
Additional fees may apply to rush requests on weeke
Date and Time Required for all E&P TATs:
For all tests with rush TATs requested, please

Project Information

ALS Client Code / QUOTE #:
Job / Project #: 2501179 DH
PO / AFE:
LSD: 12-7 Line 1, Elora

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#
Major/Minor Code: Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (ALS use only): JO
ALS Contact: Sampler: AP

Analysis Re

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	GEM CHEM 3	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~ALGREEN DUP~~ BH4	23-6-25	4:05pm	GW		✓			

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO
Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

PWQOs
Provincial water quality objectives

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☑ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
				4.8			

SHIPMENT RELEASE (client use)

Released by: AP Date: 23/6/2025 Time: 8:20

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Time:

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: AP Date: 24-Jun-25 Time: 11:45

JAN 2023 FRONT

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

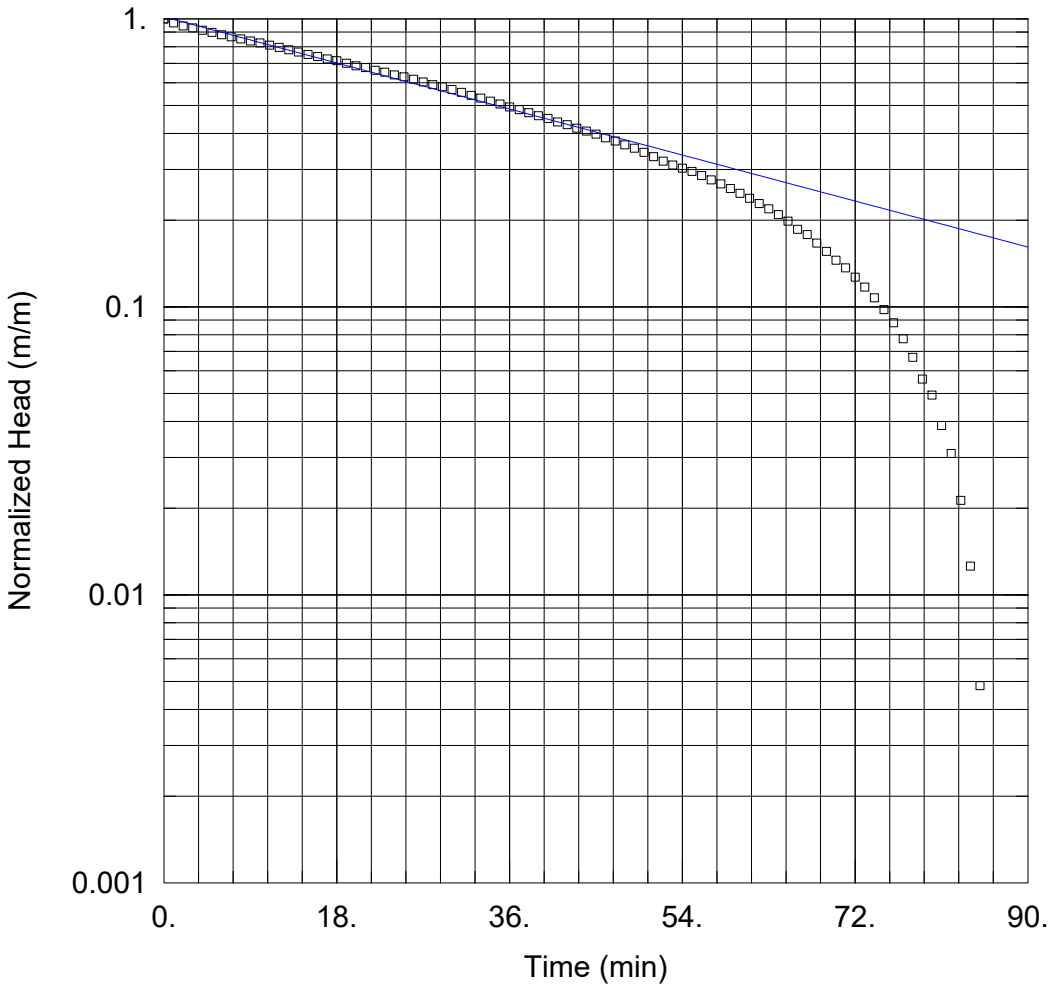
1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

APPENDIX C

In-Situ Hydraulic Conductivity Testing Results

In-Situ Hydraulic Conductivity Test (Rising Head) - BH1 (Trial-1)

Prepared By:	Prepared For:
Planet Engineering Inc.	Elora Greens Inc.
Project:	**Location:**
2501179DH	Elora, ON.



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 8.655E-6 cm/sec y0 = 1.049 m

AQUIFER DATA

Saturated Thickness: 6. m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH1)

Initial Displacement: 1.033 m
Static Water Column Height: 4.57 m
Total Well Penetration Depth: 4.57 m
Screen Length: 3.05 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

PLANET ENGINEERING Inc.
Consulting Engineers

Data Set: C:\01_HLV2K\Projects\2501179DH\K-tests\BH1-1.aqt
Title: In-Situ Hydraulic Conductivity Test (Rising Head) - BH1 (Trial-1)
Date: 07/09/25
Time: 11:42:06

PROJECT INFORMATION

Company: Planet Engineering Inc.
Client: Elora Greens Inc.
Project: 2501179DH
Location: Elora, ON.
Test Date: 20/06/2025
Test Well: BH1

AQUIFER DATA

Saturated Thickness: 6. m
Anisotropy Ratio (Kz/Kr): 1.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 2.479

VISUAL ESTIMATION RESULTS

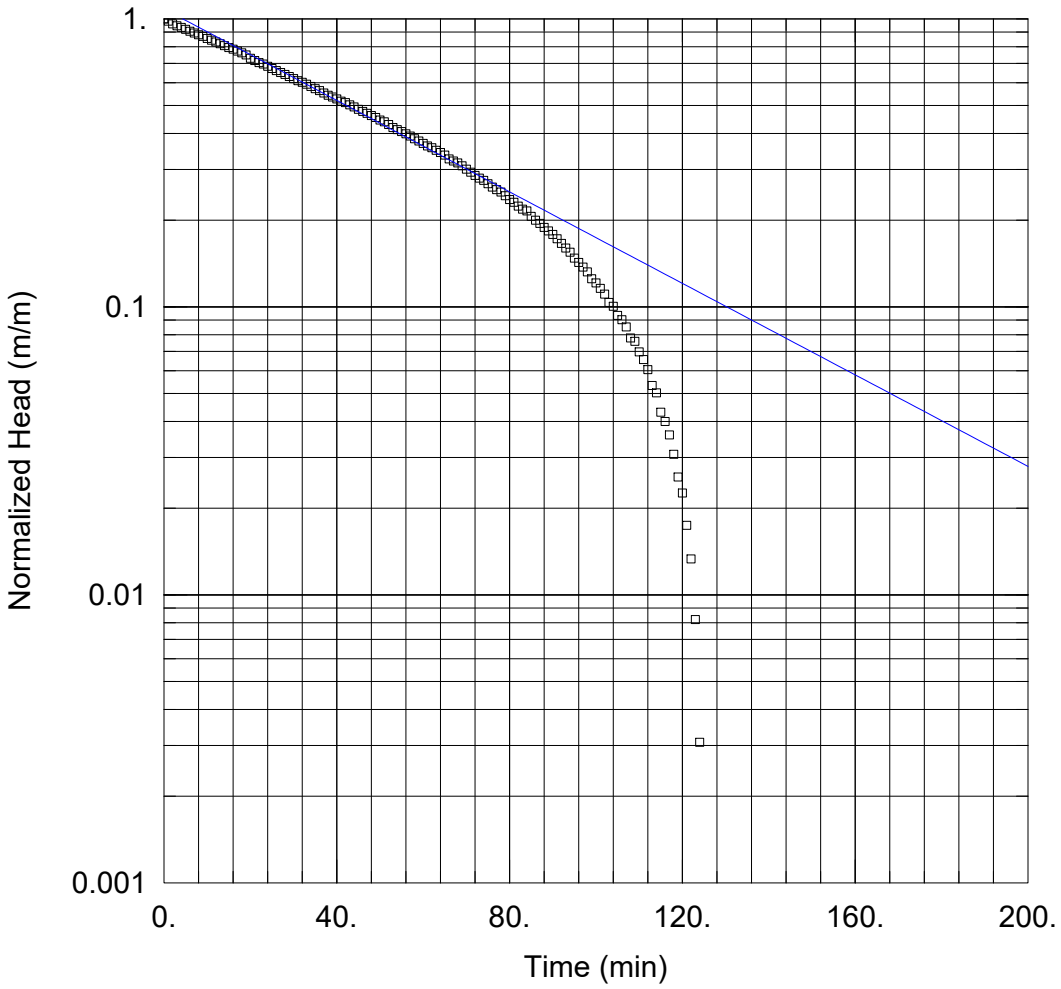
Estimated Parameters

Parameter	Estimate	
K	8.655E-6	cm/sec
y0	1.049	m

T = K*b = 0.005193 cm²/sec

In-Situ Hydraulic Conductivity Test (Rising Head) - BH1(Trial-2)

Prepared By:	Prepared For:
Planet Engineering Inc.	Elora Greens Inc.
Project:	**Location:**
2501179DH	Elora, ON.



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 7.873E-6 cm/sec y0 = 1.056 m

AQUIFER DATA

Saturated Thickness: 6.45 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH1)

Initial Displacement: 0.975 m
Static Water Column Height: 5.01 m
Total Well Penetration Depth: 5.01 m
Screen Length: 3.05 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

PLANET ENGINEERING Inc.
Consulting Engineers

Data Set: C:\01_HLV2K\Projects\2501179DH\K-tests\BH1-2.aqt
Title: In-Situ Hydraulic Conductivity Test (Rising Head) - BH1(Trial-2)
Date: 07/09/25
Time: 11:44:31

PROJECT INFORMATION

Company: Planet Engineering Inc.
Client: Elora Greens Inc.
Project: 2501179DH
Location: Elora, ON.
Test Date: 20/06/2025
Test Well: BH1

AQUIFER DATA

Saturated Thickness: 6.45 m
Anisotropy Ratio (Kz/Kr): 1.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 2.521

VISUAL ESTIMATION RESULTS

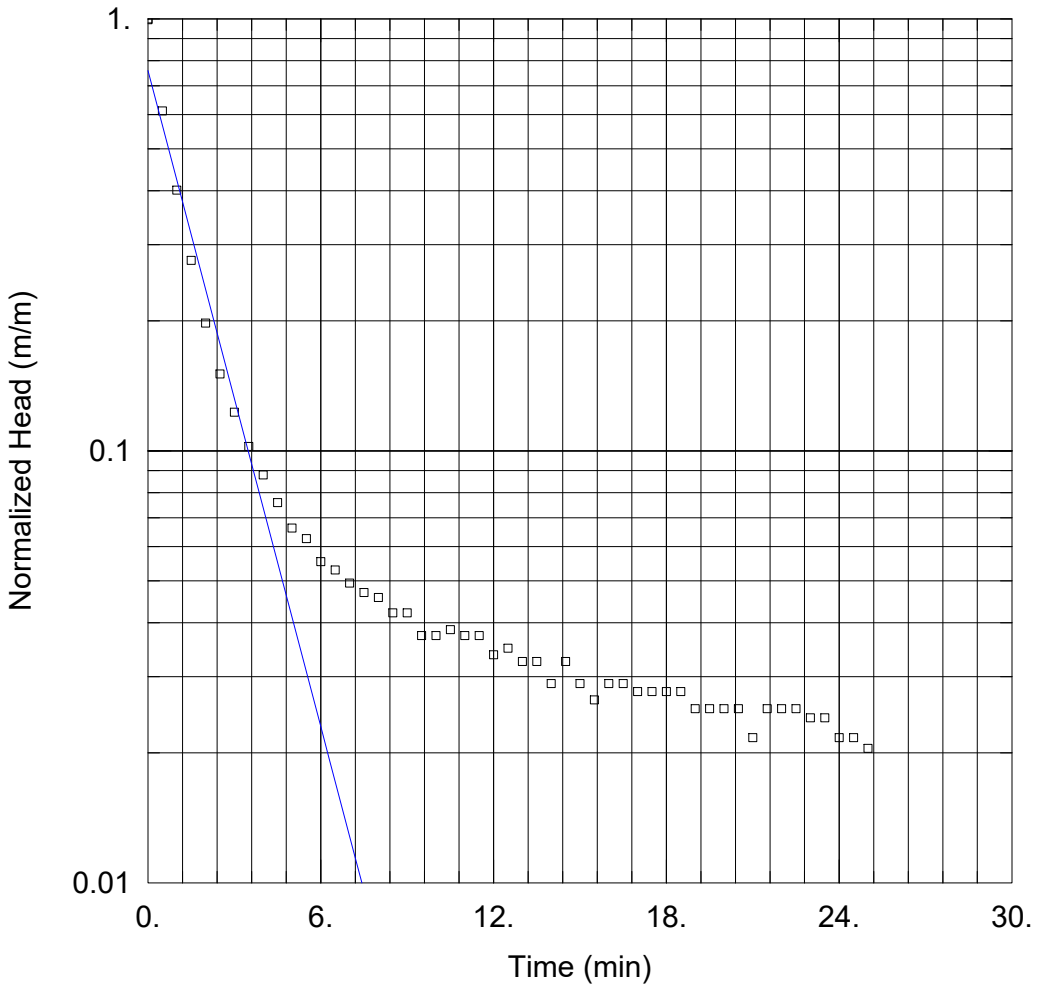
Estimated Parameters

Parameter	Estimate	
K	7.873E-6	cm/sec
y0	1.056	m

T = K*b = 0.005078 cm²/sec

In-Situ Hydraulic Conductivity Test (Rising Head) - BH4 (Trial-1)

Prepared By:	Prepared For:
Planet Engineering Inc.	Elora Greens Inc.
Project:	**Location:**
2501179DH	Elora, ON.



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0002584 cm/sec y0 = 0.6298 m

AQUIFER DATA

Saturated Thickness: 6.29 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH4)

Initial Displacement: 0.83 m
Static Water Column Height: 5.4 m
Total Well Penetration Depth: 5.4 m
Screen Length: 3.05 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

PLANET ENGINEERING Inc.
Consulting Engineers

Data Set: C:\01_HLV2K\Projects\2501179DH\K-tests\BH4-1.aqt
Title: In-Situ Hydraulic Conductivity Test (Rising Head) - BH4 (Trial-1)
Date: 07/09/25
Time: 11:50:14

PROJECT INFORMATION

Company: Planet Engineering Inc.
Client: Elora Greens Inc.
Project: 2501179DH
Location: Elora, ON.
Test Date: 20/06/2025
Test Well: BH4

AQUIFER DATA

Saturated Thickness: 6.29 m
Anisotropy Ratio (Kz/Kr): 1.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 2.597

VISUAL ESTIMATION RESULTS

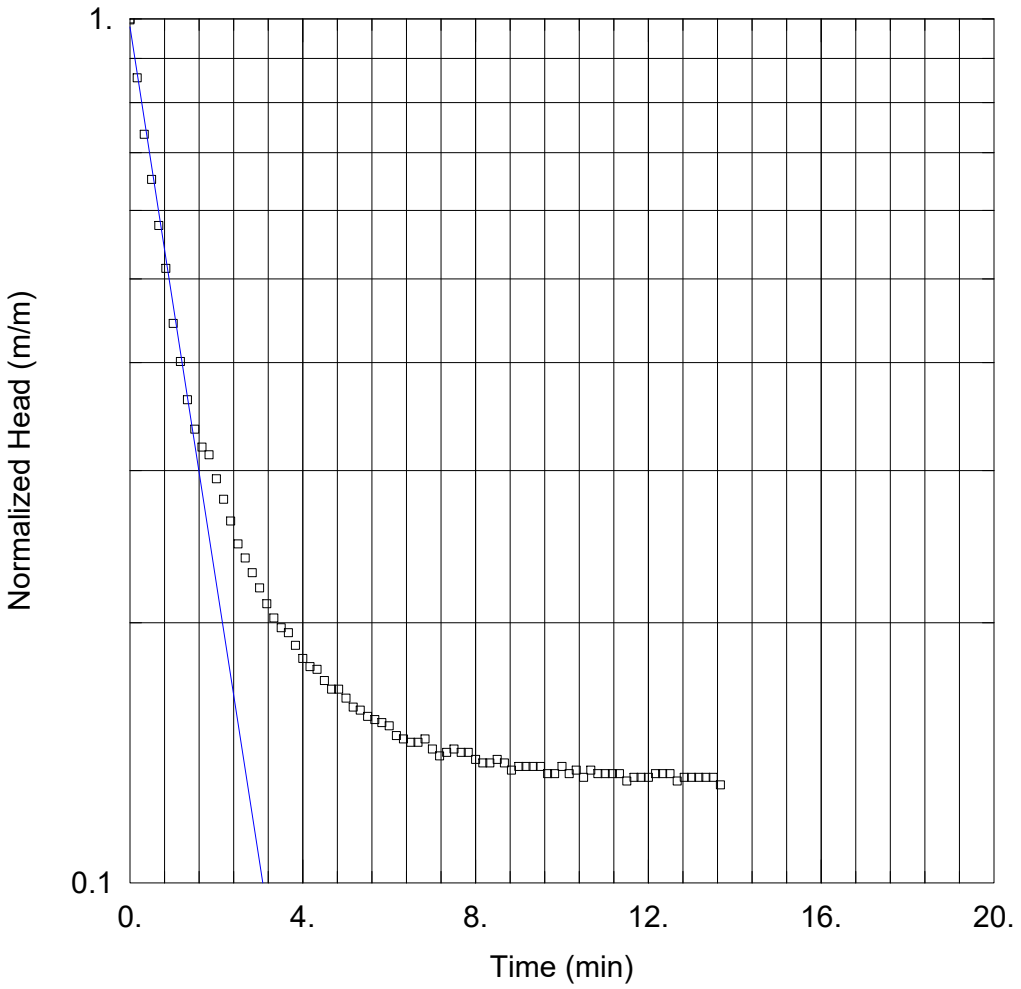
Estimated Parameters

Parameter	Estimate	
K	0.0002584	cm/sec
y0	0.6298	m

T = K*b = 0.1625 cm²/sec

In-Situ Hydraulic Conductivity Test (Rising Head) - BH4 (Trial-2)

Prepared By:	Prepared For:
Planet Engineering Inc.	Elora Greens Inc.
Project:	**Location:**
2501179DH	Elora, ON.



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0003298 cm/sec y0 = 0.7538 m

AQUIFER DATA

Saturated Thickness: 6.36 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH4)

Initial Displacement: 0.77 m
Static Water Column Height: 5.47 m
Total Well Penetration Depth: 5.47 m
Screen Length: 3.05 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

PLANET ENGINEERING Inc.
Consulting Engineers

Data Set: C:\01_HLV2K\Projects\2501179DH\K-tests\BH4-2.aqt
Title: In-Situ Hydraulic Conductivity Test (Rising Head) - BH4 (Trial-2)
Date: 07/09/25
Time: 11:51:59

PROJECT INFORMATION

Company: Planet Engineering Inc.
Client: Elora Greens Inc.
Project: 2501179DH
Location: Elora, ON.
Test Date: 23/06/2025
Test Well: BH4

AQUIFER DATA

Saturated Thickness: 6.36 m
Anisotropy Ratio (Kz/Kr): 1.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 2.603

VISUAL ESTIMATION RESULTS

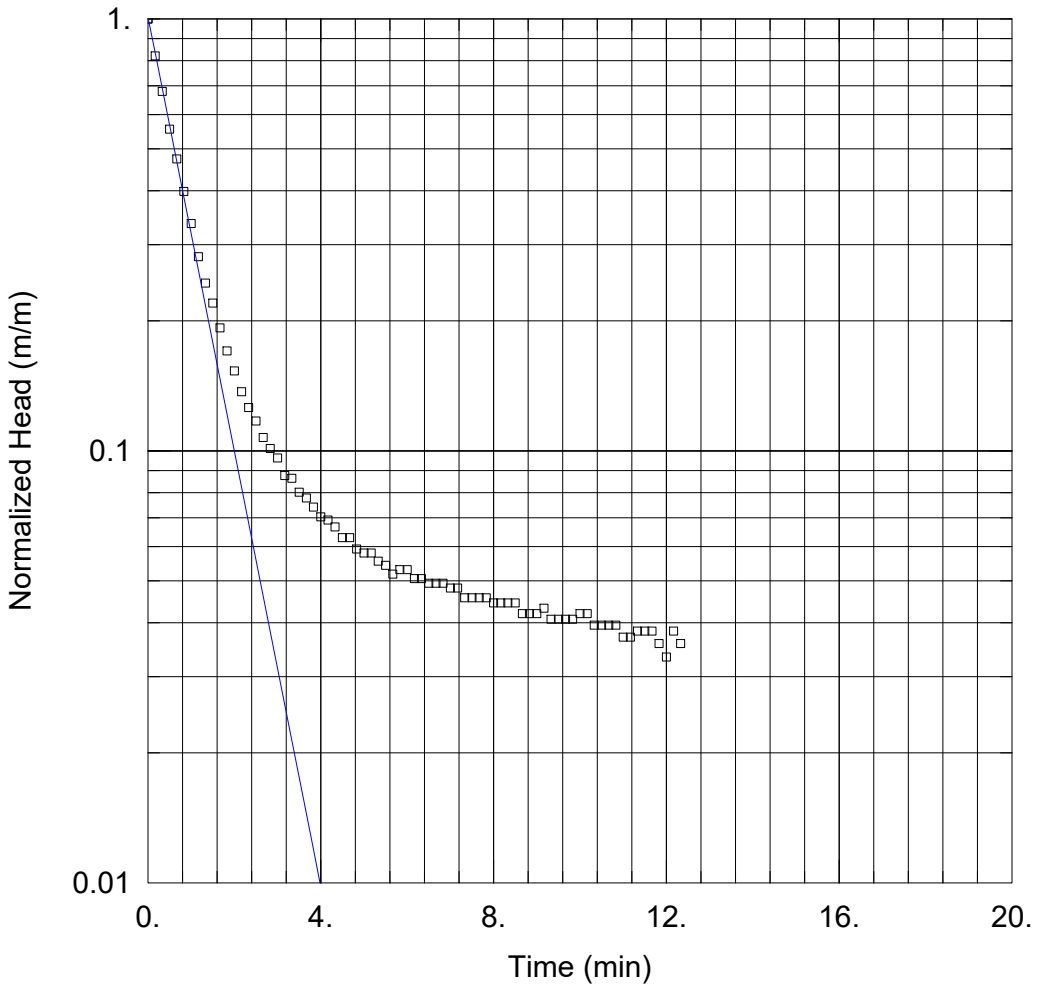
Estimated Parameters

Parameter	Estimate	
K	0.0003298	cm/sec
y0	0.7538	m

T = K*b = 0.2098 cm²/sec

In-Situ Hydraulic Conductivity Test (Rising Head) - BH6 (Trial-1)

Prepared By:	Prepared For:
Planet Engineering Inc.	Elora Greens Inc.
Project:	**Location:**
2501179DH	Elora, ON.



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0005181 cm/sec y0 = 0.8204 m

AQUIFER DATA

Saturated Thickness: 5.3 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH6)

Initial Displacement: 0.81 m
Static Water Column Height: 4.89 m
Total Well Penetration Depth: 4.89 m
Screen Length: 3.05 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

PLANET ENGINEERING Inc.
Consulting Engineers

Data Set: C:\01_HLV2K\Projects\2501179DH\K-tests\BH6-1.aqt
Title: In-Situ Hydraulic Conductivity Test (Rising Head) - BH6 (Trial-1)
Date: 07/09/25
Time: 12:01:54

PROJECT INFORMATION

Company: Planet Engineering Inc.
Client: Elora Greens Inc.
Project: 2501179DH
Location: Elora, ON.
Test Date: 20/06/2025
Test Well: BH6

AQUIFER DATA

Saturated Thickness: 5.3 m
Anisotropy Ratio (Kz/Kr): 1.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 2.618

VISUAL ESTIMATION RESULTS

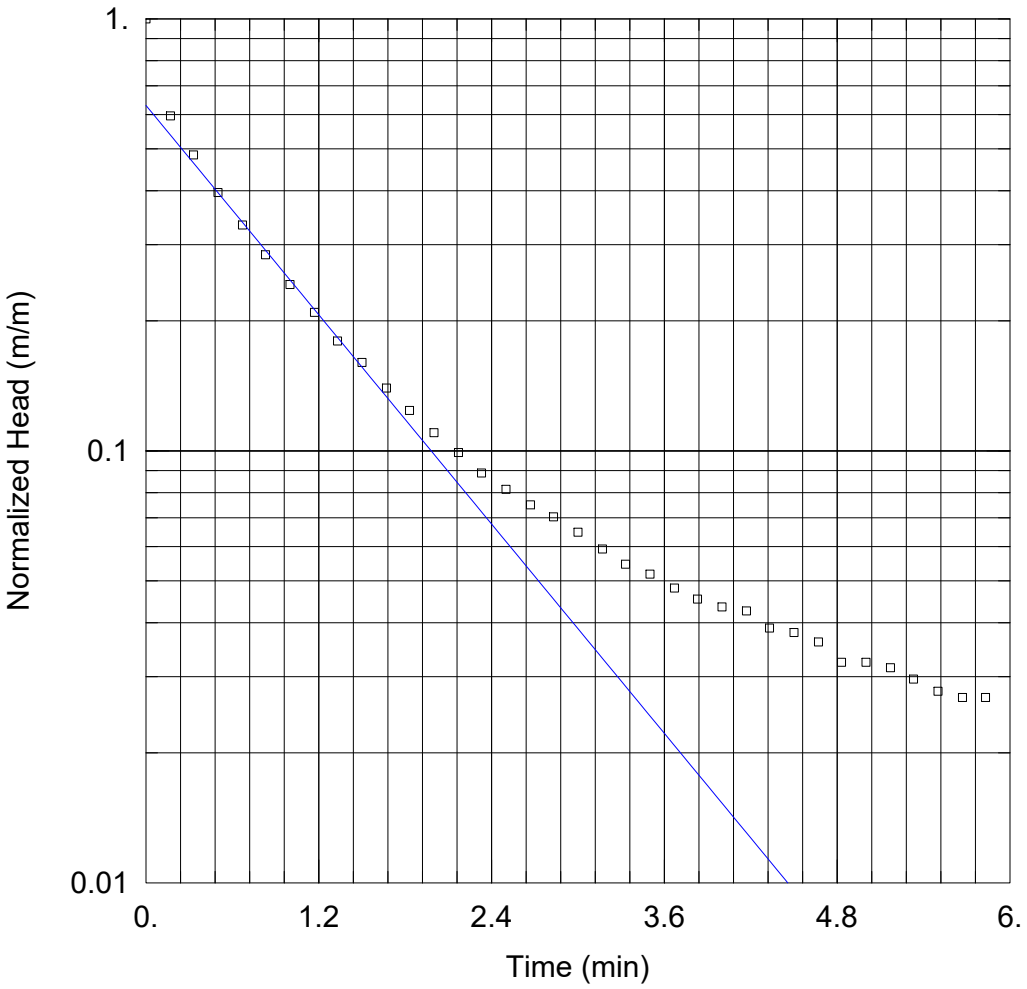
Estimated Parameters

Parameter	Estimate	
K	0.0005181	cm/sec
y0	0.8204	m

T = K*b = 0.2746 cm²/sec

In-Situ Hydraulic Conductivity Test (Rising Head) - BH6 (Trial-2)

Prepared By:	Prepared For:
Planet Engineering Inc.	Elora Greens Inc.
Project:	**Location:**
2501179DH	Elora, ON.



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0004156 cm/sec y0 = 0.6806 m

AQUIFER DATA

Saturated Thickness: 5.3 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH6)

Initial Displacement: 1.08 m
Static Water Column Height: 4.89 m
Total Well Penetration Depth: 4.89 m
Screen Length: 3.05 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

PLANET ENGINEERING Inc.
Consulting Engineers

Data Set: C:\01_HLV2K\Projects\2501179DH\K-tests\BH6-2.aqt
Title: In-Situ Hydraulic Conductivity Test (Rising Head) - BH6 (Trial-2)
Date: 07/09/25
Time: 12:08:54

PROJECT INFORMATION

Company: Planet Engineering Inc.
Client: Elora Greens Inc.
Project: 2501179DH
Location: Elora, ON.
Test Date: 20/06/2025
Test Well: BH6

AQUIFER DATA

Saturated Thickness: 5.3 m
Anisotropy Ratio (Kz/Kr): 1.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 2.618

VISUAL ESTIMATION RESULTS

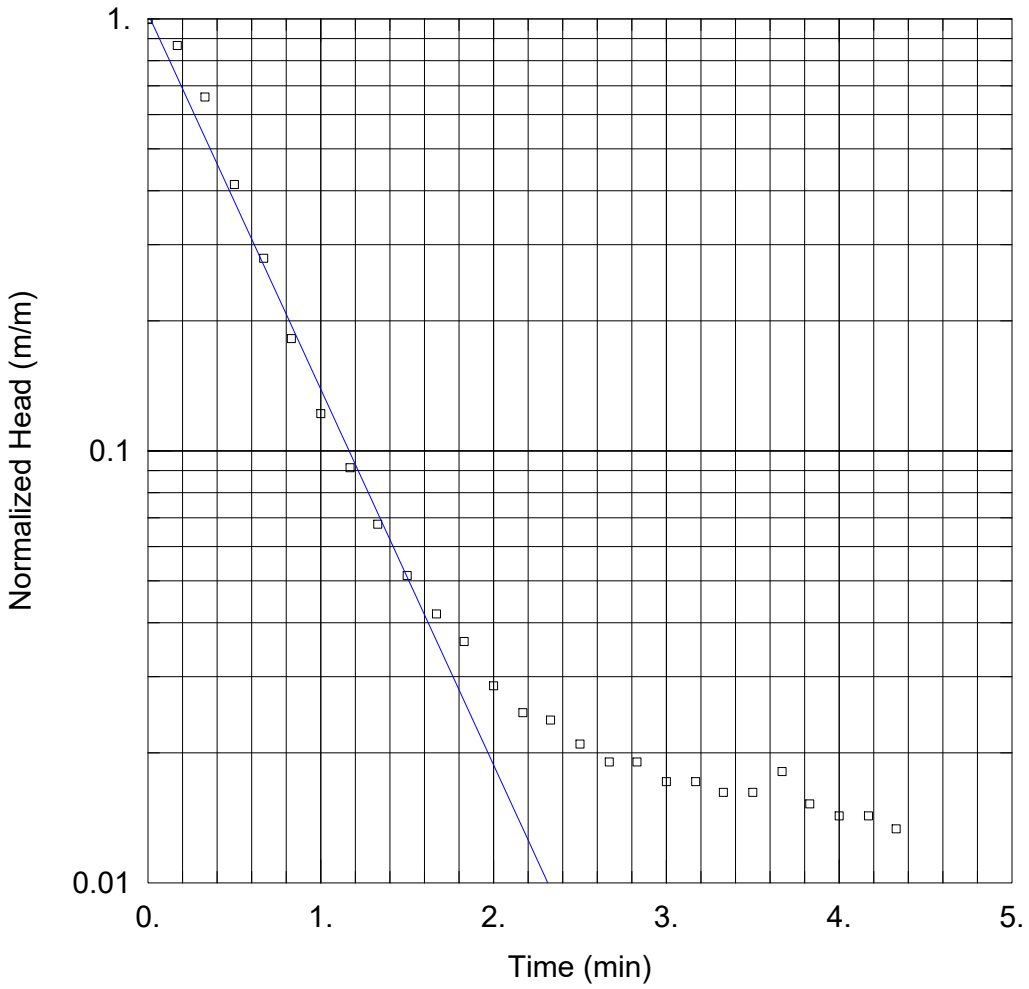
Estimated Parameters

Parameter	Estimate	
K	0.0004156	cm/sec
y0	0.6806	m

T = K*b = 0.2203 cm²/sec

In-Situ Hydraulic Conductivity Test (Rising Head) - BH7 (Trial-1)

Prepared By:	Prepared For:
Planet Engineering Inc.	Elora Greens Inc.
Project:	**Location:**
2501179DH	Elora, ON.



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0008563 cm/sec y0 = 1.079 m

AQUIFER DATA

Saturated Thickness: 5.93 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH7)

Initial Displacement: 1.05 m
Static Water Column Height: 4.7 m
Total Well Penetration Depth: 4.7 m
Screen Length: 3.05 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

PLANET ENGINEERING Inc.
Consulting Engineers

Data Set: C:\01_HLV2K\Projects\2501179DH\K-tests\BH7-1.aqt
Title: In-Situ Hydraulic Conductivity Test (Rising Head) - BH7 (Trial-1)
Date: 07/09/25
Time: 12:21:34

PROJECT INFORMATION

Company: Planet Engineering Inc.
Client: Elora Greens Inc.
Project: 2501179DH
Location: Elora, ON.
Test Date: 20/06/2025
Test Well: BH7

AQUIFER DATA

Saturated Thickness: 5.93 m
Anisotropy Ratio (Kz/Kr): 1.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 2.505

VISUAL ESTIMATION RESULTS

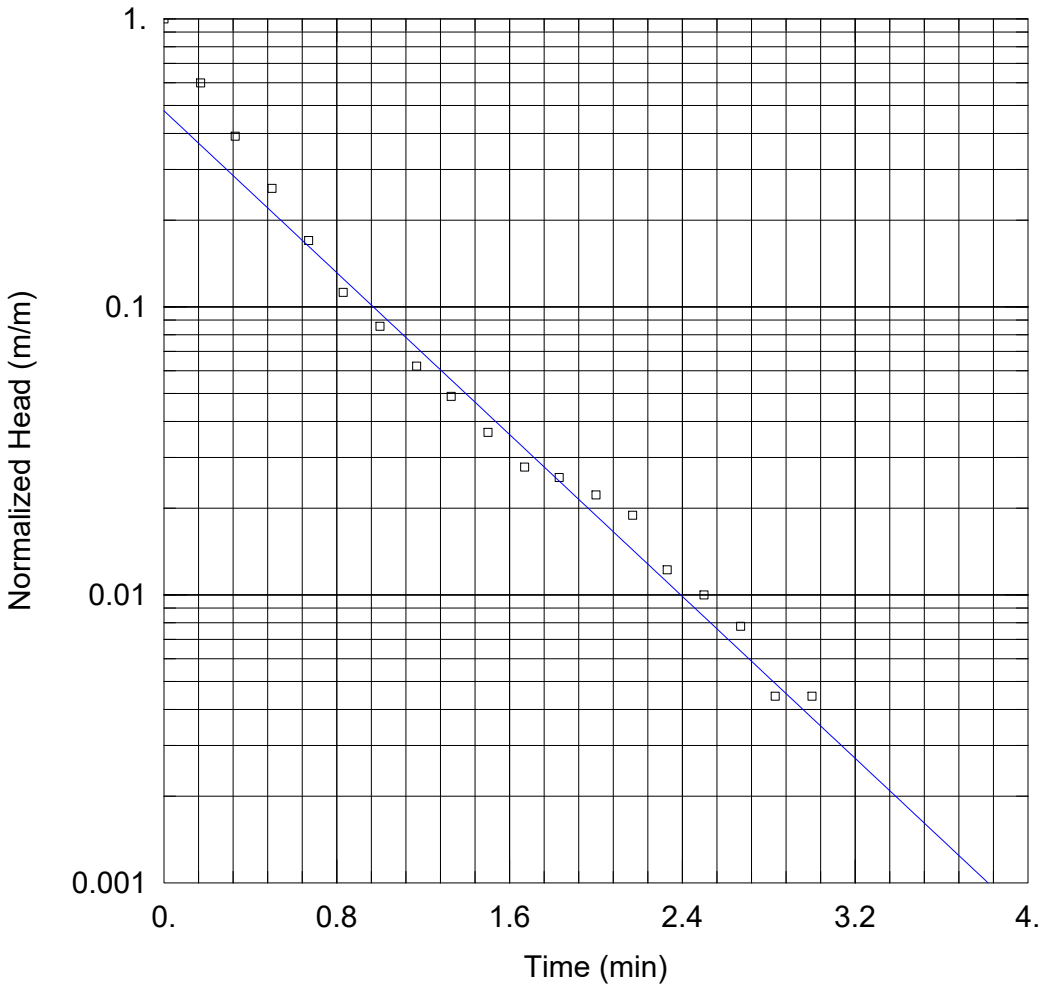
Estimated Parameters

Parameter	Estimate	
K	0.0008563	cm/sec
y0	1.079	m

T = K*b = 0.5078 cm²/sec

In-Situ Hydraulic Conductivity Test (Rising Head) - BH 7 (Trial-2)

Prepared By:	Prepared For:
Planet Engineering Inc.	Elora Greens Inc.
Project:	**Location:**
2501179DH	Elora, ON.



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.000692 cm/sec y0 = 0.4315 m

AQUIFER DATA

Saturated Thickness: 5.93 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH7)

Initial Displacement: 0.9 m
Static Water Column Height: 4.7 m
Total Well Penetration Depth: 4.7 m
Screen Length: 3.05 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

PLANET ENGINEERING Inc.
Consulting Engineers

Data Set: C:\01_HLV2K\Projects\2501179DH\K-tests\BH7-2.aqt
Title: In-Situ Hydraulic Conductivity Test (Rising Head) - BH 7 (Trial-2)
Date: 07/09/25
Time: 12:23:33

PROJECT INFORMATION

Company: Planet Engineering Inc.
Client: Elora Greens Inc.
Project: 2501179DH
Location: Elora, ON.
Test Date: 20/06/2025
Test Well: BH7

AQUIFER DATA

Saturated Thickness: 5.93 m
Anisotropy Ratio (Kz/Kr): 1.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 2.505

VISUAL ESTIMATION RESULTS

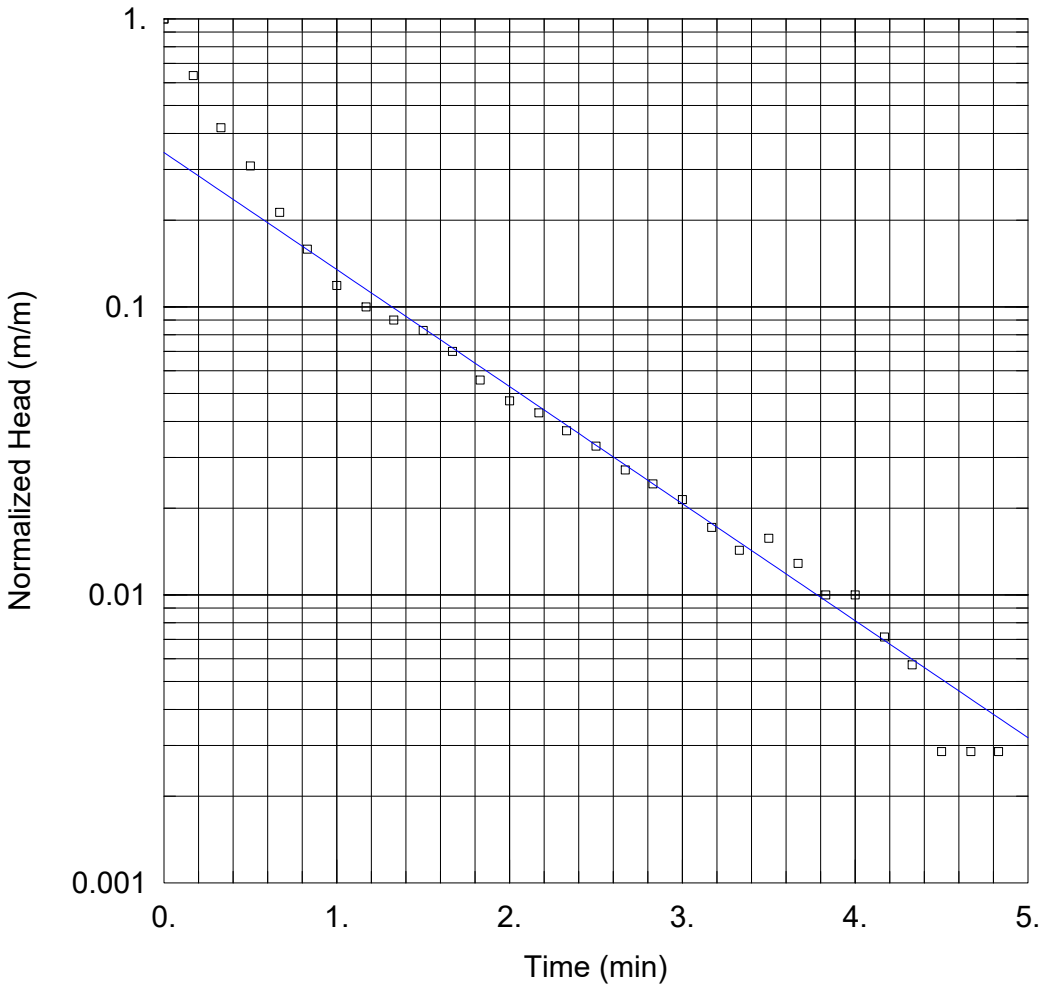
Estimated Parameters

Parameter	Estimate	
K	0.000692	cm/sec
y0	0.4315	m

T = K*b = 0.4104 cm²/sec

In-Situ Hydraulic Conductivity Test (Rising Head) - BH7 (Trial-3)

Prepared By:	Prepared For:
Planet Engineering Inc.	Elora Greens Inc.
Project:	**Location:**
2501179DH	Elora, ON.



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0004002 cm/sec y0 = 0.2404 m

AQUIFER DATA

Saturated Thickness: 5.93 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH7)

Initial Displacement: 0.7 m
Static Water Column Height: 4.7 m
Total Well Penetration Depth: 4.7 m
Screen Length: 3.05 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

PLANET ENGINEERING Inc.
Consulting Engineers

Data Set: C:\01_HLV2K\Projects\2501179DH\K-tests\BH7-3.aqt
Title: In-Situ Hydraulic Conductivity Test (Rising Head) - BH7 (Trial-3)
Date: 07/09/25
Time: 12:25:45

PROJECT INFORMATION

Company: Planet Engineering Inc.
Client: Elora Greens Inc.
Project: 2501179DH
Location: Elora, ON.
Test Date: 20/06/2025
Test Well: BH7

AQUIFER DATA

Saturated Thickness: 5.93 m
Anisotropy Ratio (Kz/Kr): 1.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 2.505

VISUAL ESTIMATION RESULTS

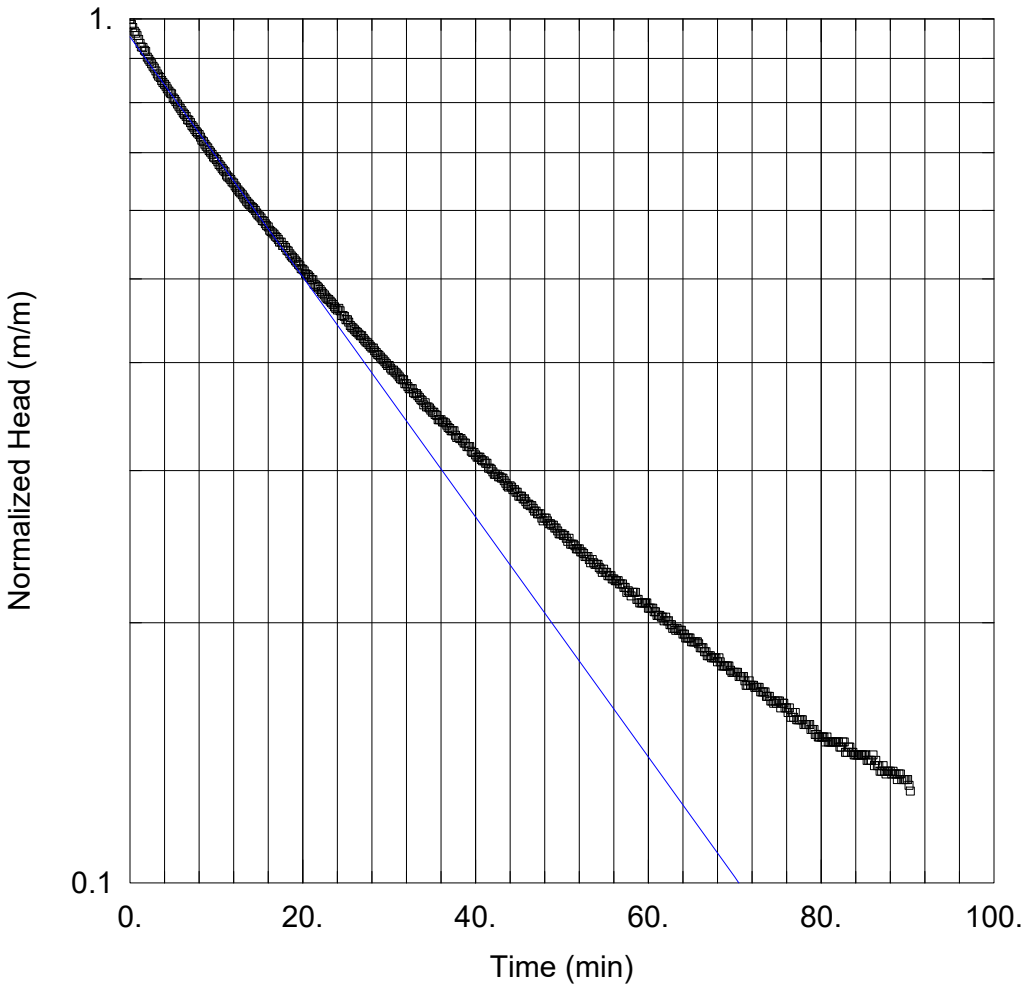
Estimated Parameters

Parameter	Estimate	
K	0.0004002	cm/sec
y0	0.2404	m

T = K*b = 0.2373 cm²/sec

In-Situ Hydraulic Conductivity Test (Rising Head) - BH10 (Trial-1)

Prepared By:	Prepared For:
Planet Engineering Inc.	Elora Greens Inc.
Project:	**Location:**
2501179DH	Elora, ON.



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.401E-5 cm/sec y0 = 0.9625 m

AQUIFER DATA

Saturated Thickness: 4.89 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH10)

Initial Displacement: 1.01 m
Static Water Column Height: 4.45 m
Total Well Penetration Depth: 4.45 m
Screen Length: 3.05 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

PLANET ENGINEERING Inc.
Consulting Engineers

Data Set: C:\01_HLV2K\Projects\2501179DH\K-tests\BH10-1.aqt
Title: In-Situ Hydraulic Conductivity Test (Rising Head) - BH10 (Trial-1)
Date: 07/11/25
Time: 15:07:41

PROJECT INFORMATION

Company: Planet Engineering Inc.
Client: Elora Greens Inc.
Project: 2501179DH
Location: Elora, ON.
Test Date: 20/06/2025
Test Well: BH10

AQUIFER DATA

Saturated Thickness: 4.89 m
Anisotropy Ratio (Kz/Kr): 1.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 2.565

VISUAL ESTIMATION RESULTS

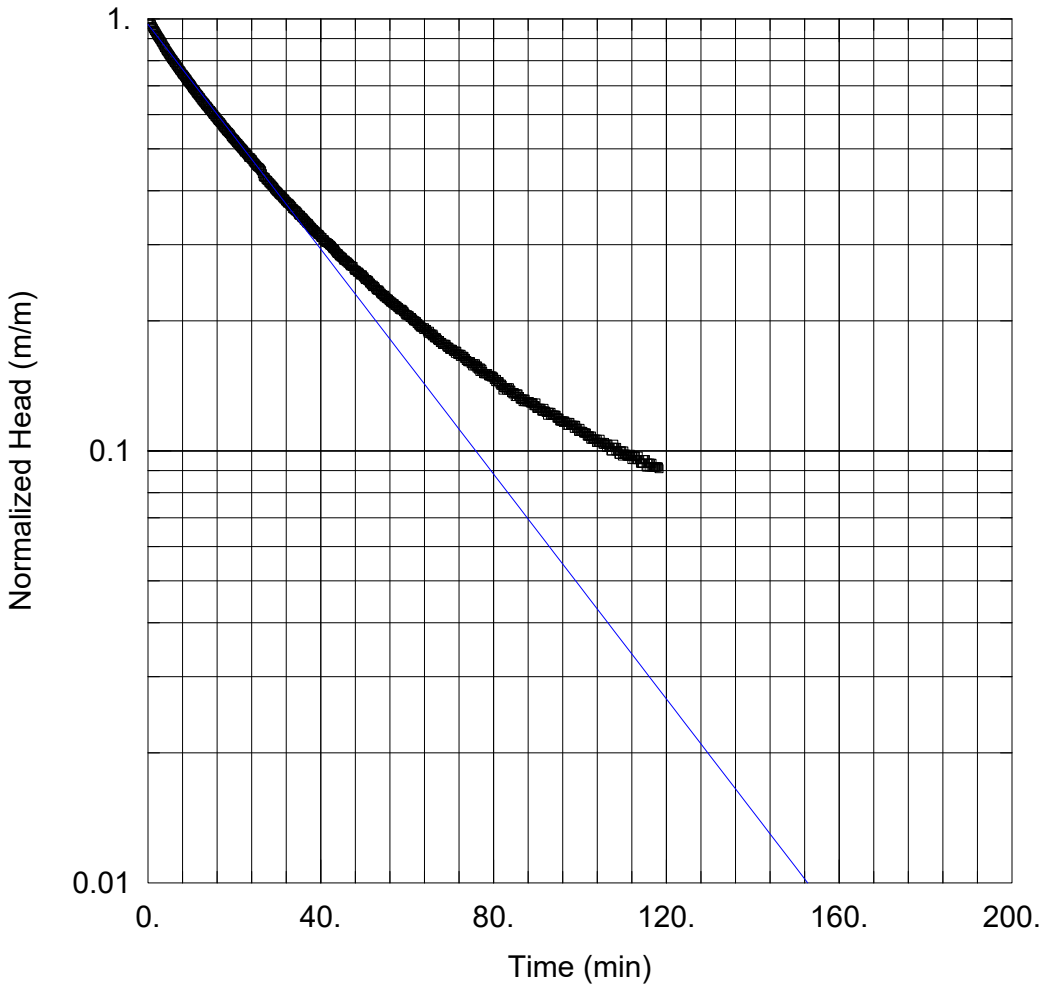
Estimated Parameters

Parameter	Estimate	
K	1.401E-5	cm/sec
y0	0.9625	m

T = K*b = 0.006851 cm²/sec

In-Situ Hydraulic Conductivity Test (Rising Head) - BH 10 (Trial-2)

Prepared By:	Prepared For:
Planet Engineering Inc.	Elora Greens Inc.
Project:	**Location:**
2501179DH	Elora, ON.



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.312E-5 cm/sec y0 = 1.069 m

AQUIFER DATA

Saturated Thickness: 4.89 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH10)

Initial Displacement: 1.1 m
Static Water Column Height: 4.45 m
Total Well Penetration Depth: 4.45 m
Screen Length: 3.05 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

PLANET ENGINEERING Inc.
Consulting Engineers

Data Set: C:\01_HLV2K\Projects\2501179DH\K-tests\BH10-2.aqt
Title: In-Situ Hydraulic Conductivity Test (Rising Head) - BH 10 (Trial-2)
Date: 07/11/25
Time: 15:09:34

PROJECT INFORMATION

Company: Planet Engineering Inc.
Client: Elora Greens Inc.
Project: 2501179DH
Location: Elora, ON.
Test Date: 20/06/2025
Test Well: BH10

AQUIFER DATA

Saturated Thickness: 4.89 m
Anisotropy Ratio (Kz/Kr): 1.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 2.565

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	1.312E-5	cm/sec
y0	1.069	m

T = K*b = 0.006418 cm²/sec

APPENDIX D

Information on Water Well Records

Water Well Record

WELL_ID	BOREHOLE ID	Zone	Easting	Northing	Well Depth (m)	Water Depth (m)	Bedrock Depth	Date Completed	Final Status
6700136	10464284	17	547291	4836505	56.4	8.2	12.5	24-Jan-61	Water Supply
6700138	10464286	17	547642	4836414	33.5	5.5	14.3	16-Jul-65	Water Supply
6701754	10465899	17	547970	4836183	42.4	10.7	18.3	11-Aug-47	Water Supply
6703333	10467475	17	547464	4836263	48.5	12.2	20.1	19-Apr-69	Water Supply
6704815	10468922	17	547695	4836360	30.8	5.2	12.8	15-Sep-73	Water Supply
6705103	10469202	17	547964	4835423	43.6	13.7	18.9	11-Jun-74	Water Supply
6705104	10469203	17	547964	4835423	39.0	11.6	18.9	03-Jun-74	Water Supply
6705323	10469417	17	547964	4836623	25.9	4.6	14.3	19-Jul-74	Water Supply
6706007	10470089	17	547664	4836323	29.0	2.7	12.8	17-May-76	Water Supply
6706165	10470245	17	548064	4836423	35.7	10.1	16.5	30-Aug-76	Water Supply
6706871	10470941	17	547114	4835923	34.7	3.7	14.3	06-Oct-78	Water Supply
6707310	10471363	17	548170	4836143	43.0	3.7	1.2	16-Aug-80	Water Supply
6707784	10471794	17	547562	4835536	41.1	4.3	19.8	04-Mar-83	Water Supply
6708501	10472397	17	547882	4836499	16.8	4.6	15.5	03-Aug-86	Water Supply
6708530	10472425	17	547920	4836527	21.3	3.0	14.9	29-Aug-86	Water Supply
6710773	10474614	17	547341	4835882	36.6	16.8	17.4	14-Nov-91	Water Supply
6715272	11327058	17	547081	4836201	10.6			17-Feb-05	Monitoring and Test Hole
6715281	11327067	17	547706	4836325	36.6	10.1	13.4	07-Feb-05	Water Supply
6715282	11327068	17	547680	4836344				07-Feb-05	Abandoned-Other
6715446	11327232	17	547414	4836435	31.0		10.7	04-Aug-05	Monitoring and Test Hole
7043040	11765488	17	547053	4836199	11.3			05-Apr-07	Monitoring and Test Hole
7195814	1004242536	17	547466	4836266	17.1			15-Jul-12	Monitoring and Test Hole
7195815	1004242539	17	547461	4836261	179.8			20-Jun-12	Monitoring and Test Hole
7203164	1004344391	17	547660	4836405				29-Apr-13	Abandoned-Other
7357972	1008271701	17	547162	4836520		14.0		05-Feb-20	Abandoned-Other
7382528	1008638581	17	547216	4836494		3.7		19-Feb-21	Abandoned-Other

Geo Log of Selected Wells

WELL_ID	Thickness	Material Color	Material	Material2	Material3	Depth_m
6700136	7.92		PREVIOUSLY DUG			7.92
	4.57		GRAVEL	STONES		12.50
	43.89	GREY	LIMESTONE			56.39
6700138	12.19		CLAY			12.19
	2.13		GRAVEL			14.33
	19.20	GREY	LIMESTONE			33.53
6701754	1.22		TOPSOIL			1.22
	17.07		HARDPAN	BOULDERS		18.29
	24.08		LIMESTONE			42.37
6703333	7.62		CLAY	MEDIUM SAND		7.62
	6.10		CLAY			13.72
	6.40		HARDPAN			20.12
	28.35	GREY	LIMESTONE			48.46
6704815	6.10		CLAY	SAND		6.10
	6.71		HARDPAN	GRAVEL		12.80
	17.98	GREY	LIMESTONE			30.78
6705103	12.19		CLAY	SOFT		12.19
	6.71		GRAVEL			18.90
	24.69	GREY	LIMESTONE			43.59
6705104	3.05		CLAY			3.05
	12.19		CLAY	GRAVEL	SOFT	15.24
	3.66		GRAVEL	CEMENTED		18.90
	20.12	GREY	LIMESTONE			39.01
6705323	0.91	BROWN	FILL			0.91
	2.13	GREY	CLAY			3.05
	3.05	GREY	STONES	CLAY		6.10
	3.05	BLUE	HARDPAN			9.14
	5.18	BLUE	HARDPAN	GRAVEL		14.33
	11.58	GREY	LIMESTONE			25.91
6706007	1.52		PREV. DRILLED			1.52
	11.28	BROWN	CLAY			12.80
	16.15	GREY	LIMESTONE			28.96
6706165	12.19	BROWN	CLAY	BOULDERS		12.19
	4.27		GRAVEL	CEMENTED		16.46
	19.20	GREY	LIMESTONE			35.66
6706871	1.52		PREVIOUSLY DUG			1.52
	4.57		CLAY	SOFT		6.10
	8.23		CLAY	GRAVEL	LAYERED	14.33
	20.42	GREY	LIMESTONE			34.75
6707310	1.22	BROWN	CLAY	STONES		1.22
	41.76	BROWN	LIMESTONE			42.98
6707784	0.61	BROWN	TOPSOIL			0.61
	1.83	BROWN	CLAY			2.44
	3.66	BROWN	SAND			6.10
	6.10	BROWN	CLAY	STONES		12.19
	6.10	BROWN	HARDPAN			18.29
	1.52	BROWN	HARDPAN			19.81
	21.34	GREY	LIMESTONE			41.15
6708501	0.91	BROWN	CLAY	SANDY	LOOSE	0.91
	1.52	BROWN	CLAY	GRAVEL	SANDY	2.44
	4.27	GREY	CLAY	HARD		6.71
	0.61	GREY	CLAY	BOULDERS	LOOSE	7.32
	1.83	GREY	CLAY	GRAVEL	HARD	9.14
	1.52	GREY	CLAY	BOULDERS	LOOSE	10.67
	2.44	GREY	GRAVEL	FINE SAND	LOOSE	13.11
	0.91	GREY	CLAY	LOOSE		14.02
	1.52	GREY	GRAVEL	SAND	LOOSE	15.54
	1.22	GREY	LIMESTONE	HARD		16.76

Geo Log of Selected Wells

WELL_ID	Thickness	Material Color	Material	Material2	Material3	Depth_m
6708530	1.52	BROWN	SAND	GRAVEL	LOOSE	1.52
	3.96	GREY	CLAY	SANDY	LOOSE	5.49
	3.35	GREY	CLAY	GRAVEL	LOOSE	8.84
	1.83	BROWN	CLAY	SANDY	LOOSE	10.67
	1.83	GREY	CLAY	GRAVEL	LOOSE	12.50
	2.44	GREY	SAND	GRAVEL	LOOSE	14.94
	6.40	GREY	LIMESTONE	HARD		21.34
6710773	7.62	BROWN	CLAY	STONES		7.62
	9.75	GREY	CLAY	STONES		17.37
	17.68	BROWN	ROCK			35.05
	1.50	GREY	ROCK			36.58
6715272	0.20	GREY				0.20
	0.40	BROWN	SAND	GRAVEL	LOOSE	0.60
	0.50	BROWN	SILT	CLAY	LOOSE	1.10
	4.30	BROWN	SILT	CLAY	SAND	5.40
	5.20	GREY	SILT	SAND	CLAY	10.60
6715281	0.61	BLACK	TOPSOIL			0.61
	12.80	BROWN	CLAY	STONES		13.41
	0.92	BROWN	LIMESTONE	FRACTURED		14.33
	22.25	BROWN	LIMESTONE			36.58
6715446	0.15	BROWN	SILT	TOPSOIL		0.15
	6.85	BROWN	SILT	SAND	CLAY	7.00
	3.70	GREY	SILT			10.70
	20.30		ROCK			31.00
7043040	0.90	BROWN	FILL	SAND	GRAVEL	0.90
	0.30	BLACK	TOPSOIL			1.20
	10.10	BROWN	SILT	CLAY	GRAVEL	11.30
7195814	3.65	BROWN	CLAY	STONES		3.65
	13.41	GREY	CLAY	STONES		17.06
7195815	2.43		FILL			2.43
	2.75	BROWN	CLAY	STONES		5.18
	15.85	GREY	CLAY	STONES		21.03
	9.14	BROWN	LIMESTONE			30.17
	8.23	WHITE	LIMESTONE			38.40
	3.96	BROWN	LIMESTONE			42.36
	11.58	WHITE	LIMESTONE			53.94
	16.16	GREY	LIMESTONE			70.10
	40.84	WHITE	LIMESTONE			110.94
	68.86					179.80

APPENDIX E

Drawings Provided by the Client

DRAFT PLAN OF SUBDIVISION

LEGAL DESCRIPTION

PT LT 3 CON 1 NICHOL PART 2 , 61R501;
TOWNSHIP OF CENTRE WELLINGTON
COUNTY OF WELLINGTON

OWNER'S CERTIFICATE

I HEREBY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING LIMITED TO SUBMIT THIS PLAN FOR APPROVAL.

Date: _____

_____
Farhan Kamali Siddiqui
Elora Greens Inc.

Date: _____

_____
Mohammad Tahir

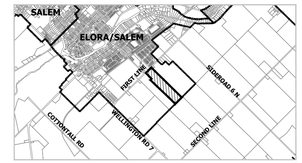
SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

Date: _____

_____
James M. Laws, Surveyor, O.L.S.
Van Harten Surveying Inc.

KEY PLAN



Scale: N.T.S

ADDITIONAL INFORMATION
Required Under Section 51 (17) of the Planning Act, R.S.O., 1990, c.P.13 as Amended

(a) As Shown	(b) As Shown	(c) As Shown
(d) Residential, Mixed Use, Park, Trail, Pump Station, Stormwater Management		
(e) As Shown	(f) As Shown	(g) As Shown
(h) Municipal Water Supply	(i) Clay/Sandy Loam	(j) As Shown
(k) All Services As Required	(l) As Shown	

AREA SCHEDULE

DESCRIPTION	LOTS/BLOCKS	UNITS	AREA
Low Density Residential	1-18	202-472	9.327 ha
Multiple Residential	19,20	60-131	1.751 ha
Mixed Use	21	34-74	0.988 ha
Park	22-25		1.287 ha
Trail	26		1.057 ha
Walkways	27,28		0.042 ha
Pump Station	29		0.263 ha
Stormwater Management	30		1.992 ha
0.3m Reserve	31-33		0.003 ha
Roads			4.871 ha
Total	**33**	**296-677**	**21.581 ha**

NOTES

1. All dimensions are in metres unless otherwise shown.
2. Contains information licensed under the Open Government Licence - Ontario.

Revision No.	Date	Issued / Revision	By
1.	March 6, 2026	Preliminary Draft Plan;	PL

Stamp	**Date** March 6, 2026
	File No. 24277A
	Plan Scale 1:1500 (Arch D)
	Drawn By P.L.
	Checked By P.S.
Project Elora Green 127 First Line, Township of Centre Wellington, County of Wellington.	
File Name DRAFT PLAN OF SUBDIVISION	**Dwg No.** 1 of 1
Scale Bar 0 10 25 50 100 150m	

K:\24277A-127 First Line-Centre Wellington\DP\DP_SPlan2026.dwg

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE