PATERSON GROUP

memorandum

re: **Groundwater Monitoring Summary**
**Proposed Residential Development**
**560 Hazeldean Road – Ottawa**

to: Regional Group – Stefanie Kaminski – skaminski@regionalgroup.com
date: May 26, 2026
file: PH5178-MEMO.01

Further to your request and authorization, Paterson Group (Paterson) is conducting an on-going groundwater monitoring program in support of the proposed residential development located at the aforementioned site.

## 1.0 Background Information

Field investigations were carried out by Paterson between May 2018 and May 2025 at the subject site. During that time, a total of seventeen (17) boreholes were extended to a maximum depth of 12.7 m below ground surface (bgs). At that time, select boreholes were equipped with monitoring well installations, including BH 2B-25, BH 3-25, BH 6-20, and BH 7-20, which have been utilized for the current groundwater monitoring program. It is understood the monitoring wells were distributed in a manner to provide general coverage of the proposed development, taking into consideration underground utilities and site features.

### Field Survey

The monitoring well locations, and ground surface elevations at each monitoring well location, were surveyed by Paterson using a handheld GPS unit and referenced to a geodetic datum. The location and ground surface elevation at each monitoring well location is presented on Drawing PG7472-1 – Test Hole Location Plan attached to the current memorandum.

### Subsurface Profile

The subsurface profile at the monitoring well locations included in the current groundwater monitoring program generally consisted of topsoil or asphaltic concrete followed by fill material and/or a stiff to firm brown clayey silt. The above noted layers are underlain by a firm to stiff grey silty clay to clayey silt. Details of the subsurface profile at the monitoring wells included in current groundwater monitoring program can be found in the Soil Profile and Test Data Sheets attached to the current report.

**Monitoring Well Installation**

Typical monitoring well construction details are described below:

- ❑ 1.5 to 3 m of slotted 51 mm diameter PVC screen at the base of the aforementioned monitoring wells.
- ❑ 51 mm diameter PVC riser pipe from the top of the screen to ground surface.
- ❑ Bentonite hole plug placed above PVC slotted screen extending to the existing ground surface.
- ❑ The 51 mm diameter PVC riser extended to ground surface and either capped with a flush mount cover, or extended above the ground surface and covered with a protective steel monitoring well casing.

Specific details of the installation of each monitoring well are further included in the well records attached to the current report.

## 2.0 Groundwater Monitoring Program

On November 29, 2025, BH 2B-25, BH 3-25, BH 6-20, and BH 7-20 was equipped with a Van Essen Instrument Mini-Diver Water Level Logger to accurately monitor fluctuations in the groundwater levels. In addition, a Van Essen Instruments Baro-Diver was installed in BH 6-20 to monitor changes in atmospheric pressure. The Mini-Divers were programmed to continuously measure and record groundwater levels throughout the subject site at a rate of 1 reading every 24 hours.

The results of the groundwater fluctuations and correlated precipitation events for each monitoring well location between November 29, 2025, and May 21, 2026, have been summarized in Figure 1 through Figure 4 attached to the current report.

## 3.0 Groundwater Monitoring Results

The data presented in Figure 1 through Figure 4 illustrate the collected groundwater elevations between November 29, 2025, and May 21, 2026. The groundwater readings measured within the monitoring wells across the subject site varied from a minimum elevation of 93.64 m asl to a maximum average elevation of 96.18 m asl. The low and high groundwater elevation measurements at each monitoring well location are summarized in Table 1 below.

Based on our analysis of the datalogger readings, seasonal groundwater fluctuations can be observed at each monitoring well location with a difference in elevation between the low and high readings ranging from 0.92 to 1.94 m. The low groundwater level across the site was noted to be at an average elevation of 94.08 m asl throughout the monitoring period. The high groundwater table across the site during this monitoring period was found to be at an average elevation of 95.34 m asl.

**Table 1: Groundwater Monitoring Summary**

| Well ID | Ground Surface Elevation (m asl) | Low Groundwater Elevation (m asl) | High Groundwater Elevation (m asl) | Difference in Groundwater Elevation (m asl) |
|---|---|---|---|---|
| BH 2B-25 | 95.02 | 93.64 | 94.80 | 1.16 |
| BH 3-25 | 95.40 | 94.22 | 95.24 | 1.02 |
| BH 6-20 | 95.95 | 94.24 | 95.16 | 0.92 |
| BH 7-20 | 96.00 | 94.24 | 96.18 | 1.94 |
| Average | | 94.08 | 95.34 | 1.26 |

We trust that this information satisfies your requirements.

Best Regards,

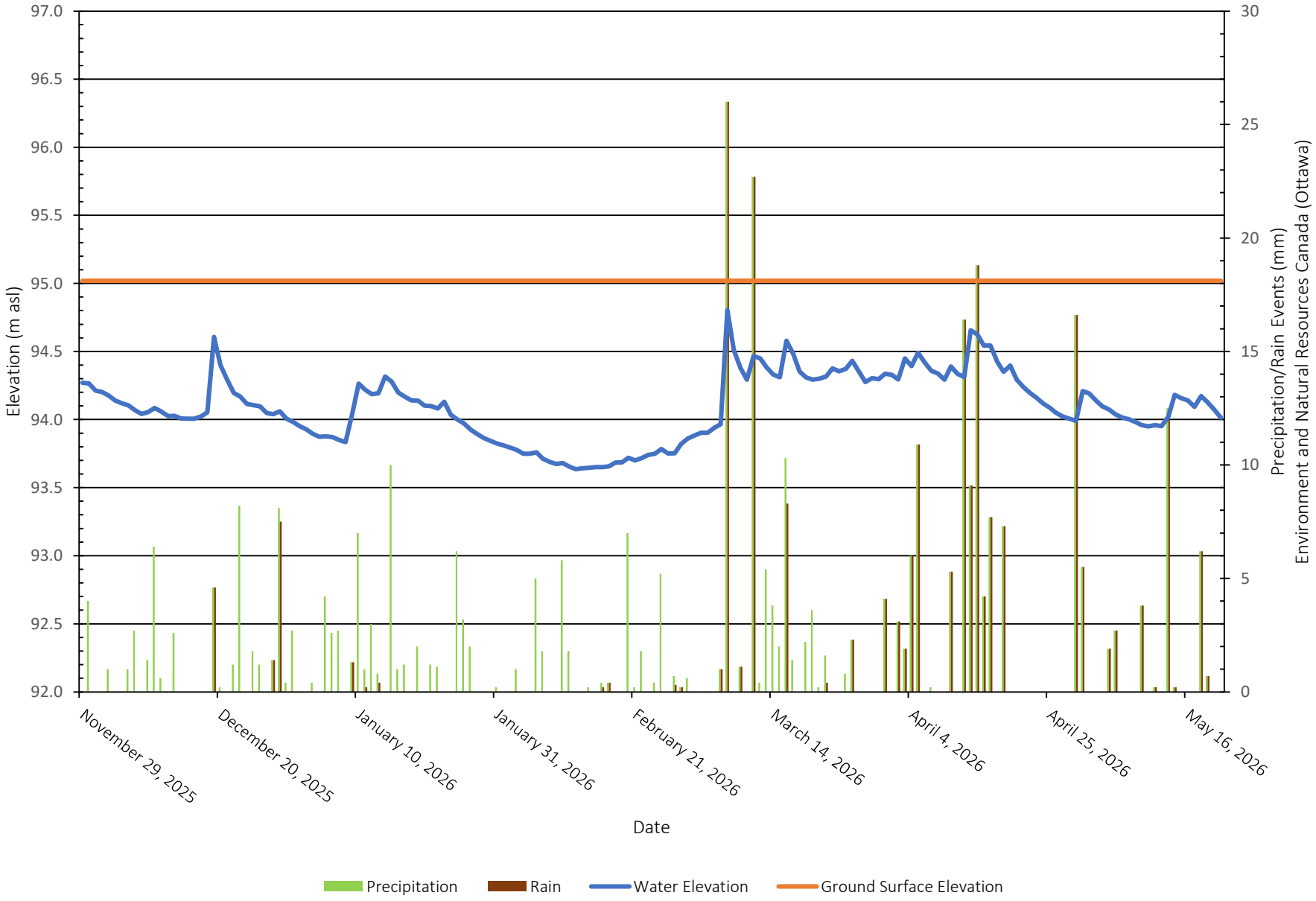
**Paterson Group Inc.**


Nicholas Zulinski, P.Geo., géo.

**Attachments**

- ❑ Figure 1 through Figure 4 – Groundwater Monitoring Levels
- ❑ Soil Profile and Test Data Sheets
- ❑ Drawing PG7472-1 – Test Hole Location Plan

## Figure 1: BH2B-25 - Monitoring Well Water Elevations

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## Figure 2: BH3-25 - Monitoring Well Water Elevations

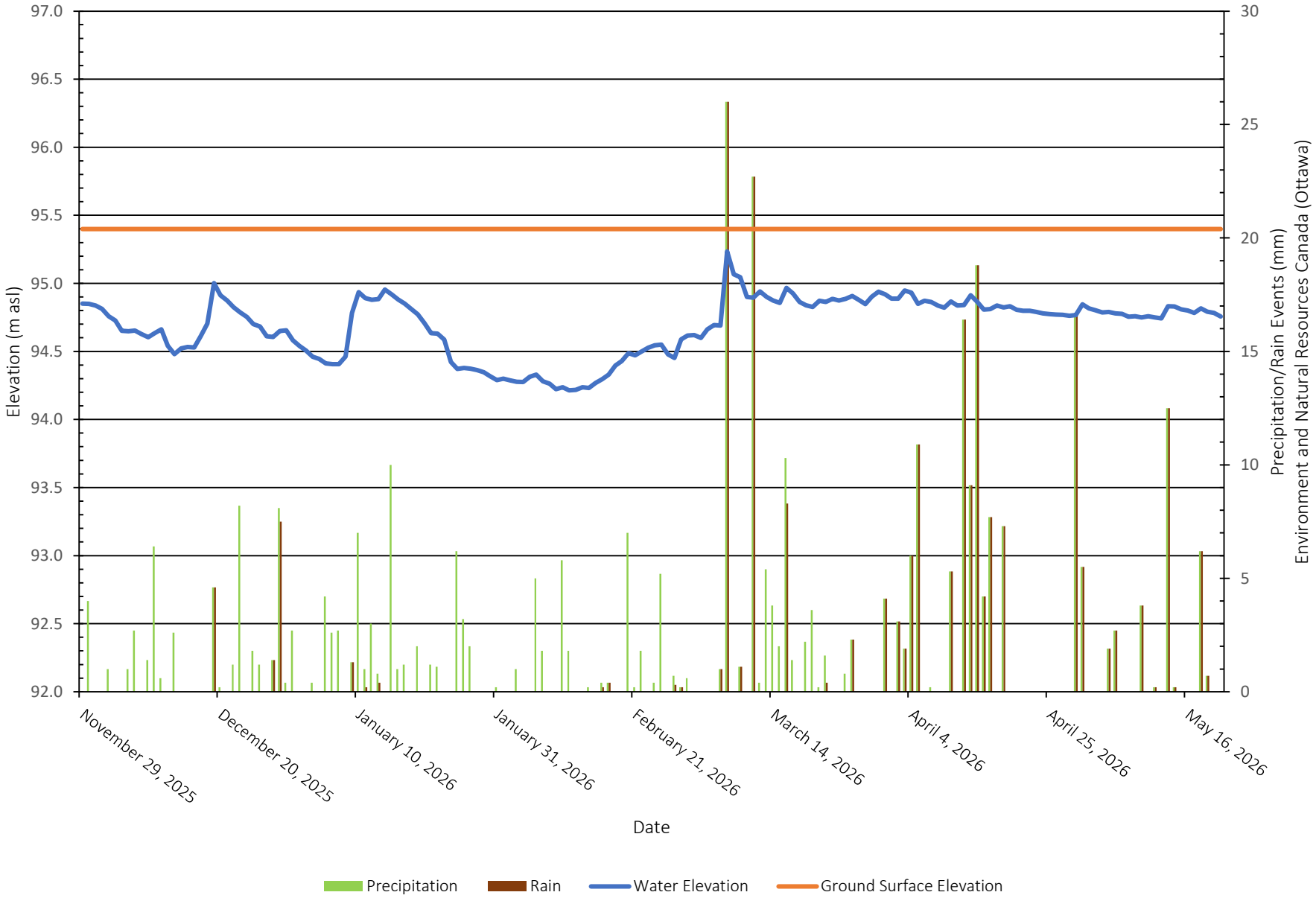


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Figure 3: BH6-20 - Monitoring Well Water Elevations

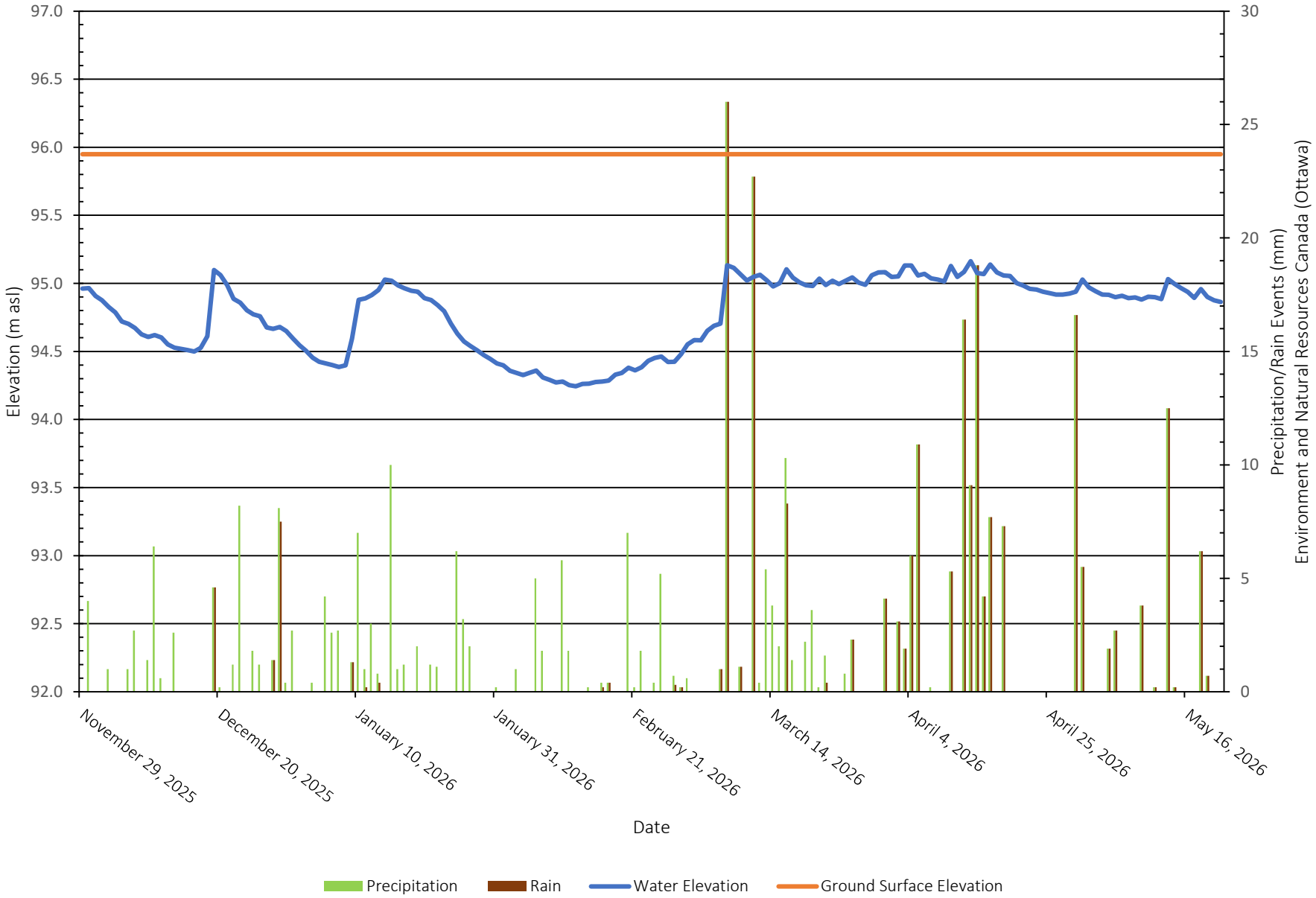


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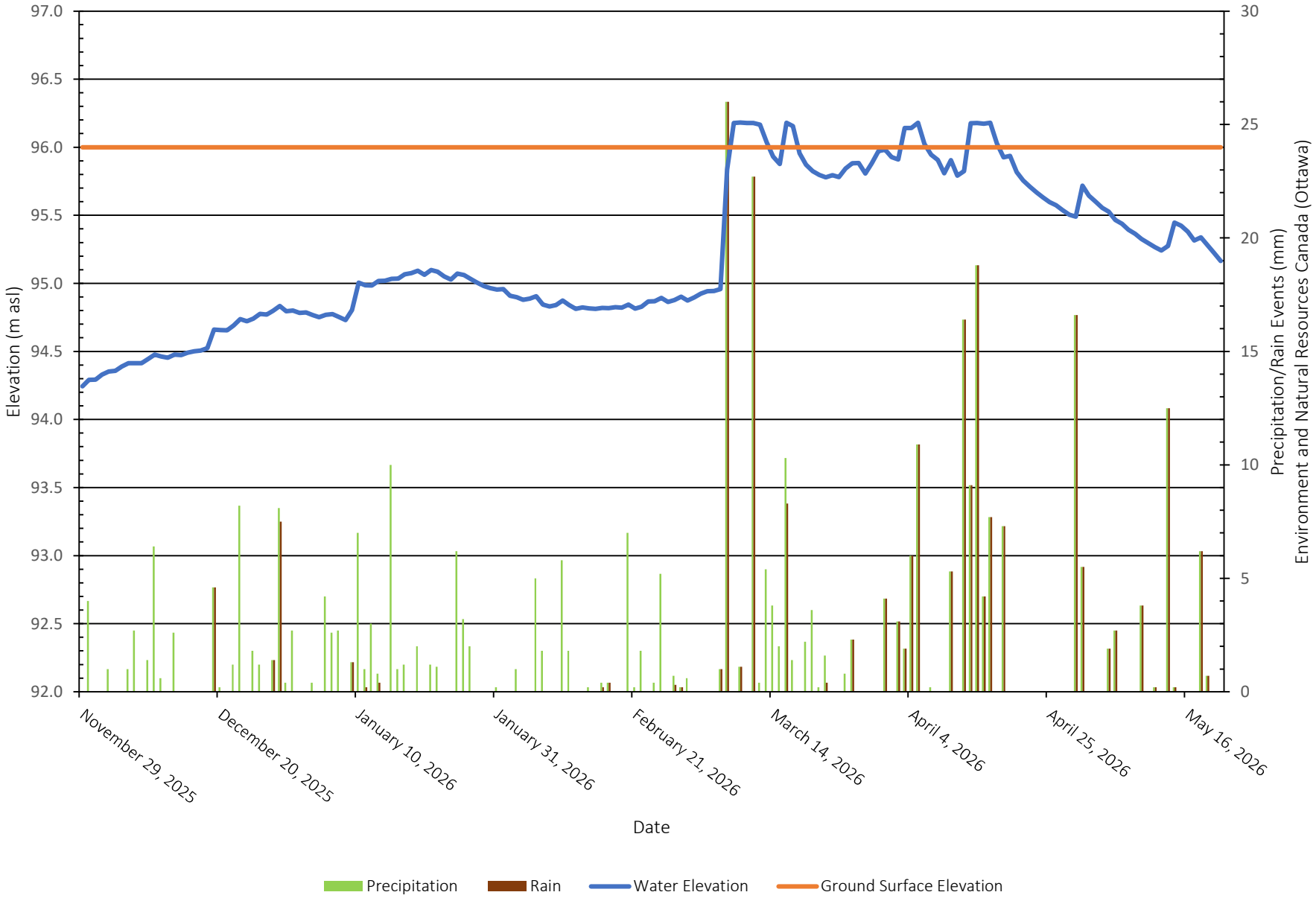
Figure 4: BH7-20 - Monitoring Well Water Elevations

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# SOIL PROFILE AND TEST DATA

## Geotechnical Investigation

560 Hazeldean Road, Ottawa, ON

**COORD. SYS.:** MTM ZONE 9 **EASTING:** 351864.41 **NORTHING:** 5016805.75 **ELEVATION:** 94.90

**PROJECT:**

**ADVANCED BY:** CME-55 Low Clearance Drill

**REMARKS:**

**DATE:** May 29, 2025

**FILE NO. :** PG7472

**HOLE NO. :** BH 2-25

| SAMPLE DESCRIPTION | STRATA PLOT | DEPTH (m) | SAMPLE TYPE AND NO. | SAMPLE RECOVERY (%) | SAMPLE N OR RQD | WATER CONTENT (%) | PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) ▲ UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80 | PIEZOMETER CONSTRUCTION | ELEVATION (m) |
|---|---|---|---|---|---|---|---|---|---|
| GROUND SURFACE | | 0 | | | | | | | 94 |
| **TOPSOIL:** with organics 0.05m [ 94.85m ] | | | AU 1 | | | | | | |
| **FILL:** Brown silty fine sand, trace topsoil 0.69m [ 94.21m ] | | | | | | | | | |
| Stiff, brown **CLAYEY SILT**, some trace to sand | | 1 | SS 2 | 42 | 3-4-3-2 7 | | | | 93 |
| | | 2 | SS 3 | | 1-2-1-2 3 | | | | 92 |
| 2.97m [ 91.93m ] | | 3 | SS 4 | 71 | P | | 7 63 | | 91 |
| Firm, grey **SILTY CLAY** to **CLAYEY SILT** | | | SS 5 | 50 | P | | 5 39 | | 90 |
| | | 4 | | | | | 34 | | 89 |
| | | 5 | | | | | 2 43 | | 88 |
| | | 6 | | | | | 34 | | 87 |
| | | 7 | | | | | 39 | | 86 |
| | | | | | | | 34 | | 85 |
| 8.08m [ 86.82m ] | | 8 | | | | | 34 | | 84 |
| End of Borehole | | 9 | | | | | | | 83 |
| | | 10 | | | | | | | |
| | | 11 | | | | | | | |
| | | 12 | | | | | | | |

# SOIL PROFILE AND TEST DATA

## Geotechnical Investigation

560 Hazeldean Road, Ottawa, ON

**COORD. SYS.:** MTM ZONE 9 **EASTING:** 351863.47 **NORTHING:** 5016805.63 **ELEVATION:** 95.02

**PROJECT:**

**ADVANCED BY:** CME-55 Low Clearance Drill

**REMARKS:**

**DATE:** May 29, 2025

**FILE NO. :** PG7472

**HOLE NO. :** BH 2B-25

| SAMPLE DESCRIPTION | STRATA PLOT | DEPTH (m) | SAMPLE: TYPE AND NO. | SAMPLE: RECOVERY (%) | SAMPLE: N OR RQD | SAMPLE: WATER CONTENT (%) | PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 | REMOULDED SHEAR STRENGTH (kPa) ▲ UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 | PL (%) WATER CONTENT (%) LL (%) 20 40 60 80 | MONITORING WELL CONSTRUCTION | ELEVATION (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GROUND SURFACE | | | | | | | | | | | |
| **OVERBURDEN** | | 0 | | | | | | | | | 95 |
| | | 1 | | | | | | | | 0.97 m 2025-06-06 | 94 |
| | | 2 | | | | | | | | 1.83m | 93 |
| | | 3 | | | | | | | | | 92 |
| | | 4 | | | | | | | | | 91 |
| 4.57m [ 90.45m ] | | | | | | | | | | 4.57m | |
| End of Borehole | | 5 | | | | | | | | | 90 |
| (GWL at 0.97 m depth - June 6, 2025) | | 6 | | | | | | | | | 89 |
| | | 7 | | | | | | | | | 88 |
| | | 8 | | | | | | | | | 87 |
| | | 9 | | | | | | | | | 86 |
| | | 10 | | | | | | | | | 85 |
| | | 11 | | | | | | | | | 84 |
| | | 12 | | | | | | | | | |

# SOIL PROFILE AND TEST DATA

## Geotechnical Investigation

560 Hazeldean Road, Ottawa, ON

**COORD. SYS.:** MTM ZONE 9 **EASTING:** 351805.60 **NORTHING:** 5016758.90 **ELEVATION:** 95.40

**PROJECT:**

**ADVANCED BY:** CME-55 Low Clearance Drill

**REMARKS:**

**DATE:** May 29, 2025

**FILE NO. :** PG7472

**HOLE NO. :** BH 3-25

| SAMPLE DESCRIPTION | STRATA PLOT | DEPTH (m) | SAMPLE TYPE AND NO. | SAMPLE RECOVERY (%) | SAMPLE N OR RQD | WATER CONTENT (%) | ELEVATION (m) |
|---|---|---|---|---|---|---|---|
| GROUND SURFACE | | | | | | | 95 |
| **ASPHALT** 0.08m [ 95.32m ] | | 0 | AU 1 | | | | |
| **FILL:** Brown silty sand with crushed stone and some clay 0.46m [ 94.94m ] | | 1 | SS 2 | 67 | 1-1-1-1 2 | | 94 |
| Stiff to firm, brown **CLAYEY SILT**, trace sand | | 2 | SS 3 | 62 | P | | 93 |
| 2.97m [ 92.43m ] | | 3 | SS 4 | 42 | P | | 92 |
| Firm, grey **SILTY CLAY** | | 4 | SS 5 | 100 | P | | 91 |
| 4.42m [ 90.98m ] | | 5 | SS 6 | 100 | P | | 90 |
| End of Borehole | | 6 | | | | | 89 |
| (GWL at 0.61 m depth - June 6, 2025) | | 7 | | | | | 88 |
| | | 8 | | | | | 87 |
| | | 9 | | | | | 86 |
| | | 10 | | | | | 85 |
| | | 11 | | | | | 84 |
| | | 12 | | | | | |

PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE)

20 40 60 80

△ REMOULDED SHEAR STRENGTH (kPa)

▲ UNDRAINED SHEAR STRENGTH (kPa)

20 40 60 80

PL (%) WATER CONTENT (%) LL (%)

20 40 60 80

△12 △5 △2 △2 ▲77 ▲43 ▲34 ▲34

MONITORING WELL CONSTRUCTION

0.61 m 2025-06-06

1.00m

4.05m

# patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

## SOIL PROFILE AND TEST DATA

**Geotechnical Investigation**
**Proposed Development - 560 Hazledean Road**
**Ottawa, Ontario**

**DATUM** Geodetic

**FILE NO.** PG5642

**REMARKS**

**HOLE NO.** BH 6 - 20

**BORINGS BY** CME-55 Low Clearance Drill **DATE** 2020 December 21

| SOIL DESCRIPTION | STRATA PLOT | SAMPLE TYPE | SAMPLE NUMBER | SAMPLE % RECOVERY | SAMPLE N VALUE or RQD | DEPTH (m) | ELEV. (m) |
|---|---|---|---|---|---|---|---|
| **GROUND SURFACE** | | | | | | | |
| **TOPSOIL** 0.13 | | | | | | 0 | 95.95 |
| Stiff, brown **SILT** to **CLAYEY SILT** with sand | | AU | 1 | | | | |
| | | SS | 2 | 46 | 5 | 1 | 94.95 |
| | | SS | 3 | 79 | 2 | 2 | 93.95 |
| | | SS | 4 | 66 | 1 | | |
| 3.05 | | | | | | 3 | 92.95 |
| Firm, grey **SILTY CLAY** to **CLAYEY SILT** | | SS | 5 | 100 | P | | |
| 3.65 | | | | | | | |
| End of Borehole | | | | | | | |
| (GWL @ 0.77 m depth - January 4, 2021) | | | | | | | |

**Pen. Resist. Blows/0.3m**
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

Monitoring Well Construction

20 40 60 80 100

**Shear Strength (kPa)**

▲ Undisturbed △ Remoulded

# patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

## SOIL PROFILE AND TEST DATA

**Geotechnical Investigation**
**Proposed Development - 560 Hazledean Road**
**Ottawa, Ontario**

**DATUM** Geodetic

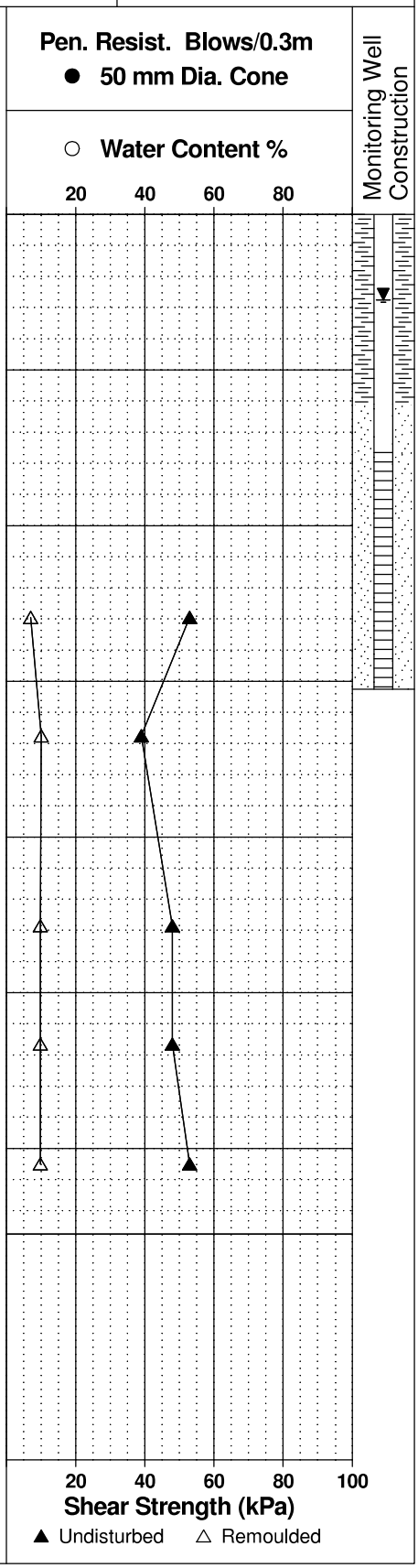
**FILE NO.** PG5642

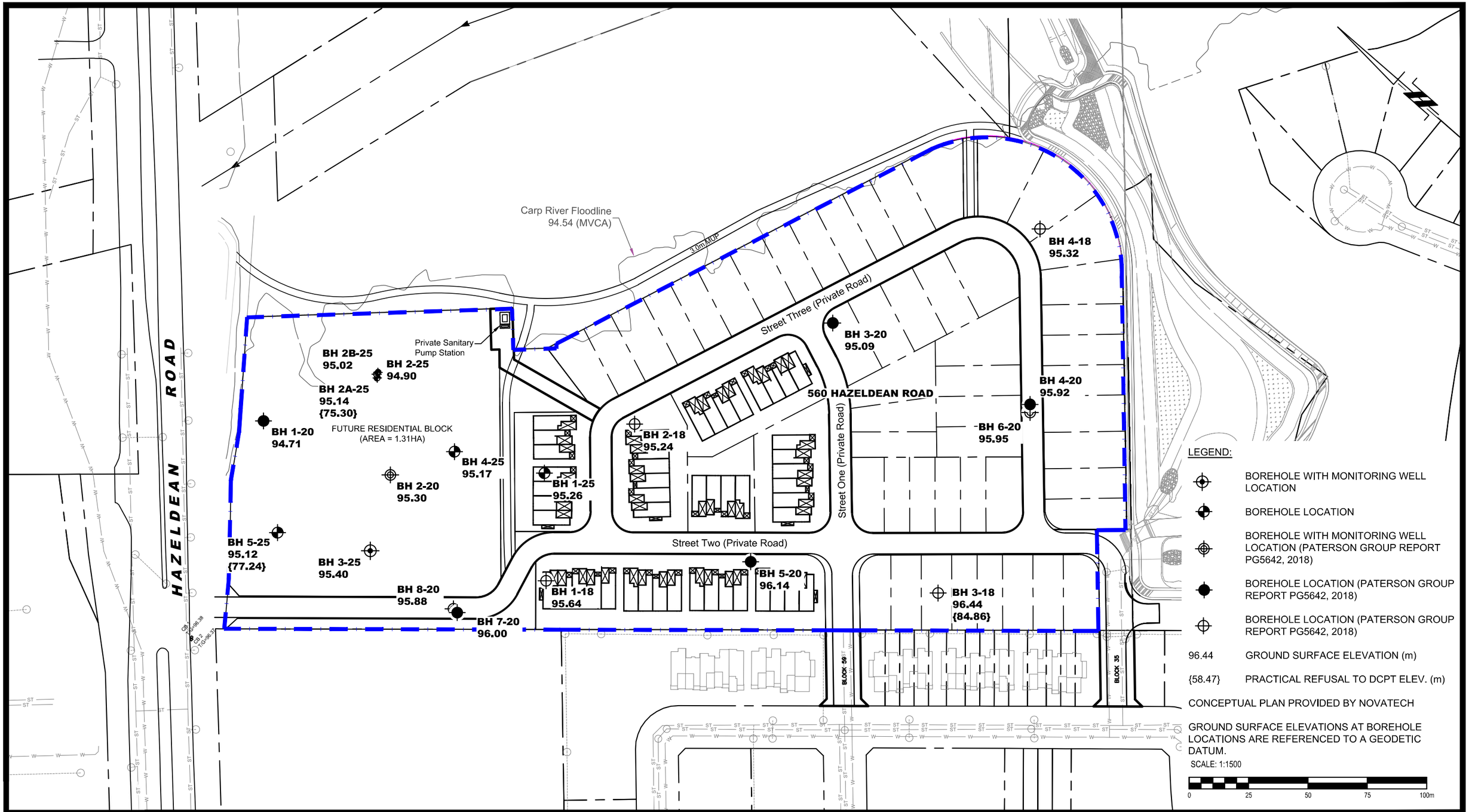
**REMARKS**

**HOLE NO.** BH 7 - 20

**BORINGS BY** CME-55 Low Clearance Drill **DATE** 2020 December 21

| SOIL DESCRIPTION | STRATA PLOT | SAMPLE TYPE | SAMPLE NUMBER | SAMPLE % RECOVERY | SAMPLE N VALUE or RQD | DEPTH (m) | ELEV. (m) |
|---|---|---|---|---|---|---|---|
| **GROUND SURFACE** | | | | | | 0 | 96.00 |
| **TOPSOIL** 0.18 | | AU | 1 | | | | |
| Stiff, brown **CLAYEY SILT** with sand | | SS | 2 | 46 | 4 | 1 | 95.00 |
| | | SS | 3 | 79 | 5 | 2 | 94.00 |
| 2.81 | | SS | 4 | 66 | 2 | | |
| Firm to stiff, grey **SILTY CLAY** to **CLAYEY SILT** | | SS | 5 | 46 | P | 3 | 93.00 |
| | | | | | | 4 | 92.00 |
| | | | | | | 5 | 91.00 |
| | | | | | | 6 | 90.00 |
| 6.55 | | | | | | | |
| End of Borehole | | | | | | | |
| (GWL @ 0.55 m depth - January 4, 2021) | | | | | | | |






PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

| NO. | REVISIONS | DATE | INITIAL |
|---|---|---|---|
| 1 | ADDED 2025 BOREHOLE LOCATION BH 1-25 TO BH 5-25 AND UPDATED CONCEPTUAL PLAN | 11/06/2025 | DR |

REGIONAL GROUP
GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
560 HAZELDEAN ROAD
OTTAWA, ONTARIO

Title:
# TEST HOLE LOCATION PLAN

| | |
|---|---|
| Scale: 1:1500 | Date: 04/2025 |
| Drawn by: GK | Report No.: PG7472-1 |
| Checked by: DR | Dwg. No.: PG7472-1 |
| Approved by: SD | Revision No.: 1 |

11x17

p:\autocad drawings\geotechnical\pg74xx\pg7472\pg7472-1 test hole location plan (rev.01).dwg