

Memo



To: Michel Kearney, P.Geo. – City of Ottawa
From: Rob Kell, M.A.Sc., P.Eng., P.Geo., Dillon Consulting Limited
cc: Brent Loney, M.Sc., P.Geo., Dillon Consulting Limited
Date: May 15, 2020
Subject: Review of Caivan - ABIC - Groundwater Field Investigation Memo
Our File: 20-2859

As requested, Dillon has completed a review of the memo prepared by the Paterson Group, titled "Groundwater Field Investigation, Proposed Warehouse Complex - 3713 Borrisokane Road – Ottawa", May 13, 2020. The Paterson memo provides a summary of a field program to assess groundwater elevations at the east side of the subject site and an assessment of the potential for construction dewatering for the construction of the infiltration gallery and septic proposed for the site. The memo indicates that the base elevation of the proposed infiltration gallery will be at 97.5 masl and the base elevation of the septic tank will be higher than 99.0 masl.

Eleven test holes were excavated to approximately 96 to 99 masl on May 6-8, 2020. Four test pits (TP74, TP75, TP76 and TP77) were excavated in the area of the proposed infiltration gallery and one test pit (TP78) excavated in the area of the proposed septic tank to a depth of 5.1 m (99.0 masl). The remaining test pits were located south of the proposed infiltration gallery. Water levels were recorded in the test pits which were left open for about 48 hours. The use of test pits to assess groundwater conditions, while not as technically appropriate as monitoring wells, can be useful to provide a qualitative assessment of near-surface groundwater conditions. Monitoring wells / piezometers were installed in November 2019 west of the proposed and groundwater elevations measured in November 2019 in those installations were generally higher than those measured in the test pits (these levels are tabulated below and are shown on Figure 1 derived from the Paterson Site Plan figure).

Proposed Infiltration Gallery

With the exception of one test pit (TP74), inferred groundwater levels in the test pits were at or below the bottom elevation of the proposed infiltration gallery 97.5 masl. The water level at TP74 was at 98.8 masl, 1.3 m above the bottom excavation of the proposed infiltration gallery. The higher water level at this test pit was attributed by Paterson to lower hydraulic conductivity fill material noted within the test hole. Paterson states that the lower hydraulic conductivity fill material in the area " ... contains limited groundwater" and concludes that construction dewatering is not expected to be required when constructing the infiltration gallery. We assume that Paterson meant that these materials would conduct less groundwater, such that construction dewatering requirements would be minimal. Dillon has reviewed the groundwater conditions in this general area which indicate that interpolated groundwater levels are generally at an elevation of 97.5 masl (corresponding to the bottom elevation of the proposed Infiltration Gallery). As such, we have no information that would contradict the Paterson conclusion that construction dewatering is not expected to be required.

Further, the deep aquifer piezometric groundwater elevations proximal to the landfill and laterally across from the ABIC site range from approximately 96 to 96.7 masl. As such, even if significant construction dewatering occurred to an elevation of 97.5 masl, this would not be expected to have a detrimental effect in terms of the local gradient between this site and the landfill (i.e., there would not be a gradient towards the ABIC site).

Although not within the construction dewatering assessment, we note that the water table is expected to be at or near the bottom of the infiltration gallery and there will be limited unsaturated soil beneath the infiltration system. As such groundwater mounding in the longer term should be expected in the vicinity of infiltration gallery and the groundwater mound will cause localized vertical and horizontal groundwater flow.

Septic Tank

Test pit TP78 was excavated to a depth corresponding to the proposed bottom of the tank (99.0 masl). The test pit was dry and, as such, Patterson concludes that construction dewatering will not be required during the installation of the septic tanks. It is noted that the water level at TP79 (located approximately 25 m south of TP78) was at an elevation of 100.6 masl. Water levels at other test pits excavated nearby support a groundwater elevation less than 99.0 masl. As stated above, Dillon's review of the groundwater levels in this general area indicates levels less than 99.0 masl, and we have no information that would contradict the Patterson conclusion that construction dewatering is not expected to be required in the area of the septic tank.



Test Pit Number	Ground Elevation (masl)	Depth (m)	Bottom Elevation (masl)	Water Depth (m)	Water Elevation (masl)	Monitoring Well / Piezometer	Ground Elevation (masl)	Water Elevation (masl)
TP74	103.77	7.8	96.0	5.0	98.8	BH9-19	104.25	100.24
TP75	105.01	9.0	96.0	8.0	97.0	BH11-19	104.17	100.27
TP76	103.59	7.7	95.9	dry	<95.9	BH16-19	105.31	99.29
TP77	101.51	5.8	95.7	4.0	97.5	BH19-19	104.14	100.45
TP78	104.10	5.1	99.0	dry	<99.0	BH20-19	100.24	96.41
TP79	104.07	5.1	99.0	3.5	100.6			
TP95	105.72	8.5	97.2	8.0	97.7			
TP97	103.91	7.0	96.9	6.0	97.9			
TP98	103.97	8.0	96.0	dry	<96.0			
TP99	104.15	8.1	96.1	6.0	98.2			
TP100	103.01	6.4	96.6	5.9	97.1			

- Monitoring wells / piezometer installed in November 2019 and water levels taken November 29, 2019

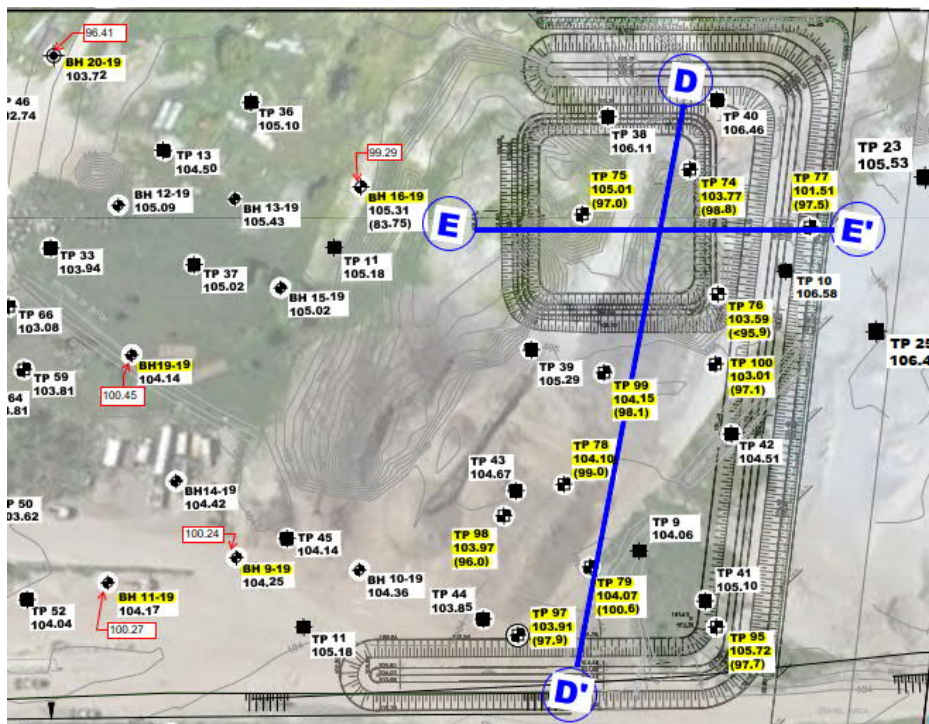


Figure 1 - Site Plan (Plan is from the Paterson Memo with water levels at the monitoring wells / piezometers recorded in November 2019)