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# Memo

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**To:** Erin Tait, Program Manager, Environmental Remediation Unit

**From:** Kevin Hicks, M.Sc., P.Geo. QP<sub>ESA</sub>

**Cc:**

**Ref:** CA0044157.1045.8

**Date:** March 2, 2026

**Subject:** Review of Phase I and Phase II Environmental Site Assessment Reports  
Kanata Lakes Golf course, 7000 Campeau Drive, Ottawa, ON  
Paterson Group Reports PE4321-1R and PE4321-2 Rev 2.

WSP Canada Inc. (WSP) was retained by the City of Ottawa, Environmental Remediation Unit, to provide a technical review of the above-noted Phase I and Phase II Environmental Site Assessment (ESA) reports prepared by Paterson Group in reference to the former Kanata Lakes Golf Course, hereinafter referred to as the "Site". It is WSP's understanding that the owner of the golf course, ClubLink Corporation ULC, intends to redevelop the Site to residential property use. It is anticipated that some portions of the Site will be dedicated to the City of Ottawa for parks, stormwater management ponds and open space lands together with the road network.

The peer review was undertaken to provide an independent review and opinion with respect to the findings, conclusions and/or recommendations provided in the reports in the context of relevant legislation in the Province of Ontario. To that end, the specific objectives of the peer review were to:

- Review the general conformance and identify any specific concerns with respect to the investigation methodologies relative to current standard scientific and engineering practices relevant to the field of site assessment and remediation and the conclusions and recommendations drawn therefrom;
- Determine the adequacy of the environmental characterization of the Site;
- Provide an opinion as to the adequacy of the report with respect to the reporting requirements for Phase Two Environmental Site Assessment as set forth in Schedule E of Ontario Regulation 153/04 – Records of Site Condition (O.Reg. 153/04);
- Identify any relevant data gaps that may impact the site characterization and filing of a Record of Site Condition (RSC); and,



- Identify the need for, and purpose of any supplementary environmental site assessment activities considered necessary to support the filing of an RSC.

Based on a review of the reports provided, WSP offers the following comments for consideration.

## **Phase I ESA, Report PE4321-1R, January 18, 2021**

### **General Comments**

- The subject report is referenced as a Phase I Environmental Site Assessment. In keeping with the spirit of O.Reg. 153/04 and the eventual requirement to file one or more RSCs, the report should be referenced as a Phase One Environmental Site Assessment and should meet the reporting requirements stipulated in Schedule E of O.Reg. 153/04. The QP should consider the need to review the requirements for Phase One ESA reports as stipulated in Schedule D, Table 1 of O.Reg. 153/04.

### **Specific Comments**

- Section 4.1 General, Phase I-ESA Study Area Determination: The report states “Properties outside the 250 m radius are not considered to have impacted the subject land, based on their significant distance from the site.” Depending on the specific nature of current and past uses of and activities, determination of the Phase I Study Area based solely on distance may be inadequate to identify potentially contaminating activities (PCA) and resulting areas of potential environmental concern (APEC) that may be present at the Site. The QP should consider the need to indicate other lines of evidence to support statements made in the report.
- Section 4.1 General, First Developed Use Determination: The first line of the second paragraph states “Aerial photographs from the time the property was reportedly developed, were not available for review.” It is unclear what the QP is endeavoring to convey by this statement as air photos dating between 1934 and 2007 covering the development of the site are readily available from the National Air Photo Library. The QP may wish to consider the need to acquire additional aerial photographs for the period between 1945 and 1976 to provide a more thorough understanding of the Site development history.
- Section 4.1 General, Plan of Survey: As per O.Reg. 153/04, it is noted that a legal Plan of Survey is required to be included as part of the Phase One ESA. The plan of survey is also required to be submitted as part of the Record of Site Condition submission, with outlines of the Phase One ESA Property clearly shown on the plan.
- Section 4.2 Environmental Source Information, Areas of Natural Heritage and Significance Interest: The report states “A search for areas of natural significance and features within the Phase I study area was conducted on the web site of the Ontario Ministry of Natural Resources (MNR) on March 22, 2018. The search did not identify any provincially significant life sciences or earth sciences areas of natural heritage and scientific interest on the Phase I Property or within the Phase I Study Area.” Sections 1 (1) (6) and 1 (1) (7) of O.Reg. 153/04 define an Area of Natural Significance as meaning “an area identified by the Ministry of Natural Resources as significant habitat of a threatened or

endangered species” or “an area which is habitat of a species that is classified under section 7 of the Endangered Species Act, 2007 as a threatened or endangered species.” A review of the Natural Heritage Information Centre (NHIC) Species at Risk in Ontario (SARO) data as provided for 1 kilometer grid on-line mapping tool available via the Ministry of Natural Resources indicates the potential presence of several threatened or endangered species at the Site. The QP should consider the need to revise the report and/or undertake a species at risk assessment given the potential presence of threatened or endangered species at the Site. As per Section 41 (1) (a), the presence of such species would render the Site (i) to be within an area of natural significance, (ii) include or be adjacent to an area of natural significance or part of such an area, or (iii) include land that is within 30 metres of an area of natural significance or part of such an area, thus rendering the Site an environmentally sensitive site requiring application of the Table 1 Background SCS when undertaking a Phase Two ESA.

- Section 4.3 Physical Setting Sources, Geological Maps: The third sentence of the first paragraph states “Overburden soils are reported to consist primarily of Precambrian bedrock.” It is unclear what the QP is endeavouring to convey by this statement. The QP should consider the need to revise statements made in the report to more accurately the geological conditions and/or processes.
- Section 4.3 Physical Setting Sources, Water Well Records: The first paragraph states “The online interactive well record mapping system was accessed on May 22, 2018. Well records were not identified for the Phase I Property although it was reported that the aesthetic and irrigation water is provided to the Phase I Property via drilled wells.” The interactive water well mapping system was accessed on February 26, 2026. Two water wells were identified on the golf course (Well ID 1519238) and neighbouring property on Shaughnessy Crescent (Well ID1503336). The well shown as being on the golf course (Well ID 1519238) was constructed in 1984 for Lindia Construction. Wm. Terron Ltd. was identified as the owner of the well on Shaughnessy Crescent (Well ID1503336) and the use of the water is indicated as golf course. Although it is conceivable that these well records were added sometime after 2021, the QP should consider the need to revise statements made in future Phase One ESA reports prepared in reference to the Site.
- 7.1 Land Use History: Table 1: Land Use History. The column headers “Property Use” and “Description of Property Use” at the top of the table are inverted. The column “Property Use” is intended to indicate the property use as per those identified in Section 1 (3) of O.Reg. 153/04 whereas the column “Description of Property Use” is intended to provide a narrative description of the activities associated with the property use.
- 7.1 Land Use History: The first sentence of the third paragraph states “No off-site PCAs were identified within the Phase I Study Area.” A hydro corridor and transformer station are located abutting the east boundary of Parcel 3. Table 2 Potentially Contaminating Activities in Schedule D of O.Reg. 153/04 lists PCA 55 - Transformer Manufacturing, Processing and Use. The QP should consider the need to revise statements made in the report to reflect the presence of an off-site PCA within the Phase I Study Area, and if so, to determine if the PCA results in an APEC at the Site.



## Phase II ESA, Report PE4321-2 Rev 2, April 1, 2021

### General Comments

- There are several instances, notably in the Executive Summary, where the QP notes that concentrations of a contaminant were detected but no indication is provided as to whether the concentrations met or exceeded the Table 3 or Table 7 SCS, as applicable. The QP may wish to consider the need to revise the report to provide a more definitive understanding of the results being discussed.
- The subject report is referenced as a Phase II Environmental Site Assessment. In keeping with the spirit of O.Reg. 153/04 and the eventual requirement to file one or more RSCs, the report should be referenced as a Phase Two Environmental Site Assessment and should meet the reporting requirements stipulated in Schedule E of O.Reg. 153/04. The QP should consider the need to review the requirements for Phase Two ESA reports as stipulated in Schedule E, Table 1 of O.Reg. 153/04.
- Exceedances of the Table 3 or Table 7 Site Condition Standards (SCS) were identified for mercury at several sampling locations. It is noted that no analyses for methyl mercury were performed on any of the samples exceeding Table 3 or Table 7 SCS. The QP should consider the need to undertake additional sample analyses to address this issue.
- The figures provided as part of the report do not meet the requirements stipulated in O.Reg. 153/04, Schedule E, Table 1 of O.Reg. 153/04. These include requirements for figures depicting: sampling locations relative to each of the APECs identified at the Site; soil and groundwater sampling results exceeding applicable SCS; for each parameter group defined in the Analytical Protocol for which a contaminant has been analysed, figures showing the Site in plan view and cross section illustrating the delineation of the lateral and vertical extent of contaminants of concern in each media sampled; among others. It is noted that of the figures provided, more than one parameter group has been included on individual figures. The figures provided lack any labelling of relevant site features such as buildings, storage tanks, etc. The QP should consider the need to revise the figures presented in the report to meet the Phase Two ESA reporting requirements stipulated in the regulations.
- The report indicates that mercury concentrations exceeding the Table 3 or Table 7 SCS, as applicable, were identified in shallow soil samples collected from various locations across the Phase II Property. Mercurial fungicides were commonly applied to golf course greens from the 1950s through the mid-1990s to control snow mold growth. Studies have shown that such historical applications led to elevated mercury concentrations, commonly in the top 30-60 cm of the soil column and that elevated mercury concentrations may extend to in excess of 15 m beyond the greens (Fushtey and Frank, 1981). Mercurial fungicides may also have been applied to other areas of the golf course where higher aesthetic conditions are desired such as tee boxes as suggested by mercury concentration reported in sample HA-TA-20. Given the commonality of this practice, the QP should consider the need to identify the historical application of mercurial fungicides to the greens as an APEC and should consider this and other information if/when planning any additional site investigations required to delineate the extent of the mercury impacts. It is also understood that the



layout of the original nine hole golf course was changed during development of the existing residential community resulting in some of the greens being relocated. The QP should consider the need to interview long term greenskeeping staff employed by the golf course, if not already done so.

- Only three cross sections were included in the report. As multiple RSCs will need to be filed for the Site, the QP should consider the need to include additional cross sections to provide adequate depictions of the site conditions and contaminant distributions and to meet the reporting requirements stipulated in O.Reg. 153/04.
- Of the three cross sections provided in the report, labels identifying the geologic materials were provided on the first cross section only (PE4321-8R). Labels (or a legend) should be provided on each cross section.
- Several of the sampling callout boxes shown on Figure PE4321-4R appear to reference incorrect locations on the golf course. For example, sample location BH9-AU1 indicates the sample to have been collected from the rough whereas the sample appears to have been collected in the fairway based on the location shown. Several other similar errors were noted. The QP should consider the need to revise the figure to correct any such inconsistencies. These errors should be cross checked with Table 4 for consistency.

### Specific Comments

- Section 1.4 Applicable Site Condition Standard: The last paragraph on page 2 of the report states “Section 41 of O.Reg. 153/04 does not apply to the Phase II Property, as the property is not within 30 m of an environmentally sensitive area and the pH of the soil is between 5 and 9. It is noted in Table 4 that only two soil samples, one surface soil sample and one subsurface soil sample, were subject to pH determination. The sampling is considered inadequate to effectively determine the soil pH across the 71 Ha golf course as a whole, in addition to the needs to support selection of the Table 3 or Table 7 SCS at each of the four respective parcels for which RSCs will be required. The QP should consider the need to complete additional soil sampling for pH determination.
- Section 2.2 Past Investigations, Phase I Environmental Site Assessment, 2018: The report references a Phase I ESA as being completed in 2018. A subsequent Phase I ESA report dated January 18, 2021 was also provided as part of the documentation package received from the City. It is unclear why the Phase II ESA references the 2018 Phase I ESA rather than the January 18, 2021 Phase I ESA. Regardless, both the Phase I and Phase II ESA reports will need to be updated not only to meet the respective reporting requirements stipulated in Schedules D and E of O.Reg. 153/04, but also to meet report aging limitations set forth under Sections 28 and 33.5 of O.Reg. 153/04.
- Section 3.2 Media Investigated: The report states “During the subsurface investigation, soil samples and groundwater samples were obtained and submitted for laboratory analysis.” Two ponds are located on the Site. Although the ponds do not constitute a water body as they were presumably constructed for stormwater management purposes, any sediment within the ponds that may be impacted by contaminants of potential concern associated with APECs at the Site is not exempt from



sampling. Both ponds are located in closed proximity to greens where elevated levels of mercury have been identified and therefore may have been impacted by surface runoff from the greens. The QP should thus consider the need to carry out sediment sampling within the ponds to address this potential concern.

- Section 3.3 Phase I Conceptual Site Model, Contaminants of Potential Concern (CPCs): The report indicates that two aboveground storage tanks (ASTs) were present for storage of fuel at the Site. The report does not indicate the nature of the fuel stored in the ASTs. The QP should consider the need to ascertain the contents of the ASTs to confirm that all contaminants of potential concern associated with the fuel(s) stored in the ASTs such as lead, lead scavengers, oxygenates, and polycyclic aromatic hydrocarbons have been considered as part of the sampling programs if and where necessary.

2,4-dichlorophenoxyacetic acid (2,4-D) is a phenoxy acid herbicide commonly used on golf courses to control broadleaf weeds such as dandelion and clover. It is often used in conjunction with other phenoxy acid herbicides. Although not listed in the tables of Site Condition Standards, the omission of such compounds does not preclude the need for the QP to determine whether such compounds represent contaminants of potential concern and thus may be or are present on, in or under a property. The QP should consider the need to determine whether phenoxy acid herbicides were ever in use at the Site, and if so, the need to determine the concentrations of these contaminants in relevant media at the Site.

- Section 4.7 Analytical Testing: The last sentence of the fourth paragraph (page 12) is incomplete.
- Section 4.9 Elevation Surveying: The report does not provide an accurate specification of the location of any benchmark used in surveying of elevations. The QP should consider the need to revise the report accordingly.
- Section 5.1 Geology: The QP states that much of the fill material identified across the Phase II Property consisted of reworked native material. While reworking and re-locating earthen material is consistent with typical golf course development practices, the QP should consider the need to determine what, if any, contaminants of potential concern attributable to the re-working operations may have been imparted to the re-worked fill material and if testing performed to date is considered adequate to address such concerns.
- Section 5.3 Fine-Coarse Soil Texture: A limited number of grain size determinations were made indicating the soils beneath the site to be fine-medium textured, although the QP has considered the SCS for coarse textured soil when evaluating the results of the laboratory analyses. As up to four RSCs may be required for the Site, the QP is reminded that a sufficient number of grain size determinations will be required from each of the parcels to allow use of the fine-medium SCS. However, the reviewer notes that selection of the SCS for fine-medium textured soil may be irrelevant given the nature of the contaminant exceedances identified at the Site.
- Section 5.7 Quality Assurance and Quality Control Results: The first paragraph states “As per the Sampling and Analysis Plan, a duplicate soil sample was obtained at BH8.” Page iv of the Executive Summary indicates that a total of 27 soil samples were collected, including a duplicate sample. As



stated in Schedule E, Section 3, paragraphs 4 and 5, “sufficient field duplicate samples shall be collected in each medium being sampled, so that at least one field duplicate sample can be submitted for laboratory analysis for every ten samples submitted for laboratory analysis” and “at least one field duplicate sample shall be submitted for laboratory analysis for every ten samples submitted for laboratory analysis.” It is also noted per the tables provided in the report that duplicate sample submissions for QA/QC purposes were not made for all contaminants of potential concern. Based on the information provided, the report fails to meet this requirement. The QP should thus consider the need to carry out additional sampling to meet the requirements set forth on O.Reg. 153/04.

The second paragraph states “Although the RPDs calculated are outside of the acceptable range of 20% for two parameters, the remaining RPDs (78%) are within the acceptable range.” It is unclear how (78%) relates to the remaining RPDs.

No travel blanks were employed as part of the groundwater sampling program; however, the reviewer recognizes that no measurable BTEX or PHC F1 concentrations were reported in the samples collected at the Site suggesting that such QA/QC would have been of little value.

- Section 5.8 Phase II Conceptual Site Model: The second bullet on page 22 of the report indicates that APEC 4 (PCA 30: importation of fill of unknown quality) resides in the southeast portion of the Site. Given the subsurface conditions shown on the cross sections provided, it is unclear how similar APECs associated with PCA 30 were not identified elsewhere at the Site. The QP may wish to consider the need to revise statements made in the report accordingly.
- Section 5.8 Phase II Conceptual Site Model, Potentially Contaminating Activities and Areas of Potential Environmental Concern: The first paragraph states “As per Table 1 in Section 2.2, the following on-site potentially contaminating activities (PCAs) were considered to result in four (4) areas of potential environmental concern (APECs):”. The reviewer notes that Table 1 was not provided in the Section 2.2 of the report. Similar statements were noted elsewhere the report. The QP should consider the need to revise the report to address such inconsistent statements.
- Section 5.8 Phase II Conceptual Site Model, Fill Placement: Numerous sand traps and bunkers were noted to be present throughout the course. These features are likely to contain imported sand as such material is not known to occur naturally within the Site. The QP should consider the need to confirm this and whether any revisions to the report are necessary to reflect the actual Site conditions.
- Section 5.8 Phase II Conceptual Site Model, Distribution of Contaminants: The report states “Mercury concentrations were not detected in any of the groundwater samples analyzed. The mercury impacts are considered to be contained to the overburden.” A more thorough discussion of the distribution of contaminants is required. Per O.Reg. 153/04, where a contaminant is present on, in or under the phase two property at a concentration greater than the applicable site condition standard, identification of the following is required: i) each area where a contaminant is present on, in or under the phase two property at a concentration greater than the applicable site condition standard; ii) the contaminants associated with each of the areas referred to in subparagraph i, iii)



each medium in which a contaminant associated with an area referred to in subparagraph i is present; and iv) a description and assessment of what is known about each of the areas referred to in subparagraph i. The QP should consider the need for any revisions necessary to meet the requirements stated in O.Reg. 153/04.

- Section 5.8 Phase II Conceptual Site Model, Migration of Contaminants: The report states “Based on observations made during the Phase I and Phase II ESA, physical transport of contaminants on the Phase II Property is considered to be negligible.” As noted above, mercury exceedances were noted in surface soil samples collected on greens adjacent to water features present at the Site. Sediment within these features may be impacted by mercury and other potential CPCs by surface runoff from the greens. The QP should consider the need to revise the report to reflect this possibility, together with the need to conduct any sampling to assess this potential concern.
- Table 17: Maximum Soil Concentrations and Table 28: Maximum Groundwater Concentrations: The table provided does not include all contaminants of potential concern analyzed during the Phase II ESA. The tables should thus be revised to include the missing parameters. For parameters reported below method detection limits, the highest reporting detection limit should be indicated.