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## MEMORANDUM

**TO:** John Wu – City of Ottawa **RVA:** 194453  
**COPIES TO:** Ashley Burke – GWLRA, Andrew Hanna, GWLRA, Farzi  
Jalali - GWLRA  
**FROM:** Nate Rodgers – R. V. Anderson Associates Limited  
**DATE:** December 4, 2020  
**SUBJECT:** 320 McRae Avenue - Foundation Drainage Narrative

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This memorandum provides supplementary information to the Site Servicing & Stormwater Management Report dated September 23, 2020 regarding the design intent of the foundation drainage system. A further update to the above mentioned report will be issued when the foundation drainage system design is finalized.

The foundation drainage system is expected to be designed as per the recommendations in the Geotechnical Investigation report prepared by Pinchin dated April 14, 2020. The recommendations include:

- A perimeter drainage system consisting of a minimum 150 mm diameter fabric wrapped perforated drainage tile surrounded by 19 mm diameter clear stone (OPSS 1004) with a minimum cover of 150 mm on top and sides and 50 mm below the drainage tile. The clear stone gravel should be wrapped in a non-woven geotextile (Terrafix 270R or equivalent).
- An underfloor drainage system beneath the slab, constructed in similar fashion to the foundation drainage.

Refer to the Geotechnical Investigation report for further details.

The long term flow rate entering the foundation drainage system is expected to be 65,000L/day which is detailed in the Water Taking & Discharge Plans report prepared by Pinchin April 7, 2020.

The quality of water collected by the foundation drainage system is examined in the Phase II ESA report, draft issued November 30, 2020, the Remedial Technology Evaluation – Overview

letter, dated November 26, 2020, the Water Taking & Discharge Plans report dated April 7, 2020, and the Remedial Plan for Addressing Groundwater Impacts Memo dated December 4, 2020 (attached in Appendix A) all prepared by Pinchin. Based on the findings of the above reports, it is understood that the groundwater onsite was found to have contaminants exceeding the allowable levels entering either the sanitary or storm sewer systems as specified in the Sewer Use Bylaw. The above named reports propose remedial measures including removing the impacted soil from the site and providing groundwater monitoring to assess residual contaminant levels. Following remedial measures, three scenarios are presented which all require ultimate discharge to the sanitary system.

- Scenario 1: Remedial actions bring groundwater quality below both MECP Table 7 standards and sanitary sewer discharge standards. In this case foundation drainage will be pumped to the sanitary system.
- Scenario 2: Remedial actions fail to bring groundwater quality below MECP Table 7 standards but successfully meet sanitary sewer discharge standards. In this case foundation drainage will be pumped to the sanitary system.
- Scenario 3: Remedial actions fail to bring groundwater quality below both MECP Table 7 standards and also fail to successfully meet sanitary sewer discharge standards. In this case Pinchin has recommended treatment of the groundwater be completed by passing it through activated carbon cylinders being pumped to the sanitary system.

Refer to the Environmental and Water Taking Reports for further information.

Any water treatment systems, if required, will be designed by others as part of the building systems.

As all remedial scenarios presented require discharge to sanitary sewer, the foundation drainage flow rate of 65,000 L/day (0.75L/s) is included in the site flow rates for the sanitary sewer capacity analysis in the site servicing report. It is understood that the water collected by the foundation drainage will be collected in a sump pit(s) and pumped via internal plumbing with the connection to the sanitary system within the building.

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## **APPENDIX A**

### **Remedial Plan for Addressing Groundwater Impacts at 320 McRae Avenue, 1976 Scott Street, 311 and 315 Tweedsmuir Avenue**

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# MEMORANDUM

DATE: December 4, 2020

MEMO TO: John Wu – City of Ottawa

COPIES TO: Ashley Burke – GWLRA, Andrew Hanna – GWLRA, Farzi Jalali - GWLRA

FROM: Rob MacKenzie - Pinchin

RE: Remedial Plan for Addressing Groundwater Impacts at 320 McRae Avenue, 1976 Scott Street, 311 and 315 Tweedsmuir Avenue

PINCHIN FILE: 230236.006

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This memorandum provides supplementary information for the Phase Two Environment Site Assessment (ESA) completed by Pinchin Ltd. (Pinchin) at the 320 McRae Avenue, 1976 Scott Street, 311 and 315 Tweedsmuir Avenue property (Site). The Phase Two ESA findings are provided in the draft report prepared by Pinchin titled “Phase Two Environmental Site Assessment, 320 McRae Avenue, 1976 Scott Street, 311 and 315 Tweedsmuir Avenue, Ottawa, Ontario” and dated November 30, 2020. The Phase Two ESA was completed to support the filing of a Record of Site Condition (RSC) for the proposed redevelopment of the Site.

## 1.0 BACKGROUND

The Phase Two ESA identified groundwater at monitoring well MW-1 with concentrations of benzene, ethylbenzene, petroleum hydrocarbons in the F1 to F3 fractions and naphthalene exceeding the applicable Ontario Ministry of the Environment, Conservation and Parks (MECP) Table 7 Site Condition Standards (*Table 7 Standards*) and/or the City of Ottawa’s criteria for discharge to the sanitary sewer (*Sanitary Discharge Criteria*). These parameters are collectively referred to as the contaminants of concern (COCs). The location of MW-1 and the estimated areal extent of groundwater impacts in the vicinity of this well are shown on the attached Figure 1. Monitoring well MW-1 was installed to intersect the shallow water table at the Site and screened between 4.5 and 7.6 metres below ground surface (mbgs). A deep monitoring well (MW201), screened between 12.1 and 15.2 mbgs, was also installed to vertically delineate the groundwater impacts at MW-1. Groundwater samples collected from MW201 met the *Table 7 Standards*, confirming that the impacts were confined to the shallow groundwater zone at MW-1.

## 2.0 REMEDIAL PLAN

Given that the identified groundwater impacts are limited to the shallow groundwater zone in a relatively small area measuring approximately 20 metres by 20 metres in the northern portion of the Site, Pinchin plans to undertake groundwater remedial activities comprised of the following:



- Excavate the impacted groundwater area to a depth of approximately 8 mbgs (i.e., the planned depth for the underground parking garage);
- Using a vacuum truck and/or an on-Site tanker, extract groundwater from the excavation for a period of approximately two weeks. The frequency of pumping will depend on the rate of recharge but based on previous hydrogeological testing at the Site, it is expected that daily pumping of the excavation will be completed. The contaminated groundwater will be disposed of off-Site at a licenced liquid waste disposal facility;
- Collect groundwater samples from the excavation to monitor remedial progress; and
- Compare the results of the groundwater samples to the *Table 7 Standards* and the *Sanitary Discharge Criteria*.

The goal of the groundwater remediation program will be to remediate the groundwater to meet the *Table 7 Standards*. If this is achieved, then the groundwater will also be suitable for discharge to the sanitary sewer given that the *Sanitary Discharge Criteria* are less stringent than the *Table 7 Standards* for the COCs. Depending on the effectiveness of groundwater remediation, one of the following scenarios will occur.

#### Scenario 1

Should the groundwater remediation program successfully reduce COC levels to meet the *Table 7 Standards*, then the groundwater can be discharged to the sanitary sewer without treatment. Remediating the groundwater to meet the *Table 7 Standards* will also mean that a risk assessment will not be required to support the filing of the RSC for the Site, which can be filed following the excavation of previously identified impacted soil that will be removed as part of Site redevelopment. It is important to note that the MECP requires post-remediation groundwater monitoring consisting of two quarterly groundwater sampling events with results meeting the *Table 7 Standards* before the RSC can be filed. This will require the installation of new monitoring wells in the remediated area as the MECP will not allow excavation grab samples to be used to verify that remediation has been achieved.

#### Scenario 2

Should the groundwater remediation program not be successful in lowering the COC levels to below the *Table 7 Standards* but the *Sanitary Discharge Criteria* are met, then the groundwater can be discharged to the sanitary sewer without treatment. A risk assessment (RA) will be required to address the residual groundwater impacts not meeting the *Table 7 Standards* through the development of Property Specific Standards (PSS) before the RSC can be filed. The RA will include risk management measures intended to be protective of building occupants and the environment.



### Scenario 3

In the event that the groundwater remediation program is not successful in reducing COC levels to meet the *Sanitary Discharge Criteria*, then treatment of the impacted groundwater before discharge to the sanitary sewer will be required during post-construction operation of the building. However, given that the amount of impacted groundwater at the Site is finite and much of it will be removed through the excavation for the underground parking garage and the remedial activities described above, it is expected that post-construction groundwater treatment will not be a permanent requirement and that the treatment system can be removed from the Site once influent monitoring to the system shows that the groundwater originating from the foundation drainage system meets the *Sanitary Discharge Criteria*. It is anticipated that a mobile treatment unit (MTU) will be used for the groundwater treatment that will receive influent from the foundation drainage and discharge the treated groundwater to the sanitary sewer. The design of the MTU will depend in part on the residual groundwater concentrations and the volume of groundwater derived from the drainage system which will be reassessed after the building is constructed, and will meet all required codes. Given that the COCs are petroleum hydrocarbon-related parameters, the impacted groundwater will be treated by passing it through activated carbon cylinders and no air emissions will be generated. As per Scenario 2, an RA will be needed to develop PSS before filing the RSC.

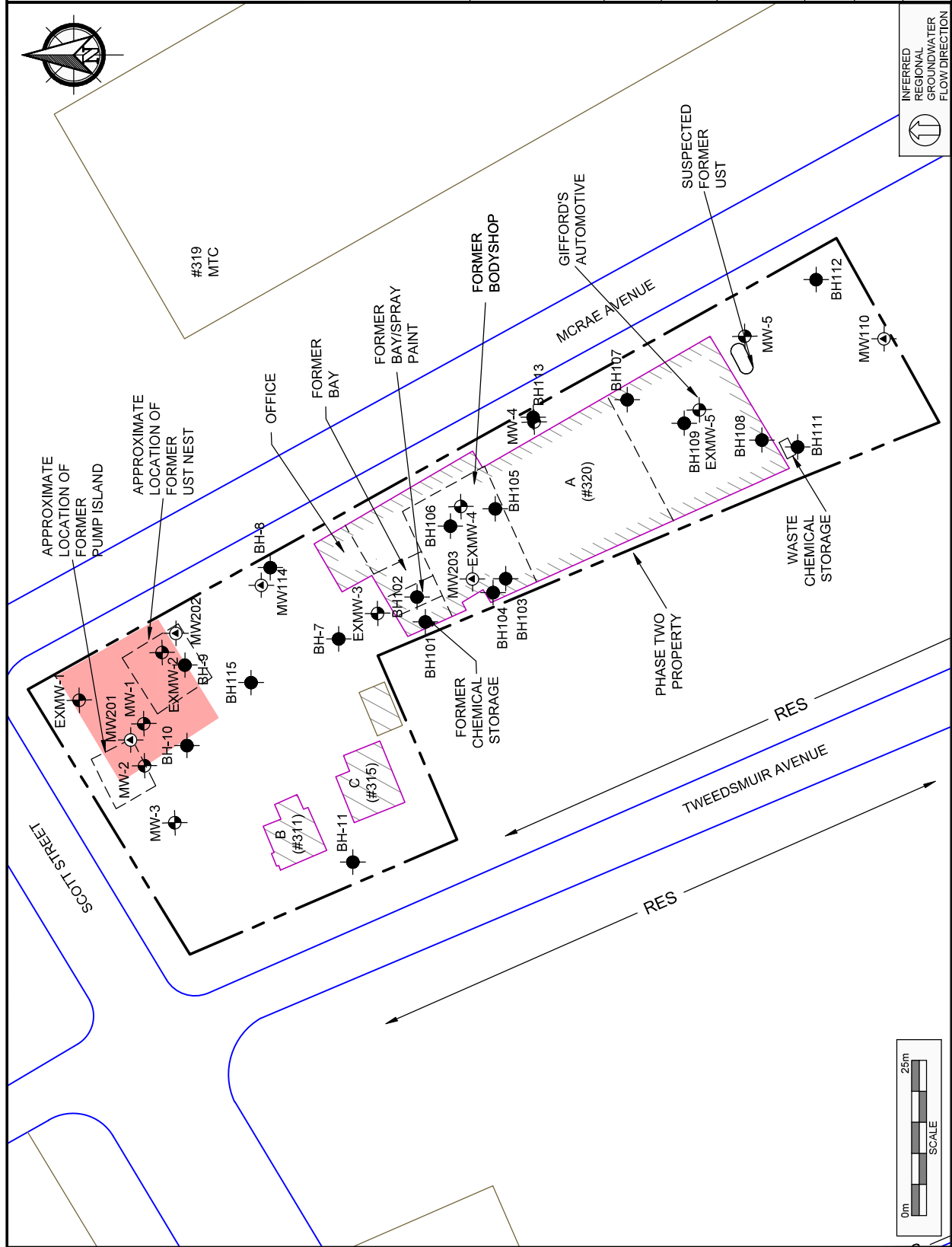
I trust that the above is sufficient to explain Pinchin's plan to address the groundwater impacts at the Site. Should you have any questions or require additional information, feel free to contact me.

**LEGEND**

- PHASE TWO PROPERTY BOUNDARY
- RES RESIDENTIAL
- MTC MULTI-TENANT COMMERCIAL
- UST UNDERGROUND STORAGE TANK
- BOREHOLE (PINCHIN, 2018 AND 2020)
- MONITORING WELL (PINCHIN, 2020)
- ▨ SITE BUILDING
- ⊕ EXISTING MONITORING WELL
- ▭ ESTIMATED AREAL EXTENT OF IMPACTED GROUNDWATER



PROJECT NAME	PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
CLIENT NAME	1213763 ONTARIO INC.
PROJECT LOCATION	320 MCRAE AVENUE, 1976 SCOTT STREET, AND 311 AND 315 TWEEDSMUIR AVENUE, OTTAWA, ONTARIO
FIGURE NAME	IMPACTED GROUNDWATER LOCATION PLAN
SCALE	AS SHOWN
PROJECT NO.	230236.006
DATE	DECEMBER 2020
FIGURE NO.	1



INFERRED REGIONAL GROUNDWATER FLOW DIRECTION

