June 29, 2022
CO810.02

Welldale Limited Partnership
180 Kent Street, Suite 200
Ottawa, Ontario
K1P 0B6

Attention: Mr. Kevin A. Harper
Director, Infill Development

Re: Remedial Action Plan
1186 - 1194 Wellington Street West, Ottawa, Ontario

Dear Mr. Harper:

As requested by Welldale Limited Partnership (Welldale), Terrapex Environmental Ltd. (Terrapex) has prepared the following Remedial Action Plan (RAP) for the properties located at 1186-1194 Wellington Street West, Ottawa, Ontario (collectively, "the Site"). The Site location is provided in Figure 1.

The remediation is required to address soil at the Site with a concentration of barium greater than the applicable Ministry of the Environment, Conservation and Parks (MECP) Table 3 Site Condition Standards (SCS) in order to obtain a Record of Site Condition (RSC) as part of Welldale's proposed mixed use residential/commercial redevelopment of the above referenced properties.

SITE DESCRIPTION

The Site is located at the southwest corner of the intersection of Wellington Street West and Parkdale Avenue and comprises three separate adjacent properties with municipal addresses of 1186, 1188 and 1194 Wellington Street West. The first developed land use was prior to 1910 when the Site was used for institutional purposes with a church located on the central portion of the Site. Since that time, it has been used for various commercial and institutional uses including a gas station, an automotive service garage, a furniture store, a pharmacy, a movie theatre and a church.

Current usage includes:

- A parking lot at 1186 Wellington Street West;
- A Rexall Pharmacy and office building at 1188 Wellington Street West; and,
- The Cornerstone House of Refuge Apostolic Church at 1194 Wellington Street West.

The Site layout is presented in Figure 2.

Stratigraphy and Hydrogeology

Finished surfaces at the Site were generally observed to be grass/topsoil, asphalt, or concrete covered. The stratigraphy encountered consisted generally of approximately 0.6 to 1.0 m of fill material overlying silty sand/sandy silt. Based on auger refusal, the apparent bedrock surface ranged between 3.1 and 3.8 m below grade (bg). From the recovered rock cores, bedrock was observed to be limestone that was weathered and of strong to fair quality near the surface that improved with depth.

The water table at the Site was relatively flat, lying just beneath the apparent bedrock surface, which similarly appeared to be relatively flat. The depth to groundwater in the shallow bedrock monitoring wells on June 7, 2021 ranged between 3.92 and 4.09 m bg.

Surrounding Property Use

The surrounding property use consists for the following:

North: Wellington Street West, with commercial properties along Wellington Street West including a gas station (approximately 20 m north of the Site), and parkland/market beyond;

Northeast: Intersection of Wellington Street West and Parkdale Avenue, residential and commercial properties beyond;

East: Parkdale Avenue, residential (Wellington West Retirement Community and Salvation Army Grace Manor long-term care facility) beyond;

Southeast: Parkdale Avenue, Canada Post distribution centre and residential/community property use beyond;

South: Un-named laneway, St. Albertus Church and parking lot, residential and commercial property beyond;

Southwest: Hamilton Avenue North, residential property beyond;

West: Hamilton Avenue North, commercial property beyond; and,

Northwest: Intersection of Wellington Street West and Hamilton Avenue North, residential and commercial offices beyond including Bouk's Complete Car Care (approximately 40 m from the Site).

REMEDIAL CRITERIA

Welldale has indicated that their long-term objective is to redevelop the Site in accordance with both Ontario Regulation (O. Reg.) 153/04 and City of Ottawa permitting requirements. This includes the filing of a RSC in accordance with Section 168.3.1 of the *Environmental Protection Act* and the associated *Records of Site Condition – Part XV.1 of the Act* regulation (O. Reg. 153/04) and the City of Ottawa site plan approvals process. The RSC is required on the basis of a change in property use for the Site from commercial/institutional to residential.

The remedial criteria for the Site, as determined during the Phase Two Environmental Site Assessment (ESA) are the full depth generic SCS applicable for residential, parkland, or institutional property use that are listed in Table 3 of the April 15, 2011 MECP *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* document (hereafter referenced as the Table 3 SCS).

In accordance with the requirements of Section 35 of O. Reg. 153/04, notification of the intent to use standards corresponding to a non-potable groundwater condition was provided to the Clerk of the City of Ottawa on May 21, 2021 (as part of the Phase Two ESA). In a letter dated June 14, 2021, the municipality indicated its concurrence with the proposed use of non-potable standards at the Site.

BACKGROUND

Terrapex completed a Phase One and Two ESA at the Site in 2021. Based on the findings of a Phase One ESA (that included a review of previous assessment and remediation work conducted by others at the Site), the following Areas of Potential Concern (APECs) were identified:

- APEC 1 – In the northeastern portion of the Site in the vicinity of the former underground storage tank (UST) nest (fuel storage and reported leaks/spills);
- APEC 2 – In the eastern portion of the Site in the vicinity of the former pump islands (former fuel distribution);
- APEC 3 – In the eastern portion of the Site in the vicinity of the former automotive service garage (vehicle maintenance and repair);
- APEC 4 – In the eastern and southern portion of the Site in the parking lot and loading dock area (importation of fill material of unknown quality);
- APEC 5 – In the southwest corner of the Site in the vicinity of two former ASTs (fuel storage);
- APEC 6 – In the northeastern portion of the Site related to the off-site gas station located approximately 20 m from the Site; and,
- APEC 7 – All paved areas (de-icing activities in winter).

The Contaminants of Potential Concern (COPCs) associated with the APECs were metals and inorganics (soil and groundwater), petroleum hydrocarbons (PHCs) (soil and groundwater), volatile organic compounds (VOCs) (soil and groundwater), and polycyclic aromatic hydrocarbons (PAHs) (soil only unless impacts are found).

Terrapex conducted a Phase Two ESA to confirm the soil and groundwater conditions at the Site related to the above APECs and COPCs. The assessment included the drilling of eleven boreholes (BH101 to MW111) across the Site, including one borehole that was drilled within the basement of the Cornerstone House of Refuge Apostolic Church (APEC 5). Five of the boreholes (MW104, MW104, MW106, MW109 and MW111) were completed as monitoring wells.

Based on the results of our Phase Two ESA, Terrapex concluded that:

- A COPC was identified within soil at the Site. Specifically, the concentration of barium in soil sample MW111-1 (located in APECs 3, 4, and 7 on the 1186 Wellington Street West property) at a depths between 0.0 and 0.6 m bg was greater than the Table 3 SCS. The barium impacts were vertically delineated based on the results from sample MW111-3 collected between 1.2 and 1.8 m bg. All other soil samples had concentrations of COPCs less than the MECP Table 3 SCS;
- Groundwater impacts were not identified (i.e., concentrations of all COPCs were less than the MECP Table 3 SCS at all monitoring wells); and,
- Sediment was not present at the Site.

A supplemental Phase Two ESA was conducted in January 2022 to delineate the identified soil impacts at MW111. This included the drilling of 11 additional boreholes (BH201 to BH211) in the vicinity of MW111 to depths of approximately 1.2 m bg for delineation purposes. Additional soil samples were submitted from six of the boreholes for laboratory analysis of metals and inorganics.

All samples submitted for laboratory analysis from the supplemental Phase Two ESA had concentrations of barium less than the Table 3 SCS. On that basis, the areal extent of the barium soil impacts has been delineated.

As delineated soil impacts were identified on-Site, remediation will be required prior to filing of a RSC.

The locations of all of the boreholes and monitoring wells are provided in Figure 2. A visual representation of the metals and inorganics soil results and the extent of the proposed soil remediation are shown in Figure 3.

REMEDIAL APPROACH

To meet the project objectives of remediating the identified soil impacts to concentrations at or less than the applicable standards, Terrapex recommends that the preferred remedial approach is excavation and off-site disposal of the soils with concentrations that exceed the Table 3 SCS. This includes the soil in the area surrounding MW111 and bounded by BH202/BH203 to the north, BH205 to the east, BH206/BH207 to the south, and BH208 to the west. The estimated area of impact is provided on Figure 3.

The base of the completed excavation (estimated at a maximum of 1.2 m bg) is anticipated to be above the unconfined shallow groundwater table (assumed to be approximately 4.0 m bg based on previous monitoring results). Therefore, significant groundwater in the excavation is not anticipated. Further, as no concentrations of COPCs greater than the Table 3 SCS were identified in groundwater, no confirmatory groundwater sampling is required.

A licenced contractor will be retained to provide excavation and soil disposal services during the remediation. The contractor tasks will include excavation and disposal of contaminated soil, stockpiling of soil (as required), water management (if required), assisting in collecting the required soil samples, and backfilling/compaction following the completion of the excavation.

In general, the proposed work and analytical program will comply with best industry practices, Terrapex standard operating procedures (SOPs) and MECP/City of Ottawa requirements.

Further details on specific tasks to be completed are provided below.

1. Preparatory Activities

   Preparatory activities will include the following:

   - It is assumed that Welldale will coordinate with the tenants to advise of the work and effects on site access to the 1186 Wellington Street West property for the duration of the work.
   - Terrapex will develop a project logistics plan for equipment access/placement, soil stockpiling and material staging in discussion with the selected contractor, Welldale and/or tenants (as required).
   - Terrapex will review soil disposal locations with the selected contractor.

2. Health and Safety

Health and safety activities will include the following:

- Underground services will be located by local utilities. A private locating company will also be retained to identify secondary services prior to commencing excavation. Any underground services within the proposed excavation areas will be identified.
- A site-specific health and safety plan (HASP) for work will be prepared and updated as required. Regular health and safety meetings will be conducted on-Site during the remediation.
- Temporary fencing will be installed around the perimeter of the Site and maintained for the duration of the project in order to secure the Site, protect visitors to the Site, and limit unauthorized access to the excavation area.
- A project kick-off meeting will be held with all workers, representatives of Welldale and/or tenants to:
  - review safety requirements for the project;
  - discuss project communication protocols;
  - location of first aid equipment on the Site; and,
  - the emergency plan for the Site.

3. Soil Excavation/Management:

- Terrapex will coordinate, supervise, and provide direction to the contractor regarding the excavation, handling, segregation and temporary storage of impacted soil, non-impacted soil and other materials (e.g., asphalt, concrete, gravel) generated during the excavation.
- Terrapex will review the disposal documentation to verify that contaminated soil, wastes, and debris are sent to appropriate licenced disposal facilities.
- Excavation will be conducted to remove all soil with concentrations that exceed the Table 3 SCS (as confirmed by field observations, screening, and confirmatory sampling further described below). Based on available results, the maximum depth of the excavation is estimated at 1.2 m over a maximum estimated area of 140 m^2. Soil with concentrations exceeding the Table 3 SCS will be sent off-Site to a MECP-accredited soil disposal location.

- The final excavation limits (sidewalls and base) will be divided in a grid pattern with individual grid units being less than or equal to 5 m^2 on excavation sidewalls, and less than or equal to 10 m^2 on the excavation base. Subject to practical limitations (e.g., excavation limits being represented by building foundations) or safety considerations (e.g., unstable sidewalls), a minimum of one soil sample will be collected from each grid unit for screening using an RKI "Eagle" combustible vapour meter (or equivalent), calibrated using *n*-hexane and operated in "methane elimination" mode. Additional field screening samples will be collected as appropriate to reflect variances in soil conditions within a grid unit (lithology, visual indications of impact, etc.).
- A subset of the field screening samples will be selected as confirmatory soil samples and submitted for laboratory analyses of metals and inorganics to confirm achievement of the remediation criteria. The selection of confirmatory samples will be based on apparent "worst case" conditions at the final excavation limits, as well as to obtain general coverage of the excavation sidewalls and base. Subject to practical limitations or safety considerations, the minimum number of confirmatory samples representative of the final limits of the excavation will meet the requirements outlined in Table 1, below with additional samples submitted for quality control/quality assurance (QA/QC) purposes.

Table 1 Minimum Excavation Confirmatory Sample Requirements [1] (adapted from Schedule E, O. Reg. 153/04)

Floor Area (m^2)[2]	Floor Samples	Sidewall Samples [3]
< 25	2	2
> 25 to 50	2	3
> 50 to 100	3	3
> 100 to 250	3	5
>250 to 500	4	6

Notes:

[1] *Confirmatory samples should represent nominal "worst-case" conditions and should be selected to provide areal and vertical representation from the entirety of the excavation (e.g., sidewall samples should not all be taken from the same wall).*

[2] *Floor area is to be determined at the base of the excavation.*

[3] *At least one confirmatory sample should exist for each sidewall, even if this results in a greater number of sidewall samples than the minimum number listed in the table.*

- Any groundwater that accumulates in the excavation will be removed from the Site using a vacuum truck and disposed of at an MECP-licenced facility, or containerized in an on-Site tank for testing. Water that is determined to exceed the City's sewer-use limits based on testing must be removed from the Site for off-site disposal to an MECP-licenced facility, or treated on-Site using a mobile groundwater treatment system before discharge to the sanitary sewer under a sewer-use agreement obtained from the City per the requirements of the sewer use by-law.
- Materials considered potentially suitable for reuse as backfill within the completed excavation will be stockpiled separately from other materials and subjected to field screening and confirmatory sampling in a manner consistent with the process described above. The minimum number of field screening samples and verification samples required for materials being considered for reuse to backfill the completed excavation is outlined in Table 2, below.

Table 2 Minimum Soil Sampling Requirements for Stockpiles (adapted from Schedule E, O. Reg. 153/04)

Pile Volume (m^3)	Field Screening Samples	Verification Samples
≤ 130	5	3
> 130 to 220	10	4
> 220 to 320	10	5
> 320 to 430	15	6
> 430 to 550	15	7
> 550 to 670	20	8
> 670 to 800	20	9
> 800 to 950	25	10
> 950 to 1,100	25	11

- Materials imported to the Site for the purposes of backfilling the completed excavation will be obtained from a commercial supplier (i.e., sourced from a pit or quarry operating under a “site plan”, or licence, issued under the *Aggregate Resources Act*). No soils received from other properties (i.e., materials imported as Excess Soils per O. Reg. 406/19) will be used as backfill for the completed excavation.

  The environmental quality of soil imported to Site to backfill the completed excavation will be assessed and confirmed to be consistent with the remediation criteria. This assessment will be completed by collecting an appropriate number of samples per the criteria outlined in Table 3, below.

Table 3 Minimum Soil Sampling Requirements for Imported Soil (Backfill) [1] (adapted from Schedule E, O. Reg. 153/04)

Cumulative Volume (m^3)	Field Screening Samples [2]	Verification Samples [3]
≤ 130	n/a	3
> 130 to 220	n/a	4
> 220 to 320	n/a	5
> 320 to 430	n/a	6
> 430 to 550	n/a	7
> 550 to 670	n/a	8
> 670 to 800	n/a	9
> 800 to 950	n/a	10
> 950 to 1,100	n/a	11

Notes:

1. *If multiple originating locations apply, indicated requirements apply to each originating location.*
2. *Although there are no established minimum field screening sample requirements, importation should be monitored on a full time basis, with visual QA/QC checks made of each load of imported soil so that any changes to the type or apparent environmental quality of imported soil may be readily identified.*
3. *Minimum verification sample requirement can be met through sampling at the source location, the receiving location, or a combination of the two.*

- Following receipt of the analytical results of the confirmatory soil samples from the remedial excavation (indicating that no further excavation is required), the excavation will be backfilled and compacted in accordance with recommendations of a geotechnical engineer. It is assumed that the excavation will be backfilled in lifts to approximately 0.6 m bg using excavated soil suitable for re-use (based on analytical results and geotechnical requirements), or imported sand and granular fill confirmed to meet the remediation criteria (based on the sampling requirements described above). The surface of the excavation will be capped at grade with compacted gravel or asphalt.
- During the remedial excavation program, if any monitoring wells are affected by the excavation, those monitoring wells will be decommissioned in accordance with the requirements of Revised Regulation Ontario (R.R.O.) 1990, Regulation 903. In addition, as all groundwater samples collected during the Phase Two ESA had concentrations of all COPCs less than the Table 3 SCS, post-remedial groundwater sampling will not be completed.

4. Data Interpretation/Reporting

- Terrapex will tabulate and interpret analytical results for the confirmatory soil samples to provide direction to the contractor on where exceedances have been identified and further excavation is required, or areas that have samples with concentrations that meet the Table 3 SCS and therefore can be backfilled.
- Following the completion of the remediation, Terrapex will prepare a report documenting the excavation and will include the following:
    i. Summary of the field work conducted.
    ii. Interpretation of the field observations.
    iii. Discussion of the sampling and analytical program.
    iv. Interpretation of analytical result and confirmation that the work was completed in accordance with all pertinent regulations, meets the requirements for O. Reg. 153/04 in order to obtain a RSC.

REFERENCES

Ministry of the Environment, Conservation and Parks (MECP), 2020. *Protocol for Analytical Methods Used in the Assessment of Properties and Excess Soil Quality under Part XV.1 of the Environmental Protection Act* (PIBS 4696). November 30, 2020.

Terrapex Environmental Ltd. (Terrapex), 2021(a). *Phase One Environmental Site Assessment, 1186-1196 Wellington Street West, Ottawa, Ontario.* June 23, 2021.

Terrapex Environmental Ltd. (Terrapex), 2021(b). *Phase Two Environmental Site Assessment, 1186-1196 Wellington Street West, Ottawa, Ontario.* June 23, 2021.

CLOSURE

This remedial work plan has been prepared in accordance with the terms of reference for this project as agreed upon by Welldale Limited Partnership and Terrapex Environmental Ltd. and generally accepted engineering or environmental consulting practices in this area. The reported information and associated remedial work plan is believed to provide a reasonable representation of the general environmental conditions at the site; however, the assessment and plan are based on data that were collected at specific locations and conditions may vary at other locations, or with the passage of time. The assessment and associated remedial work plan is also limited to those chemical parameters specifically addressed in this report.

This document has been prepared for the sole use of Welldale Limited Partnership. Terrapex Environmental Ltd. accepts no liability for claims arising from the use of this report, or from actions taken or decisions made as a result of this report, by parties other than Welldale Limited Partnership.

Sincerely,
TERRAPEX ENVIRONMENTAL LTD.

Keith Brown, PEng, QP_{ESA}
Senior Project Manager

Mike Grinnell, PEng, QP_{ESA}
Senior Project Manager

Attach

Figures

FIGURES

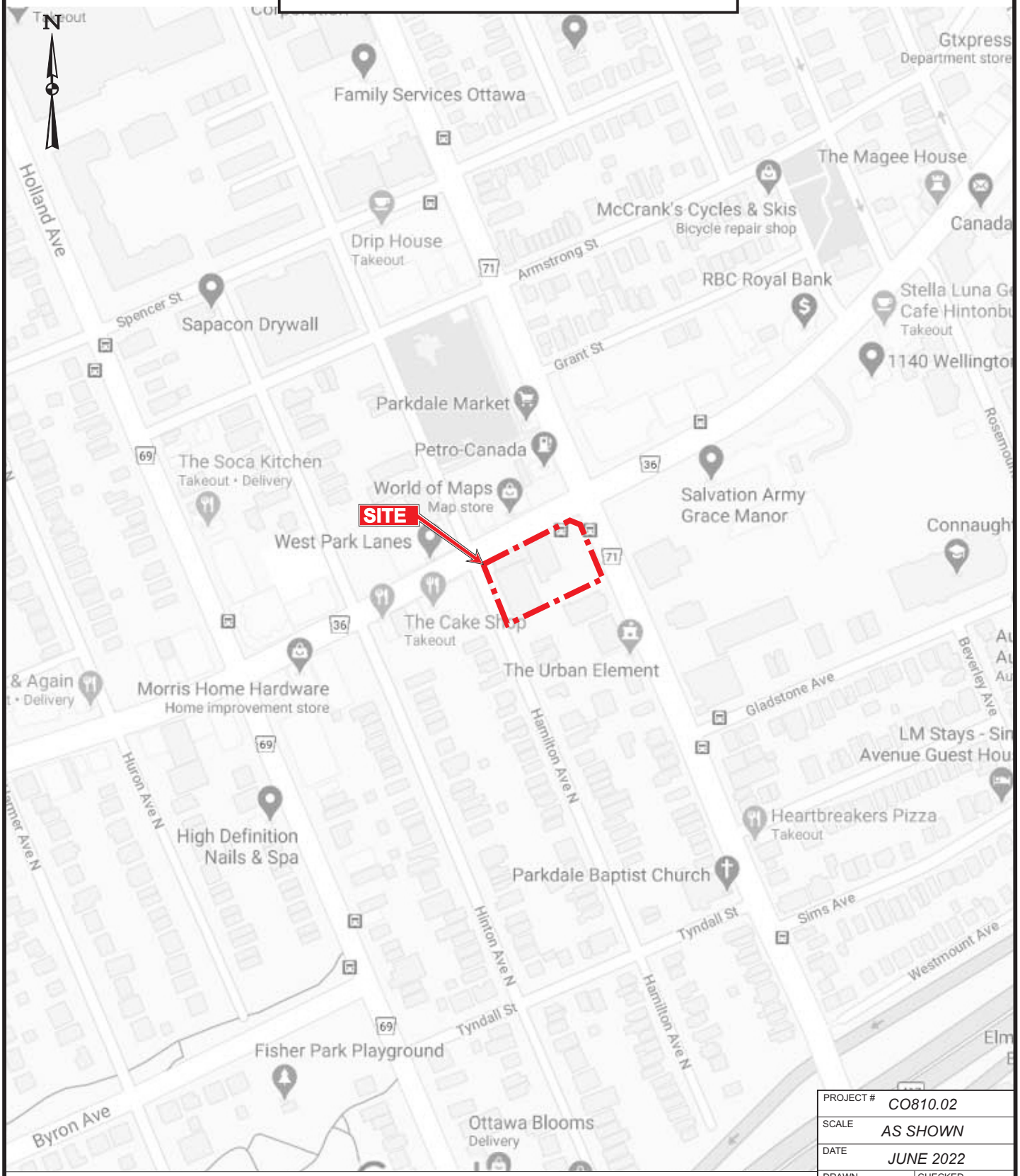
TERRAPEX

SITE LOCATION

1186-1196 WELLINGTON STREET WEST
OTTAWA, ONTARIO

CLIENT

WELLDALE LIMITED PARTNERSHIP



0 50m 100m

SOURCE: GOOGLE MAPS, 2020

PROJECT #	CO810.02
SCALE	AS SHOWN
DATE	JUNE 2022
DRAWN	EM/ AB
CHECKED	KWB
DRAWING #	FIGURE 1

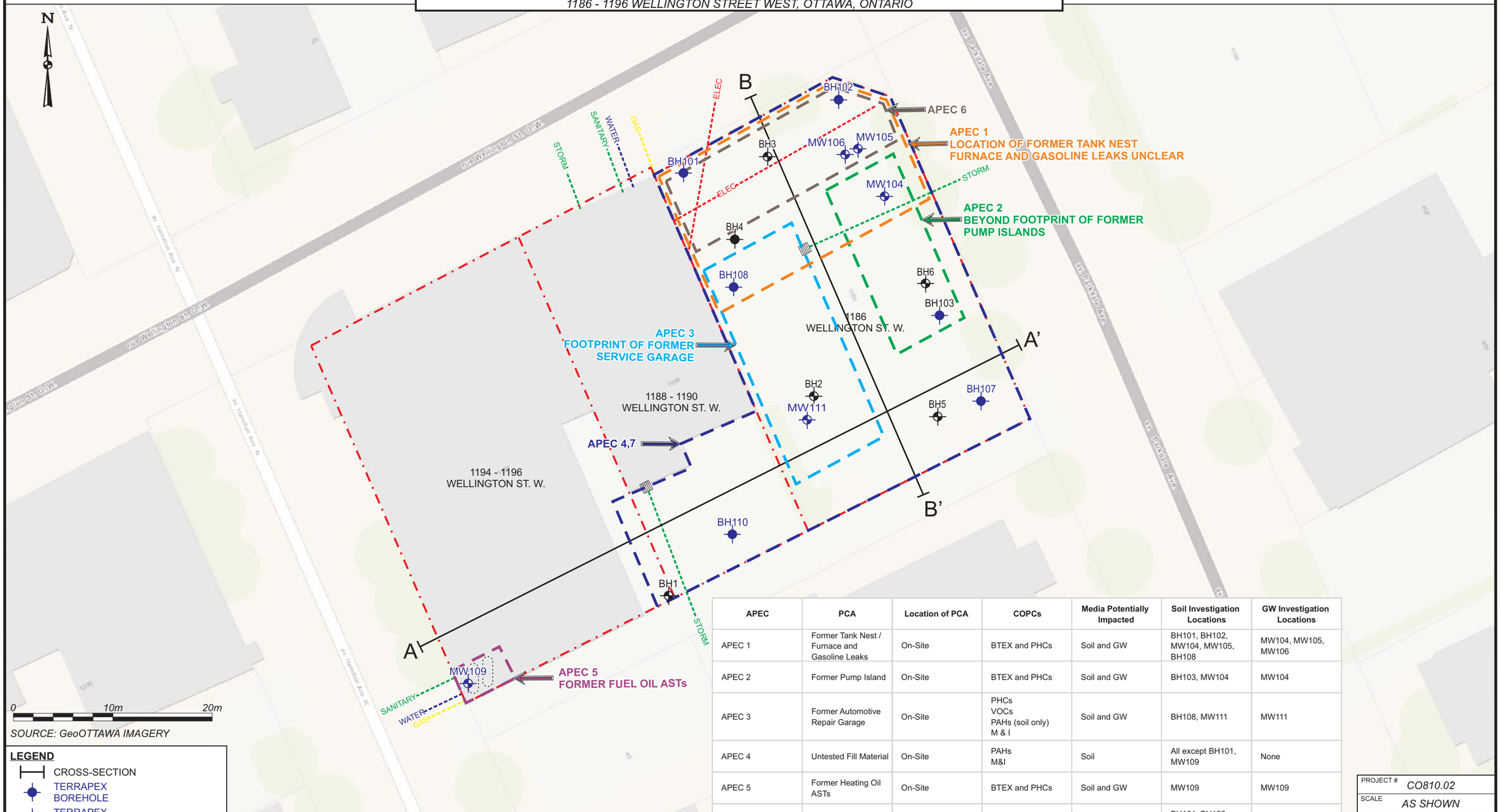
TERRAPEX

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN
PHASE TWO SAMPLING LOCATIONS

1186 - 1196 WELLINGTON STREET WEST, OTTAWA, ONTARIO

CLIENT

WELLDALE LIMITED PARTNERSHIP



LEGEND

- CROSS-SECTION
- TERRAPEX BOREHOLE
- TERRAPEX MONITORING WELL
- PATERSON GROUP MONITORING WELL
- PATERSON GROUP BOREHOLE

APEC	PCA	Location of PCA	COPCs	Media Potentially Impacted	Soil Investigation Locations	GW Investigation Locations
APEC 1	Former Tank Nest / Furnace and Gasoline Leaks	On-Site	BTEX and PHCs	Soil and GW	BH101, BH102, MW104, MW105, BH108	MW104, MW105, MW106
APEC 2	Former Pump Island	On-Site	BTEX and PHCs	Soil and GW	BH103, MW104	MW104
APEC 3	Former Automotive Repair Garage	On-Site	PHCs VOCs PAHs (soil only) M & I	Soil and GW	BH108, MW111	MW111
APEC 4	Untested Fill Material	On-Site	PAHs M&I	Soil	All except BH101, MW109	None
APEC 5	Former Heating Oil ASTs	On-Site	BTEX and PHCs	Soil and GW	MW109	MW109
APEC 6	Retail Fuel Outlet	Off-Site	BTEX and PHCs	Soil and GW	BH101, BH102, MW105	MW105, MW106
APEC 7	Parking Lot Deicing	On-Site	EC / SAR Cl / Na	Soil Groundwater	All except BH101, MW109	All except MW109

PROJECT #	CO810.02
SCALE	AS SHOWN
DATE	JUNE 2022
DRAWN	JOB
CHECKED	KWB
DRAWING #	FIGURE 2

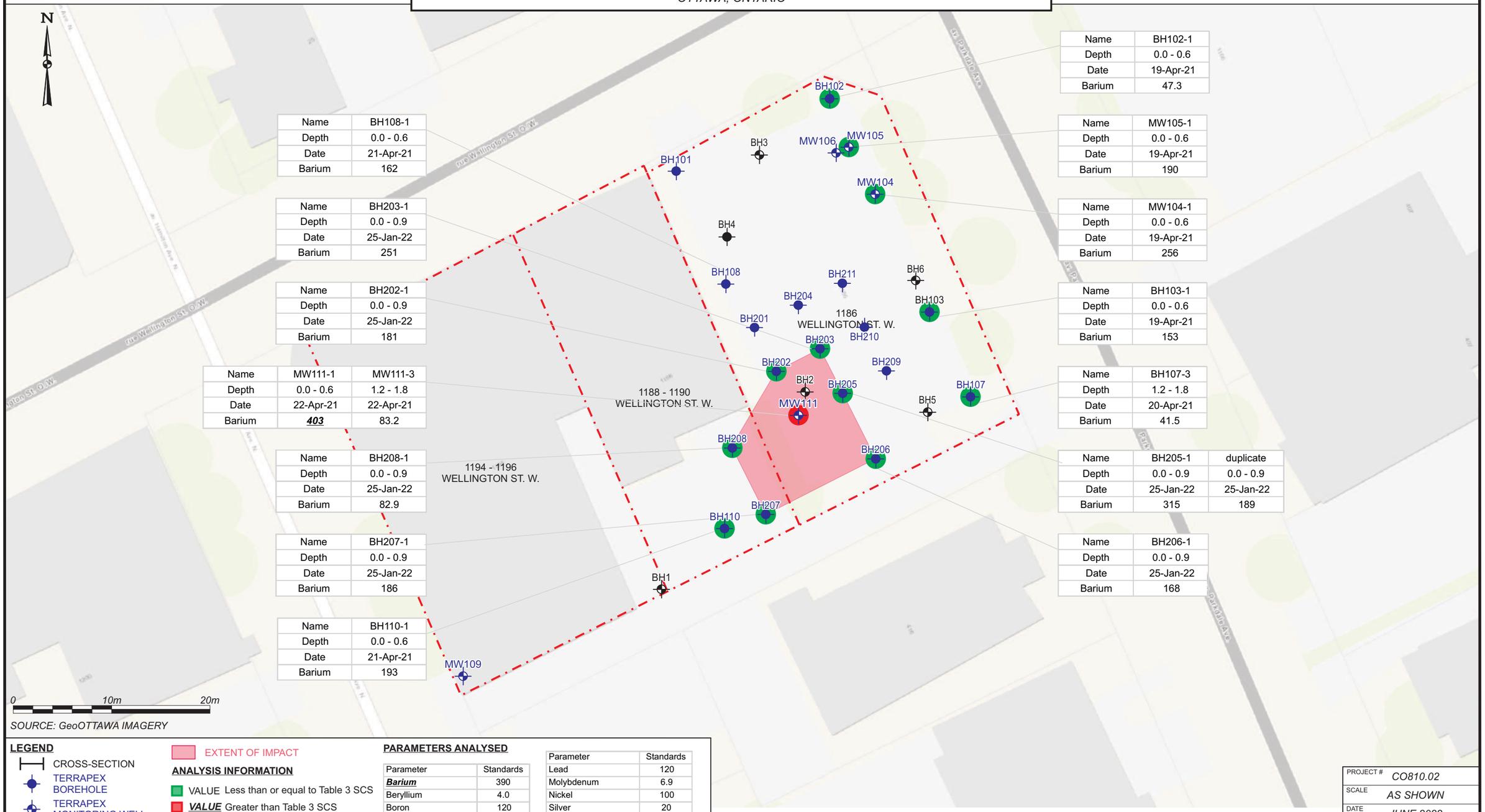
TERRAPEX

EXTENT OF IMPACT

1186 - 1196 WELLINGTON STREET WEST
OTTAWA, ONTARIO

CLIENT

WELLDALE LIMITED PARTNERSHIP



Name	BH102-1
Depth	0.0 - 0.6
Date	19-Apr-21
Barium	47.3

Name	BH108-1
Depth	0.0 - 0.6
Date	21-Apr-21
Barium	162

Name	MW105-1
Depth	0.0 - 0.6
Date	19-Apr-21
Barium	190

Name	BH203-1
Depth	0.0 - 0.9
Date	25-Jan-22
Barium	251

Name	MW104-1
Depth	0.0 - 0.6
Date	19-Apr-21
Barium	256

Name	BH202-1
Depth	0.0 - 0.9
Date	25-Jan-22
Barium	181

Name	BH103-1
Depth	0.0 - 0.6
Date	19-Apr-21
Barium	153

Name	MW111-1	MW111-3
Depth	0.0 - 0.6	1.2 - 1.8
Date	22-Apr-21	22-Apr-21
Barium	***403***	83.2

Name	BH107-3
Depth	1.2 - 1.8
Date	20-Apr-21
Barium	41.5

Name	BH208-1
Depth	0.0 - 0.9
Date	25-Jan-22
Barium	82.9

Name	BH205-1	duplicate
Depth	0.0 - 0.9	0.0 - 0.9
Date	25-Jan-22	25-Jan-22
Barium	315	189

Name	BH207-1
Depth	0.0 - 0.9
Date	25-Jan-22
Barium	186

Name	BH206-1
Depth	0.0 - 0.9
Date	25-Jan-22
Barium	168

Name	BH110-1
Depth	0.0 - 0.6
Date	21-Apr-21
Barium	193

SOURCE: GeoOTTAWA IMAGERY

LEGEND

- CROSS-SECTION
- TERRAPEX BOREHOLE
- TERRAPEX MONITORING WELL
- PATERSON GROUP MONITORING WELL
- PATERSON GROUP BOREHOLE
- EXTENT OF IMPACT

ANALYSIS INFORMATION

- VALUE Less than or equal to Table 3 SCS
- ***VALUE*** Greater than Table 3 SCS

Standards from Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (April 15, 2011). Table 3: Full Depth Generic SCS in a Non-Potable Ground Water Condition, Residential, Parkland, Institutional Property-Use, Coarse-Textured Soil.

PARAMETERS ANALYSED

Parameter	Standards
Barium	390
Beryllium	4.0
Boron	120
Cadmium	1.2
Chromium	160
Cobalt	22
Copper	140

Parameter	Standards
Lead	120
Molybdenum	6.9
Nickel	100
Silver	20
Thallium	1.0
Uranium	23
Vanadium	86
Zinc	340

PROJECT #	CO810.02
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DRAWN	JOB/SW
CHECKED	KWB
DRAWING #	FIGURE 3