November 20, 2018 Proposal No. 18100899

Ms. Mary Jarvis
Canada Lands Company
100 Queen Street, Suite 1050
Ottawa, Ontario
K1P 1J9

SUMMARY OF PHASE TWO ENVIRONMENTAL SITE ASSESSMENT AND REMEDIATION COMPLETED AT, 405 ROCHESTER STREET AND 550, 552, 556, 558, 562 AND 568 BOOTH STREET, OTTAWA, ONTARIO

Ms. Valiquette,

Golder Associates Ltd. (Golder) is pleased to provide Canada Lands Company (CLC) with this summary of Phase Two Environmental Site Assessment (ESA) and remediation activities completed at the former NRCan property located 450 Rochester Street and 550, 552, 556, 558, 562 and 568 Booth Street (the "Site") bound by Orangeville Street, Booth Street, Rochester Street and Norman Street. This summary has been prepared to supplement the Phase One ESA recently completed for the Site to assist CLC in their municipal development approvals and to plan the next steps in the environmental assessment and remediation of the Site.

2018 Phase One ESA

Golder was retained to complete a Phase One ESA for the Site in accordance with Ontario Regulation 153/04 (Golder Phase One ESA Report, dated August 2018). The Phase One ESA identified 17 individual Areas of Potential Environmental Concern (APECs) as follows.

- **APEC 1 -** Potential for subsurface impacts due to the former presence of a machine shop, lumberyard, carriage shop and railway located on the northern portion of the Site and a former lumberyard immediately north of the Site.
- **APEC 2 -** Potential for subsurface impacts due to the former presence of a coal storage shed located on the eastern portion of the Site, east of the 556 Booth Street building.
- **APEC 3 -** Documented soil (fill) impacts outside the building footprints on the central and southern portions of the Site.
- **APEC 4 -** Potential for limited areas of soil (fill) impacts due to the presence of residual impacted fill material beneath and adjacent to structures/utilities on the northern portion of the Site.
- **APEC 5 -** Documented metals and VOC (volatile organic compound) impacts in groundwater across the Site.
- **APEC 6 -** Potential for subsurface impacts due to the former presence of an AST (above ground storage tank) of unknown content south of the 550 Booth Street building and an oil spill in the southeast corner of the 550 Booth Street basement.

- **APEC 7 -** Potential for subsurface impacts due to the former bulk storage of chemicals, former metal fabrication and current transformers in the building at 568 Booth Street.
- **APEC 8 -** Potential for subsurface impacts due to the former bulk storage of chemicals and current transformers in the building at 562 Booth Street.
- **APEC 9 -** Potential for subsurface impacts due to the former bulk storage of chemicals, equipment maintenance and current transformers in the building at 556 Booth Street.
- **APEC 10 -** Potential for subsurface impacts due to the current and/or former presence of fuel USTs (underground storage tanks) in the butler hut building and PHC (petroleum hydrocarbon) impacted groundwater identified north of the butler hut building.
- **APEC 11 -** Potential for subsurface impacts due to the former bulk storage of chemicals in the hazardous substances storage shed and an oil spill on the north side of the 556 Booth Street sub-basement floor.
- **APEC 12 -** Potential for subsurface impacts due to former ore dressing, coal gasification, fuels research and current transformers in the building at 552 Booth Street.
- **APEC 13 -** Potential for subsurface impacts due to former ore dressing and current transformers in the building at 550 Booth Street.
- **APEC 14 -** Potential for subsurface impacts due to presence of a generator and former day tank located on the northeast corner of the building at 558 Booth Street.
- **APEC 15 -** Potential for subsurface impacts due to presence of a hydraulic hoist, and historic fuel spills in the sub-basement of the northern portion of the 568 Booth Street building and former oil storage shed and current generator with fuel AST located on the south side of the northern portion of the 568 Booth Street building.
- **APEC 16 -** Potential for subsurface impacts due to current presence of transformers in the southeast corner of the sub-basement floor at 450 Rochester Street.
- **APEC 17 -** Potential for subsurface impacts along the east side of the Site due to former off-Site lumber yard and associated rail lines approximately 15 m east of the Site and documented soil and groundwater impacts on the adjacent property east of the Site at 615 Booth Street.

As a result of the above APECs, it was concluded that a Phase Two ESA would be required in order to obtain a Record of Site Condition (RSC), as would be required under O.Reg. 153/04 to permit a change in land use which includes residential use.

As required under O.Reg. 153/04, an on-Site Potentially Contaminating Activity (PCA) will automatically result in an APEC and a Phase Two ESA is required to address each APEC before an RSC can be filed. The regulation does not permit the use of historical Phase Two ESA or remediation work to be used to eliminate PCAs or APECs which are on the Site at the Phase One ESA stage, nor does it preclude the need to undertake a new Phase Two ESA in accordance with O.Reg. 153/04. However, historical Phase Two ESA and remediation reports can be incorporated into the subsequent Phase Two ESA report where the information is considered recent, accurate, reliable and conforms with the requirements of O.Reg. 153/04. In some instances, historical Phase Two ESA and remediation work may be considered sufficient to satisfy the Phase Two ESA requirements and no new

investigation is required beyond a summary of available information. Only historical information which is not considered sufficient to document the condition of the Site at the time of completing an RSC would need to be updated, re-done or supplemented.

The following sections outlines the historical Phase Two ESA and remediation work undertaken at the Site as a means of documenting the current Site condition.

Phase Two ESAs

Prior the Phase One ESA having been completed and remedial works discussed in the following section, a series of Phase Two ESA investigations had been completed on the Site. The Phase Two ESA work completed at the Site included more than 150 boreholes and monitoring wells. The investigation covered all exterior areas of the Site. Borehole locations from the Phase Two ESA are included in Attachment A. Boreholes were mostly terminated at bedrock surface with all monitoring wells being extended and screened in the bedrock.

As shown on the Phase Two ESA figures, almost all of the soil/fill at the Site was identified as being impacted above the applicable standards for a mixture of petroleum hydrocarbons, metals, volatile organic compounds and polycyclic aromatic hydrocarbons.

Groundwater at the Site for the most part satisfied the applicable regulation at the time of the investigations, however, in comparison to current standards it was identified that at least three separate locations were identified on the Site with exceedances for metals, petroleum hydrocarbons or volatile organic compounds.

Remediation

Prior to transacting the lands from Public Works and Government Services Canada and/or Natural Resources Canada to CLC, 42,034 metric tonnes of contaminated soil identified in the Phase Two ESAs were removed from the Site. This includes all of the soil on the Site to bedrock with the following exceptions:

- Beneath building slabs;
- Between foundation walls and bedrock, where building foundations extended below top of rock;
- To support excavation walls on the perimeter of the Site; and,
- To support utilities and structures throughout the Site, including steam tunnels, retaining walls and duct banks.

Samples collected from the inaccessible soil and excavation sidewalls reported exceedances of petroleum hydrocarbons, metals and polycyclic aromatic hydrocarbons. Attachment B documents the location of residual soil impacts.

No remediation of groundwater has occurred on the Site as all excavations were above the groundwater table.

Conclusion

Currently, there is sufficient Phase Two ESA and remedial information to generally characterize the condition of the Site for the purpose of planning (i.e. zoning and subdivision) understanding that additional work will be required to satisfy the specific requirements of the expected future RSC. These specific additional requirements include but not limited to:

- Review and summary of all historical data to current applicable provincial standards for residential use;
- Collection of groundwater samples within each APEC for all chemicals of concern within at least 18 months of completing the RSC;
- Vertical and lateral delineation of groundwater impacts exceeding applicable residential standards. Generally accepted minimum spacing of 50 metres required for lateral delineation;
- Evaluation of previously unassessed residual soil from areas of the Site that will not be removed as part of the proposed redevelopment program, including those present below structures or buildings that will remain on-Site. Delineation (including to bedrock or property line) of all soil exceedances of MOE Table 7 Residential Standards; and,
- Risk assessment or remediation of any residual exceedances, as applicable, prior to redevelopment. It is expected that most of the residual soils will be removed during redevelopment.

It is noted that any areas of the Site that are severed and developed with commercial or community land use only will not be subject to RSC requirements.

Closure

Given the preliminary nature of the development plans, it is considered that the current level of information should be sufficient for initial steps in the municipal planning process. Once the detailed plan of subdivision, including land use, footprint and depth of basement and parking excavations, severances for roadway and utility easements, etc. are known, the requirements for remediation, risk assessment and Phase Two ESA to satisfy the details of O.Reg. 153/04 can be developed. RSCs will be required for any parcels of land that will be redeveloped for uses that include parkland, residential and/or institutional use, as defined in O.Reg. 153/04, prior to occupancy. Typically the City of Ottawa will issue excavation permits prior to receipt of an RSC, however, above grade building permits may be withheld until the receipt and acceptance of the RSC.

Sincerely,

Golder Associates Ltd.

Eric Wilson, P.Eng.
Associate, Environmental Engineer

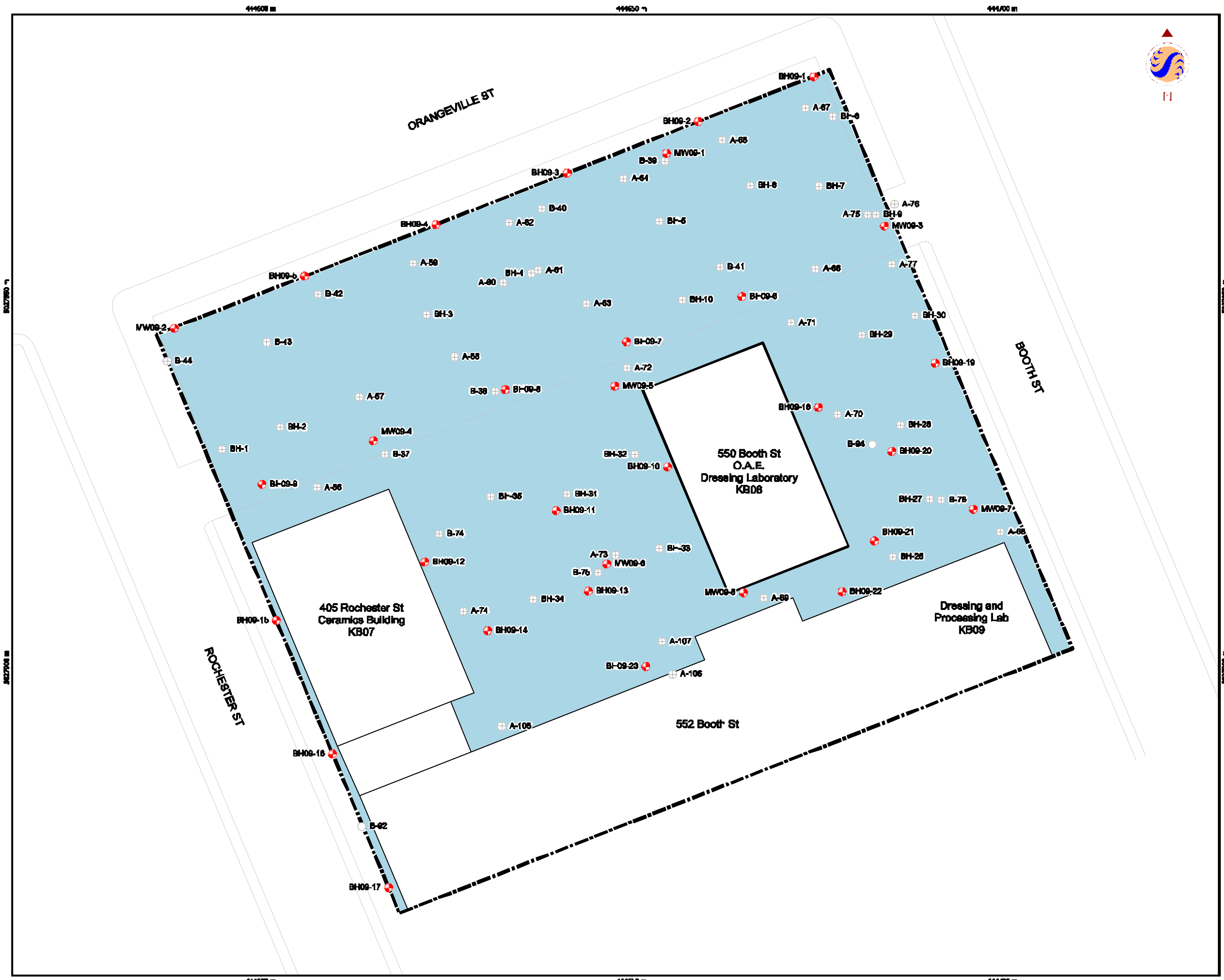
Keith Holmes, P.Geo.
Associate, Senior Geoscientist

KPH/EDW/hw
https://golderassociates.sharepoint.com/sites/26212g/deliverables/phase ii esa summary/18100899-clc booth street phase ii esa desktop-nov 2018 rev1.docx

Attachments: Attachment A – Phase Two ESA Investigation
Attachment B – Remedial Excavations and Residual Soil

ATTACHMENT A

Phase Two ESA Investigation



Legend

- 2009 JWS Borehole/Monitoring Well Location With Soil Concentrations of Inorganic Parameters Above the Ontario Standard
- Existing Monitoring Well
- Former Borehole
- Study Area
- Building
- Curb
- Estimated Areal Extent of Soil Exceeding the Ontario Standards

0 20 m

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Notes

1. This drawing illustrates supporting information specific to a Jacques Whitford Stantec Limited report and must not be used for other purposes.
2. Coordinate System: UTM Zone 18 NAD 83.

Stantec

September 2009
160900553

Client/Project
Natural Resources Canada
Phase II Environmental Site Assessment
North West Quadrant Booth Street
Ottawa, Ontario

Figure No.
4

Title
Delineation of Soil Exceeding Ontario Table 1 Standards - Inorganics

Legend

- 2009 JWS Borehole/Monitoring Well Location With Soil Concentrations of Inorganic Parameters Above the Ontario Standard
- 2009 JWS Borehole/Monitoring Well Location With Soil Concentrations of Inorganic Parameters Below the Ontario Standard
- Existing Monitoring Well
- Former Borehole
- Former Soil Surface Sample
- Building
- Curb
- Study Area
- Estimated Areal Extent of Soil Exceeding the Ontario Standards

Notes

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Stantec

September 2009
160900553

Client/Project
Natural Resources Canada
Phase II Environmental Site Assessment
North Central Quadrant Booth Street
Ottawa, Ontario

Figure No.
4

Title
Delineation of Soil Exceeding The Ontario Standards - Inorganics

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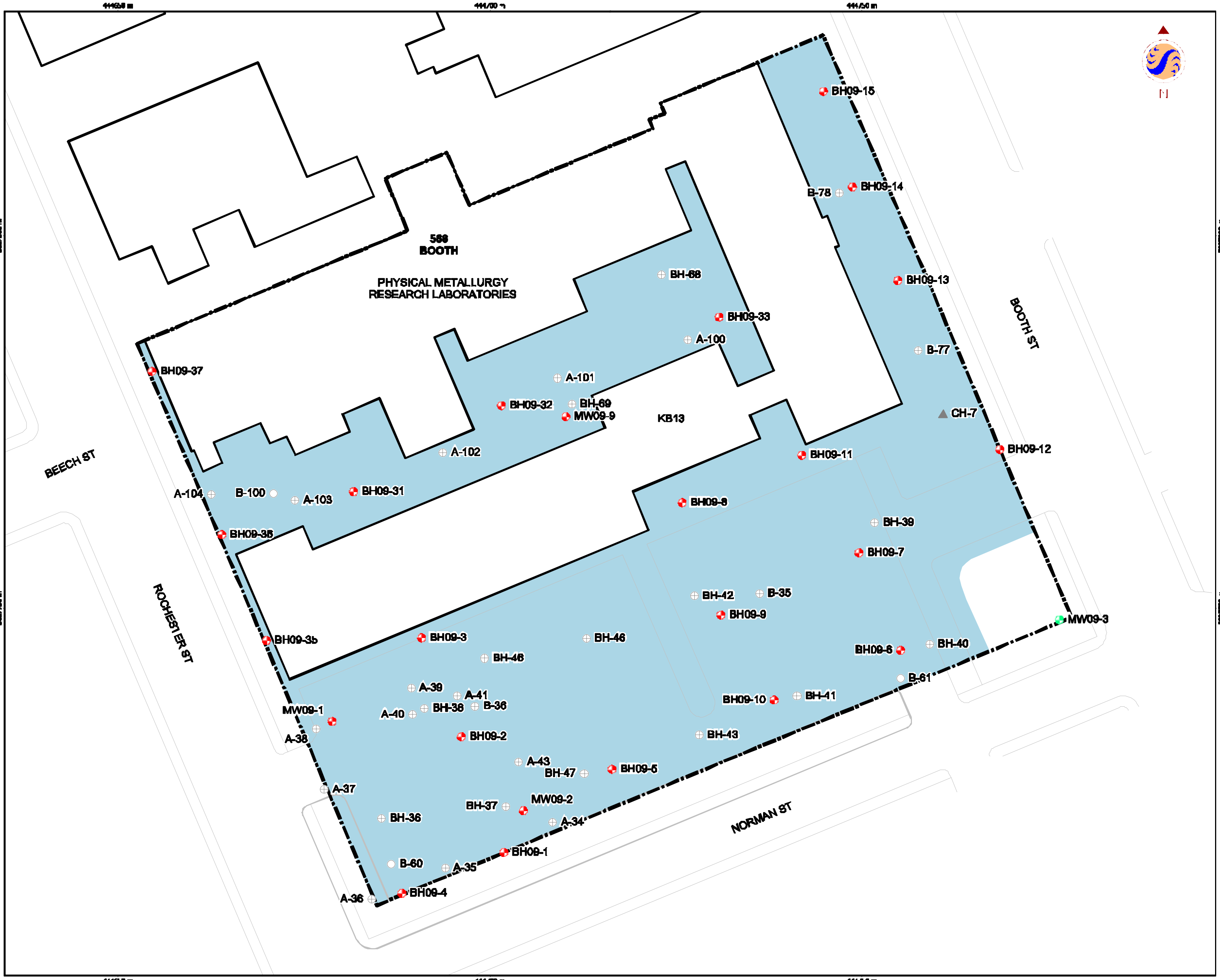
9/24/2009 1:00:37 PM By: estroazkali Revised 09-22-2009 By: estroazkali



Legend

- 2009 JWS Borehole/Monitoring Well Location With Soil Concentrations of Inorganic Parameters Above the Ontario Standard
- 2009 JWS Borehole/Monitoring Well Location With Soil Concentrations of Inorganic Parameters Below the Ontario Standard
- Existing Monitoring Well
- Former Borehole
- Former Soil Surface Sample
- Building
- Curb
- Study Area
- Estimated Areal Extent of Soil Exceeding the Ontario Standards

0 — 20 m

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Notes

1. This drawing illustrates supporting information specific to a Jacques Whitford Stantec Limited Report and must not be used for other purposes.
2. Coordinate System: UTM Zone 18 NAD 83

Stantec

September 2009
160900553

Client/Project
Natural Resources Canada
Phase II Environmental Site Assessment
South Central Quadrant Booth Street
Ottawa, Ontario

Figure No.
4

Title
Delineation of Soil Exceeding The Ontario Standards - Inorganics

ATTACHMENT B

Remedial Excavations and Residual Soil

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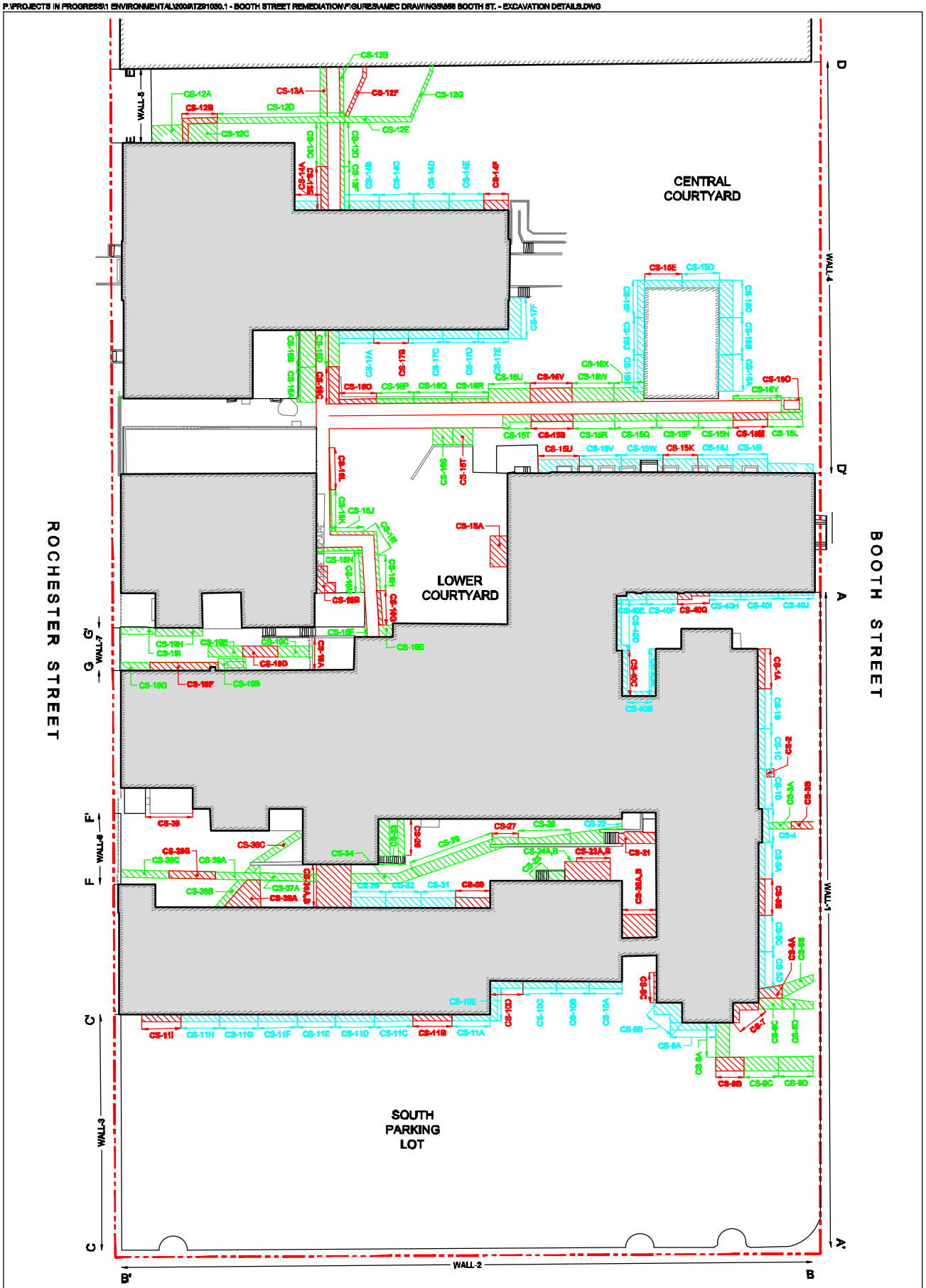


LEGEND

- PROPERTY BOUNDARY
- FOUNDATION WALL SAMPLE (CS-11F)
- UTILITY SAMPLE (CS-16B)
- SAMPLE SUBMITTED FOR LABORATORY ANALYSIS (CS-11F)
- SAMPLE EXCEEDS FEDERAL GUIDELINES (CS-11F)

TITLE: COMPOSITE SAMPLE LOCATIONS AND WELL SECTION LOCATIONS

PROJECT: SOIL REMEDIATION BOOTH STREET COMPLEX CENTRAL QUADRANT

CLIENT: Public Works and Government Services Canada

PROJECT NO: TZ91080.1

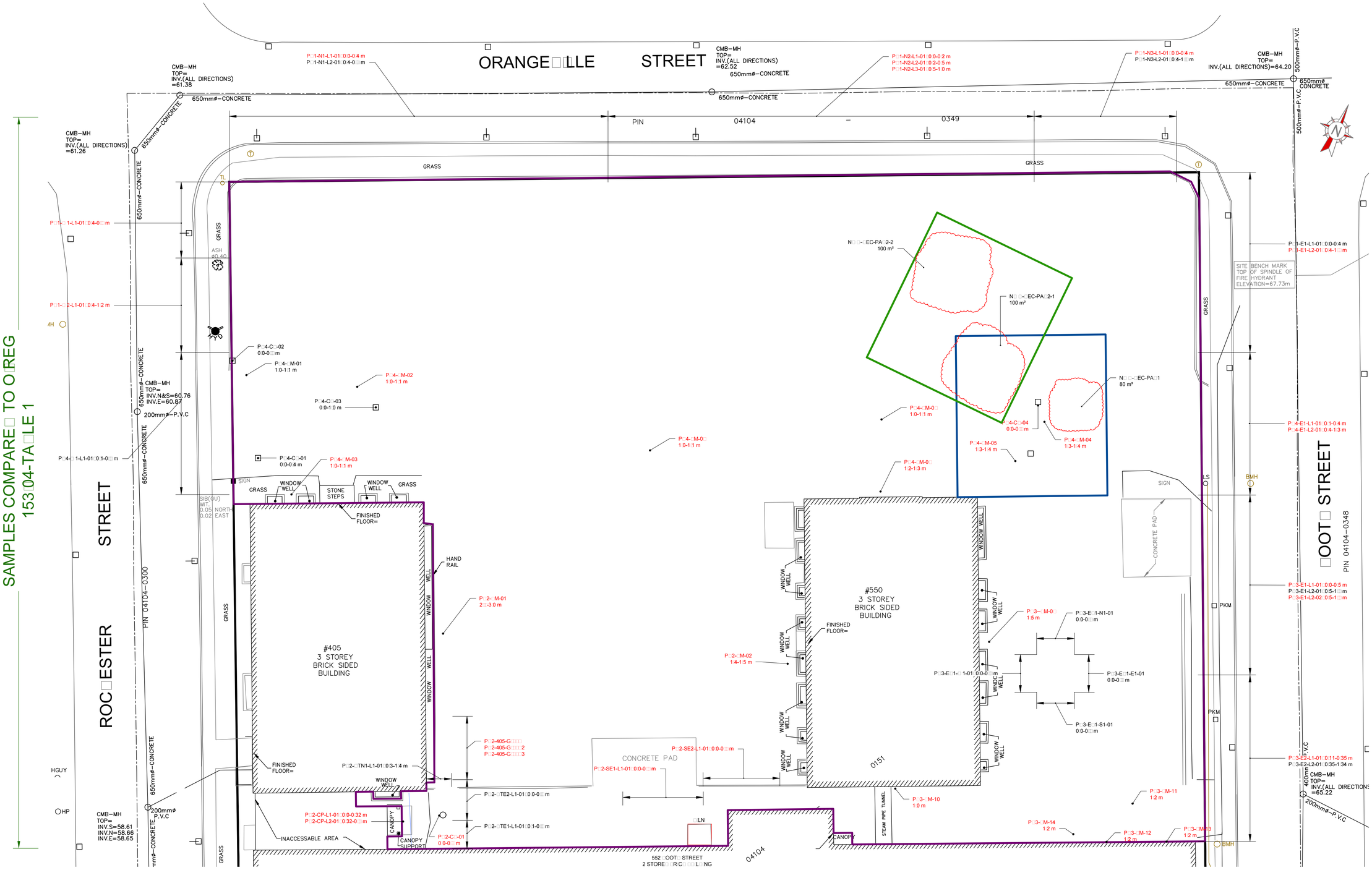
SCALE: 1 : 500

DATE: MARCH 2011

DRAWN BY: MEM

CHECKED BY: KDH

FIGURE NO: 4



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- P□4-E1-L1-01□0.□-3.0 m — P□□□□4 - E□□□□ □□1 - L□□□□1 - S□□□□□□□01□□□□□□□□ □□m □□□

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C□□tomer
Public Works and Government Services Canada

Project
Booth Street Complex Remediation Project
Northwest Quadrant Remediation
550 & 552 Boot□Street □□□405 Roc□e□ter Street□Ott□□□O□t□rio

Title
EXCAVATION LIMITS AND SAMPLE LOCATIONS O.REG CRITERIA

DESSAU
Dessau inc.
2625, Queensview Drive, Suite 105
Ottawa (Ontario) K2B 8K2
Telephone : 613.226.9667
Fax : 613.226.7389

Prepared	S. Durand	Discipline	ENVIRONMENTAL
Drawn	S. Meteer	Scale	1:200
Checked	S. Durand	Date	2011-12-09

Project manager: **E. Domingue**
Sequence no.: **04 of 04**

M. dept.	Project	Work pckg.	Sub-w.p.	Disc.	Drawing no.	Rev.
143	P043159	0100	000	HD	0004	00

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SHEET A1