

TO: All Tenderers

FROM: McElhanney Ltd.

DATE: June 26, 2023

PROJECT: **Marchmont Road Renewal - Tender**

FILE NO: 2233-02107-00

1. PRECEDENCE

1. This Addendum shall form an integral part of the Work. This Addendum shall take precedence over all requirements of the Tender Documents with which it may prove to be at variance unless otherwise qualified by McElhanney.

2. PURPOSE

1. This addendum is in response to the questions that were asked during the tender period.
2. This addendum provides additional information and instructions to the bidders.
3. The questions below are in no particular order.

3. INSTRUCTIONS

1. Correction to Instructions to Tenderers – Part I (all revisions in red text)

- a. Section 4.13 added

2. Revisions / Additions to Form of Tender – Appendix 1 – Schedule of Quantities and Prices (all revisions in red text)

- a. 31.02 – Quantity reduced
- b. 31.03 – Added to account for contaminated soils excavation and disposal
- c. 33.09 – Quantity increased
- d. 33.12 – Added to account for contaminated soils disposal

3. Revisions to Supplemental Specifications

- a. 31 23 01 – 3.3.9ss added

4. Additional Information

- a. Technical Memo: Soil Assessment for Marchmont Rd Project, Duncan BC prepared by McElhanney Ltd.

5. Questions (previous questions in grey text)

- a. Will there be a pre-tender meeting scheduled?
 - i. **There will not be a pre-tender meeting scheduled. Bidders are responsible for visiting the project site to assess conditions as required.**
- b. Per the Form of Tender, please confirm if the *Total Tender Price* on the *Summary Sheet* is to include the *Optional Work* price?
 - i. **As noted on Page 6 of the Appendix 1 – Schedule of Quantities and Prices, Optional Work is included in the Total Tender Price**
- c. Is there a geotechnical report that can be provided?
 - i. **There has not been geotechnical investigation or reporting completed for the project.**
- d. Per the Schedule of Quantities and Prices - item# 32.03, description states Thickness Varies. Please consider providing a base line thickness and material type for the driveway re-grading.
 - i. **Please assume 100mm thickness of Granular Base, matching line item 32.02**
- e. Please confirm the depth of existing asphalt being removed.
 - i. **Asphalt depth is unknown.**
- f. Please confirm if temporary restoration with cold mix asphalt will be required over surfaces where asphalt has not yet been restored but is being travelled on. If so, please indicate which pay item covers the costs.
 - i. **Granular base or cold mix asphalt may be used for temporary trench restoration. It will be the Contractor's responsibility to maintain the restoration until final paving to the satisfaction of the City and Engineer.**
- g. Please confirm if we are to remove and replace sections of private concrete/asphalt driveways.
 - i. **It is assumed that no removal and replacement of private concrete and asphalt driveways will be required. Minor adjustments to the back of sidewalk elevations may be utilized.**
- h. Please confirm if we are to include removal and replacement of existing fences? If we are, please indicate which pay item covers the costs.
 - i. **It is assumed no fence removal and replacement will be required for the project.**

Addendum #2

- i. Please confirm if we are to include removal of existing trees/shrubs? If we are, please indicate which pay item covers the costs.
 - i. **It is assumed no vegetation removal and replacement will be required for the project.**

- j. Please confirm which pay item we are to carry the costs for catch basin removals. When removing existing catchbasins, please confirm if existing CB leads are to be removed or abandoned.
 - i. **Per the supplemental specifications, all underground infrastructure removals are to be included in line item 31.01 Common Excavation. Catchbasins leads are to be removed as required for new construction; they can be abandoned if there are no conflicts or concerns from the geotechnical engineer during subgrade reviews.**

- k. Please confirm if temporary water will be required
 - i. **A suggested shut-down plan is provided within the Contract Drawings. Contractor to provide proposed shut-down plan for approval. Temporary water will be the Contractor's responsibility if required, but not the preferred methodology.**

- l. Under the Roadworks notes on the drawings, item #5 states that we are to restore all boulevards with 200mm depth of topsoil and sod per MMCD. When referencing the Schedule of Quantities and Prices - item# 32.07, shows topsoil at 100mm depth. Please confirm the depth of topsoil to be placed.
 - i. **Topsoil to be placed at a depth of 100mm as per the Schedule of Quantities and Prices**

- m. Please confirm if the City will be providing a laydown area
 - i. **The City will not be providing a designated laydown area, however full road closures will be permitted per Question 5n**

- n. Please confirm if full road closures will be permitted. If they are, please indicated durations full road closures will be accommodated for.
 - i. **Full road closures will be permitted for the duration of the project.**

- o. Please confirm if analytical soil testing for the environmental composition of the material being disposed offsite will be conducted by the owner.
 - i. **Soil analytical testing has been conducted during the tender period. The preliminary results have been appended to the addendum along with the corresponding revised Schedule of Quantities and Prices.**

- p. Per the schedule of Quantities and Prices – Item 33.06, please confirm if manhole D4 and 4.19m of 450mm SDR35 are to be included in this item
 - i. **Item 33.06 is for the tie-in to existing manhole only.**

4. ATTACHMENTS

Instruction to Tenderers – Part I – Issued for Addendum #2

Form of Tender – Appendix 1 – Schedule of Quantities and Prices – Issued for Addendum #2

Supplemental Specifications – Issued for Addendum #2

Technical Memo: Soil Assessment for Marchmont Rd Project, Duncan BC

1.0 Introduction.....IT - 1

2.0 Tender DocumentsIT - 1

3.0 Submission of TendersIT - 2

4.0 Supplemental Instructions to Tenderers.....IT - 3

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(FOR USE WHEN UNIT PRICES FORM THE BASIS OF PAYMENT TO BE USED ONLY WITH THE GENERAL CONDITIONS AND OTHER STANDARD DOCUMENTS OF THE UNIT PRICE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS.)

(TO BE READ WITH “INSTRUCTIONS TO TENDERERS - PART II”
CONTAINED IN THE EDITION OF THE PUBLICATION
“MASTER MUNICIPAL CONSTRUCTION DOCUMENTS” SPECIFIED IN ARTICLE 2.2 BELOW)

Owner: City of Duncan
(NAME OF OWNER)

Contract: Marchmont Road Renewal
(TITLE OF CONTRACT)

Reference No.: 2233-02107-00
(OWNER'S CONTRACT REFERENCE NO.)

1.0 Introduction

1.1 These Instructions apply to and govern the preparation of tenders for this *Contract*. The *Contract* is generally for the following work:

Road reconstruction along Marchmont Road between Trunk Road and
Day Road. Works generally include removals, earthworks, road
works, watermain, storm sewer, and landscaping.

(BRIEF DESCRIPTION OF THE WORK)

1.2 Direct all inquiries regarding the *Contract*, to:

McElhanney Ltd.

Jon Irving, P.Eng., Engineering Division Manager

(NAME AND POSITION OF INDIVIDUAL WHO WILL ANSWER INQUIRIS)

Address: 107-225 Canada Ave
Duncan, BC
V9L 1T6

Phone: 250 - 748 - 3335

Email: jirving@mcelhanney.com

2.0 Tender Documents

2.1 The tender documents which a tenderer should review to prepare a tender consist of all of the *Contract Documents* listed in Schedule 1 entitled “Schedule of Contract Documents”. Schedule 1 is attached to the Agreement which is included as part of the tender package. The *Contract Documents* include the drawings listed in Schedule 2 to the Agreement, entitled “List of *Contract Drawings*”.

2.2 A portion of the *Contract Documents* are included by reference. Copies of these documents have not been included with the tender package. These

documents are the Instructions to Tenderers - Part II, General Conditions, Specifications and Standard Detail Drawings. They are those contained in the publication entitled "Master Municipal Construction Documents - General Conditions, Specifications and Standard Detail Drawings". Refer to Schedule 1 to the Agreement or, if not specified in Schedule 1, then the applicable edition shall be the most recent edition as of the date of the *Tender Closing Date*. All sections of this publication are by reference included in the *Contract Documents*.

2.3 Any additional information made available to tenderers prior to the *Tender Closing Time* by the *Owner* or representative of the *Owner*, such as geotechnical reports or as-built plans, which is not expressly included in Schedule 1 or Schedule 2 to the Agreement, is not included in the *Contract Documents*. Such additional information is made available only for the assistance of tenderers who must make their own judgment about its reliability, accuracy, completeness and relevance to the *Contract*, and neither the *Owner* nor any representative of the *Owner* gives any guarantee or representation that the additional information is reliable, accurate, complete or relevant.

3.0 Submission of Tenders

3.1 Tenders must be submitted in a sealed envelope, marked on the outside with the above *Contract* Title and Reference No., and must be received by the office of:

Brian Murphy, Director of Public Works and Engineering

(TITLE OF POSITION)

on or before:

Tender Closing Time: 2: 00 , Pm local time
Tender Closing Date: June 28 , 20 23

at City of Duncan

Address: 200 Craig Street
 Duncan, BC V9L 1W3
 Documents to be dropped off at front desk

3.2 Late tenders will not be accepted or considered, and will be returned unopened.

4.0 Supplemental
Instructions to
Tenderers

- 4.1 **Freedom of Information:** The City is subject to the provisions of the Freedom of Information and Protection of Privacy Act. As a result, while Section 21 of the Act does offer some protection for third party business interests, the City cannot guarantee that any information provided to the City can be held in confidence.
- 4.2 **Funding:** Proceeding with an award of this tender may be subject to available funding.
- 4.3 **Award:** The intent is to award the lowest bid price or bid prices but the lowest or any bid price will not necessarily be accepted. If the City elects to reject all bids, the City will not be liable to any bidder for any claims whether for costs incurred by any bidder in preparing the bid, damages, loss of anticipated profit in connection with the work, or any other matter whatsoever.
- 4.4 **Notice of Project:** Submit to WorkSafe BC a completed Notice of Project, providing a copy to the City.
- 4.5 **Construction Traffic Management Plan:** Submit to the Contract Administrator, prior to construction, a construction traffic management plan for review by the Contract Administrator and the Owner.
- 4.6 **Facsimile:** Faxed amendments or revocations will not be accepted.
- 4.7 **Inquiries:** All questions should be received at least 5 business days prior to the closing time and date.
- 4.8 **Working Hours:** The Contractor is required to abide by the following working hours set out in the City of Duncan Good Neighbour Bylaw No. 3156, 2017.
- 4.9 **Important Dates:**
- .1 The Last Addendum will be posted by the end of the day Monday June 26th, 2023
- 4.10 **Superintendent:** The *Owner* reserves the right to object to the *Superintendent* listed in the tender. If the *Owner* objects to the *Superintendent* then the *Owner* will permit a tenderer to, within 5 days, propose a substitute *Superintendent* acceptable to the *Owner* provided that there is no resulting adjustment in the *Tender Price* or the completion date set out in paragraph 2.2 of the Form of Tender. A tenderer will not be required to make such a substitution and, if the *Owner* objects to a listed *Superintendent*, the tenderer may, rather than propose a substitute *Superintendent*, consider its tender rejected by the *Owner* and by written notice withdraw its tender. The *Owner* shall, in that event, return the tenderer's bid security.
- 4.11 **Schedule:** See critical dates in Appendix 2 of the Form of Tender
- 4.12 **Asphalt Paving Coordination:** Asphalt Paving will be completed by Duncan Paving in direct contract with the Owner. The successful Contractor will be responsible for coordinating and facilitating paving work including traffic control.
- 4.13 **Fuel Consumption:** The successful Contract shall provide a summary of all fuel usage quantities throughout the duration of the project to the Owner upon project completion.

FORM OF TENDER

APPENDIX 1 – SCHEDULE OF QUANTITIES AND PRICES

Form of Tender - Appendix 1

SCHEDULE OF QUANTITIES AND PRICES
(See paragraph 5.3.1 of the Instructions to Tenderers - Part II)

(All prices and *Quotations* including the *Contract Price* shall include all *Taxes*, but shall not include *GST*.)

Any work called for in these Contract Documents, shown on the plans, or which is necessary for the completion of the Work called for in these Contract Documents and which is not specifically listed as a separate payment item in this Appendix shall be deemed incidental to the performance of the Work and to the general purpose of the Contract; no separate payment will be made on account of any such Work, but the costs of any such incidental Work shall be included in the Unit and Lump Sum Prices.

Summary Sheet

Division 01:	General Requirements	\$ _____
Division 03:	Concrete	\$ _____
Division 31:	Earthworks	\$ _____
Division 32:	Roads and Site Improvements	\$ _____
Division 33:	Utilities	\$ _____
Optional Work		\$ _____

TOTAL TENDER PRICE	\$ _____
GST (5%)	\$ _____
TENDER PRICE plus GST	\$ _____

Tenderer's Initials _____

DIV 01		GENERAL REQUIREMENTS					
Item No.	Section	Specification Title	Unit	Quantity	Unit Price	Amount	
	01 10 00SS	Quality Control Testing					
1.01	1.1	Quality Control Testing	Lump Sum	1			
	01 10 00SS	Survey					
1.02	1.2	Layout Survey, Quantity Survey, Volume Calculations, and Record Survey	Lump Sum	1			
	01 33 01	Project Record Documents					
1.03	1.8.1	Project Record Documents	Lump Sum	1			
	01 52 01	Temporary Structures					
1.04	1.6.2ss	Mobilization & Demobilization	Lump Sum	1			
	01 55 00	Traffic Control, Vehicle Access and Parking					
1.05	1.5.1, 1.4.15ss	Traffic Management Plan (TMP), Traffic Control, Vehicle Access and Parking	Lump Sum	1			
	01 57 01	Environmental Protection					
1.06	1.6.1 1.6.2ss	Environmental Protection & Plan	Lump Sum	1			
Sub-Total							\$

DIV 03		CONCRETE					
Item No.	Section	Specification Title	Unit	Quantity	Unit Price	Amount	
	03 30 20	Concrete Walks, Curb And Gutter					
3.01	1.4.3	Curb & Gutter Mountable Curb & Non-mountable Curb	Lineal Metre	471			
3.02	1.4.5	Concrete Walks, Infill Strips and Walkways (100mm thickness)	Square Metre	589			
3.03	1.4.5	Concrete Driveway Ramps (150mm thickness)	Square Metre	125			
Sub-Total							\$

DIV 31		EARTHWORKS					
Item No.	Section	Specification Title	Unit	Quantity	Unit Price	Amount	
	31 11 41	Shrub and Tree Preservation					
31.01	1.3.1	Shrub and Tree Preservation	Lump Sum	1			
	31 24 13	Roadway Excavation, Embankment and Compaction					
31.02	1.8.14ss	Common Excavation	Cubic Metre	300			

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31.03	1.8.14ss	Common Excavation Contaminated Soils, dispose offsite	Cubic Metre	1200		
31.04	1.8.9	Subgrade Preparation	Square Metre	3150		
Sub-Total					\$	

DIV 32		ROADS AND SITE IMPROVEMENTS				
Item No.	Section	Specification Title	Unit	Quantity	Unit Price	Amount
	32 11 16.1	Granular Sub-Base				
32.01	1.4.3	Granular Sub-Base 200mm Thickness - Roads & Curbs	Square Metres	2800		
	32 11 23	Granular Base				
32.02	1.4.2	Granular Base 100mm Thickness – Roads, Curbs	Square Metres	2800		
32.03	1.4.2	Granular Base Thickness Varies – Driveway Re-grading	Square Metres	150		
	32 12 16	Hot-Mix Asphalt Concrete Paving				
32.04	N/A	Facilitate Asphalt Paving (Duncan Paving Contracted by Owner)	Lump Sum	1		
	32 17 23	Painted Pavement Markings				
32.05	1.5.2	Permanent Painted Pavement Markings	Lump Sum	1		
32.06	1.5.3	Permanent Thermoplastic Pavement Markings	Lump Sum	1		
32.07	1.5.6ss	Relocate Traffic Control Signs	Each	1		
	32 91 21	Topsoil and Finish Grading				
32.08	1.4.1	Topsoil - 100mm depth	Square Metres	50		
	32 92 23	Sodding				
32.09	1.8.1	Sodding	Square Metres	50		
Sub-Total					\$	

DIV 33		UTILITIES				
Item No.	Section	Specification Title	Unit	Quantity	Unit Price	Amount
	33 11 01	Waterworks				
33.01	1.8.1, 1.8.2, 1.8.3	Watermain – HDPE DR9 200mm diameter, 0-2m depth, imported backfill, including fittings and appurtenances	Lineal Metres	248		
33.02	1.8.4	Water Service Connections Connect existing water services to new watermain	Each	20		
33.03	1.8.13	Watermain Tie-In	Lump Sum	4		
33.04	1.8.14	Hydrant Assembly Standard Drawing W4	Each	1		

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	33 40 01	Storm Sewers				
33.05	1.6.1, 1.6.2	Drainage Pipe - PVC SDR35 450mm diameter, 0-4m depth, imported backfill	Lineal Metres	174		
33.06	1.6.3	Drainage Service Connections 150mm diameter, including inspection chambers	Each	2		
33.07	1.6.5	Catchbasin Lead – PVC SDR35 200mm diameter	Lineal Metres	35		
33.08	1.6.9	Drainage Tie-In	Each	1		
	33 44 01	Manholes and Catchbasins				
33.09	1.5.1.1ss	Manhole Base, lid, slab, cover and frame, 1500mm diameter	Each	4		
33.10	1.5.1.4	Manhole Re-benching	Each	1		
33.11	1.5.2	Catchbasin Top Inlet	Each	7		
		Miscellaneous				
33.12	N/A	Disposal of Contaminated Materials required for Utilities Trenching Work offsite	Cubic Metre	790		
Sub-Total						\$

Tenderer's Initials _____

OPTIONAL WORK
(Included in Tender Price)

This section forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

Optional items quoted on will be reviewed and accepted or rejected at the Owner's option. Accepted optional items prices will be identified in the construction agreement.

Coordinate related work and modify surrounding work to integrate the Work of each optional item.

Prices quoted should not include GST.

<i>Item No.</i>	<i>Section</i>	<i>Specification Title</i>	<i>Unit</i>	<i>Quantity</i>	<i>Unit Price</i>	<i>Amount</i>
	31 24 13	Roadway Excavation, Embankment and Compaction				
1	1.8.5	Common Excavation - Off-Site Disposal, below design subgrade to suitable soils	Cubic Metre	1000		
2	1.8.7	Embankment Fill – Imported to reach design subgrade	Cubic Metre	1000		
	32 12 16	Hot-Mix Asphalt Concrete Paving				
3	1.5.9ss	Asphalt Speed Hump	Each	2		
	32 17 23	Painted Pavement Markings				
4	1.5.5ss	Traffic Control Signs Speed Humps Only	Each	4		
5	1.5.3	Permanent Thermoplastic Pavement Markings Speed Humps only	Lump Sum	1		

Tenderer's Initials _____

SUPPLEMENTARY SPECIFICATIONS		
Add the following Supplementary Specifications (attached at end):		
SECTION	SUB SECTION	SUPPLEMENTARY SPECIFICATION
01 10 00SS Measurement and Payment	All	
Revise the following Master Municipal Specifications Platinum Edition:		
SECTION	SUB SECTION	SUPPLEMENTARY SPECIFICATION
01 52 01 Temporary Structures	1.6 Payment	<p>Add Clause 1.6.2: "Payment for mobilization and demobilization shall include all the Contractor costs of mobilization at the beginning of the project and the cost of demobilization at the end of the project.</p> <p>.1 Included in the mobilization are such items as bonding, insurance, permits, moving personnel, equipment and materials to the site, setting up temporary facilities and all preparation for performing the <i>Work</i>.</p> <p>.2 Included in demobilization are preparation and submission of record drawings, operation and maintenance manuals, removal of all personnel, equipment and materials and cleanup of the <i>Site</i> and the <i>Work</i>.</p> <p>.3 The lump sum price bid for this work shall be relative to the costs involved but shall not exceed ten percent of the <i>Tender Price</i>.</p> <p>.4 Payment shall be made as follows, as approved by the Contract Administrator:</p> <p>.1 60% of the lump sum bid will be included in the first progress payment certificate</p> <p>.2 40% of the lump sum bid will be included in the final progress payment certificate</p> <p>.5 The Contract Administrator may at his discretion authorize partial payment if mobilization or demobilization is not complete</p> <p>.6 The cost of other items specified under General Requirements shall be considered incidental to the work and separate payment will not be made for any other items in the General Requirements unless specifically noted in the <i>Schedule of Quantities and Prices</i>."</p>
01 55 00 Traffic Control, Vehicle Access and Parking	1.4 Traffic Control	<p>Add Clause 1.4.15:</p> <p>"Provide a detailed Traffic Management Plan (TMP) and drawings with dedicated traffic control and pedestrian delineation for safety of motorists, pedestrians and bicycle traffic for all locations where roadways are affected by construction activities. The TMP shall be sealed by a qualified professional engineer and will be approved by the Contract Administrator in advance of implementation. This plan is to be submitted to the Contract Administrator a minimum of 14 calendar days prior to the contractor's desired date of construction commencement. The plan shall be updated and modified as requested by the Contract</p>

	<p>Administrator, as the construction project proceeds and traffic management needs warrant. The TMP is to contain sufficient details to allow the Contract Administrator and Owner a clear understanding of how the Contractor will ensure the following performance specification will be achieved, at a minimum.</p> <ol style="list-style-type: none">1. TMP shall be prepared in accordance with the BC Ministry of Transportation and Infrastructure guidelines specified in the 2020 Traffic Management Guidelines for Work on Roadways Manual, and the 2016 Standard Specifications for Highway Construction. Table of Contents to include the following:<ol style="list-style-type: none">1.1. General Information1.2. Operations and Signage1.3. Users and Access1.4. Traffic Control Drawings1.5. Public Information Plan1.6. Incident Management Plan1.7. Implementation Plan2. Partial closure of existing travel lanes to a minimum of single lane alternating traffic to facilitate construction of the Works may be requested3. Diverted travel lanes must be on paved or granular base surfaces. Travel surface will allow for vehicles to move through the construction zone at an intended speed of 20 km/h.4. Minimize stopping traffic in the travel lane. No dumping or off loading of materials shall be permitted in the travel lane. Stoppages are permitted for vehicle access to and egress from the construction zone or for construction vehicles crossing the travel lane. No delays for full lane closure of more than 5 minutes.5. Provide a plan of all off site and on site signage and traffic control devices for review and acceptance by the Contract Administrator and the Owner. Update the plan as requested whenever signage or traffic control device locations are changed.6. Provide access for garbage collection and recycling pick-up programs and mail delivery to all residents and businesses. Provide communication to and coordination with all service providers as necessary to ensure access as required.7. Provide for the BC Transit bus routes. Communicate to and coordinate with BC Transit as necessary regarding temporary bus stop locations, transit through the work zone and any other issues that may arise that require discussion and coordination.8. Work shall be in accordance with City of Duncan Noise Bylaws.9. At the discretion of the Contract Administrator, the Contractor may be requested to modify the TMP to accommodate any irregularities or excessive congestion of traffic flow. Maximum total delays of up to 5 minutes are permitted10. Maintain at least one access to all properties, at all times unless otherwise authorized by the Contract Administrator or unless the work is directly in front of a residential driveway. Where closures of residential driveways are required, provide
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		<p>a hand delivered letter a minimum of 72 hours prior to construction to impacted property owner(s). Driveways shall be closed for 72 hours for concrete curing. Daily access shall be provided for trenching where possible using steel plates.</p> <p>11. Facilitate priority access through the work zone for fire trucks and all other emergency vehicles when they are operating with emergency lights and sirens active and where possible otherwise.</p> <p>12. Where sidewalks are closed, provide adequate signage regarding pedestrian detour including signage at closest pedestrian crossing at each side of the closed section. Where work directly impacts sidewalk accessibility, "fixed in place" ramps with a tactile surface are to be provided at either end of the work area allowing pedestrians to safely negotiate the grade change between the roadway surface and drop ramps, curbs, and boulevards. Ramps must be of solid / sound construction, a minimum of 1.5m wide, less than 8% grade, and fixed in place with a traction surface and have a raised barrier edge a minimum of 35mm high.</p> <p>13. Provide plan for on site or off site storage of materials and equipment, location of site trailers and all other storage facilities (e.g. shipping containers). Use of the road right-of way or other public lands will require a Permit to Occupy a Road Allowance.</p>
01 57 01 Environmental Protection	1.1 Section 10 57 01 Includes	Add Clause 1.1.5: "Qualified Environmental Professional"
	1.2 Temporary Erosion and Sediment Controls	Add Clause 1.2.1.4: "All catch basin, silt trap, and lawn basin inlet castings that may receive runoff from the work area to be covered with filter cloth. Ensure no silt or sediment enters the storm drainage system while removing the silt cloth once construction is complete"
	1.4 Environmental Protection	<p>Add Clause 1.4.4: "Disposal of Waste:</p> <ol style="list-style-type: none"> 1. Do not bury rubbish and waste materials on site. 2. Do not dispose of waste or volatile materials such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers. 3. Dispose of waste materials off property, in accordance with applicable provincial and/or federal regulations. Removal and disposal of Asbestos Cement pipe shall follow current WCB requirements."
		<p>Add Clause 1.4.5: "Concrete and Asphalt Cutting and Placing:</p> <ol style="list-style-type: none"> 1. Control and pick up all wet or dry residue from saw cutting, coring, grinding and milling operations by means of a vacuum device or street sweeper. Under no circumstances is any dust, debris or run-off to migrate into waterways, storm or sanitary sewers. 2. Minimize the volume of wastewater produced by cutting tools by recycling and reusing wastewater whenever possible. 3. Do not allow cement washout into the streets, driveways, gutters, storm drains, ditches or water courses.

		<p>4. Set up and operate portable mixers on tarps or heavy drop cloths to contain spillage.</p> <p>5. When breaking up and milling pavement, remove broken pavement and sweep area clean.”</p>
	1.6 Measurement and Payment	Add Clause 1.6.2: “Environmental Protection Plan shall be lump sum and includes all work to prepare, deliver and enact an Environmental Management Plan prepared by a registered qualified environmental professional (QEP) that contains the following components: tree protection plan; sensitive ecosystem management plan; sediment and erosion control plan; invasive species management plan; waste disposal; storage areas and laydown area management plan; equipment idling control plan; hazardous material control and spill response plan.”
31 23 01 Excavation, Trenching and Backfilling	3.3 Excavation	Clause 3.3.9 delete: “Provisions of Provincial Contaminated Sites Legislation” Replace with “Provisions of Provincial Contaminated Sites Legislation and Technical Memo: Soil Assessment for Marchmont Rd Project, Duncan BC prepared by McElhanney Ltd.”
31 24 13 Roadway Excavation, Embankment and Compaction	1.8 Measurement and Payment	Add Clause 1.8.14: “Payment for common excavation (neat line area to design subgrade) includes excavation and offsite disposal to design subgrade, including asphalt and concrete removal. Payment includes removal of all existing site fixtures, retaining walls, signs, fencing, stumps, pipes, culverts, conduits and underground infrastructure as shown on the Drawings. Measurement shall be based on the surface area neat lines required and shown on the Drawings and surveyed volume calculations as specified in Supplemental Specifications 01 10 00SS.”
32 12 16 Hot Mix Asphalt Concrete Paving	1.5 Measurement and Payment	Clause 1.5.1 change: "based on weigh tickets provided to Contract Administrator as loads are delivered" to "based on area for each thickness specified in the Schedule of Quantities and Prices”.
		Add Clause 1.5.9: “Payment for asphalt speed humps includes all materials, preparation, work and incidentals required to complete installation as shown in the Contract Drawings.”
32 17 23 Painted Pavement Markings	1.5 Measurement and Payment	Add Clause 1.5.5: “Supply and installation of traffic control signs shall be paid at the unit price shown on the Schedule of Quantities and Prices and shall include all labour, equipment and materials required to complete the installation as shown on the Contract Drawings.”
		Add Clause 1.5.6: “Relocation of existing traffic control signs shall be paid at the unit price shown on the Schedule of Quantities and Prices and shall include all labour, equipment and materials required to complete the removal and re-installation as shown on the Contract Drawings. The post and signs shall be salvaged for re-installation and new concrete bases installed. Sign relocations required for construction that are not shown in the Contract Drawings will be considered incidental to the work.”
33 44 01 Manholes and Catchbasins	1.5 Measurement and Payment	Clause 1.5.1.1 delete: "except riser". Replace with: "including riser". Delete Clause 1.5.1.2

TECHNICAL MEMO

To
John Pite, Manager of Engineering
City of Duncan

From
Brian White, P.Eng, Task Lead
McElhanney, Environmental Services

Re
Soil Assessment for Marchmont Rd Project, Duncan June 26, 2023
BC

1. Introduction

McElhanney Ltd. (McElhanney) was retained by the City of Duncan (the Client; the City) to complete a Soil Assessment program prior to construction activities along Marchmont Road in Duncan, BC (the Project). Refer to *Figure 1* for the approximate Project boundary. The purpose of the Soil Assessment was to characterize the quality of soils within the Project construction footprint (the Site) that are anticipated to be excavated as a result of planned construction activities.



Figure 1: Approximate Project Boundary (red outline; imagery courtesy of Google Earth)

2. Background

McElhanney understands that the City is planning to complete water and storm system upgrades and road improvements along Marchmont Road from Trunk Road to Day Road.

2.1. PROJECT OBJECTIVES

The Soil Assessment aims to meet the following objectives:

- To investigate soils in areas of planned soil cuts for potential contamination from the roadway, unknown fill, or other historical activities;
- Characterize soils within the areas of planned soil cuts to determine future soil management and disposal options during construction; and,
- Provide recommendations and associated measures to manage the presence of contamination, if identified, in soil during construction phases of the work.

3. Scope of Work

McElhanney's Soil Assessment for the Site was developed using the McElhanney Issued for Tender drawings dated May 1, 2023. The sampling locations were chosen to target areas of greatest potential for soil disturbance and cuts during construction. The scope of work included:

- Project management, subcontractor coordination and Client communication.
- A desktop search of regulatory and historical databases to assess likelihood and potential sources of contamination including: aerial photographs, BC Contaminated Sites Registry, and Federal Contaminated Sites Inventory.
- A subsurface investigation work plan targeting soils within the Project footprint.
- A site-specific Health & Safety Plan completed by McElhanney field personnel and reviewed by its subcontractors.
- Application for City permits and retention of traffic control.
- Preliminary layout of all planned test hole locations using a handheld GPS
- Completion of a BC One Call and private utility locate of the proposed ground disturbance locations by a third-party subcontractor.
- Advancement of 4 test holes, to a maximum exploratory depth of 1.8 meters below ground surface (mbgs) using hydro vacuum truck (hydrovac).
- Logging of each sample collected for soil type, colour, density, moisture content, staining, odour and other relevant observations in general accordance with McElhanney's Soil Classification Manual for Geotechnical Assessments (based on the modified Unified Soil Classification System).

- Collection of soil samples at regular depth intervals or where geological units changed, for analyses of Potential Contaminants of Concern (PCOCs). Headspace vapour analysis was completed through field screening on each sample collected for the presence or absence of volatiles organic compounds at the time of sample collection using a photoionization detector (PID).
- Collection of one blind field duplicate (BFD) sample at a rate of approximately 1 in 10 for quality assurance/quality control purposes.
- Submission of soil samples to a CALA certified laboratory, ALS Environmental, for analysis on a regular turnaround time.
- Evaluated the soil analytical results to the current applicable BC Contaminated Sites Regulation (CSR) standards for Residential Low Density and Industrial Land Use (RLLD/IL).
- Confirm or refute the presence or absence of contamination and provide an estimate of the possible extent, magnitude, and variability of the contamination.
- Preparation of this Soil Assessment report outlining the results of historical searches, field activities, methodology, analytical results, discussion, an estimate of soil volumes by class and proposed receiving facilities, and conclusions.

4. Desktop Review

4.1. REGULATORY DATABASE REVIEW

4.1.1. BC Ministry of Environment & Climate Change Strategy (ENV) Site Registry Search

The iMapBC Environmental Remediation Sites layer, which is maintained by ENV, was used to perform a 500 m radius search from the edge of the Site for BC Site Registry listings. The Site Registry is a data repository maintained under the provisions of the Environmental Management Act (EMA) and CSR regarding information on activities with contamination causing potential. There were eight listings identified within the 500m search radius as shown on *Figure 2*. The nearest identified site was 230m west of the Project boundary. None of the Registered Sites are considered of environmental concern due to their distance from Site.

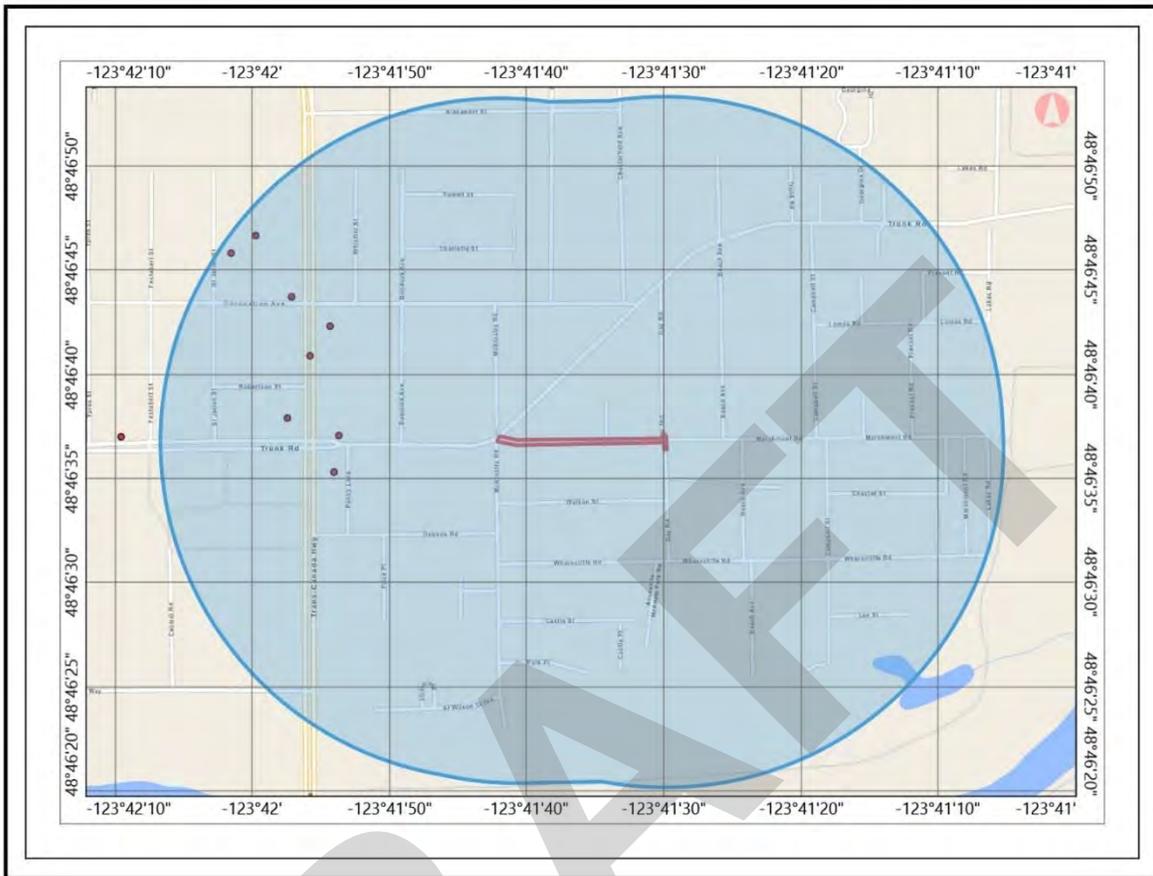


Figure 2: iMap BC BC Site Registry Search Results within 500m of the Project Footprint.

4.2. FEDERAL CONTAMINATED SITES INVENTORY

The Federal Contaminated Sites Inventory (FCSI), which is maintained by the Government of Canada, was used to perform a 500 m search from the edge of Site for all known federal contaminated sites. The FCSI includes information on all known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility (Government of Canada, 1903; 1911).

There was one suspected Federal Contaminated Site (Site 00004571 – Indigenous Services Canada) within the 500 m search area. The site was approximately 300m west of the Project boundary and is not considered of environmental concern due to the distance. Search results are presented on [Figure 3](#).

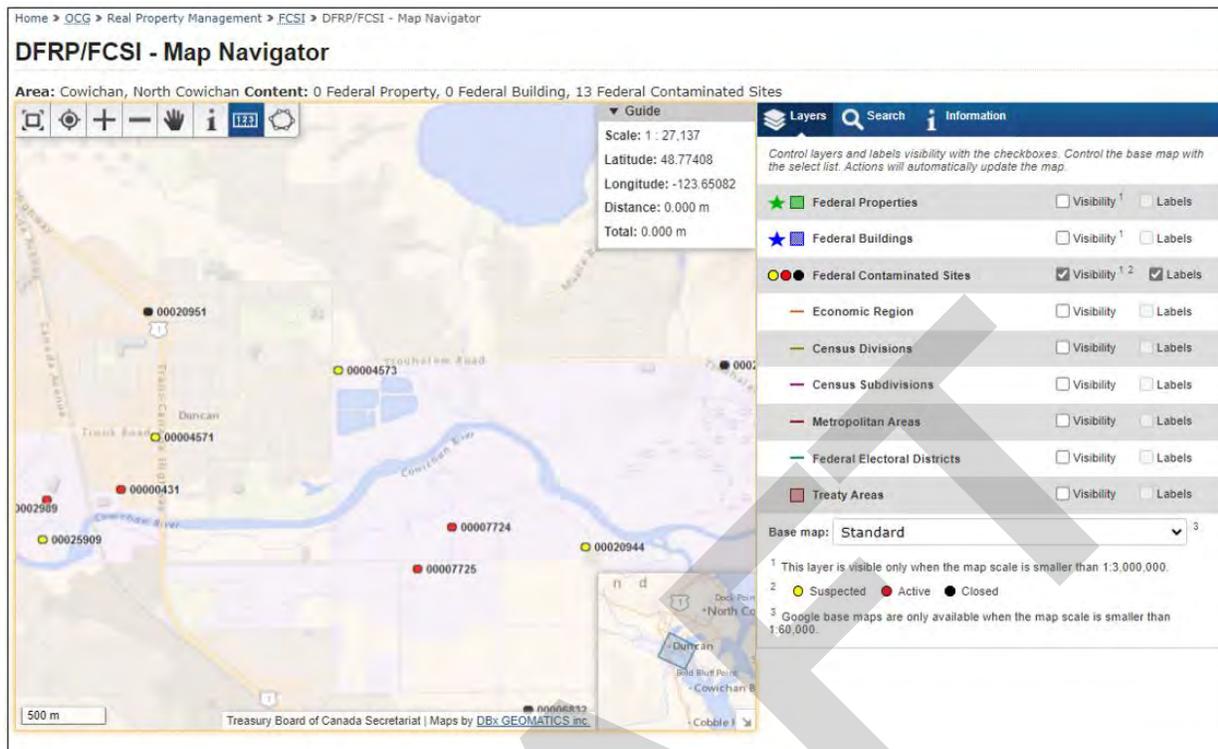


Figure 3: Federal Contaminated Sites Inventory Search results within 500 m of the Site.

4.3. HISTORICAL RECORDS REVIEW

4.3.1. Aerial Photograph Interpretation

Historical aerial photographs were obtained from UBC's Geographic Information Center and images from Google Earth. A selection of photographs were available for review from the following years; 1946, 1956, 1962, 1975, 1986, 1998, 2006, 2012, and 2023. A summary of our review has been presented in *Table 1* and copies of select aerial photographs with a detailed review are provided in *Appendix A*.

Table 1: Aerial Photograph Interpretation.

Year	Photograph Reference	Site Area	Adjacent Properties
1946	BC;246;75	Marchmont Road was visible.	Trunk Road was constructed west and north of the Site. Day Road was partially constructed on the east boundary south of the Site. Watson Street was partially constructed south of the Site. The surrounding area appeared primarily residential and treed. McAdam Park was visible southeast of the Site.
1956	BC2082;69	A clearing for the current Day Road on the northeast boundary of the Site appeared visible.	Further residential development surrounding the Site was observed.

Year	Photograph Reference	Site Area	Adjacent Properties
1962	BC5057;50	Observations were similar to 1956.	Further residential development surrounding the Site was observed. Watson Street appeared to be completed connecting McKinstry Street and Day Road south of the Site.
1975	BC5647-068	Observations were similar to 1962.	Day Road was completed and connected to Trunk Road northeast of the Site. Further residential development was evident. The large residential complex on the corner of Trunk Road and McKinstry Road was constructed.
1986	30BCC394NO138	Observations were similar to 1975.	Observations were similar to 1975.
1998	30BCC98036NO66	Observations were similar to 1986.	Further residential development was observed.
2006	Google Earth	Observations were similar to 1998.	Observations were similar to 1998.
2012	Google Earth	Observations were similar to 2006.	Observations were similar to 2006.
2023	Google Earth	Observations were similar to 2012	Observations were similar to 2012.

Based on the review of available aerial photographs, no on or off-Site concerns were identified.

4.3.2. Potential Contamination Sources Summary

Based on the findings of the desktop review, the main sources of potential contamination within the Project footprint are fill of unknown origins and road salting. The PCOCs are outlined in *Table 2*

Table 2: Summary of Potential Contamination Sources and Potential Contaminants of Concern (PCOCs).

Location	Description	PCOCs
Project Footprint	Potential for fill of unknown origin and road salting on all road Right of Way (ROWs).	Chloride and sodium ions, LEPHs, HEPHs, PAHs, metals

PAHs - Polycyclic aromatic hydrocarbons

LEPH – Light extractable petroleum hydrocarbons

HEPH – Heavy extractable petroleum hydrocarbons

Note that although not a Schedule 2 activity, road salting has been identified as a potential contamination causing activity as we understand that soils originating from trench excavation may be unsuitable for re-use during construction and off-site disposal will be necessary. To accommodate acceptance by local soil disposal dump sites, chloride and sodium ions were added as PCOCs for screening purposes.

5. Regulatory Framework

The investigations described within this report were completed in accordance with the BC EMA, and its associated regulation the BC CSR, the governing provincial legislation on the management and remediation of contaminated sites. Under the EMA, the BC CSR contains the relevant standards to characterize soil, vapour and groundwater quality.

5.1. APPLICABLE SOIL STANDARDS

Soil results were evaluated to the current BC CSR Schedule 3.1 standards. Road ROWs fall under the BC CSR Industrial Land Use (IL) definition and therefore these standards were applied for the Site. The majority of potential soil receiving facilities in the Duncan area require soils to meet BC CSR Residential Low Density (RLLD) Land Use standards. Considering current Site use and the goal of characterizing soils for relocation, standards for IL and RLLD Land uses were applied for the Site in this assessment.

The BC CSR Schedule 3.1 standards consist of the following three parts:

- Part 1 – Matrix numerical soil standards;
- Part 2 – Generic numerical soil standards to protect human health; and,
- Part 3 – Generic numerical soil standards to protect environmental health.

For the matrix standards included in Part 1, the following Site-specific factors were considered applicable:

- Intake of contaminated soil (mandatory);
- Drinking water use (as per ENV Protocol 21);
- Toxicity to soil invertebrates and plants (mandatory); and,
- Groundwater flow to surface water used by freshwater and marine aquatic life.

Groundwater used for irrigation was not considered applicable as the potential receiving sites are not within 500m of agricultural land. Based on this assessment, when soils are relocated, any potential receiving soil sites **must be more than 500m from lands using groundwater for irrigation**. Regional background soil quality estimates for **Region 1 – Vancouver Island**, as outlined in *ENV Protocol 4 – Establishing Background Concentrations in Soil*, were also considered, where applicable (BC ENV, 2021).

6. Methodologies

Field activities were completed June 15 and 16, 2023. Investigation methods were conducted by qualified, trained staff and in general accordance to prescribed guidance documents such as the BC Field Sampling Manual parts A, D, and E (BC ENV, 2013 and 2020). When working on roadways traffic control was used to ensure safe isolation of the work zone. A summary of the methods used during the completion of the field program are provided in the following subsections. Select Site photographs are included in *Appendix B*.

6.1. UTILITY LOCATING

Kelly's First Call Locating (First Call) met with McElhanney field staff on-Site June 15, 2023, to perform the utility clearances prior to ground disturbance activities. A BC One Call was completed by McElhanney prior to arriving on the Site. Available One Call information was reviewed during the utility clearance activities, and utility clearances were completed by use of Electromagnetic (EM) and Ground Penetrating Radar (GPR) scanning to identify any unmarked subsurface utilities or anomalous materials.

6.2. HYDROVAC INVESTIGATION

Hydroforce Excavating Ltd was retained to complete hydrovac activities at four locations on June 16, 2023. Material removed during the hydrovac activities was transported to Environmental 360 Solutions Ltd.'s facility in Nanaimo for disposal.

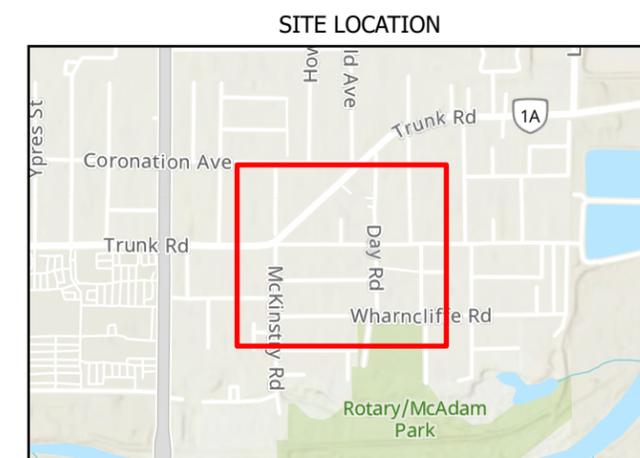
During test hole advancement, soils were logged for soil type, colour, density, moisture content, observed staining, odour, and other relevant observations in general accordance with McElhanney's *Soil Classification Manual for Geotechnical Assessments* (based on the modified Unified Soil Classification System). Select soil samples were collected directly from the soil sample bags, minimizing potential cross-contamination. Sample frequency depended on field observations, including changes in stratigraphy, and results of soil headspace readings. Soil samples were obtained from select depths for field screening and eight soil samples and one duplicate soil sample were submitted for laboratory analysis of PCOCs to ALS Environmental in Burnaby, BC under Chain of Custody. *Table 3* in *Section 7.2* provides a summary of analytical exceedances in soil and the PCOCs analyzed. All other analytical samples were placed on hold for further analysis if required.

Approximate locations of each test hole are presented on *Figure 4*.

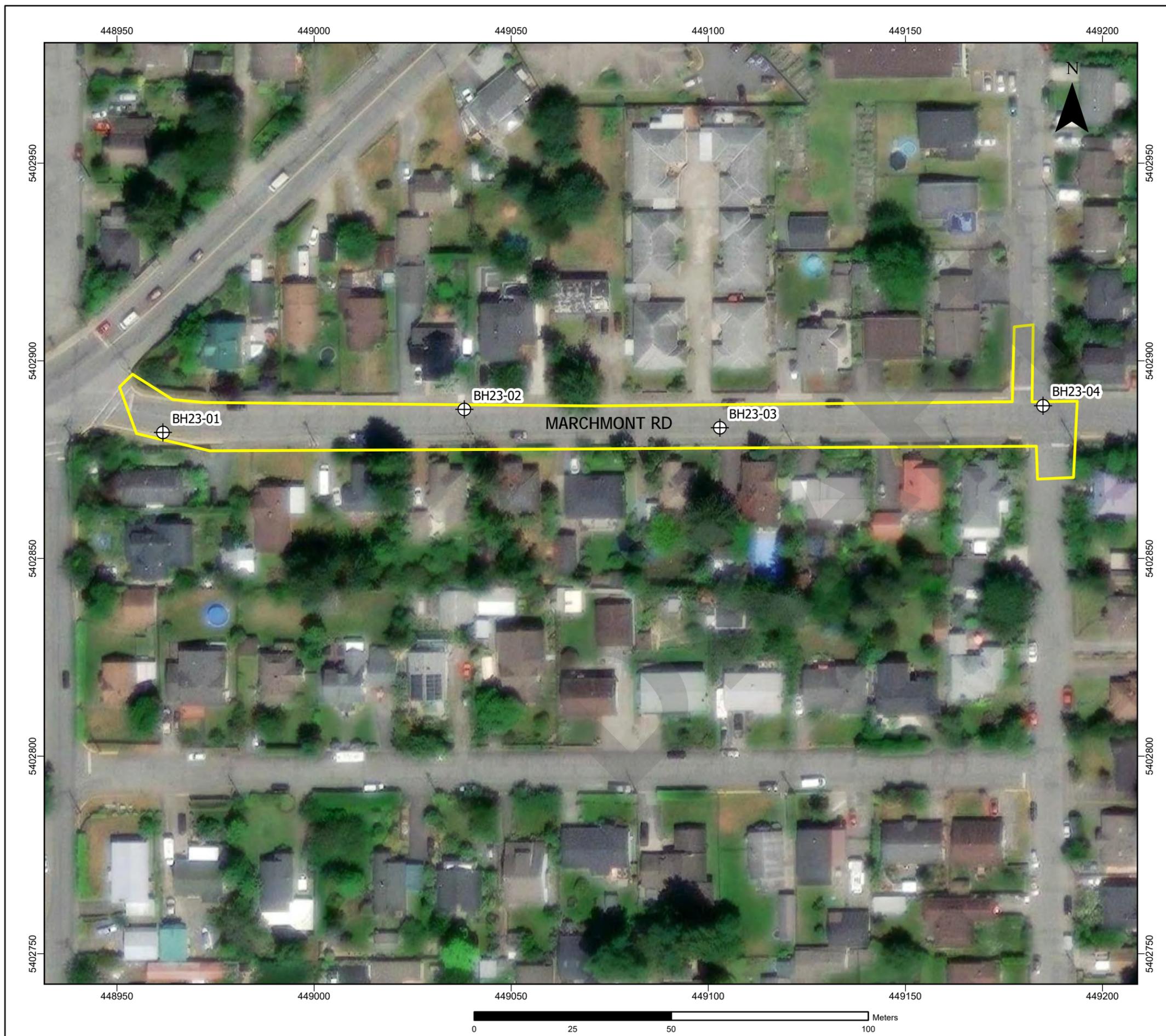
Figure 4: MARCHMONT ROAD
SOIL ASSESSMENT
BOREHOLE LOCATIONS

LEGEND

- ⊕ Borehole Sample
- ▭ Site Boundary



DATE: 2023-06-22
 REV: 0
 SCALE: 1 : 1,000
 COORD: NAD 1983 UTM Zone 10
 PROJECT: 2233-02107-00
 DRAWN BY: JD
 REVIEWED BY: VA



6.3. SOIL SAMPLING

During test hole advancement, select soil samples were collected. At each depth interval, the collected soil sample was divided into two portions: one for potential laboratory analysis and the other for field headspace analysis. Samples collected for laboratory analysis were placed in laboratory supplied 120mL sterilized glass jars and 40 mL pre-weighed methanol vials (using single use Terra-Cores™). Field headspace screening samples were placed into plastic sealable bags (approximately 40% full) and set aside for approximately seven to 10 minutes to allow semi-volatile and volatile organic compounds to partition to the vapour phase within the airspace contained within the bag. The headspace concentration was then measured using a PID in units of parts per million (ppm). All soil samples collected for laboratory analysis were placed into coolers with ice packs and shipped to ALS Laboratory in Burnaby, BC under Chain of Custody.

6.4. QUALITY ASSURANCE / QUALITY CONTROL

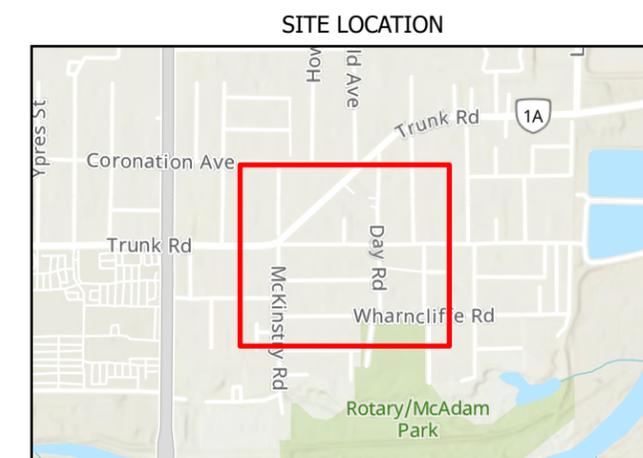
Several Quality Assurance/Quality Control (QA/QC) measures were employed during program sampling. Specifically, the following items identify both in-house and external QA/QC protocols applied:

- Duplicate samples were collected on an approximate 10% frequency and analyzed to evaluate laboratory accuracy.
- The field PID meter was calibrated with isobutylene of a known concentration and zero-calibrated with fresh air prior to use before each day.
- ALS is certified with the Canadian Association for Laboratory Accreditation (CALA) and performs its analytical services under auditable QA/QC standards.
- All activities were conducted by qualified and trained staff.
- The project was managed in accordance with McElhanney's certified ISO 9001 program.
- Soil samples were collected in accordance with the BC Field Sampling Manual.
 - Nitrile gloves were worn during sampling and replaced for each subsequent sample to minimize the potential for cross-contamination between samples.
 - Dedicated disposable Terra-cores were used to sample soils for VOC analysis.
 - All soil samples were collected in laboratory-supplied sterile sampling jars, bottles.
- To preserve sample integrity, samples were shipped in coolers containing ice packs to ALS Laboratory in Burnaby, BC.
- All PCOCs were extracted within their laboratory-prescribed holding time; and
- Summary analytical tables prepared for this report were verified to be true with original analytical records.

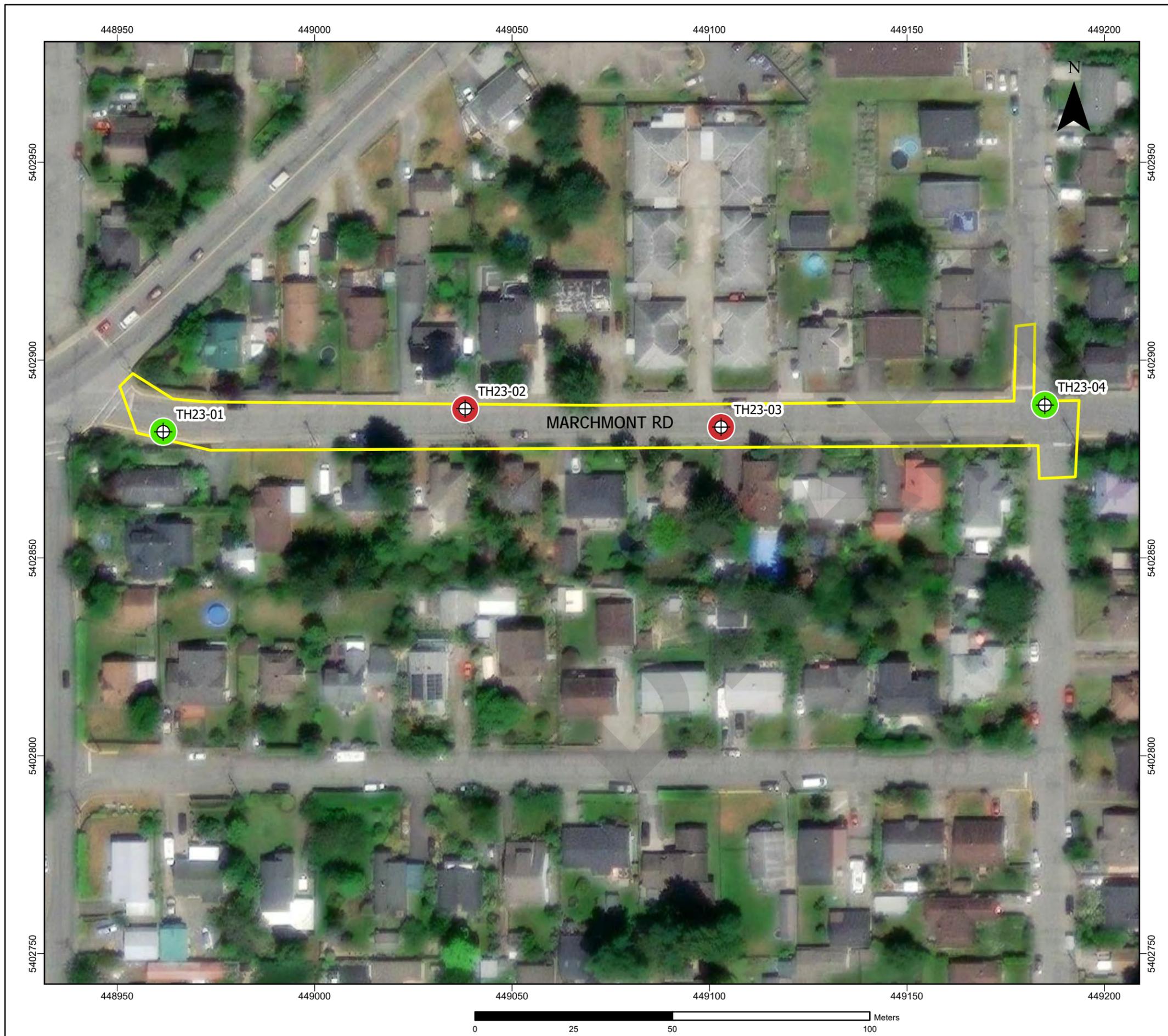
**Figure 5: MARCHMONT ROAD
SOIL ASSESSMENT
BOREHOLE LOCATIONS**

LEGEND

-  Testhole Location
-  Concentrations below BC CSR Standards for RLLD
-  Concentrations exceed BC CSR Standards for IL
-  Site Boundary



DATE: 2023-06-22
REV: 0
SCALE: 1 : 1,000
COORD: NAD 1983 UTM Zone 10
PROJECT: 2233-02107-00
DRAWN BY: JD
REVIEWED BY: VA



7. Results

7.1. GEOLOGY

A general description of the Site's geology observed at the investigation locations is provided below:

- **Asphalt** at surface at thicknesses of approximately 0.05m – 0.08m; underlain by
- **Sand and gravel, trace cobbles** to maximum advanced depths of 1.8m.

The soil samples collected during this investigation were collected from the sidewalls of each test hole. No visible or olfactory indications of petroleum hydrocarbons were noted. An additional layer of asphalt and asphalt fill was noted at location TH23-03 at a depth of approximately 0.3m extending to a depth of approximately 0.9m. Uniform sand was logged at TH23-01 from 0.3mbgs to 1.8mbgs, the western-most location closest to Trunk Rd. No groundwater was encountered during this Soil Assessment.

7.2. ANALYTICAL RESULTS

A summary of soil analytical exceedances from the test holes submitted for laboratory analyses are included in *Table 3* and on *Figure 5*. The detailed analytical results table is included in *Appendix C*. Laboratory Certificates of Analysis are included in *Appendix D*.

Table 3: Summary of Soil Exceedances.

Sample ID	Sample Depth (mbgs)	Soil Sample PID Headspace Reading	PCOCs	Results
TH23-02A	0.3 - 0.6	0.7	Chloride ion, sodium ion, PAHs, LEPH, HEPH, BTEXSM, VPH and metals	Chloride ion > BC CSR IL Standards Select PAHs > BC CSR RLLD Standards
TH23-03A / DUP-A	0.3 - 0.6	0.2	Chloride ion, sodium ion, PAHs, LEPH, HEPH, and metals	Chloride ion and select PAHs > BC CSR IL Standards Sodium ion > BC CSR RLLD Standards
TH23-03B	1.2 – 1.5	0.2	Chloride ion, sodium ion, PAHs, LEPH, HEPH, and metals	Chloride ion > BC CSR IL Standards

Notes:

Formatted Bold – Parameter exceeds applicable standard

PAHs – Polycyclic Aromatic Hydrocarbons

LEPH/HEPH – Light/Heavy Extractable Petroleum Hydrocarbons

VPH – Volatile Petroleum Hydrocarbons

BTEXSM – Benzene, Toluene, Ethylbenzene, Xylenes, Styrene, and MTBE

PPM – Parts per million

IL – Industrial Land Use

RLLD – Residential Low Density Land Use

VOCs – Volatile Organic Compounds

8. Analytical QA/QC

8.1. RELATIVE PERCENT DIFFERENCE (RPD)

Blind field duplicate (BFD) samples were collected during the investigation to assess laboratory precision. Two duplicate soil samples were analyzed during the investigation.

Relative Percent Difference (RPD) calculations were conducted on select sample sets where duplicate samples were collected. Relative percent difference was calculated using laboratory result values of a select sample, its duplicate result, and the equation $\% \text{ Difference} = \frac{|E_1 - E_2|}{\frac{1}{2}(E_1 + E_2)} \cdot 100$. Descriptive statistics were applied to each duplicate sample.

The RPD results are considered less precise when the concentration of a given parameter is less than five times the analytical laboratory Reportable Detection Limit (RDL). Consequently, RPD values were not calculated in instances when the concentration of either the sample or duplicate sample are less than five times the RDL and/or either sample is reported at concentrations less than the RDL. Generally, the range of acceptable values for RPD is 20% to 50% with values under 20% considered with a higher degree of assurance. The sample duplicate RPD Data Quality Objectives (DQO) provided in the BC Environmental Laboratory Manual are summarized in *Table 4* for each of the PCOCs analyzed.

Table 4: Sample Duplicate Data Quality Objectives (BC Environmental Laboratory Manual).

Parameter Category	Recommended Laboratory DQOs (RPD %)
Organics in Soil	
<i>Polycyclic Aromatic Hydrocarbons</i>	50
<i>Volatile Organics (including BTEX and VH)</i>	40
<i>Extractable Petroleum Hydrocarbons (EPH, LEPH, HEPH)</i>	40
<i>Most Other Typical Organic Parameters</i>	40
Metals in Soil	
<i>High Variability Metals (Ag, Al, Ba, Hg, K, Mo, Na, Pb, Sn, Sr, Ti)</i>	40
<i>Other Metals</i>	30
Inorganics	
<i>General Inorganics in Soil</i>	30

RPD values were calculated in soil for parameters with concentrations greater than five times the RDL. Inorganics (metals and salinity), LEPH, HEPH, and PAH parameters for the duplicate sample pair met these criteria and results are summarized in *Table 5*. In instances where the calculated RPD values were greater than the 30% threshold, a review of those samples was conducted to confirm if additional analysis was warranted:

- Uranium results were calculated above the 30% threshold at 30.8%

- 1-Methylnaphthalene, a PAH parameter, results were calculated above the 50% threshold at 50.5%

The RPD values above thresholds are likely due to heterogeneity within the fill soil unit. Both PAH concentrations for 1-methylnaphthalene and uranium concentrations are well below the applicable standards. Outside of these above noted parameters, the remainder of the RPD values in soil are below the DQOs. In addition, ALS Laboratories implements internal QA/QC procedures and checks using certified reference materials, duplicates, method blanks and method spikes. McElhanney reviewed the laboratory QA/QC, and no issues were identified.

Table 5: Summary of RPD Calculations.

Sample ID / Duplicate ID	Parameter	Sample Size	Standard Deviation (%)	Upper 95% Confidence Limit	Average RPD (%)	RPD Range (%)
TH23-03A / DUP-A	Inorganics: metals, chloride ion, sodium ion	28	7.42	12.43	10.13	0.7 – 30.8
TH23-03A / DUP-A	LEPHs / HEPHs	2	1.88	30.07	27.88	26.5 – 29.2
TH23-03A / DUP-A	PAHs	19	12.30	28.63	23.99	8.4 – 50.5

Based on the result of RPD calculations and our review of the ALS QA/QC report, McElhanney considers the results accurate and reliable for the purposes of this investigation.

9. Conclusions

Based on the findings of this Soil Assessment and the information available at the time of this investigation, McElhanney makes the following conclusions:

- The soil stratigraphy within the Project area is generally comprised of 0.05m of asphalt, followed by sand and gravel fill to maximum explored depths of 1.8m.
- Asphalt fill was discovered at location TH23-03 on the south side of Marchmont Road to depths of 0.9m and is inferred to be the source of the elevated PAHs identified in this area. The full extent of the asphalt fill is unknown at this time, however it was not identified on the north side of Marchmont at locations TH23-02 and TH23-04. Therefore, the estimated extents of soils containing IL+ PAHs continue west until TH23-01, east to the end of the alignment, and to the centerline of the road.
- Extents of all other contaminants were estimated as halfway between a contaminated sample and a clean sample.
- No groundwater was encountered during the investigation.
- Chloride ions and select PAHs were identified in areas of fill soils as exceeding BC CSR IL standards. Sodium ions were identified in areas of fill soils exceeding BC CSR RLLD standards. Select soils within the Project footprint are of concern and will need to be managed appropriately during construction.

A summary of soil quality along the project alignment referring to construction stations in the McElhanney IFT drawings submitted May 1, 2023 and depths below existing ground surface is provided in [Table 6](#) and on annotated [Figures 201](#) and [202](#) from the IFT drawings dated May 1, 2023.

Table 6: Summary of Soil Quality Along the Project Alignment.

General Location	Construction Element	Soil Quality	Parameters Exceeding Applicable Standard	Construction Stations		Depth Below Existing Ground Surface		Approximate Cross-Sectional Area (m ²)	Preliminary Soil Volume Estimate (m ³)
				From (m)	To (m)	From (m)	To (m)		
Marchmont Rd	Water main	RLLD-	-	1+012.03	1+027.225	below asphalt	trench depth	28	35
Marchmont Rd	Water main	IL+	PAHs and chloride ions	1+027+225	1+252.71	below asphalt	0.9	203	245
Marchmont Rd	Water main	IL+	Chloride ions	1+027+225	1+252.71	0.9	trench depth	169	205
Marchmont Rd	Storm main	IL+	Chloride ions (RLLD+ PAHs)	1+084.56	1+177.92	below asphalt	0.9	84	100
Marchmont Rd	Storm main	RLLD+	PAHs	1+084.56	1+177.92	0.9	trench depth	58	70
Marchmont Rd	Storm main	RLLD-	-	1+177.92	1+250.48	below asphalt	trench depth	116	140
Marchmont Rd	Roadway	RLLD-	-	1+000	1+026.5	below asphalt	0.5	71	30
Marchmont Rd (eastbound lane) Day Rd (southbound lane)	Roadway	IL+	PAHs & Chloride ions	1+020	1+262	below asphalt	0.5	1270	540
Marchmont Rd (westbound lane)	Roadway	IL+	Chloride ions	1+026.5	1+177.92	below asphalt	0.5	981	420
Marchmont Rd (westbound lane) and Day Rd (northbound lane)	Roadway	RLLD-	-	1+177.92	1+255	below asphalt	0.5	504	215

Notes:

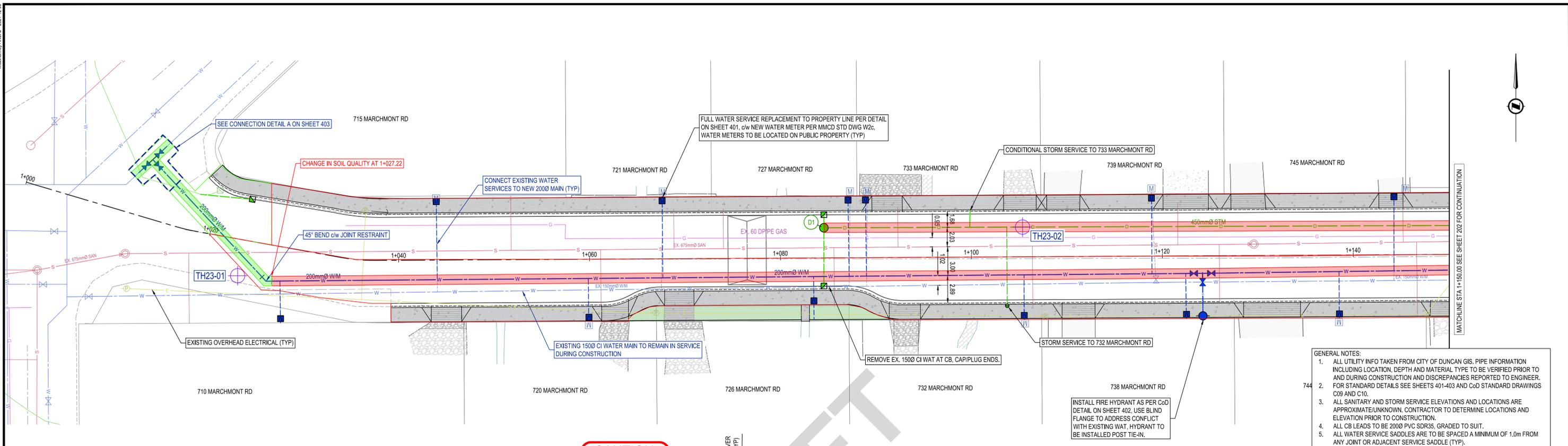
RLLD -: Concentrations of parameters in soil are less than BC CSR Residential land use standards.

RLLD +: Concentrations of parameters in soil are greater than BC CSR Residential low density land use standards but less than BC CSR industrial land use standards.

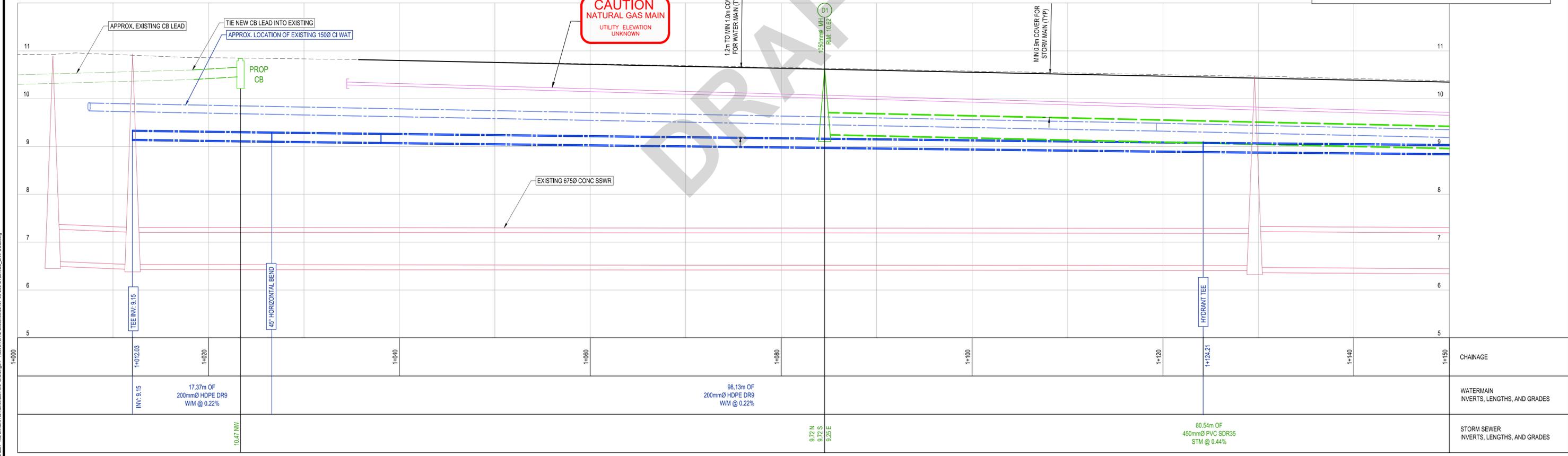
IL +: Concentrations of parameters in soil are greater than BC CSR Industrial land use standards.

Construction stations are as per McElhanney IFT drawings dated May 1, 2023.

Concentrations of chloride ions were between 40-100 ug/g in certain areas. All residential quality soils must be taken to a facility that accepts chloride ions up to 100ug/g. Residential quality soils cannot be relocated to an area within 500m of a groundwater well used for irrigation.



- GENERAL NOTES:
1. ALL UTILITY INFO TAKEN FROM CITY OF DUNCAN GIS. PIPE INFORMATION INCLUDING LOCATION, DEPTH AND MATERIAL TYPE TO BE VERIFIED PRIOR TO AND DURING CONSTRUCTION AND DISCREPANCIES REPORTED TO ENGINEER. FOR STANDARD DETAILS SEE SHEETS 401-403 AND CoD STANDARD DRAWINGS C09 AND C10.
 2. ALL SANITARY AND STORM SERVICE ELEVATIONS AND LOCATIONS ARE APPROXIMATE/UNKNOWN. CONTRACTOR TO DETERMINE LOCATIONS AND ELEVATION PRIOR TO CONSTRUCTION.
 3. ALL CB LEADS TO BE 2000 PVC SDR35. GRADED TO SUIT.
 4. ALL WATER SERVICE SADDLES ARE TO BE SPACED A MINIMUM OF 1.0m FROM ANY JOINT OR ADJACENT SERVICE SADDLE (TYP).



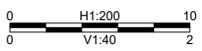
Rev	Date	Description	Drawn	Design	App'd
PB	2023-06-26	ANNOTATION FOR SOIL MANAGEMENT	VA	-	-
PB	2023-05-01	ISSUED FOR TENDER	MR	MR	JL
PA	2023-04-19	ISSUED FOR PERMITTING	MR	MR	JL

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ORIGINAL DWG SIZE: ANSI D (22" x 34")



McElhanney

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Duncan BC
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T 250 748 3335

PERMIT TO PRACTICE
McElhanney Ltd.
PERMIT NUMBER: 1002299
Engineer and Geotechnical Engineer

DUNCAN

PRELIMINARY
NOT FOR
CONSTRUCTION

THIS DRAWING HAS NOT BEEN APPROVED AND MAY CONTAIN ERRORS AND OMISSIONS

CITY OF DUNCAN
200 CRAIG STREET DUNCAN, BC V9L 3Y2

MARCHMONT RD RENEWAL

UTILITY PLAN & PROFILE - STA 1+000.00 TO 1+150.00

Drawing No.	201
Project Number	2233-02107-00
Rev.	PB

A preliminary estimate of neat soil volumes for each soil quality identified is provided in *Table 7*.

Table 7: Preliminary Estimate of Neat Soil Volumes for Each Soil Quality Class.

Soil Quality	Preliminary Soil Volume Estimate (m ³)	Relocation / Disposal	Potential Disposal Facilities
RLLD -	420	Soils may be reused on Site within the ROW. Soils can be relocated to any facility that accepts RLLD- soils with chloride ions up to 100 ug/g.	-
RLLD+	70	Soils may be reused on Site within the ROW. Soils can be relocated to any facility that accepts soils greater than RLLD standards and less than IL standards.	-
IL+ Chloride Ions	1,510	Soils are considered a waste and must be disposed of at a permitted facility.	GRT Facility Duke Point Nanaimo, BC 250-883-1124 https://www.grtenv.com/contact-us

Notes:

RLLD -: Concentrations of parameters in soil are less than BC CSR Residential land use standards.

RLLD+: Concentrations of parameters in soil are greater than BC CSR Residential low density land use standards but less than BC CSR industrial land use standards.

IL+: Concentrations of parameters in soil are greater than BC CSR Industrial land use standards.

Concentrations of chloride ions are between 40-100 ug/g in certain areas. All residential quality soils must be taken to a facility that accepts chloride ions up to 100ug/g. Residential quality soils cannot be relocated to an area within 500m of a groundwater well used for irrigation.

Volumes were estimated using the IFT drawings submitted May 1, 2023 and the following assumptions:

- Assumptions in soil volume estimate calculations include:
 - Average trench width of 1.2m;
 - Neat soil volumes provided are in-situ and do not account for any soil bulking factors;
 - Calculations are based on McElhanney IFT drawings dated May 1, 2023, and include main lines only;
 - Depth of soils that will be disturbed in roadway improvement areas of 425mm; and,
 - Bedding under the pipe invert of 150mm.

10. Recommendations

Given the findings of the Soil Assessment completed at the Site, McElhanney recommends the following:

- Complete additional sampling to further delineate and potentially reduce IL+ soil volumes. This sampling can be deferred following tender closing when the contract has been awarded during utility locating or potholing activities by the successful proponent.
- A Soil Management Plan (SMP) is recommended for the proposed construction of the Project. The SMP will define roles and responsibilities for the work, identify soil handling, transport, and disposal procedures, outline reporting requirements, and inform crews of visual cues that will assist with the identification of potential chance finds for contaminants during the execution of the project. The SMP would reference the findings of this report and speak to the contractor's requirements for off-site disposal.
- Review of the analytical results by a Qualified Professional upon selection of a receiving Site for disposal to confirm assumptions made within are applicable to the disposal location.
- Remediation of soil beyond the areas that will be disturbed as a result of construction is not required. The City is not required at this time to chase or remediate the impacts of the historical contamination within the roadway as there is an exemption from doing so by BC ENV. However, it is conceivable that future work and maintenance in this area will be required. The City should make third parties and staff aware of the environmental concerns during future permitting requests. Any and all future work should include consideration of the contaminants of concern as identified herein.

11. Professional Statement and Closure

In conformance with applicable regulations, we confirm that:

- This Soil Assessment has been prepared in accordance with the applicable standards; and
- The undersigned have demonstrable experience in investigation of the type of contamination at the Site for which this statement applies and are familiar with the investigation carried out at the Site.

McElhanney appreciates the opportunity to provide environmental services to the City of Duncan and we look forward to working with you for the duration of this assignment. If you have any questions regarding the information within, please do not hesitate to contact the undersigned.

Yours Truly,

McELHANNEY LTD.

Prepared by:

Reviewed by:

DRAFT

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12. Limitations of Report

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Investigation and Subsurface Risks. The environmental characterization data was collected in general accordance with the standards and methods identified in the document by experienced professionals. Subsurface conditions between boreholes, monitoring wells, and sampling locations have been based, by necessity, on assumptions of what exists between the actual locations sampled or investigated and may vary significantly from actual site conditions. Interpretations of groundwater levels and flow direction are based on water level measurements at selected monitoring well locations and are expected to fluctuate. Borehole and monitoring well observations indicate the approximate subsurface conditions at those locations only. Even a comprehensive sampling and testing program, implemented in accordance with appropriate equipment by experienced personnel, may fail to detect certain conditions. Actual conditions may vary significantly between the points investigated and all persons making use of this report should be aware of, and accept, this risk. Subsurface sampling may result in unavoidable contamination of certain subsurface areas not known to be previously contaminated such as, but not limited to, a geologic formation, the groundwater or other hydrous body. McElhanney is not responsible for such contamination.

Information from Client and Third Parties. McElhanney has relied in good faith on information provided by the Client and third parties noted in this report and has assumed such information to be accurate, complete, reliable, non-fringing, and fit for the intended purpose without independent verification. McElhanney accepts no responsibility for any deficiency, misstatements or inaccuracy contained in this report as a result of omissions or errors in information provided by third parties or for omissions, misstatements or fraudulent acts of persons interviewed.

Independent Judgments. McElhanney will not be responsible for the independent conclusions, interpretations, interpolations and/or decisions of the Client, or others, who may come into possession of this report, or any part thereof. This restriction of liability includes decisions made to purchase, finance or sell land.

Effect of Changes. All evaluations and conclusions stated in this report are based on facts, observations, site specific details, legislation and regulations as they existed at the time of the investigation. Some

conditions are subject to change over time and the Client recognizes that the passage of time, natural occurrences, and direct or indirect human intervention at or near the site may substantially alter such evaluations and conclusions. Regulatory statutes are also subject to change and interpretation, which may change over time. McElhanney should be requested to re-evaluate the conclusions of this report and to provide amendments as required prior to any reliance upon the information presented herein upon any of the following events: a) any changes (or possible changes) as to the site or regulatory requirements upon which this report was based, or b) new information is discovered in the future during site excavations, building demolition or other activities, or c) additional subsurface investigations or testing conducted by others.

DRAFT

13. **References**

- BC Ministry of the Environment and Climate Change Strategy. (BC ENV). 2013 and 2020. *British Columbia Field Sampling Manual – For Continuous Monitoring Plus the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples*.
- BC Ministry of the Environment and Climate Change Strategy. (BC ENV). 2021. *Contaminated Sites Regulation*, BC Reg. 375/96, includes Stage 10/11 Housekeeping Amendments, March 2021.
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