

September 29, 2021

FOI No: 2021-36

VIA E-MAIL – Redacted

Redacted

Dear Redacted

Re: Request for Records
Freedom of Information and Protection of Privacy Act

The City of White Rock has reviewed your request for access to the following records pursuant to the Freedom of Information and Protection of Privacy Act (the "Act"):

- *Regarding the development at 1454 Oxford Street:*
 - *the hydrogeological and geotechnical reports*
 - *Approval in Principle of a remediation plan from the Ministry of Environment*
 - *Indemnity Agreement executed by the Developer*

Access to these records is available. However, some of the information in the records is excepted from the disclosure requirements of the Act. I have severed the excepted information so that I could disclose to you the remaining information as attached.

The severed information is excepted from disclosure under section 22 of the Act. Severing is necessary to avoid disclosing third-party personal information without permission.

Please contact our office if you have any questions or concerns.

Sincerely,



Ken Overton
Manager, Property, Risk Management, and FOI
604-541-2104

Att.

Corporate Administration
P: 604.541.2212 | F: 604.541.9348

City of White Rock
15322 Buena Vista Avenue, White Rock BC, Canada V4B 1Y6

WHITE ROCK
City by the Sea!

www.whiterockcity.ca

If you believe that the City of White Rock has been unreasonable in its handling of your request, you may ask the Information and Privacy Commissioner to review our response. You have 30 days from receipt of this notice to request a review by writing to:

Office of the Information and Privacy Commissioner
3rd Floor, 756 Fort Street
Victoria BC V8W 1H2

Should you decide to request a review, please provide the Commissioner's office with:

1. your name, address, and telephone number;
2. a copy of this letter;
3. a copy of your original request sent to the City of White Rock; and
4. the reasons or grounds upon which you are requesting the review.



Stantec Consulting Ltd.
500-4730 Kingsway, Burnaby BC V5H 0C6

January 12, 2016
File: 123312347

Attention: Mr. Steve Commons
#1550 – 1185 West Georgia Street
Vancouver, BC V6E 4E6

Dear Mr. Commons,

Reference: Desktop Geotechnical Assessment of 1454 Oxford Street, White Rock, BC

INTRODUCTION

In accordance with the authorization received by Trez Capital (Trez) of our proposal dated January 6, 2016, Stantec Consulting Ltd. (Stantec) has prepared this letter report to summarize the findings of our desktop geotechnical assessment of the property located at 1454 Oxford Street, in White Rock, BC.

PROJECT UNDERSTANDING

It is our understanding that Trez is considering financing the acquisition of the land for a proposed development to be located at the above referenced property. Trez was provided a previously prepared Stantec geotechnical report '*Preliminary Geotechnical Assessment – 1454 Oxford Street White Rock, BC*', dated July 16, 2012, prepared for Epcor Utilities Inc. (Epcor).

At the time of the preparation of the 2012 Stantec report, the type of development was unknown and preliminary geotechnical recommendations were provided for options including lightly loaded residential structures (i.e., wood-framed buildings up to 5 stories with columns load less than 300 kN) and moderately loaded medium-rise residential structures (i.e., reinforced concrete towers between 5 and 10 stories with multiple levels of underground parking, with column loads of less than 1000 kN).

Trez has provided Stantec with architectural drawings prepared by Chris Dikeakos Architects Inc. (CDA), (Drawing No.s A1.00 to A5.09, dated October 6, 2015) prepared for submission for advisory design panel review.

Based on a review of the drawings, we understand that the proposed development will comprise of two residential towers with adjoining common and amenity areas occupying the majority of the site area. The residential towers, "Tower A" and "Tower B", will rise 21 and 24 floors from sidewalk level to maximum heights of 71 m and 82 m, respectively. The available drawings suggest that the towers will each have a footprint area of 775 m² excluding the adjoining common and amenity areas. The development will include three levels of parking below the proposed development. The final depth of the parking areas below surrounding site grades has not been specified at this time.



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Reference: Desktop Geotechnical Assessment of 1454 Oxford Street, White Rock, BC

Based on our experience with similar developments, it is anticipated that the base of the parking areas/foundations elevation would be 9 to 12 m below surrounding site grades depending on parking level heights and structural slab thicknesses.

SCOPE OF WORK

This desktop geotechnical assessment consisted of a review of published surficial geological maps, our existing test hole information for the site, and a review of similarly sized developments in the area, in order to provide comments on the suitability of the site soil and groundwater conditions considering the currently proposed development.

LIMITATIONS

As Trez has requested that no additional subsurface investigation be completed at this time, the information presented by Stantec will not be definitive, but rather an opinion of probable soil conditions and the suitability of the probable soils in consideration of the proposed development. Based on this limitation, the appropriate level of caution should be used when relying on this information.

SUBSURFACE CONDITIONS

Surficial Geology

Based on our review of surficial geology map 1484A¹, the project site is on the boundary between two soil units:

- Capilano Sediments: marine and glaciomarine stony (including till-like deposits) to stoneless silt loam to clay loam with minor sand and silt normally less than 3 m thick but up to 30 m thick, containing marine shells.
- Vashon Drift: lodgment till (with sandy loam matrix) and minor flow till containing lenses and interbeds of glaciolacustrine laminated stony silt.

Our previous experience within the vicinity of the proposed project indicates similar soil conditions to those described above.

¹ Armstrong, J.E. and Hicock, S.R. (1980). *Surficial Geology, New Westminster, West of Sixth Meridian, British Columbia*, Map 1484A, Geological Survey of Canada, "A" Series Map, December 1, 1980.



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Reference: Desktop Geotechnical Assessment of 1454 Oxford Street, White Rock, BC

Subsurface Investigation

Stantec completed a geotechnical subsurface investigation on June 6th, 2012, at the subject site. The subsurface investigation involved completing eight (8) test holes to depths between 3 m and 7 m. As per our report dated July 16, 2012, the soil conditions at the proposed site generally consist of a thin surficial layer of loose topsoil, underlain by variable fill, further underlain by stiff to very stiff lean silt and clay soils.

A subgrade water reservoir was previously located at the site, with the approximate location shown on Drawing No.1 (attached). To the south of the former reservoir location, the topsoil is underlain by 1.8 m to 2.1 m of loose to compact silty sand fill, which in turn is underlain by native 0.6 m to 0.9 m of compact silty sand with gravel, further underlain by stiff to very stiff soils consisting of lean clay (with fine sand) to the maximum 3.1 m termination depth of test holes TH12-01 and TH12-02.

In areas to the east, west, and north of the former reservoir, the topsoil is underlain by 0.6 m to 1.8 m of loose to compact variable silt and sand fill, which in turn is underlain by stiff to very stiff soils consisting of lean clay (with fine sand) to the maximum 3.1 m termination depth of test holes TH12-03, TH12-05, TH12-07 and TH12-08.

Within the former reservoir location, the topsoil is underlain by 4.6 m of loose to compact variable silt and sand fill underlain by stiff to very stiff soils consisting of lean silt (with sand and gravel) to the maximum 7 m depth of TH12-04 and TH12-06.

The stiff to very stiff lean clay and silt encountered beneath the fill is considered to be glaciated and till-like and considered to be the Capilano Sediments described in the published surficial geology information.

Monitoring wells installed during a separate environmental investigation of this site indicated that the groundwater table was intercepted at a depth ranging between 7.0 m and 8.4 m below current site grades.

Test holes were not completed at the east half of the site due to the heavy density of trees and the environmental restrictions in this area at the time of the investigation. It is understood that no development is currently proposed for this area.

It should be noted that none of the Stantec test holes were completed to the anticipated depth of the currently proposed development (9 to 12 m below surround site grades).



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Reference: Desktop Geotechnical Assessment of 1454 Oxford Street, White Rock, BC

DEVELOPMENT REVIEW – SURROUNDING AREA

Stantec completed a review of medium to high rise sized developments in the surrounding area, in order to provide comments on the suitability of the local soils to support similarly size developments, with our findings summarized in Table 1.

Table 1 Similar Developments within Project Vicinity

Development Name	Maximum Height (Storeys)	Distance from the Site (Direction)
The Belaire	12	200 m (N)
Beverley by Cressy	12	250 m (E)
Miramar Village by Bosa Properties	21	700 m (E)
Avra by Epta Properties	17	830 m (E)
Vista Royale	13	960 m (NE)

Based on this review, the proposed residential "Tower B" will be the highest in the area, with "Tower A" matching that of one of the towers at Miramar Village. Similar to the proposed development, the Miramar Village development was found to have three underground levels of parking.



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Reference: Desktop Geotechnical Assessment of 1454 Oxford Street, White Rock, BC

CONCLUSION

Based on the desktop review of available resources (surficial geology maps, subsurface data), and our experience in this area, it is considered that the soil conditions are likely to consist of topsoil underlain by up to 2.1 m of compact variable silt and sand fill (4.6 m in the former reservoir location) which in turn is underlain by stiff to very stiff soils consisting of lean silt and clay (glaciated, till-like). Based on the limited groundwater information, groundwater could be intercepted between 7.0 m and 8.4 m below current site grades. It is anticipated that the proposed development would be founded within the till-like deposit of stiff to very stiff lean clay and potentially below the groundwater level.

Based on our experience with the native fill-like soils encountered at the site and the successful completion of similar height developments in the surrounding area, the native till-like soils would be suitable to support the proposed residential towers on conventional spread footings or raft slab foundations, following site preparation works which could include tree removal and grubbing, stripping of topsoil, removal of fills (poor quality and not suitable for re-use), compaction of native soils, and placement of import fills to achieve design site grades.

It is not anticipated that preloading, ground improvement, or deep foundations would be required for the proposed development based on the anticipated soil conditions. Additionally, for the construction of the underground parking structure/foundations, these soils would be suitable to maintain near vertical excavation walls with the use of a conventional temporary shotcrete and anchor shoring system.

If the groundwater level is above the base of the foundation or underground parking elevations, conventional solutions such as temporary construction dewatering and permanent foundation wall 'tanking' with suitable underside of slab drainage could be utilized.

As none of the Stantec boreholes have been completed to the anticipated depth of the proposed development, and these boreholes do not provide adequate site coverage for the proposed residential development, and the current ground water information is limited, a detailed geotechnical assessment is required to confirm the anticipated soil conditions and to collect the required detailed subsurface information to support the detailed design of the proposed development.



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Reference: Desktop Geotechnical Assessment of 1454 Oxford Street, White Rock, BC

CLOSING

This report was prepared for the exclusive use of Trez Capital and their agents. Any use of this report or the material contained herein by third parties, or for other than the intended purpose, should first be approved in writing by Stantec.

Stantec would be pleased to work with the Trez or its clients to provide additional services for this or other properties as required. Stantec is a multi-disciplinary consulting firm which provides engineering services including geotechnical, civil, mechanical, electrical and structural, in addition to architectural, land development, environmental, archeological, transportation for detailed design and construction of residential developments.

We trust that this letter will serve your immediate needs. If you have any questions, please contact us. At a future date, we would be pleased to provide additional services to this project.

Regards,

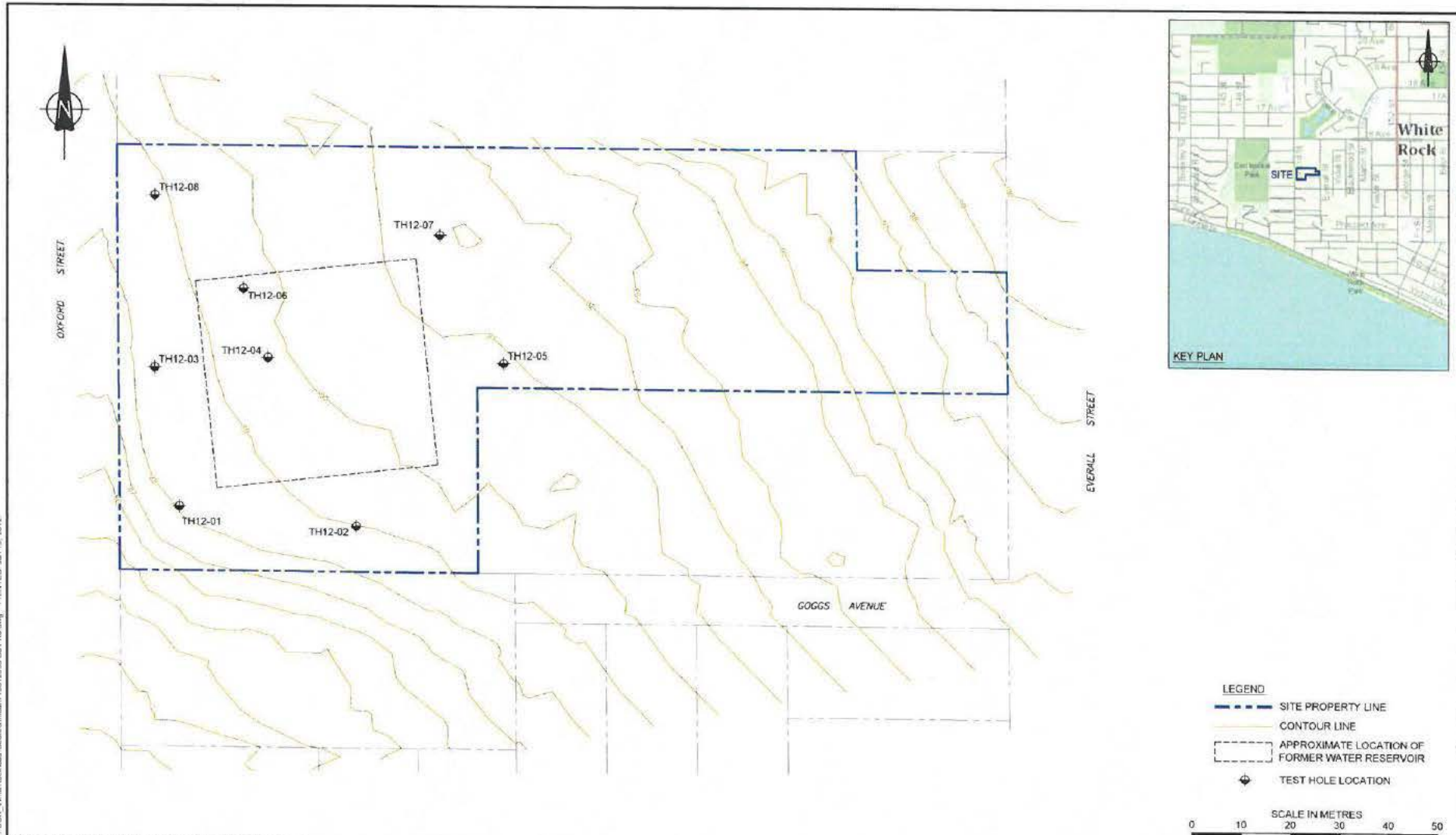
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LEGEND

- SITE PROPERTY LINE
- CONTOUR LINE
- APPROXIMATE LOCATION OF FORMER WATER RESERVOIR
- TEST HOLE LOCATION

SCALE IN METRES

0 10 20 30 40 50

1:750

NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

Reference: BUTLER SANDVICK FILE: 4202 DWG: 4202-T1 DATE: MAY 25TH, 2012	Job No.: 115612093 Scale: 1:750 Date: 19-June-12 Dwn. By: SS App'd By: JP	Client: EPCOR UTILITIES INC. Site Address: 1454 OXFORD STREET WHITE ROCK, BC	GEOTECHNICAL SITE ASSESSMENT	TEST HOLE LOCATION PLAN	Dwg. No.: <div style="font-size: 24pt; text-align: center;">1</div>	
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R:\2011\stareck\115612093_EPCOR\WhiteRock\Geotech\115612093.DWG PRINTED Jun 19, 2012



28 June, 2016

Victoria File: 26250-20/18637
SITE: 18637

VIA EMAIL ONLY: matthew.redmond@stantec.com and cmcbeath@whiterockcity.ca

Stantec Consulting Ltd.
4370 Dominion St. 5th Floor
Burnaby, V5G 4L7
Attention: Matthew Redmond

City of White Rock
15322 Buena Vista Avenue
White Rock, BC V4B 1Y6
Attention: Chris McBeath

Dear Matthew Redmond:

**Re: Release Request – Subdivision, Zoning and Development Applications
1454 Oxford Street, White Rock
PID: 029-076-234**

This letter is to acknowledge receipt of the proponent's request for release of the above-referenced subdivision, zoning and development applications. According to our records, there is an outstanding requirement for a preliminary site investigation for the subject site as outlined in our site profile decision letter dated 27 November, 2015. Investigation of all environmental media must be conducted until the full extent of contamination is determined at the site and which has migrated from the site. Section 58 and 59 of the Contaminated Sites Regulation describe the requirements for the conduct of preliminary and detailed site investigation and the content of reports based on those investigations.

The ministry has received the following information in support of a release request for the above-referenced applications:

1. A written opinion from Bob Beck, Approved Professional, dated 22 June, 2016 with the site investigation reports and remediation plan and schedule attached, confirming that:
 - (a) the parcel is not a high risk site;
 - (b) all contamination at and migrating from the proponent's parcel has been delineated on the proponent's parcel and neighbouring parcels;

- (c) remediation of all contamination at the proponent's parcel to applicable standards is achievable prior to occupancy; and
 - (d) once remediation is complete, the proponent's parcel will meet applicable environmental quality standards and criteria in the Regulation and will be eligible for a Certificate of Compliance.
2. A commitment in writing from Jatinder Minhas, Elegant Oxford Project Corp., dated 13 May, 2016 indicating that the parcel will be remediated in accordance with the remediation plan.

Based on the information provided, we are prepared to provide the necessary release so that the City of White Rock may proceed with approval of the subdivision, zoning and development applications. To that end, please accept this letter as notice pursuant to *Land Title Act* (section 85.1(2)(e)) and *Local Government Act* (section 557(2)(e)), that the City of White Rock may approve the subdivision, zoning and development applications under this section because the Director has received and accepted a notice of independent remediation with respect to the site.

As a condition of the release and pursuant to section 54(3)(d) of the *Environmental Management Act* (Act), the Director imposes the following requirements on the proponent with respect to the site:

1. Remediation, including monitoring, inspections and maintenance of any works, undertaken on the parcel being developed must be completed in the manner and schedule specified in the remediation plan entitled "Site Remediation Work Plan, 1454 Oxford Street, White Rock, BC", prepared by Stantec and dated 13 May, 2016 for as long as the project proceeds, or as agreed by the Director in response to an acceptable request for modification.
2. A statement by an Approved Professional must be submitted to the Director annually, within 30 days of the anniversary of the date of issue of this letter. The statement shall include the following:
 - a. A summary of remedial activities undertaken during the reporting period; and
 - b. Assessment of overall remediation progress, including evaluation in comparison to the actions and schedule set out in the plan(s) referenced above.
3. Remediation must be completed within five years of the date of issue of this letter.
4. Remediation must be confirmed in accordance with applicable legislation and ministry guidance. Within 90 days of completing remediation, a report summarizing confirmation of remediation must be prepared in accordance with section 49 (2) of the Contaminated Sites Regulation and submitted to the Director.

5. Immediately notify a Director and register a covenant under section 219 of the *Land Title Act*, incorporating the contents of the remediation plan, if the property is sold before completion of the development.

Please be advised of the following:

- The ministry recommends that the proponent review all aspects of the government's contaminated sites legislation and supporting guideline documents and protocols to ensure that all required information is collected and documented during investigation and where necessary, remediation of the site;
- Those persons undertaking site investigations and remediation at contaminated sites in British Columbia are required to do so in accordance with the requirements of the Act and its regulations. The ministry considers these persons responsible for identifying and addressing any human health or environmental impacts associated with the contamination;
- In cases of site demolition, we recommend that a survey of building materials and equipment be undertaken to identify any materials that require special management;
- Under the authority of the Act, all applications eligible under Protocol 6 must be submitted by an Approved Professional via the Contaminated Sites Approved Professional Society. For further clarification of application eligibility please see [Protocol 6, "Eligibility of Applications for Review by Approved Professionals"](#);
- Fees are applicable for the ministry's contaminated sites services, pursuant to section 9 of the Contaminated Sites Regulation. Information on the government's contaminated sites legislation and supporting guideline documents and protocols as well as a Contaminated Sites Services Application Form can be obtained from the ministry's Land Remediation web page located at: <http://www.env.gov.bc.ca/epd/remediation/>; and
- Penalties for noncompliance with the contaminated sites requirements of the Act and Regulation are provided in section 120(17) of the Act.

Decisions of a Director may be appealed under Part 8 of the Act.

Please contact the undersigned at 604 582-5377 if you have any questions about this letter.

Yours truly,

A handwritten signature in black ink, appearing to read "Vin Hanemayer". The signature is written in a cursive style with a prominent initial "V".

Vincent Hanemayer
for Director, *Environmental Management Act*

vch\

INDEMNIFICATION AGREEMENT dated as of ^{May 4, 2017} ~~December~~ _____, 2016.

BETWEEN

ELEGANT OXFORD PROJECT CORPORATION

#215 – 8171 Cook Road
Richmond, B.C.
V6Y 3T8

and

1055731 B.C. LTD.

2535 - 3700 No. 3 Road
Richmond, B.C.
V6X 3X2

(collectively, the "Indemnitor")

AND

CITY OF WHITE ROCK

15322 Buena Vista Avenue
White Rock, B.C.
V4B 1Y6

(collectively the "City")

(together the "Parties")

WHEREAS

- A. The Indemnitor owns the lands and premises having a civic address of 1454 Oxford Street, in the City of White Rock, British Columbia and legally described as follows:

PID: 029-076-234

LOT 1 SECTION 10 TOWNSHIP 1 NEW WESTMINSTER DISTRICT PLAN EPP25563

(the "Lands");

- B. The Indemnitor wishes to develop the Lands into high-rise residential condominiums (the "Development") and, as condition of the City's approval of the Development, the City requires the Indemnitor to indemnify the City from any and all liability arising out of or relating to the presence of contaminated soil on the Lands.

NOW THEREFORE, in consideration of the premises and other good and valuable consideration (the receipt and sufficiency of which is acknowledged by each of the Parties), the Parties agree as follows:

1. The Indemnitor hereby indemnifies, saves harmless and releases the City from any and all liabilities, actions, proceedings, damages, claims, remediation recovery claims, losses, costs, orders, fines, penalties and expenses whatsoever, (including any and all environmental or statutory liability for remediation, all legal and consultants' fees and expenses and the cost of remediation of the Parcel and any other property) arising from or in connection with the presence, release or alleged release of any Contaminants at or from the Lands prior to, during or subsequent the construction of the Development, or any act or omission of the Indemnitor, its officers, employers, volunteers, agents, contractors, and invitees which may lead to the presence, release or alleged release of any Contaminants.

The obligations of the Indemnitor under this section 1 will survive the completion of construction of the Development.

For the purposes of this section 1, "Contaminants" means any pollutants, contaminants, deleterious substances, underground or above-ground tanks, lead, asbestos, asbestos-containing materials, hazardous, corrosive, or toxic substances, hazardous waste, waste, polychlorinated biphenyls ("PCBs"), PCB-containing equipment or materials, pesticides, defoliants, fungi, including mould and spores arising from fungi, or any other solid, liquid, gas, vapour, odour, heat, sound, vibration, radiation, or combination of any of them, which is now or hereafter prohibited, controlled, or regulated under Environmental Laws.

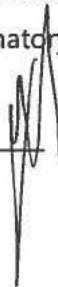
For the purposes of this section 1, "Environmental Laws" means any statutes, laws, regulations, orders, bylaws, standards, guidelines, protocols, criteria, permits, code of practice, or other lawful requirements of any government authority having jurisdiction over the Land now or hereafter in force relating in any way to the environment, environmental assessment, health, occupational health and safety, protection of any form of plant or animal life or transportation of dangerous goods, including the principles of common law and equity.

2. Any reference to "City" in Sections 1 is deemed to include a reference to any and all of the City's elected officials, officers, employees, agents, successors, agents and assigns.
3. This Agreement will be governed by and construed in accordance with the laws of the Province of British Columbia.
4. No amendment or modification to this Agreement will be effective unless it is in writing and duly executed by the Parties.
5. In this Agreement, wherever the singular or neuter is used it will be construed as if the plural or masculine or feminine, as the case may be, had been used where the context so requires.
6. This Agreement will enure to the benefit of and be binding upon the Parties and their successors and permitted assigns.
7. This Agreement constitutes the entire agreement between the Parties with respect to the subject matter of this Agreement.
8. This Agreement may be executed in counterparts, which when taken together will constitute one and the same Agreement. This Agreement may be executed by the exchange of signed counterparts by facsimile transmission or electronically in PDF or similar secure format.

IN WITNESS WHEREOF the Parties hereto have executed this Agreement as of the day and year first written.

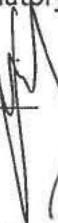
ELEGANT OXFORD PROJECT CORP.

by its authorized signatory:

_____ 

1055731 B.C. LTD.

by its authorized signatory:

_____ 

CITY OF WHITE ROCK

by its authorized signatory:



Bill Lawrence, Deputy Mayor



Tracey Arthur
City Clerk



Hemmera Envirochem Inc.
18th Floor, 4730 Kingsway
Burnaby, BC V5H 0C6
T: 604.669.0424
F: 604.669.0430
hemmera.com

November 24, 2017
File: 2131-002.02

Isle of Mann Group of Companies
#304 - 15292 Croydon Drive
Surrey, BC V3Z 0Z5

Attn: Brent Tedford

Dear Mr. Tedford,

Re: 1454 Oxford Street, White Rock Hydrogeological Review

Hemmera Envirochem Inc. (Hemmera) was retained by Isle of Mann Group of Companies to review the potential impact that the proposed development at 1454 Oxford Street (the Site) may have on the City of White Rocks' water supply wells as per our proposal dated August 3, 2017. The City's supply wells are located immediately south of the Site at 1444 Oxford Street.

1.0 SITE AND SURROUNDINGS

We understand that the development may include residential towers and three levels of underground parking, representing an approximate excavation depth of between 10-12 metres. A concern was raised during the application process around the potential for the development of the project to affect the groundwater resource.

1.1 HYDROGEOLOGY

The Site is underlain by Capilano Sediments, which are generally described by Anderson and Hicock (1976) as marine and glaciomarine silt loam to clay loam with minor sand and silt. Driller's logs for the supply wells on the south adjacent property (1444 Oxford Street) indicate 40m of till, 3m of clay, and 40 m of sand and fines, which is consistent with the mapped (Capilano) unit. Beneath the Capilano unit, the driller's logs indicate a sand and gravel aquifer at a depth of approximately 100 metres below grade. This aquifer is interpreted to be Quadra fluvial channel fill and floodplain deposits, described by Anderson (1976) as sand containing minor silt and gravel lenses and interbeds. The BC Ministry of Environment's aquifer description for White Rock (Pre-Vashon glaciofluvial till, Sunnyside Uplands Aquifer 57) is consistent with the drilling observations. The aquifer is described as having low vulnerability because it is overlain by the low permeability Capilano Sediments.

Sixteen water wells were identified within approximately 1,200m of the Site, all of which are screened in the Quadra sands, as follows and illustrated in **Figure 1**:

- Vicinity of Site (Goggs Avenue), 4 wells, shallowest well 102m, White Rock Municipal Supply
- 500m South (Buena Vista), 4 wells, shallowest well 41m, White Rock Municipal Supply
- 600m West (High Street), 2 wells, shallowest well 98m, White Rock Municipal Supply
- 900m NW (18A Avenue), 1 well, 102m, Individual owner
- 900m ENE (16th Avenue), 2 wells, shallowest well 144m, White Rock Municipal Supply
- 1200m NE (Bakerview Park), 3 wells, shallowest well 125m, Surrey Municipal Supply

1.2 WELLHEAD PROTECTION

Based on a recent site visit, at least one of the wells at 1444 Oxford Avenue is completed at surface grade. A hydrogeological report of the White Rock water supply wells indicated that Well #1 (in the vicinity of the Site) was in a below ground chamber (Piteau 2010) and recommended a retrofit. It is not known if this work was carried out. If this work has not yet been completed, we recommend it be finished. Hemmera has enquired with the City of White Rock's Engineering Department in this regard, but not yet received any comments. Hemmera did receive a report (Piteau, June 2017) regarding Well #8 (113708; the easternmost of the Goggs Avenue wells, at Overall Street – see **Figure 1**). This well was drilled in 2016 and screened in the Quadra aquifer from 107 to 119m depth. Water wells in the immediate vicinity of the site are illustrated in blue in **Figure 2**. Shallow environmental testing wells (monitoring wells) at the Site are shown in black¹. The monitoring wells on Site are providing data to assist with property development and will have to be decommissioned after they have fulfilled this purpose. The BC Groundwater Protection Regulation requires decommissioning of wells that have been out of service for five years.

2.0 DISCUSSION AND CONCLUSIONS

The water supply aquifer that is situated beneath the Site is significantly deeper than the proposed depth of excavation and therefore, the excavation depth and any dewatering associated with the proposed building is not expected to affect the water supply aquifer.

Infiltration and aquifer recharge is reduced by constructed features, because rainfall from paved surfaces and roofs is generally re-directed to the storm sewer. However, the aquifer beneath the Site is extensive, covering all White Rock and Surrey west of Highway 99, and includes significant unpaved areas. A slight local increase in surface cover is not expected to significantly affect water levels in the aquifer.

¹ The locations in the figure attached to Hemmera's Data Gap and Work Plan (September 8, 2017) were inaccurate. Figure 2 attached to this Hydrogeological Desktop Review provides accurate locations.

Potential issues during construction may include physical damage of a well or introduction of surface water to a well with improper wellhead protection. Either of these scenarios may introduce contaminants to the aquifer in which the well is screened. Hemmera was not able to inspect Well #1 or receive confirmation from the City that the recommended well head protection retrofit had been completed. We recommend that the City be advised that the retrofit should be completed for Well #1 (or acknowledgement that it has been carried out) prior to any construction activities at the Site. A plan should be formulated to address construction practices near the off-Site water wells (and any on-Site monitoring wells that will not have been decommissioned by the time construction begins) specifically addressing exclusion of machinery and water discharge near the wells, and response for a spill of fuel or hydraulic oil. Thus, with the application of best work practices, the project is not expected to have any deleterious effect on existing water supply wells, or the supply of water derived from the water supply property.

3.0 CLOSURE

In preparing this Proposal, Hemmera has relied in good faith on information provided by others, and has assumed that the information provided by those individuals is both complete and accurate. These Services shall not create any rights or benefits to parties other than Isle of Mann Group of Companies and Hemmera. No third party shall have the right to rely on Hemmera opinions rendered in connection with the Services without Hemmera's written consent and the third party's agreement to be bound to the same conditions and limitations as Isle of Mann Group of Companies. Any use that a third party makes of these opinions, or any reliance on or decision made based on it, is the responsibility of such third parties. Hemmera accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on these opinions.

This Draft report is provided for discussion purposes. As such, the report is not signed. Please review the report and provide Hemmera with comments and written revisions you feel are appropriate. Once comments and revision requests are received and reviewed, we will finalize the report and circulate signed copies. To avoid unofficial Draft for Discussion reports being used or referenced, we request that you avoid circulation of the electronic Draft Reports and destroy any hardcopies produced. We trust the enclosed draft report meets your current needs. If you have any questions or comments, please contact the undersigned.

Yours truly,
Hemmera Envirochem Inc.

DRAFT

Gabriel Viehweger, M.S., P.Geo., CSAP
Senior Hydrogeologist
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DRAFT

Gerry Papini, M.Sc., P.Geo.
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gpapini@hemmera.com

4.0 REFERENCES

Armstrong, J.E. and Hicock, S.R., Surficial Geology, New Westminster, Map 148A, Geological Survey of Canada 1976

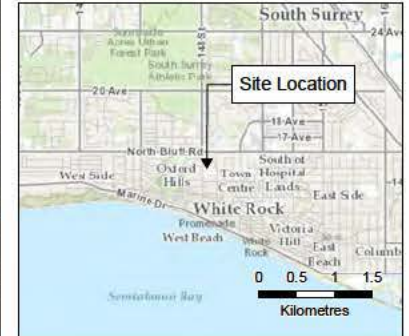
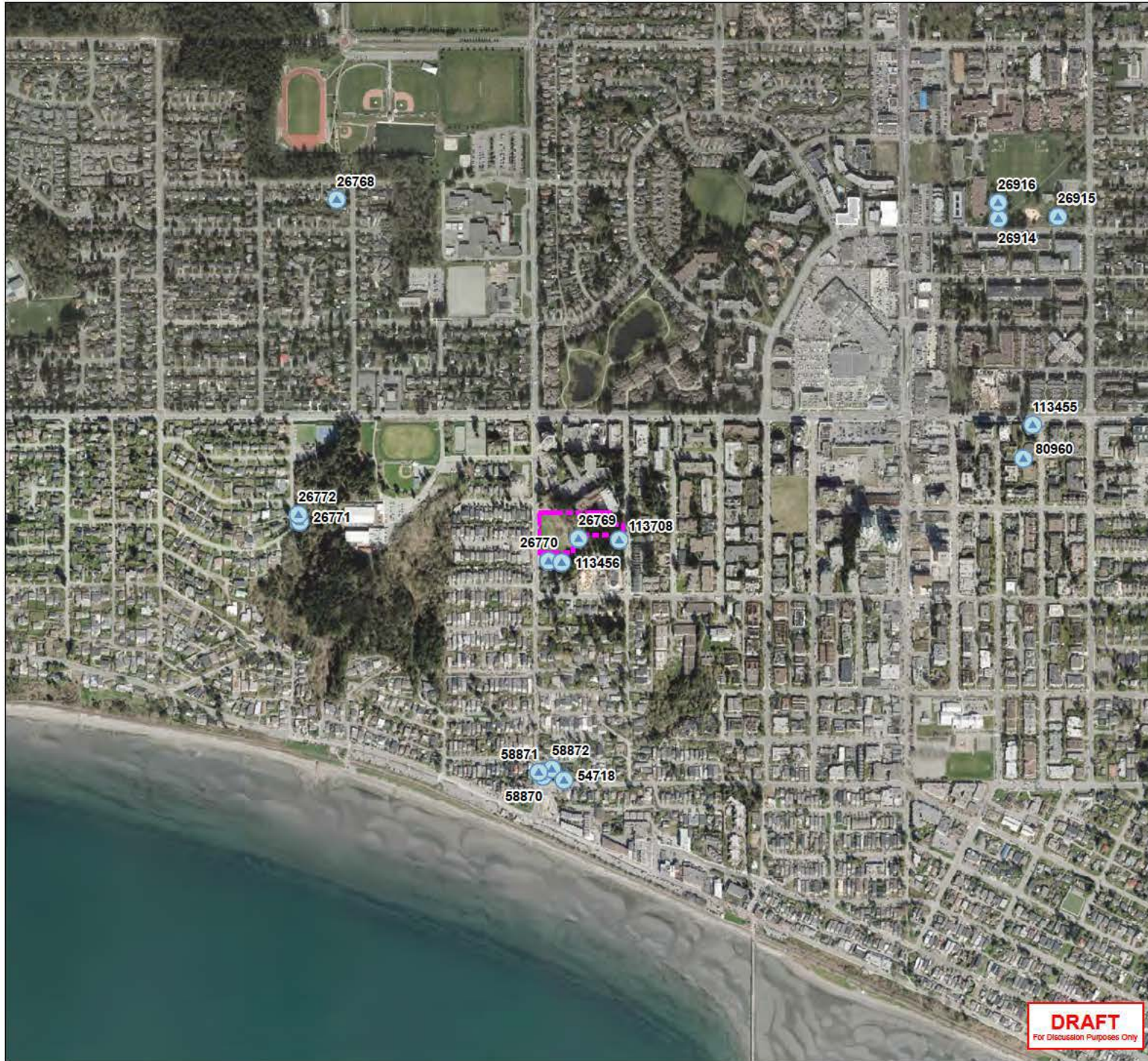
BC Ministry of Environment, iMapBC (water well locations, well logs, aquifer boundaries, aquifer description)

Piteau Associates, Hydrogeological Assessment for White Rock Groundwater Supply, 2010



FIGURES

Hydrogeological Assessment
1454 Oxford Street, White Rock

Site Location and Water Wells



Legend

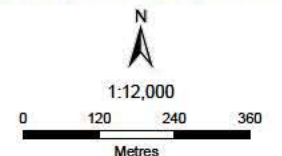
-  Municipal Water Well
-  Site Boundary

Notes

1. This is a sample note.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Aerial Image: ESRI World Imagery
- Inset Basemap: ESRI World Topographic Map



2131-002.02 Production Date Figure 1
Sep 27, 2017






DRAFT
For Discussion Purposes Only

 **HEMMERA** Isle of Mann Group of Companies

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Site Detail

Legend

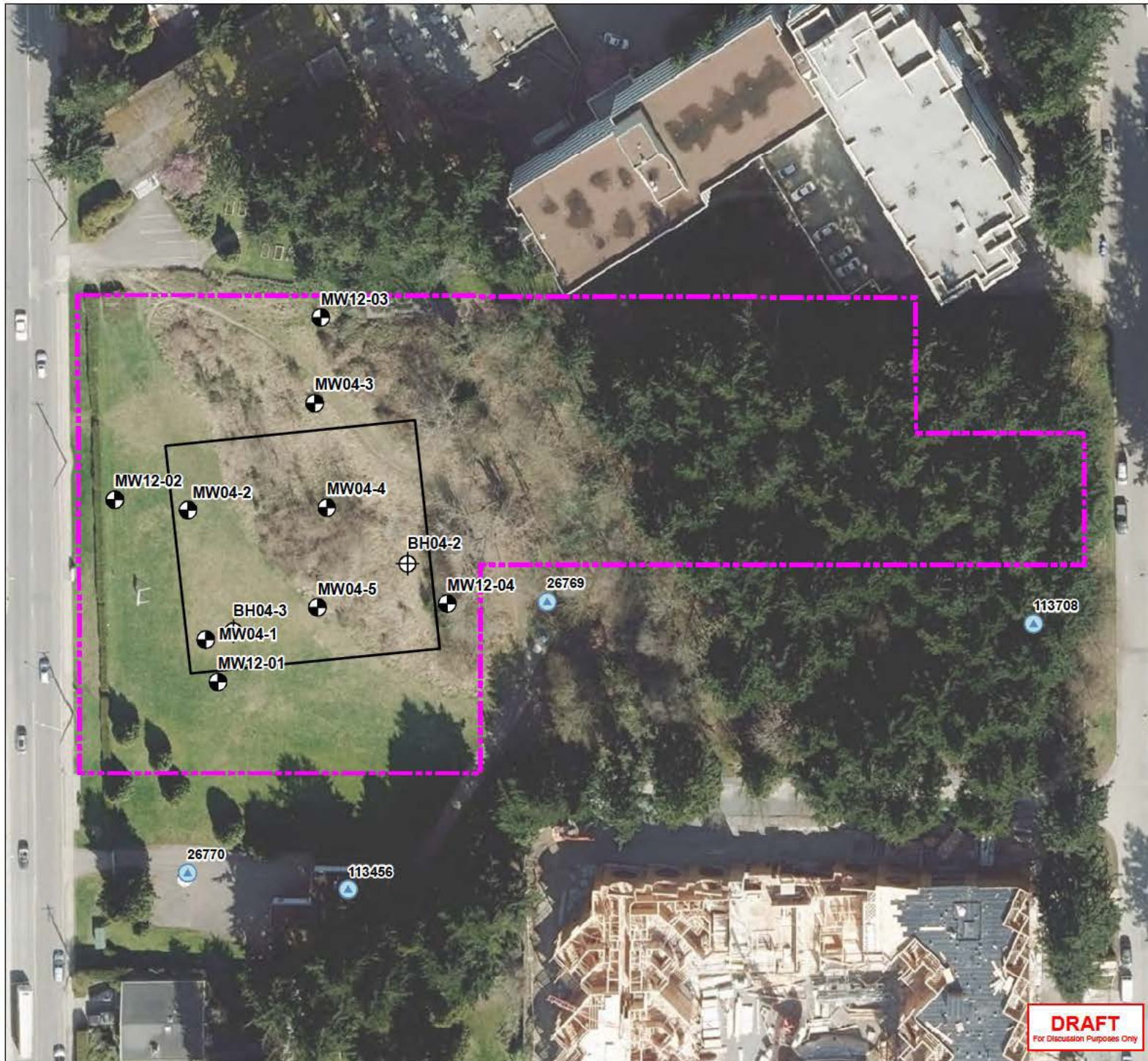
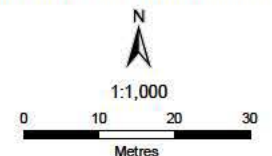
-  Borehole (Stantec 2004)
-  Monitoring Well (Stantec 2012)
-  Municipal Water Well
-  Site Boundary
-  Approximate location and extent of former water reservoir

Notes

1. This is a sample note.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Aerial Image: ESRI World Imagery
- Inset Basemap: ESRI World Topographic Map



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March 11, 2021
File No. 105640.01

Isle of Mann Group of Companies
15336-31 Avenue, Suite 401
Surrey, BC V3Z 0X2

Attention: Brent Tedford, Senior Development Manager

Re: Independent Remediation and Site Closure of 1454 Oxford Street, White Rock, BC

Hemmera Envirochem Inc. (Hemmera), a wholly owned subsidiary of Ausenco Engineering Canada Inc. (Ausenco), was retained by Isle of Mann Group of Companies to address comments from the City of White Rock (City) associated with independent remediation activities proposed at the development site located at 1454 Oxford Street (the Site).

1.0 CITY OF WHITE ROCK REQUESTS

On March 8, 2021, the City requested clarification regarding the proposed independent remediation at the Site as it relates to protection of Wellhead #1, erosion and sediment control planning, updates to the remedial plan and overall timing of the issuance of a Certificate of Compliance for the Site. Questions were as follows:

- Would any of Hemmera's recommendations for the upgrading of the protection of wellhead #1 (Hemmera 2017¹) apply to the remediation activities, or would that only be necessary for the excavation of the overall development?
- Are there any measures (e.g., erosion and sediment control, soil removal only during drying weather, etc.) that Hemmera would recommend for the remediation activity?
- Is there an update to the area proposed for excavation relative to the previously prepared Stantec Site Remediation Work Plan?
- What is the approximate timeline from completion of this independent remediation to obtaining a Certificate of Compliance?

The following letter address the questions and concerns raised by the City of White Rock.

¹ Hemmera Letter Report, dated November 24, 2017, Re: 1454 Oxford Street, White Rock Hydrogeological Review, for Ilse of Mann Group of Companies.

2.0 WELL PROTECTION & SEDIMENT CONTROL DURING INDEPENDENT REMEDIATION

The Hemmera 2017 letter discusses the potential issues that may arise during development construction activities on the Site (including remediation which was expected to occur concurrently with the development excavation), including physical damage or introduction of surface water to the City water supply Well #1 (in the vicinity of the Site at 1444 Oxford Street). Hemmera recommended that the City retrofit Well #1 with surface protection prior to any construction activities (originally recommended by Piteau in 2010), if not already completed by the City. In the absence of a retro fit and/or as an additional protection measure, it was also recommended that a plan be formulated to address construction practices near the water well, specifically addressing exclusion of machinery and water discharge near the well, and a response plan for a spill of fuel or hydraulic oil.

The proposed independent remediation scope of work is not expected to result in risk to the existing City water supply well (Well #1). The work is not expected to take more than a single day and trucks will be hot loaded with soil at the Site (soil will be directed from the excavation by the excavator directly into the waiting trucks, without stockpiling). The hot loading of the soils will preclude any excess soil piles on the Site that may otherwise result in surface runoff and/or sediment erosion that could pose a risk to Well #1. The location of the work will also preclude any mobilization of equipment near the property boundary in proximity to Well#1. Upon completion of remediation, the excavation will be backfilled with clean gravel or rock to mitigate water accumulation and sediment erosion of the newly exposed surface. In addition, although the work represents an overall low risk concern relative to spills, a suitable health and safety plan, including spill response planning, will be completed prior to conducting the work. Notwithstanding the above, the Isle of Mann Group of Companies is committed to completing the independent remediation during favourable weather conditions to further mitigate the unlikely potential for surface runoff or soil erosion issues at the Site.

In summary, the independent remediation planned at the Site is considered low risk to water supply Well#1 located on 1444 Oxford Street. Further planning and mitigation protection associated with Well#1, as outlined in the Hemmera 2017 letter, are still recommended during the proposed development activities at the Site.

3.0 UPDATE TO REMEDIAL PLAN SCOPE OF WORK

The Stantec Site Remedial Work Plan (Stantec, 2016) assumed that there was a similar confirmed small amount of contaminated soil (5 m x 5 m by 3 m deep; 75 m³) in the vicinity of MW04-2, however, they also suggested that as much as 14,175 m³ of fill material on the Site might be contaminated and would require stockpiling and sampling during the development. The Stantec remedial plan was drafted prior to the Detailed Site Investigation (DSI) work completed by Hemmera in 2018. The DSI has refined the extent and scope of remediation required at the Site. Groundwater contamination at the Site was refuted using updated Ministry of Environment guidance and protocols, which includes the confirming that the groundwater meets the standards for drinking water quality. In addition, further soil investigation has resulted in a more accurate estimation of soil contamination at the Site, in two distinct areas measuring 5 m x 5 m by 3 m deep (150 m³) in the vicinity of MW04-02 and BH4-2.

In summary, the original Stantec investigation and resulting remedial plan assumed as much as 14,250 m³ of contaminated and suspect contaminated soil may be present on the Site which would be addressed concurrently with the Site development. The updated remedial plan anticipates approximately 150 m³ of shallow soil in two distinct areas requiring remediation, which will be addressed prior to development activities.

Further to the above, under the independent remediation process, and pursuant to the Ministry of Environment's acceptance of Independent Remediation in their letter dated June 28, 2016, there is no requirement to notify the Ministry of Environment of the amendments to the remedial plan. This is predicated on the commitment from the proponent to complete remediation in a manner consistent with the applicable regulations and protocols supporting the Site being eligible for a Certificate of Compliance upon completion of independent remediation, as outlined in the letter.

4.0 TIMELINE FOR CERTIFICATE OF COMPLIANCE

The timeline for the issuance of the Certificate of Compliance is unfortunately beyond the control of the Isle of Mann Group of Companies. At this time, Hemmera has been directed to commence reporting and documentation in support of the Certificate of Compliance immediately following independent remediation at the Site. It is expected that the reporting and documentation could take anywhere from one to two months to complete, following confirmation of independent remediation. Once complete, the recommendation package would be forwarded to the Contaminated Sites Approved Professional (CSAP) Society for review and screening. The CSAP screening process generally takes anywhere from two to three weeks (assuming the Site is not subject to a random performance audit) before being forwarded to the Ministry of Environment with a recommendation for issuance of the Certificate of Compliance. Currently, the Ministry of Environment has advised proponents to plan for a minimum of three months before obtaining any instruments once they have been forwarded to them for review.

Based on the above, it is anticipated that the Certificate of Compliance could be issued for the Site within six months after completion of independent remediation. However, the process could be extended by several months more should the Site be randomly selected for auditing by CSAP or delayed by the Ministry of Environment review process.

Based on the uncertainty in timelines, mostly associated with Ministry of Environment timelines, it would be considered beneficial for planning the Site's development for the City to consider the Ministry of Environment's acceptance of independent remediation under the contaminated sites regulation and the commitment from the proponent for a Certificate of Compliance prior to occupancy as a suitable path forward for the Site.

5.0 CLOSURE

We sincerely appreciate the opportunity to have assisted you with this project and if there are any questions, please do not hesitate to contact the undersigned.

This Report has been prepared by Hemmera, based on fieldwork conducted by Hemmera, for sole benefit and use by Isle of Mann Group of Companies. In performing this Work, Hemmera has relied in good faith on information provided by others, and has assumed that the information provided by those individuals is both complete and accurate. This Work was performed to current industry standard practice for similar environmental work, within the relevant jurisdiction and same locale. The findings presented herein should be considered within the context of the scope of work and project terms of reference; further, the findings are time sensitive and are considered valid only at the time the Report was produced. The conclusions and recommendations contained in this Report are based upon the applicable guidelines, regulations, and legislation existing at the time the Report was produced; any changes in the regulatory regime may alter the conclusions and/or recommendations.

Report prepared by:
Hemmera Envirochem Inc.



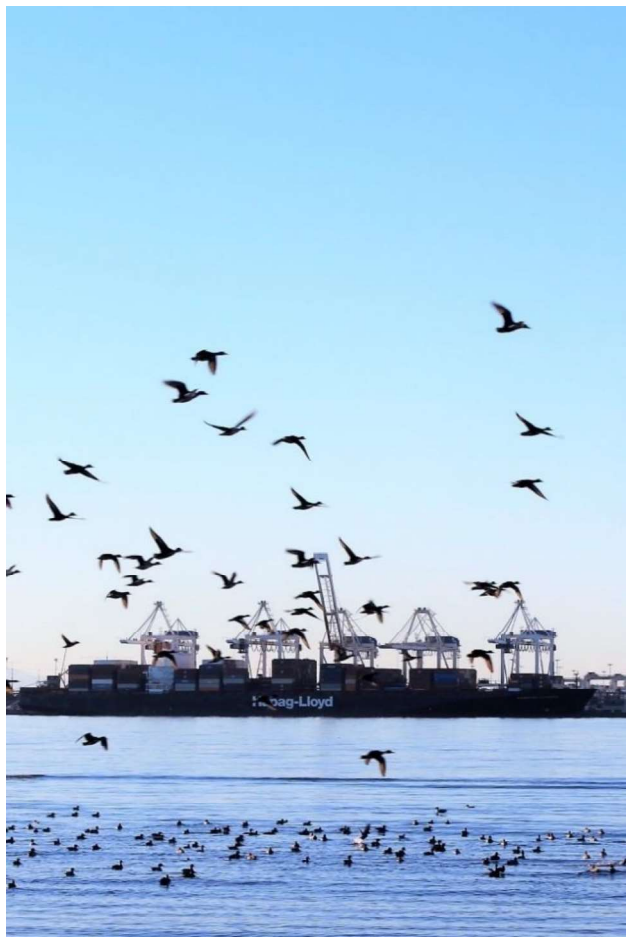
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Environmental Management Plan – Independent Remediation Program 1454 Oxford Street, White Rock, BC



Prepared for:

Isle of Mann Group of Companies

15336-31 Avenue, Suite 401
Surrey, BC V3Z 0X2

Project No. 105640.01

March 17, 2021

Prepared by:

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1.0 INTRODUCTION

This Environmental Management Plan has been prepared by Hemmera, based on work conducted by Hemmera, for sole benefit and use by Isle of Mann Group of Companies (IMGC). In performing this Work, Hemmera has relied in good faith on information provided by others, and has assumed that the information provided by those individuals is both complete and accurate. This Work was performed to current industry standard practice for similar environmental work, within the relevant jurisdiction and same locale. The findings presented herein should be considered within the context of the scope of work and project terms of reference; further, the findings are time sensitive and are considered valid only at the time the Report was produced. The conclusions and recommendations contained in this Report are based upon the applicable guidelines, regulations, and legislation existing at the time the Report was produced; any changes in the regulatory regime may alter the conclusions and/or recommendations.

1.1 Purpose and Objectives

The purpose of this Environmental Management Plan (EMP) is to provide Contractors and Consultants with environmental guidance, objectives, standard protocols, and mitigation measures for the Project in order to support compliance with applicable legislation, conditions of permits and approvals and the expectations of the community during independent remediation at 1454 Oxford Street, White Rock, BC (the “Project”).

This EMP identifies the specific roles and responsibilities associated with the Project team members, provides an overview of existing environmental conditions, identifies important legislative requirements, describes how environmental risks will be appropriately managed through mitigation and site restoration, and in the event of an incident, the emergency response procedures and reporting protocols to be implemented. This EMP also describes the environmental monitoring framework that will be implemented during remediation and post-remediation phases of the Project to inspect, evaluate, and report on work practices and the efficacy of the environmental remediation, effectiveness mitigation, and environmental protection efforts.

It is the responsibility of all members of the Project team to be familiar with the contents of the EMP and to comply with the practices and procedures described herein. The Contractor is also responsible to disseminate the EMP to their supervisors and crews and must keep a hard copy of the EMP on site where is it readily accessible.

The content of this EMP is subject to change to reflect updated Best Management Practices (BMPs) and mitigation measures developed in response to changes to the Project design or approach to construction.

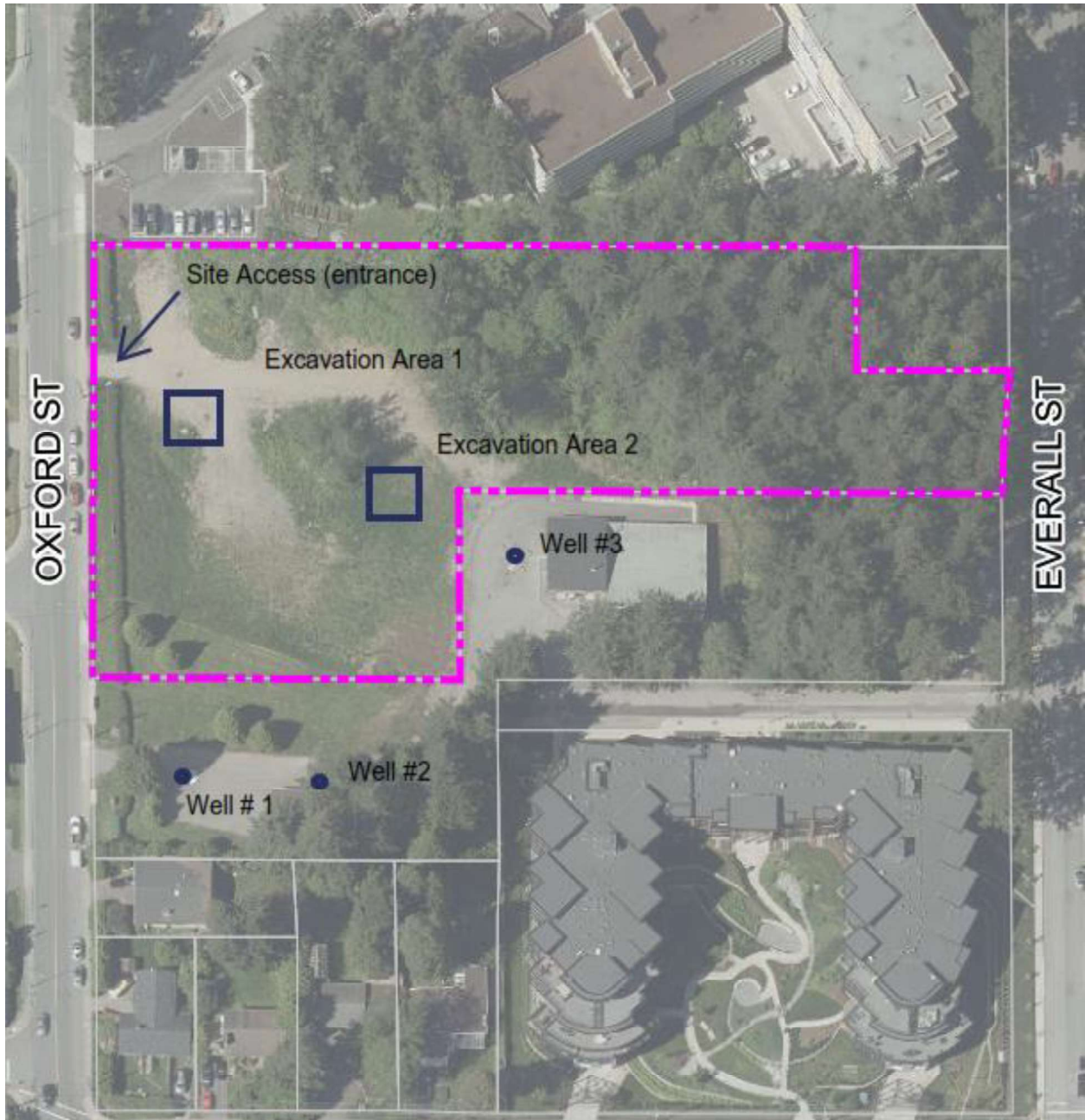


Figure 1 Project Area

2.0 CONTACT LIST

2.1 Emergency Contacts

A list of emergency contact numbers is provided below in **Table 1**:

Table 1 Emergency Contact Numbers

Contact	Contact Number
Emergency Management BC (EMBC)	1-800-663-3456
DFO Spill Reporting line	1-800-465-4336
MoE Conservation Officer	1-877-952-7277

2.2 Project-Specific Contacts

Contact information for Project-specific contacts are provided below in **Table 2**:

Table 2 Contact Information for Key Members of the Project

Title	Name	Contact #
CLIENT Team		
Senior Development Manager	Brent Tedford	Redacted S. 22
Contractor Contacts		
TBC		
Qualified Environmental Professionals		
Contaminated Sites Expert	Jason Wilkins	Redacted S. 22
Environmental Project Manager	Rada Kolev	
Environmental Monitors		
TBD	Hemmera On Site Staff	

Note: Tables 1 and 2 will be reviewed and completed following appointment of the general Contractor.

3.0 PROJECT OVERVIEW

3.1 Project Description

The proposed independent remediation scope of work is not expected to take more than a single day and trucks will be hot loaded with soil at the Site (soil will be directed from the excavation by the excavator directly into the waiting trucks, without stockpiling). The extent and scope of remediation required at the Site is limited to two distinct areas measuring 5 m x 5 m by 3 m deep (150 m³) in the vicinity of MW04-02 and BH4-2 (See **Figure 1**).

3.2 Location / Site Description

The property located at 1454 Oxford Street, White Rock, BC (the “Site”). Currently the southwestern portion of the Site is vacant, cleared and grassed. The remainder of the Site is densely vegetated. Historically the western portion of the Site was occupied by a municipal water reservoir, constructed as an open, in-ground, concrete lined basin with an approximate area of 42 m x 45 m. The reservoir was utilized from approximately the late 1940s or early 1950s until the late 1960s. The reservoir basin remained open and unutilised until the late 1980s or early 1990s when it was filled in with material of unknown quality, reportedly sourced from local development sites. Several environmental investigations were completed which have identified two small areas where independent remediation will be completed at the Site.

3.3 Proposed Work Schedule

The proposed start date of the project is dependent on acceptance of the EMP and Independent Remediation from the City of White Rock; however, assuming acceptance, independent remediation is expected to take 1 – 2 days to complete.

4.0 PROJECT TEAM / ROLES AND RESPONSIBILITIES

This section provides an overview of the roles and responsibilities of each of the key Project team leaders and members. The responsibilities identified for each role reflect an environmental management context and are not exhaustive.

4.1 CLIENT

IMGC is responsible for overseeing the successful delivery of all aspects of the Project including engineering, construction, and environmental protection. IMGC will oversee measures to ensure that all employees, contractors and visitors on the Project Site are appropriately informed and are aware of issues pertaining to health, safety, and the environment. IMGC responsibilities include:

- Oversight of engineering, design, construction, and environmental performance of the Project as per IMGC direction in line with the EMP;
- Ensuring that environmental incidents, including non-conformances with the EMP, are reported to IMGC and regulatory agencies as required;
- Ensuring that corrective actions related to non-conformances are undertaken in a timely manner to meet agency and stakeholder requirements;
- Ensuring adherence to IMGC policy and all applicable environmental and archaeological regulatory permits, approvals, and authorizations during the planning, design, construction, and operation of the Project;
- Supporting delivery of an environmental risk overview during project orientation (prepared and delivered by the QEP) to all field staff and support team, IMGC staff, and Contractor's representatives prior to start of construction;
- Leading communication with regulatory agencies to determine existing and emerging environmental issues or concerns, so that appropriate environmental planning and mitigation measures can be developed and implemented;
- Providing advice on key decisions such as stop work activities in any events of non-compliance with EMP and/or issued regulatory permits, and/or in the event that Project activities result in harm to the environment; and
- Ensuring that environmental incidents, including occurrences of non-compliance/non-conformance, are reported to the IMGC team and regulatory agents as required, and that any such instances are corrected by notifying the Manager.

4.2 Contractor

The responsibilities of the Contractor will include, but are not limited to:

- Ensuring all construction activities are completed according to Project designs approved by the IMGC and that all construction work performed by employees and sub-contractors complies with the requirements of the EMP, and any Contractor-prepared site- or task- specific EPPs;
- Completing all construction activities within the applicable timing windows and prior to the expiration of applicable permits and approvals. In the event that construction may continue beyond the duration of the timing windows and/or the permit/approval, the Contractor's Construction Manager must:
 - For Contractor-held permits/approvals, take all necessary steps to obtain an extension or renewal; and

- For IMGCC and/or QEP-held permits, notify the Construction Manager and the QEP well in advance of the expiration date.
- Providing all construction staff, including sub-contractors, with an orientation and/or appropriate training on environmental mitigation measures outlined in the EMP;
- Maintaining all construction equipment in good working condition;
- Keeping a current version of the EMP, applicable permits/approvals on site in a known location during all construction activities;
- Communicating regularly and effectively with all Project team members regarding the construction schedule and activities as it pertains to environmental issues, and adjusting construction activities as needed to stay in compliance with the EMP and any relevant permits/approvals;
- Notifying IMGCC and the QEP in the event of any incidents that have potential to result in harm to the environment, any unforeseen changes in environmental conditions on-site (e.g., slope instability, flooding), the discovery of any archaeological resources, and any concerns or complaints from landowners or regulatory inspections; and
- Leaving all completed work areas in a condition that is safe for the public, and environmentally stable (e.g. no eroding soils).

4.3 Qualified Environmental Professional

The QEP's team will work together as the IMGCC QEP to provide environmental design, planning, management, and monitoring services for the Project. Specific responsibilities of the QEP include, but are not limited to:

- Securing and maintaining applicable (non-Contractor held) environmental permits and approvals to ensure regulatory compliance during Project construction;
- Developing site-specific restoration and compensation plans and providing advice and guidance regarding implementation;
- Conducting all necessary environmental surveys;
- Developing and overseeing environmental protection and monitoring programs undertaken by the QEP;
- Providing advice on key decisions such as stop work activities in any events of non-compliance with EMP and/or issued regulatory permits, and/or if Project activities result in harm to the environment;
- Being available for consultation with IMGCC and Contractor during normal working hours or if not available, to have a backup system in place to address any issues related to environmental performance that may arise;
- Reviewing and reporting to the IMGCC and Contractor on the Contractor's compliance with the EMP through regular environmental monitoring reports prepared by the QEP;
- Advising and reporting to the Construction Manager in the event of any areas of non-compliance, ineffective mitigation measures, or environmental incidents; and
- Delivering the environmental risk overview during project orientation with all Hemmera field and support team, IMGCC staff, and Contractor's representatives prior to start of construction to address environmental considerations of the Project.

4.4 Environmental Monitor

The Environmental Monitors are responsible for determining whether work activities are in compliance with environmental obligations (i.e., permits/approvals and BMPs, the EMP, and EPPs). The Environmental Monitor reports to the QEP. The role of the Environmental Monitor includes the following responsibilities:

- Act as a representative of IMGCC and observe, record, and report on environmental compliance of construction activities, and provide advice and guidance related to environmental protection;
- Being familiar with requirements outlined in permits, by-laws, applicable legislation, this EMP and relevant BMPs;
- Reviewing EMP, EPPs and all relevant documentation and verifying that environmental impacts of the work have been adequately identified and mitigation measures are sufficient to protect environmental resources;
- Flagging sensitive zones identified in advance of construction planning and prior to start of construction in these areas;
- Providing on-site monitoring for the duration of high-risk activities such as instream works or contaminated material excavation and off-site transportation, and at a frequency of at least once per week during low-risk activities such as work along roadways or in the existing ROW;
- Reporting on matters that arise during construction that are not included in the EMP, discuss with the Construction Manager and the QEP, and resolve with the Manager;
- Providing any other information or advice to construction teams in order to support compliance with all applicable permits, management plans, and by-laws; and
- Submitting routine reports for review to the QEP, including daily and weekly environmental monitoring reports, (see **Section 10.2** for more details).

5.0 ENVIRONMENTAL OVERVIEW

This section provides a general overview of the environmental features present within the Project and identifies the sensitivities associated with these habitats and features as well as the species which may be affected by the proposed construction activities.

5.1 Aquatic Resources

Not Applicable

5.1.1 Waterbodies

Not Applicable

5.1.2 Fish and Aquatic Species

Not Applicable

5.1.3 Riparian Areas

Not Applicable

5.2 Terrestrial Resources

5.2.1 Upland Vegetation and Wildlife

Not Applicable

5.2.2 Parks, Greenbelts and Ecological Areas

Special considerations may need to be taken by the Contractor while working in these areas, as they may potentially be associated with high levels of public use and/or wildlife habitat values. The parks, greenbelts, and sensitive natural areas that are located within 100 m of the Project are presented in **Table 3**.

Table 3 Parks, Greenbelts and Ecological Areas within 100 m of the Project Footprint

Park/Greenbelt/Ecological Area	Distance to Project
Down Gradient City Water Supply Well (Well #1)	50 – 60 m

6.0 ENVIRONMENTAL MITIGATION MEASURES AND BEST PRACTICES

Project activities have the potential to negatively impact environmental values associated with the proposed works. Many of these impacts can be avoided or minimized through implementation of site-specific mitigation measures.

6.1 Erosion and Sediment Control

Project activities, including excavation, vehicle and equipment movement and excavation back filling, have the potential to cause the erosion of soil and transport of sediment by water.

The proposed independent remediation scope of work is not expected to result in risk to the existing City water supply well (Well #1). The work is not expected to take more than a single day and trucks will be hot loaded with soil at the Site (soil will be directed from the excavation by the excavator directly into the waiting trucks, without stockpiling). The hot loading of the soils will preclude any excess soil piles on the Site that may otherwise result in surface runoff and/or sediment erosion that could pose a risk to Well #1. The location of the work will also preclude any mobilization of equipment near the property boundary in proximity to Well#1. Upon completion of remediation, the excavation will be backfilled with clean gravel or rock to mitigate water accumulation and sediment erosion of the newly exposed surface.

To further manage erosion and sediment during independent remediation, the work should only be completed during favourable weather conditions.

6.2 Site Preparation

Site preparation includes all pre-construction activities within the site. The Contractor will perform all site preparation tasks within roadways and will be responsible to ensure the associated activities do not result in harm to the natural environment. The Contractor will work with the Construction Manager and QEP to ensure that the requirements listed below are undertaken prior to commencement of construction.

6.3 Construction

6.3.1 Excavation Activities

The following BMPs and mitigation measures apply during all excavation activities:

- Minimize the area of excavation to the extent possible;
- Any contaminated soil to be removed off-site must be undertaken in accordance with the *Environmental Management Act Contaminated Sites Regulation, Sections 46.1 and 46.2, as amended in BC Reg. 196/2017*;
- Contaminated material shall be trucked to an approved storage facility off-site; and,
- Backfill excavations as quickly as possible by compacting the subsoil in lifts, and spreading any remaining spoil over the excavation before replacing the overburden.

6.3.2 Site Access and Egress

- The Site will be accessed off Oxford Street and equipment movement will be restrict to the general vicinity to the excavation areas.
- The roadside catch basin on the immediate downslope side of all egress locations must be protected with a suitable catch basin inlet protector (e.g., silt sack). The EM/QEP may request additional catch basins also be protected if sediment-laden runoff water is flowing past the initial catch basin; and
- Mud and debris tracked onto a municipal roadway must be swept clean on at least a daily basis; more frequently during rain events.

6.3.3 Water Management and Treatment

Water management is not expected during excavation activities due to the shallow depth, and limited excavation size and duration.

6.3.4 Protection of Exposed Soils

If excavated material is required to be stored on-site, surface protection measures help prevent erosion by covering the surface of erodible soil (e.g., topsoil and underlying soil materials) with a physical protective layer that prevents interaction with water or minimizes water velocity. The Contractor shall implement the following soil protection measures, as necessary, on all exposed soils, including stockpiles and grubbed and graded areas:

- Tarps or poly sheeting;
- Water (i.e., spray surface soil to keep down dust if wind erosion is a concern);

6.3.5 Cleanup and Restoration

The Contractor will maintain a clean work site and restore all Project areas following completion, including the following:

- Upon completing construction, the Contractor will return the affected work site and surrounding area to as close to original condition as is practical; and
- During cleanup, remove and dispose of all construction garbage and waste.

6.4 Environmental Incidents and Spills

It is expected that all reasonable preventative measures will be taken to avoid the release of waste or hazardous materials into the environment. The Contractor is responsible for implementing the following measures to avoid and/or mitigate the potential effects of environmental incidents and spills.

6.4.1 Environmental Response Team

In the event of an environmental incident or emergency, the Contractor's environmental representative will contact IMGC environmental team, EM, and QEP directly to coordinate a response. The QEP and IMGC will develop an emergency response plan and will work with the EM and Contractor to implement on-site activities.

The Contractor and Manager will also designate Environmental Response Teams (ERTs). The Contractor's ERT Team will respond to on-site emergencies and will contact the Construction Managers ERT in the event of an environmental emergency. The IMGC will contact applicable regulatory agencies, or will designate the QEP, as per **Section 7.10.4**. The EM/QEP and Construction Manager will be responsible for following up with the Contractor regarding monitoring of any clean-up and mitigation activities.

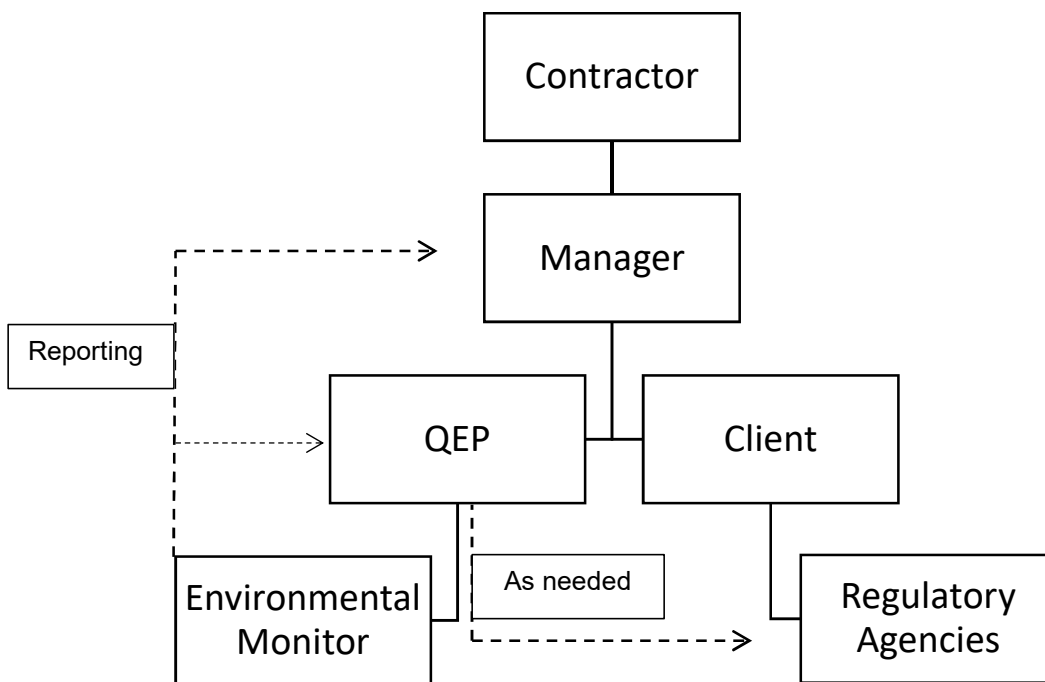


Figure 2 Emergency Response Team

6.4.2 Spill Prevention

Contractors will identify potential spill hazards (i.e., refuelling equipment on a slope), determine the level of risk for activities that could result in a spill, and take measures to reduce the potential of a spill. All efforts will be taken to minimize the risk of spills, including:

- Maintain equipment on the work site in a manner that prevents spills to the environment;
- Appropriately train equipment operators and crews on how to contain spills or leakage from equipment;
- Place absorbent pads underneath areas of the equipment or vehicles that require maintenance;
- Transfer liquid waste into containers using funnels, pumps, or other flow control devices to minimize the potential for spills;
- Ensure that any equipment left on the work site overnight are secure and any fluid (i.e., oil, engine coolant) containers are locked within the equipment;
- Drip pads should be placed underneath all equipment parked on site overnight;
- Before operation of equipment each day, operators will check for leaks and hydraulic hose connections for excess lubricants;
- Store all fuels and lubricants brought onto the Project site in properly labelled containers; and
- Ensure all products and equipment are used in a manner that avoids potential spills.

6.4.3 Spill Kits

Spill kits must be available in every vehicle and piece of equipment operating on the work site and at each watercourse crossing. All spill kits must be fully stocked and restocked as soon as possible if used. All spill kits will include the following, at a minimum:

- 2 each - 10' oil only socks;
- 15 each - polypropylene sorbent pads (oil only) 18" x 18" x 3/8";
- 2 each - 10-quart cellulose sorbent material, oil only;
- 1 each - barrier ribbon, yellow "Caution Do Not Enter";
- 1 each - poly disposal bags (45-gallon drum size, minimum 6 mm);
- 1 each - blank labels for plastic bags;
- 1 each - plastic bag tie;
- 1 each - epoxy plug compound (hydrocarbon compatible);
- 1 each - spill kit container marked "Spill Response Kit"; and
- Temporary storm drain plug / cover.

6.4.4 Spill Response and Reporting

The Contractor must ensure that crew members are trained in spill recognition, response, reporting and cleanup procedures. All spills, regardless of size must be properly cleaned.

Any spills greater than 1 Litre (L) onto the ground, or any spills into any watercourses (regardless of size) must be reported to the Construction Manager and Environmental Monitor/QEP immediately. The Environmental Monitor/QEP will then notify the IMGCC. The IMGCC will coordinate reporting to regulatory agencies if needed, with the support of the QEP/EM.

7.0 SITE RESTORATION

All instructions and mitigation measures outlined in this Plan shall be followed during site restoration activities. In addition to those to be outlined in this Plan, the following BMPs and mitigation measures apply to all site restoration measures:

The Contractor must adhere to the following requirements:

- Slope stabilization (as required); and,
- All disturbed areas will be graded similar to the pre-construction contour, except where it is not practical or safe to do so or there is a practical reason to adjust the grade (e.g., for improved revegetation success).

8.0 ENVIRONMENTAL MONITORING

Environmental monitoring will be undertaken daily during project construction to provide advice and guidance to the Contractor related to mitigation measures and to observe and document compliance with all relevant environmental obligations, including this EMP. The QEP will coordinate and direct environmental monitoring activities and ensure a suitably experienced Environmental Monitor is available to attend the site as needed. An Environmental Monitor must inspect the site on behalf of the QEP and must be present during all high-risk construction activities, including:

- Work occurring during or following a rainfall; and
- Dewatering and discharge.

In the event of any circumstances that result in non-compliance, the IMGCC will determine if stop work is necessary. The Contractor must implement all appropriate mitigation measures to address the non-compliance or until conditions change such that construction activities can once again be initiated in compliance with all environmental obligations.

8.1 Tailgate Meetings

Field crew tailgate meetings will be convened by the Contractor prior to the commencement of construction, as required by the nature of the work. These meetings can be integrated with regular health and safety meetings and will be used to review environmental requirements and environmental precautions applicable to the work. The Contractor's crew will sign and date a Tailgate Meeting Record form confirming they have received proper training informing them of their environmental obligations while conducting their work duties. Tailgate meetings, including content pertaining to environmental management and protection, will be documented and kept on file for inspection/auditing by the applicable regulatory agencies.

9.0 CLOSURE

This EMP is a collection of industry recognized BMPs and site-specific measures that must be implemented by the Contractor during independent remediation at the Site. This EMP should be considered a living document and new BMPs and measures may be added or removed as deemed appropriate by the Project Team.

We sincerely appreciate the opportunity to have assisted you with this project and if there are any questions, please do not hesitate to contact the undersigned by phone at 604.669.0424.

Report prepared by:
Hemmera Envirochem Inc.



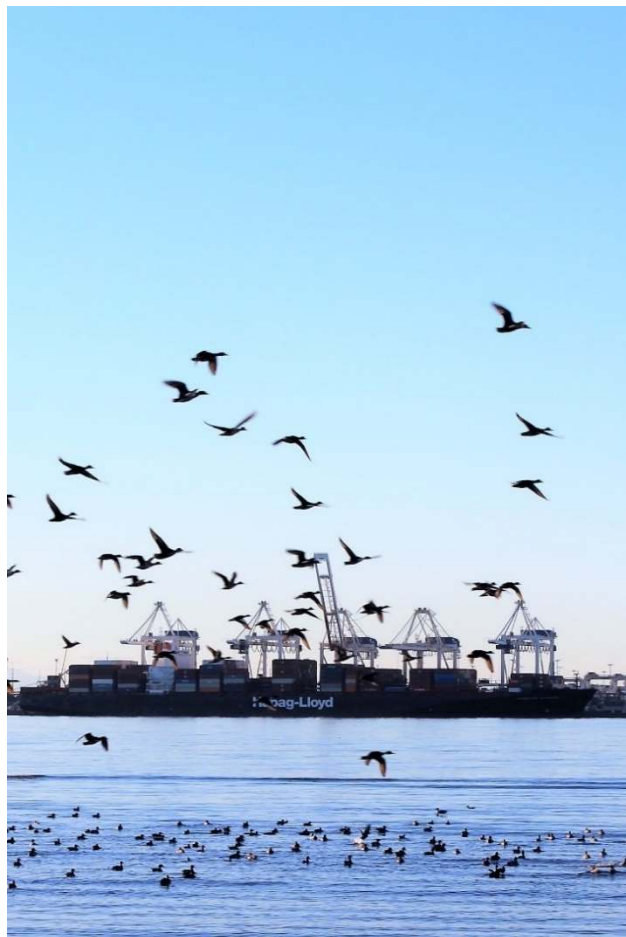
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Environmental Management Plan – Independent Remediation Program 1454 Oxford Street, White Rock, BC



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15336-31 Avenue, Suite 401
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Project No. 105640.01

April 15, 2021

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1.0 INTRODUCTION

This Environmental Management Plan has been prepared by Hemmera, based on work conducted by Hemmera, for sole benefit and use by Isle of Mann Group of Companies (IMGC). In performing this Work, Hemmera has relied in good faith on information provided by others, and has assumed that the information provided by those individuals is both complete and accurate. This Work was performed to current industry standard practice for similar environmental work, within the relevant jurisdiction and same locale. The findings presented herein should be considered within the context of the scope of work and project terms of reference; further, the findings are time sensitive and are considered valid only at the time the Report was produced. The conclusions and recommendations contained in this Report are based upon the applicable guidelines, regulations, and legislation existing at the time the Report was produced; any changes in the regulatory regime may alter the conclusions and/or recommendations.

1.1 Purpose and Objectives

The purpose of this Environmental Management Plan (EMP) is to provide Contractors and Consultants with environmental guidance, objectives, standard protocols, and mitigation measures for the Project in order to support compliance with applicable legislation, conditions of permits and approvals and the expectations of the community during independent remediation at 1454 Oxford Street, White Rock, BC (the “Project”).

This EMP identifies the specific roles and responsibilities associated with the Project team members, provides an overview of existing environmental conditions, identifies important legislative requirements, describes how environmental risks will be appropriately managed through mitigation and site restoration, and in the event of an incident, the emergency response procedures and reporting protocols to be implemented. This EMP also describes the environmental monitoring framework that will be implemented during remediation and post-remediation phases of the Project to inspect, evaluate, and report on work practices and the efficacy of the environmental remediation, effectiveness mitigation, and environmental protection efforts.

It is the responsibility of all members of the Project team to be familiar with the contents of the EMP and to comply with the practices and procedures described herein. The Contractor is also responsible to disseminate the EMP to their supervisors and crews and must keep a hard copy of the EMP on site where it is readily accessible.

The content of this EMP is subject to change to reflect updated Best Management Practices (BMPs) and mitigation measures developed in response to changes to the Project design or approach to construction.

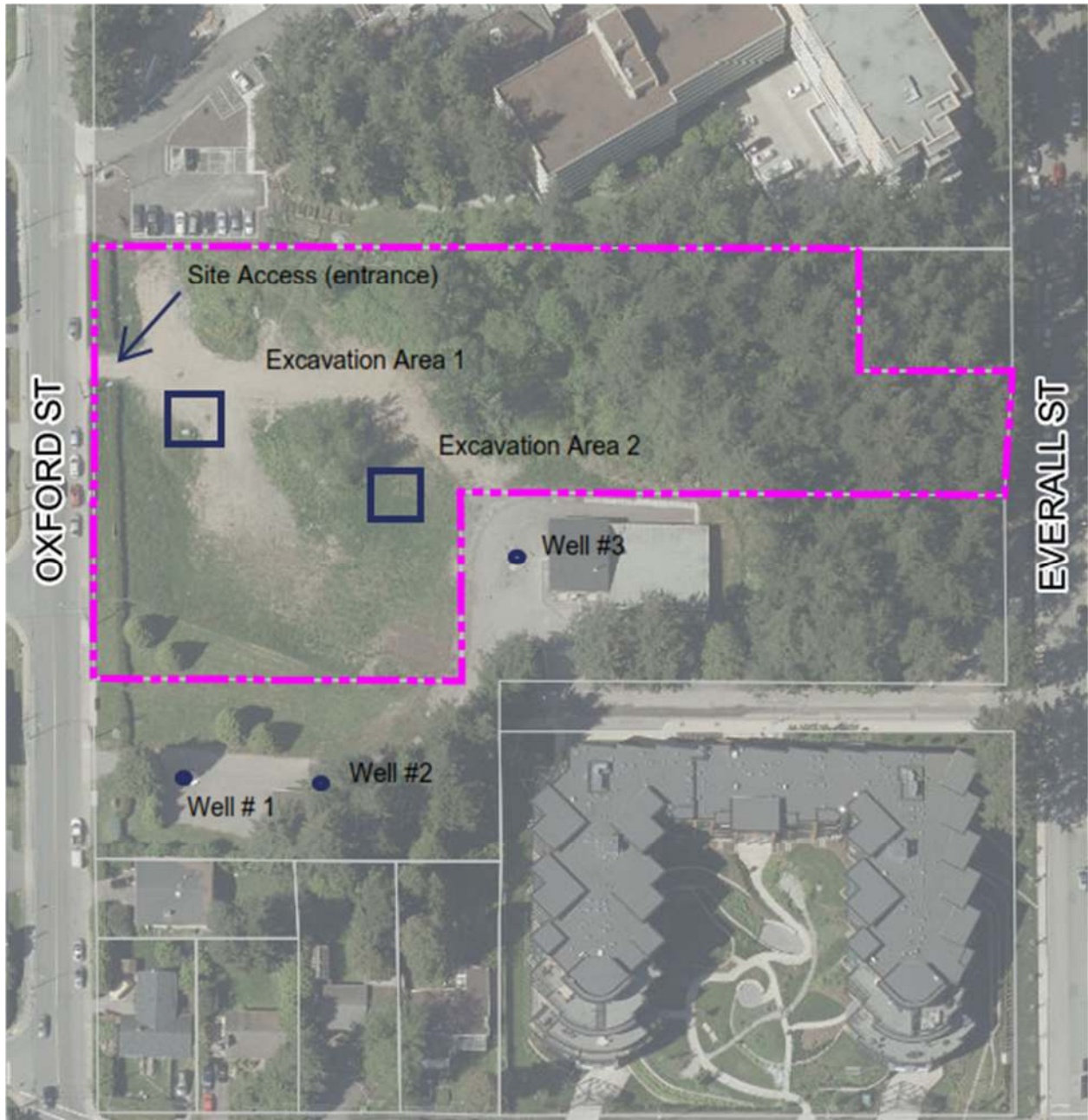


Figure 1 Project Area

2.0 CONTACT LIST

2.1 Emergency Contacts

A list of emergency contact numbers is provided below in **Table 1**:

Table 1 Emergency Contact Numbers

Contact	Contact Number
Emergency Management BC (EMBC)	1-800-663-3456
DFO Spill Reporting line	1-800-465-4336
City of White Rock, Operations Yard	1-604-541-2181
Water Utility Control Room	1-604-541-2273
MoE Conservation Officer	1-877-952-7277

2.2 Project-Specific Contacts

Contact information for Project-specific contacts are provided below in **Table 2**:

Table 2 Contact Information for Key Members of the Project

Title	Name	Contact #
CLIENT Team		
Senior Development Manager	Brent Tedford	Redacted S. 22
Contractor Contacts		
TBC		
Qualified Environmental Professionals		
Contaminated Sites Expert	Jason Wilkins	Redacted S. 22
Environmental Project Manager	Rada Kolev	
Environmental Monitors		
TBD	Hemmera On Site Staff	

Note: Tables 1 and 2 will be reviewed and completed following appointment of the general Contractor.

3.0 PROJECT OVERVIEW

3.1 Project Description

The proposed independent remediation scope of work is not expected to take more than a single day and trucks will be hot loaded with soil at the Site (soil will be directed from the excavation by the excavator directly into the waiting trucks, without stockpiling). The extent and scope of remediation required at the Site is limited to two distinct areas measuring 5 m x 5 m by 3 m deep (150 m³) in the vicinity of MW04-02 and BH4-2 (See **Figure 1**).

3.2 Location / Site Description

The property located at 1454 Oxford Street, White Rock, BC (the “Site”). Currently the southwestern portion of the Site is vacant, cleared and grassed. The remainder of the Site is densely vegetated. Historically the western portion of the Site was occupied by a municipal water reservoir, constructed as an open, in-ground, concrete lined basin with an approximate area of 42 m x 45 m. The reservoir was utilized from approximately the late 1940s or early 1950s until the late 1960s. The reservoir basin remained open and unutilised until the late 1980s or early 1990s when it was filled in with material of unknown quality, reportedly sourced from local development sites. Several environmental investigations were completed which have identified two small areas where independent remediation will be completed at the Site.

3.3 Proposed Work Schedule

The proposed start date of the project is dependent on acceptance of the EMP and Independent Remediation from the City of White Rock; however, assuming acceptance, independent remediation is expected to take 1 – 2 days to complete.

4.0 PROJECT TEAM / ROLES AND RESPONSIBILITIES

This section provides an overview of the roles and responsibilities of each of the key Project team leaders and members. The responsibilities identified for each role reflect an environmental management context and are not exhaustive.

4.1 CLIENT

IMGC is responsible for overseeing the successful delivery of all aspects of the Project including engineering, construction, and environmental protection. IMGC will oversee measures to ensure that all employees, contractors and visitors on the Project Site are appropriately informed and are aware of issues pertaining to health, safety, and the environment. IMGC responsibilities include:

- Oversight of engineering, design, construction, and environmental performance of the Project as per IMGC direction in line with the EMP;
- Ensuring that environmental incidents, including non-conformances with the EMP, are reported to IMGC and regulatory agencies as required;
- Ensuring that corrective actions related to non-conformances are undertaken in a timely manner to meet agency and stakeholder requirements;
- Ensuring adherence to IMGC policy and all applicable environmental and archaeological regulatory permits, approvals, and authorizations during the planning, design, construction, and operation of the Project;
- Supporting delivery of an environmental risk overview during project orientation (prepared and delivered by the QEP) to all field staff and support team, IMGC staff, and Contractor's representatives prior to start of construction;
- Leading communication with regulatory agencies to determine existing and emerging environmental issues or concerns, so that appropriate environmental planning and mitigation measures can be developed and implemented;
- Providing advice on key decisions such as stop work activities in any events of non-compliance with EMP and/or issued regulatory permits, and/or in the event that Project activities result in harm to the environment; and
- Ensuring that environmental incidents, including occurrences of non-compliance/non-conformance, are reported to the IMGC team and regulatory agents as required, and that any such instances are corrected by notifying the Manager.

4.2 Contractor

The responsibilities of the Contractor will include, but are not limited to:

- Ensuring all construction activities are completed according to Project designs approved by the IMGC and that all construction work performed by employees and sub-contractors complies with the requirements of the EMP, and any Contractor-prepared site- or task- specific EPPs;
- Completing all construction activities within the applicable timing windows and prior to the expiration of applicable permits and approvals. In the event that construction may continue beyond the duration of the timing windows and/or the permit/approval, the Contractor's Construction Manager must:
 - For Contractor-held permits/approvals, take all necessary steps to obtain an extension or renewal; and

- For IMGCC and/or QEP-held permits, notify the Construction Manager and the QEP well in advance of the expiration date.
- Providing all construction staff, including sub-contractors, with an orientation and/or appropriate training on environmental mitigation measures outlined in the EMP;
- Maintaining all construction equipment in good working condition;
- Keeping a current version of the EMP, applicable permits/approvals on site in a known location during all construction activities;
- Communicating regularly and effectively with all Project team members regarding the construction schedule and activities as it pertains to environmental issues, and adjusting construction activities as needed to stay in compliance with the EMP and any relevant permits/approvals;
- Notifying IMGCC and the QEP in the event of any incidents that have potential to result in harm to the environment, any unforeseen changes in environmental conditions on-site (e.g., slope instability, flooding), the discovery of any archaeological resources, and any concerns or complaints from landowners or regulatory inspections; and
- Leaving all completed work areas in a condition that is safe for the public, and environmentally stable (e.g. no eroding soils).

4.3 Qualified Environmental Professional

The QEP's team will work together as the IMGCC QEP to provide environmental design, planning, management, and monitoring services for the Project. Specific responsibilities of the QEP include, but are not limited to:

- Securing and maintaining applicable (non-Contractor held) environmental permits and approvals to ensure regulatory compliance during Project construction;
- Developing site-specific restoration and compensation plan, as outlined in Sections 6.4.5 and 7.0, and providing advice and guidance regarding implementation;
- Conducting all necessary environmental surveys;
- Developing and overseeing environmental protection and monitoring programs undertaken by the QEP;
- Providing advice on key decisions such as stop work activities in any events of non-compliance with EMP and/or issued regulatory permits, and/or if Project activities result in harm to the environment;
- Being available for consultation with IMGCC and Contractor during normal working hours or if not available, to have a backup system in place to address any issues related to environmental performance that may arise;
- Reviewing and reporting to the IMGCC and Contractor on the Contractor's compliance with the EMP through regular environmental monitoring reports prepared by the QEP, if required;
- Advising and reporting to the Construction Manager in the event of any areas of non-compliance, ineffective mitigation measures, or environmental incidents; and
- Delivering the environmental risk overview during project orientation with all Hemmera field and support team, IMGCC staff, and Contractor's representatives prior to start of construction to address environmental considerations of the Project, as outlined in Section 6

4.4 Environmental Monitor

The Environmental Monitors are responsible for determining whether work activities are in compliance with environmental obligations (i.e., permits/approvals and BMPs, the EMP, and EPPs). The Environmental Monitor reports to the QEP. The role of the Environmental Monitor includes the following responsibilities:

- Act as a representative of IMGC and observe, record, and report on environmental compliance of construction activities, and provide advice and guidance related to environmental protection;
- Being familiar with requirements outlined in permits, by-laws, applicable legislation, this EMP and relevant BMPs;
- Reviewing EMP, EPPs and all relevant documentation and verifying that environmental impacts of the work have been adequately identified and mitigation measures are sufficient to protect environmental resources;
- Flagging sensitive zones identified in advance of construction planning and prior to start of construction in these areas;
- Providing on-site monitoring for the duration of high-risk activities such as instream works or contaminated material excavation and off-site transportation, and at a frequency of at least once per week during low-risk activities such as work along roadways or in the existing ROW;
- Reporting on matters that arise during construction that are not included in the EMP, discuss with the Construction Manager and the QEP, and resolve with the Manager;
- Providing any other information or advice to construction teams in order to support compliance with all applicable permits, management plans, and by-laws; and
- Submitting routine reports for review to the QEP, including daily and weekly environmental monitoring reports, (see **Section 10.2** for more details).

5.0 ENVIRONMENTAL OVERVIEW

This section provides a general overview of the environmental features present within the Project and identifies the sensitivities associated with these habitats and features as well as the species which may be affected by the proposed construction activities.

5.1 Aquatic Resources

Not Applicable

5.1.1 Waterbodies

Not Applicable

5.1.2 Fish and Aquatic Species

Not Applicable

5.1.3 Riparian Areas

Not Applicable

5.2 Terrestrial Resources

5.2.1 Upland Vegetation and Wildlife

Not Applicable

5.2.2 Parks, Greenbelts and Ecological Areas

Special considerations may need to be taken by the Contractor while working in these areas, as they may potentially be associated with high levels of public use and/or wildlife habitat values. The parks, greenbelts, and sensitive natural areas that are located within 100 m of the Project are presented in **Table 3**.

Table 3 Parks, Greenbelts and Ecological Areas within 100 m of the Project Footprint

Park/Greenbelt/Ecological Area	Distance to Project
Blue Heron Nesting Area	>30 m east of work area
Down Gradient City Water Supply Well (Well #1)	50 – 60 m

6.0 ENVIRONMENTAL MITIGATION MEASURES AND BEST PRACTICES

Project activities have the potential to negatively impact environmental values associated with the proposed works. Many of these impacts can be avoided or minimized through implementation of site-specific mitigation measures.

6.1 Project Orientation

At the commencement of the project, the QEP, along with the site contractor, will conduct a project orientation addressing the following:

- Expected health and safety risks associated with the proposed work; at this time, hazardous materials are not expected to be encountered during the work (see **Section 6.4.1**), however, other health and safety concerns associated with operation of heavy machinery will be discussed.
- Personal Protective Equipment (PPE) required on site, as detailed in the site specific health and safety plan that will be prepared and reviewed prior to commencement of any on site work.
- Environmental sensitive areas, including the risks to the water well installations and the importance of maintaining physical distance from the well sites and mitigating measures, as described in this plan.
- Procedures for stop work should the team identify, or become aware of, health and safety or environmental concerns that may arise during the on site works.
- Other details outlined in this Environmental Management Plan.

6.2 Erosion and Sediment Control

Project activities, including excavation, vehicle and equipment movement and excavation back filling, have the potential to cause the erosion of soil and transport of sediment by water.

The proposed independent remediation scope of work is not expected to result in risk to the existing City water supply well (Well #1). The work is not expected to take more than a single day and trucks will be hot loaded with soil at the Site (soil will be directed from the excavation by the excavator directly into the waiting trucks, without stockpiling). The hot loading of the soils will preclude any excess soil piles on the Site that may otherwise result in surface runoff and/or sediment erosion that could pose a risk to Well #1. The location of the work will also preclude any mobilization of equipment near the property boundary in proximity to Well#1. Upon completion of remediation, the excavation will be backfilled with clean gravel or rock to mitigate water accumulation and sediment erosion of the newly exposed surface.

To further manage erosion and sediment during independent remediation, the work should only be completed during favourable weather conditions.

6.3 Site Preparation

Site preparation includes all pre-construction activities within the site. The Contractor will perform all site preparation tasks within roadways and will be responsible to ensure the associated activities do not result in harm to the natural environment. The Contractor will work with the Construction Manager and QEP to ensure that the requirements listed below are undertaken prior to commencement of construction.

6.4 Remediation

6.4.1 Hazardous Waste Exposure & PPE

At this time, hazardous waste, as defined under the BC *Environmental Management Act* and Hazardous Waste Regulation has not been identified and is not expected to be encountered during the remediation activities at the Site. The contamination being excavated is associated with trace metals (chromium, copper and lead) greater than applicable commercial land use standard under the Contaminated Sites Regulation. These trace metals are stable and only represent a risk to human health and the environment through direct long-term exposure (ingestion, leaching and inhalation). Nevertheless, direct exposure will be mitigated during the remediation as the soil will be hot loaded directly from the ground into the truck using an excavator for immediate off site disposal at a permitted facility. The potential exposure scenario and duration represents a negligible risk to the public, works and the environment during the proposed scope of work. Additional personal protective equipment, other than those normally proposed during routine soil handling scopes of work, are not required or recommended. This is consistent with general industry practice, Workers Compensation Board and Ministry of Environment and Climate Change Strategy expectation during these types of remediation activities.

6.4.2 Excavation Activities

The following BMPs and mitigation measures apply during all excavation activities:

- Minimize the area of excavation to the extent possible;
- Any contaminated soil to be removed off-site must be undertaken in accordance with the *Environmental Management Act Contaminated Sites Regulation, Sections 46.1 and 46.2, as amended in BC Reg. 196/2017*;
- Contaminated material shall be trucked to an approved storage facility off-site; and,
- Backfill excavations as quickly as possible by compacting the subsoil in lifts, and spreading any remaining spoil over the excavation before replacing the overburden.

6.4.3 Site Access and Egress

- The Site will be accessed off Oxford Street and equipment movement will be restricted to the general vicinity to the excavation areas.
- The roadside catch basin on the immediate downslope side of all egress locations must be protected with a suitable catch basin inlet protector (e.g., silt sack). The EM/QEP may request additional catch basins also be protected if sediment-laden runoff water is flowing past the initial catch basin; and
- Mud and debris tracked onto a municipal roadway must be swept clean on at least a daily basis; more frequently during rain events.

6.4.4 Water Management and Treatment

Water management is not expected during excavation activities due to the shallow depth, and limited excavation size and duration.

6.4.5 Protection of Exposed Soils

If excavated material is required to be stored on-site, surface protection measures help prevent erosion by covering the surface of erodible soil (e.g., topsoil and underlying soil materials) with a physical protective layer that prevents interaction with water or minimizes water velocity. The Contractor shall implement the following soil protection measures, as necessary, on all exposed soils, including stockpiles and grubbed and graded areas:

- Tarps or poly sheeting;
- Water (i.e., spray surface soil to keep down dust if wind erosion is a concern);

6.4.6 Cleanup and Restoration

The Contractor will maintain a clean work site and restore all Project areas following completion, including the following:

- Upon completing construction, the Contractor will return the affected work site and surrounding area to as close to original condition as is practical; and
- During cleanup, remove and dispose of all construction garbage and waste.

6.5 Environmental Incidents and Spills

It is expected that all reasonable preventative measures will be taken to avoid the release of waste or hazardous materials into the environment. The Contractor is responsible for implementing the following measures to avoid and/or mitigate the potential effects of environmental incidents and spills.

6.5.1 Environmental Response Team

In the event of an environmental incident or emergency, the Contractor's environmental representative will contact IMGC environmental team, EM, and QEP directly to coordinate a response. The QEP and IMGC will develop an emergency response plan and will work with the EM and Contractor to implement on-site activities.

The Contractor and Manager will also designate Environmental Response Teams (ERTs). The Contractor's ERT Team will respond to on-site emergencies and will contact the Construction Managers ERT in the event of an environmental emergency. The IMGC will contact applicable regulatory agencies, or will designate the QEP, as per **Section 7.10.4**. The EM/QEP and Construction Manager will be responsible for following up with the Contractor regarding monitoring of any clean-up and mitigation activities.

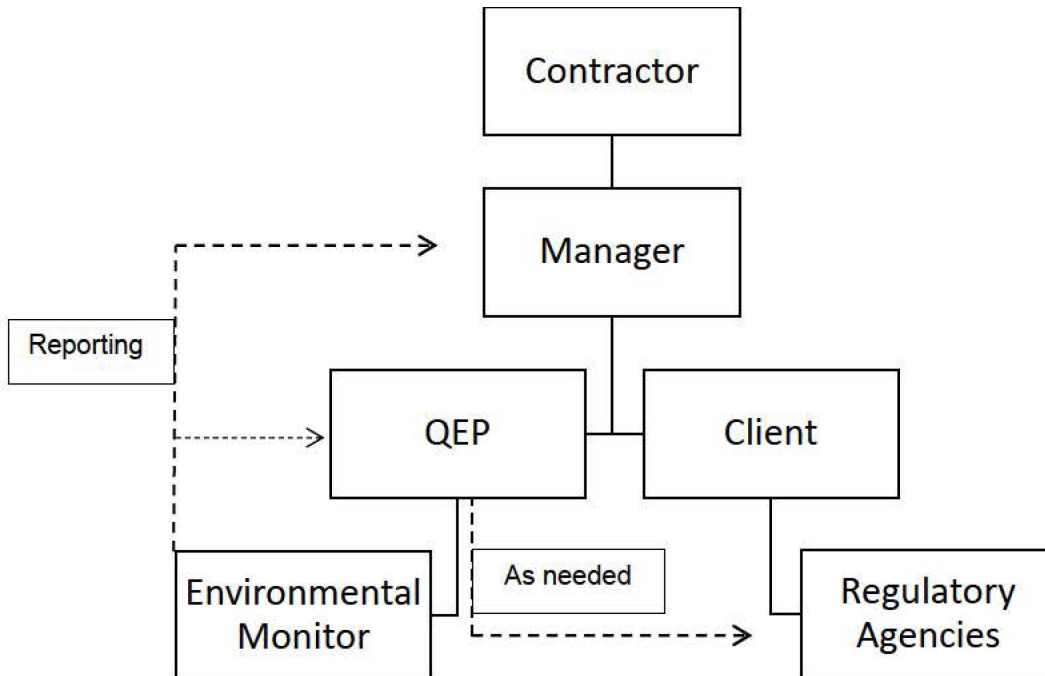


Figure 2 Emergency Response Team

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Contractors will identify potential spill hazards (i.e., refuelling equipment on a slope), determine the level of risk for activities that could result in a spill, and take measures to reduce the potential of a spill. All efforts will be taken to minimize the risk of spills, including:

- Maintain equipment on the work site in a manner that prevents spills to the environment;
- Appropriately train equipment operators and crews on how to contain spills or leakage from equipment;
- Place absorbent pads underneath areas of the equipment or vehicles that require maintenance;
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Spill kits must be available in every vehicle and piece of equipment operating on the work site and at each watercourse crossing. All spill kits must be fully stocked and restocked as soon as possible if used. All spill kits will include the following, at a minimum:

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8.0 ENVIRONMENTAL MONITORING

Environmental monitoring will be undertaken daily during project construction to provide advice and guidance to the Contractor related to mitigation measures and to observe and document compliance with all relevant environmental obligations, including this EMP. The QEP will coordinate and direct environmental monitoring activities and ensure a suitably experienced Environmental Monitor is available to attend the site as needed. An Environmental Monitor must inspect the site on behalf of the QEP and must be present during all high-risk construction activities, including:

- Work occurring during or following a rainfall; and
- Dewatering and discharge.

In the event of any circumstances that result in non-compliance, the IMGC will determine if stop work is necessary. The Contractor must implement all appropriate mitigation measures to address the non-compliance or until conditions change such that construction activities can once again be initiated in compliance with all environmental obligations.

8.1 Tailgate Meetings

Field crew tailgate meetings will be convened by the Contractor prior to the commencement of construction, as required by the nature of the work. These meetings can be integrated with regular health and safety meetings and will be used to review environmental requirements and environmental precautions applicable to the work. The Contractor's crew will sign and date a Tailgate Meeting Record form confirming they have received proper training informing them of their environmental obligations while conducting their work duties. Tailgate meetings, including content pertaining to environmental management and protection, will be documented and kept on file for inspection/auditing by the applicable regulatory agencies.

9.0 CLOSURE

This EMP is a collection of industry recognized BMPs and site-specific measures that must be implemented by the Contractor during independent remediation at the Site. This EMP should be considered a living document and new BMPs and measures may be added or removed as deemed appropriate by the Project Team.

We sincerely appreciate the opportunity to have assisted you with this project and if there are any questions, please do not hesitate to contact the undersigned by phone at 604.669.0424.

Report prepared by:
Hemmera Envirochem Inc.

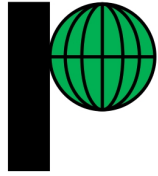


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Report prepared by:
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FILE: 3431-TM1

TECHNICAL MEMORANDUM

DATE: July 19, 2021

TO: Birk Madsen
City of White Rock

FROM: Arnd Burgert
Email: aburgert@piteau.com

RE: **1454 Oxford Street Development and Soil Remediation:
Review of Potential Effects on City of White Rock Production Wells**

Further to our recent communications, Piteau Associates Engineering Ltd. has prepared the following technical memorandum to provide guidance to the City of White Rock (the City) on the potential for proposed residential construction and contaminated soil removal at the above-noted property (the Site) to impact any of the municipal wells in the Oxford Street well field, or the aquifer from which they draw groundwater. To this end, we have reviewed the following documents provided by the City:

- Hemmera Envirochem Inc., 2017. 1454 Oxford Street, White Rock Hydrogeological Review. Report to Isle of Mann Group of Companies. November 24.
- Hemmera Envirochem Inc., 2021. Environmental Management Plan – Independent Remediation Program 1454 Oxford Street, White Rock, BC. Report to Isle of Mann Group of Companies. April 15.
- Hemmera Envirochem Inc., 2021. Environmental Management Plan – Independent Remediation Program 1454 Oxford Street, White Rock, BC. Report to Isle of Mann Group of Companies. March 17.
- Hemmera Envirochem Inc., 2021. Independent Remediation and Site Closure of 1454 Oxford Street, White Rock BC. Report to Isle of Mann Group of Companies. March 11.
- City of White Rock, 2018. 2018 Water Utility Capital Works Goggs Avenue Contract No. WR18-021. June.

The proposed development includes construction of two high-rise residential towers immediately north of City-owned lands on which Wells 1, 2, 3, and 8 are situated. Both buildings will have three levels of underground parking.



The maximum excavation depth is 15.1 m, and anchored shotcrete will be required on all sides. The anchor pattern includes anchors on a 1.8 m horizontal and vertical spacing extending in the horizontal plane as much as 16.5 m from the excavation wall. The pattern will necessitate up to eight vertically stacked rows of anchors to cover the deepest portions of the excavation. Most of the anchor boreholes angle downwards at 15°, with a few at 20° or 40°.

A former open water reservoir at the Site (Figure 1) was backfilled with material including two zones with soil containing chromium, copper, and lead at concentrations exceeding the commercial land use standards set out in the Contaminated Sites Regulation. The maximum depth of contamination is 3 m below ground level. Prior to construction at the Site, the developer will remove the contaminated soil in accordance Part 13 of the regulation (Independent Remediation).

Piteau has reviewed the documents listed above to assess potential risks to the City's wells and the source aquifer that could arise from removal of contaminated soils from within the former reservoir, and excavation for the building foundations. The assessment and results are summarized in the remainder of this memorandum.

The approximate maximum extent of the area to be penetrated by anchors along the south and east excavation walls is depicted by the purple dashed line on Figure 1. Anchors may penetrate onto the City's lands beyond the location of Well 3, presenting a conflict. We recommend that the contractor be required to provide a minimum 2 m setback between the anchor boreholes and City infrastructure including wells, underground pipes and ducts. This offset should be adequate to protect the well casing and pipes from vibrations or excess pressure generated during grouting.

The proposed method for removal of contaminated soils from the Site is by excavating for immediate off-site transport and disposal. This will avoid stockpiling and the potential for the development of any leachate. The potential for fugitive dust remains, but the mass of contaminant metals transported by this means would be insufficient to pose a risk of aquifer pollution. Accordingly, the potential for the proposed soil removal to pollute groundwater is judged to be very low.

Diversion of precipitation into the storm sewer system by surfaces such as roofs and pavement will result in a reduction of aquifer recharge since a portion of this water would otherwise infiltrate into the ground. Hemmera indicate that a reduction in aquifer recharge is not expected because the aquifer extends beyond Hwy. 99 and includes large unpaved areas. However, they fail to mention that the portion of the aquifer in the vicinity of Hwy. 99 lies far beyond the groundwater divide, and therefore does not contribute to recharge to the southern part of the aquifer, including the portion beneath the Oxford Street well field. Additionally, as development in Surrey and White Rock progressively leads to densification, the argument that there are remaining unpaved spaces for recharge to occur is not protective of future recharge rates. While the proposed development alone will not have a measurable effect on the aquifer recharge rate, cumulative effects of multiple developments are likely to contribute to reduced recharge in the future. We therefore recommend that the City consider revising its building bylaws to accommodate inclusion of stormwater infiltration measures in the design of new developments where practicable, using best management practices.



During construction, spilt fuel or other liquids could lead to groundwater pollution. The reporting and remediation requirements set out in the Environmental Management Act and Contaminated Sites Regulation provide sufficient regulatory framework to limit the risk of contaminants entering groundwater supplies. However, we recommend that the construction contractor be advised of the proximity to the Oxford well field and the need for vigilance to avoid contamination. Following construction, the potential for contaminants to be released will be much lower.

We trust this letter provides the information you require.

LIMITATIONS

This investigation has been conducted using a standard of care consistent with that expected of scientific and engineering professionals undertaking similar work under similar conditions in BC. No warranty is expressed or implied.

This memorandum is prepared for the sole use of the City of White Rock. Any use, interpretation, or reliance on this information by any third party, is at the sole risk of that party, and Piteau Associates accepts no liability for such unauthorized use.

CLOSING

We trust the above is adequate for your current needs. If you have any questions regarding the above, or we can be of further service, please do not hesitate to contact us.

Respectfully submitted,

PITEAU ASSOCIATES ENGINEERING LTD.

Arnd Burgert, P. Geo.
Sr. Hydrogeologist

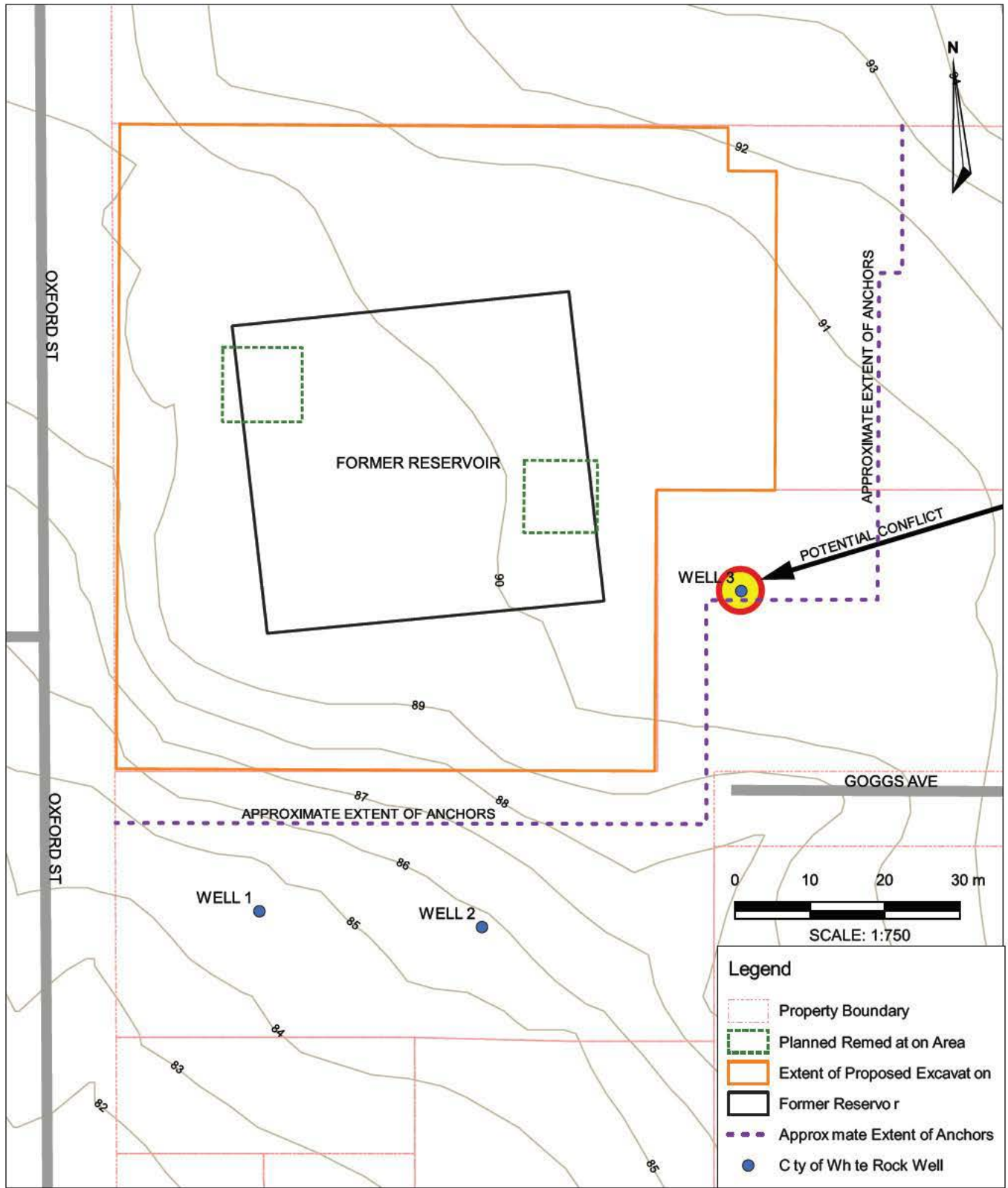


Reviewed by:

David J. Tiplady, P. Eng.
Principal Hydrogeologist
Vice President, Groundwater

AB/DJT/ld

FIGURE



Legend

- Property Boundary
- Planned Remedation Area
- Extent of Proposed Excavation
- Former Reservoir
- Approximate Extent of Anchors
- City of White Rock Well

PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

CITY OF WHITE ROCK
 ASSESSMENT OF PROPOSED SITE REMEDIATION
 AND RESIDENTIAL CONSTRUCTION
 1454 OXFORD STREET, WHITE ROCK



PITEAU ASSOCIATES
 GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

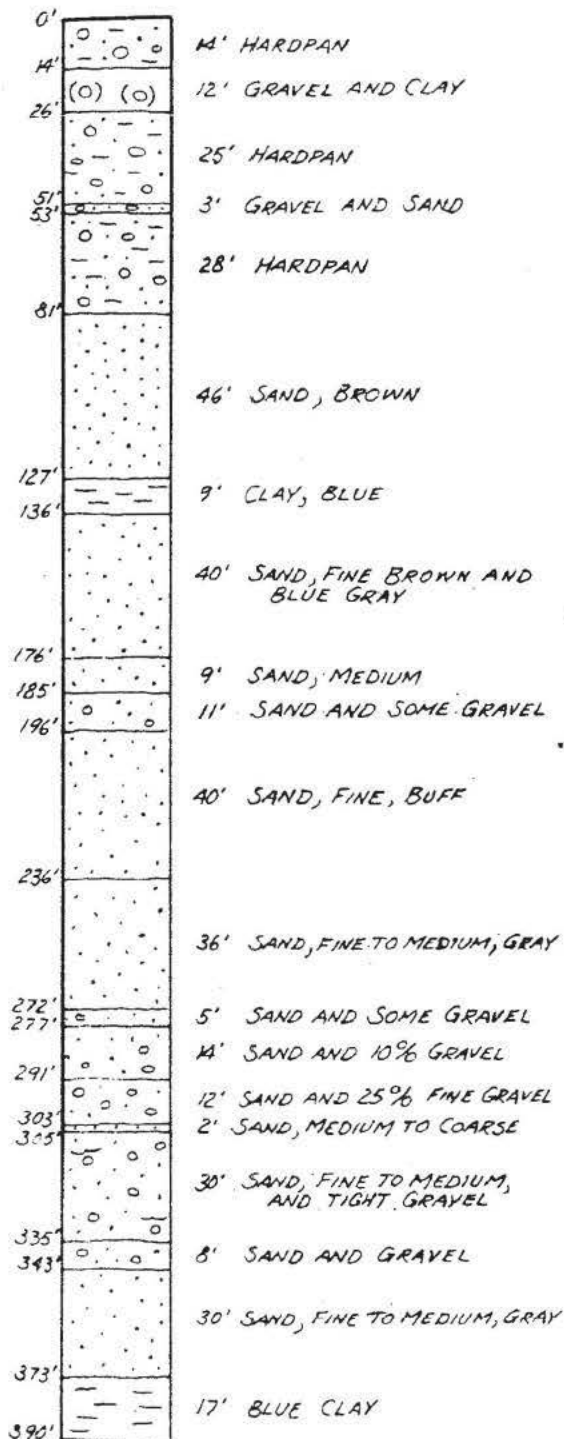
SITE PLAN

BY:	DATE:
AB	JUL 21
APPROVED:	FIG:
DJT	1

APPENDIX A
CONSTRUCTION AND LITHOLOGICAL LOG
FOR CITY OF WHITE ROCK WELL 3

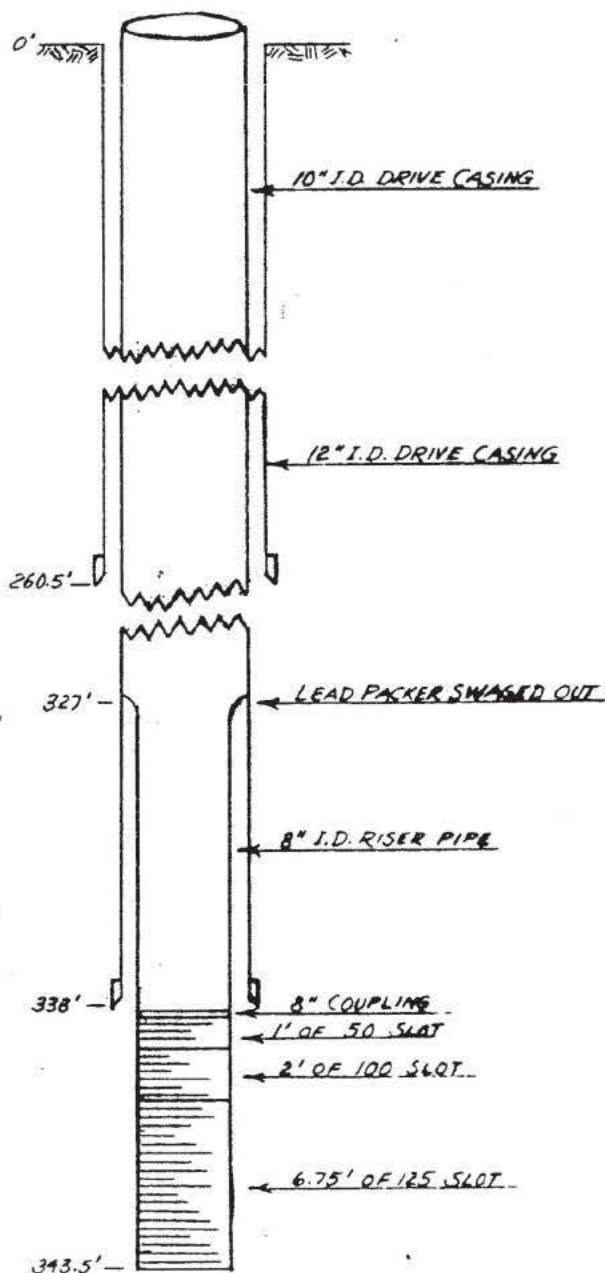
WHITEROCK NO. 6

LOG



HOLE BOTTOMED AT 390'

CASING AND SCREEN DETAILS



JOHNSON 10" NOMINAL EVERDUR
CONTINUOUS WIRE WOUND SCREEN
I.D. = 8 5/8"
O.D. = 9 1/2"

WHITE ROCK WATER WORKS COMPANY, LTD.
VANCOUVER, BRITISH COLUMBIA

DRILLED BY: PACIFIC WATER WELLS, LTD.

ROBINSON AND ROBERTS
GROUND WATER GEOLOGISTS
TACOMA, WASHINGTON

John B Roberts

JULY 21, 1959

A-414, H.N.