Public Works and Government Services Canada | Travaux publics et Services gouvernementaux Canada

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:

Public Works and Government Services Canada
100-167 Lombard Avenue
Winnipeg
Manitoba
R3B 0T6
Bid Fax: (204) 983-0338

INVITATION TO TENDER
APPEL D'OFFRES

Tender To: Public Works and Government Services Canada

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

Soumission aux: Travaux Publics et Services Gouvernementaux Canada

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici et sur toute feuille ci-annexée, au(x) prix indiqué(s).

Comments - Commentaires

Issuing Office - Bureau de distribution

Public Works and Government Services Canada
Northern Contaminated Site Program
ATB Place North Tower
10025 Jasper Avenue
Edmonton
Alberta
T5J 1S6

Title - Sujet Wasagaming Remediation	
Solicitation No. - N° de l'invitation ET022-181767/A	**Date** 2017-11-15
Client Reference No. - N° de référence du client PC-ET022-181767	**GETS Ref. No. - N° de réf. de SEAG** PW-$NCS-030-11232
File No. - N° de dossier NCS-7-40164 (030)	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à 02:00 PM** **on - le 2017-12-01**	**Time Zone** **Fuseau horaire** Central Standard Time CST
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☑ **Other-Autre:** ☐	
Address Enquiries to: - Adresser toutes questions à: Calixto, Monnette	**Buyer Id - Id de l'acheteur** ncs030
Telephone No. - N° de téléphone (204) 899-9768 ( )	**FAX No. - N° de FAX** ( ) -
Destination - of Goods, Services, and Construction: **Destination - des biens, services et construction:** See Herein	

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address
Raison sociale et adresse du fournisseur/de l'entrepreneur

Delivery Required - Livraison exigée See Herein	**Delivery Offered - Livraison proposée**
Vendor/Firm Name and Address **Raison sociale et adresse du fournisseur/de l'entrepreneur** **Telephone No. - N° de téléphone** **Facsimile No. - N° de télécopieur**	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) **Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)** **Signature** **Date**	

Canada

Item Article	Description	Dest. Code Dest.	Inv. Code Fact.	Qty Qté	U. of I. U. de D.	Unit Price/Prix unitaire FOB/FAM Destination	Plant/Usine	Delivery Req. Livraison Req.	Del. Offered Liv. offerte
1	Wasagaming Remediation	ET022	ET022	1	Each	$	XXXXXXXXXX	See Herein	

RETURN BIDS TO:
Public Works and Government Services Canada
Room 100,
167 Lombard Ave.
Winnipeg
Manitoba
R3B 0T6

"Firms intending to submit bids on this project should obtain bid documents through the GETS service provider on the Government of Canada Web site at http://buyandsell.gc.ca/procurement-data/tenders.

Firms that obtain bid documents from a source other than the official site run the risk of not receiving a complete package"

INVITATION TO TENDER

Remediation of Former Gas Station Site
Riding Mountain National Park, MB
R.090731.001

IMPORTANT NOTICE TO BIDDERS

PROMPT PAYMENT IN THE CONSTRUCTION INDUSTRY
Prompt Payment Principles
Public Services and Procurement Canada advocates that construction-related payments should follow these three principles:

- **Promptness**: The department will review and process invoices promptly. If disputes arise, Public Services and Procurement Canada will pay for items not in dispute, while working to resolve the disputed amount quickly and fairly
- **Transparency**: The department will make construction payment information such as payment dates, company names, contract and project numbers, publicly available; likewise, contractors are expected to share this information with their lower tiers
- **Shared responsibility**: Payers and payees are responsible for fulfilling their contract terms including their obligations to make and receive payment, and to adhere to industry best practices

For more information: http://www.tpsgc-pwgsc.gc.ca/biens-property/divulgation-disclosure/psdic-ppci-eng.html

SUPPORT THE USE OF APPRENTICES
The Government of Canada proposes to support the employment of apprentices in federal construction and maintenance projects. To support this initiative, a voluntary certification signaling the Bidder's commitment to hire and train apprentices is available on Appendix 4.

PWGSC UPDATE ON ASBESTOS USE
Effective April 1, 2016, all Public Works and Government Services Canada (PWGSC) contracts for new construction and major rehabilitation will prohibit the use of asbestos-containing materials. Further information can be found at http://www.tpsgc-pwgsc.gc.ca/comm/vedette-features/2016-04-19-00-eng.html

ADDITION OF TERMINOLOGY
Take note of the additional paragraph included in clause R2810D identified in SC04.

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SPECIAL INSTRUCTIONS TO BIDDERS (SI)

SI01 BID DOCUMENTS

1. The following are the Bid Documents:

   a. Invitation to Tender - Page 1;
   b. Special Instructions to Bidders;
   c General Instructions - Construction Services - Bid Security Requirements R2710T (2017-09-21)
   d. Clauses & Conditions identified in “Contract Documents”;
   e. Drawings and Specifications;
   f. Bid and Acceptance Form and related Appendix(s); and
   g. Any amendment issued prior to solicitation closing.

   Submission of a bid constitutes acknowledgement that the Bidder has read and agrees to be bound by these documents.

2. General Instructions - Construction Services - Bid Security Requirements R2710T is incorporated by reference and is set out in the Standard Acquisition Clauses and Conditions (SACC) Manual, issued by Public Works and Government Services Canada (PWGSC). The SACC Manual is available on the PWGSC Web site: https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/5/R

SI02 ENQUIRIES DURING THE SOLICITATION PERIOD

1. Enquiries regarding this bid must be submitted in writing to the Contracting Authority named on the Invitation to Tender - Page 1 at e-mail address Monnette.Calixto@tpsgc-pwgsc.gc.ca Except for the approval of alternative materials as described in GI15 of R2710T, enquiries should be received no later than **five (5)** calendar days prior to the date set for solicitation closing to allow sufficient time to provide a response. Enquiries received after that time may result in an answer NOT being provided.

2. To ensure consistency and quality of the information provided to Bidders, PWGSC will examine the content of the enquiry and will decide whether or not to issue an amendment.

3. All enquiries and other communications related to this bid sent throughout the solicitation period must be directed ONLY to the Contracting Authority named in paragraph 1. above. Failure to comply with this requirement may result in the bid being declared non- compliant.

SI03 REVISION OF BID

A bid may be revised by letter or facsimile in accordance with GI10 of R2710T. The facsimile number for receipt of revisions is (204) 983-0338.

SI04 BID RESULTS

1. A public bid opening will be held in the office designated on the Front Page “Invitation to Tender” (top left corner) for the receipt of bids shortly after the time set for solicitation closing.

2. The responsive bid carrying the lowest price will be recommended for contract award.

3. Following solicitation closing, bid results may be obtained by emailing PWGSC.WSTESATPA-OSTEASEAA.TPSGC@pwgsc-tpsgc.gc.ca

SI05 INSUFFICIENT FUNDING

In the event that the lowest compliant bid exceeds the amount of funding allocated for the Work, Canada in its sole discretion may

a. cancel the solicitation; or

b. obtain additional funding and award the Contract to the Bidder submitting the lowest compliant bid.

SI06 BID VALIDITY PERIOD

1. Canada reserves the right to seek an extension to the bid validity period prescribed in BA04 of the Bid and Acceptance Form. Upon notification in writing from Canada, Bidders will have the option to either accept or reject the proposed extension.

2. If the extension referred to in paragraph 1. above is accepted, in writing, by all those who submitted bids, then Canada will continue immediately with the evaluation of the bids and its approvals processes.

3. If the extension referred to in paragraph 1.above is not accepted in writing by all those who submitted bids then Canada will, at its sole discretion, either

   a. continue to evaluate the bids of those who have accepted the proposed extension and seek the necessary approvals; or

   b. cancel the invitation to tender.

4. The provisions expressed herein do not in any manner limit Canada's rights in law or under GI11 of R2710T.

SI07 CONSTRUCTION DOCUMENTS

The successful Contractor will be provided **one electronic copy** of the sealed and signed drawings, the specifications and the amendments upon acceptance of the offer. Additional copies, up to a maximum 0, will be provided free of charge upon request by the Contractor. Obtaining more copies will be the responsibility of the Contractor including costs.

SI08 WCB AND SAFETY PROGRAM

1. The recommended Bidder shall provide to the Contracting Authority, prior to Contract award:

   1.1 a Workers Compensation Board *Experience and Industry Rating Statement - Manitoba*, or equivalent documentation from another jurisdiction;

   1.2 a Workers Compensation Board letter of good standing, also listing covered Directors, Principals, Proprietor(s) or Partners who will be or who are anticipated to be present on the work site(s), or equivalent documentation from another jurisdiction; and

   1.3 a Certificate of Recognition (COR) or Registered Safety Plan (RSP). A health and safety policy and program, as required by other provincial/territorial Occupational Health and Safety Acts, will be acceptable in lieu of a COR or RSP.

2. The recommended Bidder shall deliver all of the above documents to the Contracting Authority on or before the date stated (usually 3-5 days after notification) by the Contracting Authority. Failure to comply with the request may result in the bid being declared non-compliant.

Exemption to Generic Safety Programs *(Manitoba only)* - Contractors having five (5) or less employees do not require a written program. However, evidence of a system to manage health and safety remains a requirement.

SI09 WEB SITES

The connection to some of the Web sites in the solicitation documents is established by the use of hyperlinks. The following is a list of the addresses of the Web sites:

Treasury Board Appendix L, Acceptable Bonding Companies
http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=14494&section=text#appL

Buy and Sell
https://www.achatsetventes-buyandsell.gc.ca

Canadian economic sanctions
http://www.international.gc.ca/sanctions/index.aspx?lang=eng

Contractor Performance Evaluation Report (Form PWGSC-TPSGC 2913)
http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/2913.pdf

Bid Bond (form PWGSC-TPSGC 504)
http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/504.pdf

Performance Bond (form PWGSC-TPSGC 505)
http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/505_eng.pdf

Labour and Material Payment Bond (form PWGWSC-TPSGC 506)
http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/506.pdf

Standard Acquisition Clauses and Conditions (SACC) Manual
https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/5/R

PWGSC, Industrial Security Services
http://ssi-iss.tpsgc-pwgsc.gc.ca/index-eng.html

PWGSC, Code of Conduct and Certifications
http://www.tpsgc-pwgsc.gc.ca/app-acq/cndt-cndct/contexte-context-eng.html

Construction and Consultant Services Contract Administration Forms Real Property Contracting
http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html

Declaration Form
http://www.tpsgc-pwgsc.gc.ca/ci-if/formulaire-form-eng.html

Trade agreements
https://buyandsell.gc.ca/policy-and-guidelines/Policy-and-Legal-Framework/Trade-Agreements

CONTRACT DOCUMENTS (CD)

1. The following are the Contract Documents:

   a. Contract Page when signed by Canada;
   b. Duly completed Bid and Acceptance Form and any Appendices attached thereto;
   c. Drawings and Specifications;
   d. General Conditions and clauses

GC1	General Provisions – Construction Services	R2810D	(2017-08-17);
GC2	Administration of the Contract	R2820D	(2016-01-28);
GC3	Execution and Control of the Work	R2830D	(2015-02-25);
GC4	Protective Measures	R2840D	(2008-05-12);
GC5	Terms of Payment	R2850D	(2016-01-28);
GC6	Delays and Changes in the Work	R2860D	(2016-01-28);
GC7	Default, Suspension or Termination of Contract	R2870D	(2008-05-12);
GC8	Dispute Resolution	R2880D	(2016-01-28);
GC9	Contract Security	R2890D	(2014-06-26);
GC10	Insurance	R2900D	(2008-05-12);
Allowable Costs for Contract Changes Under GC6.4.1		R2950D	(2015-02-25);

   Supplementary Conditions

   e. Any amendment issued or any allowable bid revision received before the date and time set for solicitation closing;
   f. Any amendment incorporated by mutual agreement between Canada and the Contractor before acceptance of the bid; and
   g. Any amendment or variation of the contract documents that is made in accordance with the General Conditions.

2. The documents identified by title, number and date above are incorporated by reference and are set out in the Standard Acquisition Clauses and Conditions (SACC) Manual, issued by Public Works and Government Services Canada (PWGSC). The SACC Manual is available on the PWGSC Web site: https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual

3. The language of the contract documents is the language of the Bid and Acceptance Form submitted.

SUPPLEMENTARY CONDITIONS (SC)

There is no document security requirement applicable to this Contract.

SC01 LIMITATION OF LIABILITY

GC1.6 of R2810D is deleted and replaced with the following:

GC1.6 Indemnification by the Contractor

1. The Contractor shall indemnify and save Canada harmless from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings whether in respect to losses suffered by Canada or in respect of claims by any third party, brought or prosecuted and in any manner based upon, arising out of, related to, occasioned by, or attributable to the activities of the Contractor in performing the Work, provided such claims are caused by the negligent or deliberate acts or omissions of the Contractor, or those for whom it is responsible at law.

2. The Contractor's obligation to indemnify Canada for losses related to first party liability shall be limited to:

   a. In respect to each loss for which insurance is to be provided pursuant to the insurance requirements of the Contract, the Commercial General Liability insurance limit for one occurrence as referred to in the insurance requirements of the Contract .

   b. In respect to losses for which insurance is not required to be provided in accordance with the insurance requirements of the Contract, the greater of the Contract Amount or $5,000,000, but in no event shall the sum be greater than $20,000,000.

      The limitation of this obligation shall be exclusive of interest and all legal costs and shall not apply to any infringement of intellectual property rights or any breach of warranty obligations.

3. The Contractor's obligation to indemnify Canada for losses related to third party liability shall have no limitation and shall include the complete costs of defending any legal action by a third party. If requested by Canada, the Contractor shall defend Canada against any third party claims.

4. The Contractor shall pay all royalties and patent fees required for the performance of the Contract and, at the Contractor's expense, shall defend all claims, actions or proceedings against Canada charging or claiming that the Work or any part thereof provided or furnished by the Contractor to Canada infringes any patent, industrial design, copyright trademark, trade secret or other proprietary right enforceable in Canada.

5. Notice in writing of a claim shall be given within a reasonable time after the facts, upon which such claim is based, became known.

SC02 INSURANCE TERMS

1) **Insurance Contracts**

(a) The Contractor must, at the Contractor's expense, obtain and maintain insurance contracts in accordance with the requirements of the Certificate of Insurance. Coverage must be placed with an Insurer licensed to carry out business in Canada.

(b) Compliance with the insurance requirements does not release the Contractor from or reduce its liability under the Contract. The Contractor is responsible for deciding if additional insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any additional insurance coverage is at the Contractor's expense, and for its own benefit and protection.

2) **Period of Insurance**

(a) The policies required in the Certificate of Insurance must be in force from the date of contract award and be maintained throughout the duration of the Contract.

(b) The Contractor must be responsible to provide and maintain coverage for Products/Completed Operations hazards on its Commercial General Liability insurance policy, for a period of six (6) years beyond the date of the Certificate of Substantial Performance.

3) **Proof of Insurance**

(a) Before commencement of the Work, and no later than thirty (30) days after contract award, the Contractor must deposit with Canada a Certificate of Insurance on the form attached herein.

(b) Upon request by Canada, the Contractor must provide originals or certified true copies of all contracts of insurance maintained by the Contractor pursuant to the Certificate of Insurance.

4) **Insurance Proceeds**

In the event of a claim, the Contractor must, without delay, do such things and execute such documents as are necessary to effect payment of the proceeds.

5) **Deductible**

The payment of monies up to the deductible amount made in satisfaction of a claim must be borne by the Contractor.

SC03 INTERPRETATION

R2810D General Condition GC1.1.2 Terminology is modified to include the following,

"Architectural and Engineering Services":

Mean's services to provide a range of investigation and recommendation reports, planning, design, preparation, or supervision of the construction, repair, renovation or restoration of a work and includes contract administration services, for real property projects.

"Construction Services":

Means construction, repair, renovation or restoration of any work except a vessel and includes; the supply and erection of a prefabricated structure; dredging; demolition; environmental services related to a real property; or, the hire of equipment to be used in or incidentally to the execution of any construction services referred to above.

"Facility Maintenance Services":

Means services related to activities normally associated with the maintenance of a facility and keeping spaces, structures and infrastructure in proper operating condition in a routine, scheduled, or anticipated fashion to prevent failure and/or degradation including inspection, testing, servicing, classification as to serviceability, repairs, rebuilding and reclamation, as well as cleaning, waste removal, snow removal, lawn care, replacement of flooring, lighting or plumbing fixtures, painting and other minor works.

SC04 WORKPLACE SAFETY AND HEALTH

1. EMPLOYER/PRIME CONTRACTOR

1.1 The Contractor shall, for the purposes of the Workplace Safety and Health Act and Regulations, Manitoba, and for the duration of the Work:

1.1.1 act as the Employer, where there is only one employer on the work site, in accordance with the Authority Having Jurisdiction;

1.1.2 assume the role of Prime Contractor, where there are two or more employers involved in work at the same time and space at the work site, in accordance with the Authority Having Jurisdiction; and

1.1.3 agree, in the event of two or more Contractors working at the same time and space at the work site, without limiting the General Conditions, to Canada's order * to:

1.1.3.1 assume, as the Prime Contractor, the responsibility for Canada's other Contractor(s); or

1.1.3.2 accept that Canada's other Contractor is Prime Contractor and conform to that Contractor's Site Specific Health and Safety Plan.

** "order" definition: after contract award, Contractor is ordered by a Change Order*

2. SUBMITTALS

2.1 The Contractor shall provide to Canada:

2.1.1 prior to the pre-construction meeting, a transmittal and copy of a completed Notice of Project form PWGSC - TPSGC 458 (form will be provided to the proposed contractor prior to award), as sent to the Authority Having Jurisdiction (AHJ); and

2.1.2 prior to commencement of work and without limiting the terms of the General Conditions:

2.1.2.1 copies of all other necessary permits, notifications and related documents as called for in the scope of work/specifications and/or by the AHJ; and

2.1.2.2 a site specific Health and Safety Plan as requested.

NOTE: Please do not include any forms that include personal 3rd party information such as the names of the contractor's employees and their related claims information.

3. LABOUR AUTHORITY CONTACT*:*

The contact below represents the Labour Authority in the jurisdiction (AHJ). They are not representatives of the Workers Compensation.

Do not contact the people referenced below for issues pertaining to WCB or WCB Clearances. Those queries must be directed specifically to the WCB, and where the WCB has both a Labour and Compensation component, WCB issues must be directed to the Compensation/Employer Services sections.

MANITOBA

Manitoba Labour
Workplace Safety and Health Branch
200 – 401 York Avenue
Winnipeg, Manitoba, R3C 0P8
Attention: Client Services

Telephone: (204) 945-6848
Facsimile: (204) 945-4556

SC05 Limitation of Submissions

1) While there is no requirement for firms to participate in this procurement in joint venture, they may elect to do so if they see fit. However, only one submission per bidder will be accepted, whether it is submitted by a firm as an individual Bidder or by that firm as part of a joint venture Bidder. If more than one submission is received from a firm acting either individually or in joint venture, all such submissions shall be rejected and no further consideration shall be given to the firm or to any proposed joint venture of which the firm forms part.

2) A joint venture is defined as an association of two or more parties which combine their money, property, knowledge, skills, time or other resources in a joint business enterprise agreeing to share the profits and the losses and each having some degree of control over the enterprise.

3) An arrangement whereby Canada contracts directly with a Contractor who may retain sub-contractors to perform portions of the work is not a joint venture arrangement. A sub-contractor may be proposed as part of the Contractors Team by more than one Bidder.

4) Any joint venture must be in full compliance with the requirements of any provincial or territorial law pertaining thereto in the Province or Territory in which the project is located.

BID AND ACCEPTANCE FORM (BA)

BA01 IDENTIFICATION
Remediation of Former Gas Station Site, Riding Mountain National Park, MB

BA02 BUSINESS NAME AND ADDRESS OF BIDDER

Name: _____

Address: _____

Telephone: _____ Fax: _____ PBN: _____

E-mail address: _____

Industrial Security Program Organisation Number (ISP ORG#) _____
(when required)

BA03 THE OFFER

$ _____excluding Applicable Taxe(s).
(amount in numbers)

The Bidder offers to Canada to perform and complete the Work for the above named project in accordance with the Bid Documents for the **TOTAL BID AMOUNT INDICATED IN APPENDIX 1**.

BA04 BID VALIDITY PERIOD
The bid must not be withdrawn for a period of thirty (30) days following the date of solicitation closing.

BA05 ACCEPTANCE AND CONTRACT
Upon acceptance of the Bidder's offer by Canada, a binding Contract will be formed between Canada and the Bidder. The documents forming the Contract will be the Contract Documents identified in "Contract Documents (CD)" section.

BA06 CONSTRUCTION TIME

The Contractor must perform and complete the Work within **eighty (80)** days from the date of notification of acceptance of the offer.

BA07 BID SECURITY
The Bidder must enclose bid security with its bid in accordance with GI08 - Bid Security Requirements of R2710T - General Instructions - Construction Services - Bid Security Requirements.

BA08 SIGNATURE

_____
Name and title of person authorized to sign on behalf of Bidder (Type or print)

_____ _____
Signature Date

APPENDIX 1 - COMBINED PRICE FORM

1) The prices per unit will govern in establishing the Total Extended Amount. Any arithmetical errors in this Appendix will be corrected by Canada.

2) Canada may reject the bid if any of the prices submitted do not reasonably reflect the cost of performing the part of the work to which that price applies.

LUMP SUM

The Lump Sum Amount designates Work to which a Lump Sum Arrangement applies.
(a) Work included in the Lump Sum Amount represents all work not included in the unit price table.

LUMP SUM AMOUNT (LSA) Excluding applicable taxe(s)	

UNIT PRICE TABLE

The Unit Price Table designates Work to which a Unit Price Arrangement applies.
(a) Work included in each item is as described in the referenced specification section.
(b) The Price per Unit shall not include any amounts for Work that is not included in that unit price Item.

Item	Specification Reference	Class of Labour, Plant or Material	Unit of Measur-ement	Estimated Quantity (EQ)	Price per Unit applicable taxe(s) extra (PU)	Extended amount (EQ x PU) applicable taxe(s) extra
WINTER WORK						
	31 23 33.01	Excavate and stockpile uncontaminated soil material	m3 (cubic meter)	500		
	31 23 33.01	Excavate and dispose of unsuitable uncontaminated soil material at Owner direction	m3	500		
	31 23 33.01	Excavate and dispose of contaminated soil material at licensed facility	m3	1675		
	31 32 19.02	Supply geomembrane material	m2 (square meter)	715		
	31 32 19.02	Install geomembrane material	m2	715		
	31 23 33.01	Place and compact stockpiled uncontaminated soil material	m3	500		
	31 23 33.01	Supply, backfill & compact imported fill material	m3	2175		
		Supply, place & landscape topsoil	yard	10		
SPRING WORK						
	32 16 15	Sidewalk replacement	LM (linear meter)	75		
					TOTAL EXTENDED AMOUNT (TEA) Excluding applicable taxe(s)	

TOTAL BID AMOUNT (LSA +TEA) Excluding applicable taxe(s)	

APPENDIX 2 - INTEGRITY PROVISIONS

(Text copied from the Ineligibility and Suspension Policy http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html dated 2016-04-04)

List of names: All Bidders, regardless of their status under the Policy, must submit the following information when participating in a procurement process or real property transaction:

- Bidders that are corporate entities, including those bidding as joint ventures, must provide a complete list of the names of all current directors or, for a privately owned corporation, the names of the owners of the corporation;
- Bidders Bidding as sole proprietors, including sole proprietors bidding as joint ventures, must provide a complete list of the names of all owners; or
- Bidders that are a partnership do not need to provide a list of names.

If the list of names has not been received in a procurement process or real property transaction by the time the evaluation of Bids or Offers is completed, or has not been received in a procurement process or real property transaction where no Bid/Offer will be submitted, the Contracting Authority will inform the Bidder of a time within which to provide the information. Providing the required names is a mandatory requirement for award of a contract or real property agreement. Failure to provide the list of names within the time specified will render a Bid or Offer non-responsive, or the Bidder otherwise disqualified for award of a contract or real property agreement.

APPENDIX 3 - LISTING OF SUBCONTRACTORS

1) In accordance with GI07 - Listing of Subcontractors and Suppliers of R2710T- General Instructions - Construction Services - Bid Security Requirements, the Bidder should provide a list of Subcontractors with his Bid.

2) The Bidder should submit the list of Subcontractors and for any portion of the Work valued at 20% or greater of the submitted Bid Price.

	Subcontractor	Division
1		
2		
3		
4		
5		
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11		
12		
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14		
15		

APPENDIX 4 - VOLUNTARY CERTIFICATION TO SUPPORT THE USE OF APPRENTICES

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA APPRENTICE PROCUREMENT INITIATIVE

1. To encourage employers to participate in apprenticeship training, Bidders, bidding on construction and maintenance contracts by Public Works and Government Services Canada (PWGSC) are being asked to sign a voluntary certification, signaling their commitment to hire and train apprentices.

2. Canada is facing skills shortages across various sectors and regions, especially in the skilled trades. Equipping Canadians with skills and training is a shared responsibility. The Government of Canada made a commitment to support the use of apprentices in federal construction and maintenance contracts. Contractors have an important role in supporting apprentices through hiring and training and are encouraged to certify that they are providing opportunities to apprentices as part of doing business with the Government of Canada.

3. The Government of Canada is encouraging apprenticeships and careers in the skilled trades. In addition, the government offers a tax credit to employers to encourage them to hire apprentices. Information on this tax measure administered by the Canada Revenue Agency can be found at: www.cra-arc.gc.ca. Employers are also encouraged to find out what additional information and supports are available from their respective provincial or territorial jurisdiction.

4. Signed certifications on page 2 of 2 will be used to better understand contractor use of apprentices on Government of Canada maintenance and construction contracts and may inform future policy and program development.

5. The Contractor hereby certifies the following:

   In order to help meet demand for skilled trades people, the Contractor agrees to use, and require its subcontractors to use, reasonable commercial efforts to hire and train registered apprentices, to strive to fully utilize allowable apprenticeship ratios * and to respect any hiring requirements prescribed by provincial or territorial statutes

   The Contractor hereby consents to this information being collected and held by PWGSC, and Employment and Social Development Canada to support work to gather data on the hiring and training of apprentices in federal construction and maintenance contracts.

   To support this initiative, a voluntary certification signaling the Contractor's commitment to hire and train apprentices is available at page 2 of 2.

   If you accept fill out and sign page 2 of 2.

   * *The journeyperson-apprentice ratio is defined as the number of qualified/certified journeypersons that an employer must employ in a designated trade or occupation in order to be eligible to register an apprentice as determined by provincial/territorial (P/T) legislation, regulation, policy directive or by law issued by the responsible authority or agency.*

Voluntary Certification

(To be filled out and returned with bid on a voluntary basis)

Note: The contractor will be asked to fill out a report every six months or at project completion as per sample "Voluntary Reports for Apprentices Employed during the Contract" provided at Annex C

Name: _____

Signature: _____

Company Name: _____

Company Legal Name: _____

Solicitation Number: _____

Number of company employees: _____

Number of apprentices planned to be working on this contract: _____

Trades of those apprentices:

_____

_____

_____

_____

_____

_____

_____

ANNEX A - CERTIFICATE OF INSURANCE (Not required at solicitation closing)

CERTIFICATE OF INSURANCE

Travaux publics et Services gouvernementaux Canada | Public Works and Government Services Canada

Description and Location of Work	Contract No.
Remediation of Former Gas Station Site – R.090731.001 Riding Mountain National Park, MB	ET022-181767
	Project No. R.090731.001

Name of Insurer, Broker or Agent	Address (No., Street)	City	Province	Postal Code

Name of Insured (Contractor)	Address (No., Street)	City	Province	Postal Code

Additional Insured

Her Majesty the Queen in Right of Canada as represented by the Minister of Public Works and Government Services

Type of Insurance	Insurer Name and Policy Number	Inception Date D / M / Y	Expiry Date D / M / Y	Limits of Liability		
				Per Occurrence	Annual General Aggregate	Completed Operations Aggregate
Commercial General Liability **Umbrella/Excess Liability**				**$** **$**	**$** **$**	**$** **$**
Pollution Liability				**$** ☐Per Incident ☐ Per Occurence		Aggregate **$**

I certify that the above policies were issued by insurers in the course of their Insurance business in Canada, are currently in force and include the applicable insurance coverage's stated on page 2 of this Certificate of Insurance, including advance notice of cancellation / reduction in coverage.

Name of person authorized to sign on behalf of Insurer(s) (Officer, Agent, Broker)

Telephone number

Signature

Date D / M / Y

CERTIFICATE OF INSURANCE Page 2 of 2

General

The insurance policies required on page 1 of the Certificate of Insurance must be in force and must include the insurance coverage listed under the corresponding type of insurance on this page.

The policies must insure the Contractor and must include Her Majesty the Queen in Right of Canada as represented by the Minister of Public Works and Government Services as an additional Insured.

The Policy shall be endorsed to provide the Owner with not less than 30 days' notice in writing in advance of any cancellation or change or amendment restricting coverage.

Without increasing the limit of liability, the policies must protect all insured parties to the full extent of coverage provided. Further, the policies must apply to each Insured in the same manner and to the same extent as if a separate policy had been issued to each.

Commercial General Liability
The insurance coverage provided must not be substantially less than that provided by the latest edition of IBC Form 2100.
The policy must either include or be endorsed to include coverage for the following exposures or hazards if the Work is subject thereto:
(a) Blasting.
(b) Pile driving and caisson work.
(c) Underpinning.
(d) Removal or weakening of support of any structure or land whether such support be natural or otherwise if the work is performed by the insured contractor.

The policy must have the following minimum limits:
(a) **$5,000,000** Each Occurrence Limit;
(b) **$10,000,000** General Aggregate Limit per policy year if the policy contains a General Aggregate; and
(c) **$5,000,000** Products/Completed Operations Aggregate Limit.

Umbrella or excess liability insurance may be used to achieve the required limits.

Contractors Pollution Liability
The policy must have a limit usual for a contract of this nature, but not less than **$1,000,000** per incident or occurrence and in the aggregate.

ANNEX B - VOLUNTARY REPORT FOR APPRENTICES EMPLOYED DURING THE CONTRACT (Sample)

(This report is not required at bid deposit)

The Contractor should compile and maintain records on the number of apprentices and their trade that were hired to work on the contract.

The Contractor should provide this data in accordance with the format below. If no apprentices were hired during the contract period, the Contractor should still provide a "nil" report.

The data should be submitted to the Contracting Authority either six months after contract award or at the end of the contract, whichever comes first.

Number of apprentices hired	Trade

TABLE OF CONTENTS

Part 1 General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract entails the remediation of approximately 2,675 cubic meters of petroleum hydrocarbon impacted soil located at 122 Wasagaming Drive within Riding Mountain National Park in Manitoba. Also included with this work will be the removal and replacement of approximately 75 m of sidewalk adjacent to the work area.

.2 The work is to be completed in accordance with these Specifications and with reference to Appendix A – Remedial Action Plan and all referenced background documentation.

.3 The Work includes, but is not limited to, the following items:

- .1 Obtain all required permits and approvals before work commences.
- .2 Participate in meetings including award meeting and kick off meeting at a minimum.
- .3 Provide submittals as detailed within this specification.
- .4 Design and provide dewatering system
- .5 Remove approximately 75 m of existing sidewalks
- .6 Perform excavation and offsite disposal of in-situ petroleum hydrocarbon (PHC) impacted soil (approximately 2,675 m^3).
- .7 Treat and properly dispose of PHC impacted groundwater.
- .8 Address concerns regarding slope stability and protection of adjacent properties by using proper excavation and dewatering techniques
- .9 Supply and install geomembrane
- .10 Backfill and compact excavated area with clean fill material
- .11 Replace previously removed sidewalks
- .12 Restore site

1.2 WORK DETAILS

- .1 Prepare Site for excavation work. Obtain of all required permits, public and private utility locates. Provide for temporary removal of surface obstructions, site traffic control planning, protection of the excavation area during non-working hours, and other preparatory work.
- .2 Assist the Departmental Representative in the collection of material samples proposed for use as imported backfill to allow for laboratory analysis.
- .3 Provide for groundwater management including dewatering of the excavation area. This will include the design, supply and operation of the dewatering and water treatment systems.
- .4 Remove existing sidewalks along west and south property lines. Asphalt roadways are not to be disturbed.
- .5 Excavate and stockpile non-impacted soil onsite.
- .6 Excavate and transport unsuitable non-impacted soil for disposal at an approved location.
- .7 Excavate and transport impacted soil offsite for disposal at a licensed facility.

.8 Collect, treat and dispose of hydrocarbon impacted water from within the excavated area to the local sanitary sewer system.

.9 Protect and maintain the integrity of the sidewalls of the excavation, with special attention to the portions of the excavation adjacent to existing buildings and structures.

.10 Assist the Departmental Representative in the collection of soil samples from the extents of the excavation.

.11 Supply and place geomembrane on excavation sidewalls as specified.

.12 Supply, place and compact imported backfill material.

.13 Place and compact stockpiled non-impacted soil.

.14 Assist the Departmental Representative in performing compaction testing during backfilling activities.

.15 Replace sidewalks that were previously removed.

.16 Restore work area and accesses.

1.3 SITE INFORMATION

.1 The 122 Wasagaming Drive property is located at the northeast corner of Wasagaming Drive and Buffalo Drive in Wasagaming, Manitoba, which is within Riding Mountain National Park (RMNP). The Site is currently vacant with no buildings or structures located on the property. Commercial properties are located immediately to the north and to the east. A back lane is present between the Site and the west adjacent property.

.2 Historically, the Site was occupied by a residence, a garage and a fuel-dispensing service station. Underground storage tanks were removed in March of 2014.

.3 A Remedial Action Plan (RAP) has been prepared by KGS Group describing the requirements for the Site remediation. The RAP is attached herein as Appendix A.

.4 Previous environmental assessments performed at the Site have identified petroleum hydrocarbon impacts in soil and groundwater. A Phase I/II Environmental Site Assessment (ESA) was conducted in 2009 by Clear Sky Environmental Services Inc. and again in 2013 by Golder Associates Ltd. DST Consulting Engineers Inc. completed a supplemental Phase II ESA in 2014. The DST Phase II ESA report is attached herein as Appendix B.

1.4 DEFINITIONS

.1 Work: Scope of work as detailed and described in this Specification and potential additive scope of work under or in conjunction with this Specification.

.2 Site: Portion of the property on which the Work will be conducted (122 Wasagaming Drive in Riding Mountain Nation Park of Canada, Wasagaming, Manitoba).

.3 Departmental Representative: Directors and/or other employees designated as representatives of and exercising the roles and attributes of Canada under the contract.

.4 Contractor: Firm or representative retained to conduct the Work as per this Specification.

.5 Contractor’s Foreman: Contractor's resident site representative, who is authorized to make decisions on behalf of Contractor and will be present at the Site for the duration of the Work.

.6 Provide: For this Specification, the word "provide" means supply and/or install.

1.5 PROJECT COORDINATION

.1 The Contractor shall co-ordinate progress of the Work, schedules, submittals, use of the Site, temporary utilities, and construction facilities maintaining all specified or implied safety or engineering controls related to access by the Contractor, Departmental Representative and public at large.

.2 The Contractor shall co-ordinate the Work with the Departmental Representative such that there is no interference between the Work and other activities onsite.

1.6 CONTRACT METHOD

.1 Construct Work under a unit price plus lump sum contract.

1.7 CONTRACTOR USE OF PREMISES

.1 Limit use of Site for Work, storage and access.

.2 Co-ordinate use of premises under direction of Departmental Representative.

.3 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

.4 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.

.5 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Departmental Representative.

.6 At completion of operations, condition of existing work is to be equal to or better than that which existed before new work started.

1.8 EXAMINATION OF SITE

.1 Prior to mobilization, verify Site conditions to obtain actual dimensions required to ensure correct execution of the Work, and notify the Departmental Representative in writing of all the matters that could hamper proper execution of the Work. Provide a minimum of 48 hours notice to the Departmental Representative prior to examining the Site.

.2 Commencement of mobilization constitutes acceptance of existing conditions, and verification of dimensions.

.3 The Contractor shall be responsible for all survey layouts in accordance with Drawings.

.4 The Departmental Representative will identify control points for the survey baseline.

1.9 SUBSURFACE CONDITIONS

.1 Subsurface investigations have been completed at the Site. Borehole logs, detailing subsurface soil and groundwater conditions at the Site, are included in Appendix B – FINAL REPORT – Supplemental Phase II ESA by DST Consulting Engineers.

.2 The Contractor shall promptly notify the Departmental Representative in writing if subsurface conditions at the Work differ materially from those indicated in the Specifications, or reasonable assumption of probable conditions based thereon.

.3 If the Departmental Representative determines that the conditions do differ materially, instructions shall be issued for changes in the Work.

1.10 EXISTING SERVICES

.1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, provide Departmental Representative with 48 hours' notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian and vehicular traffic and neighbouring property owners.

.3 Provide alternative routes for personnel, pedestrian and vehicular traffic.

.4 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.

.5 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.

.6 Provide temporary services when directed by Departmental Representative to maintain critical building and tenant systems.

.7 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.

.8 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.

.9 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

.10 Record locations of maintained, re-routed and abandoned service lines.

.11 Construct barriers in accordance with Section 015600- Temporary Barriers and Enclosures.

1.11 ON-SITE DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each document as follows:

- .1 Contract Drawings.
- .2 Specifications.
- .3 Request for Clarifications and responses.
- .4 Addenda.
- .5 Reviewed Shop Drawings.
- .6 List of Outstanding Shop Drawings.
- .7 Change Orders.

.8 Other Modifications to Contract.

.9 Field Test Reports.

.10 Copy of Approved Work Schedule.

.11 Health and Safety Plan and Other Safety Related Documents.

.12 All applicable permits.

.13 Excavation and site drilling license (bound in specification).

.14 Material Safety Data Sheets Specifications.

.15 Labour conditions and wage schedules.

.16 Other documents as specified.

1.12 PROJECT MEETINGS

.1 A project start-up meeting and final inspection may be required, as directed by the Departmental Representative.

.2 The Contractor shall hold regular safety meetings onsite for Contractor's staff and subcontractors. Departmental Representative will attend all safety meetings.

.3 The Contractor shall prepare a safety orientation that will be required to be presented to all visitors prior to access to the Site.

.4 Regular construction progress meetings during the work shall be at the discretion of the Departmental Representative.

1.13 SUBMITTALS

.1 All submittals are to be in accordance with Section 01 33 00 - Submittal Procedures.

.2 The Contractor shall submit for review by the Departmental Representative the intended work construction schedule.

.3 The Contractor shall submit for review by the Departmental Representative, submittals for those products identified in the specifications.

.4 Any Work affected by submittals shall not proceed until review is complete.

.5 The Contractor shall review submittals prior to submission to the Departmental Representative. This review represents that necessary requirements have been determined and verified, or shall be, and that each submittal has been checked and coordinated with requirements of the Work and Contract Documents.

.6 Where submittals are to include shop drawings, the Contractor shall ensure that they are stamped by a Professional Engineer with the authority to practice in the jurisdiction.

1.14 MEASURE OF PAYMENT

.1 Reimbursement for all aspects or Work under this specification will be agreed upon at the end of each field day between the Departmental Representative and Contractor and shall be measured and recorded daily by the Contractor and approved daily by the Departmental Representative and both parties shall sign off daily. Original waste manifests will be required to verify measurements and adherence to the specifications.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 ACCESS AND EGRESS

.1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.2 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of surrounding premises. Make arrangements with Departmental Representative to facilitate work as stated.

.2 Contractor shall provide sanitary facilities for use by the Contractor’s personnel. Keep facilities clean.

.3 Maintain existing services and provide for personnel and vehicle access.

1.3 EXISTING SERVICES

.1 Establish location and extent of service lines in area of Work before starting Work. Notify the Departmental Representative of findings.

.2 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.

.3 Where Work involves breaking into or connecting to existing services, provide Departmental Representative 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions to a minimum.

.4 Provide for pedestrian and vehicular traffic.

.5 Construct barriers in accordance with Section 01 56 00- Temporary Barriers and Enclosures.

1.4 SPECIAL REQUIREMENTS

.1 Carry out Work in compliance with local by-laws and regulations including Parks Canada policies and requirements during daylight hours only. Work outside these hours to be negotiated with the Departmental Representative and in accordance with all regulatory requirements.

.2 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.3 Keep within limits of work and avenues of ingress and egress.

1.5 SMOKING ENVIRONMENT

.1 No smoking permitted during the Work.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by the Departmental Representative are specified under sections as follows:

.1 Section 31 23 33.01 - Excavating, Trenching and Backfilling

.1 Water quality Testing (dewatering discharge) as per **3.7 Dewatering**

1.2 APPOINTMENT AND PAYMENT

.1 Departmental Representative will appoint and pay for services of testing laboratory except as follows:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.

.4 Mill tests and certificates of compliance.

.5 Tests specified to be carried out by Contractor under supervision of Departmental Representative.

.2 Departmental Representative will appoint and pay for services of testing laboratory for the following:

.1 Preliminary environmental testing of proposed imported backfill material.

.2 Inspection and testing for compaction of various fills.

.3 Confirmatory sampling for petroleum hydrocarbon impacts.

.3 Where tests or inspections by designated testing laboratory reveal Work is not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.3 CONTRACTOR’S RESPONSIBILITIES

.1 Provide labour, equipment and facilities to:

.1 Provide access to Work for inspection and testing.

.2 Facilitate inspections and tests.

.3 Make good Work disturbed by inspection and test.

.4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.

.2 Notify Departmental Representative 48 hour’s minimum in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 DEFINITIONS

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.

.4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.

.5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.

.6 Master Plan: summary-level schedule that identifies major activities and key milestones.

.7 Milestone: significant event in project, usually completion of major deliverable.

.8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.2 REQUIREMENTS

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.2 Plan to complete Work in accordance with prescribed milestones and time frame.

.3 Limit activity durations to maximum of approximately 5 working days, to allow for progress reporting.

.4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Submit Master Plan to Departmental Representative within 5 working days of award of Contract.

.3 Submit Project Schedule to Departmental Representative within 5 working days of receipt of acceptance of Master Plan.

1.4 PROJECT MILESTONES

.1 Project milestones form interim targets for Project Schedule.

.1 Mobilization 30 days after contract award

.2 Dewatering Operational within 10 days of mobilization

.3 Excavation complete within 30 days of commencement of dewatering.

.4 Complete Backfilling of site within 5 days of excavation completion

.5 Demobilization (substantial completion) by March 1, 2018.

1.5 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 Departmental Representative will review and return revised schedule within 5 working days.

.3 Revise schedule and resubmit within 2 working days. Repeat as required.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.6 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:

.1 Contract Award.

.2 Award Meeting.

.3 Shop Drawing.

.4 Sample submissions.

.5 Utility Locate Drawings.

.6 Dewatering Plan.

.7 Site Meeting.

.8 Permits.

.9 HASP, EPP, SRP, etc.

.10 Mobilization.

.11 Dewatering.

.12 Excavation.

.13 Geomembrane Installation.

.14 Backfill.

.15 Demobilization.

1.7 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule as requested by Departmental Representative reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.8 PROJECT MEETINGS

.1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

.2 Weather related delays with their remedial measures will be discussed and negotiated.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent Work are co-ordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

.10 Keep one reviewed copy of each submission on site.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Submit drawings stamped and signed by professional engineer registered or licensed in Manitoba, Canada.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow 3 days for review of each submission by Departmental Representative.

.5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing, of revisions other than those requested.

.7 Accompany submissions with transmittal letter containing:

.1 Date.

.2 Project title and number.

.3 Contractor's name and address.

.4 Identification and quantity of each shop drawing, product data and sample.

.5 Other pertinent data.

.8 Submissions include:

.1 Date and revision dates.

.2 Project title and number.

.3 Name and address of:

.1 Subcontractor.

.2 Supplier.

.3 Manufacturer.

.4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.

.5 Details of appropriate portions of Work as applicable:

.1 Layout, showing dimensions, including identified field dimensions, and clearances.

.2 Performance characteristics.

.3 Standards.

.4 Single line and schematic diagrams.

.5 Relationship to adjacent work.

.9 After Departmental Representative's review, distribute copies.

.10 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.11 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.12 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

.13 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.14 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.

.15 Delete information not applicable to project.

.16 Supplement standard information to provide details applicable to project.

.17 The review of shop drawings by the Departmental Representative is for the sole purpose of ascertaining conformance with project objectives. This review does not mean that Departmental Representative approves detail design inherent in shop drawings, responsibility for which remains with the Contractor submitting same, and such review does not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirement of construction and Contract Documents.

.18 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at the Site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

.19 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

1.3 SAMPLES

.1 Submit for review samples as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to Departmental Representative's site office.

.3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.4 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.5 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.

.6 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.4 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic copy of high resolution digital photography in jpg format with progress statement as directed by Departmental Representative.

.2 Project identification: name and number of project and date of exposure indicated.

.3 Number of viewpoints: 4 locations.

.1 Viewpoints and their location as determined by Departmental Representative.

.4 Frequency of photographic documentation: daily as directed by Departmental Representative.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.3 Province of Manitoba.

.1 The Workers Compensation Act RSM 1987 - Updated 1/2017

.2 The Workplace Safety and Health Act - W210 10/02

.3 The Workplace Safety and Health Regulation - 217/2006

1.2 SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures.

.2 Submit site-specific Health and Safety Plan for review by Departmental Representative and PSPC within 5 days after date of Award and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

.3 On-site contingency and Emergency Response Plan.

.4 Site control measures employed at site including site map, site Work zones, site communications, alerting means for emergencies, standard operating procedures or safe work practices, and identification of nearest medical assistance.

.5 Emergency response requirements addressing: pre-emergency planning, personnel roles, lines of authority and communication, emergency recognition and prevention, safe distances and places of refuge, site security and control, evacuation routes and procedures, decontamination procedures not covered under decontamination section, emergency medical treatment and first aid, emergency alerting and response procedures, critique of response and follow-up, PPE and emergency equipment, site topography, layout, prevailing weather conditions, and procedures for reporting incidents to local, provincial, or federal agencies.

.6 Procedures dealing with cold stress.

.7 Spill containment program if waste material is generated, excavated, stored, or managed on site.

.8 First Aid Kit and location.

.9 Spill Response Plan.

.10 Spill Prevention Plan.

.11 First Aid Certificates as required Occupational Health and Safety regulations.

.12 Muster Point.

.3 Submit electronic copy of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative.

.4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors. Submit verbal report immediately followed by a written report within 24 hours to the Departmental Representative.

.5 Submit copies of incident and accident reports. Submit verbal report immediately followed by a written report within 24 hours to the Departmental Representative.

.6 Departmental Representative will review Contractor's site-specific Health and Safety Plan including on-site contingency and Emergency Response Plan, Spill Prevention and Spill Response Plan and provide comments to Contractor within 3 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative 3 days after receipt of comments from Departmental Representative.

.7 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.8 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.

.9 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

.10 Contractor shall be responsible and assume the Prime Contractor role for the entire Project.

1.3 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.4 MEETINGS

.1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.5 REGULATORY REQUIREMENTS

.1 Do Work in accordance with Section 01 41 00- Regulatory Requirements.

1.6 PROJECT/SITE CONDITIONS

.1 Work at site will involve contact with:

.1 Ethylbenzene.

.2 Xylenes.

.3 Hexane.

.4 Petroleum hydrocarbon (PHC) impacted soils. Impacted soils defined as soils with PHC concentrations exceeding Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (CEQG) and Canada Wide Standards (CWS) for PHCs in soil.

.5 PHC concentrations in soils have the potential to be ingested or inhaled if dust is mobilized by wind, and can be carried long distances. Dust may come from excavation activities or during transport of materials for disposal off site.

.6 Cold weather and wet conditions.

1.7 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

.3 Ensure Health and Safety guidelines provide for safe and minimal risk for site personnel and minimize impact of activities involving contact with hazardous materials or hazardous wastes on general public and surrounding environment.

1.8 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.9 COMPLIANCE REQUIREMENTS

.1 Comply with The Manitoba Workers Compensation Act and Regulation and The Manitoba Workplace Safety and Health Regulation.

.2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.10 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Manitoba and advise Departmental Representative verbally and in writing.

1.11 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

.1 Have site-related working experience specific to activities associated with PHC impacted soil.

.2 Have working knowledge of occupational safety and health regulations.

.3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.

.4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

.5 Be on site during execution of Work and report directly to and be under direction of site supervisor.

1.12 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Manitoba, and in consultation with the Departmental Representative.

1.13 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.

.2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.14 BLASTING

.1 Blasting or other use of explosives is not permitted.

1.15 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

1.16 PERSONNEL HEALTH, SAFETY, AND HYGIENE

.1 Training: ensure personnel entering site are trained in accordance with specified personnel training requirements.

.2 Levels of Protection: establish levels of protection for each Work area based on planned activity and location of activity.

.3 Personal Protective Equipment:

.1 Furnish site personnel with appropriate PPE. Ensure that safety equipment and protective clothing is kept clean and maintained. Include requirements in Health and Safety Plan.

.4 Heat Stress/Cold Stress: implement heat stress, cold stress monitoring program as applicable and include in site-specific Health and Safety Plan.

.5 Emergency and First-Aid Equipment:

.1 Locate and maintain emergency and first-aid equipment in appropriate location onsite including first-aid kit to accommodate number of site personnel; portable emergency eye wash; two 9 kg ABC type dry chemical fire extinguishers.

.2 As minimum, provide on-site at all times when Work activities are in progress 1 first-aid technician holding at a minimum a Standard First Aid and CPR certification recognized in Canada, as per Canada Labour Code and Manitoba Safety and Health regulations. Provide proof of certification within 5 days of Award.

.6 Safety Meetings: conduct mandatory daily safety meetings for all personnel on site, Departmental Representative, and additionally as required by special or Work-related conditions; include refresher training for existing equipment and protocols, review

ongoing safety issues and protocols, and examine new site conditions as encountered. Hold additional safety meetings on as-needed basis.

1.17 SITE CONTROL

.1 Meet specified requirements as indicated in Section 01 14 00 - Work Restrictions, Section 01 35 43 - Environmental Procedures, Section 01 52 00 - Construction Facilities, Section 01 74 11 - Cleaning and Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.2 Restrict access to site to those involved in the remediation Work.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 DEFINITIONS

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures.

.2 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review Departmental Representative.

.3 Environmental Protection Plan must include comprehensive overview of known and/or potential environmental issues to be addressed during construction.

.4 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.5 Include in Environmental Protection Plan:

.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.

.2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.

.3 Names and qualifications of persons responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.6 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.

.7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.

.1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.

.8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.

.1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.

.9 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.

.12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.13 Waste Water Management Plan identifying methods and procedures for management, treatment and discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

.14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.

.15 Pesticide treatment plan to be included and updated, as required.

1.3 FIRES

.1 Fires and burning of rubbish on site is not permitted.

1.4 DRAINAGE

.1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.2 Provide temporary drainage and pumping required to keep excavations and site free from water.

.3 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.

.4 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.5 SITE CLEARING AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties as indicated.

.2 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2m minimum.

.3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.

.1 Avoid unnecessary traffic, dumping and storage of materials over root zones.

.4 Minimize stripping of topsoil and vegetation.

.5 Restrict tree removal to areas designated by Departmental Representative.

1.6 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this Contract.

.2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.

.3 Cover dry materials and rubbish to prevent blowing dust and debris.

1.7 HISTORICAL/ARCHAEOLOGICAL CONTROL

.1 Contractor to immediately notify Departmental Representative if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in area are discovered during construction.

1.8 NOTIFICATION

.1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

.2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.

.1 Take action only after receipt of written approval by Departmental Representative.

.3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 CLEANING

.1 Progress Cleaning: leave Work area clean at end of each day.

.2 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.

.3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 This Section references to laws, by laws, ordinances, rules, regulations, codes, orders of Authority Having Jurisdiction, and other legally enforceable requirements applicable to Work and that are; or become, in force during performance of Work.

1.2 REFERENCES TO REGULATORY REQUIREMENTS

.1 Perform Work in accordance with all applicable codes, standards, and regulations applicable to Work including amendments up to tender closing date issued by the Government of Canada and Manitoba and other codes of provincial or local application, provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Specific design and performance requirements listed in the specifications or indicated on the Drawings may exceed the minimum requirements established by the referenced Building Code. These requirements will govern over the minimum requirements listed in the Building Code

1.3 REFERENCED STANDARDS

.1 Meet or exceed the governing codes, standards and guidelines, and regulations applicable; to Work and issued under the authority of the Government of Canada and Manitoba as follows but not limited to:

- .1 Contract documents.
- .2 Specified standards, codes and referenced documents.
- .3 Manitoba Environment Act (C.C.S.M. c. E125), 2015
- .4 Canadian Environmental Assessment Act (CEAA), 2012
- .5 Transportation of Dangerous Goods Act (TDGA), 1992
- .6 Motor Vehicle Safety Act (MVSA), 1993
- .7 National Building Code of Canada, 2005.
- .8 National Fire Code of Canada, 2005.
- .9 Canada Labour Code Part 11- Occupational Health and Safety (R.S. 1985, c.L-2).
- .10 Canadian Council of Minister of the Environment Documents:
  - .1 PN1326, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products.
  - .2 PN1299-1999, Canadian Environmental Quality Guidelines.
  - .3 PN1398, Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil – User Guidance
- .11 Canadian Environmental Protection Act. (CEPA), 1999, c.33.
- .12 Section 53 Technical CEPA Guidelines for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products 1995.
- .13 Canada Labour Code (R.S. 1985, c. L-2). .1 Part II - Occupational Health and Safety.

.14 Transportation of Dangerous Goods Act (TDGA), 1992, c.34.

.15 Motor Vehicle Safety Act (MVSA), 1995.

.16 A Guideline for the Dismantling and Removal of Underground and Aboveground Storage Tank Systems in Manitoba.

.17 A Guideline for the Environmental Investigation and Remediation of Petroleum Storage Sites in Manitoba.

.18 Manitoba Guideline 96-05 Treatment and Disposal of Petroleum Contaminated Soil.

.19 The Manitoba Contaminated Sites Remediation Act.

1.4 SMOKING ENVIRONMENT

.1 No smoking allowed on site during Work. Comply with smoking restrictions and municipal by-laws.

1.5 WHMIS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada and Health and Welfare Canada.

.2 Deliver copies of WHMIS data sheets to Departmental Representative on delivery of materials in accordance with Section 01 33 00 - Submittal Procedures.

1.6 NATIONAL PARKS ACT

.1 Perform Work in accordance with National Parks Act.

1.7 QUALITY ASSURANCE

.1 Regulatory Requirements: Except as otherwise specified, Contractor shall apply for, obtain, and pay all fees associated with, permits, licenses, certificates, and approvals required by regulatory requirements and Contract Documents, based on General Conditions of Contract and the following:

.1 Regulatory requirements and fees in force on date of Bid submission, and

.2 Any change in regulatory requirements or fees scheduled to become effective after date of tender submission and of which public notice has been given before date of tender submission

Part 2 Products

2.1 EASEMENTS AND NOTICES

.1 Departmental Representative will obtain permanent easements and rights of servitude that may be required for performance of Work.

.2 Contractor shall give notices required by regulatory requirements.

2.2 PERMITS

.1 Contractor shall apply for, obtain, and pay for any and all permits where required by authority having jurisdiction.

.2 Departmental Representative will issue appropriate instructions to Contractor for correction to Work where Contract Document deficiencies are required to be corrected in order to comply with permit requirements.

.3 Contractor shall correct deficiencies in accordance with Departmental Representative's instructions. Where deficiency is not corrected, Departmental Representative reserves the right to make correction and charge Contractor for costs incurred.

.4 Contractor will provide permits to Departmental Representative.

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 INSPECTION

.1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such Work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

1.2 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Contractor.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Owner. Pay costs for retesting and re-inspection.

1.3 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.4 PROCEDURES

.1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made – if applicable.

.2 Submit samples and/or materials required for testing, as specifically requested by the Departmental Representative and/or testing agency. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.5 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

1.6 REPORTS

.1 Submit electronic copies of inspection and test reports to Departmental Representative.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 INSTALLATION AND REMOVAL

.1 Provide temporary utilities in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.2 WATER SUPPLY

.1 Contractor shall provide and pay for supply of potable water for construction use if required to carry out Work.

.2 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.

.3 Pay for utility charges at prevailing rate.

1.3 TEMPORARY HEATING AND VENTILATION

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

.2 Construction heaters used inside building must be vented to outside or be non-flameless type.

.3 Provide temporary heat and ventilation in enclosed areas as required to:

- .1 Facilitate progress of Work.
- .2 Protect Work and products against dampness and cold.
- .3 Prevent moisture condensation on surfaces.
- .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
- .5 Provide adequate ventilation to meet health regulations for safe working environment.

.4 Ventilating:

- .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
- .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
- .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
- .4 Ventilate storage spaces containing hazardous or volatile materials.
- .5 Ventilate temporary sanitary facilities.
- .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.5 Maintain strict supervision of operation of temporary heating and ventilating equipment to:

- .1 Conform with applicable codes and standards.

.2 Enforce safe practices.

.3 Prevent abuse of services.

.4 Prevent damage to finishes.

.5 Vent direct-fired combustion units to outside.

.6 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction by repairing/re-doing at Contractor cost.

.7 Provide full-time watchman during non-working hours in order to monitor and maintain operation of the temporary heating system used for the dewatering and water treatment systems.

1.4 TEMPORARY POWER AND LIGHT

.1 Contractor to provide and pay for temporary power during construction for temporary lighting and equipment required to carry out the Work.

.2 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.

.3 Provide and maintain temporary lighting throughout project. Ensure that the site is well-illuminated during working and non-working hours.

1.5 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and by-laws and Parks Canada policies.

.2 Burning rubbish and construction waste materials is not permitted on site.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

1.2 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

.2 Identify areas which have to be gravelled to prevent tracking of mud.

.3 Indicate use of supplemental or other staging area.

.4 Provide construction facilities in order to execute work expeditiously.

.5 Remove from site all such work after use.

1.3 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.4 CONSTRUCTION PARKING

.1 An employee parking area will be designated by the Departmental Representative.

1.5 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

.3 Accept liability for damage, safety of equipment and overloading of existing equipment.

1.6 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.7 CONSTRUCTION SIGNAGE

.1 Signs and notices for safety and instruction shall be provided and maintained in good condition for the duration of the Work.

.2 Maintain signs and notices in good condition for duration of project, and dispose of off site on completion of Work or as directed by Departmental Representative.

1.8 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.

.2 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

.3 Protect travelling public from damage to person and property.

.4 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

.5 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.6 Construct access and haul roads necessary.

.7 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.8 Dust control: adequate to ensure safe operation at all times.

.9 Location, grade, width, and alignment of construction roads: subject to approval by Departmental Representative.

.10 Lighting: to assure full and clear visibility for full width of work areas during night work operations.

.11 Provide snow removal at all accesses and working areas used by the Contractor during period of Work. Departmental Representative will provide area for dumping of clean snow near site.

1.9 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.2 HOARDING

.1 Erect 2 m high temporary fence around the entire perimeter of the work area. Provide at least one lockable entrance gate. Maintain fence in good repair. Fence should not be left with unattended openings. Should openings be required in order to carry out the Work, Contractor must provide watchman in order to ensure pedestrians and/or wildlife do not enter the work area.

.2 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures. Repair/replace damaged trees at Contractor cost.

1.3 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard rails and barricades around excavations in accordance with all applicable regulations and Parks Canada mandate and policies.

1.4 ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.5 PUBLIC TRAFFIC FLOW

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

1.6 TRAFFIC CONTROL

.1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.

.2 When working on traveled surfaces, place equipment in a position to present minimum of interference and hazard to traveling public. Keep equipment units as close together as working conditions permit and preferably on same side of traveled way. Do not leave equipment on traveled way overnight.

.3 Do not close any lanes or roads without approval of Departmental Representative.

.4 Keep traveled way graded, free of potholes and of sufficient width for required number of lanes of traffic.

.5 Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Work which requires road user response.

1.7 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.8 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred during Work by paying all costs to repair/replace subject to inspection by Departmental Representative.

1.9 PROTECTION OF BUILDING FINISHES

.1 Provide protection for finished and partially finished building finishes and equipment during the performance of Work.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 21-Construction/Demolition Waste Management And Disposal.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

.1

END OF SECTION

Part 1 General

1.1 PROJECT CLEANLINESS

.1 Maintain work in tidy condition, free from accumulation of waste products and debris.

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.

.3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.4 Provide on-site refuse and recycling containers for collection of waste materials and debris.

.5 Provide and use marked separate bins for recycling.

.6 Dispose of waste materials and debris off site.

.7 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.8 Provide adequate ventilation during use of volatile or noxious substances.

.9 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.2 FINAL CLEANING

.1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work including fencing.

.2 Remove waste products and debris other than that caused by others, and leave Work area clean.

.3 Prior to inspection by Departmental Representative and as per Section 01 77 00 - Closeout Procedures, remove surplus products, tools, construction machinery and equipment.

.4 Remove waste products and debris other than that caused by Owner or other Contractors.

.5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.

.6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

.1 Protect environment and prevent environmental pollution damage.

1.2 STORAGE, HANDLING AND PROTECTION

.1 Unless specified otherwise, materials for removal do not become Contractor's property.

.2 Transport and deliver non-salvageable items to licensed disposal facility.

.3 Protect structural components not removed for demolition from movement and/or damage. Photos of before construction and after construction required to be submitted to Departmental Representative for review.

.4 Support affected structures and adjacent property. If safety of adjacent structures is endangered, immediately cease and desist operations and immediately notify the Departmental Representative on site.

.5 Protect surface drainage, mechanical and electrical installations and utilities from damage and blockage. Repair at Contractor cost as directed by the Departmental Representative.

.6 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.

1.3 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of oil, mineral spirits, volatile materials, paint thinner into waterways, storm, and/or sanitary sewers.

1.4 SCHEDULING

.1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 APPLICATION

.1 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

.1 Progress Cleaning: Leave Work area clean at end of each day.

.2 Substantial Cleaning: upon substantial completion remove surplus materials, rubbish, tools and equipment.

.3 Upon completion of deficiencies and at final completion, complete a final cleaning. Departmental Representative to review and accept and/or request deficient items addressed.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

- .1 Contractor's Inspection: Contractor and all sub-Contractors to conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Specification and Contract Documents.
  - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
  - .2 Request Departmental Representative's inspection.
- .2 Departmental Representative's Inspection:
  - .1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.
  - .2 Contractor to correct Work as directed.
- .3 Completion Tasks: submit written certificates that tasks have been performed as follows:
  - .1 Work: completed and inspected for compliance with the Specification and Contract Documents.
  - .2 Defects: corrected and deficiencies completed.
  - .3 Work: complete and ready for final inspection.
- .4 Final Inspection:
  - .1 When completion tasks are done, request final inspection of Work by Departmental Representative and Contractor.
  - .2 When Work incomplete according to Departmental Representative, complete outstanding items and request re-inspection.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Provide evidence when requested by the Departmental Represestative for type, source and quality of products supplied.

1.2 AS -BUILT DOCUMENTS AND SAMPLES

.1 Maintain at site for Departmental Representative one record copy of:

- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Change Orders and other modifications to Contract.
- .5 Reviewed shop drawings, product data, and samples.
- .6 Field test records.
- .7 Inspection certificates.
- .8 Manufacturer's certificates.

.2 Maintain record documents in clean, dry and legible condition.

- .1 Do not use record documents for construction purposes.

.3 Keep record documents and samples available for inspection by Departmental Representative.

.4 Record information in a report format as Work progresses.

.5 Report to include, but not be limited to:

- .1 Measured locations of utilities.
- .2 Limits of excavation.
- .3 Changes made by change orders.
- .4 References to related shop drawings and modifications.

.6 Specifications: Legibly mark each item to record actual construction, including changes made by addenda or change orders.

.7 Documents as required by individual Specifications sections.

.8 Prior to completion of project, submit the following to the Departmental Representative:

- .1 Copies of all documents and permits obtained by the Contractor.
- .2 Results of all testing carried out by the Contractor.
- .3 Any other pertinent information requested by the Departmental Representative.
- .4 Copies of all disposal certificates or receipts including landfill, water disposal, etc. as applicable.

1.3 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Record information on set of black line drawings provided by Departmental Representative.

.2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information in a report format concurrently with construction progress.

.1 Do not conceal Work until required information is recorded.

.2 Report to include, but not limited to:

.1 Measured locations of utilities.

.2 Limits of excavation.

.3 Changes made by others.

.4 References to related shop drawings and modifications.

.4 Contract Drawings and shop drawings: mark each item to record actual construction, including:

.1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

.2 Field changes of dimension and detail.

.3 Changes made by change orders.

.4 Details not on original Contract Drawings.

.5 Referenced Standards to related shop drawings and modifications.

.5 Specifications: mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records as required by individual specifications sections.

.7 Provide digital photos, if requested, for site records.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 31 23 33.01 EXCAVATING AND BACKFILLING

.2 Section 03 30 00 CAST-IN-PLACE CONCRETE

1.2 REFERENCE STANDARDS

.1 Canadian Standards Association (CSA International)

.1 CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 Province of Manitoba Standard Construction Specifications No. 900 –Aggregate for Granular Base course

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals in accordance with Section 01 33 00- Submittal Procedures.

Part 2 Products

2.1 MATERIALS

.1 Concrete mixes and materials: in accordance with Section 03 30 00- Cast-in-Place Concrete.

.2 Granular base:

.1 Class “A” granular base course material as per Province of Manitoba Standard Construction Specifications No. 900 –Aggregate for Granular Base course.

Part 3 Execution

3.1 SUBGRADE PREPARATION

.1 Areas to receive granular base to be free from debris, snow, ice, water and frozen ground.

.2 Hand trim, make firm and remove loose material and debris from excavations. Where material has been disturbed, compact soil to density at least equal to undisturbed soil.

3.2 GRANULAR BASE

.1 Obtain Departmental Representative's written approval of subgrade before placing granular base.

.2 Place granular base material to be minimum 100mm thick.

.3 Compact granular base in maximum 150 mm layers to at least 95% of maximum density to ASTM D698.

3.3 CONCRETE

.1 Obtain Departmental Representative written approval of granular base and reinforcing steel prior to placing concrete.

.2 Do concrete work in accordance with Section 03 30 00- Cast-in-Place Concrete.

.3 Immediately after floating, give sidewalk surface uniform broom finish to produce regular corrugations not exceeding 2 mm deep, by drawing broom in direction normal to centre line.

.4 Provide edging with 10 mm radius edging tool.

3.4 TOLERANCES

.1 Finish surfaces to within 3 mm in 3m as measured with 3m straightedge placed on surface.

3.5 CONTROL JOINTS

.1 Install transverse control joints by sawcutting at intervals of minimum 1250 mm and maximum 1750 mm.

.2 Longitudinal sawcut joints at 1500 mm or less as directed by the Departmental Representative.

.3 When sidewalk is adjacent to curb, make joints of curb, gutters and sidewalk coincide.

3.6 ISOLATION JOINTS

.1 Install isolation joints around manholes and catch basins and along length adjacent to concrete curbs, catch basins, buildings, or permanent structure.

.2 Install joint filler in isolation joints as indicated in accordance with Section 03 30 00- Cast-in-Place Concrete.

3.7 CURING

.1 Cure concrete by adding moisture continuously in accordance with CSA-A23.1/A23.2 to exposed finished surfaces for at least 1 day after placing, or sealing moisture in by curing compound as directed by Departmental Representative.

.2 Where burlap is used for moist curing, place two pre-wetted layers on concrete surface and keep continuously wet during curing period.

.3 Apply curing compound evenly to form continuous film, in accordance with manufacturer's requirements.

3.8 CLEANING

.1 Proceed in accordance with Section 01 74 11- Cleaning.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 31 23 33.01 EXCAVATING AND BACKFILLING

.2 Section 32 16 15 CONCRETE WALKS, CURBS AND GUTTERS

1.2 PRICE AND PAYMENT PROCEDURES

.1 Measurement and Payment:

.1 Measure cast-in-place concrete in cubic metres calculated from neat dimensions as indicated authorized in writing by Departmental Representative.

.1 Concrete placed beyond dimensions indicated will not be measured.

1.3 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C260/C260M-[10a], Standard Specification for Air-Entraining Admixtures for Concrete.

.2 ASTM C309-[11], Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.3 ASTM C494/C494M-[15], Standard Specification for Chemical Admixtures for Concrete.

.4 CAN/CGSB-51.34-[M86 (R1988)], Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.2 CSA International

.1 CSA A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA A283-06-R2016, Qualification Code for Concrete Testing Laboratories.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Pre-installation Meetings: in accordance with Section 01 32 16.07- Construction Progress Schedules - Bar (GANTT) Chart. Convene pre-installation meeting one week prior to beginning concrete works.

.1 Ensure site supervisor and Departmental Representative attend.

.1 Verify project requirements.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 At least 4 weeks prior to beginning Work, provide Departmental Representative with samples of materials proposed for use as follows:

.1 5 L of curing compound.

.2 One 2 m length of each type of joint filler.

.3 Provide testing results reports for review by Departmental Representative and do not proceed without written approval when deviations from mix design or parameters are found.

.4 Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.

.5 Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

.6 Provide two copies of WHMIS MSDS in accordance with Section 01 35 29.06- Health and Safety Requirements.

1.6 QUALITY ASSURANCE

.1 Quality Assurance: in accordance with Section 01 45 00- Quality Control.

.2 Provide Departmental Representative minimum 4 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.

.1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.

.3 Minimum 4 weeks prior to starting concrete work, provide proposed quality control procedures for review by Departmental Representative on following items:

.1 Falsework erection.

.2 Hot weather concrete.

.3 Cold weather concrete.

.4 Curing.

.5 Finishes.

.6 Formwork removal.

.7 Joints.

.4 Quality Control Plan: provide written report to Departmental Representative verifying compliance that concrete in place meets performance requirements of concrete as established in PART 2 - PRODUCTS.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.

.1 Do not modify maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2.

.2 Deviations to be submitted for review by Departmental Representative.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

Part 2 Products

2.1 DESIGN CRITERIA

.1 Design criteria to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.

2.2 PERFORMANCE CRITERIA

.1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Departmental Representative and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.

2.3 MATERIALS

.1 Portland Cement: to CSA A3001, Type GU.

.2 Water: to CSA A23.1.

.3 Aggregates: to CSA A23.1/A23.2.

.4 Admixtures:

.1 Air entraining admixture: to ASTM C260.

.2 Departmental Representative to approve chemical admixtures for accelerating or retarding set during cold and hot weather placing.

.5 Curing compound: to CSA A23.1/A23.2.

.6 Pre-moulded joint fillers:

.1 Bituminous impregnated fibre board: to ASTM D1751.

2.4 MIXES

.1 Mix criteria to CSA A23.1/A23.2

.1 Minimum Specified Compressive Strength @ 28 days = 30 MPa

.2 Minimum Cementitious Content = 300 kg/m3

.3 Maximum Water/Cement Ratio = 0.49

.4 Slump = 80 ± 20 mm

.5 Aggregate Size = 20 mm Nominal

.6 Air Content = 5% to 8%

Part 3 Execution

3.1 PREPARATION

.1 Obtain Departmental Representative's written approval before placing concrete.

.1 Provide 72 hours minimum notice prior to placing of concrete.

.2 During concreting operations:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitate placing with minimum of re-handling, and without damage to existing structure or Work.

.3 Pumping of concrete is permitted only after approval of equipment and mix.

.4 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.5 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, workability, air content, temperature, and test samples taken.

.6 Do not place load upon new concrete until authorized by Departmental Representative.

3.2 INSTALLATION/APPLICATION

.1 Do cast-in-place concrete work to CSA A23.1/A23.2.

.2 Finishing and curing:

.1 Finish concrete to CSA A23.1/A23.2.

.2 Use curing compounds compatible with applied finish on concrete surfaces.

.3 Joint fillers:

.1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Departmental Representative.

.2 When more than one piece is required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.

.3 Locate and form expansion joints as indicated.

.4 Install joint filler.

3.3 FIELD QUALITY CONTROL

.1 Site tests: conduct tests as follows and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

.1 Concrete pours.

.2 Slump.

.3 Air content.

.4 Compressive strength at 7 and 28 days.

.5 Air and concrete temperature.

.2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Departmental Representative for review to CSA A23.1.

.1 Ensure testing laboratory is certified to CSA A283.

.3 Departmental Representative will pay for costs of tests as specified in this section.

.4 Departmental Representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

.5 Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

3.4 CLEANING

.1 Clean in accordance with Section 01 74 11- Cleaning:

.1 Owner will provide appropriate area on job site where concrete trucks can be safely washed.

.2 Do not dispose of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.

.3 Prevent admixtures and additive materials from entering drinking water supplies or streams.

.4 Using appropriate safety precautions, collect liquid or solidify liquid with inert, non-combustible material and remove for disposal.

.5 Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 31 32 19.16 GEOMEMBRANES

1.2 MEASUREMENT PROCEDURES

.1 Excavation and Stockpile of Uncontaminated Soil will be measured in cubic metres in their original location (in place). Excavation and Stockpile of Uncontaminated Soil quantities measured will be actual volume removed within the following limits:

- .1 Depth from ground elevation immediately prior to excavation, to elevation as directed by Departmental Representative.
- .2 Payment for Excavation and Stockpile of Uncontaminated Soil will be at the tendered unit price to include excavation and stockpiling on site, and all incidentals to the completion of the work.
- .3 Excavated and stockpiled material to be measured by the Departmental Representative daily. Volumes to be mutually agreed upon in writing by the Contractor and Department Representative at the end of each work day.
- .4 Areas for stockpile of uncontaminated soil to be identified by the Departmental Representative and are anticipated to be immediately adjacent to the site on Buffalo Drive.
- .5 Estimated quantity: 500 cubic meters

.2 Excavation and disposal of Unsuitable and Uncontaminated Soil will be measured in cubic metres in their original location (in place). Excavation and disposal of Unsuitable and Uncontaminated Soil quantities measured will be actual volume removed within the following limits:

- .1 Depth from ground elevation immediately prior to excavation, to elevation as directed by Departmental Representative.
- .2 Payment for Excavation and removal of Unsuitable and Uncontaminated Soil will be at the tendered unit price to include excavation, removal and disposal off site, and all incidentals required to complete this work.
- .3 Excavated and disposed material to be measured by the Departmental Representative daily. Volumes to be mutually agreed upon in writing by the Contractor and Department Representative at the end of each work day.
- .4 Locations for disposal of unsuitable and uncontaminated will be identified by the Departmental Representative, and are anticipated to be local to the project site.
- .5 Estimated quantity: 500 cubic meters

.3 Excavation and Disposal of Contaminated Soil will be measured in cubic metres in their original location. Excavation and Disposal of Contaminated Soil quantities measured will be actual volume removed within following limits:

- .1 Depth from ground elevation immediately prior to excavation, to elevation as directed by Departmental Representative.

.2 Payment for Excavation and Disposal of Contaminated Soil will be at the tendered unit price to include excavation, transportation from the site to an approved soil treatment facility, tipping fees at the soil treatment facility, and all incidentals to the completion of the work.

.3 Excavated material for disposal to be measured by the Departmental Representative daily. Volumes to be mutually agreed upon in writing by the Contractor and Department Representative at the end of each work day.

.4 Estimated Quantity 1675 cubic meters

.4 Backfill of Uncontaminated Soil from Stockpile will be measured in cubic metres.

.1 Backfill quantities will be actual volume of material placed and compacted. The volume will be measured after placement and compaction.

.2 Payment for Backfill of Uncontaminated Soil from Stockpile will at the tendered unit price to include placement of backfill, compaction and all incidentals to the completion of the work.

.3 Backfill of Uncontaminated Soil to be measured by the Departmental Representative daily. Volumes to be mutually agreed upon in writing by the Contractor and Department Representative at the end of each work day.

.4 Estimated quantity: 500 cubic meters

.5 Backfill of Imported Fill material quantities will be measured in cubic metres.

.1 Backfill of Imported Fill material quantities will be actual volume of material supplied, placed and compacted. The volume will be measured after placement and compaction.

.2 Payment for Backfill of Imported Fill material will at the tendered unit price to include transportation of soil from the borrow area to site, placement of backfill, compaction, site restoration and all incidentals to the completion of the work.

.3 Backfill of Imported Fill material to be measured by the Departmental Representative daily. Volumes to be mutually agreed upon in writing by the Contractor and Department Representative at the end of each work day.

.4 Estimated quantity: 2175 cubic meters

1.3 REFERENCE STANDARDS

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM C117-04, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM D422-632002, Standard Test Method for Particle-Size Analysis of Soils.

.4 ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3) (600 kN-m/m3).

.5 ASTM D1557-02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3) (2,700 kN-m/m3).

.6 ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.3 Canadian Environmental Assessment Act (CEAA), 1992, c. 37.

.4 Canadian Environmental Protection Act (CEPA), 1999, c.33.

.5 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.4 DEFINITIONS

.1 Excavation classes: One class of excavation will be recognized: common excavation.

.1 Common excavation: excavation of materials of whatever nature. Common excavation will include both hydrocarbon impacted material that must be disposed of off-site at the specified location, and uncontaminated material that may be stockpiled and used as backfill material assuming all required material properties are satisfied, or uncontaminated material that is unsuitable and removed from site for disposal.

.2 Topsoil:

.1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

.2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.

.3 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.4 Borrow or Imported Fill material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

.5 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.

.6 Unsuitable materials:

.1 Material with ice and snow.

.2 Weak, chemically unstable, and compressible materials.

.3 Frost susceptible materials:

.1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM C136 / ASTM D422: Sieve sizes to CAN/CGSB-8.1 / CAN/CGSB-8.2.

.2 Table:

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45 – 100
0.02 mm	10 - 80
0.005 mm	0 - 45

.3 Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.

.7 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.5 SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Quality Control: in accordance with Section 01 45 00- Quality Control:

.1 Submit condition survey of existing conditions as described in Part 1.6 EXISTING CONDITIONS of Section 31 23 33.01.

.2 Submit for review by Departmental Representative proposed dewatering methods as described in Part 3 Execution of Section 31 23 33.01.

.3 Submit to Departmental Representative written notice of excavation work at least 7 days prior to excavation work, to ensure cross sections are taken.

.3 Preconstruction Submittals:

.1 Submit construction equipment list for major equipment to be used in this section to Departmental Representative a minimum of 7 days prior to start of Work.

.2 Submit schedule describing the sequence and duration of all tasks necessary for the successful completion of the Project to Departmental Representative a minimum of 2 weeks prior to start of Work.

.3 Submit records of underground utility locates to Departmental Representative a minimum of 7 days prior top start of Work , indicating: location plan of relocated and abandoned services, location plan of existing utilities as found in field and clearance record from utility authority.

.4 Submit a plan to the Departmental Representative 7 days prior to start of Work for maintaining the on-site fire hydrant, located in the southwest corner of the excavation, throughout the duration of the excavation and backfilling activities unless an alternate plan can be agreed to with the Authority having jurisdiction.

.4 Samples:

.1 Submit samples in accordance with Section 01 33 00- Submittal Procedures.

.2 Inform Departmental Representative at least 2 weeks prior to beginning Work, of proposed source of fill materials

.3 Submit 70 kg samples of type of fill specified including representative sample of uncontaminated excavated material for the purpose of environmental laboratory analyses, grain size, liquid limit and Proctor.

.4 Ship samples prepaid to Departmental Representative in labelled, tightly closed containers to prevent contamination and exposure to elements.

1.6 EXISTING CONDITIONS

.1 Examine report:

Final Report - Supplemental Phase II ESA

122 Wasagaming Drive

Riding Mountain National Park
Wasagaming, Manitoba
Written by DST Consulting Engineers, August 8, 2014
(attached here as Appendix B)

.2 Buried services:

.1 Before commencing work verify location of buried services on and adjacent to site.

.2 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.3 A minimum of 5 days prior to beginning excavation Work, notify applicable authorities having jurisdiction to establish location and state of use of buried utilities and structures. Authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.

.4 If required, confirm locations of buried utilities within excavation area or in close proximity to excavation area by careful soil hydro vac methods and/or hand-digging.

.5 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.

.6 Where utility lines exist in area of excavation, notify Departmental Representative and authority having jurisdiction for that utility before beginning Work in that area. Do not proceed until the authority having jurisdiction for that utility is satisfied with the methodology to excavate around the utility line.

.7 Arrange with authority having jurisdiction for relocation of buried services that interfere with execution of work and pay costs of relocating services.

.8 Record location of maintained, re-routed and abandoned underground lines. Provide record to Departmental Representative.

.9 Confirm locations of recent excavations adjacent to area of excavation.

.3 Existing buildings and surface features:

.1 Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.

.2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.

.3 Where required for excavation, cut roots or branches as directed by Departmental Representative.

Part 2 Products

2.1 MATERIALS

.1 Common Excavation: Common Excavation shall include all excavation, including contaminated and clean material, through frozen or unfrozen clay, silt, sand, gravel, hard-pan, dense tills, earth, roots, brush, rubbish, quick-sand, rubble, water, ice, snow,

shale, cobbles, boulders (less than one cubic metre in volume), loose rock, and any other obstacles which may be encountered. Most of the contaminated soil is below the groundwater table. See attached test-hole logs for information on soil types and groundwater conditions.

.2 Common Backfill: Common Backfill shall include uncontaminated material previously excavated and stockpiled at the site and imported fill material , free of ice and free of organic and/or soft materials which would disintegrate through decay or weathering, and of such moisture content that the soil will compact to the specified density and remain stable. Moisture to be added as required to achieve specified density.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control drawings.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

.4 All above site specific measures to be provided in the environmental protection plan submittal.

3.2 SITE PREPARATION

.1 Remove and properly dispose of obstructions, ice and snow, from surfaces to be excavated within limits indicated. Departmental Representative to provide snow stock-pile location.

.2 Approximately six spruce trees are located within the excavation limits that will need to be removed by the contractor. Salvageable firewood is to be delivered to the park wood yard in 8 ft lengths with limbs removed. Firewood minimum diameter to be 5 inches. Limbs and slash are to be deposited at an approved location outside the park.

.3 Remove sidewalks in order to facilitate dewatering and excavation activities as per 3.6 Concrete Removal.

.4 The Contractor shall protect 3 catch basins near the Work as noted on the drawings that discharge directly to Clear Lake by preventing any discharge from the site. Mitigation measures are to be specified as part of the environmental protection plan and spill response plan submittals required a minimum of 3 weeks before mobilization to site for the Work.

3.3 PREPARATION/PROTECTION

.1 Protect existing features in accordance with Section 01 56 00- Temporary Barriers and Enclosures and applicable local regulations as well as Parks Canada policies.

.2 Keep excavations clean, free of standing water, snow, and loose soil.

.3 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage. Departmental Representative to inspect and approve. Damage to be corrected at Contractor cost.

.4 Protect buried services that are required to remain undisturbed.

.5 Locate all utilities in the vicinity of the excavation

.6 Obtain all permits required for the excavation and disposal of petroleum hydrocarbon impacted soil off-site at a licensed disposal facility.

3.4 STRIPPING OF TOPSOIL

.1 Begin topsoil/overburden stripping of areas as directed by the Departmental Representative after area has been cleared of snow, ice, weeds, grasses and/or brush.

.2 Strip topsoil/overburden to depths as directed by the Departmental Representative.

.1 Do not mix topsoil with subsoil.

.3 Stockpile in locations as directed by the Departmental Representative.

.1 Stockpile height not to exceed 2 m and should be protected from erosion.

.4 Dispose of unused topsoil to location as directed by the Departmental Representative.

.5 Stockpile to be protected by minimum 2 meter fencing.

3.5 STOCKPILING

.1 Stockpile fill materials in areas designated by the Departmental Representative.

.1 Stockpile granular materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

.3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies and catch basins.

3.6 CONCRETE REMOVAL

.1 Removal of sidewalks:

.1 Approximately 75 meters of a 2.5 meter wide (100 mm thick) reinforced concrete sidewalk is expected to be removed to facilitate the dewatering and excavation activities

.2 Exact limits of removal will be as directed by the Departmental Representative

.3 Cut sidewalk neatly in order that surface may break evenly and cleanly.

.4 Removal of the sidewalks adjacent to the property is authorized, as part of this project.

.5 The Contractor shall protect and maintain curbs and adjacent streets/road/alleys throughout the duration of the project, and as directed by the Departmental Representative, and as per the Specifications.

.6 Protect underlying and adjacent granular materials.

.7 Payment for Concrete Removal will be incidental to site preparation. Removal to include sawcutting, demolition and off-site disposal of all associated materials including concrete rubble and reinforcing.

3.7 DEWATERING

.1 Keep excavations free of water, snow and ice while Work is in progress.

.2 A wellpoint dewatering system shall be utilized for dewatering the site in order to facilitate the required excavation, and to maintain stable excavation side slopes.

.3 The wellpoint dewatering system shall achieve concurrent groundwater cutoff on all sides of the excavation, throughout the duration of excavation and backfilling activities.

.4 The Contractor shall engage a specialist dewatering subcontractor, or dewatering Engineer licensed to practice within the province of Manitoba, and shall be responsible for designing, installing and operating a wellpoint dewatering system that is capable of dewatering the site in order to carry out the Work in accordance with the specified schedule milestones, and as shown on the Drawings.

.5 The Contractor shall be required to maintain groundwater a minimum of 1.0 meter below the excavation invert, as determined at the center of the excavation area, at all times.

.6 The Contractor will be required to demonstrate to the Departmental Representative that the required groundwater level has been reached for a given planned excavation depth at the beginning of each day of planned excavation activities.

.7 The Contractor should note that a number of monitoring wells exist at the site that may or may not be suitable for determining groundwater levels prior to excavation activities. These wells are identified in the DST Report attached in Appendix B. Should these wells not prove to be suitable for determining the groundwater level, the Contractor shall be responsible for providing some alternate means of measuring groundwater levels at the center of the excavation. The Contractor shall include the planned method of measuring groundwater levels in the Dewatering Plan.

.8 The Contractor shall provide a Dewatering Plan for review by the Departmental Representative. The plan should include sufficient detail to fully describe:

.1 wellpoint installation methodology

.2 wellpoint locations,

.3 pre-excavation pumping schedule,

.4 freeze prevention methods, as operations are expected under freezing conditions, typical of a winter construction season,

.5 groundwater treatment methodology and layout of equipment/discharge to sanitary sewer,

.6 excavation groundwater level measurement installations and measurement methods,

.7 sampling and analysis program,

.8 wellpoint dewatering system monitoring plan, including planned methods for continuous oversight, troubleshooting, and repair to allow for operation of the wellpoint dewatering system on a 24/7 basis, continually for the duration of the work where wellpoint dewatering is required. This shall include planning for on-

site redundancy of critical wellpoint dewatering system components, as necessary.

.9 Level of backfill necessary within the excavation to facilitate shut-down of the well point dewatering system.

.9 Protect open excavations against flooding and damage due to surface run-off and groundwater infiltration.

.10 Collected groundwater from the wellpoint dewatering system shall be disposed into the local sanitary sewer system after treatment in accordance with the standards of City of Winnipeg Sewer By-Law No. 92/2010. The groundwater treatment system shall be capable of operation and discharge under freezing conditions, typical of a winter construction season.

.11 The Departmental Representative shall collect and submit treated water samples to a third party testing laboratory service (Canadian Association of Laboratory Accreditation (CALA) accredited) for analysis as per the following schedule:

.1 immediately upon starting dewatering activities;

.2 on the second day of dewatering activities;

.3 on the fifth day of dewatering activities; and,

.4 once per week thereafter during dewatering activities.

.12 Additional samples may be required at the discretion of the Departmental Representative.

.13 All discharge water samples are to be submitted for emergency turn-around analysis of benzene, toluene, ethylbenzene and xylenes (BTEX); total purgeable hydrocarbons; and total extractable hydrocarbons; or equivalent.

.14 The results of the laboratory analyses are to be submitted directly from the laboratory to the Departmental Representative for review.

.15 Immediately notify the Departmental Representative if the discharge water is found to not be in compliance with the City of Winnipeg Sewer By-Law No. 92/2010. Adjust the water treatment methodology as required to ensure that further discharge water is in compliance with the City of Winnipeg Sewer By-Law No. 92/2010.

.16 Costs for Laboratory Testing of water samples will be paid by the Departmental Representative.

.17 Provide flocculation tanks, settling basins, or other treatment facilities as required to remove suspended solids or other materials before discharging any water from the site.

3.8 EXCAVATION

.1 Maintain sides and slopes of excavations in safe condition at all times and by appropriate methods, and in accordance with Section 01 35 29.06- Health and Safety Requirements.

.1 Where excavation conditions are or become unstable, the Contractor shall modify their excavation and/or dewatering plans accordingly. If necessary, the Contractor may be required to engage the services of a Professional Engineer licensed to practice in Manitoba to assist with the development of a revised excavation and/or dewatering plan.

.2 Advise Departmental Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.

.3 Excavate to lines, grades, elevations and dimensions as indicated on the Design Drawings and as directed by the Departmental Representative. The excavation limits, and completion depths shall vary based on the field screening of hydrocarbon vapor concentrations that will be undertaken by the Departmental Representative, on site, and throughout the duration of the excavation works. At all times the Contractor is responsible for maintaining the stability and integrity of the excavation, based on operations of their wellpoint dewatering system and based on their requirement to maintain the excavation in a safe condition, as per Part 3.8.1 in Section 31 23 33.01.

.4 Keep excavated and stockpiled materials safe distance away from the edge of excavation as directed by the Departmental Representative. Stockpiled material not to exceed 5 m in height.

.5 Excavation and stockpiling must not interfere with bearing capacity of adjacent foundations.

.6 Restrict vehicle operations and stockpiling directly adjacent to open excavations.

.7 Place excavated hydrocarbon impacted material directly into trucks for transport and disposal. Hydrocarbon impacted soil may be temporarily stockpiled within the footprint of the excavation site only.

.8 Dispose of surplus and unsuitable excavated material in approved location off site.

.9 Do not obstruct flow of surface drainage or natural watercourses.

.10 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.11 Notify Departmental Representative when bottom of excavation is reached.

.12 Obtain Departmental Representative written approval of completed excavation.

.13 Hand trim, make firm and remove loose material and debris from excavations.

.1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

.14 Install geomembranes as per the Drawings and in accordance with Section 31 32 19.02-Geomembranes.

3.9 IMPORTED FILL MATERIAL

.1 The Contractor shall supply granular backfill which shall be free from organic material and shall meet the following requirements:

.1 Not more than 50% shall pass the 4.75 mm sieve, and not more than 15% shall pass the 0.075 mm sieve. The gravel shall be uniformly graded from coarse to fine and the maximum particles shall not exceed 150 mm in diameter.

.2 A 70 Kg sample of the granular material which the Contractor proposes to use shall be submitted to the Departmental Representative at least 14 days before the material is to be used in the work. The Departmental Representative will test the material for conformance to the grading requirements.

3.10 BACKFILLING

.1 Do not proceed with backfilling operations until completion of following:

.1 Departmental Representative has inspected and approved installations.

.2 Departmental Representative has inspected and approved of construction below finish grade.

.3 Inspection, testing, approval, and recording location of underground utilities.

.2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Continue operation of the wellpoint dewatering system until such time sufficient backfill is placed and compacted in the excavation to maintain excavation stability and integrity, while also maintaining intact installation of the geomembrane.

.5 The backfill shall be placed in layers not to exceed 200 mm in depth and each layer shall be thoroughly compacted by means of packers or mechanical tampers approved by the Departmental Representative to a relative compaction of not less than 95% standard Proctor.

.6 Grade final surface to match surrounding terrain while maintaining a minimum 1% slope from the centre of the site to ensure proper drainage of surface water..

3.11 TESTS FOR COMPACTION

.1 Samples and/or tests of backfill materials, both before and after placement and compaction, will be taken by the Departmental Representative at frequent intervals. For these samples and tests, corrections, adjustments and modifications of methods, materials, and moisture content will be made by the Contractor in order to secure the desired compaction.

3.12 CLEANING DURING EXCAVATION AND BACKFILLING

.1 Contractor to keep accumulations of mud, snow, ice, fill materials, debris, etc from building up on adjacent roadways and walkways during the period of Work.

.2 Clean areas affected by Work as directed by Departmental Representative.

3.13 RESTORATION

.1 Reinstate sidewalks removed to facilitate dewatering and excavation activities to thickness, structure and elevation that existed before removal. Design drawing to be submitted and reviewed by Departmental Representative 14 days before restoration.

.2 Sidewalk restoration is to be scheduled in the spring during more favourable (above freezing) weather conditions. Exact schedule for this work to be approved by Departmental Representative and Parks Canada. Contractor is reminded that extra care will be required to accommodate increased pedestrian and vehicular traffic during the sidewalk replacement work.

.3 Allow for the supply and installation of 10 cubic yards of topsoil in order to restore adjacent properties that may have been disturbed during the Work as directed by the Departmental Representative. Topsoil to be neatly placed in order to provide for an aesthetic transition to the neighbouring properties. Payment for topsoil will be at the

tendered unit price which is to include supply and installation and all incidentals associated with the completion of this work.

.4 Clean and reinstate areas affected by Work as directed by Departmental Representative.

.5 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 31 23 33.01 EXCAVATING, TRENCHING AND BACKFILLING

1.2 MEASUREMENT PROCEDURES

.1 Supply and Installation of Geomembranes on the completed excavation side slopes will be measured in square metres of geomembrane. No allowance will be made for seams and overlaps. Supply and installation of all required installation equipment, seaming, quality control testing, key trench (or other methods used to secure the geomembrane above the excavation side slopes), and all other such works shall be incidental.

.2 The estimated quantity of geomembrane is 715 square meters assuming the geometry shown of the contract drawings plus a 10% waste factor. The Contractor will be expected to supply at least this amount material in a form that will suit the geometry shown on the drawings. Should the excavation be reduced from that that shown on the drawings and therefore reducing the amount of side-slope needing geomembrane protection, the full amount of the "Geomembrane Supply" quantity will still be paid for based on the estimated quantity of 715 square meters. However, only the actual amount of geomembrane installed will be paid for under the unit rate for "Geomembrane Installation".

1.3 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM D751, Standard Test Method for Coated Fabrics.

.2 ASTM D1593, Standard Specification for Non-rigid Vinyl Chloride Plastic Film and Sheeting.

.3 ASTM D2261, Standard Test Method for Tearing Strength of Fabrics by the Tongue (Single-Rip) Procedure (Constant-Rate-of-Extension Tensile Testing Machine).

.4 ASTM D5034, Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test).

1.4 SUBMITTALS

.1 Submit samples in accordance with Section 01 33 00 – Submittals.

.2 Submit to Departmental Representative the following samples at least one week prior to beginning of Work:

.1 Minimum 0.5 m length of standard width membrane with product literature.

.3 Provide shop drawings indicating the proposed installation details including layout, dimensions and details, including fabricated and field seams, anchor trenches and protrusion details.

1.5 QUALITY ASSURANCE

.1 Submit to Departmental Representative copies of manufacturer’s mill test data including certificates at least one week prior to start of Work.

.2 Test quality of resin and membrane to ensure consistency of raw material and geomembrane quality in accordance with manufacturer's recommendations.

.3 Test seams by non-destructive methods over their full length, using vacuum test unit or air pressure test.

.1 Use air lance to apply air at 343 kPa through nozzle directed at edge of overlap seam. Seam failure is indicated by inflation or lifting of any part of geomembrane.

.4 Provide test results in writing to Departmental Representative, for each shift's production, including documentation of non-destructive testing and repairs at end of each shift.

1.6 STORAGE AND HANDLING

.1 Store and handle materials in accordance with manufacturer's written instructions.

.2 During delivery and storage, protect geo-membranes from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris, ice and rodents.

.3 Storage and Handling Requirements:

.1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 The Contractor shall remove from site and dispose of packaging materials and remnants of geomembrane installation at appropriate disposal facilities.

Part 2 Products

2.1 GEOMEMBRANE

.1 Geomembrane:

.1 36 mil reinforced polypropylene

.2 Physical Properties:

TESTED PROPERTY	TEST METHOD	UNIT ENGLISH (METRIC)	VALUE ENGLISH (METRIC)
Plies, Reinforcing			1
Thickness mils. Minimum			
1. Overall	ASTM D 751	mil (mm)	0.36 (0.90)
2. Over Scrim	Optical Method	mil (mm)	11 (0.28)
Low Temperature	ASTM D 2136 1/8in Mandrel, 4hrs, pass	˚F (˚C)	-65 (-54)
Puncture Resistance, min	FTMS 101C, Method 2031	lbs (kN)	350 (1.56)
Tear Strength, min	ASTM D 5884	lbs (kN)	100 (0.45)
Dimensional Stability (% chg, max)	ASTM D 1204 180˚F/82˚C, 1hr		-0.5
Hydrostatic Resistance, Min	ASTM D 751, Method A, Proc 1	psi (mPa)	375 (2.58)
Ply Adhesion, min	ASTM D 413, Machine Method Mod.	lbs/in (kN/ m)	30 (5.25)
Water Absorption max, % wt chg	ASTM D 471, 30 days @ 70˚F (21˚C)		<1.0
Env. Stress Crack Resistance (min. hrs w/o failure)	ASTM D 1693 3000 hrs		unaffected by ESC
UV Resistance	ASTM G26 Xemon Arc @ 80˚C, 4000 hrs		pass
TYPICAL FABRICATED SEAM PROPERTIES*			
Bonded Seam Strength	ASTM D 751 – Modified	lbs (kN/m)	175 (0.78)
Peel Adhesion	ASTM D 413 – modified	lbs (kN/m)	20 (3.5) or FTB
*Factory bonded seam strength is the responsibility of the fabricator.			

.3 Geomembrane to be free of striations, roughness, pinholes, bubbles, blisters, un-dispersed raw materials and any sign of contamination by foreign matter.

.2 Seams: completed in accordance with manufacturer's recommendations.

.1 Physical properties for resin used for seaming are same as those for resin used in manufacture of membrane.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate are acceptable for geomembrane installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

.1 Installation of geomembranes on completed excavation side slopes shall be as shown on the Contract Drawings.

.2 Maintain area of installation free of debris, loose materials, water, ice, and snow accumulations.

.3 Place and seam panels in accordance with manufacturer's recommendations on graded surface as indicated on reviewed shop drawings. Minimize wrinkles, avoid scratches and crimps to geomembranes and avoid damage to supporting material. All sections of the liner are to be joined in accordance with manufacturer’s recommendations.

.4 Protect installed membrane from displacement, damage or deterioration before, during and after placement of backfill.

.5 Replace damaged, torn or permanently twisted panels to approval of Departmental Representative. Remove rejected damaged panels from site.

.6 Keep field seaming to minimum. Locate field seams up and down slopes, with no horizontal field seam less than 1.5 m beyond toe of slope.

.7 Keep seam area clean and free of moisture, dust, dirt, debris and foreign material.

.8 Test field seams as seaming work progresses by non-destructive methods over their full length. Repair seams which do not pass non-destructive test. Reconstruct seam between failed location and any passed test location, until non-destructive testing is successful.

.9 Repair minor tears and pinholes by patching until non-destructive testing is successful. Patches to be round or oval in shape, made of same geomembrane material, and extend minimum of 75 mm beyond edge of defect.

3.3 PROTECTION

.1 Do not permit vehicular traffic directly on membrane.

END OF SECTION

KGS GROUP
CONSULTING ENGINEERS

|Kontzamanis|Graumann|Smith|MacMillan|Inc.|

3rd Floor
865 Waverley Street
Winnipeg,
Manitoba
R3T 5P4
204.896.1209
fax: 204.896.0754
www.kgsgroup.com

November 9, 2017 File No. 17-0006-007

Public Services and Procurement Canada
Environmental Services
100-167 Lombard Ave
Winnipeg, Manitoba
R3C 2Z1

ATTENTION: Ms. Joan La Rue-van Es, M.Sc. P.Eng.
Senior Environmental Specialist

RE: Remediation of Hydrocarbon Impacted Soil
122 Wasagaming Drive, Wasagaming, Manitoba
Riding Mountain National Park
Remedial Action Plan - FINAL

Dear Ms. La Rue-van Es:

KGS Group has been retained by Public Services and Procurement Canada (PSPC) Environmental Services on behalf of Parks Canada Agency (PCA) to assist in contract administration and project management for the required remedial activities at 122 Wasagaming Drive in Wasagaming, Riding Mountain National Park (RMNP), Manitoba. We are pleased to present to you this letter outlining the recommended Remedial Action Plan (RAP). All activities, including excavation activities, transportation and disposal of contaminated soil at an approved facility, supply and placement of backfill material, compaction of backfill material, site restoration, and replacement of the adjacent sidewalk will be conducted under the site supervision of KGS Group field personnel.

The award of the remediation excavation and backfilling contract is not part of the KGS Group scope of work. Site remediation is tentatively scheduled for January 2018. A more detailed schedule will be provided by the Contractor upon award of the remediation excavation and backfilling contract.

As the remediation Contractor has not yet been awarded, it has been assumed that all impacted soil will be transported to the HAZCO waste disposal site in Virden Manitoba.

Background

The subject property is located on the northeast corner of Wasagaming Drive and Buffalo Drive, approximately 300 m south of Clear Lake (refer to attached Drawing G01). The subject property, approximately 910 m^2 in size, is currently vacant. The subject property consisted of a former service station with underground storage tanks that were removed in March 2014. Several investigations were completed at the subject property including a Phase I/II Environmental Site Assessment (ESA) by Clear Sky Environmental Services in 2009, a Phase I/II/III ESA by Golder Associates in 2013, a Supplemental Phase II ESA by DST Consulting Engineers in 2014 and a Human Health Preliminary Quantitative and Ecological Risk Assessment by AMEC Foster Wheeler in 2015.

Review of the previous investigations at the site, including the 2013 Phase I/II/III ESA report and the 2014 Phase II ESA report indicated that the estimated volume of petroleum hydrocarbon impacted soil exceeding the applicable Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (CEQG) and Canada Wide Standards for Petroleum Hydrocarbons in Soil (CWS) is approximately 3,500 m^3 and extends up to a depth of 4.5 m. Impacted groundwater above the Federal Interim Groundwater Quality Guidelines (FIGQG) was also identified onsite and estimated to include an area of 660 m^2. Soil impacts were delineated in all directions and extend into the adjacent streets west and south of the property. Groundwater is not used for potable water within the Town of Wasagaming.

Remedial Action Plan

The recommended RAP for the hydrocarbon impacted soil present at the subject property consists of excavation and off-site disposal of impacted soil (ex-situ treatment) at a licensed waste disposal facility. The location and details of disposal is the responsibility of the Contractor who will be invigilated for adherence to the project specifications by KGS Group who will act as the Departmental Representative. Remediation will include the excavation of approximately 2,675 m^3 of non-impacted and impacted soils within the subject property boundaries up to a depth of 3.5 m on the east side of the property and up to 4.5 m depth on the west side of the property (refer to attached Drawing G02). The site will be dewatered to maintain a stable and safe excavation. Water extracted during dewatering will be treated prior to disposal via the RMNP sanitary sewer system. Discharge water will be monitored for adherence to the City of Winnipeg sewer discharge by-law. To enable dewatering activities and removal of impacted soil within the property boundaries, PCA has approved the removal of the adjacent sidewalks along the west and south property boundaries. To minimize removal and reconstruction of the adjacent streets and utilities, it is expected that some impacted soils will remain at and outside of the subject property boundaries. To mitigate the migration of remaining impacts left on the subject property limits, and on adjacent properties, the completed excavation will be lined with geomembrane at completion of the excavation and prior to backfilling. The Contractor will be responsible for protection of all storm water drains from uncontrolled and untreated discharge at the site.

Work Program

As of November 8, 2017, award of the remediation excavation and backfilling contract has not been issued. Further details of a finalized work program will be forwarded once the Contractor has been determined. KGS Group will be on-site to direct the excavation and backfill activities using field hydrocarbon vapour screening instruments. Confirmatory soil samples will be submitted for laboratory analysis of petroleum hydrocarbons.

Specifically, KGS Group will complete the following work at the subject property:

- Prepare a Health and Safety Plan;
- Ensure that the Contractor completes the project in accordance with the Project Specifications;
- Ensure the Contractor has arranged for the clearance of all utility service lines on the site prior to commencement of dewatering and excavation activities;

- Ensure that a dewatering plan with water treatment that meets City of Winnipeg Sewer By-Law No. has been prepared by the Contractor for implementation prior to excavation activities.

- Collect water samples of treated groundwater at the start of dewatering activities for confirmatory laboratory analysis;

- Supervise dewatering activities and ensure that impacted groundwater is treated prior to discharging to the local sewer system;

- Provide site supervision during the removal of hydrocarbon impacted soil from the area identified in the previous 2013 Phase I/II/III ESA and 2014 Supplemental Phase II ESA;

- Ensure that non-impacted soil suitable for reuse as backfill is stockpiled at a location approved by PCA (estimated 500 m^3);

- Ensure that non-impacted and unsuitable soil is removed and disposed of at a location approved by PCA (estimated 500 m^3);

- Ensure that hydrocarbon impacted soil is excavated and transported offsite for disposal at a licensed disposal facility (estimated 1,675 m^3);

- In the event that impacted soil must be temporarily stockpiled on site pending transport, KGS Group will sample stockpiled soil and send for rush analysis of hydrocarbons in order to determine if soil must be treated as hazardous waste. KGS Group will ensure that the impacted soil is stockpiled on a polyethylene liner and covered;

- Retrieve confirmatory soil samples from the walls and floor of the final excavated area for closure purposes. Selected soil samples will be transported to a certified laboratory (Maxxam Analytics) for analysis of petroleum hydrocarbons (including benzene, toluene, ethylbenzene, xylenes (BTEX) and petroleum hydrocarbon (PHC) Fractions F1 to F4) for comparison with CCME CEQG and CWS. Upon receipt of laboratory analysis, KGS Group will notify the PSPC Project Manager whether the excavation can be backfilled or if additional excavation is necessary within the property boundaries. A minimum of 44 soil samples, including blind field duplicate samples for Quality Assurance/Quality Control (QA/QC), will be submitted for closure purposes;

- Supervise the installation of geomembrane within the completed excavation prior to backfilling;

- Supervise backfilling and site restoration activities, including replacement of the sidewalk along the west and south property boundaries, and conduct compaction tests to ensure that backfilling is completed in accordance with industry standards and project specifications. Compaction testing will be completed by trained field personnel using a Humboldt Model 5001 Nuclear Density Gauge, owned and operated by KGS Group;

- Prepare a closure report detailing the site remediation activities. KGS Group will ensure that all site diagrams are drawn to scale and reflect the actual location of the excavation, sampling locations and buried utilities located on the site. The report will provide summary data for the CCME National Classification System for Contaminated Sites

(NCSCS) classification score (as required), as well as recommendations for the decommissioning and/or future groundwater sampling program of the existing monitoring wells located on and adjacent to the subject property.

We trust that this RAP meets your requirements and approval. Should you have any questions or concerns please contact the undersigned.

Prepared By:

Bonnie Hoffensetz, M.Sc.
Senior Environmental Scientist/
Assistant Department Head

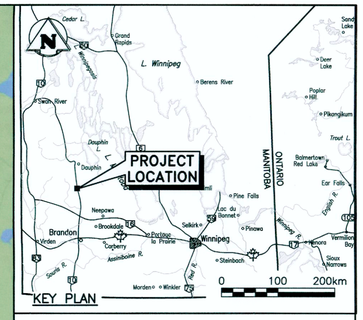
Approved By:

Jason Mann, P.Geo.
Associate Principal and Department Head,
Environmental Services

BMH/jr

SITE PLAN
SCALE: 1:5000 (11x17)

AREA MAP
SCALE: 1:100000 (11x17)



KEY PLAN

LIST OF DRAWINGS:

G01 – SITE LOCATION
G02 – PLAN AND SECTION

NOTES:

1. THESE DRAWINGS TO BE READ IN CONJUNCTION WITH THE TECHNICAL SPECIFICATIONS.
2. PARKS CANADA OFFICE LOCATED AT 135 WASAGAMING DRIVE.

NO.	YY/MM/DD	DESCRIPTION	DESIGN BY	DESIGN CHECK
0	17/11/08	ISSUED FOR TENDER	GRS	JDM

REVISIONS / ISSUE

CLIENT: Public Services and Procurement Canada — Canada

PROJECT:
REMEDIATION OF HYDROCARBON IMPACTED SOIL
122 WASAGAMING DRIVE
RIDING MOUNTAIN NATIONAL PARK

DWG. DESCRIPTION:
SITE LOCATION

APEGM
Certificate of Authorization
KGS Group
No. 245

AUTHENTICATION FOR CURRENT REVISION

ENG. STAMP: PROVINCE OF MANITOBA — G.R. SIEBERT — 9/19 — REGISTERED PROFESSIONAL ENGINEER

KGS GROUP CONSULTING ENGINEERS

DESIGN BY:	GRS	DATE (YY/MM/DD):	17/10/19
DESIGN CHECK:	JDM	DATE:	17/11/08
DRAWN BY:	KRG	DATE:	17/10/19
DWG CHECK:		DATE:	17/11/08

DWG. NO. 17-0006-007 G01 REV: 0

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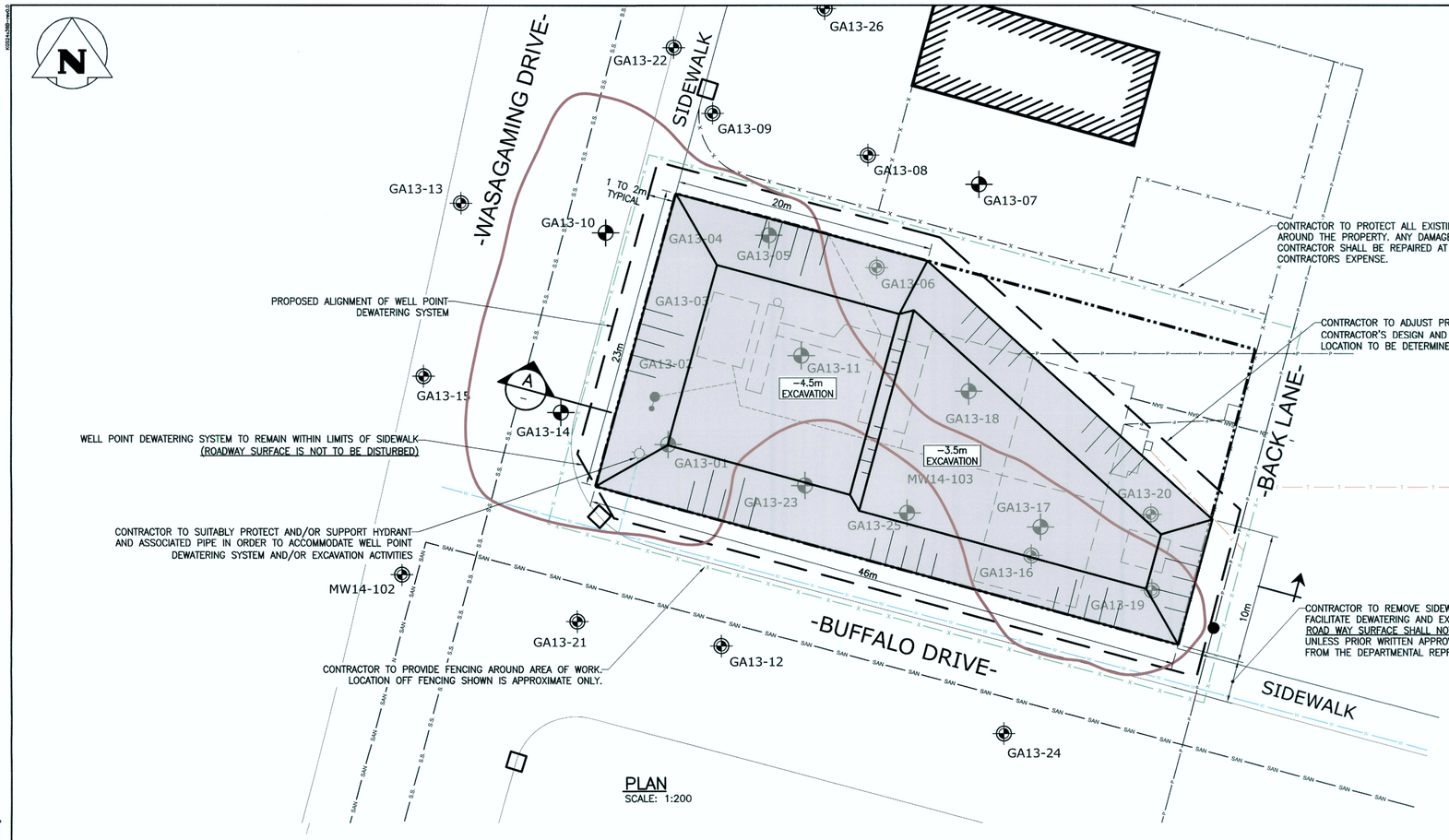

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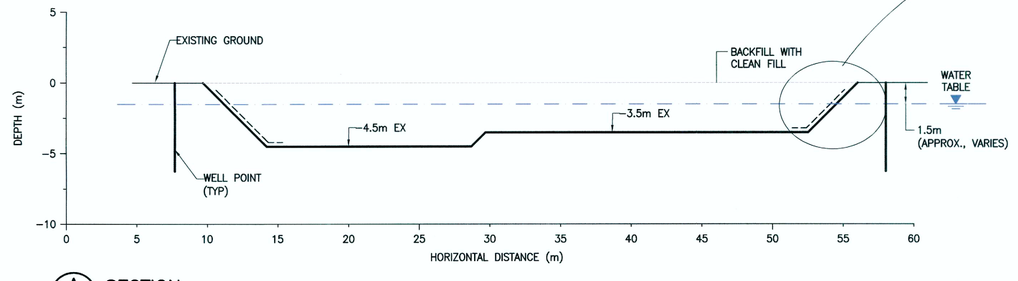

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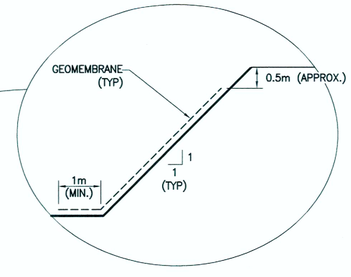

LEGEND:

- MW14-103 — MONITORING WELL LOCATION (DST)
- GA13-05 — MONITORING WELL LOCATION (GOLDER)
- GA13-05 — BOREHOLE LOCATION (GOLDER)
- SAN — SANITARY SEWER
- UNDERGROUND WATERLINE
- OVERHEAD POWERLINE
- UTILITIES MARKED BY PRIVATE LOCATOR
- FENCE
- S.S. — STORM SEWER
- PROPERTY LINE
- UNDERGROUND TELEPHONE
- AREA OF CONTAMINATED SOIL (VARIES)
- BUILDING OUTLINE
- FORMER BUILDING FOOTPRINT
- CONSTRUCTION FENCE (LOCATION APPROXIMATE)
- CATCH BASIN (LOCATION APPROXIMATE)
- HYDRO POLE (LOCATION APPROXIMATE)

NOTES:

1. CONTRACTOR TO VERIFY LOCATIONS OF BURIED SERVICES BEFORE INSTALLING OF WELL POINTS AND THE START OF EXCAVATION. CONTRACTOR TO SUBMIT DESIGN OF WELL POINT LAYOUT AND/ OR EXCAVATION THAT ADDRESSES ANY INTERFERENCES FOR REVIEW BY DEPARTMENTAL REPRESENTATION PRIOR TO IMPLEMENTATION.
2. CONTAMINATED SOIL TO BE REMOVED OFF SITE TO LICENSED FACILITY AS APPROVED BY DEPARTMENTAL REPRESENTATIVE.
3. FINAL LIMITS, GEOMETRY AND DEPTH OF EXCAVATION SHALL VARY BASED ON CONTRACTOR WELL POINT DEWATERING SYSTEM DESIGN AND PLAN FOR MAINTAINING A STABLE EXCAVATION. DEPARTMENTAL REPRESENTATIVE SHALL FIELD SCREEN SOIL HYDROCARBON VAPORS THROUGHOUT EXCAVATION ACTIVITIES UNTIL COMPLETION OF EXCAVATION.

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SCALE: 1:200

NO.	YY/MM/DD	DESCRIPTION	DESIGN BY	DESIGN CHECK
0	17/11/08	ISSUED FOR TENDER	GRS	JDM

REVISIONS / ISSUE

CLIENT: Public Services and Procurement Canada — Canada

PROJECT:
REMEDIATION OF HYDROCARBON IMPACTED SOIL
122 WASAGAMING DRIVE
RIDING MOUNTAIN NATIONAL PARK

DWG. DESCRIPTION:
PLAN AND SECTION

APEGM Certificate of Authorization KGS Group No. 245

AUTHENTICATION FOR CURRENT REVISION
ENG. STAMP: PROVINCE OF MANITOBA G.R. SIEBERT REGISTERED PROFESSIONAL ENGINEER

KGS GROUP CONSULTING ENGINEERS

DESIGN BY:	GRS	DATE (YY/MM/DD):	17/10/20
DESIGN CHECK:	JDM	DATE:	17/11/08
DRAWN BY:	PwD	DATE:	17/10/20
DWG CHECK:		DATE:	17/11/08

DWG. NO. 17-0006-007 G02 REV: 0

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FINAL REPORT
Supplemental Phase II ESA
122 Wasagaming Drive
Riding Mountain National Park
Wasagaming, Manitoba

August 8, 2014

DST File No.: OE-WG-017795

Prepared for:

Public Works and Government Services Canada
Environmental Services, Western Region

Prepared by:

DST Consulting Engineers Inc.
885 Regent Street, Suite 3-1B, Sudbury, Ontario, P3E 5P5
Tel: (705) 523-6680 Fax: (705) 523-6690 Email: sudbury@dstgroup.com

Distribution:

PWGSC	– One Electronic Copy, Two Hard Copies
DST Consulting Engineers Inc.	– One Electronic Copy

EXECUTIVE SUMMARY

DST Consulting Engineers Inc. (DST) was engaged by the Department of Public Works and Government Services Canada (PWGSC) to complete environmental site assessment work at the Commercial Property at 122 Wasagaming Drive, in Wasagaming, within Riding Mountain National Park in Manitoba (the Site).

Contaminated soil and groundwater had been previously identified at the Site, along with a need for further delineation and the preparation of a remedial action plan (Golder 2013).

DST further delineated the contamination through the advancement of three additional boreholes completed as monitoring wells, and the analysis of soil and groundwater samples for contaminants of concern. DST also completed an additional round of groundwater monitoring and sampling at all accessible wells.

Current and previous (Golder 2013) soil analytical results indicate the presence of soil contamination including ethylbenzene, xylenes, hexane, and petroleum hydrocarbon fractions F1-3 extending over much of the Site and onto Wasagaming Drive. Current groundwater analytical results also indicate hydrocarbon contamination extending over much of the Site and onto Wasagaming Drive, west of the Site.

Following the analysis of all results, DST performed a remedial options analysis. Several relevant remedial options were investigated, including excavation and off-site disposal, in situ chemical remediation, in situ biological remediation, risk assessment and natural attenuation with monitoring. The recommended remedial option is to complete a risk assessment combined with monitored natural attenuation. It is anticipated that a risk assessment will determine that a Risk Management Plan and/or Remedial Action Plan will be required to deal with the hydrocarbon contamination at the Site.

DST completed the NCSCS scoring for the Site. The NCSCS score for the site was calculated as 58.9, resulting in a ranking of category Class 2 – Medium Priority for Action.

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LIST OF ATTACHMENTS

1 INTRODUCTION

DST Consulting Engineers Inc. (DST) was retained by the Department of Public Works and Government Services Canada (PWGSC) to carry out a Supplemental Phase II Environmental Site Assessment (ESA) at Block 24 Lot 1 8604/R, the commercial property located at 122 Wasagaming Drive, Wasagaming, Manitoba (the 'Site'). The Site is located within Riding mountain National Park. The Site location is shown in Figure 1.

1.1 Objectives

The objectives of the investigation were to:

- Reduce data gaps through further delineation of soil and groundwater contamination identified on and down gradient of the Site by Golder Associates Ltd. (Golder) in their 2013 Phase II ESA for the Site;
- Conduct groundwater sampling to further establish groundwater conditions; and,
- To provide a remedial options assessment.

2 BACKGROUND INFORMATION

2.1 Site Description

The Site is located on the Northeast corner of the Wasagaming Drive and Buffalo Drive intersection, approximately 300 m south of Clear Lake. Topography at the site is relatively flat, with drainage provided by storm sewers located along the curbs of the adjacent streets.

The Site is approximately 910 m^2, and is currently vacant. However, it formerly hosted a residence, garage and fuel dispensing service station. Underground fuel storage tanks (USTs) formerly located at the Site were removed in March 2014. The locations of the former USTs and buildings are shown in Figure 2.

2.2 Regional Geology

The regional geology at the Site is characterized by glaciofluvial deposits of gravel sand and silt varying between 40 and 60 m in thickness, and overlying hard grey salicious shale of the Riding Mountain Formation, Millwood Member (Golder 2013).

2.3 Past Investigations

A Phase I/II ESA was completed in 2009 by Clear Sky Environmental Services Inc. (Clear Sky) and again in 2013 by Golder. DST was provided the 2013 Golder report, which, in turn, provided a summary of the Clear Sky report. According to Golder (2013), Clear Sky identified that the subsoil in the area of the pump island and former and current USTs and groundwater at the Site had potential petroleum hydrocarbon (PHC) impacts. Clear Sky advanced eight boreholes and selected soil samples were analyzed for PHC Fractions F1-F4 and benzene, ethylbenzene, toluene and xylenes (BTEX), and compared with applicable Canadian Council of Ministers of the Environment (CCME) federal criteria. The Clear Sky report identified the following impacts:

- An area of 621 m^2 of soil, including 110 m^2 under the existing Site building, had been impacted by PHCs;
- The maximum vertical extent of the soil impacts was given as 4.5 m (below grade surface); and,
- The total volume of impacted soil was calculated to be 1865 m^3.

According to Golder (2013) the Clear Sky Report included the following limitations:

- The inability to assess off-site conditions;
- The inability to assess conditions under the buildings; and
- No hazardous building materials were sampled.

The Clear Sky sampling locations were not shown in the Golder report.

Subsequently, Golder completed a Phase I/II ESA in 2012-2013 to address the identified limitations and data gaps. The Phase I ESA completed by Golder indicated the following

potentially contaminating activities (PCAs) related to potential soil, groundwater, and/or surface water contamination:

- The then current (now removed) and former USTs on the west side of the Site;
- Current and former waste oil storage locations on the east side of the Site; and,
- The southeast garage bay containing a sump and hydraulic hoist.

Barrels containing soil, possibly soil cuttings from the Clear Sky Phase II investigation, were also observed on the Site during Golder's Phase I Investigation.

The Phase II ESA completed by Golder included the advancement of 27 boreholes and the installation of 16 monitoring wells. Soil samples collected from the area of the USTs and pump island exhibited PHC F1 and F2 concentrations that exceeded the applicable federal criteria.

Also, the PHC F2 and F3 concentrations exceeded the applicable federal criteria in an area located under the southeast portion of the building, and the applicable standard for PHC F1 was exceeded in the area of a waste oil UST east of the building in the southeast corner of the Site. Metals exceedances were also noted in the Golder (2013) report. Figure 3 illustrates the locations and soil contaminant concentrations where they exceeded the applicable federal criteria.

In addition, groundwater in the area of the pump island and USTs was found to exhibit PHCs and BTEX in excess of applicable federal criteria.

In summary, the Golder (2013) Phase I/II ESA identified the following areas of confirmed impacts:

- An area of PHC impacted soil in the southeast portion of the site, primarily under the former location of the southeast garage bay;
- An area of PHC impacted soil in the western portion of the Site, in the area of the former and present USTs and pump island;
- Two borehole locations (GA13-02 and GA13-19) within the above areas (one in each area) that were impacted by selenium;
- There were multiple onsite and offsite locations where multiple dissolved metals (including aluminum, arsenic, barium, cadmium, copper, iron, lead, selenium, and zinc) concentrations exceeded the federal guidelines for the protection of aquatic life pathway only; and,
- An area of groundwater impacted by PHCs in the western portion of the site, in the area of the former and present USTs, and extending off-site to the west and northeast along Wasagaming Drive.

Golder (2013) recommended that in-situ chemical oxidation (ISCO) be used to remediate the site in conjunction with removal and off-site disposal of the existing USTs.

The following data gaps were listed in Golder's (2013) report:

- Confirm the depth of existing gasoline and waste oil USTs;

- Confirm the extent and volume of contaminated soil in the two identified areas of soil contamination;
    - Southeast areas of impact beneath the (former) building and to the southeast of GA13-19 could not be fully defined;
    - Western area impacts south and west of GA13-14 could not be clearly defined due to the presence of buried utilities;
- Confirm future land use for the Site and determine the fate of the on-site building (now known to be demolished);
- Complete an additional round of groundwater monitoring and sampling to confirm the absence of Light non-aqueous phase Liquid (LNAPL) within monitoring wells, confirm groundwater flow direction, to assess groundwater quality after conditions have stabilized following drilling, and to collect monitored natural attenuation parameters;
- Assess potential vapour impact to on-site buildings (no longer a concern as the building has been demolished); and,
- Develop a remedial action plan (RAP) for the remediation/risk management of hydrocarbon contaminated soil and groundwater, consistent with relevant regulations, guidelines and codes of practice.

Clear Sky Environmental Services (Clear Sky 2014) observed the removal of one 2300 L waste oil UST and two 13,600 L gasoline USTs from Site on March 17, 2014, and performed excavation limit and backfill soil sampling. The tanks were intact with no evidence of leaks, but impacted soil was identified on the Site as follows:

- The excavated soil, also used to backfill in the tank nest was impacted, with concentrations of PHC F1, PHC F2 and BTEX exceeding the applicable federal criteria;
- Soil samples collected from the tank nest excavation floor at a depth of 3.7 m and from the tank nest west wall at a depth of 1.8 m also exhibited PHC F1, PHC F2 and BTEX concentrations in excess of the federal guidelines;
- A soil sample collected from the north wall of the tank nest excavation at a depth of 2.4 m exhibited concentrations of PHC F1, benzene and ethylbenzene in excess of the federal guidelines; and,
- A soil sample collected from the soil under the pump island and piping (depth not available) exhibited concentrations of PHC F1, PHC F2 and BTEX above the federal guidelines.
- Soil samples from the waste oil tank excavation floor and north wall, both at a depth of 1.5 m exhibited concentrations within the federal guidelines.

3 SCOPE OF WORK

The scope of work was defined in the DST proposal dated February 3, 2014 (DST, 2014) and accepted by PWGSC. Two site visits were conducted by DST to complete the following scope of work. The first site visit was completed March 6, 2014 to advance three boreholes, collect soil samples and install a monitoring well in each borehole. The second Site visit took place between June 10 and June 19, 2014 to monitor groundwater conditions and collect groundwater samples. The following scope of work was proposed:

- Mobilize and demobilize the required personnel and equipment;
- Conduct underground utility locates;
- Develop and implement a Health and Safety Plan that met provincial and federal regulations;
- The collection of floor and sidewall samples (and soil pile samples if required) in conjunction with the removal of three USTs from two locations at the site;
- The advancement of three offsite boreholes (northwest and southwest of USTs and one southeast of waste oil tank) and one onsite borehole (in the vicinity of GA-13 and GA-17);
- The installation of groundwater monitoring wells in three of the boreholes (northwest and southwest of USTs and in the vicinity of GA-13 and GA-17);
- The collection of soil samples (two soil samples from each of the boreholes and one field duplicate sample) for analysis of PHC fractions 1 through 4 (F1-F4) and benzene, toluene, ethylbenzene and xylenes (BTEX);
- Laboratory analysis of one worst case soil sample for volatile organic compounds (VOCs);
- Level surveying of the newly installed wells;
- The collection of groundwater samples and field data from all existing wells (estimated to be 19) for PHC F1 to F4 and BTEX;
- The collection of groundwater samples and field data from five wells for PHC F1 to F4 and VOCs;
- Groundwater monitoring at all accessible monitoring wells to confirm the absence of Light non-aqueous phase Liquid (LNAPL) within monitoring wells, groundwater flow direction, and to collect monitored natural attenuation parameters;
- The collection and submission of quality control/ quality assurance groundwater samples;
- Preparation of a report including the comparison of soil and groundwater analytical data to applicable federal criteria, National Classification System for Contaminated Sites (NCSCS) scoring, remedial options analyses, and, recommendations.

3.1 Deviations From the Original Scope of Work

DST did not complete the sampling of the final limits of the UST removal excavation(s). It was indicated to DST that this work would be completed by others.

It was not possible to install a borehole southeast of the property due to buried utilities clearance issues. In addition, the Client requested that three wells which had heaved due to frost (GA13-21, GA13-12, and GA13-24) be repaired and re-surveyed.

Monitoring well GA13-20 could not be found during the groundwater sampling event. It is likely that this well was destroyed during UST removal activities in this area.

4 ASSESSMENT CRITERIA

Federal guidelines apply to the Site, given its location within Riding Mountain National Park, Wasagaming, Manitoba. Accordingly, CCME and Federal Contaminated Sites Action Plan (FCSAP) Guidelines were applied.

Manitoba has adopted the CCME Canadian Environmental Quality Guidelines (with an incremental risk level of 10^6 where CCME lists both 10^6 and 10^5 risk levels) as their provincial guidelines.

4.1 Exposure Pathway Exclusion

For the purpose of selecting guidelines and standards for this investigation, the marine aquatic life exposure pathway was excluded.

In addition, the potable groundwater and aquatic life pathways were excluded based on the following information detailed in Golder (2013):

- Domestic wells are not used for potable well purposes within the town site of Wasagaming;
- There is a regulation prohibiting the installation of new drinking water wells within the town site of Wasagaming;
- A municipal water supply is available within Wasagaming;
- The groundwater travel time from the Site to the nearest down-gradient water body (Clear Lake) is estimated to be greater than 1000 years;
- PHC plumes in similar surface conditions tend to be mitigated within the order of 50 to 58 m, and Clear Lake is approximately 300 m distant;
- Natural attenuation appears to be present on the site based on elevated dissolved iron and manganese concentrations onsite (indicating anaerobic biodegradation); and,
- Metal concentrations in groundwater are expected to diminish as groundwater conditions return to aerobic.

4.2 Soil

The following sources were used to provide soil criteria for parameters analysed as part of this investigation.

4.2.1 Volatile Organic Compounds, Inorganics and pH

The former and potential future use of the site is combined residential and commercial, and the Site is within a Riding Mountain National Park. Grain size analysis confirm that soil at the Site is coarse grained. Accordingly, the CCME Canadian Environmental Quality Guidelines, Soil Quality Guidelines for the Protection of Human and Environmental Health for Residential/Parkland land use and coarse soil were applied to the Site. A risk level of 10^6, in accordance with Manitoba criteria, was chosen for consistency with previous reports.

The CCME guidelines for VOCs and inorganic compounds and pH were obtained from the CCME Summary Table, *Soil Quality Guidelines for the Protection of Human and Environmental Health*, Residential Parkland, Coarse Soil, available from the CCME web page (CCME 2014).

4.2.2 Petroleum Hydrocarbons

The petroleum hydrocarbon fractions 1 through 4 (PHC F1 – 4) guidelines were derived from the 2008 Canadian Council of Ministers of the Environment document, Canada Wide Standards for Petroleum Hydrocarbons in Soil, Technical supplement (CCME 2008) Table 3 Tier 1 levels (mg/kg soil) for PHCs for coarse-grained surface soils, and Table 5 - Tier 1 levels (mg/kg soil) for PHCs for coarse-grained subsoils (both tables had the same values for the critical pathway). The lowest number of all the pathways indicated on the tables, with the exception of the protection of potable groundwater and the protection of groundwater for aquatic life, were used.

4.3 Groundwater

The Federal guidelines applied to the Site for Groundwater were derived from Environment Canada (2012) *Guidance Document on Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites* (FIGQG), Table 2, Tier 1 the lowest of values for all pathways listed, employing a factor for the freshwater life pathway.

The 2010 version of FIGQG was used in the previous report (Golder 2013). The 2012 edition of the FIGQG, revised the "Protection of freshwater/marine life" section under "Pathways Elimination" to provide clarification and guidance on when to eliminate this pathway.

According to the updated FIGQG, distance-factored freshwater life pathway criteria be used for chloride, fluoride and chlorinated solvents. Fluoride and chloride were not among the contaminants of concern for the Site, and the plume is a hydrocarbon plume, not a chlorinated solvent plume. Accordingly the freshwater life pathway was eliminated for the Site. The criteria and pathways used were consistent with previous reports.

The protection of potable groundwater pathway was also excluded, for the reasons explained above. Therefore, drinking water criteria were not applied to this investigation.

5 METHODOLOGY

All work was conducted in accordance with industry and DST standard operating procedures. It is understood that the Site is within federal jurisdiction and that the CCME environmental quality criteria, methods and procedures apply. It is also noted that Manitoba provincial standards rely on federal standards and guidelines. Hence federal methods and procedures, consistent with the federal criteria, were used in the completion of the scope of work for this project.

5.1 Ground Disturbance and Utility Locates

Prior to completing the drilling activities, all relevant service providers were contacted and utility locates were requested to identify all public and private underground utilities. All locates were arranged by a utility clearance sub-contractor (Structure Scan Inc.). The Site was also inspected and site conditions reviewed with the subcontractors, including the locations of potential underground private utility lines.

5.2 Field Screening and Soil Sampling Methodology

All soil samples collected were field screened and logged with respect to colour, texture, moisture, and visible/olfactory evidence of petroleum contamination. A portion of each of the soil samples was placed in plastic bags and allowed to equilibrate for approximately 15 minutes in a warm environment (i.e. the interior of the field vehicle) prior to being tested for combustible headspace vapour concentrations (CHVCs). Combustible headspace vapour concentrations were measured using an RKI Eagle portable vapour meter, with methane response switched off. The equipment was calibrated prior to its use in the field in accordance with the manufacturers specifications.

A portion of selected soil samples was placed directly into laboratory-supplied sample jars. The sample jars were filled completely with the soil sample to reduce the amount of headspace vapour within the jars. Cross-contamination between samples was prevented by washing sampling tools with phosphate-free detergent and water and then rinsing with distilled water, using disposable sampling equipment, and by wearing new disposable nitrile gloves during sampling activities. Once collected, selected soil samples were placed in a cooler packed with ice, under chain of custody documentation, until delivery to Maxxam Analytics (Maxxam) within the applicable sample hold times.

5.3 Monitoring Well Installation and Development

Each groundwater monitoring well was constructed of 5.1 cm polyvinyl chloride (PVC) well materials consisting of a 0.254 mm (0.01 inch) machine slotted section installed to intersect the water table and a solid riser extending to grade. An appropriate sand pack backfilled the screened portion of the well and a bentonite seal was employed in the well annulus around the riser portion to prevent surface contamination. A steel flush-mount cover was installed at each well location.

Monitoring wells were developed by purging up to five well casing volumes of groundwater from them (or until dry several times); generally within 24 hours of their installation. Purged water was set aside in sealed containers for subsequent disposal, depending on the results of groundwater chemical analysis.

DST completed a level survey of the newly installed monitoring wells at the Site (as well as repaired wells), using a local benchmark, the top of the fire hydrant located at the Site.

5.4 Groundwater Monitoring and Sampling

Groundwater levels and phase-separated hydrocarbon thicknesses (if applicable) were measured using a Heron Instruments ™ oil/water interface probe.

Field parameters including temperature, electric conductivity (EC), dissolved oxygen (DO), oxidation/reduction potential (ORP), and pH were measured as described below. The final stabilized values are reported herein. Nitrate and nitrite concentrations were determined in the field using HACH Aquachek nitrate/nitrite colourimetric test strips.

Using dedicated water sampling equipment, and a peristaltic pump, each well was purged of groundwater prior to sampling. Purging and sampling were conducted using low stress purging procedures described in the document “Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells” (US EPA 2010). In accordance with US EPA 2010, the pumping rate was adjusted so as to provide a drawdown not exceeding 10 cm. A YSI 556 MPS equipped with a flow through cell and programed to measure indicator field parameters (i.e. temperature, EC, DO, and pH) at intervals corresponding to the time taken to refill the flow-through cell (the cell turn-over time) was used to measure field parameters. When three consecutive field parameter readings indicated they were within specified limits (0.1 for pH, 10% for DO, and 3% for temperature) of each other, groundwater samples, except for volatile samples, were collected using the peristaltic pump and dedicated tubing. Volatile samples were collected last, using the dedicated tubing and a Wattera foot valve.

To reiterate, the foot valve was used to develop the wells and to collect volatile samples (e.g. PHC F1 and VOCs); the peristaltic pump was used to purge the wells prior to sampling and to collect all non-volatile samples. Groundwater samples were transferred directly into laboratory-supplied containers minimizing contact with the atmosphere and other surfaces. Headspace was eliminated from the sample bottles where appropriate.

Clean, new nitrile gloves were worn during the sampling process and discarded between samples. The samples were placed in a cooler packed with ice under chain of custody documentation, until delivery to Maxxam within applicable hold times.

5.5 Residue Management

Soil cuttings were stored on the Site pending analytical results, and then disposed of appropriately by a waste subcontractor, Tervita Corporation (Tervita).

Purged water was set aside in sealed containers until analytical results indicating proper disposal were available, and then disposed of appropriately by Tervita.

6 RESULTS

The results of the investigation are summarized in the following subsections.

6.1 Soil Analytical Results

Soil analytical results are summarized in Table 1 and sampling locations are illustrated on Figure 3.

Both samples from MW14-103 (MW14-103 @ 2.3 to 3.0 m and MW14-103 @ 3.6 to 4.0 m) within the former building footprint, near the former hydraulic hoist area exhibited concentrations of PHC F1 that exceeded the CCME guideline for residential/parkland land use. Both of these samples also exhibited ethylbenzene concentrations that were greater than the CCME guidelines for residential land use. As a worst-case sample, MW14-103@2.3 to 3.0 m was also analysed for a full VOC suite and exceeded the CCME guideline for n-Hexane for residential/parkland land use. All other samples exhibited concentrations that were within CCME guidelines for residential/parkland. Exceedances are tabled below and shown in Figure 3, along with historical exceedances (Golder 2013), and data from the Clear Sky (2014) UST removal report.

2014 and 2013 Soil Exceedances

Sample Location	Depth (m)	Parameter	Concentration (µg/g)	CCME Guideline (µg/g)
MW14-103	2.4-3.0	Ethylbenzene	0.77	0.082
		Hexane (n)	1.9	0.49
		PHC F1	250	30
MW14-103	3.6-4.2	Ethylbenzene	0.34	0.082
		PHC F1	48	30
GA13-01	2.3-2.7	Benzene	0.0332	0.0095
		PHC F1	46	30
GA13-01	4.4-4.6	Benzene	0.0125	0.0095
GA13-02	3.0-3.5	Benzene	0.0386	0.0095
		PHC F1	103	30
GA13-02	3.8-4.3	Benzene	0.0122	0.0095
		Selenium	2.74	1
GA13-03	2.3-2.7	Xylenes	59.4	11
		PHC F1	700	30
		PHC F2	257	150
GA13-04	2.3-2.7	Benzene	0.141 (1)	0.0095
		PHC F1	106 (1)	30
GA13-05	2.3-2.7	Benzene	0.0115	0.0095
		PHC F1	107	30
GA13-10	2.3-2.7	Benzene	0.0885	0.0095
		Xylenes	15.4	11
		PHC F1	196	30
GA13-11	1.5-2.0	PHC F1	60	30
GA13-14	2.3-2.7	Benzene	0.828	0.0095
		Xylenes	76.9 (1)	11
		PHC F1	1200 (1)	30
		PHC F2	377	150
GA13-16	1.5-2.3	PHC F1	334	30
		PHC F2	731	150

Sample Location	Depth (m)	Parameter	Concentration (µg/g)	CCME Guideline (µg/g)
		PHC F3	563	300
GA13-17	1.5-2.3	PHC F3	2200 (1)	300
GA13-19	3.0-3.5	PHC F1	39	30
		Selenium	1.51	1
Gasoline UST Nest Excavation (backfill)	0 – 3.7 m	PHC F1	1150	30
		PHC F2	569	150
		Benzene	0.568	0.0095
		Ethylbenzene	10.7	0.082
		Toluene	0.959	0.37
		Xylenes	50.6	11
Gasoline UST Nest Excavation (floor)	3.7 m	PHC F1	1370	30
		PHC F2	626	150
		Benzene	0.217	0.0095
		Ethylbenzene	14.2	0.082
		Toluene	4.55	0.37
		Xylenes	62.2	11
Gasoline UST Nest Excavation (west wall)	1.8 m	PHC F1	2210	30
		PHC F2	599	150
		Benzene	0.307	0.0095
		Ethylbenzene	21.7	0.082
		Toluene	6.13	0.37
		Xylenes	88.6	11
Gasoline UST Nest Excavation (north wall)	2.4 m	PHC F1	175	30
		Benzene	0.0947	0.0095
		Ethylbenzene	0.813	0.082

Note: 1) The duplicate concentration was higher than the sample concentration; duplicate sample concentration is reported in table.

6.2 Groundwater Field Data

Groundwater field data are summarized in Table 2.

The groundwater monitoring data indicates that no phase-separated hydrocarbons were observed at any of the monitoring wells accessed in June 2014. Groundwater elevations were consistently higher in June 2014 than they were in January 2013.

Electric conductivity values ranged from 366 µS/cm to 689 µS/cm at GA13-04 in June 2014. The recorded EC value at GA13-02 in June 2014 appears to be anomalous. These values are consist with those reported by Golder (2013).

Groundwater pH readings ranged from 6.71 at GA13-04 to 9.39 at GA13-12 and DO concentrations ranged from 1.66 mg/L at GA13-03 to 9.39 at GA13-19 in June 2014. The recorded DO value at GA13-04 appears to be anomalous.

Nitrate and nitrite concentrations (measured using colourimetric field test strips) ranged from 0 ppm (at 10 of the wells) to 40 ppm at GA13-02 and from 0 ppm (at 16 of the wells) to 3 ppm at GA13-03 respectively.

Oxidation/ reduction potential values ranged from 12.1 mV at GA13-03 to 52.4 mV at GA13-21. This indicates that the shallow groundwater regime in the vicinity of the is generally in an oxidizing state.

6.3 Groundwater Flow Characteristics

Groundwater elevations are shown in Table 3 along with other field parameters, and groundwater elevation contours are presented in Figure 5. The hydraulic gradient was calculated to be 0.022 with a groundwater flow direction towards the north-northwest, using groundwater elevations measured in wells GA13-04 and GA13-27, which are aligned in the direction of groundwater flow.

There appears to be a groundwater mounding effect occurring at the Site. This is common where tank nests or former tank nests are present. This mounding effect appears to have a southwestern component to it as demonstrated in Figure 5 and the soil concentrations observed at GA13-14 (Golder 2013). Also, a preferential pathway following underground utilities along Wasagaming drive may have an affect contaminant migration.

6.4 Groundwater Analytical Results

Groundwater analytical results are summarized in Table 3 and sampling locations are illustrated on Figure 4.

The groundwater exceedances are tabled below and shown in Figure 4. It is noted that in 2014, all samples were analysed for PHC F1 to F4 and BTEX, but only five samples (and one duplicate) were analysed for the full VOC suite (MW14-103, GA13-02, GA13-03, GA13-03, GA13-04 and GA13-06). Samples were not analysed for dissolved metals in 2014.

2014 Groundwater Hydrocarbon Exceedances

Sample ID	Parameter	Concentration (µg/L)	FIGQG (µg/L)
MW14-103	PHC F1	1400	810
GA13-03	PHC F1	6300	810
	PHC F2	1900	1500
GA13-04	Benzene	570	140
	Methyl-t-Butyl Ether	370	340
	PHC F1	3500	810
GA13-22	Benzene	440	140

Historical groundwater hydrocarbon exceedances (Golder 2013) are presented below.

2013 Groundwater Hydrocarbon Exceedances (data from Golder 2013)

Sample ID	Parameter	Concentration (µg/L)	FIGQG (µg/L)
GA13-02	Benzene	1250	140
	Xylenes	5650	3900
	PHC F1	12100	810
	PHC F2	2560	1500
GA13-03	Xylenes	14600	3900

Sample ID	Parameter	Concentration (µg/L)	FIGQG (µg/L)
	PHC F1	46700	810
	PHC F2	7220	1500
GA13-04	Benzene	1230	140
	PHC F1	10100	810
	PHC F2	3990	1500
GA13-22	Benzene	660	140

6.5 Quality Assurance/ Quality Control (QA/QC)

Duplicate soil and groundwater samples were collected from the Site:

- Soil sample MW14-105 @ 1.8 to 2.4 m was a field duplicate of MW14-101 at 1.8 @ 2.4 m; and,
- Groundwater samples GA13-103 and GA13-124 were field duplicates of samples GA13-03 and GA13-24.

Relative percent differences (RPDs) were not calculable for the soil samples because all analytical results were less than the laboratory reported detection limits for all of these samples and duplicate samples. Relative percent differences were calculable for some of the groundwater parameters for sample GA13-03 and its duplicate. All calculable RPDs were within alert limits. Tables 4 and 5 present the soil and groundwater RPDs respectively.

Laboratory spikes and blanks were within alert limits. The laboratory certificates of analysis are attached in Appendix B.

6.6 National Classification System for Contaminated Sites (NCSCS)

The CCME NCSCS is a method for evaluating contaminated sites according to their current or potential for adverse effects on human and ecological health. The system is used to compare contaminated sites across Canada in order to prioritized investigation and remediation.

An updated NCSCS score of 58.9 was calculated for the site, resulting in a ranking of category Class 2 – Medium Priority for Action. The NCSCS score sheet is provided in Appendix C.

6.7 Discussion of Results

Soil and groundwater analytical results, including results from the current investigation and historical data, are discussed in the following subsections.

6.7.1 Soil Contamination

Contaminated soil was identified by Golder (2013) in two areas of the Site. Soil with concentrations of PHC F1, F2 and F3 and selenium in excess of CCME Guidelines was identified on the southeast portion of the Site (GA13-16, GA13-17 and GA13-19), and soil in excess of BTEX and PHC F1and F2 guidelines were identified on the western portion of the Site (GA13-01, GA13-02, GA13-03, GA13-04, GA13-05, GA13-10, GA13-11 and GA13-14) extending northwest

onto Wasagaming Drive. The selenium exceedances noted above are within the area of PHC impacted soil.

DST further delineated the area of contaminated soil, finding no contamination at MW14-101 and MW14-102 located along the western side of Wasagaming Drive, and finding soil with concentrations of ethylbenzene, hexane (n), and PHC F1 in excess of CCME Guidelines at MW14-103. MW14-103 was located west of the previously identified area of soil contamination on the southeastern portion of the property and east of the previously identified area of contamination located on the western portion of the property. Considering the groundwater flow direction and the location of MW14-103 in relation to the two areas identified by Golder (2013), it is prudent to assume that the two areas are connected. The estimated area (980 m^2) of contaminated soil and the soil exceedances, including both 2013 and 2014 data, is shown in Figure 3. This area was estimated by using the "halfway approach", wherein soil is considered contaminated up to a point located half way between a sample that exhibits concentrations exceeding the guideline and a sample that exhibits concentrations that meet guideline. Given the range of sample depths for which exceedances were identified, an average depth of 3.5 m is reasonable. Therefore, the volume of contaminated soil is estimated at approximately 3500 m^3.

Soil samples collected during the removal of the two gasoline USTs and one waste oil UST on March 17, 2014 identified contaminated soil in the vicinity of the UST nest, in the excavated material used to backfill the tank removal excavation and at the north wall, west wall and floor of the excavation (Clear Sky 2014). The soil hydrocarbon concentrations identified in the former UST locations may be considered representative of "worst-case" for the Site.

6.7.2 Groundwater Contamination

Golder (2013) identified groundwater with concentrations of PHC F1 and F2, benzene, toluene and xylenes in excess of the FIGQG. The area of hydrocarbon contamination was located on the western portion of the property, extending under Wasagaming Drive (GA13-02, GA13-03, GA13-04 and GA13-22). Golder (2013) also identified selenium and other metals in groundwater with concentrations exceeding FIGQG for the freshwater life pathway, Health Canada Drinking Water guidelines and the CCME guidelines for the protection of freshwater life. When the freshwater life aquatic pathways are eliminated and Drinking Water Guidelines are not considered (see Section 4), the observed metal concentrations do not exceed the guidelines.

DST updated and refined the delineation of the hydrocarbon contamination, finding no contamination greater than the FIGQG in MW14-101 and MW14-102, but identifying groundwater with concentrations of PHC F1 in excess of FIGQG in MW14-103. In addition, DST also identified hydrocarbon concentrations in excess of FIGQG in GA13-03, GA13-04 and GA13-22. The obvious difference between the Golder (2013) data and the 2014 data is the hydrocarbon concentrations identified at GA13-02. The reason for this significant change in concentrations between January 2013 and June 2014 is unknown. Additional sampling of this well should be conducted prior to any targeted groundwater remediation at this location.

The area of confirmed groundwater contamination (840 m^2) is shown in Figure 4, along with the 2014 exceedances of the FIGQG. This area was determined using the "halfway approach" in some areas and knowledge of past groundwater and soil data in other areas as applicable.

Note that groundwater PHC (and other organic) concentrations often fluctuate with time. The phenomenon known as rebound, occurs as residual contamination is repeatedly removed from soil pore capillary spaces through the action of seasonal groundwater fluctuation though the soil. This phenomenon is particularly evident with light non aqueous phase liquid contamination in the saturated zone near the water table where the soil is subjected to hysteresis of repeated saturation. For this reason, three consecutive "clean" results are typically required before groundwater at a monitoring well is considered remediated.

Table 6 shows the data from wells in and down gradient of the hydrocarbon contamination plume for which data from 2013 and 2014 were available. The data show a significant decrease in hydrocarbon concentrations for all wells sampled. Although part of the decrease in hydrocarbon concentrations may be attributable to sampling methodology, the results do support Golder's assertion (Golder 2013) that natural attenuation processes appear to be active onsite.

There is no groundwater quality data in the immediate vicinity of the former USTs which would be representative of "worst case" conditions at the Site.

6.7.3 Natural Attenuation

Dissolved oxygen concentrations and ORP values at the monitoring wells indicated that aerobic processes are active in most areas around the Site. The lowest observed DO concentration and ORP value was observed at GA13-03, the nearest downgradient well from the source area (i.e. the former USTs and the pump islands) and the most impacted monitoring well. This suggests that anaerobic conditions may exist in the source areas, though they quickly move to aerobic as the contaminants migrate downgradient. This is indicative of favourable natural attenuation processes at the Site.

7 REMEDIAL OPTIONS ANALYSIS-REMOVED FROM REPORT

8 CONCLUSIONS AND RECOMMENDATIONS

Soil at the Site includes soil with concentrations of selenium, PHC F1-F3 and BTEX parameters in excess of CCME guidelines. The area of impacted soil, both onsite and offsite, is estimated at approximately 980 m^2, and the volume of contaminated soil is estimated at 3500 m^3.

Groundwater at the Site includes groundwater with concentrations of PHC F1, PHC F2, benzene and methyl-t-butyl ether in excess of the FIGQGs. The area of impacted groundwater, both onsite and offsite, is estimated at approximately 660 m^2.

The NCSCS score was updated for the Site. The updated score was 58.9 – Class 2 – Medium priority for action.

DST recommends that a PQRA be completed for the Site. The PQRA will determine if additional assessment, remediation or risk mitigation work is required for the Site. Identified risks to human health and ecological receptors would be addressed in RMP or limited RAP, or both. It is anticipated that the RMP developed would include ongoing groundwater monitoring.

9 REFERENCES

Canadian Council of Ministers of the Environment, 2014. Canadian Environmental Quality Guidelines Summary Table. Available from http://st-ts.ccme.ca/?chems=all (Accessed June 19 2014).

Canadian Council of Ministers of the Environment, 2008. Canada Wide Standards for Petroleum Hydrocarbons in Soil, Technical supplement.

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Environment Canada, 2012. Guidance Document on Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites. Update of the May 2010 version.

Golder Associates Ltd., 2013. Phase I/II/III Environmental Site Assessment, Former Gasoline Service Station,122 Wasagaming Drive, Wasagaming Manitoba.

United States Environmental Protection Agency. 2010. “Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells”.

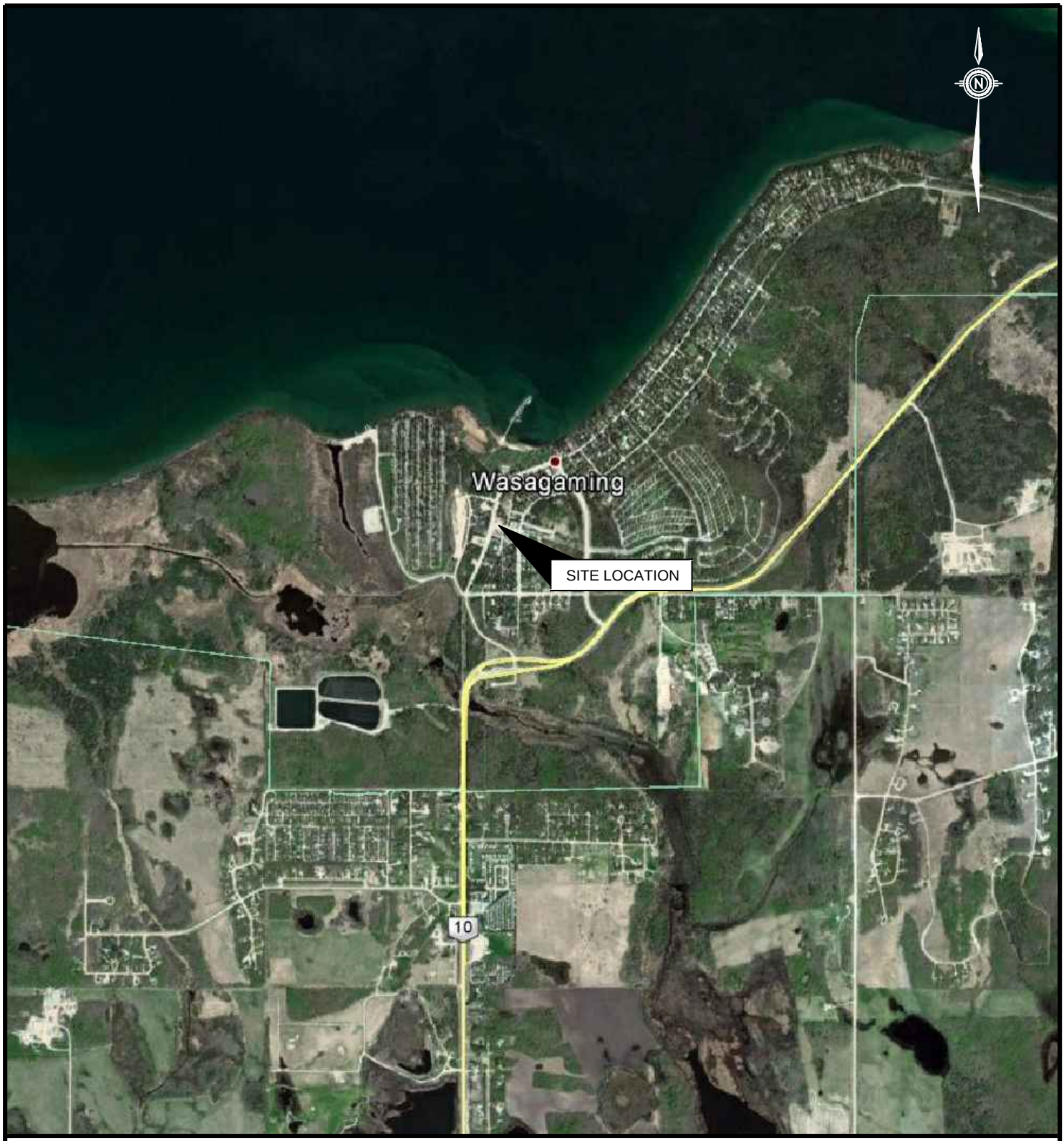
10 CLOSURE

If you have any questions regarding this report, or require clarification regarding the described work, please do not hesitate to contact the undersigned.

For DST Consulting Engineers Inc.

François Pugh, P.Eng, Ph.D.
Environmental Engineer

Curtis Schmidt, P.Eng.
Environmental Engineer



APPROXIMATE SCALE
0 175 350 700m

SOURCE:
1. GOOGLE EARTH, © 2014 GOOGLE

NOTE:
1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE ASSOCIATED TECHNICAL REPORT.

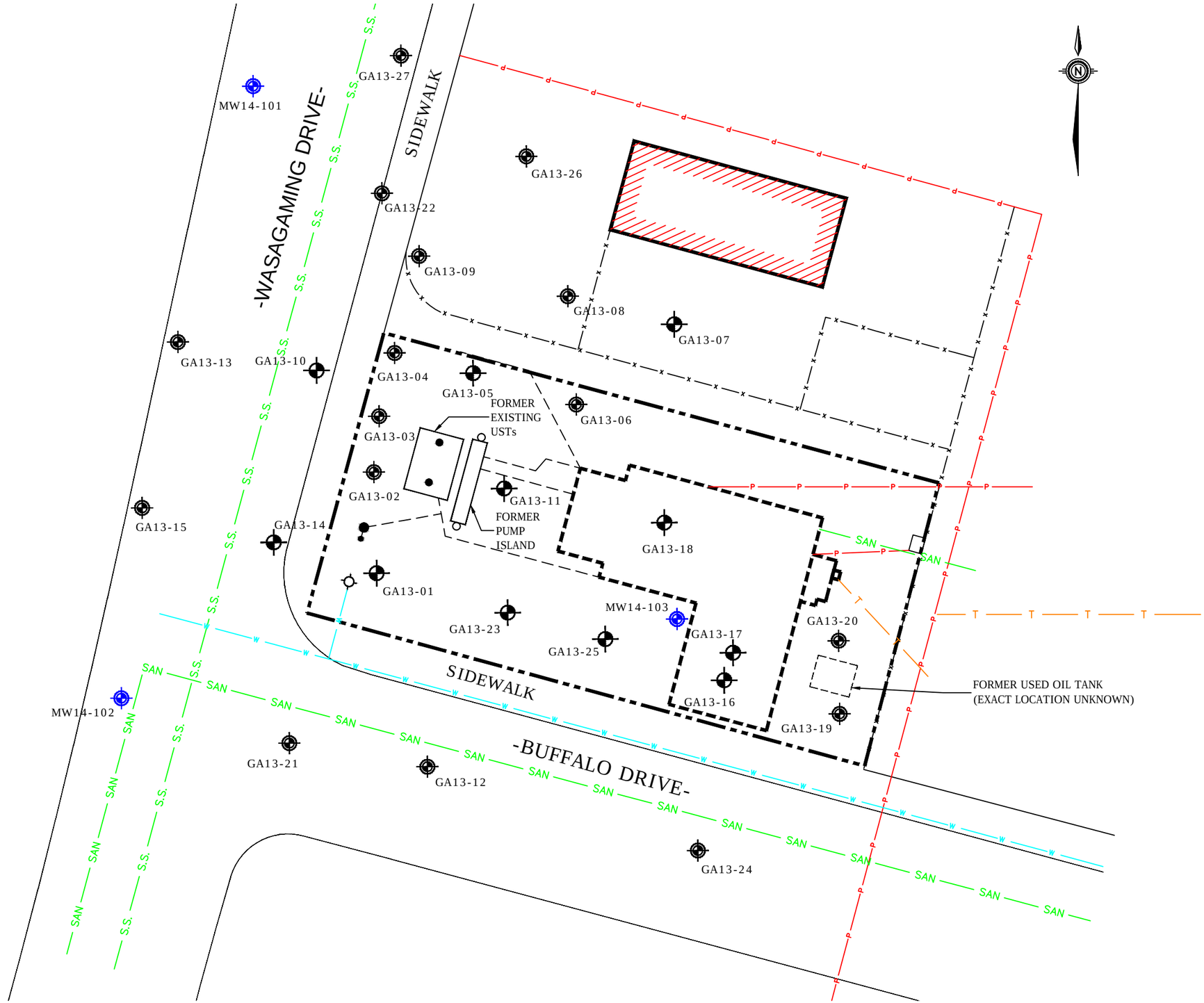
REV	DATE	ISSUE	APPROVAL
A	21/08/14	DRAFT	M.M.

DRAWN BY: R.P.	DATE: August 2014
DESIGN BY: F.P.	PROJECT NO.: OE-WG-017795
FIGURE No.: FIGURE 1	

PROJECT TITLE
SUPPLEMENTAL PHASE II ESA
RIDING MOUNTAIN NATIONAL PARK
122 WASAGAMING DRIVE
WASAGAMING, MANITOBA

DRAWING TITLE
SITE LOCATION MAP

DST consulting engineers
885 REGENT STREET, UNIT 3-1B
SUDBURY, ONTARIO, P3E 5M4
TEL (705) 523-6680 FAX (705) 523-6690
www.dstgroup.com



APPROXIMATE SCALE

0 5 10 20m

SOURCE: Golder Associates (2013)

DST
consulting engineers
885 REGENT STREET, UNIT 3-1B
SUDBURY, ONTARIO, P3E 5M4
TEL (705) 523-6680 FAX (705) 523-6690
www.dstgroup.com

LEGEND:

- MW14-103 — BOREHOLE/MONITORING WELL LOCATION (DST)
- GA13-05 — BOREHOLE/MONITORING WELL LOCATION (GOLDER)
- GA13-05 — BOREHOLE LOCATION (GOLDER)
- SAN — SANITARY SEWER
- W — UNDERGROUND WATERLINE
- P — OVERHEAD POWERLINE
- UTILITIES MARKED BY PRIVATE LOCATOR
- x — FENCE
- S.S. — STORM SEWER
- PROPERTY LINE
- T — UNDERGROUND TELEPHONE
- BUILDING FOOTPRINT
- FORMER BUILDING FOOTPRINT

REV	DATE	ISSUE	APPROVAL
A	21/08/14	DRAFT	M.M.

PROJECT TITLE

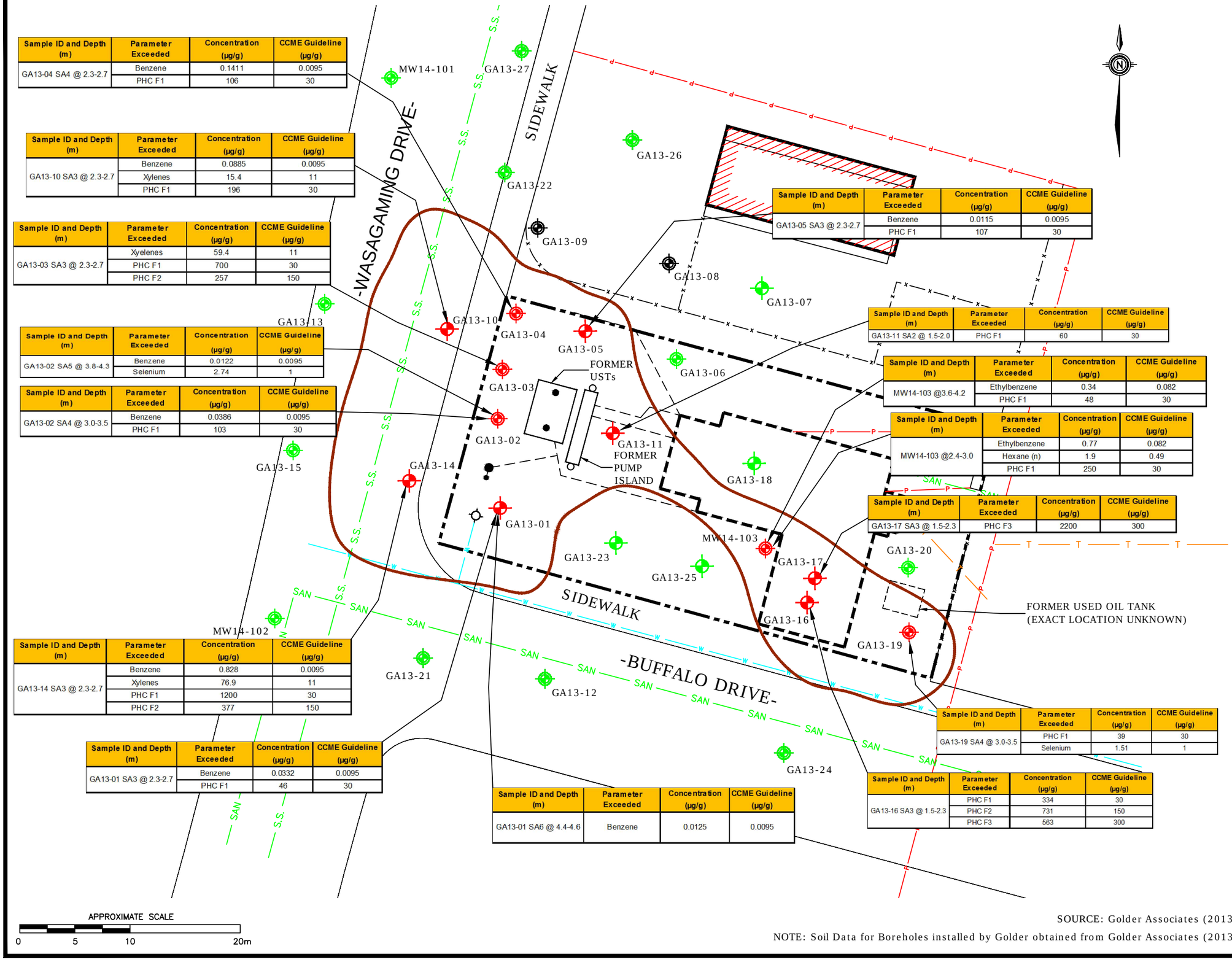
SUPPLEMENTAL PHASE II ESA
RIDING MOUNTAIN NATIONAL PARK
122 WASAGAMING DRIVE
WASAGAMING, MANITOBA

DRAWING TITLE

SITE PLAN

DESIGNED BY: F.P.	SCALE: As Shown
DRAWN BY: R.P.	DATE: August 2014
APPROVED BY: M.M.	PROJECT NO.: OE-WG-017795

FIGURE 2



Sample ID and Depth (m)	Parameter Exceeded	Concentration (µg/g)	CCME Guideline (µg/g)
GA13-04 SA4 @ 2.3-2.7	Benzene	0.1411	0.0095
	PHC F1	106	30

Sample ID and Depth (m)	Parameter Exceeded	Concentration (µg/g)	CCME Guideline (µg/g)
GA13-10 SA3 @ 2.3-2.7	Benzene	0.0885	0.0095
	Xylenes	15.4	11
	PHC F1	196	30

Sample ID and Depth (m)	Parameter Exceeded	Concentration (µg/g)	CCME Guideline (µg/g)
GA13-03 SA3 @ 2.3-2.7	Xylenes	59.4	11
	PHC F1	700	30
	PHC F2	257	150

Sample ID and Depth (m)	Parameter Exceeded	Concentration (µg/g)	CCME Guideline (µg/g)
GA13-02 SA5 @ 3.8-4.3	Benzene	0.0122	0.0095
	Selenium	2.74	1

Sample ID and Depth (m)	Parameter Exceeded	Concentration (µg/g)	CCME Guideline (µg/g)
GA13-02 SA4 @ 3.0-3.5	Benzene	0.0386	0.0095
	PHC F1	103	30

Sample ID and Depth (m)	Parameter Exceeded	Concentration (µg/g)	CCME Guideline (µg/g)
GA13-14 SA3 @ 2.3-2.7	Benzene	0.828	0.0095
	Xylenes	76.9	11
	PHC F1	1200	30
	PHC F2	377	150

Sample ID and Depth (m)	Parameter Exceeded	Concentration (µg/g)	CCME Guideline (µg/g)
GA13-01 SA3 @ 2.3-2.7	Benzene	0.0332	0.0095
	PHC F1	46	30

Sample ID and Depth (m)	Parameter Exceeded	Concentration (µg/g)	CCME Guideline (µg/g)
GA13-01 SA6 @ 4.4-4.6	Benzene	0.0125	0.0095

Sample ID and Depth (m)	Parameter Exceeded	Concentration (µg/g)	CCME Guideline (µg/g)
GA13-05 SA3 @ 2.3-2.7	Benzene	0.0115	0.0095
	PHC F1	107	30

Sample ID and Depth (m)	Parameter Exceeded	Concentration (µg/g)	CCME Guideline (µg/g)
GA13-11 SA2 @ 1.5-2.0	PHC F1	60	30

Sample ID and Depth (m)	Parameter Exceeded	Concentration (µg/g)	CCME Guideline (µg/g)
MW14-103 @3.6-4.2	Ethylbenzene	0.34	0.082
	PHC F1	48	30

Sample ID and Depth (m)	Parameter Exceeded	Concentration (µg/g)	CCME Guideline (µg/g)
MW14-103 @2.4-3.0	Ethylbenzene	0.77	0.082
	Hexane (n)	1.9	0.49
	PHC F1	250	30

Sample ID and Depth (m)	Parameter Exceeded	Concentration (µg/g)	CCME Guideline (µg/g)
GA13-17 SA3 @ 1.5-2.3	PHC F3	2200	300

Sample ID and Depth (m)	Parameter Exceeded	Concentration (µg/g)	CCME Guideline (µg/g)
GA13-19 SA4 @ 3.0-3.5	PHC F1	39	30
	Selenium	1.51	1

Sample ID and Depth (m)	Parameter Exceeded	Concentration (µg/g)	CCME Guideline (µg/g)
GA13-16 SA3 @ 1.5-2.3	PHC F1	334	30
	PHC F2	731	150
	PHC F3	563	300

SOURCE: Golder Associates (2013)

NOTE: Soil Data for Boreholes installed by Golder obtained from Golder Associates (2013)

DST consulting engineers
885 REGENT STREET, UNIT 3-1B
SUDBURY, ONTARIO, P3E 5M4
TEL (705) 523-6680 FAX (705) 523-6690
www.dstgroup.com

LEGEND:

- MW14-103 — BOREOLE/MONITORING WELL LOCATION (ANALYTICAL RESULTS MEET CURRENT GUIDELINES)
- GA13-05 — BOREHOLE LOCATION (ANALYTICAL RESULTS MEET CURRENT GUIDELINES)
- GA13-05 — BOREHOLE/MONITORING WELL LOCATION (ANALYTICAL RESULTS EXCEED CURRENT GUIDELINES)
- BOREHOLE LOCATION (ANALYTICAL RESULTS EXCEED CURRENT GUIDELINES)
- BOREHOLE/MONITORING WELL LOCATION (GOLDER)
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- P — OVERHEAD POWERLINE
- UTILITIES MARKED BY PRIVATE LOCATOR
- x — FENCE
- S.S. — STORM SEWER
- PROPERTY LINE
- T — UNDERGROUND TELEPHONE
- APPROXIMATE AREA OF CONTAMINATED SOIL (980 m²)
- BUILDING FOOTPRINT
- FORMER BUILDING FOOTPRINT

REV	DATE	ISSUE	APPROVAL
A	21/08/14	DRAFT	M.M.

PROJECT TITLE

SUPPLEMENTAL PHASE II ESA
RIDING MOUNTAIN NATIONAL PARK
122 WASAGAMING DRIVE
WASAGAMING, MANITOBA

DRAWING TITLE

SOIL EXCEEDANCES

DESIGNED BY: F.P.	SCALE: As Shown
DRAWN BY: R.P.	DATE: August 2014
APPROVED BY: M.M.	PROJECT NO.: OE-WG-017795

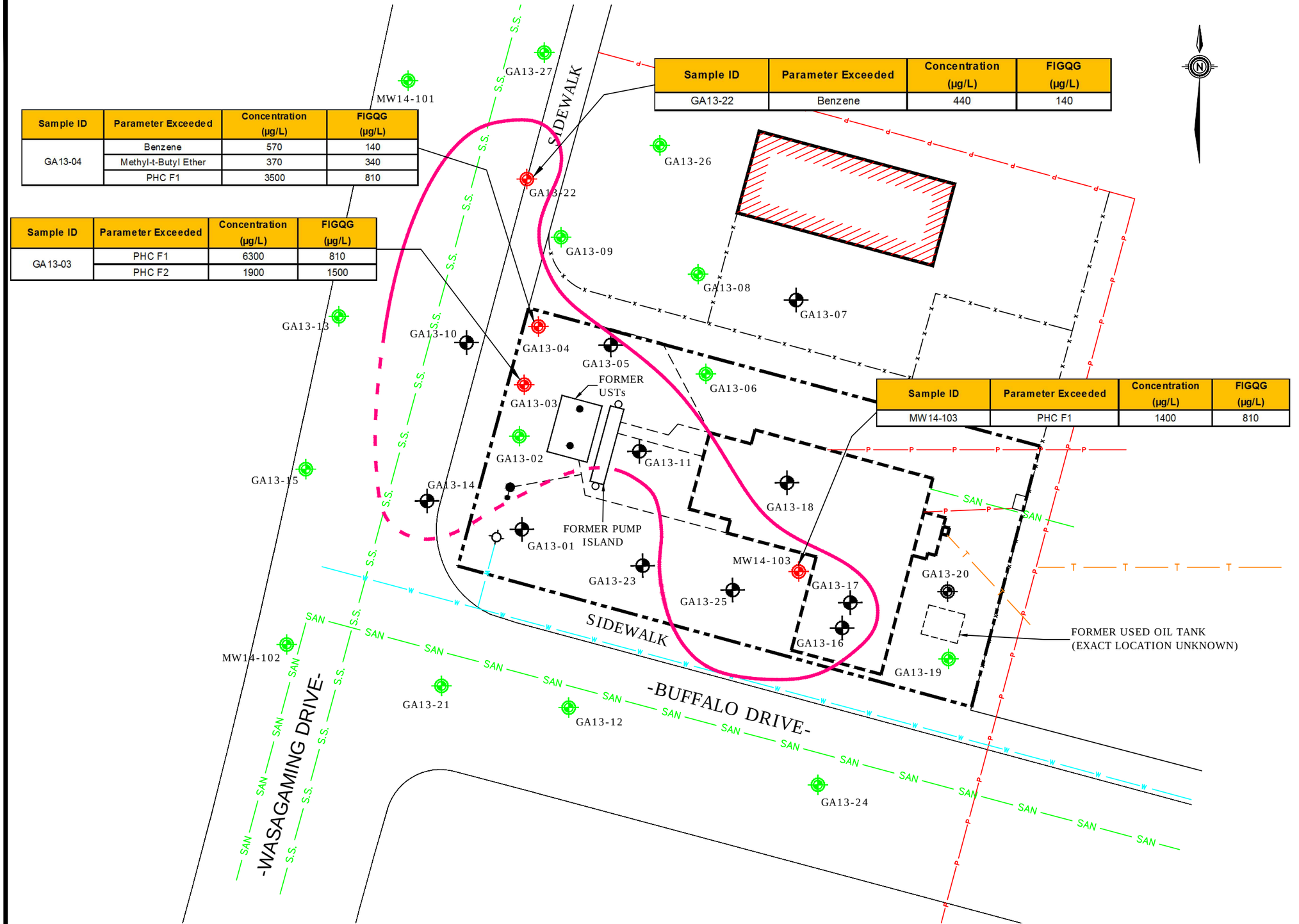
FIGURE 3

Sample ID	Parameter Exceeded	Concentration (µg/L)	FIGQG (µg/L)
GA13-04	Benzene	570	140
	Methyl-t-Butyl Ether	370	340
	PHC F1	3500	810

Sample ID	Parameter Exceeded	Concentration (µg/L)	FIGQG (µg/L)
GA13-03	PHC F1	6300	810
	PHC F2	1900	1500

Sample ID	Parameter Exceeded	Concentration (µg/L)	FIGQG (µg/L)
GA13-22	Benzene	440	140

Sample ID	Parameter Exceeded	Concentration (µg/L)	FIGQG (µg/L)
MW14-103	PHC F1	1400	810



APPROXIMATE SCALE

0 5 10 20m

SOURCE: Golder Associates (2013)

DST consulting engineers
885 REGENT STREET, UNIT 3-1B
SUDBURY, ONTARIO, P3E 5M4
TEL (705) 523-6680 FAX (705) 523-6690
www.dstgroup.com

LEGEND:

- MW14-103 — BOREOLE/MONITORING WELL LOCATION (ANALYTICAL RESULTS MEET CURRENT GUIDELINES)
- MW14-103 — BOREHOLE/MONITORING WELL LOCATION (ANALYTICAL RESULTS EXCEED CURRENT GUIDELINES)
- GA13-20 — BOREHOLE/MONITORING WELL LOCATION (GOLDER)
- GA13-27 — BOREHOLE LOCATION (GOLDER)
- SAN — SANITARY SEWER
- W — UNDERGROUND WATERLINE
- P — OVERHEAD POWERLINE
- UTILITIES MARKED BY PRIVATE LOCATOR
- x — FENCE
- S.S. — STORM SEWER
- PROPERTY LINE
- T — UNDERGROUND TELEPHONE
- APPROXIMATE AREA OF CONTAMINATED GROUNDWATER (844 m²)
- BUILDING FOOTPRINT
- FORMER BUILDING FOOTPRINT

REV	DATE	ISSUE	APPROVAL
A	21/08/14	DRAFT	M.M.

PROJECT TITLE

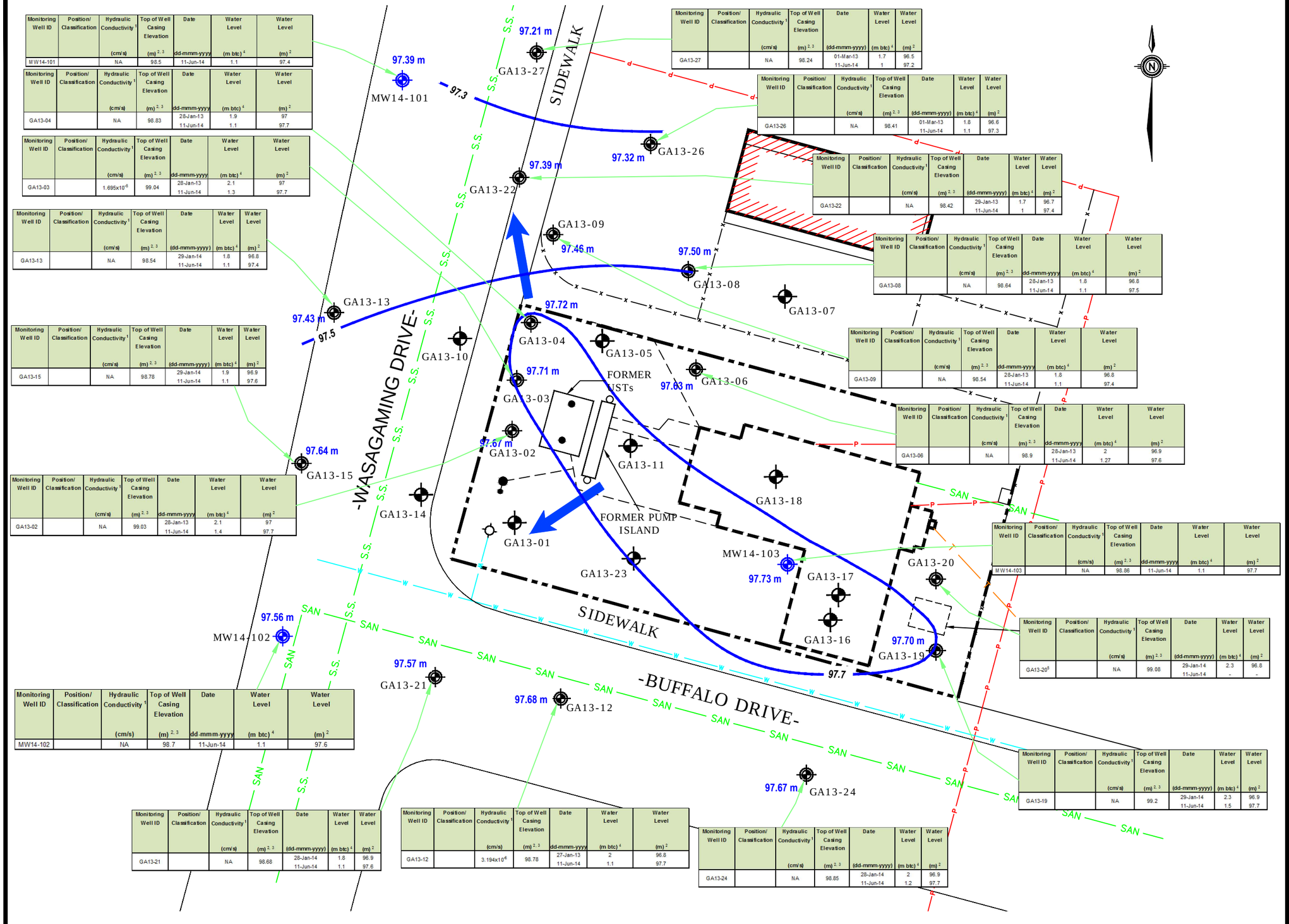
SUPPLEMENTAL PHASE II ESA
RIDING MOUNTAIN NATIONAL PARK
122 WASAGAMING DRIVE
WASAGAMING, MANITOBA

DRAWING TITLE

2014 GROUNDWATER EXCEEDANCES

DESIGNED BY:	SCALE:
F.P.	As Shown
DRAWN BY:	DATE:
R.P.	August 2014
APPROVED BY:	PROJECT NO.:
M.M.	OE-WG-017795

FIGURE 4



Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
MW14-101		NA	98.5	11-Jun-14	1.1	97.4

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
GA13-04		NA	98.83	28-Jan-13 11-Jun-14	1.9 1.1	97 97.7

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
GA13-03		1.695×10^{-6}	99.04	28-Jan-13 11-Jun-14	2.1 1.3	97 97.7

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
GA13-13		NA	98.54	29-Jan-14 11-Jun-14	1.8 1.1	96.8 97.4

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
GA13-15		NA	98.78	29-Jan-14 11-Jun-14	1.9 1.1	96.9 97.6

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
GA13-02		NA	99.03	28-Jan-13 11-Jun-14	2.1 1.4	97 97.7

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
MW14-102		NA	98.7	11-Jun-14	1.1	97.6

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
GA13-21		NA	98.68	28-Jan-14 11-Jun-14	1.8 1.1	96.9 97.6

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
GA13-12		3.194×10^{-6}	98.78	27-Jan-13 11-Jun-14	2 1.1	96.8 97.7

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
GA13-24		NA	98.85	28-Jan-14 11-Jun-14	2 1.2	96.9 97.7

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
GA13-27		NA	98.24	01-Mar-13 11-Jun-14	1.7 1	96.5 97.2

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
GA13-26		NA	98.41	01-Mar-13 11-Jun-14	1.8 1.1	96.6 97.3

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
GA13-22		NA	98.42	29-Jan-13 11-Jun-14	1.7 1	96.7 97.4

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
GA13-08		NA	98.64	28-Jan-13 11-Jun-14	1.8 1.1	96.8 97.5

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
GA13-09		NA	98.54	28-Jan-13 11-Jun-14	1.8 1.1	96.8 97.4

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
GA13-06		NA	98.9	28-Jan-13 11-Jun-14	2 1.27	96.9 97.6

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
MW14-103		NA	98.86	11-Jun-14	1.1	97.7

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
GA13-20[5]		NA	99.08	29-Jan-14 11-Jun-14	2.3 -	96.8 -

Monitoring Well ID	Position/ Classification	Hydraulic Conductivity [1] (cm/s)	Top of Well Casing Elevation (m) [2, 3]	Date (dd-mmm-yyyy)	Water Level (m btc) [4]	Water Level (m) [2]
GA13-19		NA	99.2	29-Jan-14 11-Jun-14	2.3 1.5	96.9 97.7

SOURCES: Golder Associates (2013)

DST
consulting engineers
885 REGENT STREET, UNIT 3-1B
SUDBURY, ONTARIO, P3E 5M4
TEL (705) 523-6680 FAX (705) 523-6690
www.dstgroup.com

LEGEND:

- MW14-103 — BOREHOLE/MONITORING WELL LOCATION (DST)
- GA13-26 — BOREHOLE/MONITORING WELL LOCATION (GOLDER)
- GA13-023 — BOREHOLE LOCATION (GOLDER)
- SAN — SANITARY SEWER
- W — UNDERGROUND WATERLINE
- P — OVERHEAD POWERLINE
- UTILITIES MARKED BY PRIVATE LOCATOR
- x — FENCE
- S.S. — STORM SEWER
- PROPERTY LINE
- T — UNDERGROUND TELEPHONE
- BUILDING FOOTPRINT
- FORMER BUILDING FOOTPRINT
- 97.73 m — GROUNDWATER ELEVATION
- 97.7 — GROUNDWATER CONTOUR LINE
- INTERPRETED GROUNDWATER FLOW DIRECTION

REV	DATE	ISSUE	APPROVAL
A	21/08/14	DRAFT	M.M.

PROJECT TITLE

SUPPLEMENTAL PHASE II ESA
RIDING MOUNTAIN NATIONAL PARK
122 WASAGAMING DRIVE
WASAGAMING, MANITOBA

DRAWING TITLE

GROUNDWATER CONTOURS
(JUNE 11, 2014)

DESIGNED BY: F.P.	SCALE: As Shown
DRAWN BY: R.P.	DATE: August 2014
APPROVED BY: M.M.	PROJECT NO.: OE-WG-017795

FIGURE 5

APPENDIX A

BOREHOLE LOGS

LOG OF BOREHOLE MW14-101

REF. No.: OE-WG-017795	**DST CONSULTING ENGINEERS INC.**
CLIENT: Public Works and Government Services Canada	UTM: Zone 5612090 N, 14 431285 E
PROJECT: Supplemental Phase II ESA	METHOD: Hollow Stem Auger/Split Spoon Auger
LOCATION: Wasagaming, Manitoba	DIAMETER: 20 cm ID
SURFACE ELEVATION: 98.72 metres	DATE: 6 March 2014

CHVC * ■ % LEL 20 40 60 80 ○ PPM 200 400 600 800	CHVC Conc. PPM	SAMPLES No.	Type	SPT N-Value	SYMBL	SUBSURFACE PROFILE MATERIAL DESCRIPTION	DPTH m	ELEV m	Well Installation Details	REMARKS
						SURFACE				
	ND					SAND & GRAVEL - FILL - Brown, frozen.				150 mm Flushmount Casing concrete in place.
	5						1	98		-Bentonite seal.
	ND					SILTY SAND - Fine grained, moist, brown, frozen.		97		Groundwater Elevation = 97.39 m on June 11/14.
	5					SAND - Fine grained, wet.	2			MW14-101 @ 1.8-2.4 m submitted for PHC and BTEX analysis.
	10					SANDY SILT & CLAY - Medium gravel, brown.		96		MW14-101 @ 2.4-3.0 m submitted for PHC and BTEX analysis.
	ND					SILTY SAND - Fine grained, brown, wet.	3			-Sandpack.
	ND							95		-51 mm PVC screen slot 10.
						End of Borehole at 4.2 m.	4			
							5	94		
								93		
							6			
								92		
							7			
								91		
							8			
								90		

DST consulting engineers

Auger Sample
Split Spoon
Bentonite & Riser
Sand Pack & Screen

ND - Not Detectable
* - Combustible Headspace Vapour Concentration

GASTECBH OE-WG-017795.GPJ DST_MIN.GDT 15/7/14

L O G O F BOREHOLE MW14-102

REF. No.: OE-WG-017795	**DST CONSULTING ENGINEERS INC.**
CLIENT: Public Works and Government Services Canada	UTM: Zone 5612043 N, 14 431272 E
PROJECT: Supplemental Phase II ESA	METHOD: Split Spoon Auger
LOCATION: Wasagaming, Manitoba	DIAMETER: 20 cm ID
SURFACE ELEVATION: 98.82 metres	DATE: 6 March 2013

CHVC * ■ % LEL 20 40 60 80 ○ PPM 200 400 600 800	CHVC Conc. PPM	SAMPLES No.	Type	SPT N-Value	SYMBL	SUBSURFACE PROFILE MATERIAL DESCRIPTION	DPTH m	ELEV m	Well Installation Details	REMARKS
						SURFACE				
	ND					Ashphalt Surface SAND & GRAVEL - FILL - Frozen.				150 mm Flushmount Casing concrete in place. -Bentonite seal.
	ND					- Trace silt, wet, brown, frozen.	1	98		Groundwater Elevation = 97.56 m on June 11/14.
	5					- Some silt, brown, wet.				MW14-102 @ 1.2-1.8 m submitted for PHC, BTEX , PH and grain size analysis.
						SILTY SAND & GRAVEL - Brown, wet.	2	97		
	10									MW14-102 @ 1.8-2.4 m submitted for PHC and BTEX analysis.
	ND					SAND & GRAVEL - Wet.		96		
						SILTY SAND & GRAVEL - Brown, wet.	3			-51 mm PVC screen slot. -Sandpack.
	ND									
	ND						4	95		
						End of Borehole at 4.2 m.				
							5	94		
							6	93		
							7	92		
							8	91		
								90		

DST consulting engineers

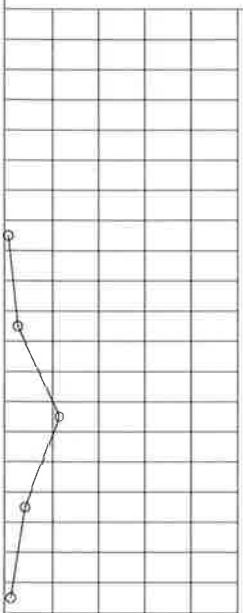
Auger Sample
Split Spoon
Bentonite & Riser
Sand Pack & Screen

ND - Not Detectable
* - Combustible Headspace Vapour Concentration

GASTECBH OE-WG-017795.GPJ DST_MIN.GDT 15/7/14

LOG OF BOREHOLE MW14-103

REF. No.: OE-WG-017795	**DST CONSULTING ENGINEERS INC.**
CLIENT: Public Works and Government Services Canada	UTM: Zone 5612049 N, 14 431317 E
PROJECT: Supplemental Phase II ESA	METHOD: Split Spoon Auger
LOCATION: Wasagaming, Manitoba	DIAMETER: 20 cm ID
SURFACE ELEVATION: 99.02 metres	DATE: 6 March 2013



CHVC Conc. PPM	SAMPLES No.	Type	SPT N-Value	SYMBL	SUBSURFACE PROFILE — MATERIAL DESCRIPTION	DPTH m	ELEV m	Well Installation Details	REMARKS
					SURFACE				
ND					SAND & GRAVEL - FILL - Brown, frozen.		99		150 mm Flushmount Casing concrete in place.
ND					SAND - Trace gravel, brown, frozen.				-Bentonite seal.
10					SILTY SAND - Trace grvel, brown, moist.	1	98		Groundwater Elevation = 97.73 m on June 11/14. -Sandpack.
50					- Trace gravel, grey, wet, slight fuel odour.	2	97		-51 mm PVC screen slot.
230									MW14-103 @ 2.4-3.0 m submitted for PHCs, VOCs, PH and grain size analysis.
80					- Slight fuel odour.	3	96		
20					GRAVELLY SILT & SAND - Grey, wet, slight fuel odour.	4	95		MW14-103 @ 3.6-4.2 m submitted for PHC and BTEX analysis.
					End of Borehole at 4.2 m.	5	94		
						6	93		
						7	92		
						8	91		

DST consulting engineers

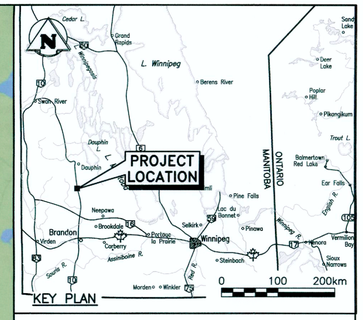
Auger Sample
Split Spoon
Bentonite & Riser
Sand Pack & Screen

ND - Not Detectable
* - Combustible Vapour Headspace Concentration

GASTECBH OE-WG-017795.GPJ DST_MIN.GDT 15/7/14

SITE PLAN
SCALE: 1:5000 (11x17)

AREA MAP
SCALE: 1:100000 (11x17)



KEY PLAN

LIST OF DRAWINGS:

G01 – SITE LOCATION
G02 – PLAN AND SECTION

NOTES:

1. THESE DRAWINGS TO BE READ IN CONJUNCTION WITH THE TECHNICAL SPECIFICATIONS.
2. PARKS CANADA OFFICE LOCATED AT 135 WASAGAMING DRIVE.

NO.	YY/MM/DD	DESCRIPTION	DESIGN BY	DESIGN CHECK
0	17/11/08	ISSUED FOR TENDER	GRS	JDM

REVISIONS / ISSUE

CLIENT: Public Services and Procurement Canada — Canada

PROJECT:
REMEDIATION OF HYDROCARBON IMPACTED SOIL
122 WASAGAMING DRIVE
RIDING MOUNTAIN NATIONAL PARK

DWG. DESCRIPTION:
SITE LOCATION

APEGM
Certificate of Authorization
KGS Group
No. 245

AUTHENTICATION FOR CURRENT REVISION

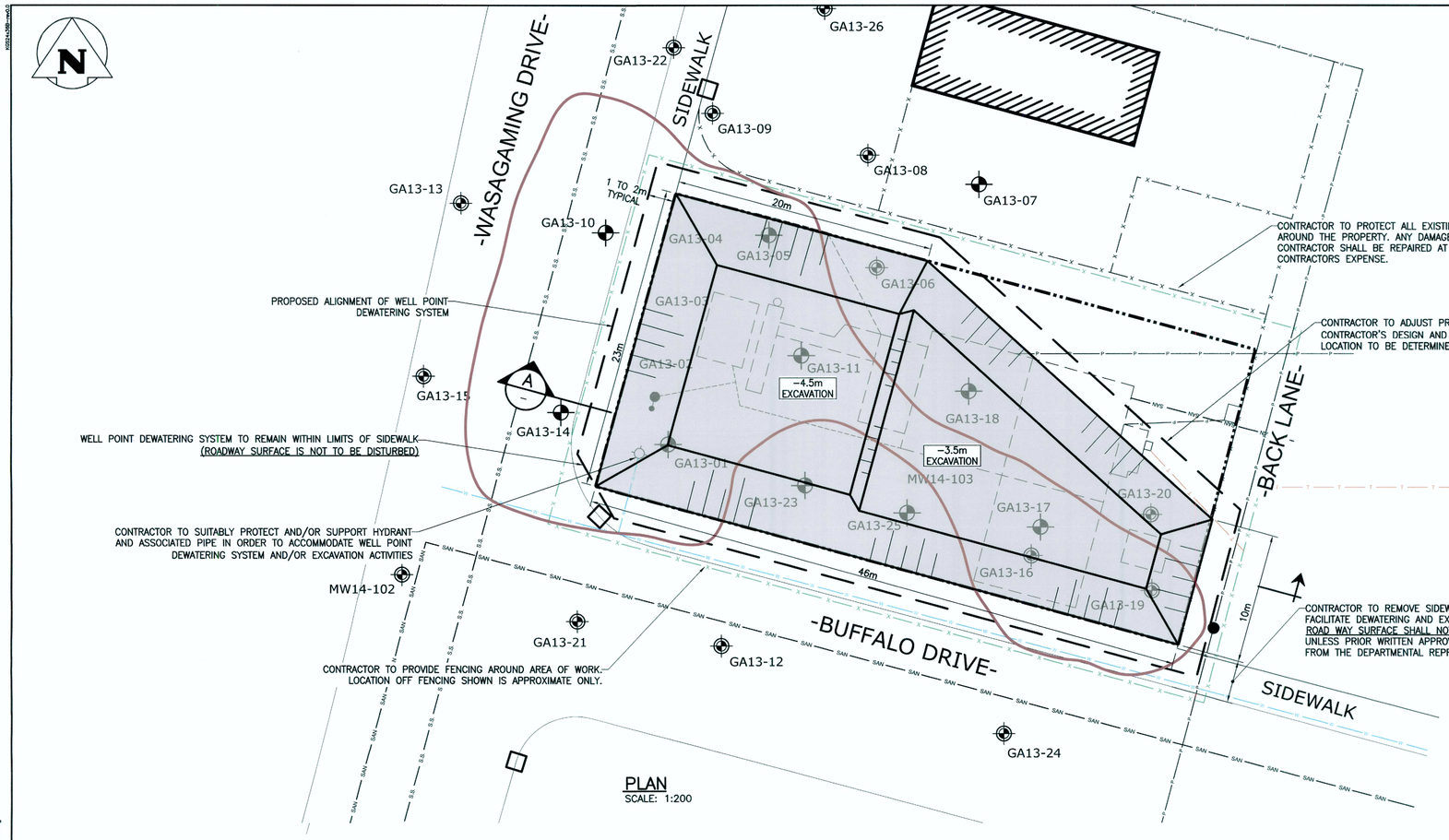
ENG. STAMP: PROVINCE OF MANITOBA — G.R. SIEBERT — 9/19 — REGISTERED PROFESSIONAL ENGINEER

KGS GROUP CONSULTING ENGINEERS

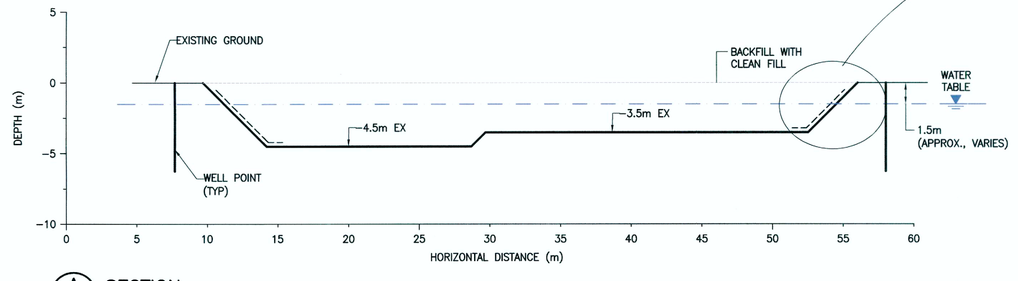
DESIGN BY:	GRS	DATE (YY/MM/DD):	17/10/19
DESIGN CHECK:	JDM	DATE:	17/11/08
DRAWN BY:	KRG	DATE:	17/10/19
DWG CHECK:		DATE:	17/11/08

DWG. NO. 17-0006-007 G01 REV: 0

Filename: P:\Projects\2017\17-0006-007\Dwg\Geo\17-0006-007_G01 - Tab:G01 Plotted By: dderoche 17/11/09 [Thu 8:25am]
24 X 36 / PLOT SCALE: 1=1



PLAN
SCALE: 1:200



A SECTION
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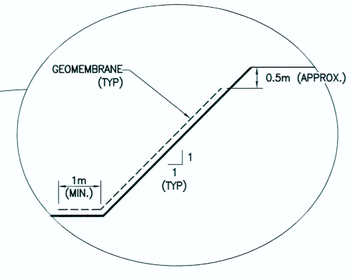

LEGEND:

- MW14-103 — MONITORING WELL LOCATION (DST)
- GA13-05 — MONITORING WELL LOCATION (GOLDER)
- GA13-05 — BOREHOLE LOCATION (GOLDER)
- SAN — SANITARY SEWER
- UNDERGROUND WATERLINE
- OVERHEAD POWERLINE
- UTILITIES MARKED BY PRIVATE LOCATOR
- FENCE
- S.S. — STORM SEWER
- PROPERTY LINE
- UNDERGROUND TELEPHONE
- AREA OF CONTAMINATED SOIL (VARIES)
- BUILDING OUTLINE
- FORMER BUILDING FOOTPRINT
- CONSTRUCTION FENCE (LOCATION APPROXIMATE)
- CATCH BASIN (LOCATION APPROXIMATE)
- HYDRO POLE (LOCATION APPROXIMATE)

NOTES:

1. CONTRACTOR TO VERIFY LOCATIONS OF BURIED SERVICES BEFORE INSTALLING OF WELL POINTS AND THE START OF EXCAVATION. CONTRACTOR TO SUBMIT DESIGN OF WELL POINT LAYOUT AND/ OR EXCAVATION THAT ADDRESSES ANY INTERFERENCES FOR REVIEW BY DEPARTMENTAL REPRESENTATION PRIOR TO IMPLEMENTATION.
2. CONTAMINATED SOIL TO BE REMOVED OFF SITE TO LICENSED FACILITY AS APPROVED BY DEPARTMENTAL REPRESENTATIVE.
3. FINAL LIMITS, GEOMETRY AND DEPTH OF EXCAVATION SHALL VARY BASED ON CONTRACTOR WELL POINT DEWATERING SYSTEM DESIGN AND PLAN FOR MAINTAINING A STABLE EXCAVATION. DEPARTMENTAL REPRESENTATIVE SHALL FIELD SCREEN SOIL HYDROCARBON VAPORS THROUGHOUT EXCAVATION ACTIVITIES UNTIL COMPLETION OF EXCAVATION.

5 0 5 10 15m
SCALE: 1:200

NO.	YY/MM/DD	DESCRIPTION	DESIGN BY	DESIGN CHECK
0	17/11/08	ISSUED FOR TENDER	GRS	JDM

REVISIONS / ISSUE

CLIENT: Public Services and Procurement Canada — Canada

PROJECT:
REMEDIATION OF HYDROCARBON IMPACTED SOIL
122 WASAGAMING DRIVE
RIDING MOUNTAIN NATIONAL PARK

DWG. DESCRIPTION:
PLAN AND SECTION

APEGM Certificate of Authorization KGS Group No. 245

AUTHENTICATION FOR CURRENT REVISION
ENG. STAMP: PROVINCE OF MANITOBA G.R. SIEBERT REGISTERED PROFESSIONAL ENGINEER

KGS GROUP CONSULTING ENGINEERS

DESIGN BY:	GRS	DATE (YY/MM/DD):	17/10/20
DESIGN CHECK:	JDM	DATE:	17/11/08
DRAWN BY:	PwD	DATE:	17/10/20
DWG CHECK:		DATE:	17/11/08

DWG. NO. 17-0006-007 G02 REV: 0

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