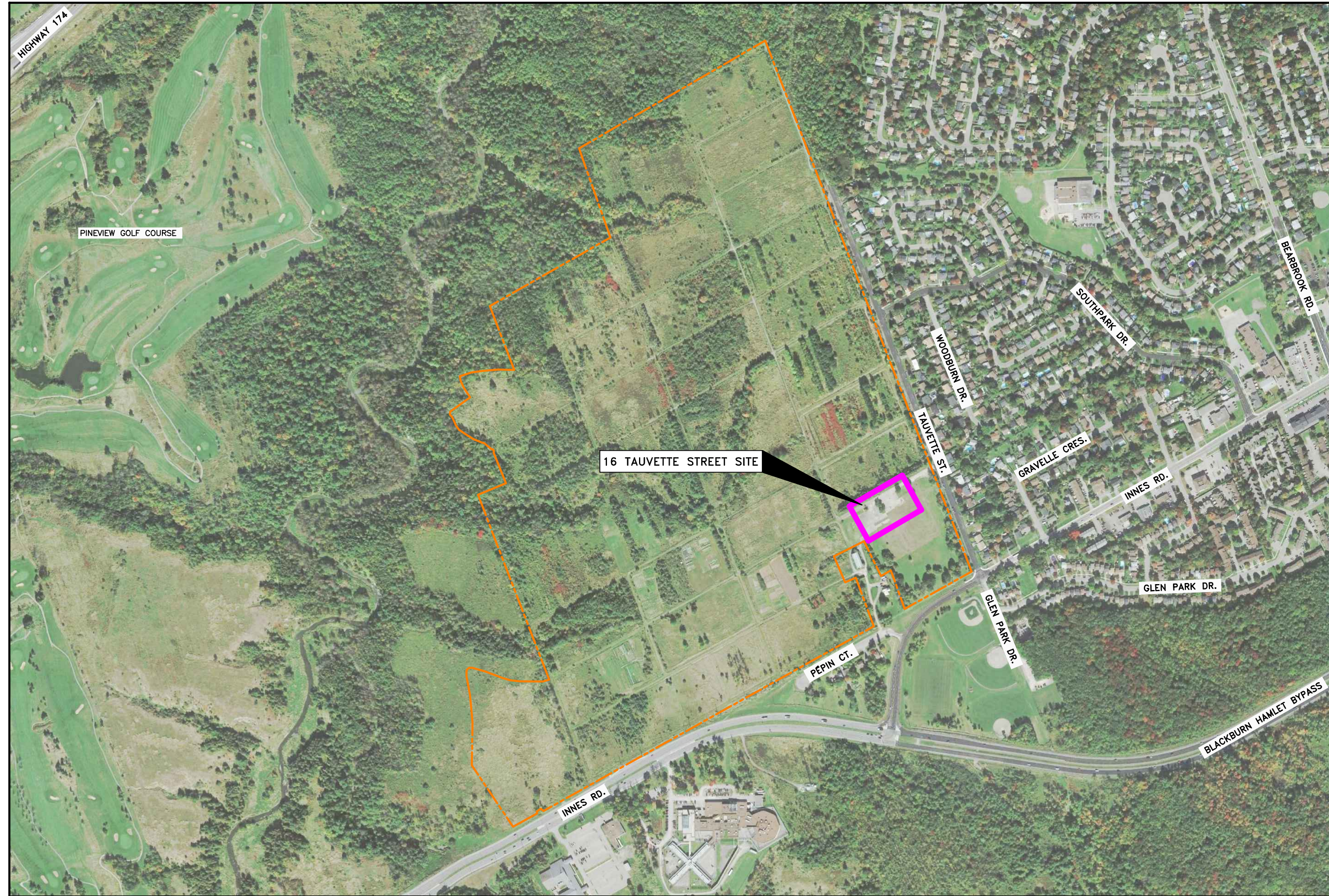




FIGURE 1: 16 TAUVERTE STREET SITE



NOTE(S):
 1. SCALE AND SITE INFRASTRUCTURE LOCATIONS ARE APPROXIMATE
 2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PHOTOCOPIED, FAXED OR PRINTED IN OTHER THAN ITS ORIGINAL SIZE AND COLOURS
 3. 'm' : METRES

LEGEND
 - - - - - NCC PROPERTY ASSET LIMITS

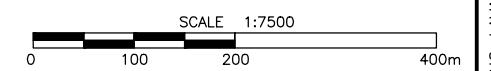
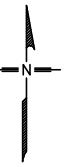




FIGURE 2: REMEDIAL WORK ZONE – 16 TAUVETTE STREET



NOTE(S):
1. SCALE AND SITE INFRASTRUCTURE LOCATIONS ARE APPROXIMATE
2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PHOTOCOPIED, FAXED OR PRINTED IN OTHER THAN ITS ORIGINAL SIZE AND COLOURS
3. 'm' : METRES

LEGEND	
	NCC PROPERTY ASSET LIMITS
	UNDERGROUND STORM SEWER
	UNDERGROUND WATER
	FORMER SITE INFRASTRUCTURE
	FORMER BURIED FUEL SUPPLY LINE
	LINE OF VEGETATION (E.G. CEDAR HEDGE)
	RAISED MANHOLE
HP	HYDRO POLE
	FIRE HYDRANT
	CATCH BASIN
	ABANDONED WATER WELL
GH8	FORMER GREENHOUSE IDENTIFICATION

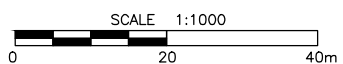
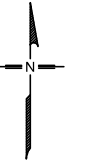
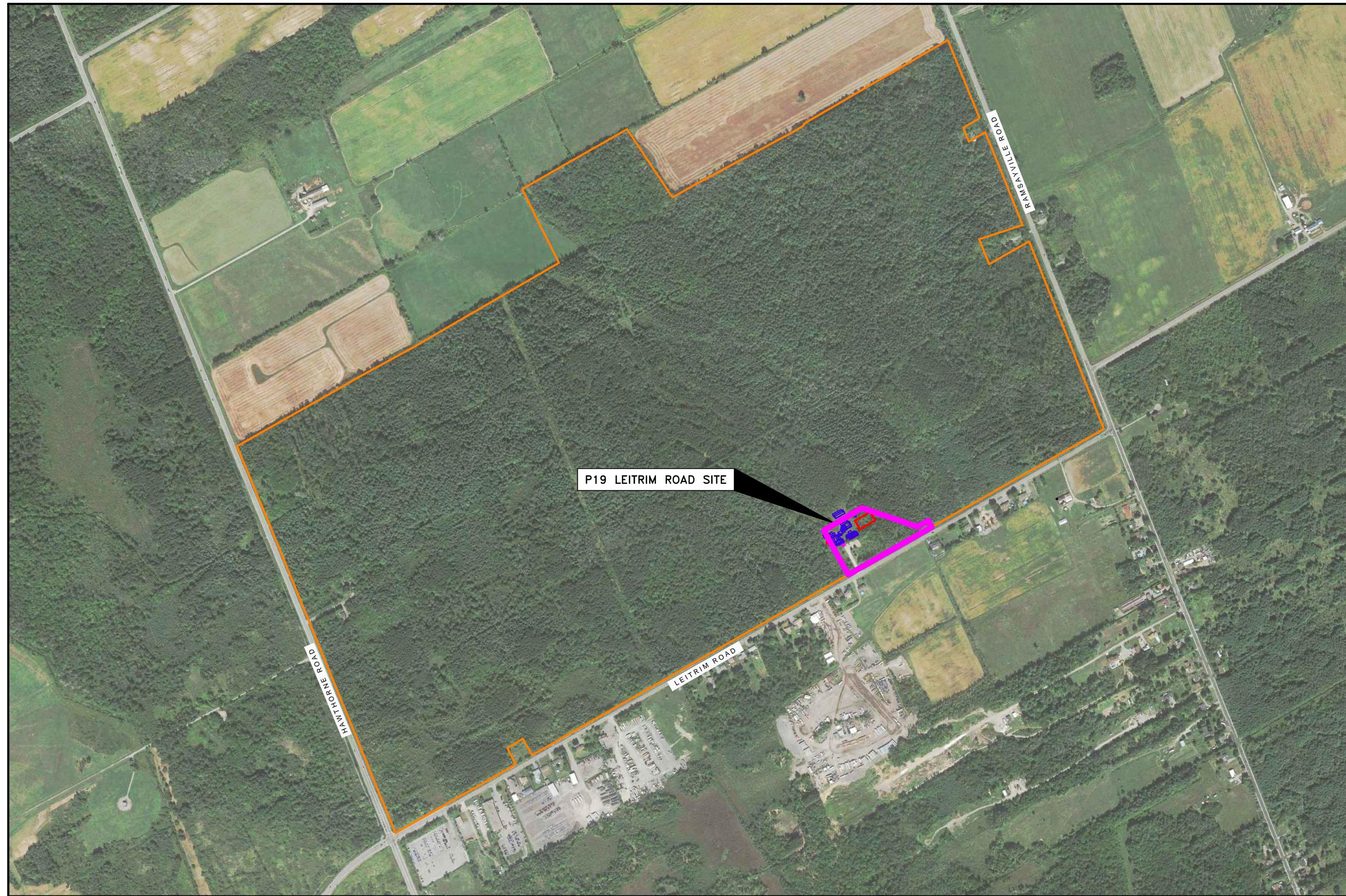


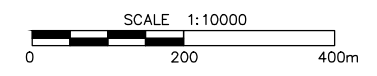


FIGURE 3: P19 LEITRIM ROAD SITE



P19 LEITRIM ROAD SITE

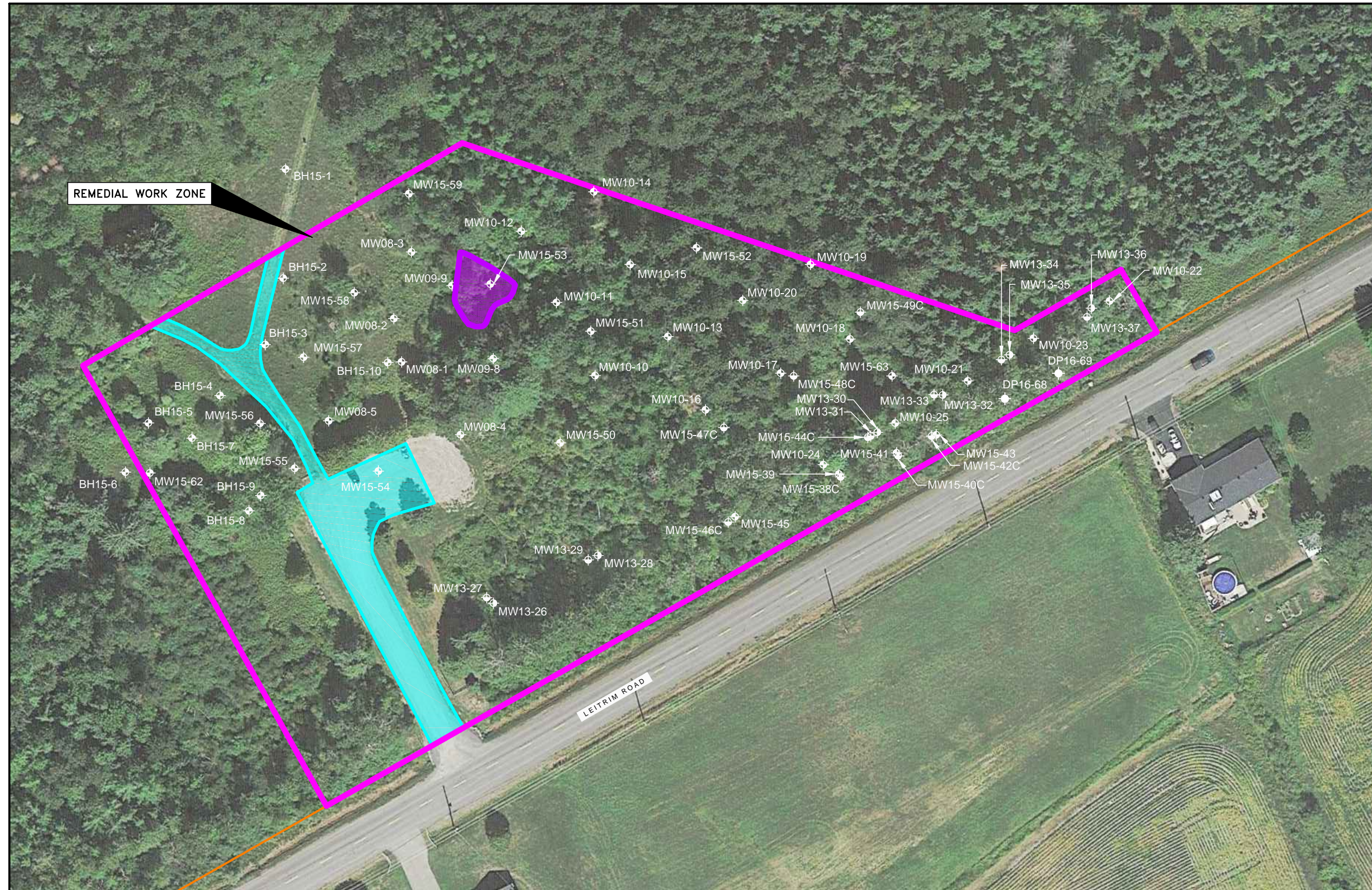
LEGEND	
	NCC PROPERTY ASSET LIMITS
	HISTORIC STRUCTURES
	HISTORIC BUILDINGS
	HISTORIC DISTURBED AREAS



NOTE(S):
1. SCALE AND SITE INFRASTRUCTURE LOCATIONS ARE APPROXIMATE
2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PHOTOCOPIED, FAXED OR PRINTED IN OTHER THAN ITS ORIGINAL SIZE AND COLOURS
3. 'm' : METRES



FIGURE 4: REMEDIAL WORK ZONE – P19 LEITRIM ROAD



NOTE(S):
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2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PHOTOCOPIED, FAXED OR PRINTED IN OTHER THAN ITS ORIGINAL SIZE AND COLOURS
3. 'm' : METRES

LEGEND

- NCC PROPERTY ASSET LIMITS
- DEMARCATED FLAT SWAMP
- AREA TO BE MAINTAINED FOR PUBLIC ACCESS AND PARKING
- BOREHOLE
- MONITORING WELL (SHALLOW SAND)
- MONITORING WELL (INTERMEDIATE CLAY)
- MONITORING WELL (DEEP CLAY)
- DRIVE POINT



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1.1 GENERAL

- .1 All conditions of the Contract apply to this and all other Sections.
- .2 This Section applies to all sections incorporated in the Request for Proposal Documents.
- .3 In interpreting the Specifications, in the event of discrepancies or conflicts between Section 01 00 10 – *General Requirements* and other Sections, Section 01 00 10 – *General Requirements* governs.

1.2 PROJECT COORDINATION

- .1 Cooperate with the National Capital Commission (NCC) and other contractors, as well as all those having authority to access 16 Tavette Street and P19 Leitrim Road and those having an interest in the project.
- .2 Bring any conflict associated with the Project to the attention of the Engineer for review and resolution by the Owner. The Owner's decision shall be final and binding within the terms of the Contract.
- .3 Attend administrative and problem solving Site meetings, as required by the Engineer.
- .4 The Engineer arranges and manages project progress meetings, records and issues minutes identifying significant proceedings and action items.

1.3 DRAWINGS AND SPECIFICATIONS

- .1 Carry out all Work in accordance with the NCC's Specifications, the Contractor's design and associated plans.
- .2 Environmental information including borehole and test-pit logs from environmental investigations carried out within 16 Tavette Street and P19 Leitrim Road are attached in the *Supporting Documentation*. An itemized list of *Supporting Documentation* is provided in Section 01 11 00 – *Summary of Work*.
- .3 Additional information and/or drawings showing details as to the Work to be carried out may be provided from time to time, as found necessary, to define the project requirements. The Contractor shall guide his/her Work on the information provided as part of the Request for Proposal.

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- .4 The Contractor shall be provided with a copy of all revisions and Specifications, which may be reproduced to suit the project requirements. The Contractor shall keep at least one copy of Specifications at the Site.

1.4 SCHEDULE

- .1 Submit the proposed construction schedule to the Engineer within 10 working days of the Contract award date. The schedule is to be presented in bar chart format and shall include milestone dates and all major activities or tasks identified in the Contract Documents and will specifically include all major price items as separate activities. During each active phase of the project, the schedule shall be sufficiently detailed to allow for weekly progress reviews and updates.
- .2 The Contractor shall include in the proposed construction schedule the critical dates provided elsewhere in the Request for Proposal Documents.
- .3 During each active phase of the project, and a minimum of 10 working days before initiating a new phase of the project, as required, submit with each weekly progress update, an update of schedule showing changes in strategy, if any, and progress as a percentage completed for each activity, on a regular basis, as determined by the Engineer. Progress Reports will be submitted in a format satisfactory to the Engineer in order to show the status of the Work in detail and to compare actual progress with the Contract schedule.

1.5 SUBMITTALS

- .1 Provide submittals to the Engineer as required and listed in the various sections of the Specifications. All submittals are to identify the applicable Specification section and paragraph for which the submittal is intended. Submittals from subcontractors are to be reviewed for compliance to the Specifications by the Contractor prior to transmittal to the Engineer. All supporting documentation is to be provided when requested. Deficiencies in the submittals are to be addressed promptly. Work affected by a submittal shall not proceed until review and approval (when required) are completed.
- .2 Provide the Engineer with copies of all permits, approvals, notifications and licenses related to and obtained for the Work, within 7 calendar days of their receipt and no later than 7 working days before commencing the associated Work.

1.6 FIELD ENGINEERING

- .1 When specified, provide the services of professional practitioners to undertake field engineering requirements. All Work shall be done according to industry standards, following the most current guidelines and practices.
- .2 The Contractor shall establish all lines and grades on all parts of the Works to the satisfaction of and as directed by the Engineer. The Contractor shall survey, under the direction of the Engineer, the limits of the optional excavation; the Contractor laydown area layout and all other Site requirements as detailed in the Specifications. Surveying Work shall be carried out by qualified personnel using equipment in conformity with industry standards.

1.7 SUBSURFACE CONDITIONS

- .1 Information on subsurface conditions, including soil characteristics and groundwater conditions, is available to the Contractor through the Supporting Documentation itemized in Section 01 11 00 – *Summary of Work*. This information is provided for the Contractor's reference only and the Owner does not warrant the accuracy or completeness of the information. The Contractor may, at its cost and discretion, confirm Site conditions to its own satisfaction upon contract award.

1.8 REFERENCES AND CODES

- .1 Perform the Work in accordance with the latest revised and amended versions of all federal, provincial and municipal laws, acts, regulations, by-laws, ordinances, standards and guidelines, as they may apply to the Work and in compliance with the Specifications as appropriate. Should there be any discrepancy or conflict between the documents (laws, acts, regulations, by-law, ordinances, standard or guidelines), the most stringent shall apply. Please note that a MOECC Environmental Compliance Approval (ECA) is not required for use of In-Situ Activated Carbon Adsorption on NCC lands; however, it is considered an asset.
- .2 Wherever in this Contract there is a list of statutes, regulations, by-laws, ordinances, standards, guidelines or other references under the heading "References and Codes" or any other heading, such list should be considered to be non-exhaustive and is included for information and illustration purposes only. It shall be the responsibility of the

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Contractor to make appropriate inquiries with respect to the applicable requirements.

- .3 Without limiting the generality of paragraphs 1.8.1 and 1.8.2 above, the Project must be performed in a manner that meets or exceeds the requirements of the following list, including but not limited to federal, provincial and municipal laws, regulations, by-laws, ordinances, standards and guidelines:

- .1 Contract documents.
- .2 Specified standards, codes and reference documents.
- .3 Municipal Noise By-Laws.
- .4 Sewer Use By-Law of the City of Ottawa.
- .5 Ontario Environmental Protection Act and Regulations made thereunder.
- .6 Ontario Water Resources Act and Regulations made thereunder.
- .7 Soil Ground Water and Sediment Standards, Ontario Ministry of the Environment and Climate change (MOECC)
- .8 Ontario Provincial Standard Specifications (OPSS).
- .9 Occupational Health and Safety Act R.S.O.
- .10 Ontario Regulation 347– General Waste Management.
- .11 Gasoline Handling Act.
- .12 Canadian Environmental Protection Act.
- .13 Canadian Transportation of Dangerous Goods Act (TDGA).
- .14 Canadian Environmental Quality Guidelines (CEQG), Canadian Council of the Ministers of the Environment (CCME).
- .15 Fisheries Act.
- .16 Federal Brownfields Legislation.
- .17 Migratory Birds Regulations.
- .18 City of Ottawa Traffic and Parking By-Laws.
- .19 Ontario Heritage Act.
- .20 Historic Sites and Monuments Act.
- .21 National Capital Act.
- .22 Ontario Dangerous Goods Transportation Act;
- .23 Ontario Regulation 213/91 - Construction Projects.
- .24 Ontario Regulation 675/98: Classification and Exemption of Spills and Reporting of Discharges

1.9 COMPLIANCE WITH APPLICABLE LAWS

- .1 By submitting a Request for Proposal, the Contractor certifies that he/she has the legal capacity to enter into a contract and is in possession of all valid licences, permits, registrations, certificates, declarations, filings, or other authorizations necessary to comply with all federal, provincial and municipal laws and regulations applicable

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to the submission of the proposal by the Contractor and entry into any ensuing contract for the performance of the Work.

- .2 For the purposes of validating the certification in clause 1.9.1, a Contractor shall, if requested, provide a copy of every valid licence, permit, registration, certificate, declaration, filing or other authorization listed in the request, and shall provide such documentation within the time limits set out in said request.
- .3 Failure to comply with the requirements of clause 1.9.1 shall result in disqualification of the Request for Proposal.

1.10 HOURS OF WORK

- .1 The Contractor shall comply with all pertinent legislation, regulations or by-laws regarding working hours. No Work shall be permitted on Saturdays, Sundays and statutory holidays without the approval of the Engineer.
- .2 Prior to starting the Work the Contractor shall submit to the Engineer in writing the proposed hours of work. The Engineer shall be advised in writing with 48 hours advance notice of any changes to the hours of work.
- .3 The Contractor is to provide for the Engineer's approval a proposed work plan for Saturdays, Sundays and statutory holidays 48 hours prior to the Work (Thursday) detailing the extent of Work and proposed resource assignment.
- .4 The Contractor shall work between the hours of 7:00 am to 6:00 pm. No Work shall be permitted outside of these hours without the approval of the Engineer.

1.11 SITE SAFETY

- .1 The Contractor shall provide a copy of the Site Specific Health and Safety Plan to the Engineer within 7 days after date of Notice to Proceed prior to undertaking any Work on the Site. The Site Specific Health and Safety Manual shall include the additional health and safety requirements outlined in Section 01 70 50 – *Site Specific Health and Safety*.
- .2 The Contractor shall ensure that the Work performed, the equipment supplied and all services provided under this contract, either by the Contractor or under sub-contracts, comply with all federal and provincial regulatory requirements, as well as the Site Specific Health and Safety Plan.

1.12 QUALITY OF WORKMANSHIP
EQUIPMENT, MATERIALS
AND SUBCONTRACTORS

- .1 All Work shall be carried out by competent tradespersons trained and experienced in the tasks assigned. All equipment, vehicles, tools, etc., are to be in good working order, well maintained and suitable for the Work to be done. All materials and consumables shall be new and in compliance with the Specifications. Subcontracted Work shall be awarded to firms with appropriate expertise, tradespersons, equipment and financial soundness to successfully fulfil their project commitments.
- .2 The Engineer reserves the right to investigate the suitability of any subcontractor proposed by the Contractor and reject such subcontractor if it is determined that they are not capable of successfully undertaking the task assigned.

1.13 QUALITY ASSURANCE
AND QUALITY CONTROL

- .1 Ensure that the Work is performed and completed in compliance with references, codes and specifications by implementing quality management techniques on the Site.
- .2 Provide access to and co-operate with the Engineer during Work inspections.
- .3 Provide timely notice to the Engineer requesting inspections when the Work is subject to inspections, testing or approvals by the Engineer and regulatory agencies.

1.14 TEMPORARY FACILITIES

- .1 Washroom facilities shall be provided by the Contractor.
- .2 Keep facilities clean and free from clutter and litter, so as to not present a hazard to areas of the property outside the Remedial Work Zone or adjacent properties and not provide grounds for complaints. Installations are to meet all municipal by-laws.
- .3 The proposed location and configuration of Site facilities must be submitted and approved by the Engineer prior to installation.
- .4 The Contractor shall make all necessary applications, obtain required permits and approvals, and pay all fees and charges for such additional facilities and their use.
- .5 Unless otherwise approved by the Engineer, parking of non-construction related and personal vehicles will generally not be permitted in the Remedial Work Zone, with the exception of the vehicles of the Contractor's supervisory personnel and the Engineer. These authorized

vehicles are not to disrupt the flow of Work.

- .6 Only signs approved by the Engineer shall be erected or posted on the Site.

1.15 CONSTRUCTION SERVICES

- .1 If additional public utility services are required, approval shall be obtained from the appropriate agencies for use of and tie-in to existing services, including power, sewer, telephone and water, as may be required. The Contractor shall also be responsible for the installation, maintenance and shutdown of services/facilities upon completion of the Work. There is no power or water supply available at either 16 Tauvette Street or P19 Leitrim Road.

1.16 WORK ACCESS

- .1 The Contractor shall access his/her assigned work area in such a way as to avoid damage to the property and areas outside the Remedial Work Zone, including inconvenience to the adjacent properties' owners or occupants. Haulage vehicles shall follow the predetermined trucking routes approved by the Engineer.
- .2 The Contractor shall obtain Road Occupancy Permits as may be required while undertaking the Work and obtain authorization for accessing the street from the Site with all project equipment. Site access is not to interfere with the current operations or public use of existing transportation routes.
- .3 Access to active Work areas shall be restricted to authorized personnel only. Throughout the course of the Work the Contractor shall maintain a system of Site security and controlled access to his/her assigned area. This system will:
 - .1 Maintain a list of persons authorized to enter active work areas;
 - .2 Prevent unwanted or unintentional entry into the work area; and,
 - .3 Supervise, control and document the access and egress of authorized persons to and from each work area.
- .4 The boundaries of the controlled access areas will be based on the construction Site limits and defined Contractor lay down areas.

-
- .5 The Contractor may be required to share project access roads and gates with other contractors and project personnel. The Contractor shall co-operate with others with regards to usage of such access and assist the Engineer with co-ordination as may be required.

1.17 PROTECTION OF
PRIVATE PROPERTY

- .1 The Contractor shall not encroach upon areas of the property outside the Remedial Work Zone and shall take such precautions and provide such protection as necessary to prevent any damage to adjacent areas during the work.
- .2 The Contractor is entirely responsible for all damage to adjacent areas, equipment, etc., arising from the Work and caused by negligence or any act by himself/herself or any person engaged on the Work including subcontractors, service companies and employees thereof.

1.18 SITE SECURITY

- .1 The Contractor shall be solely responsible for the security of his/her assigned work area. The proposed work area shall be defined by the Contractor, and submitted to the Engineer for approval. The NCC will not assume responsibility or liability for any loss or damage of materials, equipment, tools, consumables, temporary installations or personal items suffered by the Contractor, subcontractors, suppliers and/or any employees thereof. The Contractor shall provide reasonable access in areas under the Contractor's responsibility to all authorized firms, personnel and equipment.
- .2 The Contractor and subcontractor's personnel shall be restricted to the Remedial Work Zone, and are not to access private property and/or tenant occupied property outside of the designated work area, except for where his/her Work merges with another Contractor's Work. In this case, the Contractor shall advise the Engineer of the schedule of the merging Work and shall obtain approval from the Engineer before proceeding with this Work.

1.19 FIRE PREVENTION

- .1 Fire prevention instructions are to be included in the Site Specific Health and Safety Plan.

1.20 SITE SUPERVISION

- .1 Provide and post on-site the name and phone number of an authorized representative of the Contractor who can be contacted on a 24-hour basis, in case of an emergency.

1.21 SERVICE CLEARANCES
AND NOTIFICATION

- .1 Drawings are for reference only, and any services identified on such drawings may not be accurate or complete.
- .2 Prior to undertaking the Work, the Contractor shall notify all utility and service owners and municipalities to verify the locations of existing services including sewers, water mains, gas mains and all other underground and overhead installations, and shall obtain, when possible, certificates or written confirmation that they have visited the Site and have identified the locations of their respective services. The Contractor shall comply with all existing regulations and reasonable requests from the affected service companies pertaining to protective measures, inspections, temporary support, dismantling, reinstatement and safety.
- .3 The Contractor shall advise road authorities and obtain authorization prior to routing construction traffic onto roadways and/or restricting or changing in any way normal traffic patterns. Copies of all applications, certificates, licenses or other authorization forms are to be provided to the Engineer, as well as displayed in an appropriate location on the Site.
- .4 Copies of all applications, certificates, licenses or other authorization forms are to be provided to the Engineer, and displayed in an appropriate location on the Site.

1.22 PROTECTION OF
SERVICES, UTILITIES,
STRUCTURES AND
VEGETATION

- .1 Take due care during the course of the Work to avoid damage to existing pavement, ground cover, structures, equipment and utilities to be maintained. The Contractor is entirely responsible for all damage caused, intentionally or otherwise, by himself/herself, his/her employees, his/her subcontractors or any other person engaged by the Contractor to undertake Work under this Contract.
- .2 Sustain in place and protect from any damage any and all services to be maintained during the Contract in a manner approved by the Engineer and the respective service company or authority.

- .3 Protect from damage all vegetation including trees outside the Remedial Work Zone at 16 Tauvette Street and at P19 Leitrim Road. To the extent practicable, removal of trees within the Remedial Work Zone shall be limited. Submit a Site Preparation and Restoration Plan for all vegetation including trees within the Remedial Work Zones at 16 Tauvette Street and P19 Leitrim Road, as per Sections 01 11 00 – *Summary of Work* and 02 23 10 - *Clearing and Grubbing*.
- .4 Any damages to vegetation outside of the Remedial Work Zone or not included in the Site Preparation and Restoration Plan shall be fixed, or equivalent financial compensation provided, to the satisfaction of the Engineer and paid for by the Contractor.

1.23 EXISTING PROPERTY
BOUNDARY
MARKERS

- .1 Maintain or reinstate existing boundary property markers (survey bars) if damaged during the Work.

1.24 APPROVALS,
PERMITS, LICENCES
AND STANDARDS

- .1 The NCC is responsible for obtaining all authorizations as may be required under the Canadian Environmental Assessment Act.
- .2 The Contractor is responsible for obtaining a City of Ottawa Sewer Discharge Agreement, if necessary, and is fully responsible for complying with all of the conditions of these permits, including all chemical testing.
- .3 Other than .1 above, the Contractor shall secure, provide, pay for and maintain all permits, licences and approvals that may be required to undertake the work by federal, provincial, municipal and/or any other authority having jurisdiction. Please note that a MOECC Environmental Compliance Approval (ECA) is not required for use of In-Situ Activated Carbon Adsorption on NCC lands; however, it is considered an asset.

1.25 CONSTRUCTION
MAINTENANCE

- .1 The Contractor shall maintain in good working order all temporary facilities, construction fencing and gates, temporary access ways, supports, etc., for the duration of the Work. Deficiencies identified by the Engineer shall be immediately remedied to the satisfaction of the Engineer.

1.26 PUBLIC ROADS AND
PATHWAYS

- .1 This section applies to public roads and recreational pathways other than those reconstructed or modified as part of the Work.
- .2 Execute the Work in such a manner that the use of adjacent public roads and recreational pathways by vehicles and equipment engaged in the Work will not inconvenience or endanger public, cyclists, pedestrians and vehicular traffic, nor hinder the use of such facilities.
- .3 The Contractor shall provide all necessary flag persons, warning lights, signs and barricades to direct and protect vehicular and pedestrian traffic from vehicles assigned to the Work, entering or leaving the Site, in accordance with regulatory requirements and municipal standards. Road blockages due to the Work conducted shall be undertaken in accordance to regulatory requirements and municipal standards, including prior notification, application and payment of permits, signage and detour posting.
- .4 Haulage routes shall be restricted to those identified on the Urban and Rural Truck Routes Maps of the City of Ottawa. The Contractor shall follow predetermined trucking routes and restrictions, or as approved by the Engineer.
- .5 The Contractor shall ensure that there is no deposit and build-up of soil or other debris on road surfaces or recreational pathways due to his/her Work. Cleanup, if required, shall include the use of dust control measures and street sweeping. The Contractor shall proceed immediately with the road and/or pathway cleanups when requested by the Engineer or by municipal authorities.
- .6 The Contractor is responsible for dust control, as specified in Section 02 36 20 – *Dust and Soil Tracking Control*.

1.27 HOUSEKEEPING

- .1 Maintain all occupied Site areas in a neat and orderly fashion, free from accumulation of debris for the duration of the project. Waste materials, rubbish and debris shall not be allowed to accumulate. Under no circumstances shall soil be tracked beyond the confines of the Remedial Work Zone. There shall be no debris left or discarded in adjacent areas by the Contractor and/or his/her personnel, including but not limited to: roadways, parking areas, common or public areas and public property. Construction supplies, tools and equipment are to be organized and stored so as to maintain a safe and visually acceptable work site. The Contractor is to have on-Site only materials and equipment necessary to perform the Work.

1.28 ENVIRONMENTAL
CONTROLS

- .1 Only qualified Remediation Contractors are authorized to manage, supervise and undertake Remediation Work described herein including, but not limited to: excavation, loading, hauling, segregation, stockpiling and off-Site disposal of overburden material and water; water management; dust and soil tracking control, in-situ injection, and construction personnel health risk management associated with the Remediation Work.
- .2 Environmental monitoring and compliance of all activities on the Remedial Work Zone shall be governed by Sections 01 11 00 – *Summary of Work*, 01 35 00 – *Special Procedures for Contaminated Sites*, 01 56 10 – *Environmental Protection*, 02 23 10 – *Clearing and Grubbing*, 02 32 00 – *Excavation Water Management*, 02 32 20 – *Excavation of Overburden and Other Materials*, 02 31 40 – *Filling and Backfilling* and 02 36 20 – *Dust and Soil Tracking Control*. The provisions detailed in these sections apply to all personnel assigned to the Work or present on the Site.
- .3 Conduct all activities in an environmentally responsible manner, in compliance with all references and codes and meet current industry standards in such a manner as to reasonably minimize impact upon the environment.
- .4 The Contractor shall be responsible for cooperating with the Engineer and other project personnel to ensure that all Site activities comply with the provisions of the Specifications.
- .5 The Contractor shall also cooperate with the Engineer's staff in obtaining bulk samples and field testing for contaminants.
- .6 Oil, grease, gasoline, diesel and other potential hazardous materials shall be stored in a manner acceptable to the Engineer and in compliance with the Ontario Environmental Protection Act and the Canadian Environmental Protection Act.
- .7 All liquid industrial wastes, including impacted groundwater, waste oil and fuel, shall be registered with the Ontario Ministry of the Environment and Climate Change by the Contractor, as necessary, under Ontario Regulation 347 and transported by a licensed waste carrier to a MOECC waste disposal site certified to accept such wastes.
- .8 The Spill and Emergency Control Plan provided by the Contractor for review by the Engineer shall include a written procedure, including location map and spill prevention, containment and response, for on-site equipment re-fueling

1.29 GARBAGE AND REFUSE

- .1 The Contractor shall be responsible for the disposal of all garbage and refuse from within the Remedial Work Zone. The Contractor shall ensure that his/her Work force, including subcontractors and service personnel, will be responsible for any cleanup of debris caused by his/her personnel.

1.30 DUST CONTROL

- .1 Implement all necessary control measures to minimize dust generated by any and all activities, as indicated in Section 02 36 20 - *Dust and Soil Tracking Control*.

1.31 TRACKING CONTROL

- .1 Take all necessary precautions to prevent the tracking of soil onto municipal/provincial/federal roadways, public and private properties. All moving of equipment from the optional excavation area at 16 Tauvette Street is to be controlled through a decontamination zone, which may include a decontamination pad, as detailed in the Specifications. The Contractor shall immediately clean all debris and dust deposits resulting from the Work, to the satisfaction of the Engineer, using dust control measures, as detailed in Section 02 36 20 – *Dust and Soil Tracking Control*.
- .2 Comply with Section 02 36 20 – *Dust and Soil Tracking Control*.

1.32 SURFACE WATER CONTROL

- .1 Take all necessary precautions to prevent contaminated water from entering the storm and sanitary sewer systems or discharge beyond or outside the Remedial Work Zone along surface routes, including compliance with the City of Ottawa Sewer Use By- Law. The Contractor shall seal all manhole covers and construct sludge traps around all storm water catch basins. The Contractor shall also inspect and/or clean out all sludge traps on a scheduled basis to ensure their satisfactory performance.
- .2 Comply with Sections 01 35 00 – *Special Procedure for Contaminated Sites* and 02 32 00 – *Excavation Water Management*.

1.33 ADVERSE WEATHER CONDITIONS

- .1 Site operations shall be suspended at any time when, in the opinion of the Engineer, satisfactory material control and/or Site safety cannot be maintained on account of rain, wind or other unsatisfactory weather conditions.

1.34 EMERGENCY SPILL

- .1 All spills should be dealt with in the following manner:
 - .1 In accordance with the *Ontario Environmental Protection Act* and the *Canadian Environmental Protection Act*;
 - .2 The responsible party shall clean up the spill immediately using all resources required to bring the Site back to pre-spill conditions;
 - .3 The Contractor shall submit to the Engineer for his/her review a Spill and Emergency Control Plan within 7 days of the Contract award date. No Work shall proceed until the Engineer has provided the Contractor with written approval to proceed;
 - .4 The Contractor shall have cleanup materials on Site to deal with all types of potential spills;
 - .5 Notifications, as required by the Ontario Environmental Protection Act and the Canadian Environmental Protection Act, to the Engineer and to the NCC 24 hour Emergency Communication Service (613-239-5353).
- .2 In addition to Clause 1.34.1, preparation for and response to emergency spills shall be governed by the Sections 02 32 00 – *Excavation Water Management*, 01 56 10 – *Environmental Protection* and 02 32 20 – *Excavation of Overburden and Other Materials*. The provisions detailed in these sections apply to all personnel assigned to the Work or present on the Site.
- .3 The Contractor shall have a written procedure incorporating the provisions of Sections 02 32 00 – *Excavation Water Management*, 01 56 10 – *Environmental Protection* and 02 32 20 – *Excavation of Overburden and Other Material* for responding to an emergency spill within the Remedial Work Zone, the fueling pad, on adjacent lands, on public roadways and in public areas. The procedure shall comply with existing regulatory requirements and Specifications and shall address the need for immediate control and containment of the spilled product, as well as cleanup of all affected areas and monitoring for remnant contaminants. The procedure shall provide specific details for personnel training and protection, controlling entry into sewer systems, cleanup and verification (by the Engineer and at the expense of the Contractor) of decontamination of affected areas, reporting and documentation.

- .4 The Contractor shall have available at all times suitable materials (e.g., sawdust, wood chips, absorbents, brooms, etc.) for the cleanup of fuel spills. Any spillage of oil, grease, gasoline, diesel or other hazardous material shall be controlled by the Contractor, as required under *The Canadian Environmental Protection Act, the Ontario Environmental Protection Act*, and reported immediately to the Engineer. Disposal of cleanup wastes shall be in accordance with applicable legislation.

1.35 PROJECT CLOSEOUT

- .1 At or prior to Substantial Completion, remove surplus products, tools, construction machinery and equipment not required for performance of any remaining Work.
- .2 Compile submittals, documents executed by subcontractors, suppliers and manufacturers, and submit this material to the Engineer.
- .3 Inspect the Work to ensure it is complete, that major and minor construction deficiencies and defects are corrected, and that the Site is clean and in a suitable condition. Notify the Engineer in writing of Substantial Completion of the Work and request an inspection. Cooperate with the Engineer during the inspection and correct deficiencies.

PART 2 – PRODUCTS

2.1 EQUIPMENT

- .1 The Contractor shall supply, operate and maintain equipment, tools and supplies suitable for the Work required to be undertaken, clean, free of defects and in compliance with regulatory and safety requirements. The Contractor shall provide:
- i) All fuel and lubricants required to operate the equipment; and
 - ii) All maintenance and repairs necessary to keep equipment and tools in good condition and working order.
- .2 No bulk storage of fuel, oil or other lubrication products will be permitted on the Site, unless explicitly approved in writing by the Engineer. Equipment fueling and oil change operations shall be undertaken in an area specified by the Engineer and only after suitable means of spill containment and cleanup have been implemented by the Contractor.
- .3 The Contractor shall undertake regular preventive

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maintenance on major equipment off-hours to avoid delays in the Work. Should a breakdown of major equipment occur, the Contractor shall immediately arrange for repair or replacement of the defective unit. Under no circumstances will delays associated with equipment breakdown be allowed to exceed one day (24 hours). All costs associated with repairs or replacement shall be at the expense of the Contractor, including project delays.

PART 3 – EXECUTION

NOT USED

END OF
SECTION

PART 1 – GENERAL

1.1 GENERAL

All conditions of the Contract and Section 01 00 10 – *General Requirements* apply to this Section.

1.2 RELATED SECTIONS

Section 01 35 00 – Special Procedures for Contaminated Sites

Section 01 56 10 – Environmental Protection

Section 02 31 40 – Filling and Backfilling

Section 02 32 00 – Excavation Water Management

Section 02 32 20 – Excavation of Overburden and Other Materials

Sections 02 36 20 – Dust and Soil Tracking Control

Section 02 23 10 – Clearing and Grubbing

Section 01 70 50 – Site Specific Health and Safety

Section 02 22 60 – Removal of Existing Asphalt Pavement

1.3 WORK COVERED BY CONTRACT DOCUMENTS

Work under this Contract comprises of Environmental Site Remediation at two independent sites. Work includes: In-Situ Activated Carbon Adsorption to remediate Petroleum Hydrocarbon and/or Volatile Organic Compound Impacted Soil and/or Groundwater at 16 Tauvette Street, Ottawa, ON and at NCC Parking Lot P19 located on Leirrim Road west of Ramsayville Road in Ottawa, ON (P19 Leirrim Road). The in-situ remedial program at 16 Tauvette Street may be combined with source removal by excavation, if desired. Refer to Figures 1 and 3 for Site locations.

1.4 CONTRACT METHOD

Complete work as per contract method stated in the Request for Proposals.

1.5 DEFINITIONS

- .1 **In-situ Activated Carbon Adsorption:** an in-situ environmental remediation technology used for soil and/or groundwater remediation to reduce the concentrations of targeted environmental contaminants. In-situ Activated Carbon Adsorption technology may include introduction of approved microbes and/or amendments to enhance biodegradation and/or chemical reduction processes.

- .2 **Petroleum Hydrocarbon Impacted Soil:** soils containing concentrations of benzene, toluene, ethylbenzene, xylenes (BTEX), and/or petroleum hydrocarbon (PHC) fractions F1 through F4 exceeding Remedial Objectives - Petroleum Hydrocarbons.
- .3 **Petroleum Hydrocarbon Impacted Groundwater:** groundwater containing concentrations of benzene, toluene, ethylbenzene, xylenes (BTEX), and/or petroleum hydrocarbon (PHC) fractions F1 through F4 exceeding Remedial Objectives. – Petroleum Hydrocarbons.
- .4 **Volatile Organic Compound Impacted Soil:** soils containing concentrations of one or more volatile organic compounds (VOC) exceeding Remedial Objectives – Volatile Organic Compounds.
- .5 **Volatile Organic Compound Impacted Groundwater:** groundwater containing concentrations of one or more volatile organic compounds (VOC) exceeding Remedial Objectives – Volatile Organic Compounds.
- .6 **Remedial Objectives:** analysed concentrations in soil and/or groundwater are equal to or lower than those in Tables 1 and 2.

Table 1: Remedial Objectives – Petroleum Hydrocarbons

Contaminant of Concern	Remedial Objective – Soil (µg/g)	Remedial Objective – Groundwater (µg/L)
Benzene	0.0068	5
Toluene	0.08	24
Ethylbenzene	0.018	2.4
Xylenes	2.4	300
F1 PHC (-BTEX)	65	750
F2 PHC	150	150
F3 PHC	1,300	500
F4 PHC	5,600	500

Table 2: Remedial Objectives – Volatile Organic Compounds

Contaminant of Concern	Remedial Objective – Soil (µg/g)	Remedial Objective – Groundwater (µg/L)
Dichloroethane, 1,1- (1,1-DCA)	0.47	5
Dichloroethane, 1,2- (1,2-DCA)	0.05	0.5
Dichloroethylene, 1,1- (1,1-DCE)	0.05	0.5
Dichloroethylene, cis-1,2- (c-1,2-DCE)	1.9	1.6
Dichloroethylene, trans-1,2- (t-1,2-DCE)	0.084	1.6
Tetrachloroethylene (PCE)	0.2	0.5
Trichloroethylene (TCE)	0.01	0.5
Vinyl Chloride	0.02	0.5

- .7 **Target Zone 16 Tauvette Street:** area of Petroleum Hydrocarbon Impacted Soil and Groundwater (lateral and vertical extent to be confirmed by the Contractor) at the following locations within 16 Tauvette Street: in the vicinity of a former underground fuel storage tank (UST Area #1) in the west portion of the former greenhouse complex parking lot and in the vicinity of a former fuel supply line associated with an above ground fuel storage tank (AST Area) in the east portion of the former greenhouse complex parking lot.
- .8 **Target Zone P19 Leitrim Road:** area of Volatile Organic Compounds Impacted Soil and Groundwater (lateral and vertical extent to be confirmed by the Contractor) in the vicinity of the NCC parking lot known as P19, extending from the area north of the parking lot to the east and southeast in an arc-like fashion to immediately north of Leitrim Road.
- .9 **Target Dosage:** mass of activated carbon and any ancillary amendments, the number of injection locations and the targeted injection depths designed by the Contractor to remediate Petroleum Hydrocarbon and/or Volatile Organic Compound Impacted Soil and Groundwater to concentrations below Remedial Objectives.
- .10 **Site:** within the context of these Specifications, the term Site refers to the former greenhouse complex parking lot area at 16 Tauvette Street and/or the lands to the north and to the east of NCC parking lot P19, and north of Leitrim Road, unless otherwise stated.
- .11 **Remedial Work Zone:** within the context of these Specifications, the term Remedial Work Zone refers to the areas identified in Figure 2 (16 Tauvette Street) and Figure 4 (P19 Leitrim Road).
- .12 **Substantial Completion:** within the context of these Specifications, the term Substantial Completion means the Work is complete and the Site has been restored to a state whereby it is or may be used for its intended purpose, the Soil and Groundwater Verification Sampling Program demonstrates soil and groundwater satisfies Remedial Objectives, and is so accepted by the Owner. The Owner retains the right to independently verify the results of the Work and withhold approval on the basis of these results.
- .13 **Engineer:** within the context of these Specifications, the term Engineer refers to personnel appointed by the National Capital Commission or its consultant acting on its behalf. The Engineer will provide recommendations and technical guidance to the Owner for the enforcement of these specifications by the Owner.
- .14 **Contractor:** The Contractor is the person or entity identified as such in the Contract. The term Contractor means the Contractor or the Contractor's authorized representative as designated to the Owner in writing.
- .15 **Owner:** the Owner is the National Capital Commission (NCC) and includes the Owner's authorized agent or representative as designated to the Contractor in writing, but does not include the Consultant.

1.7 BACKGROUND AND SITE
CONDITIONS – 16 TAUVETTE STREET

- .1 Remediation activities will occur within the former greenhouse complex parking lot area at 16 Tauvette Street in Ottawa, ON. Refer to Figure 1.
- .2 The Remedial Work Zone at 16 Tauvette Street is located within an asphalt parking lot and vegetated areas of the former greenhouse complex. It is bounded to the north by active agricultural land, to the west by a residence / active agricultural land, fallow agricultural land to the south and Tauvette Street to the east. Refer to Figure 2.
- .3 The 16 Tauvette Street Site includes a parking lot that formerly serviced 8 greenhouses and an office structure. Associated infrastructure included two (2) underground petroleum storage tanks (USTs) and four (4) above ground petroleum storage tanks (ASTs). The USTs were removed in the 1980s. Site buildings were demolished (foundations may remain below ground) and all associated infrastructure including ASTs were removed from the Site in 2013. The Remedial Work Zone of 16 Tauvette Street includes areas currently used as a parking lot for Site visitors.
- .4 Environmental site assessments have identified Petroleum Hydrocarbon Impacted Soil and Groundwater in the vicinity of a former underground fuel storage tank (UST Area #1) and in the vicinity of a former fuel supply line associated with an above ground fuel storage tank (AST Area). Refer to Figure 2 for former infrastructure locations.
- .5 Historical remedial activities at the Site have included partial excavation of heavily impacted soils in the former AST Area and Monitored Natural Attenuation of former UST Area #1. Residual petroleum hydrocarbon impacts above Remedial Objectives remain in soil and groundwater in both locations at the Site.
- .6 Recent testing indicates contaminated soil would be classified as solid non-hazardous waste for the purpose of off-site landfill disposal in Ontario.
- .7 Investigations in the Remedial Work Zone have described soil conditions as sand and gravel fill to depths ranging from 0.5 to 2.4 metres below ground surface (m bgs) overlying clay to at least 9 m bgs. Bedrock has not been encountered during any investigations in the Remedial Work Zone.
- .8 The depth to shallow groundwater in the area of impact ranges from approximately 0.6 to 2.3 m bgs. The water table is generally positioned within clay soils or near the fill/clay interface. The interpreted groundwater flow direction in the overburden is to the north/northeast. Petroleum Hydrocarbon Impacted Soil has been identified from near surface to a depth of approximately 6.1 m bgs.

- .9 In-situ Activated Carbon Adsorption has been selected as the preferred remedial technology for 16 Tauvette Street. However, at the Contractor's discretion, the remedial program at UST Area #1 may be combined with source area remediation via conventional excavation methods if the Contractor determines this would provide cost-benefit to the NCC and/or is required to satisfy the specified Remedial Objectives.
- .10 Following completion of the remedial program, soil and groundwater in the vicinity of UST Area #1 and former AST Area must satisfy Remedial Objectives – Petroleum Hydrocarbons.
- .11 Remediation of 16 Tauvette Street may commence immediately after contract award. Substantial Completion, including remedial efforts, Site reinstatement and verification, must be complete by March 31, 2018.

1.8 BACKGROUND AND SITE CONDITIONS – P19 LEITRIM ROAD

- .1 Remediation activities will occur to the north and to the east of NCC parking lot P19, north of Leitrim Road, in Ottawa, ON. Refer to Figure 3.
- .2 The Remedial Work Zone at P19 Leitrim Road consists of a gravel parking lot and forested conservation land. It is bounded to the north, east and west by mature forest and walking trails and Leitrim Road to the south. Refer to Figure 4.
- .3 The P19 Leitrim Road Site was formerly occupied by a building complex housing various federal, provincial and municipal operations. Site buildings and associated infrastructure were demolished between 1998 and 2001 (foundations may remain below ground). The property was converted to conservation land, and now supports recreational trails within the NCC Greenbelt.
- .4 The P19 Leitrim Road Site includes a demarcated flat swamp which is within the Remedial Work Zone. Refer to Figure 4. Access to this area will be permitted for remedial activities. However, mitigation measures specific to the flat swamp must be included in the Environmental Protection Plan, as detailed in Clause 1.13.2.4.
- .5 In general, subsurface soil conditions in the Remedial Work Zone consist of brown sand with trace silt overlying grey silty clay to clay. The native sand and silty clay deposits are well graded. The native sand deposits extend to depths in excess of 6.1 m bgs. . The silty clay to clay deposits extend to depths in excess of 9.1 m bgs. Bedrock has not been encountered during previous investigations at the Remedial Work Zone.
- .6 Three distinct overburden groundwater flow regimes exist beneath the Site. The first resides within the shallow overburden sand unit, the second within the top portion of the clay/silty clay unit, and the third is in the deep overburden, solely in the clay layer.
- .7 Environmental site assessments have identified subsurface chlorinated volatile organic compound impacts, mainly

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trichloroethylene (TCE) and its associated degradation products including cis-1,2-dichloroethylene (c-1,2-DCE) and vinyl chloride (VC) in groundwater, and to a lesser extent in soil at the Site.

- .8 Impacted soils comprise of a discontinuous plume, predominately beneath the 'hot spots' of the groundwater plume in the sand aquifer.
- .9 The groundwater plume resides in an unconfined shallow medium to coarse sand aquifer, at depths ranging from 0.5 to 4.3 m bgs. The plume is travelling in a southeasterly direction, towards the property boundary.
- .10 To date, remedial activities have not been completed at the Site.
- .11 In-situ Activated Carbon Adsorption has been selected as the preferred remedial technology for the site. Source area remediation by excavation is not permitted.
- .12 Following completion of the remedial program, soil and groundwater must satisfy Remedial Objectives – Volatile Organic Compounds.
- .13 Remediation of P19 Leitrim Road may commence immediately after contract award. Substantial Completion, including remedial efforts, Site reinstatement and verification, must be complete by March 31, 2018.

1.9 SUPPORTING DOCUMENTATION – 16 TAUVETTE STREET

- .1 The Contractor will be provided with an electronic version of the following supporting documentation:
 - .1 Supplemental Environmental Site Assessment, 16 Tauvette Street, Ottawa, ON. Report by SNC-Lavalin Inc. dated February, 2017.
 - .2 Groundwater (Natural Attenuation) Monitoring Program, 16 Tauvette Street, Ottawa, Ontario. Report by Arcadis Canada Inc. dated September 30, 2015.
 - .3 Removal of PHC-Contaminated Soil, 16 Tauvette Street (NCC Property Asset #6976), Ottawa, Ontario. Report by Decommissioning Consulting Services dated August 28, 2014.
 - .4 Phase II Environmental Site Assessment Update, 16 Tauvette Street (NCC Property Asset #6976), Ottawa, ON. Report by Decommissioning Consulting Services dated May 31, 2013.
 - .5 Screening Level Risk Assessment and Remedial Option Feasibility Study - Former UST Area, 16 Tauvette Street, Ottawa, Ontario, NCC Property Asset No. 6976. Report by Intera Engineering Ltd. dated July, 19, 2008.

1.10 SUPPORTING DOCUMENTATION
– P19 LEITRIM ROAD

- .1 The Contractor will be provided with an electronic version of the following supporting documentation:
1. Summary of Results – Drive Point Installation and Sampling, NCC Property Asset 97390, P19, Leitrim Road, Ottawa, ON. Report by Amec Foster Wheeler, February 2017.
 2. Phase II Environmental Site Assessment, NCC Property Asset 97390 P19 Leitrim Road Ottawa Ontario. Report by Amec Foster Wheeler, March 2016.
 3. 2014 Groundwater Monitoring Program, NCC Property Asset 97390 P19 Leitrim Road Ottawa Ontario. Report by Amec Foster Wheeler, March 2015.
 4. Final Report – Supplemental Soil and Groundwater Sampling, NCC Property Asset 97390, Parking Lot 19. Report by Stantec Consulting Ltd., October 24, 2013.
 5. Final Report - National Capital Commission, NCC Property Asset No. 97390, Leitrim Road, Ottawa, Ontario, 2011 Groundwater Monitoring Program. Report by SNC-Lavalin Environment, January 20, 2012
 6. Final Report National Capital Commission, NCC Property - Asset No. 97390, Leitrim, Road, Ottawa, Ontario, Supplemental Groundwater Delineation Activities. Report by SNC-Lavalin Environment, March 16, 2011.

1.11 RELIANCE ON EXISTING INFORMATION

- .1 The information provided in Sections 1.7, 1.8, 1.9 and 1.10 is provided for the Contractor's reference only; the Owner does not warrant the accuracy or completeness of the information. The Contractor may, at its cost and discretion, confirm Site conditions to its own satisfaction upon contract award.

1.12 WORK METHODOLOGY

- .1 The approach of the remediation at 16 Tavette Street is In-Situ Activated Carbon Adsorption of Petroleum Hydrocarbon Impacted Soil and Groundwater at UST Area #1 and AST Area, with discretionary source area remediation at UST Area #1 via conventional excavation methods.
- .2 The approach of the remediation at P19 Leitrim Road is In-Situ Activated Carbon Adsorption of Volatile Organic Compound Impacted soil and Groundwater.

1.13 SCOPE OF WORK

- .1 The Contractor shall provide all supervision, labour, equipment, tools, materials, consumables, transportation, permits / approvals, power, water, and other services as are necessary for undertaking and completing the Work. There are no buildings, washroom facilities, power or water services available for Contractor's use at either Site.

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- .2 The required Work to be undertaken by the Contractor under the Contract will include, but not be limited to, the following activities:
 - .1 Provide a Final Remedial Design of the remedial program, including, but not limited to descriptions of: implementation and remedial schedule, in-situ injection method, equipment required, rationale for selection of injection locations, injection depths, injection media composition and manufacturer specifications, Target Dosages, proposed delivery concentrations and rates to achieve the Target Dosage, dosage and composition of any amendments included in the injectate to promote biodegradation or chemical reduction, field performance measurements that will be used to demonstrate successful application of the Target Dosage in the Target Zones, risks and mitigations, quality assurance/quality control monitoring approach, and the proposed limits and volume of source area to be excavated at 16 Tauvette Street, if proposed. The Final Remedial Design must include a Site Layout Plan showing the proposed placement of injection locations and proposed excavation area(s), as applicable. The Final Remedial Design is to be provided to the Owner for review at least ten working days prior to mobilization to the Site.
 - .2 Site Preparation and Restoration Plan, including, but not limited to the following activities to allow access to the work area: Site modification requirements, asphalt removal, tree and vegetation removal, equipment and materials required, utility disruptions, restoration strategies, environmental and infrastructure protection strategies, plans to minimize stripping of topsoil and vegetation, construction plans and materials including grading, backfilling, off-site disposal locations of waste materials and methods used to restore Site to pre-construction conditions.
 - .1 To the extent practicable, removal of trees within the Remedial Work Zone shall be limited. The number, species and size [trunk diameter at breast height (DBH)] of any trees being removed must be documented in the Site Preparation and Restoration Plan.
 - .2 The Site Preparation and Restoration Plan must identify any monitoring wells within the Remedial Work Zone to be altered or decommissioned. If maintenance of existing monitoring wells is deemed to impede remedial efforts, monitoring wells may be decommissioned (abandoned). Decommissioning of any existing monitoring wells shall be in accordance with Ontario Regulation 903 and in advance of remedial work.
 - .3 At P19 Leitrim Road, the Site Preparation and Restoration Plan must include a Site Layout Plan clearly indicating the limits of the Remedial Work Zone. During site preparation Work, these limits must be surveyed and staked in the field with a maximum 10 metre spacing between stakes.
 - .4 At 16 Tauvette Street, reinstatement of pavement is not required. Site reinstatement details as per Section 02 31 40 - *Filling and Backfilling*.
 - .3 Soil and Groundwater Management Plan, including, but not limited to: methodology for managing excavated contaminated soil including segregation and stockpiling (16 Tauvette Street only, if required), staging areas and

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- sequencing, proposed methodology for dewatering, if required, groundwater and surface water management strategies, and off-site disposal of solid and liquid waste materials.
- .4 Environmental Protection Plan, including, but not limited to: description of the Contractor's actions in case of breakdown, or other problem, erosion and sediment control, dust and soil tracking control, waste management and complete list of wastes, including waste registration numbers as required by provincial regulations that will be generated by activities, information on proposed technology including possible environmental impacts. If work is to occur within the flat swamp at P19 Leitrim Road, the Environmental Protection Plan must also include, but not be limited to, erosion and sediment control, vegetation removal / protection and compaction, as applicable.
 - .5 Site Specific Health and Safety Plan, including Spill and Emergency Control Plan, name and phone number of Site supervisory Health and Safety Officer, schedule for safety meetings and a copy of the Contractor's Safety Manual.
 - .6 Soil and Groundwater Verification Sampling Plan, including, but not limited to description of: verification sampling schedule, sample collection and equipment decontamination methods, rationale for selection and distribution of soil and groundwater sampling locations, sampling depths, laboratory parameters, methodologies and accreditation for all analyses. The Soil and Groundwater Verification Sampling Plan shall include a quality assurance and quality control (QA/QC) program designed to minimize possible cross-contamination during sample collection, handling, shipping and analysis and a Site plan showing the placement of all proposed soil and groundwater sampling locations. The Soil and Groundwater Verification Sampling Plan is to be provided to the Owner for review at least ten working days prior to its initiation.
 - .7 Obtain all necessary permits and approvals to undertake the project. Please note that a MOECC Environmental Compliance Approval (ECA) is not required for use of In-Situ Activated Carbon Adsorption on NCC lands; however, it is considered an asset.
 - .8 Mobilization of equipment and materials.
 - .9 Site preparation and remediation as per the Site Preparation and Restoration Plan, Final Remedial Design, Soil and Groundwater Management Plan, Environmental Protection Plan and Site Specific Health and Safety Plan. All modifications that deviate from these Plans shall be reviewed and approved by the Engineer prior to implementation.
 - .10 Source removal via conventional excavation methods, if selected to complement the remedial program at 16 Tauvette Street, including, but not limited to: loading, transportation, end disposal of contaminated soil to an MOECC approved waste disposal facility identified by the Contractor and approved by the Engineer, management of contaminated groundwater during excavation activities, as required, backfilling and grading of all disturbed areas and surveying.

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- .11 The Contractor will provide the Engineer with reports of field performance measurements demonstrating compliance with the Final Remedial Design.
- .12 Soil and Groundwater Verification Sampling Program, as per the Soil and Groundwater Verification Sampling Plan. In execution of the soil and groundwater verification sampling program:
 - .1 Soil verification boreholes are to be backfilled with bentonite; backfilling with soil cuttings will not be permitted. Restoration at surface must be appropriate for the surrounding area with boreholes completed in paved areas restored at surface with gravel and topsoil applied at surface in vegetated areas.
 - .2 Existing monitoring wells at the Site may be accessed for the purposes of verification sampling. Any monitoring wells installed shall be in accordance with Ontario Regulation 903, including steel protective cover. Protective covers shall be flush to grade in paved areas and have a minimum stick up of 0.5 m in vegetated areas, unless directed otherwise by the Engineer. The Contractor will not be required to decommission any monitoring wells installed as part of the Soil and Groundwater Verification Sampling Program.
 - .3 Discrete samples for laboratory analysis shall be collected in the field following protocols designed to minimize the loss of volatile constituents and using laboratory supplied sampling containers. Soil or groundwater samples collected as composites will be deemed to not satisfy the requirements of the Soil and Groundwater Verification Sampling Program.
 - .4 Final verification laboratory analyses are to be conducted by a laboratory accredited by the Canadian Association for Laboratory Accreditation (CALA) or equivalent Canadian certification for all analytical parameters.
 - .5 Final verification laboratory analyses are to be performed in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Canadian Council of Ministers of the Environment (CCME) Canada-Wide Standard for Petroleum Hydrocarbons in Soil and supporting documents, as applicable.
 - .6 Detection limits for all analyses must be equal to or lower than the Remedial Objective for each parameter.
 - .7 A report detailing the results of the Soil and Groundwater Verification Sampling Program must be provided to the Owner. The report shall include, but is not limited to: a detailed description of field methodologies followed, scale drawing(s) illustrating sampling locations in relation to Site

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features, tabulated analysed soil and groundwater concentrations with comparisons to Remedial Objectives, borehole logs, water level measurements, copies of laboratory certificates of analyses and results of the quality assurance/quality control program.

- .8 Restoration of the Site to conditions pre-approved in the Site Preparation and Restoration Plan. Any removal or damage to site infrastructure or features not as per the Site Preparation and Restoration Plan shall be reinstated, replaced, repaired and/or compensated at the Contractor's expense.
- .9 De-mobilization of all equipment, materials and constructed features and closeout, including off-site disposal of any wastes. All vegetated areas should be free of debris as approved by the Engineer.

1.14 WORK SEQUENCE AND SCHEDULE

- .1 Complete the Work to accommodate the NCC schedule for completion
- .2 Substantial Completion of all Work, including remedial efforts, Site reinstatement, verification and demobilization, by March 31, 2018.

1.15 CONTRACTOR USE OF PREMISES

- .1 With the exception of the limitations indicated in paragraph .2 below, the Contractor has unrestricted use of the Remedial Work Zones, within the parameters set forth in the Contract General Conditions, Specifications and Figures, during each active phase of the of work. The Remedial Work Zones are shown in Figures 2 and 4.
- .2 Coordinate use of premises under direction of Engineer.

1.16 SUBMITTALS

- .1 Prior to mobilization of any equipment or materials to the Site, the Contractor shall submit the following documents, for the Engineer's information and approval:
 - .1 Final Remedial Design, including Construction Schedule and Site Layout Plan;
 - .2 Site Preparation and Restoration Plan;
 - .3 Soil and Groundwater Management Plan;
 - .4 Environmental Protection Plan;
 - .5 Spill and Emergency Control Plan
 - .6 Site-Specific Health and Safety Plan
 - .7 Soil and Groundwater Verification Sampling Plan;
 - .8 Laboratory certificates of analyses for proposed imported fill material sources.
- .2 Submittals for Progress Meetings which are to be carried out weekly during active field work phases of the project are to be provided to the Engineer at least 24 hours prior to scheduled

progress meetings, as follows:

- .1 Copies of daily transport manifests, weigh bills, bills of lading, disposal receipts and reports of quantities of work executed associated with excavation and/or backfilling work, if applicable;
- .2 Daily water pumping and discharge volumes and rates, if applicable;
- .3 Weekly copies of Site entry and work area logbooks with information on worker and visitor access; and,
- .4 Any other information required by the Engineer or relevant to the agenda of the upcoming progress meeting.

1.17 DOCUMENTS
REQUIRED

- .1 Maintain at Site, one copy of each of the following:
 - .1 Final Remedial Design;
 - .2 Contract Drawings;
 - .3 Specifications;
 - .4 Addenda;
 - .5 Reviewed submittals;
 - .6 Change orders;
 - .7 Field test reports;
 - .8 Copy of approved schedule;
 - .9 Health and Safety Plan and other safety related documents;
 - .10 Other documents, as specified.

PART 2 – PRODUCTS NOT USED

PART 3 – EXECUTION

NOT USED

END OF
SECTION

PART 1 – GENERAL

1.1 GENERAL

- .1 All conditions of the Contract and Section 01 00 10 – *General Requirements* apply to this Section.
- .2 The Contractor shall execute the work in a manner that meets or exceeds the requirements set out in Clause 1.8 of Section 01 00 10 – *General Requirements*.

1.2 RELATED WORK

- .1 Section 01 11 00 – *Summary of Work*
- .2 Section 02 23 10 – *Clearing and Grubbing*
- .3 Section 02 32 00 – *Excavation Water Management*
- .4 Section 02 32 20 – *Excavation of Overburden and Other Materials*
- .5 Section 02 31 40 – *Filling and Backfilling*
- .6 Section 02 36 20 – *Dust and Soil Tracking Control*

1.3 REFERENCE STANDARDS

- .1 Ontario Provincial Standard Specifications (OPSS 805), OPSD-219.110
- .2 City of Ottawa Sewer Use By-Law 2003-514
- .3 Ontario Regulation 387/04 Water Taking
- .4 Canadian Environmental Protection Act and Regulations
- .5 Ontario Environmental Protection Act, R.S.O. 1990 and Regulations
- .6 Ontario Water Resources Act, R.S.O. 1990 and Regulations
- .7 Ontario Regulation 153/04 – Records of Site Condition Part XV.1 of the Act & Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act.
- .8 Canadian Council of Ministers of the Environment Documentation

1.4 OUTLINE OF WORK

- .1 Provide all supervision, labour, equipment, tools, materials, consumables, transportation and other services necessary for undertaking and completing the work detailed and specified herein, including but not limited to:
 - .1 Appropriate submittals, water management and control, equipment and personnel decontamination, dust and particulate control, pollution control, erosion and sediment control, progress cleaning, final decontamination, materials/waste removal and disposal.

1.5 SEQUENCING AND SCHEDULING

- .1 Excavation work shall not commence until all mitigation measures in PART 3 of this Section are in place.
- .2 Excavation of overburden and other material at 16 Tauvette Street, if required, shall be carried out as per Section 02 32 20 – *Excavation of Overburden and Other Materials* and Section 02 32 00 – *Excavation Water Management*.

1.6 SUBMITTALS

- .1 Site Layout: Within ten working days of date of *Notice to Proceed* and prior to the mobilization to Site, submit site layout drawings showing existing conditions and facilities, construction facilities and temporary controls to be provided by the Contractor, as listed in Section 01 00 10 – *General Requirements*.

PART 2 – PRODUCTS

2.1 MATERIALS

- .1 Refer to Section 02 31 40 – *Filling and Backfilling*, Clause 2.1.

2.2 EROSION AND SEDIMENT CONTROL

- .1 Provide and maintain temporary measures, which may include but are not limited to: silt fence barriers, straw bales, and any other construction required to prevent erosion and migration of silt, mud, sediment, and other debris off-Site or to other areas of the Site where damage might result, or that might otherwise be required by Laws and Regulations. Ensure that sediment control measures are available during construction. Installation of the erosion and sedimentation control measures should be in accordance with Ontario Provincial Standard Specifications (OPSS 805, OPSS-219.110).

PART 3 – EXECUTION

3.1 DUST AND PARTICULATE CONTROL

- .1 Execute work so as to minimize raising dust from operations and prevent dust from spreading to adjacent areas.
- .2 Implement and maintain dust and particulate control measures, as deemed necessary by the Engineer during construction and in accordance with provincial and municipal regulations and with Section 02 36 20 – *Dust and Soil Tracking Control*.

3.3 POLLUTION CONTROL

- .1 Provide methods, means and facilities to prevent contamination of soil, water and the atmosphere from construction operations.
- .2 Spills should be managed in accordance with the applicable regulatory requirements listed in Section 01 00 10 - *General Requirements*, Clause 1.8 (References and Codes) and Clause 1.34 (Emergency Spill).
- .3 Promptly report spills and releases potentially causing damage to the environment to:
 - .1 Authority having jurisdiction or interest in spill or release, including any conservation authority, water supply authorities, drainage authority, road authority and fire department;
 - .2 Owner of pollutant, if known;
 - .3 Person having control over pollutant, if known; and,
 - .4 NCC 24 Hour Emergency Communication Service at 613-239-5353.
- .4 Take immediate action to contain and mitigate effects from spill or releases.
- .5 Provide spill response materials, including, containers, adsorbent, shovels, and personal protective equipment. Make spill response materials available at all times when hazardous materials or wastes are being handled or transported. Spill response materials must be compatible with type of materials being handled.

3.4 EQUIPMENT DECONTAMINATION

- .1 Decontaminate affected equipment, including vehicles after working in potentially contaminated work areas, as well as prior to subsequent work or travel in clean areas and prior to leaving the Site.

- .2 As a minimum precaution, perform following steps during equipment decontamination: Mechanically remove packed dirt, grit and debris by scraping and brushing, without using water. If not effective in removing contaminated material from equipment, establish a washing station using high-pressure, low-volume, water. Any wash water is to be contained within the remediation limits and directed to a designated area for removal. Perform assessment, as directed by the Engineer, to determine effectiveness of decontamination.
- .3 Each piece of equipment may be inspected by the Engineer after decontamination and prior to removal from the Site and/or travel in clean areas. The Engineer will have the right to require that additional decontamination be completed, if deemed necessary.
- .4 Dispose waste solids and liquids from the decontamination area at a MOECC licensed off-site disposal facility approved by the Engineer.
- .5 Furnish and equip personnel engaged in equipment decontamination with suitable personal protective equipment, as required, such as disposable clothing, respiratory protection and face shields.

3.5 WATER CONTROL

- .1 Protect Site from puddling or running water., (see Section 02 31 40 – *Filling and Backfilling*).
- .2 Provide sediment and erosion control as per the Environmental Protection Plan.
- .3 Prevent surface water runoff from leaving work areas.
- .4 Do not discharge treated water, surface water runoff or groundwater to any water bodies, ditches, or into sewers other than those so designated and approved.
- .5 Monitor and maintain surface drainage, including ensuring that gutters are kept open, water is not directed across or over pavements or sidewalks and runoff from unstabilized areas is intercepted and diverted to a suitable outlet.
- .6 Dispose of water in manner not injurious to public health or safety, to property or to any part of work completed or under construction.
- .7 Provide, operate and maintain necessary equipment appropriately sized to keep excavations, staging areas and other work areas free from water.

3.6 EROSION AND
SEDIMENT CONTROL

- .1 Plan and execute construction by methods to control surface drainage from excavations, stockpiles, staging areas and other Work areas. Prevent erosion and sedimentation, in compliance with the erosion and sediment control measures in the Environmental Protection Plan prepared by the Contractor.
- .2 Erosion and sediment control measures will conform to OPSS 805 and OPSD 219.110.
- .3 Minimize amount of bare soil exposed at one time. Stabilize disturbed soils as quickly as practical. Strip vegetation, regrade or otherwise develop in such a way as to minimize erosion. Remove accumulated mud resulting from Work from adjoining surface and from drainage systems within the work area, and repair damage caused by soil erosion and sedimentation, as directed by the Engineer.
- .4 Periodically inspect landscapes and earthworks to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- .5 The Engineer shall inspect and monitor the erosion and sediment measures on a regular basis and direct the Contractor to take corrective actions as may be necessary.
- .6 If soil and/or debris from the Site accumulate in low areas, sewers, roadways, gutters, ditches or any other areas where the Engineer determines it is undesirable, the Contractor shall remove accumulation and restore area to its original condition at no cost to the Owner.
- .7 Maintain and repair all environmental protection measures (straw bales, end runs, undercutting beneath bales, silt fence barriers, rock flow check dams, etc.).
- .8 Unless indicated or directed by the Engineer, remove temporary erosion and sediment control devices upon completion of work.

3.8 PROGRESS CLEANING

- .1 Maintain cleanliness of work areas and surrounding Site to comply with federal, provincial, and local fire and safety laws, ordinances, codes, and regulations.
- .2 Coordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials.

3.9 FINAL
DECONTAMINATION

- .1 Perform final decontamination of temporary installations, equipment, and materials that may have come in contact with potentially contaminated materials prior to removal from Site.

3.10 REMOVAL AND
DISPOSAL

- .2 Perform decontamination to remove potentially contaminated materials as specified to the satisfaction of the Engineer. The Engineer will direct the Contractor to perform additional decontamination, if required.

- .1 Remove surplus materials and temporary facilities from Site.
- .2 Dispose of all non-contaminated waste materials, litter, debris, and rubbish off-Site.
- .3 Do not burn or bury rubbish and waste materials on-Site.
- .4 Dispose of volatile or hazardous wastes such as mineral spirits, oil, or paint thinner, as well as any other waste, only at approved licensed waste facilities.
- .5 Dispose of the following materials at appropriate off-Site facility identified by the Contractor and approved by the Engineer; debris including excess construction material, non-contaminated litter and rubbish; disposable Personal Protection Equipment worn during cleaning; wastewater removed from wastewater storage tank, and wastewater generated from final decontamination operations.
- .6 Dispose of materials in accordance with Section 02 32 20 - *Excavation of Overburden and Other Materials*, as directed by the Engineer.

END OF SECTION

PART 1 – GENERAL

1.1 GENERAL

- .1 All conditions of the Contract and Section 01 00 10 – *General Requirements* apply to this Section.
- .2 This Section applies to all construction work involved on the Site.
- .3 Where there is a conflict between this Section and the other Sections of the Specifications, the most stringent shall apply in all cases.

1.2 RELATED WORK

- .1 This Section applies to all sections included in the Specifications.

1.3 OUTLINE OF WORK

- .1 Provide all supervision, labour, equipment, tools, materials, consumables, transportation and other services necessary for undertaking and completing the work detailed and specified herein and on the Drawings, including but not limited to:
 - .1 Conduct the work in a manner to prevent adverse effects to the Environment (humans, air, water, soil and biota).
- .2 The proposed in-situ remediation program is not anticipated to trigger the need for an environmental assessment under Section 67 of the Canadian Environmental Assessment Act (CEAA).

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

3.1 FIRES

- .1 Fires and burning of rubbish on-site are not allowed.
- .2 Provide supervision, attendance and fire protection measures as directed.

3.2 DISPOSAL OF WASTES

- .1 Do not bury rubbish and waste materials on-site.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner on-site or into waterways, storm or sanitary sewers.

3.3 DRAINAGE

- .1 Drainage to be controlled within the Remedial Work Zone according to Section 02 32 00 – *Excavation Water Management* and Section 01 35 00 – *Special Procedures for Contaminated Sites* to prevent uncontrolled release of Site surface water or groundwater to waterbodies, sewers or other potential receivers.

3.4 SITE CLEARING AND PLANT PROTECTION

- .1 Protect trees and plants as required outside the Remedial Work Zone and on adjacent properties. Vegetation within the Remedial Work Zone may need to be removed. Management of the vegetation must be in accordance with Section 02 23 10 – *Clearing and Grubbing*.
- .2 No trees shall be removed or disturbed outside the Remedial Work Zone in any way without the explicit written direction from the Engineer. Any unmarked tree (live non-ash species) removed, or damaged with a trunk diameter at breast height greater than 10 cm diameter without prior approval from the Engineer must be compensated for to the NCC.
- .3 If grassland and lawn areas are used for laydown or staging during remedial activities, the Contractor will limit circulation of machinery to paved areas to the extent possible and will reseed any impacted vegetation as soon as practicable using a mix approved by the NCC. All machinery will be maintained free of fluid leaks at all times.
- .4 At P19 Leitrim Road, remedial activities will be undertaken in the forested area, therefore tree removal within the Remedial Work Zone will likely be necessary to enable the movement of equipment. Cutting of vegetation, including trees with a diameter at breast height less than 10cm, will be limited to only that which interferes with the proposed works and movement of machinery. The Contractor will inform the NCC of the number, species and size (diameter at breast height) of any trees that require removal. Machinery will circulate on existing trails through the forested area where possible.
- .5 At 16 Tauvette Street, all retainable trees susceptible to being damaged and/or within two metres of equipment in operation will be protected by temporary fencing or other suitable barrier installed at the dripline to prevent damage to the Critical Root Zone. Any damage to a tree must be reported to the NCC who will advise of applicable mitigation measures (e.g. pruning of the branch, replacement of the tree) to be undertaken by the Contractor. Materials will not be stored within the dripline of any trees.

3.5 FLORA AND FAUNA HABITAT PROTECTION

- .1 All the water collected within the Remedial Work Zone must be managed according to Section 02 32 00 – *Excavation Water Management* and Section 01 35 00 – *Special Procedures for Contaminated Sites* in order to preserve

existing aquatic habitats.

- .2 Nesting migratory birds will be protected in accordance with the *Migratory Birds Convention Act, 1994*. All work activities with the potential to disturb or destroy migratory birds, such as tree and vegetation removal and fill placement in vegetated areas, will not take place in the core migratory bird nesting season, which is defined to be from April 15 to August 15 for most species utilizing these habitats in this region of Ontario. If grassland or lawn areas will be used for laydown or staging during the core migratory bird nesting season, the Contractor will inspect the areas for ground nests prior to any disturbance.
- .3 If work affecting breeding bird habitats must be completed during the identified breeding season for migratory birds, the services of a qualified avian biologist will be obtained by, and at the expense of, the Contractor, to conduct a nesting survey prior to any disturbance, to identify and locate nests of species covered by the *Migratory Birds Convention Act, 1994*. If a nest containing eggs or young is encountered, the immediate area must be avoided and work must stop until the NCC's Environmental Services Section provides direction.

3.6 POTENTIAL IMPACT TO WILDLIFE

- .1 Any wildlife encountered on the Site will not be knowingly harmed or harassed. The Contractor will ensure that the Work site is kept clean and that no garbage or food scraps that could attract animals or alter their behavior are left behind. The Contractor will ensure that all debris and solid waste left on the site are removed upon completion of the Work.

3.7 POTENTIAL IMPACT TO SPECIES AT RISK

- .1 No species at risk were observed at the Sites during an ecological survey conducted by the Owner. The Owner has identified a list of species at risk most likely to occur at the Sites and will train the Engineer in the identification of these species. In the event that a species at risk is identified, the Contractor will be required to follow mitigation measures as identified by the Owner and communicated by the Engineer.
 - .1 In the event that a faunal species at risk is encountered, it shall be permitted to leave the area on its own and without disturbance. If it does not move from the site, the Contractor will stop work until the NCC's Environmental Services Section provides direction.
 - .2 At 16 Tavette Street, impacts to vegetation will be avoided to the extent possible and trees and laydown areas will be inspected for species at risk and their nests prior to disturbance. Any damaged vegetation will be reseeded as soon as practicable using a mix approved by the NCC.

- .3 At P19 Leitrim Road, the Contractor will limit the removal of trees and snags (standing dead trees) to those that directly interfere with remedial activities and movement of machinery. The absence of species at risk must be verified before the removal of vegetation, including snags. If a snag shows signs of bat roosting (urine or droppings, staining or scratch marks near a cavity opening) it must be avoided until the NCC's Environmental Services Section provides direction.

3.8 POTENTIAL SPREAD OF INVASIVE SPECIES

- .1 At 16 Tauvette Street, common and glossy buckthorn are found in the willow and cedar tree clusters present on the Site. An NCC representative will train the Contractor's staff to identify these invasive species. If the Contractor must operate or store machinery in these areas, the Contractor shall inspect and clean the machinery of dirt and plant material before it contacts the grassland or lawn areas or is moved off-site.
- .2 At P19 Leitrim Road, glossy and common buckthorn are found across the Site. Wild parsnip was identified in the shrubland sector and purple loosestrife in the flat swamp. An NCC representative will train the Contractor's staff to identify these invasive species. If any of these species must be removed, cuttings will be disposed of appropriately to minimize spread (as garbage and not green waste). The Contractor shall inspect and clean the machinery of dirt and plant material before it is moved off-site.

3.9 POTENTIAL IMPACT TO FLAT SWAMP

- .1 The high water mark boundaries of a flat swamp at P19 Leitrim Road have been identified with flags on the Site. Carbon injections may be undertaken in the flat swamp provided that mitigation measures, as documented in the Environmental Protection plan are executed.

3.10 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed as per this Contract. Ensure application of the erosion and sediment controls in the Environmental Protection Plan.
- .2 Control emissions from equipment and direct exhaust discharges away from vegetation. Make sure that the exhaust system of all machinery is in good condition.
- .3 Cover or wet down dry materials to prevent blowing dust and debris. Provide dust control for temporary roads. Dispose of wastes materials off-site as required and, as a minimum, on a weekly basis.

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- .4 Turn off the engines of haulage trucks or other equipment if waiting time is uncertain or prolonged.

3.11 ENVIRONMENTAL
CONTROL

- .1 The Contractor is responsible for ensuring all environmental controls described in Sections 01 35 00 – *Special Procedures for Contaminated Sites*, 02 23 10 – *Clearing and Grubbing*, 02 32 00 – *Excavation Water Management*, 02 32 20 – *Excavation of Overburden and Other Materials* and 02 36 20 – *Dust and Soil Tracking Control*.

END OF SECTION

PART 1 – GENERAL

1.1 GENERAL

- .1 All conditions of the Contract and Section 01 00 10 – *General Requirements* apply to this Section.

1.2 RELATED WORK

- .1 This Section applies to all sections included in the Specifications.

1.3 REFERENCES

- .1 Province of Ontario Occupational Health and Safety Act, R.S.O. [1990 Updated 2005].
- .2 Canada Labour Code and regulations

1.4 SUBMITTALS

- .1 Contractor to prepare and submit Site Specific Health and Safety Plan within 5 working days after date of Notice to Proceed for review by the Engineer; the Health and Safety Plan must have final status prior to commencement of Work. The Engineer will review Contractor's Site Specific Health and Safety Plan and provide comments to Contractor within 5 working days after receipt of plan. The Contractor will revise plan as appropriate and resubmit plan to Engineer within 5 working days after receipt of comments from the Engineer. The Engineer's review of Contractor's final Health and Safety plan should not be construed as approval and does not delegate the Contractor's overall responsibility for construction Health and Safety. The Site Specific Health and Safety Plan must be prepared by personnel competent and qualified in Occupational Health and Safety and include:
 - .1 Results of Site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operations.
 - .3 Schedule for safety meetings.
 - .4 The name and phone number of the Site supervisory Health and Safety Officer and a list of emergency contacts.

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- .5 A Personal Protective Equipment (PPE) Program addressing, at a minimum: donning and doffing procedures; PPE selection based upon site hazards; PPE use; the limitations of specific PPE including during temperature extremes; PPE maintenance, storage, decontamination and disposal; PPE inspection procedures prior to, during and after use; and evaluation of effectiveness of PPE program.
 - .6 Medical surveillance requirements for personnel assigned to work at the Site, procedures for dealing with heat and/or cold stress and other appropriate medical considerations.
 - .7 Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment, and action levels.
 - .8 Written respiratory protection program for project activities including certificates for respirator fit testing, if required.
 - .9 Site control measures employed at Site including site map, site work zones, use of 'buddy system', site communications including site security, alerting means for emergencies, standard operating procedures or safe work practices, and identification of nearest medical assistance.
 - .10 Decontamination procedures for both personnel and equipment.
 - .11 A Spill and Emergency Control Plan, including 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, procedures for reporting incidents to local, provincial, or federal agencies, and spill containment program if hazardous or waste material is generated, excavated, stored, or managed on- Site.
 - .12 A copy of the Contractor's Safety Manual.
- .2 During active phases of the project, submit copies of Contractor's authorized representative's Work site health and safety inspection reports to the Engineer weekly.
 - .3 Submit copies of reports or directions issued by any health and safety inspection agency to the Engineer within 24 hours of their receipt.

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- .4 Submit copies of incident and accident reports to the Engineer.
 - .5 Submit Workplace Hazardous Materials Information System (WHMIS) Safety Data Sheets (SDS) to the Engineer for any hazardous materials brought onto the Site.
 - .6 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 the Engineer.
 - .7 Submit copies of all health and safety related notices, permits, and approvals, as required.

1.5 GENERAL REQUIREMENTS

- .1 Develop a 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 The Engineer may respond in writing where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.
- .3 Comply with Ontario Health and Safety Act, R.S.O. (O. Reg 213/91).
- .4 Comply with Workplace Hazardous Materials Information System (WHMIS) Regulation, R.R.O. 1990 (O. Reg. 860)
- .5 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations, Part X – Hazardous Substances.
- .6 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 Ontario having jurisdiction and advise the Engineer verbally and in writing.
- .7 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator(s). Health and Safety Coordinator must:
 - .1 Have Site related working experience.
 - .2 Have working knowledge of occupational safety and health regulations.

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- .3 Be responsible for implementing 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 Contractor's Site Specific Health and Safety Plan.
- .5 Be on-site during execution of Work.
- .8 Ensure applicable items, articles, notices and orders are posted in conspicuous location on-site in accordance with Acts and Regulations of Ontario having jurisdiction, and in consultation with the Engineer.
- .9 Blasting or other use of explosives is not permitted without prior written permission from the Engineer.
- .10 Give precedence to safety and health of public and Site personnel and protection of environment over cost and schedule considerations for Work.
- .11 No smoking or consumption of alcohol or any drug which could impair sight, balance or judgment is permitted on the job.

1.6 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by the authority having jurisdiction or by the Engineer.
- .2 Provide the Engineer with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 The Engineer may stop Work if non-compliance of health and safety regulations and Site Specific Health and Safety Plan is not corrected at no additional cost for the resulting delays to become compliant.

1.7 PERSONNEL HEALTH, SAFETY, AND HYGIENE

- .1 Personnel Hygiene and Personnel Decontamination Procedures. Provide, at a minimum, the following:
 - .1 Suitable containers for storage and disposal of used disposable PPE.
 - .2 Potable water and suitable sanitation facility.
- .2 Ensure that procedures are strictly followed by Site personnel; including the following procedures, as a minimum:

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- .1 Ensure prescription eyeglasses worn are safety glasses and do not permit contact lenses on-site within the Remedial Work zone.
 - .2 Ensure footwear are CSA-approved steel-toed safety shoes or boots and is covered by rubber overshoes when entering or working in potentially contaminated work areas.
 - .3 Dispose of or decontaminate PPE worn on-site at end of each workday.
 - .4 Decontaminate reusable PPE before reissuing.
 - .5 Ensure Site personnel have passed respirator fit test prior to entering potentially contaminated work areas requiring such equipment.
 - .6 Ensure facial hair does not interfere with proper respirator fit.
- .3 Air Monitoring Program:
- .1 Develop an air monitoring program for dust PHC emissions and include in Site Specific Health and Safety Plan.
 - .2 During progress of work activities, monitor air quality in and around work zones, as required. Conduct monitoring on regular periodic basis, and additionally as required by special or Work-related conditions. Report departures from general background to the Engineer who will, in conjunction with Health and Safety Officer, determine if and when operations should be shut down and restarted.
 - .3 Provide minimum instruments for air monitoring, as required.
 - .4 Operate air monitoring equipment with personnel trained in equipment provided and under control of Health and Safety Officer, as required.
- .4 Emergency and First Aid Equipment:
- .1 Locate and maintain emergency and first aid equipment in appropriate location on-site including first aid kit to accommodate number of Site personnel; portable emergency eye wash; two 9 kg ABC type dry chemical fire extinguishers.
 - .2 Self-contained breathing apparatus units as required by the Site Specific Health and Safety Plan; blankets and towels; stretcher; and 1 hand-held emergency siren must be readily available.

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- .3 As a minimum, provide 1 certified first aid technician on-site at all times when Work activities are in progress.
- .5 Site Communications:
 - .1 Post emergency phone numbers and contact information near site telephones.
 - .2 Ensure personnel use "buddy" system and develop hand signal system appropriate for site activities.
 - .3 Furnish selected personnel with 2-way radios or other appropriate on-site communication devices.
 - .4 Safety Meetings: conduct mandatory daily safety meetings for personnel, and additionally as required by special or Work related conditions and the Site Specific Health and Safety Plan; include refresher training for existing equipment and protocols, review ongoing safety issues and protocols, and examine new site conditions as encountered.
- .6 Custodian: the Contractor's Health and Safety Officer is responsible for keeping safety equipment and facilities clean, properly equipped, and maintained.

1.8 UNFORESEEN CONDITIONS

- .1 Should unforeseen or peculiar safety-related factors, hazards, or conditions become evident during performance of Work, stop work and immediately advise the Engineer verbally and in writing.

PART 2 – PRODUCTS

- .1 Utilize appropriate air quality monitoring equipment and other devices required by the Site Specific Health and Safety Plan.

PART 3 – EXECUTION

3.1 GENERAL EXECUTION

- .1 The Contractor shall act as Constructor and is responsible for all aspects of health and safety during the course of the Work. The Contractor shall be responsible for creating and implementing the Site Specific Health and Safety Plan covering all aspects of the Work and for adherence by all personnel on-site, including any subcontractors. The Contractor shall assume full responsibility for ensuring that during construction his/her employees, subcontractors, their employees and visitors follow the Site Specific Health and

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- Safety Plan. The Contractor shall also be responsible for establishing exclusion zones to limit public access to Work zones.
- .2 During active phases of the project, the Contractor shall hold mandatory daily safety meetings on the Site. The Contractor shall notify the Engineer of the time and place of all meetings and allow the Engineer to participate. Meetings should reiterate safety measures to be taken and discuss any violations committed and preventive measures to avoid future violations.
 - .3 The Contractor shall require all personnel on the Site to wear the appropriate personal protective equipment as outlined within this Section.
 - .4 No ignition source shall be permitted within 1.5 metres of an open excavation. All electric motors and electric controls used in the excavation area shall be explosion proof or non-sparking totally enclosed fan cooled (TEFC) and meet the requirements for Class 1, Division 1, Group D (methane), rated equipment in accordance with the National Electric Code (NEC). If the potential for a hazardous location can be eliminated with the use of forced ventilation, then explosion proof equipment is not required.
 - .5 Personnel shall be alert to the potential for encountering subsurface hazards. Potential hazards include (but are not limited to):
 - .1 Liquid Wastes
 - .2 Other hazardous and toxic materials
 - .6 If any unexpected hazardous wastes are exposed, excavation shall stop immediately and the Engineer shall be notified.

3.2 EXCAVATION SAFETY

- .1 Any time excavations and trenching exceed 1.2 metres in depth, shoring, bracing or sloping of the side walls is required prior to entry. If sloping is the method used, side walls of the trench shall be sloped in accordance with the Ontario Occupational Health and Safety Act (O. Reg. 213/91).
- .2 All excavations and trenches shall be protected from inadvertent entry by members of the public. Temporary construction fencing 1.8 m high shall be erected to surround any excavations or trenches left unsupervised.
- .3 Backfill excavations in accordance with Section 02 31 40 - *Filling and Backfilling* to maintain a safe work site.

3.3 VIOLATIONS

- .1 Should any health and safety violations be called to the Contractor's attention by anyone, the Contractor shall immediately correct the violations.

- .2 If the Contractor violates any health and safety rule or regulation, or does not comply with the requirements of the Site Specific Health and Safety Plan, the Engineer may issue an order to stop all work until the violations/non-compliance are remedied. The Contractor shall not be entitled to any extension of the time or any claim for damage or to any compensation for either the directive or the work suspension order. A decision by the Engineer not to order discontinuance of any or all of the Contractor's operations shall not relieve the Contractor of responsibility for safety.

END OF SECTION

PART 1 – GENERAL

1.1 GENERAL

- .1 All conditions of the Contract and of Section 01 00 10 – *General Requirements* apply to this section.

1.2 RELATED SECTIONS

- .1 Section 01 11 00 – *Summary of Work*

1.3 PROTECTION

- .1 Protect existing pavement not designated for removal. In event of damage, immediately replace or make repairs to approval of Engineer at no additional cost.

PART 2 – PRODUCTS

2.1 MATERIAL AND EQUIPMENT

- .1 The Contractor shall furnish all materials, tools, equipment, facilities, and services as required for removal of asphalt pavement and other Site preparation work.

PART 3 – EXECUTION

3.1 PREPARATION

- .1 Prior to any work that involves ground disturbance (including, but not limited to, asphalt removal), confirm locations of all buried utilities within the Site in accordance with all regulatory requirements.
- .2 Ensure the Site is secure throughout the course of operations. This includes, but is not limited to, moving and maintaining, as required, signage, fencing or barricades that advise and control access to the Site to ensure public safety. The contractor will be responsible for supplying temporary closure fencing or barriers and signage.

3.2 REMOVAL

- .1 Saw-cut asphalt to limits required for excavation.
- .2 Remove existing asphalt pavement as per the Site Preparation and Restoration Plan. All modifications that deviate from the Site Preparation and Restoration Plan shall be reviewed and approved by the Engineer prior to implementation.
- .3 Use equipment and methods of removal and hauling which do not tear, gouge, break or otherwise damage or disturb adjacent pavement.

- .4 Prevent contamination of removed asphalt pavement by topsoil, underlying gravel or other materials.
- .5 Provide for suppression of dust generated by removal process.
- .6 Dispose off-site at an approved recycling or disposal facility.

3.3 SWEEPING

- .1 Sweep remaining asphalt surfaces clean of debris resulting from removal operations using rotary power brooms and hand brooms as required.
- .2 Sweepings shall be disposed off-site.

3.4 FINISH TOLERANCES

- .1 Site reinstatement details as per *Section 02 31 40 - Filling and Backfilling*. Reinstatement of pavement is not required.

END OF SECTION

PART 1 – GENERAL

1.1 GENERAL

- .1 All conditions of the Contract and Section 01 00 10 – *General Requirements apply to this Section.*

1.2 RELATED SECTIONS

- .1 Section 01 11 00 – *Summary of Work*
.2 Section 01 56 10 – *Environmental Protection*
.3 Section 02 32 20 – *Excavation of Overburden and Other Materials*
.4 Section 02 31 40 – *Filling and Backfilling*
.5 Section 02 36 20 – *Dust and Soil Tracking Control*

1.3 OUTLINE OF WORK

- .1 Provide all supervision, labour, equipment, tools, materials consumables, transportation and other services necessary for undertaking and completing the Work detailed and specified herein, including but not limited to: clearing, grubbing and disposing of trees, snags, logs, brush, stumps which are free of soil materials, shrubs, boulders, and rubbish from areas identified in the Site Preparation and Restoration Plan.
- .2 Perform all Work relating to clearing and grubbing in accordance with industry best management practices.

1.4 DEFINITIONS

- .1 **Clearing** – Consists of cutting off trees and brush vegetative growth to not more than a specified height above ground and disposing of felled trees, previously uprooted trees and stumps.
- .2 **Grubbing** – Consists of excavation and disposal of stumps, roots and boulders to not less than the depth specified in Section 3.1.7.
- .3 **Critical Root Zone (CRZ)** – Consists of an area surrounding a tree equivalent to a radius 10 times the diameter of the tree trunk at breast height or 1.4 m above the ground.

1.6 PROTECTION OF EXISTING FEATURES

- .1 Protect as necessary and prevent damage to fencing, trees, landscaping, natural features, bench marks, existing pavement and utility lines which are to remain.

- .1 Repair any damaged items to approval of the Engineer.
- .2 As per Section 3.1, should the NCC deem as damaged any trees that were designated to remain (as per the Site Preparation and Restoration Plan), damaged branches shall be trimmed following best management practices or financial compensation shall be provided to the NCC (assessment to be completed by the NCC Forester or Certified Arborist) as per The Guide to Tree Appraisal 9th edition.

PART 2 – PRODUCTS

2.1 MATERIAL AND EQUIPMENT

- .1 The Contractor shall furnish all materials, tools, equipment, facilities, and services as required for performing Site clearing, grubbing and other Site preparation work.

PART 3 – EXECUTION

3.1 EXECUTION

- .1 Prior to any Work that involves ground disturbance (including, but not limited to, grubbing), confirm locations of all buried utilities within the Remedial Work Zone in accordance with all regulatory requirements.
- .2 Ensure the Site is secure throughout the course of operations. This includes, but is not limited to, moving and maintaining, as required, signage, fencing or barricades that advise and control access to the Site to ensure public safety. The Contractor will be responsible for supplying temporary closure fencing or barriers and signage.
- .3 Keep sediment control measures in good condition during operations.
- .4 Limit the removal of vegetation to the least amount possible. Cut only trees as required and as pre-approved by the Engineer in the Site Preparation and Restoration Plan. Cut trees at a height of not more than 300 mm above ground (trees for removal should be marked in advance of the Work).
- .5 Remove trees using techniques that do not damage any retained vegetation or infrastructure within the Site and that protect the surrounding property.
- .6 Perform clearing and grubbing to remove vegetation and objectionable material from the Site, only within the limits of the Remedial Work Zone, as is absolutely necessary and as pre-approved by the Engineer in the Site Preparation and

Restoration Plan. Remove cleared materials and debris from the Site.

- .7 If required, remove stumps, roots larger than 750 mm in diameter and root mass and boulders to not less than 200 mm below the ground surface. Otherwise, stumps and roots may be mechanically cut (flat) not more than 300 mm above ground surface and left in place.
- .8 Mechanically cut and dispose of invasive shrubs if the Site is to be grubbed.
- .9 Fill depressions made by grubbing with clean imported topsoil and make new surface conform to existing adjacent surface of ground.
- .10 Remove dangerous branches from any residual trees.
- .11 Any damage done by the Contractor to infrastructure on the grounds or neighbouring property must be reported to the Engineer and be repaired at no cost to the NCC.
- .12 Standard tree protection measures for all trees shall apply as per International Society of Arboriculture's Best Management Practices, which shall include, but are not limited to:
 - .1 Do not store any material or equipment within the CRZ of the tree;
 - .2 Do not attach any signs, notices or posters to any tree;
 - .3 Do not raise or lower the existing grade within the CRZ without approval;
 - .4 Tunnel or bore when digging within the CRZ of a tree;
Do not damage the root system, trunk or branches of any tree;
 - .5 Ensure that exhaust fumes from all equipment are NOT directed towards any tree's canopy.

Should adherence to these Best Management Practices compromise the success of the remedial program, deviations should be clearly detailed in the Final Remedial Design and Site Preparation and Restoration Plan and will be considered at the discretion of the NCC. No deviation will be permitted without advance written consent by the NCC Project Manager.

3.2 DISPOSAL OF REMOVED MATERIALS AND DEBRIS

- .1 Retain approximately 5% wood material within the removal areas as down woody debris (DWD); this should be in varying sizes and scattered throughout the Site, away from

parking lots, walking trails and/or agricultural land.

- .2 Dispose of remaining cleared materials at an approved offsite facility for disposal, or for grinding and/or composting, or as approved by the Engineer.
- .3 Dispose of grubbed materials, at an approved off-Site facility as contaminated waste.
- .4 The Canadian Food Inspection Agency has taken action to limit the spread of Emerald Ash Borer (EAB) by issuing a ministerial order to prohibit movement of firewood, and ash-tree products such as nursery stock, logs, branches and wood chips from areas of Ottawa to any other surrounding regions. For this project, ash logs 100 mm in diameter or larger shall be disposed of at a licensed solid waste facility.

END OF SECTION

PART 1 – GENERAL

1.1 GENERAL

- .1 All conditions of the Contract and Section 01 00 10 – *General Requirements* apply to this Section.

1.2 RELATED WORK

- .1 Section 01 11 00 – *Summary of Work*
- .2 Section 01 35 00 – *Special Procedures for Contaminated Sites*
- .3 Section 01 56 10 – *Environmental Protection*
- .4 Section 02 32 00 – *Excavation Water Management*
- .5 Section 02 32 20 – *Excavation of Overburden and Other Materials*

1.3 OUTLINE OF WORK

- .1 Provide all supervision, labour, equipment, tools, materials, transportation and other services necessary for undertaking and completing the work detailed and specified herein and in the Contract documents, including but not limited to:
 - .1 Provision of clean, virgin fill as outlined within this Section.
 - .2 Backfilling excavated areas to prevent the collection of standing water, to eliminate unsafe excavation walls, and to allow for continued use of any disturbed areas for their pre-construction use. Excavated areas are to be backfilled immediately following excavation.
 - .3 Placement of final cover.

1.4 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
- .2 OPS.PROV 1010 (APRIL 2013). Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material
- .3 Ontario Regulation 153/04, Records of Site Condition, including Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act.
- .4 Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health.

1.5 SUBMITTALS

- .1 At least ten working days prior to commencing work, provide the Engineer with initial proof that all proposed sources of imported soil fill satisfy Remedial Objectives, and satisfy the provincial site condition standards and federal soil quality guidelines applicable at the Site for the tested parameters. Sampling must satisfy the requirements of Ontario Regulation 153/04 (as amended) Schedule E and include copies of analytical test data for all contaminants identified at the Site.
- .2 Obtain written approval of the Engineer for proposed imported materials prior to their delivery to the Site.
- .3 Provide the Engineer with weigh bills or bills of lading documenting the volume of each type and source of fill imported to the Site.

1.6 TESTING

- .1 Following initial approval of the fill by the Engineer, the Contractor will be responsible for providing continued analytical testing results in accordance with Ontario Regulation 153/04 Schedule E for all imported soil fill brought to the Site. As outlined in the Regulation, analytical results will be provided for every 160 cubic metres of imported soil fill, provided the source of said materials does not change. Imported soil fill testing will include metals (to include the following elements Ba, Be, B (total), B (available), Cd, Cr, CrVI, Co, Cu, Pb, Mo, Na, Ni, Ag, V, Zn, As, Se, Sb, Hg, U), petroleum hydrocarbons (fractions F1-F4), polycyclic aromatic hydrocarbons and volatile organic compounds, or as approved by the Engineer.

1.7 FILL QUALITY

- .1 All soil fill imported to the Site must satisfy for the tested parameters: Remedial Objectives; and the provincial site condition standards and federal soil quality guidelines applicable at the Site (refer to Section 01 11 00 – Summary of Work, Clause 1.9 – Supporting Documentation); and be approved by the Engineer.

PART 2 – PRODUCTS

2.1 MATERIALS

- .1 Soil Fill: Pit-Run Material from an off-site virgin source, as per OPSS 1010 and approved by the Engineer. To be unfrozen, free from rocks larger than 75 mm. To be free of recycled or reclaimed materials, clay, ice, snow, debris, and other deleterious materials.. Must also comply with Clauses 1.5, 1.6 and 1.7 of this Section.

-
- .2 Granular Fill: Imported Granular A fill as per OPSS 1010. To be free of recycled or reclaimed materials, ice, snow, debris, and other deleterious materials.
 - .3 Native Fill: Excavated material from the Site, maximum 200 mm minus particle size plus fines. To be free of clay, ice, snow, debris, and other deleterious materials.

PART 3 – EXECUTION

3.1 BACKFILLING AND SURFACE RESTORATION

- .1 Backfilled areas to be free of debris, snow, ice, water and frozen ground.
- .2 Excavations are to be backfilled to within 300 mm of grade using Native Fill and/or imported Soil Fill. Native Fill is not to be placed within two metres of grade. Below two metres excavations may be backfilled with Native Fill and/or imported Soil Fill, in any proportion at the discretion of the Contractor.
- .3 Native Fill and/or imported Soil Fill to be placed in 200 mm compacted lifts.
- .4 Compacted Granular A (300 mm in 150 mm lifts) will be placed above the Native Fill/Soil Fill to return excavations to match the existing grade.
- .5 Compaction testing, if required and at the discretion of the Engineer, will be at the Contractor's expense.

END OF SECTION

PART 1 – GENERAL

1.1 GENERAL

- .1 All conditions of the Contract and Section 01 00 10 – *General Requirements* apply to this Section.

1.2 RELATED WORK

- .1 Section 01 11 00 – *Summary of Work*
- .2 Section 01 35 00 – *Special Procedures for Contaminated Sites*
- .3 Section 01 56 10 – *Environmental Protection*
- .4 Section 02 31 40 – *Filling and Backfilling*
- .5 Section 02 32 20 – *Excavation of Overburden and Other Materials*

1.3 REFERENCE STANDARDS

- .1 City of Ottawa Sewer Use By-Law 2003-514.
- .2 Ontario Regulation 387/04 Water Taking and Transfer.
- .3 Ontario Regulation 63/16 Water Taking

1.4 OUTLINE OF WORK

- .1 Provide all supervision, labour, equipment, tools, materials, consumables, transportation and other services necessary for undertaking and completing the work detailed and specified herein, including but not limited to:
 - .1 Manage surface water to minimize entry into any excavation(s) and maximize natural infiltration.
 - .2 Construct sumps equipped with filter-equipped pump(s), to be located at the bottom of excavation(s), as required, to collect excavation water and maintain dry conditions, as required.
 - .3 Operate and maintain any required Water Management Facilities including all pumps and filters for the duration of the Contract.
- .4 Provide, operate and maintain pumping equipment at any water collection areas.

1.5 EXISTING CONDITIONS

- .1 Refer to Section 01 11 00 –Summary of Work, Clauses 1.7 and 1.8 - Background and Site Conditions and Clauses 1.9 and 1.10 - Supporting Documentation.

1.6 PERMITS AND TESTING

- .1 Takings and discharges of surface water and groundwater from the Site must comply with all applicable federal, provincial and municipal permits, regulations and by-laws and adhere the requirements of Section 01 35 00 – *Special Procedures for Contaminated Sites*.

1.7 SUBMITTALS/SHOP DRAWINGS

- .1 The Contractor shall submit to the Engineer the design of any proposed drainage system(s), including details of filter and/or treatment facilities, power supply and pipes to pump water to tank(s) and/or treatment facilities.

PART 2 – PRODUCTS

2.1 EQUIPMENT

- .1 Pumps shall be of sufficient size and capacity to efficiently handle the anticipated water volume while staying within the permitted maximum flow rates identified in any relevant permit(s).

PART 3 – EXECUTION

3.1 WATER MANAGEMENT

- .1 The Contractor, at its cost, will be responsible for management of any water that accumulates in remedial excavation(s), including but not limited to: testing, permitting, treatment, pumping, discharge fees, etc. Water removal by vacuum truck and off-site disposal at a MOECC licensed waste facility is deemed an acceptable method of managing water. Alternate methods of water management and/or disposal require prior approval of the Engineer.

END OF SECTION

PART 1 – GENERAL

1.1 GENERAL

- .1 All conditions of the Contract and Section 01 00 10 – *General Requirements* apply to this Section.

1.2 RELATED WORK

- .1 Section 01 11 00 – *Summary of Work*
- .2 Section 01 35 00 – *Special Procedures for Contaminated Sites*
- .3 Section 01 56 10 – *Environmental Protection*
- .4 Section 02 31 40 – *Filling and Backfilling*
- .5 Section 02 32 00 – *Excavation Water and Management*
- .6 Section 02 36 20 – *Dust and Soil Tracking Control*
- .7 Section 02 23 10 – *Clearing and Grubbing*
- .8 Section 02 22 60 – *Removal of Existing Asphalt*

1.3 EXISTING CONDITIONS

- .1 Refer to Section 01 11 00 – *Summary of Work*, Clause 1.7 - *Background and Site Conditions – 16 Tauvette Street*.

1.4 OUTLINE OF WORK

- .1 Provide all supervision, labour, equipment, tools, materials, consumables, transportation and other services necessary for undertaking and completing the Work detailed and specified herein, including but not limited to:
 - .1 Partial removal of heavily contaminated soil via conventional excavation methods from UST Area #1 at 16 Tauvette Street at the Contractor's discretion if the Contractor determines this would provide cost-benefit to the NCC and/or is required to satisfy the specified Remedial Objectives.
 - .2 Transportation and off-site disposal of excavated contaminated soil at a MOECC approved landfill.

1.5 EXISTING UTILITIES AND STRUCTURES

- .1 Prior to any work that involves ground disturbance, confirm locations and state of use of all buried utilities and structures within the Site in accordance with all regulatory requirements. It is the Contractor's responsibility to contact the utility owners for information regarding the exact location of all underground utilities, to exercise the necessary care in construction operations and to take such other precautions as are necessary to safeguard all utilities from damage.
- .2 Maintain and protect from damage all utilities and structures, including any existing property markers or survey datum. Information on the protection of the utilities may be obtained from the utility owner.

1.6 SUBMITTALS

- .1 Prior to the commencement of any site work, the Contractor shall submit for the Engineer's review and approval the following:
 - .1 Operating procedures respecting the excavation area and the contractor lay down area, including equipment inspection area.
 - .2 Quantity and assignment of equipment and staff on the work Site.
- .2 Prior to the commencement of any Site work, the Contractor shall submit for the Engineer's review and approval the business names of all waste carriers and receivers, and their respective MOECC ECA numbers.
- .3 Prior to the commencement of excavation work, the Contractor shall submit for the Engineer's review and comment the following:
 - .1 Copies of all clearance certificates from utility and service companies.
- .4 During and upon completion of the Work, the Contractor shall submit for the Engineer's information the following:
 - .1 Documentation pertaining to off-site disposal and movement of excavated material, wastes, recyclables and all other materials.
 - .2 Details about any spill of excavated materials or Other Materials on public property and roadways, including the circumstances of the incident, reports to authorities and cleanup efforts.
- .5 Upon completion of the work, the Contractor shall submit for the Engineer's review and comment a survey of the final excavation's surface and subsurface limits and elevations. The Contractor shall also submit copies of all weigh bills and manifests documenting the volumes of overburden, liquid wastes and other materials disposed off-site.

1.8 REFERENCES

- .1 Ontario Environmental Protection Act, 1990
- .2 Ontario Water Resources Act, 1990
- .3 Ontario Regulation 153/04, Record of Site Condition
- .4 Ontario Regulation 903 Wells
- .5 Ontario Regulation 213/91 - Construction Projects.

PART 2 – PRODUCTS

2.1 EXCAVATION EQUIPMENT

- .1 Excavation equipment shall be suited for the intended work and in good working condition, and operated by competent personnel.

2.2 SOIL HANDLING
EQUIPMENT

- .1 Loaders, bulldozers, compactors, etc., as required. These shall be in good working condition, and operated by competent personnel.

2.3 HAULAGE VEHICLES

- .1 Size and configuration of haulage vehicles will be appropriate for the Site conditions, shall be in good working condition, and operated by competent personnel.
- 2 Haulage vehicles will be constructed in a manner to avoid spillage of contents, with sealed and locking closures, as appropriate.
- .3 Dump trucks are to be equipped with appropriate tarpaulins of suitable size and design to comply with Section 02 36 20 – *Dust and Soil Tracking Control*.
- .4 Haulage vehicles required to access public roads shall be licensed to do so.
- .5 Haulage vehicles required to access public roads shall operate by authorization of an Environmental Compliance Approval/Certificate of Approval (Waste Management System) issued by the Ontario Ministry of the Environment and Climate Change under Part V of the *Environmental Protection Act*.

PART 3 – EXECUTION

3.1 SITE PREPARATION

- .1 Conduct a condition survey with the Engineer of existing trees and other plants, lawns, fencing, service poles, wires, pavement, survey bench marks and monuments, and any other structure or installation which may be affected by the Work.
- 2 Remove asphalt, as necessary, within the Remedial Work Zone prior to commencing excavation work. See Section 02 22 60 – *Removal of Existing Asphalt*.
- .3 Protect existing surface structures from damage while work is in progress. In the event of damage, immediately make repairs to the satisfaction of the Engineer.
- .4 Construction laydown area, construction fencing, Site access roads or ramps shall be constructed, as required, and maintained by the Contractor for the duration of the excavation program.
- 5 Manage water as per Section 01 35 00 – *Special Procedures for Contaminated Sites* and Section 02 32 00 – *Excavation Water Management*.

3.2 DECOMMISSIONING OF
MONITORING WELLS

- .1 Any monitoring wells within the Contractor's proposed excavation limits are to be decommissioned as per Ontario Ministry of the Environment and Climate Change (MOECC) O.Reg 903 under the Ontario Water Resources Act prior to commencing excavation activities.

3.3 ASPHALT

- .1 Remove all asphalt from the excavation area for recycling at an approved facility, in accordance with Section 02 22 60 – *Removal of Existing Asphalt and Pavement*.

3.4 EXCAVATION

- .1 Excavate soil from UST Area #1 at 16 Tauvette Street at the Contractor's discretion.
- .2 Load, haul and dispose of excavated material off-site at an MOECC approved waste disposal facility identified by the Contractor and approved by the Engineer. Re-use of excavated material as backfill is at the Contractor's discretion, except:
 - .1 Native Fill is not to be placed within two metres of grade as described in Section 02 31 40 – *Filling and Backfilling*.

3.5 OVERBURDEN MATERIAL
HAULAGE

- .1 Haulage vehicle operators shall remain in their vehicles when inside the Remedial Work Zone unless they are required to work outside of the vehicle.
- .2 Haulage shall be in accordance with Section 02 36 20 – *Dust and Soil Tracking Control*.
- .3 The Contractor shall comply with municipal and provincial restrictions concerning truck loads during the spring thaw period, and of the territories his/her trucks have to travel through for off-site disposal of excavated materials and Other Materials.
- .4 The Contractor shall maintain records of quantities of material disposed of off-site at an MOECC approved disposal facility, along with the weigh tickets from such approved disposal sites.
- .5 Haulage operations shall be performed in accordance with applicable municipal, provincial and federal laws and regulations.

3.6 WASTER/SOIL SPIL
SPILL RESPONSE

- .1 Haulage Every effort must be made to minimize the risk of a spill of Excavated Overburden Material, Other Material or wastes.
- .2 A Spill and Emergency Control Plan as per Section 01 11 00 – *Summary of Work* must be implemented before starting any Work on Site.

3.7 EXCAVATION
SUPPORT

- .1 Support Systems for all excavations shall comply with the relevant sections of Ontario Regulation 213/91: Construction Projects.
- .2 No person shall enter or be permitted to enter an excavation that does not comply with the relevant sections of Ontario Regulation 213/91: Construction Projects.

3.8 END OF EXCAVATION
SUPPORT

- .1 Notify the Engineer when excavation is complete.
- .2 Survey the final excavation area limits, as indicated in Clause 1.6 of this Section, and submit to Engineer for review.
- .3 Provide the Engineer with all submittals, as indicated in Clause 1.6 of this Section, including weigh bills and manifests

END OF SECTION

PART 1 – GENERAL

1.1 GENERAL

- .1 All conditions of the Contract and Section 01 00 10 – *General Requirements* apply to this Section.

1.2 RELATED WORK

- .1 Section 01 11 00 – *Summary of Work*
- .2 Section 01 35 00 – *Special Procedures for Contaminated Sites*
- .3 Section 01 56 10 – *Environmental Protection*
- .4 Section 02 32 00 – *Excavation Water Management*
- .5 Section 02 32 20 – *Excavation of Overburden and Other Materials*
- .6 Section 02 31 40 – *Filling and Backfilling*

1.3 OUTLINE OF WORK

- .1 Provide all supervision, labour, equipment, tools, materials, consumables, transportation and other services necessary for undertaking and completing the work detailed and specified herein, including but not limited to dust and soil tracking control.

1.4 EXISTING CONDITIONS

- .1 Refer to Section 01 11 00 – *Summary of Work*, Clauses 1.7 and 1.8, *Background and Site Conditions*.

1.5 REFERENCES

- .1 Ontario Provincial Standard Specifications (Construction):
 - .1 OPSS 506 Construction Specification for Dust Suppressants.

1.6 SUBMITTALS

- .1 Prior to the commencement of any Site work, the Contractor shall submit for the Engineer's review, an Environmental Protection Plan including the following:
 - .1 A dust control plan detailing measures to be taken to minimize the release of airborne particulates during all work activities.
 - .2 A soil tracking control plan detailing measures to be taken to minimize the tracking of soil onto public roadways and methods to be used to clean compacted surfaces.
- .2 During and upon completion of the work, the Contractor shall submit for the Engineer's information the following:
 - .1 All reported complaints associated with dust, which may have been generated as a result of the work.
 - .2 All reported complaints addressing the tracking of soil onto public roadways.

PART 2 – PRODUCTS

2.1 MATERIALS

- .1 Water used for dust control measures and cleaning of vehicles shall be free of contaminants that could adversely affect backfill material and the environment.

PART 3 – EXECUTION

3.1 DUST CONTROL MEASURES

- .1 The Contractor must comply with Section 49 of O.Reg. 419/05.
- .2 Dust control measures shall include:
 - .1 Instructing workers on dust control methods.
 - .2 Adjustment of the excavation rate, grading activities and soil handling to minimize dust emission.
 - .3 Limiting the speed of construction vehicles in the construction area to 10 km/h.
 - .4 Use of dust suppression technologies (e.g., water), as required.

- .5 Use of tarpaulins over haulage trucks (incoming and outgoing).
 - .6 Monitoring dust emission visually and taking action to suppress dust, as necessary.
 - .7 Monitoring wind conditions and adjusting excavation, soil handling and/or haulage rates or suspending work, as necessary.
 - .8 Supplying and having available at all times suitable dust suppressant equipment to control and prevent dust on the work Site.
- .3 Spray water using a system equipped with shut-off device and capable of uniform application at the following rates using low pressure, low volume nozzles:
- .1 0.36 L/m² for every 20 heavy vehicular passes during very hot and dry conditions.
 - .2 0.36 L/m² for every 38 heavy vehicular passes during warm and overcast conditions.
 - .3 0.36 L/m² for every 76 heavy vehicular passes during cool conditions.
 - .4 No stipulated watering rate is specified for wet or rainy conditions.

3.2 RECORDING AND DOCUMENTATION

- .1 During active phases of the project, the Contractor shall maintain a daily log of dust control related activities recording the following information: date, time, vehicular traffic, water application rates (L/m²), weather conditions and visual observations regarding dust and submit daily to the Engineer.

3.3 DUST MONITORING

- .1 The Engineer will monitor dust emissions, as well as the effectiveness of dust control methods and complaints or reports from the public. The Engineer may collect soil samples for chemical analysis from areas adjacent to the Remedial Work Zone, as required, to monitor dust emissions. If contamination is confirmed outside the Remedial Work Zone, the Contractor will excavate and dispose of soil contaminated by the Contractor's activities at no additional cost to the Owner.
- .2 Should the dust control measures implemented by the Contractor not address the problem to the satisfaction of the Engineer, the activities generating the dust shall be discontinued until conditions change, to allow the operation to continue in compliance with the requirements.
- .3 Should the Engineer determine that the weather conditions are such that control of dust emission becomes difficult or that exposure might occur, the Contractor will be ordered to stop any operation that is aggravating the condition and take the appropriate mitigating action.

- .4 The Contractor shall not resume the ceased activities or operations until, in the opinion of the Engineer, weather conditions and/or Site conditions are suitable.

3.4 SOIL TRACKING CONTROL MEASURES

- .1 Clean all equipment and vehicles exiting the Site, including brushing and washing tires and undercarriage, as may be required to remove the soil. See Section 01 35 00 – *Special Procedures for Contaminated Sites*.
- .2 Avoid overfilling haulage vehicles. Loads should be lower than the top of the dump box at all times.
- .3 Apply tarpaulins and secure tailgates of all loaded haulage vehicles prior to accessing public roads.
- .4 Take all necessary precautions to prevent the tracking of soil waste onto public roadways and private properties. All movement of equipment off the work Site is to be controlled through decontamination zones. The Contractor shall immediately clean all debris and dust deposits on- and off-Site resulting from the work, to the satisfaction of the Engineer, using strict dust control measures.

3.5 HAULAGE VEHICLE TARPAULINS

- .1 Roller tarpaulins will be permitted and used for both incoming and outgoing haulage vehicles when moist fill conditions exist and dust is not generated from the truck boxes as set out in the dust control plan.
- .2 When permitted, roller tarpaulins shall be maintained in a state of good repair at all times.
- .3 When dry conditions exist and dust is seen to be coming from the truck boxes from above the edge of the box or below the side of the roller tarpaulins, the latter shall be tied down to the side of the box to reduce the opening.
- .4 In the event that properly secured roller tarpaulins do not eliminate dust emissions from the truck box, additional controls including the use of a water spray to dampen the surface of the load or the use of overlapping tarpaulins tied down to the outside of the box shall be applied.

END OF SECTION