

**STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY**

In the Matter of Remedial Action by:	AGREED ORDER
City of Bothell at Bothell Landing MTCA Site	No. DE 15746

TO: Jennifer Phillips  
City Manager  
City of Bothell  
18415 - 101st Avenue NE  
Bothell, WA 98011

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Cleanup Action Plan  
Compliance Monitoring Plan  
Schedule of Deliverables

## **I. INTRODUCTION**

The mutual objective of the State of Washington, Department of Ecology (Ecology) and the City of Bothell (City) under this Agreed Order (Order) is to provide for remedial action at a facility where there has been a release or threatened release of hazardous substances. This Order requires the City to implement a Cleanup Action Plan (CAP) (Exhibit B) and Compliance Monitoring Plan (Exhibit C) at the Bothell Landing Model Toxics Control Act Site (Site) that include engineering controls, institutional controls and monitored natural attenuation. Ecology believes the actions required by this Order are in the public interest.

## **II. JURISDICTION**

This Order is issued pursuant to the Model Toxics Control Act (MTCA), RCW 70.105D.050(1).

## **III. PARTIES BOUND**

This Order shall apply to and be binding upon the Parties to this Order, their successors and assigns. The undersigned representative of each party hereby certifies that he or she is fully authorized to enter into this Order and to execute and legally bind such party to comply with this Order. The City agrees to undertake all actions required by this Order. No change in ownership or corporate status shall alter the City's responsibility under this Order. The City shall provide a copy of this Order to all agents, contractors, and subcontractors retained to perform work required by this Order, and shall ensure that all work undertaken by such agents, contractors, and subcontractors complies with this Order.

## **IV. DEFINITIONS**

Unless otherwise specified herein, the definitions set forth in RCW 70.105D.020 and WAC 173-340-200 shall control the meanings of the terms in this Order.

A. Site: The Site is referred to as the Bothell Landing Site. The Site constitutes a facility under RCW 70.105D.020(8). The Site is defined by where a hazardous substance, other than a consumer product in consumer use, has been deposited, stored, disposed of, or placed, or otherwise come to be located. Based upon factors currently known to Ecology, the Site is generally

located near the intersection of SR 522 and Bothell Way NE in Bothell, WA as shown in the Site Location Diagram (Exhibit A-1). The Remedial Investigation and Feasibility Study dated August 10, 2017 (RI/FS) documented the release of hazardous substances in the area shown in the Site Diagram (Exhibit A-2). The boundaries shown in Exhibit A-2 do not necessarily reflect the boundaries of the Site as defined in MTCA.

- B. Parties: Refers to the State of Washington, Department of Ecology and the City.
- C. Potentially Liable Person (PLP): Refers to the City.
- D. Agreed Order or Order: Refers to this Order and each of the exhibits to this Order.

All exhibits are integral and enforceable parts of this Order.

## V. FINDINGS OF FACT

Ecology makes the following findings of fact, without any express or implied admissions of such facts by the City:

A. The City acquired the Site in 2008. As a result of the relocation of SR 522 the Site is bifurcated by SR 522. The City still owns the Site, including the land under SR 522. The Site formerly housed a strip mall, restaurants, and historic gas stations, with multiple former underground petroleum storage tanks

B. Pursuant to Agreed Order DE 6294, the City completed an RI/FS dated August 10, 2017. A copy of the RI/FS is available at Ecology's offices and through the City.

C. Pursuant to Agreed Order DE 6294, the City completed a series of interim remedial actions that are more fully described in the RI/FS and CAP (Exhibit B).

D. Following the interim remedial actions, soil remains contaminated with petroleum hydrocarbons and benzene and groundwater remains contaminated with halogenated volatile organic compounds (HVOCs) from the Ultra Custom Care Cleaners Site and with arsenic.

E. Ecology currently expects that HVOCs from the Ultra Custom Care Cleaners Site will be remediated pursuant to a separate cleanup action plan.

## VI. ECOLOGY DETERMINATIONS

Ecology makes the following determinations, without any express or implied admissions of such determinations (and underlying facts) by the City.

A. The City is an “owner or operator” as defined in RCW 70.105D.020(22) of a “facility” as defined in RCW 70.105D.020(8).

B. Based upon all factors known to Ecology, a “release” or “threatened release” of “hazardous substance(s)” as defined in RCW 70.105D.020(32) and (13), respectively, has occurred at the Site.

C. Based upon credible evidence, Ecology issued a PLP status letter to the City dated November 20, 2008, pursuant to RCW 70.105D.040, .020(26), and WAC 173-340-500. By letter dated November 25, 2008, the City voluntarily waived its rights to notice and comment and accepted Ecology’s determination that the City is a PLP under RCW 70.105D.040.

D. Pursuant to RCW 70.105D.030(1) and .050(1), Ecology may require PLPs to investigate or conduct other remedial actions with respect to any release or threatened release of hazardous substances, whenever it believes such action to be in the public interest. Based on the foregoing facts, Ecology believes the remedial actions required by this Order are in the public interest.

E. The City has completed the remedial activities required by Agreed Order No. DE 6294 to Ecology’s satisfaction, as memorialized in the Satisfaction of Agreed Order letter dated January 31, 2018.

## **VII. WORK TO BE PERFORMED**

Based on the Findings of Fact and Ecology Determinations, it is hereby ordered that the City take the following remedial actions at the Site. The area within the Site where remedial action pursuant to this Order is necessary under RCW 70.105D is described in the Site Diagram (Exhibit A-2). These remedial actions must be conducted in accordance with WAC 173-340:

A. The City will implement the CAP (Exhibit B) and Compliance Monitoring Plan (Exhibit C) in accordance with the Schedule of Deliverables (Exhibit D) and all other requirements of this Order. The following naming conventions shall be used for documents: Agency Review

Draft (designation for the first time Ecology receives a document); Public Review Draft (designates a document ready for public comment); and Final (designation for a document after public comment and Ecology approval).

B. The City shall submit to Ecology written quarterly Progress Reports unless Ecology authorizes less frequent reporting. The Progress Reports shall describe the actions taken during the previous reporting period to implement the requirements of this Order. All Progress Reports shall be submitted by the tenth (10th) day of the month in which they are due after the effective date of this Order. Unless otherwise specified by Ecology, Progress Reports and any other documents submitted pursuant to this Order shall be sent by certified mail, return receipt requested, to Ecology's project coordinator. The Progress Reports shall include the following:

- a. A list of on-site activities that have taken place during the reporting period;
- b. Detailed description of any deviations from required tasks not otherwise documented in project plans or amendment requests;
- c. Description of all deviations from the Schedule of Deliverables (Exhibit D) during the current reporting period and any planned deviations in the upcoming reporting period;
- d. For any deviations in schedule, a plan for recovering lost time and maintaining compliance with the Schedule of Deliverables (Exhibit D);
- e. All raw data (including laboratory analyses) received by the City during the past reporting period and an identification of the source of the sample; and
- f. A list of deliverables for the upcoming reporting period if different from the Schedule of Deliverables (Exhibit D).

C. All plans or other deliverables submitted by the City for Ecology's review and approval under the Schedule of Deliverables (Exhibit D) shall, upon Ecology's approval, become integral and enforceable parts of this Order.

D. If Ecology determines that the City has failed to make sufficient progress or failed to implement the remedial action, in whole or in part, Ecology may, after notice to the City,

perform any or all portions of the remedial action or at Ecology's discretion allow the City opportunity to correct. The City shall reimburse Ecology for the costs of doing such work in accordance with Section VIII.A (Remedial Action Costs). Ecology reserves the right to enforce requirements of this Order under Section X (Enforcement).

E. Except where necessary to abate an emergency situation, the City shall not perform any remedial actions at the Site outside those remedial actions required by this Order, unless Ecology concurs, in writing, with such additional remedial actions.

## **VIII. TERMS AND CONDITIONS**

### **A. Payment of Remedial Action Costs**

The City shall pay to Ecology costs incurred by Ecology pursuant to this Order and consistent with WAC 173-340-550(2). These costs shall include work performed by Ecology or its contractors for, or on, the Site under RCW 70.105D, including remedial actions and Order preparation, negotiation, oversight, and administration. These costs shall include work performed both prior to and subsequent to the issuance of this Order. Ecology's costs shall include costs of direct activities and support costs of direct activities as defined in WAC 173-340-550(2). For all Ecology costs incurred, the City shall pay the required amount within thirty (30) days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general statement of work performed will be provided upon request. Itemized statements shall be prepared quarterly. Pursuant to WAC 173-340-550(4), failure to pay Ecology's costs within ninety (90) days of receipt of the itemized statement of costs will result in interest charges at the rate of twelve percent (12%) per annum, compounded monthly.

In addition to other available relief, pursuant to RCW 19.16.500, Ecology may utilize a collection agency and/or, pursuant to RCW 70.105D.055, file a lien against real property subject to the remedial actions to recover unreimbursed remedial action costs.

**B. Designated Project Coordinators**

The project coordinator for Ecology is:

Jerome Cruz  
Department of Ecology  
3190 160th Avenue SE  
Bellevue, WA 98008-5452  
Phone: (425) 649-7094  
Email: jcr461@ecy.wa.gov

The project coordinator for the City is:

Nduta Mbuthia  
Senior Capital Project Engineer  
City of Bothell, Public Works Department  
18415 - 101st Avenue NE  
Bothell, WA 98011  
Phone: (425) 806-6829  
Email: Nduta.Mbuthia@bothellwa.gov

Each project coordinator shall be responsible for overseeing the implementation of this Order. Ecology's project coordinator will be Ecology's designated representative for the Site. To the maximum extent possible, communications between Ecology and the City, and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order shall be directed through the project coordinators. The project coordinators may designate, in writing, working level staff contacts for all or portions of the implementation of the work to be performed required by this Order.

Any party may change its respective project coordinator. Written notification shall be given to the other party at least ten (10) calendar days prior to the change.

**C. Performance**

All geologic and hydrogeologic work performed pursuant to this Order shall be under the supervision and direction of a geologist or hydrogeologist licensed by the State of Washington or under the direct supervision of an engineer registered by the State of Washington, except as otherwise provided for by RCW 18.43 and 18.220.



All engineering work performed pursuant to this Order shall be under the direct supervision of a professional engineer registered by the State of Washington, except as otherwise provided for by RCW 18.43.130.

All construction work performed pursuant to this Order shall be under the direct supervision of a professional engineer or a qualified technician under the direct supervision of a professional engineer. The professional engineer must be registered by the State of Washington, except as otherwise provided for by RCW 18.43.130.

Any documents submitted containing geologic, hydrogeologic, or engineering work shall be under the seal of an appropriately licensed professional as required by RCW 18.43 and 18.220.

The City shall notify Ecology in writing of the identity of any engineer(s) and geologist(s), contractor(s) and subcontractor(s), and others to be used in carrying out the terms of this Order, in advance of their involvement at the Site.

**D. Access**

Ecology or any Ecology authorized representative shall have access to enter and freely move about all property at the Site that the City either owns, controls, or has access rights to at all reasonable times for the purposes of, *inter alia*: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Order; reviewing the City's progress in carrying out the terms of this Order; conducting such tests or collecting such samples as Ecology may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Order; and verifying the data submitted to Ecology by the City. The City shall make all reasonable efforts to secure access rights for those properties within the Site not owned or controlled by the City where remedial activities or investigations will be performed pursuant to this Order. Ecology or any Ecology authorized representative shall give reasonable notice before entering any Site property owned or controlled by the City unless an emergency prevents such notice. All persons who access the Site pursuant to this section shall comply with any applicable health and safety plan(s). Ecology employees and their representatives shall not be required to sign any liability release or waiver as a condition of Site property access.

**E. Sampling, Data Submittal, and Availability**

With respect to the implementation of this Order, the City shall make the results of all sampling, laboratory reports, and/or test results generated by it or on its behalf available to Ecology. Pursuant to WAC 173-340-840(5), all sampling data shall be submitted to Ecology in both printed and electronic formats in accordance with Section VII (Work to be Performed), Ecology's Toxics Cleanup Program Policy 840 (Data Submittal Requirements), and/or any subsequent procedures specified by Ecology for data submittal.

If requested by Ecology, the City shall allow Ecology and/or its authorized representative to take split or duplicate samples of any samples collected by the City pursuant to implementation of this Order. The City shall notify Ecology seven (7) days in advance of any sample collection or work activity at the Site. Ecology shall, upon request, allow the City and/or its authorized representative to take split or duplicate samples of any samples collected by Ecology pursuant to the implementation of this Order, provided that doing so does not interfere with Ecology's sampling. Without limitation on Ecology's rights under Section VIII.D (Access), Ecology shall notify the City prior to any sample collection activity unless an emergency prevents such notice.

In accordance with WAC 173-340-830(2)(a), all hazardous substance analyses shall be conducted by a laboratory accredited under WAC 173-50 for the specific analyses to be conducted, unless otherwise approved by Ecology.

**F. Public Participation**

Ecology shall maintain the responsibility for public participation at the Site. However, the City shall cooperate with Ecology, and shall:

1. If agreed to by Ecology, develop appropriate mailing lists and prepare drafts of public notices and fact sheets at important stages of the remedial action, such as the submission of work plans, remedial investigation/feasibility study reports, cleanup action plans, and engineering design reports. As appropriate, Ecology will edit, finalize, and distribute such fact sheets and prepare and distribute public notices of Ecology's presentations and meetings.

2. Notify Ecology's project coordinator prior to the preparation of all press releases and fact sheets, and before meetings related to remedial action work to be performed at the Site with the interested public and/or local governments. Likewise, Ecology shall notify the City prior to the issuance of all press releases and fact sheets related to the Site, and before meetings related to the Site with the interested public and local governments. For all press releases, fact sheets, meetings, and other outreach efforts by the City that do not receive prior Ecology approval, the City shall clearly indicate to its audience that the press release, fact sheet, meeting, or other outreach effort was not sponsored or endorsed by Ecology.

3. When requested by Ecology, participate in public presentations on the progress of the remedial action at the Site. Participation may be through attendance at public meetings to assist in answering questions or as a presenter.

4. When requested by Ecology, arrange and/or continue information repositories to be located at the following locations:

- a. King County Bothell Library  
18215 98th Ave. NE  
Bothell, WA 98011
- b. Ecology's Northwest Regional Office  
3190 160th Ave. SE  
Bellevue, WA 98008-5452  
  
Call for an appointment:  
Sally Perkins  
Phone: (425) 649-7109  
Fax: (425) 649-4450  
E-mail: [nwro\\_public\\_request@ecy.wa.gov](mailto:nwro_public_request@ecy.wa.gov)
- c. City of Bothell – City Hall  
18415 – 101<sup>st</sup> Ave NE  
Bothell, WA 98011  
Phone: (425) 486-7811

At a minimum, copies of all public notices, fact sheets, and documents relating to public comment periods shall be promptly placed in these repositories. A copy of all documents related to this Site

shall be maintained in the repository at Ecology's Northwest Regional Office in Bellevue, Washington.

**G. Retention of Records**

During the pendency of this Order, and for ten (10) years from the date of completion of work performed pursuant to this Order, the City shall preserve all records, reports, documents, and underlying data in its possession relevant to the implementation of this Order and shall insert a similar record retention requirement into all contracts with project contractors and subcontractors. Upon request of Ecology, the City shall make all records available to Ecology and allow access for review within a reasonable time.

Nothing in this Order is intended to waive any right the City may have under applicable law to limit disclosure of documents protected by the attorney work-product privilege and/or the attorney-client privilege. If the City withholds any requested records based on an assertion of privilege, the City shall provide Ecology with a privilege log specifying the records withheld and the applicable privilege. No Site-related data collected pursuant to this Order shall be considered privileged.

**H. Resolution of Disputes**

1. In the event that the City elects to invoke dispute resolution the City must utilize the procedure set forth below.

a. Upon the triggering event (receipt of Ecology's project coordinator's written decision or an itemized billing statement), the City has fourteen (14) calendar days within which to notify Ecology's project coordinator in writing of its dispute (Informal Dispute Notice).

b. The Parties' project coordinators shall then confer in an effort to resolve the dispute informally. The parties shall informally confer for up to fourteen (14) calendar days from receipt of the Informal Dispute Notice. If the project coordinators cannot resolve the dispute within those 14 calendar days, then within seven (7) calendar days Ecology's project coordinator shall issue a written decision (Informal Dispute Decision) stating: the

nature of the dispute; the City's position with regards to the dispute; Ecology's position with regards to the dispute; and the extent of resolution reached by informal discussion.

c. The City may then request regional management review of the dispute. This request (Formal Dispute Notice) must be submitted in writing to the Northwest Region Toxics Cleanup Section Manager within seven (7) calendar days of receipt of Ecology's Informal Dispute Decision. The Formal Dispute Notice shall include a written statement of dispute setting forth: the nature of the dispute; the disputing Party's position with respect to the dispute; and the information relied upon to support its position.

d. The Section Manager shall conduct a review of the dispute and shall issue a written decision regarding the dispute (Decision on Dispute) within thirty (30) calendar days of receipt of the Formal Dispute Notice. The Decision on Dispute shall be Ecology's final decision on the disputed matter.

2. The Parties agree to only utilize the dispute resolution process in good faith and agree to expedite, to the extent possible, the dispute resolution process whenever it is used.

3. Implementation of these dispute resolution procedures shall not provide a basis for delay of any activities required in this Order, unless Ecology agrees in writing to a schedule extension.

4. In case of a dispute, failure to either proceed with the work required by this Order or timely invoke dispute resolution may result in Ecology's determination that insufficient progress is being made in preparation of a deliverable, and may result in Ecology undertaking the work under Section VII.D (Work to be Performed) or initiating enforcement under Section X (Enforcement).

#### **I. Extension of Schedule**

1. The City's request for an extension of schedule shall be granted only when a request for an extension is submitted in a timely fashion, generally at least thirty (30) days prior to expiration of the deadline for which the extension is requested, and good cause exists for granting the extension. All extensions shall be requested in writing. The request shall specify:

- a. The deadline that is sought to be extended;
- b. The length of the extension sought;
- c. The reason(s) for the extension; and
- d. Any related deadline or schedule that would be affected if the extension were granted.

2. The burden shall be on the City to demonstrate to the satisfaction of Ecology that the request for such extension has been submitted in a timely fashion and that good cause exists for granting the extension. Good cause may include, but may not be limited to:

- a. Circumstances beyond the reasonable control and despite the due diligence of the City including delays caused by unrelated third parties or Ecology, such as (but not limited to) delays by Ecology in reviewing, approving, or modifying documents submitted by the City;
- b. Acts of God, including fire, flood, blizzard, extreme temperatures, storm, or other unavoidable casualty; or
- c. Endangerment as described in Section VIII.K (Endangerment).

However, neither increased costs of performance of the terms of this Order nor changed economic circumstances shall be considered circumstances beyond the reasonable control of the City.

3. Ecology shall act upon any City written request for extension in a timely fashion. Ecology shall give the City written notification of any extensions granted pursuant to this Order. A requested extension shall not be effective until approved by Ecology. Unless the extension is a substantial change, it shall not be necessary to amend this Order pursuant to Section VIII.J (Amendment of Order) when a schedule extension is granted.

4. At the City's request, an extension shall only be granted for such period of time as Ecology determines is reasonable under the circumstances. Ecology may grant schedule extensions exceeding ninety (90) days only as a result of:

- a. Delays in the issuance of a necessary permit which was applied for in a timely manner;

- b. Other circumstances deemed exceptional or extraordinary by Ecology; or
- c. Endangerment as described in Section VIII.K (Endangerment).

**J. Amendment of Order**

The project coordinators may verbally agree to minor changes to the work to be performed without formally amending this Order. Minor changes will be documented in writing by Ecology within seven (7) days of verbal agreement.

Except as provided in Section VIII.L (Reservation of Rights), substantial changes to the work to be performed shall require formal amendment of this Order. This Order may only be formally amended by the written consent of both Ecology and the City. Ecology will provide its written consent to a formal amendment only after public notice and opportunity to comment on the formal amendment.

When requesting a change to the Order, the City shall submit a written request to Ecology for approval. Ecology shall indicate its approval or disapproval in writing and in a timely manner after the written request is received. If Ecology determines that the change is substantial, then the Order must be formally amended. Reasons for the disapproval of a proposed change to this Order shall be stated in writing. If Ecology does not agree to a proposed change, the disagreement may be addressed through the dispute resolution procedures described in Section VIII.H (Resolution of Disputes).

**K. Endangerment**

In the event Ecology determines that any activity being performed at the Site under this Order is creating or has the potential to create a danger to human health or the environment on or surrounding the Site, Ecology may direct the City to cease such activities for such period of time as it deems necessary to abate the danger. The City shall immediately comply with such direction.

In the event the City determines that any activity being performed at the Site under this Order is creating or has the potential to create a danger to human health or the environment, the City may cease such activities. The City shall notify Ecology's project coordinator as soon as possible, but no later than twenty-four (24) hours after making such determination or ceasing such

activities. Upon Ecology's direction, the City shall provide Ecology with documentation of the basis for the determination or cessation of such activities. If Ecology disagrees with the City's cessation of activities, it may direct the City to resume such activities.

If Ecology concurs with or orders a work stoppage pursuant to this section, the City's obligations with respect to the ceased activities shall be suspended until Ecology determines the danger is abated, and the time for performance of such activities, as well as the time for any other work dependent upon such activities, shall be extended in accordance with Section VIII.I (Extension of Schedule) for such period of time as Ecology determines is reasonable under the circumstances.

Nothing in this Order shall limit the authority of Ecology, its employees, agents, or contractors to take or require appropriate action in the event of an emergency.

**L. Reservation of Rights**

This Order is not a settlement under RCW 70.105D. Ecology's signature on this Order in no way constitutes a covenant not to sue or a compromise of any of Ecology's rights or authority. Ecology will not, however, bring an action against the City to recover remedial action costs paid to and received by Ecology under this Order. In addition, Ecology will not take additional enforcement actions against the City regarding remedial actions required by this Order, provided the City complies with this Order.

Ecology nevertheless reserves its rights under RCW 70.105D, including the right to require additional or different remedial actions at the Site should it deem such actions necessary to protect human health or the environment, and to issue orders requiring such remedial actions. Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting from the release or threatened release of hazardous substances at the Site.

By entering into this Order, the City does not admit to any liability for the Site. Although the City is committing to conducting the work required by this Order under the terms of this Order, the City expressly reserves all rights available under law, including but not limited to the right to



seek cost recovery or contribution against third parties, and the right to assert any defenses to liability in the event of enforcement.

**M. Transfer of Interest in Property**

No voluntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Site shall be consummated by the City without provision for continued implementation of all requirements of this Order and implementation of any remedial actions found to be necessary as a result of this Order.

Prior to the City's transfer of any interest in all or any portion of the Site, and during the effective period of this Order, the City shall provide a copy of this Order to any prospective purchaser, lessee, transferee, assignee, or other successor in said interest; and, at least thirty (30) days prior to any transfer, the City shall notify Ecology of said transfer. Upon transfer of any interest, the City shall notify all transferees of the restrictions on the activities and uses of the property under this Order and incorporate any such use restrictions into the transfer documents.

**N. Compliance with Applicable Laws**

1. All actions carried out by the City pursuant to this Order shall be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits or approvals, except as provided in RCW 70.105D.090. At this time, no federal, state, or local requirements have been identified as being applicable to the actions required by this Order. The City has a continuing obligation to identify additional applicable federal, state, and local requirements which apply to actions carried out pursuant to this Order, and to comply with those requirements. As additional federal, state, and local requirements are identified by Ecology or the City, Ecology will document in writing if they are applicable to actions carried out pursuant to this Order, and the PLP must implement those requirements.

2. All actions carried out by the City pursuant to this Order shall be done in accordance with relevant and appropriate requirements identified by Ecology. At this time, no relevant and appropriate requirements have been identified as being applicable to the actions required by this Order. If additional relevant and appropriate requirements are identified by Ecology or the City,

Ecology will document in writing if they are applicable to actions carried out pursuant to this Order and the PLP must implement those requirements.

3. Pursuant to RCW 70.105D.090(1), the City may be exempt from the procedural requirements of RCW 70.94, 70.95, 70.105, 77.55, 90.48, and 90.58 and of any laws requiring or authorizing local government permits or approvals. However, the City shall comply with the substantive requirements of such permits or approvals. For permits and approvals covered under RCW 70.105D.090(1) that have been issued by local government, the Parties agree that Ecology has the non-exclusive ability under this Order to enforce those local government permits and/or approvals. At this time, no state or local permits or approvals have been identified as being applicable but procedurally exempt under this section.

4. The City has a continuing obligation to determine whether additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Order. In the event either Ecology or the City determines that additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Order, it shall promptly notify the other party of its determination. Ecology shall determine whether Ecology or the City shall be responsible to contact the appropriate state and/or local agencies. If Ecology so requires, the City shall promptly consult with the appropriate state and/or local agencies and provide Ecology with written documentation from those agencies of the substantive requirements those agencies believe are applicable to the remedial action. Ecology shall make the final determination on the additional substantive requirements that must be met by the City and on how the City must meet those requirements. Ecology shall inform the City in writing of these requirements. Once established by Ecology, the additional requirements shall be enforceable requirements of this Order. The City shall not begin or continue the remedial action potentially subject to the additional requirements until Ecology makes its final determination.

Pursuant to RCW 70.105D.090(2), in the event Ecology determines that the exemption from complying with the procedural requirements of the laws referenced in RCW 70.105D.090(1) would result in the loss of approval from a federal agency that is necessary for the state to

administer any federal law, the exemption shall not apply and the City shall comply with both the procedural and substantive requirements of the laws referenced in RCW 70.105D.090(1), including any requirements to obtain permits or approvals.

**O. Land Use Restrictions**

As detailed in the CAP (Exhibit B), institutional controls are required at the Site. Environmental (Restrictive) Covenants will be used to implement the institutional controls. In consultation with the City, Ecology will prepare the Environmental (Restrictive) Covenants consistent with WAC 173-340-440, RCW 64.70, and any policies or procedures specified by Ecology. The Environmental (Restrictive) Covenants shall restrict future activities and uses of the Site as agreed to by Ecology and the City.

The City shall record the Environmental (Restrictive) Covenant for affected properties it owns with the office of the King County Auditor as detailed in the Schedule of Deliverables (Exhibit D). The City shall provide Ecology with the original recorded Environmental (Restrictive) Covenants within thirty (30) days of the recording date.

**P. Financial Assurances**

Pursuant to WAC 173-340-440(11), the City shall maintain sufficient and adequate financial assurance mechanisms to cover all costs associated with the operation and maintenance of the remedial action at the Site, including institutional controls, compliance monitoring, and corrective measures.

Within sixty (60) days of the effective date of this Order, the City shall submit to Ecology for review and approval an estimate of the costs under this Order for operation and maintenance of the remedial actions at the Site, including institutional controls, compliance monitoring and corrective measures. Within sixty (60) days after Ecology approves the aforementioned cost estimate, the City shall provide proof of financial assurances sufficient to cover all such costs in a form acceptable to Ecology.

The City shall adjust the financial assurance coverage and provide Ecology's project coordinator with documentation of the updated financial assurance for:

1. Inflation, annually, within thirty (30) days of the anniversary date of the entry of this Order; or if applicable, the modified anniversary date established in accordance with this section, or if applicable, ninety (90) days after the close of the City's fiscal year if the financial test or corporate guarantee is used.

2. Changes in cost estimates, within thirty (30) days of issuance of Ecology's approval of a modification or revision to the CAP (Exhibit B) that result in increases to the cost or expected duration of remedial actions. Any adjustments for inflation since the most recent preceding anniversary date shall be made concurrent with adjustments for changes in cost estimates. The issuance of Ecology's approval of a revised or modified CAP will revise the anniversary date established under this section to become the date of issuance of such revised or modified CAP.

**Q. Periodic Review**

As remedial action, including groundwater monitoring, continues at the Site, the Parties agree to review the progress of remedial action at the Site, and to review the data accumulated as a result of monitoring the Site as often as is necessary and appropriate under the circumstances. At least every five (5) years after the initiation of cleanup action at the Site the Parties shall meet to discuss the status of the Site and the need, if any, for further remedial action at the Site. At least ninety (90) days prior to each periodic review, the City shall submit a report to Ecology that documents whether human health and the environment are being protected based on the factors set forth in WAC 173-340-420(4). Ecology reserves the right to require further remedial action at the Site under appropriate circumstances. This provision shall remain in effect for the duration of this Order.

**R. Indemnification**

The City agrees to indemnify and save and hold the State of Washington, its employees, and agents harmless from any and all claims or causes of action (1) for death or injuries to persons, or (2) for loss or damage to property, to the extent arising from or on account of acts or omissions of the City, its officers, employees, agents, or contractors in entering into and implementing this Order. However, the City shall not indemnify the State of Washington nor save nor hold its

employees and agents harmless from any claims or causes of action to the extent arising out of the negligent acts or omissions of the State of Washington, or the employees or agents of the State, in entering into or implementing this Order.

**IX. SATISFACTION OF ORDER**

The provisions of this Order shall be deemed satisfied upon the City's receipt of written notification from Ecology that the City has completed the remedial activity required by this Order, as amended by any modifications, and that the City has complied with all other provisions of this Agreed Order.

**X. ENFORCEMENT**

Pursuant to RCW 70.105D.050, this Order may be enforced as follows:

A. The Attorney General may bring an action to enforce this Order in a state or federal court.

B. The Attorney General may seek, by filing an action, if necessary, to recover amounts spent by Ecology for investigative and remedial actions and orders related to the Site.

C. A liable party who refuses, without sufficient cause, to comply with any term of this Order will be liable for:

1. Up to three (3) times the amount of any costs incurred by the State of Washington as a result of its refusal to comply.

2. Civil penalties of up to twenty-five thousand dollars (\$25,000) per day for each day it refuses to comply.

D. This Order is not appealable to the Washington Pollution Control Hearings Board.

This Order may be reviewed only as provided under RCW 70.105D.060.

Effective date of this Order: \_\_\_\_\_

CITY OF BOTHELL

STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

  
\_\_\_\_\_  
Jennifer Phillips

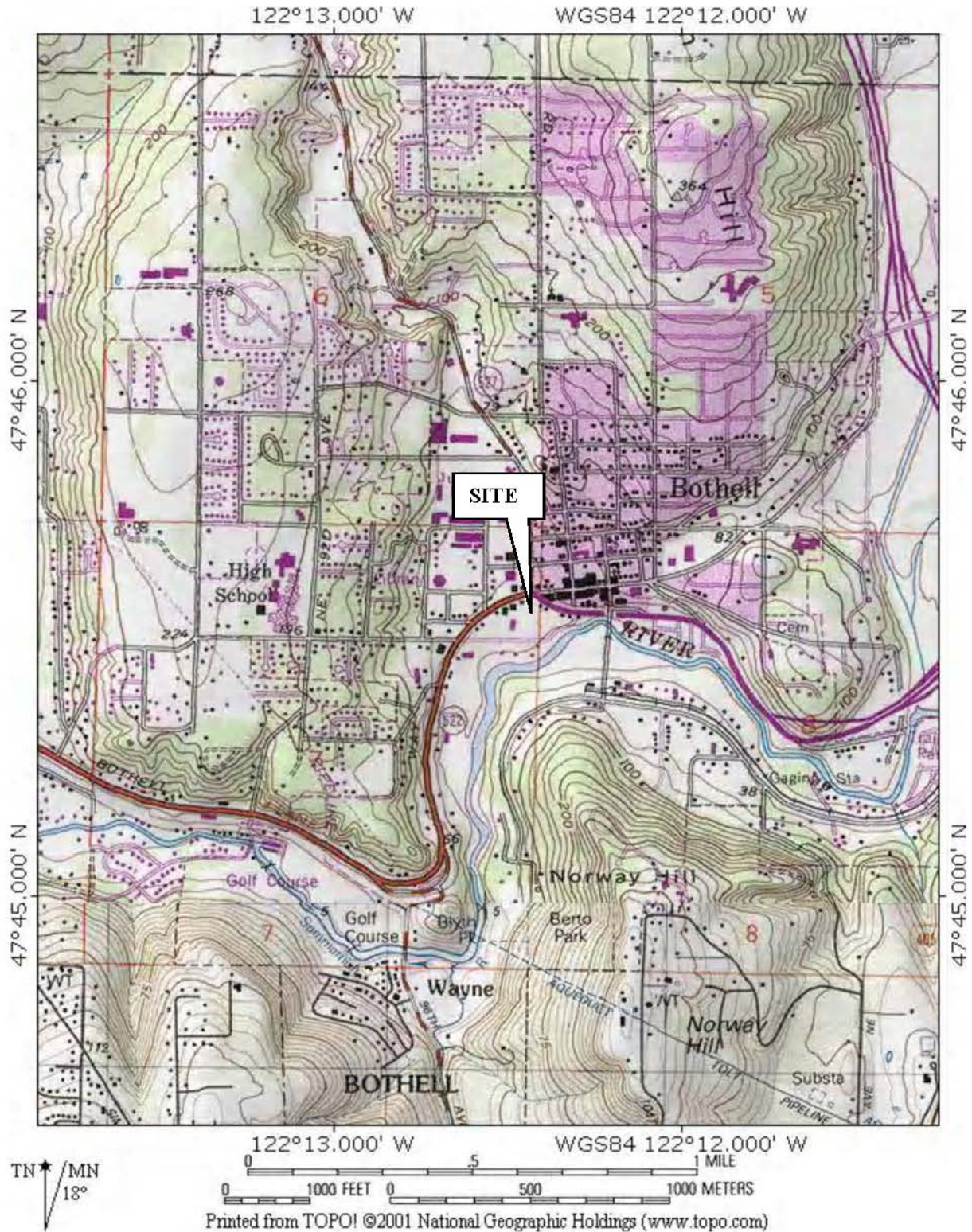
\_\_\_\_\_  
Robert W. Warren

City Manager  
Bothell, WA  
(425) 806-6100

Section Manager  
Toxics Cleanup Program  
Northwest Regional Office  
(425) 649-7054



# EXHIBIT A-1



## SITE VICINITY

**BOTHELL LANDING SITE  
CLEANUP ACTION PLAN  
BOTHELL, WASHINGTON**

EXHIBIT

# A-1

PROJECT NO.

2007-098-920
















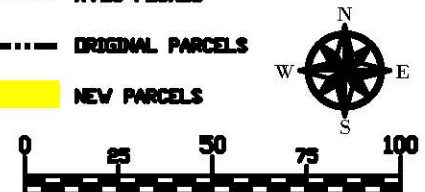
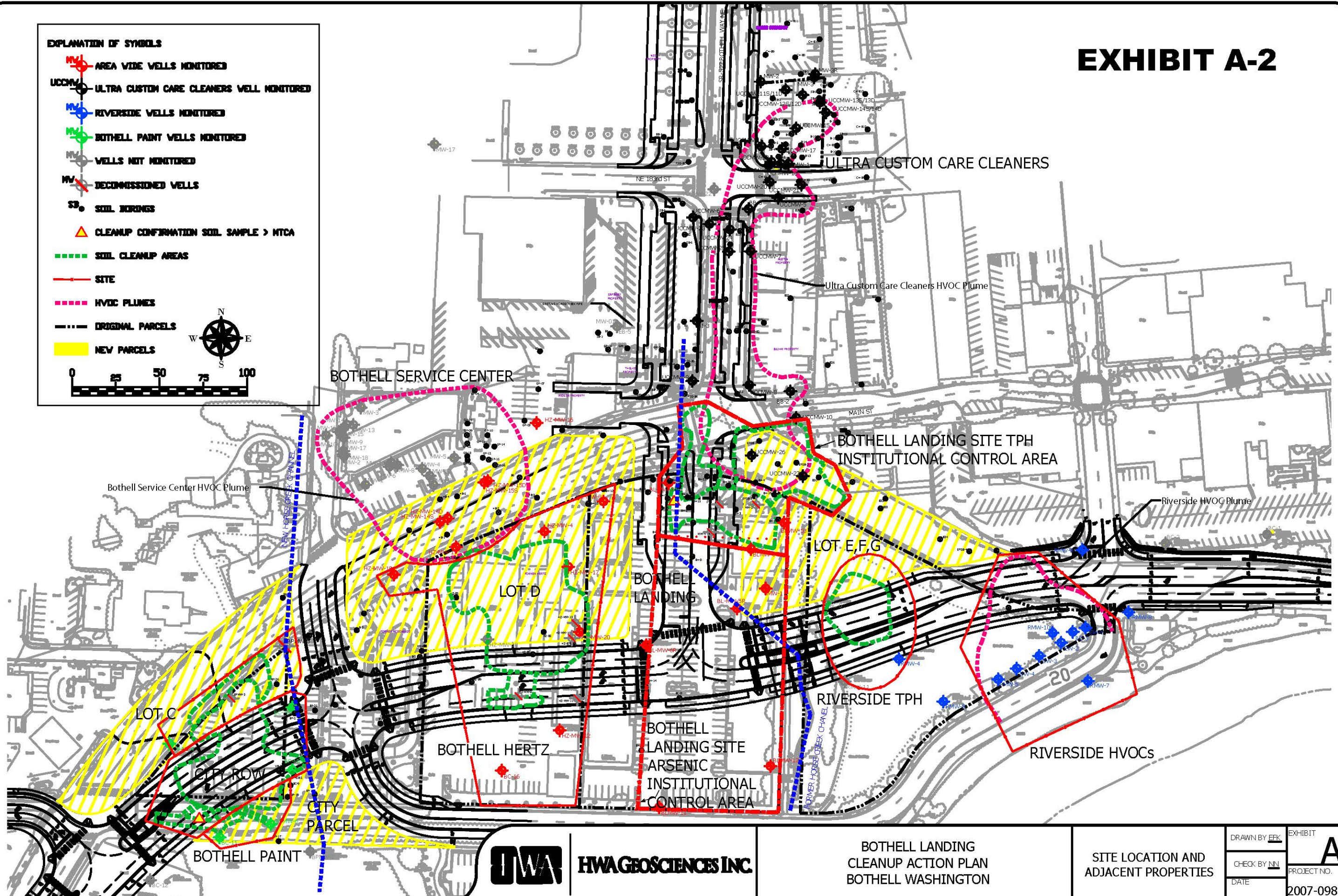
**HWA GEOSCIENCES INC.**



# EXHIBIT A-2

**EXPLANATION OF SYMBOLS**

-  AREA WIDE WELLS MONITORED
-  ULTRA CUSTOM CARE CLEANERS WELL MONITORED
-  RIVERSIDE WELLS MONITORED
-  BOTHELL PAINT WELLS MONITORED
-  WELLS NOT MONITORED
-  DECOMMISSIONED WELLS
-  SOIL BORINGS
-  CLEANUP CONFIRMATION SOIL SAMPLE > MTC
-  SOIL CLEANUP AREAS
-  SITE
-  HVOC PLUMES
-  ORIGINAL PARCELS
-  NEW PARCELS

BOTHELL LANDING  
CLEANUP ACTION PLAN  
BOTHELL WASHINGTON

SITE LOCATION AND  
ADJACENT PROPERTIES

DRAWN BY	EFK	EXHIBIT	<b>A-2</b>
CHECK BY	NN	PROJECT NO.	
DATE		2007-098 T2020	



**EXHIBIT B**

**DRAFT FINAL CLEANUP ACTION PLAN REV1  
BOTHELL LANDING SITE  
BOTHELL, WASHINGTON**

**City of Bothell**

**August 10, 2017**

**Issued by:**

**Washington State  
Department of Ecology  
Toxics Cleanup Program**

Northwest Regional Office  
3190 – 160th Avenue SE  
Bellevue, Washington 98008



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Figure 4      Conceptual Site Model

## **EXECUTIVE SUMMARY**

This document presents the draft Cleanup Action Plan (dCAP) for the Bothell Landing Site in Bothell, Washington. This dCAP was prepared by the Washington State Department of Ecology (Ecology) in collaboration with the City of Bothell. This dCAP has been prepared to meet the requirements of the Model Toxics Control Cleanup Act (MTCA) administered by Ecology under Chapter 173-340 of the Washington Administrative Code (WAC). This dCAP describes Ecology's proposed cleanup action for this site and sets forth the requirements that the cleanup must meet.

### **Background**

The Bothell Landing Site is located along Bothell Way NE / SR 522 at its (past and current) intersection with Bothell Way NE/ former SR 527, in Bothell, Washington. The Site formerly housed a strip mall, restaurants, and historic gas stations, with multiple former petroleum underground storage tanks (USTs). The City acquired properties on which the Site lies in 2008 for construction of the SR 522 realignment, and entered into an Agreed Order with Ecology in 2009. Remedial investigation activities were initiated in 2009, and finalized in 2016. Interim action soil cleanups for petroleum hydrocarbons were conducted in 2010, 2013, 2014, 2015, and 2017 at the Site. Chemicals of concern (COCs) at the Site following the interim action cleanups are:

- Soil: Gasoline-range petroleum hydrocarbons, benzene
- Ground water: arsenic

### **Cleanup Action Overview**

The selected remedy for the Site is a combination of excavation of contaminated soils (already completed as interim actions), engineering controls (capping under roadways) and institutional controls (environmental covenants restricting access to soil and ground water), as described below:

1. Remnant petroleum contaminated soil under roadway – leave in place and implement:
  - Engineering controls – paved SR 522 roadway capping petroleum impacted soils
  - Institutional controls – implement environmental covenants for area shown in Figure 2
2. Ground water arsenic – include institutional controls in new environmental covenant for the arsenic impacted area (shown in Figure 2) and provide compliance monitoring for ground water with option to remove arsenic from the covenant if monitoring shows naturally elevated concentrations unrelated to historical or current contamination at the Site.

**DRAFT CLEANUP ACTION PLAN REV 1  
BOTHELL LANDING SITE  
BOTHELL, WASHINGTON**

**1 INTRODUCTION**

**1.1 PURPOSE**

This document is the draft Cleanup Action Plan (dCAP) for the Bothell Landing Site located in Bothell, Washington. The general location of the Site is shown in Figures 1 and 2. A CAP is required as part of the site cleanup process under Chapter 173-340 WAC, Model Toxics Control Act (MTCA) Cleanup Regulations. The purpose of the dCAP is to identify the proposed cleanup action for the Site and to provide an explanatory document for public review. More specifically, this plan:

- Describes the Site
- Summarizes current site conditions;
- Summarizes the cleanup action alternatives considered in the remedy selection process;
- Describes the selected cleanup action for the Site and the rationale for selecting this alternative;
- Identifies site-specific cleanup levels and points of compliance for each hazardous substance and medium of concern for the proposed cleanup action;
- Identifies applicable state and federal laws for the proposed cleanup action;
- Identifies residual contamination remaining on the site after cleanup and restrictions on future uses and activities at the site to ensure continued protection of human health and the environment;
- Discusses compliance monitoring requirements; and
- Presents the schedule for implementing the CAP.

Ecology has made a preliminary determination that a cleanup conducted in conformance with this dCAP will comply with the requirements for selection of a remedy under WAC 173-340-360.

**1.2 PREVIOUS STUDIES**

Previous studies at the Site include the following:

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HWA GeoSciences, 2007b, *Phase II Environmental Site Assessment Beta Bothell Landing Property, Bothell, Washington*. Prepared for City of Bothell, November 1, 2007.

HWA GeoSciences, 2009a, *Remedial Investigation and Feasibility Study Work Plan, Bothell Landing Property, Bothell, Washington*. Prepared for City of Bothell, August 26, 2009.

HWA GeoSciences, 2009b, *Aquifer Testing and Permeability Estimates, Bothell Crossroads RI/FS, Bothell, Washington*. Prepared for City of Bothell, October 6, 2009.

HWA GeoSciences, 2011a, *Documentation of Interim Action at Bothell Landing Site, Bothell, Washington*. Prepared for City of Bothell, February 2, 2011.

HWA GeoSciences, 2011b, *Remedial Investigation Feasibility Study Final Work Plan, Bothell Landing Site Bothell, Washington*, September 19, 2011. Includes Ecology Amendment No. 1 to Agreed Order.

HWA GeoSciences, 2014a, *Letter Report: Bothell Landing Interim Action Status Report, January – March 2014, Bothell, WA*, dated April 7, 2014.

HWA GeoSciences, 2014b, Addendum 2 to August 20, 2014 Letter Re: Area Wide Ground Water Monitoring Network, Bothell Agreed Order Sites, Bothell, Washington. Letter dated August 27, 2014.

HWA GeoSciences, 2014c, Area Wide Ground Water Monitoring Network, Bothell Agreed Order Sites, Bothell, WA. Letter Dated August 22, 2014.

HWA GeoSciences, 2014d, *Interim Action Cleanup Action Report, Bothell Landing Site, Bothell, WA*, Dated September 2, 2014.

HWA GeoSciences, 2014e, *Area Wide Ground Water Monitoring, Second Round Results, Bothell Agreed Order Sites, Bothell, WA*. Letter Dated October 17, 2014.

HWA GeoSciences, 2015a, *Area Wide Ground Water Monitoring, Third Round Results, Bothell Agreed Order Sites, Bothell, WA*. Letter Dated January 16, 2015.

HWA GeoSciences, 2015b, *Area Wide Ground Water Monitoring, Fourth Round Results, Bothell Agreed Order Sites, Bothell, WA*. Letter Dated April 16 2015.

HWA GeoSciences, 2015c, *Addendum No. 1 to Interim Action Cleanup Report, (HWA, 9/1/14) Bothell Landing Site, Bothell, WA*, Dated November 6, 2015.

Kleinfelder, 1999, *Phase II Soil and Ground Water Exploration, Bothell Landing Shopping Plaza, Bothell, Washington*. Prepared for Buck & Gordon, LLP, Seattle, WA, September 8, 1999.

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Parametrix, 2009a, *Bothell Landing Remedial Investigation/Feasibility Study, Revision No. 0*. Prepared for City of Bothell, November 2009.

Parametrix, 2009b, *Bothell Landing Draft Cleanup Action Plan, Revision No. 1*, Prepared for City of Bothell, December 2009.

Parametrix, 2010a, *Technical Memorandum, Responses to Ecology Comments: Bothell Landing Draft RI/FS and CAP*, dated March 10, 2010.

Parametrix, 2010b, *Interim Action Work Plan, Bothell Landing Site, Revision No.2*, Prepared for City of Bothell, April 2010.

Riley Group, *Draft Phase I Environmental Site Assessment, Bothell Landing Property #1*, May 29, 2007.

### **1.3 REGULATORY FRAMEWORK**

The dCAP is being conducted under Agreed Order DE 6294, dated February 3, 2009, as amended by Amendment No. 1 to Agreed Order, dated June 9, 2010, between the City of Bothell (City) and the Washington State Department of Ecology (Ecology) to address soil and ground water contamination related to historical releases of hazardous substances at the Site. Requirements under the Agreed Order include performance of a remedial investigation/feasibility study (RI/FS) and development of a dCAP.

There are no other local, state or federal regulatory actions at the site.

## 2 SITE DESCRIPTION

### 2.1 SITE HISTORY

Details of historic property use and the several site assessments performed to date at the Site can be found in Kleinfelder (1999), Riley Group (2007), ECOSS (2008), HWA (2007, 2009a), and Parametrix (2009a). The following is a summary of those assessments.

Two service stations were previously located at the northeast and northwest corners of the Site between the 1930's and 1970's. The stations were demolished during site reconstruction in the 1970's and the underground storage tanks (USTs) associated with the stations were reported to have been removed (Riley Group, 2007).

Prior to 2009, the former 2.8 acre Bothell Landing property was occupied by two, single-story restaurants in the northeast and northwest corners of the property and two, multi-tenant retail and office buildings in the southern portion of the property. The remainder of the property was covered with asphalt-paved parking and landscaping. The buildings were demolished in May 2010 in advance of soil cleanup work and subsequent construction of the new roadway. The remnant portions of the property and vacated former SR 522 roadway have been conjugated into new City parcels and are being sold to private parties for redevelopment; the southern portion of the property will become a part of the expanded park. The restaurants and retail buildings were excluded as possible sources of contamination, whereas the service stations were not. Extensive subsequent RI explorations confirmed this.

In 1998, the City purchased the north-central portion of the site at 10001 Woodinville Way as part of a roadway widening and the Rotunda Park project. In the course of site excavation, five USTs and associated petroleum-affected soils were discovered. The USTs were assumed to have been associated with one of the former service stations. The City removed approximately 385 tons of petroleum-affected soils from the Site. Petroleum hydrocarbon and aromatic hydrocarbon concentrations remaining in the excavation sidewalls exceeded Ecology's Model Toxics Cleanup Act (MTCA) cleanup levels. The excavation was backfilled with clean imported soils. A plastic sheeting barrier was placed around the excavation limits to minimize recontamination of soil from adjacent impacted soils.

The remaining (non-City owned at the time) parcels comprising the Site were investigated by Kleinfelder (1999) who identified gasoline, diesel, oil, and benzene in soil and ground water at the Site. The property owners at the time filed a restrictive covenant in January 2002 acknowledging that impacted soils and ground water remained at the property. Ecology issued an interim No Further Action (NFA) determination for the Site in 2002 for soils only. The Site was later removed from the Voluntary Cleanup Program in 2006 due to the lack of further activity, such as monitoring or remediation. The 2002 NFA determination was also rescinded at this time due to cleanup exceedances.



HWA performed a Phase II environmental site assessment in 2007. The assessment identified soils in the northern portion of the property (vicinity of the known UST releases) containing petroleum-related compounds (petroleum hydrocarbons, aromatic hydrocarbons, and semi-volatile organic compounds) exceeding Ecology MTCA Method A cleanup levels (Table 740-1 in WAC 173-340-900). Ground water at the Site apparently was affected by multiple sources. Petroleum hydrocarbon impacts to ground water from historic UST releases at the property appeared to be limited. Chlorinated solvents were detected in ground water samples at the northwest and northeast portions of the property. These detections appeared to be from an upgradient source located north-northeast of the Site (the Ultra Custom Care Cleaners site, which is under a separate Agreed Order between the City and Ecology.)

Parametrix's 2009 remedial investigation concluded that petroleum contamination in soil and ground water at the former gas station area was relatively well defined within the (then) property boundaries; however, soil contamination extended into the (then) SR 522 right-of-way where it was less well defined. The extent of the petroleum-contaminated ground water plume was limited to the vicinity of the former Rotunda Park. The backfill around the Horse Creek culvert (see Figure 2) did not appear to be a preferential pathway for contaminated ground water. Surface water in the open channel portion of Horse Creek did not appear to be significantly affecting nearby surface soils or ground water. Halogenated volatile organic compounds (HVOCs) including tetrachloroethene (PCE), trichloroethene (TCE), and breakdown products, were present in ground water throughout the central and northern portions of the Site with concentrations generally below MTCA Method A cleanup levels (Table 720-1 in WAC 173-340-900). One location at the southeast corner of the Rotunda Park area contained vinyl chloride in ground water exceeding the MTCA cleanup level. Concentration distributions indicated that the HVOCs were migrating to the Site from an upgradient source (the Ultra Custom Care Cleaners site).

Interim action petroleum hydrocarbon soil cleanups were conducted in two phases; the first one in 2010; and the second one in 2013/2014/2015/2017, after the realignment of the SR522 roadway now crossing the Site. This phasing was necessary in order to effectively manage access to contaminated soils beneath the old (operational in 2010) and the new (operational in 2013) roadways, with minimal impacts to traffic. The interim action cleanups were performed in compliance with the terms and conditions of the 2009 Agreed Order as amended between Ecology and the City. Figure 3 shows the extents of the interim action cleanups.

## **2.2 HUMAN HEALTH AND ENVIRONMENTAL CONCERNS**

### **2.2.1 Conceptual Site Model**

The conceptual model for the Site identifies the primary contaminant sources, release mechanisms, transport mechanisms, secondary contaminant sources, potential pathways, and

exposure routes. Existing chemical data, site characterization data, and identification of potential human and ecological receptors were used to develop the model are shown on Figure 4.

### **2.2.2 Primary Sources of Contamination and Primary Release Mechanisms**

The primary contaminant sources are the former leaking USTs. The primary contaminants are petroleum hydrocarbons, with release mechanisms of tank leakage or spills to soil and ground water.

### **2.2.3 Secondary Sources And Release Mechanisms**

Secondary sources and release mechanisms, based on the RI data are limited to leaching from soil to ground water of TPH, as no air or surface water impacts were identified.

### **2.2.4 Pathways And Potential Receptors**

Potential exposure routes for human and ecological receptors include the following:

**Dermal/Direct Contact** – Exposure to chemicals in soil may occur through direct contact with soil. Direct contact is a potential exposure route for current and future on-site workers or visitors. Burrowing or ground-dwelling mammals and invertebrates may be exposed directly to the soil contaminants.

**Inhalation** – Particulates from soil can be transported by air and inhaled by potential on-site and off-site receptors. Emissions of volatile chemicals from soil and ground water may also be transported as vapors by air. Terrestrial biota could also be exposed to chemicals volatilizing to outdoor air, but if this exposure actually occurs the duration of exposure would be expected to be relatively short. Burrowing animals may be exposed to volatile air contaminants in underground stagnant air while spending time within the burrow.

**Ingestion** – Ingestion of chemicals in Site soil is a primary exposure route for human and ecological receptors. Uptake by plants is also a potential exposure route.

Potentially complete exposure pathways after completion of the Interim Actions are::

Soil - TPH:

- Current/future construction/utility worker
  - Incidental soil ingestion and dermal contact

Remaining soil impacts are located under an active roadway, therefore the only potential receptors are future construction workers.

Ground water – Arsenic:

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- Current/future construction/utility worker:
  - Direct ingestion of contaminated ground water
- Ecological receptors
  - Dermal contact with ground water in a burrow

Remaining ground water impacts are limited to arsenic in ground water, which is generally greater than 6 feet below grade in the areas impacted, therefore park visitors or others are unlikely to be exposed to any ground water, as there are no drinking water wells and it is not planned or legal to install any in the impacted area. The only potential human receptors would be future construction workers involved in excavation below ground water level or dewatering work.

Vapor - TPH:

- Current/future construction/utility worker:
  - Inhalation of vapors from the subsurface (ground water and soil) in outdoor air
- Ecological receptors
  - Inhalation of vapors from the subsurface (ground water and soil) in a burrow

Remaining vapor impacts are located under an active roadway, therefore the only potential human receptors would be future construction workers involved in excavation or dewatering work. Arsenic in ground water does not pose a vapor risk, therefore there are no vapor-related risks in park-zoned areas.

## **2.3 CLEANUP STANDARDS**

### **2.3.1 Contaminants of concern**

#### **2.3.1.1 Soil COCs**

Based on the studies before the interim cleanups, chemicals of potential concern (COPCs) in Site soil were:

- HVOCs (primarily PCE, TCE, (cis)-1,2-DCE, and vinyl chloride)
- Total petroleum hydrocarbons (gasoline-, diesel- and motor oil-range)
- BTEX (benzene, toluene, ethylbenzene, and xylenes)
- Lead
- Polycyclic aromatic hydrocarbons (PAHs) (including naphthalenes)

The *Interim Action Work Plan* (Parametrix, 2010b) also included other metals (arsenic, cadmium, chromium, mercury, selenium, and silver) and polychlorinated biphenyls (PCBs) as COPCs. Because PCBs, HVOCs, arsenic, barium, cadmium, chromium, lead, mercury, selenium, or silver were never detected in Site soil at concentrations exceeding MTCA Method A or B

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cleanup levels or natural background concentrations during the Phase II ESA, RI, or the two initial interim action cleanups, they were dropped as COPCs during subsequent cleanup and RI activity.

Following the interim action soil cleanups, only one area had soils remaining on Site with cleanup level exceedances, namely the area of L-PEX-8 (under the Horse Creek culvert). The sample had gasoline and benzene concentrations exceeding Site cleanup levels.

Thus soil chemicals of concern (COCs) remaining on Site are:

- Total petroleum hydrocarbons, gasoline-range
- Benzene

### **2.3.1.2 Ground Water COCs**

COPCs for ground water in the RI area before the interim cleanups were:

- HVOCs
- Total petroleum hydrocarbons (gasoline-, diesel- and motor oil-range)
- BTEX
- Metals (arsenic, cadmium, chromium, and lead)

Ground water monitoring data following the soil cleanups indicate the following COCs remain on Site:

- Arsenic

The HVOC contamination originating from an off Site source is not considered to be a COC at the Site requiring site-specific remediation because cleanup at the Ultra Cleaners Agreed Order Site will remedy HVOC ground water contamination at the Bothell Landing site.

### **2.3.2 Cleanup Levels**

Cleanup levels for COCs that need to be addressed by the cleanup in affected media at the site (soil and ground water) are presented in Section 4.3.

### **3 CLEANUP ACTION ALTERNATIVES AND ANALYSIS**

#### **3.1 CLEANUP ACTION ALTERNATIVES**

The initial technologies screened for contaminated soil under the Horse Creek culvert include:

- Excavation and removal
- In-situ bioremediation
- Monitored natural attenuation
- Engineering and institutional controls

The initial technologies screened for arsenic contaminated ground water at the Site were:

- Excavation and removal
- In-situ chemical fixation
- Institutional controls

Cleanup alternatives (assembled from the selected cleanup technologies) considered for addressing residual petroleum contaminated soil under the Horse Creek culvert were:

- Excavation and removal with monitored natural attenuation
- In-situ bioremediation with monitored natural attenuation and engineering / institutional controls
- Engineering and institutional controls

Cleanup alternatives considered for arsenic contaminated ground water at the Site were:

- In-situ chemical fixation with institutional controls
- Institutional controls

#### **3.2 INITIAL SCREENING OF ALTERNATIVES**

The selected alternative for both petroleum and arsenic impacts was engineering and institutional controls. The other alternatives (excavation and removal with monitored natural attenuation, in-situ bioremediation with monitored natural attenuation and engineering / institutional controls, and in-situ chemical fixation with institutional controls) were eliminated during the screening process due to efficacy, and cost-to-benefit ratios evaluated via a disproportionate cost analysis.

#### **3.3 DETAILED EVALUATION OF ALTERNATIVES**

The preferred alternative was recommended in accordance with remedy selection requirements under MTCA, and meets all threshold and other requirements specified in WAC 173-340-360.

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The selected alternative was evaluated for compliance with the following, as detailed in the RI/FS:

- The minimum requirements in WAC 173-340-360(2)(a)&(b)
  - Protection of human health and the environment
  - Compliance with cleanup standards
  - Compliance with ARARs
  - Provide for compliance monitoring
  - Use of permanent solutions to the maximum extent practicable (see also WAC 173-340-360(3))
  - Provide for a reasonable restoration timeframe (see also WAC 173-340-360(4))
  - Consideration of public concerns
- WAC 173-340-360(2)(c) Requirements for ground water cleanup actions
- WAC 173-340-360(2)(e) Requirements for institutional controls (see also WAC 173-340-440)

## **4 DESCRIPTION OF SELECTED REMEDY**

### **4.1 SITE DESCRIPTION**

The Bothell Landing Site was defined in the Agreed Order (prior to completion of the RI) as consisting of the extent of contamination caused by the release of hazardous substances at a location generally south of the intersection of SR 522 and SR 527 as they existed at the time the Agreed Order was signed. The Site is in the vicinity of a former 2.8-acre property where petroleum hydrocarbon impacts were discovered. The 2.8-acre parcel no longer exists in its original configuration, although the City currently owns that land, which includes public rights-of-way for the newly constructed and re-aligned SR 522 and Bothell Way NE, and portions of three newly formed parcels on the east, west, and south sides of the new “T” intersection, two of which include portions of the now vacated, former SR 522 roadway. Current City-owned parcels that now contain a portion of the former 2.8-acre Bothell Landing parcel are:

- Northeast corner – Lot E, F, G
- Northwest corner – Lot D
- South part – City park land (Park at Bothell Landing)

The City acquired the original 2.8-acre Bothell Landing property through two property purchases, 1) in 1998 for roadway widening and construction of a small park (Rotunda Park), and 2) in 2008 for construction of the SR 522 realignment. A 48-inch diameter concrete culvert conveyed Horse Creek through the northern and eastern portion of the property, and daylighted just beyond the east property boundary. Flow to this drainage was re-routed to a new drainage system (consisting of pipes and open channel segments) constructed some 300 feet west of the old Horse Creek channel, in 2016. Figure 2 shows the former and new locations of the Horse Creek Channel.

### **4.2 DESCRIPTION OF THE CLEANUP ACTION**

Based on the results of the remedial investigation and feasibility study conducted under MTCA and the application of the selection of remedy criteria, the preferred cleanup alternatives for contaminated soil and ground water at the Site (developed in accordance with WAC 173-340-350 through 173-340-390) includes:

1. Contaminated soil on site prior to interim actions – adopt interim actions as the final cleanup
2. Remnant contaminated soil under roadway – leave in place and implement:
  - Engineering controls – paved SR 522 roadway capping petroleum impacted soils.
  - Institutional controls – implement environmental covenants for area shown in Figure 2)

3. Ground water arsenic – include institutional controls in new environmental covenant for the arsenic impacted area and provide compliance monitoring for ground water with option to remove arsenic from the covenant if monitoring shows naturally elevated concentrations unrelated to historical or current contamination at the site. For arsenic in ground water, the institutional control could consist of an environmental covenant that documents remaining arsenic contamination in ground water, prohibits withdrawal and use for any purpose other than monitoring, site investigation, or construction-related activities with notification and approval by Ecology. A request to lift the covenant can be made to Ecology if compliance monitoring from the site shows that the arsenic persists after historical ground water contamination and the petroleum hydrocarbon contamination has not been detected for an appropriate period of time (eight quarters of monitoring). If arsenic remains at elevated concentrations over a sufficiently long time period with no other detections of petroleum hydrocarbon or solvent contamination, this data can be used to demonstrate that the elevated concentrations represents a locally high natural background for arsenic. Based on this evidence, a request can be made to remove the institutional controls for ground water at the site.

The RI indicates that HVOCs in ground water at the northern portion of the Site are from the Ultra Custom Care Cleaners site, located 200 feet north and upgradient of the Site. PCE, trichloroethene (TCE), vinyl chloride (VC), and cis-1,2-dichloroethene (1,2-DCE) were detected at concentrations exceeding MTCA cleanup levels in several Site wells and numerous upgradient wells leading to the source area at the Ultra Custom Care Cleaners site. The Ultra Custom Care Cleaners site is also owned by the City, and is undergoing investigation cleanup under a separate Agreed Order with Ecology (Agreed Order DE 9704).

For ground water, the HVOC issues will be addressed under the Ultra Custom Care Cleaners Agreed Order.

There are currently no buildings over the affected areas at the Site. If buildings are planned prior to cleanup in those areas, VI assessment will be conducted under the Ultra Custom Care Cleaners Agreed Order and appropriate vapor mitigation measures implemented for the buildings (e.g., vapor barriers, sub-slab depressurization systems, etc.)

### **4.3 CLEANUP STANDARDS AND POINT OF COMPLIANCE**

Cleanup standards consist of appropriate cleanup levels applied at a defined point of compliance that meet applicable state and federal laws (WAC 173-340-700). Cleanup levels are described below.

#### **4.3.1 Soil**

Soil remediation levels proposed in the *Interim Action Work Plan* (Parametrix, 2010b) include:



- MTCA Method A Soil Cleanup Levels for Unrestricted Land Use (WAC 173-340, Table 740-1).
- MTCA Method B TPH Soil Cleanup Levels for direct contact and protection of ground water

An evaluation of Method B risk-based TPH soil cleanup levels for the Site was specified in Section 3.1.1.1 of the *Compliance Monitoring Quality Assurance Project Plan (CMQAPP)* appendix of the *Interim Action Work Plan* (Parametrix, 2010b). The CMQAPP called for characterization of TPH-impacted soil via analysis of petroleum hydrocarbon fractionation and other target compounds in order to evaluate whether the standard MTCA Method A soil cleanup levels were appropriate for the Site compared to MTCA Method B risk-based soil TPH cleanup levels. The results of the petroleum hydrocarbon fractionation analyses (NWVPH/NWEPH analysis) were input into Ecology's MTCA TPH 11.1 spreadsheet model to determine TPH soil cleanup levels protective of human health via direct contact and via leaching to a source of potable ground water. HWA's evaluation of MTCA Method B risk-based cleanup levels for TPH-impacted soil at the Site is included in Appendix F. The calculated Method B cleanup levels for gasoline-range petroleum hydrocarbons at the Site range between 84 and 246 milligrams per kilogram (mg/kg) depending on the mixture of hydrocarbon fractions and specific compounds such as benzene. The Method B TPH cleanup level of 84 mg/kg is a calculated value for protection of potable ground water from contamination by benzene based upon Ecology's three-phase partitioning model (Equation 747-1 in WAC 173-340-747). The MTCA Method A cleanup level for gasoline-range petroleum hydrocarbons with detectible benzene in soil is 30 mg/kg. The calculated Method B cleanup levels for diesel- and oil-range petroleum hydrocarbons at the Site range between 3,130 and 5,225 mg/kg depending on the mixture of hydrocarbon fractions and specific compounds.

The resulting soil remediation levels used (i.e., the more stringent of Method A or B) meet all the requirements of WAC 173-340-720 through 173-340-760 and should be considered the Site cleanup levels. Soil cleanup levels are summarized below:

<u>Compound</u>	<u>Cleanup level (mg/kg)</u>
TPH Diesel	2000 A
TPH Oil	2000 A
Gasoline	100/30 A*
Benzene	0.03 A
Xylenes	9 A
Arsenic	20 A

A – MTCA Method A soil cleanup level

\* Gasoline mixtures without benzene and the total of ethyl benzene, toluene and xylene are less than 1% of the gasoline mixture = 100 mg/kg, all other gasoline mixtures = 30 mg/kg

### 4.3.2 Ground Water

Appropriate levels of cleanup for ground water are determined by the highest beneficial use of that ground water. Shallow ground water present at the Site is not currently used for drinking water, and no water wells are located downgradient of the Site. The appropriate ground water cleanup levels for the Site are MTCA Method A for ground water for almost all the COCs; however, for ground water arsenic, a cleanup level of 10.0 µg/L will be used based on the drinking water standard. Ground water cleanup levels are summarized below:

<u>Compound</u>	<u>Cleanup level (µg/L)</u>
TPH Gas	800
TPH Diesel	500
TPH Oil	500
Arsenic	10

### 4.3.3 Point of Compliance

The point of compliance is the specific location(s) at which a particular cleanup level must be met in order to demonstrate compliance of a cleanup action. MTCA defines standard and conditional points of compliance.

#### 4.3.3.1 Soil

The standard soil point of compliance under MTCA (WAC 173-340-740 (6)(b-(d))) is:

- For soil cleanup levels based on protection of ground water, the point of compliance shall be established throughout the Site
- For soil cleanup levels based on protection from vapors, the point of compliance shall be established throughout the Site from the ground surface to the uppermost ground water saturated zone
- For soil cleanup levels based on human exposure via direct contact or other exposure pathways where contact with the soil is required to complete the pathway, the point of compliance shall be established in the soils throughout the Site from the ground surface to 15 feet bgs.

MTCA recognizes that, for cleanup actions that involve containment or capping, cleanup levels may not be met at the standard point of compliance, but the cleanup action would be determined to comply with cleanup standards provided:

- The selected remedy is permanent to the maximum extent practicable
- The cleanup action is protective of human health and terrestrial ecological receptors
- Institutional controls are implemented to limit activities that could interfere with the long-term integrity of the containment system
- Compliance monitoring and periodic reviews are conducted
- The capped or contained COCs and measures to prevent migration and contact with them are specified in a CAP

The cleanup alternatives are evaluated based on standard soil point of compliance for removal and treatment alternatives (WAC 173-340-740(6)(a)-(e), and for containment remedies (WAC 173-340-740(6)(f)).

#### **4.3.3.2 Ground Water**

The standard ground water point of compliance under MTCA (WAC 173-340-720(8)(b)) is in ground water throughout the Site from the uppermost level of the saturated zone to the lowest depth which could potentially be affected.

For this Site, the standard ground water point of compliance is proposed for arsenic impacts, i.e., ground water throughout the Site.

#### **4.4 APPLICABLE, RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)**

Cleanup actions under MTCA (WAC 173-340-710) require the identification of all applicable or relevant and appropriate requirements (ARARs). These requirements are defined as:

“Applicable” requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a site.

“Relevant and appropriate” requirements means those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not “applicable” to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a site, address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the particular site.

The potential ARARs for the Site include three types:

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- Chemical-specific
- Location-specific
- Action-specific

Chemical-specific ARARs are typically health- or risk-based values that when applied to site-specific conditions represent cleanup standards. Location-specific ARARs are related to the geographical position and/or physical condition of the site and may affect the type of remedial action selected. Action-specific ARARs are usually technology-based or activity-based requirements or limitations on actions or conditions taken with respect to specific hazardous substances. The action-specific requirements do not determine the selected remedial alternative, but indicate how or to what level a selected alternative must perform.

Potential ARARs were identified for each medium of potential concern. These potential ARARs are shown in Table 1.

#### **4.5 RESTORATION TIMEFRAME**

**TPH in soil** - The interim action soil cleanups (which are adopted as the final soil cleanup) were completed in 2017. The engineering controls (i.e., capping) were implemented during final SR 522 roadway construction, in 2013. Institutional controls (environmental covenant) are anticipated to be implemented once a final CAP is approved.

**Arsenic in ground water** - Institutional controls (environmental covenant) and monitoring are anticipated to be implemented after the CAP is issued and approved, sometime in 2017.

#### **4.6 COMPLIANCE MONITORING**

Compliance monitoring requirements (specified in WAC 173-340-410) include the following elements:

- Protection monitoring to confirm that human health and the environment are adequately protected during implementation of an alternative
- Performance monitoring to confirm that cleanup standards or other performance standards are met
- Confirmation monitoring to monitor the long-term effectiveness of the remedy after completion of the alternative

**Petroleum In Soil** – Site ground water is in compliance for petroleum hydrocarbons, therefore no further compliance monitoring is required.

**Arsenic in Ground Water** - The institutional control remedy for arsenic in ground water provides for compliance monitoring by quarterly ground water monitoring for two years. Remaining arsenic impacts to ground water are in wells BLMW-11, BLMW-12, and MW-1.

A Compliance Monitoring Plan will be submitted as part of the Cleanup Action Plan which describes the monitoring.

#### 4.7 SCHEDULE FOR IMPLEMENTATION

**TPH in soil** - The interim action soil cleanups (which are adopted as the final soil cleanup) were completed in 2017. The engineering controls (i.e., capping) were implemented during final SR 522 roadway construction, in 2013. Institutional controls (environmental covenant) are anticipated to be implemented once a final CAP is approved.

**Arsenic in ground water** - Institutional controls (environmental covenant) and monitoring are anticipated to be implemented after the CAP is issued and approved, sometime in 2017.

#### 4.8 INSTITUTIONAL/ENGINEERING CONTROLS

Institutional Controls will be applied to the petroleum in soil and arsenic in ground water impacts. The main component would be environmental covenants restricting access to soil and ground water, as follows:

1. Remnant contaminated soil under roadway – leave in place and implement:
  - Engineering controls – paved SR 522 roadway capping petroleum impacted soils.
  - Institutional controls – implement environmental covenants for area shown in Figure 2)
2. Ground water arsenic – include institutional controls in new environmental covenant for the arsenic impacted area and provide compliance monitoring for ground water with option to remove arsenic from the covenant if monitoring shows naturally elevated concentrations unrelated to historical or current contamination at the site. For arsenic in ground water, the institutional control could consist of an environmental covenant that documents remaining arsenic contamination in ground water, prohibits withdrawal and use for any purpose other than monitoring, site investigation, or construction-related activities with notification and approval by Ecology. A request to lift the covenant can be made to Ecology if compliance monitoring from the site shows that the arsenic persists after historical ground water contamination and the petroleum hydrocarbon contamination has not been detected for an appropriate period of time (eight quarters of monitoring). If arsenic remains at elevated concentrations over a sufficiently long time period with no other detections of petroleum hydrocarbon or solvent contamination, this data can be used to demonstrate that the elevated concentrations represents a locally high

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natural background for arsenic. Based on this evidence, a request can be made to remove the institutional controls for ground water at the site.

The environmental covenant will document the contamination in soil and ground water. An environmental covenant could prohibit soil excavation and ground water withdrawal for any purpose other than monitoring, and/or site investigation. Excavation or ground water withdrawal for construction-related activities will require notification and approval by Ecology.

#### **4.9 PUBLIC PARTICIPATION**

The dCAP will be distributed for public review and comment, with a 30-day comment period. Public participation procedures will be outlined in a Public Participation Plan prepared by Ecology.

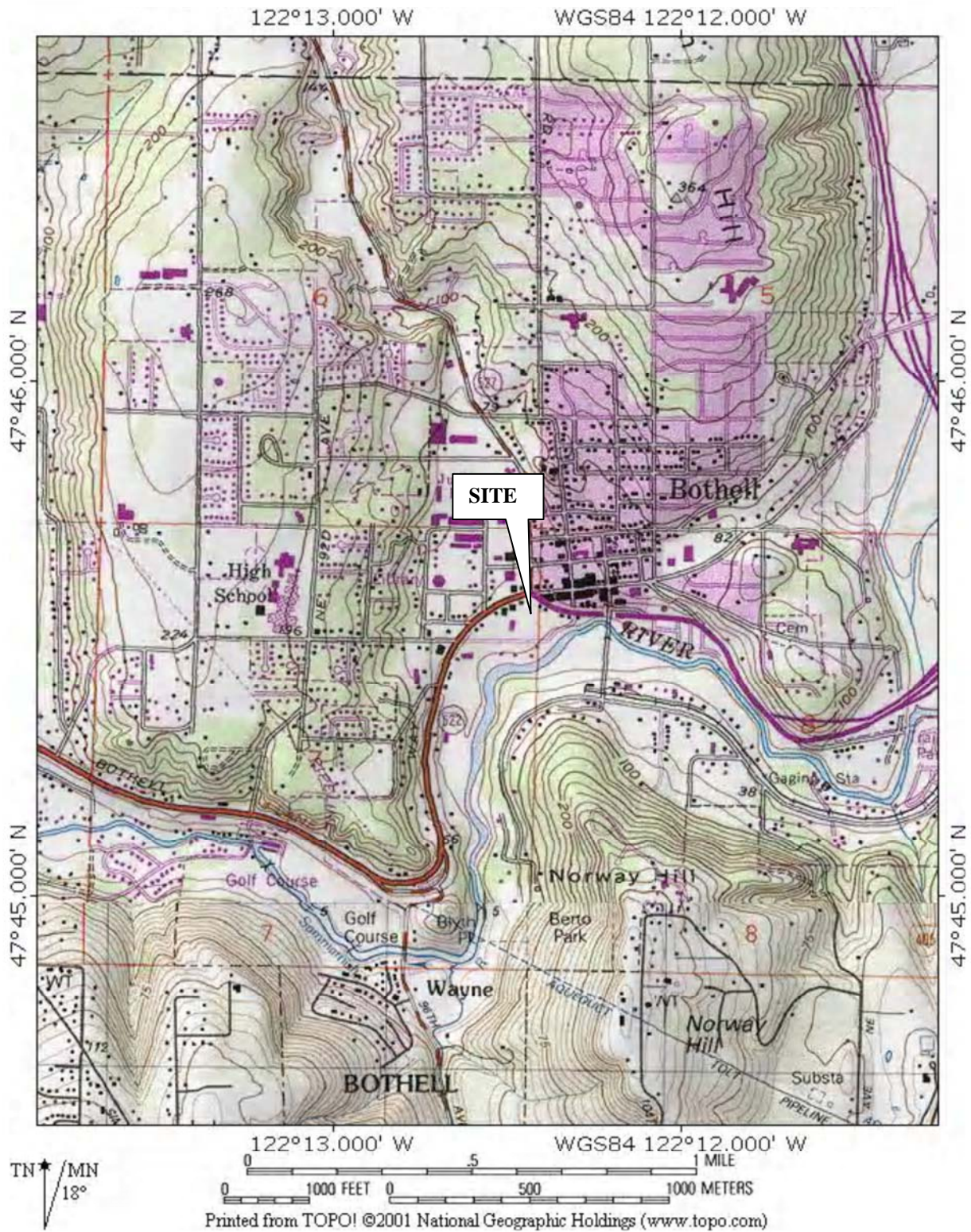
**Table 1. Potential Applicable or Relevant and Appropriate Requirements (ARARs)**

<b>ARAR</b>	<b>Description</b>	<b>Applicability</b>
<b>Soil</b>		
Model Toxics Control Act (WAC 173-340-740, -747)	MTCA regulates the investigation and cleanup of releases to the environment that may pose a threat to human health or the environment. Establishes cleanup levels for soil, including derivation of soil concentrations protective of groundwater.	MTCA cleanup levels are applicable to Site soil.
<b>Groundwater</b>		
Safe Drinking Water Act, Primary Drinking Water Regulations (40 Code of Federal Regulations [CFR] 141.50 and 141.61(a))	These regulations protect the quality of public drinking water supplies through regulation of chemical parameters and constituent concentrations as maximum concentration limits (MCLs).	MCLs are potentially relevant and appropriate where groundwater is a potential source of drinking water.
Model Toxics Control Act (WAC 173-340-720)	MTCA regulates the investigation and cleanup of releases to the environment that may pose a threat to human health or the environment. Establishes cleanup levels for groundwater.	MTCA cleanup levels are applicable to Site groundwater.
<b>Surface Water</b>		
Clean Water Act, Section 304, National Recommended Water Quality Criteria, EPA Office of Science and Technology (4304T, 2004).	There are no ambient water quality criteria for PCE for protection of freshwater organisms.	Surface water quality criteria are potentially relevant and appropriate to ambient surface water quality for point-source discharges to Horse Creek.
Clean Water Act, National Pollutant Discharge Elimination System (40 CFR Part 122) and Washington State National Pollutant Discharge Elimination System Permit Program (WAC 173-220).	The National Pollutant Discharge Elimination System (NPDES) program requires that permits be obtained for point-source discharges of pollutants to surface water. Under this regulation, a point-source discharge to a surface water body cannot cause an exceedance of water quality standards in the receiving water body outside the mixing zone.	Substantive regulatory requirements of the NPDES permit program are potentially applicable to the direct discharge of treated groundwater to a surface water body such as Horse Creek or Sammamish River.
Clean Water Act's National Toxics Rule (NTR) (40 CFR 131.36)	Provides values that have to be met for point-source discharges to surface water.	Potentially applicable to point-source discharges to Horse Creek should remedial activities cause release to surface water. If applicable, these values would have to be met at the mixing zone boundary established for the discharge.
Clean Water Act, General Pretreatment Regulations (40 CFR Part 403).	The regulations limit pollutants in wastewater discharges to sanitary sewer systems to protect publicly owned treatment works (POTWs) from accepting wastewater that would damage their system or cause them to exceed their NPDES permit discharge limits.	These regulations are potentially applicable to the discharge of treated groundwater to City of Bothell POTWs.
Washington State Water Quality Standards for Surface Waters (WAC 173-201A)	Washington State water quality standards protect freshwater aquatic life by specifying protection criteria by stretch of surface waters. WAC 173-201A provides limitations on other parameters such as turbidity, temperature, dissolved oxygen, and pH for protection of organisms. Tributaries of waters whose uses are designated salmon and trout spawning, core rearing and migration, or extraordinary primary contact recreation are protected at the same level as the waters themselves.	The substantive requirements of this regulation are potentially applicable for remedial actions affecting Horse Creek.
Washington Surface Water Quality Standards, Short-Term Modifications (WAC 173-201A-410)	Washington State provides for short-term modifications of standards for specific water bodies on a short-term basis when necessary to accommodate essential activities, respond to emergencies, or to otherwise protect the public interest.	These would be potentially applicable to remedial actions affecting Horse Creek.
Model Toxics Control Act (WAC 173-340-730)	MTCA regulates the investigation and cleanup of releases to the environment that may pose a threat to human health or the environment. Establishes cleanup levels for surface water.	MTCA cleanup levels may be applicable to the Site if remedial activities cause a release to surface water.
<b>Air</b>		
National Emission Standards for Hazardous Air Pollutants (NESHAPs) (40 CFR Part 261)	Establishes specific emissions levels allowed for toxic air pollutants.	Applicable to treatment alternatives that may emit toxic pollutants to the air.
Washington Clean Air Act and Implementing Regulations (WAC 173-400; WAC 173-460; WAC 173-490)	WAC 173-400 requires air emissions at the Site boundary to fall below the acceptable source impact limit (ASIL). WAC 173-400 also requires control of fugitive dust emissions during construction and defines general emission discharge treatment requirements. WAC 173-460 requires systemic control of new sources emitting air pollutants. WAC 173-490 sets emission standards and source control for volatile organic compounds.	Applicable for air stripping/sparging remedial technology.
Model Toxics Control Act (WAC 173-340-750)	MTCA regulates the investigation and cleanup of releases to the environment that may pose a threat to human health or the environment. Establishes cleanup levels for air.	MTCA cleanup levels may be applicable to the Site if remedial activities cause a release to air.

**Table 1. Potential Applicable or Relevant and Appropriate Requirements (ARARs)**

ARAR	Description	Applicability
<b>Miscellaneous</b>		
Protection of Wetlands, Executive Order 11990 (40 CFR Part 6, Appendix A)	This executive order mandates that response actions taken by federal agencies must be designed to avoid long- and short-term impacts to wetlands. If remediation activities are located near/in wetlands, the activities must be designed to avoid adverse impact to the wetlands wherever possible, including minimizing wetlands destruction and preserving wetland values.	This Act would be potentially applicable to remedial activities at the Site.
Endangered Species Act (50 CFR Parts 17, 402)	Section 7 of the Endangered Species Act (ESA) and 40 CFR Part 402 require that federal agencies consider the effects of their proposed actions on federal listed species. It requires consultation between the agency proposing the action and the U.S. Fish and Wildlife Service (USFWS) or National Oceanic and Atmospheric Administration (NOAA) Fisheries, as appropriate. Preparation of a biological assessment is conducted, addressing the potential effects to listed species in the area and methods to minimize those effects.	The ESA is potentially applicable to remedial actions at the Site because the USFWS has determined that federal threatened species (bald eagle and bull trout) may use the project area. Therefore, they could potentially be affected by these actions.
Native American Graves Protection and Repatriation Act (43 CFR Part 10)	Native American Graves Protection and Repatriation Act regulations protect Native American burials from desecration through the removal and trafficking of human remains and "cultural items," including funerary and sacred objects.	This Act is potentially applicable to remedial actions at the Site because it is possible that the disturbance of Native American materials could occur as a result of work in the stream bed or subsurface excavations elsewhere at the Site. Such materials are not known to be present at the Site, but could be inadvertently uncovered during soil or sediment removal.
National Historic Preservation Act (36 CFR Parts 60, 63, and 800)	National Historic Preservation Act (NHPA) regulations require federal agencies to consider the possible effects on historic sites or structures of actions proposed for federal funding or approval. Historic sites or structures as defined in the regulations are those on or eligible for the National Register of Historic Places, generally at least 50 years old.	This Act is potentially applicable to stream bed or other subsurface work at the Site. No such sites are known to be present in the area.
Washington Hazardous Waste Management Act (WAC 173-303)	Establishes standards for the generation, transport, treatment, storage, or disposal of designated dangerous waste in the state.	This regulation is potentially applicable to alternatives that would involve handling of contaminated media at the Site. The area of contamination policy allows contaminated media to be consolidated within the same area of a site without triggering Resource Conservation and Recovery Act or Washington dangerous waste regulations.
Department of Transportation of Hazardous Wastes (49 CFR 105 – 180)	Establishes specific U.S. Department of Transportation rules and technical guidelines for the off-site transport of hazardous materials.	Applicable to remedial activities that involve the off-site transportation of hazardous waste.
Washington Solid Waste Handling Standards (WAC 173-350)	Establishes standards for handling and disposal of solid non-hazardous waste in Washington.	These regulations are potentially applicable to solid nonhazardous wastes and are potentially relevant and appropriate to on-site remedial actions governing contaminated media management.
Washington Water Well Construction Act Regulations (WAC 173-160)	Provides requirements for water well construction.	These regulations are potentially applicable to the installation, operation, or closure of monitoring and treatment wells at the Site.





**SITE VICINITY**

**BOTHELL LANDING SITE  
CLEANUP ACTION PLAN  
BOTHELL, WASHINGTON**

FIGURE NO.

**1**

PROJECT NO.

2007-098-920

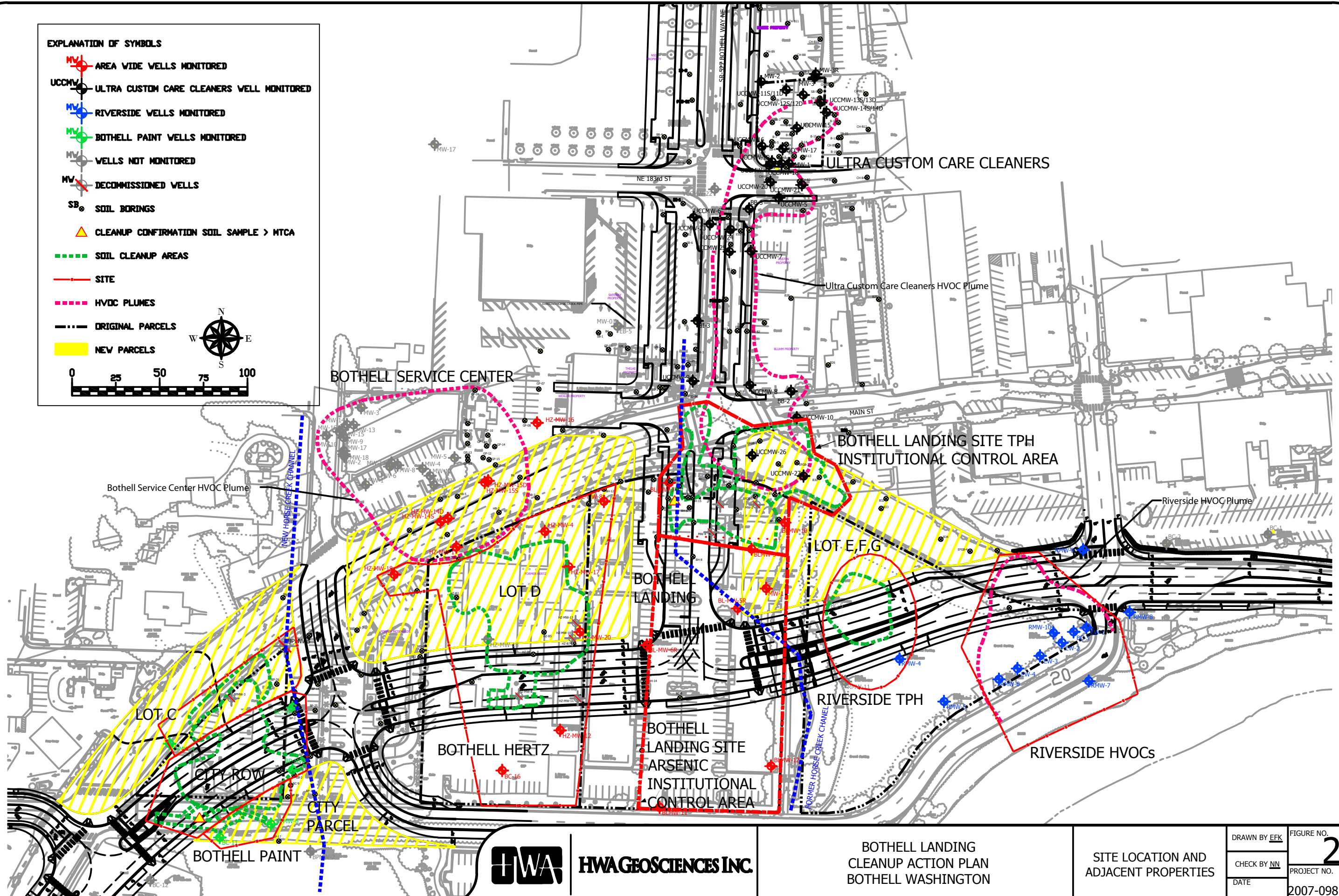
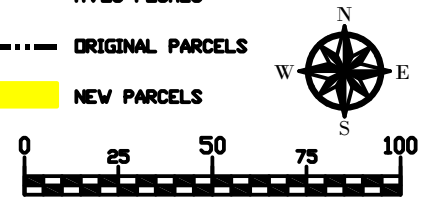


**HWA GEOSCIENCES INC.**



**EXPLANATION OF SYMBOLS**

- AREA WIDE WELLS MONITORED
- ULTRA CUSTOM CARE CLEANERS WELL MONITORED
- RIVERSIDE WELLS MONITORED
- BOTHELL PAINT WELLS MONITORED
- WELLS NOT MONITORED
- DECOMMISSIONED WELLS
- SOIL BORINGS
- CLEANUP CONFIRMATION SOIL SAMPLE > MTCA
- SOIL CLEANUP AREAS
- SITE
- HVOC PLUMES
- ORIGINAL PARCELS
- NEW PARCELS

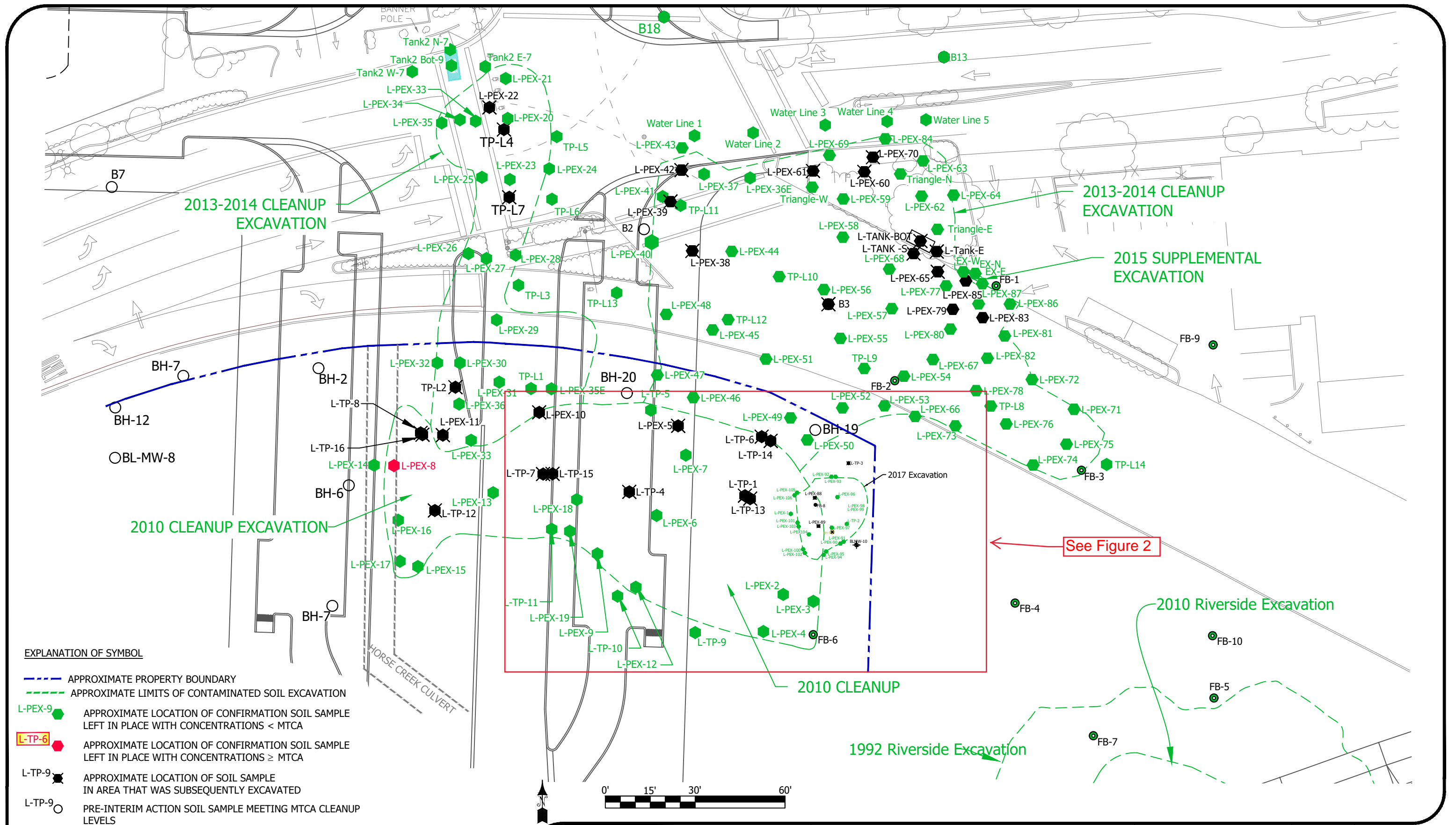


**HWAGEOSCIENCES INC.**

BOTHELL LANDING  
CLEANUP ACTION PLAN  
BOTHELL WASHINGTON

SITE LOCATION AND  
ADJACENT PROPERTIES

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CHECK BY <u>NN</u>	PROJECT NO.
DATE	2007-098 T2020



**EXPLANATION OF SYMBOL**

- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE LIMITS OF CONTAMINATED SOIL EXCAVATION
- L-PEX-9 APPROXIMATE LOCATION OF CONFIRMATION SOIL SAMPLE LEFT IN PLACE WITH CONCENTRATIONS < MTCA
- L-TP-6 APPROXIMATE LOCATION OF CONFIRMATION SOIL SAMPLE LEFT IN PLACE WITH CONCENTRATIONS ≥ MTCA
- L-TP-9 APPROXIMATE LOCATION OF SOIL SAMPLE IN AREA THAT WAS SUBSEQUENTLY EXCAVATED
- L-TP-9 PRE-INTERIM ACTION SOIL SAMPLE MEETING MTCA CLEANUP LEVELS
- FB-10 2016 FARALLON BORING



**HWA GEOSCIENCES INC.**

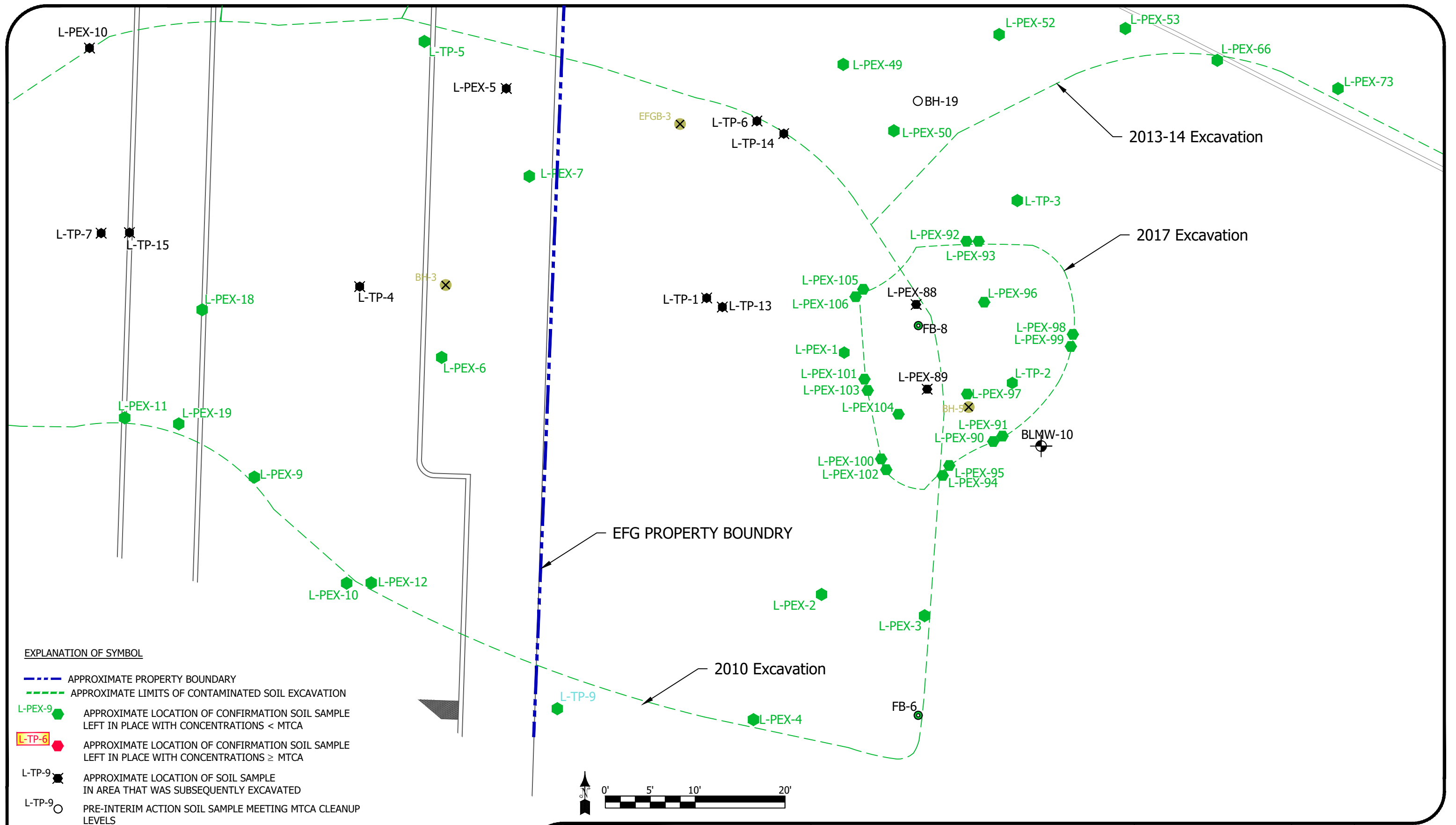
BOTHELL LANDING SITE  
BOTHELL, WASHINGTON

EXTENT OF ALL INTERIM  
ACTION EXCAVATIONS

DRAWN BY EFK  
CHECK BY AS  
DATE  
02.16.17

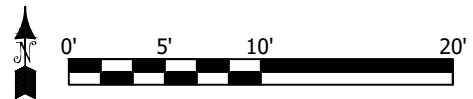
FIGURE NO.  
**3**  
PROJECT NO.  
2007-098 T2020





**EXPLANATION OF SYMBOL**

- - - APPROXIMATE PROPERTY BOUNDARY
- - - APPROXIMATE LIMITS OF CONTAMINATED SOIL EXCAVATION
- L-PEX-9 APPROXIMATE LOCATION OF CONFIRMATION SOIL SAMPLE LEFT IN PLACE WITH CONCENTRATIONS < MTCA
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- L-TP-9 PRE-INTERIM ACTION SOIL SAMPLE MEETING MTCA CLEANUP LEVELS
- FB-10 2016 FARALLON BORING



BASE MAP PROVIDED BY PARAMETRIX

S:\2007 PROJECTS\2007-098-22 BOTHELL CROSSROADS\CAD 2007-098\HWA 2007-098-21 T2043.DWG <Riverside 2017 FIG 4> Plotted: 3/8/2017 2:50 PM



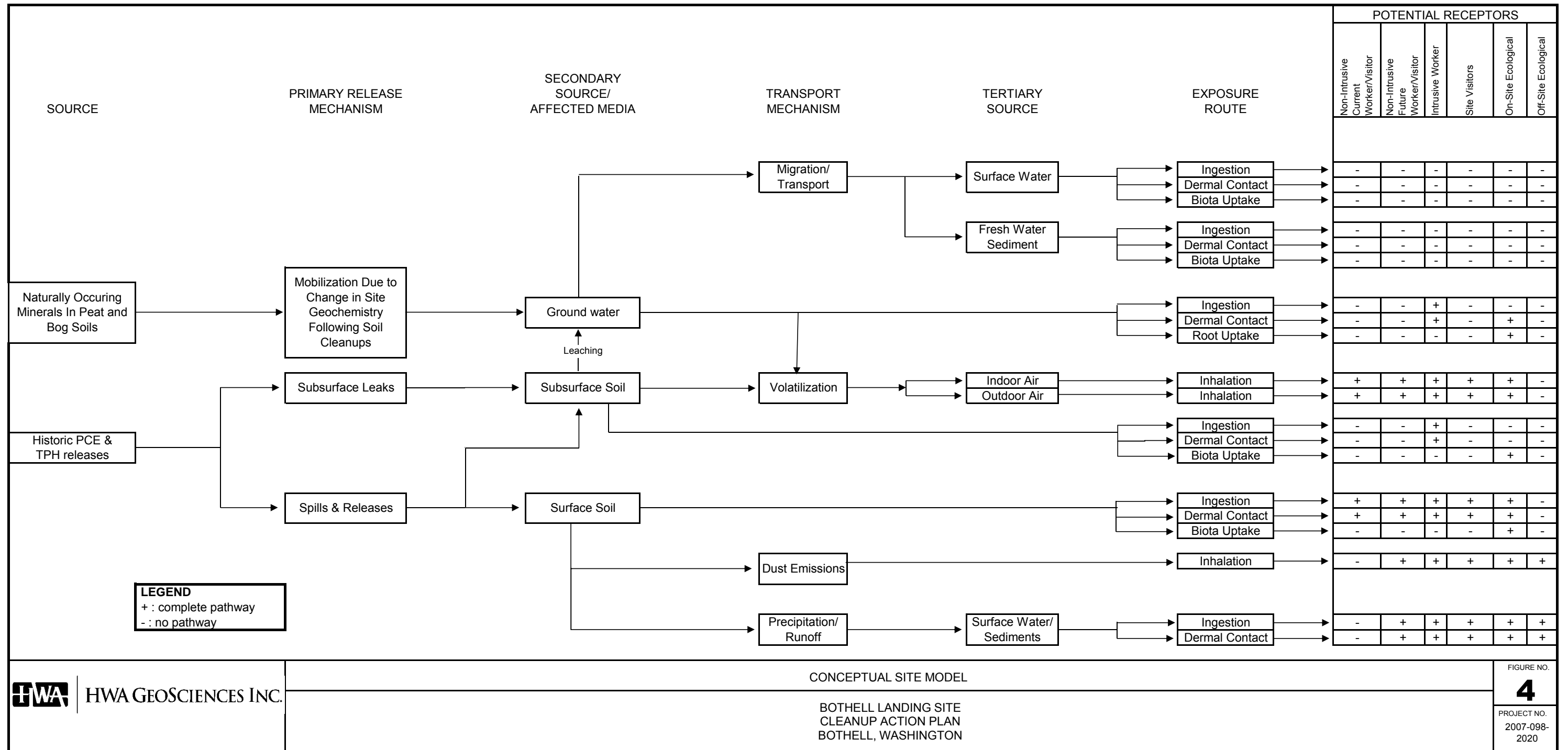
**HWA GEOSCIENCES INC.**

BOTHELL LANDING SITE  
BOTHELL, WASHINGTON

EXTENT OF 2017  
INTERIM ACTION  
EXCAVATION

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DATE 02.16.17

FIGURE NO. **3A**  
PROJECT NO. 2007-098 T2043



## EXHIBIT C

**COMPLIANCE GROUND WATER  
MONITORING PLAN  
BOTHELL LANDING SITE  
BOTHELL, WASHINGTON  
HWA Project No. 2007-098**

**January 2, 2018**

**Prepared for:  
City of Bothell**



**HWA GEOSCIENCES INC.**

- *Geotechnical Engineering*
- *Hydrogeology*
- *Geoenvironmental Services*
- *Inspection & Testing*

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**COMPLIANCE GROUND WATER MONITORING PLAN  
BOTHELL LANDING SITE  
BOTHELL, WASHINGTON**

**1.0 INTRODUCTION**

This compliance monitoring plan has been prepared for the Bothell Landing site in Bothell, Washington (Figure 1). The Site is under an Agreed Order between the City of Bothell (City) and the Washington State Department of Ecology (Ecology). Remedial investigations and feasibility studies (RI/FS) have been completed for the Site. The Site has remaining impacts to ground water which were addressed with remedies that included interim action soil excavation and disposal and ground water monitoring. This plan describes the ground water monitoring to be conducted at the Site.

This compliance monitoring plan has been prepared to fulfill the requirements of the Agreed Order per Washington Administrative Code (WAC) 173-340-410(1)(b), and WAC 173-340-820 (sampling and analysis plans).

This plan describes the ground water sample collection wells, procedures, analysis, and Data Quality Objectives (DQOs) and criteria for the project. HWA GeoSciences Inc. prepared this plan in accordance with the U.S. Environmental Protection Agency (EPA) and Ecology requirements contained in the following:

- EPA QA/R-5, EPA Requirements for Quality Assurance Project Plans, Final, March 2001
- EPA QA/G-5, EPA Guidance for Quality Assurance Project Plans, December 2002
- EPA QA/G-4, EPA Guidance on Systematic Planning Using the Data Quality Objectives Process, February 2006
- Ecology Model Toxics Control Act (Ecology 2007)

## 2.0 PROJECT ORGANIZATION AND MANAGEMENT

### 2.1 PROJECT ORGANIZATION

Specific project roles and responsibilities for oversight and sampling are described in Table 2-1.

**Table 2-1**  
**Project Roles and Responsibilities**

<b>Personnel</b>	<b>Responsibilities</b>
Department of Ecology (Agency)	Provides regulatory oversight
City of Bothell (Owner) Project Manager	Provides project oversight and performs contract administration
Owner's Representative (Environmental Consultant)	Conducts compliance sampling; coordinates analytical laboratory testing of samples; prepares reports

### 2.2 PROBLEM DEFINITION/BACKGROUND

The Bothell Landing Site is located along Bothell Way NE / SR 522 at its (past and current) intersection with Bothell Way NE/ former SR 527, in Bothell, Washington. The Site formerly housed a strip mall, restaurants, and historic gas stations, with multiple former petroleum underground storage tanks (USTs). The City acquired properties on which the Site lies in 2008 for construction of the SR 522 realignment, and entered into an Agreed Order with Ecology in 2009. Remedial investigation activities were initiated in 2009, and finalized in 2016. Interim action soil cleanups for petroleum hydrocarbons were conducted in 2010, 2013, 2014, and 2015 at the Site. Chemicals of concern (COCs) at the Site following the interim action cleanups are:

- Soil: Gasoline-range petroleum hydrocarbons, benzene
- Ground water: arsenic

The selected remedy for the Site is a combination of excavation of contaminated soils (already completed as interim actions), engineering controls (capping under roadways) and institutional controls (environmental covenants restricting access to soil and ground water), as described below:

1. Remnant petroleum contaminated soil under roadway – leave in place and implement:
  - Engineering controls – paved SR 522 roadway capping petroleum impacted soils
  - Institutional controls – implement environmental covenants
2. Ground water arsenic – include institutional controls in new environmental covenant for the arsenic impacted area and provide compliance monitoring for ground water with option to remove arsenic from the covenant if monitoring shows naturally elevated concentrations unrelated to historical or current contamination at the Site.

This monitoring plan describes sample collection procedures and quality assurance and control methods to ensure representative data is collected during the interim action.

## 2.3 QUALITY OBJECTIVES AND CRITERIA

### 2.3.1 Data Quality Objectives

Data quality objectives (DQOs) were developed according to EPA’s DQOs Process (EPA 2006), to provide data of known and appropriate quality. The DQO process is a seven-step planning approach to develop sampling designs for data collection activities that support decision-making. It provides a systematic procedure for defining the criteria that a data collection design should satisfy. The DQOs for the project are shown in Table 2-2.

**Table 2-2  
Design Characterization Sampling DQOs**

<b>DQO</b>	<b>Description</b>
State the Problem	Is contaminated ground water present at the site? Is contaminated ground water reaching the River?
Identify the Goal of the Study	Determine if ground water arsenic is high natural background or contamination induced; assess attenuation if the latter. Reduce contaminant concentrations reaching the river Is the collected chemical data adequate to identify and determine if contamination still exists?
Identify Information Inputs	Analytical results (what are the detected concentrations? are they above cleanup levels? was QA/QC criteria met?). Actual sample locations (correct location and depth?).
Define the Study Boundaries	The selected locations are points of compliance.
Develop the Analytic Approach	Sampling and analysis strategies will be developed to support the decision making process. Analytical results will be used to determine the presence or absence of contamination. Results will be compared to site specific cleanup levels established in the interim action work plan
Specify Performance or Acceptance Criteria	The tolerable limits of uncertainty regarding the cleanup of contamination at the site will be based on exceedance or non-exceedance of cleanup levels. Tolerable limits on analytical results are determined by the Quality Assurance/Quality Control (QA/QC) criteria defined in this plan.
Develop the Plan to Obtain Data	Presented in this plan.

### 2.3.2 Data Quality Indicators

Data quality and usability are evaluated in terms of performance criteria. Performance and acceptance criteria are expressed in terms of data quality indicators (DQIs). The principal indicators of data quality are precision, accuracy, bias, sensitivity, completeness, comparability, and representativeness. Table 2-3 provides a description of project DQIs.

**Table 2-3  
General Description of DQIs**

DQI	Description
Precision:	A measure of agreement among repeated measurements of the same property under identical conditions. Usually assessed as a relative percent difference (RPD) between duplicate measurements. RPD guidelines for laboratory duplicate analyses are contained in the standard operating procedures (SOPs) for each analytical method and will be obtained from the laboratory for validation purposes.
Accuracy:	A measure of the overall agreement of a measurement to a known value. Analytical accuracy is assessed as percent recovery from matrix spike or reference material measurements. Percent recovery guidelines are contained in laboratory SOPs for each analytical method.
Bias:	The systematic or persistent distortion of a measurement process that causes error in one direction. Usually assessed with reference material or matrix spike measurements. Bias as reported by the laboratory will be used to assess data validity.
Sensitivity:	The capability of a method or instrument to meet prescribed reporting limits. Assessed by comparison with risk-based reporting limits, method reporting limits, instrument reporting limits, or laboratory quantitation limits, as appropriate. In general, reporting limits for the analytical methods used will be at or below applicable criteria.
Completeness:	A measurement of the amount of valid data needed to be obtained for a task. Assessed by comparing the amount of valid results to the total results set. Project requirements for completeness are 90%.
Comparability:	A qualitative term that expresses the measure of confidence that one data set can be compared to another. Assessed by comparing sample collection and handling methods, sample preparation and analytical procedures, holding times, reporting units, and other QA protocols. To ensure comparability of data collected for the Bus Barn to previous data, standard collection and measurement techniques will be used.
Representativeness:	A qualitative term that expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variation at a sample point, or environmental condition. To ensure representativeness, the sampling design will incorporate sufficient samples so that contamination is detected, if present. Additionally, all sampling procedures detailed in this plan will be followed.

## 2.4 SPECIAL TRAINING AND CERTIFICATION

All personnel conducting sampling activities on the project site must be 40-hour Hazardous Waste Operation (HAZWOPER) trained per 29 Code of Federal Regulations (CFR) 1910.120 and be current with their annual 8-hour refresher course.

All personnel working at the project site will be briefed on potential site hazards, health and safety procedures, and sampling procedures. Following completion of this training, all personnel will be required to sign an acknowledgement form verifying that they have completed the task-specific training.

## 2.5 SAMPLING DOCUMENTATION AND RECORDS

Sampling documentation will be accomplished according to the procedures provided in Table 2-4.

**Table 2-4  
Sampling and Sample Handling Records**

<b>Record</b>	<b>Use</b>	<b>Responsibility/Requirements</b>
Field Notebook	Record significant events and observations.	Maintained by field sampler/geologist; must be bound; all entries must be factual, detailed, objective; entries must be signed and dated.
Sampling Field Data Sheet	Provide a record of each sample collected (Appendix A).	Completed, dated, and signed by sampler; maintained in project file.
Sample Label	Accompanies sample; contains specific sample identification information.	Completed and attached to sample container by sampler.
Chain-of-Custody Form	Documents chain-of-custody for sample handling (Appendix A).	Documented by sample number. Original accompanies sample. A copy is retained by QA Manager.
Chain-of-Custody Seal	Seals sample shipment container (e.g., cooler) to prevent tampering or sample transference. Individual samples do not require custody seals, unless they are to be archived, before going to the lab for possible analysis at a later date.	Completed, signed, and applied by sampler at time samples are transported.
Sampling and Analysis Request	Provides a record of each sample number, date of collection/transport, sample matrix, analytical parameters for which samples are to be analyzed.	Completed by sampler at time of sampling/transport; copies distributed to laboratory project file.

### **2.5.1 Field Logs and Forms**

A bound field notebook will be maintained to provide daily records of significant events and observations that occur during field investigations. All entries are to be made in waterproof ink, signed, and dated. Pages of the field notebook are not to be removed, destroyed, or thrown away. Corrections will be made by drawing a single line through the original entry (so that the original entry can still be read) and writing the corrected entry alongside. The correction will be initialed and dated. Most corrected errors will require a footnote explaining the correction.

If an error made on a document is assigned to one person, that individual may make corrections simply by crossing out the error and entering the correct information. The erroneous information should not be obliterated. Any error discovered on a document should be corrected by the person who made the entry.

All field logs and forms will be retained in the project files.

### **2.5.2 Photographs**

All photographs taken of field activities will be documented with the following information noted in the field notebook:

- Date, time, and location of photograph taken
- Description of photograph taken
- Reasons photograph was taken
- Viewing direction

Digital photographs will be reviewed in the field to assess quality and need to re-shoot the photograph.

## **2.6 REPORTING**

Following completion of the confirmation sampling and analysis, the results will be included in an interim remedial action report. Reporting will include the following:

- Summary of field activities completed.
- Figures showing sampling locations.
- Summary of laboratory analytical results and a comparison to relevant regulatory criteria.
- Field log forms and sampling forms.
- Laboratory data sheets and the results of data review/validation.
- Recommendations for further sampling, if needed.

Preliminary results will be communicated verbally as they become available.

### 3.0 SAMPLING PROCESS DESIGN

#### 3.1 SAMPLING APPROACH

Compliance monitoring after the cleanup will include existing monitoring wells with documented past impacts, as summarized in Table 3-1.

**Table 3-1A**  
**Sampling Approach– Ground Water**  
**INITIAL ROUND**

Sample type	Sampling location	Sampling Frequency / Rationale	Analytes
<b>Arsenic</b>			
Point of compliance	BLMW-11 BLMW-12 MW-1	Initial Round	Total petroleum hydrocarbons, diesel and oil range (TPH-D, TPH-O)  Volatile Organic compounds (VOCs)  Semivolatile Organic compounds (SVOCs)  Total and dissolved metals (arsenic, cadmium, chromium, lead, mercury)  Field parameters: dissolved oxygen, redox potential, pH, conductivity, temperature, ferrous iron

**Table 3-1B  
Sampling Approach – Ground Water  
SUBSEQUENT ROUNDS**

<b>Sample type</b>	<b>Sampling location</b>	<b>Sampling Frequency / Rationale</b>	<b>Analytes</b>
<b>Arsenic</b>			
Point of compliance	BLMW-11 BLMW-12 MW-1	Quarterly for two years, then modify based on results and consultation with Ecology*	Total Arsenic Dissolved Arsenic Total petroleum hydrocarbons, diesel and oil range TPH-D, TPH-O Field parameters

\* If compliance monitoring from the Site shows that the arsenic remains at elevated concentrations for eight quarters of monitoring, with no other detections of petroleum hydrocarbon contamination, this data can be used to demonstrate that the elevated concentrations represents a locally high natural background for arsenic. Based on this evidence, a request can be made to remove the institutional controls for ground water at the site and discontinue monitoring.

Figure 1 shows the well locations.

The objective of the sampling is to confirm that all COCs have met cleanup levels in ground water and establish if observed concentrations of arsenic are naturally occurring or induced by historical petroleum contamination in ground water at the site. Cleanup levels are provided in the cleanup action plan. The initial round of sampling will include a wider suite of analytes, to confirm the COC list. Note, however, that solvents are being addressed under separate agreements for the source sites, Bothell Service Center and Ultra Custom Cleaners.

Descriptions of the specific sampling methods for the above activities are presented in Sections 3.2. In addition, all sampling will be conducted in accordance with standard operating procedures.

### **3.2 SAMPLING METHODS AND PROCEDURES**

Descriptions of the specific sampling and laboratory methods for the project are presented in this section.



### 3.2.1 Ground Water Sampling Procedures

Monitoring wells will be purged before sample collection to obtain ground water samples that are representative of the formation water rather than stagnant water from the well casing. Ground water that has occupied the well casing is often under oxidizing conditions, and thus may be chemically different from true formation water.

Monitoring wells will be purged and sampled using low-flow purging methods (Barcelona et al. 1994). Sampling staff will measure ground water levels to the nearest 0.01-foot using a decontaminated electronic well probe prior to collection of samples. Prior to collection of ground water samples, the wells will be purged by pumping a small volume of water to ensure sampled water represents aquifer conditions. The volume pumped will be determined in the field based on stabilization of field parameters: specific conductance, dissolved oxygen, and pH. Wells will be purged by very slowly lowering semi-rigid polyethylene tubing to a depth corresponding to roughly the midpoint of the screen, securing the tubing to prevent vertical movement, connecting it to a peristaltic pump, and then pumping at a rate not to exceed 0.5 liters/minute (0.132 gallons/minute). At a minimum, two pump and tubing volumes will be purged (1/2" I.D. tubing = 0.010 gallon/lineal foot). Samples from all wells will be collected once the parameter values have stabilized over the course of three sets of measurements as follows:

specific conductance	10 uS
dissolved oxygen	2 mg/L
pH	0.1

If a well can be pumped dry prior to reaching the desired purge volume, it will be allowed to recover prior to sampling, using the minimum time between purging and sampling that would allow collection of sufficient sample volume. Samples will be pumped directly into the appropriate containers, as provided by the laboratory. A Field Data Sampling Sheet (provided in Appendix A) will be filled out for each well. New tubing will be used for each well. All purge water will be collected and discharged to the sanitary sewer.

After collection, all samples will be labeled, chilled in a cooler to 4oC, and shipped to the testing laboratory for analysis. Full chain-of-custody and field documentation procedures will be employed, as described in Section 2.6. The laboratory will analyze the water samples for the constituents listed on Table 3-2.

### 3.2.2 Sample Collection

When filling the sample bottles, the following procedures and precautions will be adhered to:

- Sample bottles will be filled directly from dedicated pump tubing or sampling ports with minimal air contact.

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- Bottle caps will be removed carefully so that the inside of the cap is not touched. Caps must never be put on the ground. Caps for volatile organic compound (VOC) vials will contain a Teflon-lined septum. The Teflon side of the septum must be facing the sample to prevent contamination of the sample through the septum.
- The sampling team will wear appropriate nonpowdered latex or nitrile gloves (PVC or vinyl gloves can leave trace levels of phthalate or vinyl chloride). Gloves will be changed between wells or more often.
- Tubing or hoses from the sampling systems must not touch or be placed in the sample bottles.
- VOC vials must be filled so that they are headspace-free. These sample bottles therefore need to be slightly overfilled (water tension will maintain a convex water surface in the bottle). The caps for these bottles will be replaced gently, to eliminate air bubbles in the sample. The bottles must then be checked by inverting them and tapping them sharply with a finger. If air bubbles appear, open the bottle, add more water, and repeat the process until all air bubbles are gone. Do not empty the bottle and refill it, as VOC bottles already contain preservatives.
- Sample bottles, caps, or septums that fall on the ground before filling will be discarded.

## WATER LEVEL MONITORING

Samplers will measure ground water levels at each of the monitoring wells at the start of each sampling round in order to monitor changes in seasonal or long-term water elevations and ground water flow directions.

### **3.2.3 Sample Containers, Preservation, and Holding Times**

Table 3-2 provides a summary of sample analyses and specifications for containers, preservation, and holding times. The analytical laboratory will provide the sample containers and necessary preservation.

**Table 3-2  
Sample Containers, Preservation, and Holding Times**

<b>Analysis</b>	<b>Method</b>	<b>Matrix</b>	<b>Container</b>	<b>Preservation</b>	<b>Holding Time</b>
Arsenic/ Metals	EPA#200.8	Water	500mL HDPE	HNO <sub>3</sub> pH<2 Cool to 6°C	6 months to analyze
TPH-D TPH-O	NWTPH- Dx	Water	(2) 500mL amber	HCl pH<2 Cool to 6°C	14 days to extract, 40 days to analyze after extraction
VOCs	EPA 8021/8260	Water	(3) 40mL glass vial (VOA)	HCl pH<2, 6oC	14 days to analyze
SVOCs	EPA 8270	Water	1 liter amber	Cool to 6oC	7 days to extract, 40 days to analyze after extraction

### 3.2.4 Decontamination Procedures

Decontamination of all non-disposable tools and equipment will be conducted prior to each sampling event and between each sampling location in accordance with the standard operating procedures. The following steps will be taken during decontamination of sampling equipment used during field investigations:

- Scrub with non-phosphate detergent (i.e., Alconox or similar)
- Rinse with tap water
- Rinse thoroughly with deionized water
- Allow to air dry and place in a new plastic bag for storage

### 3.2.5 Investigation-Derived Waste

**Water** – Well purge water will be filtered through and activated granular carbon filter and discharged to the ground.

**Solid waste** - All disposable sampling materials and personal protective equipment, such as disposable coveralls, gloves, and paper towels used in sample processing will be placed inside polyethylene bags or other appropriate containers. Disposable materials will be placed in a normal refuse container and disposed of as normal solid waste.

## 3.3 SAMPLE HANDLING AND CUSTODY

The following sections describe sample handling and custody procedures.

### **3.3.1 Sample Identification and Labeling**

Prior to the field investigation, each sample location will be assigned a unique code. Each sample collected at that location will be pre-assigned an identification code using the sampling site followed by other specific information describing the sample. The sample numbering protocol is shown in Table 3-3.

**Table 3-3**  
**Sample Numbering Protocol**

Sample designations	BL = Bothell Landing Site MW= Monitoring well DUP= blind duplicate sample
Examples	BLMW-1-030517: Monitoring well BLMW-1, collected on 03/05/2017 DUP-1-030517: Blind duplicate collected on 03/05/2017

### 3.3.2 Sample Storage, Packaging, and Transportation

Samples will be placed in a cooler following collection and chilled to approximately 6°C. Following completion of each days sampling, all samples will be transported and/or shipped to the analytical laboratory, as appropriate. Samples which are routinely delivered to the laboratory on the same day as collection may not have sufficient time to chill to 6°C.

### 3.3.3 Sample Custody

The chain-of-custody procedures used for this project provide an accurate written or computerized record that can be used to trace the possession of each sample from the time each is collected until the completion of all required analyses. A sample is in custody if it is in any of the following places:

- In someone's physical possession
- In someone's view
- In a secured container
- In a designated secure area

The following information will be provided on the chain-of-custody form:

- Sample identification numbers
- Matrix type for each sample
- Analytical methods to be performed for each sample
- Number of containers for each sample
- Sampling date and time for each sample
- Names of all sampling personnel
- Signature and dates indicating the transfer of sample custody

All samples will be maintained in custody until formally transferred to the laboratory under a written chain-of-custody. Samples will be kept in sight of the sampling crew or in a secure, locked vehicle at all times. Samples that leave the custody of field personnel will be sealed by placing a signed and dated Custody Seal across the seam of the shipping container.

**3.4 ANALYTICAL METHODS**

All samples will be submitted to a commercial analytical laboratory certified by Ecology to perform the required analyses. Analytical methods are listed in Table 3-2. Laboratory reporting limits will be verified prior to analyses to ensure that, at a minimum, reporting limits for each analyte are equal to or lower than MTCA Method A cleanup levels. Matrix interferences may make it impossible to achieve the desired reporting limits and associated quality control (QC) criteria. In such instances, the laboratory shall report the reason for noncompliance with QC criteria or elevated detection limits.

**3.5 QUALITY ASSURANCE/QUALITY CONTROL**

Quality assurance (QA)/QC checks consist of measurements performed in the field and laboratory. The analytical methods referenced in Section 3.4 specify routine methods required to evaluate data precision and accuracy, and determine whether the data are within acceptable limits.

**3.5.1 Field Methods**

Guidelines for minimum samples for field QA/QC sampling are summarized in Table 3-4.

**Table 3-4  
Guidelines for Minimum QA/QC Samples for Field Sampling**

<b>Media</b>	<b>Field Duplicate</b>	<b>Trip Blank</b>	<b>Equipment Blank</b>
Water	1 per batch, including other sites sampled during same event (Max 20 samples)	None – no volatile analyses planned	None – no reusable equipment

**Field Duplicates**

A minimum of one blind field duplicate will be analyzed per 20 samples, including other nearby sites (i.e., Bothell Hertz, Bothell Landing) sampled during the same event. Field duplicates will be collected following field samples. Duplicate samples will be coded so the laboratory cannot discern which samples are field duplicates.

### **Trip Blanks**

No trip blanks will be collected because no volatile organic analyses are planned. Arsenic is unlikely to cause cross-contamination of samples.

### **3.5.2 Equipment/Rinsate Blanks**

No equipment blanks will be collected because no non-disposable sampling equipment will be used.

### **3.5.3 Laboratory Methods and Quality Control**

Specific procedures and frequencies for laboratory QA procedures and QC analyses are detailed in the laboratory's QA Plan and SOPs for each method. QC analyses will be performed by the laboratory according to their Ecology-approved SOPs.

Accuracy and precision are determined through QC parameters such as surrogate recoveries, matrix spikes, QC check samples, and blind field duplicates. A blind field duplicate sample will be analyzed as a QC sample for verification of precision and accuracy. If results of the blind field duplicate are outside the control limits, corrective action and/or data qualification will be determined after review by the Data QA Manager or his/her designee. Blind field duplication can be of poor quality because of sample heterogeneity. Therefore, the Data QA Manager will determine corrective action. QC sample requirements are listed in Table 3-4.

All analyses performed for this project must reference QC results to enable reviewers to validate (or determine the quality of) the data. Sample analysis data, when reported by the laboratory, will include QC results. All data will be checked for internal consistency, transmittal errors, laboratory protocols, and for complete adherence to the QC elements.

### **3.5.4 Laboratory Instruments**

All instruments and equipment used during analysis will be operated, calibrated, and maintained according to manufacturer's guidelines and recommendations, and in accordance with procedures in the analytical method cited, as documented in the laboratory QA plan. Properly trained personnel will operate, calibrate, and maintain laboratory instruments. Calibration blanks and check standards will be analyzed daily for each parameter to verify instrument performance and calibration before beginning sample analysis.

Where applicable, all calibration procedures will meet or exceed regulatory guidelines. The Data QA Manager must approve any variations from these procedures before beginning sample analysis.

After the instruments are calibrated and standardized within acceptable limits, precision and accuracy will be evaluated by analyzing a QC check sample for each analysis performed that

day. Acceptable performance of the QC check sample verifies the instrument performance on a daily basis. Analysis of a QC check standard is also required. QC check samples containing all analytes of interest will be either purchased commercially or prepared from pure standard materials independently from calibration standards. The QC check samples will be analyzed and evaluated according to the EPA method criteria.

Instrument performance check standards and calibration blank results will be recorded in a laboratory instrument logbook that will also contain evaluation parameters, benchmark criteria, and maintenance information. If the instrument logbook does not provide maintenance information, a separate maintenance logbook will be maintained for the instrument.

### **3.6 FIELD INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE**

The types of field instruments and equipment that are anticipated to be used during sampling include:

- Water level meters
- Sampling pumps
- Field parameter instrument (pH, DO, SC, Temp, ORP)

Equipment maintenance will be performed according to manufacturers' specifications. The frequency of inspection, testing, and maintenance will be established, based on operation procedures and manufacturers' specifications. Field personnel will be responsible for inspection, testing, and maintenance of field equipment. A hard copy of procedures and manufacturer's specifications will be provided to all field personnel working with the equipment. All equipment will be inspected and tested prior to use.

The results of inspection and testing, as well as any problems encountered and corrective actions, will be documented in the activity field notebook. The equipment serial number and date of activity will be included in notebooks so that a complete record is maintained. If problems are encountered, they will be reported to the Manager.

### **3.7 INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES**

Field supplies such as sample containers and trip/rinsate blank water shall be obtained from reputable suppliers and shall be certified analyte-free. Records of certification shall be kept by the laboratory (for laboratory-supplied supplies) or by the Owner's Representative in the project file.

### **3.8 DATA MANAGEMENT**

The objectives of data management are to assure that large volumes of information and data are technically complete, accessible, and efficiently handled.



### **3.8.1 Field Data**

The original hard (paper) copies of all field notes and laboratory reports will be stored in the project file. Photocopies of these documents should be prepared for working copies as needed.

Field data should be recorded in bound notebooks or individual sampling sheets. The field team members should review the field data for completeness prior to placing it in the files. All filed data will be digitized (scanned) to electronic media and placed in the project file.

### **3.8.2 Laboratory Data**

The laboratory data reports will be archived in the project files. The electronic data will be incorporated into Excel spreadsheets and archived on electronic media and placed in the project file.

## 4.0 DATA VERIFICATION AND VALIDATION

Data verification is confirmation by examination and provision of objective evidence that specified requirements have been fulfilled. Validation is confirmation by examination and provision of objective evidence that the particular requirement for a specific intended use have been fulfilled. Techniques for data verification and validation will be in accordance with the Guidance on Environmental Data Validation and Verification (EPA 2001b).

### 4.1 DATA REVIEW, VERIFICATION AND VALIDATION

All data packages provided by the laboratory must provide a summary of quality control results adequate to enable reviewers to validate or determine the quality of the data. The Data QA Manager is responsible for conducting checks for internal consistency, transmittal errors, and for adherence to specified quality control elements.

Field measurements (pH, specific conductance, temperature) will be verified and checked through review of instrument calibration, measurement, and recording procedures.

A verification level validation will be performed on all field documentation and analytical data reports. The data validation process will be used to verify the data quality. The following QC elements will be reviewed, as appropriate:

- Trip blank and rinsate blank results.
- Analytical holding times.
- Preparation blank contamination.
- Check standard precision.
- Analytical accuracy (blank and matrix spike recoveries and laboratory control sample recoveries).
- Analytical precision (comparison of replicate sample results, expressed as relative percent difference [RPD]).
- Each data package will be assessed to determine whether the required documentation is of known and verifiable quality. This includes the following items:
  - Field chain-of-custody record is present, complete and signed.
  - Certified analytical report.
  - QA/QC sample results.

Data will be qualified using guidance provided in the Contract Laboratory Program (CLP) functional guidelines for assessing data (EPA 1994a, 1994b).

The Data QA Manager will prepare a quality assurance text section for each report deliverable describing the results of the data validation and describing any qualifiers that are added to the data.

## 4.2 VERIFICATION AND VALIDATION METHODS

The Data QA Manager will review the following:

- Chain-of-custody documentation
- Holding times
- Equipment/trip blank results
- Field Duplicate results
- Method blank results

A limited review (minimum 10 percent) of the following laboratory QC data results will be conducted:

- Laboratory matrix spike/matrix spike duplicate (MS/MSD) and/or matrix duplicate results
- Laboratory surrogate recoveries
- Laboratory check samples

If, based on this limited review the QC data results indicate potential data quality problems, further evaluations will be conducted.

### 4.2.1 Precision

Precision measures the mutual agreement among individual measurements of the same property, usually under prescribed similar conditions. QA/QC sample types that measure precision include field duplicates, MSD, and matrix duplicates. The estimate of precision of duplicate measurements is expressed as a RPD (Relative Percent Difference), which is calculated:

$$RPD = \frac{D_1 - D_2}{(D_1 + D_2) \div 2} \times 100$$

Where D1 = First sample value  
D2 = Second sample value.

The RPDs will be routinely calculated and compared with DQOs.

#### **4.2.2 Accuracy**

Accuracy is assessed using the results of standard reference material, linear check samples, and MS analyses. It is normally expressed as a percent recovery, which is calculated:

$$\text{Percent Recovery} = \frac{(\text{Total Analyte Found} - \text{Analyte Originally Present}) \times 100}{\text{Analyte Added}}$$

The percent recovery will be routinely calculated and checked against DQOs.

#### **4.2.3 Bias**

Bias is the systematic or persistent distortion of a measurement process that causes errors in one direction. Bias will be assessed with field duplicate and laboratory matrix spike samples, similar to that described for accuracy. Bias measurements are usually carried out with a minimum frequency of 1 in 20, or one per batch of samples analyzed, under the same sampling episode.

#### **4.2.4 Sensitivity**

Sensitivity expresses the capability of a method or instrument for meeting prescribed measurement reporting limits. Sensitivity will be assessed by comparing data reporting limits with applicable cleanup criteria and analytical or instrument method reporting limits.

#### **4.2.5 Completeness**

The amount of valid data produced will be compared with the total analyses performed to assess the percent of completeness. Completeness will be routinely calculated and compared with the DQOs.

#### **4.2.6 Comparability**

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. Sample data will be comparable with other measurement data for similar samples and sample conditions. Comparability of the data will be maintained by using consistent methods and units.

#### **4.2.7 Representativeness**

Sample locations and sampling procedures will have been chosen to maximize representativeness. A qualitative assessment (based on professional experience and judgment) will be made of sample data representativeness based on review of sampling records and QA audit of field activities.

### **4.3 RECONCILIATION AND USER REQUIREMENTS**

The Data QA Manager will prepare a text section for each report deliverable describing the results of the data review and describing any qualifiers that were added to the data. The QC section will also summarize the laboratory's QC criteria and will include recommendations on whether additional actions such as re-sampling are necessary.

### **4.4 DATA REPORTING**

All laboratory data packages will contain the following information:

- Cover letter
- Chain-of-custody forms
- Summary of sample results
- Summary of QC results
- Ecology Environmental Information Management (EIM) electronic data deliverable (EDD)

The minimum information to be presented for each sample for each parameter or parameters group:

Client sample number and laboratory sample number

- Sample matrix
- Date of analysis
- Dilution factors (as reflected by practical quantitation limits (PQL))
- Analytical method
- Detection/quantitation limits
- Definitions of any data qualifiers used

Additionally, sample weights/volumes used in sample preparation/analysis and identification of analytical instrument will not be reported but will be kept in laboratory records for future reference.

The minimum QC summary information to be presented for each sample for each parameters or parameter group will include:

- Surrogate standard recovery results
- Matrix QC results (matrix spike/matrix spike duplicate, duplicate)
- Method blank results

January 2, 2018














HWA Project No. 2007-098

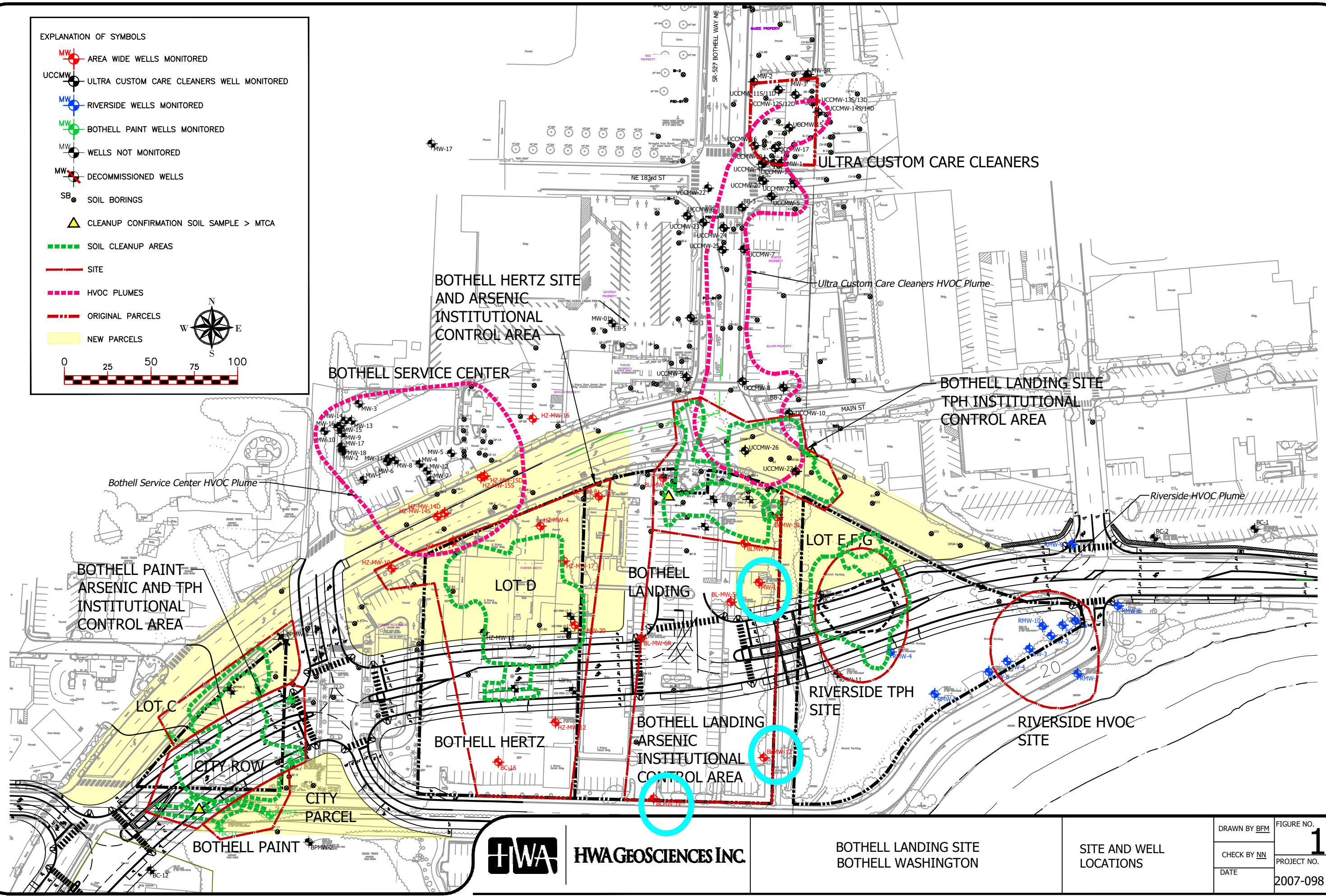
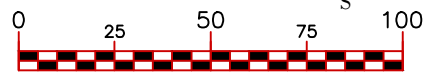
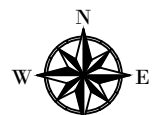
EIM EDDs will be in accordance with the most recent version of the results spreadsheet submittal capable of being quickly uploaded into the Ecology EIM database.

## 5.0 REFERENCES

- Ecology. 1995. Guidance for Remediation of Petroleum Contaminated Soils. November 1995.
- Ecology. 2007. Model Toxics Control Act Cleanup Regulations. Washington Administrative Code (WAC) 173-340. November 2007.
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- EPA. 1984. NEIC procedures manual for the evidence audit of enforcement investigations by contractor evidence audit teams. Technical Report EPA-330/9-81-003-R. U.S. Environmental Protection Agency, Washington, D.C.
- EPA. 1986. Test methods for evaluating solid waste, 3rd edition. U.S. Environmental Protection Agency, Washington, D.C. November 1986, as updated.
- EPA. 1994a. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. Office of Emergency and Remedial Response. USEPA, Washington, D.C.
- EPA. 1994b. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. Office of Emergency and Remedial Response. USEPA, Washington, D.C.
- EPA. 2001a. EPA Requirements for Quality Assurance Project Plans. EPA QA/R-5, EPA/240/B-01/003, March 2001.
- EPA. 2001b. Guidance on Environmental Data Validation and Verification. EPA QA/G-8.
- EPA. 2002. Guidance for Quality Assurance Project Plans. EPA QA/G-5. EPA/240/R-02/009, December 2002.
- EPA. 2004. Contract Laboratory Program (CLP) Guidance for Field Samplers. Appendix B. EPA/540/R-00003. August 2004.
- EPA. 2006. Guidance on Systematic Planning Using the Data Quality Objectives Process. EPA QA/G-4. February 2006.
- HWA, 2008a Phase I Site Assessment, Hertz Rentals Property, Bothell, WA.. Prepared by HWA Geosciences, Inc. October 8, 2008
- HWA, 2008b. Phase II Site Assessment, Hertz Rentals Property, Bothell, WA.. Prepared by HWA Geosciences, Inc. October 10, 2008

EXPLANATION OF SYMBOLS

-  AREA WIDE WELLS MONITORED
-  ULTRA CUSTOM CARE CLEANERS WELL MONITORED
-  RIVERSIDE WELLS MONITORED
-  BOTHELL PAINT WELLS MONITORED
-  WELLS NOT MONITORED
-  DECOMMISSIONED WELLS
-  SOIL BORINGS
-  CLEANUP CONFIRMATION SOIL SAMPLE > MTCA
-  SOIL CLEANUP AREAS
-  SITE
-  HVOC PLUMES
-  ORIGINAL PARCELS
-  NEW PARCELS



HWAGEOSCIENCES INC.

BOTHELL LANDING SITE  
BOTHELL WASHINGTON

SITE AND WELL  
LOCATIONS

DRAWN BY BFM	FIGURE NO. <b>1</b>
CHECK BY NN	PROJECT NO.
DATE	2007-098 T2020



**APPENDIX A**  
**OF COMPLIANCE MONITORING PLAN**

**Chain of Custody Form**  
**Field Sampling Data Sheet**





**HWA GEOSCIENCES INC.**  
 21312 30th Drive SE, Suite 110, Bothell, WA 98021  
 Tel: 425-774-0106 / Fax: 425-774-2714

**FIELD SAMPLING DATA SHEET**

Project Name: \_\_\_\_\_  
 Project Number: \_\_\_\_\_  
 Project Location: \_\_\_\_\_  
 Client/Contact: \_\_\_\_\_

Well Number: \_\_\_\_\_  
 Sample Number: \_\_\_\_\_  
 Weather: \_\_\_\_\_  
 Date: \_\_\_\_\_

**WELL MONITORING:**

Time	Pump Depth	Depth to Water	Measuring Point (TOC?)	Measuring Point Elevation	Water Level Elevation	Gallons in Well (Case Volume)

(2" dia=0.163 gal/ft)  
(4" dia=0.653 gal/ft)

**WELL PURGING:**

Time	Method	Gallons	Case Volume	pH	Conductivity	Temperature	Dissolved Oxygen		

**WELL SAMPLING:**

Time	Sampling Method	Sample Analysis	Container Number	Container Volume	Container Type	Field Filtered (Y/N)	Preservative	Iced (Y/N)

**COMMENTS/NOTES:** (Include equipment used: Bailers, Filters, Well Probe, pH/Conductivity, Meter, etc.)


Total # of Bottles: \_\_\_\_\_ Sampler: \_\_\_\_\_ Signature: \_\_\_\_\_

## EXHIBIT D

### Bothell Landing Facility Schedule of Deliverables

<u>Deliverables.</u>	<u>Due Date</u>
Draft Institutional Control (IC) Plan; Draft Environmental Covenant(s); and a Title Report	Within 120 days after the effective date of the Agreed Order
Final IC Plan and Final Environmental Covenant(s)	Within 30 days of receipt of Ecology comments on the Draft IC Plan and Draft Environmental Covenant(s).
Record Final Environmental Covenant(s) with King County Auditor	Within 5 days after Ecology's approval of the Final IC Plan or Ecology's signature as grantee of the Final Environmental Covenant(s), whichever occurs last.
Start ground water monitoring	Within 90 days after final CAP is approved
Combined TPH/Arsenic ground water monitoring	Quarterly for two years, then modify based on results and consultation with Ecology
Combined TPH/Arsenic ground water monitoring reports	90 days after 4 <sup>th</sup> quarter sampling
Progress reports	Every 3 months unless Ecology authorizes less frequent reporting