STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action by: CHEVRON TANK FARM PORT WASHINGTON NARROWS	AGREED ORDER No. DE-07TCPHQ-5024 (needs new number)

TO: The City of Bremerton
Public Works Department
3027 Olympus Drive
Bremerton, Washington 98310

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ATTACHMENT-1 January 2012 Draft Cleanup Action Plan
ATTACHMENT-2 January 2012 Technical Memorandum Former Chevron Property Performance Groundwater Monitoring Results
ATTACHMENT-3 September 2011 Remedial Investigation and Feasibility Study Report
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I. INTRODUCTION

The mutual objective of the State of Washington, Department of Ecology (Ecology) and the City of Bremerton (the 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 complete a final cleanup action plan for the site and to prepare, and submit to Ecology for review and approval, a draft and a final long-term groundwater monitoring plan for the site and a detailed outline of a future soil monitoring plan for the site. The two plans may be parts of a single site monitoring plan. The soil monitoring plan shall be used to demonstrate that soil remediation is complete and that soil use restrictions may be removed. The long-term groundwater monitoring plan and the soil monitoring plan will include a field sampling plan, a quality assurance plan, and a health and safety plan. The City shall prepare, and submit to Ecology for review and approval, a draft and a final institutional controls plan for the site. The institutional controls plan shall state what institutional controls or procedures the City has already established, what institutional controls or procedures the City will establish, and a specific timetable for their establishment. The institutional controls plan shall identify what entity will implement, maintain, and enforce each institutional control and how the protectiveness of each institutional control will be measured. As part of the institutional controls plan, the City shall prepare, and submit to Ecology for review and approval, a draft and a final environmental covenant to be attached to the property deed for the site. The City shall carry out and execute all plans approved by Ecology.

Ecology believes the actions required by this Order are in the public interest.

II. JURISDICTION

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

III. PARTIES BOUND

This Agreed 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 the terms and conditions of 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 Chapter 70.105D RCW and Chapter 173-340 WAC shall control the meanings of the terms in this Order.

A. Site: The Site is referred to as Chevron Tank Farm Port Washington Narrows and is generally located at 1310 Highland Avenue in Bremerton, Washington 98310. The Site is defined by the extent of contamination caused by the release of hazardous substances at the Site. The Site is more particularly described in the Site diagram (Exhibit A). The Site constitutes a Facility under RCW 70.105D.020(5).

B. Parties: Refers to the State of Washington, Department of Ecology and the City of Bremerton.

C. Potentially Liable Person (PLP): Refers to the City of Bremerton.

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. The terms "Agreed Order" or "Order" shall include all exhibits to 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 Chevron Tank Farm Port Washington Narrows site (the "Site") is located at 1310 Highland Avenue, Bremerton, Washington (the "Property") and consists of approximately 1.5-acres. The Property is bounded on the northeast by the Port Washington Narrows, on the northwest by a small inlet (Smith Cove), on the southeast by a residential area and on the southwest by a mixed residential and business area. (Exhibit-A). From approximately 1950 until 1988, Chevron operated a bulk storage and distribution center for petroleum products on the property, including a fuel distribution dock.

B. Currently the City of Bremerton owns the Property and it is a vacant piece of land. (Exhibit-A)

C. Three rounds of groundwater sampling were collected in 2010 and two rounds in 2011 as well as one round of groundwater sampling during the 2008 remedial investigation. All of these groundwater samples were analyzed for total petroleum hydrocarbons-gasoline (TPH-G), TPH-diesel (TPH-D), TPH-Oil (TPH-O), benzene, ethylbenzene, toluene, and xylenes (BETX), with selected samples being analyzed for total and dissolved lead, total and dissolved iron, and dissolved manganese. Results of the latest round of groundwater sampling (September 2011) showed elevated concentrations of TPH-G (2,100 µg/l), TPH-D (1,300 µg/l), and benzene (310 µg/l). TPH – Oil was not detectable in any of the samples. These concentrations exceed MTCA Method-A cleanup levels of 800 µg/l (TPH-G), 500 µg/l (TPH-D and TPH-O), and 5 µg/l (benzene).

In March of 2008, Parametrix conducted an interim action at the site. The interim action consisted of excavation of soil "hot spots" and in-situ chemical treatment of contaminated soil. Confirmational soil samples were collected six months following the in-situ soil treatment to determine the efficacy of the treatment. Twelve soil samples were collected from the treatment area and analyzed for gasoline, diesel, oil, benzene, ethylbenzene, toluene, xylenes, and polycyclic aromatic hydrocarbons. Exceedances for gasoline (1,000 mg/kg), benzene (5.4 mg/kg), ethylbenzene (20 mg/kg), total xylenes (94 mg/kg) and polycyclic aromatic hydrocarbons (2.7 mg/kg – toxicity equivalent method) were found. Ten new groundwater

monitoring wells were installed. Eleven groundwater samples collected from nine new wells and two existing wells. Exceedances of gasoline (2,100 µg/l, diesel (1,300 µg/l), and benzene (310 µg/l) were found.

D. In March of 2008, Parametrix conducted a remedial investigation and feasibility study at the site. Groundwater and soil samples were collected from four surface stations, nineteen push probes, and two new and ten existing groundwater monitoring wells. Bench and pilot studies of in-situ chemical treatment of the contaminated soil were also conducted. Following the bench and pilot studies, an interim action – consisting of excavation of contaminated soil "hotspots" and chemical treatment of the contaminated soil was carried out.

E. In February of 2006, Parametrix conducted a sediment characterization study. Sediment samples were collected from nineteen subtidal and intertidal locations. One location failed State of Washington sediment management standards for chemistry but successfully passed a followup bioassay test. In 2007, Ecology requested Hart-Crowser to conduct a similar sediment characterization study of thirteen sediment locations. All sediment samples successfully passed both chemical and bioassay tests.

F. In June 2005, Parametrix conducted a Due Diligence Investigation for the City of Bremerton to evaluate the then-current conditions at the Site. The evaluation included a comprehensive summary of site investigation, previous remediation efforts, data gaps, additional investigations, a number of potential remedial alternatives and recommendations for the property's acquisition. (Attachment-6)

G. Eighteen groundwater monitoring wells were placed on the site; sixteen remain. From October 1988 to October 2003, a total of thirty-one rounds of quarterly, semiannual and/or annual groundwater sampling have been conducted at the site. All of these groundwater samples were analyzed for total petroleum hydrocarbons-gasoline (TPH-G), TPH-diesel (TPH-D), TPH-Oil (TPH-O), benzene, ethylbenzene, toluene, xylenes (BETX) and dissolved lead. Results of the latest round of groundwater sampling (October 2003) showed elevated concentrations of TPH-G (9,000 µg/l), TPH-D (32,000 µg/l), TPH-O (5,200 µg/l) and benzene (700 µg/l). These

concentrations exceed MTCA Method-A cleanup levels of 800 µg/l (TPH-G), 500 µg/l (TPH-D and TPH-O) and 5 µg/l (benzene). (Attachment-7).

H. In March 1994, Chevron Company conducted a Supplemental Site Assessment. As a part of this investigation, nine soil borings were drilled and six borings were converted into groundwater monitoring wells. A total of thirteen soil samples were selected and sent to an off-site laboratory for TPH-G, TPH-D, TPH-O, polycyclic aromatic hydrocarbon (PAHs) and total lead analysis. Some of the soil samples showed elevated concentrations of TPH-G (1,300 mg/kg), TPH-D (11,000 mg/kg) and PAH range of 1.2 mg/kg to 24 mg/kg. These concentrations exceed MTCA Method-A cleanup levels of 100 mg/kg, 2,000 mg/kg and 0.1 mg/kg (prorated to benzo(a)pyrene with toxicity equivalent factors). (Attachment-8).

I. In November of 1991, Hart Crowser (Chevron's consultant) installed a soil vapor extraction (SVE) system to remove the volatile organic compounds (VOCs) from the soils. The system included eleven dedicated extraction wells and five groundwater monitoring wells. The SVE system was operated from November 1991 through December 1994. Because of the low VOC recovery the system was turned off in December 1994. During this period a total of approximately 195,000 pounds of VOCs were extracted and the thickness of product was reduced in some of the groundwater monitoring wells. (Attachment-9).

J. In July 1991, Ecology conducted a site hazard assessment investigation. As a part of this investigation groundwater, sediment and shellfish samples were collected. These samples were analyzed for TPH-G, TPH-D, BTEX, semi-volatile organic compounds (SVOCs) and total lead. Groundwater results showed: total TPH (5,660 µg/l), benzene (2,420 µg/l), toluene (4,390 µg/l) and nitrobenzene (152 µg/l). Results of sediment samples (all compounds) were below their practical quantitation limits (PQL). Since PQLs were higher than the Sediment Management Standards, it does not preclude the presence of these compounds in the sediments exceeding the marine Sediment Management Standards. In addition, total TPH (100 mg/kg – 412 mg/kg), xylene (78 µg/kg – 103 µg/kg) and lead (11.3 mg/kg – 53.3 mg/kg) were also detected in sediment samples. (Attachment-10).

K. In May 1989, Chevron conducted soil investigation and Phase-I remediation (some product removal). Nine test pits were excavated and a total of eighteen (18) soil samples were collected for TPH-G, TPH-D and total hydrocarbon identification (HCID) analysis. Elevated levels of TPH-G (25,000 mg/kg) and TPH-D (5,800 mg/kg) were detected in soil samples. In addition, measurement of free phase hydrocarbon thickness revealed the presence of approximately 3 to 4 feet of free product at certain locations on the site. A total of 47 gallons of free product was removed during a period of one year. (Attachment-11).

L. In November 1988, Chevron conducted a soil and groundwater investigation. As a part of this investigation, twelve (12) exploratory borings and seven (7) test pits were installed and a total of seventeen (17) soil samples were collected for TPH-G, TPH-D and BTEX analysis. Elevated levels of TPH-G (4,300 mg/kg), TPH-D (17,000 mg/kg), benzene (3.4 mg/kg), toluene (15 mg/kg), ethylbenzene (3.1 mg/kg) and xylenes (12.4 mg/kg) were detected exceeding their MTCA Method-A cleanup levels of respectively, 30 mg/kg, 2,000 mg/kg, 0.03 mg/kg, 7 mg/kg, 6 mg/kg and 9 mg/kg. (Attachment-12).

Nine of the above-mentioned twelve borings were converted into groundwater monitoring wells and groundwater samples were collected for total petroleum hydrocarbon (TPH) and BTEX analysis. TPH, BTEX concentrations of 1,742 µg/l, 6,100 µg/l, 19,000 µg/l, 2,900 µg/l and 23,000 µg/l were detected respectively. These concentrations exceed MTCA Method-A cleanup levels of 800 µg/l (TPH), 5 µg/l (benzene), 1,000 µg/l (toluene and xylenes) and 700 µg/l (ethylbenzene) (Attachment-12).

VI. ECOLOGY DETERMINATIONS

A. The City is an "owner or operator" as defined in RCW 70.105D.020(17), of a "facility" as defined in RCW 70.105D.020(5) because it is the current owner of the Site.

B. Based upon all factors known to Ecology, a “release” or “threatened release” of “hazardous substance(s)” as defined in RCW 70.105D.020(25) and RCW 70.105D.020(10), respectively, has occurred at the Site.

C. Based upon credible evidence, Ecology issued a PLP status letter to the City dated October 25, 2006, pursuant to RCW 70.105D.040, -.020(21) and WAC 173-340-500. By letter dated October 27, 2006, 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.

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 and that these actions be conducted in accordance with Chapter 173-340 WAC unless otherwise specifically provided for herein:

A. The City shall conduct the remedial actions fully described in Exhibit B to this Agreed Order. Generally, the City shall develop a draft final cleanup action plan (dFCAP) for the Site and, the City shall develop a draft and draft final long-term groundwater monitoring plan, a draft and draft final soil monitoring plan, a draft and draft final sampling health and safety plan, a draft and a draft final institutional controls plan, and a draft and draft final environmental covenant to be placed on the property deed. As part of the dFCAP, the City shall carry out the following tasks:

- Installing one or more new groundwater monitoring wells;
- Collecting groundwater and soil samples to define the full nature and extent of remediation;

B. The City shall perform actions required by this Order according to the schedule included in Exhibit B.

C. Upon the approval of the draft cleanup action report, the City shall prepare a draft final CAP in accordance with WAC 173-340-380 that provides a proposed remedial action to

address the contamination at the site. In addition to a general description of the proposed remedial action, the dFCAP shall describe the results of contaminated soils excavation, the chemical oxidation pilot scale study, the application of enhanced bioremediation technologies, and studies of natural attenuation of residual groundwater contamination. The dFCAP shall also include: cleanup levels from the RI/FS together with the rationale for their selection; a schedule for implementation; description of any institutional controls proposed; and summary of applicable local, state and federal laws pertinent to the proposed cleanup action. It shall also contain a draft environmental covenant for the site.

D. If, at any time after the first exchange of comments on drafts, Ecology determines that insufficient progress is being made in the preparation of any of the deliverables required by Exhibit B, Ecology may complete and issue the final deliverable.

VIII. TERMS AND CONDITIONS OF ORDER

A. Public Notice

RCW 70.105D.030(2)(a) requires that, at a minimum, this Order be subject to concurrent public notice. Ecology shall be responsible for providing such public notice and reserves the right to modify or withdraw any provisions of this Order should public comment disclose facts or considerations which indicate to Ecology that this Order is inadequate or improper in any respect.

B. 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 Chapter 70.105D RCW, including remedial actions and Order preparation, negotiation, oversight, and administration. These costs shall include work performed both prior (retroactive to October 1, 2006) 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). Ecology has accumulated $92 832.51 in remedial action costs related to this facility as of December 31, 2011. The City has paid this amount

following submittal of itemized statements by Ecology to the City. For all costs subsequent to December 31, 2011, 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..

C. Implementation of Remedial Action

If Ecology determines that the City has failed without good cause 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 that remain incomplete. If Ecology performs all or portions of the remedial action because of the City's failure to comply with its obligations under this Order, the City shall reimburse Ecology for the costs of doing such work in accordance with Section VIII.B (Remedial Action Costs), provided that the City is not obligated under this Section to reimburse Ecology for costs incurred for work inconsistent with or beyond the scope of this Order.

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.

D. Designated Project Coordinators

The project coordinator for Ecology is:

Christopher Maurer
Toxics Cleanup Program
PO Box 47600, Olympia, WA 98504-7600
(360) 407-7223

E-mail: cmau461@ecy.wa.gov

The project coordinator for the City is:

Thomas Knuckey
3027 Olympus Drive
Bremerton, Washington 98310
(360) 473-2376
E-Mail: thomas.knuckey@ci.bremerton.wa.us

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.

E. Performance

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

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

Any documents submitted containing geologic, hydrologic or engineering work shall be under the seal of an appropriately licensed professional as required by Chapter 18.220 RCW or RCW 18.43.130.

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.

F. Access

Ecology or any Ecology authorized representative shall have the full authority 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.

G. 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. Attached as Exhibit D is Ecology Policy 840, Data Submittal Requirements.

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.F (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 Chapter 173-50 WAC for the specific analyses to be conducted, unless otherwise approved by Ecology.

H. Public Participation

A Public Participation Plan is required for this Site. Ecology shall review any existing Public Participation Plan to determine its continued appropriateness and whether it requires amendment, or if no plan exists, Ecology shall develop a Public Participation Plan alone or in conjunction with the City.

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 list, 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 major meetings with the interested public and local governments. Likewise, Ecology shall notify the City prior to the issuance of all press releases and fact sheets, and before major meetings 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. Bremerton Public Library
612 5th Street North
Bremerton, Washington 98337

b. Washington Department of Ecology
Headquarters Office
300 Desmond Drive
Lacey, WA 98503

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 Headquarters Office in Lacey, Washington.

I. 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.

J. Resolution of Disputes

1. In the event a dispute arises as to an approval, disapproval, proposed change, or other decision or action by Ecology's project coordinator, or an itemized billing statement under Section VIII.B (Remedial Action Costs), the Parties shall utilize the dispute resolution procedure set forth below.

a. Upon receipt of Ecology's project coordinator's written decision or the itemized billing statement, the City has fourteen (14) days within which to notify Ecology's project coordinator in writing of its objection to the decision or itemized statement.

b. The Parties' project coordinators shall then confer in an effort to resolve the dispute. If the project coordinators cannot resolve the dispute within fourteen (14) days, Ecology's project coordinator shall issue a written decision.

c. The City may then request regional management review of the decision. This request shall be submitted in writing to the Toxics Cleanup Land & Aquatic Lands Cleanup Section Manager within seven (7) days of receipt of Ecology's project coordinator's written decision.

d. The Section Manager shall conduct a review of the dispute and shall endeavor to issue a written decision regarding the dispute within thirty (30) days of the City's request for review. The Section Manager's decision 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.

K. Extension of Schedule

1. 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.M (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 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.L (Amendment of Order) when a schedule extension is granted.

4. 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.M (Endangerment).

L. 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.N (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. The City shall submit a written request for amendment to Ecology for approval. Ecology shall indicate its approval or disapproval in writing and in a timely manner after the written request for amendment is received. If the amendment to this Order represents a substantial change, Ecology will provide public notice and opportunity to comment. Reasons for the disapproval of a proposed amendment to this Order shall be stated in writing. If Ecology does not agree to a proposed amendment, the disagreement may be addressed through the dispute resolution procedures described in Section VIII.J (Resolution of Disputes).

M. Endangerment

In the event Ecology determines that any activity being performed at the Site 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 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 Section VIII.M (Endangerment), 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.K (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.

N. Reservation of Rights

This Order is not a settlement under Chapter 70.105D RCW. 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 Chapter 70.105D RCW, including the right to require additional or different remedial actions at the Site should it deem such actions necessary to protect human health and 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.

O. 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 restrict uses and activities to those consistent with this Order and notify all transferees of the restrictions on the use of the property.

P. 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, except as provided in RCW 70.105D.090. The permits or specific federal, state or local requirements that the agency has determined are applicable and that are known at the time of entry of this Order have been identified in Exhibit C.

2. Pursuant to RCW 70.105D.090(1), the City is exempt from the procedural requirements of Chapters 70.94, 70.95, 70.105, 77.55, 90.48, and 90.58 RCW 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. The exempt permits or approvals and the applicable substantive requirements of those permits or approvals, as they are known at the time of entry of this Order, have been identified in Exhibit C.

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.

3. 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.

Q. Land Use Restrictions

The City shall record a restrictive covenant with the offices of the Island County Auditor within ten (10) days of the completion of the remedial action. The Restrictive Covenant shall restrict future uses of the site. The City shall provide Ecology with a copy of the recorded Restrictive Covenant within thirty (30) days of the recording date.

R. 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 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.

S. 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 for death or injuries to persons or 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. In the event the City refuses, without sufficient cause, to comply with any term of this Order, the City will be liable for:

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

b. 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 BREMERTON

_____

Patty Lent
Mayor
The City of Bremerton
Bremerton, Washington
Telephone: (360) 473-5266

STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY

_____

Tim L. Nord
Section Manager
Toxics Cleanup Program
Land & Aquatic Lands Cleanup Section
Telephone: (360) 407-7226

Parametrix ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

4660 KITSAP WAY, SUITE A
BREMERTON, WA 98312-2357
T. 360.377.0014 F. 360.479.5961
www.parametrix.com

TECHNICAL MEMORANDUM

Date:	January 13, 2012
To:	Christopher Maurer
From:	David Dinkuhn, P.E.
Subject:	Former Chevron Property Performance Groundwater Monitoring Results
cc:	Thomas Knuckey, P.E.
Project Number:	233-1896-098
Project Name:	Former Chevron Property Remediation

FORMER CHEVRON PROPERTY PERFORMANCE GROUNDWATER MONITORING

This technical memorandum presents a summary of the results of a performance groundwater monitoring event at the Former Chevron Property in Bremerton, Washington. The performance monitoring was conducted under the site's existing Agreed Order Number DE-07TCPHQ-5024. Data from this monitoring event was intended to be used to evaluate groundwater conditions following an oxygen release compound (OCR) injection event conducted in June 2011. The results of the evaluation are discussed in the site's *Draft Cleanup Action Plan* (Parametrix, 2012).

PERFORMANCE MONITORING RESULTS

Groundwater samples were collected on September 28 through 30, 2011 using a peristaltic pump. Low flow sampling techniques were used to collect samples at ten monitoring wells located within the area of the ORC injection. These wells included: MW-4R, -9R, -10R, -11, -13R, -21R, -22R, -25, -26R, and -27. Prior to sampling, the wells were purged until measured water quality parameters stabilized according to criteria specified in the Supplemental Remedial Investigation/Feasibility Study (RI/FS) and Interim Action (IA) Work Plan (Parametrix 2011). Upon stabilization, groundwater samples were collected in appropriate containers. The final set of water quality parameter measurements and approximate sampling times is provided in Table 1. Field sampling forms related to the sample collection are attached.

Groundwater samples were submitted to Onsite Environmental of Redmond, Washington, for chemical analysis of gasoline and diesel range organics along with benzene, toluene, ethylbenzene, and xylenes. A summary of the sampling results is presented in Table 2. An analytical data review memorandum and the laboratory report are also attached.

The depth to groundwater was measured in each well on September 28, 2011 to provide data used to develop inferred elevation contours as shown on Figure 1. The measurements were collected within a 1-hour period to give a representative snapshot of groundwater elevations. Figure 1 also shows inferred groundwater flow direction based on the elevation contours.

Table 1. Final Water Quality Parameters

Well ID	Date/Time	pH (units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/l)	Temperature (ºC)	Turbidity (NTU)	Redox (mV)
MW-4R	9/29/11 @ 1204	7.11	5.11	0.06	15.44	116	-163
MW-9R	9/28/11 @ 1549	7.05	1.91	6.68**	17.71	106	-152
MW-10R	9/30/11 @ 0944	6.52	81.2	6.16**	16.61	6.5	-96
MW-11	9/30/11 @ 1108	6.41	89.0	0.00	16.28	21.1	-106
MW-13R	9/29/11 @ 1442	7.42	5.99	7.70**	20.61	170	-133
MW-21R	9/28/11 @ 1219	7.06	3.33	0.00	15.31	646*	-195
MW-22R	9/29/11 @ 1051	7.65	6.04	8.48**	17.86	112	-139
MW-25	9/29/11 @1604	6.21	5.16	0.00	14.63	60	-94
MW-26R	9/28/11 @ 1721	6.52	>100	0.00	15.66	82.3	-275
MW-27	9/30/11 @ 1156	6.53	1.18	0.00	15.07	>1000	-111

Notes:

mS/cm = millisiemens per centimeter.

mg/l = milligrams per liter.

ºC = degrees Celsius.

NTU = nephelometric turbidity units.

mV = millivolts.

% = percent.

*= visual turbidity was observed to be clear.

** = low yield well, result elevated due to persistent bubbling during purge.

DISCUSSION

The sample results indicate a continued general decreasing trend in groundwater concentrations. Refer to the DCAP for a detailed discussion.

REFERENCES

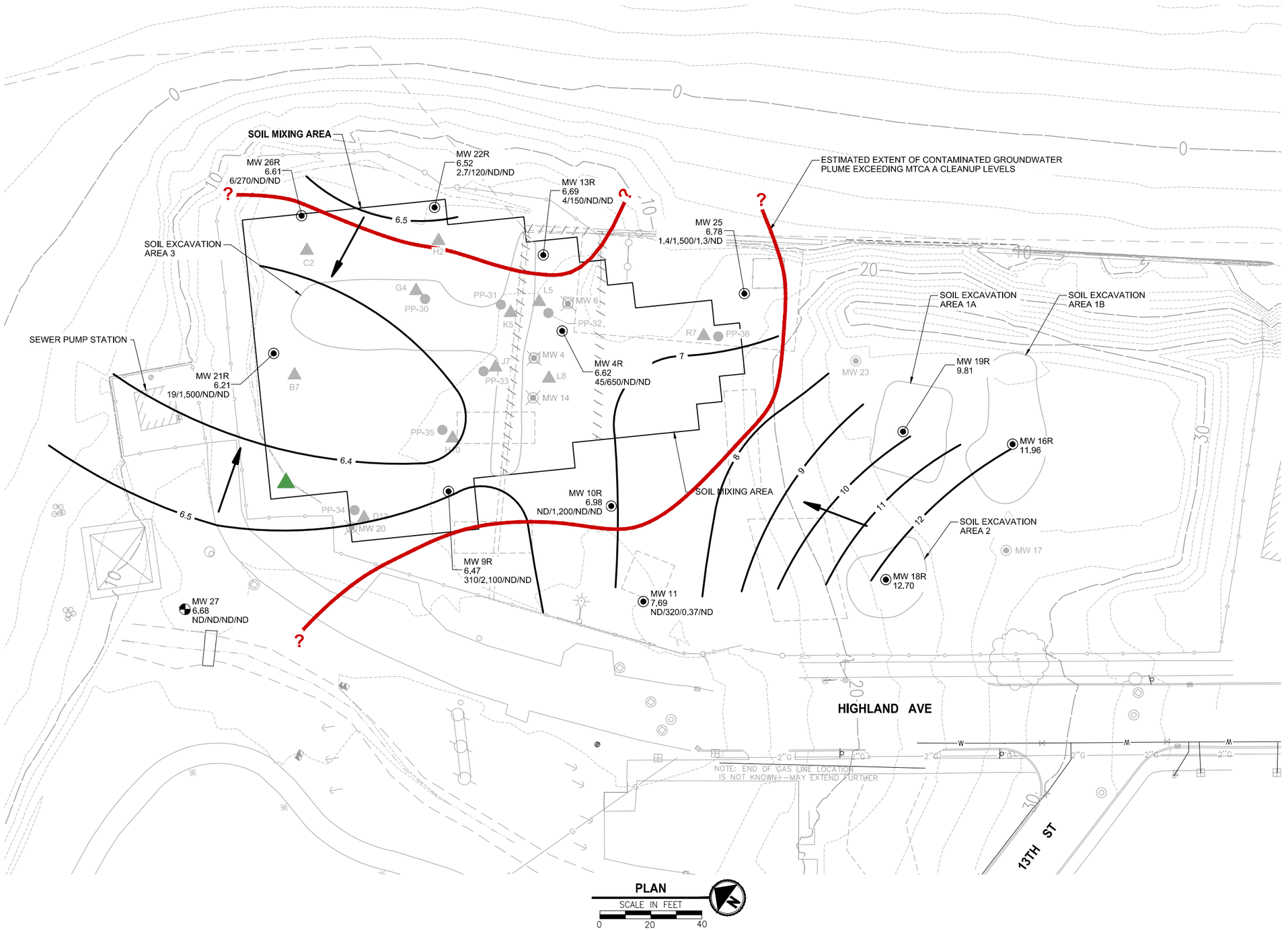
Parametrix. 2011. Technical Memorandum: Former Chevron Property Supplemental RI/FS and IA Work Plan. Prepared for Ecology on behalf of City of Bremerton. February 15.

Parametrix. 2012. Former Chevron Property Draft Cleanup Action Plan. Prepared for Ecology on behalf of the City of Bremerton. January.

ATTACHMENTS:

Figure 1 – Former Chevron Property DCAP Sampling Results September 2011
Table 2 – Groundwater Results Summary
Field Sampling Forms
Data Validation Technical Memorandum
Laboratory Report

ATTACHMENTS



LEGEND

- EXISTING CHAIN LINK FENCE
- EXISTING MONITORING WELL
- SOIL MIXING AREA CONFIRMATION SOIL SAMPLE LOCATION (DEPTH)
- PUSH-PROBE LOCATION
- SOIL EXCAVATION AREA
- MW 14 — WELL DESTROYED DURING INTERIM ACTION
- MW 19R — QUARTERLY MONITORING WELL LOCATION
- R — INDICATES REPLACEMENT WELL INSTALLED FOR PERFORMANCE MONITORING
- 10 — GROUNDWATER ELEVATION
- GROUNDWATER FLOW DIRECTION
- 15.11 — GROUNDWATER ELEVATION AT TIME OF SAMPLING
- ESTIMATED CONTAMINATED GROUNDWATER PLUME EXCEEDING MTCA A CLEANUP LEVELS
- 19/1,500/ND/ND — GW RESULTS FOR BENZENE GASOLINE/DIESEL/LUBE OIL RESULTS IN ug/L
- NEW WELL INSTALLED FOR PERFORMANCE MONITORING IN MARCH 2011
- ND — NOT DETECTED
- PROPOSED NEW MONITORING WELL MW-20R

GENERAL NOTES:

1. CONTOUR DATUM NAVD 88

CLEANUP LEVELS	
MTCA A	**ug/L**
BENZENE	5
GASOLINE	800
DIESEL	500
LUBE OIL	500

REVISIONS NO.	DESCRIPTION	DATE	BY

ENGINEER STAMP

0 1" 2"
TWO INCHES AT FULL SCALE IF NOT SCALE ACCORDINGLY

SCALE
HORIZ. 1"=20' VERT. N/A

FIELD BOOK

DRAWING NO. 3

CITY OF BREMERTON
DEPARTMENT OF PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

DRAWN BY: SBR DATE 9/10
DESIGN BY: DLD WASH. P.E. # DATE 4/10
CHECKED BY: WASH. P.E. # DATE

FORMER CHEVRON PROPERTY DCAP
SAMPLING RESULTS
SEPTEMBER 2011

FIG. NO. 1

PN: 255-1896-063

SHEET OF

BREMERTON BOARDWALK PROJECT

FILE: BR1896063P041304 038 F17o
DATE: Jan 09, 2012 - 11:46am PLOTTED BY: peterjul
IMAGES: Chevron Property FIG1 |
XREFS: XB-BREM_WTRFRNT-BA-SV-061201 | XBR1896063P041130IF-BA

Table 2 Groundwater Results Summary, RI 1st through 4th Monitoring Events and Performance Monitoring (February, May, and August 2010, and April and September 2011)

PARAMETERS	Units	Monitoring Well No.	MW-04R									MW-09R							MW-10R						MW-11							
		Sample Date	3/19/08[1]	1/21/10	6/1/10	6/1/10*	8/11/10	8/11/10*	4/5/11	4/5/11*	9/29/11	1/20/10	5/25/10	5/25/10*	8/11/10	4/7/11	4/7/11 Z	9/28/11	3/17/08[1]	1/20/10	5/25/10	8/10/10	4/5/11	9/30/11	3/13/08	1/20/10	5/25/10	8/10/10	8/10/10*	4/5/11	4/5/11*	9/30/11
		MTCA A																														
VOLATILE ORGANICS (BTEX)																																
Benzene	ug/L	5	160	60 J	58	--	52	--	39	--	45	120 J	160	170	360	280	170	310	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	ug/L	1,000	10 U	2.0 J	1.0 U	--	1.0 U	--	4.0 U	--	1.0 U	4 U	3.2	3.6	11	11	7.6	13	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	700	45	31 J	45	--	40	--	17	--	20	89 J	89	97	230	220	120	150	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
m,p-Xylene	ug/L	1,000	86	15 J	7.6	--	4.7	--	9.4	--	2.1	170 J	120	140	400	300	180	190	6.8	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
o-Xylene	ug/L	1,000	12	1.8 J	1.0 U	--	1.0 U	--	4.0	--	1.0 U	4 U	3.5	3.9	8.1	11	6.7	10	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOTAL PETROLEUM HYDROCARBONS																																
Gasoline	ug/L	800	5,400	1,200 J	1,100	--	1,000	--	960	--	650	1,800 J	1,500	1,700	3,100	4,800	3,100	2,100	400 U	400 U	1,100	780	830	1200	100 U	100 U	100 U	140	130	100 U	100 U	320
Diesel	mg/L	0.5	27	0.64 M	0.34 U	--	0.62 M	--	0.46	--	0.34 U	0.31 U	0.29 U	0.69	0.45 M	0.82	--	0.33 U	160	0.27 U	0.61 U	0.42 U	0.45 U	0.81 U	0.27	0.17 U	0.26 U	0.25 U	0.25 U	0.26 U	0.26 U	0.37
Lube Oil	mg/L	0.5	2.3	0.45 U	0.42 U	--	0.41 U	--	0.42 U	--	0.42 U	0.49 U	0.47 U	0.66	0.42 U	0.43 U	--	0.42 U	8.8 U	0.44 U	0.42 U	0.45 U	0.43 U	0.43 U	0.40 U	0.27 U	0.42 U	0.41 U	0.41 U	0.42 U	0.42 U	0.42 U
METALS																																
Total Lead	ug/L	15	--	8.2	--	--	--	--	--	--	--	80	36 J	74 J	21 J	170	--	--	--	3.8	--	--	--	--	--	4.7	--	--	--	--	--	--
Dissolved Lead	ug/L	15	--	1.0 U	--	--	--	--	--	--	--	13	12	14	17	3.0	--	--	--	2.2	--	--	--	--	--	1.4	--	--	--	--	--	--
Dissolved Iron	ug/L		--	4,200	--	--	--	--	--	--	--	34,000	--	--	--	--	--	--	--	6,400	--	--	--	--	--	270	--	--	--	--	--	--
Total Ferrous Iron	mg/L		--	--	7.36	--	9.75	--	5.4	--	--	--	46.2	42.1	29.2	49.4	--	--	--	--	25.2	34.4	12.4	--	--	--	19.0	30.4	30.0	2.66	2.74	--
Dissolved Manganese	ug/L		--	3,000	4,600	--	4,400	--	3,400	--	--	5,000	3,600	3,900	4,200	4,500	--	--	--	1,100	1,400	2,000	1,500	--	--	300	1,400	2,600	2,600	400	400	--
PAHs								--																								
Naphthalene	ug/L		--	1.4	--	--	--	--	1.0 U	1.0 U	--	6.4	--	--	--	--	--	--	--	0.14	--	--	--	--	--	0.13 U	--	--	--	--	--	--
2-Methylnaphthalene	ug/L		--	0.20	--	--	--	--	1.0 U	1.0 U	--	2.8	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	0.13 U	--	--	--	--	--	--
1-Methylnappthalene	ug/L		--	3.2	--	--	--	--	4.7	4.9	--	2.2	--	--	--	--	--	--	--	21	--	--	--	--	--	0.13 U	--	--	--	--	--	--
Acenaphthylene	ug/L		--	0.23	--	--	--	--	1.0 U	1.0 U	--	0.11 U	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	0.13 U	--	--	--	--	--	--
Acenaphthene	ug/L		--	1.9	--	--	--	--	3.3	3.4	--	0.18	--	--	--	--	--	--	--	0.23	--	--	--	--	--	0.13 U	--	--	--	--	--	--
Flourene	ug/L		--	1.8	--	--	--	--	2.3	2.3	--	0.14	--	--	--	--	--	--	--	0.32	--	--	--	--	--	0.13 U	--	--	--	--	--	--
Phenanthrene	ug/L		--	0.15	--	--	--	--	1.0 U	1.0 U	--	0.17	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	0.13 U	--	--	--	--	--	--
Anthracene	ug/L		--	0.44	--	--	--	--	1.0 U	1.0 U	--	0.11 U	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	0.13 U	--	--	--	--	--	--
Fluoranthene	ug/L		--	0.39	--	--	--	--	1.0 U	1.0 U	--	0.11 U	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	0.13 U	--	--	--	--	--	--
Pyrene	ug/L		--	0.26	--	--	--	--	1.0 U	1.0 U	--	0.11 U	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	0.13 U	--	--	--	--	--	--
Benzo(a)anthracene	ug/L		--	0.047	0.032	0.03	0.050 U	0.042	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.014	--	--	--	--	--	0.013 U	--	--	--	--	--	--
Chrysene	ug/L		--	0.033	0.010 U	0.010 U	0.050 U	0.023	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	0.013 U	--	--	--	--	--	--
Benzo(b)fluoranthene	ug/L		--	0.013	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	0.013 U	--	--	--	--	--	--
Benzo(k)fluoranthene	ug/L		--	0.028	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	0.013 U	--	--	--	--	--	--
Benzo(a)pyrene	ug/L	0.1	--	0.020	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	0.013 U	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L		--	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	0.013 U	--	--	--	--	--	--
Dibenz(a,h)anthracene	ug/L		--	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	0.013 U	--	--	--	--	--	--
Benzo[g,h,i]perylene	ug/L		--	0.010 U	--	--	--	--	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	0.013 U	--	--	--	--	--	--
GENERAL CHEMISTRY																																
Alkalinity	mg/L		--	190	1,900	--	2,100	--	2,300	--	--	700	720	730	800	730	--	--	220	190	200	210	230	--	170	52	210	120	110	70	66	--
Nitrate (as Nitrogen)	mg/L		--	0.050 U	0.050 U	--	0.050 U	--	0.050 U	--	--	0.050 U	0.050 U	0.050 U	0.14	0.050 U	--	--	0.050 U	0.77	0.094	0.050 U	0.050 U	--	0.050 U	0.050 U	0.070	0.086	0.1	0.050 U	0.050 U	--
Sulfate	mg/L		--	250	150	--	120	--	110	--	--	30	7.5	7.4	5.0 U	5.0 U	--	--	5.0 U	10	10 U	5.0 U	5.0 U	--	5.0 U	8.8	10 U	25 U	25 U	5.0 U	5.0 U	--
Chloride	mg/L		--	290	250	--	250	--	230	--	--	77	120	120	78	91	--	--	2.5	10	10	14	6.8	--	5.2	3.1	7.9	8.8	9.4	6.0	5.5	--
Dissolved Methane	ug/L		--	710	590	--	670	--	740	--	--	2,100	8,600	7,800	6,600	9,900	--	--	--	170	510	260	590	--	--	15	1,200	870	730	310	340	--
BOD5	mg/L		--	8.97	8.1	--	8.6	--	--	--	--	5.46	3.0	4.3	12.3	--	--	--	--	3.06	2.0	12 U	--	--	--	3.36	3.1	12 U	12 U	--	--	--
FIELD PARAMETERS																																
Turbidity	NTU		--	333	5.3	5.3	106	106	9.0	9.0	116.0	146	57.9	57.9	>1000	>1000	>1000	106.0	208	54.7	3.0	235	2.7	6.5	12.6	165	1.5	32.9	32.9	3.4	3.4	21.1
pH	--		--	6.63	6.90	6.90	7.01	7.01	7.09	7.09	7.11	6.36	6.77	6.77	6.94	6.78	6.78	7.05	6.38	6.00	6.32	6.05	6.50	6.52	6.20	5.27	6.20	6.27	6.27	6.17	6.17	6.41
Specific Conductance	mS/cm		--	3.50	3.42	3.42	32.6	32.6	35.1	35.1	5.48	1.52	1.42	1.42	2.65	1.81	1.81	1.91	53.4	35.9	51.2	90	90	81.2	63.5	10.3	32.0	90	90	64.3	64.3	89.0
Dissolved Oxygen	mg/L		--	4.91	4.55	4.55	0.0	0.0	4.02	4.02	0.06	9.65	0.96	0.96	0.0	0.40	0.40	6.68	0.0	5.38	6.31	2.38	2.20	6.16	0.0	5.87	0.90	0.0	0.0	2.67	2.67	0.00
ORP	mV		--	-136	-115	-115	-161	-161	-149	-149	-163	-124	-136.8	-136.8	-169	-134	-134	-152	-35	-64	-19.0	-79	-110	-96	62	169	-49.3	-110	-110	-31	-31	-106

Notes:

1 Sample collected from original well decommissioned during 2009 Interim Action.

* Duplicate collected.

CAL = Value out of calibration range.

J = Analyte was detected. Reported concentration should be considered an estimate.

M = Hydrocarbons in the gasoline range are impacting the diesel range result.

mg/L= Milligrams per liter.

mS/cm= Millisiemens per centimeter.

mV = Millivolts.

NC = Parameter not collected due to malfunctioning equipment.

NTU = Nephalometric turbidity units.

O = Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

ORP = Oxidation reduction potential.

R = Replacement well.

µg/L = Micrograms per liter.

U = Analyte not detected above practical quantitation limit given.

U1 = The practical quantitation limit is elevated due to interferences present in the sample.

Z = Sample collected was unpreserved and allowed to settle prior to analysis. Results provided to assess affects of suspended sediment in the samples.

Exceeds MTCA A cleanup level.

Table 2 Groundwater Results Summary, RI 1st through 4th Monitoring Events and Performance Monitoring (February, May, and August 2010, and April and September 2011)

PARAMETERS	Units	Monitoring Well No.	MW-13R						MW-16R					MW-18R				MW-19R						MW-20	MW-21R						
		Sample Date	2/15/10	5/26/10	8/11/10	4/6/11	4/6/11 Z	9/29/11	2/16/10	5/27/10	8/10/10	4/6/11	4/6/11 Z	2/16/10	5/25/10	8/10/10	4/6/11	3/12/08[1]	2/16/10	5/26/10	8/12/10	4/7/11	4/7/11 Z	3/13/08	3/18/08[1]	2/15/10	6/1/10	8/11/10	8/11/10*	4/6/11	4/6/11*	9/28/11
		MTCA A																													
VOLATILE ORGANICS (BTEX)																															
Benzene	ug/L	5	35 J	33	22	11	17	4	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	15	46 J	34	27	--	45	--	19
Toluene	ug/L	1,000	4.0 U	1.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	3.7	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	91	5.0 J	2.9	1.7	--	6.7	--	1.0 U
Ethylbenzene	ug/L	700	13 J	15	10	2.6	3.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	620	230 J	240	120	--	340	--	34
m,p-Xylene	ug/L	1,000	4.0 U	1.4	1.7	1.0 U	1.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.5	1.0 U	910	190 J	210	100	--	290	--	21
o-Xylene	ug/L	1,000	4.0 U	1.0 U	1.0 U	1.0 U	1.1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	110	8.9 J	2.3	1.9	--	4.0 U	--	1.0 U
TOTAL PETROLEUM HYDROCARBONS																															
Gasoline	ug/L	800	680 J	560	510	420	470	150	100 U	100 U	100 U	100 U	400 U	100 U	100 U	180 O	100 U	400 U	640 J	380	620 O	130	280	100 U	9,200	4,400 J	4,400	2,800	--	5,100	--	1500
Diesel	mg/L	0.5	0.49 U1	0.43	0.39 U	0.41	--	0.26 U	0.28 U	0.27 U	0.37	0.28 U	--	0.27 U	0.26 U	0.27 U	0.27 U	8.1	0.29 U	0.26 U	0.42 M	0.26 U	--	0.27 U	1.7	0.89 U1	0.79 U	0.87 M	--	0.68 U	--	0.42 U
Lube Oil	mg/L	0.5	0.70 J	0.45 U	0.43 U	0.42 U	--	0.42 U	0.44 U	0.43 U	0.39 U	0.44 U	--	0.43 U	0.42 U	0.43 U	0.43 U	0.42 U	0.46 U	0.42 U	0.42 U	0.42 U	--	0.44 U	0.40 U	0.46 U	0.42 U	0.41 U	--	0.42 U	--	0.42 U
METALS																															
Total Lead	ug/L	15	5.2	--	--	--	--	--	1.4	--	--	--	--	1.6	--	--	--	4.5	5.7	--	--	--	--	15	10	15	2.8 J	10 J	5.5 J	1.1	1.1 U	--
Dissolved Lead	ug/L	15	1.1	--	--	--	--	--	1.0 U	--	--	--	--	1.0 U	--	--	--	1.0 U	1.0 U	--	--	--	--	1.0 U	8.9	2.3	1.4	1.4	1.0	1.0 U	1.0 U	--
Dissolved Iron	ug/L		3,600	--	--	--	--	--	56 U	--	--	--	--	830	--	--	--	--	5,100	--	--	--	--	--	--	18,000	--	--	--	--	--	--
Total Ferrous Iron	mg/L		--	15.2	9.31	7.94	--	--	--	1.66	0.336	0.094	--	--	12.1	17.8	1.48	--	--	15.4	17.4	0.839	--	--	--	--	16.2	17.9	--	10.1	--	--
Dissolved Manganese	ug/L		1,500	1,300	2,000	1,800	--	--	10 U	3,800	11,000	10 U	--	1,200	2,800	9,500	1,900	--	2,200	2,400	3,500	1,600	--	--	--	4,100	4,500	3,500	--	4,200	--	--
PAHs																															
Naphthalene	ug/L		15	--	--	0.35	--	--	0.11 U	--	--	--	--	1.0	--	--	--	0.88	0.43	--	--	--	--	0.12 U	18	18	--	--	--	--	--	--
2-Methylnaphthalene	ug/L		1.1	--	--	0.10 U	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	0.11 U	0.17	--	--	--	--	0.12 U	32	7.3	--	--	--	--	--	--
1-Methylnappthalene	ug/L		4.7	--	--	0.38	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	15	4.3	--	--	--	--	0.12 U	20	18	--	--	--	--	--	--
Acenaphthylene	ug/L		1.1	--	--	0.40	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	0.42	0.12	--	--	--	--	0.12 U	0.099	1.1 U	--	--	--	--	--	--
Acenaphthene	ug/L		48	--	--	22	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	0.96	0.58	--	--	--	--	0.38	1.1	1.3	--	--	--	--	--	--
Flourene	ug/L		21	--	--	7.6	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	5.2	1.5	--	--	--	--	0.12 U	0.96	0.61	--	--	--	--	--	--
Phenanthrene	ug/L		3.2	--	--	0.70	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	2.9	0.31	--	--	--	--	0.12 U	0.65	0.44	--	--	--	--	--	--
Anthracene	ug/L		1.9	--	--	1.2	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	0.15	0.10 U	--	--	--	--	0.12 U	0.095 U	0.26	--	--	--	--	--	--
Fluoranthene	ug/L		1.5	--	--	1.2	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	0.11 U	0.10 U	--	--	--	--	0.12 U	0.11	0.12	--	--	--	--	--	--
Pyrene	ug/L		0.91	--	--	0.58	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	0.11 U	0.10 U	--	--	--	--	0.12 U	0.095 U	0.11 U	--	--	--	--	--	--
Benzo(a)anthracene	ug/L		0.15	0.057	0.061	0.058	--	--	0.011 U	--	--	--	--	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.015	0.012	0.011 U	--	--	--	--	--	--
Chrysene	ug/L		0.15	0.040	0.050 U	0.044	--	--	0.011 U	--	--	--	--	0.010 U	--	--	--	0.021	0.010 U	--	--	--	--	0.013	0.011	0.011 U	--	--	--	--	--	--
Benzo(b)fluoranthene	ug/L		0.093	0.010 U	0.010 U	0.018	--	--	0.011 U	--	--	--	--	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.012 U	0.010	0.011 U	--	--	--	--	--	--
Benzo(k)fluoranthene	ug/L		0.083	0.010 U	0.010 U	0.014	--	--	0.011 U	--	--	--	--	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.012 U	0.011	0.011 U	--	--	--	--	--	--
Benzo(a)pyrene	ug/L	0.1	0.092	0.010 U	0.010 U	0.017	--	--	0.011 U	--	--	--	--	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.012 U	0.012	0.011 U	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L		0.041	0.010 U	0.010 U	0.010 U	--	--	0.011 U	--	--	--	--	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.012 U	0.0099	0.011 U	--	--	--	--	--	--
Dibenz(a,h)anthracene	ug/L		0.013	0.010 U	0.010 U	0.010 U	--	--	0.011 U	--	--	--	--	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.012 U	0.0095 U	0.011 U	--	--	--	--	--	--
Benzo[g,h,i]perylene	ug/L		0.053	--	--	0.010 U	--	--	0.011 U	--	--	--	--	0.010 U	--	--	--	0.11 U	0.010 U	--	--	--	--	0.12 U	0.013	0.011 U	--	--	--	--	--	--
GENERAL CHEMISTRY																															
Alkalinity	mg/L		1,300	1,400	1,600	1,500	--	--	20 U	450	710	20 U	--	200	420	870	250	160	170	200	190	120	--	180	150	140	1,400	1,500	--	2,000	--	--
Nitrate (as Nitrogen)	mg/L		0.050 U	0.050 U	0.050 U	0.050 U	--	--	0.087	0.25 U	0.050 U	0.050 U	--	0.16	0.050 U	0.050 U	0.35	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	--	0.050 U	0.050 U	0.050 U	0.050 U	0.057	--	0.27	--	--
Sulfate	mg/L		460	460	560	280	--	--	5.9	5.0 U	5.0 U	5.0 U	--	26	7.8	5.0 U	7.4	5.0 U	10 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	230	170	120	--	110	--	--
Chloride	mg/L		710	670	750	420	--	--	4.2	8.3	8.4	8.7	--	3.7	4.3	14	2.4	3.4	4.7	2.5	3.1	2.0 U	--	11	28	140	120	110	--	100	--	--
Dissolved Methane	ug/L		280	580	680	290	--	--	0.83	3,100	590	4.1	--	420	2,100	5,400	4300	--	32	44	350	61	--	--	--	--	5,700	4,200	4,800	--	3,200	--	--
BOD5	mg/L		4.47	2.2	5.1	--	--	--	2.00 U	1.0 U	12 U	--	--	2.52	8.1	12 U	--	--	4.20	1.1	2.9	--	--	--	--	--	17	8.4	16.2	--	--	--	--
FIELD PARAMETERS																															
Turbidity	NTU		366	275.3	106	>1000	>1000	170.0	86.3	2565	>1000	704	704	58.1	16.7	221	28.6	NC	340	319	32.7	>1000		NC	168	303	8.9	384	384	52.2	52.2	646.0
pH	--		6.96	6.81	6.89	6.99	6.99	7.42	6.16	6.53	6.87	6.37	6.37	6.03	6.49	6.61	6.51	6.00	6.40	6.68	6.34	6.41		6.56	6.39	6.56	6.83	7.00	7.00	7.06	7.06	7.06
Specific Conductance	mS/cm		57.3	4.53	55.2	438	438	5.99	4.9	64.9	1.38	18.6	18.6	51.6	58.0	2.20	90	34.5	48.2	38.0	CAL	82.1		79.1	44.4	33.3	2.50	4.47	4.47	430	430	3.33
Dissolved Oxygen	mg/L		7.56	3.07	0.0	4.82	4.82	7.70	10.09	2.32	6.27	14.10	14.10	2.79	1.29	0.0	3.39	0.0	3.00	5.05	0.01	4.10	--	0.0	0.0	0.00	4.92	0.0	0.0	1.80	1.80	0.00
ORP	mV		-13	-96.3	-146	-103	-103	-133	290	-20.3	-38	147	147	143	-2.1	-156	-27	-35	1	-49.8	-84	4	--	-44	15	-107	-140.0	-162	-162	-160	-160	-195

Notes:

1 Sample collected from original well decommissioned during 2009 Interim Action.

* Duplicate collected.

CAL = Value out of calibration range.

J = Analyte was detected. Reported concentration should be considered an estimate.

M = Hydrocarbons in the gasoline range are impacting the diesel range result.

mg/L= Milligrams per liter.

mS/cm= Millisiemens per centimeter.

mV = Millivolts.

NC = Parameter not collected due to malfunctioning equipment.

NTU = Nephalometric turbidity units.

O = Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

ORP = Oxidation reduction potential.

R = Replacement well.

µg/L = Micrograms per liter.

U = Analyte not detected above practical quantitation limit given.

U1 = The practical quantitation limit is elevated due to interferences present in the sample.

Z = Sample collected was unpreserved and allowed to settle prior to analysis. Results provided to assess affects of suspended sediment in the samples.

Exceeds MTCA A cleanup level.

Table 2 Groundwater Results Summary, RI 1st through 4th Monitoring Events and Performance Monitoring (February, May, and August 2010, and April and September 2011)

PARAMETERS	Units	Monitoring Well No. / Sample Date	MW-22R 3/17/08[1]	MW-22R 1/20/10	MW-22R 5/26/10	MW-22R 8/12/10	MW-22R 4/6/11	MW-22R 9/29/11	MW-23 3/12/08	MW-25 3/18/08	MW-25 3/18/08	MW-25 1/21/10	MW-25 5/27/10	MW-25 8/12/10	MW-25 4/6/11	MW-25 9/29/11	MW-26R 3/18/08[1]	MW-26R 1/20/10	MW-26R 5/26/10	MW-26R 8/11/10	MW-26R 4/6/11	MW-26R 9/28/11	MW-27 4/7/11	MW-27 9/30/11
		MTCA A																						
VOLATILE ORGANICS (BTEX)																								
Benzene	ug/L	5	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	2.7	1.1	4.0 U	4.0	10 J	4.0 U	1.3	4.0 U	1.4	17	4.0 U	17	3.9	1.0 U	6.0	1.0 U	1.0 U
Toluene	ug/L	1,000	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	4.0	7.2 J	4.0 U	2.1	4.0 U	2.5	4.0 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	700	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	56	56	74 J	4.0 U	6.1	5.3	11	4.0 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
m,p-Xylene	ug/L	1,000	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.2	4.1	140 J	4.0 U	5.0 U	8.4	1.2	4.0 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
o-Xylene	ug/L	1,000	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	4.0	200 U1	4.0 U	1.0 U	4.0 U	1.0 U	4.0 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOTAL PETROLEUM HYDROCARBONS																								
Gasoline	ug/L	800	400 U	400 U	100 U	100 U	100 U	120	530	1,600	1,700	2,000 U	1,400	1,300 O	1,500	1500	1,300	400 U	530	240	100 U	270	100 U	100 U
Diesel	mg/L	0.5	0.26 U	0.26 U	0.27 U	0.25 U	0.27 U	0.26 U	0.26 U	1.2	1	0.49	0.92	2 M	7.0	1.3	1.3	0.27 U	0.26 U	0.31 U	0.27 U	0.26 U	0.26 U	0.26 U
Lube Oil	mg/L	0.5	0.41 U	0.41 U	0.43 U	0.41 U	0.43 U	0.41 U	0.42 U	0.48 U	0.46 U	0.42 U	0.42 U	0.41 U	0.42 U	0.41 U	0.40 U	0.43 U	0.41 U	0.40 U	0.43 U	0.41 U	0.41 U	0.42 U
METALS																								
Total Lead	ug/L	15	1.1 U	1.3	--	--	--	--	--	1.2	1.3	1.1 U	--	--	--	--	3.3	1.1 U	--	--	--	--	--	--
Dissolved Lead	ug/L	15	1.0 U	1.0 U	--	--	--	--	--	1.0 U	1.0 U	1.0 U	--	--	--	--	1.0 U	1.0 U	--	--	--	--	--	--
Dissolved Iron	ug/L		--	220	--	--	--	--	--	--	--	2,000	--	--	--	--	--	56 U	--	--	--	--	--	--
Total Ferrous Iron	mg/L		--	--	0.295	1.29	0.043	--	--	--	--	--	0.352	3.78	1.39	--	--	--	0.758	0.8	0.059	--	27.6	--
Dissolved Manganese	ug/L		--	1,400	890	3,200	840	--	--	--	--	120	220	130	170	--	--	11 U	66	560	10 U	--	3,900	--
PAHs																								
Naphthalene	ug/L		0.098 U	0.10 U	--	--	--	--	--	1.2	1.4	0.27	--	--	--	--	0.80	0.10 U	--	--	--	--	--	--
2-Methylnaphthalene	ug/L		0.098 U	0.10 U	--	--	--	--	--	0.11 U	0.11 U	0.10 U	--	--	--	--	0.10 U	0.10 U	--	--	--	--	--	--
1-Methylnappthalene	ug/L		0.098 U	0.10 U	--	--	--	--	--	22	25	0.67	--	--	--	--	69	0.10 U	--	--	--	--	--	--
Acenaphthylene	ug/L		0.098 U	0.10 U	--	--	--	--	--	0.17	0.17	0.10 U	--	--	--	--	0.45	0.15 U	--	--	--	--	--	--
Acenaphthene	ug/L		0.52	0.10 U	--	--	--	--	--	0.98	0.96	0.15	--	--	--	--	23	0.17 U	--	--	--	--	--	--
Flourene	ug/L		0.098 U	0.10 U	--	--	--	--	--	1.6	1.7	0.18	--	--	--	--	4.8	0.10 U	--	--	--	--	--	--
Phenanthrene	ug/L		0.098 U	0.10 U	--	--	--	--	--	0.11 U	0.11 U	0.10 U	--	--	--	--	10	0.10 U	--	--	--	--	--	--
Anthracene	ug/L		0.098 U	0.10 U	--	--	--	--	--	0.11 U	0.11 U	0.10 U	--	--	--	--	2.4	0.17 U	--	--	--	--	--	--
Fluoranthene	ug/L		0.098 U	0.10 U	--	--	--	--	--	0.11 U	0.11 U	0.10 U	--	--	--	--	0.88	0.10 U	--	--	--	--	--	--
Pyrene	ug/L		0.098 U	0.10 U	--	--	--	--	--	0.11 U	0.11 U	0.10 U	--	--	--	--	1.2	0.10 U	--	--	--	--	--	--
Benzo(a)anthracene	ug/L		0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.10	0.016 U	--	--	--	--	--	--
Chrysene	ug/L		0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.098	0.010 U	--	--	--	--	--	--
Benzo(b)fluoranthene	ug/L		0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.022	0.010 U	--	--	--	--	--	--
Benzo(k)fluoranthene	ug/L		0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.027	0.010 U	--	--	--	--	--	--
Benzo(a)pyrene	ug/L	0.1	0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.051	0.010 U	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L		0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.017	0.010 U	--	--	--	--	--	--
Dibenz(a,h)anthracene	ug/L		0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.010 U	0.010 U	--	--	--	--	--	--
Benzo[g,h,i]perylene	ug/L		0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.11 U	0.010 U	--	--	--	--	0.020	0.010 U	--	--	--	--	--	--
GENERAL CHEMISTRY																								
Alkalinity	mg/L		340	160	320	240	310	--	230	420	410	140	190	260	200	--	190	180	270	210	300	--	310	--
Nitrate (as Nitrogen)	mg/L		0.050 U	0.50	0.050 U	0.17	0.41	--	0.051	0.052	0.050 U	3.4	0.73	0.050 U	1.4	--	0.050 U	1.0	0.16	0.050 U	0.050 U	--	0.050 U	--
Sulfate	mg/L		22	1,200	75	200	39	--	5.0 U	36	36	13	8.0	26	5.0 U	--	1,400	1,200	1,400	2,200	1,300	--	25 U	--
Chloride	mg/L		370	9,100	390	1,600	97	--	3.0	980	910	38	31	610	24	--	9,400	9,100	10,000	20,000	8,400	--	9.8	--
Dissolved Methane	ug/L		--	6.3	21	10	6.8	--	--	--	--	220	190	330	190	--	--	3.0	68	5.0	29	--	8,600	--
BOD5	mg/L		--	2.00 U	1.0 U	1.2 U	--	--	--	--	--	2.00 U	1.9	4.3	--	--	--	2.00 U	1.7	1.5	--	--	--	--
FIELD PARAMETERS																								
Turbidity	NTU		212	56.3	4.1	132	0.8	112.0	29	120	120	164	4.8	32.6	65.5	60.0	85.7	70.2	3.8	38.0	0.1	82.3	49.2	>1000
pH	--		6.62	6.32	6.82	6.69	7.03	7.65	6.49	6.31	6.31	5.81	6.28	6.96	6.20	6.21	6.24	6.19	6.31	6.53	6.88	6.52	6.58	6.53
Specific Conductance	mS/cm		19.6	17.9	1.37	CAL	128	6.04	52.4	19.8	19.8	31.8	28.9	5.13	90	51.6	3.25	16.6	22.42	CAL	CAL	CAL	92	1.18
Dissolved Oxygen	mg/L		0.0	7.55	4.90	0.01	1.75	8.48	0.0	0.0	0.0	4.96	1.10	0.0	0.57	0.00	0.0	6.75	5.52	0.01	0.36	0.00	0.27	0.00
ORP	mV		148	54	62.0	-36	32	-139	19	-56	-56	-14	85.6	-120	-30	-99	48	58	-64.5	-98	-84	-275	-88	-111

Notes:

1 Sample collected from original well decommissioned during 2009 Interim Action.

* Duplicate collected.

CAL = Value out of calibration range.

J = Analyte was detected. Reported concentration should be considered an estimate.

M = Hydrocarbons in the gasoline range are impacting the diesel range result.

mg/L= Milligrams per liter.

mS/cm= Millisiemens per centimeter.

mV = Millivolts.

NC = Parameter not collected due to malfunctioning equipment.

NTU = Nephalometric turbidity units.

O = Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

ORP = Oxidation reduction potential.

R = Replacement well.

µg/L = Micrograms per liter.

U = Analyte not detected above practical quantitation limit given.

U1 = The practical quantitation limit is elevated due to interferences present in the sample.

Z = Sample collected was unpreserved and allowed to settle prior to analysis. Results provided to assess affects of suspended sediment in the samples.

Exceeds MTCA A cleanup level.

PARAMETRIX

Form 02-EN-101/Rev. 10/02

Groundwater Sampling Field Data Sheet No. 2

Well #: 4R

Sample #: CHEV-GW-MW4R-0130

233-1896-098

Project Number:	~~255-1896-063~~	Date:	9/29/2011
Project Name:	Fmr. Chevron Prop.	Location:	Bremerton, WA (Evergreen Park)
Project Address:	1400 Park Ave, Bremerton, WA	Sampled By:	Mike Baxter
Client Name:	City of Bremerton	Purged By:	Same

Casing Diameter: 2" ____ 4" ____ 6" ____ Other ✓

Depth to Water (feet):	10.75	Purge Volume Measurement Method:	Watch + measuring cup.
Depth of Well (feet):	16.93	Date Purged:	9/29/2011
Reference Point (surveyor's notch, etc.):	TOC	Purge Time (from/to:	1143 - 1223
Date/Time Sampled:	9/29/2011 1210	Flow = 300 ml/min	

Purge Volume Calculation: $(\pi r^2 h)(7.48\ gal/ft^3)$(# Casing volumes)

Purge Volume (gallons) for: 2" = (0.16)(h)(#Cv); 4" = (0.653)(h)(#Cv); 6" = (1.48)(h)(#Cv)

Calculated Purge Volume (gallons): ____ Actual Purge Volume (gallons): 3

TIME (2400 hr)	WATER LEVEL (feet)	pH (units)	COND (mS/cm)	DO (mg/L)	TEMP °C	Turb. ~~SAL %~~	REDOX (mv)
1148	—	7.12	0.548	0.00	15.74	154.0	-169
1152	—	7.11	0.529	0.00	15.55	127.0	-167
1156	—	7.11	0.521	0.00	15.48	108.0	-165
1200	—	7.11	0.515	0.00	15.46	116.0	-164
1204	—	7.11	0.511	0.06	15.44	116.0	-163

Purge Equipment:	Geopump Peristaltic/ Horiba Multi-meter	Sampling Equipment:	Same
Laboratory:	OnSite (Redmond, WA)	Date Sent to Lab:	10/3/2011
Chain-of-Custody (yes/no):	Yes	Field QC Sample Number:	CHEV-GW-MW4R-1130
Shipment Method:	Hand Delivered	Split With (names[s]/organization):	N/A

Well Integrity: Bolted, capped, locked, and clear of debris.

Remarks: Slight fuel odor. Effervescent (small bubbles).

Signature: [signature]

PARAMETRIX

Form 02-EN-101/Rev. 10/02

Groundwater Sampling Field Data Sheet No. 2

Well #: MW-9R

Sample #: CHEV-GW-MW9R-0620

233-1896-090

Project Number: ~~233-1896-003~~		Date: 9/28/2011	
Project Name: Fmr Chevron Prop.		Location: Bremerton, WA (Evergreen Park)	
Project Address: 1400 Park Ave, Bremerton, WA		Sampled By: Mike Baxter	
Client Name: City of Bremerton		Purged By: (same)	
Casing Diameter: 2" ____	4" ____	6" ____	Other ✓
Depth to Water (feet): 11.19		Purge Volume Measurement Method: Stopwatch + Measure Cup	
Depth of Well (feet): 16.32 ~~Not measured~~ MK		Date Purged: 9/28/2011	
Reference Point (surveyor's notch, etc.): TOC		Purge Time (from/to): 1501 - 1610	
Date/Time Sampled: 9/28/2011 1550		Flow = *See Remarks	

Purge Volume Calculation: $(\pi r^2 h)(7.48\ gal/ft^3)$(# Casing volumes)

Purge Volume (gallons) for: 2" = (0.16)(h)(#Cv); 4" = (0.653)(h)(#Cv); 6" = (1.48)(h)(#Cv)

Calculated Purge Volume (gallons): ____ Actual Purge Volume (gallons): 2

TIME (2400 hr)	WATER LEVEL (feet)	pH (units)	COND (mS/cm)	DO (mg/L)	TEMP °C	Turb. ~~SAL %~~	REDOX (mv)
~~1546~~ MK							
1617	—	7.01	0.242	3.20	17.98	209.0	-136
1621	—	7.01	0.235	4.66	18.03	327.0	-136
1625	—	7.01	0.219	5.30	17.84	122.0	-139
1629	—	7.04	0.214	6.07	17.82	117.0	-142
1633	—	7.03	0.209	5.89	17.92	115.0	-144
1637	—	7.01	0.203	5.77	17.88	88.9	-143
1641	—	7.00	0.199	5.51	17.65	106.7	-143
1645	—	7.02	0.196	6.32	17.63	54.0	-148
1649	—	7.05	0.191	6.68	17.74	106.0	-152

Purge Equipment:	Geopump Peristaltic/ Horiba multi-meter	Sampling Equipment:	Same
Laboratory:	On Site (Redmond, WA)	Date Sent to Lab:	10/3/2011
Chain-of-Custody (yes/no):	Yes	Field QC Sample Number:	CHEV-GW-MW9R-1120
Shipment Method:	Hand Delivered	Split With (names[s]/organization):	N/A

Well Integrity: Bolted, ~~Unsecured~~ MK locked, clear of debris.

Remarks: Low purging well. Varied flow rate 100-300 ml/min to maintain flow. Fuel odor.

Signature:

DO values may be elevated due to bubbles in flow stream.

PARAMETRIX

Form 02-EN-101/Rev. 10/02

Groundwater Sampling Field Data Sheet No. 2

Well #: 10R

Sample #: CHEV-GW-MW10R-0110

Project Number:	233-1896-005T	Date:	9/30/2011
Project Name:	Fmr. Chevron Prop.	Location:	Evergreen Park - Bremerton, WA
Project Address:	1400 Park Ave, Bremerton, WA	Sampled By:	Mike Barker
Client Name:	City of Bremerton	Purged By:	↓

Casing Diameter: 2" ____ 4" ____ 6" ____ Other ✓

Depth to Water (feet):	8.94	Purge Volume Measurement Method:	Watch + Measuring Cup
Depth of Well (feet):	14.95	Date Purged:	9/30/2011
Reference Point (surveyor's notch, etc.):	TOC	Purge Time (from/to):	0918 - 1005
Date/Time Sampled:	9/30/2011 0955	Flow = 300 ml/min	

Purge Volume Calculation: $(\pi r^2 h)(7.48\ gal/ft^3)$(# Casing volumes)

Purge Volume (gallons) for: 2" = (0.16)(h)(#Cv); 4" = (0.653)(h)(#Cv); 6" = (1.48)(h)(#Cv)

Calculated Purge Volume (gallons): ____ Actual Purge Volume (gallons): 1.5

TIME (2400 hr)	WATER LEVEL (feet)	pH (units)	COND (mS/cm)	DO (mg/L)	TEMP °C	Turb, ~~SAL~~ %	REDOX (mv)
0920	-	6.05	90.6	1.36	16.29	221.0	-92
0924	-	6.24	84.7	2.48	16.40	66.3	-99
0928	-	6.35	83.0	4.61	16.49	26.0	-100
0932	-	6.41	82.4	5.05	16.42	17.7	-100
0936	-	6.42	81.9	5.47	16.39	7.2	-96
0940	-	6.47	81.8	5.36	16.48	9.0	-94
0944		6.52	81.6	6.16	16.61	6.5	-96

Purge Equipment:	Geopump Peristaltic / Horiba Multi-meter	Sampling Equipment:	Same
Laboratory:	Onsite (Redmond, WA)	Date Sent to Lab:	10/3/2011
Chain-of-Custody (yes/no):	Yes	Field QC Sample Number:	CHEV-GW-MW10R-1130
Shipment Method:	Hand Delivered	Split With (names[s]/organization):	N/A

Well Integrity: Bolted, capped, and clear of debris.

Remarks: Low producing well. Bubbles in flow may affect DO readings. Petroleum odor.

Signature:

PARAMETRIX

Form 02-EN-101/Rev. 10/02

Groundwater Sampling Field Data Sheet No. 2

Well #: MW-11

Sample #: CHEV-GW-MW11-010

Project Number:	233-1896-098	Date:	9/30/2011
Project Name:	Fmr. Chevron Prop.	Location:	Evergreen Park - Bremerton, WA
Project Address:	1400 Park Ave, Bremerton, WA	Sampled By:	Mike Baxter
Client Name:	City of Bremerton	Purged By:	↓

Casing Diameter: 2" ✓ 4" ____ 6" ____ Other ~~✓~~ [illegible]

Depth to Water (feet):	8.25	Purge Volume Measurement Method:	Watch + Measure Cup
Depth of Well (feet):	18.78	Date Purged:	9/30/2011
Reference Point (surveyor's notch, etc.):	TOC	Purge Time (from/to:	1045 - 1114
Date/Time Sampled:	9/30/2011 1110	Flow = 300 ml/min.	

Purge Volume Calculation: $(\pi r^2 h)(7.48\ gal/ft^3)$(# Casing volumes)

Purge Volume (gallons) for: 2" = (0.16)(h)(#Cv); 4" = (0.653)(h)(#Cv); 6" = (1.48)(h)(#Cv)

Calculated Purge Volume (gallons): ____ Actual Purge Volume (gallons): 2.5

TIME (2400 hr)	WATER LEVEL (feet)	pH (units)	COND (mS/cm)	DO (mg/L)	TEMP °C	Turb. ~~SAL %~~	REDOX (mv)
1048	–	6.41	87.8	0.26	16.09	87.6	-90
1052	–	6.40	87.1	0.00	16.37	52.1	-99
1056	–	6.43	86.9	0.00	16.56	33.5	-99
1100	–	6.42	87.3	0.00	16.48	14.3	-96
1104	–	6.40	88.5	0.00	16.40	12.0	-102
~~1110~~ 1108	–	6.41	89.0	0.00	16.28	21.1	-106

Purge Equipment:	Geopump Peristaltic/ Horiba Multi-meter	Sampling Equipment:	Same
Laboratory:	Onsite (Redmond, WA)	Date Sent to Lab:	10/3/2011
Chain-of-Custody (yes/no):	Yes	Field QC Sample Number:	CHEV-GW-MWAR-1130
Shipment Method:	Hand Delivered	Split With (names[s]/organization):	N/A

Well Integrity: Bolted, capped, locked, and clear of debris.

Remarks: Good producing well. Slight petroleum odor. Low Turbidity.

Signature: [signature]

PARAMETRIX

Form 02-EN-101/Rev. 10/02

Groundwater Sampling Field Data Sheet No. 2

Well #: 13R

~~223-1846-008~~

Sample #: CHEV-GW-MW13R-0120

Project Number:	~~223-1846-008~~ WA	Date:	9/29/2011
Project Name:	Fmr. Chevron Prop.	Location:	Bremerton, WA (Evergreen Park)
Project Address:	1400 Park Ave, Bremerton, WA	Sampled By:	Mike Baxter
Client Name:	City of Bremerton	Purged By:	Same

Casing Diameter: 2" _____ 4" _____ 6" _____ Other ✓

Depth to Water (feet):	9.50	Purge Volume Measurement Method:	Watch + measuring cup
Depth of Well (feet):	15.00	Date Purged:	9/29/2011
Reference Point (surveyor's notch, etc.):	TOC	Purge Time (from/to):	1412 - 1510
Date/Time Sampled:	9/29/2011 1450	Flow = 100 ml/min (low producer)	

Purge Volume Calculation: $(\pi r^2 h)(7.48\ gal/ft^3)$(# Casing volumes)

Purge Volume (gallons) for: 2" = (0.16)(h)(#Cv); 4" = (0.653)(h)(#Cv); 6" = (1.48)(h)(#Cv)

Calculated Purge Volume (gallons): _____ Actual Purge Volume (gallons): 1

TIME (2400 hr)	WATER LEVEL (feet)	pH (units)	COND (mS/cm)	DO (mg/L)	TEMP °C	~~SAL %~~ Turb.	REDOX (mv)
1418	—	7.14	0.605	5.00	19.39	906.0	-129
1422	—	7.18	0.601	6.61	19.78	502.0	-129
1426	—	7.20	0.602	6.81	20.06	253.0	-128
1430	—	7.29	0.603	7.16	20.17	144.0	-130
1434	—	7.33	0.604	7.43	20.29	252.0	-131
1438	—	7.37 ~~7.57~~	0.595	7.57	20.35	217.0	-132
1442	—	7.42	0.599	7.70	20.61	170.0	-133

Purge Equipment:	Geopump Peristaltic/ Horiba Multi-Meter	Sampling Equipment:	Same
Laboratory:	Onsite (Redmond, WA)	Date Sent to Lab:	10/3/2011
Chain-of-Custody (yes/no):	Yes	Field QC Sample Number:	CHEV-GW-MW13R-0130
Shipment Method:	Hand delivered	Split With (names[s]/organization):	N/A

Well Integrity: Bolted, capped, locked, and clear of debris.

Remarks: low producing well. DO may be elevated due to bubbles in flow stream.

Signature: [signature]

PARAMETRIX

Form 02-EN-101/Rev. 10/02

Groundwater Sampling Field Data Sheet No. 2

Well #: MW-21R

Sample #: CHEV-GW-MW-21R-0120

233-1896-098

Project Number:	~~255-1896-063~~ MK	Date:	9/28/2011
Project Name:	Former Chevron Property Remed	Location:	Fmr Chevron Prop. (Evergreen Park)
Project Address:	1400 Park Ave, Bremerton, WA	Sampled By:	Mike Baxter
Client Name:	City of Bremerton	Purged By:	(same)

Casing Diameter: 2" ~~✓~~ MK 4" ____ 6" ____ Other ✓

Depth to Water (feet):	8.91	Purge Volume Measurement Method:	Stopwatch + Measure Cup
Depth of Well (feet):	12.20 ~~Not measured~~ MK	Date Purged:	9/28/2011
Reference Point (surveyor's notch, etc.):	TOC	Purge Time (from/to:	1120 - 1231
Date/Time Sampled:	9/28/2011 1230	Flow = 300 ml/min	

Purge Volume Calculation: $(\pi r^2 h)(7.48\ gal/ft^3)$(# Casing volumes)

Purge Volume (gallons) for: 2" = (0.16)(h)(#Cv); 4" = (0.653)(h)(#Cv); 6" = (1.48)(h)(#Cv)

Calculated Purge Volume (gallons): ____ Actual Purge Volume (gallons): 5

TIME (2400 hr)	WATER LEVEL (feet)	0.1 pH (units)	3% COND (mS/cm)	0.3 mg/L DO (mg/L)	TEMP °C	Tubb. 10% ~~SAL %~~	10 mv REDOX (mv)
1127	—	6.98	0.374	0.00	15.45	315.0	-231
1131	—	7.02	0.368	0.00	15.42	232.0	-227
* See remarks below.							
1147	—	7.03	0.354	0.00	15.42	90.5	-204
1151	—	7.05	0.345	0.00	15.31	155.0	-203
1155	—	7.05	0.343	0.00	15.30	211.0	-202
1159	—	7.06	0.341	0.00	15.31	276.0	-201
1203	—	7.06	0.339	0.00	15.32	344.0	-200
1207	—	7.06	0.337	0.00	15.32	368.0	-199
1211	—	7.06	0.338	0.00	15.32	491.0	-198
1215	—	7.07	0.334	0.00	15.31	475.0	-197
1219	—	7.06	0.333	0.00	15.31	646.0	-195

Meter appears to be malfunction. Sample clear when taken @ 1230

Purge Equipment:	Geopump peristaltic/ Horiba multi-meter	Sampling Equipment:	Same
Laboratory:	Onsite (Redmond, WA)	Date Sent to Lab:	10/3/2011
Chain-of-Custody (yes/no):	Yes	Field QC Sample Number:	CHEV-GW-MW4R-1130
Shipment Method:	Hand Delivered	Split With (names[s]/organization):	N/A

Well Integrity: Bolted, locked, and clear of debris.

* Remarks: Stopped purge to check DO calibration. Restart @ 1143. Fuel odor.

Signature: [signature]

PARAMETRIX

Form 02-EN-101/Rev. 10/02

Groundwater Sampling Field Data Sheet No. 2

Well #: MW-22R

Sample #: CHEV-GW-MW22R-0110

233-1896-098

Project Number:	~~255-1896-063~~	Date:	9/29/2011
Project Name:	Fmr. Chevron Prop.	Location:	Bremerton, WA (Evergreen Park)
Project Address:	1400 Park Ave, Bremerton, WA	Sampled By:	Mike Baxter
Client Name:	City of Bremerton	Purged By:	Same

Casing Diameter: 2" ____ 4" ____ 6" ____ Other ✓

Depth to Water (feet):	8.36	Purge Volume Measurement Method:	Watch + measuring cup
Depth of Well (feet):	15.04	Date Purged:	9/29/2011
Reference Point (surveyor's notch, etc.):	TOC	Purge Time (from/to:	1010 - 1115
Date/Time Sampled:	9/29/2011 1055	Flow = >300 ml/min (low purging well)	

Purge Volume Calculation: $(\pi r^2 h)(7.48\ gal/ft^3)$(# Casing volumes)

Purge Volume (gallons) for: 2" = (0.16)(h)(#Cv); 4" = (0.653)(h)(#Cv); 6" = (1.48)(h)(#Cv)

Calculated Purge Volume (gallons): ____ Actual Purge Volume (gallons): 1

TIME (2400 hr)	WATER LEVEL (feet)	pH (units)	COND (mS/cm)	DO (mg/L)	TEMP °C	Turb. ~~SAL %~~	REDOX (mv)
1015	—	7.07	0.643	2.04	16.68	624.0	-126
1019	—	7.19	0.629	4.68	16.95	711.0	-120
1023	—	7.28	0.625	5.93	17.17	553.0	-121
1027	—	7.25	0.627	5.28	17.16	>1000	-120
1031	—	7.36	0.614	6.53	17.43	662.0	-127
1035	—	7.46	0.617	7.51	17.60	441.0	-131
1039	—	7.52	0.615	7.95	17.80	213.0	-133
1043	—	7.55	0.611	8.21	17.86	223.0	-136
1047	—	7.57	0.606	8.36	17.59	116.0	-137
1051	—	7.65	0.604	8.48	17.86	112.0 ~~331.0~~	-139

Purge Equipment:	Geopump peristaltic/ Horiba Multi-meter	Sampling Equipment:	Same
Laboratory:	On Site (Redmond, WA)	Date Sent to Lab:	10/3/2011
Chain-of-Custody (yes/no):	Yes	Field QC Sample Number:	CHEV-GW-MW22R-1130
Shipment Method:	Hand Delivered	Split With (names[s]/organization):	N/A

Well Integrity: Bolted, capped, locked, and clear of debris.

Remarks: Low producing well. Had to vary rate to maintain flow. DO may be elevated due to bubbles in flow stream.

Signature: [signature]

PARAMETRIX

Form 02-EN-101/Rev. 10/02

Groundwater Sampling Field Data Sheet No. 2

Well #: MW-25

Sample #: CHEV-GW-MW25-0130

233-1896-098

Project Number:	~~255-1896-063~~ MW	Date:	9/29/2011
Project Name:	Fmr. Chevron Prop.	Location:	Bremerton, WA (Evergreen Park)
Project Address:	1400 Park Ave, Bremerton, WA	Sampled By:	Mike Baxter
Client Name:	City of Bremerton	Purged By:	Same

Casing Diameter: 2" ✓ 4" ____ 6" ____ Other ✓ MW

Depth to Water (feet):	10.10	Purge Volume Measurement Method:	Watch + Measuring Cup
Depth of Well (feet):	19.80	Date Purged:	9/29/2010
Reference Point (surveyor's notch, etc.):	TOC	Purge Time (from/to:	1540 - 1617
Date/Time Sampled:	9/29/2011 1610	Flow = 300 ml/min	

Purge Volume Calculation: $(\pi r^2 h)(7.48\ gal/ft^3)$(# Casing volumes)

Purge Volume (gallons) for: 2" = (0.16)(h)(#Cv); 4" = (0.653)(h)(#Cv); 6" = (1.48)(h)(#Cv)

Calculated Purge Volume (gallons): ____ Actual Purge Volume (gallons): 3

TIME (2400 hr)	WATER LEVEL (feet)	pH (units)	COND (~~m~~S/~~c~~m)	DO (mg/L)	TEMP °C	Turb. ~~SAL %~~	REDOX (mv)
1544	—	6.52	6.16	0.00	14.46	162.0	-85
1548	—	6.30	5.66	0.00	14.65	79.0	-94
1552	—	6.27	5.31	0.00	14.71	61.2	-96
1556	—	6.23	4.98	0.00	14.74	56.5	-96
1600	—	6.25	4.96	0.00	14.72	63.2	-97
1604	—	6.21	5.16	0.00	14.63	60.0 ~~45.8~~ MW	-99

Purge Equipment:	Geopump Peristaltic/ Horiba Multi-meter	Sampling Equipment:	Same
Laboratory:	Onsite (Redmond, WA)	Date Sent to Lab:	10/3/2011
Chain-of-Custody (yes/no):	Yes	Field QC Sample Number:	CHEV-GW-MW4K-1130
Shipment Method:	Hand delivered	Split With (names[s]/organization):	N/A

Well Integrity: Bolted, capped, locked, and clear of debris.

Remarks: Good producing well. Petroleum odor.

Signature: [signature]

PARAMETRIX

Form 02-EN-101/Rev. 10/02

Groundwater Sampling Field Data Sheet No. 2

Well #: 26R

233-1896-098

Sample #: CHEV-GW-MW26R-0110

Project Number:	~~233-1896-003~~	Date:	9/28/2011
Project Name:	Fmr. Chevron Prop.	Location:	Bremerton, WA
Project Address:	1100 Park Ave, Bremerton, WA	Sampled By:	Mike Baxter
Client Name:	City of Bremerton	Purged By:	Same

Casing Diameter: 2" ____ 4" ____ 6" ____ Other ✓

Depth to Water (feet):	~~14.34~~ 9.39	Purge Volume Measurement Method:	Stopwatch + Measure Tape
Depth of Well (feet):	14.21 ~~Not Measured~~	Date Purged:	9/28/2011
Reference Point (surveyor's notch, etc.):	TOC	Purge Time (from/to):	1648 - 1730
Date/Time Sampled:	9/28/2011 1725	Flow = 300 mL/min	

Purge Volume Calculation: $(\pi r^2 h)(7.48\ gal/ft^3)$(# Casing volumes)

Purge Volume (gallons) for: 2" = (0.16)(h)(#Cv); 4" = (0.653)(h)(#Cv); 6" = (1.48)(h)(#Cv)

Calculated Purge Volume (gallons): ____ Actual Purge Volume (gallons): 4

TIME (2400 hr)	WATER LEVEL (feet)	pH (units)	COND (mS/cm)	DO (mg/L)	TEMP °C	Turb. ~~SAL-%~~	REDOX (mv)
1653	—	6.62	>10	0.25	15.58	69.3	-106
1657	—	6.63	>10	0.02	15.75	33.7	-198
1701	—	6.71	>10	0.00	15.75	25.2	-222
1705	—	6.70	>10	0.00	15.71	18.3	-240
1709	—	6.71	>10	0.00	15.69	10.9	-256
1713	—	6.65	>10	0.00	15.67	7.1	-265
1717	—	6.57	>10	0.00	15.64	16.1	-271
1721	—	6.52	>10	0.00	15.66	82.3	-275

Purge Equipment:	Geopump Peristaltic/ Horiba Multi-meter	Sampling Equipment:	Same
Laboratory:	OnSite (Redmond, WA)	Date Sent to Lab:	10/2/2011
Chain-of-Custody (yes/no):	Yes	Field QC Sample Number:	CHEV-GW-MW26R-1130
Shipment Method:	Hand Delivered	Split With (names[s]/organization):	N/A

Well Integrity: Bolted, locked, and clear of debris.

Remarks: Good producer. Low turbidity.

Signature:

PARAMETRIX

Form 02-EN-101/Rev. 10/02

Groundwater Sampling Field Data Sheet No. 2

Well #: MW-27

Sample #: CHEV-GW-MW27-0100

Project Number:	233.1706-008	Date:	9/30/2011
Project Name:	Fmr. Chevron Prop.	Location:	Evergreen Park - Bremerton, WA
Project Address:	1400 Park Ave, Bremerton, WA	Sampled By:	Mike Baxter
Client Name:	City of Bremerton	Purged By:	↓

Casing Diameter: 2" ____ 4" ____ 6" ____ Other ✓

Depth to Water (feet):	6.08	Purge Volume Measurement Method:	Watch + Measure Cup
Depth of Well (feet):	13.70	Date Purged:	9/30/2011
Reference Point (surveyor's notch, etc.):	TOC	Purge Time (from/to):	1136 - 1203
Date/Time Sampled:	9/30/2011 1200	Flow = 300 ml/min	

Purge Volume Calculation: $(\pi r^2 h)(7.48\ gal/ft^3)$(# Casing volumes)

Purge Volume (gallons) for: 2" = (0.16)(h)(#Cv); 4" = (0.653)(h)(#Cv); 6" = (1.48)(h)(#Cv)

Calculated Purge Volume (gallons): ____ Actual Purge Volume (gallons): 2.0

TIME (2400 hr)	WATER LEVEL (feet)	pH (units)	COND (~~mS~~/m)	DO (mg/L)	TEMP °C	Turb. ~~SAL %~~	REDOX (mv)
1140	–	6.38	0.103	0.21	15.79	861.0	-83
1144	–	6.46	0.112	0.00	15.32	>1000	-97
1148	–	6.49	0.114	0.00	15.22	>1000	-102
1152	–	6.51	0.117	0.00	15.10	>1000	-106
1156	–	6.53	0.116	0.00	15.07	>1000	-111

Purge Equipment:	Geopump Peristaltic/ Horiba Multi-Meter	Sampling Equipment:	Same
Laboratory:	Onsite (Redmond, WA)	Date Sent to Lab:	10/3/2011
Chain-of-Custody (yes/no):	Yes	Field QC Sample Number:	CHEV-GW-MW12-1130
Shipment Method:	Hand Delivered	Split With (names[s]/organization):	N/A

Well Integrity: Bolted, capped, locked, and clear of debris.

Remarks: Medium producing well. Very turbid.

Signature:

Parametrix ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

4660 KITSAP WAY, SUITE A
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TECHNICAL MEMORANDUM

Date:	October 26, 2011
To:	Project File
From:	Lara Linde
Subject:	Quality Assurance/Quality Control Review for Former Chevron Property
cc:	David Dinkuhn
Project Number:	233-1896-098
Project Name:	Former Chevron Property Remediation Performance Monitoring September 2011

INTRODUCTION

This technical memorandum summarizes the results of an internal quality assurance/quality control (QA/QC) review of analytical results for groundwater samples collected on September 28 through 30, 2011. Eleven groundwater samples, including one field duplicate (CHEV-GW-MW4R-1130), were submitted to OnSite Environmental, Inc. (Redmond, WA) for analysis. The samples were accompanied by one gasoline/BTEX trip blank.

All samples were analyzed for gasoline/BTEX and diesel/lube oil with the exception of the trip blank which was analyzed for gasoline/BTEX only. Final laboratory data were submitted to Parametrix via a Tier II-type data report and EIM EDDs (On-Site Laboratory Reference Number 1110-008). All data and analytical QC elements were reviewed against laboratory and method QC criteria, and qualifiers were applied where judged appropriate.

DATA REVIEW SUMMARY

All samples collected were prepared and analyzed using standard methods. All sample temperature requirements and method holding times were met. All analyses requested on the COC were conducted. No laboratory method or trip blank contamination was reported. Field duplicate results were acceptable.

The laboratory case narrative did not note any issues. The laboratory qualified some diesel results with "U1" indicating an elevated practical quantitation limit. These results were not qualified based on this data review. All other analytical QC results were in control, indicating acceptable analytical accuracy and precision.

CONCLUSION

All samples were analyzed within holding times, and appropriate standard methods were used. No laboratory method blank contamination was observed. Analytical accuracy and precision were determined to be generally acceptable based on this review. Field duplicate results were acceptable. All data reported should be considered valid as qualified and acceptable for further use.

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 12, 2011

David Dinkuhn
Parametrix, Inc.
4660 Kitsap Way, Suite A
Bremerton, WA 98312

Re: Analytical Data for Project 233-1896-098
Laboratory Reference No. 1110-008

Dear David:

Enclosed are the analytical results and associated quality control data for samples submitted on October 3, 2011.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: October 12, 2011
Samples Submitted: October 3, 2011
Laboratory Reference: 1110-008
Project: 233-1896-098

Case Narrative

Samples were collected on September 28, 29, and 30, 2011 and received by the laboratory on October 3, 2011. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: October 12, 2011
Samples Submitted: October 3, 2011
Laboratory Reference: 1110-008
Project: 233-1896-098

NWTPH-Gx/BTEX

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CHEV-GW-MW21R-0100**					
Laboratory ID:	10-008-01					
Benzene	**19**	1.0	EPA 8021	10-8-11	10-8-11	
Toluene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Ethyl Benzene	**34**	1.0	EPA 8021	10-8-11	10-8-11	
m,p-Xylene	**21**	1.0	EPA 8021	10-8-11	10-8-11	
o-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Gasoline	**1500**	100	NWTPH-Gx	10-8-11	10-8-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*85*	*73-121*				
Client ID:	**CHEV-GW-MW9R-0120**					
Laboratory ID:	10-008-02					
Benzene	**310**	10	EPA 8021	10-8-11	10-8-11	
Toluene	**13**	10	EPA 8021	10-8-11	10-8-11	
Ethyl Benzene	**150**	10	EPA 8021	10-8-11	10-8-11	
m,p-Xylene	**190**	10	EPA 8021	10-8-11	10-8-11	
o-Xylene	**10**	10	EPA 8021	10-8-11	10-8-11	
Gasoline	**2100**	1000	NWTPH-Gx	10-10-11	10-10-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*95*	*73-121*				
Client ID:	**CHEV-GW-MW26R-0110**					
Laboratory ID:	10-008-03					
Benzene	**6.0**	1.0	EPA 8021	10-8-11	10-8-11	
Toluene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Ethyl Benzene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
m,p-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
o-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Gasoline	**270**	100	NWTPH-Gx	10-8-11	10-8-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*92*	*73-121*				

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date of Report: October 12, 2011
Samples Submitted: October 3, 2011
Laboratory Reference: 1110-008
Project: 233-1896-098

NWTPH-Gx/BTEX

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CHEV-GW-MW22R-0110**					
Laboratory ID:	10-008-04					
Benzene	**2.7**	1.0	EPA 8021	10-8-11	10-8-11	
Toluene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Ethyl Benzene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
m,p-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
o-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Gasoline	**120**	100	NWTPH-Gx	10-8-11	10-8-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*87*	*73-121*				
Client ID:	**CHEV-GW-MW4R-0130**					
Laboratory ID:	10-008-05					
Benzene	**45**	1.0	EPA 8021	10-8-11	10-8-11	
Toluene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Ethyl Benzene	**20**	1.0	EPA 8021	10-8-11	10-8-11	
m,p-Xylene	**2.1**	1.0	EPA 8021	10-8-11	10-8-11	
o-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Gasoline	**650**	100	NWTPH-Gx	10-8-11	10-8-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*84*	*73-121*				
Client ID:	**CHEV-GW-MW4R-1130**					
Laboratory ID:	10-008-06					
Benzene	**46**	1.0	EPA 8021	10-8-11	10-8-11	
Toluene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Ethyl Benzene	**21**	1.0	EPA 8021	10-8-11	10-8-11	
m,p-Xylene	**1.9**	1.0	EPA 8021	10-8-11	10-8-11	
o-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Gasoline	**620**	100	NWTPH-Gx	10-8-11	10-8-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*83*	*73-121*				

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: October 12, 2011
Samples Submitted: October 3, 2011
Laboratory Reference: 1110-008
Project: 233-1896-098

NWTPH-Gx/BTEX

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CHEV-GW-MW13R-0120**					
Laboratory ID:	10-008-07					
Benzene	**3.6**	1.0	EPA 8021	10-8-11	10-8-11	
Toluene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Ethyl Benzene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
m,p-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
o-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Gasoline	**150**	100	NWTPH-Gx	10-8-11	10-8-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*86*	*73-121*				
Client ID:	**CHEV-GW-MW25-0130**					
Laboratory ID:	10-008-08					
Benzene	**1.4**	1.0	EPA 8021	10-8-11	10-8-11	
Toluene	**2.5**	1.0	EPA 8021	10-8-11	10-8-11	
Ethyl Benzene	**11**	1.0	EPA 8021	10-8-11	10-8-11	
m,p-Xylene	**1.2**	1.0	EPA 8021	10-8-11	10-8-11	
o-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Gasoline	**1500**	100	NWTPH-Gx	10-8-11	10-8-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*81*	*73-121*				
Client ID:	**CHEV-GW-MW10R-0110**					
Laboratory ID:	10-008-09					
Benzene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Toluene	**1.2**	1.0	EPA 8021	10-8-11	10-8-11	
Ethyl Benzene	**1.2**	1.0	EPA 8021	10-8-11	10-8-11	
m,p-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
o-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Gasoline	**1200**	100	NWTPH-Gx	10-8-11	10-8-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*86*	*73-121*				

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: October 12, 2011
Samples Submitted: October 3, 2011
Laboratory Reference: 1110-008
Project: 233-1896-098

NWTPH-Gx/BTEX

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CHEV-GW-MW11R-0100**					
Laboratory ID:	10-008-10					
Benzene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Toluene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Ethyl Benzene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
m,p-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
o-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Gasoline	**320**	100	NWTPH-Gx	10-8-11	10-8-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*84*	*73-121*				
Client ID:	**CHEV-GW-MW27-0100**					
Laboratory ID:	10-008-11					
Benzene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Toluene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Ethyl Benzene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
m,p-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
o-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Gasoline	**ND**	100	NWTPH-Gx	10-8-11	10-8-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*86*	*73-121*				
Client ID:	**Trip Blank**					
Laboratory ID:	10-008-12					
Benzene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Toluene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Ethyl Benzene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
m,p-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
o-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Gasoline	**ND**	100	NWTPH-Gx	10-8-11	10-8-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*88*	*73-121*				

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: October 12, 2011
Samples Submitted: October 3, 2011
Laboratory Reference: 1110-008
Project: 233-1896-098

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Laboratory ID:	MB1008W1					
Benzene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Toluene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Ethyl Benzene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
m,p-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
o-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Gasoline	**ND**	100	NWTPH-Gx	10-8-11	10-8-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*89*	*73-121*				
Laboratory ID:	MB1008W2					
Benzene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Toluene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Ethyl Benzene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
m,p-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
o-Xylene	**ND**	1.0	EPA 8021	10-8-11	10-8-11	
Gasoline	**ND**	100	NWTPH-Gx	10-8-11	10-8-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*86*	*73-121*				
Laboratory ID:	MB1010W1					
Gasoline	**ND**	100	NWTPH-Gx	10-10-11	10-10-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*83*	*73-121*				

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: October 12, 2011
Samples Submitted: October 3, 2011
Laboratory Reference: 1110-008
Project: 233-1896-098

NWTPH-Gx/BTEX
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-008-04										
	ORIG	DUP									
Benzene	**2.71**	**2.56**	NA	NA		NA		NA	6	30	
Toluene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Ethyl Benzene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
m,p-Xylene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
o-Xylene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Gasoline	**121**	**133**	NA	NA		NA		NA	9	30	
Surrogate:											
Fluorobenzene						*87*	*88*	*73-121*			
Laboratory ID:	10-008-10										
	ORIG	DUP									
Benzene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Toluene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Ethyl Benzene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
m,p-Xylene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
o-Xylene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Gasoline	**319**	**265**	NA	NA		NA		NA	18	30	
Surrogate:											
Fluorobenzene						*84*	*86*	*73-121*			
MATRIX SPIKES											
Laboratory ID:	10-008-04										
	MS	MSD	MS	MSD		MS	MSD				
Benzene	**52.9**	**52.2**	50.0	50.0	2.71	**100**	**99**	82-120	1	8	
Toluene	**49.5**	**49.0**	50.0	50.0	ND	**99**	**98**	84-119	1	8	
Ethyl Benzene	**49.2**	**48.7**	50.0	50.0	ND	**98**	**97**	84-122	1	9	
m,p-Xylene	**48.9**	**48.3**	50.0	50.0	ND	**98**	**97**	85-121	1	9	
o-Xylene	**48.0**	**48.0**	50.0	50.0	ND	**96**	**96**	84-121	0	9	
Surrogate:											
Fluorobenzene						*91*	*88*	*73-121*			

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Date of Report: October 12, 2011
Samples Submitted: October 3, 2011
Laboratory Reference: 1110-008
Project: 233-1896-098

NWTPH-Dx
(with acid/silica gel clean-up)

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CHEV-GW-MW21R-0100**					
Laboratory ID:	10-008-01					
Diesel Range Organics	**ND**	0.42	NWTPH-Dx	10-5-11	10-5-11	U1
Lube Oil Range Organics	**ND**	0.42	NWTPH-Dx	10-5-11	10-5-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*98*	*50-150*				
Client ID:	**CHEV-GW-MW9R-0120**					
Laboratory ID:	10-008-02					
Diesel Range Organics	**ND**	0.33	NWTPH-Dx	10-5-11	10-5-11	U1
Lube Oil Range Organics	**ND**	0.42	NWTPH-Dx	10-5-11	10-5-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*101*	*50-150*				
Client ID:	**CHEV-GW-MW26R-0110**					
Laboratory ID:	10-008-03					
Diesel Range Organics	**ND**	0.26	NWTPH-Dx	10-5-11	10-5-11	
Lube Oil Range Organics	**ND**	0.41	NWTPH-Dx	10-5-11	10-5-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*114*	*50-150*				
Client ID:	**CHEV-GW-MW22R-0110**					
Laboratory ID:	10-008-04					
Diesel Range Organics	**ND**	0.26	NWTPH-Dx	10-5-11	10-5-11	
Lube Oil Range Organics	**ND**	0.41	NWTPH-Dx	10-5-11	10-5-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*104*	*50-150*				
Client ID:	**CHEV-GW-MW4R-0130**					
Laboratory ID:	10-008-05					
Diesel Range Organics	**ND**	0.34	NWTPH-Dx	10-5-11	10-5-11	U1
Lube Oil Range Organics	**ND**	0.42	NWTPH-Dx	10-5-11	10-5-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*86*	*50-150*				
Client ID:	**CHEV-GW-MW4R-1130**					
Laboratory ID:	10-008-06					
Diesel Range Organics	**ND**	0.33	NWTPH-Dx	10-5-11	10-5-11	U1
Lube Oil Range Organics	**ND**	0.41	NWTPH-Dx	10-5-11	10-5-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*87*	*50-150*				

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Date of Report: October 12, 2011
Samples Submitted: October 3, 2011
Laboratory Reference: 1110-008
Project: 233-1896-098

NWTPH-Dx
(with acid/silica gel clean-up)

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CHEV-GW-MW13R-0120**					
Laboratory ID:	10-008-07					
Diesel Range Organics	**ND**	0.26	NWTPH-Dx	10-5-11	10-5-11	
Lube Oil Range Organics	**ND**	0.42	NWTPH-Dx	10-5-11	10-5-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*91*	*50-150*				
Client ID:	**CHEV-GW-MW25-0130**					
Laboratory ID:	10-008-08					
Diesel Range Organics	**1.3**	0.26	NWTPH-Dx	10-5-11	10-5-11	M
Lube Oil Range Organics	**ND**	0.41	NWTPH-Dx	10-5-11	10-5-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*80*	*50-150*				
Client ID:	**CHEV-GW-MW10R-0110**					
Laboratory ID:	10-008-09					
Diesel Range Organics	**ND**	0.81	NWTPH-Dx	10-5-11	10-5-11	U1
Lube Oil Range Organics	**ND**	0.43	NWTPH-Dx	10-5-11	10-5-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*103*	*50-150*				
Client ID:	**CHEV-GW-MW11R-0100**					
Laboratory ID:	10-008-10					
Diesel Range Organics	**0.37**	0.26	NWTPH-Dx	10-5-11	10-5-11	M
Lube Oil Range Organics	**ND**	0.42	NWTPH-Dx	10-5-11	10-5-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*107*	*50-150*				
Client ID:	**CHEV-GW-MW27-0100**					
Laboratory ID:	10-008-11					
Diesel Range Organics	**ND**	0.26	NWTPH-Dx	10-5-11	10-5-11	
Lube Oil Range Organics	**ND**	0.42	NWTPH-Dx	10-5-11	10-5-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*84*	*50-150*				

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Date of Report: October 12, 2011
Samples Submitted: October 3, 2011
Laboratory Reference: 1110-008
Project: 233-1896-098

NWTPH-Dx
QUALITY CONTROL
(with acid/silica gel clean-up)

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1005W1					
Diesel Range Organics	**ND**	0.25	NWTPH-Dx	10-5-11	10-5-11	
Lube Oil Range Organics	**ND**	0.40	NWTPH-Dx	10-5-11	10-5-11	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*94*	*50-150*				

Analyte	Result		Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE							
Laboratory ID:	10-008-01						
	ORIG	DUP					
Diesel Range Organics	**ND**	**ND**			NA	NA	U1
Lube Oil Range Organics	**ND**	**ND**			NA	NA	
Surrogate:							
o-Terphenyl			*98* *102*	*50-150*			
Laboratory ID:	10-008-02						
	ORIG	DUP					
Diesel Range Organics	**ND**	**ND**			NA	NA	U1
Lube Oil Range Organics	**ND**	**ND**			NA	NA	
Surrogate:							
o-Terphenyl			*101* *98*	*50-150*			

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OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

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Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: Paramefrix
Project Number: 233-1796-098
Project Name: Former Chevron Property
Project Manager: David Dinkuhn
Sampled by: Mike Baxter

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☑ Standard (7 Days)
(TPH analysis 5 Days)
☐ _____ (other)

Laboratory Number: 10-008

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx /BTEX	NWTPH-Dx	Volatiles 8260B	Halogenated Volatiles 8260B	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082	Organochlorine Pesticides 8081A	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA / MTCA Metals (circle one)	TCLP Metals	HEM (oil and grease) 1664	% Moisture
1	CHEV-GW-MW21R-~~0120~~ 0100 DS	9/28/2011	1230	GW	4			✓	✓												
2	CHEV-GW-MW9R-0120	↓	1550	↓	↓			↓	↓												
3	CHEV-GW-MW26R-0110	↓	1725	↓	↓			↓	↓												
4	CHEV-GW-MW22R-0110	9/29/2011	1055	↓	↓			↓	↓												
5	CHEV-GW-MW4R-0130	↓	1210	↓	↓			↓	↓												
6	CHEV-GW-MW4R-1130	↓	1220	↓	↓			↓	↓												
7	CHEV-GW-MW13R-0120	↓	1450	↓	↓			↓	↓												
8	CHEV-GW-MW25-0130	↓	1610	↓	↓			↓	↓												
9	CHEV-GW-MW10R-0110	9/30/2011	0955	↓	↓			↓	↓												
10	CHEV-GW-MW11R-~~0110~~ 0100 DS	↓	1110	↓	↓			↓	↓												

	Signature	Company	Date	Time
Relinquished		Paramefrix	10/3/2011	1101
Received			10/3/11	1101
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: Parametrix
Project Number: 233-1896-098
Project Name: Former Chevron Property
Project Manager: David Dinkuhn
Sampled by: Mike Baxter

Turnaround Request (in working days)

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Days
- ☐ 3 Days
- ☒ Standard (7 Days) (TPH analysis 5 Days)
- ☐ _____ (other)

Laboratory Number: 10-008

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx /BTEX	NWTPH-Dx	Volatiles 8260B	Halogenated Volatiles 8260B	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082	Organochlorine Pesticides 8081A	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA / MTCA Metals (circle one)	TCLP Metals	HEM (oil and grease) 1664	% Moisture
11	CHEV-GW-MW27-0100	9/30/2011	1200	GW	4			✓	✓												
12	Trip Blank	–	0000	DIW	2			✓													

	Signature	Company	Date	Time
Relinquished		Parametrix	10/3/2011	1101
Received			10/3/11	1101
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

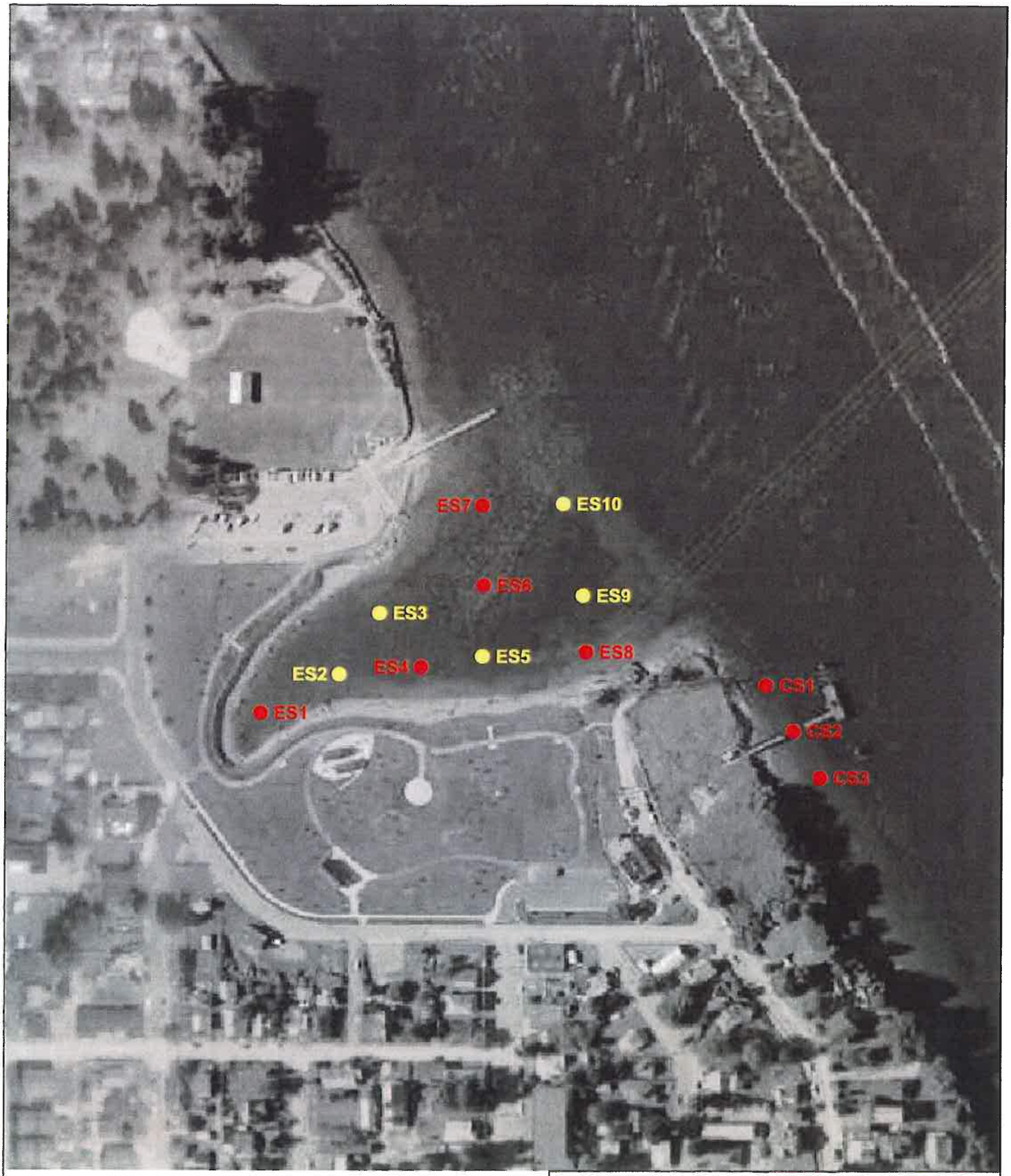
Comments/Special Instructions

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

Evergreen Park Bremerton, Washington	
Vicinity Map	
17330-06	6/07
HARTCROWSER	Figure **1**

SRN 06/13/07 1733006-001.dwg



Sample Location and Number

ES1 Sample for Analysis

ES2 Archive Sample

0 200 400

Scale in Feet

N

Evergreen Park
Bremerton, Washington

Sediment Sample Location Plan

17330-06 6/07

HARTCROWSER

Figure
2

EAL 06/13/07 1733006-005.dwg

Table 1 - Sample Location Coordinates

Sample ID	LAT	LONG
ES-01	47.573569	-122.628147
ES-02	47.573665	-122.627865
ES-03	47.573809	-122.627612
ES-04	47.573629	-122.627546
ES-05	47.573617	-122.627102
ES-06	47.573893	-122.627126
ES-07	47.574145	-122.627156
ES-08	47.573833	-122.626567
ES-09	47.574049	-122.626616
ES-10	47.574302	-122.626868
CS-01	47.573492	-122.625353
CS-02	47.573423	-122.625373
CS-03	47.573102	-122.625023

Table 2 - Sample Descriptions

Sample Number	Collection Date	Visual Sediment Description	Comments
CS-01	4/27/2007	Greenish brown, poorly graded, subangular SAND with Gravel (SP).	Hand core. Surface cobbles removed. Worms, shells, snails.
CS-02	4/26/2007	Greenish brown, poorly graded, angular to subangular SAND with Gravel (SP).	Grab. Worms, shore crab. Black creosote stain with slight oily odor
CS-03	4/27/2007	Greenish brown to black silty SAND (SM).	Hand core. Surface cobbles removed. Shells, worms, snails.
ES-01	4/26/2007	Greenish black, subangular, silty SAND (SM).	Grab. Shore crab, shrimp, hermit crab, shell pieces, *Ulva sp*.
ES-02	4/27/2007	Greenish brown/black, subangular, poorly graded SAND with Cobbles (SP).	Hand core. Worms, shells.
ES-03	4/27/2007	Greenish brown to black, subangular, silty SAND (SM).	Hand core. Shells, worms, *Ulva sp*.
ES-04	4/26/2007	Greenish brown, subangular, silty SAND (SM).	Grab. Amphipods, gastropods, *Ulva sp*.
ES-05	4/27/2007	Black, subangular, poorly graded SAND (SP).	Hand core.
ES-06	4/26/2007	Black, subangular, silty SAND (SM).	Grab.
ES-07	4/26/2007	Black, subangular, poorly graded SAND (SP).	Grab. Worms, seaweed, snails.
ES-08	4/26/2007	Black, subangular silty SAND (SM).	Grab. Gastropods, *Ulva sp*. Seagrass, bivalves
ES-09	4/26/2007	Black, subangular, silty SAND (SM).	Grab. Shrimp, snails, worms, *Ulva sp*.
ES-10	4/27/2007	Black, subangular, poorly graded SAND (SP).	Hand core. Worms, shells. Field duplicate.
Carr Ref 12	4/28/2007	Greenish brown, subangular, poorly graded SAND (SP).	Red algae, *Ulva sp*. Slight sulfur odor.
Carr Ref 29	4/28/2007	Dark greenish brown, subangular, silty SAND (SM).	Worms, red algae, *Ulva sp*. Slight sulfur odor.

Table 3 - Analytical Results for Sediment Samples Compared to SMS (Organic Carbon Normalized) Sediment Quality Criteria

Sample ID	SMS		ES-01	ES-06	ES-07	ES-08
Sampling Date	SQS	CSL	4/26/2007	4/26/2007	4/26/2007	4/26/2007
Conventionals in %						
Total Organic Carbon	-	-	1.15	0.598	1.01	1.33
Preserved Total Solids	-	-	58.30	62.50	69.20	54.30
Total Solids	-	-	67.10	70.80	70.70	64.30
Conventionals in mg/kg						
N-Ammonia	-	-	21.0	12.6	17.0	30.1
Sulfide	-	-	538	210	49.0	552
NWTPHD in mg/kg						
Diesel Range Hydrocarbons	-	-	200	30	36	39
Motor Oil	-	-	700	90	110	140
NWTPHG in mg/kg						
Gasoline Range Hydrocarbons	-	-	12 U	17 U	13 U	12 U
Metals in mg/kg						
Arsenic	57	93	4.7	2.6	2.8	3.1
Cadmium	5.1	6.7	0.6	0.3 U	0.3 U	0.5
Chromium	260	270	36.3	13.8	22.3	24.3
Copper	390	390	51.7	9.4	17.9	23.4
Lead	450	530	83	11	24	25
Mercury	0.41	0.59	0.31	0.12	0.10	0.16
Silver	6.1	6.1	0.5 U	0.4 U	0.4 U	0.4 U
Zinc	410	960	133	29	60	76
PCBs in mg/kg OC						
Aroclor 1016	-	-	1.65 U	3.34 U	1.88 U	1.43 U
Aroclor 1221	-	-	1.65 U	3.34 U	1.88 U	1.43 U
Aroclor 1232	-	-	1.65 U	3.34 U	1.88 U	1.43 U
Aroclor 1242	-	-	1.65 U	3.34 U	1.88 U	1.43 U
Aroclor 1248	-	-	1.65 U	3.34 U	1.88 U	1.43 U
Aroclor 1254	-	-	4.52	9.03	1.88 U	1.43 U
Aroclor 1260	-	-	2.17	3.34 U	1.88 U	1.43 U
Total PCBs	12	65	6.70	9.03	1.88 U	1.43 U
LPAHs in mg/kg OC						
2-Methylnaphthalene	38	64	33.91	10.37 U	6.04 U	4.66 U
Acenaphthene	16	57	5.39 U	10.37 U	6.04 U	4.66 U
Acenaphthylene	66	66	5.39 U	10.37 U	6.04 U	4.66 U
Anthracene	220	1200	7.65	10.37 U	9.80	5.71
Fluorene	23	79	5.39 U	10.37 U	6.04 U	4.66 U
Naphthalene	99	170	12.17	10.37 U	6.04 U	4.66 U
Phenanthrene	100	480	32.17	14.88	28.71	15.04
Total LPAHs	370	780	85.91	14.88	38.51	20.75
HPAHs in mg/kg OC						
Benzo(a)anthracene	110	270	29.57	25.08	21.78	15.79
Benzo(a)pyrene	99	210	38.26	28.43	23.76	18.05
Benzo(b)fluoranthene			49.57	23.41	18.81	19.55
Benzo(k)fluoranthene			42.61	26.76	19.80	15.04
Total Benzofluoranthenes	230	450	92.17	50.17	38.61	34.59
Benzo(g,h,i)perylene	31	78	25.22	20.07	14.85	12.78
Chrysene	110	460	39.13	33.44	25.74	21.05
Dibenz(a,h)anthracene	12	33	5.39	10.37 U	6.04 U	4.66 U

Table 3 - Analytical Results for Sediment Samples Compared to SMS (Organic Carbon Normalized) Sediment Quality Criteria

Sample ID	SMS		ES-01	ES-06	ES-07	ES-08
Sampling Date	SQS	CSL	4/26/2007	4/26/2007	4/26/2007	4/26/2007
Fluoranthene	160	1200	49.57	41.81	41.58	25.56
Indeno(1,2,3-cd)pyrene	34	88	23.48	16.56	12.87	11.28
Pyrene	1000	1400	64.35	60.20	47.52	36.09
Total HPAHs	960	5300	367.13	275.75	226.73	175.19
Phthalates in mg/kg OC						
bis(2-Ethylhexyl)phthalate	47	78	73.04	10.37 U	6.04 U	9.02
Butylbenzylphthalate	4.9	64	12.17	*10.37 U*	*6.04 U*	4.66 U
Diethylphthalate	61	110	5.39 U	10.37 U	6.04 U	4.66 U
Dimethylphthalate	53	53	5.39 U	10.37 U	6.04 U	4.66 U
Di-n-Butylphthalate	220	1700	5.39 U	10.37 U	6.04 U	4.66 U
Di-n-Octyl phthalate	58	4500	5.39 U	10.37 U	6.04 U	4.66 U
Chlorinated Hydrocarbons in mg/kg OC						
1,2,4-Trichlorobenzene	0.81	1.8	*5.39 U*	*10.37 U*	*6.04 U*	*4.66 U*
1,2-Dichlorobenzene	2.3	2.3	*5.39 U*	*10.37 U*	*6.04 U*	*4.66 U*
1,3-Dichlorobenzene			5.39 U	10.37 U	6.04 U	4.66 U
1,4-Dichlorobenzene	3.1	9	*5.39 U*	*10.37 U*	*6.04 U*	*4.66 U*
Hexachlorobenzene	0.38	2.3	*5.39 U*	*10.37 U*	*6.04 U*	*4.66 U*
Hexachlorobutadiene	3.9	6.2	*5.39 U*	*10.37 U*	*6.04 U*	*4.66 U*
Hexachloroethane			5.39 U	10.37 U	6.04 U	4.66 U
Misc. Extractables in mg/kg OC						
Dibenzofuran	15	58	5.39 U	10.37 U	6.04 U	4.66 U
N-Nitrosodiphenylamine	11	11	5.39 U	10.37 U	6.04 U	4.66 U
Phenolics (Acids) in ug/kg						
2,4-Dimethylphenol	29	29	*62 U*	*62 U*	*61 U*	*62 U*
2-Methylphenol	63	63	62 U	62 U	61 U	62 U
4-Methylphenol	670	670	62 U	62 U	61 U	62 U
Pentachlorophenol	360	690	310 U	310 U	310 U	310 U
Phenol	420	1200	62 U	62 U	61 U	62 U
Benzoic Acid	650	650	620 U	620 U	610 U	620 U
Benzyl Alcohol	57	73	*62 U*	*62 U*	*61 U*	*62 U*
Low Level (SIMs) Semivolatiles in mg/kg OC						
Dibenz(a,h)anthracene	12	33	4.78	3.68	2.48	2.56
Butylbenzylphthalate	4.9	64	13.04	1.04 U	0.60 U	0.47 U
Dimethylphthalate	53	53	3.04	1.04 U	0.60 U	0.47 U
1,2,4-Trichlorobenzene	0.81	1.8	0.54 U	1.04 U	0.60 U	0.47 U
1,2-Dichlorobenzene	2.3	2.3	0.54 U	1.04 U	0.60 U	0.47 U
1,3-Dichlorobenzene	-	-	0.54 U	1.04 U	0.60 U	0.47 U
1,4-Dichlorobenzene	3.1	9	1.13	1.04 U	0.60 U	0.47 U
Hexachlorobenzene	0.38	2.3	*0.54 U*	*1.04 U*	*0.60 U*	*0.47 U*
Hexachlorobutadiene	3.9	6.2	0.54 U	1.04 U	0.60 U	0.47 U
N-Nitrosodiphenylamine	11	11	2.78	1.04 U	0.60 U	0.47 U
Low Level (SIMs) Phenolics (Acids) in ug/kg						
2,4-Dimethylphenol	29	29	6.2 UJ	6.2 UJ	6.1 UJ	6.2 UJ
2-Methylphenol	63	63	6.2 U	6.2 U	6.1 U	9.4
Pentachlorophenol	360	690	31 U	31 U	31 U	31 U
Benzyl Alcohol	57	73	31 UJ	31 UJ	31 UJ	31 UJ

Table 3 - Analytical Results for Sediment Samples Compared to SMS (Organic Carbon Normalized) Sediment Quality Criteria

Sample ID	SMS		ES-01	ES-06	ES-07	ES-08
Sampling Date	SQS	CSL	4/26/2007	4/26/2007	4/26/2007	4/26/2007
Grain Size in %						
Gravel			15.6	7.6	1.0	3.6
Very Coarse Sand			4.0	1.7	3.7	2.5
Coarse Sand			9.3	4.1	7.5	5.7
Medium Sand			22.2	16.8	6.4	21.5
Fine Sand			16.6	33.1	46.9	28.6
Very Fine Sand			12.6	25.1	24.5	21.4
Total Fines			19.8	11.6	10.0	16.7
Coarse Silt			8.2	3.7	3.9	5.7
Medium Silt			3.9	1.5	0.9	2.6
Fine Silt			1.7	1.0	0.9	1.5
Very Fine Silt			1.3	1.0	0.8	1.6
8-9 Phi Clay			1.4	1.4	0.8	1.5
9-10 Phi Clay			0.9	0.8	0.7	1.1
> 10 Phi Clay			2.4	2.2	2.0	2.7

Concentration exceeding the criterion is boxed.
Reporting limit exceeding the criterion is italicized.
U = Not detected at reporting limit indicated.
J = Estimated value.

Table 4 - Analytical Results for Sediment Samples Compared to Apparent Effects Threshold (Dry Weight) Sediment Quality Criteria

Sample ID	AETs		CARR REF12	CARR REF29	CS-01
Sampling Date	LAET	2LAET	4/28/2007	4/28/2007	4/27/2007
Conventionals in %					
Total Organic Carbon	-	-	0.285	0.310	0.306
Preserved Total Solids	-	-	74.80	75.10	78.60
Total Solids	-	-	76.10	76.50	76.40
Conventionals in mg/kg					
N-Ammonia	-	-	9.73	8.96	11.6
Sulfide	-	-	1.32 U	20.3	1.24 U
NWTPHD in mg/kg					
Diesel Range Hydrocarbons	-	-	6.5	6.5 U	12
Motor Oil	-	-	13	15	110
NWTPHG in mg/kg					
Gasoline Range Hydrocarbons	-	-	9.5 U	11 U	9.2 U
Metals in mg/kg					
Arsenic	57	93	1.2	1.9	2.1
Cadmium	5.1	6.7	0.3 U	0.3 U	0.2 U
Chromium	260	270	16.0	19.7	19.5
Copper	390	390	3.9	8.3	21.8
Lead	450	530	3 U	3 U	16
Mercury	0.41	0.59	0.05 U	0.04 U	0.06 U
Silver	6.1	6.1	0.4 U	0.4 U	0.4 U
Zinc	410	960	22	27	50
PCBs in ug/kg					
Aroclor 1016	-	-	19 U	19 U	19 U
Aroclor 1221	-	-	19 U	19 U	19 U
Aroclor 1232	-	-	19 U	19 U	19 U
Aroclor 1242	-	-	19 U	19 U	19 U
Aroclor 1248	-	-	19 U	19 U	19 U
Aroclor 1254	-	-	19 U	19 U	19 U
Aroclor 1260	-	-	19 U	19 U	19 U
Total PCBs	130	1000	19 U	19 U	19 U
LPAHs in ug/kg					
2-Methylnaphthalene	960	4400	61 U	62 U	62 U
Acenaphthene	1300	1300	61 U	62 U	62 U
Acenaphthylene	670	1400	61 U	62 U	62 U
Anthracene	1500	5400	61 U	62 U	62 U
Fluorene	500	730	61 U	62 U	62 U
Naphthalene	2100	2400	61 U	62 U	62 U
Phenanthrene	540	1000	61 U	62 U	62 U
Total LPAHs	5200	13000	61 U	62 U	62 U
HPAHs in ug/kg					
Benzo(a)anthracene	1300	1600	61 U	62 U	62 U
Benzo(a)pyrene	1600	3000	61 U	62 U	62 U
Benzo(b)fluoranthene			61 U	62 U	62 U
Benzo(k)fluoranthene			61 U	62 U	62 U
Total Benzofluoranthenes	3200	3600	61 U	62 U	62 U
Benzo(g,h,i)perylene	670	720	61 U	62 U	62 U
Chrysene	1400	2800	61 U	62 U	62 U
Dibenz(a,h)anthracene	230	540	61 U	62 U	62 U

Table 4 - Analytical Results for Sediment Samples Compared to Apparent Effects Threshold (Dry Weight) Sediment Quality Criteria

Sample ID	AETs		CARR REF12	CARR REF29	CS-01
Sampling Date	LAET	2LAET	4/28/2007	4/28/2007	4/27/2007
Fluoranthene	1700	2500	61 U	62 U	62 U
Indeno(1,2,3-cd)pyrene	600	690	61 U	62 U	62 U
Pyrene	2600	3300	61 U	62 U	62 U
Total HPAHs	12000	17000	61 U	62 U	62 U
Phthalates in ug/kg					
bis(2-Ethylhexyl)phthalate	1300	1900	61 U	62 U	62 U
Butylbenzylphthalate	63	900	61 U	62 U	62 U
Diethylphthalate	200	200	61 U	62 U	62 U
Dimethylphthalate	71	160	61 U	62 U	62 U
Di-n-Butylphthalate	1400	1400	61 U	62 U	62 U
Di-n-Octyl phthalate	6200	6200	61 U	62 U	62 U
Chlorinated Hydrocarbons in ug/kg					
1,2,4-Trichlorobenzene	31	51	*61 U*	*62 U*	*62 U*
1,2-Dichlorobenzene	35	50	*61 U*	*62 U*	*62 U*
1,3-Dichlorobenzene			61 U	62 U	62 U
1,4-Dichlorobenzene	110	120	61 U	62 U	62 U
Hexachlorobenzene	22	70	*61 U*	*62 U*	*62 U*
Hexachlorobutadiene	11	120	*61 U*	*62 U*	*62 U*
Hexachloroethane			61 U	62 U	62 U
Misc. Extractables in ug/kg					
Dibenzofuran	540	700	61 U	62 U	62 U
N-Nitrosodiphenylamine	28	40	*61 U*	*62 U*	*62 U*
Phenolics (Acids) in ug/kg					
2,4-Dimethylphenol	29	29	*61 U*	*62 U*	*62 U*
2-Methylphenol	63	63	61 U	62 U	62 U
4-Methylphenol	670	670	61 U	77	62 U
Pentachlorophenol	360	690	300 U	310 U	310 U
Phenol	420	1200	61 U	62 U	150
Benzoic Acid	650	650	610 U	620 U	620 U
Benzyl Alcohol	57	73	*61 U*	*62 U*	*62 U*
Semivolatiles (SIM) in ug/kg					
1,2,4-Trichlorobenzene	31	51	6.1 U	6.2 U	6.2 U
1,2-Dichlorobenzene	35	50	6.1 U	6.2 U	6.2 U
1,3-Dichlorobenzene	-	-	6.1 U	6.2 U	6.2 U
1,4-Dichlorobenzene	110	120	6.1 U	6.2 U	6.2 U
Butylbenzylphthalate	63	900	6.1 U	6.2 U	6.2 U
Dibenz(a,h)anthracene	230	540	6.1 U	6.2 U	6.2 U
Dimethylphthalate	71	160	6.1 U	6.2 U	6.2 U
Hexachlorobenzene	22	70	6.1 U	6.2 U	6.2 U
Hexachlorobutadiene	11	120	6.1 U	6.2 U	6.2 U
N-Nitrosodiphenylamine	28	40	6.1 U	6.2 U	6.2 U
2,4-Dimethylphenol	29	29	6.1 UJ	6.2 UJ	6.2 UJ
2-Methylphenol	63	63	6.1 U	6.2 U	6.2 U
Pentachlorophenol	360	690	30 U	31 U	31 U
Benzyl Alcohol	57	73	30 UJ	31 UJ	31 UJ

Table 4 - Analytical Results for Sediment Samples Compared to Apparent Effects Threshold (Dry Weight) Sediment Quality Criteria

Sample ID	AETs		CARR REF12	CARR REF29	CS-01
Sampling Date	LAET	2LAET	4/28/2007	4/28/2007	4/27/2007
Grain Size in %					
Gravel			0.3	0.1 U	41.7
Very Coarse Sand			0.7	0.8	4.8
Coarse Sand			4.6	4.8	9.9
Medium Sand			27.6	9.7	29.3
Fine Sand			44.7	21.5	11.8
Very Fine Sand			18.5	38.0	0.8
Total Fines			3.5	25.2	1.7
Coarse Silt				14.4	
Medium Silt				5.5	
Fine Silt				1.8	
Very Fine Silt				0.8	
8-9 Phi Clay				0.8	
9-10 Phi Clay				0.4	
> 10 Phi Clay				1.5	

Concentration exceeding the criterion is boxed.
Reporting limit exceeding the criterion is italicized.
U = Not detected at reporting limit indicated.
J = Estimated value.

Table 4 - Analytical Results for Sediment Samples Compared to Apparent Effects Threshold (Dry Weight) Sediment Quality Criteria

Sample ID	AETs		CS-02	CS-03	ES-04
Sampling Date	LAET	2LAET	4/26/2007	4/27/2007	4/26/2007
Conventionals in %					
Total Organic Carbon	-	-	0.392	0.431	0.447
Preserved Total Solids	-	-	83.00	68.50	74.10
Total Solids	-	-	80.20	77.10	79.00
Conventionals in mg/kg					
N-Ammonia	-	-	17.8	14.5	12.7
Sulfide	-	-	1.21 U	192	1.39 U
NWTPHD in mg/kg					
Diesel Range Hydrocarbons	-	-	8.8	9.7	12
Motor Oil	-	-	32	29	49
NWTPHG in mg/kg					
Gasoline Range Hydrocarbons	-	-	8.8 U	11 U	9.9 U
Metals in mg/kg					
Arsenic	57	93	1.1 J	1.6	4.1
Cadmium	5.1	6.7	0.2 U	0.2 U	0.2
Chromium	260	270	17.4 J	31.0	19.4
Copper	390	390	14.1	34.6	11.6
Lead	450	530	14	15	13
Mercury	0.41	0.59	0.05 U	0.05 U	0.08
Silver	6.1	6.1	0.4 U	0.4 U	0.4 U
Zinc	410	960	50	61	48
PCBs in ug/kg					
Aroclor 1016	-	-	19 U	19 U	19 U
Aroclor 1221	-	-	19 U	19 U	19 U
Aroclor 1232	-	-	19 U	19 U	19 U
Aroclor 1242	-	-	19 U	19 U	19 U
Aroclor 1248	-	-	19 U	19 U	19 U
Aroclor 1254	-	-	19 U	19 U	19 U
Aroclor 1260	-	-	19 U	19 U	19 U
Total PCBs	130	1000	19 U	19 U	19 U
LPAHs in ug/kg					
2-Methylnaphthalene	960	4400	62 U	61 U	62 U
Acenaphthene	1300	1300	62 U	61 U	62 U
Acenaphthylene	670	1400	62 U	61 U	62 U
Anthracene	1500	5400	62 U	61 U	62 U
Fluorene	500	730	62 U	61 U	62 U
Naphthalene	2100	2400	62 U	61 U	62 U
Phenanthrene	540	1000	62 U	61 U	67
Total LPAHs	5200	13000	62 U	61 U	67
HPAHs in ug/kg					
Benzo(a)anthracene	1300	1600	62 U	61 U	66
Benzo(a)pyrene	1600	3000	62 U	61 U	72
Benzo(b)fluoranthene			62 U	61 U	83
Benzo(k)fluoranthene			62 U	61 U	73
Total Benzofluoranthenes	3200	3600	62 U	61 U	156
Benzo(g,h,i)perylene	670	720	62 U	61 U	62 U
Chrysene	1400	2800	62 U	61 U	89
Dibenz(a,h)anthracene	230	540	62 U	61 U	62 U

Table 4 - Analytical Results for Sediment Samples Compared to Apparent Effects Threshold (Dry Weight) Sediment Quality Criteria

Sample ID	AETs		CS-02	CS-03	ES-04
Sampling Date	LAET	2LAET	4/26/2007	4/27/2007	4/26/2007
Fluoranthene	1700	2500	62 U	61 U	150
Indeno(1,2,3-cd)pyrene	600	690	62 U	61 U	62 U
Pyrene	2600	3300	62 U	61 U	160
Total HPAHs	12000	17000	62 U	61 U	693
Phthalates in ug/kg					
bis(2-Ethylhexyl)phthalate	1300	1900	62 U	61 U	62 U
Butylbenzylphthalate	63	900	62 U	61 U	62 U
Diethylphthalate	200	200	62 U	61 U	62 U
Dimethylphthalate	71	160	62 U	61 U	62 U
Di-n-Butylphthalate	1400	1400	62 U	61 U	62 U
Di-n-Octyl phthalate	6200	6200	62 U	61 U	62 U
Chlorinated Hydrocarbons in ug/kg					
1,2,4-Trichlorobenzene	31	51	*62 U*	*61 U*	*62 U*
1,2-Dichlorobenzene	35	50	*62 U*	*61 U*	*62 U*
1,3-Dichlorobenzene			62 U	61 U	62 U
1,4-Dichlorobenzene	110	120	62 U	61 U	62 U
Hexachlorobenzene	22	70	*62 U*	*61 U*	*62 U*
Hexachlorobutadiene	11	120	*62 U*	*61 U*	*62 U*
Hexachloroethane			62 U	61 U	62 U
Misc. Extractables in ug/kg					
Dibenzofuran	540	700	62 U	61 U	62 U
N-Nitrosodiphenylamine	28	40	*62 U*	*61 U*	*62 U*
Phenolics (Acids) in ug/kg					
2,4-Dimethylphenol	29	29	*62 U*	*61 U*	*62 U*
2-Methylphenol	63	63	62 U	61 U	62 U
4-Methylphenol	670	670	62 U	61 U	62 U
Pentachlorophenol	360	690	310 U	310 U	310 U
Phenol	420	1200	93	1,100	62 U
Benzoic Acid	650	650	620 U	610 U	620 U
Benzyl Alcohol	57	73	*62 U*	*61 U*	*62 U*
Semivolatiles (SIM) in ug/kg					
1,2,4-Trichlorobenzene	31	51	6.2 U	6.1 U	6.2 U
1,2-Dichlorobenzene	35	50	6.2 U	6.1 U	6.2 U
1,3-Dichlorobenzene	-	-	6.2 U	6.1 U	6.2 U
1,4-Dichlorobenzene	110	120	6.2 U	6.1 U	6.2 U
Butylbenzylphthalate	63	900	6.2 U	6.1 U	7.5
Dibenz(a,h)anthracene	230	540	6.2 U	6.1 U	11
Dimethylphthalate	71	160	6.2 U	6.1 U	6.2 U
Hexachlorobenzene	22	70	6.2 U	6.1 U	6.2 U
Hexachlorobutadiene	11	120	6.2 U	6.1 U	6.2 U
N-Nitrosodiphenylamine	28	40	6.2 U	6.1 U	6.2 U
2,4-Dimethylphenol	29	29	6.2 UJ	6.1 UJ	6.2 UJ
2-Methylphenol	63	63	6.2 U	6.1 U	6.2 U
Pentachlorophenol	360	690	31 U	31 U	31 U
Benzyl Alcohol	57	73	31 UJ	31 UJ	31 UJ

Table 4 - Analytical Results for Sediment Samples Compared to Apparent Effects Threshold (Dry Weight) Sediment Quality Criteria

Sample ID	AETs		CS-02	CS-03	ES-04
Sampling Date	LAET	2LAET	4/26/2007	4/27/2007	4/26/2007
Grain Size in %					
Gravel			47.4	23.7	14.2
Very Coarse Sand			10.6	8.3	2.3
Coarse Sand			5.4	3.7	10.2
Medium Sand			8.7	14.6	31.3
Fine Sand			22.9	42.9	23.1
Very Fine Sand			2.1	4.4	12.6
Total Fines			2.8	2.3	6.3
Coarse Silt					2.9
Medium Silt					0.7
Fine Silt					0.4
Very Fine Silt					0.5
8-9 Phi Clay					0.5
9-10 Phi Clay					0.3
> 10 Phi Clay					1.1

Concentration exceeding the criterion is boxed.
Reporting limit exceeding the criterion is italicized.
U = Not detected at reporting limit indicated.
J = Estimated value.

Parametrix ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

TECHNICAL MEMORANDUM

Date:	February 15, 2006
To:	Phil Williams, City of Bremerton Public Works
From:	Bill Webb, Parametrix
Subject:	Chevron Property Sediment Characterization Study
cc:	Phil Struck, Parametrix
Project Number:	255-1896-063 (03/01)
Project Name:	Pt Narrows Beach Sewer Replacement

INTRODUCTION

The purpose of this Technical Memorandum is to describe the results of the sediment characterization study conducted in the Port Washington Narrows and Smith Cove located in Bremerton, Washington (Figure 1). This study was conducted in support of a potential aquatic land lease from the state Department of Natural Resources (DNR) and potential acquisition of the Chevron property. Each area will be considered separately for purposes of this report. The first area is called the "sewer line corridor", and the second area is called the "Chevron property". Data from both areas will be used to make decisions regarding future projects planned by the City of Bremerton.

This investigation consisted of collecting a total of 25 sediment samples which were submitted for physical, chemical and bioassay analysis and comparison to applicable Sediment Quality Standards (SQS) described in Washington State Sediment Management Standards (SMS).

On November 21, 2005, a total of 8 (including duplicate) surface sediment grab samples were collected via boat from the area including Smith Cove extending south to the USS Turner Joy (stations S-1, S-2, S-6, and C-1 through C-5 – see Figure 2 attached). Samples were collected from the top 10 cm of sediment. On November 29, 2005, a total of 13 additional sediment samples were collected in the intertidal zone during an extreme low tide on and in the vicinity of the Chevron property and along the sewer corridor (samples S-3, S-4, S-5, and C-6 through C-10). Five sediment samples were collected from the surface to a depth of 10 cm, and 5 subsurface samples were collected from approximately 2 feet below ground surface (bgs) at the same locations as the surface sediment samples and three surface sediment samples were collected along the sewer corridor. On December 14, 2005 a surface sediment sample was collected for bioassay analysis from station C-1. At the request of the Department of Ecology (Ecology), three additional surface sediment samples were collected on January 06, 2006.

Sample locations are shown in Figures 2, 3, and 4 (attached). All sampling was conducted in accordance with the Ecology guidelines and the Sampling and Analysis Plan (SAP) for the site (Parametrix 2005).

FIELD OBSERVATIONS

Substrate in the sampling area generally consisted of sand, gravel and cobble ranging in size from silt and sand to cobbles greater than 1-ft in diameter. Due to the large percentage of cobbles at several stations, samples were difficult to obtain and required multiple grabs that were composited and homogenized.

Debris on the beach offshore of the former Chevron property included metal pipes, bricks, concrete, and rip-rap. A petroleum and sulfur odor was noted along an approximately 50-100 ft segment of shoreline on the northeast side of the site near the fueling pier. An unidentified staining was observed approximately two inches below ground surface. This staining was located in the vicinity of sample stations C-6 and C-8.

SAMPLING AND ANALYSIS

Sediment samples were analyzed for of the following contaminants in accordance with the SAP:

- Petroleum hydrocarbons using NWTPH-Dx
- Metals using EPA Method 6010/7470
- Semi-volatile organic compounds (SVOCs) and poly-aromatic hydrocarbons (PAHs) using EPA Method 8270
- Sediment Management Standards (SMS) parameters (including metals and semi-volatile organics), as specified in WAC 173-204-320.

Table 1 lists all sample numbers and analytical parameters for each sampling location. Analytical results were compared to the Marine Sediment Quality Standards (SQS) – WAC 173-204-320, (See Table 2 - attached) to assess sediment quality. For organic chemicals whose numerical criteria are TOC-normalized, tables include both dry-weight and TOC-normalized concentration values. Analytical results are shown in spreadsheet form in attached Table 2.

Table 1. Sample Location and Analytes

Site	Sample ID	Analytes
Sewer Line Corridor	S-1 through S-6	All SMS Parameters
Chevron Property	C-1 through C-4	All SMS Parameters, TPH-Dx
	C-5 through C-10	Metals, SVOCs, PAHS, TPH-Dx, TOC
	C-5-S through C-10-S	Metals, SVOCs, PAHS, TPH-Dx, TOC
	C-11 through C-13	PAHS, TOC
	C-8	Bioassay

RESULTS

Sewer Line Corridor

Six samples were collected in this area (S-1 through S-6) and analyzed for SMS parameters. No Sediment Quality Standard (SQS) was exceeded in any sample (See Table 2). Sediment along the proposed sewer line corridor generally contained trace concentrations of metals, semi-volatile organic compounds (SVOCs), poly aromatic hydrocarbons (PAHs), and petroleum compounds.

Chevron Property

A total of five sediment samples were collected offshore of the Chevron property, and 13 samples were collected within the intertidal area for chemical analysis. One sample was collected from station C-8 for

bioassay analysis. Offshore samples (C-1 through C-5) were collected in both the Port Washington Narrows and Smith Cove at estimated elevations that ranged from –2 ft to –12.8 ft. MLLW. No chemicals detected in off-shore samples exceeded SQS.

In the intertidal area, sample location C-8 exceeded SQS for fluoranthene, chrysene, benzofluoranthenes, and Total HPAHs. No other samples exceeded applicable SQS levels. Table 2 (attached) shows results in comparison to SQS.

Sediment chemistry laboratory analysis results are provided in the Data Attachment.

BIOASSAY TESTING

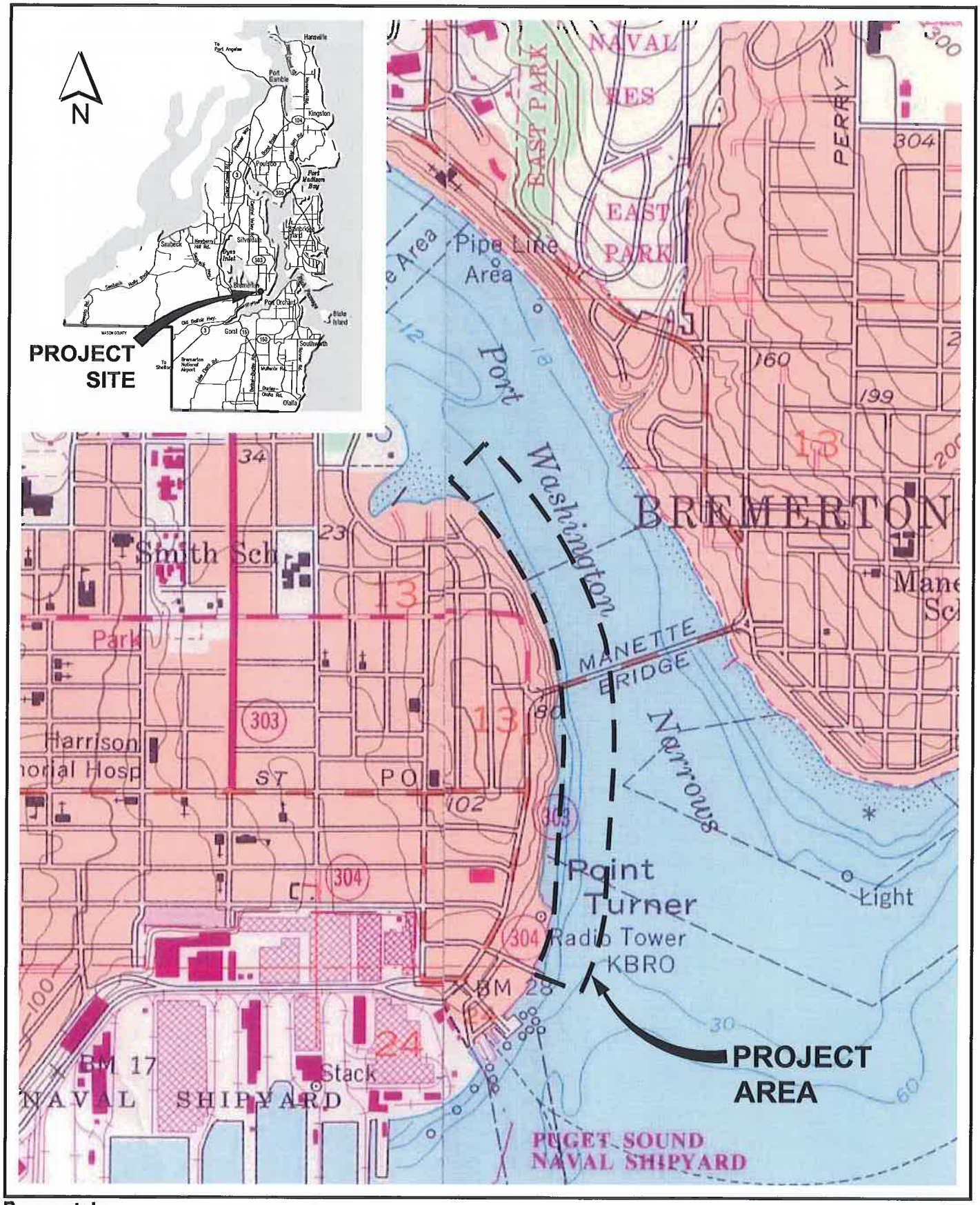
Based on chemistry sample results, no further action was necessary or warranted at any location except the surface sample from station C-8. Washington Administrative Code (WAC) 173-204-310 allows a confirmatory marine biological test (bioassay) to be performed (WAC 173-204-315) when one applicable chemical or human health criterion in WAC 173-204-320 through 173-204-340 is exceeded. Pursuant to this, an additional sample was collected from station C-8 and delivered on December 13, 2005 to Weston Environmental Laboratory in Port Gamble for bioassay analysis.

Bioassays were conducted pursuant to SMS requirements and consisted of the 48-hr larval Bay mussel (Mytilus galloprovincialis), the 10-day amphipod (*Eohaustoris estuaries*), and the 20-day juvenile polychaete worms (*Neanthes arenaceodentata*). Results were compared to both SQS and Cleanup Screening Levels. For all tests, there was no statistically significant difference between the test sediment from station C-8, and reference sediment. The confirmatory marine sediment bioassay tests demonstrate that sediment at the site pass SMS criteria. The complete bioassay report is provided in the Data Attachment.

CONCLUSIONS

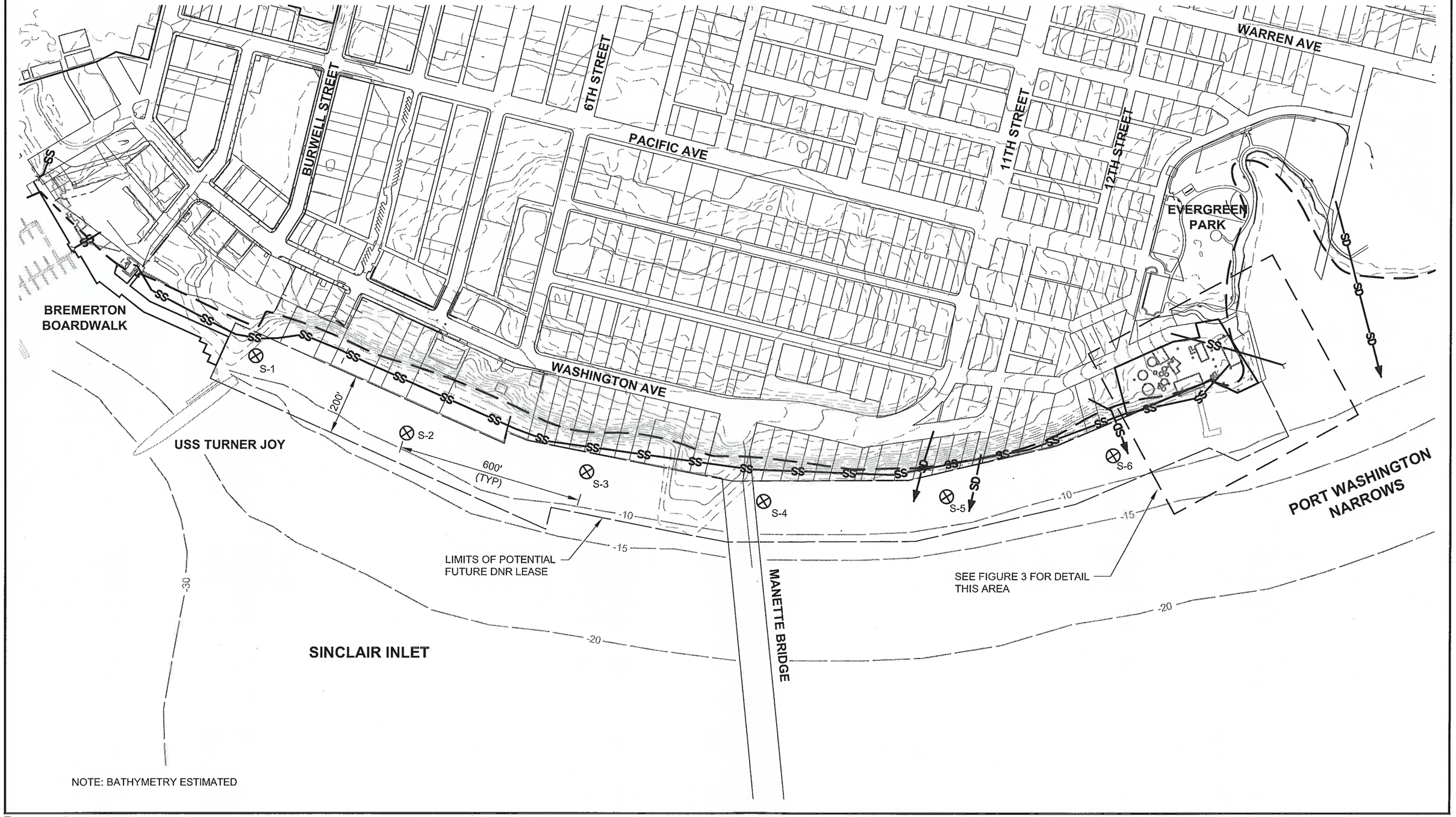
Based on sampling results, sediments within both the sewer line corridor and adjacent to the former Chevron site meet applicable SMS requirements and no further sampling or cleanup action is necessary or warranted.

FIGURES



Parametrix DATE: Feb 16, 2006 FILE: BR1896063P02T01F-01

Figure 1
Pt Narrows Beach
Sediment Study
Project Vicinity



Parametrix DATE: Feb 16, 2006 FILE: BR1896063P02T01F-02

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0 300

SCALE IN FEET

Approx Shoreline

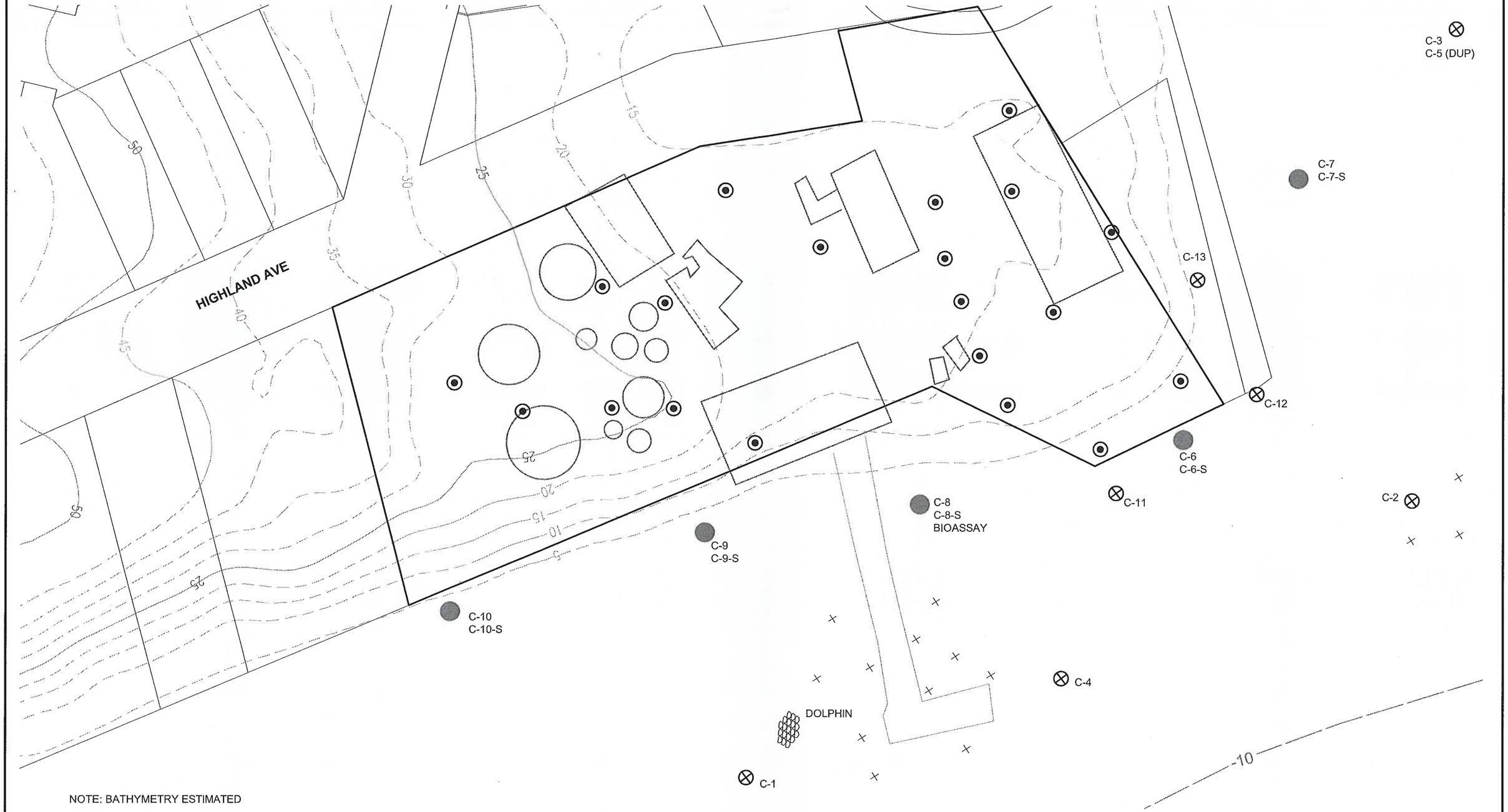
SS Sanitary Sewer

SD Storm Drain Outfall

Future DNR Lease Area

Sediment Grab Sample Location

Figure 2
Pt Narrows Beach
Sewer Line Corridor
Sediment Sample Locations



Parametrix DATE: Feb 16, 2006 FILE: BR1896063P02T01F-02

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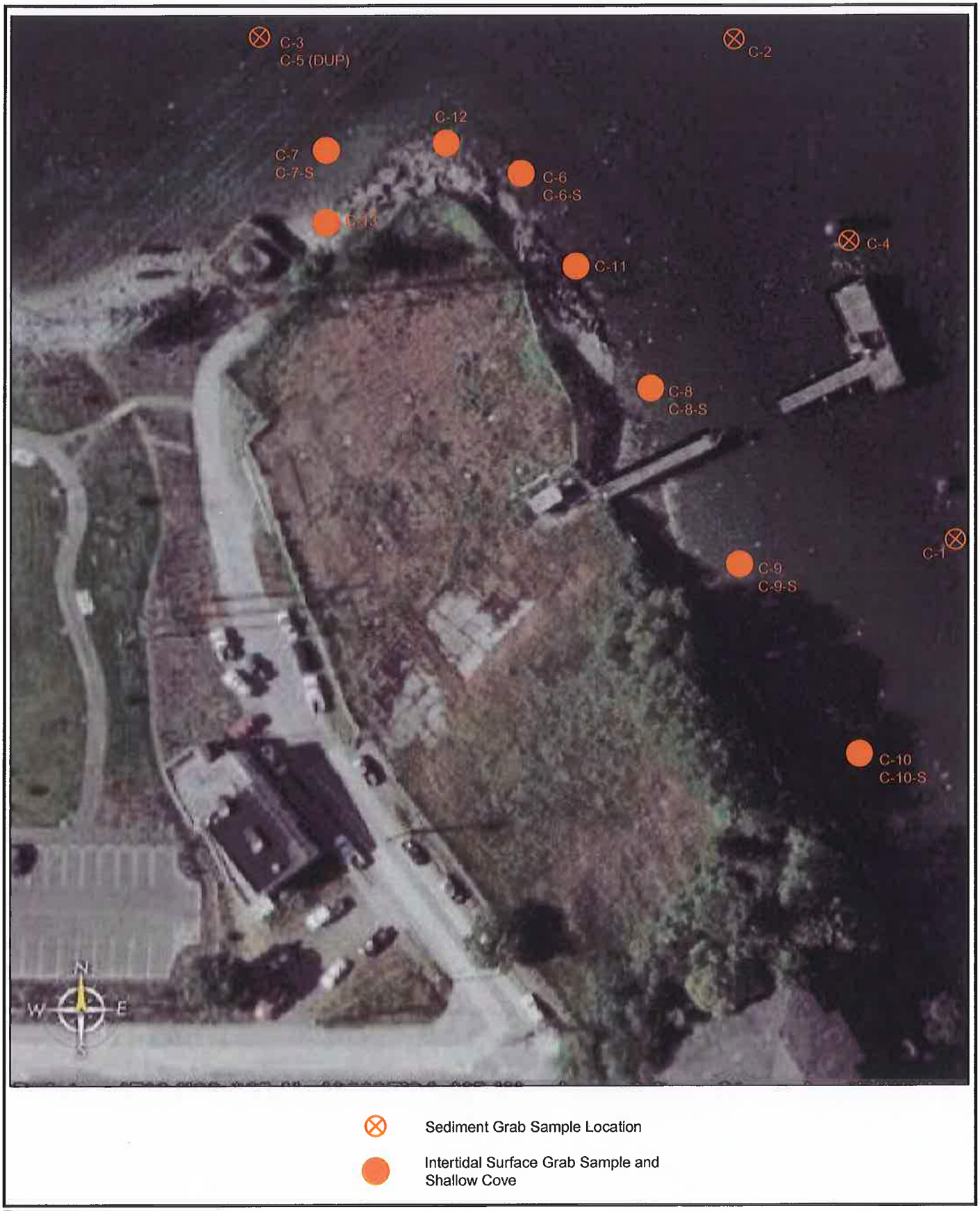
SCALE IN FEET

- Surface Sediment Grab Sample Location (Dec. 2005)
- Intertidal Surface Grab and Subsurface (2-ft BGS) Sample (Dec. 2005)
- Monitoring Well
- × Failed Sampling Location Due to Large Cobble Substrate (Dec. 2005)
- Chevron Property

Figure 3
Former Chevron Site, Sample Locations



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SCALE IN FEET

Figure 4
Pt Narrows Beach
Former Chevron Site
Sediment Sampling Locations

TABLES

Table 2. Summary of sediment sampling results, ormer Chevron Property and sewer line corridor, City of Bremerton, Washington. Samples collected December 2005 and January 2006.

ANALYTE	SQS	SIZM/ SCSL	UNITS	C-1	C-2	C-3	C-4	C-5	S-1	S-2	S-6	S-3	S-4	S-5	C-6	C-7	C-8	C-9	C-10	C-6-S	C-7-S	C-8-S	C-9-S	C-10-S	C-11	C-12	C-13
Total Solids			%	77	74.9	63.2	74.1	62.7	78.5	80.6	76.6	80.9	81	84.6											82.6	71.9	73.5
Preserved Total Solids			%	76.7	72.3	59.2	73.8	64.9	77.1	77.1	73.7	81.7	81.3	85.2													
Total Volatile Solids			%	1.23	2.15	2.86	1.59	3.13	1.6	1.75	1.26	1.81	1.42	1.38													
N-Ammonia			mg-N/kg	6.97	13	9.92	6.51	10.5	7.28	4.95	4.28	6.03	1.47	0.66													
Sulfide			mg/kg	0.91 UJ	6.5 J	580 J	17 J	500 J	11 J	4.9 J	1.3 UJ	29	1.5 U	1.5 U													
Total Organic Carbon			%	0.593	0.81	1.65	0.468	2.24	0.461	0.409	0.426	0.421	0.28	0.268	0.380	0.526	0.528	0.492	0.503	0.269	1.140	0.305	0.205	0.167	0.392	0.631	1.040
Antimony			mg/kg dw	6 UJ	6 UJ	7 UJ	7 UJ	8 UJ	6 UJ	6 UJ	6 UJ	10 UJ	6 UJ	6 UJ	6 UJ	6 UJ	10 UJ	6 UJ	6 UJ	6 UJ	6 UJ	6 UJ	6 UJ	6 UJ	6 UJ			
Arsenic	57	93	mg/kg dw	6 U	6 U	7 U	7 U	8 U	6 U	6 U	6 U	10 U	6 U	6 U	6 U	6 U	10 U	6 U	6	6 U	6 U	6 U	6 U	6 U			
Cadmium	5.1	6.7	mg/kg dw	0.3 U	0.3	0.5	0.3	0.5	0.3	0.2 U	0.2 U	0.6 U	0.3	0.2 U	0.3 U	0.2 U	0.6 U	0.2 U	0.2 U	0.2	0.2 U	0.2 U	0.2 U	0.2 U			
Chromium	260	270	mg/kg dw	18.6	14.1	20.8	18.8	21.9	17.5	13.3	16.3	11 J	22.2 J	33.8 J	16.5 J	20 J	15 J	20.1 J	23.3 J	19.8 J	24.8 J	19.2 J	16.6 J	18.8 J			
Copper	390	390	mg/kg dw	15.4	15	19.6	18.7	19.8	16.3 J	8.6	15.1	9.9 J	29.1 J	32.7 J	15.3 J	11.6 J	15.8 J	19 J	20.8 J	17.2 J	10.7 J	19.5 J	14.8 J	16.1 J			
Lead	450	530	mg/kg dw	15	13	27	16	21	14	12	24	16	82	34	26	14	18	18	23	31	13	28	23	147			
Mercury	0.41	0.59	mg/kg dw	0.06 U	0.06 U	0.09	0.06 U	0.09	0.05 U	0.06	0.05 U	0.06 U	0.04	0.04 U	0.07 U	0.05 U	0.21	0.05 U	0.05 U	0.04 U	0.21	0.06	0.05 U	0.05 U			
Nickel			mg/kg dw	18	17	20	20	22	20	13	16	13	24	26	18	25	16	24	24	22	21	22	17	22			
Silver	6.1	6.1	mg/kg dw	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U	0.3 U	0.4 U	0.8 U	0.4 U	0.4	0.4 U	0.4 U	0.9 U	0.3 U	0.4 U	0.3 U	0.3 U	0.4 U	0.4 U	0.3 U			
Zinc	410	960	mg/kg dw	45.7	40.1	49.8	47.4	48.3	36	27.1	46.4	38	65.1	120	57.6	51.2	44	49.5	63.1	72.4	37.2	60	45.7	111			
Naphthalene	99	170	mg/kg oc	3.37 U	2.47 U	1.15 U	4.27 U	0.89 U	4.34 U	3.91 J	4.46 U	4.51 U	6.79 U	7.46 U	5.26 U	3.80 U	3.79 U	4.07 U	5.17	7.06 U	1.75 U	4.26 J	9.27 U	11.38 U	4.85 U	3.01 U	1.92 U
Acenaphthylene	66	66	mg/kg oc	3.37 U	1.85 J	2.06	2.99 J	1.83	4.34 U	4.65 J	4.46 U	4.51 U	6.79 U	7.46 U	5.26 U	3.80 U	7.01	4.07 U	3.78 U	7.06 U	1.23 J	3.93 J	9.27 U	11.38 U	4.85 U	3.01 U	1.92 U
Acenaphthene	16	57	mg/kg oc	3.37 U	2.47 U	1.15 U	4.27 U	0.89 U	4.34 U	4.89 U	4.46 U	4.51 U	6.79 U	7.46 U	5.26 U	3.80 U	3.79 U	4.07 U	3.78 U	7.06 U	1.75 U	6.23 U	9.27 U	11.38 U	4.85 U	3.01 U	1.92 U
Fluorene	23	79	mg/kg oc	3.37 U	2.47 U	1.15 U	4.27 U	0.94	4.34 U	4.89 U	4.46 U	4.51 U	6.79 U	7.46 U	5.26 U	3.80 U	3.79 U	4.07 U	3.78 U	7.06 U	1.75 U	6.23 U	9.27 U	11.38 U	4.85 U	3.01 U	1.92 U
Phenanthrene	100	480	mg/kg oc	3.37 U	7.41	7.27	4.49	8.93	3.47 J	15.65	4.46 U	6.89	3.93 J	7.46 U	3.42 J	3.61 J	16.86	11.38	7.36	7.06 U	2.28	5.90 J	5.85 J	9.58 J	4.85 U	4.28	1.92
Anthracene	220	1200	mg/kg oc	3.37 U	2.35 J	3.39	4.27 U	5.80	4.34 U	2.93 J	4.46 U	4.51 U	6.79 U	7.46 U	5.26 U	3.80 U	6.44	4.07 U	3.78 U	7.06 U	2.46	7.21	4.68 J	11.38 U	4.85 U	3.01 U	1.92 U
Total LPAHs	370	780	mg/kg oc	3.37 U	11.60	12.73	7.48	17.50	3.47	27.14	4.46 U	6.89	3.93	7.46 U	3.42	3.61	30.30	11.38	12.52	3.05 U	5.96	21.31	10.54	9.58	4.85 U	4.28	1.92
2-Methylnaphthalene	38	64	mg/kg oc	3.37 U	2.47 U	1.15 U	4.27 U	0.89 U	4.34 U	4.89 U	4.46 U	4.51 U	6.79 U	7.46 U	5.26 U	3.80 U	3.79 U	4.07 U	3.78 U	7.06 U	1.75 U	5.90 J	9.27 U	11.38 U	4.85 U	3.01 U	1.92 U
Fluoranthene	160	1200	mg/kg oc	2.87 J	13.58	29.70	14.96	25.45	8.68	24.45	3.99 J	14.01	5.71 J	7.46 U	28.95	7.03	**587.12**	9.15	9.15	7.06 J	13.16	52.46	21.46	59.88	5.10	14.74	6.15
Pyrene	1000	1400	mg/kg oc	2.87 J	11.23	23.03	12.39	21.43	5.64	19.80	2.58 J	9.98	4.29 J	7.46 U	13.16	5.13	208.33	7.32	4.77	9.67	11.40	42.62	15.61	31.14	4.85 U	12.52	5.77
Benzo(a)anthracene	110	270	mg/kg oc	3.37 U	5.43	10.91	10.68	8.93	2.82 J	9.05	4.46 U	5.70	6.79 U	7.46 U	5.00 J	2.66 J	54.92	3.86 J	2.78 J	4.46 J	5.44	19.67	8.78 J	7.78 J	4.85 U	6.66	2.69
Chrysene	110	460	mg/kg oc	2.53 J	8.64	15.76	12.39	12.05	3.69 J	11.00	3.05 J	6.89	3.57 J	7.46 U	7.89 J	3.80	**136.36**	4.07	3.18 J	7.06 U	6.58	21.64	11.71	16.77	6.38	8.08	3.75
Benzo(b)fluoranthene			*mg/kg oc*	*3.37 U*	*7.41*	*13.94*	*15.60*	*10.71*	*5.21*	*19.07*	*2.35 J*	*5.23*	*6.79 U*	*7.46 U*	*6.84*	*3.80*	*130.68*	*3.86 J*	*3.78*	*5.20 J*	*6.40*	*23.61*	*15.61*	*14.97*	*4.85 U*	*9.19*	*3.56*
Benzo(k)fluoranthene			*mg/kg oc*	*3.37 U*	*6.42*	*12.73*	*12.39*	*12.50*	*3.04 J*	*12.96*	*3.52 J*	*5.94*	*6.79 U*	*7.46 U*	*5.26*	*2.09 J*	*125.00*	*4.07*	*2.39 J*	*3.72 J*	*4.74*	*14.43*	*12.68*	*7.19 J*	*4.85 U*	*6.34*	*2.69*
Benzofluoranthenes	230	450	mg/kg oc	3.37 U	13.83	26.67	27.99	23.21	8.24	32.03	5.87	11.16	6.79 U	7.46 U	12.11	5.89	**255.68**	7.93	6.16	8.92	11.14	38.03	28.29	22.16	4.85 U	*15.53*	6.25
Benzo(a)pyrene	99	210	mg/kg oc	3.37 U	6.30	12.12	15.17	10.71	3.47 J	14.91	4.46 U	5.94	6.79 U	7.46 U	3.95 J	3.23 J	54.92	4.88	2.98 J	5.95 J	6.58	23.28	9.27	7.19 J	4.85 U	7.61	3.17
Indeno(1,2,3-cd)pyrene	34	88	mg/kg oc	3.37 U	1.60 J	2.55	3.63	2.46	4.34 U	3.67 J	4.46 U	3.33 J	6.79 U	7.46 U	5.26 U	3.80 U	16.29	4.07 U	3.78 U	7.06 U	1.58 J	5.25 J	9.27 U	11.38 U	4.85 U	3.80	1.92 U
Dibenz(a,h)anthracene	12	33	mg/kg oc	3.37 U	2.47 U	0.91 J	4.27 U	0.71 J	4.34 U	4.89 U	4.46 U	4.51 U	6.79 U	7.46 U	5.26 U	3.80 U	4.36	4.07 U	3.78 U	7.06 U	1.75 U	6.23 U	9.27 U	11.38 U	4.85 U	3.01 U	1.92 U
Benzo(g,h,i)perylene	31	78	mg/kg oc	3.37 U	1.73 J	2.61	3.85 J	2.46	4.34 U	3.18 J	4.46 U	4.04 J	6.79 U	7.46 U	5.26 U	3.80 U	13.26	4.07 U	3.78 U	7.06 U	1.67 J	6.56	9.27 U	11.38 U	4.85 U	4.28	2.02
Total HPAHs	960	5300	mg/kg oc	8.26	62.35	124.24	101.07	107.41	32.54	118.09	15.49	61.05	13.57	7.46 U	71.05	27.76	**1331.25**	37.20	29.03	36.06	57.54	209.51	95.12	144.91	11.48	73.22	29.81
1,2-Dichlorobenzene	2.3	2.3	mg/kg oc	**3.37 U**	**2.47 U**	1.15 U	**4.27 U**	0.89 U	**4.34 U**	**4.89 U**	**4.46 U**	**4.51 U**	**6.79 U**	**7.46 U**	**5.26 U**	**3.80 U**	**3.79 U**	**4.07 U**	**3.78 U**	**7.06 U**	1.75 U	**6.23 U**	**9.27 U**	**11.38 U**			
1,4-Dichlorobenzene	3.1	9	mg/kg oc	**3.37 U**	2.47 U	1.15 U	**4.27 U**	0.89 U	**4.34 U**	**4.89 U**	**4.46 U**	**4.51 U**	**6.79 U**	**7.46 U**	**5.26 U**	**3.80 U**	**3.79 U**	**4.07 U**	**3.78 U**	**7.06 U**	1.75 U	**6.23 U**	**9.27 U**	**11.38 U**			
1,2,4-Trichlorobenzene	0.81	1.8	mg/kg oc	**3.37 U**	**2.47 U**	**1.15 U**	**4.27 U**	**0.89 U**	**4.34 U**	**4.89 U**	**4.46 U**	**4.51 U**	**6.79 U**	**7.46 U**	**5.26 U**	**3.80 U**	**3.79 U**	**4.07 U**	**3.78 U**	**7.06 U**	**1.75 U**	**6.23 U**	**9.27 U**	**11.38 U**			
Hexachlorobenzene	0.38	2.3	mg/kg oc	0.17 U	0.12 U	0.06 U	0.21 U	0.05 U	0.22 U	0.23 U	0.23 U	0.23 U	0.35 U	0.36 U	**5.26 U**	**3.80 U**	**3.79 U**	**4.07 U**	**3.78 U**	**7.06 U**	**1.75 U**	**6.23 U**	**9.27 U**	**11.38 U**			
Dimethylphthalate	53	53	mg/kg oc	3.37 U	2.47 U	1.15 U	4.27 U	0.89 U	4.34 U	4.89 U	4.46 U	4.51 U	6.79 U	7.46 U	5.26 U	3.80 U	3.79 U	4.07 U	3.78 U	7.06 U	1.75 U	6.23 U	9.27 U	11.38 U			
Diethylphthalate	61	110	mg/kg oc	3.37 U	2.35 J	0.91 J	4.27 U	0.45 J	4.34 U	3.91 J	2.82 J	4.51 U	6.79 U	7.46 U	5.26 U	3.80 U	3.79 U	4.07 U	3.78 U	7.06 U	1.75 U	6.23 U	9.27 U	11.38 U			
Di-n-butylphthalate	220	1700	mg/kg oc	3.20 J	2.96	2.12	4.49	1.16	5.21	5.38	5.63	4.51 U	6.79 U	7.46 U	5.26 U	3.80 U	3.79 U	4.07 U	3.78 U	7.81	1.75 U	6.23 U	9.27 U	11.38 U			
Butylbenzylphthalate	4.9	64	mg/kg oc	3.37 U	2.47 U	1.15 U	4.27 U	0.89 U	4.34 U	4.89 U	4.46 U	4.51 U	**6.79 U**	**7.46 U**	**5.26 U**	3.80 U	3.79 U	4.07 U	3.78 U	**7.06 U**	1.75 U	**6.23 U**	**9.27 U**	**11.38 U**			
Bis(2-ethylhexyl)phthalate	47	78	mg/kg oc	3.37 UB	3.46 UB	4.61 JB	4.27 UB	3.39 JB	6.07 UB	8.56 JB	4.46 UB	3.33 J	4.64 J	7.46 U	3.42 J	3.42 J	3.79 U	4.07 U	10.34	9.29	1.40 J	13.11	7.80 J	9.58 J			
Di-n-octylphthalate	58	4500	mg/kg oc	3.37 U	2.47 U	1.15 U	4.27 U	0.89 U	4.34 U	4.89 U	4.46 U	4.51 U	6.79 U	7.46 U	5.26 U	3.80 U	3.79 U	4.07 U	35.79	7.06 U	1.75 U	6.23 U	9.27 U	11.38 U			
Dibenzofuran	15	58	mg/kg oc	3.37 U	2.47 U	1.15 U	4.27 U	0.89 U	4.34 U	4.89 U	4.46 U	4.51 U	6.79 U	7.46 U	5.26 U	3.80 U	3.79 U	4.07 U	3.78 U	7.06 U	1.75 U	6.23 U	9.27 U	11.38 U	4.85 U	3.01 U	1.92 U
Hexachlorobutadiene	3.9	6.2	mg/kg oc	0.17 U	0.12 U	0.06 U	0.21 U	0.05 U	0.22 U	0.23 U	0.23 U	0.23 U	0.35 U	0.36 U	**5.26 U**	3.80 U	3.79 U	**4.07 U**	3.78 U	**7.06 U**	1.75 U	**6.23 U**	**9.27 U**	**11.38 U**			
N-Nitrosodiphenylamine	11	11	mg/kg oc	3.37 U	2.47 U	1.15 U	4.27 U	0.89 U	4.34 U	4.89 U	4.46 U	4.51 U	6.79 U	7.46 U	5.26 U	3.80 U	3.79 U	4.07 U	3.78 U	7.06 U	1.75 U	6.23 U	9.27 U	**11.38 U**			
Phenol	420	1200	ug/kg dw	72	340	19 U	16 J	20 U	20 U	14 J	22	38	19 U	20 U	20 U	20 U	20 U	20 U	19 U	19 U	20 U	19 U	19 U	130			
2-Methylphenol	63	63	ug/kg dw	20 U	20 U	19 U	20 U	20 U	20 U	20 U	19 U	17 J	19 U	20 U	20 U	20 U	20 U	20 U	19 U	19 U	20 U	19 U	19 U	19 U			
4-Methylphenol	670	670	ug/kg dw	20 U	12 J	19 U	20 U	20 U	20 U	20 U	19 U	19 U	19 U	20 U	20 U	20 U	20 U	20 U	19 U	19 U	20 U	19 U	19 U	19 U			
2,4-Dimethylphenol	29	29	ug/kg dw	20 U	20 U	19 U	20 U	20 U	20 U	20 U	19 U	19 U	19 U	20 U	20 U	20 U	20 U	20 U	19 U	19 U	20 U	19 U	19 U	19 U			
Pentachlorophenol	360	690	ug/kg dw	99 U	99 U	96 U	97 U	98 U	98 U	98 U	97 U	95 U	96 U	99 U	98 U	98 U	97 U	99 U	95 U	97 U	98 U	96 U	96 U	96 U			
Benzyl Alcohol	57	73	ug/kg dw	20 U	20 U	19 U	20 U	20 U	20 U	20 U	19 U	19 U	19 U	20 U	20 U	20 U	20 U	20 U	19 U	19 U	20 U	19 U	19 U	19 U			
Benzoic Acid	650	650	ug/kg dw	200 U	200 U	190 U	200 U	200 U	200 U	200 U	190 U	190 U	190 U	200 U	200 U	200 U	200 U	200 U	190 U	190 U	200 U	190 U	190 U	190 U			
gamma-BHC (Lindane)			ug/kg dw	0.99 U	0.99 U	0.98 U	0.97 U	1.1 U	1 U	0.96 U	0.97 U	0.96 U	0.98 U	0.97 U	--	--	--	--	--	--	--	--	--	--	--			
Heptachlor			ug/kg dw	0.99 U	0.99 U	0.98 U	0.97 U	1.1 U	1 U	0.96 U	0.97 U	0.96 U	0.98 U	0.97 U	--	--	--	--	--	--	--	--	--	--	--			
Aldrin			ug/kg dw	0.99 U	0.99 U	0.98 U	0.97 U	1.1 U	1 U	0.96 U	0.97 U	0.96 U	0.98 U	0.97 U	--	--	--	--	--	--	--	--	--	--	--			
Dieldrin			ug/kg dw	2 U	2 U	2 U	2 U	2.2 U	2 U	1.9 U	1.9 U	1.9 U	2 U	2 U	--	--	--	--	--	--	--	--	--	--	--			
4,4'-DDE			ug/kg dw	2 U	2 U	2 U	2 U	2.2 U	2 U	1.9 U	1.9 U	1.9 U	2 U	2 U	--	--	--	--	--	--	--	--	--	--	--			
4,4'-DDD			ug/kg dw	2 U	2 U	2 U	2 U	2.2 U	2 U	1.9 U	1.9 U	1.9 U	2 U	2 U	--	--	--	--	--	--	--	--	--	--	--			
4,4'-DDT			ug/kg dw	2 U	2 U	2 U	2 U	2.2 U	2 U	1.9 U	1.9 U	1.9 U	2 U	2 U	--	--	--	--	--	--	--	--	--	--	--			
gamma Chlordane			ug/kg dw	0.99 U	0.99 U	0.98 U	0.97 U	1.1 U	1 U	0.96 U	0.97 U	0.96 U	0.98 U	0.97 U	--	--	--	--	--	--	--	--	--	--	--			
alpha Chlordane			ug/kg dw	0.99 U	0.99 U	0.98 U	0.97 U	1.1 U	1 U	0.96 U	0.97 U	0.96 U	0.98 U	0.97 U	--	--	--	--	--	--	--	--	--	--	--			
Aroclor 1016			mg/kg oc	3.37 U	2.47 U	1.15 U	4.06 U	0.89 U	4.34 U	4.89 U	4.46 U	4.75 U	6.79 U	7.46 U	--	--	--	--	--	--	--	--	--	--	--			
Aroclor 1221			mg/kg oc	3.37 U	2.47 U	1.15 U	4.06 U	0.89 U	4.34 U	4.89 U	4.46 U	4.75 U	6.79 U	7.46 U	--	--	--	--	--	--	--	--	--	--	--			
Aroclor 1232			mg/kg oc	3.37 U	2.47 U	1.15 U	4.06 U	0.89 U	4.34 U	4.89 U	4.46 U	4.75 U	6.79 U	7.46 U	--	--	--	--	--	--	--	--	--	--	--			
Aroclor 1242			mg/kg oc	3.37 U	2.47 U	1.15 U	4.06 U	0.89 U	4.34 U	4.89 U	4.46 U	4.75 U	6.79 U	7.46 U	--	--	--	--	--	--	--	--	--	--	--			
Aroclor 1248			mg/kg oc	3.37 U	2.47 U	1.15 U	4.06 U	0.89 U	4.34 U	4.89 U	4.46 U	4.75 U	6.79 U	7.46 U	--	--	--	--	--	--	--	--	--	--	--			
Aroclor 1254			mg/kg oc	3.37 U	2.47 U	1.15 U	4.06 U	0.89 U	4.34 U	4.89 U	4.46 U	4.75 U	6.79 U	7.46 U	--	--	--	--	--	--	--	--	--	--	--			
Aroclor 1260			mg/kg oc	3.37 U	2.47 U	4.24	4.06 U	0.89 U	4.34 U	4.89 U	4.46 U	4.75 U	6.79 U	7.46 U	--	--	--	--	--	--	--	--	--	--	--			
Total PCBs	12	65	mg/kg oc	3.37 U	2.47 U	4.24	4.06 U	0.89 U	4.34 U	4.89 U	4.46 U	4.75 U	6.79 U	7.46 U	--	--	--	--	--	--	--	--	--	--	--			
Diesel			mg/kg dw	6 U	25	27	20	40	--	--	--	7.5	6 U	6 U	11	8.1	6.7	6.2 U	6 U	29	7.7	11	5.9 U	5.9 U			
Motor Oil			mg/kg dw	17	140	110	50	160	--	--	--	26	12 U	12 U	55	29	47	30	16	78	27	68	12 U	12 U			

111 Exceeds SQS

111 Not detected but TOC normalized result exceeds SQS.

CHEMISTRY LABORATORY DATA

Parametrix ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

TECHNICAL MEMORANDUM

Date:	January 31, 2005
To:	Project File
From:	Stuart Currie
Subject:	Quality Assurance/Quality Control Review of Laboratory Data for the November 2005 and January 2006 Bremerton Sediment Sampling
cc:	Phil Struck Lara Linde
Project Number:	255-1896-063 (02/02)
Project Name:	Pt. Narrows Beach Sewer Replacement

This memorandum summarizes the results of an internal quality assurance/quality control (QA/QC) review of analytical results for sediment samples collected on November 21 and 29, 2005, and January 9, 2006. Twenty-four (24) surface grab sediment samples were collected and submitted to Analytical Resources, Inc. (ARI) in Tukwila, Washington for analysis for various Sediment Management Standards (SMS) parameters.

Final laboratory data (ARI Reports IU01, IU50, IV18, IV58, and IX82) were submitted to Parametrix via hardcopy Tier II data reports. All data were reviewed using laboratory quality criteria specified in the ARI (2006) Quality Assurance Plan (QAP)[1] and qualifiers were applied where judged appropriate. This review included evaluation of the following (where applicable):

- Preparation and analytical holding times;
- Laboratory method blanks;
- Laboratory control samples (LCS) and LCS duplicates (LCSD)[2];
- Laboratory replicates;
- Matrix spike (MS) and MS duplicates (MSD); and
- Surrogate compound recoveries.

All samples were analyzed within the required holding times and the appropriate methods were used. Analytical accuracy and precision were determined to be generally acceptable based on this review. Specific instances of out of control laboratory QC results were identified and data qualifiers were assigned based on results that exceeded laboratory QC criteria. Table 1 summarizes all qualified data. No data were rejected and all data reported should be considered valid, representative of the samples collected, and acceptable for further use.

[1] ARI. 2006. Quality Assurance Plan. Revision 12-006. Prepared by Analytical Resources, Inc., Tukwila, WA. January 16, 2006.
[2] LCS/LCSD may also be referred to as Blank Spike/Blank Spike Duplicate.

Table 1. Qualified Bremerton Sediment Data

Sample ID	Analyte	Result	Unit	Qualifier	Reason
C-1	Antimony	6	mg/kg dw	UJ	MS recovery was <75%.
C-10	Antimony	6	mg/kg dw	UJ	MS recovery was <75%.
C-10-S	Antimony	6	mg/kg dw	UJ	MS recovery was <75%.
C-2	Antimony	6	mg/kg dw	UJ	MS recovery was <75%.
C-3	Antimony	7	mg/kg dw	UJ	MS recovery was <75%.
C-4	Antimony	7	mg/kg dw	UJ	MS recovery was <75%.
C-5	Antimony	8	mg/kg dw	UJ	MS recovery was <75%.
C-6	Antimony	6	mg/kg dw	UJ	MS recovery was <75%.
C-6-S	Antimony	6	mg/kg dw	UJ	MS recovery was <75%.
C-7	Antimony	6	mg/kg dw	UJ	MS recovery was <75%.
C-7-S	Antimony	6	mg/kg dw	UJ	MS recovery was <75%.
C-8	Antimony	10	mg/kg dw	UJ	MS recovery was <75%.
C-8-S	Antimony	6	mg/kg dw	UJ	MS recovery was <75%.
C-9	Antimony	6	mg/kg dw	UJ	MS recovery was <75%.
C-9-S	Antimony	6	mg/kg dw	UJ	MS recovery was <75%.
S-1	Antimony	6	mg/kg dw	UJ	MS recovery was <75%.
S-2	Antimony	6	mg/kg dw	UJ	MS recovery was <75%.
S-3	Antimony	10	mg/kg dw	UJ	MS recovery was <75%.
S-4	Antimony	6	mg/kg dw	UJ	MS recovery was <75%.
S-5	Antimony	6	mg/kg dw	UJ	MS recovery was <75%.
S-6	Antimony	6	mg/kg dw	UJ	MS recovery was <75%.
C-1	bis(2-Ethylhexyl)phthalate	20	ug/kg dw	UB	Analyte detected in MB @ >MRL; sample result was ≤MRL.
C-2	bis(2-Ethylhexyl)phthalate	28	ug/kg dw	UB	Analyte detected in MB @ >MRL; sample result was ≤MB conc.
C-3	bis(2-Ethylhexyl)phthalate	76	ug/kg dw	JB	Analyte detected in MB @ >MRL; sample result was ≤5X MB conc.
C-4	bis(2-Ethylhexyl)phthalate	20	ug/kg dw	UB	Analyte detected in MB @ >MRL; sample result was ≤MRL.
C-5	bis(2-Ethylhexyl)phthalate	76	ug/kg dw	JB	Analyte detected in MB @ >MRL; sample result was ≤5X MB conc.
S-1	bis(2-Ethylhexyl)phthalate	28	ug/kg dw	UB	Analyte detected in MB @ >MRL; sample result was ≤MB conc.
S-2	bis(2-Ethylhexyl)phthalate	35	ug/kg dw	JB	Analyte detected in MB @ >MRL; sample result was ≤5X MB conc.
S-6	bis(2-Ethylhexyl)phthalate	19	ug/kg dw	UB	Analyte detected in MB @ >MRL; sample result was ≤MRL.
C-10	Chromium	23.3	mg/kg dw	J	MS recovery was >125%.
C-10-S	Chromium	18.8	mg/kg dw	J	MS recovery was >125%.
C-6	Chromium	16.5	mg/kg dw	J	MS recovery was >125%.
C-6-S	Chromium	19.8	mg/kg dw	J	MS recovery was >125%.
C-7	Chromium	20	mg/kg dw	J	MS recovery was >125%.
C-7-S	Chromium	24.8	mg/kg dw	J	MS recovery was >125%.
C-8	Chromium	15	mg/kg dw	J	MS recovery was >125%.
C-8-S	Chromium	19.2	mg/kg dw	J	MS recovery was >125%.
C-9	Chromium	20.1	mg/kg dw	J	MS recovery was >125%.
C-9-S	Chromium	16.6	mg/kg dw	J	MS recovery was >125%.

Table 1. Qualified Bremerton Sediment Data

Sample ID	Analyte	Result	Unit	Qualifier	Reason
S-3	Chromium	11	mg/kg dw	J	MS recovery was >125%.
S-4	Chromium	22.2	mg/kg dw	J	MS recovery was >125%.
S-5	Chromium	33.8	mg/kg dw	J	MS recovery was >125%.
C-10	Copper	20.8	mg/kg dw	J	Duplicate RPD was >20%.
C-10-S	Copper	16.1	mg/kg dw	J	Duplicate RPD was >20%.
C-6	Copper	15.3	mg/kg dw	J	Duplicate RPD was >20%.
C-6-S	Copper	17.2	mg/kg dw	J	Duplicate RPD was >20%.
C-7	Copper	11.6	mg/kg dw	J	Duplicate RPD was >20%.
C-7-S	Copper	10.7	mg/kg dw	J	Duplicate RPD was >20%.
C-8	Copper	15.8	mg/kg dw	J	Duplicate RPD was >20%.
C-8-S	Copper	19.5	mg/kg dw	J	Duplicate RPD was >20%.
C-9	Copper	19.0	mg/kg dw	J	Duplicate RPD was >20%.
C-9-S	Copper	14.8	mg/kg dw	J	Duplicate RPD was >20%.
S-3	Copper	9.9	mg/kg dw	J	Duplicate RPD was >20%.
S-4	Copper	29.1	mg/kg dw	J	Duplicate RPD was >20%.
S-5	Copper	32.7	mg/kg dw	J	Duplicate RPD was >20%.
C-1	Sulfides	0.91	mg/kg	UJ	Duplicate RPD was >30%.
C-2	Sulfides	6.5	mg/kg	J	Duplicate RPD was >30%.
C-3	Sulfides	580	mg/kg	J	Duplicate RPD was >30%.
C-4	Sulfides	17	mg/kg	J	Duplicate RPD was >30%.
C-5	Sulfides	500	mg/kg	J	Duplicate RPD was >30%.
S-1	Sulfides	11	mg/kg	J	Duplicate RPD was >30%.
S-2	Sulfides	4.9	mg/kg	J	Duplicate RPD was >30%.
S-6	Sulfides	1.3	mg/kg	UJ	Duplicate RPD was >30%.

J Analyte was detected; the reported concentration should be considered an estimate
JB Analyte was detected; the reported concentration should be considered an estimate based on blank contamination
MB Method blank
MRL Method reporting limit
UB Analyte should be considered not detected at the reported concentration based on blank contamination
UJ Analyte was not detected and the reporting limit should be considered an estimate

CHEMISTRY DATA FOR SAMPLES

C-1
C-2
C-3
C-4
C-5
S-1
S-2
S-6

Analytical Resources, Incorporated
Analytical Chemists and Consultants

7 December 2005

David Gillingham
Parametrix, Inc.
411 108th Avenue NE
Suite 1800
Bellevue, WA 98004-5571

RE: Client Project: Bremerton Sediments
ARI Job No. IU50

Dear David:

Please find enclosed the original chain of custody records (COC) and the final results for the samples from the project referenced above. Analytical Resources, Inc accepted thirteen sediment samples intact on November 30, 2005. The samples were received with no discrepancies in the paperwork. The samples were analyzed for SVOAs, pesticides, PCBs, NWTPH-Dx, grain size, total metals and conventional parameters as requested.

A small amount of zinc was detected in the method blank associated with the metals analyses of these samples. Zinc was detected in all samples associated with this blank. Since the concentrations of zinc measured in the samples were significantly greater than the amount found in the blank, no corrective actions were taken.

A matrix spike (MS) and a matrix spike duplicate (MD) were prepared and analyzed for metals in conjunction with sample S-3. The percent recovery for chromium was high following the initial analysis of the MS. The RPD for copper was high following the initial analysis of the MD. Since the percent recoveries for all elements were within acceptable QC limits for the corresponding LCS, it was concluded that the sample matrix and a lack of sample homogeneity were the cause of the high percent recovery and RPD. No corrective actions were taken based on the MS or the MD results.

There were no further problems with these analyses.

A copy of these reports and all associated raw data will be kept on file with ARI. Should you have any questions please feel free to call me at any time.

Sincerely,
ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206/695-6210
mark@arilabs.com

Enclosures
cc: File IU50
MDH/mdh

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 1401	Turn-around Requested:
ARI Client Company: Parametrix	Phone:
Client Contact: David Gillingham	
Client Project Name: Bremerton Sediments	
Client Project #:	Samplers: DG, LL

Page: 1 of 1

Date: 11/21/05 | Ice Present?

No. of Coolers: | Cooler Temps: 6.0 | 3.7

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: metals	SVOC	Pest PCB	TPH-DX	TOC Ammonia TVS	Sulfides	total solids	Grain size	Notes/Comments
C-1	11/21/05	1146	Sed	6	X	X	X	X	X	X	X	X	Archive
C-2		1027		6				X					extra 16oz
C-3		1102		6				X					Glass Jar.
C-4		0950		6				X					Frozen
C-5		1102		6				X					
S-1		1225		6									HCB &
S-2		1258		6									HCBD
S-6		1345		6									with 8081

Comments/Special Instructions

	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: David Gillingham	Printed Name: Fred Branson	Printed Name:	Printed Name:
	Company: Parametrix	Company: ARI	Company:	Company:
	Date & Time: 11/21/05 1640	Date & Time: 11/21/05 - 1640	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Data Reporting Qualifiers

Effective 12/28/04

Inorganic Data

U Indicates that the target analyte was not detected at the reported concentration

* Duplicate RPD is not within established control limits

B Reported value is less than the CRDL but ≥ the Reporting Limit

N Matrix Spike recovery not within established control limits

NA Not Applicable, analyte not spiked

H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible

L Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U Indicates that the target analyte was not detected at the reported concentration

* Flagged value is not within established control limits

B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.

J Estimated concentration when the value is less than ARI's established reporting limits

D The spiked compound was not detected due to sample extract dilution

NR Spiked compound recovery is not reported due to chromatographic interference

E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA The flagged analyte was not analyzed for

NS The flagged analyte was not spiked into the sample

M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

Geotechnical Data

A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.

F Samples were frozen prior to particle size determination

SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations

SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis

W Weight of sample in some pipette aliquots was below the level required for accurate weighting

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: MB-112805
METHOD BLANK

Lab Sample ID: MB-112805
LIMS ID: 05-20013
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA
Date Sampled: NA
Date Received: NA

Date Extracted: 11/28/05
Date Analyzed: 12/01/05 11:25
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.0 g
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: NA
pH: NA

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
67-72-1	Hexachloroethane	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	100	< 100 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**20**	**28**
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: MB-112805
METHOD BLANK

Lab Sample ID: MB-112805
LIMS ID: 05-20013
Matrix: Sediment
Date Analyzed: 12/01/05 11:25

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	76.4%	2-Fluorobiphenyl	78.4%
d14-p-Terphenyl	88.0%	d4-1,2-Dichlorobenzene	74.0%
d5-Phenol	79.5%	2-Fluorophenol	82.7%
2,4,6-Tribromophenol	82.9%	d4-2-Chlorophenol	76.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: C-1
SAMPLE

Lab Sample ID: IU01A
LIMS ID: 05-20006
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 12/01/05 12:29
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 16.1%
pH: 7.0

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**72**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
67-72-1	Hexachloroethane	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	**Di-n-Butylphthalate**	**20**	**19 J**
206-44-0	**Fluoranthene**	**20**	**17 J**
129-00-0	**Pyrene**	**20**	**17 J**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**20**	**16 J**
218-01-9	**Chrysene**	**20**	**15 J**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: C-1**
 SAMPLE

Lab Sample ID: IU01A
LIMS ID: 05-20006
Matrix: Sediment
Date Analyzed: 12/01/05 12:29

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	78.0%	2-Fluorobiphenyl	83.2%
d14-p-Terphenyl	87.2%	d4-1,2-Dichlorobenzene	70.8%
d5-Phenol	79.7%	2-Fluorophenol	86.7%
2,4,6-Tribromophenol	94.4%	d4-2-Chlorophenol	77.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS
Page 1 of 2

Sample ID: C-2
SAMPLE

Lab Sample ID: IU01B
LIMS ID: 05-20007
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 12/01/05 13:01
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 21.8%
pH: 7.5

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**340**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	**4-Methylphenol**	**20**	**12 J**
67-72-1	Hexachloroethane	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	**Acenaphthylene**	**20**	**15 J**
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	**Diethylphthalate**	**20**	**19 J**
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	**Phenanthrene**	**20**	**60**
120-12-7	**Anthracene**	**20**	**19 J**
84-74-2	**Di-n-Butylphthalate**	**20**	**24**
206-44-0	**Fluoranthene**	**20**	**110**
129-00-0	**Pyrene**	**20**	**91**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**44**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**20**	**23 B**
218-01-9	**Chrysene**	**20**	**70**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**60**
207-08-9	**Benzo(k)fluoranthene**	**20**	**52**
50-32-8	**Benzo(a)pyrene**	**20**	**51**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**13 J**
53-70-3	Dibenz(a,h)anthracene	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: C-2
SAMPLE

Lab Sample ID: IU01B
LIMS ID: 05-20007
Matrix: Sediment
Date Analyzed: 12/01/05 13:01

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	20	14 J

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	85.2%	2-Fluorobiphenyl	90.0%
d14-p-Terphenyl	86.4%	d4-1,2-Dichlorobenzene	79.2%
d5-Phenol	90.4%	2-Fluorophenol	98.9%
2,4,6-Tribromophenol	101%	d4-2-Chlorophenol	87.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: C-3
SAMPLE

Lab Sample ID: IU01C
LIMS ID: 05-20008
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 12/01/05 13:33
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 26.0 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 32.6%
pH: 7.5

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	< 19 U
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	**Acenaphthylene**	**19**	**34**
83-32-9	Acenaphthene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	**Diethylphthalate**	**19**	**15 J**
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	96	< 96 U
85-01-8	**Phenanthrene**	**19**	**120**
120-12-7	**Anthracene**	**19**	**56**
84-74-2	**Di-n-Butylphthalate**	**19**	**35**
206-44-0	**Fluoranthene**	**19**	**490**
129-00-0	**Pyrene**	**19**	**380**
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	**Benzo(a)anthracene**	**19**	**180**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**19**	**76 B**
218-01-9	**Chrysene**	**19**	**260**
117-84-0	Di-n-Octyl phthalate	19	< 19 U
205-99-2	**Benzo(b)fluoranthene**	**19**	**230**
207-08-9	**Benzo(k)fluoranthene**	**19**	**210**
50-32-8	**Benzo(a)pyrene**	**19**	**200**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**19**	**42**
53-70-3	**Dibenz(a,h)anthracene**	**19**	**15 J**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: C-3**
Page 2 of 2 **SAMPLE**

Lab Sample ID: IU01C QC Report No: IU01-Parametrix
LIMS ID: 05-20008 Project: BREMERTON SEDIMENTS
Matrix: Sediment NA
Date Analyzed: 12/01/05 13:33

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	19	43

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	82.0%	2-Fluorobiphenyl	87.6%
d14-p-Terphenyl	83.6%	d4-1,2-Dichlorobenzene	73.2%
d5-Phenol	85.6%	2-Fluorophenol	94.1%
2,4,6-Tribromophenol	104%	d4-2-Chlorophenol	83.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: C-4
SAMPLE

Lab Sample ID: IU01D
LIMS ID: 05-20009
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 12/01/05 14:06
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 18.0%
pH: 7.3

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**16 J**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
67-72-1	Hexachloroethane	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	**Acenaphthylene**	**20**	**14 J**
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	97	< 97 U
85-01-8	**Phenanthrene**	**20**	**21**
120-12-7	Anthracene	20	< 20 U
84-74-2	**Di-n-Butylphthalate**	**20**	**21**
206-44-0	**Fluoranthene**	**20**	**70**
129-00-0	**Pyrene**	**20**	**58**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**50**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**20**	**20 B**
218-01-9	**Chrysene**	**20**	**58**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**73**
207-08-9	**Benzo(k)fluoranthene**	**20**	**58**
50-32-8	**Benzo(a)pyrene**	**20**	**71**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**17 J**
53-70-3	Dibenz(a,h)anthracene	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: C-4
SAMPLE

Lab Sample ID: IU01D
LIMS ID: 05-20009
Matrix: Sediment
Date Analyzed: 12/01/05 14:06

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	20	18 J

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	82.4%	2-Fluorobiphenyl	85.2%
d14-p-Terphenyl	86.8%	d4-1,2-Dichlorobenzene	73.6%
d5-Phenol	83.7%	2-Fluorophenol	94.1%
2,4,6-Tribromophenol	100%	d4-2-Chlorophenol	82.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: C-5
SAMPLE

Lab Sample ID: IU01E
LIMS ID: 05-20010
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 12/01/05 14:38
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 32.1%
pH: 7.6

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
67-72-1	Hexachloroethane	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	**Acenaphthylene**	**20**	**41**
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	**Diethylphthalate**	**20**	**10 J**
86-73-7	**Fluorene**	**20**	**21**
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	**Phenanthrene**	**20**	**200**
120-12-7	**Anthracene**	**20**	**130**
84-74-2	**Di-n-Butylphthalate**	**20**	**26**
206-44-0	**Fluoranthene**	**20**	**570**
129-00-0	**Pyrene**	**20**	**480**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**200**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**20**	**76 B**
218-01-9	**Chrysene**	**20**	**270**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**240**
207-08-9	**Benzo(k)fluoranthene**	**20**	**280**
50-32-8	**Benzo(a)pyrene**	**20**	**240**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**55**
53-70-3	**Dibenz(a,h)anthracene**	**20**	**16 J**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: C-5
SAMPLE

Lab Sample ID: IU01E
LIMS ID: 05-20010
Matrix: Sediment
Date Analyzed: 12/01/05 14:38

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	20	55

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	85.6%	2-Fluorobiphenyl	89.6%
d14-p-Terphenyl	88.4%	d4-1,2-Dichlorobenzene	73.6%
d5-Phenol	87.7%	2-Fluorophenol	96.5%
2,4,6-Tribromophenol	107%	d4-2-Chlorophenol	85.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: S-1**
 SAMPLE

Lab Sample ID: IU01F
LIMS ID: 05-20011
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 12/01/05 15:10
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 16.5%
pH: 7.8

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
67-72-1	Hexachloroethane	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	**Phenanthrene**	**20**	**16 J**
120-12-7	Anthracene	20	< 20 U
84-74-2	**Di-n-Butylphthalate**	**20**	**24**
206-44-0	**Fluoranthene**	**20**	**40**
129-00-0	**Pyrene**	**20**	**26**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**13 J**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**20**	**24 B**
218-01-9	**Chrysene**	**20**	**17 J**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**24**
207-08-9	**Benzo(k)fluoranthene**	**20**	**14 J**
50-32-8	**Benzo(a)pyrene**	**20**	**16 J**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: S-1
SAMPLE

Lab Sample ID: IU01F
LIMS ID: 05-20011
Matrix: Sediment
Date Analyzed: 12/01/05 15:10

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	84.8%	2-Fluorobiphenyl	90.0%
d14-p-Terphenyl	93.2%	d4-1,2-Dichlorobenzene	75.2%
d5-Phenol	86.4%	2-Fluorophenol	95.2%
2,4,6-Tribromophenol	109%	d4-2-Chlorophenol	85.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS
Page 1 of 2

Sample ID: S-2
SAMPLE

Lab Sample ID: IU01G
LIMS ID: 05-20012
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 12/01/05 15:42
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 15.7%
pH: 7.4

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**14 J**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
67-72-1	Hexachloroethane	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	**Naphthalene**	**20**	**16 J**
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	**Acenaphthylene**	**20**	**19 J**
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	**Diethylphthalate**	**20**	**16 J**
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	**Phenanthrene**	**20**	**64**
120-12-7	**Anthracene**	**20**	**12 J**
84-74-2	**Di-n-Butylphthalate**	**20**	**22**
206-44-0	**Fluoranthene**	**20**	**100**
129-00-0	**Pyrene**	**20**	**81**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**37**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**20**	**35 B**
218-01-9	**Chrysene**	**20**	**45**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**78**
207-08-9	**Benzo(k)fluoranthene**	**20**	**53**
50-32-8	**Benzo(a)pyrene**	**20**	**61**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**15 J**
53-70-3	Dibenz(a,h)anthracene	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: S-2
SAMPLE

Lab Sample ID: IU01G
LIMS ID: 05-20012
Matrix: Sediment
Date Analyzed: 12/01/05 15:42

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	20	13 J

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	82.4%	2-Fluorobiphenyl	87.6%
d14-p-Terphenyl	89.6%	d4-1,2-Dichlorobenzene	75.6%
d5-Phenol	85.1%	2-Fluorophenol	93.6%
2,4,6-Tribromophenol	102%	d4-2-Chlorophenol	84.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: S-6**
 SAMPLE

Lab Sample ID: IU01H
LIMS ID: 05-20013
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 12/01/05 16:15
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 14.6%
pH: 7.9

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**19**	**22**
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	**Diethylphthalate**	**19**	**12 J**
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	97	< 97 U
85-01-8	Phenanthrene	19	< 19 U
120-12-7	Anthracene	19	< 19 U
84-74-2	**Di-n-Butylphthalate**	**19**	**24**
206-44-0	**Fluoranthene**	**19**	**17 J**
129-00-0	**Pyrene**	**19**	**11 J**
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	Benzo(a)anthracene	19	< 19 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**19**	**16 JB**
218-01-9	**Chrysene**	**19**	**13 J**
117-84-0	Di-n-Octyl phthalate	19	< 19 U
205-99-2	**Benzo(b)fluoranthene**	**19**	**10 J**
207-08-9	**Benzo(k)fluoranthene**	**19**	**15 J**
50-32-8	Benzo(a)pyrene	19	< 19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: S-6**
 SAMPLE

Lab Sample ID: IU01H
LIMS ID: 05-20013
Matrix: Sediment
Date Analyzed: 12/01/05 16:15

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	76.0%	2-Fluorobiphenyl	83.2%
d14-p-Terphenyl	86.8%	d4-1,2-Dichlorobenzene	67.2%
d5-Phenol	77.6%	2-Fluorophenol	83.2%
2,4,6-Tribromophenol	92.8%	d4-2-Chlorophenol	75.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS
Page 1 of 2

Sample ID: S-6
MATRIX SPIKE

Lab Sample ID: IU01H
LIMS ID: 05-20013
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 12/01/05 16:47
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 26.0 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 14.6%
pH: 7.9

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	---
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	---
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	---
91-20-3	Naphthalene	19	< 19 U
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	---
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	**Diethylphthalate**	**19**	**12 J**
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	96	---
85-01-8	Phenanthrene	19	< 19 U
120-12-7	Anthracene	19	< 19 U
84-74-2	**Di-n-Butylphthalate**	**19**	**22**
206-44-0	Fluoranthene	19	< 19 U
129-00-0	Pyrene	19	---
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	Benzo(a)anthracene	19	< 19 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**19**	**16 JB**
218-01-9	Chrysene	19	< 19 U
117-84-0	Di-n-Octyl phthalate	19	< 19 U
205-99-2	Benzo(b)fluoranthene	19	< 19 U
207-08-9	Benzo(k)fluoranthene	19	< 19 U
50-32-8	Benzo(a)pyrene	19	< 19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: S-6
MATRIX SPIKE

Lab Sample ID: IU01H
LIMS ID: 05-20013
Matrix: Sediment
Date Analyzed: 12/01/05 16:47

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	84.8%	2-Fluorobiphenyl	90.4%
d14-p-Terphenyl	94.8%	d4-1,2-Dichlorobenzene	76.4%
d5-Phenol	86.4%	2-Fluorophenol	98.1%
2,4,6-Tribromophenol	91.2%	d4-2-Chlorophenol	86.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: S-6
MATRIX SPIKE DUPLICATE

Lab Sample ID: IU01H
LIMS ID: 05-20013
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 12/01/05 17:19
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 26.0 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 14.6%
pH: 7.9

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	---
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	---
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	---
91-20-3	Naphthalene	19	< 19 U
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	---
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	Diethylphthalate	19	< 19 U
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	96	---
85-01-8	Phenanthrene	19	< 19 U
120-12-7	Anthracene	19	< 19 U
84-74-2	**Di-n-Butylphthalate**	**19**	**18 J**
206-44-0	Fluoranthene	19	< 19 U
129-00-0	Pyrene	19	---
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	Benzo(a)anthracene	19	< 19 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**19**	**18 JB**
218-01-9	Chrysene	19	< 19 U
117-84-0	Di-n-Octyl phthalate	19	< 19 U
205-99-2	Benzo(b)fluoranthene	19	< 19 U
207-08-9	Benzo(k)fluoranthene	19	< 19 U
50-32-8	Benzo(a)pyrene	19	< 19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: S-6
MATRIX SPIKE DUPLICATE

Lab Sample ID: IU01H
LIMS ID: 05-20013
Matrix: Sediment
Date Analyzed: 12/01/05 17:19

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
NA

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	78.4%	2-Fluorobiphenyl	84.8%
d14-p-Terphenyl	87.6%	d4-1,2-Dichlorobenzene	68.4%
d5-Phenol	81.1%	2-Fluorophenol	90.1%
2,4,6-Tribromophenol	92.5%	d4-2-Chlorophenol	79.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS
Page 1 of 1

Sample ID: S-6
MS/MSD

Lab Sample ID: IU01H
LIMS ID: 05-20013
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted MS/MSD: 11/28/05

Sample Amount MS: 26.0 g-dry-wt
MSD: 26.0 g-dry-wt

Date Analyzed MS: 12/01/05 16:47
MSD: 12/01/05 17:19

Final Extract Volume MS: 0.5 mL
MSD: 0.5 mL

Instrument/Analyst MS: NT6/PK
MSD: NT6/PK

Dilution Factor MS: 1.00
MSD: 1.00

GPC Cleanup: NO

Percent Moisture: 14.6%
pH: 7.9

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Phenol	21.5	645	723	86.2%	590	723	78.6%	8.9%
1,4-Dichlorobenzene	< 19.4	395	482	82.0%	352	482	73.0%	11.5%
1,2,4-Trichlorobenzene	< 19.4	438	482	90.9%	400	482	83.0%	9.1%
Acenaphthene	< 19.4	486	482	101%	452	482	93.8%	7.2%
Pentachlorophenol	< 96.8	417	723	57.7%	388	723	53.7%	7.2%
Pyrene	11.4	476	482	96.4%	438	482	88.5%	8.3%

Results reported in µg/kg
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: LCS-112805**
Page 1 of 1 **LAB CONTROL**

Lab Sample ID: LCS-112805
LIMS ID: 05-20013
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS
Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 12/01/05 11:57
Instrument/Analyst: NT6/PK
GPC Cleanup: NO

Sample Amount: 25.0 g
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: NA
pH: NA

Analyte	Lab Control	Spike Added	Recovery
Phenol	603	750	80.4%
1,4-Dichlorobenzene	387	500	77.4%
1,2,4-Trichlorobenzene	414	500	82.8%
Acenaphthene	428	500	85.6%
Pentachlorophenol	614	750	81.9%
Pyrene	442	500	88.4%

Semivolatile Surrogate Recovery

d5-Nitrobenzene	76.0%
2-Fluorobiphenyl	81.2%
d14-p-Terphenyl	88.8%
d4-1,2-Dichlorobenzene	74.4%
d5-Phenol	80.3%
2-Fluorophenol	83.5%
2,4,6-Tribromophenol	82.1%
d4-2-Chlorophenol	77.3%

Results reported in µg/kg

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: MB-112805
METHOD BLANK

Lab Sample ID: MB-112805
LIMS ID: 05-20012
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: NA
Date Received: NA

Date Extracted: 11/28/05
Date Analyzed: 11/29/05 14:30
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 25.0 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: NA
Percent Moisture: NA

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	1.0	< 1.0 U
76-44-8	Heptachlor	1.0	< 1.0 U
309-00-2	Aldrin	1.0	< 1.0 U
60-57-1	Dieldrin	2.0	< 2.0 U
72-55-9	4,4'-DDE	2.0	< 2.0 U
72-54-8	4,4'-DDD	2.0	< 2.0 U
50-29-3	4,4'-DDT	2.0	< 2.0 U
5103-74-2	gamma Chlordane	1.0	< 1.0 U
5103-71-9	alpha Chlordane	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	1.0	< 1.0 U
87-68-3	Hexachlorobutadiene	1.0	< 1.0 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	122%
Tetrachlorometaxylene	96.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: C-1
SAMPLE

Lab Sample ID: IU01A
LIMS ID: 05-20006
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/29/05 15:34
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: 7.0
Percent Moisture: 16.1%

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	0.99	< 0.99 U
76-44-8	Heptachlor	0.99	< 0.99 U
309-00-2	Aldrin	0.99	< 0.99 U
60-57-1	Dieldrin	2.0	< 2.0 U
72-55-9	4,4'-DDE	2.0	< 2.0 U
72-54-8	4,4'-DDD	2.0	< 2.0 U
50-29-3	4,4'-DDT	2.0	< 2.0 U
5103-74-2	gamma Chlordane	0.99	< 0.99 U
5103-71-9	alpha Chlordane	0.99	< 0.99 U
118-74-1	Hexachlorobenzene	0.99	< 0.99 U
87-68-3	Hexachlorobutadiene	0.99	< 0.99 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	118%
Tetrachlorometaxylene	60.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: C-2
SAMPLE

Lab Sample ID: IU01B
LIMS ID: 05-20007
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/29/05 16:06
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: 7.5
Percent Moisture: 21.8%

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	0.99	< 0.99 U
76-44-8	Heptachlor	0.99	< 0.99 U
309-00-2	Aldrin	0.99	< 0.99 U
60-57-1	Dieldrin	2.0	< 2.0 U
72-55-9	4,4'-DDE	2.0	< 2.0 U
72-54-8	4,4'-DDD	2.0	< 2.0 U
50-29-3	4,4'-DDT	2.0	< 2.0 U
5103-74-2	gamma Chlordane	0.99	< 0.99 U
5103-71-9	alpha Chlordane	0.99	< 0.99 U
118-74-1	Hexachlorobenzene	0.99	< 0.99 U
87-68-3	Hexachlorobutadiene	0.99	< 0.99 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery	
Decachlorobiphenyl	101%
Tetrachlorometaxylene	82.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD

Sample ID: C-3
SAMPLE

Lab Sample ID: IU01C
LIMS ID: 05-20008
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/29/05 16:38
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: 7.5
Percent Moisture: 32.6%

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	0.98	< 0.98 U
76-44-8	Heptachlor	0.98	< 0.98 U
309-00-2	Aldrin	0.98	< 0.98 U
60-57-1	Dieldrin	2.0	< 2.0 U
72-55-9	4,4'-DDE	2.0	< 2.0 U
72-54-8	4,4'-DDD	2.0	< 2.0 U
50-29-3	4,4'-DDT	2.0	< 2.0 U
5103-74-2	gamma Chlordane	0.98	< 0.98 U
5103-71-9	alpha Chlordane	0.98	< 0.98 U
118-74-1	Hexachlorobenzene	0.98	< 0.98 U
87-68-3	Hexachlorobutadiene	0.98	< 0.98 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	108%
Tetrachlorometaxylene	84.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: C-4
SAMPLE

Lab Sample ID: IU01D
LIMS ID: 05-20009
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/29/05 17:10
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: 7.3
Percent Moisture: 18.0%

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	0.97	< 0.97 U
76-44-8	Heptachlor	0.97	< 0.97 U
309-00-2	Aldrin	0.97	< 0.97 U
60-57-1	Dieldrin	2.0	< 2.0 U
72-55-9	4,4'-DDE	2.0	< 2.0 U
72-54-8	4,4'-DDD	2.0	< 2.0 U
50-29-3	4,4'-DDT	2.0	< 2.0 U
5103-74-2	gamma Chlordane	0.97	< 0.97 U
5103-71-9	alpha Chlordane	0.97	< 0.97 U
118-74-1	Hexachlorobenzene	0.97	< 0.97 U
87-68-3	Hexachlorobutadiene	0.97	< 0.97 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	109%
Tetrachlorometaxylene	81.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD

Sample ID: C-5
SAMPLE

Lab Sample ID: IU01E
LIMS ID: 05-20010
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/29/05 17:42
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 22.2 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: 7.6
Percent Moisture: 32.1%

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	1.1	< 1.1 U
76-44-8	Heptachlor	1.1	< 1.1 U
309-00-2	Aldrin	1.1	< 1.1 U
60-57-1	Dieldrin	2.2	< 2.2 U
72-55-9	4,4'-DDE	2.2	< 2.2 U
72-54-8	4,4'-DDD	2.2	< 2.2 U
50-29-3	4,4'-DDT	2.2	< 2.2 U
5103-74-2	gamma Chlordane	1.1	< 1.1 U
5103-71-9	alpha Chlordane	1.1	< 1.1 U
118-74-1	Hexachlorobenzene	1.1	< 1.1 U
87-68-3	Hexachlorobutadiene	1.1	< 1.1 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery	
Decachlorobiphenyl	100%
Tetrachlorometaxylene	90.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD

Sample ID: S-1
SAMPLE

Lab Sample ID: IU01F
LIMS ID: 05-20011
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/29/05 18:15
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 25.1 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: 7.8
Percent Moisture: 16.5%

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	1.0	< 1.0 U
76-44-8	Heptachlor	1.0	< 1.0 U
309-00-2	Aldrin	1.0	< 1.0 U
60-57-1	Dieldrin	2.0	< 2.0 U
72-55-9	4,4'-DDE	2.0	< 2.0 U
72-54-8	4,4'-DDD	2.0	< 2.0 U
50-29-3	4,4'-DDT	2.0	< 2.0 U
5103-74-2	gamma Chlordane	1.0	< 1.0 U
5103-71-9	alpha Chlordane	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	1.0	< 1.0 U
87-68-3	Hexachlorobutadiene	1.0	< 1.0 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	100%
Tetrachlorometaxylene	84.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: S-2
SAMPLE

Lab Sample ID: IU01G
LIMS ID: 05-20012
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/29/05 18:47
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 26.0 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: 7.4
Percent Moisture: 15.7%

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	0.96	< 0.96 U
76-44-8	Heptachlor	0.96	< 0.96 U
309-00-2	Aldrin	0.96	< 0.96 U
60-57-1	Dieldrin	1.9	< 1.9 U
72-55-9	4,4'-DDE	1.9	< 1.9 U
72-54-8	4,4'-DDD	1.9	< 1.9 U
50-29-3	4,4'-DDT	1.9	< 1.9 U
5103-74-2	gamma Chlordane	0.96	< 0.96 U
5103-71-9	alpha Chlordane	0.96	< 0.96 U
118-74-1	Hexachlorobenzene	0.96	< 0.96 U
87-68-3	Hexachlorobutadiene	0.96	< 0.96 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	95.5%
Tetrachlorometaxylene	78.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: S-2
MATRIX SPIKE

Lab Sample ID: IU01G
LIMS ID: 05-20012
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/29/05 19:19
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: 7.4
Percent Moisture: 15.7%

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	0.98	---
76-44-8	Heptachlor	0.98	---
309-00-2	Aldrin	0.98	---
60-57-1	Dieldrin	2.0	---
72-55-9	4,4'-DDE	2.0	< 2.0 U
72-54-8	4,4'-DDD	2.0	< 2.0 U
50-29-3	4,4'-DDT	2.0	---
5103-74-2	gamma Chlordane	0.98	< 0.98 U
5103-71-9	alpha Chlordane	0.98	< 0.98 U
118-74-1	Hexachlorobenzene	0.98	---
87-68-3	Hexachlorobutadiene	0.98	---

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	121%
Tetrachlorometaxylene	88.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: S-2
MATRIX SPIKE DUP

Lab Sample ID: IU01G
LIMS ID: 05-20012
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/29/05 19:51
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 25.9 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: 7.4
Percent Moisture: 15.7%

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	0.97	---
76-44-8	Heptachlor	0.97	---
309-00-2	Aldrin	0.97	---
60-57-1	Dieldrin	1.9	---
72-55-9	4,4'-DDE	1.9	< 1.9 U
72-54-8	4,4'-DDD	1.9	< 1.9 U
50-29-3	4,4'-DDT	1.9	---
5103-74-2	gamma Chlordane	0.97	< 0.97 U
5103-71-9	alpha Chlordane	0.97	< 0.97 U
118-74-1	Hexachlorobenzene	0.97	---
87-68-3	Hexachlorobutadiene	0.97	---

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	92.0%
Tetrachlorometaxylene	81.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: S-2
MS/MSD

Lab Sample ID: IU01G
LIMS ID: 05-20012
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted MS/MSD: 11/28/05

Date Analyzed MS: 11/29/05 19:19
MSD: 11/29/05 19:51
Instrument/Analyst MS: ECD3/YZ
MSD: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount MS: 25.4 g-dry-wt
MSD: 25.9 g-dry-wt
Final Extract Volume MS: 5.0 mL
MSD: 5.0 mL
Dilution Factor MS: 1.00
MSD: 1.00
Silica Gel: Yes
pH: 7.4
Percent Moisture: 15.7%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
gamma-BHC (Lindane)	< 0.961	7.67	9.84	77.9%	6.55	9.66	67.8%	15.8%
Heptachlor	< 0.961	8.85	9.84	89.9%	7.57	9.66	78.4%	15.6%
Aldrin	< 0.961	8.50	9.84	86.4%	7.76	9.66	80.3%	9.1%
Dieldrin	< 1.92	15.9	19.7	80.7%	13.8	19.3	71.5%	14.1%
4,4'-DDT	< 1.92	19.1	19.7	97.0%	17.0	19.3	88.1%	11.6%
Hexachlorobenzene	< 0.961	8.68	9.84	88.2%	7.45	9.66	77.1%	15.3%
Hexachlorobutadiene	< 0.961	7.99	9.84	81.2%	7.40	9.66	76.6%	7.7%

Reported in µg/kg (ppb)
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD

Sample ID: S-6
SAMPLE

Lab Sample ID: IU01H
LIMS ID: 05-20013
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/29/05 20:23
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: 7.9
Percent Moisture: 14.6%

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	0.97	< 0.97 U
76-44-8	Heptachlor	0.97	< 0.97 U
309-00-2	Aldrin	0.97	< 0.97 U
60-57-1	Dieldrin	1.9	< 1.9 U
72-55-9	4,4'-DDE	1.9	< 1.9 U
72-54-8	4,4'-DDD	1.9	< 1.9 U
50-29-3	4,4'-DDT	1.9	< 1.9 U
5103-74-2	gamma Chlordane	0.97	< 0.97 U
5103-71-9	alpha Chlordane	0.97	< 0.97 U
118-74-1	Hexachlorobenzene	0.97	< 0.97 U
87-68-3	Hexachlorobutadiene	0.97	< 0.97 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	91.2%
Tetrachlorometaxylene	79.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD

Sample ID: LCS-112805
LAB CONTROL

Lab Sample ID: LCS-112805
LIMS ID: 05-20012
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/29/05 15:02
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: NA
Percent Moisture: NA

Analyte	Lab Control	Spike Added	Recovery
gamma-BHC (Lindane)	3.52	4.00	88.0%
Heptachlor	3.32	4.00	83.0%
Aldrin	3.40	4.00	85.0%
Dieldrin	7.20	8.00	90.0%
4,4'-DDE	7.50	8.00	93.8%
4,4'-DDD	7.14	8.00	89.2%
4,4'-DDT	7.02	8.00	87.8%
gamma Chlordane	3.50	4.00	87.5%
alpha Chlordane	3.54	4.00	88.5%
Hexachlorobenzene	3.66	4.00	91.5%
Hexachlorobutadiene	2.94	4.00	73.5%

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	91.8%
Tetrachlorometaxylene	88.5%

Reported in µg/kg (ppb)

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: MB-112805
METHOD BLANK

Lab Sample ID: MB-112805
LIMS ID: 05-20006
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: NA
Date Received: NA

Date Extracted: 11/28/05
Date Analyzed: 11/30/05 02:15
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: NA
Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	Aroclor 1254	20	< 20 U
11096-82-5	Aroclor 1260	20	< 20 U
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	91.5%
Tetrachlorometaxylene	91.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: C-1
SAMPLE

Lab Sample ID: IU01A
LIMS ID: 05-20006
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/30/05 04:05
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 7.0
Percent Moisture: 16.1%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	Aroclor 1254	20	< 20 U
11096-82-5	Aroclor 1260	20	< 20 U
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	90.2%
Tetrachlorometaxylene	92.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: C-1
MATRIX SPIKE

Lab Sample ID: IU01A
LIMS ID: 05-20006
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/30/05 04:23
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 7.0
Percent Moisture: 16.1%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	---
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	Aroclor 1254	20	< 20 U
11096-82-5	Aroclor 1260	20	---
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	92.5%
Tetrachlorometaxylene	93.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: C-1
MATRIX SPIKE DUP

Lab Sample ID: IU01A
LIMS ID: 05-20006
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/30/05 04:41
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 7.0
Percent Moisture: 16.1%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	---
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	Aroclor 1254	20	< 20 U
11096-82-5	Aroclor 1260	20	---
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	84.2%
Tetrachlorometaxylene	84.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: C-1
MS/MSD

Lab Sample ID: IU01A
LIMS ID: 05-20006
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted MS/MSD: 11/28/05

Date Analyzed MS: 11/30/05 04:23
MSD: 11/30/05 04:41
Instrument/Analyst MS: ECD5/LJR
MSD: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount MS: 25.5 g-dry-wt
MSD: 25.4 g-dry-wt
Final Extract Volume MS: 5.0 mL
MSD: 5.0 mL
Dilution Factor MS: 1.00
MSD: 1.00
Silica Gel: No
pH: 7.0
Percent Moisture: 16.1%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Aroclor 1016	< 19.7 U	104	100	104%	109	101	108%	4.7%
Aroclor 1260	< 19.7 U	87.4	100	87.4%	81.5	101	80.7%	7.0%

Results reported in µg/kg (ppb)
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: C-2
SAMPLE

Lab Sample ID: IU01B
LIMS ID: 05-20007
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/30/05 04:59
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 7.5
Percent Moisture: 21.8%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	Aroclor 1254	20	< 20 U
11096-82-5	Aroclor 1260	20	< 20 U
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	92.0%
Tetrachlorometaxylene	87.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: C-3
SAMPLE

Lab Sample ID: IU01C
LIMS ID: 05-20008
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/30/05 05:17
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 7.5
Percent Moisture: 32.6%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	19	< 19 U
53469-21-9	Aroclor 1242	19	< 19 U
12672-29-6	Aroclor 1248	19	< 19 U
11097-69-1	Aroclor 1254	19	< 19 U
11096-82-5	**Aroclor 1260**	**19**	**70**
11104-28-2	Aroclor 1221	19	< 19 U
11141-16-5	Aroclor 1232	19	< 19 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	93.2%
Tetrachlorometaxylene	83.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: C-4
SAMPLE

Lab Sample ID: IU01D
LIMS ID: 05-20009
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/30/05 05:35
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 7.3
Percent Moisture: 18.0%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	19	< 19 U
53469-21-9	Aroclor 1242	19	< 19 U
12672-29-6	Aroclor 1248	19	< 19 U
11097-69-1	Aroclor 1254	19	< 19 U
11096-82-5	Aroclor 1260	19	< 19 U
11104-28-2	Aroclor 1221	19	< 19 U
11141-16-5	Aroclor 1232	19	< 19 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	93.8%
Tetrachlorometaxylene	82.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: C-5
SAMPLE

Lab Sample ID: IU01E
LIMS ID: 05-20010
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/30/05 05:54
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 7.6
Percent Moisture: 32.1%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	Aroclor 1254	20	< 20 U
11096-82-5	Aroclor 1260	20	< 20 U
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	89.0%
Tetrachlorometaxylene	84.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: S-1
SAMPLE

Lab Sample ID: IU01F
LIMS ID: 05-20011
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/30/05 06:12
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 7.8
Percent Moisture: 16.5%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	Aroclor 1254	20	< 20 U
11096-82-5	Aroclor 1260	20	< 20 U
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	96.5%
Tetrachlorometaxylene	83.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: S-2
SAMPLE

Lab Sample ID: IU01G
LIMS ID: 05-20012
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/30/05 06:30
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 7.4
Percent Moisture: 15.7%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	Aroclor 1254	20	< 20 U
11096-82-5	Aroclor 1260	20	< 20 U
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	99.2%
Tetrachlorometaxylene	93.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: S-6
SAMPLE

Lab Sample ID: IU01H
LIMS ID: 05-20013
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted: 11/28/05
Date Analyzed: 11/30/05 06:48
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.9 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 7.9
Percent Moisture: 14.6%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	19	< 19 U
53469-21-9	Aroclor 1242	19	< 19 U
12672-29-6	Aroclor 1248	19	< 19 U
11097-69-1	Aroclor 1254	19	< 19 U
11096-82-5	Aroclor 1260	19	< 19 U
11104-28-2	Aroclor 1221	19	< 19 U
11141-16-5	Aroclor 1232	19	< 19 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	87.2%
Tetrachlorometaxylene	88.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: LCS-112805
LAB CONTROL

Lab Sample ID: LCS-112805
LIMS ID: 05-20006
Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: NA
Date Received: NA

Date Extracted: 11/28/05
Date Analyzed: 11/30/05 02:33
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: NA
Percent Moisture: NA

Analyte	Lab Control	Spike Added	Recovery
Aroclor 1016	89.3	102	87.5%
Aroclor 1260	88.9	102	87.2%

PCB Surrogate Recovery

Decachlorobiphenyl	93.8%
Tetrachlorometaxylene	88.8%

Results reported in µg/kg (ppb)

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID
Page 1 of 1
Matrix: Sediment

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Received: 11/21/05

Data Release Authorized:
Reported: 11/28/05

ARI ID	Sample ID	Extraction Date	Analysis Date	DL	Range	Result
MB-112205	Method Blank	11/22/05	11/23/05	1.0	Diesel	< 5.0 U
05-20006	HC ID: ---		FID3A		Motor Oil	< 10 U
					o-Terphenyl	92.0%
IU01A	C-1	11/22/05	11/23/05	1.0	Diesel	< 6.0 U
05-20006	HC ID: **MOTOR OIL**		FID3A		**Motor Oil**	**17**
					o-Terphenyl	94.0%
IU01B	C-2	11/22/05	11/25/05	1.0	**Diesel**	**25**
05-20007	HC ID: **DRO/MOTOR OIL**		FID3A		**Motor Oil**	**140**
					o-Terphenyl	83.6%
IU01C	C-3	11/22/05	11/25/05	1.0	**Diesel**	**27**
05-20008	HC ID: **DRO/MOTOR OIL**		FID3A		**Motor Oil**	**110**
					o-Terphenyl	75.6%
IU01D	C-4	11/22/05	11/23/05	1.0	**Diesel**	**20**
05-20009	HC ID: **DRO/RRO**		FID3A		**Motor Oil**	**50**
					o-Terphenyl	87.1%
IU01E	C-5	11/22/05	11/25/05	1.0	**Diesel**	**40**
05-20010	HC ID: **DRO/MOTOR OIL**		FID3A		**Motor Oil**	**160**
					o-Terphenyl	84.9%
IU01E DP	C-5	11/22/05	11/25/05	1.0	**Diesel**	**35**
05-20010	HC ID: **DRO/MOTOR OIL**		FID3A		RPD:	13.3%
					Motor Oil	**140**
					RPD:	13.3%
					o-Terphenyl	89.3%

Reported in mg/kg (ppm)

Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.
HC ID: DRO/RRO indicates results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID
Page 1 of 1

Sample ID: C-1
MS/MSD

Lab Sample ID: IU01A
LIMS ID: 05-20006
Matrix: Sediment
Data Release Authorized:
Reported: 11/28/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Date Extracted MS/MSD: 11/22/05

Sample Amount MS: 8.41 g-dry-wt
MSD: 8.40 g-dry-wt

Date Analyzed MS: 11/23/05 17:59
MSD: 11/23/05 18:14

Final Extract Volume MS: 1.0 mL
MSD: 1.0 mL

Instrument/Analyst MS: FID3A/JGR
MSD: FID3A/JGR

Dilution Factor MS: 1.00
MSD: 1.00

Percent Moisture: 16.1%

Range	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Diesel	< 6.0 U	179	178	101%	186	179	104%	3.8%

Results reported in mg/kg
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID
Page 1 of 1

Sample ID: LCS-112205
LAB CONTROL

Lab Sample ID: LCS-112205
LIMS ID: 05-20006
Matrix: Sediment
Data Release Authorized:
Reported: 11/28/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: NA
Date Received: NA

Date Extracted: 11/22/05
Date Analyzed: 11/23/05 17:30
Instrument/Analyst: FID3A/JGR

Sample Amount: 10.0 g
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

Range	Lab Control	Spike Added	Recovery
Diesel	142	150	94.7%

TPHD Surrogate Recovery

o-Terphenyl	93.6%

Results reported in mg/kg

METHOD BLANK RESULTS-CONVENTIONALS
IU01-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

Project: BREMERTON SEDIMENTS
Event: NA
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	11/22/05	Percent	< 0.01 U
Preserved Total Solids	11/22/05	Percent	< 0.01 U
Total Volatile Solids	11/22/05	Percent	< 0.01 U
N-Ammonia	11/23/05	mg-N/kg	0.15
Sulfide	11/22/05	mg/kg	< 1.0 U
Total Organic Carbon	11/25/05 11/28/05	Percent	< 0.020 U < 0.020 U

SAMPLE RESULTS-CONVENTIONALS
IU01-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

Project: BREMERTON SEDIMENTS
Event: NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Client ID: C-1
ARI ID: 05-20006 IU01A

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/22/05 112205#1	EPA 160.3	Percent	0.01	77.00
Preserved Total Solids	11/22/05 112205#1	EPA 160.3	Percent	0.01	76.70
Total Volatile Solids	11/22/05 112205#1	EPA 160.4	Percent	0.01	1.23
N-Ammonia	11/23/05 112305#1	EPA 350.1M	mg-N/kg	0.12	6.97
Sulfide	11/22/05 112205#1	EPA 376.2	mg/kg	0.91	< 0.91 U
Total Organic Carbon	11/25/05 112505#1	Plumb,1981	Percent	0.020	0.593

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
IU01-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

Project: BREMERTON SEDIMENTS
Event: NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Client ID: C-2
ARI ID: 05-20007 IU01B

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/22/05 112205#1	EPA 160.3	Percent	0.01	74.90
Preserved Total Solids	11/22/05 112205#1	EPA 160.3	Percent	0.01	72.30
Total Volatile Solids	11/22/05 112205#1	EPA 160.4	Percent	0.01	2.15
N-Ammonia	11/23/05 112305#1	EPA 350.1M	mg-N/kg	0.13	13.0
Sulfide	11/22/05 112205#1	EPA 376.2	mg/kg	1.3	6.5
Total Organic Carbon	11/28/05 112805#1	Plumb,1981	Percent	0.020	0.810

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
IU01-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

Project: BREMERTON SEDIMENTS
Event: NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Client ID: C-3
ARI ID: 05-20008 IU01C

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/22/05 112205#1	EPA 160.3	Percent	0.01	63.20
Preserved Total Solids	11/22/05 112205#1	EPA 160.3	Percent	0.01	59.20
Total Volatile Solids	11/22/05 112205#1	EPA 160.4	Percent	0.01	2.86
N-Ammonia	11/23/05 112305#1	EPA 350.1M	mg-N/kg	0.16	9.92
Sulfide	11/22/05 112205#1	EPA 376.2	mg/kg	79	580
Total Organic Carbon	11/25/05 112505#1	Plumb,1981	Percent	0.020	1.65

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
IU01-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

Project: BREMERTON SEDIMENTS
Event: NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Client ID: C-4
ARI ID: 05-20009 IU01D

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/22/05 112205#1	EPA 160.3	Percent	0.01	74.10
Preserved Total Solids	11/22/05 112205#1	EPA 160.3	Percent	0.01	73.80
Total Volatile Solids	11/22/05 112205#1	EPA 160.4	Percent	0.01	1.59
N-Ammonia	11/23/05 112305#1	EPA 350.1M	mg-N/kg	0.13	6.51
Sulfide	11/22/05 112205#1	EPA 376.2	mg/kg	1.3	17
Total Organic Carbon	11/25/05 112505#1	Plumb,1981	Percent	0.020	0.468

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
IU01-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

Project: BREMERTON SEDIMENTS
Event: NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Client ID: C-5
ARI ID: 05-20010 IU01E

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/22/05 112205#1	EPA 160.3	Percent	0.01	62.70
Preserved Total Solids	11/22/05 112205#1	EPA 160.3	Percent	0.01	64.90
Total Volatile Solids	11/22/05 112205#1	EPA 160.4	Percent	0.01	3.13
N-Ammonia	11/23/05 112305#1	EPA 350.1M	mg-N/kg	0.16	10.5
Sulfide	11/22/05 112205#1	EPA 376.2	mg/kg	46	500
Total Organic Carbon	11/25/05 112505#1	Plumb,1981	Percent	0.020	2.24

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
IU01-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

Project: BREMERTON SEDIMENTS
Event: NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Client ID: S-1
ARI ID: 05-20011 IU01F

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/22/05 112205#1	EPA 160.3	Percent	0.01	78.50
Preserved Total Solids	11/22/05 112205#1	EPA 160.3	Percent	0.01	77.10
Total Volatile Solids	11/22/05 112205#1	EPA 160.4	Percent	0.01	1.60
N-Ammonia	11/23/05 112305#1	EPA 350.1M	mg-N/kg	0.13	7.28
Sulfide	11/22/05 112205#1	EPA 376.2	mg/kg	1.1	11
Total Organic Carbon	11/28/05 112805#1	Plumb,1981	Percent	0.020	0.461

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
IU01-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

Project: BREMERTON SEDIMENTS
Event: NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Client ID: S-2
ARI ID: 05-20012 IU01G

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/22/05 112205#1	EPA 160.3	Percent	0.01	80.60
Preserved Total Solids	11/22/05 112205#1	EPA 160.3	Percent	0.01	77.10
Total Volatile Solids	11/22/05 112205#1	EPA 160.4	Percent	0.01	1.75
N-Ammonia	11/23/05 112305#1	EPA 350.1M	mg-N/kg	0.12	4.95
Sulfide	11/22/05 112205#1	EPA 376.2	mg/kg	1.3	4.9
Total Organic Carbon	11/28/05 112805#1	Plumb,1981	Percent	0.020	0.409

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
IU01-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

Project: BREMERTON SEDIMENTS
Event: NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Client ID: S-6
ARI ID: 05-20013 IU01H

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/22/05 112205#1	EPA 160.3	Percent	0.01	76.60
Preserved Total Solids	11/22/05 112205#1	EPA 160.3	Percent	0.01	73.70
Total Volatile Solids	11/22/05 112205#1	EPA 160.4	Percent	0.01	1.26
N-Ammonia	11/23/05 112305#1	EPA 350.1M	mg-N/kg	0.13	4.28
Sulfide	11/22/05 112205#1	EPA 376.2	mg/kg	1.3	< 1.3 U
Total Organic Carbon	11/25/05 112505#1	Plumb,1981	Percent	0.020	0.426

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

REPLICATE RESULTS-CONVENTIONALS
IU01-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

Project: BREMERTON SEDIMENTS
Event: NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: IU01A Client ID: C-1					
N-Ammonia	11/23/05	mg-N/kg	6.97	7.44	6.5%
ARI ID: IU01C Client ID: C-3					
Total Solids	11/22/05	Percent	63.20	63.40 63.90	0.6%
Preserved Total Solids	11/22/05	Percent	59.20	60.70 60.00	1.3%
Total Volatile Solids	11/22/05	Percent	2.86	3.20 2.99	5.7%
Total Organic Carbon	11/25/05	Percent	1.65	1.47 1.65	6.5%
ARI ID: IU01F Client ID: S-1					
Sulfide	11/22/05	mg/kg	11	16	37.0%

MS/MSD RESULTS-CONVENTIONALS
IU01-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

Project: BREMERTON SEDIMENTS
Event: NA
Date Sampled: 11/21/05
Date Received: 11/21/05

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: IU01A Client ID: C-1						
N-Ammonia	11/23/05	mg-N/kg	6.97	136	122	105.6%
ARI ID: IU01C Client ID: C-3						
Total Organic Carbon	11/25/05	Percent	1.65	3.07	1.68	84.6%
ARI ID: IU01F Client ID: S-1						
Sulfide	11/22/05	mg/kg	11	160	150	99.0%

LAB CONTROL RESULTS-CONVENTIONALS
IU01-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

Project: BREMERTON SEDIMENTS
Event: NA
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	LCS	Spike Added	Recovery
Sulfide	11/22/05	mg/kg	110	120	90.8%
Total Organic Carbon	11/25/05	Percent	0.523	0.500	104.6%
	11/28/05		0.542	0.500	108.4%

STANDARD REFERENCE RESULTS-CONVENTIONALS
IU01-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/30/05

Project: BREMERTON SEDIMENTS
Event: NA
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
N-Ammonia	11/23/05	mg-N/kg	109	100	109.0%
SPEX 28-24AS					
Total Organic Carbon	11/25/05	Percent	3.21	3.35	95.8%
NIST #8704	11/28/05		3.05	3.35	91.0%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: IU01MB
LIMS ID: 05-20007
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/28/05	6010B	12/02/05	7440-36-0	Antimony	5	5	U
3050B	11/28/05	6010B	12/02/05	7440-38-2	Arsenic	5	5	U
3050B	11/28/05	6010B	12/02/05	7440-43-9	Cadmium	0.2	0.2	U
3050B	11/28/05	6010B	12/02/05	7440-47-3	Chromium	0.5	0.5	U
3050B	11/28/05	6010B	12/02/05	7440-50-8	Copper	0.2	0.2	U
3050B	11/28/05	6010B	12/02/05	7439-92-1	Lead	2	2	U
CLP	11/28/05	7471A	12/01/05	7439-97-6	Mercury	0.05	0.05	U
3050B	11/28/05	6010B	12/02/05	7440-02-0	Nickel	1	1	U
3050B	11/28/05	6010B	12/02/05	7440-22-4	Silver	0.3	0.3	U
3050B	11/28/05	6010B	12/02/05	7440-66-6	Zinc	0.6	0.6	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: C-1
SAMPLE

Lab Sample ID: IU01A
LIMS ID: 05-20006
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Percent Total Solids: 77.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/28/05	6010B	12/02/05	7440-36-0	Antimony	6	6	U
3050B	11/28/05	6010B	12/02/05	7440-38-2	Arsenic	6	6	U
3050B	11/28/05	6010B	12/02/05	7440-43-9	Cadmium	0.3	0.3	U
3050B	11/28/05	6010B	12/02/05	**7440-47-3**	**Chromium**	0.6	**18.6**	
3050B	11/28/05	6010B	12/02/05	**7440-50-8**	**Copper**	0.3	**15.4**	
3050B	11/28/05	6010B	12/02/05	**7439-92-1**	**Lead**	3	**15**	
CLP	11/28/05	7471A	12/01/05	7439-97-6	Mercury	0.06	0.06	U
3050B	11/28/05	6010B	12/02/05	**7440-02-0**	**Nickel**	1	**18**	
3050B	11/28/05	6010B	12/02/05	7440-22-4	Silver	0.4	0.4	U
3050B	11/28/05	6010B	12/02/05	**7440-66-6**	**Zinc**	0.8	**45.7**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: C-1
DUPLICATE

Lab Sample ID: IU01A
LIMS ID: 05-20006
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Antimony	6010B	6 U	6 U	0.0%	+/- 6	L
Arsenic	6010B	6 U	6 U	0.0%	+/- 6	L
Cadmium	6010B	0.3 U	0.3 U	0.0%	+/- 0.3	L
Chromium	6010B	18.6	20.9	11.6%	+/- 20%	
Copper	6010B	15.4	16.2	5.1%	+/- 20%	
Lead	6010B	15	16	6.5%	+/- 20%	
Mercury	7471A	0.06 U	0.06 U	0.0%	+/- 0.06	L
Nickel	6010B	18	20	10.5%	+/- 20%	
Silver	6010B	0.4 U	0.4 U	0.0%	+/- 0.4	L
Zinc	6010B	45.7	45.8	0.2%	+/- 20%	

Reported in mg/kg-dry

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: C-1
MATRIX SPIKE

Lab Sample ID: IU01A
LIMS ID: 05-20006
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Antimony	6010B	6 U	84	256	32.8%	N
Arsenic	6010B	6 U	274	256	107%	
Cadmium	6010B	0.3 U	66.6	64.0	104%	
Chromium	6010B	18.6	79.5	64.0	95.2%	
Copper	6010B	15.4	81.2	64.0	103%	
Lead	6010B	15	255	256	93.8%	
Mercury	7471A	0.06 U	0.64	0.605	106%	
Nickel	6010B	18	77	64.0	92.2%	
Silver	6010B	0.4 U	64.5	64.0	101%	
Zinc	6010B	45.7	101	64.0	86.4%	

Reported in mg/kg-dry

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: C-2
SAMPLE

Lab Sample ID: IU01B
LIMS ID: 05-20007
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Percent Total Solids: 74.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/28/05	6010B	12/02/05	7440-36-0	Antimony	6	6	U
3050B	11/28/05	6010B	12/02/05	7440-38-2	Arsenic	6	6	U
3050B	11/28/05	6010B	12/02/05	**7440-43-9**	**Cadmium**	0.3	**0.3**	
3050B	11/28/05	6010B	12/02/05	**7440-47-3**	**Chromium**	0.6	**14.1**	
3050B	11/28/05	6010B	12/02/05	**7440-50-8**	**Copper**	0.3	**15.0**	
3050B	11/28/05	6010B	12/02/05	**7439-92-1**	**Lead**	3	**13**	
CLP	11/28/05	7471A	12/01/05	7439-97-6	Mercury	0.06	0.06	U
3050B	11/28/05	6010B	12/02/05	**7440-02-0**	**Nickel**	1	**17**	
3050B	11/28/05	6010B	12/02/05	7440-22-4	Silver	0.4	0.4	U
3050B	11/28/05	6010B	12/02/05	**7440-66-6**	**Zinc**	0.8	**40.1**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: C-3
SAMPLE

Lab Sample ID: IU01C
LIMS ID: 05-20008
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Percent Total Solids: 63.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/28/05	6010B	12/02/05	7440-36-0	Antimony	7	7	U
3050B	11/28/05	6010B	12/02/05	7440-38-2	Arsenic	7	7	U
3050B	11/28/05	6010B	12/02/05	**7440-43-9**	**Cadmium**	0.3	**0.5**	
3050B	11/28/05	6010B	12/02/05	**7440-47-3**	**Chromium**	0.7	**20.8**	
3050B	11/28/05	6010B	12/02/05	**7440-50-8**	**Copper**	0.3	**19.6**	
3050B	11/28/05	6010B	12/02/05	**7439-92-1**	**Lead**	3	**27**	
CLP	11/28/05	7471A	12/01/05	**7439-97-6**	**Mercury**	0.07	**0.09**	
3050B	11/28/05	6010B	12/02/05	**7440-02-0**	**Nickel**	1	**20**	
3050B	11/28/05	6010B	12/02/05	7440-22-4	Silver	0.4	0.4	U
3050B	11/28/05	6010B	12/02/05	**7440-66-6**	**Zinc**	0.9	**49.8**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: C-4
SAMPLE

Lab Sample ID: IU01D
LIMS ID: 05-20009
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Percent Total Solids: 74.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/28/05	6010B	12/02/05	7440-36-0	Antimony	7	7	U
3050B	11/28/05	6010B	12/02/05	7440-38-2	Arsenic	7	7	U
3050B	11/28/05	6010B	12/02/05	**7440-43-9**	**Cadmium**	0.3	**0.3**	
3050B	11/28/05	6010B	12/02/05	**7440-47-3**	**Chromium**	0.7	**18.8**	
3050B	11/28/05	6010B	12/02/05	**7440-50-8**	**Copper**	0.3	**18.7**	
3050B	11/28/05	6010B	12/02/05	**7439-92-1**	**Lead**	3	**16**	
CLP	11/28/05	7471A	12/01/05	7439-97-6	Mercury	0.06	0.06	U
3050B	11/28/05	6010B	12/02/05	**7440-02-0**	**Nickel**	1	**20**	
3050B	11/28/05	6010B	12/02/05	7440-22-4	Silver	0.4	0.4	U
3050B	11/28/05	6010B	12/02/05	**7440-66-6**	**Zinc**	0.8	**47.4**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: C-5
SAMPLE

Lab Sample ID: IU01E
LIMS ID: 05-20010
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Percent Total Solids: 62.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/28/05	6010B	12/02/05	7440-36-0	Antimony	8	8	U
3050B	11/28/05	6010B	12/02/05	7440-38-2	Arsenic	8	8	U
3050B	11/28/05	6010B	12/02/05	7440-43-9	Cadmium	0.3	0.5	
3050B	11/28/05	6010B	12/02/05	7440-47-3	Chromium	0.8	21.9	
3050B	11/28/05	6010B	12/02/05	7440-50-8	Copper	0.3	19.8	
3050B	11/28/05	6010B	12/02/05	7439-92-1	Lead	3	21	
CLP	11/28/05	7471A	12/01/05	7439-97-6	Mercury	0.07	0.09	
3050B	11/28/05	6010B	12/02/05	7440-02-0	Nickel	2	22	
3050B	11/28/05	6010B	12/02/05	7440-22-4	Silver	0.5	0.5	U
3050B	11/28/05	6010B	12/02/05	7440-66-6	Zinc	0.9	48.3	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: S-1
SAMPLE

Lab Sample ID: IU01F
LIMS ID: 05-20011
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Percent Total Solids: 76.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/28/05	6010B	12/02/05	7440-36-0	Antimony	6	6	U
3050B	11/28/05	6010B	12/02/05	7440-38-2	Arsenic	6	6	U
3050B	11/28/05	6010B	12/02/05	**7440-43-9**	**Cadmium**	0.2	**0.3**	
3050B	11/28/05	6010B	12/02/05	**7440-47-3**	**Chromium**	0.6	**17.5**	
3050B	11/28/05	6010B	12/02/05	**7440-50-8**	**Copper**	0.2	**16.3**	
3050B	11/28/05	6010B	12/02/05	**7439-92-1**	**Lead**	2	**14**	
CLP	11/28/05	7471A	12/01/05	7439-97-6	Mercury	0.05	0.05	U
3050B	11/28/05	6010B	12/02/05	**7440-02-0**	**Nickel**	1	**20**	
3050B	11/28/05	6010B	12/02/05	7440-22-4	Silver	0.4	0.4	U
3050B	11/28/05	6010B	12/02/05	**7440-66-6**	**Zinc**	0.7	**36.0**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: S-2
SAMPLE

Lab Sample ID: IU01G
LIMS ID: 05-20012
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Percent Total Solids: 81.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/28/05	6010B	12/02/05	7440-36-0	Antimony	6	6	U
3050B	11/28/05	6010B	12/02/05	7440-38-2	Arsenic	6	6	U
3050B	11/28/05	6010B	12/02/05	7440-43-9	Cadmium	0.2	0.2	U
3050B	11/28/05	6010B	12/02/05	7440-47-3	Chromium	0.6	13.3	
3050B	11/28/05	6010B	12/02/05	7440-50-8	Copper	0.2	8.6	
3050B	11/28/05	6010B	12/02/05	7439-92-1	Lead	2	12	
CLP	11/28/05	7471A	12/01/05	7439-97-6	Mercury	0.05	0.06	
3050B	11/28/05	6010B	12/02/05	7440-02-0	Nickel	1	13	
3050B	11/28/05	6010B	12/02/05	7440-22-4	Silver	0.3	0.3	U
3050B	11/28/05	6010B	12/02/05	7440-66-6	Zinc	0.7	27.1	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: S-6
SAMPLE

Lab Sample ID: IU01H
LIMS ID: 05-20013
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: 11/21/05
Date Received: 11/21/05

Percent Total Solids: 79.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/28/05	6010B	12/02/05	7440-36-0	Antimony	6	6	U
3050B	11/28/05	6010B	12/02/05	7440-38-2	Arsenic	6	6	U
3050B	11/28/05	6010B	12/02/05	7440-43-9	Cadmium	0.2	0.2	U
3050B	11/28/05	6010B	12/02/05	**7440-47-3**	**Chromium**	0.6	**16.3**	
3050B	11/28/05	6010B	12/02/05	**7440-50-8**	**Copper**	0.2	**15.1**	
3050B	11/28/05	6010B	12/02/05	**7439-92-1**	**Lead**	2	**24**	
CLP	11/28/05	7471A	12/01/05	7439-97-6	Mercury	0.05	0.05	U
3050B	11/28/05	6010B	12/02/05	**7440-02-0**	**Nickel**	1	**16**	
3050B	11/28/05	6010B	12/02/05	7440-22-4	Silver	0.4	0.4	U
3050B	11/28/05	6010B	12/02/05	**7440-66-6**	**Zinc**	0.7	**46.4**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: IU01LCS
LIMS ID: 05-20007
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU01-Parametrix
Project: BREMERTON SEDIMENTS

Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Antimony	6010B	203	200	102%	
Arsenic	6010B	209	200	104%	
Cadmium	6010B	52.2	50.0	104%	
Chromium	6010B	51.3	50.0	103%	
Copper	6010B	50.2	50.0	100%	
Lead	6010B	197	200	98.5%	
Mercury	7471A	1.00	1.00	100%	
Nickel	6010B	49	50	98.0%	
Silver	6010B	49.7	50.0	99.4%	
Zinc	6010B	47.5	50.0	95.0%	

Reported in mg/kg-dry

N-Control limit not met
Control Limits: 80-120%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Parametrix	Project No.: IU01
Client Project: Bremerton Sediments	

Case Narrative

1. The samples were submitted for grain size analysis according to PSEP methodology.
2. The samples were run in a single batch, and one sample was chosen for triplicate analysis. The triplicate data is reported on the QA summary.
3. Some of the samples were mostly sand and contained fewer than the required 5 grams in the pipette portion of the analysis. When this occurs, we generally run the samples anyway, and flag the data. The principle problem with this is that because there is so little material, random weighing errors occur. This can either make the amount retained in a given phi size appear to be more than the amount in the next larger phi size, or give a negative value for the mass in a given phi size. In this condition, we generally adjust the value in the offending phi size to a value that is reasonable and/or eliminates the negative values. This was done on samples C-1, C-2, C-4, S-1, and S-2.
4. All of the samples listed in #3 above had less than the required 5 grams in the pipette portion. Our balance has a capacity of about 200 g (by 0.0001), and a sample size that would give 5 grams of fines could not be split and stay within the capacity of the balance.
5. The data is provided in summary tables and plots.
6. There were no other noted anomalies in the samples or methods on this project.

Approved by: Taylor McKenzie Date: 12/01/05
Title: Lead Technician

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Physical Analyses

SM Indicates that the sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with moisture content, porosity and saturation calculation that assume only water is present.

SS Indicates that the sample was not appropriate for the method requested because it did not contain the proportion of "fines" required to perform the pipette portion of the analysis

W Indicates that the amount of sample in some pipette aliquots was below the level required for accurate weighting resulting in negative weights which were adjusted to zero.

F Indicates that the samples were frozen prior to particle size determination.

ANALYTICAL RESOURCES INCORPORATED

Parametrix
Bremerton Sediments

Apparent Grain Size Distribution Summary
Percent Finer Than Indicated Size

Sample No.	Gravel			Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt				Clay	
Phi Size	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
Sieve Size (microns)	3/8"	#4	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (62)	31.00	15.60	7.80	3.90	2.00	1.00
C-3	100.0	78.9	74.8	71.0	64.1	46.7	24.9	12.3	8.6	6.7	5.6	4.5	3.4	2.5
C-3	100.0	81.7	78.5	74.1	66.7	48.7	25.9	12.7	8.8	7.0	5.7	4.6	3.6	2.5
C-3	100.0	74.2	70.7	66.9	60.1	43.2	23.0	11.3	7.9	6.4	5.3	4.3	3.2	2.1
C-1	100.0	85.8	74.8	72.1	68.5	6.4	3.6	3.3	1.7	1.6	1.5	1.3	1.1	0.9
C-2	100.0	83.4	73.3	67.3	58.7	12.9	4.9	3.9	2.8	2.6	2.3	1.8	1.3	1.0
C-4	100.0	96.1	91.1	86.4	80.3	10.7	3.6	2.9	2.8	2.5	2.2	1.8	1.3	1.1
C-5	100.0	96.0	90.4	85.4	76.9	56.4	30.0	14.3	9.9	7.9	6.7	5.2	3.7	2.5
S-1	100.0	76.0	68.3	65.1	60.9	38.4	6.3	2.9	2.4	2.1	1.8	1.6	1.2	0.9
S-2	100.0	83.4	56.9	44.5	39.0	23.0	3.9	2.7	2.2	2.0	1.7	1.5	1.1	0.8
S-6	100.0	73.8	66.3	63.0	59.1	10.6	5.5	4.7	1.2	1.1	1.1	1.0	0.8	0.7

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

IU01

ANALYTICAL RESOURCES INCORPORATED

Parametrix
Bremerton Sediments

Apparent Grain Size Distribution Summary
Percent Retained in Each Size Fraction

Sample No.	Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Coarse Silt	Medium Silt	Fine Silt	Very Fine Silt	Clay		
Phi Size	> -1	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	< 10
Sieve Size (microns)	> #10 (2000)	10 to 18 (2000-1000)	18-35 (1000-500)	35-60 (500-250)	60-120 (250-125)	120-230 (125-62)	62.5-31.0	31.0-15.6	15.6-7.8	7.8-3.9	3.9-2.0	2.0-1.0	<1.0
C-3	25.2	3.8	6.9	17.4	21.8	12.5	3.7	1.9	1.1	1.1	1.1	0.9	2.5
C-3	21.5	4.4	7.4	18.0	22.8	13.3	3.9	1.8	1.2	1.1	1.0	1.1	2.5
C-3	29.3	3.8	6.7	17.0	20.1	11.8	3.4	1.5	1.1	1.0	1.1	1.1	2.1
C-1	25.2	2.8	3.6	62.1	2.8	0.3	1.6	0.1	0.1	0.2	0.2	0.2	0.9
C-2	26.7	6.0	8.7	45.7	8.0	1.0	1.1	0.3	0.3	0.5	0.5	0.3	1.0
C-4	8.9	4.6	6.1	69.7	7.1	0.7	0.1	0.2	0.3	0.4	0.5	0.2	1.1
C-5	9.6	5.0	8.6	20.5	26.4	15.7	4.4	2.1	1.2	1.5	1.4	1.2	2.5
S-1	31.7	3.2	4.2	22.5	32.1	3.4	0.5	0.3	0.3	0.2	0.4	0.4	0.9
S-2	43.1	12.4	5.5	16.0	19.1	1.2	0.6	0.2	0.2	0.3	0.4	0.3	0.8
S-6	33.7	3.2	3.9	48.5	5.1	0.8	3.5	0.1	0.1	0.0	0.2	0.0	0.7

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

IU01

ANALYTICAL RESOURCES INCORPORATED

Parametrix
Bremerton Sediments

PSEP Total Solids Analysis
Percent of Wet Weight

Sample No.	Total Solids (%)
C-3	69.5
C-3	69.0
C-3	70.9
C-1	82.1
C-2	78.8
C-4	77.8
C-5	65.5
S-1	81.9
S-2	84.2
S-6	86.3

Triplicate Average	69.8
Standard Deviation	0.98
%RSD	1.40

(Total Solids at 90 C)

IU01

QA SUMMARY

ANALYTICAL RESOURCES INCORPORATED

PROJECT:	Parametrix	Project No.:	Bremerton Sediments
ARI Triplicate Sample ID:	C	Batch No.:	IU01
Client Triplicate Sample ID:	C-3	Page:	1 of 1

Relative Standard Deviation, By Phi Size

Sample ID	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
C-3	100.0	78.9	74.8	71.0	64.1	46.7	24.9	12.3	8.6	6.7	5.6	4.5	3.4	2.5
C-3	100.0	81.7	78.5	74.1	66.7	48.7	25.9	12.7	8.8	7.0	5.7	4.6	3.6	2.5
C-3	100.0	74.2	70.7	66.9	60.1	43.2	23.0	11.3	7.9	6.4	5.3	4.3	3.2	2.1
AVE	NA	78.25	74.68	70.66	63.65	46.19	24.61	12.09	8.44	6.69	5.54	4.45	3.39	2.38
STDEV	NA	3.79	3.91	3.63	3.31	2.80	1.47	0.74	0.50	0.30	0.22	0.15	0.19	0.21
%RSD	NA	4.84	5.23	5.13	5.20	6.07	5.99	6.10	5.98	4.45	4.03	3.34	5.47	9.00

The Triplicate Applies To The Following Samples

Client ID	Date Sampled	Date Extracted	Date Complete	QA Ratio (95-105)	Data Qualifiers	Pipette Portion (5.0-25.0g)
C-3	11/21/05	11/23/05	12/1/05	100.5		6.9
C-3	11/21/05	11/23/05	12/1/05	100.1		6.9
C-3	11/21/05	11/23/05	12/1/05	99.9		5.9
C-1	11/21/05	11/22/05	12/1/05	101.5	SS	4.0
C-2	11/21/05	11/22/05	12/1/05	100.8	SS	4.6
C-4	11/21/05	11/22/05	12/1/05	99.5	SS, W	3.4
C-5	11/21/05	11/22/05	12/1/05	99.9		5.5
S-1	11/21/05	11/22/05	12/1/05	100.1	SS	3.6
S-2	11/21/05	11/22/05	12/1/05	100.3	SS	3.5
S-6	11/21/05	11/22/05	12/1/05	103.6		6.2

* ARI Internal QA limits = 95-105%

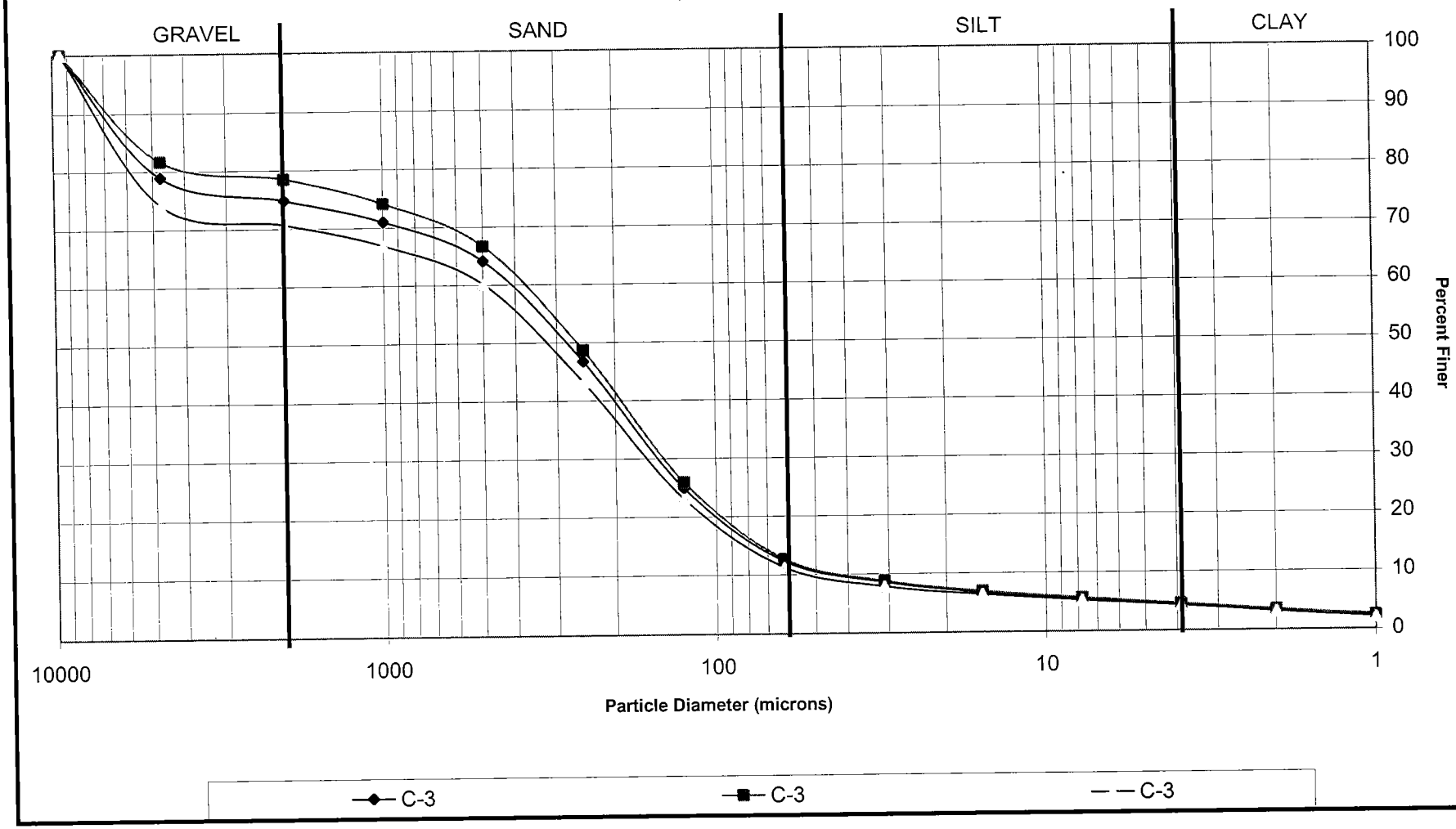
Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

ANALYTICAL RESOURCES INCORPORATED

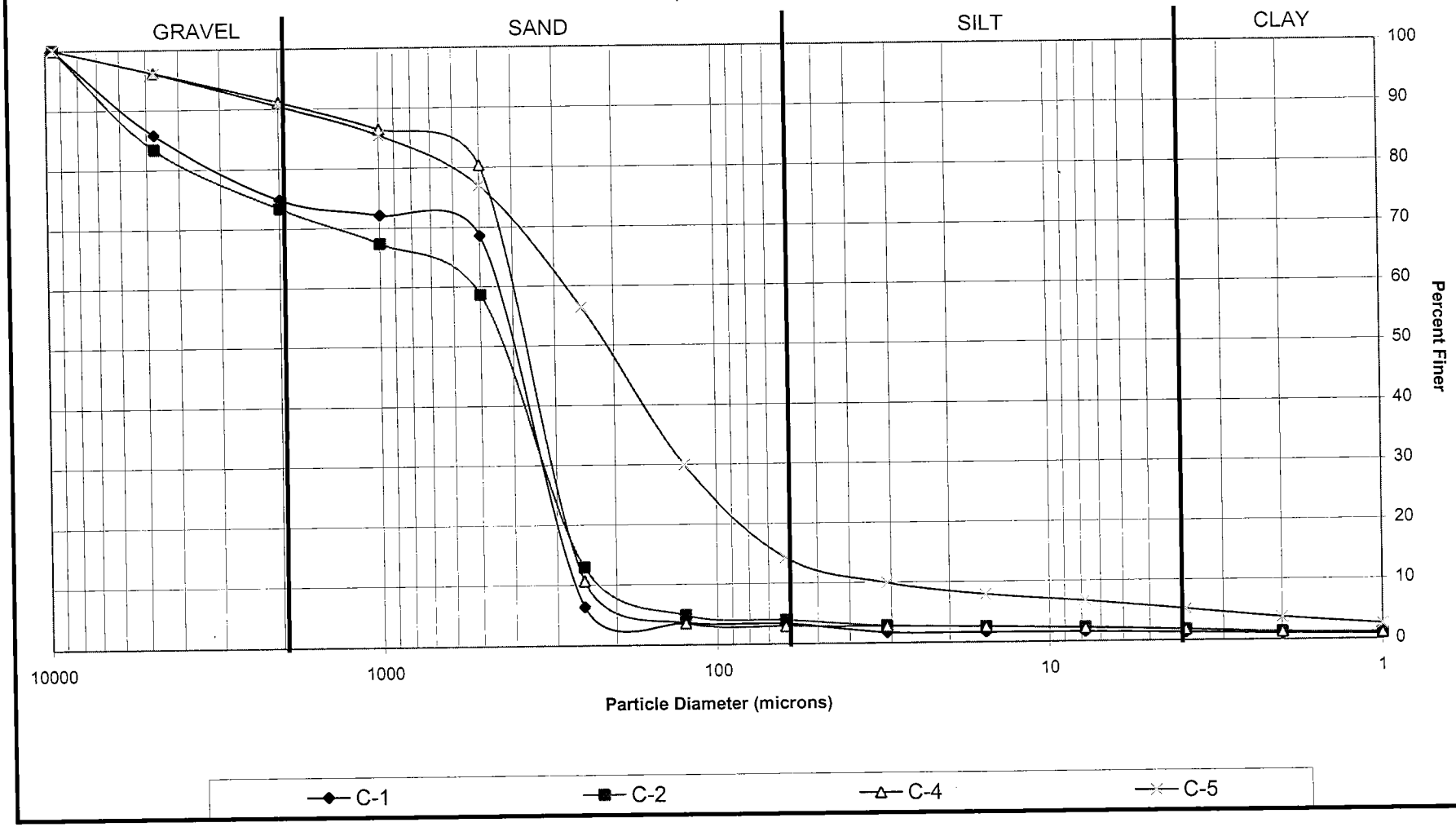
PSEP Grain Size Distribution

Triplicate Sample Plot



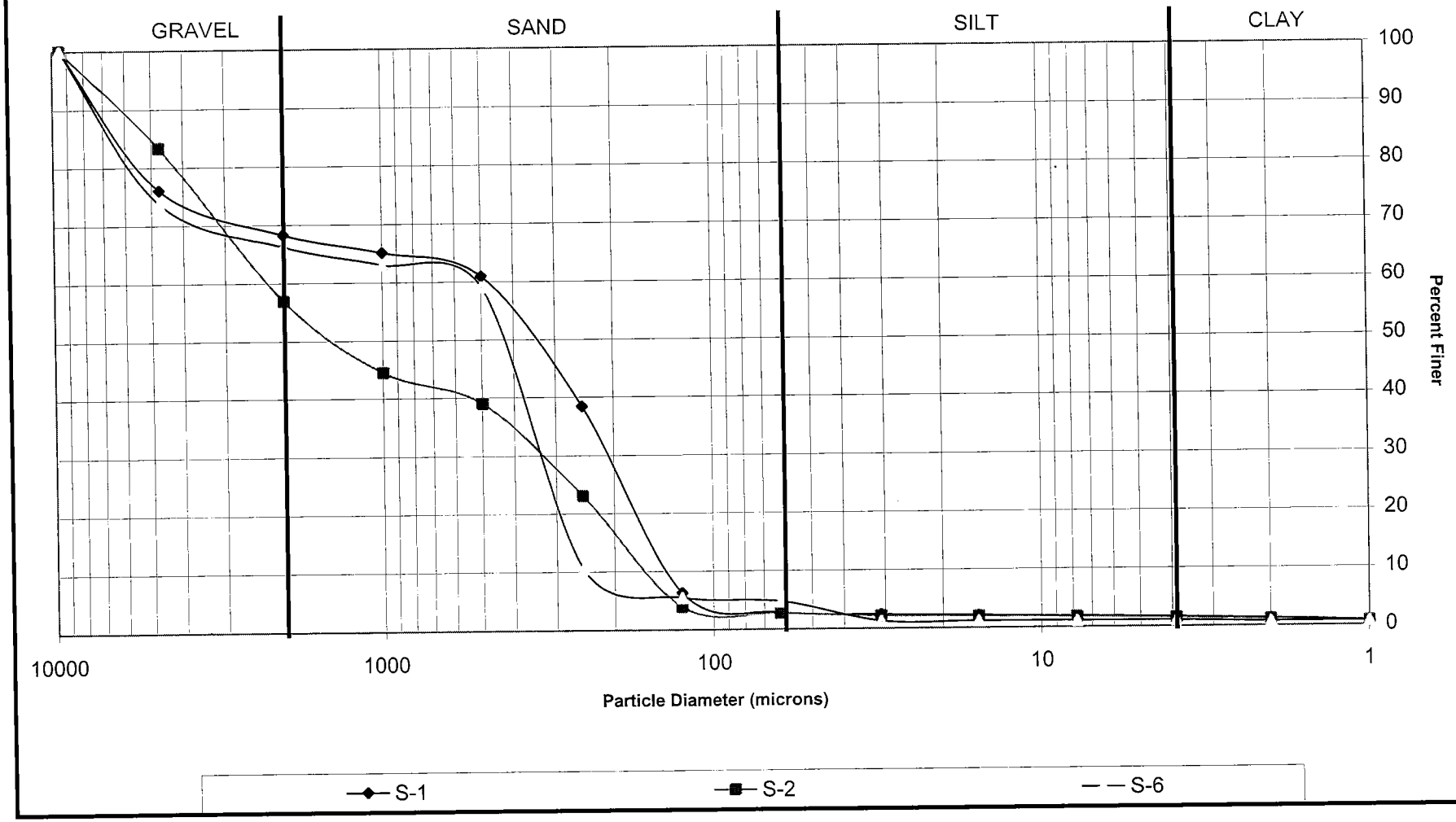
ANALYTICAL RESOURCES INCORPORATED

PSEP Grain Size Distribution



ANALYTICAL RESOURCES INCORPORATED

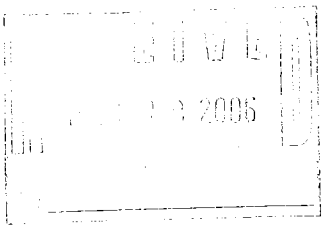
PSEP Grain Size Distribution



CHEMISTRY DATA FOR SAMPLES

S-3
S-4
S-5
C-6
C-7
C-8
C-9
C-10
C-6-S
C-7-S
C-8-S
C-9-S
C-10-S

Analytical Resources, Incorporated
Analytical Chemists and Consultants



7 December 2005

David Gillingham
Parametrix, Inc.
411 108th Avenue NE
Suite 1800
Bellevue, WA 98004-5571

RE: Client Project: Bremerton Sediments
ARI Job No. IU01

Dear David:

Please find enclosed the original chain of custody record (COC) and the final results for the samples from the project referenced above. Analytical Resources, Inc accepted eight sediment samples on November 21, 2005. The samples were received intact and there were no discrepancies in the paperwork. The samples were analyzed for SVOAs, pesticides, PCBs, NWTPH-Dx, grain size, total metals and conventional parameters as requested.

A matrix spike (MS) and a matrix spike duplicate (MSD) were extracted and analyzed for SVOAs in conjunction with sample S-6. The area for the internal standard (IS), d12-perylene, was slightly (3%) low following the initial analysis of the MS. It was also noted that the area for d12-perylene in the MSD was within control limits by a small margin (1.5%). Since the percent recoveries for all surrogates and the remaining ISs were within acceptable QC limits, it was concluded that the sample matrix was the cause of the low IS recovery in the MS. No corrective actions were taken.

The percent recovery for the surrogate, DCBP, was high following the initial pesticide analysis of the method blank (MB) associated with these samples. Since no target compounds were detected in the MB, the high bias does not compromise the RLs. No corrective actions were taken.

A small amount of ammonia was detected in the MB associated with these samples. Ammonia was detected in all samples associated with this blank. Since the concentrations of ammonia measured in the samples were significantly greater than the amount found in the blank, no corrective actions were taken.

A matrix duplicate (MD) was prepared and analyzed for total sulfides in conjunction with sample S-1. The RPD was high following the initial analysis of the MD. The MD was re-distilled and re-analyzed. Similar results were obtained for the re-analysis. Since the percent recoveries for sulfide were within acceptable QC limits for the corresponding MS and LCS, it was concluded that a lack of sample homogeneity was the cause of the high RPDs. No further corrective actions were taken. The results for the original analyses only have been submitted for the MD.

Gillingham, Parametrix
Bremerton Sediments
Sediment
IU01

7 December 2005

There were no further problems with these analyses.

A copy of these reports and all associated raw data will be kept on file with ARI. Should you have any questions please feel free to call me at any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206/695-6210
mark@arilabs.com

Enclosures

cc: File IU01

MDH/mdh

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 1650	Turn-around Requested: By Dec 7 - 5 day	Date: Nov 29, 2005	
ARI Client Company: Parametrix	Phone: (360) 377-0014	Page: 1 of 2	
Client Contact: Phil Struck		No. of Coolers: 2	Cooler Temps: 3.4, 5.4
Client Project Name: City of Bremerton Sediment Study			
Client Project #: 255-1896-063	Samplers: Linde, Elkind, Struck, ~~Knuckey~~		

Ice - yes

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: NWTPH-Dx w/ RRO	Metals by SMS	SVOCs by SMS	All SMS Parameters	Archive				Notes/Comments
S-3	11/29/05	2045	Sediment	6				X	X				Sulfides
S-4		21:00		6				X	X				preserved in field
S-5		21:15		6				X	X				w/ Zinc Acetate
C-6		20:49		4	X	X	X		X				
C-7		20:27		4	X	X	X		X				
C-8		21:05		4	X	X	X		X				
C-9		21:25		4	X	X	X		X				
C-10		21:21		4	X	X	X		X				
C-6-S		20:58		4	X	X	X		X				
C-7-S		20:36		4	X	X	X		X				

Comments/Special Instructions: C-6 and C-6-S: very strong petroleum odor	Relinquished by: (Signature) Lara Linde	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Lara Linde	Printed Name: Brian Keger	Printed Name:	Printed Name:
	Company: Parametrix	Company: ARI	Company:	Company:
	Date & Time: 11/30/05 0920	Date & Time: 11/30/05 0920	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: Unless specified by workorder or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 10150	Turn-around Requested: By Dec 1 – 5day
ARI Client Company: Parametrix	Phone: (360) 377-0014
Client Contact: Phil Struck	
Client Project Name: City of Bremerton Sediment Study	
Client Project #: 255-1896-063	Samplers: Linde, Elkind, Struck, ~~Knuckey~~

Date: NOV 29, 2005
Page: 2 of 2
No. of Coolers:
Cooler Temps:

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: NWTPH-DX w/ PRO	metals by SMS	SVOCs by SMS	Archive					Notes/Comments
C-8-S	11/29/05	21:07	Sediment	4	X	X	X	X					
C-9-S		21:33		4	X	X	X	X					
C-10-S		21:47		5	X	X	X	X					
Please email preliminary results to: pstruck@parametrix.com and dgillingham@parametrix.com													

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
	(Signature): Lara Linde	(Signature):	(Signature):	(Signature):
	Printed Name: Lara Linde	Printed Name: BRIAN KEGEL	Printed Name:	Printed Name:
	Company: Parametrix	Company: ARI	Company:	Company:
	Date & Time: 11/30/05 0920	Date & Time: 11/30/05 0926	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: Unless specified by workorder or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

Data Reporting Qualifiers

Effective 12/28/04

Inorganic Data

U Indicates that the target analyte was not detected at the reported concentration

* Duplicate RPD is not within established control limits

B Reported value is less than the CRDL but ≥ the Reporting Limit

N Matrix Spike recovery not within established control limits

NA Not Applicable, analyte not spiked

H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible

L Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U Indicates that the target analyte was not detected at the reported concentration

* Flagged value is not within established control limits

B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.

J Estimated concentration when the value is less than ARI's established reporting limits

D The spiked compound was not detected due to sample extract dilution

NR Spiked compound recovery is not reported due to chromatographic interference

E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA The flagged analyte was not analyzed for

NS The flagged analyte was not spiked into the sample

M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

Geotechnical Data

A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.

F Samples were frozen prior to particle size determination

SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations

SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis

W Weight of sample in some pipette aliquots was below the level required for accurate weighting

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: MB-120105
METHOD BLANK

Lab Sample ID: MB-120105
LIMS ID: 05-20410
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: NA
Date Received: NA

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 12:55
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.0 g
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: NA
pH: NA

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
67-72-1	Hexachloroethane	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	100	< 100 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: MB-120105
METHOD BLANK

Lab Sample ID: MB-120105
LIMS ID: 05-20410
Matrix: Sediment
Date Analyzed: 12/02/05 12:55

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	82.4%	2-Fluorobiphenyl	85.6%
d14-p-Terphenyl	105%	d4-1,2-Dichlorobenzene	79.6%
d5-Phenol	85.1%	2-Fluorophenol	94.7%
2,4,6-Tribromophenol	84.0%	d4-2-Chlorophenol	83.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: S-3
SAMPLE

Lab Sample ID: IU50A
LIMS ID: 05-20402
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 14:33
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 26.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 17.8%
pH: 7.7

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**19**	**38**
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	**2-Methylphenol**	**19**	**17 J**
106-44-5	4-Methylphenol	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	Diethylphthalate	19	< 19 U
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	95	< 95 U
85-01-8	**Phenanthrene**	**19**	**29**
120-12-7	Anthracene	19	< 19 U
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**59**
129-00-0	**Pyrene**	**19**	**42**
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	**Benzo(a)anthracene**	**19**	**24**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**19**	**14 J**
218-01-9	**Chrysene**	**19**	**29**
117-84-0	Di-n-Octyl phthalate	19	< 19 U
205-99-2	**Benzo(b)fluoranthene**	**19**	**22**
207-08-9	**Benzo(k)fluoranthene**	**19**	**25**
50-32-8	**Benzo(a)pyrene**	**19**	**25**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**19**	**14 J**
53-70-3	Dibenz(a,h)anthracene	19	< 19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: S-3
SAMPLE

Lab Sample ID: IU50A
LIMS ID: 05-20402
Matrix: Sediment
Date Analyzed: 12/02/05 14:33

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	19	17 J

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	84.0%	2-Fluorobiphenyl	90.8%
d14-p-Terphenyl	75.2%	d4-1,2-Dichlorobenzene	73.6%
d5-Phenol	84.0%	2-Fluorophenol	95.2%
2,4,6-Tribromophenol	86.7%	d4-2-Chlorophenol	83.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: S-4
SAMPLE

Lab Sample ID: IU50B
LIMS ID: 05-20403
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 15:05
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 26.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 17.7%
pH: 7.6

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	< 19 U
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	Diethylphthalate	19	< 19 U
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	96	< 96 U
85-01-8	**Phenanthrene**	**19**	**11 J**
120-12-7	Anthracene	19	< 19 U
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**16 J**
129-00-0	**Pyrene**	**19**	**12 J**
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	Benzo(a)anthracene	19	< 19 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**19**	**13 J**
218-01-9	**Chrysene**	**19**	**10 J**
117-84-0	Di-n-Octyl phthalate	19	< 19 U
205-99-2	Benzo(b)fluoranthene	19	< 19 U
207-08-9	Benzo(k)fluoranthene	19	< 19 U
50-32-8	Benzo(a)pyrene	19	< 19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: S-4
SAMPLE

Lab Sample ID: IU50B
LIMS ID: 05-20403
Matrix: Sediment
Date Analyzed: 12/02/05 15:05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	86.4%	2-Fluorobiphenyl	92.4%
d14-p-Terphenyl	71.2%	d4-1,2-Dichlorobenzene	75.2%
d5-Phenol	83.5%	2-Fluorophenol	94.9%
2,4,6-Tribromophenol	87.2%	d4-2-Chlorophenol	82.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: S-5
SAMPLE

Lab Sample ID: IU50C
LIMS ID: 05-20404
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 15:37
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 16.2%
pH: 7.5

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
67-72-1	Hexachloroethane	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: S-5**
Page 2 of 2 **SAMPLE**

Lab Sample ID: IU50C
LIMS ID: 05-20404
Matrix: Sediment
Date Analyzed: 12/02/05 15:37

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	72.8%	2-Fluorobiphenyl	79.2%
d14-p-Terphenyl	68.8%	d4-1,2-Dichlorobenzene	61.6%
d5-Phenol	70.9%	2-Fluorophenol	81.9%
2,4,6-Tribromophenol	78.4%	d4-2-Chlorophenol	70.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-6
SAMPLE

Lab Sample ID: IU50D
LIMS ID: 05-20405
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 16:09
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 23.4%
pH: 7.5

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
67-72-1	Hexachloroethane	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	**Phenanthrene**	**20**	**13 J**
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**110**
129-00-0	**Pyrene**	**20**	**50**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**19 J**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**20**	**13 J**
218-01-9	**Chrysene**	**20**	**30**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**26**
207-08-9	**Benzo(k)fluoranthene**	**20**	**20**
50-32-8	**Benzo(a)pyrene**	**20**	**15 J**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-6
SAMPLE

Lab Sample ID: IU50D
LIMS ID: 05-20405
Matrix: Sediment
Date Analyzed: 12/02/05 16:09

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	74.8%	2-Fluorobiphenyl	80.4%
d14-p-Terphenyl	61.6%	d4-1,2-Dichlorobenzene	62.0%
d5-Phenol	70.9%	2-Fluorophenol	81.1%
2,4,6-Tribromophenol	80.8%	d4-2-Chlorophenol	70.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-7
SAMPLE

Lab Sample ID: IU50E
LIMS ID: 05-20406
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 16:42
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 21.4%
pH: 7.5

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
67-72-1	Hexachloroethane	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	**Phenanthrene**	**20**	**19 J**
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**37**
129-00-0	**Pyrene**	**20**	**27**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**14 J**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**20**	**18 J**
218-01-9	**Chrysene**	**20**	**20**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**20**
207-08-9	**Benzo(k)fluoranthene**	**20**	**11 J**
50-32-8	**Benzo(a)pyrene**	**20**	**17 J**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: C-7**
Page 2 of 2 **SAMPLE**

Lab Sample ID: IU50E
LIMS ID: 05-20406
Matrix: Sediment
Date Analyzed: 12/02/05 16:42

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	81.6%	2-Fluorobiphenyl	88.0%
d14-p-Terphenyl	65.6%	d4-1,2-Dichlorobenzene	69.6%
d5-Phenol	76.3%	2-Fluorophenol	87.7%
2,4,6-Tribromophenol	84.0%	d4-2-Chlorophenol	75.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-8
SAMPLE

Lab Sample ID: IU50F
LIMS ID: 05-20407
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 17:14
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 15.8%
pH: 7.8

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
67-72-1	Hexachloroethane	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	**Acenaphthylene**	**20**	**37**
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	97	< 97 U
85-01-8	**Phenanthrene**	**20**	**89**
120-12-7	**Anthracene**	**20**	**34**
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**3,100 E**
129-00-0	**Pyrene**	**20**	**1,100**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**290**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**720**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**690**
207-08-9	**Benzo(k)fluoranthene**	**20**	**660**
50-32-8	**Benzo(a)pyrene**	**20**	**290**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**86**
53-70-3	**Dibenz(a,h)anthracene**	**20**	**23**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-8
SAMPLE

Lab Sample ID: IU50F
LIMS ID: 05-20407
Matrix: Sediment
Date Analyzed: 12/02/05 17:14

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	20	70

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	63.6%	2-Fluorobiphenyl	67.2%
d14-p-Terphenyl	50.4%	d4-1,2-Dichlorobenzene	54.0%
d5-Phenol	58.7%	2-Fluorophenol	69.6%
2,4,6-Tribromophenol	70.1%	d4-2-Chlorophenol	58.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-8
DILUTION

Lab Sample ID: IU50F
LIMS ID: 05-20407
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/05/05 12:46
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 10.0
Percent Moisture: 15.8%
pH: 7.8

CAS Number	Analyte	RL	Result
108-95-2	Phenol	200	< 200 U
541-73-1	1,3-Dichlorobenzene	200	< 200 U
106-46-7	1,4-Dichlorobenzene	200	< 200 U
100-51-6	Benzyl Alcohol	200	< 200 U
95-50-1	1,2-Dichlorobenzene	200	< 200 U
95-48-7	2-Methylphenol	200	< 200 U
106-44-5	4-Methylphenol	200	< 200 U
67-72-1	Hexachloroethane	200	< 200 U
105-67-9	2,4-Dimethylphenol	200	< 200 U
65-85-0	Benzoic Acid	2,000	< 2,000 U
120-82-1	1,2,4-Trichlorobenzene	200	< 200 U
91-20-3	Naphthalene	200	< 200 U
87-68-3	Hexachlorobutadiene	200	< 200 U
91-57-6	2-Methylnaphthalene	200	< 200 U
131-11-3	Dimethylphthalate	200	< 200 U
208-96-8	Acenaphthylene	200	< 200 U
83-32-9	Acenaphthene	200	< 200 U
132-64-9	Dibenzofuran	200	< 200 U
84-66-2	Diethylphthalate	200	< 200 U
86-73-7	Fluorene	200	< 200 U
86-30-6	N-Nitrosodiphenylamine	200	< 200 U
118-74-1	Hexachlorobenzene	200	< 200 U
87-86-5	Pentachlorophenol	970	< 970 U
85-01-8	Phenanthrene	200	< 200 U
120-12-7	Anthracene	200	< 200 U
84-74-2	Di-n-Butylphthalate	200	< 200 U
206-44-0	**Fluoranthene**	**200**	**2,700**
129-00-0	**Pyrene**	**200**	**1,400**
85-68-7	Butylbenzylphthalate	200	< 200 U
56-55-3	**Benzo(a)anthracene**	**200**	**310**
117-81-7	bis(2-Ethylhexyl)phthalate	200	< 200 U
218-01-9	**Chrysene**	**200**	**780**
117-84-0	Di-n-Octyl phthalate	200	< 200 U
205-99-2	**Benzo(b)fluoranthene**	**200**	**620**
207-08-9	**Benzo(k)fluoranthene**	**200**	**480**
50-32-8	**Benzo(a)pyrene**	**200**	**270**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**200**	**170 J**
53-70-3	Dibenz(a,h)anthracene	200	< 200 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-8
DILUTION

Lab Sample ID: IU50F
LIMS ID: 05-20407
Matrix: Sediment
Date Analyzed: 12/05/05 12:46

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	200	170 J

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	65.2%	2-Fluorobiphenyl	68.8%
d14-p-Terphenyl	64.4%	d4-1,2-Dichlorobenzene	56.4%
d5-Phenol	60.3%	2-Fluorophenol	60.8%
2,4,6-Tribromophenol	47.5%	d4-2-Chlorophenol	60.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-9
SAMPLE

Lab Sample ID: IU50G
LIMS ID: 05-20408
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 17:46
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 18.9%
pH: 7.7

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
67-72-1	Hexachloroethane	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	**Phenanthrene**	**20**	**56**
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**45**
129-00-0	**Pyrene**	**20**	**36**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**19 J**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**20**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**19 J**
207-08-9	**Benzo(k)fluoranthene**	**20**	**20**
50-32-8	**Benzo(a)pyrene**	**20**	**24**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-9
SAMPLE

Lab Sample ID: IU50G
LIMS ID: 05-20408
Matrix: Sediment
Date Analyzed: 12/02/05 17:46

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	75.6%	2-Fluorobiphenyl	81.2%
d14-p-Terphenyl	65.6%	d4-1,2-Dichlorobenzene	65.6%
d5-Phenol	73.3%	2-Fluorophenol	86.1%
2,4,6-Tribromophenol	87.7%	d4-2-Chlorophenol	72.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-10
SAMPLE

Lab Sample ID: IU50H
LIMS ID: 05-20409
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 18:18
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 26.4 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 16.8%
pH: 7.6

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	< 19 U
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	**Naphthalene**	**19**	**26**
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	Diethylphthalate	19	< 19 U
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	95	< 95 U
85-01-8	**Phenanthrene**	**19**	**37**
120-12-7	Anthracene	19	< 19 U
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**46**
129-00-0	**Pyrene**	**19**	**24**
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	**Benzo(a)anthracene**	**19**	**14 J**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**19**	**52**
218-01-9	**Chrysene**	**19**	**16 J**
117-84-0	**Di-n-Octyl phthalate**	**19**	**180**
205-99-2	**Benzo(b)fluoranthene**	**19**	**19**
207-08-9	**Benzo(k)fluoranthene**	**19**	**12 J**
50-32-8	**Benzo(a)pyrene**	**19**	**15 J**
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-10
SAMPLE

Lab Sample ID: IU50H
LIMS ID: 05-20409
Matrix: Sediment
Date Analyzed: 12/02/05 18:18

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	82.8%	2-Fluorobiphenyl	89.2%
d14-p-Terphenyl	69.6%	d4-1,2-Dichlorobenzene	71.6%
d5-Phenol	79.2%	2-Fluorophenol	93.6%
2,4,6-Tribromophenol	90.7%	d4-2-Chlorophenol	78.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-6-S
SAMPLE

Lab Sample ID: IU50I
LIMS ID: 05-20410
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 18:50
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 9.4%
pH: 7.7

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	< 19 U
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	Diethylphthalate	19	< 19 U
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	97	< 97 U
85-01-8	Phenanthrene	19	< 19 U
120-12-7	Anthracene	19	< 19 U
84-74-2	**Di-n-Butylphthalate**	**19**	**21**
206-44-0	**Fluoranthene**	**19**	**19 J**
129-00-0	**Pyrene**	**19**	**26**
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	**Benzo(a)anthracene**	**19**	**12 J**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**19**	**25**
218-01-9	Chrysene	19	< 19 U
117-84-0	Di-n-Octyl phthalate	19	< 19 U
205-99-2	**Benzo(b)fluoranthene**	**19**	**14 J**
207-08-9	**Benzo(k)fluoranthene**	**19**	**10 J**
50-32-8	**Benzo(a)pyrene**	**19**	**16 J**
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-6-S
SAMPLE

Lab Sample ID: IU50I
LIMS ID: 05-20410
Matrix: Sediment
Date Analyzed: 12/02/05 18:50

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	80.8%	2-Fluorobiphenyl	83.6%
d14-p-Terphenyl	66.0%	d4-1,2-Dichlorobenzene	69.6%
d5-Phenol	73.1%	2-Fluorophenol	84.8%
2,4,6-Tribromophenol	84.8%	d4-2-Chlorophenol	74.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-7-S
SAMPLE

Lab Sample ID: IU50J
LIMS ID: 05-20411
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 20:26
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 18.3%
pH: 7.7

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
67-72-1	Hexachloroethane	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	**Acenaphthylene**	**20**	**14 J**
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	**Phenanthrene**	**20**	**26**
120-12-7	**Anthracene**	**20**	**28**
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**150**
129-00-0	**Pyrene**	**20**	**130**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**62**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**20**	**16 J**
218-01-9	**Chrysene**	**20**	**75**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**73**
207-08-9	**Benzo(k)fluoranthene**	**20**	**54**
50-32-8	**Benzo(a)pyrene**	**20**	**75**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**18 J**
53-70-3	Dibenz(a,h)anthracene	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-7-S
SAMPLE

Lab Sample ID: IU50J
LIMS ID: 05-20411
Matrix: Sediment
Date Analyzed: 12/02/05 20:26

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	20	19 J

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	76.8%	2-Fluorobiphenyl	80.0%
d14-p-Terphenyl	69.2%	d4-1,2-Dichlorobenzene	65.6%
d5-Phenol	70.7%	2-Fluorophenol	84.0%
2,4,6-Tribromophenol	86.7%	d4-2-Chlorophenol	70.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: C-8-S
SAMPLE

Lab Sample ID: IU50K
LIMS ID: 05-20412
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 20:58
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 26.0 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 14.1%
pH: 7.8

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	< 19 U
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	**Naphthalene**	**19**	**13 J**
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	**2-Methylnaphthalene**	**19**	**18 J**
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	**Acenaphthylene**	**19**	**12 J**
83-32-9	Acenaphthene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	Diethylphthalate	19	< 19 U
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	96	< 96 U
85-01-8	**Phenanthrene**	**19**	**18 J**
120-12-7	**Anthracene**	**19**	**22**
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**160**
129-00-0	**Pyrene**	**19**	**130**
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	**Benzo(a)anthracene**	**19**	**60**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**19**	**40**
218-01-9	**Chrysene**	**19**	**66**
117-84-0	Di-n-Octyl phthalate	19	< 19 U
205-99-2	**Benzo(b)fluoranthene**	**19**	**72**
207-08-9	**Benzo(k)fluoranthene**	**19**	**44**
50-32-8	**Benzo(a)pyrene**	**19**	**71**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**19**	**16 J**
53-70-3	Dibenz(a,h)anthracene	19	< 19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: C-8-S**
 SAMPLE

Lab Sample ID: IU50K
LIMS ID: 05-20412
Matrix: Sediment
Date Analyzed: 12/02/05 20:58

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	19	20

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	82.8%	2-Fluorobiphenyl	84.4%
d14-p-Terphenyl	70.8%	d4-1,2-Dichlorobenzene	70.8%
d5-Phenol	76.3%	2-Fluorophenol	93.6%
2,4,6-Tribromophenol	92.0%	d4-2-Chlorophenol	76.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: C-9-S
SAMPLE

Lab Sample ID: IU50L
LIMS ID: 05-20413
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 21:30
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 26.1 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 15.4%
pH: 7.9

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	< 19 U
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	Diethylphthalate	19	< 19 U
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	96	< 96 U
85-01-8	**Phenanthrene**	**19**	**12 J**
120-12-7	**Anthracene**	**19**	**9.6 J**
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**44**
129-00-0	**Pyrene**	**19**	**32**
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	**Benzo(a)anthracene**	**19**	**18 J**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**19**	**16 J**
218-01-9	**Chrysene**	**19**	**24**
117-84-0	Di-n-Octyl phthalate	19	< 19 U
205-99-2	**Benzo(b)fluoranthene**	**19**	**32**
207-08-9	**Benzo(k)fluoranthene**	**19**	**26**
50-32-8	**Benzo(a)pyrene**	**19**	**19**
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-9-S
SAMPLE

Lab Sample ID: IU50L
LIMS ID: 05-20413
Matrix: Sediment
Date Analyzed: 12/02/05 21:30

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	74.8%	2-Fluorobiphenyl	77.6%
d14-p-Terphenyl	68.8%	d4-1,2-Dichlorobenzene	63.2%
d5-Phenol	69.1%	2-Fluorophenol	85.1%
2,4,6-Tribromophenol	86.9%	d4-2-Chlorophenol	68.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: C-10-S
SAMPLE

Lab Sample ID: IU50M
LIMS ID: 05-20414
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 22:02
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 26.0 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 15.1%
pH: 7.7

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**19**	**130**
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	Diethylphthalate	19	< 19 U
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	96	< 96 U
85-01-8	**Phenanthrene**	**19**	**16 J**
120-12-7	Anthracene	19	< 19 U
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**100**
129-00-0	**Pyrene**	**19**	**52**
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	**Benzo(a)anthracene**	**19**	**13 J**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**19**	**16 J**
218-01-9	**Chrysene**	**19**	**28**
117-84-0	Di-n-Octyl phthalate	19	< 19 U
205-99-2	**Benzo(b)fluoranthene**	**19**	**25**
207-08-9	**Benzo(k)fluoranthene**	**19**	**12 J**
50-32-8	**Benzo(a)pyrene**	**19**	**12 J**
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: C-10-S**
 SAMPLE

Lab Sample ID: IU50M
LIMS ID: 05-20414
Matrix: Sediment
Date Analyzed: 12/02/05 22:02

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	79.2%	2-Fluorobiphenyl	82.0%
d14-p-Terphenyl	73.2%	d4-1,2-Dichlorobenzene	66.8%
d5-Phenol	74.7%	2-Fluorophenol	90.1%
2,4,6-Tribromophenol	104%	d4-2-Chlorophenol	73.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: C-6-S
MS/MSD

Lab Sample ID: IU50I
LIMS ID: 05-20410
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted MS/MSD: 12/01/05

Date Analyzed MS: 12/02/05 19:22
MSD: 12/02/05 19:54
Instrument/Analyst MS: NT6/PK
MSD: NT6/PK
GPC Cleanup: NO

Sample Amount MS: 25.5 g-dry-wt
MSD: 26.0 g-dry-wt
Final Extract Volume MS: 0.5 mL
MSD: 0.5 mL
Dilution Factor MS: 1.00
MSD: 1.00
Percent Moisture: 9.4%
pH: 7.7

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Phenol	< 19.4	433	734	59.0%	574	721	79.6%	28.0%
1,4-Dichlorobenzene	< 19.4	247	490	50.4%	355	481	73.8%	35.9%
1,2,4-Trichlorobenzene	< 19.4	307	490	62.7%	423	481	87.9%	31.8%
Acenaphthene	< 19.4	344	490	70.2%	442	481	91.9%	24.9%
Pentachlorophenol	< 97.2	398	734	54.2%	569	721	78.9%	35.4%
Pyrene	26.1	307	490	57.3%	398	481	77.3%	25.8%

Results reported in µg/kg
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: C-6-S
MATRIX SPIKE

Lab Sample ID: IU50I
LIMS ID: 05-20410
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 19:22
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 9.4%
pH: 7.7

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	---
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	---
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
67-72-1	Hexachloroethane	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	---
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	---
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	---
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	---
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**20**	**32**
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-6-S
MATRIX SPIKE

Lab Sample ID: IU50I
LIMS ID: 05-20410
Matrix: Sediment
Date Analyzed: 12/02/05 19:22

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	60.8%	2-Fluorobiphenyl	68.0%
d14-p-Terphenyl	55.6%	d4-1,2-Dichlorobenzene	50.0%
d5-Phenol	59.7%	2-Fluorophenol	68.0%
2,4,6-Tribromophenol	76.0%	d4-2-Chlorophenol	58.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: C-6-S
MATRIX SPIKE DUPLICATE

Lab Sample ID: IU50I
LIMS ID: 05-20410
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 19:54
Instrument/Analyst: NT6/PK
GPC Cleanup: No

Sample Amount: 26.0 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 9.4%
pH: 7.7

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	---
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	---
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	---
91-20-3	Naphthalene	19	< 19 U
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	---
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	Diethylphthalate	19	< 19 U
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	96	---
85-01-8	Phenanthrene	19	< 19 U
120-12-7	Anthracene	19	< 19 U
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	Fluoranthene	19	< 19 U
129-00-0	Pyrene	19	---
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	Benzo(a)anthracene	19	< 19 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**19**	**39**
218-01-9	Chrysene	19	< 19 U
117-84-0	Di-n-Octyl phthalate	19	< 19 U
205-99-2	Benzo(b)fluoranthene	19	< 19 U
207-08-9	Benzo(k)fluoranthene	19	< 19 U
50-32-8	Benzo(a)pyrene	19	< 19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C-6-S
MATRIX SPIKE DUPLICATE

Lab Sample ID: IU50I
LIMS ID: 05-20410
Matrix: Sediment
Date Analyzed: 12/02/05 19:54

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

CAS Number	Analyte	RL	Result
191-24-2	Benzo(g,h,i)perylene	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	87.6%	2-Fluorobiphenyl	90.0%
d14-p-Terphenyl	76.0%	d4-1,2-Dichlorobenzene	71.2%
d5-Phenol	82.9%	2-Fluorophenol	92.8%
2,4,6-Tribromophenol	103%	d4-2-Chlorophenol	82.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: LCS-120105
LAB CONTROL

Lab Sample ID: LCS-120105
LIMS ID: 05-20410
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 13:27
Instrument/Analyst: NT6/PK
GPC Cleanup: NO

Sample Amount: 25.0 g
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: NA
pH: NA

Analyte	Lab Control	Spike Added	Recovery
Phenol	411	500	82.2%
1,3-Dichlorobenzene	369	500	73.8%
1,4-Dichlorobenzene	372	500	74.4%
Benzyl Alcohol	296	500	59.2%
1,2-Dichlorobenzene	390	500	78.0%
2-Methylphenol	402	500	80.4%
4-Methylphenol	854	1000	85.4%
Hexachloroethane	406	500	81.2%
2,4-Dimethylphenol	381	500	76.2%
Benzoic Acid	400	500	80.0%
1,2,4-Trichlorobenzene	408	500	81.6%
Naphthalene	410	500	82.0%
Hexachlorobutadiene	409	500	81.8%
2-Methylnaphthalene	430	500	86.0%
Dimethylphthalate	472	500	94.4%
Acenaphthylene	462	500	92.4%
Acenaphthene	434	500	86.8%
Dibenzofuran	448	500	89.6%
Diethylphthalate	493	500	98.6%
Fluorene	469	500	93.8%
N-Nitrosodiphenylamine	634	500	127%
Hexachlorobenzene	487	500	97.4%
Pentachlorophenol	398	500	79.6%
Phenanthrene	490	500	98.0%
Anthracene	476	500	95.2%
Di-n-Butylphthalate	498	500	99.6%
Fluoranthene	450	500	90.0%
Pyrene	539	500	108%
Butylbenzylphthalate	494	500	98.8%
Benzo(a)anthracene	477	500	95.4%
bis(2-Ethylhexyl)phthalate	542	500	108%
Chrysene	480	500	96.0%
Di-n-Octyl phthalate	482	500	96.4%
Benzo(b)fluoranthene	558	500	112%
Benzo(k)fluoranthene	543	500	109%
Benzo(a)pyrene	500	500	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: LCS-120105
LAB CONTROL

Lab Sample ID: LCS-120105
LIMS ID: 05-20410
Matrix: Sediment
Date Analyzed: 12/02/05 13:27

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063

Analyte	Lab Control	Spike Added	Recovery
Indeno(1,2,3-cd)pyrene	561	500	112%
Dibenz(a,h)anthracene	589	500	118%
Benzo(g,h,i)perylene	597	500	119%

Semivolatile Surrogate Recovery	
d5-Nitrobenzene	75.2%
2-Fluorobiphenyl	78.0%
d14-p-Terphenyl	96.8%
d4-1,2-Dichlorobenzene	68.8%
d5-Phenol	74.9%
2-Fluorophenol	80.5%
2,4,6-Tribromophenol	82.1%
d4-2-Chlorophenol	73.9%

Results reported in µg/kg

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: MB-120105
METHOD BLANK

Lab Sample ID: MB-120105
LIMS ID: 05-20403
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: NA
Date Received: NA

Date Extracted: 12/01/05
Date Analyzed: 12/05/05 22:32
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 25.0 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: NA
Percent Moisture: NA

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	1.0	< 1.0 U
76-44-8	Heptachlor	1.0	< 1.0 U
309-00-2	Aldrin	1.0	< 1.0 U
60-57-1	Dieldrin	2.0	< 2.0 U
72-55-9	4,4'-DDE	2.0	< 2.0 U
72-54-8	4,4'-DDD	2.0	< 2.0 U
50-29-3	4,4'-DDT	2.0	< 2.0 U
5103-74-2	gamma Chlordane	1.0	< 1.0 U
5103-71-9	alpha Chlordane	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	1.0	< 1.0 U
87-68-3	Hexachlorobutadiene	1.0	< 1.0 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery	
Decachlorobiphenyl	104%
Tetrachlorometaxylene	88.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD

Sample ID: S-3
SAMPLE

Lab Sample ID: IU50A
LIMS ID: 05-20402
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/05/05 23:36
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 26.2 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: 7.7
Percent Moisture: 17.8%

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	0.96	< 0.96 U
76-44-8	Heptachlor	0.96	< 0.96 U
309-00-2	Aldrin	0.96	< 0.96 U
60-57-1	Dieldrin	1.9	< 1.9 U
72-55-9	4,4'-DDE	1.9	< 1.9 U
50-29-3	4,4'-DDT	1.9	< 1.9 U
5103-74-2	gamma Chlordane	0.96	< 0.96 U
5103-71-9	alpha Chlordane	0.96	< 0.96 U
118-74-1	Hexachlorobenzene	0.96	< 0.96 U
87-68-3	Hexachlorobutadiene	0.96	< 0.96 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	101%
Tetrachlorometaxylene	85.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: S-4
SAMPLE

Lab Sample ID: IU50B
LIMS ID: 05-20403
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/06/05 00:08
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: 7.6
Percent Moisture: 17.7%

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	0.98	< 0.98 U
76-44-8	Heptachlor	0.98	< 0.98 U
309-00-2	Aldrin	0.98	< 0.98 U
60-57-1	Dieldrin	2.0	< 2.0 U
72-55-9	4,4'-DDE	2.0	< 2.0 U
72-54-8	4,4'-DDD	2.0	< 2.0 U
50-29-3	4,4'-DDT	2.0	< 2.0 U
5103-74-2	gamma Chlordane	0.98	< 0.98 U
5103-71-9	alpha Chlordane	0.98	< 0.98 U
118-74-1	Hexachlorobenzene	0.98	< 0.98 U
87-68-3	Hexachlorobutadiene	0.98	< 0.98 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	95.8%
Tetrachlorometaxylene	93.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD

Sample ID: S-4
MATRIX SPIKE

Lab Sample ID: IU50B
LIMS ID: 05-20403
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/06/05 00:40
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: 7.6
Percent Moisture: 17.7%

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	0.97	---
76-44-8	Heptachlor	0.97	---
309-00-2	Aldrin	0.97	---
60-57-1	Dieldrin	1.9	---
72-55-9	4,4'-DDE	1.9	< 1.9 U
72-54-8	4,4'-DDD	1.9	< 1.9 U
50-29-3	4,4'-DDT	1.9	---
5103-74-2	gamma Chlordane	0.97	< 0.97 U
5103-71-9	alpha Chlordane	0.97	< 0.97 U
118-74-1	Hexachlorobenzene	0.97	---
87-68-3	Hexachlorobutadiene	0.97	---

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery	
Decachlorobiphenyl	98.2%
Tetrachlorometaxylene	96.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: S-4
MATRIX SPIKE DUP

Lab Sample ID: IU50B
LIMS ID: 05-20403
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/06/05 01:12
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: 7.6
Percent Moisture: 17.7%

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	0.97	---
76-44-8	Heptachlor	0.97	---
309-00-2	Aldrin	0.97	---
60-57-1	Dieldrin	1.9	---
72-55-9	4,4'-DDE	1.9	< 1.9 U
72-54-8	4,4'-DDD	1.9	< 1.9 U
50-29-3	4,4'-DDT	1.9	---
5103-74-2	gamma Chlordane	0.97	< 0.97 U
5103-71-9	alpha Chlordane	0.97	< 0.97 U
118-74-1	Hexachlorobenzene	0.97	---
87-68-3	Hexachlorobutadiene	0.97	---

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery	
Decachlorobiphenyl	98.2%
Tetrachlorometaxylene	95.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: S-4
MS/MSD

Lab Sample ID: IU50B
LIMS ID: 05-20403
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted MS/MSD: 12/01/05

Date Analyzed MS: 12/06/05 00:40
MSD: 12/06/05 01:12
Instrument/Analyst MS: ECD3/YZ
MSD: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount MS: 25.8 g-dry-wt
MSD: 25.8 g-dry-wt
Final Extract Volume MS: 5.0 mL
MSD: 5.0 mL
Dilution Factor MS: 1.00
MSD: 1.00
Silica Gel: Yes
pH: 7.6
Percent Moisture: 17.7%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
gamma-BHC (Lindane)	< 0.975	7.45	9.70	76.8%	7.64	9.69	78.8%	2.5%
Heptachlor	< 0.975	8.70	9.70	89.7%	9.13	9.69	94.2%	4.8%
Aldrin	< 0.975	8.73	9.70	90.0%	9.27	9.69	95.7%	6.0%
Dieldrin	< 1.95	16.8	19.4	86.6%	17.3	19.4	89.2%	2.9%
4,4'-DDT	< 1.95	17.9	19.4	92.3%	18.3	19.4	94.3%	2.2%
Hexachlorobenzene	< 0.975	8.46	9.70	87.2%	8.63	9.69	89.1%	2.0%
Hexachlorobutadiene	< 0.975	8.02	9.70	82.7%	8.05	9.69	83.1%	0.4%

Reported in µg/kg (ppb)
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD

Sample ID: S-5
SAMPLE

Lab Sample ID: IU50C
LIMS ID: 05-20404
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/06/05 01:44
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: 7.5
Percent Moisture: 16.2%

CAS Number	Analyte	RL	Result
58-89-9	gamma-BHC (Lindane)	0.97	< 0.97 U
76-44-8	Heptachlor	0.97	< 0.97 U
309-00-2	Aldrin	0.97	< 0.97 U
60-57-1	Dieldrin	2.0	< 2.0 U
72-54-8	4,4'-DDD	2.0	< 2.0 U
50-29-3	4,4'-DDT	2.0	< 2.0 U
5103-74-2	gamma Chlordane	0.97	< 0.97 U
5103-71-9	alpha Chlordane	0.97	< 0.97 U
118-74-1	Hexachlorobenzene	0.97	< 0.97 U
87-68-3	Hexachlorobutadiene	0.97	< 0.97 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery	
Decachlorobiphenyl	97.8%
Tetrachlorometaxylene	96.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD

Sample ID: LCS-120105
LAB CONTROL

Lab Sample ID: LCS-120105
LIMS ID: 05-20403
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/05/05 23:04
Instrument/Analyst: ECD3/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
pH: NA
Percent Moisture: NA

Analyte	Lab Control	Spike Added	Recovery
gamma-BHC (Lindane)	3.34	4.00	83.5%
Heptachlor	3.28	4.00	82.0%
Aldrin	3.30	4.00	82.5%
Dieldrin	7.46	8.00	93.2%
4,4'-DDE	7.94	8.00	99.2%
4,4'-DDD	7.38	8.00	92.2%
4,4'-DDT	7.42	8.00	92.8%
gamma Chlordane	3.64	4.00	91.0%
alpha Chlordane	3.64	4.00	91.0%
Hexachlorobenzene	3.34	4.00	83.5%
Hexachlorobutadiene	2.92	4.00	73.0%

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	94.8%
Tetrachlorometaxylene	86.2%

Reported in µg/kg (ppb)

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: MB-120105
METHOD BLANK

Lab Sample ID: MB-120105
LIMS ID: 05-20402
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: NA
Date Received: NA

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 19:11
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: NA
Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	Aroclor 1254	20	< 20 U
11096-82-5	Aroclor 1260	20	< 20 U
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	100%
Tetrachlorometaxylene	92.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: S-3
SAMPLE

Lab Sample ID: IU50A
LIMS ID: 05-20402
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 19:47
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 7.7
Percent Moisture: 17.8%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	Aroclor 1254	20	< 20 U
11096-82-5	Aroclor 1260	20	< 20 U
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	93.2%
Tetrachlorometaxylene	85.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: S-3
MATRIX SPIKE

Lab Sample ID: IU50A
LIMS ID: 05-20402
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 20:06
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 7.7
Percent Moisture: 17.8%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	---
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	Aroclor 1254	20	< 20 U
11096-82-5	Aroclor 1260	20	---
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	100%
Tetrachlorometaxylene	91.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: S-3
MATRIX SPIKE DUP

Lab Sample ID: IU50A
LIMS ID: 05-20402
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 20:24
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 7.7
Percent Moisture: 17.8%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	---
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	Aroclor 1254	20	< 20 U
11096-82-5	Aroclor 1260	20	---
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	97.5%
Tetrachlorometaxylene	86.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: S-3
MS/MSD

Lab Sample ID: IU50A
LIMS ID: 05-20402
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted MS/MSD: 12/01/05

Sample Amount MS: 25.7 g-dry-wt
MSD: 25.6 g-dry-wt
Final Extract Volume MS: 5.0 mL
MSD: 5.0 mL
Dilution Factor MS: 1.00
MSD: 1.00
Silica Gel: No
pH: 7.7
Percent Moisture: 17.8%

Date Analyzed MS: 12/02/05 20:06
MSD: 12/02/05 20:24
Instrument/Analyst MS: ECD5/LJR
MSD: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Aroclor 1016	< 19.5 U	98.9	99.8	99.1%	95.2	100	95.2%	3.8%
Aroclor 1260	< 19.5 U	103	99.8	103%	99.1	100	99.1%	3.9%

Results reported in µg/kg (ppb)
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: S-4
SAMPLE

Lab Sample ID: IU50B
LIMS ID: 05-20403
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 20:42
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 7.6
Percent Moisture: 17.7%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	19	< 19 U
53469-21-9	Aroclor 1242	19	< 19 U
12672-29-6	Aroclor 1248	19	< 19 U
11097-69-1	Aroclor 1254	19	< 19 U
11096-82-5	Aroclor 1260	19	< 19 U
11104-28-2	Aroclor 1221	19	< 19 U
11141-16-5	Aroclor 1232	19	< 19 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	101%
Tetrachlorometaxylene	90.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: S-5
SAMPLE

Lab Sample ID: IU50C
LIMS ID: 05-20404
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 21:00
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 7.5
Percent Moisture: 16.2%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	Aroclor 1254	20	< 20 U
11096-82-5	Aroclor 1260	20	< 20 U
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	98.5%
Tetrachlorometaxylene	86.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: LCS-120105
LAB CONTROL

Lab Sample ID: LCS-120105
LIMS ID: 05-20402
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: NA
Date Received: NA

Date Extracted: 12/01/05
Date Analyzed: 12/02/05 19:29
Instrument/Analyst: ECD5/LJR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g-dry-wt
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: NA
Percent Moisture: NA

Analyte	Lab Control	Spike Added	Recovery
Aroclor 1016	90.9	102	89.1%
Aroclor 1260	93.5	102	91.7%

PCB Surrogate Recovery

Decachlorobiphenyl	101%
Tetrachlorometaxylene	88.5%

Results reported in µg/kg (ppb)

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID

Matrix: Sediment

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Received: 11/30/05

Data Release Authorized:
Reported: 12/05/05

ARI ID	Sample ID	Extraction Date	Analysis Date	DL	Range	Result
IU50A	S-3	11/30/05	12/01/05	1.0	**Diesel**	**7.5**
05-20402	HC ID: **DRO/MOTOR OIL**		FID3A		**Motor Oil**	**26**
					o-Terphenyl	80.2%
IU50B	S-4	11/30/05	12/01/05	1.0	Diesel	< 6.0 U
05-20403	HC ID: ---		FID3A		Motor Oil	< 12 U
					o-Terphenyl	82.4%
MB-113005	Method Blank	11/30/05	12/01/05	1.0	Diesel	< 5.0 U
05-20404	HC ID: ---		FID3A		Motor Oil	< 10 U
					o-Terphenyl	79.1%
IU50C	S-5	11/30/05	12/01/05	1.0	Diesel	< 6.0 U
05-20404	HC ID: ---		FID3A		Motor Oil	< 12 U
					o-Terphenyl	79.6%
IU50D	C-6	11/30/05	12/02/05	1.0	**Diesel**	**11**
05-20405	HC ID: **DRO/MOTOR OIL**		FID3A		**Motor Oil**	**55**
					o-Terphenyl	75.3%
IU50E	C-7	11/30/05	12/02/05	1.0	**Diesel**	**8.1**
05-20406	HC ID: **DRO/MOTOR OIL**		FID3A		**Motor Oil**	**29**
					o-Terphenyl	71.1%
IU50F	C-8	11/30/05	12/02/05	1.0	**Diesel**	**6.7**
05-20407	HC ID: **DRO/MOTOR OIL**		FID3A		**Motor Oil**	**47**
					o-Terphenyl	67.3%
IU50G	C-9	11/30/05	12/02/05	1.0	Diesel	< 6.2 U
05-20408	HC ID: **MOTOR OIL**		FID3A		**Motor Oil**	**30**
					o-Terphenyl	74.9%
IU50H	C-10	11/30/05	12/02/05	1.0	Diesel	< 6.0 U
05-20409	HC ID: **MOTOR OIL**		FID3A		**Motor Oil**	**16**
					o-Terphenyl	76.7%
IU50I	C-6-S	11/30/05	12/02/05	1.0	**Diesel**	**29**
05-20410	HC ID: **DRO/MOTOR OIL**		FID3A		**Motor Oil**	**78**
					o-Terphenyl	73.6%
IU50J	C-7-S	11/30/05	12/02/05	1.0	**Diesel**	**7.7**
05-20411	HC ID: **DRO/MOTOR OIL**		FID3A		**Motor Oil**	**27**
					o-Terphenyl	69.6%
IU50K	C-8-S	11/30/05	12/02/05	1.0	**Diesel**	**11**
05-20412	HC ID: **DRO/MOTOR OIL**		FID3A		**Motor Oil**	**68**
					o-Terphenyl	66.2%
IU50L	C-9-S	11/30/05	12/02/05	1.0	Diesel	< 5.9 U
05-20413	HC ID: ---		FID3A		Motor Oil	< 12 U
					o-Terphenyl	72.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID
Page 2 of 2
Matrix: Sediment

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Received: 11/30/05

Data Release Authorized:
Reported: 12/05/05

ARI ID	Sample ID	Extraction Date	Analysis Date	DL	Range	Result
IU50M	C-10-S	11/30/05	12/03/05	1.0	Diesel	< 5.9 U
05-20414	HC ID: ---		FID3A		Motor Oil	< 12 U
					o-Terphenyl	69.8%

Reported in mg/kg (ppm)

Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.
HC ID: DRO/RRO indicates results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID
Page 1 of 1

Sample ID: S-5
MS/MSD

Lab Sample ID: IU50C
LIMS ID: 05-20404
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Date Extracted MS/MSD: 11/30/05

Date Analyzed MS: 12/01/05 11:51
MSD: 12/01/05 12:06
Instrument/Analyst MS: FID3A/PKC
MSD: FID3A/PKC

Sample Amount MS: 8.40 g-dry-wt
MSD: 8.42 g-dry-wt
Final Extract Volume MS: 1.0 mL
MSD: 1.0 mL
Dilution Factor MS: 1.00
MSD: 1.00
Percent Moisture: 16.2%

Range	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Diesel	< 6.0 U	136	179	76.0%	155	178	87.1%	13.1%

TPHD Surrogate Recovery

	MS	MSD
o-Terphenyl	91.6%	88.0%

Results reported in mg/kg
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID
Page 1 of 1

Sample ID: LCS-113005
LAB CONTROL

Lab Sample ID: LCS-113005
LIMS ID: 05-20404
Matrix: Sediment
Data Release Authorized:
Reported: 12/05/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: NA
Date Received: NA

Date Extracted: 11/30/05
Date Analyzed: 12/01/05 10:51
Instrument/Analyst: FID3A/PKC

Sample Amount: 10.0 g
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

Range	Lab Control	Spike Added	Recovery
Diesel	130	150	86.7%

TPHD Surrogate Recovery

o-Terphenyl	90.2%

Results reported in mg/kg

METHOD BLANK RESULTS-CONVENTIONALS
IU50-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/07/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	11/30/05	Percent	< 0.01 U
Preserved Total Solids	11/30/05	Percent	< 0.01 U
Total Volatile Solids	11/30/05	Percent	< 0.01 U
N-Ammonia	12/02/05	mg-N/kg	< 0.10 U
Sulfide	12/01/05	mg/kg	< 1.0 U
Total Organic Carbon	12/06/05	Percent	< 0.020 U

SAMPLE RESULTS-CONVENTIONALS
IU50-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/07/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Client ID: S-3
ARI ID: 05-20402 IU50A

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/30/05 113005#1	EPA 160.3	Percent	0.01	80.90
Preserved Total Solids	11/30/05 113005#1	EPA 160.3	Percent	0.01	81.70
Total Volatile Solids	11/30/05 113005#1	EPA 160.4	Percent	0.01	1.81
N-Ammonia	12/02/05 120205#1	EPA 350.1M	mg-N/kg	0.12	6.03
Sulfide	12/01/05 120105#1	EPA 376.2	mg/kg	3.0	29
Total Organic Carbon	12/06/05 120605#1	Plumb,1981	Percent	0.020	0.421

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
IU50-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/07/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Client ID: S-4
ARI ID: 05-20403 IU50B

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/30/05 113005#1	EPA 160.3	Percent	0.01	81.00
Preserved Total Solids	11/30/05 113005#1	EPA 160.3	Percent	0.01	81.30
Total Volatile Solids	11/30/05 113005#1	EPA 160.4	Percent	0.01	1.42
N-Ammonia	12/02/05 120205#1	EPA 350.1M	mg-N/kg	0.12	1.47
Sulfide	12/01/05 120105#1	EPA 376.2	mg/kg	1.5	< 1.5 U
Total Organic Carbon	12/06/05 120605#1	Plumb,1981	Percent	0.020	0.280

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
IU50-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/07/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Client ID: S-5
ARI ID: 05-20404 IU50C

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/30/05 113005#1	EPA 160.3	Percent	0.01	84.60
Preserved Total Solids	11/30/05 113005#1	EPA 160.3	Percent	0.01	85.20
Total Volatile Solids	11/30/05 113005#1	EPA 160.4	Percent	0.01	1.38
N-Ammonia	12/02/05 120205#1	EPA 350.1M	mg-N/kg	0.12	0.66
Sulfide	12/01/05 120105#1	EPA 376.2	mg/kg	1.5	< 1.5 U
Total Organic Carbon	12/06/05 120605#1	Plumb,1981	Percent	0.020	0.268

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

REPLICATE RESULTS-CONVENTIONALS
IU50-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/07/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: IU50A Client ID: S-3					
Total Solids	11/30/05	Percent	80.90	80.70 78.90	1.4%
Preserved Total Solids	11/30/05	Percent	81.70	82.60	1.1%
Total Volatile Solids	11/30/05	Percent	1.81	1.58 1.65	7.0%
N-Ammonia	12/02/05	mg-N/kg	6.03	5.82	3.5%
Total Organic Carbon	12/06/05	Percent	0.421	0.390 0.539	17.5%
ARI ID: IU50C Client ID: S-5					
Sulfide	12/01/05	mg/kg	< 1.5	< 1.4	NA

MS/MSD RESULTS-CONVENTIONALS
IU50-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/07/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: IU50A Client ID: S-3						
N-Ammonia	12/02/05	mg-N/kg	6.03	133	122	103.7%
Total Organic Carbon	12/06/05	Percent	0.421	1.49	1.05	101.4%
ARI ID: IU50C Client ID: S-5						
Sulfide	12/01/05	mg/kg	< 1.5	160	210	75.1%
Sulfide	12/01/05	mg/kg	< 1.5	170	210	80.6%

LAB CONTROL RESULTS-CONVENTIONALS
IU50-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/07/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	LCS	Spike Added	Recovery
Sulfide	12/01/05	mg/kg	670	730	92.0%
Total Organic Carbon	12/06/05	Percent	0.538	0.500	107.6%

STANDARD REFERENCE RESULTS-CONVENTIONALS
IU50-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/07/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
N-Ammonia SPEX 28-24AS	12/02/05	mg-N/kg	104	100	104.0%
Total Organic Carbon NIST #8704	12/06/05	Percent	3.90	3.35	116.4%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: IU50MB
LIMS ID: 05-20403
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/30/05	6010B	12/05/05	7440-36-0	Antimony	5	5	U
3050B	11/30/05	6010B	12/05/05	7440-38-2	Arsenic	5	5	U
3050B	11/30/05	6010B	12/05/05	7440-43-9	Cadmium	0.2	0.2	U
3050B	11/30/05	6010B	12/05/05	7440-47-3	Chromium	0.5	0.5	U
3050B	11/30/05	6010B	12/05/05	7440-50-8	Copper	0.2	0.2	U
3050B	11/30/05	6010B	12/05/05	7439-92-1	Lead	2	2	U
CLP	11/30/05	7471A	12/01/05	7439-97-6	Mercury	0.05	0.05	U
3050B	11/30/05	6010B	12/05/05	7440-02-0	Nickel	1	1	U
3050B	11/30/05	6010B	12/05/05	7440-22-4	Silver	0.3	0.3	U
3050B	11/30/05	6010B	12/05/05	**7440-66-6**	**Zinc**	0.6	**0.8**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: S-3
SAMPLE

Lab Sample ID: IU50A
LIMS ID: 05-20402
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Percent Total Solids: 80.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/30/05	6010B	12/05/05	7440-36-0	Antimony	10	10	U
3050B	11/30/05	6010B	12/05/05	7440-38-2	Arsenic	10	10	U
3050B	11/30/05	6010B	12/05/05	7440-43-9	Cadmium	0.6	0.6	U
3050B	11/30/05	6010B	12/05/05	**7440-47-3**	**Chromium**	1	**11**	
3050B	11/30/05	6010B	12/05/05	**7440-50-8**	**Copper**	0.6	**9.9**	
3050B	11/30/05	6010B	12/05/05	**7439-92-1**	**Lead**	6	**16**	
CLP	11/30/05	7471A	12/01/05	7439-97-6	Mercury	0.06	0.06	U
3050B	11/30/05	6010B	12/05/05	**7440-02-0**	**Nickel**	3	**13**	
3050B	11/30/05	6010B	12/05/05	7440-22-4	Silver	0.8	0.8	U
3050B	11/30/05	6010B	12/05/05	**7440-66-6**	**Zinc**	2	**38**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: S-3
DUPLICATE

Lab Sample ID: IU50A
LIMS ID: 05-20402
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Antimony	6010B	10 U	10 U	0.0%	+/- 10	L
Arsenic	6010B	10 U	10 U	0.0%	+/- 10	L
Cadmium	6010B	0.6 U	0.6 U	0.0%	+/- 0.6	L
Chromium	6010B	11	12	8.7%	+/- 20%	
Copper	6010B	9.9	13.1	27.8%	+/- 20%	*
Lead	6010B	16	15	6.5%	+/- 6	L
Mercury	7471A	0.06 U	0.06 U	0.0%	+/- 0.06	L
Nickel	6010B	13	13	0.0%	+/- 3	L
Silver	6010B	0.8 U	0.8 U	0.0%	+/- 0.8	L
Zinc	6010B	38	39	2.6%	+/- 20%	

Reported in mg/kg-dry

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: S-3
MATRIX SPIKE

Lab Sample ID: IU50A
LIMS ID: 05-20402
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Antimony	6010B	10 U	80	227	35.2%	N
Arsenic	6010B	10 U	240	227	106%	
Cadmium	6010B	0.6 U	60.5	56.8	107%	
Chromium	6010B	11	84	56.8	129%	N
Copper	6010B	9.9	75.1	56.8	115%	
Lead	6010B	16	251	227	104%	
Mercury	7471A	0.06 U	0.67	0.586	114%	
Nickel	6010B	13	77	56.8	113%	
Silver	6010B	0.8 U	61.2	56.8	108%	
Zinc	6010B	38	94	56.8	98.6%	

Reported in mg/kg-dry

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
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Sample ID: S-4
SAMPLE

Lab Sample ID: IU50B
LIMS ID: 05-20403
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Percent Total Solids: 79.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/30/05	6010B	12/05/05	7440-36-0	Antimony	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-38-2	Arsenic	6	6	U
3050B	11/30/05	6010B	12/05/05	**7440-43-9**	**Cadmium**	0.2	**0.3**	
3050B	11/30/05	6010B	12/05/05	**7440-47-3**	**Chromium**	0.6	**22.2**	
3050B	11/30/05	6010B	12/05/05	**7440-50-8**	**Copper**	0.2	**29.1**	
3050B	11/30/05	6010B	12/05/05	**7439-92-1**	**Lead**	2	**82**	
CLP	11/30/05	7471A	12/01/05	**7439-97-6**	**Mercury**	0.04	**0.04**	
3050B	11/30/05	6010B	12/05/05	**7440-02-0**	**Nickel**	1	**24**	
3050B	11/30/05	6010B	12/05/05	7440-22-4	Silver	0.4	0.4	U
3050B	11/30/05	6010B	12/05/05	**7440-66-6**	**Zinc**	0.7	**65.1**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: S-5
SAMPLE

Lab Sample ID: IU50C
LIMS ID: 05-20404
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Percent Total Solids: 80.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/30/05	6010B	12/05/05	7440-36-0	Antimony	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-38-2	Arsenic	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-43-9	Cadmium	0.2	0.2	U
3050B	11/30/05	6010B	12/05/05	**7440-47-3**	**Chromium**	0.6	**33.8**	
3050B	11/30/05	6010B	12/05/05	**7440-50-8**	**Copper**	0.2	**32.7**	
3050B	11/30/05	6010B	12/05/05	**7439-92-1**	**Lead**	2	**34**	
CLP	11/30/05	7471A	12/01/05	7439-97-6	Mercury	0.04	0.04	U
3050B	11/30/05	6010B	12/05/05	**7440-02-0**	**Nickel**	1	**26**	
3050B	11/30/05	6010B	12/05/05	**7440-22-4**	**Silver**	0.4	**0.4**	
3050B	11/30/05	6010B	12/05/05	**7440-66-6**	**Zinc**	0.7	**120**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
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Sample ID: C-6
SAMPLE

Lab Sample ID: IU50D
LIMS ID: 05-20405
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Percent Total Solids: 72.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/30/05	6010B	12/05/05	7440-36-0	Antimony	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-38-2	Arsenic	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-43-9	Cadmium	0.3	0.3	U
3050B	11/30/05	6010B	12/05/05	**7440-47-3**	**Chromium**	0.6	**16.5**	
3050B	11/30/05	6010B	12/05/05	**7440-50-8**	**Copper**	0.3	**15.3**	
3050B	11/30/05	6010B	12/05/05	**7439-92-1**	**Lead**	3	**26**	
CLP	11/30/05	7471A	12/01/05	7439-97-6	Mercury	0.07	0.07	U
3050B	11/30/05	6010B	12/05/05	**7440-02-0**	**Nickel**	1	**18**	
3050B	11/30/05	6010B	12/05/05	7440-22-4	Silver	0.4	0.4	U
3050B	11/30/05	6010B	12/05/05	**7440-66-6**	**Zinc**	0.8	**57.6**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
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Sample ID: C-7
SAMPLE

Lab Sample ID: IU50E
LIMS ID: 05-20406
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Percent Total Solids: 77.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/30/05	6010B	12/05/05	7440-36-0	Antimony	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-38-2	Arsenic	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-43-9	Cadmium	0.2	0.2	U
3050B	11/30/05	6010B	12/05/05	**7440-47-3**	**Chromium**	0.6	**20.0**	
3050B	11/30/05	6010B	12/05/05	**7440-50-8**	**Copper**	0.2	**11.6**	
3050B	11/30/05	6010B	12/05/05	**7439-92-1**	**Lead**	2	**14**	
CLP	11/30/05	7471A	12/01/05	7439-97-6	Mercury	0.05	0.05	U
3050B	11/30/05	6010B	12/05/05	**7440-02-0**	**Nickel**	1	**25**	
3050B	11/30/05	6010B	12/05/05	7440-22-4	Silver	0.4	0.4	U
3050B	11/30/05	6010B	12/05/05	**7440-66-6**	**Zinc**	0.7	**51.2**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: C-8
SAMPLE

Lab Sample ID: IU50F
LIMS ID: 05-20407
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Percent Total Solids: 82.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/30/05	6010B	12/05/05	7440-36-0	Antimony	10	10	U
3050B	11/30/05	6010B	12/05/05	7440-38-2	Arsenic	10	10	U
3050B	11/30/05	6010B	12/05/05	7440-43-9	Cadmium	0.6	0.6	U
3050B	11/30/05	6010B	12/05/05	**7440-47-3**	**Chromium**	1	**15**	
3050B	11/30/05	6010B	12/05/05	**7440-50-8**	**Copper**	0.6	**15.8**	
3050B	11/30/05	6010B	12/05/05	**7439-92-1**	**Lead**	6	**18**	
CLP	11/30/05	7471A	12/01/05	**7439-97-6**	**Mercury**	0.04	**0.21**	
3050B	11/30/05	6010B	12/05/05	**7440-02-0**	**Nickel**	3	**16**	
3050B	11/30/05	6010B	12/05/05	7440-22-4	Silver	0.9	0.9	U
3050B	11/30/05	6010B	12/05/05	**7440-66-6**	**Zinc**	2	**44**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: C-9
SAMPLE

Lab Sample ID: IU50G
LIMS ID: 05-20408
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Percent Total Solids: 82.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/30/05	6010B	12/05/05	7440-36-0	Antimony	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-38-2	Arsenic	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-43-9	Cadmium	0.2	0.2	U
3050B	11/30/05	6010B	12/05/05	**7440-47-3**	**Chromium**	0.6	**20.1**	
3050B	11/30/05	6010B	12/05/05	**7440-50-8**	**Copper**	0.2	**19.0**	
3050B	11/30/05	6010B	12/05/05	**7439-92-1**	**Lead**	2	**18**	
CLP	11/30/05	7471A	12/01/05	7439-97-6	Mercury	0.05	0.05	U
3050B	11/30/05	6010B	12/05/05	**7440-02-0**	**Nickel**	1	**24**	
3050B	11/30/05	6010B	12/05/05	7440-22-4	Silver	0.3	0.3	U
3050B	11/30/05	6010B	12/05/05	**7440-66-6**	**Zinc**	0.7	**49.5**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: C-10
SAMPLE

Lab Sample ID: IU50H
LIMS ID: 05-20409
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Percent Total Solids: 83.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/30/05	6010B	12/05/05	7440-36-0	Antimony	6	6	U
3050B	11/30/05	6010B	12/05/05	**7440-38-2**	**Arsenic**	6	**6**	
3050B	11/30/05	6010B	12/05/05	7440-43-9	Cadmium	0.2	0.2	U
3050B	11/30/05	6010B	12/05/05	**7440-47-3**	**Chromium**	0.6	**23.3**	
3050B	11/30/05	6010B	12/05/05	**7440-50-8**	**Copper**	0.2	**20.8**	
3050B	11/30/05	6010B	12/05/05	**7439-92-1**	**Lead**	2	**23**	
CLP	11/30/05	7471A	12/01/05	7439-97-6	Mercury	0.05	0.05	U
3050B	11/30/05	6010B	12/05/05	**7440-02-0**	**Nickel**	1	**24**	
3050B	11/30/05	6010B	12/05/05	7440-22-4	Silver	0.4	0.4	U
3050B	11/30/05	6010B	12/05/05	**7440-66-6**	**Zinc**	0.7	**63.1**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: C-6-S
SAMPLE

Lab Sample ID: IU50I
LIMS ID: 05-20410
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Percent Total Solids: 84.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/30/05	6010B	12/05/05	7440-36-0	Antimony	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-38-2	Arsenic	6	6	U
3050B	11/30/05	6010B	12/05/05	**7440-43-9**	**Cadmium**	0.2	**0.2**	
3050B	11/30/05	6010B	12/05/05	**7440-47-3**	**Chromium**	0.6	**19.8**	
3050B	11/30/05	6010B	12/05/05	**7440-50-8**	**Copper**	0.2	**17.2**	
3050B	11/30/05	6010B	12/05/05	**7439-92-1**	**Lead**	2	**31**	
CLP	11/30/05	7471A	12/01/05	7439-97-6	Mercury	0.04	0.04	U
3050B	11/30/05	6010B	12/05/05	**7440-02-0**	**Nickel**	1	**22**	
3050B	11/30/05	6010B	12/05/05	7440-22-4	Silver	0.3	0.3	U
3050B	11/30/05	6010B	12/05/05	**7440-66-6**	**Zinc**	0.7	**72.4**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: C-7-S
SAMPLE

Lab Sample ID: IU50J
LIMS ID: 05-20411
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Percent Total Solids: 81.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/30/05	6010B	12/05/05	7440-36-0	Antimony	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-38-2	Arsenic	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-43-9	Cadmium	0.2	0.2	U
3050B	11/30/05	6010B	12/05/05	7440-47-3	Chromium	0.6	24.8	
3050B	11/30/05	6010B	12/05/05	7440-50-8	Copper	0.2	10.7	
3050B	11/30/05	6010B	12/05/05	7439-92-1	Lead	2	13	
CLP	11/30/05	7471A	12/01/05	7439-97-6	Mercury	0.05	0.21	
3050B	11/30/05	6010B	12/05/05	7440-02-0	Nickel	1	21	
3050B	11/30/05	6010B	12/05/05	7440-22-4	Silver	0.3	0.3	U
3050B	11/30/05	6010B	12/05/05	7440-66-6	Zinc	0.7	37.2	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: C-8-S
SAMPLE

Lab Sample ID: IU50K
LIMS ID: 05-20412
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Percent Total Solids: 79.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/30/05	6010B	12/05/05	7440-36-0	Antimony	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-38-2	Arsenic	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-43-9	Cadmium	0.2	0.2	U
3050B	11/30/05	6010B	12/05/05	**7440-47-3**	**Chromium**	0.6	**19.2**	
3050B	11/30/05	6010B	12/05/05	**7440-50-8**	**Copper**	0.2	**19.5**	
3050B	11/30/05	6010B	12/05/05	**7439-92-1**	**Lead**	2	**28**	
CLP	11/30/05	7471A	12/01/05	**7439-97-6**	**Mercury**	0.05	**0.06**	
3050B	11/30/05	6010B	12/05/05	**7440-02-0**	**Nickel**	1	**22**	
3050B	11/30/05	6010B	12/05/05	7440-22-4	Silver	0.4	0.4	U
3050B	11/30/05	6010B	12/05/05	**7440-66-6**	**Zinc**	0.7	**60.0**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: C-9-S
SAMPLE

Lab Sample ID: IU50L
LIMS ID: 05-20413
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Percent Total Solids: 79.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/30/05	6010B	12/05/05	7440-36-0	Antimony	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-38-2	Arsenic	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-43-9	Cadmium	0.2	0.2	U
3050B	11/30/05	6010B	12/05/05	**7440-47-3**	**Chromium**	0.6	**16.6**	
3050B	11/30/05	6010B	12/05/05	**7440-50-8**	**Copper**	0.2	**14.8**	
3050B	11/30/05	6010B	12/05/05	**7439-92-1**	**Lead**	2	**23**	
CLP	11/30/05	7471A	12/01/05	7439-97-6	Mercury	0.05	0.05	U
3050B	11/30/05	6010B	12/05/05	**7440-02-0**	**Nickel**	1	**17**	
3050B	11/30/05	6010B	12/05/05	7440-22-4	Silver	0.4	0.4	U
3050B	11/30/05	6010B	12/05/05	**7440-66-6**	**Zinc**	0.7	**45.7**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: C-10-S
SAMPLE

Lab Sample ID: IU50M
LIMS ID: 05-20414
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Percent Total Solids: 82.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	11/30/05	6010B	12/05/05	7440-36-0	Antimony	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-38-2	Arsenic	6	6	U
3050B	11/30/05	6010B	12/05/05	7440-43-9	Cadmium	0.2	0.2	U
3050B	11/30/05	6010B	12/05/05	**7440-47-3**	**Chromium**	0.6	**18.8**	
3050B	11/30/05	6010B	12/05/05	**7440-50-8**	**Copper**	0.2	**16.1**	
3050B	11/30/05	6010B	12/05/05	**7439-92-1**	**Lead**	2	**147**	
CLP	11/30/05	7471A	12/01/05	7439-97-6	Mercury	0.05	0.05	U
3050B	11/30/05	6010B	12/05/05	**7440-02-0**	**Nickel**	1	**22**	
3050B	11/30/05	6010B	12/05/05	7440-22-4	Silver	0.3	0.3	U
3050B	11/30/05	6010B	12/05/05	**7440-66-6**	**Zinc**	0.7	**111**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: IU50LCS
LIMS ID: 05-20403
Matrix: Sediment
Data Release Authorized:
Reported: 12/06/05

QC Report No: IU50-Parametrix
Project: City of Bremerton Sediment Study
255-1896-063
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Antimony	6010B	221	200	110%	
Arsenic	6010B	214	200	107%	
Cadmium	6010B	53.9	50.0	108%	
Chromium	6010B	50.2	50.0	100%	
Copper	6010B	52.2	50.0	104%	
Lead	6010B	216	200	108%	
Mercury	7471A	1.03	1.00	103%	
Nickel	6010B	49	50	98.0%	
Silver	6010B	52.6	50.0	105%	
Zinc	6010B	50.3	50.0	101%	

Reported in mg/kg-dry

N-Control limit not met
Control Limits: 80-120%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Parametrix Project No.: IU50

Client Project: City of Bremerton Sediment Study, 255-1896-063

Case Narrative

1. The samples were submitted for grain size analysis according to PSEP methodology.
2. The samples were run with others, and one sample was chosen for triplicate analysis. The triplicate data is reported on the QA summary.
3. All three samples were mostly sand and contained fewer than the required 5 grams in the pipette portion of the analysis. When this occurs, we generally run the sieve portion of the analysis, and the first pipette reading which allows us to complete the QA ratio for the sample.
4. All of the samples had less than the required 5 grams in the pipette portion. Our balance has a capacity of about 200 g (by 0.0001), and a sample size that would give 5 grams of fines could not be split and stay within the capacity of the balance.
5. The data is provided in summary tables and plots.
6. There were no other noted anomalies in the samples or methods on this project.

Approved by: _____ Date: 12/1/05
Title: Geotechnical Division Manager

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

ANALYTICAL RESOURCES INCORPORATED

Parametrix
ity of Bremerton Sediment Study 255-1896-06

PSEP Total Solids Analysis
Percent of Wet Weight

Sample No.	Total Solids (%)
Trip 1	69.5
Trip 2	69.0
Trip 3	70.9
S-3	84.2
S-4	82.4
S-5	86.5

Triplicate Average	69.8
Standard Deviation	0.98
%RSD	1.40

(Total Solids at 90 C)

IU50

QA SUMMARY

ANALYTICAL RESOURCES INCORPORATED

PROJECT:	Parametrix	Project No.:	City of Bremerton Sediment Study 255-1896-063
ARI Triplicate Sample ID:	IU01 C	Batch No.:	IU50
Client Triplicate Sample ID:	Trip 1	Page:	1 of 1

Relative Standard Deviation, By Phi Size

Sample ID	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
Trip 1	100.0	78.9	74.8	71.0	64.1	46.7	24.9	12.3	8.6	6.7	5.6	4.5	3.4	2.5
Trip 2	100.0	81.7	78.5	74.1	66.7	48.7	25.9	12.7	8.8	7.0	5.7	4.6	3.6	2.5
Trip 3	100.0	74.2	70.7	66.9	60.1	43.2	23.0	11.3	7.9	6.4	5.3	4.3	3.2	2.1
AVE	NA	78.25	74.68	70.66	63.65	46.19	24.61	12.09	8.44	6.69	5.54	4.45	3.39	2.38
STDEV	NA	3.79	3.91	3.63	3.31	2.80	1.47	0.74	0.50	0.30	0.22	0.15	0.19	0.21
%RSD	NA	4.84	5.23	5.13	5.20	6.07	5.99	6.10	5.98	4.45	4.03	3.34	5.47	9.00

The Triplicate Applies To The Following Samples

Client ID	Date Sampled	Date Extracted	Date Complete	QA Ratio (95-105)	Data Qualifiers	Pipette Portion (5.0-25.0g)
Trip 1	11/21/05	11/23/05	12/1/05	100.5		6.9
Trip 2	11/21/05	11/23/05	12/1/05	100.1		6.9
Trip 3	11/21/05	11/23/05	12/1/05	99.9		5.9
S-3	11/29/05	11/30/05	12/1/05	100.9	SS	4.3
S-4	11/29/05	11/30/05	12/1/05	101.2	SS	3.9
S-5	11/29/05	11/30/05	12/1/05	100.5	SS	1.8

0	1/0/00	1/0/00	1/0/00	#DIV/0!		#DIV/0!
0	1/0/00	1/0/00	1/0/00	#DIV/0!		#DIV/0!
0	1/0/00	1/0/00	1/0/00	#DIV/0!		#DIV/0!
0	1/0/00	1/0/00	1/0/00	#DIV/0!		#DIV/0!
0	1/0/00	1/0/00	1/0/00	#DIV/0!		#DIV/0!

* ARI Internal QA limits = 95-105%

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

ANALYTICAL RESOURCES INCORPORATED

Parametrix
City of Bremerton Sediment Study 255-1896-063

Apparent Grain Size Distribution Summary
Percent Finer Than Indicated Size

Sample No.	Gravel			Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt				Clay	
Phi Size	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
Sieve Size (microns)	3/8"	#4	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (62)	31.00	15.60	7.80	3.90	2.00	1.00
Trip 1	100.0	78.9	74.8	71.0	64.1	46.7	24.9	12.3	8.6	6.7	5.6	4.5	3.4	2.5
Trip 2	100.0	81.7	78.5	74.1	66.7	48.7	25.9	12.7	8.8	7.0	5.7	4.6	3.6	2.5
Trip 3	100.0	74.2	70.7	66.9	60.1	43.2	23.0	11.3	7.9	6.4	5.3	4.3	3.2	2.1
S-3	100.0	67.3	43.2	34.7	31.7	27.1	9.2	3.4	NA	NA	NA	NA	NA	NA
S-4	100.0	80.8	63.7	54.4	28.5	10.7	4.2	3.1	NA	NA	NA	NA	NA	NA
S-5	100.0	73.9	57.2	50.1	41.5	7.5	1.8	1.4	NA	NA	NA	NA	NA	NA

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

IU50

ANALYTICAL RESOURCES INCORPORATED

Parametrix
City of Bremerton Sediment Study 255-1896-063

Apparent Grain Size Distribution Summary
Percent Retained in Each Size Fraction

Sample No.	Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Coarse Silt	Medium Silt	Fine Silt	Very Fine Silt	Clay		
Phi Size	> -1	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	< 10
Sieve Size (microns)	> #10 (2000)	10 to 18 (2000-1000)	18-35 (1000-500)	35-60 (500-250)	60-120 (250-125)	120-230 (125-62)	62.5-31.0	31.0-15.6	15.6-7.8	7.8-3.9	3.9-2.0	2.0-1.0	<1.0
Trip 1	25.2	3.8	6.9	17.4	21.8	12.5	3.7	1.9	1.1	1.1	1.1	0.9	2.5
Trip 2	21.5	4.4	7.4	18.0	22.8	13.3	3.9	1.8	1.2	1.1	1.0	1.1	2.5
Trip 3	29.3	3.8	6.7	17.0	20.1	11.8	3.4	1.5	1.1	1.0	1.1	1.1	2.1
S-3	56.8	8.5	3.0	4.5	18.0	5.8	NA	NA	NA	NA	NA	NA	NA
S-4	36.3	9.3	25.9	17.8	6.5	1.1	NA	NA	NA	NA	NA	NA	NA
S-5	42.8	7.1	8.6	34.0	5.7	0.5	NA	NA	NA	NA	NA	NA	NA

Notes to the Testing:

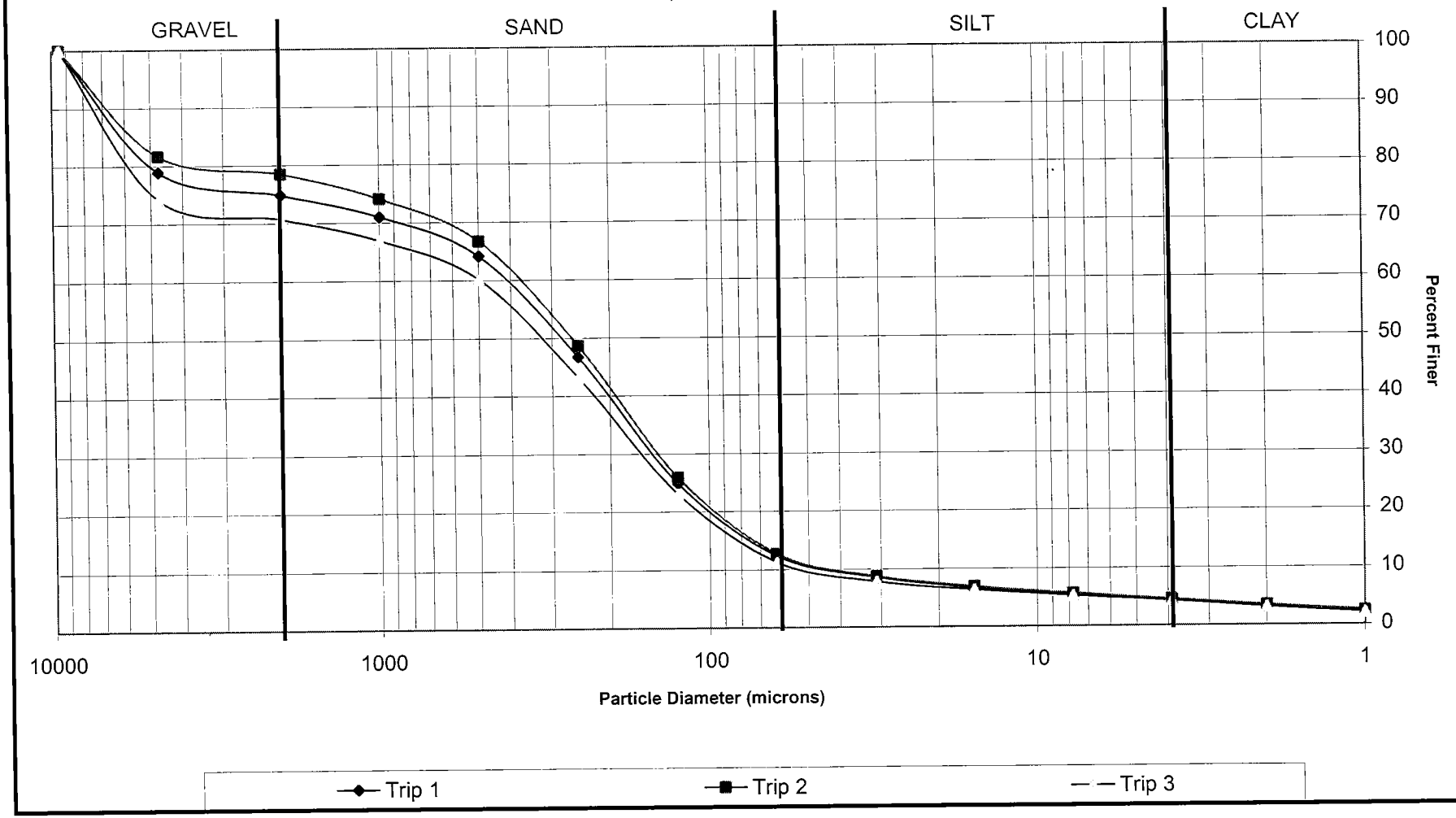
1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

IU50

ANALYTICAL RESOURCES INCORPORATED

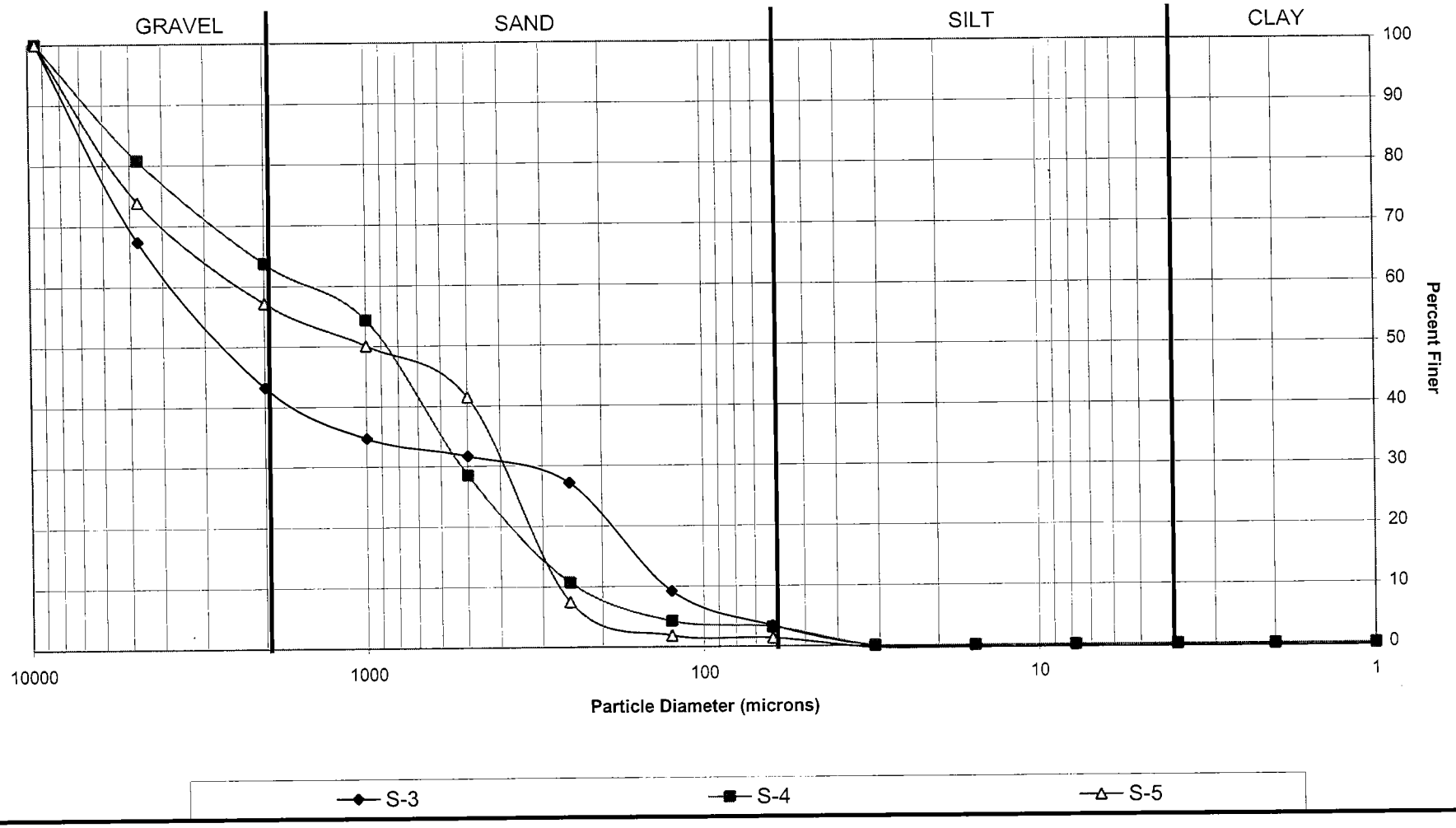
PSEP Grain Size Distribution

Triplicate Sample Plot



ANALYTICAL RESOURCES INCORPORATED

PSEP Grain Size Distribution



Analytical Resources, Incorporated
Analytical Chemists and Consultants

16 December 2005

David Gillingham
Parametrix, Inc.
411 108th Avenue NE
Suite 1800
Bellevue, WA 98004-5571

RE: Client Project: Bremerton Sediments
ARI Job No. IV18

Dear David:

Please find enclosed the final results for the samples from the project referenced above. These samples were originally received on November 30, 2005. Selected samples were analyzed for TOC per Stuart Currie on 12/07/05.

There were no problems with these analyses.

A copy of these reports and all associated raw data will be kept on file with ARI. Should you have any questions please feel free to call me at any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206/695-6210
mark@arilabs.com

Enclosures

cc: File IV18

MDH/mdh

METHOD BLANK RESULTS-CONVENTIONALS
IV18-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 12/15/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	12/07/05	Percent	< 0.01 U
Total Organic Carbon	12/12/05	Percent	< 0.020 U
	12/13/05		< 0.020 U
	12/14/05		< 0.020 U

SAMPLE RESULTS-CONVENTIONALS
IV18-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 12/15/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Client ID: C-6
ARI ID: 05-20818 IV18A

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/07/05 120705#1	EPA 160.3	Percent	0.01	79.90
Total Organic Carbon	12/14/05 121405#1	Plumb,1981	Percent	0.020	0.381

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IV18-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 12/15/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Client ID: C-7
ARI ID: 05-20819 IV18B

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/07/05 120705#1	EPA 160.3	Percent	0.01	77.30
Total Organic Carbon	12/12/05 121205#1	Plumb,1981	Percent	0.020	0.526

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IV18-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 12/15/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Client ID: C-8
ARI ID: 05-20820 IV18C

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/07/05 120705#1	EPA 160.3	Percent	0.01	82.80
Total Organic Carbon	12/12/05 121205#1	Plumb,1981	Percent	0.020	0.528

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IV18-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 12/15/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Client ID: C-9
ARI ID: 05-20821 IV18D

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/07/05 120705#1	EPA 160.3	Percent	0.01	80.40
Total Organic Carbon	12/12/05 121205#1	Plumb,1981	Percent	0.020	0.492

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IV18-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 12/15/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Client ID: C-10
ARI ID: 05-20822 IV18E

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/07/05 120705#1	EPA 160.3	Percent	0.01	83.30
Total Organic Carbon	12/12/05 121205#1	Plumb,1981	Percent	0.020	0.503

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IV18-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 12/15/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Client ID: C-6-S
ARI ID: 05-20823 IV18F

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/07/05 120705#1	EPA 160.3	Percent	0.01	84.50
Total Organic Carbon	12/13/05 121305#1	Plumb,1981	Percent	0.020	0.269

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IV18-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 12/15/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Client ID: C-7-S
ARI ID: 05-20824 IV18G

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/07/05 120705#1	EPA 160.3	Percent	0.01	81.70
Total Organic Carbon	12/13/05 121305#1	Plumb,1981	Percent	0.020	1.14

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IV18-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 12/15/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Client ID: C-8-S
ARI ID: 05-20825 IV18H

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/07/05 120705#1	EPA 160.3	Percent	0.01	85.20
Total Organic Carbon	12/13/05 121305#1	Plumb,1981	Percent	0.020	0.305

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IV18-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 12/15/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Client ID: C-9-S
ARI ID: 05-20826 IV18I

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/07/05 120705#1	EPA 160.3	Percent	0.01	83.80
Total Organic Carbon	12/13/05 121305#1	Plumb,1981	Percent	0.020	0.205

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IV18-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 12/15/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Client ID: C-10-S
ARI ID: 05-20827 IV18J

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/07/05 120705#1	EPA 160.3	Percent	0.01	86.40
Total Organic Carbon	12/13/05 121305#1	Plumb,1981	Percent	0.020	0.167

RL Analytical reporting limit
U Undetected at reported detection limit

REPLICATE RESULTS-CONVENTIONALS
IV18-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 12/15/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: IV18A Client ID: C-6					
Total Solids	12/07/05	Percent	79.90	78.60 79.40	0.8%
Total Organic Carbon	12/14/05	Percent	0.381	0.359 0.431	9.5%

MS/MSD RESULTS-CONVENTIONALS
IV18-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 12/15/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: 11/29/05
Date Received: 11/30/05

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: IV18A Client ID: C-6						
Total Organic Carbon	12/14/05	Percent	0.381	1.18	0.772	103.4%

LAB CONTROL RESULTS-CONVENTIONALS
IV18-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 12/15/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	LCS	Spike Added	Recovery
Total Organic Carbon	12/12/05	Percent	0.538	0.500	107.6%
	12/13/05		0.532	0.500	106.4%
	12/14/05		0.481	0.500	96.2%

STANDARD REFERENCE RESULTS-CONVENTIONALS
IV18-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Soil
Data Release Authorized:
Reported: 12/15/05

Project: City of Bremerton Sediment S
Event: 255-1896-063
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
Total Organic Carbon	12/12/05	Percent	3.58	3.35	106.9%
NIST #8704	12/13/05		3.54	3.35	105.7%
	12/14/05		3.07	3.35	91.6%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

DEC 22 2005
Brem

19 December 2005

David Gillingham
Parametrix, Inc.
411 108th Avenue NE
Suite 1800
Bellevue, WA 98004-5571

RE: Client Project: Bremerton Sediments
ARI Job No. IV58

Dear David:

Please find enclosed the final results for the sample from the project referenced above. This sample was originally received on November 30, 2005. Sample C-8 was analyzed for grain size per Stuart Currie on 12/13/05.

There were no problems with this analysis.

A copy of these reports and all associated raw data will be kept on file with ARI. Should you have any questions please feel free to call me at any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206/695-6210
mark@arilabs.com

Enclosures

cc: File IV58

MDH/mdh

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Parametrix Project No.: IV58

Client Project: City of Bremerton Sediment Study, 255-1896-063

Case Narrative

1. The sample was submitted for grain size analysis according to PSEP methodology.
2. The sample was run with others, and one sample was chosen for triplicate analysis. The triplicate data is reported on the QA summary.
3. The sample was mostly sand and contained fewer than the required 5 grams in the pipette portion of the analysis. When this occurs, we generally run the sieve portion of the analysis, and the first pipette reading which allows us to complete the QA ratio for the sample.
4. The sample had 2.47 grams of fines, which is less than the required 5 grams. Our balance has a capacity of about 200 g (by 0.0001), and a sample size that would give 5 grams of fines could not be split and stay within the capacity of the balance.
5. The data is provided in summary tables and plots.
6. There were no other noted anomalies in the samples or methods on this project.

Approved by: _____ Date: 12/16/05
Title: Geotechnical Division Manager

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Parametrix
City of Bremerton Sediment Study 255-1896-063

PSEP Total Solids Analysis
Percent of Wet Weight

Sample No.	Total Solids (%)
CB85-120505	59.9
CB85-120505	60.6
CB85-120505	59.9
C-8	82.8

Triplicate Average	60.2
Standard Deviation	0.42
%RSD	0.70

(Total Solids at 90 C)

QA SUMMARY

ANALYTICAL RESOURCES INCORPORATED

PROJECT:	Parametrix	Project No.:	City of Bremerton Sediment Study 255-1896-063
ARI Triplicate Sample ID:	IV03 C	Batch No.:	IV58
Client Triplicate Sample ID:	CB85-120505	Page:	1 of 1

Relative Standard Deviation, By Phi Size

Sample ID	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
CB85-120505	100.0	99.1	96.0	89.6	78.1	60.7	42.5	24.7	11.6	5.9	3.5	1.9	1.0	0.5
CB85-120505	100.0	99.6	96.6	89.1	77.8	60.7	42.4	25.0	10.3	5.6	3.3	1.8	0.9	0.4
CB85-120505	100.0	96.4	92.2	84.9	73.7	56.7	39.0	21.3	8.7	6.5	3.4	1.9	1.0	0.4
AVE	NA	98.34	94.90	87.84	76.54	59.37	41.30	23.65	10.17	6.01	3.37	1.87	0.97	0.42
STDEV	NA	1.73	2.39	2.58	2.47	2.32	1.98	2.07	1.47	0.47	0.09	0.08	0.07	0.03
%RSD	NA	1.76	2.52	2.94	3.22	3.91	4.81	8.76	14.47	7.85	2.81	4.48	6.85	7.95

The Triplicate Applies To The Following Samples

Client ID	Date Sampled	Date Extracted	Date Complete	QA Ratio (95-105)	Data Qualifiers	Pipette Portion (5.0-25.0g)
CB85-120505	12/5/05	12/13/05	12/15/05	102.0		21.0
CB85-120505	12/5/05	12/13/05	12/15/05	101.8		22.0
CB85-120505	12/5/05	12/13/05	12/15/05	99.7		17.8
C-8	11/29/05	12/13/05	12/15/05	257.3		2.5

* ARI Internal QA limits = 95-105%

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

ANALYTICAL RESOURCES INCORPORATED

Parametrix
City of Bremerton Sediment Study 255-1896-063

Apparent Grain Size Distribution Summary
Percent Finer Than Indicated Size

Sample No.	Gravel			Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt				Clay	
Phi Size	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
Sieve Size (microns)	3/8"	#4	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (62)	31.00	15.60	7.80	3.90	2.00	1.00
CB85-120505	100.0	99.1	96.0	89.6	78.1	60.7	42.5	24.7	11.6	5.9	3.5	1.9	1.0	0.5
CB85-120505	100.0	99.6	96.6	89.1	77.8	60.7	42.4	25.0	10.3	5.6	3.3	1.8	0.9	0.4
CB85-120505	100.0	96.4	92.2	84.9	73.7	56.7	39.0	21.3	8.7	6.5	3.4	1.9	1.0	0.4
C-8	100.0	85.3	68.4	60.1	40.7	17.9	3.4	2.0	NA	NA	NA	NA	NA	NA

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

ANALYTICAL RESOURCES INCORPORATED

Parametrix
City of Bremerton Sediment Study 255-1896-063

Apparent Grain Size Distribution Summary
Percent Retained in Each Size Fraction

Sample No.	Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Coarse Silt	Medium Silt	Fine Silt	Very Fine Silt	Clay		
Phi Size	> -1	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	< 10
Sieve Size (microns)	> #10 (2000)	10 to 18 (2000-1000)	18-35 (1000-500)	35-60 (500-250)	60-120 (250-125)	120-230 (125-62)	62.5-31.0	31.0-15.6	15.6-7.8	7.8-3.9	3.9-2.0	2.0-1.0	<1.0
CB85-120505	4.0	6.4	11.4	17.4	18.2	17.9	13.1	5.7	2.4	1.5	0.9	0.6	0.5
CB85-120505	3.4	7.5	11.3	17.1	18.3	17.3	14.8	4.6	2.3	1.5	0.9	0.5	0.4
CB85-120505	7.8	7.3	11.2	17.0	17.7	17.7	12.6	2.1	3.2	1.5	0.9	0.6	0.4
C-8	31.6	8.2	19.4	22.8	14.6	1.3	NA	NA	NA	NA	NA	NA	NA

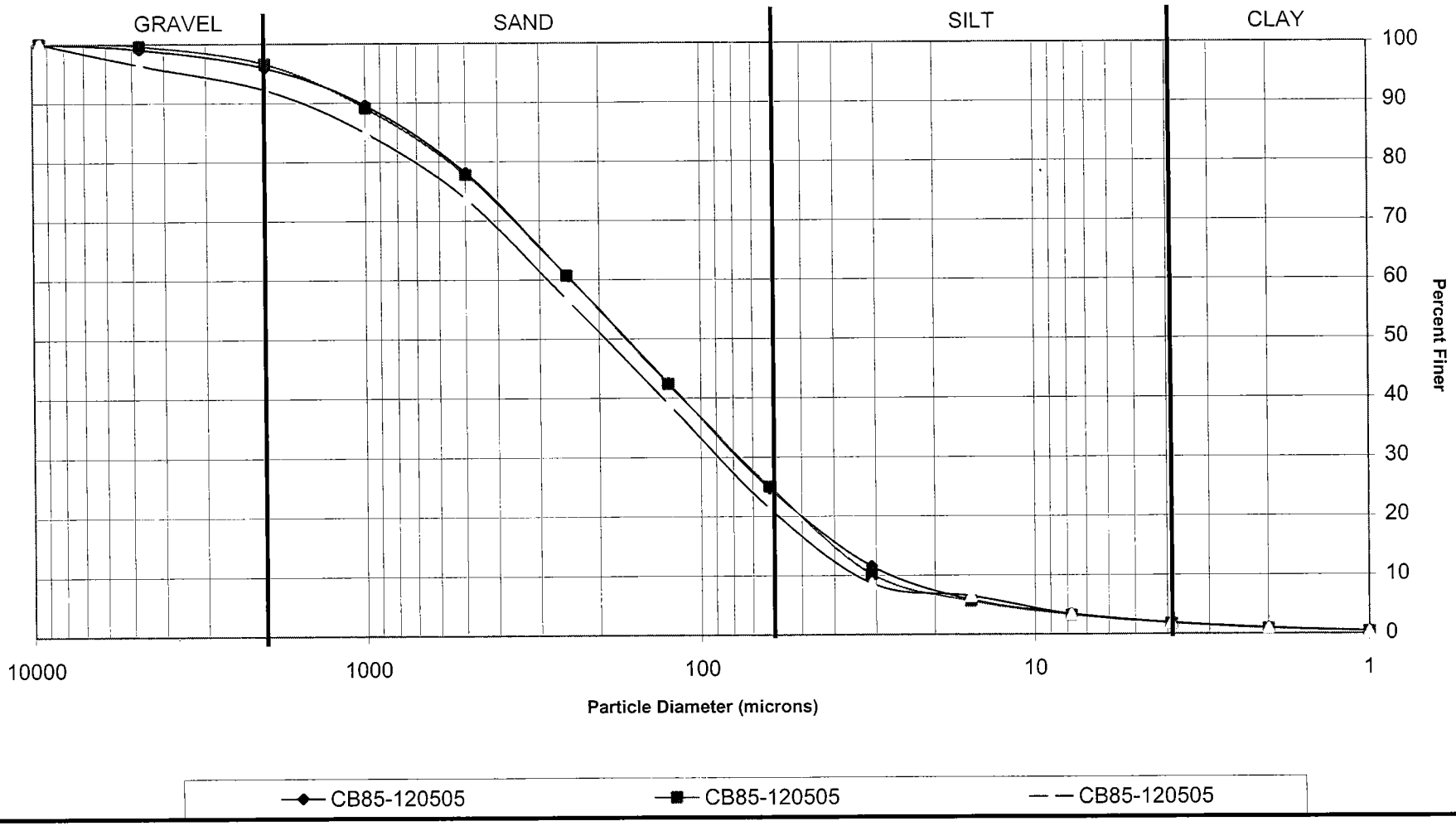
Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

ANALYTICAL RESOURCES INCORPORATED

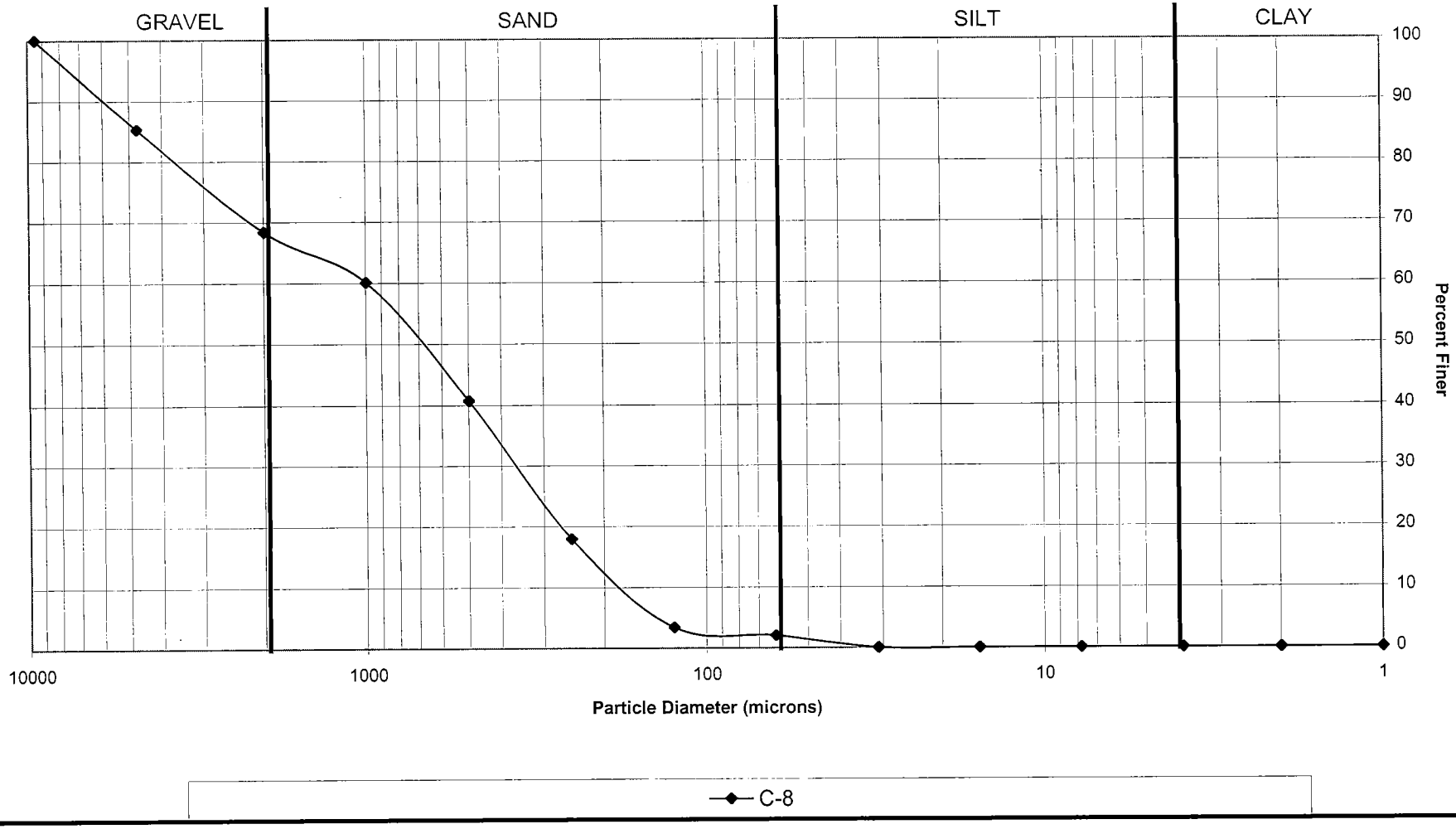
PSEP Grain Size Distribution

Triplicate Sample Plot



ANALYTICAL RESOURCES INCORPORATED

PSEP Grain Size Distribution



Analytical Resources, Incorporated
Analytical Chemists and Consultants

3 January 2006

David Gillingham
Parametrix, Inc.
411 108th Avenue NE
Suite 1800
Bellevue, WA 98004-5571

RE: Client Project: Bremerton Parametrix
ARI Job No. IW53

Dear David:

Please find enclosed the original chain of custody record and the final results for the sample from the project referenced above. One sediment sample was received on December 21, 2005. The sample was analyzed for grain size as requested.

A copy of these reports and all associated raw data will be kept on file with ARI. Should you have any questions please feel free to call me at any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206/695-6210
mark@arilabs.com

Enclosures

cc: File IW53

MDH/mdh

4.82 1W53

☒ 2433 Impala Drive • Carlsbad, CA 92008 • (760) 931-8081, FAX 931-1580
☐ 98 Main St., Ste. #428 • Tiburon, CA 94920 • (415) 435-1847, FAX 435-0479
☐ 1440 Broadway, Ste. 908 • Oakland, CA 94612 • (510) 808-0302, FAX 891-9710
☐ 152 Sunset View Lane • Sequim, WA 98382 • (360) 582-1758, FAX 582-1679
☐ 4729 NE View Drive • Port Gamble, WA 98364 • (360) 297-6903, FAX 297-6905

CHAIN OF CUSTODY

12028

DATE 12/20/05 PAGE 1 OF 1

PROJECT NAME / SURVEY / PROJECT NUMBER: Bremerton Parametrix
PROJECT MANAGER: Bill Gardiner
COMPANY: Weston
ADDRESS: 4729 NE View Dr. Port Gamble WA 98364
PHONE/FAX: 360-297-6903 / 297-6905

SAMPLE I.D.	DATE	TIME	MATRIX	INITIALS	NUMBER & TYPE OF CONTAINERS	ANALYSIS/TEST REQUESTED: Grain Size					PRESERVED HOW/ COMMENTS	FOR WESTON USE ONLY: SAMPLE TEMP. UPON RECEIPT	FOR WESTON USE ONLY: WESTON LAB ID
Ref-6	12/20/05	1437	sed	YS	1 bag	X					ice		

SPECIAL INSTRUCTIONS/COMMENTS:

SHIPPING:
Shipping VIA: Airbill No:

SAMPLE CONDITION UPON RECEIPT (FOR WESTON USE ONLY):

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature: Kasey Skrivseth	Signature: [illegible]	Signature	Signature	Signature	Signature
Firm: Weston	Firm: [illegible]	Firm	Firm	Firm	Firm
Date/Time: 12/20/05 1439	Date/Time: 12/21/05 1045	Date/Time	Date/Time	Date/Time	Date/Time

WHITE – return to originator • YELLOW – lab • PINK – retained by originator

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Weston Solutions Project No.: IW53

Client Project: Bremerton Parametrix

Case Narrative

1. Sample REF-6 was submitted for grain size analysis according to PSEP methodology.
2. The sample was run in a single batch with other PSEP samples, and one sample was chosen for triplicate analysis. The triplicate data is reported on the QA summary.
3. Sample REF-6 was mostly sand and contained fewer than the required 5 grams in the pipette portion of the analysis. Our balance has a capacity of about 205 g (by 0.0001), and a sample size that would give 5 grams of fines could not be split and stay within the capacity of the balance. When this occurs, we generally run the samples anyway, and flag the data.
4. The data is provided in summary tables and plots.
5. There were no other noted anomalies in the sample or methods on this project.

Approved by: Taylor McKenzie Date: 12/29/05
Title: Lead Technician

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

ANALYTICAL RESOURCES INCORPORATED

DATA QUALIFIERS FOR PHYSICAL ANALYSES

SM Indicates that the sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with moisture content, porosity, and saturation calculations that assume only water is present. It can also cause particles to adhere to one another, causing errors in grain size distribution analyses.

SS Indicates that the sample was not appropriate for the method requested because it did not contain the proportion of "fines'" required to perform the pipette portion of the analysis.

W Indicates that the amount of sample in some pipette readings was below the level required for accurate weighing, resulting in negative weights, which were adjusted to eliminate the negative value.

F Indicates that the samples were frozen prior to particle size determination.

ANALYTICAL RESOURCES INCORPORATED

Weston Solutions
Bremerton Parametrix

Apparent Grain Size Distribution Summary
Percent Finer Than Indicated Size

Sample No.	Gravel			Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt				Clay	
Phi Size	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
Sieve Size (microns)	3/8"	#4	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (62)	31.00	15.60	7.80	3.90	2.00	1.00
CR23/CR24	100.0	100.0	100.0	99.9	99.3	97.0	87.2	48.9	22.3	11.1	7.4	6.0	5.0	3.8
CR23/CR24	100.0	100.0	100.0	99.9	99.2	97.0	86.9	45.9	20.7	11.0	7.6	6.0	5.0	3.8
CR23/CR24	100.0	100.0	99.9	99.7	99.0	96.7	86.7	47.9	20.1	11.2	7.6	6.2	5.1	3.8
REF-6	100.0	100.0	99.8	96.9	96.4	74.6	23.7	4.0	2.1	1.7	1.5	1.2	1.0	0.8

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

IW53

ANALYTICAL RESOURCES INCORPORATED

Weston Solutions
Bremerton Parametrix

Apparent Grain Size Distribution Summary
Percent Retained in Each Size Fraction

Sample No.	Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Coarse Silt	Medium Silt	Fine Silt	Very Fine Silt	Clay		
Phi Size	> -1	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	< 10
Sieve Size (microns)	> #10 (2000)	10 to 18 (2000-1000)	18-35 (1000-500)	35-60 (500-250)	60-120 (250-125)	120-230 (125-62)	62.5-31.0	31.0-15.6	15.6-7.8	7.8-3.9	3.9-2.0	2.0-1.0	<1.0
CR23/CR24	0.0	0.1	0.6	2.3	9.8	38.3	26.7	11.2	3.7	1.3	1.0	1.3	3.8
CR23/CR24	0.0	0.1	0.7	2.2	10.2	41.0	25.1	9.7	3.5	1.6	1.0	1.2	3.8
CR23/CR24	0.1	0.2	0.7	2.3	10.0	38.8	27.8	8.8	3.6	1.5	1.1	1.2	3.8
REF-6	0.2	2.9	0.5	21.7	50.9	19.7	1.9	0.4	0.2	0.3	0.3	0.2	0.8

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

IW53

ANALYTICAL RESOURCES INCORPORATED

Weston Solutions
Bremerton Parametrix

PSEP Total Solids Analysis
Percent of Wet Weight

Sample No.	Total Solids (%)
CR23/CR24	68.0
CR23/CR24	67.9
CR23/CR24	67.9
REF-6	80.9

Triplicate Average	67.9
Standard Deviation	0.02
%RSD	0.04

(Total Solids at 90 C)

IW53

QA SUMMARY

ANALYTICAL RESOURCES INCORPORATED

PROJECT:	Weston Solutions	Project No.:	Bremerton Parametrix
ARI Triplicate Sample ID:	IW60 A	Batch No.:	IW53
Client Triplicate Sample ID:	CR23/CR24	Page:	1 of 1

Relative Standard Deviation, By Phi Size

Sample ID	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
CR23/CR24	100.0	100.0	100.0	99.9	99.3	97.0	87.2	48.9	22.3	11.1	7.4	6.0	5.0	3.8
CR23/CR24	100.0	100.0	100.0	99.9	99.2	97.0	86.9	45.9	20.7	11.0	7.6	6.0	5.0	3.8
CR23/CR24	100.0	100.0	99.9	99.7	99.0	96.7	86.7	47.9	20.1	11.2	7.6	6.2	5.1	3.8
AVE	NA	100.00	99.97	99.81	99.14	96.91	86.92	47.54	21.03	11.12	7.52	6.06	5.04	3.81
STDEV	NA	0.00	0.04	0.10	0.16	0.19	0.28	1.55	1.11	0.11	0.13	0.10	0.05	0.05
%RSD	NA	0.00	0.04	0.10	0.16	0.19	0.32	3.26	5.27	0.99	1.75	1.62	1.01	1.25

The Triplicate Applies To The Following Samples

Client ID	Date Sampled	Date Extracted	Date Complete	QA Ratio (95-105)	Data Qualifiers	Pipette Portion (5.0-25.0g)
CR23/CR24	12/20/05	12/22/05	12/29/05	102.0		18.6
CR23/CR24	12/20/05	12/22/05	12/29/05	102.5		18.2
CR23/CR24	12/20/05	12/22/05	12/29/05	102.0		18.8
REF-6	12/20/05	12/21/05	12/29/05	100.7	SS	4.9

* ARI Internal QA limits = 95-105%

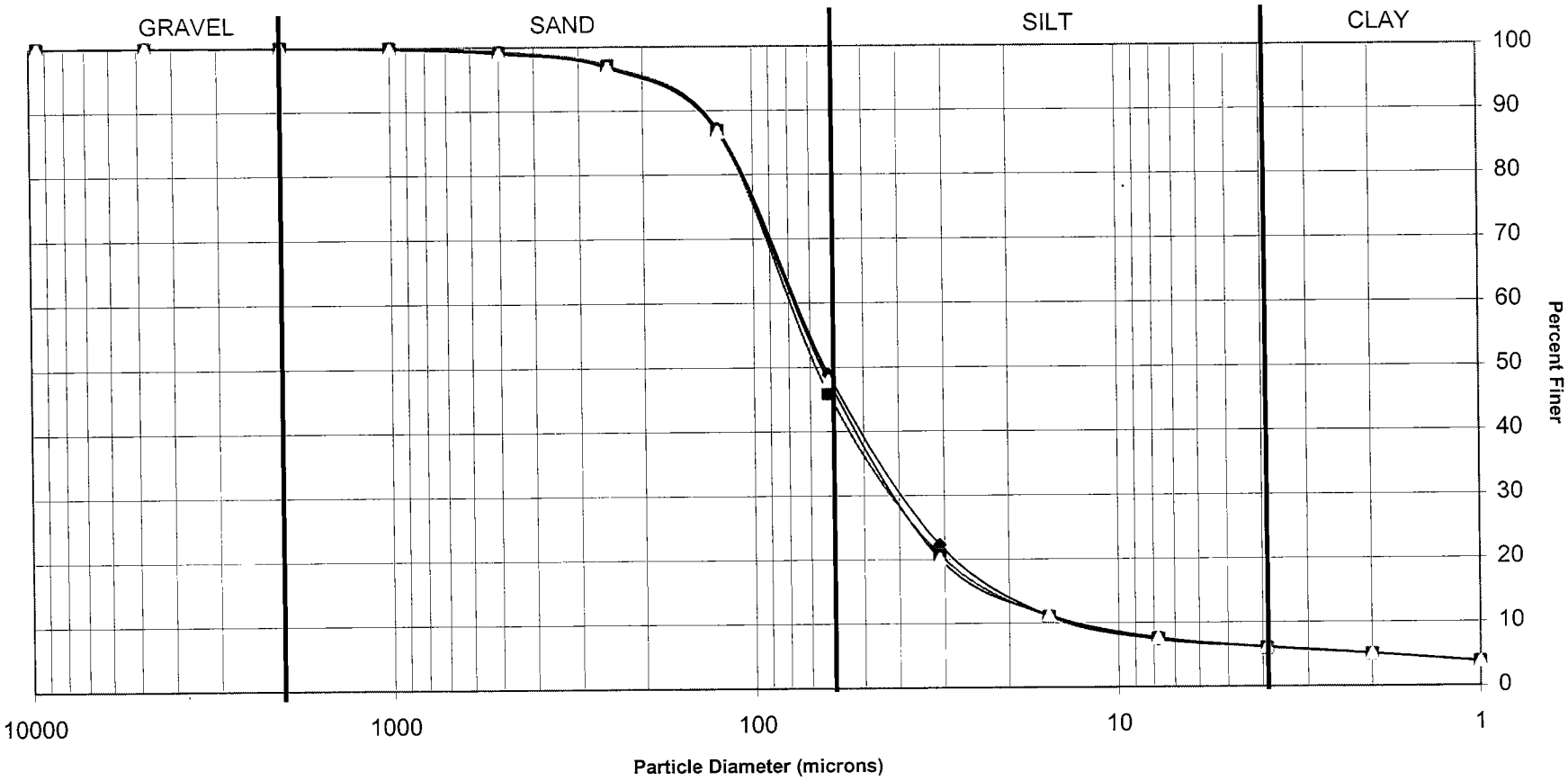
Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

ANALYTICAL RESOURCES INCORPORATED

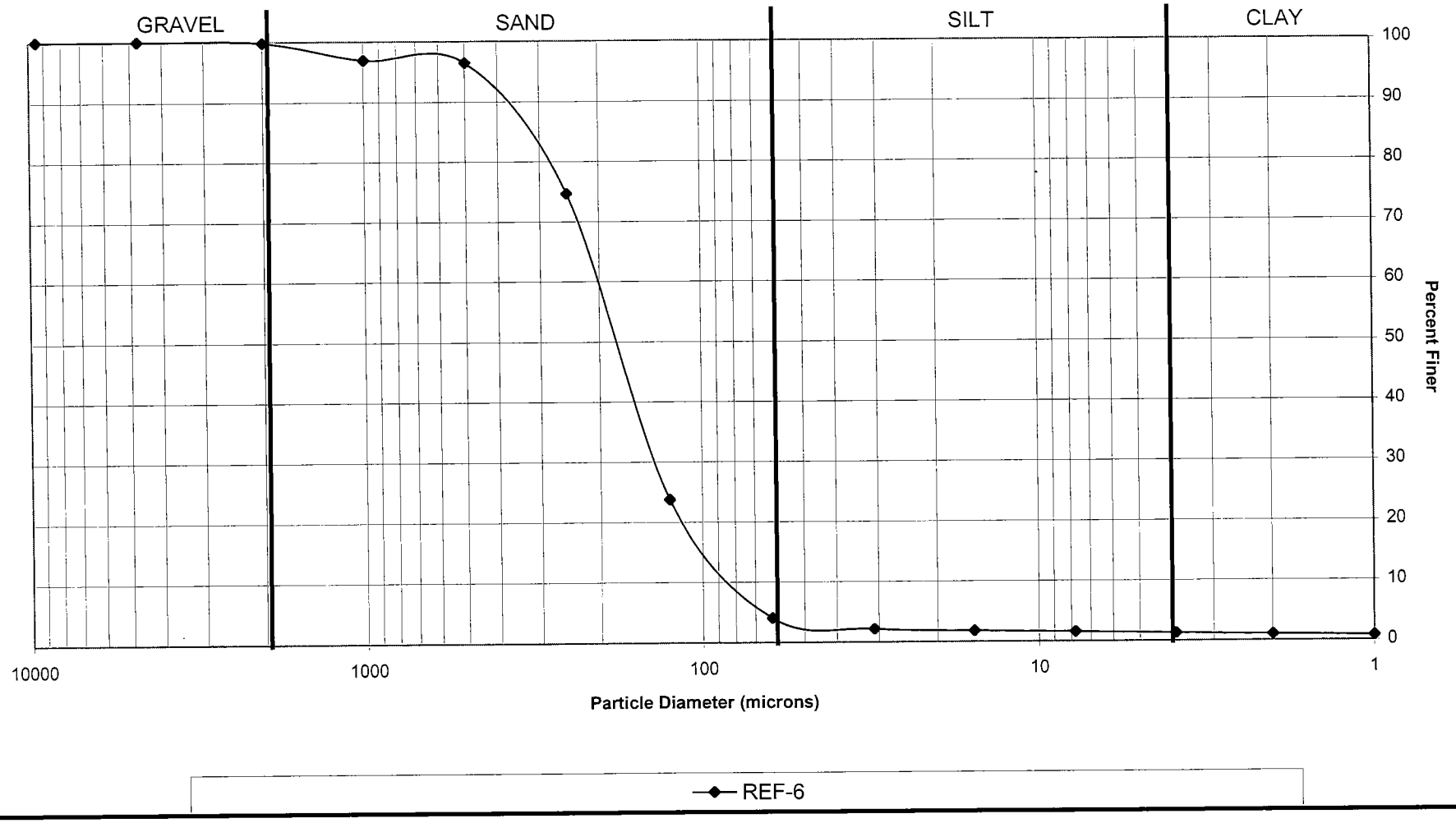
PSEP Grain Size Distribution

Triplicate Sample Plot



ANALYTICAL RESOURCES INCORPORATED

PSEP Grain Size Distribution



Analytical Resources, Incorporated
Analytical Chemists and Consultants

25 January 2006

JAN 2 3 2006
By Brem

Phil Struck
Parametrix, Inc.
5700 Kitsap Way
Suite 202
Bremerton, WA 98312-2234

RE: Client Project – 255-1896-063, Bremerton Seds
ARI Job IX82

Dear Phil:

Please find enclosed the original chain of custody record (COC) and the final results for the samples from the project referenced above. Three sediment samples were received in good condition on January 11, 2006. There were no discrepancies between the chain of custody and the sample container's labels. The samples were analyzed for PAHs, TOC and grain size as requested.

There were no analytical complications noted.

A copy of these reports and all supporting data will be kept on file with ARI. Should you have any questions please feel free to call me at any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206/695-6210
mark@arilabs.com

Enclosures

cc: File IX82

MDH/mdh

Data Reporting Qualifiers

Effective 12/28/04

Inorganic Data

U Indicates that the target analyte was not detected at the reported concentration

* Duplicate RPD is not within established control limits

B Reported value is less than the CRDL but ≥ the Reporting Limit

N Matrix Spike recovery not within established control limits

NA Not Applicable, analyte not spiked

H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible

L Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U Indicates that the target analyte was not detected at the reported concentration

* Flagged value is not within established control limits

B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.

J Estimated concentration when the value is less than ARI's established reporting limits

D The spiked compound was not detected due to sample extract dilution

NR Spiked compound recovery is not reported due to chromatographic interference

E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA The flagged analyte was not analyzed for

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D GC/MS
Page 1 of 1

Sample ID: MB-011606
METHOD BLANK

Lab Sample ID: MB-011606
LIMS ID: 06-236
Matrix: Sediment
Data Release Authorized:
Reported: 01/19/06

QC Report No: IX82-Parametrix
Project: Bremerton Seds
255-1896-063
Date Sampled: NA
Date Received: NA

Date Extracted: 01/16/06
Date Analyzed: 01/18/06 21:30
Instrument/Analyst: NT4/VTS
GPC Cleanup: No
Alumina: Yes

Sample Amount: 25.0 g
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: NA
pH: NA

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
86-73-7	Fluorene	20	< 20 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
218-01-9	Chrysene	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	66.8%
2-Fluorobiphenyl	62.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D GC/MS **Sample ID: C-11**
Page 1 of 1 **MATRIX SPIKE**

Lab Sample ID: IX82A
LIMS ID: 06-236
Matrix: Sediment
Data Release Authorized:
Reported: 01/19/06

QC Report No: IX82-Parametrix
Project: Bremerton Seds
255-1896-063
Date Sampled: 01/09/06
Date Received: 01/11/06

Date Extracted: 01/16/06
Date Analyzed: 01/18/06 23:10
Instrument/Analyst: NT4/VTS
GPC Cleanup: No
Alumina: Yes

Sample Amount: 26.1 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 18.3%
pH: 7.5

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	19	---
91-57-6	2-Methylnaphthalene	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	---
86-73-7	Fluorene	19	< 19 U
85-01-8	Phenanthrene	19	< 19 U
120-12-7	Anthracene	19	< 19 U
206-44-0	Fluoranthene	19	---
129-00-0	**Pyrene**	**19**	**28**
56-55-3	Benzo(a)anthracene	19	---
218-01-9	**Chrysene**	**19**	**20**
205-99-2	Benzo(b)fluoranthene	19	< 19 U
207-08-9	Benzo(k)fluoranthene	19	< 19 U
50-32-8	Benzo(a)pyrene	19	< 19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U
191-24-2	Benzo(g,h,i)perylene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	68.8%
2-Fluorobiphenyl	65.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D GC/MS
Page 1 of 1

Sample ID: C-11
MS/MSD

Lab Sample ID: IX82A
LIMS ID: 06-236
Matrix: Sediment
Data Release Authorized:
Reported: 01/19/06

QC Report No: IX82-Parametrix
Project: Bremerton Seds
255-1896-063
Date Sampled: 01/09/06
Date Received: 01/11/06

Date Extracted MS/MSD: 01/16/06

Date Analyzed MS: 01/18/06 23:10
MSD: 01/18/06 23:43
Instrument/Analyst MS: NT4/VTS
MSD: NT4/VTS
GPC Cleanup: NO

Sample Amount MS: 26.1 g-dry-wt
MSD: 25.5 g-dry-wt
Final Extract Volume MS: 0.5 mL
MSD: 0.5 mL
Dilution Factor MS: 1.00
MSD: 1.00
Alumina Cleanup: YES

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Naphthalene	< 19.4	347	479	72.4%	326	490	66.5%	6.2%
Acenaphthene	< 19.4	339	479	70.8%	323	490	65.9%	4.8%
Fluoranthene	20.3	420	479	83.4%	397	490	76.9%	5.6%
Benzo(a)anthracene	< 19.4	389	479	81.2%	355	490	72.4%	9.1%

Results reported in µg/kg
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D GC/MS
Page 1 of 1

Sample ID: C-13
SAMPLE

Lab Sample ID: IX82C
LIMS ID: 06-238
Matrix: Sediment
Data Release Authorized:
Reported: 01/19/06

QC Report No: IX82-Parametrix
Project: Bremerton Seds
255-1896-063
Date Sampled: 01/09/06
Date Received: 01/11/06

Date Extracted: 01/16/06
Date Analyzed: 01/19/06 00:49
Instrument/Analyst: NT4/VTS
GPC Cleanup: No
Alumina: Yes

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 20.7%
pH: 7.5

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
86-73-7	Fluorene	20	< 20 U
85-01-8	**Phenanthrene**	**20**	**20**
120-12-7	Anthracene	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**64**
129-00-0	**Pyrene**	**20**	**60**
56-55-3	**Benzo(a)anthracene**	**20**	**28**
218-01-9	**Chrysene**	**20**	**39**
205-99-2	**Benzo(b)fluoranthene**	**20**	**37**
207-08-9	**Benzo(k)fluoranthene**	**20**	**28**
50-32-8	**Benzo(a)pyrene**	**20**	**33**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	**Benzo(g,h,i)perylene**	**20**	**21**
132-64-9	Dibenzofuran	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	66.4%
2-Fluorobiphenyl	64.8%

METHOD BLANK RESULTS-CONVENTIONALS
IX82-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/25/06

Project: Bremerton Seds
Event: 255-1896-063
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	01/11/06	Percent	< 0.01 U
Total Organic Carbon	01/18/06	Percent	< 0.020 U
	01/18/06		< 0.020 U
	01/18/06		< 0.020 U
	01/23/06		< 0.020 U

SAMPLE RESULTS-CONVENTIONALS
IX82-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/25/06

Project: Bremerton Seds
Event: 255-1896-063
Date Sampled: 01/09/06
Date Received: 01/11/06

Client ID: C-12
ARI ID: 06-237 IX82B

Analyte	Date	Method	Units	RL	Sample
Total Solids	01/11/06 011106#1	EPA 160.3	Percent	0.01	71.90
Total Organic Carbon	01/18/06 011806#3	Plumb,1981	Percent	0.020	0.631

RL Analytical reporting limit
U Undetected at reported detection limit

REPLICATE RESULTS-CONVENTIONALS
IX82-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/25/06

Project: Bremerton Seds
Event: 255-1896-063
Date Sampled: 01/09/06
Date Received: 01/11/06

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: IX82B Client ID: C-12					
Total Solids	01/11/06	Percent	71.90	72.50 72.10	0.4%
Total Organic Carbon	01/18/06	Percent	0.631	0.670 0.672	3.5%

LAB CONTROL RESULTS-CONVENTIONALS
IX82-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/25/06

Project: Bremerton Seds
Event: 255-1896-063
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	LCS	Spike Added	Recovery
Total Organic Carbon	01/18/06	Percent	0.547	0.500	109.4%
	01/18/06		0.529	0.500	105.8%
	01/23/06		0.514	0.500	102.8%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Parametrix	Project No.: IX82
Client Project: Bremerton Seds 255-1896-063	

Case Narrative

1. The samples were submitted for grain size analysis according to PSEP methodology.
2. The samples were run in a single batch, and one sample was chosen for triplicate analysis. The triplicate data is reported on the QA summary.
3. The samples contained mostly sand and shell fragments. Sample C-12 was chosen for triplicate analysis. The second sample within the triplicate was calculated using the after moisture content to eliminate a negative value in the 4 phi size range.
4. All of the samples submitted for analysis contained a high percentage of shell fragments and/or organics, which may have broken down during the sieving process and affected grain size results.
5. The data is provided in summary tables and plots.
6. There were no other noted anomalies in the samples or methods on this project.

Approved by: P McKenzie Date: 1/18/06
Title: Lead Technician

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

ANALYTICAL RESOURCES INCORPORATED

Parametrix
Bremerton Seds 255-1896-063

Apparent Grain Size Distribution Summary
Percent Finer Than Indicated Size

Sample No.	Gravel			Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt				Clay	
Phi Size	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
Sieve Size (microns)	3/8"	#4	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (62)	31.00	15.60	7.80	3.90	2.00	1.00
C-12	100.0	88.8	83.6	79.9	73.0	43.2	11.0	4.5	3.5	2.8	2.3	1.8	1.3	0.9
C-12	100.0	86.9	81.6	78.0	71.3	43.3	11.1	5.0	4.0	3.2	2.8	2.2	1.5	1.0
C-12	100.0	88.8	84.0	80.6	73.9	45.2	11.9	5.6	4.1	3.5	2.9	2.3	1.6	1.1
C-11	100.0	80.4	54.0	38.0	24.5	9.9	6.3	5.4	3.3	2.7	2.2	1.7	1.1	0.8
C-13	100.0	93.7	88.6	86.1	81.8	56.0	16.0	6.6	4.3	3.3	2.7	2.1	1.5	1.0

Notes to the Testing:

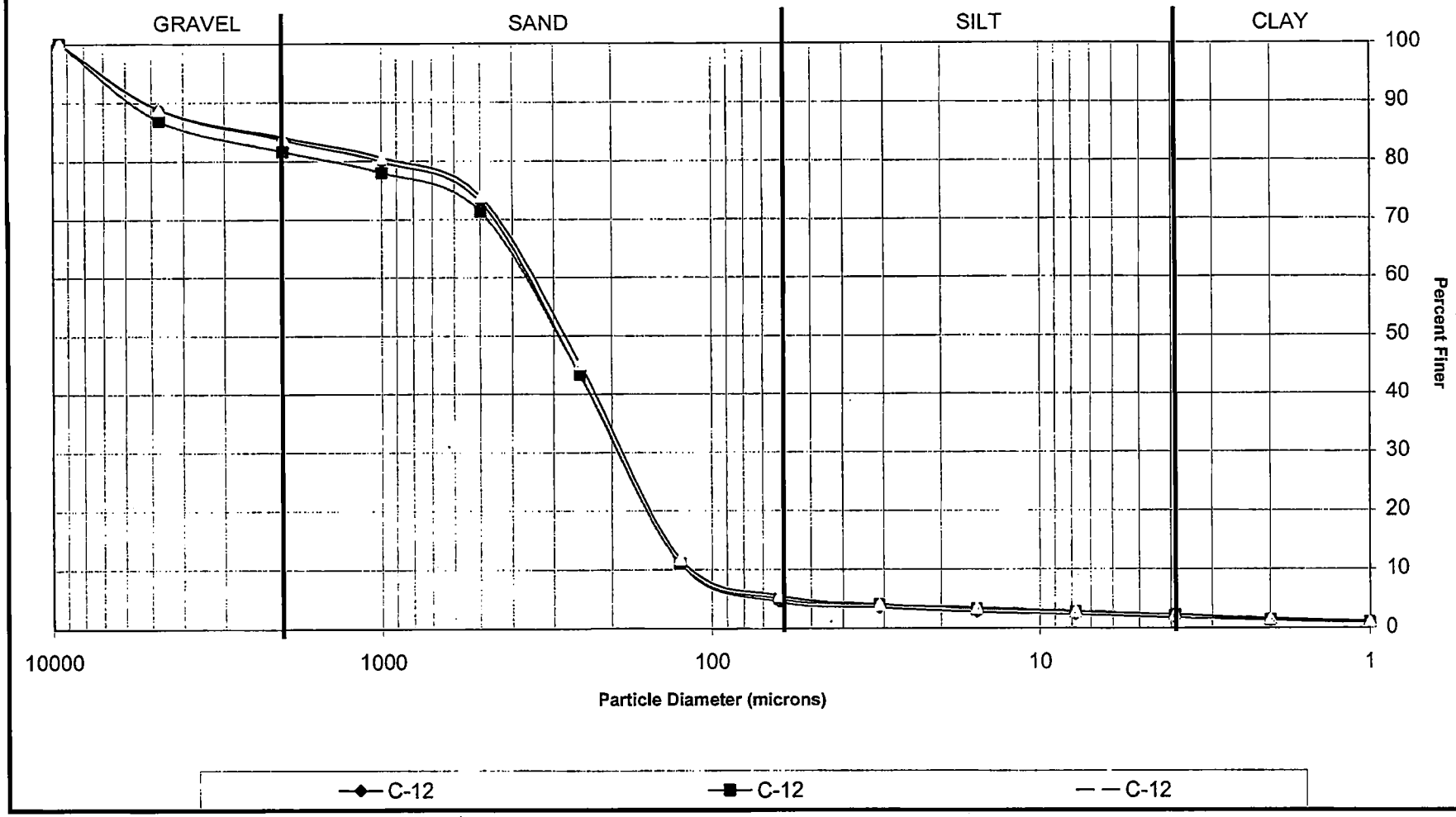
1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

IX82

ANALYTICAL RESOURCES INCORPORATED

PSEP Grain Size Distribution

Triplicate Sample Plot



ANALYTICAL RESOURCES INCORPORATED

Parametrix
Bremerton Seds 255-1896-063

PSEP Total Solids Analysis
Percent of Wet Weight

Sample No.	Total Solids (%)
C-12	81.5
C-12	81.1
C-12	81.9
C-11	82.0
C-13	77.0

Triplicate Average	81.5
Standard Deviation	0.41
%RSD	0.51

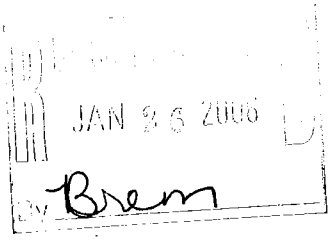
(Total Solids at 90 C)

IX82

CHEMISTRY DATA FOR SAMPLES

C-11
C-12
C-13

Analytical Resources, Incorporated
Analytical Chemists and Consultants



25 January 2006

Phil Struck
Parametrix, Inc.
5700 Kitsap Way
Suite 202
Bremerton, WA 98312-2234

RE: Client Project – 255-1896-063, Bremerton Seds
ARI Job IX82

Dear Phil:

Please find enclosed the original chain of custody record (COC) and the final results for the samples from the project referenced above. Three sediment samples were received in good condition on January 11, 2006. There were no discrepancies between the chain of custody and the sample container's labels. The samples were analyzed for PAHs, TOC and grain size as requested.

There were no analytical complications noted.

A copy of these reports and all supporting data will be kept on file with ARI. Should you have any questions please feel free to call me at any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206/695-6210
mark@arilabs.com

Enclosures

cc: File IX82

MDH/mdh

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: IX82	Turn-around Requested: 14 Day	Page: 1 of 1	
ARI Client Company: Parametrix	Phone: (360) 377-0014	Date: 1/9/06	Ice Present? Y
Client Contact: Phil Strack		No. of Coolers: 1	Cooler Temps: 3.0
Client Project Name: Bremerton Seds			
Client Project #: 255-1896-063	Samplers: L. Linde, P. Strack		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Grain Size	TOC	PAHs						Notes/Comments
C-11	1/9/06	1745	Sediment	3	X	X	X						
C-12	"	1740	"	3	X	X	X						
C-13	"	1735	"	3	X	X	X						

Comments/Special Instructions				
Please email results to: pstrack@parametrix.com	Relinquished by: (Signature) Lara Linde	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Lara Linde	Printed Name: BRIAN KEMP	Printed Name:	Printed Name:
	Company: Parametrix	Company: ARI	Company:	Company:
	Date & Time: 1/10/05 1235	Date & Time: 1/11/06 1000	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Data Reporting Qualifiers

Effective 12/28/04

Inorganic Data

U Indicates that the target analyte was not detected at the reported concentration

* Duplicate RPD is not within established control limits

B Reported value is less than the CRDL but ≥ the Reporting Limit

N Matrix Spike recovery not within established control limits

NA Not Applicable, analyte not spiked

H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible

L Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U Indicates that the target analyte was not detected at the reported concentration

* Flagged value is not within established control limits

B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.

J Estimated concentration when the value is less than ARI's established reporting limits

D The spiked compound was not detected due to sample extract dilution

NR Spiked compound recovery is not reported due to chromatographic interference

E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA The flagged analyte was not analyzed for

NS The flagged analyte was not spiked into the sample

M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

Geotechnical Data

A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.

F Samples were frozen prior to particle size determination

SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations

SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis

W Weight of sample in some pipette aliquots was below the level required for accurate weighting

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D GC/MS

Sample ID: MB-011606
METHOD BLANK

Lab Sample ID: MB-011606
LIMS ID: 06-236
Matrix: Sediment
Data Release Authorized:
Reported: 01/19/06

QC Report No: IX82-Parametrix
Project: Bremerton Seds
255-1896-063
Date Sampled: NA
Date Received: NA

Date Extracted: 01/16/06
Date Analyzed: 01/18/06 21:30
Instrument/Analyst: NT4/VTS
GPC Cleanup: No
Alumina: Yes

Sample Amount: 25.0 g
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: NA
pH: NA

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
86-73-7	Fluorene	20	< 20 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
218-01-9	Chrysene	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	66.8%
2-Fluorobiphenyl	62.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D GC/MS

Sample ID: C-11
SAMPLE

Lab Sample ID: IX82A
LIMS ID: 06-236
Matrix: Sediment
Data Release Authorized:
Reported: 01/19/06

QC Report No: IX82-Parametrix
Project: Bremerton Seds
255-1896-063
Date Sampled: 01/09/06
Date Received: 01/11/06

Date Extracted: 01/16/06
Date Analyzed: 01/18/06 22:37
Instrument/Analyst: NT4/VTS
GPC Cleanup: No
Alumina: Yes

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 18.3%
pH: 7.5

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	< 19 U
86-73-7	Fluorene	19	< 19 U
85-01-8	Phenanthrene	19	< 19 U
120-12-7	Anthracene	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**20**
129-00-0	Pyrene	19	< 19 U
56-55-3	Benzo(a)anthracene	19	< 19 U
218-01-9	**Chrysene**	**19**	**25**
205-99-2	Benzo(b)fluoranthene	19	< 19 U
207-08-9	Benzo(k)fluoranthene	19	< 19 U
50-32-8	Benzo(a)pyrene	19	< 19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U
191-24-2	Benzo(g,h,i)perylene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	68.4%
2-Fluorobiphenyl	65.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D GC/MS

Sample ID: C-11
MATRIX SPIKE

Lab Sample ID: IX82A
LIMS ID: 06-236
Matrix: Sediment
Data Release Authorized:
Reported: 01/19/06

QC Report No: IX82-Parametrix
Project: Bremerton Seds
255-1896-063
Date Sampled: 01/09/06
Date Received: 01/11/06

Date Extracted: 01/16/06
Date Analyzed: 01/18/06 23:10
Instrument/Analyst: NT4/VTS
GPC Cleanup: No
Alumina: Yes

Sample Amount: 26.1 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 18.3%
pH: 7.5

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	19	---
91-57-6	2-Methylnaphthalene	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	---
86-73-7	Fluorene	19	< 19 U
85-01-8	Phenanthrene	19	< 19 U
120-12-7	Anthracene	19	< 19 U
206-44-0	Fluoranthene	19	---
129-00-0	**Pyrene**	**19**	**28**
56-55-3	Benzo(a)anthracene	19	---
218-01-9	**Chrysene**	**19**	**20**
205-99-2	Benzo(b)fluoranthene	19	< 19 U
207-08-9	Benzo(k)fluoranthene	19	< 19 U
50-32-8	Benzo(a)pyrene	19	< 19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U
191-24-2	Benzo(g,h,i)perylene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	68.8%
2-Fluorobiphenyl	65.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D GC/MS

Sample ID: C-11
MATRIX SPIKE DUPLICATE

Lab Sample ID: IX82A
LIMS ID: 06-236
Matrix: Sediment
Data Release Authorized:
Reported: 01/19/06

QC Report No: IX82-Parametrix
Project: Bremerton Seds
255-1896-063
Date Sampled: 01/09/06
Date Received: 01/11/06

Date Extracted: 01/16/06
Date Analyzed: 01/18/06 23:43
Instrument/Analyst: NT4/VTS
GPC Cleanup: No
Alumina: Yes

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 18.3%
pH: 7.5

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	20	---
91-57-6	2-Methylnaphthalene	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	---
86-73-7	Fluorene	20	< 20 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
206-44-0	Fluoranthene	20	---
129-00-0	Pyrene	20	< 20 U
56-55-3	Benzo(a)anthracene	20	---
218-01-9	Chrysene	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d14-p-Terphenyl	62.0%
2-Fluorobiphenyl	60.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D GC/MS
Page 1 of 1

Sample ID: C-11
MS/MSD

Lab Sample ID: IX82A
LIMS ID: 06-236
Matrix: Sediment
Data Release Authorized:
Reported: 01/19/06

QC Report No: IX82-Parametrix
Project: Bremerton Seds
255-1896-063
Date Sampled: 01/09/06
Date Received: 01/11/06

Date Extracted MS/MSD: 01/16/06

Sample Amount MS: 26.1 g-dry-wt
MSD: 25.5 g-dry-wt

Date Analyzed MS: 01/18/06 23:10
MSD: 01/18/06 23:43

Final Extract Volume MS: 0.5 mL
MSD: 0.5 mL

Instrument/Analyst MS: NT4/VTS
MSD: NT4/VTS

Dilution Factor MS: 1.00
MSD: 1.00

GPC Cleanup: NO

Alumina Cleanup: YES

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Naphthalene	< 19.4	347	479	72.4%	326	490	66.5%	6.2%
Acenaphthene	< 19.4	339	479	70.8%	323	490	65.9%	4.8%
Fluoranthene	20.3	420	479	83.4%	397	490	76.9%	5.6%
Benzo(a)anthracene	< 19.4	389	479	81.2%	355	490	72.4%	9.1%

Results reported in µg/kg
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D GC/MS

Sample ID: C-12
SAMPLE

Lab Sample ID: IX82B
LIMS ID: 06-237
Matrix: Sediment
Data Release Authorized:
Reported: 01/19/06

QC Report No: IX82-Parametrix
Project: Bremerton Seds
255-1896-063
Date Sampled: 01/09/06
Date Received: 01/11/06

Date Extracted: 01/16/06
Date Analyzed: 01/19/06 00:16
Instrument/Analyst: NT4/VTS
GPC Cleanup: No
Alumina: Yes

Sample Amount: 26.1 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 26.5%
pH: 7.4

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	< 19 U
86-73-7	Fluorene	19	< 19 U
85-01-8	**Phenanthrene**	**19**	**27**
120-12-7	Anthracene	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**93**
129-00-0	**Pyrene**	**19**	**79**
56-55-3	**Benzo(a)anthracene**	**19**	**42**
218-01-9	**Chrysene**	**19**	**51**
205-99-2	**Benzo(b)fluoranthene**	**19**	**58**
207-08-9	**Benzo(k)fluoranthene**	**19**	**40**
50-32-8	**Benzo(a)pyrene**	**19**	**48**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**19**	**24**
53-70-3	Dibenz(a,h)anthracene	19	< 19 U
191-24-2	**Benzo(g,h,i)perylene**	**19**	**27**
132-64-9	Dibenzofuran	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	70.0%
2-Fluorobiphenyl	67.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D GC/MS
Page 1 of 1

Sample ID: C-13
SAMPLE

Lab Sample ID: IX82C
LIMS ID: 06-238
Matrix: Sediment
Data Release Authorized:
Reported: 01/19/06

QC Report No: IX82-Parametrix
Project: Bremerton Seds
255-1896-063
Date Sampled: 01/09/06
Date Received: 01/11/06

Date Extracted: 01/16/06
Date Analyzed: 01/19/06 00:49
Instrument/Analyst: NT4/VTS
GPC Cleanup: No
Alumina: Yes

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 20.7%
pH: 7.5

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
86-73-7	Fluorene	20	< 20 U
85-01-8	**Phenanthrene**	**20**	**20**
120-12-7	Anthracene	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**64**
129-00-0	**Pyrene**	**20**	**60**
56-55-3	**Benzo(a)anthracene**	**20**	**28**
218-01-9	**Chrysene**	**20**	**39**
205-99-2	**Benzo(b)fluoranthene**	**20**	**37**
207-08-9	**Benzo(k)fluoranthene**	**20**	**28**
50-32-8	**Benzo(a)pyrene**	**20**	**33**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	**Benzo(g,h,i)perylene**	**20**	**21**
132-64-9	Dibenzofuran	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	66.4%
2-Fluorobiphenyl	64.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D GC/MS

Sample ID: LCS-011606
LAB CONTROL

Lab Sample ID: LCS-011606
LIMS ID: 06-236
Matrix: Sediment
Data Release Authorized:
Reported: 01/19/06

QC Report No: IX82-Parametrix
Project: Bremerton Seds
255-1896-063
Date Sampled: NA
Date Received: 01/11/06

Date Extracted: 01/16/06
Date Analyzed: 01/18/06 22:03
Instrument/Analyst: NT4/VTS
GPC Cleanup: NO

Sample Amount: 25.0 g
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Alumina Cleanup: YES

Analyte	Lab Control	Spike Added	Recovery
Naphthalene	335	500	67.0%
Acenaphthene	319	500	63.8%
Fluoranthene	415	500	83.0%
Benzo(a)anthracene	382	500	76.4%

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	68.0%
2-Fluorobiphenyl	62.0%

Results reported in µg/kg

METHOD BLANK RESULTS-CONVENTIONALS
IX82-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/25/06

Project: Bremerton Seds
Event: 255-1896-063
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	01/11/06	Percent	< 0.01 U
Total Organic Carbon	01/18/06	Percent	< 0.020 U
	01/18/06		< 0.020 U
	01/18/06		< 0.020 U
	01/23/06		< 0.020 U

SAMPLE RESULTS-CONVENTIONALS
IX82-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/25/06

Project: Bremerton Seds
Event: 255-1896-063
Date Sampled: 01/09/06
Date Received: 01/11/06

Client ID: C-11
ARI ID: 06-236 IX82A

Analyte	Date	Method	Units	RL	Sample
Total Solids	01/11/06 011106#1	EPA 160.3	Percent	0.01	82.60
Total Organic Carbon	01/23/06 012306#1	Plumb,1981	Percent	0.020	0.392

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IX82-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/25/06

Project: Bremerton Seds
Event: 255-1896-063
Date Sampled: 01/09/06
Date Received: 01/11/06

Client ID: C-12
ARI ID: 06-237 IX82B

Analyte	Date	Method	Units	RL	Sample
Total Solids	01/11/06 011106#1	EPA 160.3	Percent	0.01	71.90
Total Organic Carbon	01/18/06 011806#3	Plumb,1981	Percent	0.020	0.631

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IX82-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/25/06

Project: Bremerton Seds
Event: 255-1896-063
Date Sampled: 01/09/06
Date Received: 01/11/06

Client ID: C-13
ARI ID: 06-238 IX82C

Analyte	Date	Method	Units	RL	Sample
Total Solids	01/11/06 011106#1	EPA 160.3	Percent	0.01	73.50
Total Organic Carbon	01/18/06 011806#3	Plumb,1981	Percent	0.020	1.04

RL Analytical reporting limit
U Undetected at reported detection limit

REPLICATE RESULTS-CONVENTIONALS
IX82-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/25/06

Project: Bremerton Seds
Event: 255-1896-063
Date Sampled: 01/09/06
Date Received: 01/11/06

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: IX82B Client ID: C-12					
Total Solids	01/11/06	Percent	71.90	72.50 72.10	0.4%
Total Organic Carbon	01/18/06	Percent	0.631	0.670 0.672	3.5%

MS/MSD RESULTS-CONVENTIONALS
IX82-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/25/06

Project: Bremerton Seds
Event: 255-1896-063
Date Sampled: 01/09/06
Date Received: 01/11/06

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: IX82B Client ID: C-12						
Total Organic Carbon	01/18/06	Percent	0.631	1.43	0.772	103.5%

LAB CONTROL RESULTS-CONVENTIONALS
IX82-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/25/06

Project: Bremerton Seds
Event: 255-1896-063
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	LCS	Spike Added	Recovery
Total Organic Carbon	01/18/06	Percent	0.547	0.500	109.4%
	01/18/06		0.529	0.500	105.8%
	01/23/06		0.514	0.500	102.8%

STANDARD REFERENCE RESULTS-CONVENTIONALS
IX82-Parametrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/25/06

Project: Bremerton Seds
Event: 255-1896-063
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
Total Organic Carbon	01/18/06	Percent	3.73	3.35	111.3%
NIST #8704	01/23/06		3.07	3.35	91.6%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Parametrix	Project No.: IX82
Client Project: Bremerton Seds 255-1896-063	

Case Narrative

1. The samples were submitted for grain size analysis according to PSEP methodology.
2. The samples were run in a single batch, and one sample was chosen for triplicate analysis. The triplicate data is reported on the QA summary.
3. The samples contained mostly sand and shell fragments. Sample C-12 was chosen for triplicate analysis. The second sample within the triplicate was calculated using the after moisture content to eliminate a negative value in the 4 phi size range.
4. All of the samples submitted for analysis contained a high percentage of shell fragments and/or organics, which may have broken down during the sieving process and affected grain size results.
5. The data is provided in summary tables and plots.
6. There were no other noted anomalies in the samples or methods on this project.

Approved by: P McKenzie Date: 1/18/06
Title: Lead Technician

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QA SUMMARY

ANALYTICAL RESOURCES INCORPORATED

PROJECT:	Parametrix	Project No.:	Bremerton Seds 255-1896-063
ARI Triplicate Sample ID:	IX82 C	Batch No.:	IX82
Client Triplicate Sample ID:	C-12	Page:	1 of 1

Relative Standard Deviation, By Phi Size

Sample ID	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
C-12	100.0	88.8	83.6	79.9	73.0	43.2	11.0	4.5	3.5	2.8	2.3	1.8	1.3	0.9
C-12	100.0	86.9	81.6	78.0	71.3	43.3	11.1	5.0	4.0	3.2	2.8	2.2	1.5	1.0
C-12	100.0	88.8	84.0	80.6	73.9	45.2	11.9	5.6	4.1	3.5	2.9	2.3	1.6	1.1
AVE	NA	88.19	83.09	79.49	72.73	43.89	11.33	5.03	3.87	3.17	2.65	2.10	1.45	1.01
STDEV	NA	1.11	1.30	1.34	1.34	1.11	0.50	0.52	0.30	0.37	0.30	0.27	0.14	0.11
%RSD	NA	1.26	1.57	1.69	1.84	2.54	4.44	10.42	7.78	11.68	11.17	12.93	9.66	11.05

The Triplicate Applies To The Following Samples

Client ID	Date Sampled	Date Extracted	Date Complete	QA Ratio (95-105)	Data Qualifiers	Pipette Portion (5.0-25.0g)
C-12	1/9/06	1/11/06	1/18/06	99.8		5.1
C-12	1/9/06	1/11/06	1/18/06	98.7		5.8
C-12	1/9/06	1/11/06	1/18/06	100.2		6.8
C-11	1/9/06	1/11/06	1/18/06	101.8		6.8
C-13	1/9/06	1/11/06	1/18/06	100.8		7.7

* ARI Internal QA limits = 95-105%

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

ANALYTICAL RESOURCES INCORPORATED

Parametrix
Bremerton Seds 255-1896-063

Apparent Grain Size Distribution Summary
Percent Finer Than Indicated Size

Sample No.	Gravel			Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt				Clay	
Phi Size	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
Sieve Size (microns)	3/8"	#4	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (62)	31.00	15.60	7.80	3.90	2.00	1.00
C-12	100.0	88.8	83.6	79.9	73.0	43.2	11.0	4.5	3.5	2.8	2.3	1.8	1.3	0.9
C-12	100.0	86.9	81.6	78.0	71.3	43.3	11.1	5.0	4.0	3.2	2.8	2.2	1.5	1.0
C-12	100.0	88.8	84.0	80.6	73.9	45.2	11.9	5.6	4.1	3.5	2.9	2.3	1.6	1.1
C-11	100.0	80.4	54.0	38.0	24.5	9.9	6.3	5.4	3.3	2.7	2.2	1.7	1.1	0.8
C-13	100.0	93.7	88.6	86.1	81.8	56.0	16.0	6.6	4.3	3.3	2.7	2.1	1.5	1.0

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

IX82

ANALYTICAL RESOURCES INCORPORATED

Parametrix
Bremerton Seds 255-1896-063

Apparent Grain Size Distribution Summary
Percent Retained in Each Size Fraction

Sample No.	Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Coarse Silt	Medium Silt	Fine Silt	Very Fine Silt	Clay		
Phi Size	> -1	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	< 10
Sieve Size (microns)	> #10 (2000)	10 to 18 (2000-1000)	18-35 (1000-500)	35-60 (500-250)	60-120 (250-125)	120-230 (125-62)	62.5-31.0	31.0-15.6	15.6-7.8	7.8-3.9	3.9-2.0	2.0-1.0	<1.0
C-12	16.4	3.7	6.9	29.7	32.2	6.5	1.0	0.8	0.5	0.5	0.5	0.4	0.9
C-12	18.4	3.6	6.7	28.0	32.2	6.1	1.0	0.8	0.5	0.5	0.8	0.4	1.0
C-12	16.0	3.4	6.7	28.7	33.3	6.3	1.5	0.6	0.6	0.6	0.7	0.5	1.1
C-11	46.0	16.0	13.5	14.6	3.6	0.9	2.1	0.5	0.5	0.6	0.5	0.3	0.8
C-13	11.4	2.5	4.3	25.8	39.9	9.4	2.4	1.0	0.6	0.6	0.6	0.4	1.0

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

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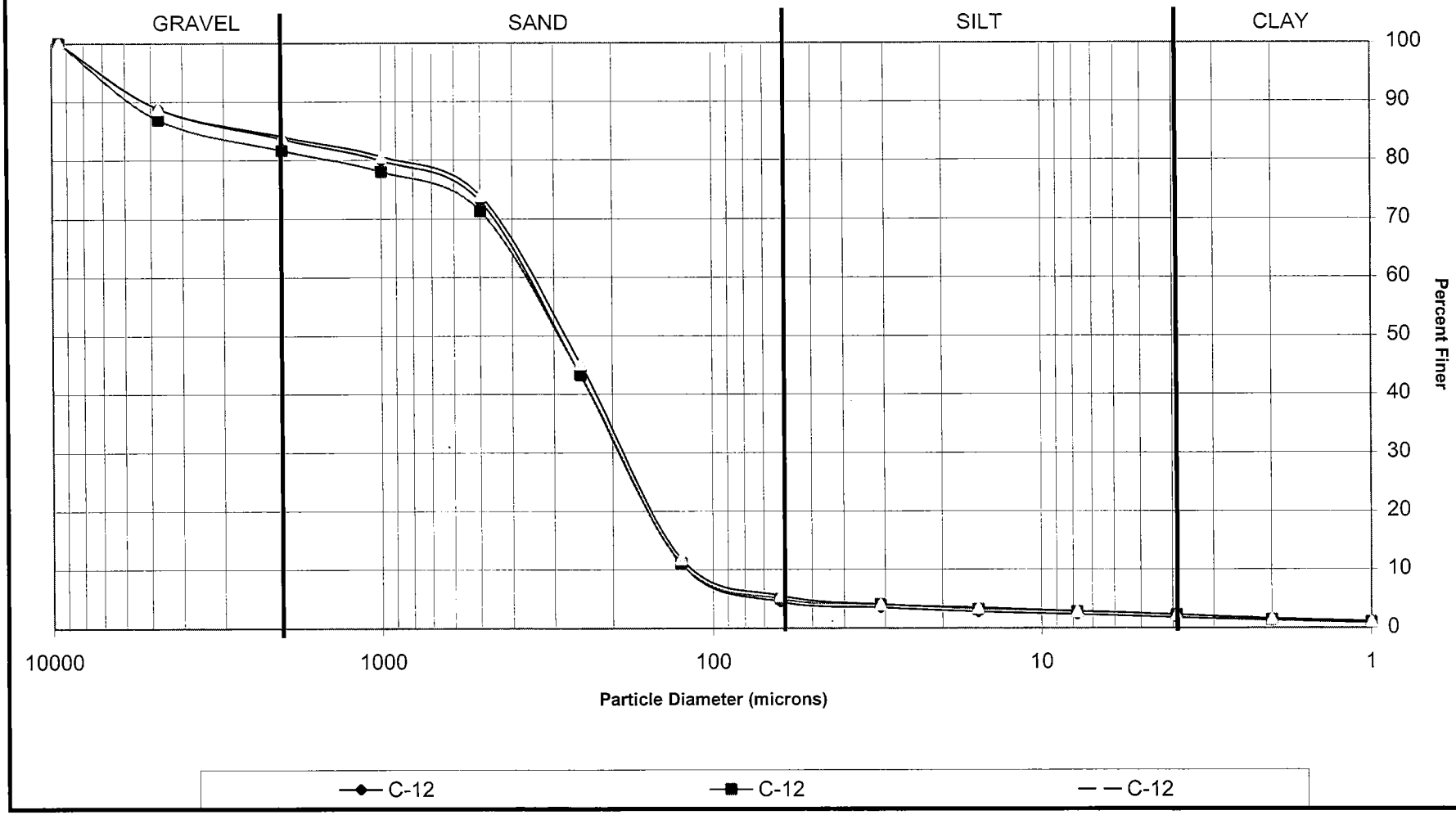
ANALYTICAL RESOURCES INCORPORATED

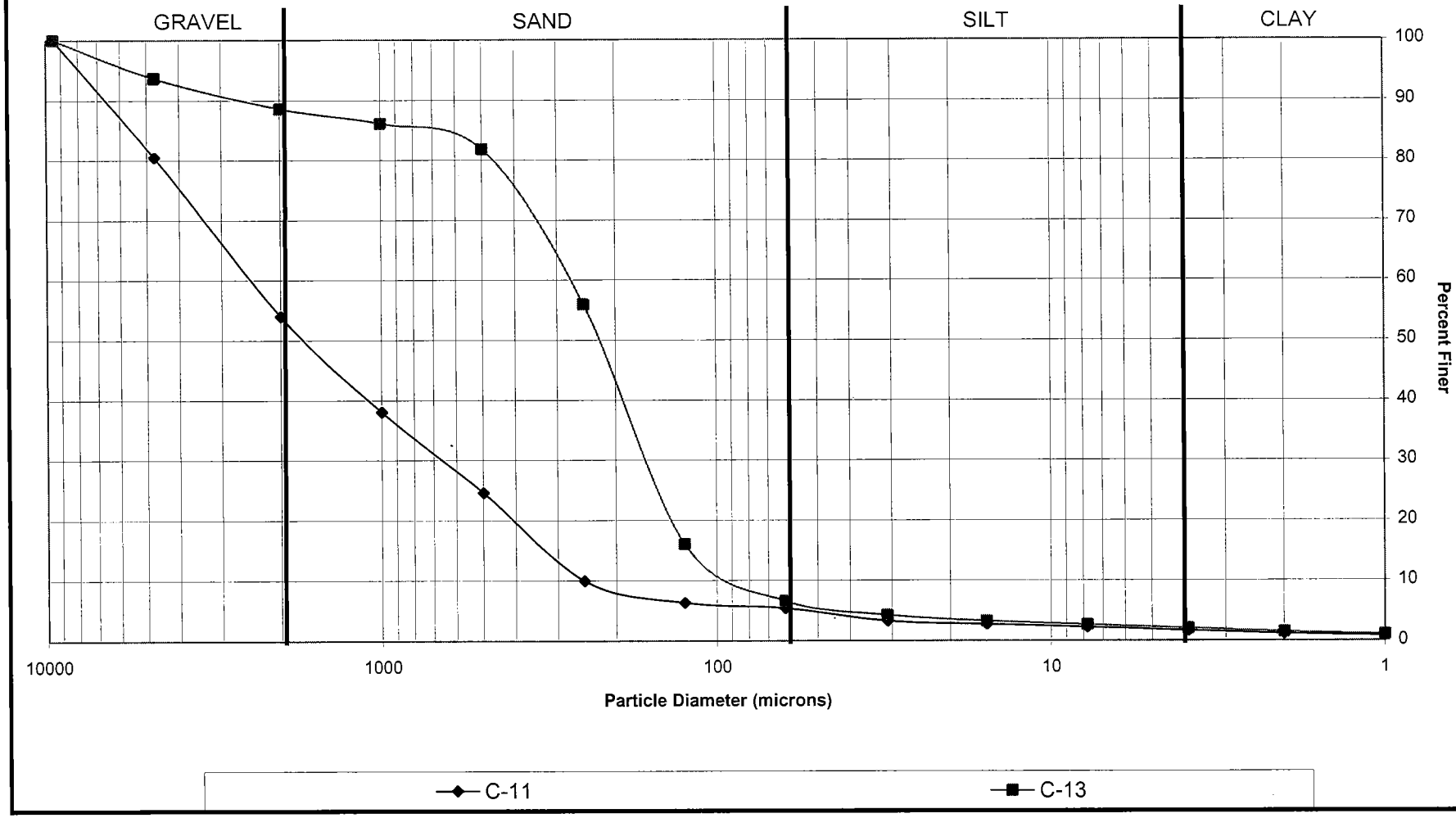
PSEP Grain Size Distribution

Triplicate Sample Plot



ANALYTICAL RESOURCES INCORPORATED

PSEP Grain Size Distribution



ANALYTICAL RESOURCES INCORPORATED

Parametrix
Bremerton Seds 255-1896-063

PSEP Total Solids Analysis
Percent of Wet Weight

Sample No.	Total Solids (%)
C-12	81.5
C-12	81.1
C-12	81.9
C-11	82.0
C-13	77.0

Triplicate Average	81.5
Standard Deviation	0.41
%RSD	0.51

(Total Solids at 90 C)

IX82

BIOASSAY REPORT

Biological Assessment of Sediment from Port Washington Narrows, Bremerton

February 2006

Prepared for:
Parametrix Inc.
5700 Kitsap Way
Bremerton, Washington 98312

Prepared by:

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Port Gamble, Washington 98364

survival and mean individual growth (MIG) of 0.95 mg/ind/day in the control. The LC50 for the cadmium chloride reference-toxicant test was 15.0 mg Cd/L, which is within the control chart limits (4.53 to 15.6 mg CuCl/L), indicating that the test organisms used in this study were of similar sensitivity of those previously tested at the Carlsbad laboratory. Dissolved oxygen, temperature, salinity and pH remained within acceptable limits throughout the test. Porewater and overlying water ammonia concentrations were below the NOEC for *N arenaceodentata* (approximately 60 mg/L). Sulfides were not detected in any of the sediments evaluated.

Mean percentage survival in the reference treatment, Ref-6, was 100%, and MIG rate was 0.81 mg/ind./day. Ref-6 MIG rate was 85%, relative to the control. Survival in the test treatment was 100%. MIG in the test treatment was 0.75 mg/ind./day and was not statistically significantly different that of Ref-6.

3.3 48-hour PSEP Larval Bioassay

A summary of *M. galloprovincialis* results is presented in Table 3.5 and a summary of water quality observations is presented in Tables 3.6. Data for each replicate and raw data sheets are presented in Appendix C. The *M. galloprovincialis* test was validated by greater than 70% normal development in the controls. The LC50 for the copper reference-toxicant test was 15.7 µg Cu/L, which is within the control chart limits (9.70 to 28.86 µg Cu/L) and the EC50 was 8.2 ug/L, which is also within the control chart limits (3.78 to 13.93 µg Cu/L). The results of the reference-toxicant test indicate that the test organisms used in this study were of similar sensitivity of those previously tested at the Carlsbad laboratory. Dissolved oxygen, temperature, pH and salinity remained within acceptable limits throughout the test. Ammonia and sulfides were undetected in the overlying water.

Mean combined mortality in Ref-6 was 12.5%. The reference treatment met the reference criteria for normal development, relative to the controls. In the test treatment, mean combined mortality (based on stocking density) was 17.7%. When compared to Ref-6, mean combined mortality was not statistically different

4.0 Discussion

Sediment C-8 was evaluated using criteria establish under the Sediment Management Standards, including both the Sediment Quality Standards and Cleanup Screening Levels (WAC Chapter 173-204). Comparisons to both SQS and CSL standards are summarized on Tables 4.1.

The treatment results from each of the bioassays were evaluated in comparison with Ref-6 performance. Reference performance met the SMS reference criteria for all testing.

1.0 Introduction

The City of Bremerton is evaluating sediment at the former bulk fuel facility located along the Port Washington Narrows in Bremerton, Washington. Weston Solutions, Inc (Weston) was requested to determine the suitability of one sediment treatment from the site following the methods prescribed by the Sediment Management Standards. This report presents the results of the biological evaluation of the sediment collected.

2.0 Methods

This section summarizes the test methods that were followed for this biological characterization. Test methods followed guidance provided by the Puget Sound Estuary Program (PSEP 1995), Sediment Management Standards (SMS; Washington Administrative Code Chapter 173-204), and the various updates presented during the Annual Sediment Management Review meetings (SMARM).

2.1 Sample and Animal Receipt

Sediment was collected by Parametrix, Inc and delivered directly to the Weston Port Gamble Environmental Laboratory on December 15, 2005. Sediment was then shipped via overnight delivery to the Weston - Carlsbad laboratory and was received in good condition on December 16, 2005. Reference sediment was collected from Carr Inlet and was shipped to Weston - Carlsbad for testing. Control and reference sediment was sieved through a 2.0 mm screen prior to testing to remove any native animals. Test sediment was not sieved prior to testing.

Amphipods (*Eohaustorius estuarius*) were supplied by Northwest Aquatic Sciences, Newport, Oregon. Animals were held in native sediment at 15°C for approximately five days to ensure that the amphipods, which were collected at low salinities, had acclimated to the test salinity of 28±1‰. Juvenile polychaete worms (*Neanthes arenaceodentata*) were supplied by Donald Reish Ph.D., Long Beach, California. The juvenile polycheates were received at weights very near the minimum weight requirement for this test. Neanthes were held five days prior to testing to allow the test organisms to grow and to ensure test acceptability. *Mytilus galloprovincialis* broodstock were supplied by Carlsbad Aquafarms, Carlsbad CA, and were received dry on the day of testing. Broodstock were kept dry until they were needed for spawning. Native *Eohaustorius* sediment from Yaquina Bay, Oregon was also provided by NAS for control sediment treatments for both the amphipod and juvenile polychaete test.

2.2 10-day Amphipod Bioassay

The 10-d acute toxicity test with *E. estuarius* was initiated on December 20, 2005. To prepare the test exposures, approximately 175 mL of sediment were placed in clean, acid and solvent-rinsed 1-L glass jars, which were then filled to

750 mL with UV-treated, 0.3-µm filtered seawater. Six replicate chambers were prepared for each test treatment and the native sediment control treatment. Five of the replicates were used to evaluate the test; the sixth replicate was used as a water quality surrogate. Test chambers were then placed in randomly assigned positions in a temperature-controlled room at 15°C and allowed to equilibrate overnight. Trickle-flow aeration was provided to prevent dissolved oxygen concentrations from dropping below acceptable levels.

Immediately prior to test initiation, water quality parameters were measured in each water quality surrogate. Dissolved oxygen (DO), temperature, pH, and salinity were monitored in water quality replicates at initiation, test days 1 through 9 and at test termination. Target test parameters were as follows:

Dissolved Oxygen:	≥4.5 mg/L
pH:	8.00 ± 0.5 units
Temperature:	15°C ± 1°C
Salinity:	28‰ ± 1‰

In addition, porewater and overlying water ammonia and sulfide concentrations were measured at test initiation and test termination.

The tests were initiated by randomly allocating 20 *E. estuarius* into each test chamber, ensuring that each of the amphipods successfully buried into the sediment. Amphipods that did not bury within approximately one hour were replaced with healthy amphipods. The 10-day amphipod bioassay was conducted as a static test. At test termination, sediment from each test chamber was sieved through a 0.5-mm screen and all recovered amphipods transferred into a Petri dish. The number of surviving and dead amphipods was then determined under a dissecting microscope. A water-only, 4-day reference-toxicant test with cadmium chloride was conducted concurrently with the sediment tests.

2.3 20-day Juvenile Polychaete Bioassay

The 20-day chronic toxicity test with *N. arenaceodentata* was initiated on January 10, 2006. To prepare the test exposures, approximately 175 mL of sediment were placed in clean, acid and solvent-rinsed 1-L glass jars, which were then filled to 950 mL with UV-treated, 0.3-µm filtered seawater. Six replicate chambers were prepared for each test treatment and the native sediment control treatment. Five of the replicates were used to evaluate the test; the sixth replicate was used as a water quality surrogate. Test chambers were then placed in randomly assigned positions in a temperature-controlled room at 20°C and allowed to equilibrate overnight. Trickle-flow aeration was provided to prevent dissolved oxygen concentrations dropped below acceptable levels.

Immediately prior to test initiation, water quality parameters were measured in each water quality surrogate. Dissolved oxygen, temperature, pH, and salinity

were monitored in water quality replicates at initiation, test days 1 through 19, and at test termination. Target test parameters were as follows:

Dissolved Oxygen:	≥5.0 mg/L
pH:	8.00 ± 0.5 units
Temperature:	20°C ± 1°C
Salinity:	28‰ ± 1‰

In addition, porewater and overlying water ammonia and sulfide concentrations were measured at test initiation and test termination.

The test was initiated by randomly allocating five *N. arenaceodentata* into each test chamber, and observing whether each of the worms successfully buried into the sediment. Worms that did not bury within approximately one hour were replaced with healthy worms. The 20-day test was conducted as a static-renewal test, with exchanges of 300 mL of water occurring every third day. *N. arenaceodentata* were fed every other day with 40 mg of TetraMarin® (approximately 8 mg dry weight per worm). At test termination, sediment from each test chamber was sieved through a 0.5-mm screen and all recovered worms transferred into a Petri dish. The number of surviving and dead worms was then determined under a dissecting microscope. All surviving worms were then transferred to pre-weighed, aluminum foil weigh boats, and then dried in a drying oven at 50°C for approximately 24 hours. Each weigh boat was removed, cooled in a dessication jar, and then weighed on a microbalance to 0.01 mg. A water-only, 4-day reference-toxicant test with cadmium chloride was conducted concurrently with the sediment tests.

2.4 48-hour Larval Bioassay

Test sediment was evaluated using the 48-h acute toxicity tests with larval Bay mussel, *M. galloprovincialis*. The 48-h larval test was initiated on December 20, 2005. To prepare the test exposures, 18 g (±1 g) of test sediment was placed in clean, acid and solvent-rinsed 1-L glass jars, which were then filled to 950 mL with UV-sterilized, 0.3-µm filtered seawater collected from Scripp's Institute of Oceanography in La Jolla, California. Six replicate chambers were prepared for each test treatment, reference sediment, and the native sediment control treatment. Five of the replicates were used to evaluate the test; the sixth replicate was used as a water quality surrogate. Each chamber was shaken for 10 seconds and then placed in predetermined randomly-assigned positions in a temperature-controlled room at 16°C.

To collect gametes for each test, mussels were placed in clean seawater and acclimated at 12°C for approximately 20 minutes. The water bath temperature was then increased over the period of 15 minutes to 20°C. Mussels were held at 20°C and monitored for spawning individuals. Spawning females were removed from the water bath and placed in individual containers with seawater. Spawning males were removed and placed in a separate water bath with other males. Gametes from at least two males and two females were used to initiate the test.

Once sufficient eggs and sperm had been collected, the eggs were screened though 60-µm mesh to remove any detritus or feces and a homogenized sperm solution added to the egg solutions. Egg-sperm solutions were periodically homogenized with a perforated plunger during the fertilization process. Approximately one hour after fertilization, embryo solutions were checked for fertilization rate. Only those embryo stocks with >90% fertilization were used to initiate the tests. Embryo solutions were rinsed free of excess sperm on 20-µm mesh and then combined to create one embryo stock solution. Density of the embryo stock solution was determined by counting the number of embryos in a subsample of stock solution. This was used to determine the volume of embryo stock solution to deliver approximately 27,000 embryos to each test chamber.

The test was initiated by randomly allocating an aliquot of the embryo stock solution into each test chamber four hours after sediments were shaken and within two hours of egg fertilization. Embryos were held in suspension during initiation using a perforated plunger. The actual stocking density was 39.2 embryos/mL, which was within the target stocking density of 20–40 embryos/mL.

Dissolved oxygen, temperature, pH, and salinity were monitored in the water quality replicate at initiation, Day 1, and test termination. Overlying water ammonia and sulfides were measured on Day 0 and Day 2. Total ammonia as nitrogen (TAN) was monitored using an Orion meter fitted with an ammonia ion-specific probe. Total sulfides as S^{-2} were monitored using a CHEMetrics sulfide test kit which measures total acid soluble sulfides and employs methylene blue methodology. Target test parameters were as follows:

Dissolved Oxygen:	60% saturation (≥4.3 mg/L)
pH:	8.00 ± 1.00 units
Temperature:	16°C ± 1°C
Salinity:	28.0‰ ± 1.0‰

The 48-h test was conducted as a static test without aeration. The test was terminated approximately 48 hours after initiation, when 90% of the control larvae had achieved the prodissoconch I stage. At termination, the overlying seawater was decanted into a clean 1-L jar and mixed with a perforated plunger. From this container, a 10 mL subsample was transferred to a scintillation vial and preserved in 5% buffered formalin. Larvae were subsequently stained with a mild solution of Rose Bengal in 70% alcohol to help visualization of larvae. The number of normal and abnormal larvae was enumerated on an inverted microscope. Normal larvae included all D-shaped prodissoconch I stage larvae. Abnormal larvae included abnormally shaped prodissoconch I larvae and all early stage larvae. A 48-h water-only reference-toxicant test with copper sulfate and ammonia (as ammonia chloride) was conducted concurrently with the sediment tests.

2.5 Data Analysis and QA/QC

All water quality and endpoint data were entered into excel spreadsheets. Water quality parameters were summarized by calculating the mean, minimum, and maximum values for each test treatment. Endpoint data was calculated for each replicate and then mean values and standard deviations were calculated for each test treatment.

All hand-entered data was reviewed for data entry errors, which were corrected prior to summary calculations. A minimum of 10% of all calculations and data sorting were reviewed for errors. Review counts were conducted on any apparent outliers.

For suitability determinations, comparisons to controls and references were based on statistical analysis as identified in the Sediment Quality Standards (SQS) and Cleanup Screening Levels (CSL) (WAC Chapter 173-205) as clarified by Ecology (2005).

3.0 Results

This section presents the results of the sediment testing, including a summary of test results and water quality observations. Data for each of the replicates, as well as raw data forms are provided in the appendices.

3.1 10-day Amphipod Bioassay

A summary of *E. estuarius* survival is presented in Table 3.1 and a summary of water quality observations is presented in Table 3.2. Termination and all water quality data for each of the replicates, as well as raw data sheets are presented in Appendix A. The amphipod test was validated by 95% survival in the controls. The LC50 for the cadmium reference-toxicant test was 7.7 mg Cd/L, which is within the control chart limits (1.45 to 11.2 mg Cd/L), indicating that the test organisms used in this study were of similar sensitivity of those previously tested at the Carlsbad laboratory. Dissolved oxygen, temperature, pH and salinity remained within acceptable limits throughout the test. Porewater and overlying water ammonia concentrations were below the NOEC for *E. estuarius* (approximately 20 mg/L). Sulfides were not detected in any of the sediments evaluated.

Mean percentage survival in Ref-6 was 95%. This was within reference criteria of 25%, indicating that this reference was acceptable for suitability determination. Mean percentage survival in C-8 test treatment was 89% and was not statistically significantly different than the reference sediment.

3.2 20-day Juvenile Polychaete Bioassay

A summary of *N. arenaceodentata* survival and biomass is presented in Table 3.3, and a summary of water quality observations is presented in Table 3.4. Endpoint and water quality data for each replicates, as well as raw data sheets are presented in Appendix B. The juvenile polychaete test was validated by 96%

4.1 Amphipod Test Suitability Determination
Based on amphipod mortality, treatment C-8 passed the evaluation criteria for both SQS and CSL guidance. There were no statistically significant differences between the test treatment and Ref-6. Mean percentage mortality in the test treatments was within 25% of the mean percentage mortality observed in the reference, meeting both SQS and CSL criteria.

4.2 Juvenile Polychaete Test Suitability Determination
Based on the *Neanthes* mean individual growth (MIG) endpoint, treaqtment C-8 passed the SQS and CSL evaluation criteria when compared to Ref-6. Mean individual growth was within 70% of the reference and there was no statistically significant difference in growth, relative to the reference.

4.3 Bivalve Larval Test Suitability Determination
Relative to Ref-6, the test treatment C-8 passed both SQS criteria (within 15% of control-corrected number of normal larvae in Ref-6) and CSL criteria (within 30% of control-corrected number of normal larvae in Ref-6). There was also no statistically significant differences between normal survivorship in C-8 and that of Ref-6.

5.0 References

Ecology 2005. DMMP/SMS Clarification Paper: Interpreting Sediment Toxicity Tests: Consistency Between Regulatory Programs. Presented at the 18th Annual Sediment Management Annual Review Meeting by Tom Gries, Toxics Cleanup Program/Sediment Management Unit, Washington Department of Ecology, Olympia, Washington.

PSEP. 1995. Puget Sound Protocols and Guidelines. Puget Sound Estuary Program. Puget Sound Water Quality Action Team, Olympia, Washington.

Table 3.1. Test Results for the 10-day Acute Toxicity Test with *E. estuarius*, Bremerton Sediment

Treatment	Replicate	Number Initiated	Number Surviving	Number Missing or Dead	Percentage Survival	Mean Percentage Survival	SD
Control	1	20	19	1	95	95	1.7
	2	20	20	0	100		
	3	20	20	0	100		
	4	20	16	4	80		
	5	20	20	0	100		
Ref 6	1	20	20	0	100	95	1.0
	2	20	18	2	90		
	3	20	18	2	90		
	4	20	19	1	95		
	5	20	20	0	100		
C-8	1	20	18	2	90	89	1.3
	2	20	19	1	95		
	3	20	16	4	80		
	4	20	17	3	85		
	5	20	19	1	95		

Table 3.2. Water Quality Summary for the 10-day Acute Test with *E. estuarius*, Bremerton Sediment

Treatment	Dissolved Oxygen (mg/L)			Temperature (°C)			pH (units)			Salinity (ppt)		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Control	8.2	7.5	8.8	15.7	15.0	16.2	8.0	8.0	8.1	28.2	27.8	28.7
Ref 6	8.3	7.8	8.7	15.3	14.6	15.9	8.0	7.9	8.1	28.4	28.0	28.7
C-8	8.1	7.7	8.6	15.7	15.1	16.4	8.2	8.0	8.3	28.3	28.0	28.6

Table 3.3. Test Results for the 20-day Acute Toxicity Test with *N. arenaceodentata*, Bremerton Sediment

Treatment	Mean Percent Survival	SD	Mean Total Biomass (mg)	SD	Mean Individual Biomass (mg)	SD	Mean Individual Growth Rate (mg/ind/d)	SD
Control	96	8.9	95.0	22.7	19.66	3.67	0.954	0.18
Ref-6	100	0.0	83.6	6.0	16.73	1.19	0.807	0.06
C-8	100	0.0	77.5	10.9	15.49	2.18	0.746	0.11

Table 3.4. Water Quality Summary for the 20-day Acute Test with *Neanthes arenaceodentata*, Bremerton Sediment

Treatment	Dissolved Oxygen (mg/L)			Temperature (°C)			pH (units)			Salinity (ppt)		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Control	6.9	6.7	7.1	19.6	19.4	19.9	8.0	8.0	8.0	29.0	28.6	29.2
Ref 6	7.0	6.5	7.2	19.6	19.5	19.8	7.9	7.9	8.0	29.3	29.2	29.4
C-8	6.5	6.0	6.8	19.7	19.5	19.9	8.0	7.9	8.1	29.4	29.3	29.4

Table 3.5. Test Results for the Larval Test with *M. galloprovincialis*, Bremerton Sediment

Treatment	Rep	Normal	Abnormal	Total	Percent Combined Mortality	Percent Mortality	Percent Abnormal	Mean Percentage Combined Mortality	SD	Mean Percentage Mortality	SD	Mean Percentage Abnormal	SD
Control	1	344	13	357	12.4	9.1	3.6	10.3	4.5	8.9	4.1	1.6	1.3
	2	355	0	355	9.6	9.6	0.0						
	3	375	4	379	4.5	3.5	1.1						
	4	359	5	364	8.6	7.3	1.4						
	5	328	6	334	16.5	15	1.8						
	Mean	**352.2**											
Ref-6	1	360	1	361	4	3.7	0.3	12.5	6.3	12.4	6.4	0.1	0.2
	2	330	1	331	12	11.7	0.3						
	3	295	0	295	21.3	21.3	0.0						
	4	336	0	336	10.4	10.4	0.0						
	5	319	0	319	14.9	14.9	0.0						
	Mean	**328**											
C-8	1	314	3	317	16.3	15.5	0.9	17.7	5.7	17.2	5.6	0.5	0.4
	2	315*	1	316	16.0	15.7	0.3						
	3	338	1	339	9.9	9.6	0.3						
	4	285	2	287	24.0	23.5	0.7						
	5	291*	0	293	22.4	21.9	0.0						
	Mean	**312.3**											

	Rep	Embryos	Average
Stocking Density	1	376	
	2	373	
	3	477	
	4	376	
	5	328	
	6	427	392.8

*** Test chamber was double-inoculated. Value equals half of actual larval count.**

Table 3.6. Water Quality Summary for the 48-hour Larval Test with *Mytilus spp.*, Bremerton Sediment

Treatment	Dissolved Oxygen (mg/L)			Temperature (°C)			pH (units)			Salinity (ppt)		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Control	7.8	7.8	7.9	16.2	15.8	16.4	7.9	7.7	8.0	28.1	28.0	28.3
Ref 6	7.6	7.4	7.9	16.2	15.9	16.4	7.9	7.8	8.0	28.2	28.1	28.3
C-8	6.9	6.4	7.4	16.0	15.9	16.2	7.9	7.7	8.0	28.1	28.0	28.1

Table 4.1. Suitability Determination for Bremerton Sediment based on comparisons with Ref-6

Station	Amphipod				Polychaete Growth				Larval Bivalve			
	Survival (%)	SD	Stat. Diff.	M_T-M_R	Growth Rate (mg/ind/d)	SD	Stat. Diff.	MIG_T/MIG_R	Combined Mortality (%)	SD	Stat. Diff.	N_T/N_R
Control	95	1.7	NA	NA	0.954	0.18	NA	NA	10.3	4.5	NA	NA
Ref-6	95	1	No	0.0[a]	0.807	0.06	No	0.85[a]	12.5	6.3	No	0.93*
C-8	89	1.3	No	6	0.746	0.11	No	0.92	17.7	5.7	No	0.95

Green: passed SQS and CSL criteria

Orange: failed SQS but passed CSL criteria

Red: failed both SQS and CSL criteria

SD: Standard Deviation

[a] Reference Criteria of 25% (amphipod) and 0.80 (polychaete)

* Reference criteria ($N_R/N_C \geq 0.65$)

Appendix A

Results for the 10-Day Acute Test with *Eohaustorius estuarius*

Table A1. Water Quality Data for the 10-day Acute Test with E. estuarius, Bremerton Sediment

Dissolved Oxygen (mg/L)

	Day													
Treatment	0	1	2	3	4	5	6	7	8	9	10	Mean	Min	Max
Control	8.8	8.1	7.9	8.0	7.9	8.1	8.8	8.6	8.3	7.7	7.5	8.2	7.5	8.8
Ref 6	8.7	8.1	8.0	7.9	7.8	8.1	8.7	8.7	8.6	8.6	8.2	8.3	7.8	8.7
C-8	8.4	8.0	7.9	7.7	8.0	7.8	8.6	8.5	8.5	7.8	7.9	8.1	7.7	8.6

Temperature (°C)

	Day													
Treatment	0	1	2	3	4	5	6	7	8	9	10	Mean	Min	Max
Control	15.0	16.0	15.5	15.6	15.6	15.8	15.6	15.9	15.7	16.2	16.1	15.7	15.0	16.2
Ref 6	14.6	15.4	15.3	15.2	15.2	15.4	15.3	15.4	15.4	15.7	15.9	15.3	14.6	15.9
C-8	15.1	15.8	15.7	15.8	15.4	15.7	15.5	15.7	15.6	16.0	16.4	15.7	15.1	16.4

pH units

	Day													
Treatment	0	1	2	3	4	5	6	7	8	9	10	Mean	Min	Max
Control	8.1	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.01	8.00	8.10
Ref 6	8.1	7.9	8.0	8.1	8.0	8.0	8.1	8.1	8.0	8.1	8.1	8.05	7.90	8.10
C-8	8.1	8.0	8.1	8.1	8.1	8.0	8.2	8.2	8.3	8.3	8.3	8.15	8.00	8.30

Salinity (ppt)

	Day													
Treatment	0	1	2	3	4	5	6	7	8	9	10	Mean	Min	Max
Control	27.9	27.8	28.1	27.9	28.0	28.1	28.6	28.3	28.6	28.5	28.7	28.2	27.8	28.7
Ref 6	28.0	28.1	28.3	28.3	28.3	28.3	28.5	28.5	28.6	28.6	28.7	28.4	28.0	28.7
C-8	28.1	28.0	28.1	28.1	28.3	28.4	28.5	28.4	28.5	28.6	28.6	28.3	28.0	28.6

Table A2. Ammonia and Sulfide Concentrations for the 10-Day Acute Test with *E. estuarius*, Bremerton Sediment

Treatment	Overlying Ammonia (mg/L Total)		Interstitial Ammonia (mg/L Total)		Sulfides (mg/L)	
	Day 0	Day 10	Day 0	Day 10	Day 0	Day 2
Control	<0.5	<0.5	<0.5	<0.5	0	0
Ref 6	<0.5	<0.5	0.612	1.67	0	0
C-8	2.01	5.61	15.2	8.65	0	0

10 DAY SOLID PHASE TEST DATA SHEET 3

CLIENT	PROJECT	WESTON JOB NO.	PROJECT MAN.	WESTON LABORATORY	PROTOCOL	SPECIES	ACCLM.MOR
Parametrix	Bremerton Sediment	0	Bill Gardiner	Carlsbad Room 2	USACE/USEPA (1998) / WESTON BIO066	*Eohaustorius estuarius*	< 5%

ENDPOINT DATA & OBSERVATIONS

OBSERVATIONS KEY
N = normal; L = anoxic surface; B= no burrows; F= fungal patches; M= dead on surface; D= no air flow (DO); A= avoidance; U= excess food

CLIENT/ WESTON ID	REP	JAR #	INITIAL #	DAY 0 DATE 12/20/05 TECHNICIAN VS OBSERVNS.	DAY 1 DATE 12/21/05 TECHNICIAN VS OBSERVNS.	DAY 2 DATE 12/22/05 TECHNICIAN CS OBSERVNS.	DAY 3 DATE 12/23/05 TECHNICIAN VS OBSERVNS.	DAY 4 DATE 12/24/05 TECHNICIAN am OBSERVNS.	DAY 5 DATE 12/25/05 TECHNICIAN am OBSERVNS.	DAY 6 DATE 12/26/05 TECHNICIAN am OBSERVNS.	DAY 7 DATE 12/27/05 TECHNICIAN JH OBSERVNS.	DAY 8 DATE 12/28/05 TECHNICIAN CS OBSERVNS.	DAY 9 DATE 12/29/05 TECHNICIAN JH OBSERVNS.	DAY 10 DATE 12/30/05 TECHNICIAN CS OBSERVNS.	NUMBER REMAINING
Control 1 /	1			N	N	N	N	N	N	IM	IM	IM	IM	IM	19
	2			N	N	N	N	N	N	N	N	N	N	N	20
	3			N	N	N	N	N	N	N	N	N	N	N	20
	4			N	IM	2M	N	IM	2M	2M	2M	2M	2M	2M	16
	5			N	N	N	N	N	N	N	N	N	N	N	20
Ref 6 /	1			N	N	IM	IM	N	N	N	N	N	N	N	20
	2			N	N	N	IM	IM	IM	IM	IM	IM	IM	IM	18
	3			N	N	N	N	IM	IM	IM	IM	IM	IM	IM	18
	4			N	N	N	N	N	N	N	N	N	N	N	19
	5			N	N	N	N	N	N	N	N	N	N	N	20
C-8 /	1			N	IM	IM	N	N	N	N	N	N	N	N	18
	2			N	N	N	N	N	N	N	N	N	N	N	19
	3			N	N	N	N	N	N	N	N	N	N	N	16
	4			N	N	IM	N	N	N	N	N	N	N	N	17
	5			N	N	N	N	N	N	N	N	N	N	N	19
/	1														
	2														
	3														
	4														
	5														
/	1														
	2														
	3														
	4														
	5														
/	1														
	2														
	3														
	4														
	5														
	1														
	2														

10 DAY SOLID PHASE TEST DATA SHEET 2

CLIENT	PROJECT	SPECIES	WESTON LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	*Eohaustorius estuarius*	Carlsbad Room 2	USACE/USEPA (1998) / WESTON BIO066
WESTON JOB NUMBER	**PROJECT MANAGER**	**TEST START DATE** / **TIME**	**TEST END DATE**	**TIME**
0	Bill Gardiner	20Dec05 / 1630 KS/LS	30Dec05	1445 KS/LS JH

WATER QUALITY DATA

TEST: DO (mg/L) > 6.0 | TEMP (C) 15 ± 2 | SALINITY (ppt) 28 ± 2 | pH 7.8 ± 0.5 | NH3 (mg/L) < 4.0 | DILUTION WATER BATCH: SIO 121405 | TEMP.RECDR./HOBO#: 3259

CLIENT/WESTON ID	DAY	REP	JAR #	D.O. meter	D.O. mg/L	TEMP meter	TEMP °C	SALINITY meter	SALINITY ppt	pH meter	pH unit	OVERLY. NH3 Techn.	OVERLY. NH3 mg/L	INTER. NH3 Techn.	INTER. NH3 mg/L	INTER. SULFIDE Techn.	INTER. SULFIDE mg/L	TECHNICIAN	WATER RENEWAL
Control 1 /	0	surr		6	8.8	6	15.0	5	27.9	11	8.1	JH	<0.5	JH	<0.5	KS	0	JH	
		0																	
		0																	
		0																	
		0																	
Control 1 /	1	surr		6	8.1	6	16.0	5	27.8	12	8.0							KS	
Control 1 /	2	surr	13	7	7.9	7	15.5	6	28.1	11	8.0							CS	
Control 1 /	3	surr		6	8.0	6	15.6	5	27.9	11	8.0							KS	
Control 1 /	4	surr		6	7.9	6	15.6	5	28.0	11	8.0							AM	
Control 1 /	5	surr		6	8.1	6	15.8	5	28.1	11	8.0							AM	
Control 1 /	6	surr		6	8.8	6	15.6	5	28.6	11	8.0							AM	
Control 1 /	7	surr		6	8.6	6	15.9	5	28.3	11	8.0							JH	
Control 1 /	8	surr		7	8.3	7	15.7	6	28.6	12	8.0							CS	
Control 1 /	9	surr		7	7.7	7	16.2	6	28.5	12	8.0							JH	
Control 1 /	10	surr		7	7.5	7	16.1	6	28.7	11	8.0	JH	<0.5	JH	<0.5	RF	0	CS	
		0																	
		0																	
		0																	
		0																	

10 DAY SOLID PHASE TEST DATA SHEET 2

CLIENT	PROJECT	SPECIES	WESTON LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	*Eohaustorius estuarius*	Carlsbad Room 2	USACE/USEPA (1998) / WESTON BIO066
WESTON JOB NUMBER	**PROJECT MANAGER**	**TEST START DATE** / **TIME**	**TEST END DATE**	**TIME**
0	Bill Gardiner	20Dec05 / 1630 KS/LS	30Dec05	③ JH 1500 ~~1445~~ KS/LS JH

WATER QUALITY DATA

TEST	DO (mg/L)	TEMP (C)	SALINITY (ppt)	pH	NH3 (mg/L)		DILUTION WATER BATCH	TEMP.RECDR./HOBO#
	> 6.0	15 ± 2	28 ± 2	7.8 ± 0.5	< 4.0		SIO 121405	3259

CLIENT/WESTON ID	DAY	REP	JAR #	D.O.		TEMP		SALINITY		pH		OVERLY. NH3		INTER. NH3		INTER. SULFIDE		TECHNICIAN	WATER RENEWAL
				meter	mg/L	meter	°C	meter	ppt	meter	unit	Techn.	mg/L	Techn.	mg/L	Techn.	mg/L		
Ref 6 /	0	surr		6	8.7	6	14.6	5	28.0	11	8.1	JH	<0.5	JH	0.612	VB	0	JH	
		0																	
		0																	
		0																	
		0																	
Ref 6 /	1	surr		6	8.1	6	15.4	5	28.1	12	7.9							KS	
Ref 6 /	2	surr	16	~~57~~	8.0	7	15.3	6	28.3	11	8.0							S	
Ref 6 /	3	surr		6	7.9	6	15.2	5	28.3	11	8.1							KS	
Ref 6 /	4	surr		6	7.8	6	15.2	5	28.3	11	8.0							am	
Ref 6 /	5	surr		6	8.1	6	15.4	5	28.3	11	8.0							am	
Ref 6 /	6	surr		6	8.7	6	15.3	5	28.5	11	8.1							am	
Ref 6 /	7	surr		6	8.7	6	15.4	5	28.5	11	8.1							JH	
Ref 6 /	8	surr		7	8.6	7	15.4	6	28.6	12	8.0							CS	
Ref 6 /	9	surr		7	8.6	7	15.7	6	28.6	12	8.1							JH	
Ref 6 /	10	surr		7	8.2	7	15.9	6	28.7	11	8.1	JH	<0.5	JH	1.67	RF	0	CS	
		0																	
		0																	
		0																	
		0																	

① 18:12/22/05 CS ② IE 12/25/05 am ③ WT 12/30/05 JH

10 DAY SOLID PHASE TEST DATA SHEET 2

CLIENT	PROJECT	SPECIES	WESTON LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	*Eohaustorius estuarius*	Carlsbad Room 2	USACE/USEPA (1998) / WESTON BIO066
WESTON JOB NUMBER	**PROJECT MANAGER**	**TEST START DATE** / **TIME**	**TEST END DATE**	**TIME**
0	Bill Gardiner	20Dec05 / 1630 KS/LS	30Dec05	①~~1445~~ 1515 KS/LS JH

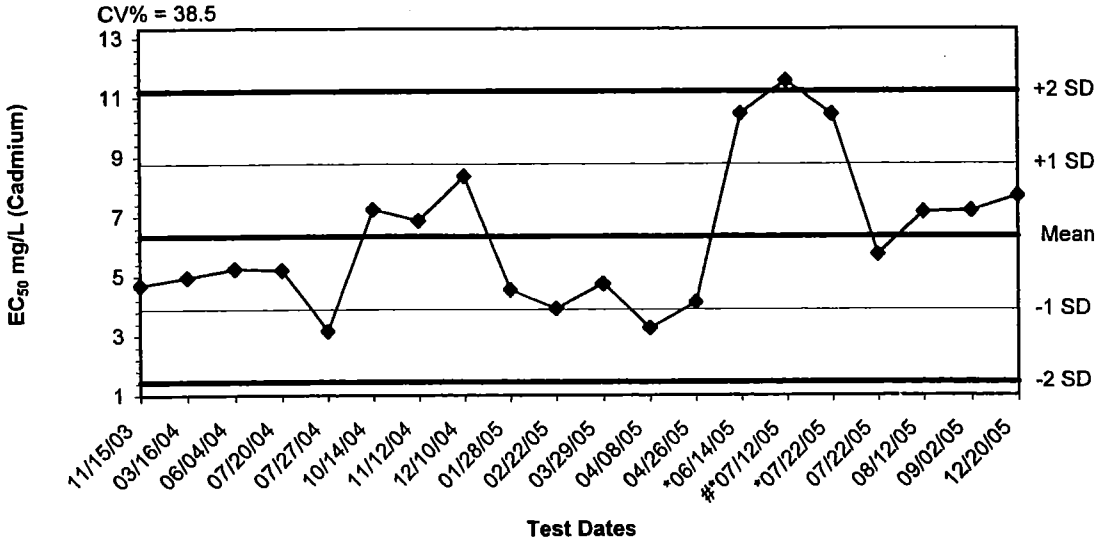
WATER QUALITY DATA

TEST	DO (mg/L)	TEMP (C)	SALINITY (ppt)	pH	NH3 (mg/L)	DILUTION WATER BATCH	TEMP.RECDR./HOBO#
	> 6.0	15 ± 2	28 ± 2	7.8 ± 0.5	< 4.0	SIO 121405	3259

CLIENT/WESTON ID	DAY	REP	JAR #	D.O. meter	D.O. mg/L	TEMP meter	TEMP °C	SALINITY meter	SALINITY ppt	pH meter	pH unit	OVERLY. NH3 Techn.	OVERLY. NH3 mg/L	INTER. NH3 Techn.	INTER. NH3 mg/L	INTER. SULFIDE Techn.	INTER. SULFIDE mg/L	TECHNICIAN	WATER RENEWAL
C-8 /	0	surr		6	8.4	6	15.1	5	28.1	11	8.1	JH	2.01	JH	15.2	KS	0	JH	
		0																	
		0																	
		0																	
		0																	
C-8 /	1	surr		6	8.0	6	15.8	5	28.0	12	8.0							KS	
C-8 /	2	surr	18	7	7.9	7	15.7	6	28.1	11	8.1							LS	
C-8 /	3	surr		6	7.7	6	15.8	5	28.1	11	8.1							KS	
C-8 /	4	surr		6	8.0	6	15.4	5	28.3	11	8.1							AM	
C-8 /	5	surr		6	7.8	6	15.7	5	28.4	11	8.0							AM	
C-8 /	6	surr		6	8.6	6	15.5	5	28.5	11	8.2							AM	
C-8 /	7	surr		6	8.5	6	15.7	5	28.4	11	8.2							JH	
C-8 /	8	surr		7	8.5	7	15.6	6	28.5	12	8.3							LS	
C-8 /	9	surr		7	7.8	7	16.0	6	28.6	12	8.3							JH	
C-8 /	10	surr		7	7.9	7	16.4	6	28.6	11	8.3	JH	5.61	JH	8.65	RF	0	LS	
		0																	
		0																	
		0																	
		0																	

① WT 12/30/05 JH

Eohaustorius estuarius Reference Toxicant Control Chart: 96-Hour Survival



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
11/15/03	4.6999	6.3246	3.8887	1.4528	8.7605	11.1964
03/16/04	4.9541	6.3246	3.8887	1.4528	8.7605	11.1964
06/04/04	5.2452	6.3246	3.8887	1.4528	8.7605	11.1964
07/20/04	5.2083	6.3246	3.8887	1.4528	8.7605	11.1964
07/27/04	3.1529	6.3246	3.8887	1.4528	8.7605	11.1964
10/14/04	7.2406	6.3246	3.8887	1.4528	8.7605	11.1964
11/12/04	6.8641	6.3246	3.8887	1.4528	8.7605	11.1964
12/10/04	8.3530	6.3246	3.8887	1.4528	8.7605	11.1964
01/28/05	4.5455	6.3246	3.8887	1.4528	8.7605	11.1964
02/22/05	3.9152	6.3246	3.8887	1.4528	8.7605	11.1964
03/29/05	4.7420	6.3246	3.8887	1.4528	8.7605	11.1964
04/08/05	3.2642	6.3246	3.8887	1.4528	8.7605	11.1964
04/26/05	4.1257	6.3246	3.8887	1.4528	8.7605	11.1964
*06/14/05	10.4483	6.3246	3.8887	1.4528	8.7605	11.1964
#*07/12/05	11.5534	6.3246	3.8887	1.4528	8.7605	11.1964
*07/22/05	10.4255	6.3246	3.8887	1.4528	8.7605	11.1964
07/22/05	5.7213	6.3246	3.8887	1.4528	8.7605	11.1964
08/12/05	7.1510	6.3246	3.8887	1.4528	8.7605	11.1964
09/02/05	7.1895	6.3246	3.8887	1.4528	8.7605	11.1964
12/20/05	7.6923	6.3246	3.8887	1.4528	8.7605	11.1964

* Tests were run at 30 ppt salinity.

Value was out of 95% CI range at time of testing.

Updated 12/28/05 KS

Acute Sediment Test-96 Hr Survival

Start Date:	12/20/2005 16:10	Test ID:	C040405.42	Sample ID:	REF-Ref Toxicant
End Date:	12/24/2005 14:40	Lab ID:	CCA-Weston, Carlsbad	Sample Type:	CDCL-Cadmium chloride
Sample Date:		Protocol:	EPA USACE-1998	Test Species:	EE-Eohaustorius estuarius
Comments:					

Conc-mg/L	1	2	3
Control	1.0000	1.0000	1.0000
2.5	0.8000	1.0000	1.0000
5	0.5000	0.8000	0.9000
10	0.4000	0.2000	0.3000
20	0.0000	0.0000	0.0000
40	0.0000	0.0000	0.0000

			Transform: Untransformed					1-Tailed			Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	1.0000	1.0000	1.0000	1.0000	1.0000	0.000	3				1.0000	1.0000
2.5	0.9333	0.9333	0.9333	0.8000	1.0000	12.372	3	0.632	2.420	0.2551	0.9333	0.9333
*5	0.7333	0.7333	0.7333	0.5000	0.9000	28.386	3	2.530	2.420	0.2551	0.7333	0.7333
*10	0.3000	0.3000	0.3000	0.2000	0.4000	33.333	3	6.641	2.420	0.2551	0.3000	0.3000
20	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	3				0.0000	0.0000
40	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	3				0.0000	0.0000

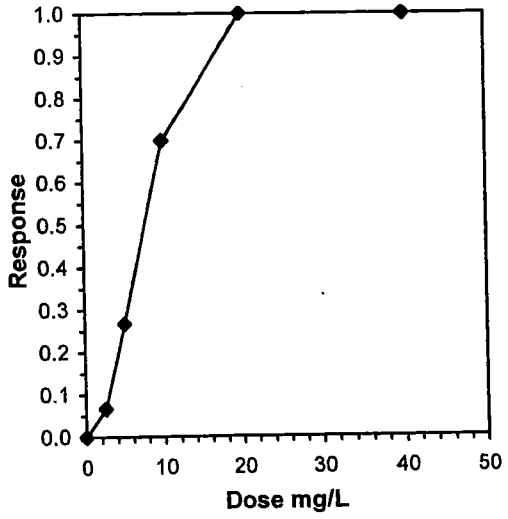
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.9315	0.805	-0.7811	0.59033
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	2.5	5	3.53553		0.25509	0.25509	0.29861	0.01667	6.6E-04	3, 8

Linear Interpolation (200 Resamples)

Point	mg/L	SD	95% CL(Exp)		Skew
IC05*	1.8750	0.7757	0.0000	5.1562	0.2474
IC10	2.9167	0.7657	0.0000	5.9792	0.0587
IC15	3.5417	0.7946	0.3907	6.9857	0.3919
IC20	4.1667	0.8019	1.5973	7.4189	0.1802
IC25	4.7917	0.7881	2.2003	7.7175	0.0621
IC40	6.5385	0.8601	2.2577	8.7205	-0.5852
IC50	7.6923	0.7435	2.0385	9.4502	-1.3930

* indicates IC estimate less than the lowest concentration



Test: SED-Acute Sediment Test
Species: EE-Eohaustorius estuarius
Sample ID: REF-Ref Toxicant
Start Date: 12/20/2005 16:10

Test ID: C040405.42
Protocol: EPA USACE-1998
Sample Type: CDCL-Cadmium chloride
End Date: 12/24/2005 14 Lab ID: CCA-Weston, Carlsbad

Pos	ID	Rep	Group	Start	24 Hr	48 Hr	72 Hr	96 Hr	Notes
	1	1	Control	10				10	
	2	2	Control	10				10	
	3	3	Control	10				10	
	4	1	2.500	10				8	
	5	2	2.500	10				10	
	6	3	2.500	10				10	
	7	1	5.000	10				5	
	8	2	5.000	10				8	
	9	3	5.000	10				9	
	10	1	10.000	10				4	
	11	2	10.000	10				2	
	12	3	10.000	10				3	
	13	1	20.000	10				0	
	14	2	20.000	10				0	
	15	3	20.000	10				0	
	16	1	40.000	10				0	
	17	2	40.000	10				0	
	18	3	40.000	10				0	

Comments:

10 DAY SOLID PHASE TEST DATA SHEET 3 - REF TOX

SPECIES	ACCLM.MORT.
Eohaustorius estuarius	< 5%

CLIENT	PROJECT	WESTON JOB NO.	PROJECT MANAGER	WESTON LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	0	Bill Gardiner	Carlsbad Room 2	USACE/USEPA (1998) / WESTON BIO066

SURVIVAL & BEHAVIOR DATA

OBSERVATIONS KEY
N = normal; LOE= loss of equilibrium; Q = quiescent; SUR= surfacing
FOS = Floating on Surface; DC = discoloration; OB = on bottom; J = jumper; NB = no body

CLIENT/ WESTON ID	CONC. value	CONC. units	REP	INITIAL NUMBER	DAY 1 DATE 12/21/05 TECHNICIAN CS #ALIVE	DAY 1 #DEAD	DAY 1 OBS	DAY 2 DATE 12/22/05 TECHNICIAN CS #ALIVE	DAY 2 #DEAD	DAY 2 OBS	DAY 3 DATE 12/23/05 TECHNICIAN VS #ALIVE	DAY 3 #DEAD	DAY 3 OBS	DAY 4 DATE 12/24/05 TECHNICIAN am #ALIVE	DAY 4 #DEAD	DAY 4 OBS
Ref.Tox.-cadmium	0	mg/L	1	10	10	0	N	10	0	N	10	0	N	10	0	N
			2	10	10	0	N	10	0	N	10	0	N	10	0	N
			3	10	10	0	N	10	0	N	10	0	N	10	0	N
Ref.Tox.-cadmium	2.5	mg/L	1	10	10	0	3Sur	10	0	1Sur	10	0	N	8	2	N
			2	10	10	0	3Sur	10	0	N	10	0	1Sur	10	0	N
			3	10	10	0	5Sur	10	0	N	10	0	1Sur	10	0	2Q
Ref.Tox.-cadmium	5	mg/L	1	10	10	0	2DC	10	0	N	8	2	DC Q	5	3	N
			2	10	10	0	1DC	10	0	2Sur	9	1	Q DC	8	1	N
			3	10	10	0	1DC	10	0	N	10	0	Q DC	9	1	N
Ref.Tox.-cadmium	10	mg/L	1	10	10	0	1Sur DC	9	1	N	8	1	Q DC	4	4	Q/DC
			2	10	9	1	3Sur 1DC	7	2	N	4	3	Q DC	2	2	Q/DC
			3	10	10	0	3Sur 1DC	7	3	DC	6	1	Q DC	3	3	Q/DC
Ref.Tox.-cadmium	20	mg/L	1	10	10	0	5Sur Q	7	3	Q	4	3	Q LOE	0 @ 2hrs	4	—
			2	10	10	0	Q	5	5	1Sur Q	2	3	Q LOE	0	4	—
			3	10	10	0	3Sur Q	4	6	DC	4	0	Q LOE	0	4	—
Ref.Tox.-cadmium	40	mg/L	1	10	10	0	3Sur Q	0 @ 4	6	DC Q	0	4	—			
			2	10	9	1	2Sur Q	1	8	DC Q	0	1	—			
			3	10	9	1	3Sur	2	7	DC Q	0	2	—			

@WC 12/22/05 CS @WC 12/24/05 am

10 DAY SOLID PHASE TEST DATA SHEET 2 - REF TOX WQ

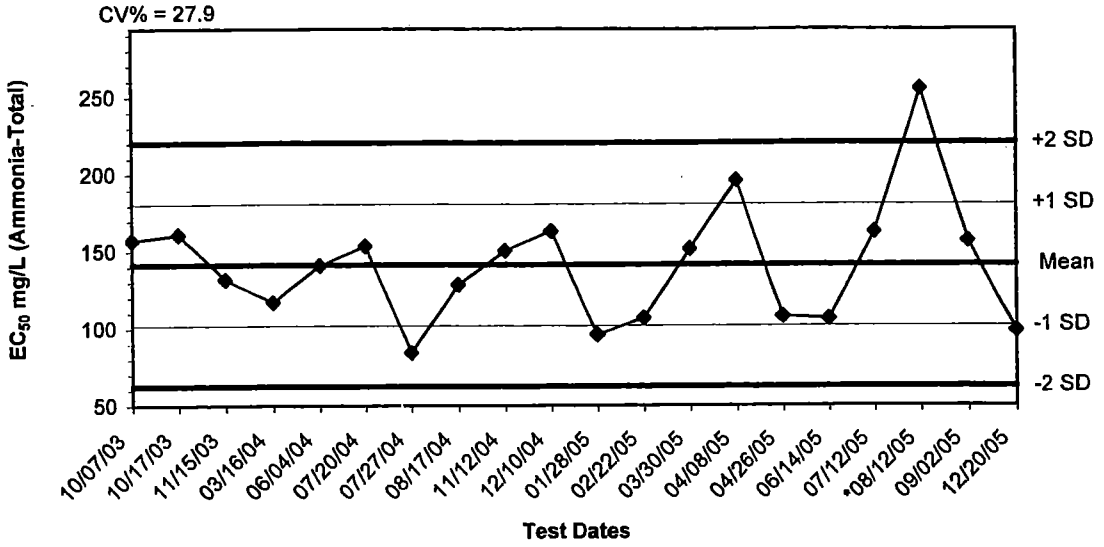
CLIENT	PROJECT	SPECIES	WESTON LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	*Eohaustorius estuarius*	Carlsbad Room 2	USACE/USEPA (1998) / WESTON
WESTON JOB NUMBER	**PROJECT MANAGER**	**TEST START DATE** / **TIME**	**TEST END DATE**	**TIME**
0	Bill Gardiner	20Dec05 / 1610 LS	24Dec05	1440 am

WATER QUALITY DATA

TEST	TEMP (C)	SAL (ppt)	DO (mg/L)	pH	DILTN.WAT.BATCH	REFERENCE TOXICANT MATERIAL	TOXICANT AMOUNT	DILUENT AMOUNT	REF. TOX. TEST I.D.
	15 ± 2	28 ± 2	> 6.0	7.8 ± 0.5	SIO 121405	cadmium chloride	6.0 mL Cd	1500 mL	c040405.42

CLIENT/ WESTON ID	CONCENTRATION value	CONCENTRATION units	DAY	REP	Dissolved Oxygen METER	Dissolved Oxygen mg/L	Temperature METER	Temperature °C	Salinity METER	Salinity ppt	pH METER	pH units	TECHNICIAN
Ref.Tox.-cadmium	0	mg/L	0	All	7	8.0	7	15.2	6	28.1	12	8.0	CS
			4	1	6	7.6	6	16.4	5	27.8	11	8.0	am
Ref.Tox.-cadmium	2.5	mg/L	0	All	7	8.1	7	15.1	6	28.1	12	8.1	CS
			4	1	6	7.5	6	16.3	5	27.9	11	8.0	am
Ref.Tox.-cadmium	5	mg/L	0	All	7	8.4	7	15.3	6	28.1	12	8.1	CS
			4	1	6	7.5	6	16.2	5	28.0	11	8.0	am
Ref.Tox.-cadmium	10	mg/L	0	All	7	8.3	7	15.3	6	28.1	12	8.1	CS
			4	1	6	7.7	6	16.2	5	28.2	11	8.0	am
Ref.Tox.-cadmium	20	mg/L	0	All	7	8.2	7	15.1	6	28.1	12	8.1	CS
			4	1	6	7.7	6	16.1	5	28.3	11	8.0	am
Ref.Tox.-cadmium	40	mg/L	0	All	7	8.4	7	15.6	6	28.0	12	8.1	CS
			4										

Eohaustorius estuarius Reference Toxicant Control Chart: 96-Hour Survival

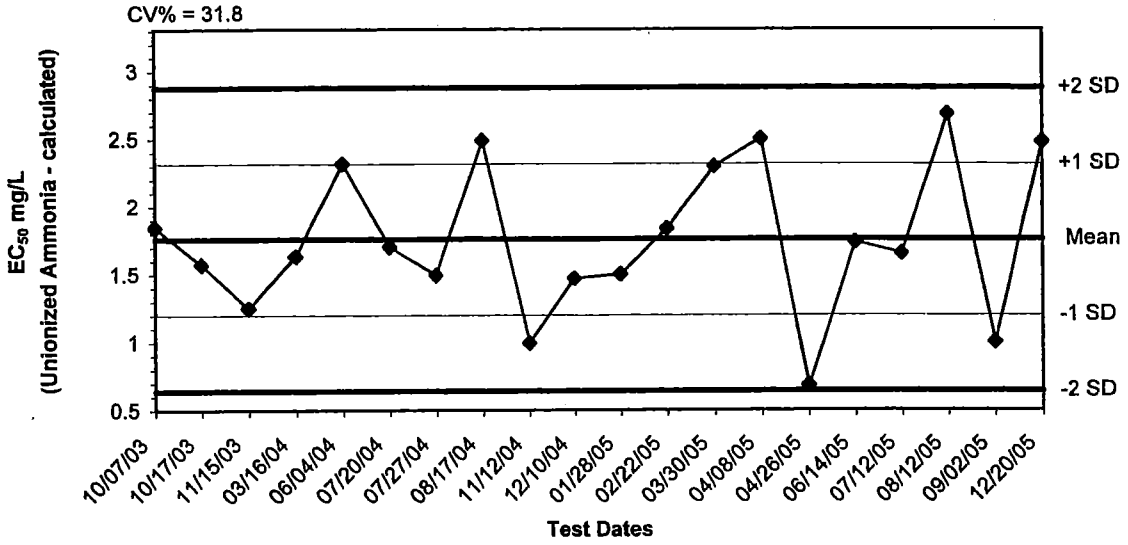


Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
10/07/03	157.3300	141.3243	101.8699	62.4156	180.7787	220.2330
10/17/03	161.0350	141.3243	101.8699	62.4156	180.7787	220.2330
11/15/03	131.9750	141.3243	101.8699	62.4156	180.7787	220.2330
03/16/04	117.0890	141.3243	101.8699	62.4156	180.7787	220.2330
06/04/04	140.9270	141.3243	101.8699	62.4156	180.7787	220.2330
07/20/04	153.5100	141.3243	101.8699	62.4156	180.7787	220.2330
07/27/04	84.5560	141.3243	101.8699	62.4156	180.7787	220.2330
08/17/04	128.3230	141.3243	101.8699	62.4156	180.7787	220.2330
11/12/04	150.3800	141.3243	101.8699	62.4156	180.7787	220.2330
12/10/04	162.9630	141.3243	101.8699	62.4156	180.7787	220.2330
01/28/05	96.0760	141.3243	101.8699	62.4156	180.7787	220.2330
02/22/05	106.9330	141.3243	101.8699	62.4156	180.7787	220.2330
03/30/05	151.5170	141.3243	101.8699	62.4156	180.7787	220.2330
04/08/05	196.0000	141.3243	101.8699	62.4156	180.7787	220.2330
04/26/05	108.0300	141.3243	101.8699	62.4156	180.7787	220.2330
06/14/05	106.4540	141.3243	101.8699	62.4156	180.7787	220.2330
07/12/05	162.7000	141.3243	101.8699	62.4156	180.7787	220.2330
*08/12/05	255.3940	141.3243	101.8699	62.4156	180.7787	220.2330
09/02/05	156.5900	141.3243	101.8699	62.4156	180.7787	220.2330
12/20/05	98.7040	141.3243	101.8699	62.4156	180.7787	220.2330

* Value was out of 95% CI range. Test was re-run on 09/02/05 and was within 95% CI.

Updated 12/28/05 KS

Eohaustorius estuarius Reference Toxicant Control Chart: 96-Hour Survival



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
10/07/03	1.8470	1.7579	1.1993	0.6407	2.3165	2.8751
10/17/03	1.5744	1.7579	1.1993	0.6407	2.3165	2.8751
11/15/03	1.2522	1.7579	1.1993	0.6407	2.3165	2.8751
03/16/04	1.6330	1.7579	1.1993	0.6407	2.3165	2.8751
06/04/04	2.3177	1.7579	1.1993	0.6407	2.3165	2.8751
07/20/04	1.7049	1.7579	1.1993	0.6407	2.3165	2.8751
07/27/04	1.4952	1.7579	1.1993	0.6407	2.3165	2.8751
08/17/04	2.4902	1.7579	1.1993	0.6407	2.3165	2.8751
11/12/04	0.9939	1.7579	1.1993	0.6407	2.3165	2.8751
12/10/04	1.4701	1.7579	1.1993	0.6407	2.3165	2.8751
01/28/05	1.5020	1.7579	1.1993	0.6407	2.3165	2.8751
02/22/05	1.8369	1.7579	1.1993	0.6407	2.3165	2.8751
03/30/05	2.2985	1.7579	1.1993	0.6407	2.3165	2.8751
04/08/05	2.5010	1.7579	1.1993	0.6407	2.3165	2.8751
04/26/05	0.6844	1.7579	1.1993	0.6407	2.3165	2.8751
06/14/05	1.7368	1.7579	1.1993	0.6407	2.3165	2.8751
07/12/05	1.6562	1.7579	1.1993	0.6407	2.3165	2.8751
08/12/05	2.6828	1.7579	1.1993	0.6407	2.3165	2.8751
09/02/05	1.0016	1.7579	1.1993	0.6407	2.3165	2.8751
12/20/05	2.4797	1.7579	1.1993	0.6407	2.3165	2.8751

Updated 12/20/05 KS

Acute Sediment Test-96 Hr Survival

Start Date:	12/20/2005 15:30	Test ID:	C040719.72	Sample ID:	REF-Ref Toxicant
End Date:	12/24/2005 15:00	Lab ID:	CCA-Weston, Carlsbad	Sample Type:	TNH3-Ammonia-total (measured)
Sample Date:		Protocol:	EPA USACE-1998	Test Species:	EE-Eohaustorius estuarius
Comments:					

Conc-mg/L	1	2	3
Control	1.0000	1.0000	1.0000
17.2	1.0000	1.0000	1.0000
33.6	1.0000	0.9000	0.9000
69.4	0.9000	0.8000	0.9000
136	0.0000	0.0000	0.1000
215	0.0000	0.0000	0.0000

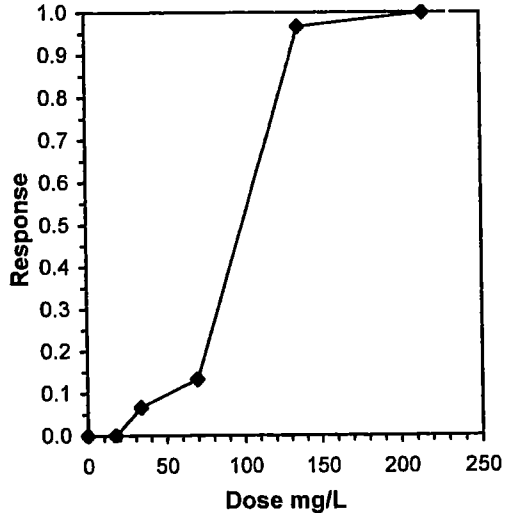
			Transform: Untransformed					1-Tailed			Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	1.0000	1.0000	1.0000	1.0000	1.0000	0.000	3				1.0000	1.0000
17.2	1.0000	1.0000	1.0000	1.0000	1.0000	0.000	3	0.000	2.470	0.0902	1.0000	1.0000
33.6	0.9333	0.9333	0.9333	0.9000	1.0000	6.186	3	1.826	2.470	0.0902	0.9333	0.9333
*69.4	0.8667	0.8667	0.8667	0.8000	0.9000	6.662	3	3.651	2.470	0.0902	0.8667	0.8667
*136	0.0333	0.0333	0.0333	0.0000	0.1000	173.205	3	26.473	2.470	0.0902	0.0333	0.0333
215	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	3				0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.91652	0.835	0.3392	-0.1795
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	33.6	69.4	48.2891		0.09019	0.09019	0.51333	0.002	5.0E-10	4, 10

Linear Interpolation (200 Resamples)

Point	mg/L	SD	95% CL(Exp)		Skew
IC05	29.500	6.182	20.890	60.805	1.0344
IC10	51.500	12.235	13.910	89.090	0.0165
IC15	70.732	5.439	39.507	76.326	-1.1941
IC20	74.728	2.190	63.539	80.322	-0.4030
IC25	78.724	2.049	68.265	84.318	-0.3651
IC40	90.712	1.727	82.442	96.306	-0.1754
IC50	98.704	1.625	91.893	104.298	0.0268



Test: SED-Acute Sediment Test						Test ID: C040719.72			
Species: EE-Eohaustorius estuarius						Protocol: EPA USACE-1998			
Sample ID: REF-Ref Toxicant						Sample Type: TNH3-Ammonia-total (measured)			
Start Date: 12/20/2005 15:30			End Date: 12/24/2005 1			Lab ID: CCA-Weston, Carlsbad			
Pos	ID	Rep	Group	Start	24 Hr	48 Hr	72 Hr	96 Hr	Notes
	1	1	Control	10				10	
	2	2	Control	10				10	
	3	3	Control	10				10	
	4	1	17.200	10				10	
	5	2	17.200	10				10	
	6	3	17.200	10				10	
	7	1	33.600	10				10	
	8	2	33.600	10				9	
	9	3	33.600	10				9	
	10	1	69.400	10				9	
	11	2	69.400	10				8	
	12	3	69.400	10				9	
	13	1	136.000	10				0	
	14	2	136.000	10				0	
	15	3	136.000	10				1	
	16	1	215.000	10				0	
	17	2	215.000	10				0	
	18	3	215.000	10				0	

Comments:

Acute Sediment Test-96 Hr Survival

Start Date:	12/20/2005 15:30	Test ID:	C040719.72	Sample ID:	REF-Ref Toxicant
End Date:	12/24/2005 15:00	Lab ID:	CCA-Weston, Carlsbad	Sample Type:	UNH3-Ammonia-unionized (calculated)
Sample Date:		Protocol:	EPA USACE-1998	Test Species:	EE-Eohaustorius estuarius
Comments:					

Conc-mg/L	1	2	3
Control	1.0000	1.0000	1.0000
0.859	1.0000	1.0000	1.0000
1.357	1.0000	0.9000	0.9000
2.243	0.9000	0.8000	0.9000
2.781	0.0000	0.0000	0.1000
3.552	0.0000	0.0000	0.0000

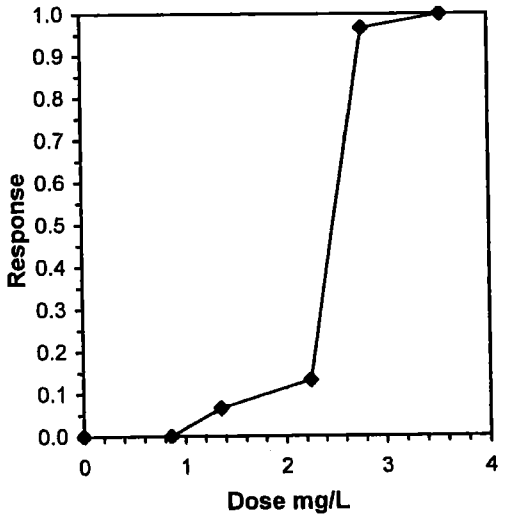
			Transform: Untransformed					1-Tailed			Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	1.0000	1.0000	1.0000	1.0000	1.0000	0.000	3				1.0000	1.0000
0.859	1.0000	1.0000	1.0000	1.0000	1.0000	0.000	3	0.000	2.470	0.0902	1.0000	1.0000
1.357	0.9333	0.9333	0.9333	0.9000	1.0000	6.186	3	1.826	2.470	0.0902	0.9333	0.9333
*2.243	0.8667	0.8667	0.8667	0.8000	0.9000	6.662	3	3.651	2.470	0.0902	0.8667	0.8667
*2.781	0.0333	0.0333	0.0333	0.0000	0.1000	173.205	3	26.473	2.470	0.0902	0.0333	0.0333
3.552	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	3				0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.91652	0.835	0.3392	-0.1795
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	1.357	2.243	1.74463		0.09019	0.09019	0.51333	0.002	5.0E-10	4, 10

Linear Interpolation (200 Resamples)

Point	mg/L	SD	95% CL(Exp)		Skew
IC05	1.2325	0.1803	0.9711	2.1917	1.0567
IC10	1.8000	0.3489	0.8697	2.7303	-0.2475
IC15	2.2538	0.1018	1.5334	2.2990	-1.9366
IC20	2.2860	0.0176	2.1957	2.3312	-0.6374
IC25	2.3183	0.0168	2.2338	2.3635	-0.5958
IC40	2.4152	0.0149	2.3484	2.4604	-0.3700
IC50	2.4797	0.0142	2.4247	2.5249	-0.1354



Reviewed by:_____

Test: SED-Acute Sediment Test
Species: EE-Eohaustorius estuarius
Sample ID: REF-Ref Toxicant
Start Date: 12/20/2005 15:30 End Date: 12/24/2005 1

Test ID: C040719.72
Protocol: EPA USACE-1998
Sample Type: UNH3-Ammonia-unionized (calculated)
Lab ID: CCA-Weston, Carlsbad

Pos	ID	Rep	Group	Start	24 Hr	48 Hr	72 Hr	96 Hr	Notes
	1	1	Control	10				10	
	2	2	Control	10				10	
	3	3	Control	10				10	
	4	1	0.859	10				10	
	5	2	0.859	10				10	
	6	3	0.859	10				10	
	7	1	1.357	10				10	
	8	2	1.357	10				9	
	9	3	1.357	10				9	
	10	1	2.243	10				9	
	11	2	2.243	10				8	
	12	3	2.243	10				9	
	13	1	2.781	10				0	
	14	2	2.781	10				0	
	15	3	2.781	10				1	
	16	1	3.552	10				0	
	17	2	3.552	10				0	
	18	3	3.552	10				0	

Comments:

10 DAY SOLID PHASE TEST DATA SHEET 2 - REF TOX WQ

CLIENT	PROJECT	SPECIES	WESTON LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	*Eohaustorius estuarius*	Carlsbad Room 2	USACE/USEPA (1998) / WESTON
WESTON JOB NUMBER	**PROJECT MANAGER**	**TEST START DATE**	**TIME**	**TEST END DATE**
0	Bill Gardiner	20Dec05	1530 LS	24Dec05

TIME @JH ~~1530~~ 1500 am

WATER QUALITY DATA

TEST	TEMP (C)	SAL (ppt)	DO (mg/L)	pH	DILTN.WAT.BATCH	REFERENCE TOXICANT MATERIAL	TOXICANT AMOUNT	DILUENT AMOUNT	REF. TOX. TEST I.D.
	15 ± 2	28 ± 2	> 6.0	7.8 ± 0.5	SIO 121405	ammonium chloride	79.3374	1500 mL	C040719.72

CLIENT/ WESTON ID	CONCENTRATION value	CONCENTRATION units	DAY	REP	Dissolved Oxygen METER	Dissolved Oxygen mg/L	Temperature METER	Temperature °C	Salinity METER	Salinity ppt	pH METER	pH units	TECHNICIAN
Ref.Tox.-ammonia	0	mg/L	0	All	6	8.6	6	16.0	5	28.1	11	8.1	JH
			4	1	6	7.7	6	16.3	5	27.8	11	8.0	am
Ref.Tox.-ammonia	15.625	mg/L	0	All	6	8.5	6	16.2	5	28.3	11	8.1	JH
			4	1	6	7.5	6	16.3	5	27.9	11	8.0	am
Ref.Tox.-ammonia	31.25	mg/L	0	All	6	8.5	6	16.2	5	28.3	11	8.0	JH
			4	1	6	7.5	6	16.3	5	28.2	11	8.0	am
Ref.Tox.-ammonia	62.5	mg/L	0	All	6	8.5	6	16.1	5	28.4	11	7.9	JH
			4	1	6	7.6	6	16.2	5	28.2	11	8.0	am
Ref.Tox.-ammonia	125	mg/L	0	All	6	8.4	6	16.5	5	28.7	11	7.7	JH
			4	1	6	7.6	6	16.2	5	28.4	11	8.0	am
Ref.Tox.-ammonia	250	mg/L	0	All	6	8.4	6	16.7	5	29.0	11	7.6	JH
			4										

1) WC 12/20/05 JH

10 DAY SOLID PHASE TEST DATA SHEET 3 - REF TOX

SPECIES	ACCLM.MORT.
Eohaustorius estuarius	< 5%

CLIENT	PROJECT	WESTON JOB NO.	PROJECT MANAGER	WESTON LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	0	Bill Gardiner	Carlsbad Room 2	USACE/USEPA (1998) / WESTON BIO066

SURVIVAL & BEHAVIOR DATA

OBSERVATIONS KEY
N = normal; LOE= loss of equilibrium; Q = quiescent; SUR= surfacing; FOS = Floating on Surface; DC = discoloration; OB = on bottom; J = jumper; NB = no body

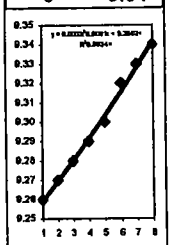
CLIENT/ WESTON ID	CONC. value	CONC. units	REP	INITIAL NUMBER	DAY 1 DATE 12/21/05 TECHNICIAN LS #ALIVE	DAY 1 #DEAD	DAY 1 OBS	DAY 2 DATE 12/22/05 TECHNICIAN LS #ALIVE	DAY 2 #DEAD	DAY 2 OBS	DAY 3 DATE 12/23/05 TECHNICIAN KS #ALIVE	DAY 3 #DEAD	DAY 3 OBS	DAY 4 DATE 12/24/05 TECHNICIAN dm #ALIVE	DAY 4 #DEAD	DAY 4 OBS
Ref.Tox.-ammonia	0	mg/L	1	10	10	0	N	10	0	N	10	0	N	10	0	N
			2	10	10	0	N	10	0	N	10	0	N	10	0	N
			3	10	10	0	N	10	0	N	10	0	N	10	0	N
Ref.Tox.-ammonia	15.625	mg/L	1	10	10	0	N	10	0	N	10	0	N	10	0	1Q
			2	10	10	0	2SUR	10	0	N	10	0	N	10	0	N
			3	10	10	0	3SUR	10	0	N	10	0	N	10	0	N
Ref.Tox.-ammonia	31.25	mg/L	1	10	10	0	2SUR	10	0	N	10	0	N	10	0	N
			2	10	10	0	4SUR	10	0	N	9	1	N	9	0	N
			3	10	10	0	2SUR	10	0	N	9	1	N	9	0	N
Ref.Tox.-ammonia	62.5	mg/L	1	10	10	0	4SUR	10	0	2SUR	10	0	N	9	1	1Q
			2	10	9	1	2SUR	9	0	N	9	0	N	8	1	N
			3	10	10	0	4SUR	10	0	1SUR	10	0	N	9	1	1Q
Ref.Tox.-ammonia	125	mg/L	1	10	10	0	6SUR DC,Q	10	0	DC,Q	5	5	Q	0	5	—
			2	10	7	3	3SUR DC,Q	6	1	DC,Q	4	2	Q	0	4	—
			3	10	10	0	3SUR DC,Q	6	4	Q,DC	6	0	Q	1	5	Q,DC
Ref.Tox.-ammonia	250	mg/L	1	10	0	10	—	—	—	—	—	—	—	—	—	—
			2	10	2	8	Q,OB	0	2	—	—	—	—	—	—	—
			3	10	1	9	Q,OB	0	1	—	—	—	—	—	—	—

Un-ionized Ammonia Calculator

Client:	Parametrix	Date of Test:	20-Dec-05
Project ID:	Bremerton Sediment	Test Type:	Eoh Reference Toxicant

To convert Total Ammonia (mg/L) to Free (un-ionized) Ammonia (mg/L) enter the corresponding total ammonia, salinity, temperature and pH.

Integer:	I-factor
1	9.26
2	9.27
3	9.28
4	9.29
5	9.30
6	9.32
7	9.33
8	9.34



	TEST	NH3T (mg/L)	salinity (ppt)	pH	temp (C)	temp (K)	i-factor	NH3U (mg/L)
	Example	0.010	22.0	8.0	22.1	297.26	9.3153	0.027
	Example2	2.000	10.0	7.3	5.0	278.16	9.2750	0.008
1	Control	0.000	28.1	8.1	23.3	296.46	9.3190	
2	15.625	17.200	28.3	8.1	23.0	296.16	9.3195	**0.859**
3	31.250	33.600	28.3	8.0	23.1	296.26	9.3195	**1.357**
4	62.500	69.400	28.4	7.9	23.1	296.26	9.3198	**2.243**
5	125.000	136.000	28.7	7.7	23.0	296.16	9.3206	**2.781**
6	250.000	215.000	29.0	7.6	23.2	296.36	9.3214	**3.552**
7								
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Ammonia Analysis
Total Ammonia (mg/L)

Project:	Organism:	Test:	Day:
Parametrix	Eoh	NH RT	0

PRETEST / INITIAL / FINAL / OTHER (circle one)
OVERLYING (OV) / POREWATER (PW) (circle one)

Standards Temperature	
Date:	**Temperature:**
12/23/05	24.0°C

Sample temperature should be within ±1°C of standards temperature at time and date of analysis.

Sample ID or Description	Conc or Rep	Date of Sampling and Initials	Ammonia Value (mg/L)	Temp °C	Date of Reading and Initials	Sample Frozen (Y/N)	pH	Sal (ppt)
control		12/21/05	<0.5	23.3	12/23/05 VS	Y		
15.625			17.2	23.0				
31.25			33.6	23.1				
62.5			69.4	23.1				
125			136	23.0				
250			215	23.2				

WESTON SOLUTIONS

Reference Toxicant
Ammmonia Spiking Worksheet

Eoh NH_3 RT

12/20/05

Assumptions in Model
Stock ammonia concentration is 8,000 mg/L = 8 mg/mL

Actual Reading
[redacted] 7090

Test Solutions			Volume of stock to reach desired concentration	
Measured Concentration mg/L	Desired Concentration mg/L	Volume mL	mL stock to increase FRESH WATER	SALT WATER
0	250	1500	52.891	79.3370945
			0.000	0
			0.000	0
			0.000	0
			0.000	0
			0.000	0

Sulfide results for Parametrix Eoh sediment test				
12/30/2005				
	OV Sulfide		PW Sulfide	
Control	Ø	RF	Ø	RF
Ref-6	Ø	RF	Ø	RF
C-8	Ø	RF	Ø	RF

Ammonia Analysis
Total Ammonia (mg/L)

Project:	Organism:	Test:	Day:
Parametrix	Eoh	10-Day Sed.	0

PRETEST / (INITIAL) / FINAL / OTHER (circle one)
OVERLYING (OV) / (POREWATER (PW)) (circle one)

Standards Temperature	
Date:	**Temperature:**
12/20/05	23°

Sample temperature should be within ±1°C of standards temperature at time and date of analysis.

Sample ID or Description	Conc or Rep	Date of Sampling and Initials	Ammonia Value (mg/L)	Temp °C	Date of Reading and Initials	Sample Frozen (Y/N)	pH	Sal (ppt)
Control ø		12/20/05 KS	<0.5	23.5°	12/20/05 JH	N	7.4	30
Ref 6		↓	0.612	23°	↓	↓	7.5	30
C-8		↓	15.2	23.3°	↓	↓	7.5	30

Ammonia Analysis
Total Ammonia (mg/L)

Project:	Organism:	Test:	Day:
Parametrix	Eohs	10-day sed.	10

PRETEST / INITIAL / FINAL / OTHER (circle one)
OVERLYING (OV) / POREWATER (PW) (circle one)

Standards Temperature		Sample temperature should be within ±1°C of standards temperature at time and date of analysis.
Date:	Temperature:	
12/30/05	24°	

Sample ID or Description	Conc or Rep	Date of Sampling and Initials	Ammonia Value (mg/L)	Temp °C	Date of Reading and Initials	Sample Frozen (Y/N)	pH	Sal (ppt)
Ø		12/30/05 LS	<0.5	23.5°	12/30/05 JH	N	①JH	①JH
Ref-6		↓	1.67	23.7°	↓	↓	↓	↓
C-8		↓	8.65	23.7°	↓	↓	↓	↓

① acid added before pH & Sal could be taken 12/30/05 JH

Appendix B

Results for the 20-Day Chronic Test with *Neanthes arenaceodentata*

Table B1. Test Results for the 20-day Chronic Toxicity Test with *N. arenaceodentata*, Bremerton Sediment

Treatment	Rep	Number Alive	Number Dead or Missing	Percent Survival	Mean Percent Survival	SD	Tare Wt. (mg)	End Wt. (mg)	Total Biomass (mg)	Biomass per Individual (mg)	Individual Growth Rate (mg/ind/d)	Mean Total Biomass (mg)	SD	Mean Individual Biomass (mg)	SD	Mean Individial Growth Rate (mg/ind/d)	SD
Control	1	5	0	100	96	8.9	124.9	234.3	109.4	21.88	1.065	94.96	23	19.66	3.67	0.954	0.2
	2	5	0	100			127.57	222.58	95.01	19.002	0.921						
	3	4	1	80			118.28	184.8	66.52	16.63	0.803						
	4	5	0	100			128.24	208.34	80.1	16.02	0.772						
	5	5	0	100			154.51	278.3	123.79	24.758	1.209						
Ref 6	1	5	0	100	100	0	93.4	183.02	89.62	17.924	0.867	83.63	6	16.73	1.19	0.807	0.1
	2	5	0	100			130.43	220.88	90.45	18.09	0.876						
	3	5	0	100			101.94	179.55	77.61	15.522	0.747						
	4	5	0	100			102.62	183.04	80.42	16.084	0.775						
	5	5	0	100			111.46	191.52	80.06	16.012	0.772						
Ref 78	1	5	0	100	100	0	137.53	216.73	79.2	15.84	0.763	77.46	11	15.49	2.18	0.746	0.1
	2	5	0	100			120.84	196.17	75.33	15.066	0.724						
	3	5	0	100			111.01	176.21	65.2	13.04	0.623						
	4	5	0	100			98.77	171.63	72.86	14.572	0.7						
	5	5	0	100			101.38	196.1	94.72	18.944	0.918						

	Rep	Number weighed	Tare Wt. (mg)	End Wt. (mg)	Total Biomass (mg)	Biomass per Individual (mg)	Mean Individual Biomass (mg)	SD
Initial biomass	1	5	59.39	60.75	1.36	0.272	0.43	0.19
	2	5	68.13	69.4	1.27	0.254		
	3	5	61.18	62.4	1.22	0.244		
	4	5	69.34	72.43	3.09	0.618		
	5	5	71.29	74.24	2.95	0.590		
	6	5	75.57	78.56	2.99	0.598		

Table B2. Water Quality Observations for 20-d Test with *N. arenaceodentata,* Bremerton Sediment

		Control			
Test Day	Rep	DO mg/L	Temp °C	pH pH units	Salinity ‰
0	6	8.1	20.3	8.0	28.0
1	6	6.9	20.3	7.9	28.3
2	6	6.8	20.0	7.5	28.4
3	6	6.4	20.0	7.5	28.4
4	6	7.0	20.3	8.3	28.4
5	6	7.2	20.1	7.9	28.3
6	6	7.0	20.7	8.1	28.4
7	6	6.7	20.3	7.8	28.3
8	6	7.1	20.5	7.4	28.5
9	6	6.6	20.3	7.8	28.4
10	6	7.0	20.6	7.9	28.5
11	6	7.1	20.1	7.9	28.7
12	6	6.9	19.8	7.8	28.5
13	6	6.6	20.3	7.4	28.7
14	6	6.8	20.2	7.7	28.7
15	6	6.6	19.8	7.7	28.7
16	6	7.5	20.2	7.8	28.7
17	6	6.9	20.2	7.7	28.9
18	6	6.7	20.3	7.9	28.7
19	6	6.6	19.6	7.4	29.2
20	1	6.2	20.2	7.9	29.4
20	2	6.5	19.8	7.9	29.3
20	3	7.1	19.5	8.0	28.6
20	4	6.8	19.9	8.0	29.2
20	5	6.7	19.4	8.0	29.1
Mean		6.9	19.6	8.0	29.0
Min		6.7	19.4	8.0	28.6
Max		7.1	19.9	8.0	29.2

Table B2. Continued.

Test Day	Rep	Ref-6 DO mg/L	Temp °C	pH pH units	Salinity ‰
0	6	8.3	19.6	8.1	27.9
1	6	6.3	19.6	7.7	28.0
2	6	6.4	19.3	7.4	28.0
3	6	5.9	19.7	7.5	28.0
4	6	6.8	19.9	8.1	27.9
5	6	6.0	19.5	7.7	28.0
6	6	6.5	19.8	7.9	28.1
7	6	6.1	19.6	7.7	28.3
8	6	6.5	19.6	7.5	28.3
9	6	6.0	19.4	7.7	28.3
10	6	6.7	19.9	7.9	28.4
11	6	6.2	19.3	7.9	28.3
12	6	6.9	19.2	7.8	28.5
13	6	6.8	19.8	7.5	28.6
14	6	6.9	19.5	7.8	28.7
15	6	6.5	19.5	7.7	28.7
16	6	7.5	19.5	7.9	28.9
17	6	7.0	19.5	7.8	28.9
18	6	7.0	19.4	7.9	29.0
19	6	7.4	20.7	7.6	29.0
20	1	7.0	19.8	8.0	29.4
20	2	7.3	19.3	8.0	29.5
20	3	7.2	19.5	8.0	29.2
20	4	6.5	19.5	7.9	29.4
20	5	7.2	19.8	7.9	29.3
Mean		7.0	19.6	7.9	29.3
Min		6.5	19.5	7.9	29.2
Max		7.2	19.8	8.0	29.4

Table B2. Continued.

Test Day	Rep	C-8 DO mg/L	C-8 Temp °C	C-8 pH pH units	C-8 Salinity ‰
0	6	8.0	19.4	8.0	27.9
1	6	6.5	19.3	7.8	28.0
2	6	6.8	19.2	7.6	28.0
3	6	6.3	19.4	7.5	28.1
4	6	6.3	19.5	8.1	28.0
5	6	5.8	19.2	7.8	28.0
6	6	6.5	19.6	8.1	28.0
7	6	5.9	19.3	7.8	28.3
8	6	6.8	19.3	7.7	28.2
9	6	5.9	19.2	8.0	28.2
10	6	7.3	19.5	8.1	28.3
11	6	6.8	19.1	8.1	28.3
12	6	6.6	19.1	8.1	28.4
13	6	6.5	19.4	7.7	28.5
14	6	6.6	19.2	7.9	28.7
15	6	6.2	19.3	7.8	28.7
16	6	6.8	19.4	7.9	28.7
17	6	2.2	19.2	7.8	29.0
18	6	7.9	19.2	8.1	29.0
19	6	6.4	19.3	7.6	29.2
20	1	6.5	19.4	8.0	29.3
20	2	6.7	19.4	8.0	29.3
20	3	6.8	19.5	8.1	29.4
20	4	6.6	19.9	8.0	29.4
20	5	6.0	19.7	7.9	29.3
Mean		6.5	19.7	8.0	29.4
Min		6.0	19.5	7.9	29.3
Max		6.8	19.9	8.1	29.4

Table B3. Ammonia and Sulfide Concentrations for the 20-Day Chronic Test with *Neanthes arenaceodentata*, Bremerton Sediment

Treatment	Overlying Water Ammonia (mg/L Total)		Porewater Ammonia (mg/L Total)		Overlying Water Sulfides (mg/L)		Porewater Sulfides (mg/L)	
	Day 0	Day 20	Day 0	Day 20	Day 0	Day 20	Day 0	Day 20
Control	<0.5	5.52	1.52	0.497	0	0	0	0
Ref 6	<0.5	1.33	2.65	0.529	0	0	0	0
C-8	2.73	2.8	20.4	3.67	0	0	0	ND

ND: No data - Interference due to high turbidity.

20-DAY CHRONIC TEST DATA SHEET 3

WESTON SOLUTIONS

CLIENT	PROJECT	MEC JOB NO.	PROJECT MANAGER	MEC LABORATORY	PROTOCOL	SPECIES
Parametrix	Bremerton Sediment	13728.001.001.0001	Bill Gardiner	Carlsbad Room 3	BIO072	*Neanthes arenaceodentata*

ENDPOINT DATA & OBSERVATIONS

OBSERVATIONS KEY
N = normal L = anoxic surface
B= no burrows F= fungal patches
M= dead on surface D= no air flow (DO
A= avoidance U= excess food

CLIENT/ MEC ID	REP	JAR	INITIAL #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	NUMBER REMAINING	TARE WEIGHT (mg) LS	TOTAL WEIGHT (mg) JH	Boat number
			TECH	1/11/06 HB	1/12/06 HB	1/13/06 VS	1/14/06 VS	1/15/06 Cum	1/16/06 VS	1/17/06 TLE	1/18/06 HB	1/19/06 CC	1/20/06 VS	1/21/06 IA	1/22/06 IA	1/23/06 VS	1/24/06 VS	1/25/06 VS	1/26/06 JH	1/27/06 LS	1/28/06 EB	1/29/06 EB	1/30/06 S				
Control / .	1			N	N	N	N	N	N	N	N	N	N	N	N	F	F	F ①	F	F ①	F	F	F	5	124.90	234.30	1
	2			2A	1A	N	N	N	N	N	N	N	N	N	N	N	N	F	F	F	F	F	F	5	127.57	222.58	2
	3			N	N	N	N	N	N	N	N	N	N	N	N	N	N	①	F	F	F	F	F	4	118.28	184.80	3
	4			N	N	N	N	N	N	N	N	N	N	N	N	N	N	①	F	F ①	F	F	F	5	128.24	208.34	4
	5			N	N	N	N	N	N	N	N	N	N	N	N	N	N	①	F	F ①	F	F	F	5	154.51	278.30	5
Ref 6 / .	1			N	N	N	N	N	N	N	N	N	N	N	N	N	N	①	N	①	N	N	N	5	93.40	183.02	6
	2			N	N	N	N	N	N	N	N	N	N	N	N	F	F	①	F	F ①	F	F	F	5	130.43	220.88	7
	3			N	N	N	N	N	N	N	N	N	N	N	N	N	N	①	N	①	N	N	N	5	101.94	179.55	8
	4			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	5	102.62	183.04	9
	5			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	5	111.46	191.52	10
C 8 / .	1			N	N	N	N	N	F	N	N	N	N	N	N	N	N	F	F	F	F	F	F	5	137.53	216.73	11
	2			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	①	N	N	N	5	120.84	196.17	12
	3			N	N	2A	N	N	F	N	N	N	N	N	N	F	F	F ①	F	F ①	F	F	F	5	111.01	176.21	13
	4			N	N	N	N	U	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	5	98.77	171.63	14
	5			N	N	N	N	N	F	N	N	N	N	N	N	N	N	① F	F	F ①	F	F	F	5	101.38	196.10	15

① small animal swimming in sample. 1/25/03 LS

Parametrix neanthes Pre-Test Weights

Date: 1/6/06

Weigh Boat	Tare Weight (mg)	Weight with Animals (mg)
A	59.39	60.75
B	68.13	69.40
C	61.18	62.40

Date: 1/9/06

Weigh Boat	Tare Weight (mg)	Weight with Animals (mg)
A	~~69.40~~ 69.34 0am	72.43
B	71.29	74.24
C	75.57	78.56

Date: _____

Weigh Boat	Tare Weight (mg)	Weight with Animals (mg)
A		
B		
C		

20 DAY CHRONIC TEST DATA SHEET 2

WESTON SOLUTIONS

CLIENT	PROJECT	SPECIES		MEC LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	*Neanthes arenaceodentata*		Carlsbad Room 3	BIO072
MEC JOB NUMBER	**PROJECT MANAGER**	**TEST START DATE**	**TIME**	**TEST END DATE**	**TIME**
13728.001.001.0001	Bill Gardiner	10Jan06	1420 JH/EB	30Jan06	1145

WATER QUALITY DATA

TEST	DO (mg/L)	TEMP (C)	SALINITY (ppt)	pH	NH3 (mg/L)		DILUTION WATER BATCH	TEMP.RECDR./HOBO#
	> 6.0	20 ± 2	28 ± 2	8.0±1.0	< 10.0		SIO121405	1967

CLIENT/MEC ID	DAY	REP	JAR #	D.O. meter	D.O. mg/L	TEMP meter	TEMP °C	SALINITY meter	SALINITY ppt	pH meter	pH unit	OVERLY. NH3 Techn.	OVERLY. NH3 mg/L	INTER. NH3 Techn.	INTER. NH3 mg/L			TECHNICIAN	Feeding		WATER RENEWAL
Control	0	① RF wq.surr	17	7	8.1	7	20.3	6	28.0	12	8.0	JH	<0.5	JH	1.52			RF		EB	
		②																			
		③																			
		④																			
		⑤																			
Control	1	WQ	17	7	6.9	7	20.3	6	28.3	12	7.9							RF			
Control	2	WQ	surr	6	6.8	6	20.0	5	28.4	10	7.5							HB		HB	
Control	3	WQ	surr	6	6.4	6	20.0	5	28.4	10	7.5							KS		KS	② KS
Control	4	WQ	surr	7	7.0	7	20.3	6	28.4	11	8.3							KS		am	am
Control	5	WQ	surr	6	7.2	6	20.1	5	28.3	12	7.9							am			
Control	6	WQ	surr	7	7.0	7	20.7	6	28.4	11	8.1							KS		EB	KS
Control	7	WQ	surr	6	6.7	6	20.3	5	28.3	12	7.8							TG			
Control	8	WQ	surr	6	7.1	6	20.5	5	28.5	11	7.4							HB		HB	
Control	9	WQ	surr	6	6.6	6	20.3	6	28.4	12	7.8							CC			EB/HB
Control	10	WQ	surr	7	7.0	7	20.6	5	28.5	11	7.9							KS		KS	

① used wq. surr instead of 5 reps 1/10/06 RF
② due to technician error, water was not renewed 1/13/06 KS
③ IE 1/15/06 am

20 DAY CHRONIC TEST DATA SHEET 2

CLIENT	PROJECT	SPECIES	MEC LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	*Neanthes arenaceodentata*	Carlsbad Room 3	BIO072
MEC JOB NUMBER	**PROJECT MANAGER**	**TEST START DATE** / **TIME**	**TEST END DATE**	**TIME**
13728.001.001.0001	Bill Gardiner	10Jan06 / 1420 JH/EB	30Jan06	1145

WATER QUALITY DATA

TEST: DO (mg/L) > 6.0 | TEMP (C) 20 ± 2 | SALINITY (ppt) 28 ± 2 | pH 8.0±1.0 | NH3 (mg/L) < 10.0 | DILUTION WATER BATCH SIO121405 | TEMP.RECDR./HOBO# 1967

CLIENT/MEC ID	DAY	REP	JAR #	D.O. meter	D.O. mg/L	TEMP meter	TEMP °C	SALINITY meter	SALINITY ppt	pH meter	pH unit	OVERLY. NH3 Techn.	OVERLY. NH3 mg/L	INTER. NH3 Techn.	INTER. NH3 mg/L	TECHNICIAN	Feeding	WATER RENEWAL
Control	11	WQ		6	7.1	6	20.1	6	28.7	12	7.9					LS		
Control	12	WQ		6	6.9	6	19.8	5	28.5	12	7.8					EA	EA	EA
Control	13	WQ		7	6.6	7	20.3	6	28.7	10	7.4					VS		
Control	14	WQ		6	6.8	6	20.2	5	28.7	11	7.7					VS	KS	
Control	15	WQ		6	6.6	6	19.8	5	28.7	10	7.7					LS		HB/LS
Control	16	WQ		6	7.5	6	20.2	5	28.7	11	7.8					JH	JH	
Control	17	WQ		6	6.9	6	20.2	5	28.9	10	7.7					LS		
Control	18	WQ		6	6.7	6	20.3	5	28.7	11	7.9					QB	QB	QB
Control	19	WQ		7	6.6	7	19.6	6	29.2	11	7.4					QB		
Control	20	1		6	6.2	6	20.2	5	29.4	11	7.9	JH	5.52 ① JH	QB	0.497	LS		
		2		6	6.5	6	19.8	5	29.3	11	7.9					LS		
		3		6	7.1	6	19.5	5	28.6	11	8.0					LS		
		4		6	6.8	6	19.9	5	29.2	11	8.0					LS		
		5		6	6.7	6	19.4	5	29.1	11	8.0					LS		

① composite of all Reps 1/30/06 JH

20 DAY CHRONIC TEST DATA SHEET 2

CLIENT	PROJECT	SPECIES	MEC LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	*Neanthes arenaceodentata*	Carlsbad Room 3	BIO072
MEC JOB NUMBER	**PROJECT MANAGER**	**TEST START DATE** / **TIME**	**TEST END DATE**	**TIME**
13728.001.001.0001	Bill Gardiner	10Jan06 / 1420 EB/JH	30Jan06	1145

WATER QUALITY DATA

TEST: DO (mg/L) > 6.0 | TEMP (C) 20 ± 2 | SALINITY (ppt) 28 ± 2 | pH 8.0±1.0 | NH3 (mg/L) < 10.0 | DILUTION WATER BATCH SIO121405 | TEMP.RECDR./HOBO# 1967

CLIENT/MEC ID	DAY	REP	JAR #	D.O. meter	D.O. mg/L	TEMP meter	TEMP °C	SALINITY meter	SALINITY ppt	pH meter	pH unit	OVERLY. NH3 Techn.	OVERLY. NH3 mg/L	INTER. NH3 Techn.	INTER. NH3 mg/L	TECHNICIAN	Feeding	WATER RENEWAL
Ref 6	0	WQ surr ① RF	7	7	8.3	7	19.6	6	27.9	12	8.1	JH	<0.5	JH	2.65	RF	EB	
		2															↓	
		3																
		4																
		5																
Ref 6	1	WQ	7	7	6.3	7	19.6	6	28.0	12	7.7					RF		
Ref 6	2	WQ	surr	6	6.4	6	19.3	5	28.0	10	7.4					HB	HB	
Ref 6	3	WQ	surr	6	5.9	6	19.7	5	28.0	10	7.5					VS	VS	@VS
Ref 6	4	WQ	surr	7	6.8	7	19.9	6	27.9	11	8.1					VS	am	am
Ref 6	5	WQ	surr	6	6.0	6	19.5	5	28.0	12	7.7					am		
Ref 6	6	WQ	surr	7	6.5	7	19.8	6	28.1	11	7.9					VS	EB	KS
Ref 6	7	WQ	surr	6	6.1	6	19.6	5	28.3	12	7.7					TVG		
Ref 6	8	WQ	surr	6	6.5	6	19.6	5	28.3	11	7.5					HB	HB	
Ref 6	9	WQ	surr	6	~~5.8~~ ③cc	6	~~19.4~~ 20.3 ③cc	6	~~28.3~~ 28.4 ③cc	12	~~7.8~~ ②cc 7.7					cc		EB/HB
Ref 6	10	WQ	surr	7	6.7	7	19.9	5	28.4	11	7.9					VS	VS	

① used WQ. surr instead of reps. 1/10/06 RF

② due to technician error, water was not renewed 1/13/06 VS

③ IF 1/19/06 cc

20 DAY CHRONIC TEST DATA SHEET 2

WESTON SOLUTIONS

CLIENT	PROJECT	SPECIES		MEC LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	*Neanthes arenaceodentata*		Carlsbad Room 3	BIO072
MEC JOB NUMBER	**PROJECT MANAGER**	**TEST START DATE**	**TIME**	**TEST END DATE**	**TIME**
13728.001.001.0001	Bill Gardiner	10Jan06	1420 JH/EB	30Jan06	1145

WATER QUALITY DATA

TEST	DO (mg/L)	TEMP (C)	SALINITY (ppt)	pH	NH3 (mg/L)		DILUTION WATER BATCH	TEMP.RECDR./HOBO#
	> 6.0	20 ± 2	28 ± 2	8.0±1.0	< 10.0		SIO121405	1967

CLIENT/MEC ID	DAY	REP	JAR #	D.O. meter	D.O. mg/L	TEMP meter	TEMP °C	SALINITY meter	SALINITY ppt	pH meter	pH unit	OVERLY. NH3 Techn.	OVERLY. NH3 mg/L	INTER. NH3 Techn.	INTER. NH3 mg/L			TECHNICIAN	Feeding		WATER RENEWAL
Ref 6	11	WQ		6	~~7.7~~ 6.2 ①	6	~~20.7~~ 19.3 ②	6	28.3	12	7.9							LS			
Ref 6	12	WQ		6	6.9	6	19.2	5	28.5	12	7.8									EA	EA
Ref 6	13	WQ		7	6.8	7	19.8	6	28.6	10	7.5							KS			
Ref 6	14	WQ		6	6.9	6	19.5	5	28.7	11	7.8							KS		KS	
Ref 6	15	WQ		6	6.5	6	19.5	5	28.7	10	7.7							LS			HB/LS
Ref 6	16	WQ		6	7.5	6	19.5	5	28.9	11	7.9							JH		JH	
Ref 6	17	WQ		6	7.0	6	19.5	5	28.9	10	7.8							LS			
Ref 6	18	WQ		6	7.0	6	19.4	5	29.0	11	7.9							EB	EB		EB
Ref 6	19	WQ		7	7.4	7	20.7	6	29.0	11	7.6							EB			
Ref 6	20	1		6	7.0	6	19.8	5	29.4	11	8.0	JH	② JH 1.33	JH	0.529			LS			
		2		6	7.3	6	19.3	5	29.5	11	8.0							LS			
		3		6	7.2	6	19.5	5	29.2	11	8.0							LS			
		4		6	6.5	6	19.5	5	29.4	11	7.9							LS			
		5		6	7.2	6	19.8	5	29.3	11	7.9							LS			

① WP 1/24/06 LS
② composite of all reps 1/30/06 JH

20 DAY CHRONIC TEST DATA SHEET 2

CLIENT	PROJECT	SPECIES	MEC LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	*Neanthes arenaceodentata*	Carlsbad Room 3	BIO072
MEC JOB NUMBER	**PROJECT MANAGER**	**TEST START DATE** / **TIME**	**TEST END DATE**	**TIME**
13728.001.001.0001	Bill Gardiner	10Jan06 / 1420 EB/JH	30Jan06	1145

WATER QUALITY DATA

TEST: DO (mg/L) > 6.0 | TEMP (C) 20 ± 2 | SALINITY (ppt) 28 ± 2 | pH 8.0±1.0 | NH3 (mg/L) < 10.0 | DILUTION WATER BATCH SIO121405 | TEMP.RECDR./HOBO# 1967

CLIENT/MEC ID	DAY	REP	JAR #	D.O. meter	D.O. mg/L	TEMP meter	TEMP °C	SALINITY meter	SALINITY ppt	pH meter	pH unit	OVERLY. NH3 Techn.	OVERLY. NH3 mg/L	INTER. NH3 Techn.	INTER. NH3 mg/L	TECHNICIAN	Feeding	WATER RENEWAL
C 8	0	WQ Surr	6	7	8.0	7	19.4	6	27.9	12	8.0	JH	2.73	JH	20.4	RF	EB	
		0 RF																
		2																
		3																
		4																
		5																
C 8	1	WQ	6	7	6.5	7	19.3	6	28.0	12	7.8					RF		
C 8	2	WQ	Surr	6	6.8	7 RF	19.2	5 RF	28.0	10	7.6					HB	HB	
C 8	3	WQ	surr	6	6.3	6	19.4	5	28.1	10	7.5					VS	VS	③VS
C 8	4	WQ	surr	7	6.3	7	19.5	6	28.0	11	8.1					VS	am	am
C 8	5	WQ	Surr	6	5.8 @ am	6	19.2	5	28.0	12	7.8					am		
C 8	6	WQ	surr	7	6.5	7	19.6	6	28.0	11	8.1					VS	EB	KS
C 8	7	WQ	Surr	6	5.9	6	19.3	5	28.3	12	7.8					DVT		
C 8	8	WQ	surr	6	6.3	6	19.3	5	28.2	11	7.7					HB	HB	
C 8	9	WQ	Surr	6	5.9	6	19.2	6	28.2	12	8.0					CC		HB/EB
C 8	10	WQ	surr	7	7.3	7	19.5	5	28.3	11	8.1					VS	VS	
C 8	11	WQ		6	6.8	6	19.1	6	28.3	12	7.8 8.1 ⑤					VS		

① used WQ Surr. instead of reps. 1/10/06 RF

② turned airflow up 1/15/06 am

③ due to technician error water was not renewed 1/13/06 VS

④ 1/17/06 HB

⑤ MA 1/24/06 VS

20 DAY CHRONIC TEST DATA SHEET 2

CLIENT	PROJECT	SPECIES	MEC LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	*Neanthes arenaceodentata*	Carlsbad Room 3	BIO072
MEC JOB NUMBER	**PROJECT MANAGER**	**TEST START DATE** / **TIME**	**TEST END DATE**	**TIME**
13728.001.001.0001	Bill Gardiner	10Jan06 / 1420 EB/JH	30Jan06	1145

WATER QUALITY DATA

TEST: DO (mg/L) > 6.0 | TEMP (C) 20 ± 2 | SALINITY (ppt) 28 ± 2 | pH 8.0±1.0 | NH3 (mg/L) < 10.0 | DILUTION WATER BATCH SIO121405 | TEMP.RECDR./HOBO# 1967

CLIENT/MEC ID	DAY	REP	JAR #	D.O. meter	D.O. mg/L	TEMP meter	TEMP °C	SALINITY meter	SALINITY ppt	pH meter	pH unit	OVERLY. NH3 Techn.	OVERLY. NH3 mg/L	INTER. NH3 Techn.	INTER. NH3 mg/L	TECHNICIAN	Feeding	WATER RENEWAL
C 8	12	WQ		6	6.6	6	19.1	5	28.4	12	8.1					DA	DA	DA
C 8	13	WQ		~~8~~ 7	6.5	~~8~~ 7	19.4	6	28.5	10	7.7					VS		
C 8	14	WQ		6	6.6	6	19.2	5	28.7	11	7.9					VS	VS	
C 8	15	WQ		6	6.2	6	19.3	5	28.7	10	7.8					LS		HB/LS
C 8	16	WQ		6	6.8	6	19.4	5	28.7	11	7.9					JH	JH	
C 8	17	WQ		6	②2.2	6	19.2	5	29.0	10	7.8					LS		
C 8	18	WQ		6	7.9	6	19.2	5	29.0	11	8.1					EB	EB	EB
C 8	19	WQ		7	6.4	7	19.3	6	29.2	11	7.6					EB		
C 8	20	1		6	6.5	6	19.4	5	29.3	11	8.0	JH	③JH 2.80	JH	3.67	LS		
		2		6	6.7	6	19.4	5	29.3	11	8.0					LS		
		3		6	6.8	6	19.5	5	29.4	11	8.1					LS		
		4		6	6.6	6	19.9	5	29.4	11	8.0					LS		
		5		6	6.8	6	19.7	5	29.3	11	7.9					LS		

① WC- 1/22/06 EB

② DO out of range: Increased aeration 1/27/06 LS

③ Composite of all reps 1/30/06 JH

Ammonia Analysis
Total Ammonia (mg/L)

Client/Project:	Organism:	Weston Test ID:	Test Duration (days):
Parametrix	Neanthes	C040719.74	20

PRETEST / INITIAL / FINAL / OTHER (circle one) **DAY of TEST:** 20
OVERLYING (OV) / POREWATER (PW) (circle one)

Calibration Standards Temperature	
Date:	**Temperature:**
1/30/06	24°

Sample temperature should be within ±1°C of standards temperature at time and date of analysis.

Sample ID or Description	Count or Rep	Date of Sampling (and Initials)	Ammonia Value (mg/L)	Temp °C	Date of Reading (and Initials)	Sample Frozen (Y/N)	pH	Sal (ppt)
Ø		1/30/06 JH/EB	HB <0.5	24.6°	1/30/06 JH	N	7.5	39
C8		↓ ↓	3.67	24.5°	↓	↓	7.3	31
Ref 6		↓ ↓	0.529	24.8°	↓	↓	7.7	33

Neanthes Parametrix

Sulfides

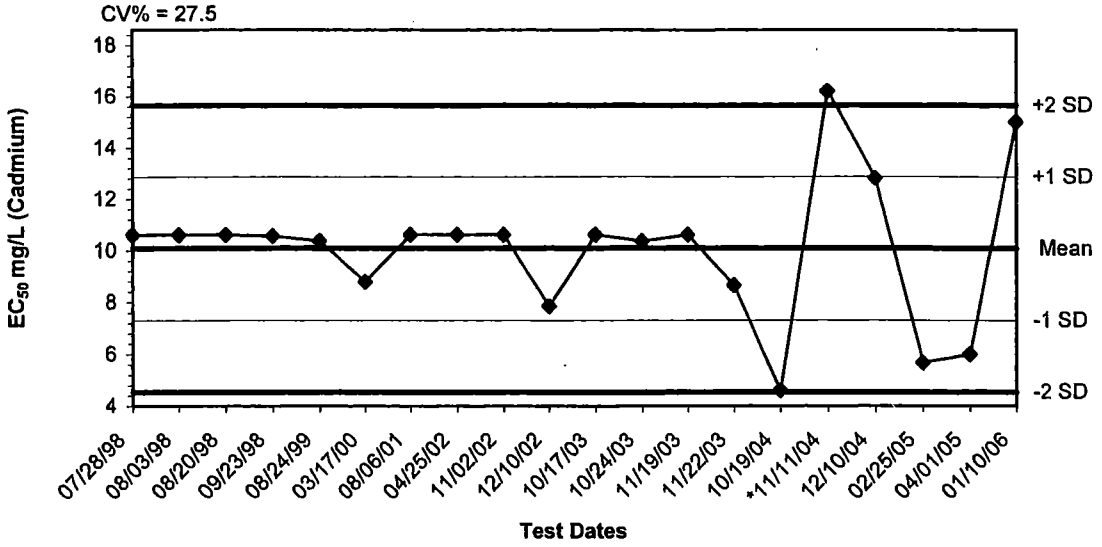
	OV	PW
Initial 1/10/06		
Control	0	0
Ref-6	0	0
C-8	0	0

	OV	PW
Final		
Control	0	0
Ref-6	0	0
C-8	0	~~X~~ Ø

JH/HB/CB

Too turbid to get reliable reading

Neanthes arenaceodentata Reference Toxicant Control Chart: 96-Hour Survival



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
07/28/98	10.6070	10.0862	7.3104	4.5347	12.8619	15.6377
08/03/98	10.6070	10.0862	7.3104	4.5347	12.8619	15.6377
08/20/98	10.6070	10.0862	7.3104	4.5347	12.8619	15.6377
09/23/98	10.5540	10.0862	7.3104	4.5347	12.8619	15.6377
08/24/99	10.3670	10.0862	7.3104	4.5347	12.8619	15.6377
03/17/00	8.7893	10.0862	7.3104	4.5347	12.8619	15.6377
08/06/01	10.6070	10.0862	7.3104	4.5347	12.8619	15.6377
04/25/02	10.6070	10.0862	7.3104	4.5347	12.8619	15.6377
11/02/02	10.6070	10.0862	7.3104	4.5347	12.8619	15.6377
12/10/02	7.8547	10.0862	7.3104	4.5347	12.8619	15.6377
10/17/03	10.6070	10.0862	7.3104	4.5347	12.8619	15.6377
10/24/03	10.3560	10.0862	7.3104	4.5347	12.8619	15.6377
11/19/03	10.6070	10.0862	7.3104	4.5347	12.8619	15.6377
11/22/03	8.6466	10.0862	7.3104	4.5347	12.8619	15.6377
10/19/04	4.6063	10.0862	7.3104	4.5347	12.8619	15.6377
*11/11/04	16.2100	10.0862	7.3104	4.5347	12.8619	15.6377
12/10/04	12.8000	10.0862	7.3104	4.5347	12.8619	15.6377
02/25/05	5.6839	10.0862	7.3104	4.5347	12.8619	15.6377
04/01/05	6.0000	10.0862	7.3104	4.5347	12.8619	15.6377
01/10/06	15.0000	10.0862	7.3104	4.5347	12.8619	15.6377

* Value out of 95% CI range. Test was rerun on 12/10/04 and was within 95% CI.
Updated 01/25/06 KS

Acute Sediment Test-96 Hr Survival

Start Date:	1/10/2006 16:00	Test ID:	C040405.43	Sample ID:	REF-Ref Toxicant
End Date:	1/14/2006 14:25	Lab ID:	CCA-Weston, Carlsbad	Sample Type:	CDCL-Cadmium chloride
Sample Date:		Protocol:	EPA USACE-1998	Test Species:	NA-Neanthes arenaceodentata
Comments:					

Conc-mg/L	1	2	3
Control	1.0000	1.0000	1.0000
3.75	1.0000	1.0000	1.0000
7.5	1.0000	1.0000	0.9000
15	0.0000	0.6000	0.9000
30	0.0000	0.0000	0.0000
60	0.0000	0.0000	0.0000

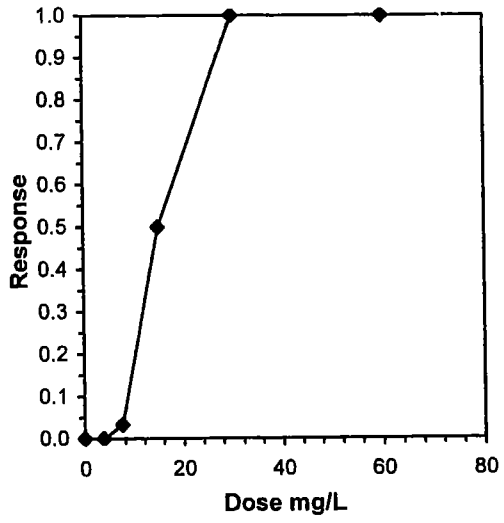
			Transform: Untransformed					1-Tailed			Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	1.0000	1.0000	1.0000	1.0000	1.0000	0.000	3				1.0000	1.0000
3.75	1.0000	1.0000	1.0000	1.0000	1.0000	0.000	3	0.000	2.420	0.4563	1.0000	1.0000
7.5	0.9667	0.9667	0.9667	0.9000	1.0000	5.973	3	0.177	2.420	0.4563	0.9667	0.9667
*15	0.5000	0.5000	0.5000	0.0000	0.9000	91.652	3	2.652	2.420	0.4563	0.5000	0.5000
30	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	3				0.0000	0.0000
60	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	3				0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.73836	0.805	-0.86	5.20674
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	7.5	15	10.6066		0.45632	0.45632	0.18	0.05333	0.07501	3, 8

Linear Interpolation (200 Resamples)

Point	mg/L	SD	95% CL(Exp)		Skew
IC05	7.768	0.967	3.268	11.143	0.5571
IC10	8.571	1.487	6.321	22.071	2.7268
IC15	9.375	1.776	7.008	22.937	1.7679
IC20	10.179	2.178	7.267	23.804	1.3302
IC25	10.982	2.339	7.200	24.670	1.0996
IC40	13.393	2.852	6.992	27.268	0.6639
IC50	15.000	3.228	6.853	29.000	0.4454



Reviewed by:_____

Test: AS-Acute Sediment Test								Test ID: C040405.43	
Species: NA-Neanthes arenaceodentata								Protocol: EPA USACE-1998	
Sample ID: REF-Ref Toxicant								Sample Type: CDCL-Cadmium chloride	
Start Date: 1/10/2006 16:00				End Date: 1/14/2006 14:2				Lab ID: CCA-Weston, Carlsbad	
Pos	ID	Rep	Group	Start	24 Hr	48 Hr	72 Hr	96 Hr	Notes
	1	1	Control	10				10	
	2	2	Control	10				10	
	3	3	Control	10				10	
	4	1	3.750	10				10	
	5	2	3.750	10				10	
	6	3	3.750	10				10	
	7	1	7.500	10				10	
	8	2	7.500	10				10	
	9	3	7.500	10				9	
	10	1	15.000	10				0	
	11	2	15.000	10				6	
	12	3	15.000	10				9	
	13	1	30.000	10				0	
	14	2	30.000	10				0	
	15	3	30.000	10				0	
	16	1	60.000	10				0	
	17	2	60.000	10				0	
	18	3	60.000	10				0	

Comments:

20-DAY CHRONIC TEST DATA SHEET 3 - REF TOX

CLIENT	PROJECT	MEC JOB NO.	SPECIES	PROJECT MANAGER	MEC LABORATORY	ACCLM.MORT.	PROTOCOL
Parametrix	Bremerton Sediment	13728.001.001.0001	*Neanthes arenaceodentata*	Bill Gardiner	Carlsbad Room 3	< 5%	BIO072

SURVIVAL & BEHAVIOR DATA

OBSERVATIONS KEY
N = normal; L = anoxic surface; B= no burrows; F= fungal patches; M= dead on surface; D= no air flow (DO?); A= avoidance; U= excess food; Q=quiescent

CLIENT/ MEC ID	CONC. value	CONC. units	REP	INITIAL NUMBER	DAY 1 DATE 1/11/06 TECHNICIAN dm #ALIVE	DAY 1 #DEAD	DAY 1 OBS	DAY 2 DATE 1/12/06 TECHNICIAN VS #ALIVE	DAY 2 #DEAD	DAY 2 OBS	DAY 3 DATE 1/13/06 TECHNICIAN VS #ALIVE	DAY 3 #DEAD	DAY 3 OBS	DAY 4 DATE 1/14/06 TECHNICIAN dm #ALIVE	DAY 4 #DEAD	DAY 4 OBS
Ref.Tox.- cadmium	0	mg/L	1	10	10	0	N	10	0	N	10	0	N	10	0	N
			2		10	0	N	10	0	N	10	0	N	10	0	N
			3		10	0	1Q	10	0	1Q	10	0	N	10	0	N
Ref.Tox.- cadmium	3.75 ~~1.875~~	mg/L	1	10	10	0	N	10	0	N	10	0	N	10	0	3Q
			2		10	0	N	10	0	N	10	0	N	10	0	N
			3		10	0	N	10	0	N	10	0	N	10	0	N
Ref.Tox.- cadmium	7.5 ~~3.75~~	mg/L	1	10	10	0	N	10	0	6DC	10	0	DC	10	0	1Q
			2		10	0	N	10	0	6DC	10	0	DC	10	0	N
			3		10	0	2Q	10	0	DC, 4Q	10	0	DC, 9Q	9	1	DC/Q
Ref.Tox.- cadmium	15 ~~7.5~~	mg/L	1	10	10	0	DC/Q	10	0	DC/Q	8	2	DC, Q	0	8	—
			2		10	0	DC/Q	10	0	DC/Q	10	0	DC, Q	6	4	DC/Q
			3		10	0	9DC/Q	10	0	DC/Q	10	0	DC, Q	9	1	DC/Q
Ref.Tox.- cadmium	30 ~~15~~	mg/L	1	10	1	9	Q/DC	0	1	—	—	—	—	—	—	—
			2		5	5	Q/DC	0	5	—	—	—	—	—	—	—
			3		3	7	Q/DC	1	2	DC/Q	0	1	—	—	—	—
Ref.Tox.- cadmium	60 ~~30~~	mg/L	1	10	0	10	— Q/DC	—	—	—	—	—	—	—	—	—
			2		1	8	NB	0	1	—	—	—	—	—	—	—
			3		3	7	Q/DC	0	3	—	—	—	—	—	—	—

20 DAY CHRONIC TEST DATA SHEET 2 - REF TOX WQ

target: 9.00mL $CdCl_2$ in 1500mL actual: 9.0002 C040405.43

CLIENT	PROJECT	SPECIES	MEC LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	*Neanthes arenaceodentata*	Carlsbad Room 3	BIO072

MEC JOB NUMBER	PROJECT MANAGER	TEST START DATE	TIME	TEST END DATE	TIME
13728.001.001.0001	Bill Gardiner	10Jan06	1600 eg/JH/TG	14Jan06	1425 am

WATER QUALITY DATA

TEST	TEMP (C)	SAL (ppt)	DO (mg/L)	NH3 (mg/L)	DILTN WAT BATCH	TEMP REC#	REFERENCE TOX MATERIAL	REFERENCE TOXICANT	LOT NO.	96-HR LC50
	20±2	28±2	> 6.0	< 10	SIO121405	1967	cadmium chloride	cadmium		

CLIENT/ MEC ID	CONCENTRATION value	CONCENTRATION units	DAY	REP	D.O. meter	D.O. mg/L	TEMP. meter	TEMP. °C	SALINITY meter	SALINITY ppt	pH meter	pH unit	TECHNICIAN	FEEDING am	FEEDING pm
Ref.Tox.-cadmium	0	mg/L	0	stock	7	8.1	7	20.3	6	27.9	12	8.2	RF		
			1	1											
			2	2											
			3	3											
			4	1	7	7.6	7	19.3	6	29.0	11	8.4	am		
Ref.Tox.-cadmium	3.75 ~~1.875~~	mg/L	0	stock	7	7.3	7	20.3	6	28.0	12	8.2	RF		
			1	1											
			2	2											
			3	3											
			4	1	7	7.4	7	19.5	6	28.6	11	8.4	am		
Ref.Tox.-cadmium	7.5 ~~3.75~~	mg/L	0	stock	7	7.3	7	20.3	6	27.9	12	8.2	RF		
			1	1											
			2	2											
			3	3											
			4	1	7	7.4	7	19.6	6	28.3	11	8.4	am		
Ref.Tox.-cadmium	15 ~~7.5~~	mg/L	0	stock	7	7.2	7	20.2	6	27.9	12	8.2	RF		
			1	1											
			2	2											
			3	3											
			4	1	7	7.4	7	19.6	6	28.2	11	8.3	am		

20 DAY CHRONIC TEST DATA SHEET 2 - REF TOX WQ

CLIENT	PROJECT	SPECIES	MEC LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	*Neanthes arenaceodentata*	Carlsbad Room 3	BIO072

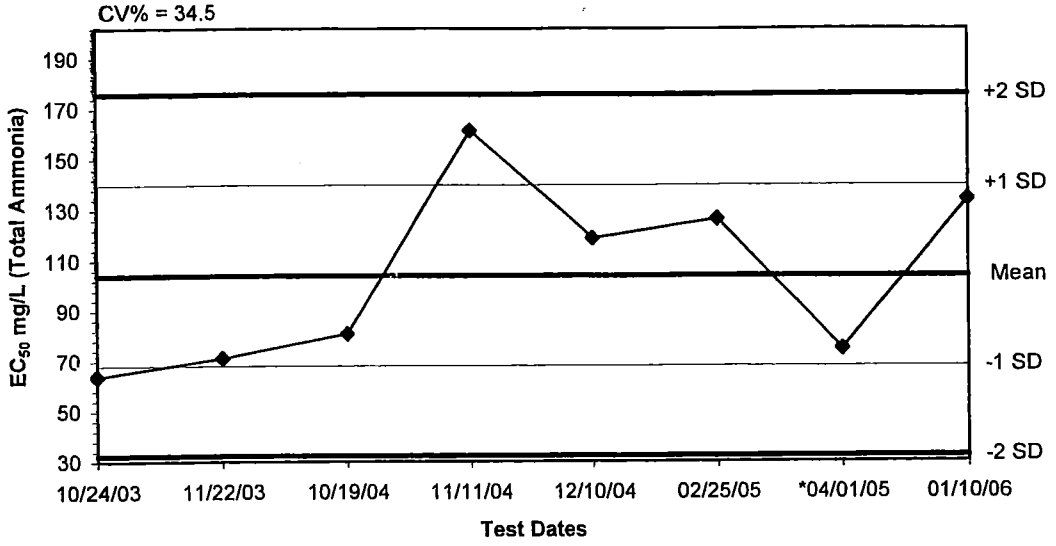
MEC JOB NUMBER	PROJECT MANAGER	TEST START DATE	TIME	TEST END DATE	TIME
13728.001.001.0001	Bill Gardiner	10Jan06	1600 JH/TG/ES	14Jan06	1425 AM

WATER QUALITY DATA

TEST	TEMP (C)	SAL (ppt)	DO (mg/L)	NH3 (mg/L)	DILTN.WAT.BATCH	TEMP REC#	REFERENCE TOX. MATERIAL	REFERENCE TOXICANT	LOT NO.	96-HR LC50
	20±2	28±2	> 6.0	< 10	SIO121405	1967	cadmium chloride	cadmium		

CLIENT/ MEC ID	CONCENTRATION value	CONCENTRATION units	DAY	REP	D.O. meter	D.O. mg/L	TEMP. meter	TEMP. °C	SALINITY meter	SALINITY ppt	pH meter	pH unit					TECHNICIAN	FEEDING am	FEEDING pm
Ref.Tox.-cadmium	30 ~~25~~	mg/L	0	stock	7	7.2	7	20.2	6	27.9	12	8.2					RF		
			1	1															
			2	2															
			3	3															
			4																
Ref.Tox.-cadmium	60 ~~50~~	mg/L	0	stock	7	7.3	7	20.2	6	27.9	12	8.2					RF		
			1	1															
			2	2															
			3	3															
			4																

Neanthes arenaceodentata Reference Toxicant Control Chart: 96-Hour Survival

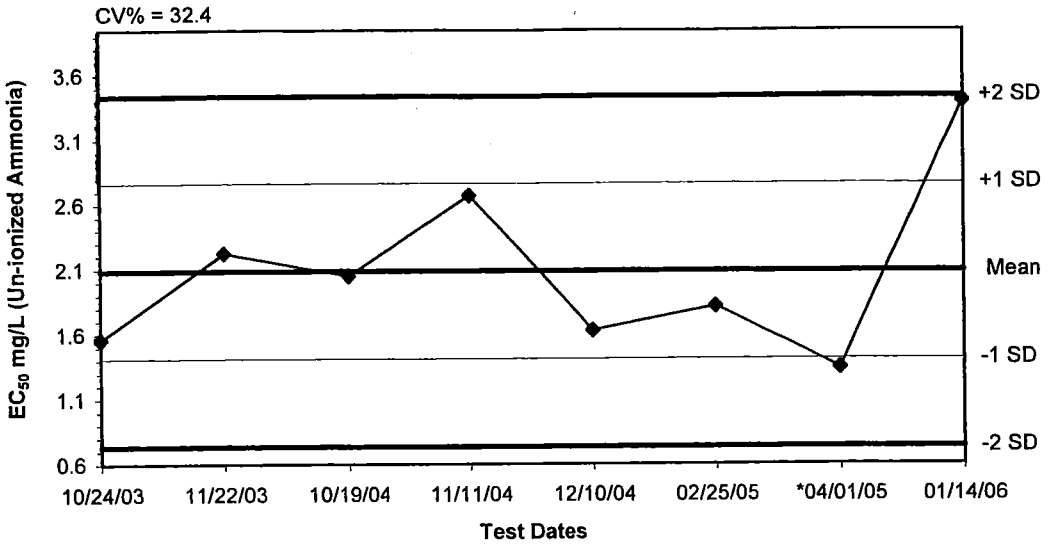


Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
10/24/03	63.9210	103.9809	68.1163	32.2516	139.8456	175.7102
11/22/03	71.2005	103.9809	68.1163	32.2516	139.8456	175.7102
10/19/04	80.7559	103.9809	68.1163	32.2516	139.8456	175.7102
11/11/04	161.5100	103.9809	68.1163	32.2516	139.8456	175.7102
12/10/04	118.9100	103.9809	68.1163	32.2516	139.8456	175.7102
02/25/05	126.4000	103.9809	68.1163	32.2516	139.8456	175.7102
*04/01/05	75.0000	103.9809	68.1163	32.2516	139.8456	175.7102
01/10/06	134.1500	103.9809	68.1163	32.2516	139.8456	175.7102

* Nominal not measured concentrations were used in statistical analysis.

Updated 01/20/06 KS

Neanthes arenaceodentata Reference Toxicant Control Chart: 96-Hour Survival



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
10/24/03	1.5600	2.0856	1.4101	0.7345	2.7612	3.4368
11/22/03	2.2242	2.0856	1.4101	0.7345	2.7612	3.4368
10/19/04	2.0488	2.0856	1.4101	0.7345	2.7612	3.4368
11/11/04	2.6673	2.0856	1.4101	0.7345	2.7612	3.4368
12/10/04	1.6301	2.0856	1.4101	0.7345	2.7612	3.4368
02/25/05	1.8157	2.0856	1.4101	0.7345	2.7612	3.4368
*04/01/05	1.3405	2.0856	1.4101	0.7345	2.7612	3.4368
01/14/06	3.3986	2.0856	1.4101	0.7345	2.7612	3.4368

* Nominal not measured concentrations were used in statistical analysis.

Updated 01/20/06 KS

Acute Sediment Test-96 Hr Survival

Start Date:	1/10/2006 16:30	Test ID:	C040719.74	Sample ID:	REF-Ref Toxicant
End Date:	1/14/2006 14:30	Lab ID:	CCA-Weston, Carlsbad	Sample Type:	TNH3-Ammonia-total (measured)
Sample Date:		Protocol:	EPA USACE-1998	Test Species:	NA-Neanthes arenaceodentata
Comments:					

Conc-mg/L	1	2	3
Control	0.9000	1.0000	1.0000
18	1.0000	1.0000	1.0000
35.2	1.0000	1.0000	1.0000
67.1	1.0000	1.0000	1.0000
133	0.4000	0.5000	0.6000
271	0.0000	0.0000	0.0000

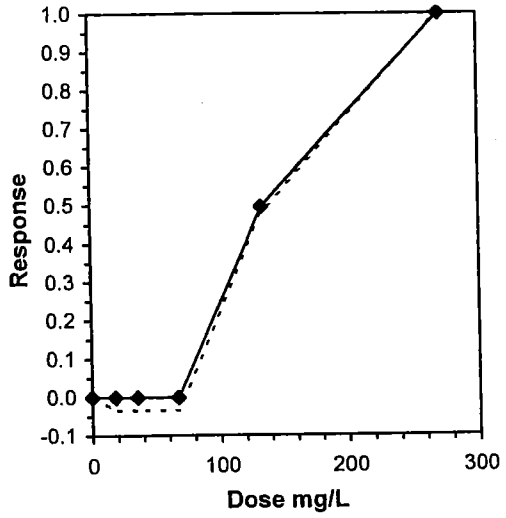
			Transform: Untransformed					1-Tailed			Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	0.9667	1.0000	0.9667	0.9000	1.0000	5.973	3				0.9917	1.0000
18	1.0000	1.0345	1.0000	1.0000	1.0000	0.000	3	-0.791	2.470	0.1041	0.9917	1.0000
35.2	1.0000	1.0345	1.0000	1.0000	1.0000	0.000	3	-0.791	2.470	0.1041	0.9917	1.0000
67.1	1.0000	1.0345	1.0000	1.0000	1.0000	0.000	3	-0.791	2.470	0.1041	0.9917	1.0000
*133	0.5000	0.5172	0.5000	0.4000	0.6000	20.000	3	11.068	2.470	0.1041	0.5000	0.5042
271	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	3				0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.78167	0.835	-0.2203	2.96154
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	67.1	133	94.4685		0.10414	0.10774	0.14567	0.00267	9.3E-07	4, 10

Linear Interpolation (200 Resamples)

Point	mg/L	SD	95% CL(Exp)		Skew
IC05	73.75	0.64	71.39	77.31	0.4899
IC10	80.39	1.28	75.67	87.52	0.4899
IC15	87.04	1.92	79.96	97.73	0.4899
IC20	93.68	2.56	84.25	107.94	0.4899
IC25	100.33	3.20	88.54	118.15	0.4899
IC40	120.27	5.16	101.40	149.42	0.5228
IC50	134.15	8.62	109.32	182.05	0.6219



ToxCalc v5.0.23

Reviewed by:_____

Test: AS-Acute Sediment Test
Species: NA-Neanthes arenaceodentata
Sample ID: REF-Ref Toxicant
Start Date: 1/10/2006 16:30

Test ID: C040719.74
Protocol: EPA USACE-1998
Sample Type: TNH3-Ammonia-total (measured)
End Date: 1/14/2006 14:3 Lab ID: CCA-Weston, Carlsbad

Pos	ID	Rep	Group	Start	24 Hr	48 Hr	72 Hr	96 Hr	Notes
	1	1	Control	10				9	
	2	2	Control	10				10	
	3	3	Control	10				10	
	4	1	18.000	10				10	
	5	2	18.000	10				10	
	6	3	18.000	10				10	
	7	1	35.200	10				10	
	8	2	35.200	10				10	
	9	3	35.200	10				10	
	10	1	67.100	10				10	
	11	2	67.100	10				10	
	12	3	67.100	10				10	
	13	1	133.000	10				4	
	14	2	133.000	10				5	
	15	3	133.000	10				6	
	16	1	271.000	10				0	
	17	2	271.000	10				0	
	18	3	271.000	10				0	

Comments:

Reviewed by:_____

Acute Sediment Test-96 Hr Survival

Start Date:	1/10/2006 16:30	Test ID:	C040719.74	Sample ID:	REF-Ref Toxicant
End Date:	1/14/2006 14:30	Lab ID:	CCA-Weston, Carlsbad	Sample Type:	UNH3-Ammonia-unionized (calculated)
Sample Date:		Protocol:	EPA USACE-1998	Test Species:	NA-Neanthes arenaceodentata
Comments:					

Conc-mg/L	1	2	3
Control	0.9000	1.0000	1.0000
0.92	1.0000	1.0000	1.0000
1.444	1.0000	1.0000	1.0000
2.236	1.0000	1.0000	1.0000
3.39	0.4000	0.5000	0.6000
4.423	0.0000	0.0000	0.0000

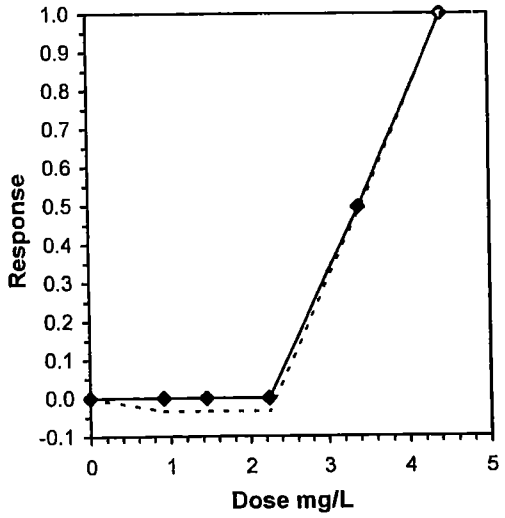
			Transform: Untransformed					1-Tailed			Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	0.9667	1.0000	0.9667	0.9000	1.0000	5.973	3				0.9917	1.0000
0.92	1.0000	1.0345	1.0000	1.0000	1.0000	0.000	3	-0.791	2.470	0.1041	0.9917	1.0000
1.444	1.0000	1.0345	1.0000	1.0000	1.0000	0.000	3	-0.791	2.470	0.1041	0.9917	1.0000
2.236	1.0000	1.0345	1.0000	1.0000	1.0000	0.000	3	-0.791	2.470	0.1041	0.9917	1.0000
*3.39	0.5000	0.5172	0.5000	0.4000	0.6000	20.000	3	11.068	2.470	0.1041	0.5000	0.5042
4.423	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	3				0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.78167	0.835	-0.2203	2.96154
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	2.236	3.39	2.75319		0.10414	0.10774	0.14567	0.00267	9.3E-07	4, 10

Linear Interpolation (200 Resamples)

Point	mg/L	SD	95% CL(Exp)		Skew
IC05	2.3524	0.0129	2.3111	2.4109	0.3211
IC10	2.4688	0.0258	2.3861	2.5858	0.3211
IC15	2.5851	0.0387	2.4612	2.7607	0.3211
IC20	2.7015	0.0516	2.5363	2.9356	0.3211
IC25	2.8179	0.0645	2.6114	3.1105	0.3211
IC40	3.1670	0.1030	2.8366	3.6353	0.3131
IC50	3.3986	0.1013	2.9880	3.7421	-0.1576



Reviewed by:_____

Test: AS-Acute Sediment Test
Species: NA-Neanthes arenaceodentata
Sample ID: REF-Ref Toxicant
Start Date: 1/10/2006 16:30

Test ID: C040719.74
Protocol: EPA USACE-1998
Sample Type: UNH3-Ammonia-unionized (calculated)
End Date: 1/14/2006 14:3 Lab ID: CCA-Weston, Carlsbad

Pos	ID	Rep	Group	Start	24 Hr	48 Hr	72 Hr	96 Hr	Notes
	1	1	Control	10				9	
	2	2	Control	10				10	
	3	3	Control	10				10	
	4	1	0.920	10				10	
	5	2	0.920	10				10	
	6	3	0.920	10				10	
	7	1	1.444	10				10	
	8	2	1.444	10				10	
	9	3	1.444	10				10	
	10	1	2.236	10				10	
	11	2	2.236	10				10	
	12	3	2.236	10				10	
	13	1	3.390	10				4	
	14	2	3.390	10				5	
	15	3	3.390	10				6	
	16	1	4.423	10				0	
	17	2	4.423	10				0	
	18	3	4.423	10				0	

Comments:

20 DAY CHRONIC TEST DATA SHEET 2 - REF TOX WQ

target: 63.47g in 1500mL actual 63.4698 C040719.74

CLIENT	PROJECT	SPECIES	MEC LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	*Neanthes arenaceodentata*	Carlsbad Room 3	BIO072

MEC JOB NUMBER	PROJECT MANAGER	TEST START DATE	TIME	TEST END DATE	TIME
13728.001.001.0001	Bill Gardiner	10Jan06	1630 AM/JH	14Jan06	1430 am

WATER QUALITY DATA

TEST	TEMP (C)	SAL (ppt)	DO (mg/L)	NH3 (mg/L)	DILTN.WAT.BATCH	TEMP REC#	REFERENCE TOX. MATERIAL	REFERENCE TOXICANT	LOT NO.	96-HR LC50
	20±2	28±2	> 6.0	< 10	SIO121405	1967	ammonium chloride	ammonia	013k042	

CLIENT/ MEC ID	CONCENTRATION value	CONCENTRATION units	DAY	REP	D.O. meter	D.O. mg/L	TEMP. meter	TEMP. °C	SALINITY meter	SALINITY ppt	pH meter	pH unit	TECHNICIAN	FEEDING am	FEEDING pm
Ref.Tox.-ammonia	0	mg/L	0	stock	7	7.2	7	20.2	6	28.0	12	8.2	RF		
			1	1											
			2	2											
			3	3											
			4	1	7	7.5	7	19.2	6	28.5	11	8.3	am		
Ref.Tox.-ammonia	12.5	mg/L	0	stock	7	7.3	7	20.2	6	28.0	12	8.1	RF		
			1	1											
			2	2											
			3	3											
			4	1	7	7.2	7	19.5	6	28.4	11	8.3	am		
Ref.Tox.-ammonia	25	mg/L	0	stock	7	7.2	7	20.2	6	28.0	12	8.0	RF		
			1	1											
			2	2											
			3	3											
			4	1	7	7.1	7	19.6	6	28.4	11	8.3	am		
Ref.Tox.-ammonia	50	mg/L	0	stock	7	7.1	7	20.1	6	28.1	12	7.9	RF		
			1	1											
			2	2											
			3	3											
			4	1	7	7.4	7	19.6	6	28.4	11	8.3	am		

20 DAY CHRONIC TEST DATA SHEET 2 - REF TOX WQ

CLIENT	PROJECT	SPECIES	MEC LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	*Neanthes arenaceodentata*	Carlsbad Room 3	BIO072
MEC JOB NUMBER	**PROJECT MANAGER**	**TEST START DATE** / **TIME**	**TEST END DATE**	**TIME**
13728.001.001.0001	Bill Gardiner	10Jan06 / 1630 JH/AM	14Jan06	1430 AM

WATER QUALITY DATA

TEST	TEMP (C)	SAL (ppt)	DO (mg/L)	NH3 (mg/L)	DILTN.WAT.BATCH	TEMP REC#	REFERENCE TOX. MATERIAL	REFERENCE TOXICANT	LOT NO.	96-HR LC50
	20±2	28±2	> 6.0	< 10	SIO121405	1967	ammonium chloride	ammonia		

CLIENT/ MEC ID	CONCENTRATION value	CONCENTRATION units	DAY	REP	D.O. meter	D.O. mg/L	TEMP. meter	TEMP. °C	SALINITY meter	SALINITY ppt	pH meter	pH unit			TECHNICIAN	FEEDING am	FEEDING pm
Ref.Tox.-ammonia	100	mg/L	0	stock	7	7.3	7	20.3	6	28.3	12	7.8			RF		
			1	1													
			2	2													
			3	3													
			4	1	7	6.9	7	19.6	6	28.6	11	8.2			am		
Ref.Tox.-ammonia	200	mg/L	0	stock	7	7.2	7	20.3	6	28.6	12	7.6			RF		
			1	1													
			2	2													
			3	3													
			4														

20-DAY CHRONIC TEST DATA SHEET 3 - REF TOX

SPECIES	ACCLM.MORT.
Neanthes arenaceodentata	< 5%

CLIENT	PROJECT	MEC JOB NO.	PROJECT MANAGER	MEC LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment	13728.001.001.0001	Bill Gardiner	Carlsbad Room 3	BIO072

SURVIVAL & BEHAVIOR DATA

OBSERVATIONS KEY
N = normal; B= no burrows; M= dead on surface; A= avoidance; Q = quiescent; L = anoxic surface; F= fungal patches; D= no air flow (DO?); U= excess food; DC = discoloration

CLIENT/ MEC ID	CONC. value	CONC. units	REP	INITIAL NUMBER	DAY 1 DATE: 1/11/06 TECHNICIAN: EB #ALIVE	DAY 1 #DEAD	DAY 1 OBS	DAY 2 DATE: 1/12/06 TECHNICIAN: VS #ALIVE	DAY 2 #DEAD	DAY 2 OBS	DAY 3 DATE: 1/13/06 TECHNICIAN: VS #ALIVE	DAY 3 #DEAD	DAY 3 OBS	DAY 4 DATE: 1/14/06 TECHNICIAN: AM #ALIVE	DAY 4 #DEAD	DAY 4 OBS
Ref.Tox.-ammonia	0	mg/L	1		10	Ø	N	9	1 NB	N	9	Ø	N	9	Ø	N
			2		10	Ø	N	10	Ø	N	10	Ø	N	10	Ø	N
			3		10	Ø	N	10	Ø	N	10	Ø	N	10	Ø	N
Ref.Tox.-ammonia	12.5	mg/L	1		10	Ø	N	10	Ø	N	10	Ø	N	10	Ø	N
			2		10	Ø	N	10	Ø	N	10	Ø	N	10	Ø	N
			3		10	Ø	N	10	Ø	N	10	Ø	N	10	Ø	N
Ref.Tox.-ammonia	25	mg/L	1		10	Ø	N	10	Ø	N	10	Ø	N	10	Ø	N
			2		10	Ø	N	10	Ø	N	10	Ø	N	10	Ø	Q
			3		10	Ø	N	10	Ø	N	10	Ø	N	10	Ø	N
Ref.Tox.-ammonia	50	mg/L	1		10	Ø	N	10	Ø	Q	10	Ø	Q	10	Ø	Q
			2		10	Ø	N	10	Ø	Q	10	Ø	Q	10	Ø	Q
			3		10	Ø	N	10	Ø	Q	10	Ø	Q	10	Ø	Q
Ref.Tox.-ammonia	100	mg/L	1		10	Ø	N	10	Ø	Q	10	Ø	Q,DC	4	6	Q,DC
			2		10	Ø	N	10	Ø	Q	10	Ø	Q,DC	5	3	Q,DC 2 NB
			3		10	Ø	N	10	Ø	Q	10	Ø	Q,DC	6	4	Q,DC
Ref.Tox.-ammonia	200	mg/L	1		10	Ø	Q	10	Ø	Q,DC	Ø	10	—	—	—	—
			2		10	Ø	Q	10	Ø	Q,DC	Ø	10	—	—	—	—
			3		10	Ø	Q,DC	10	Ø	Q,DC	Ø	10	—	—	—	—

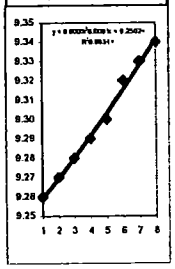
① IE 1/11/06 EB

Un-ionized Ammonia Calculator

Client:	Parametrix	Date of Test:	10-Jan-06
Project ID:	Bremerton Sediment	Test Type:	Neanthes NH RT

To convert Total Ammonia (mg/L) to Free (un-ionized) Ammonia (mg/L) enter the corresponding total ammonia, salinity, temperature and pH.

Integer:	I-factor
1	9.26
2	9.27
3	9.28
4	9.29
5	9.30
6	9.32
7	9.33
8	9.34



	TEST	NH3T (mg/L)	salinity (ppt)	pH	temp (C)	temp (K)	I-factor	NH3U (mg/L)
	Example	0.610	22.9	8.0	24.1	297.26	9.3053	0.027
	Example2	2.000	10.0	7.5	5.0	278.16	9.2750	0.008
1	Control	0.000	28.0	8.2	23.5	296.66	9.3187	
2	12.500	18.000	28.0	8.1	23.3	296.46	9.3187	**0.920**
3	25.000	35.200	28.0	8.0	23.3	296.46	9.3187	**1.444**
4	50.000	67.100	28.1	7.9	23.5	296.66	9.3190	**2.236**
5	100.000	133.000	28.3	7.8	22.9	296.06	9.3195	**3.390**
6	200.000	271.000	28.6	7.6	23.0	296.16	9.3203	**4.423**
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
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46								

Ammonia Analysis
Total Ammonia (mg/L)

Client/Project:	Organism:	Weston Test ID:	Test Duration (days):
Parametrix / Bremerton Sediment	Neanthes	C040719.74	4 days

PRETEST / ~~INITIAL~~ / FINAL / OTHER (circle one) **DAY of TEST:** Ø

OVERLYING (OV) / POREWATER (PW) (circle one)

Calibration Standards Temperature		Sample temperature should be within ±1°C of standards temperature at time and date of analysis.
Date:	**Temperature:**	
1/18/06	22.5°	

Sample ID or Description	Date Sampled	Ammonia (mg/L)	Temp °C	Date of Reading and Initials	Samples Frozen (Y/N)		
RT Ø	1/10/06	<0.5	23.5°	1/18/06 JH	Y		
RT 12.5	↓	18.0	23.3°	↓	↓		
RT 25		35.2	23.3°				
RT 50		67.1	23.5°				
RT 100		133	22.9°				
RT 200	↓	271	23.0°	↓	↓		

Reference Toxicant
Ammmonia Spiking Worksheet

Neanthes NH_3 RT 01/10/06

Assumptions in Model
Stock ammonia concentration is 8,000 mg/L = 8 mg/mL

Actual Reading
7090

Test Solutions			Volume of stock to reach desired concentration	
Measured Concentration mg/L	Desired Concentration mg/L	Volume mL	mL stock to increase	
			FRESH WATER	SALT WATER
0	200	1500	42.313	63.4696756
			0.000	0
			0.000	0
			0.000	0
			0.000	0
			0.000	0

Appendix C

Results for the 48-hour Larval Test with *Mytilus* spp.

Table C1. Test Results for the PSEP Larval Test with *M. galloprovincialis*, Bremerton Sediment

Treatment	Rep	Normal	Abnormal	Total	Percent Combined Mortality	Percent Mortality	Percent Abnormal	Mean Percentage Combined Mortality	SD	Mean Percentage Mortality	SD	Mean Percentage Abnormal	SD
Control	1	344	13	357	12.4	9.1	3.6	10.3	4.5	8.9	4.1	1.6	1.3
	2	355	0	355	9.6	9.6	0						
	3	375	4	379	4.5	3.5	1.1						
	4	359	5	364	8.6	7.3	1.4						
	5	328	6	334	16.5	15	1.8						
	Mean	**352.2**											
Ref-6	1	360	1	361	4	3.7	0.3	12.5	6.3	12.4	6.4	0.1	0.2
	2	330	1	331	12	11.7	0.3						
	3	295	0	295	21.3	21.3	0						
	4	336	0	336	10.4	10.4	0						
	5	319	0	319	14.9	14.9	0						
	Mean	**328**											
C-8	1	314	3	317	16.3	15.5	0.9	17.7	5.7	17.2	5.6	0.5	0.4
	2	315*	1	316	16	15.7	0.3						
	3	338	1	339	9.9	9.6	0.3						
	4	285	2	287	24	23.5	0.7						
	5	291*	0	293	22.4	21.9	0						
	Mean	**312.3**											

	Rep	Embryos	Average
Stocking Density	1	376	
	2	373	
	3	477	
	4	376	
	5	328	
	6	427	392.8

*** Test chamber was double-inoculated. Value equals half of actual larval count.**

Table C2. Water Quality Data for the Larval Test with *Mytilus* spp., Bremerton Sediment

Dissolved Oxygen (mg/L)

Treatment	Day 0	1	2	Mean	Min	Max
Control 1	7.8	7.9	7.8	7.8	7.8	7.9
Ref-6	7.9	7.4	7.5	7.6	7.4	7.9
C-8	7.4	6.4	7.0	6.9	6.4	7.4

Temperature (°C)

Treatment	Day 0	1	2	Mean	Min	Max
Control 1	16.3	15.8	16.4	16.2	15.8	16.4
Ref-6	16.2	15.9	16.4	16.2	15.9	16.4
C-8	16.0	15.9	16.2	16.0	15.9	16.2

pH units

Treatment	Day 0	1	2	Mean	Min	Max
Control 1	8.0	7.7	8.0	7.90	7.70	8.00
Ref-6	8.0	7.8	8.0	7.93	7.80	8.00
C-8	7.9	7.7	8.0	7.87	7.70	8.00

Salinity (ppt)

Treatment	Day 0	1	2	Mean	Min	Max
Control 1	28.0	28.3	28.1	28.1	28.0	28.3
Ref-6	28.3	28.3	28.1	28.2	28.1	28.3
C-8	28.1	28.1	28.0	28.1	28.0	28.1

Table C3. Ammonia and Sulfide Concentrations for the Larval Test with *Mytilus spp.*, Bremerton Sediment

Treatment	Ammonia (mg/L Total)		Sulfides (mg/L)	
	Day 0	Day 10	Day 0	Day 2
Control	<0.5	<0.5	0	0
Ref 6	<0.5	<0.5	0	0
C-8	<0.5	<0.5	0	0

BIVALVE LARVAE SUSPENDED PARTICULATE PHASE TEST
DATA SHEET 3

WESTON SOLUTIONS

SPECIES					
Mytilus spp. (mussel)					
CLIENT	PROJECT	WESTON JOB NUMBER	PROJECT MANAGER	WESTON LABORATORY	PROTOCOL
Parametrix	Bremerton Sediment		Bill Gardiner	Carlsbad Room 2	/ WESTON BIO073

LARVAL OBSERVATION DATA

CLIENT/ WESTON ID		VIAL NUMBER	REP	NUMBER NORMAL	NUMBER ABNORMAL	DATE	TECHNICIAN	COMMENTS
ZERO-TIME (PRE)			1	376		12/22/05	am	
			2	373		12/27/05	am	
			3	477		↓	↓	
			4	376				
			5	328				
			6	427		↓	↓	
Control /			1	344	13	12/26/05	am	rep 6 375/4 12/27/05 am
			2	355	0	↓	↓	
			3	487	10			
			4	359	5			
			5	328	6	↓	↓	
REF-6 /			1	360	1	12/26/05	am	
			2	330	1	↓	↓	
			3	295	0			
			4	336	0			
			5	319	0	↓	↓	
C-8 /			1	314	3	12/26/05	am	rep 6 279/2 12/27/05 am
			2	630	1	↓	↓	
			3	338	1			
			4	285	2			
			5	583	0	↓	↓	

BIVALVE LARVAE SUSPENDED PARTICULATE PHASE TEST
DATA SHEET 2

CLIENT	PROJECT
Parametrix	Bremerton Sediment
MEC JOB NUMBER	**PROJECT MANAGER**
	Bill Gardiner

SPECIES		WESTON LABORATORY	PROTOCOL
Mytilus spp. (mussel)		Carlsbad Room 2	/ WESTON BIO073
TEST START DATE	**TIME**	**TEST END DATE**	**TIME**
20Dec05	1730 am	22Dec05	1745 am

WATER QUALITY DATA

TEST	DO (mg/L)	TEMP (C)	SALINITY (ppt)	pH	NH3 (mg/L)		DILUTION WATER BATCH	TEMP. RECORDER (HOBO) #
	> 6.0	16±1	28±2	7.8±0.5			SIO 121905	1967

CLIENT/ MEC ID	REPLICATE	DAY	DISS. OXYGEN		TEMPERATURE		SALINITY		pH		AMMONIA		TECHNICIAN
			meter	mg/L	meter	°C	meter	ppt	meter	unit	Techn.	mg/L	
Control /	WQ surr	0	7	7.8	7	16.3	6	28.0	12	8.0	JH	<0.5	am
		1	6	7.9	6	15.8	5	28.3	12	7.7			VS
		2	7	7.8	7	16.4	6	28.1	11	8.0	KS	<0.5	CS
REF-6 /	WQ surr	0	7	7.9	7	16.2	6	28.3	12	8.0	JH	<0.5	am
		1	6	7.4	6	15.9	5	28.3	12	7.8			VS
		2	7	7.5	7	16.4	6	28.1	11	8.0	KS	<0.5	CS
C-8 /	WQ surr	0	7	7.4	7	16.0	6	28.1	12	7.9	JH	<0.5	am
		1	6	6.4	6	15.9	5	28.1	12	7.7			VS
		2	7	7.0	7	16.2	6	28.0	11	8.0	KS	<0.5	CS

TEST COMMENTS

CLIENT	PROJECT	WESTON JOB NUMBER	TEST	WESTON LABORATORY
Parametrix	Bremerton		bivalve dev.	Carlsbad

NUMBER/CODE	DATE	COMMENT BY	COMMENT
1	12/20/05	am	bivalves spawned @ 1330
2	↓	↓	jar shake @ 1345
3			fertilization @ 1530
4			used 2 males + 5 females
5			test: 1.64 mL of stock/chamber
6	↓	↓	ref tox tests: 100uL of stock/chamber
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Parametrix Bivalve - Sulfide Results		
	Initial Sulfide	Final Sulfide
Control	0	0
Ref-6	0	0
C-8	0	0
Date	12/20/05	12/22/05
Initials	KS	RF

Ammonia Analysis
Total Ammonia (mg/L)

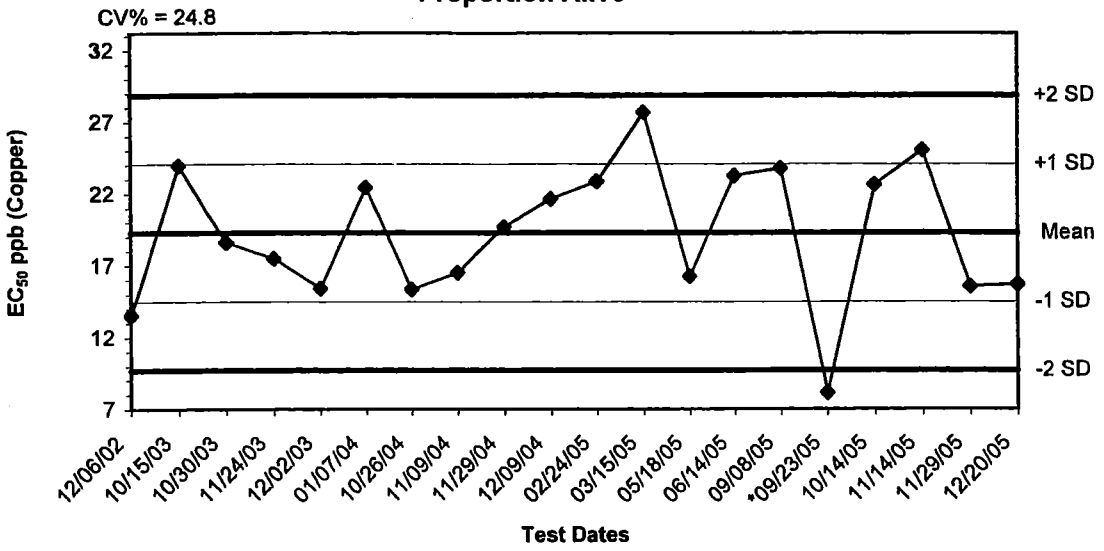
Project:	Organism:	Test:	Day:
Parametrix	Bivalves	COS1216.0273	2

PRETEST / INITIAL / FINAL / OTHER (circle one)
OVERLYING (OV) / POREWATER (PW) (circle one)

Standards Temperature		Sample temperature should be within ±1°C of standards temperature at time and date of analysis.
Date:	**Temperature:**	
12/23/05	24.0 °C	

Sample ID or Description	Conc or Rep	Date of Sampling and Initials	Ammonia Value (mg/L)	Temp °C	Date of Reading and Initials	Sample Frozen (Y/N)	pH	Sal (ppt)
Control		12/22/05 TH	<0.5	23.5	12/23/05 KS	Y		
Ref-6		↓	<0.5	23.5	↓	↓		
C-8		↓	<0.5	23.7	↓	↓		

Mytilus spp. Reference Toxicant Control Chart: Proportion Alive

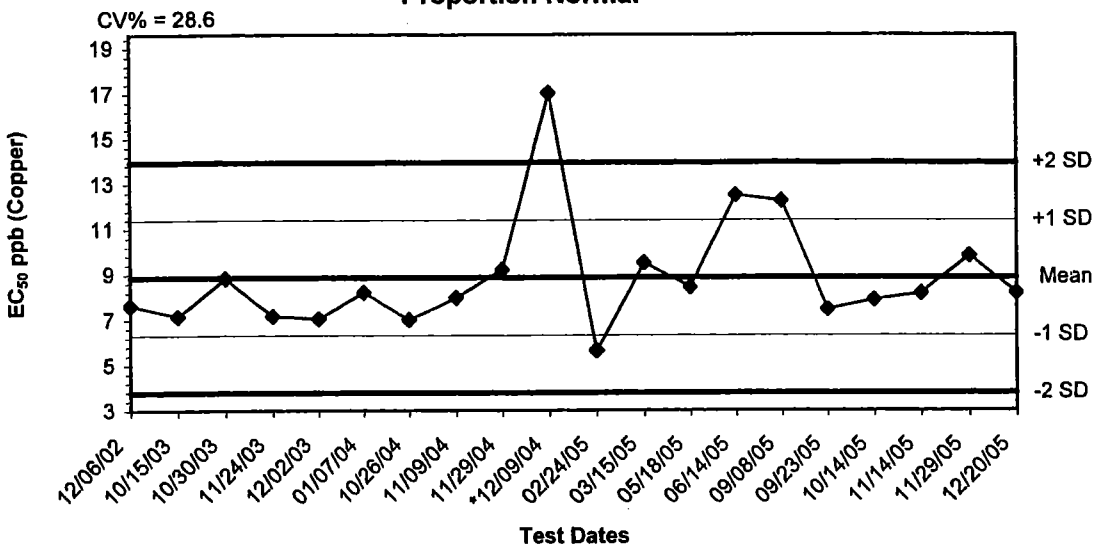


Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
12/06/02	13.5648	19.2770	14.4882	9.6994	24.0659	28.8547
10/15/03	23.9550	19.2770	14.4882	9.6994	24.0659	28.8547
10/30/03	18.6070	19.2770	14.4882	9.6994	24.0659	28.8547
11/24/03	17.4840	19.2770	14.4882	9.6994	24.0659	28.8547
12/02/03	15.4180	19.2770	14.4882	9.6994	24.0659	28.8547
01/07/04	22.4400	19.2770	14.4882	9.6994	24.0659	28.8547
10/26/04	15.3400	19.2770	14.4882	9.6994	24.0659	28.8547
11/09/04	16.5050	19.2770	14.4882	9.6994	24.0659	28.8547
11/29/04	19.7090	19.2770	14.4882	9.6994	24.0659	28.8547
12/09/04	21.6410	19.2770	14.4882	9.6994	24.0659	28.8547
02/24/05	22.8770	19.2770	14.4882	9.6994	24.0659	28.8547
03/15/05	27.6650	19.2770	14.4882	9.6994	24.0659	28.8547
05/18/05	16.2500	19.2770	14.4882	9.6994	24.0659	28.8547
06/14/05	23.2518	19.2770	14.4882	9.6994	24.0659	28.8547
09/08/05	23.7703	19.2770	14.4882	9.6994	24.0659	28.8547
*09/23/05	8.1378	19.2770	14.4882	9.6994	24.0659	28.8547
10/14/05	22.6460	19.2770	14.4882	9.6994	24.0659	28.8547
11/14/05	25.0300	19.2770	14.4882	9.6994	24.0659	28.8547
11/29/05	15.5530	19.2770	14.4882	9.6994	24.0659	28.8547
12/20/05	15.6960	19.2770	14.4882	9.6994	24.0659	28.8547

* Value out of 95% CI range.

Updated 12/28/05 KS

Mytilus spp. Reference Toxicant Control Chart: Proportion Normal



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
12/06/02	7.6427	8.8560	6.3197	3.7833	11.3924	13.9288
10/15/03	7.1556	8.8560	6.3197	3.7833	11.3924	13.9288
10/30/03	8.8205	8.8560	6.3197	3.7833	11.3924	13.9288
11/24/03	7.1709	8.8560	6.3197	3.7833	11.3924	13.9288
12/02/03	7.0620	8.8560	6.3197	3.7833	11.3924	13.9288
01/07/04	8.2139	8.8560	6.3197	3.7833	11.3924	13.9288
10/26/04	7.0185	8.8560	6.3197	3.7833	11.3924	13.9288
11/09/04	7.9725	8.8560	6.3197	3.7833	11.3924	13.9288
11/29/04	9.2071	8.8560	6.3197	3.7833	11.3924	13.9288
*12/09/04	17.0210	8.8560	6.3197	3.7833	11.3924	13.9288
02/24/05	5.6444	8.8560	6.3197	3.7833	11.3924	13.9288
03/15/05	9.5102	8.8560	6.3197	3.7833	11.3924	13.9288
05/18/05	8.4247	8.8560	6.3197	3.7833	11.3924	13.9288
06/14/05	12.5000	8.8560	6.3197	3.7833	11.3924	13.9288
09/08/05	12.2497	8.8560	6.3197	3.7833	11.3924	13.9288
09/23/05	7.4619	8.8560	6.3197	3.7833	11.3924	13.9288
10/14/05	7.8832	8.8560	6.3197	3.7833	11.3924	13.9288
11/14/05	8.1626	8.8560	6.3197	3.7833	11.3924	13.9288
11/29/05	9.8092	8.8560	6.3197	3.7833	11.3924	13.9288
12/20/05	8.1899	8.8560	6.3197	3.7833	11.3924	13.9288

* Incorrect amount of copper sulfate added. Concentrations were too high to obtain an accurate EC_{50}.

Updated 12/28/05 KS

Bivalve Larval Survival and Development Test-Proportion Alive

Start Date:	12/20/2005 17:45	Test ID:	C041130.182	Sample ID:	REF-Ref Toxicant
End Date:	12/22/2005 17:50	Lab ID:	CCA-Weston, Carlsbad	Sample Type:	CUSO-Copper sulfate
Sample Date:		Protocol:	EPAW 95-EPA West Coast	Test Species:	ME-Mytilis edulis
Comments:					

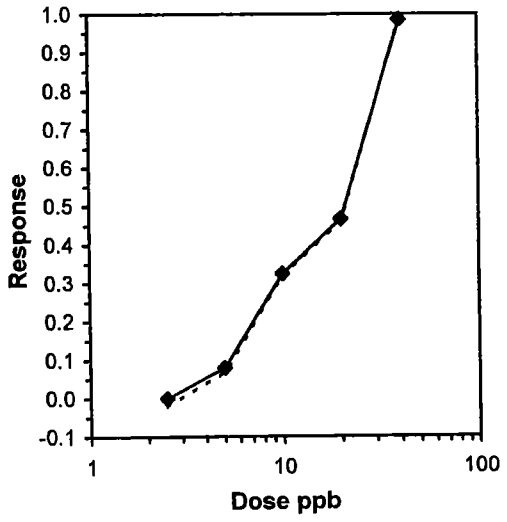
Conc-ppb	1	2	3
Control	0.8738	0.7832	0.8317
2.5	0.9159	0.7573	0.8673
5	0.8738	0.6699	0.7702
10	0.4693	0.7540	0.4725
20	0.4304	0.5243	0.3819
40	0.0032	0.0194	0.0129

			Transform: Arcsin Square Root					1-Tailed			Number	Total
Conc-ppb	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Resp	Number
Control	0.8296	1.0000	1.1474	1.0864	1.2076	5.281	3				158	927
2.5	0.8468	1.0208	1.1767	1.0556	1.2765	9.514	3	-0.337	2.500	0.2173	142	927
5	0.7713	0.9298	1.0791	0.9588	1.2076	11.549	3	0.786	2.500	0.2173	212	927
*10	0.5653	0.6814	0.8548	0.7546	1.0519	19.968	3	3.366	2.500	0.2173	403	927
*20	0.4455	0.5371	0.7305	0.6661	0.8097	9.982	3	4.797	2.500	0.2173	514	927
*40	0.0119	0.0143	0.1036	0.0569	0.1398	40.950	3	12.010	2.500	0.2173	916	927

Auxiliary Tests					Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)					0.96178		0.858		0.51033	-0.2264
Bartlett's Test indicates equal variances (p = 0.56)					3.95743		15.0863			
Hypothesis Test (1-tail, 0.05)	**NOEC**	**LOEC**	**ChV**	**TU**	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Dunnett's Test	5	10	7.07107		0.18849	0.22678	0.49145	0.01133	2.8E-07	5, 12

Trimmed Spearman-Karber

Trim Level	EC50	95% CL	
0.0%			
5.0%	16.105	15.530	16.702
10.0%	16.520	15.885	17.181
20.0%	17.353	16.549	18.195
Auto-1.4%	15.696	15.163	16.247



Bivalve Larval Survival and Development Test-Proportion Normal

Start Date:	12/20/2005 17:45	Test ID:	C041130.182	Sample ID:	REF-Ref Toxicant
End Date:	12/22/2005 17:50	Lab ID:	CCA-Weston, Carlsbad	Sample Type:	CUSO-Copper sulfate
Sample Date:		Protocol:	EPAW 95-EPA West Coast	Test Species:	ME-Mytilis edulis
Comments:					

Conc-ppb	1	2	3
Control	0.9852	0.9959	0.9922
2.5	0.9894	0.9957	0.9925
5	0.9481	0.9517	0.9706
10	0.1862	0.2790	0.1986
20	0.0000	0.0000	0.0000
40	0.0000	0.0000	0.0000

			Transform: Arcsin Square Root						1-Tailed		Number	Total
Conc-ppb	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Resp	Number
Control	0.9911	1.0000	1.4792	1.4488	1.5065	1.959	3				7	769
2.5	0.9926	1.0015	1.4858	1.4677	1.5054	1.272	3	-0.212	2.420	0.0747	6	785
*5	0.9568	0.9654	1.3629	1.3411	1.3984	2.278	3	3.768	2.420	0.0747	31	715
*10	0.2213	0.2233	0.4882	0.4462	0.5565	12.217	3	32.102	2.420	0.0747	403	524
20	0.0000	0.0000	0.0429	0.0393	0.0460	7.924	3				413	413
40	0.0000	0.0000	0.3273	0.2056	0.5236	52.444	3				11	11

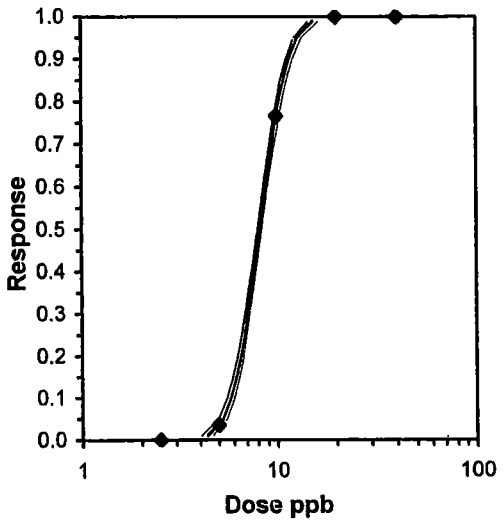
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.94183	0.805	0.81784	0.16942
Bartlett's Test indicates equal variances (p = 0.51)	2.31843	11.3449		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	2.5	5	3.53553		0.01903	0.01919	0.69279	0.00143	2.2E-09	3, 8

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	8.47408	0.38707	7.71543	9.23273	0.0091	0.27782	7.81473	0.96	0.91328	0.11801	3
Intercept	-2.7392	0.36029	-3.4454	-2.033							
TSCR	0.00841	0.00232	0.00387	0.01295							

Point	Probits	ppb	95% Fiducial Limits	
EC01	2.674	4.35265	4.05282	4.62491
EC05	3.355	5.23811	4.9566	5.49311
EC10	3.718	5.78159	5.51476	6.02439
EC15	3.964	6.17978	5.92411	6.41409
EC20	4.158	6.51571	6.26901	6.74387
EC25	4.326	6.81843	6.57894	7.04233
EC40	4.747	7.64509	7.41729	7.86729
EC50	5.000	8.18991	7.96028	8.42207
EC60	5.253	8.77356	8.53156	9.02808
EC75	5.674	9.83725	9.54603	10.1625
EC80	5.842	10.2943	9.97309	10.66
EC85	6.036	10.8539	10.4904	11.2758
EC90	6.282	11.6014	11.1735	12.1078
EC95	6.645	12.8051	12.2591	13.4658
EC99	7.326	15.4101	14.5665	16.4618



Test: BV-Bivalve Larval Survival and Development Test Test ID: C041130.182
Species: ME-Mytilis edulis Protocol: EPAW 95-EPA West Coast
Sample ID: REF-Ref Toxicant Sample Type: CUSO-Copper sulfate
Start Date: 12/20/2005 17:45 End Date: 12/22/2005 Lab ID: CCA-Weston, Carlsbad

Pos	ID	Rep	Group	Initial Density	Final Density	Total Counted	Number Normal	Notes
	1	1	Control	309	270	270	266	
	2	2	Control	309	242	242	241	
	3	3	Control	309	257	257	255	
	4	1	2.500	309	283	283	280	
	5	2	2.500	309	234	234	233	
	6	3	2.500	309	268	268	266	
	7	1	5.000	309	270	270	256	
	8	2	5.000	309	207	207	197	
	9	3	5.000	309	238	238	231	
	10	1	10.000	309	145	145	27	
	11	2	10.000	309	233	233	65	
	12	3	10.000	309	146	146	29	
	13	1	20.000	309	133	133	0	
	14	2	20.000	309	162	162	0	
	15	3	20.000	309	118	118	0	
	16	1	40.000	309	1	1	0	
	17	2	40.000	309	6	6	0	
	18	3	40.000	309	4	4	0	

Comments:

BIVALVE LARVAE SUSPENDED PARTICULATE PHASE TEST
DATA SHEET 3 - REF TOX

SPECIES					
Mytilus spp. (mussel)					
CLIENT	**PROJECT**	**WESTON JOB NUMBER**	**PROJECT MANAGER**	**WESTON LABORATORY**	**PROTOCOL**
Parametrix	Bremerton Sediment	0	Bill Gardiner	Carlsbad Room 2	/ WESTON BIO073

LARVAL OBSERVATION DATA

CLIENT/ WESTON ID	CONCENTRATION value	CONCENTRATION units	VIAL NUMBER	REP	NUMBER NORMAL	NUMBER ABNORMAL	DATE	TECHNICIAN	COMMENTS
Ref.Tox. - copper	0	mg/L		1	266	4	12/27/05	am	
				2	241	1	↓	↓	
				3	255	2	↓	↓	
				4					
Ref.Tox. - copper	2.5	mg/L		1	280	3	12/27/05	am	QA: 286/12 12/27 KS
				2	233	1	12/27/05	am	
				3	266	2	↓	↓	
				4					
Ref.Tox. - copper	5	mg/L		1	256	14	12/27/05	am	
				2	197	10	↓	↓	
				3	231	7	↓	↓	
				4					
Ref.Tox. - copper	10	mg/L		1	27	118	12/27/05	am	
				2	65	168	12/27/05	am	QA: 56/176 12/27 KS
				3	29	117	↓	↓	
				4					
Ref.Tox. - copper	20	mg/L		1	0	133	12/27/05	am	
				2	0	162	↓	↓	
				3	0	118	↓	↓	
				4					
Ref.Tox. - copper	40	mg/L		1	0	1	12/27/05	am	QA: 1/0 12/27 KS
				2	0	6	↓	↓	
				3	0	4	↓	↓	
				4					

IE 12/28/05 KS

Ref Tox Zero-Times:

1. 381
2. 353
3. 309
4. 296
5. 309
6. 210

12/27/05 am ↓ ↓

BIVALVE LARVAE SUSPENDED PARTICULATE PHASE TEST
DATA SHEET 2 - REFTOX WQ

C04 1130.182

CLIENT	PROJECT
Parametrix	Bremerton Sediment
WESTON JOB NUMBER	**PROJECT MANAGER**
0	Bill Gardiner

SPECIES		WESTON LABORATORY	PROTOCOL
Mytilus spp. (mussel)		Carlsbad Room 2	/ WESTON BIO073
TEST START DATE	**TIME**	**TEST END DATE**	**TIME**
20Dec05	1745 am	22Dec05	1750 am

WATER QUALITY DATA

0.039/mL CuSO4 5000 mL H2O CS

TEST CONDITIONS	TEMP (C)	SAL (ppt)	DO (mg/L)	NH3 (mg/L)	DILTN.WAT.BATCH	TEMP REC#	REFERENCE TOX. MATERIAL	REFERENCE TOXICANT	LOT NO.	48-HR LC50	48-HR IC50
	16±1	28±2	> 6.0	0	SIO 121905		Copper Sulfate	copper			

CLIENT/ WESTON ID	CONCENTRATION value	CONCENTRATION units	DAY	DISS. OXYGEN meter	DISS. OXYGEN mg/L	TEMPERATURE meter	TEMPERATURE °C	SALINITY meter	SALINITY ppt	pH meter	pH unit			TECHNICIAN
Ref.Tox. - copper	0	µg/L	0	7	7.9	7	16.1	6	27.9	12	8.2			RF
			1	6	8.2	6	15.8	5	27.9	12	7.9			JH
			2	7	7.8	7	15.7	6	27.8 ⑤	11	8.0			CS
Ref.Tox. - copper	2.5	µg/L	0	7	7.9	7	16.0	6	27.9	12	8.2			RF
			1	6	8.2	6	15.7	5	28.0	12	7.9			JH
			2	7	8.2	7	15.8	6	27.9	11	8.0			CS
Ref.Tox. - copper	5	µg/L	0	7	8.2	7	15.8	6	27.9	12	8.2			RF
			1	6	8.2	6	15.5	5	28.0	12	7.9			JH
			2	7	8.0	7	15.8	6	28.0	11	8.1			③RF CS
Ref.Tox. - copper	10	µg/L	0	7	7.9	7	15.8	6	⑤~~27.8~~ 27.9	12	8.2			RF
			1	6	8.2	6	15.5	5	28.0	12	7.9			JH
			2	7	7.9	7	15.8	6	27.9	11	8.1			CS
Ref.Tox. - copper	20	µg/L	0	7	7.8	7	15.7	6	27.9	12	8.2			RF
			1	6	8.3	6	15.5	5	28.0	12	8.0			JH
			2	7	7.8	7	15.9	6	27.9	11	8.1			CS
Ref.Tox. - copper	40	µg/L	0	7	7.8	7	15.8	6	27.9	12	8.2			RF
			1	6	8.2	6	15.5	5	28.0	12	8.0			JH
			2	7	7.9	7	15.9	6	27.9	11	8.1			CS

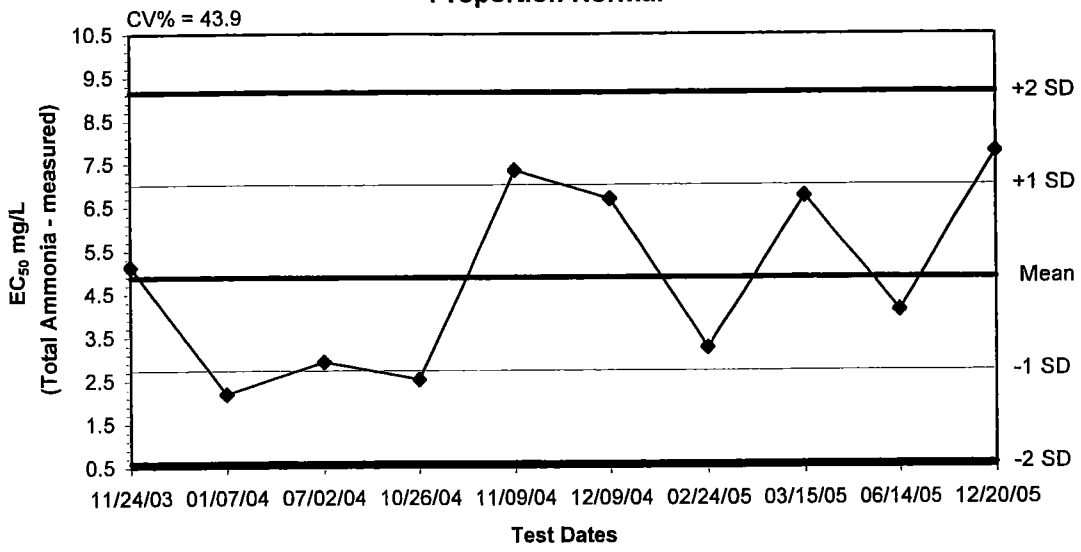
① 27.9 RF IE 12/20/05 ~~④ 12/19/05~~

② WC RF 12/20/05 ⑤ 12/22/05 CS

④ IE 12/22/05 RF

⑤ T.F. 12/22/05 RF

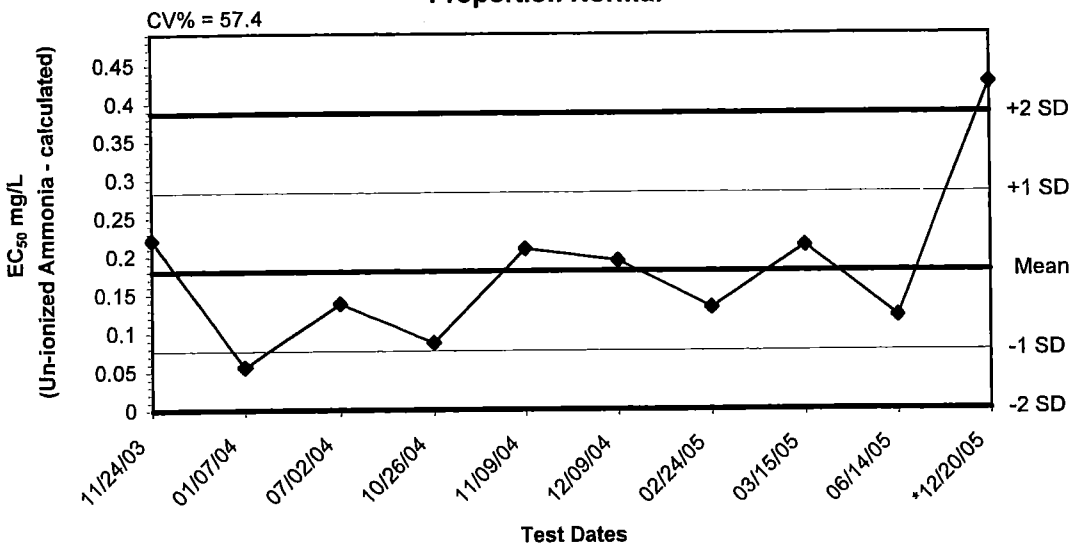
Mytilus spp. Reference Toxicant Control Chart: Proportion Normal



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
11/24/03	5.1279	4.8740	2.7363	0.5987	7.0116	9.1492
01/07/04	2.1937	4.8740	2.7363	0.5987	7.0116	9.1492
07/02/04	2.9353	4.8740	2.7363	0.5987	7.0116	9.1492
10/26/04	2.5261	4.8740	2.7363	0.5987	7.0116	9.1492
11/09/04	7.3458	4.8740	2.7363	0.5987	7.0116	9.1492
12/09/04	6.6909	4.8740	2.7363	0.5987	7.0116	9.1492
02/24/05	3.2591	4.8740	2.7363	0.5987	7.0116	9.1492
03/15/05	6.7538	4.8740	2.7363	0.5987	7.0116	9.1492
06/14/05	4.1202	4.8740	2.7363	0.5987	7.0116	9.1492
12/20/05	7.7868	4.8740	2.7363	0.5987	7.0116	9.1492

Updated 12/28/05 KS

Mytilus spp. Reference Toxicant Control Chart: Proportion Normal



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
11/24/03	0.2214	0.1798	0.0766	0.0000	0.2831	0.3863
01/07/04	0.0564	0.1798	0.0766	0.0000	0.2831	0.3863
07/02/04	0.1381	0.1798	0.0766	0.0000	0.2831	0.3863
10/26/04	0.0873	0.1798	0.0766	0.0000	0.2831	0.3863
11/09/04	0.2092	0.1798	0.0766	0.0000	0.2831	0.3863
12/09/04	0.1934	0.1798	0.0766	0.0000	0.2831	0.3863
02/24/05	0.1323	0.1798	0.0766	0.0000	0.2831	0.3863
03/15/05	0.2131	0.1798	0.0766	0.0000	0.2831	0.3863
06/14/05	0.1208	0.1798	0.0766	0.0000	0.2831	0.3863
*12/20/05	0.4263	0.1798	0.0766	0.0000	0.2831	0.3863

* Value out of 95% CI range.

Updated 12/28/05 KS

Bivalve Larval Survival and Development Test-Proportion Alive

Start Date:	12/20/2005 17:45	Test ID:	C040719.73	Sample ID:	REF-Ref Toxicant
End Date:	12/22/2005 17:50	Lab ID:	CCA-Weston, Carlsbad	Sample Type:	TNH3-Ammonia-total (measured)
Sample Date:		Protocol:	EPA USACE-1998	Test Species:	ME-Mytilis edulis
Comments:					

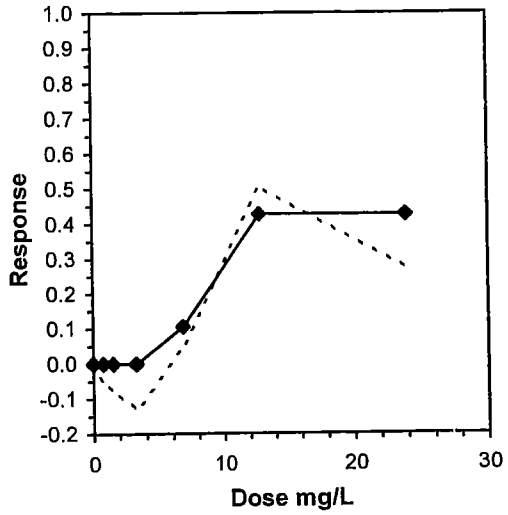
Conc-mg/L	1	2	3
Control	0.8220	0.8867	0.7735
0.727	1.0000	0.7379	0.8803
1.53	0.7152	0.9741	0.9806
3.27	0.8026	1.0000	1.0000
6.81	0.6731	1.0000	0.6926
12.8	0.4401	0.4207	0.3625
23.9	0.4401	0.5566	0.8058

			Transform: Arcsin Square Root					1-Tailed			Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	0.8274	1.0000	1.1458	1.0747	1.2275	6.715	3				0.8811	1.0000
0.727	0.8727	1.0548	1.2644	1.0333	1.5423	20.386	3	-0.657	2.530	0.4561	0.8811	1.0000
1.53	0.8900	1.0756	1.2827	1.0079	1.4310	18.574	3	-0.759	2.530	0.4561	0.8811	1.0000
3.27	0.9342	1.1291	1.3984	1.1104	1.5423	17.834	3	-1.401	2.530	0.4561	0.8811	1.0000
6.81	0.7886	0.9531	1.1625	0.9622	1.5423	28.308	3	-0.093	2.530	0.4561	0.7886	0.8950
12.8	0.4078	0.4928	0.6924	0.6461	0.7254	5.967	3	2.515	2.530	0.4561	0.5043	0.5724
23.9	0.6009	0.7262	0.8940	0.7254	1.1145	22.333	3	1.397	2.530	0.4561	0.5043	0.5724

Auxiliary Tests					Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)					0.972		0.873		0.19763	-0.6238
Bartlett's Test indicates equal variances (p = 0.32)					6.98308		16.8119			
Hypothesis Test (1-tail, 0.05)	**NOEC**	**LOEC**	**ChV**	**TU**	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Dunnett's Test	23.9	>23.9			0.42506	0.5121	0.18059	0.04874	0.02037	6, 14

Linear Interpolation (200 Resamples)

Point	mg/L	SD	95% CL(Exp)		Skew
IC05	4.956	1.454	0.608	10.529	0.3901
IC10	6.642	1.342	1.898	10.353	0.0866
IC15	7.646	1.292	2.619	10.928	-0.1623
IC20	8.574	1.299	3.177	11.676	-0.2842
IC25	9.502	1.249	3.603	12.799	-0.4020
IC40	12.287				
IC50	>23.9				



Reviewed by:_____

Bivalve Larval Survival and Development Test-Proportion Normal

Start Date:	12/20/2005 17:45	Test ID:	C040719.73	Sample ID:	REF-Ref Toxicant
End Date:	12/22/2005 17:50	Lab ID:	CCA-Weston, Carlsbad	Sample Type:	TNH3-Ammonia-total (measured)
Sample Date:		Protocol:	EPA USACE-1998	Test Species:	ME-Mytilis edulis
Comments:					

Conc-mg/L	1	2	3
Control	0.9764	0.9927	0.9958
0.727	0.9975	0.9912	0.9963
1.53	0.9864	1.0000	0.9967
3.27	0.9839	0.9905	0.9942
6.81	0.7452	0.7573	0.7383
12.8	0.0000	0.0154	0.0000
23.9	0.0000	0.0000	0.0000

			Transform: Arcsin Square Root						1-Tailed		Number	Total
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Resp	Number
Control	0.9883	1.0000	1.4693	1.4165	1.5061	3.191	3				9	767
0.727	0.9950	1.0068	1.5027	1.4770	1.5208	1.521	3	-1.148	2.500	0.0727	4	901
1.53	0.9944	1.0061	1.5031	1.4540	1.5420	2.984	3	-1.163	2.500	0.0727	4	825
3.27	0.9895	1.0013	1.4705	1.4435	1.4946	1.747	3	-0.041	2.500	0.0727	9	910
*6.81	0.7469	0.7558	1.0437	1.0338	1.0557	1.061	3	14.630	2.500	0.0727	192	764
*12.8	0.0051	0.0052	0.0715	0.0429	0.1244	64.088	3	48.055	2.500	0.0727	376	378
23.9	0.0000	0.0000	0.0376	0.0317	0.0429	14.957	3				557	557

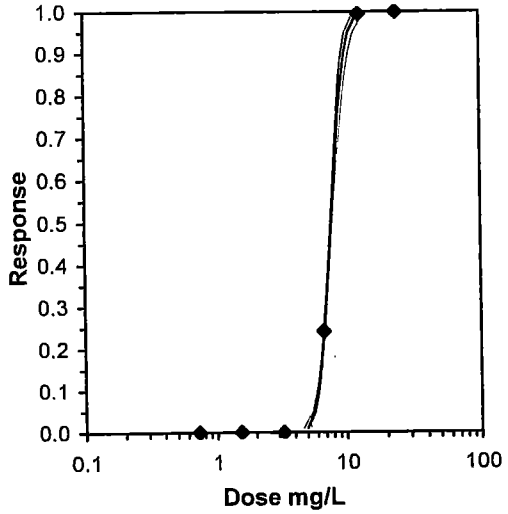
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.9705	0.858	-0.1407	-0.6856
Bartlett's Test indicates equal variances (p = 0.56)	3.9587	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	3.27	6.81	4.71897		0.01978	0.01999	0.9743	0.00127	1.3E-14	5, 12

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	11.8284	0.91439	10.0362	13.6206	0.01173	2.66983	9.48773	0.61	0.89136	0.08454	3
Intercept	-5.5433	0.77347	-7.0593	-4.0273							
TSCR	0.00764	0.00149	0.00471	0.01056							

Point	Probits	mg/L	95% Fiducial Limits	
EC01	2.674	4.95089	4.64034	5.19745
EC05	3.355	5.65325	5.41574	5.84278
EC10	3.718	6.06754	5.87468	6.22537
EC15	3.964	6.36408	6.20012	6.50383
EC20	4.158	6.61006	6.46502	6.74083
EC25	4.326	6.82866	6.69407	6.95851
EC40	4.747	7.41207	7.26708	7.58103
EC50	5.000	7.78679	7.61073	8.00766
EC60	5.253	8.18044	7.96006	8.46953
EC75	5.674	8.87935	8.56407	9.31059
EC80	5.842	9.17299	8.81387	9.66973
EC85	6.036	9.52754	9.1132	10.107
EC90	6.282	9.99318	9.50309	10.6868
EC95	6.645	10.7255	10.1101	11.61
EC99	7.326	12.2471	11.3516	13.5665



Test: BV-Bivalve Larval Survival and Development Test Test ID: C040719.73
Species: ME-Mytilis edulis Protocol: EPA USACE-1998
Sample ID: REF-Ref Toxicant Sample Type: TNH3-Ammonia-total (measured)
Start Date: 12/20/2005 17:45 End Date: 12/22/2005 Lab ID: CCA-Weston, Carlsbad

Pos	ID	Rep	Group	Initial Density	Final Density	Total Counted	Number Normal	Notes
	1	1	Control	309	254	254	248	
	2	2	Control	309	274	274	272	
	3	3	Control	309	239	239	238	
	4	1	0.727	309	401	401	400	
	5	2	0.727	309	228	228	226	
	6	3	0.727	309	272	272	271	
	7	1	1.530	309	221	221	218	
	8	2	1.530	309	301	301	301	
	9	3	1.530	309	303	303	302	
	10	1	3.270	309	248	248	244	
	11	2	3.270	309	317	317	314	
	12	3	3.270	309	345	345	343	
	13	1	6.810	309	208	208	155	
	14	2	6.810	309	342	342	259	
	15	3	6.810	309	214	214	158	
	16	1	12.800	309	136	136	0	
	17	2	12.800	309	130	130	2	
	18	3	12.800	309	112	112	0	
	19	1	23.900	309	136	136	0	
	20	2	23.900	309	172	172	0	
	21	3	23.900	309	249	249	0	

Comments:

Bivalve Larval Survival and Development Test-Proportion Alive

Start Date:	12/20/2005 17:45	Test ID:	C040719.73	Sample ID:	REF-Ref Toxicant
End Date:	12/22/2005 17:50	Lab ID:	CCA-Weston, Carlsbad	Sample Type:	UNH3-Ammonia-unionized (calculated)
Sample Date:		Protocol:	EPA USACE-1998	Test Species:	ME-Mytilis edulis
Comments:					

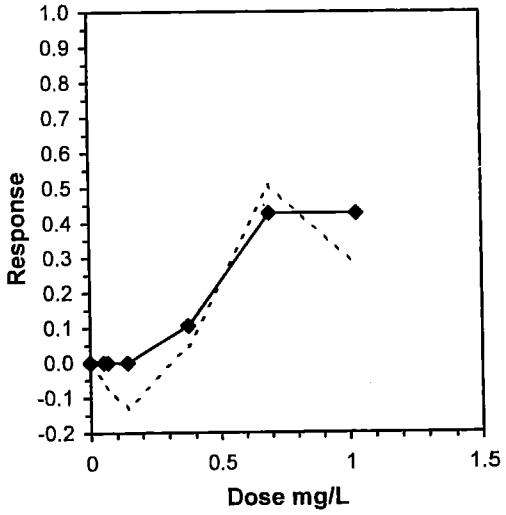
Conc-mg/L	1	2	3
Control	0.8220	0.8867	0.7735
0.05	1.0000	0.7379	0.8803
0.067	0.7152	0.9741	0.9806
0.144	0.8026	1.0000	1.0000
0.374	0.6731	1.0000	0.6926
0.693	0.4401	0.4207	0.3625
1.032	0.4401	0.5566	0.8058

			Transform: Arcsin Square Root					1-Tailed			Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	0.8274	1.0000	1.1458	1.0747	1.2275	6.715	3				0.8811	1.0000
0.05	0.8727	1.0548	1.2644	1.0333	1.5423	20.386	3	-0.657	2.530	0.4561	0.8811	1.0000
0.067	0.8900	1.0756	1.2827	1.0079	1.4310	18.574	3	-0.759	2.530	0.4561	0.8811	1.0000
0.144	0.9342	1.1291	1.3984	1.1104	1.5423	17.834	3	-1.401	2.530	0.4561	0.8811	1.0000
0.374	0.7886	0.9531	1.1625	0.9622	1.5423	28.308	3	-0.093	2.530	0.4561	0.7886	0.8950
0.693	0.4078	0.4928	0.6924	0.6461	0.7254	5.967	3	2.515	2.530	0.4561	0.5043	0.5724
1.032	0.6009	0.7262	0.8940	0.7254	1.1145	22.333	3	1.397	2.530	0.4561	0.5043	0.5724

Auxiliary Tests					Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)					0.972		0.873		0.19763	-0.6238
Bartlett's Test indicates equal variances (p = 0.32)					6.98308		16.8119			
Hypothesis Test (1-tail, 0.05)	**NOEC**	**LOEC**	**ChV**	**TU**	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Dunnett's Test	1.032	>1.032			0.42506	0.5121	0.18059	0.04874	0.02037	6, 14

Linear Interpolation (200 Resamples)

Point	mg/L	SD	95% CL(Exp)		Skew
IC05	0.2535	0.0896	0.0000	0.5959	0.5160
IC10	0.3631	0.0817	0.0549	0.5649	-0.0155
IC15	0.4185	0.0749	0.1125	0.5933	-0.2740
IC20	0.4679	0.0716	0.1607	0.6332	-0.3414
IC25	0.5174	0.0667	0.2003	0.6929	-0.4136
IC40	0.6657				
IC50	>1.032				



Reviewed by:_____

Bivalve Larval Survival and Development Test-Proportion Normal

Start Date:	12/20/2005 17:45	Test ID:	C040719.73	Sample ID:	REF-Ref Toxicant
End Date:	12/22/2005 17:50	Lab ID:	CCA-Weston, Carlsbad	Sample Type:	UNH3-Ammonia-unionized (calculated)
Sample Date:		Protocol:	EPA USACE-1998	Test Species:	ME-Mytilis edulis
Comments:					

Conc-mg/L	1	2	3
Control	0.9764	0.9927	0.9958
0.05	0.9975	0.9912	0.9963
0.067	0.9864	1.0000	0.9967
0.144	0.9839	0.9905	0.9942
0.374	0.7452	0.7573	0.7383
0.693	0.0000	0.0154	0.0000
1.032	0.0000	0.0000	0.0000

			Transform: Arcsin Square Root						1-Tailed		Number	Total
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Resp	Number
Control	0.9883	1.0000	1.4693	1.4165	1.5061	3.191	3				9	767
0.05	0.9950	1.0068	1.5027	1.4770	1.5208	1.521	3	-1.148	2.500	0.0727	4	901
0.067	0.9944	1.0061	1.5031	1.4540	1.5420	2.984	3	-1.163	2.500	0.0727	4	825
0.144	0.9895	1.0013	1.4705	1.4435	1.4946	1.747	3	-0.041	2.500	0.0727	9	910
*0.374	0.7469	0.7558	1.0437	1.0338	1.0557	1.061	3	14.630	2.500	0.0727	192	764
*0.693	0.0051	0.0052	0.0715	0.0429	0.1244	64.088	3	48.055	2.500	0.0727	376	378
1.032	0.0000	0.0000	0.0376	0.0317	0.0429	14.957	3				557	557

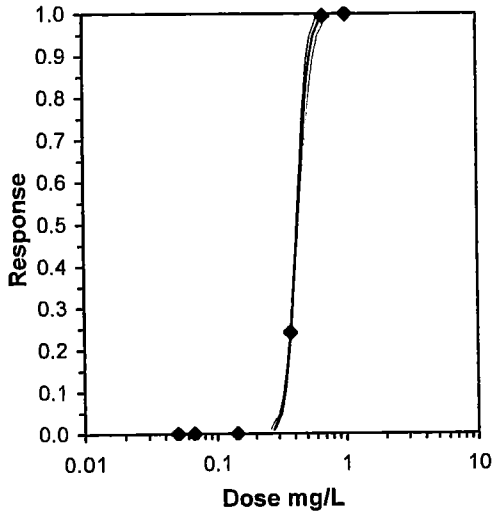
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.9705	0.858	-0.1407	-0.6856
Bartlett's Test indicates equal variances (p = 0.56)	3.9587	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	0.144	0.374	0.23207		0.01978	0.01999	0.9743	0.00127	1.3E-14	5, 12

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	12.1054	0.93472	10.2733	13.9375	0.01173	2.67403	9.48773	0.61	-0.3702	0.08261	3
Intercept	9.48197	0.39229	8.71308	10.2509							
TSCR	0.00764	0.00149	0.00471	0.01057							

Point	Probits	mg/L	95% Fiducial Limits	
EC01	2.674	0.27389	0.25711	0.2872
EC05	3.355	0.3118	0.29901	0.322
EC10	3.718	0.33411	0.32374	0.34259
EC15	3.964	0.35006	0.34125	0.35756
EC20	4.158	0.36327	0.35548	0.37029
EC25	4.326	0.375	0.36778	0.38197
EC40	4.747	0.40628	0.39851	0.41532
EC50	5.000	0.42634	0.41692	0.43814
EC60	5.253	0.44739	0.43561	0.46281
EC75	5.674	0.4847	0.46789	0.50766
EC80	5.842	0.50036	0.48122	0.52678
EC85	6.036	0.51924	0.49719	0.55004
EC90	6.282	0.54403	0.51796	0.58085
EC95	6.645	0.58295	0.55027	0.62982
EC99	7.326	0.66363	0.61622	0.73331



Test: BV-Bivalve Larval Survival and Development Test					Test ID: C040719.73			
Species: ME-Mytilis edulis					Protocol: EPA USACE-1998			
Sample ID: REF-Ref Toxicant					Sample Type: UNH3-Ammonia-unionized (calculated)			
Start Date: 12/20/2005 17:45				End Date: 12/22/2005	Lab ID: CCA-Weston, Carlsbad			
Pos	ID	Rep	Group	Initial Density	Final Density	Total Counted	Number Normal	Notes
	1	1	Control	309	254	254	248	
	2	2	Control	309	274	274	272	
	3	3	Control	309	239	239	238	
	4	1	0.050	309	401	401	400	
	5	2	0.050	309	228	228	226	
	6	3	0.050	309	272	272	271	
	7	1	0.067	309	221	221	218	
	8	2	0.067	309	301	301	301	
	9	3	0.067	309	303	303	302	
	10	1	0.144	309	248	248	244	
	11	2	0.144	309	317	317	314	
	12	3	0.144	309	345	345	343	
	13	1	0.374	309	208	208	155	
	14	2	0.374	309	342	342	259	
	15	3	0.374	309	214	214	158	
	16	1	0.693	309	136	136	0	
	17	2	0.693	309	130	130	2	
	18	3	0.693	309	112	112	0	
	19	1	1.032	309	136	136	0	
	20	2	1.032	309	172	172	0	
	21	3	1.032	309	249	249	0	

Comments:

BIVALVE LARVAE SUSPENDED PARTICULATE PHASE TEST
DATA SHEET 2 - REFTOX WQ

Coy 0719.73

CLIENT	PROJECT
Parametrix	Bremerton Sediment
MEC JOB NUMBER	**PROJECT MANAGER**
0	Bill Gardiner

SPECIES		WESTON LABORATORY	PROTOCOL
Mytilus spp. (mussel)		Carlsbad Room 2	/ WESTON BIO073
TEST START DATE	**TIME**	**TEST END DATE**	**TIME**
20Dec05	1745 am	22Dec05	1750 am

WATER QUALITY DATA

2.1155 g NH 5000 mL H2O CS

TEST CONDITIONS	TEMP (C)	SAL (ppt)	DO (mg/L)	NH3 (mg/L)	DILTN.WAT.BATCH	TEMP REC#	REFERENCE TOX. MATERIAL	REFERENCE TOXICANT	LOT NO.	48-HR LC5	48-HR IC50
	16±1	28±2	> 6.0	0	SIO 121905		ammonium chloride	ammonia			

CLIENT/ WESTON ID	CONCENTRATION value	CONCENTRATION units	DAY	DISS. OXYGEN meter	DISS. OXYGEN mg/L	TEMPERATURE meter	TEMPERATURE °C	SALINITY meter	SALINITY ppt	pH meter	pH unit			TECHNICIAN
Ref.Tox. - ammonia	0	mg/L	0	7	7.5	7	16.8	6	27.9	12	8.12			RF
			1	6	①7.9 8.3	6	15.8	5	27.9	③12 12	③8.16 8.0			JH
			2	7	7.4	7	16.4	6	27.7	11	7.9			CS
Ref.Tox. - ammonia	0.625	mg/L	0	7	7.9	7	16.0	6	27.9	12	8.16			RF
			1	6	8.2	6	15.5	5	28.0	12	8.0			JH
			2	7	7.7	7	16.0	6	27.9	11	8.0			CS
Ref.Tox. - ammonia	1.25	mg/L	0	7	7.9	7	15.8	6	27.9	12	8.0			RF
			1	6	8.3	6	15.3	5	28.0	12	8.0			JH
			2	7	7.9	7	15.9	6	27.9	11	8.0			CS
Ref.Tox. - ammonia	2.5	mg/L	0	7	8.0	7	15.7	6	27.9	12	8.0			RF
			1	6	8.3	6	15.4	5	28.0	12	8.0			JH
			2	7	8.0	7	15.8	6	27.9	11	8.0			CS
Ref.Tox. - ammonia	5	mg/L	0	7	7.7	7	15.9	6	27.9	12	8.1			RF
			1	6	8.2	6	15.4	5	28.0	12	8.0			JH
			2	7	7.7	7	15.9	6	27.9	11	8.0			CS
Ref.Tox. - ammonia	10	mg/L	0	7	7.8	7	15.9	6	27.9	12	8.1			RF
			1	6	8.1	6	15.4	5	28.0	12	8.0			JH
			2	7	7.8	7	15.9	6	27.9	11	8.0			CS

① WC RF
② WC RF 12/19/05
③ WC RF

BIVALVE LARVAE SUSPENDED PARTICULATE PHASE TEST
DATA SHEET 2 - REFTOX WQ

CLIENT	PROJECT
Parametrix	Bremerton Sediment
MEC JOB NUMBER	**PROJECT MANAGER**
0	Bill Gardiner

SPECIES		WESTON LABORATORY	PROTOCOL
Mytilus spp. (mussel)		Carlsbad Room 2	/ WESTON BIO073
TEST START DATE	**TIME**	**TEST END DATE**	**TIME**
20Dec05	1745 am	22Dec05	1750 am

WATER QUALITY DATA

TEST CONDITIONS	TEMP (C)	SAL (ppt)	DO (mg/L)	NH3 (mg/L)	DILTN.WAT.BATCH	TEMP REC#	REFERENCE TOX. MATERIAL	REFERENCE TOXICANT	LOT NO.	48-HR LC5	48-HR IC50
	16±1	28±2	> 6.0	0	SIO 121905		ammonium chloride	ammonia			

CLIENT/ WESTON ID	CONCENTRATION		DAY	DISS. OXYGEN		TEMPERATURE		SALINITY		pH				TECHNICIAN
	value	units		meter	mg/L	meter	°C	meter	ppt	meter	unit			
Ref.Tox. - ammonia	20	mg/L	0	7	7.8	7	15.8	6	27.9	12	8.0			RF
			1	6	8.2	6	15.4	5	28.1	12	7.9			JH
			2	7	8.0	7	15.9	6	28.0	11	8.0			LS

BIVALVE LARVAE SUSPENDED PARTICULATE PHASE TEST
DATA SHEET 3 - REF TOX

SPECIES					
Mytilus spp. (mussel)					
CLIENT	**PROJECT**	**WESTON JOB NUMBER**	**PROJECT MANAGER**	**WESTON LABORATORY**	**PROTOCOL**
Parametrix	Bremerton Sediment	0	Bill Gardiner	Carlsbad Room 2	/ WESTON BIO073

LARVAL OBSERVATION DATA

CLIENT/ WESTON ID	CONCENTRATION value	CONCENTRATION units	VIAL NUMBER	REP	NUMBER NORMAL	NUMBER ABNORMAL	DATE	TECHNICIAN	COMMENTS
Ref.Tox. - ammonia	0	mg/L		1	248	6	12/28/05	am	
				2	272	2	12/27/05	am	QA: 269/3 12/27 KS
				3	288	1	12/28/05	am	
				4					
Ref.Tox. - ammonia	0.625	mg/L		1	400	1	12/28/05	am	
				2	226	2	↓	↓	
				3	271	1	12/27/05	am	QA: 270/10 12/27 KS
				4					
Ref.Tox. - ammonia	1.25	mg/L		1	218	3	12/28/05	am	
				2	301	0	↓	↓	
				3	302	1	↓	↓	
				4					
Ref.Tox. - ammonia	2.5	mg/L		1	244	4	12/28/05	am	
				2	314	3	↓	↓	
				3	343	2	↓	↓	
				4					
Ref.Tox. - ammonia	5	mg/L		1	155	53	12/28/05	am	
				2	259	83	↓	↓	
				3	158	56	↓	↓	
				4					
Ref.Tox. - ammonia	10	mg/L		1	0	136	12/28/05	am	
				2	2	128	12/27/05	am	
				3	0	112	↓	↓	QA: 0/109 12/27 KS
				4					
Ref.Tox. - ammonia	20	mg/L		1	0	136	12/28/05	am	
				2	0	172	↓	↓	
				3	0	249	↓	↓	
				4					

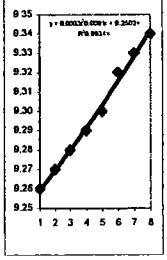
Zero-Times: 1. 381 12/27/05 am
2. 353 ↓ ↓
3. 309
4. 291
5. 309
6. 210

Un-ionized Ammonia Calculator

Client:	Parametrix	Date of Test:	20-Dec-05
Project ID:	Bremerton Sediment	Test Type:	Bivalve NH RT

To convert Total Ammonia (mg/L) to Free (un-ionized) Ammonia (mg/L) enter the corresponding total ammonia, salinity, temperature and pH.

Integer:	I-factor
1	9.26
2	9.27
3	9.28
4	9.29
5	9.30
6	9.32
7	9.33
8	9.34



	TEST	NH3T (mg/L)	salinity (ppt)	pH	temp (C)	temp (K)	i-factor	NH3U (mg/L)
	Example	0.610	22.9	8.0	24.1	297.26	9.3059	0.027
	Example2	2.000	10.0	7.5	15.0	278.16	9.2750	0.008
1	Control	0.000	27.9	8.1	24.4	297.56	9.3184	
2	0.625	0.727	27.9	8.2	24.4	297.56	9.3184	0.050
3	1.250	1.530	27.9	8.0	24.3	297.46	9.3184	0.067
4	2.500	3.270	27.9	8.0	24.3	297.46	9.3184	0.144
5	5.000	6.810	27.9	8.1	24.3	297.46	9.3184	0.374
6	10.000	12.800	27.9	8.1	24.1	297.26	9.3184	0.693
7	20.000	23.900	27.9	8.0	24.0	297.16	9.3184	1.032
8								
9								
10								
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45								
46								

Ammonia Analysis
Total Ammonia (mg/L)

Project:	Organism:	Test:	Day:
Parametrix	Bivalves	NH_3 RT	0

PRETEST / INITIAL / FINAL / OTHER (circle one)
OVERLYING (OV) / POREWATER (PW) (circle one)

Standards Temperature		Sample temperature should be within ±1°C of standards temperature at time and date of analysis.
Date:	**Temperature:**	
12/21/05	23°	

Sample ID or Description	Conc or Rep	Date of Sampling and Initials	Ammonia Value (mg/L)	Temp °C	Date of Reading and Initials	Sample Frozen (Y/N)	pH	Sal (ppt)
Ø		12/20/05 AM	<0.5	24.4°	12/21/05 JH	Y		
1.25		↓	1.53	24.4°	↓	↓		
2.5			3.27	24.3°				
0.625			0.727	24.3°				
5			6.81	24.3°				
10			12.8	24.1°				
20		↓	23.9	24.0°	↓	↓		

Reference Toxicant
Ammmonia Spiking Worksheet

Bivalve NH_3 RT 12/20/05

Assumptions in Model
Stock ammonia concentration is 8,000 mg/L = 8 mg/mL

Actual Reading
7090

Test Solutions			Volume of stock to reach desired concentration	
Measured Concentration mg/L	Desired Concentration mg/L	Volume mL	mL stock to increase FRESH WATER	SALT WATER
0	20	500	1.410	2.115655853
			0.000	0
			0.000	0
			0.000	0
			0.000	0
			0.000	0

Parametrix bivalve random numbers 12/20/05

Ammonia RT

Control	1	19
	2	12
	3	11
0.625 ~~1~~	4	16
	5	13
	6	7
1.25 ~~2~~	7	2
	8	9
	9	10
2.5 ~~5~~	10	1
	11	8
	12	15
5 ~~7~~	13	21
	14	6
	15	18
~~4~~ 10	16	14
	17	5
	18	4
20	19	20
	20	17
	21	3

Copper RT

Control	1	13
	2	11
	3	15
2.5	4	1
	5	14
	6	17
5	7	5
	8	3
	9	4
10	10	10
	11	7
	12	2
20	13	6
	14	9
	15	12
40	16	16
	17	8
	18	18

Appendix D

Chain-of-Custody Forms

WESTON SOLUTIONS

☐ 2433 Impala Drive • Carlsbad, CA 92008 • (760) 931-8081, FAX 931-1580
☐ 98 Main St., Ste. #428 • Tiburon, CA 94920 • (415) 435-1847, FAX 435-0479
☐ 1440 Broadway, Ste. 908 • Oakland, CA 94612 • (510) 808-0302, FAX 891-9710
☐ 152 Sunset View Lane • Sequim, WA 98382 • (360) 582-1758, FAX 582-1679
☐ 4729 NE View Drive • Port Gamble, WA 98364 • (360) 297-6903, FAX 297-6905

CHAIN OF CUSTODY
№ 11880

DATE_____ PAGE_____ OF_____

PROJECT NAME / SURVEY / PROJECT NUMBER: Bremerton Sediment
PROJECT MANAGER: Phil Struck
COMPANY: Parametrix
ADDRESS: 5700 Kitsap Way Ste 202 Bremerton
PHONE/FAX: (360) 377-0014 / (360) 479-5961

SAMPLE I.D.	DATE	TIME	MATRIX	INITIALS	NUMBER & TYPE OF CONTAINERS	ANALYSIS/TEST REQUESTED: PSEP Bioassay					PRESERVED HOW/ COMMENTS	FOR WESTON USE ONLY: SAMPLE TEMP. UPON RECEIPT	WESTON LAB ID
C-8	12/12/05	20:00	Sed	DD	2	X					Ice		COS1216.02 A+B

SPECIAL INSTRUCTIONS/COMMENTS: Please email results to pstruck@parametrix.com

SHIPPING:
Shipping VIA: Airbill No:

SAMPLE CONDITION UPON RECEIPT (FOR WESTON USE ONLY):

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature: Lara Linde	Signature: [signature]	Signature: Tracy [signature]	Signature: Nathaniel Johnston	Signature	Signature
Firm: Parametrix	Firm: WESTON	Firm: Weston	Firm: Weston	Firm	Firm
Date/Time: 12/13/05 13:15	Date/Time: 12/15/05 15:K	Date/Time: 12/15/05 1035	Date/Time: 12/16/05 1035	Date/Time	Date/Time

WHITE – return to originator • YELLOW – lab • PINK – retained by originator

WESTON SOLUTIONS

☐ 2433 Impala Drive • Carlsbad, CA 92008 • (760) 931-8081, FAX 931-1580
☐ 98 Main St., Ste. #428 • Tiburon, CA 94920 • (415) 435-1847, FAX 435-0479
☐ 1440 Broadway, Ste. 908 • Oakland, CA 94612 • (510) 808-0302, FAX 891-9710
☐ 152 Sunset View Lane • Sequim, WA 98382 • (360) 582-1758, FAX 582-1679
☑ 4729 NE View Drive • Port Gamble, WA 98364 • (360) 297-6903, FAX 297-6905

CHAIN OF CUSTODY

№ 11881

DATE 12/16/05 PAGE 1 OF 1

PROJECT NAME / SURVEY / PROJECT NUMBER: Bremerton Parametrix

PROJECT MANAGER: Bill Gardiner

COMPANY: Weston

ADDRESS:

PHONE/FAX:

SAMPLE I.D.	DATE	TIME	MATRIX	INITIALS	NUMBER & TYPE OF CONTAINERS	ANALYSIS/TEST REQUESTED: PSEP Bioassay					PRESERVED HOW/ COMMENTS	FOR WESTON USE ONLY: SAMPLE TEMP. UPON RECEIPT	WESTON LAB ID
REF 6	12-15-05	1430	sediment	EP	1-5GAL	X					ice	3°C ①	C051217.01

SPECIAL INSTRUCTIONS/COMMENTS:

SHIPPING:

Shipping VIA: Airbill No:

SAMPLE CONDITION UPON RECEIPT (FOR WESTON USE ONLY):

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature: [signature]	Signature: Daniel E. Sowersby	Signature	Signature	Signature	Signature
Firm: Weston	Firm: Weston	Firm	Firm	Firm	Firm
Date/Time: 12/16/05 1100	Date/Time: 12/17/05 1030	Date/Time	Date/Time	Date/Time	Date/Time

WHITE – return to originator • YELLOW – lab • PINK – retained by originator

① temp checked with laser thermometer. 12/17/05 [initials]

ATTACHMENT - 1

Chevron Property Environmental Conditions Assessment

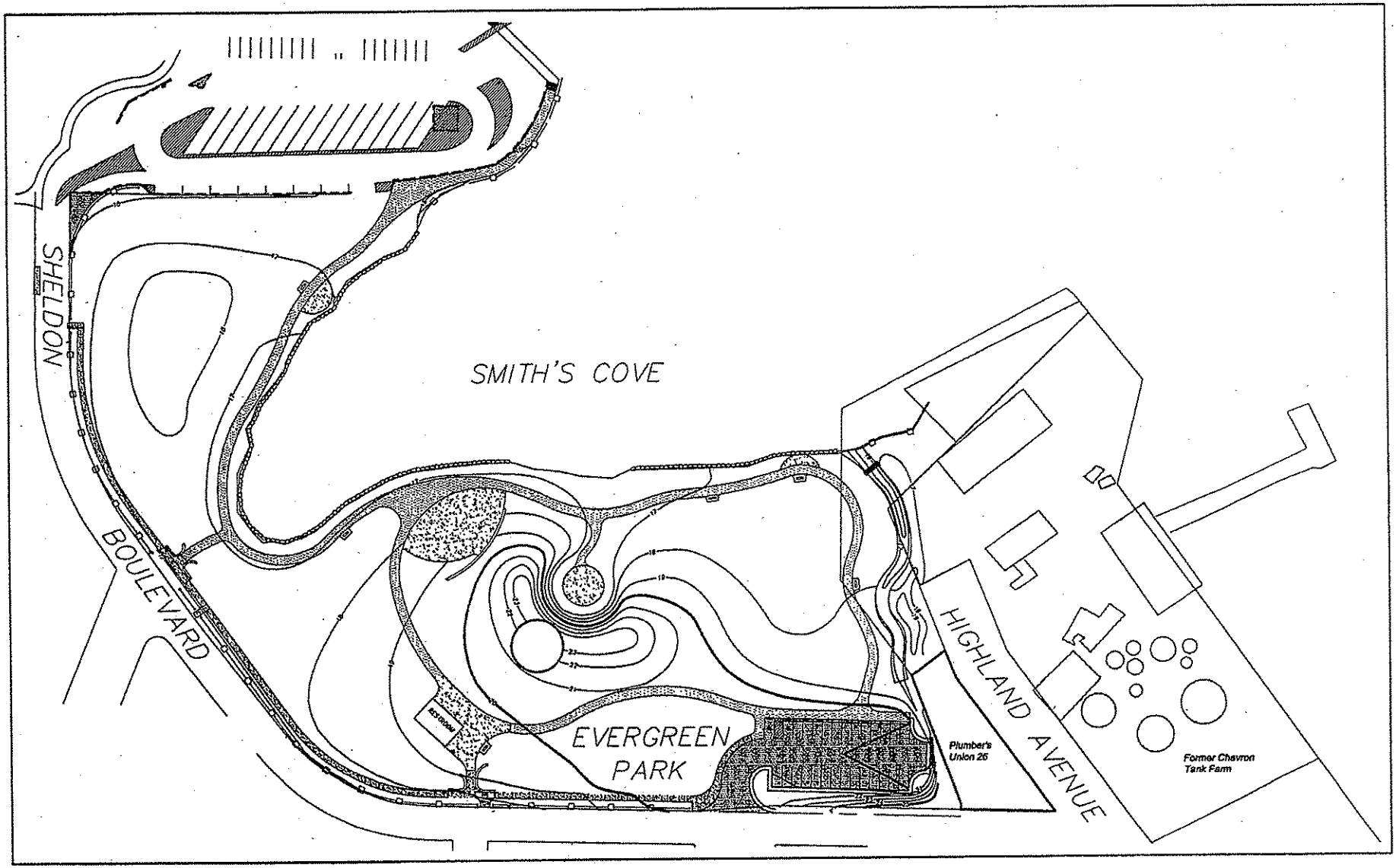
Prepared for

City of Bremerton
3027 Olympus Drive
Bremerton, Washington 98310

Prepared by

Parametrix
5700 Kitsap Way, Suite 202
Bremerton, WA 98312-2234
360-377-0014
www.parametrix.com

June 2005 | 255-1896-064



Parametrix DATE: 05/03/05 3:59pm FILE: SR1885084P01T01P-F2

0 N 120

SCALE IN FEET

Figure 3-1
Plumber's Union
Project Location Map

5. CURRENT SITE ENVIRONMENTAL CONDITIONS

This section presents a summary of current site environmental conditions based on a review of documentation provided by the City. With the exception of three sediment samples collected, no investigations were performed in support of this report. The information related to soil, groundwater, sediment and phase-separated hydrocarbons presented below is collected from previous investigations. The most recent data reported was collected in 2003 and would not meet the standard for ASTM-1527 or prospective purchaser under EPA 40CFR Part 312.

5.1 SOIL

Very little is known about current soil conditions at the site. No soil investigations were performed following the remediation actions taken in the early nineties. Prior to remediation activities, gasoline and diesel were detected in the soil at 100-200 times MTCA Method A regulations and BTEX concentrations were detected in the soil at up to 40 times MTCA Method A regulations (Ecology 1991). The vapor extraction system installed in 1991 and operated until 1994 is reported to have removed 195,000 pounds of hydrocarbons from the site. It is anticipated that concentrations in the soil today would be reduced in comparison to the results of initial sampling.

5.2 GROUNDWATER

The most recent groundwater data was collected by Chevron in March 2003. Groundwater samples were collected from six wells, the results of these analyses are presented in Table 5-1.

Table 5-1. March 2003 Groundwater Sampling Results[a]

Contaminant	Diesel (ug/L)	Oil (ug/L)	Gasoline (ug/L)	Benzene (ug/L)
MTCA Method A:	*500*	*500*	*800*	5
MW-6	4,400	4,100	1,200	39
MW-9	6,300	2,400	8,200	550
MW-18	80,000	<10,000	810	ND
MW-21	970	ND	6,500	ND
MW-22	1,500	500	100	0.89
MW-23	270	ND	ND	ND

[a] (Gettler-Ryan, 2003)

5.3 SEDIMENT

6. DATA GAPS

Based on information reviewed, several data gaps were identified that may affect a prospective purchasers future cleanup liability. This means that Ecology could require additional sampling prior to negotiating cleanup criteria and extent or the City may elect to perform some additional sampling to better understand conditions prior to deciding on a regulatory approach. While we believe that sufficient data exists to prepare cost estimates of potential property liability, these factors do create some level of uncertainty.

Data gaps include:

- **No data since 2003:** Two year old data does not meet the standard for AAI under 40 CFR, Part 312 or the guidelines set forth under ASTM 1527-00 that may affect a prospective purchaser's future cleanup liability. It is not known if site conditions have changed since 2003.
- **Absence of fate and transport information:** No data exists to establish trends in natural attenuation processes. While considerable chemical data is present, no determination of natural degradation processes (methagenesis, sulfate/iron reduction, etc.) and no mobility modeling has been performed.
- **No Site Conceptual Model Exists:** No site conceptual model has been developed for this site. A site conceptual model may be recommended or required to develop risk-based cleanup criteria
- **Limited coverage for monitoring points:** Several of the wells located along the edge of the property have been damaged or lost and no data is available for these locations. Without adequate coverage for sentinel wells, the levels of contaminants that may be migrating off the property is not known.
- **Unknown soil conditions:** Site soil data were collected prior to the implementation of any remedial actions. Current soil conditions are not known and the volume of continuing source material that may remain at levels exceeding MTCA regulations cannot be evaluated.
- **Sediment data is indicative rather than definitive:** Sediment data is sparse, limited in quantity with no off-shore data collected. Three samples were collected as part of this assessment and indicated that no hydrocarbon contamination was present. Ecology of the Washington Department of Natural Resources may require additional characterization to demonstrate that impacts are not present in the off-shore environment.
- **Impacts to adjacent properties are unknown:** Contaminants from this site may have migrated off-site to an adjacent property. Potentially-impacted properties are owned by the City of Bremerton, Washington Department of Natural Resources and privately-owned parcels to the north. Consideration of the terms of the purchase and sale agreement should include a discussion of the potential liability from these adjacent properties.

The lack of information regarding current soil conditions, sediment conditions, and lack of recent groundwater data or adequate coverage for monitoring wells present the most significant unknowns for this site. Additionally, the lack of a site conceptual model may make it difficult for the City to negotiate less restrictive cleanup criteria. Future actions to address these unknowns are impacted by the stakeholder responsibilities and regulatory scenario selected for this property as discussed below:

- Under any scenario Ecology may mandate or the City may elect to install additional monitoring wells to evaluate groundwater conditions at the property and to collect a baseline set of groundwater data from selected wells. This would mitigate the data gaps related to a lack of recent data and limited coverage for monitoring points.
- Under an Agreed Order, the level and extent of any cleanup would be negotiated and defined and Ecology would identify any additional investigation requirements. This would help to mitigate the liability associated with impacts to DNR properties and the possibility of a future enforcement order from Ecology. In addition, collection of fate and transport information or the development of site conceptual model would likely not be required. This may also eliminate the need to collect additional soil or sediment data.
- Through the VCP the City would likely be required to collect additional soil, and sediment data to develop a cleanup action plan. This would resolve the data gaps related to unknown soil and sediment conditions.
- Under a "no action" or Independent Cleanup scenario the City may additionally elect to install borings to evaluate current site soil conditions and to consider future liability as unidentified source areas may exist. This would resolve the data gap related to unknown soil conditions.
- Under an Agreed Order or the VCP, additional sampling of soil, groundwater and sediment data would provide a basis for the City to negotiate risk-based cleanup criteria which may be less restrictive. This would resolve the data gaps related to unknown soil and sediment conditions.

7. CONCEPTUAL REMEDIAL ACTION ALTERNATIVES

Several remedial alternatives were developed to assess potential cleanup costs for the site. The remedial alternatives evaluated range from no action with monitoring (low cost, low effectiveness) to significant excavation (high cost, high effectiveness).

A list of remediation options was considered in developing the remedial alternatives. These options are listed below.

Groundwater

The following remedial options were used in developing alternatives for groundwater remediation:

- Monitoring/Natural Attenuation (20 year duration) - Monitor six wells semi-annually for 10 years, annually for 10 additional years.
- Dewatering - Maintain groundwater levees below the existing hydrocarbon "smear" zone to aid removal of residual free product, reduce potential for migration of contaminants in soil, and possibly enhance natural attenuation processes.

Soil

The following remedial options were used in developing alternatives for soil remediation:

- **Cap and Cover** - Install cap consisting of a geocomposite clay liner and clean soil cover layer.
- **Cutoff Wall** - Contain site groundwater with an oil-resistant geomembrane or sheet pile wall.
- **Soil Excavation** - Excavation and offsite disposal of contaminated soil. This option is included for completeness to provide an upper bound remediation cost.

An in-situ remedial alternative, Oxygen Releasing Compound, was considered but it was determined that this site is not a good candidate for this type of remediation due to the presence of free product in some wells and soil conditions.

Sediment

The following remedial options were used in developing alternatives for sediment remediation:

- **Sediment Removal** - Excavation of a 3-foot layer of sediment located between the toe of the shoreline bank and the mean lower low water (MLLW) line. Sediment would be excavated in the dry during low tides and disposed of off-site in a Subtitle D landfill. This estimate is based on an assumed volume of 3,000 cubic yards.
- **Sediment Capping** - Placement of an oil-resistant geomembrane and 3 feet of cobbly pit run fill over sediment located between the toe of the shoreline bank and the extreme low water line. Exact dimensions are unknown, and a 50x100 foot impacted area was estimated for purposes of estimated costs.

The remedial alternatives presented below were developed from these options. Details and estimated line item costs associated with these alternatives are provided in Appendix D.

(1) Monitoring with no active remediation or institutional controls such as deed restrictions.

(2) Point of contact compliant soil capping system with monitoring and institutional controls such as deed restrictions.

(3) Point of contact compliant soil capping system and cutoff wall with monitoring and institutional controls such as deed restrictions.

(4) Cutoff wall and dewatering with monitoring and institutional controls such as deed restrictions.

(5) Point of contact compliant soil capping system, cutoff wall and dewatering with monitoring and institutional controls such as deed restrictions.

(6) Cutoff wall and soil excavation with limited monitoring.

Each of the upland alternatives were evaluated for effectiveness/risk reduction, implementability, and cost. The scoring analysis used to evaluate the alternatives is presented in Table 8-1. The alternatives which presented the highest value based on these evaluation criteria are summarized below.

- **Alternative 2: Cap and Cover with Monitoring** – The cap and cover alternative provides a barrier to receptors for the upland portion of the site but does not provide containment for groundwater or soil contaminants to migrate off-site along the shoreline. Institutional controls would be required to protect against exposure to subsurface contaminants. This alternative is unlikely to substantially reduce petroleum hydrocarbon or lead concentrations in soil or groundwater to below regulatory limits. The preliminary estimate for implementing the cap and cover alternative is $680,000 which includes 20 years of groundwater monitoring. This alternative offers a lower cost with a lower level of containment than Alternative 3.

- **Alternative 3: Cap, Cover and Cutoff Wall with Monitoring** – The cap/cover plus cutoff wall alternative would provide a higher degree of containment than the cap and cover alternative as it includes additional containment of the upland material along the shoreline. Institutional controls would be required to protect against exposure to subsurface contaminants. This alternative is unlikely to substantially reduce petroleum hydrocarbon or lead concentrations in soil or groundwater to below regulatory limits. The preliminary estimate for implementing the cap/cover plus cutoff wall alternative is $1,100,000, which includes 20 years of groundwater monitoring. This alternative offers a higher level of containment with a higher cost than Alternative 2.

Sediment remediation, if required, is estimated to cost an additional $300,000. Please note these cost estimates are based on the limited site data currently available. Actual remedial action construction costs can be anticipated to be within -30 percent to +50 percent of the costs indicated in Appendix D.

ATTACHMENT - 2

F/S 2618
Chevron Tank farm
Port WA Narrows
Bremerton

GETTLER-RYAN INC.

TRANSMITTAL

October 22, 2003
G-R #386607

TO: Mr. Joe Muzzio
SAIC
2192 Pelican Crest
Santa Cruz, California 95062

FROM: Deanna L. Harding
Project Coordinator
Gettler-Ryan Inc.
6747 Sierra Court, Suite J
Dublin, California 94568

RE: Former Chevron Bulk Terminal
#1001351
1310 Highland Avenue
Bremerton, Washington

WE HAVE ENCLOSED THE FOLLOWING:

COPIES	DATED	DESCRIPTION
1	October 17, 2003	Groundwater Monitoring and Sampling Report **Event of September 10, 2003**

COMMENTS:

This report is being sent for your review. Please provide any comments/changes and propose any groundwater monitoring modifications for the next event prior to ***November 5, 2003***, at which time the final report will be distributed to the following:

cc: Mr. Gerald O'Regan, Chevron Products Company, P.O. Box 6004, San Ramon, CA 94583
Mr. John Wietfeld, WDOE, Northwest Region, 3190 160th Avenue, SE, Bellevue, WA 98008-5452

☑ Current Site Check List included.

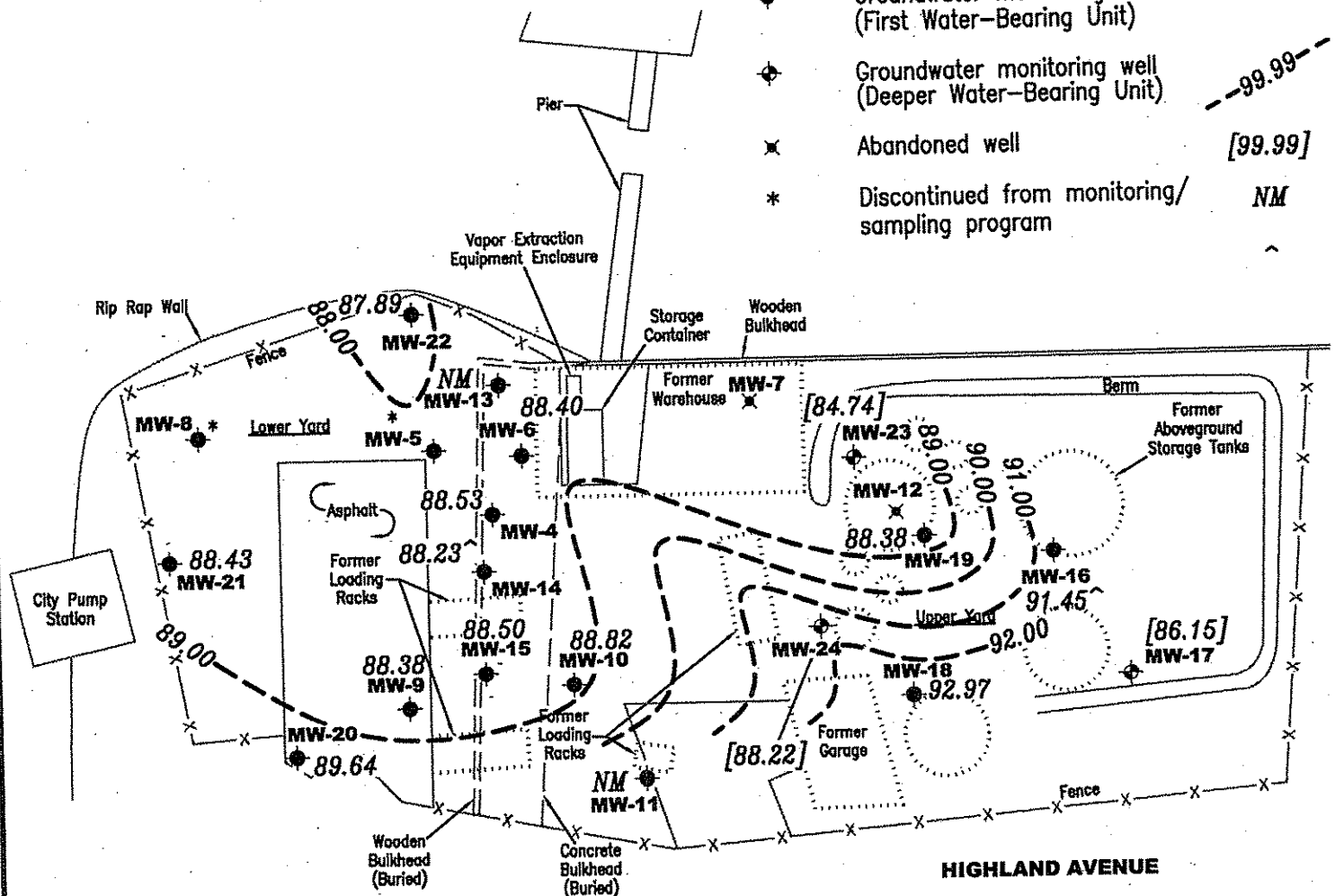
Enclosure

RECEIVED
NOV 12 2003
DEPT OF ECOLOGY

trans/1001351-gor

EXPLANATION

Groundwater monitoring well (First Water-Bearing Unit)	99.99	Groundwater elevation in feet referenced to arbitrary datum
Groundwater monitoring well (Deeper Water-Bearing Unit)	-99.99-	Groundwater elevation contour, dashed where inferred
Abandoned well	[99.99]	Not used in contouring
Discontinued from monitoring/ sampling program	NM	Not Monitored
	^	Groundwater elevation corrected for the presence of separate-phase hydrocarbons



Approximate groundwater flow direction at a gradient of 0.008 to 0.1 Ft./Ft.

N

0 60

Scale in Feet

Source: Figure modified from drawing provided by Pacific Environmental Group, Inc.

FIGURE 2

GETTLER - RYAN INC.
6747 Sierra Ct., Suite J
Dublin, CA 94568 (925) 551-7555

POTENTIOMETRIC MAP
Former Chevron Bulk Terminal #1001351
1310 Highland Avenue
Bremerton, Washington

PROJECT NUMBER 386607
REVIEWED BY
DATE September 10, 2003
REVISED DATE

FILE NAME: P:\ENVIRO\CHEVRON\1001351\Q03-100-1351.DWG | Layout Tab: Pot3

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Bulk Terminal #1001351

1310 Highland Avenue

Bremerton, Washington

WELL ID/ TOC* (ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-4												
100.34	09/10/88	10.99	90.43**	1.35	--	--	--	ND	ND	3,600	23,000	--
	03/09-10/89	12.76	90.74**	3.95	--	--	--	--	--	--	--	--
	04/04/89	12.56	91.00**	4.02	--	--	--	--	--	--	--	--
	08/07/89	11.74	89.86**	1.57	--	--	--	--	--	--	--	--
	09/21/89	11.71	89.77**	1.42	--	--	--	--	--	--	--	--
	05/21/93	9.29	91.07**	0.02	--	--	--	--	--	--	--	--
	09/20/93	10.36	89.98	--	--	--	--	--	--	--	--	--
98.46	12/23/93	10.68	89.68**	0.02	--	--	--	--	--	--	--	--
	03/25/94	--	--	--	--	--	--	--	--	--	--	--
	05/04/94	8.33	92.01	--	190,000	31,000	5,400	13	ND[10]	8.1	79	18
	09/28/94	--	--	--	--	--	--	--	--	--	--	--
	12/09/94	7.98	90.48	--	130,000	ND[10]	580,000	3,200	630	1,900	4,800	45
	03/15/95	--	--	--	--	--	--	--	--	--	--	--
	06/22/95	9.10	89.36	--	2,400,000	270,000	96,000	1,000	110	470	1,300	--
	09/11/95	10.30	88.16	--	--	--	--	--	--	--	--	--
	12/06/95	6.22	92.24	--	6,000	ND[10]	32,000	ND[10]	ND[10]	ND[10]	ND[10]	--
	03/14/96	8.38	90.08	--	--	--	--	--	--	--	--	--
	06/05/96	9.33	89.13	--	--	--	--	--	--	--	--	--
	09/04/96	DRY	--	--	--	--	--	--	--	--	--	--
	12/23/96	9.10	89.36	--	--	--	--	--	--	--	--	--
	04/15/97	--	--	--	--	--	--	--	--	--	--	--
	09/15/97	9.90	88.56	--	76,100	ND[10]	12,700	973	30	99.5	217	--
	12/29/97	7.12	91.34	--	--	--	--	--	--	--	--	--
	03/18/98	6.98	91.48	--	--	--	--	--	--	--	--	--
	06/23/98	9.63	88.83	Sheen	--	--	--	--	--	--	--	--
	03/24/99	6.47	91.99	0.00	68,500	6,390	746	36.8	ND[10]	12	35.8	--
	08/31/99[12]	10.23	88.23	Sheen	--	--	--	--	--	--	--	--
	03/17-18/00	7.05	91.41	Sheen	1,640	ND	8,910	170	ND[10]	222	504	--
	10/06/00	10.34	88.12	0.00	--	--	--	--	--	--	--	--
	04/01/01	7.96	90.50	0.00	--	--	--	--	--	--	--	--
	09/27/01	10.81	87.65	0.00	--	--	--	--	--	--	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Bulk Terminal #1001351

1310 Highland Avenue

Bremerton, Washington

WELL ID/ TOC*(ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-4 (cont)	03/28/02	8.48	89.98	0.00	--	--	--	--	--	--	--	--
	09/30/02	10.23	88.23	0.00	--	--	--	--	--	--	--	--
	03/07/03	8.68	89.78	0.00	--	--	--	--	--	--	--	--
	09/10/03	**9.93**	**88.53**	**0.00**	--	--	--	--	--	--	--	--
MW-5												
99.23	09/10/88[1]	10.05	89.18	--	--	--	--	1,900	360	290	1,900	--
	03/9-10/89	8.56	90.67	--	--	--	--	5,400	11,000	1,400	7,000	--
	04/04/89	8.22	91.01	--	--	--	--	--	--	--	--	--
	08/07/89	--	--	--	--	--	--	--	--	--	--	--
	09/21/89	--	--	--	--	--	--	--	--	--	--	--
	05/21/93	--[8]	--	--	--	--	--	--	--	--	--	--
	09/20/93	--[8]	--	--	--	--	--	--	--	--	--	--
95.96	12/23/93	--[8]	--	--	--	--	--	--	--	--	--	--
	03/25/94	--[8]	--	--	--	--	--	--	--	--	--	--
	05/04/94	--[8]	--	--	--	--	--	--	--	--	--	--
	09/28/94	--[8]	--	--	--	--	--	--	--	--	--	--
	12/09/94	5.78	90.18	--	--	--	--	--	--	--	--	--
	03/15/95	--[8]	--	--	--	--	--	--	--	--	--	--
	06/22/95	--[8]	--	--	--	--	--	--	--	--	--	--
	09/11/95	--[8]	--	--	--	--	--	--	--	--	--	--
	12/06/95	--[8]	--	--	--	--	--	--	--	--	--	--
	03/14/96	5.37	90.59	--	--	--	--	--	--	--	--	--
	06/05/96	--[8]	--	--	--	--	--	--	--	--	--	--
	09/04/96	--[8]	--	--	--	--	--	--	--	--	--	--
	12/23/96	--[8]	--	--	--	--	--	--	--	--	--	--
	04/15/97	--[8]	--	--	--	--	--	--	--	--	--	--
	09/15/97	--[8]	--	--	--	--	--	--	--	--	--	--
	12/29/97	--[8]	--	--	--	--	--	--	--	--	--	--
	03/18/98	--[8]	--	--	--	--	--	--	--	--	--	--
	06/23/98	--[8]	--	--	--	--	--	--	--	--	--	--

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Bulk Terminal #1001351
1310 Highland Avenue
Bremerton, Washington

WELL ID/ TOC* (ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-5 (cont)	03/24/99	--[8]	--	--	--	--	--	--	--	--	--	--
	08/31/99	--[8]	--	--	--	--	--	--	--	--	--	--
	03/17-18/00	--[8]	--	--	--	--	--	--	--	--	--	--
	10/06/00	--[8]	--	--	--	--	--	--	--	--	--	--
	04/01/01	--[8]	--	--	--	--	--	--	--	--	--	--
	NOT MONITORED/SAMPLED											
MW-6												
100.29	09/10/88[2]	11.08	89.21	--	--	--	--	2,000	1,500	150	4,300	--
	03/09-10/89	12.76	90.96**	4.29	--	--	--	--	--	--	--	--
	04/04/89	12.21	91.13**	3.81	--	--	--	--	--	--	--	--
	08/07/89	10.44	89.85	Trace	--	--	--	--	--	--	--	--
	09/21/89	--	--	--	--	--	--	--	--	--	--	--
	05/20/93	9.11	91.18	--	14,000	--	40,000	820	1,600	640	5,600	--
98.40	09/20/93	9.99	88.41	--	--	--	--	--	--	--	--	--
	12/23/93	10.96	87.44	--	26,000	14,000	27,000	1,400	2,300	560	5,000	26
	03/25/94	--	--	--	--	--	--	--	--	--	--	--
	05/04/94	11.31	87.09	--	20,000	16,000	21,000	720	1,100	450	2,500	ND
	09/28/94	--	--	--	--	--	--	--	--	--	--	--
	12/09/94	8.92	89.48	--	18,000	12,000	8,800	58	60	30	1,300	8.2
	03/15/95	--	--	--	--	--	--	--	--	--	--	--
	06/22/95	11.31	87.09	--	9,800	5,800	16,000	110	76	240	2,100	--
	09/11/95	10.65	87.75	--	--	--	--	--	--	--	--	--
	12/06/95	6.76	91.64	--	750	ND	7,500	12	17	20	500	--
	03/14/96	8.20	90.20	--	--	--	--	--	--	--	--	--
	06/05/96	8.95	89.45	--	26,700	20,400	9,780	41.8	22.3	135	1,070	--
	09/04/96	10.50	87.90	--	--	--	--	--	--	--	--	--
	12/23/96	7.65	90.75	--	--	--	--	--	--	--	--	--
	04/15/97	--	--	--	--	--	--	--	--	--	--	--
	09/15/97	9.83	88.57	--	3,710	908	10,800	19.6	12.5	126	810	--
	12/29/97	7.76	90.64	--	--	--	--	--	--	--	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Bulk Terminal #1001351

1310 Highland Avenue

Bremerton, Washington

WELL ID/ TOC* (ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D, Lead (ppb)
MW-6	03/18/98	7.53	90.87	--	--	--	--	--	--	--	--	--
(cont)	06/23/98	9.65	88.75	--	2,500	ND	11,000	39.2	12.8	235	1,270	--
	03/24/99	7.00	91.40	0.00	2,200	2,030	216	3.95	2.94	3.79	13.4	--
	08/31/99	10.28	88.12	0.00	9,490	5,890	4,040	25.8	ND[10]	62.7	131	--
	03/17-18/00	7.85	90.55	Sheen	2,850	1,750	1,960	21.6	ND[10]	22.9	84.4	--
	10/06/00	11.08	87.32	0.00	4,600[14]	ND[10]	6,020	13.5	24.7	39.1	118	--
	04/01/01	8.69	89.71	0.00	5,970	3,720	4,530	56.6	6.84	128	281	--
	09/27/01	10.84	87.56	0.00	7,410	5,090	4,110	25.7	5.01	35.0	55.6	--
	03/28/02	8.50	89.90	0.00	3,300[20]	3,300[20]	1,400	23	<5.0	20	32	--
	09/30/02	10.28	88.12	0.00	5,400[20]	3,200[20]	1,500	21	1.8	12	7.9	--
	03/07/03	8.74	89.66	0.00	4,400[20]	4,100[20]	1,200	39	1.9	18	22	--
	09/10/03	**10.00**	**88.40**	**0.00**	**1,300[20]**	**320[20]**	**810**	**16**	**0.9**	**5.7**	**3.1**	--
MW-7												
101.25	09/10/88[3]	9.93	91.32	--	--	--	--	ND	ND	62	21	--
	03/09-10/89	8.36	93.31**	0.53	--	--	--	--	--	--	--	--
	04/04/89	7.64	93.86**	0.31	--	--	--	--	--	--	--	--
	08/07/89	10.98	91.03**	0.95	--	--	--	--	--	--	--	--
	09/21/89	UNABLE TO LOCATE		--	--	--	--	--	--	--	--	--
	05/21/93	UNABLE TO LOCATE		--	--	--	--	--	--	--	--	--
	09/20/93	UNABLE TO LOCATE		--	--	--	--	--	--	--	--	--
	12/23/93	UNABLE TO LOCATE - PRESUMED DESTROYED				--	--	--	--	--	--	--
	03/24/99	UNABLE TO LOCATE		--	--	--	--	--	--	--	--	--
	08/31/99	UNABLE TO LOCATE		--	--	--	--	--	--	--	--	--
	03/17-18/00	UNABLE TO LOCATE		--	--	--	--	--	--	--	--	--
	ABANDONED											

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Bulk Terminal #1001351

1310 Highland Avenue

Bremerton, Washington

WELL ID/ TOC* (ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-8								3,900	19,000	2,900	18,000	--
98.17	09/10/88[4]	7.18	91.01**	0.02	--	--	--	--	--	--	--	--
	03/09-10/89	8.28	90.48**	0.74	--	--	--	--	--	--	--	--
	04/04/89	13.33	85.40**	0.70	--	--	--	--	--	--	--	--
	08/07/89	8.39	90.07**	0.36	--	--	--	--	--	--	--	--
	09/21/89	--	--	--	--	--	--	--	--	--	--	--
	05/21/93	--	--	--	--	--	--	--	--	--	--	--
	09/20/93	--	--	--	--	--	--	--	--	--	--	--
95.18	12/23/93	--	--	--	--	--	--	--	--	--	--	--
	03/25/94	--	--	--	--	--	--	--	--	--	--	--
	05/04/94	--	--	--	--	--	--	--	--	--	--	--
	09/28/94	--	--	--	--	--	--	--	--	--	--	--
	12/09/94	--	--	--	--	--	--	--	--	--	--	--
	03/15/95	--	--	--	--	--	--	--	--	--	--	--
	06/22/95	--	--	--	--	--	--	--	--	--	--	--
	09/11/95	--	--	--	--	--	--	--	--	--	--	--
	12/06/95	--	--	--	--	--	--	--	--	--	--	--
	03/14/96	--[9]	--	--	--	--	--	--	--	--	--	--
	06/05/96	--[9]	--	--	--	--	--	--	--	--	--	--
	09/04/96	--[9]	--	--	--	--	--	--	--	--	--	--
	12/23/96	--[9]	--	--	--	--	--	--	--	--	--	--
	04/15/97	--[9]	--	--	--	--	--	--	--	--	--	--
	09/15/97	--[9]	--	--	--	--	--	--	--	--	--	--
	12/29/97	--[9]	--	--	--	--	--	--	--	--	--	--
	03/18/98	--[9]	--	--	--	--	--	--	--	--	--	--
	06/23/98	--[9]	--	--	--	--	--	--	--	--	--	--
	03/24/99	--[9]	--	--	--	--	--	--	--	--	--	--
	08/31/99	--[9]	--	--	--	--	--	--	--	--	--	--
	03/17-18/00	--[9]	--	--	--	--	--	--	--	--	--	--
	10/06/00	--[9]	--	--	--	--	--	--	--	--	--	--
	04/01/01	--[9]	--	--	--	--	--	--	--	--	--	--

NOT MONITORED/SAMPLED

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Bulk Terminal #1001351
1310 Highland Avenue
Bremerton, Washington

WELL ID/ TOC* (ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D, Lead (ppb)
MW-9								6,100	11,000	1,400	9,800	--
100.34	09/10/88[5]	9.88	90.46	--	--	--	--	--	--	--	--	--
	03/09-10/89	8.34	93.13**	1.41	--	--	--	--	--	--	--	--
	04/04/89	8.74	92.80**	1.50	--	--	--	--	--	--	--	--
	08/07/89	12.58	90.03**	2.84	--	--	--	--	--	--	--	--
	09/21/89	--	--	--	--	--	--	--	--	--	--	--
	05/21/93	--	--	--	--	--	--	--	--	--	--	--
98.50	09/20/93	10.15	88.36**	0.01	--	--	--	--	--	--	--	--
	12/23/93	7.99	90.51	--	17,000	5,000	4,300	370	510	110	980	120
	03/25/94	--	--	--	--	--	--	--	--	--	--	--
	05/04/94	8.43	90.07	--	19,000	5,000	4,200	1,000	1,000	110	750	13
	09/28/94	--	--	--	--	--	--	--	--	--	--	--
	12/09/94	7.81	90.69	--	8,900	3,100	2,000	140	73	65	180	67
	03/15/95	--	--	--	--	--	--	--	--	--	--	--
	06/22/95	9.46	89.04	--	13,000	6,000	4,600	230	84	170	390	--
	09/11/95	10.15	88.35	--	--	--	--	--	--	--	--	--
	12/07/95	6.20	92.30	--	8,500	1,500	2,700	390	110	94	360	--
	03/14/96	7.39	91.11	--	--	--	--	--	--	--	--	--
	06/05/96	8.40	90.10	--	12,100	ND	7,960	1,140	1,500	124	812	--
	09/04/96	10.15	88.35	--	--	--	--	--	--	--	--	--
	12/23/96	6.75	91.75	--	--	--	--	--	--	--	--	--
	04/15/97	7.40	91.10	--	4,210	1,050	3,370	449	547	111	652	--
	09/15/97	9.95	88.55	--	5,470	1,490	7,700	943	23.6	545	515	--
	12/29/97	6.72	91.78	--	4,620	1,220	306	14.9	4.47	10.2	69.7	--
	03/18/98	6.90	91.60	--	2,290	ND	10,900	541	252	293	2,190	--
	06/23/98	9.63	88.87	--	4,290	796	12,600	980	108	513	2,790	--
	03/24/99	6.15	92.35	0.00	5,910	2,020	8,850	627	97.7	246	1,310	--
	08/31/99	9.92	88.58	0.00	3,560	939	2,160	333	ND[10]	62.3	73.5	--
	03/17-18/00	6.69	91.81	Sheen	3,860	ND[10]	16,600	819	186	741	3,760	--
	10/06/00	11.45	87.05	0.00	3,600	752[14]	3,990	437	21.1	75.6	90.1	--
	04/01/01	7.70	90.80	0.00	11,900	3,310	13,300	621	96.3	666	2,790	--
	09/27/01	9.63	88.87	0.00	13,400	4,510	4,860	419	19.6	82.3	70.2	--

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Bulk Terminal #1001351
1310 Highland Avenue
Bremerton, Washington

WELL ID/ TOC* (ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-9 (cont)	03/28/02	7.50	91.00	0.00	4,800[20]	1,800[20]	8,500	480	38	610	1,600	--
	09/30/02	9.74	88.76	0.00	3,300[20]	1,100[20]	3,000	230	9.5	47	28	--
	03/07/03	8.39	90.11	0.00	6,300[20]	2,400[20]	8,200	550	52	520	1,000	--
	09/10/03	**10.12**	**88.38**	**0.00**	**2,800[20]**	**490[20]**	**3,400**	**360**	**18**	**110**	**40**	--
MW-10												
99.94	09/10/88[6]	9.37	90.57	--	--	--	--	ND	ND	350	110	--
	03/09-10/89	6.54	93.40	--	--	--	--	150	6.8	ND	2.8	--
	04/04/89	6.51	93.43	--	--	--	--	--	--	--	--	--
	08/07/89	9.39	90.55	--	--	--	--	--	--	--	--	--
	09/21/89	--	--	--	--	--	--	--	--	--	--	--
	05/20/93	7.64	92.30	--	180,000	--	1,900	64	1.9	3.9	3.6	--
98.45	09/20/93	9.97	88.57**	0.11	--	--	--	--	--	--	--	--
	12/23/93	7.31	91.14	--	350,000	ND	4,800	23	6.2	26	130	5.4
	03/25/94	--	--	--	--	--	--	--	--	--	--	--
	05/04/94	7.98	90.47	--	220,000	38,000	3,600	71	ND	7.1	8.2	8.5
	09/28/94	--	--	--	--	--	--	--	--	--	--	--
	12/09/94	7.86	90.59	--	60,000	ND	6,700	ND	4.9	11	21	8.0
	03/15/95	--	--	--	--	--	--	--	--	--	--	--
	06/22/95	9.41	89.04	--	11,000	940	4,300	2.6	5.9	1.8	8.8	--
	09/11/95	10.12	88.33	--	--	--	--	--	--	--	--	--
	12/06/95	6.43	92.10**	0.10	780,000	26,000	4,100,000	100	960	1,200	2,300	--
	03/14/96	7.52	90.93	--	--	--	--	--	--	--	--	--
	06/05/96	8.80	89.65	--	9,890	27,600	1,610,000	ND[10]	ND[10]	ND[10]	1,170	--
	09/04/96	10.20	88.25	--	--	--	--	--	--	--	--	--
	12/23/96	7.13	91.32	--	--	--	--	--	--	--	--	--
	04/15/97	--	--	--	--	--	--	--	--	--	--	--
	09/15/97	9.83	88.65**	0.04	--	--	--	--	--	--	--	--
	12/29/97	--	--	0.06	--	--	--	--	--	--	--	--
	03/18/98	--	--	0.04	--	--	--	--	--	--	--	--
	06/23/98	9.22	89.33**	0.12	--	--	--	--	--	--	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Bulk Terminal #1001351

1310 Highland Avenue

Bremerton, Washington

WELL ID/ TOC* *(ft.)*	DATE	DTW/P *(ft.)*	GWE *(ft.)*	SPHT *(ft.)*	TPH-D *(ppb)*	TPH-O *(ppb)*	TPH-G *(ppb)*	B *(ppb)*	T *(ppb)*	E *(ppb)*	X *(ppb)*	D. Lead *(ppb)*
MW-10	03/24/99	6.11	92.34	Sheen	104,000	ND[10]	21,300	2.50	3.14	20.0	43.5	--
(cont)	08/31/99[12]	8.43	90.02	0.00	--	--	--	--	--	--	--	--
	03/17-18/00	6.47	91.98	Sheen	8,890	1,180	4,940	ND[10]	ND[10]	ND[10]	ND[10]	--
	10/06/00	10.52	87.93	0.00	--	--	--	--	--	--	--	--
	04/01/01	7.16	91.29	0.00	--	--	--	--	--	--	--	--
	09/27/01	10.19	88.26	0.00	--	--	--	--	--	--	--	--
	03/28/02	6.78	91.67	0.00	--	--	--	--	--	--	--	--
	09/30/02	9.03	89.42	0.00	--	--	--	--	--	--	--	--
	03/07/03	7.88	90.57	0.00	--	--	--	--	--	--	--	--
	09/10/03	**9.63**	**88.82**	**0.00**	--	--	--	--	--	--	--	--
MW-11												
100.03	09/10/88[7]	8.45	91.58	--	ND	--	--	ND	ND	ND	ND	--
	03/09-10/89	6.03	94.00	--	--	--	--	ND[10]	0.6	0.8	5.2	--
	04/04/89	6.47	93.56	--	--	--	--	--	--	--	--	--
	08/07/89	8.65	91.38	--	--	--	--	--	--	--	--	--
	09/21/89	--	--	--	--	--	--	--	--	--	--	--
	05/20/93	7.11	92.92	--	73,000	--	320	ND	0.7	0.7	1.0	--
98.11	09/20/93	8.62	89.49	--	20,000	4,000	600	ND	0.7	ND	2.7	ND
	12/23/93	6.69	91.42	--	25,000	6,900	250	ND	ND	ND	1.1	ND
100.03	03/25/94	5.84	94.19	--	13,000	2,900	120	ND[10]	ND[10]	ND[10]	ND[10]	ND[10]
	05/04/94	7.35	92.68	--	16,000	4,300	350	ND	ND	ND	ND	ND
	09/28/94	9.51	90.52	--	7,900	2,200	730	ND	0.9	0.9	1.3	ND
	12/09/94	6.41	93.62	--	15,000	3,500	460	ND[10]	ND[10]	ND[10]	ND[10]	ND[10]
	03/15/95	3.97	96.06	--	11,000	3,000	140	0.72	0.73	ND	ND	--
	06/22/95	8.22	91.81	--	11,000	5,000	240	ND	ND	ND	ND	--
	09/11/95	8.67	91.36	--	13,000	5,500	3,600	ND[10]	ND[10]	ND[10]	ND[10]	--
	12/06/95	4.99	95.04	--	7,300	1,800	160	ND	ND	ND	ND	--
	03/14/96	6.17	93.86	--	17,000	5,500	2,300	ND[10]	ND[10]	ND[10]	ND[10]	--
	06/05/96	7.23	92.80	--	--	--	--	--	--	--	--	--
	09/04/96	8.45	91.58	--	--	--	--	--	--	--	--	--

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Bulk Terminal #1001351
1310 Highland Avenue
Bremerton, Washington

WELL ID/ TOC* (ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-11 (cont)	12/23/96	5.48	94.55	--	--	--	--	--	--	--	--	--
	04/15/97	6.55	93.48	--	--	--	--	--	--	--	--	--
	09/15/97	8.23	91.80	--	2,170	1,010	679	ND	ND	ND	ND	--
	12/29/97	5.83	94.20	--	--	--	--	--	--	--	--	--
	03/18/98	5.95	94.08	--	--	--	--	--	--	--	--	--
	06/23/98	8.00	92.03	Sheen	--	--	--	--	--	--	--	--
	03/24/99	5.16	94.87	Sheen	1,890	837	231	ND	ND	ND	2.20	--
	08/31/99	--	--	--	--	--	--	--	--	--	--	--
	03/17-18/00	5.34	94.69	0.00	--	--	--	--	--	--	--	--
	10//06/00	--	--	--	--	--	--	--	--	--	--	--
	04/01/01	6.28	93.75	0.00	--	--	--	--	--	--	--	--
	09/27/01	9.04	90.99	0.00	--	--	--	--	--	--	--	--
	03/28/02	6.41	93.62	0.00	--	--	--	--	--	--	--	--
	09/30/02	MONITORED ANNUALLY		--	--	--	--	--	--	--	--	--
	03/07/03	7.33	92.70	0.00	--	--	--	--	--	--	--	--
	09/10/03	**MONITORED ANNUALLY**		--	--	--	--	--	--	--	--	--
MW-13												
97.11	09/10/88	--	--	--	--	--	--	--	--	--	--	--
	03/09-10/89	--	--	--	--	--	--	--	--	--	--	--
	04/04/89	--	--	--	--	--	--	--	--	--	--	--
	08/07/89	--	--	--	--	--	--	--	--	--	--	--
	09/21/89	9.80	87.31	--	--	--	--	--	--	--	--	--
	05/20/93	7.55	89.56	--	11,000	--	9,000	84	22	250	440	--
	09/20/93	8.13	88.98	--	22,000	8,200	2,800	33	6.4	58	95	100
	12/23/93	7.65	89.46	--	6,700	1,700	1,800	140	27	34	49	ND
	03/25/94	6.81	90.30	--	11,000	4,600	4,600	22	7.0	180	280	ND
	05/04/94	8.19	88.92	--	20,000	7,500	5,000	15	1.6	67	120	3.1
	09/28/94	9.71	87.40	--	72,000	28,000	17,000	48	13	250	570	20
	12/09/94	7.55	89.56	--	5,800	2,800	360	0.9	ND	6.1	7.8	7.9
	03/15/95	5.40	91.71	--	3,800	1,400	5,800	2.6	0.97	39	76	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Bulk Terminal #1001351

1310 Highland Avenue

Bremerton, Washington

WELL ID/ TOC*(ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-13	06/22/95	8.69	88.42	--	3,800	3,300	3,400	13	5.2	240	160	--
(cont)	09/11/95	8.89	88.22	--	9,200	8,700	7,500	10	2.8	120	35	--
	12/06/95	6.00	91.11	--	390	470	ND	ND	ND	ND	ND	--
	03/14/96	7.50	89.61	--	2,000	2,200	110	1.2	ND	1.2	14	--
	06/05/96	8.30	88.81	--	58,900	24,500	6,990	13.9	5.44	374	160	--
	09/04/96	8.90	88.21	--	6,630	3,380	9,160	11.3	11.8	266	61.6	--
	12/23/96	6.72	90.39	--	1,730	1,850	ND	ND	ND	ND	ND	--
	04/15/97	7.75	89.36	--	742	ND	105	ND	ND	9.53	11.2	--
	09/15/97	8.42	88.69	--	1,060	ND[10]	775	4.42	ND[10]	45.4	ND[10]	--
	12/29/97	6.60	90.51	--	791	ND	ND	ND	0.695	ND	ND	--
	03/18/98	7.40	89.71	--	--	--	--	--	--	--	--	--
	06/23/98	8.37	88.74	--	675	ND	1,080	7.70	2.54	209	24.5	--
	03/24/99	6.07	91.04	0.00	576	ND	82.8	1.92	ND	9.83	3.74	--
	08/31/99	--	--	--	--	--	--	--	--	--	--	--
	03/17-18/00	6.70	90.41	0.00	--	--	--	--	--	--	--	--
	10/06/00	--	--	--	--	--	--	--	--	--	--	--
	04/01/01	7.55	89.56	0.00	--	--	--	--	--	--	--	--
	09/27/01	9.67	87.44	0.00	--	--	--	--	--	--	--	--
	03/28/02	7.49	89.62	0.00	--	--	--	--	--	--	--	--
	09/30/02	MONITORED ANNUALLY		--	--	--	--	--	--	--	--	--
	03/07/03	7.72	89.39	0.00	--	--	--	--	--	--	--	--
	09/10/03	**MONITORED ANNUALLY**		--	--	--	--	--	--	--	--	--
MW-14												
97.58	09/10/88	--	--	--	--	--	--	--	--	--	--	--
	03/09-10/89	--	--	--	--	--	--	--	--	--	--	--
	04/04/89	--	--	--	--	--	--	--	--	--	--	--
	08/07/89	--	--	--	--	--	--	--	--	--	--	--
	09/21/89	10.00	87.58	--	--	--	--	--	--	--	--	--
	05/20/93	7.34	90.24	--	34,000	--	2,600	75	180	58	250	--
	09/20/93	8.85	88.73	--	27,000	2,700	8,700	330	570	350	1,000	46

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Bulk Terminal #1001351
1310 Highland Avenue
Bremerton, Washington

WELL ID/ TOC*(ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-14 (cont)	12/23/93	7.26	90.32	--	13,000	4,100	280	2.1	0.8	1.5	9.8	12
	03/25/94	--	--	--	--	--	--	--	--	--	--	--
	05/04/94	--	--	--	--	--	--	--	--	--	--	--
	09/28/94	--	--	--	--	--	--	--	--	--	--	--
	12/09/94	--	--	--	--	--	--	--	--	--	--	--
	03/15/95	--	--	--	--	--	--	--	--	--	--	--
	06/22/95	--	--	--	--	--	--	--	--	--	--	--
	09/11/95	--	--	--	--	--	--	--	--	--	--	--
	12/06/95	--	--	--	--	--	--	--	--	--	--	--
	03/14/96	6.98	90.60	--	6,200	2,400	ND	1.1	ND	1.1	ND	--
	06/05/96	8.20	89.38	--	--	--	--	--	--	--	--	--
	09/04/96	10.16	87.42	--	--	--	--	--	--	--	--	--
	12/23/96	6.00	91.58	--	--	--	--	--	--	--	--	--
	04/15/97	--	--	--	--	--	--	--	--	--	--	--
	09/15/97	9.00	88.58	--	7,330	1,610	1,380	5.94	2.22	5.36	2.70	--
	12/29/97	6.25	91.33	--	--	--	--	--	--	--	--	--
	03/18/98	6.31	91.27	--	--	--	--	--	--	--	--	--
	06/23/98	9.00	88.58	Sheen	--	--	--	--	--	--	--	--
	03/24/99	5.58	92.00	0.00	1,250	ND	51.0	1.17	ND	ND	1.02	--
	08/31/99	9.38	88.20	0.00	68,500	ND[10]	119	8.06	ND[10]	2.69	ND[10]	--
	03/17-18/00	5.94	91.64	Sheen	3,510	ND	237	6.97	7.56	5.70	15.5	--
	10/06/00	10.15	87.43	0.00	8,570	1,790[15]	494	9.85	3.54	23.5	32.9	--
	04/01/01	7.04	90.54	0.00	5,920	1,880	<50.0	1.43	<0.500	<0.500	<1.00	--
	09/27/01	9.93	87.65	0.00	12,200	<2,500	492	8.52	2.84	11.9	12.5	--
	03/28/02	6.80	90.77***	0.03	NOT SAMPLED DUE TO THE PRESENCE OF SPH				--	--	--	--
	09/30/02	9.35	88.22***	0.03	NOT SAMPLED DUE TO THE PRESENCE OF SPH				--	--	--	--
	03/07/03	7.58	90.00***	0.02	NOT SAMPLED DUE TO THE PRESENCE OF SPH				--	--	--	--
	09/10/03	**9.37**	**88.23****	**0.02**	**NOT SAMPLED DUE TO THE PRESENCE OF SPH**				--	--	--	--

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Bulk Terminal #1001351
1310 Highland Avenue
Bremerton, Washington

WELL ID/ TOC*(ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-14 (cont)	12/23/93	7.26	90.32	--	13,000	4,100	280	2.1	0.8	1.5	9.8	12
	03/25/94	--	--	--	--	--	--	--	--	--	--	--
	05/04/94	--	--	--	--	--	--	--	--	--	--	--
	09/28/94	--	--	--	--	--	--	--	--	--	--	--
	12/09/94	--	--	--	--	--	--	--	--	--	--	--
	03/15/95	--	--	--	--	--	--	--	--	--	--	--
	06/22/95	--	--	--	--	--	--	--	--	--	--	--
	09/11/95	--	--	--	--	--	--	--	--	--	--	--
	12/06/95	--	--	--	--	--	--	--	--	--	--	--
	03/14/96	6.98	90.60	--	6,200	2,400	ND	1.1	ND	1.1	ND	--
	06/05/96	8.20	89.38	--	--	--	--	--	--	--	--	--
	09/04/96	10.16	87.42	--	--	--	--	--	--	--	--	--
	12/23/96	6.00	91.58	--	--	--	--	--	--	--	--	--
	04/15/97	--	--	--	--	--	--	--	--	--	--	--
	09/15/97	9.00	88.58	--	7,330	1,610	1,380	5.94	2.22	5.36	2.70	--
	12/29/97	6.25	91.33	--	--	--	--	--	--	--	--	--
	03/18/98	6.31	91.27	--	--	--	--	--	--	--	--	--
	06/23/98	9.00	88.58	Sheen	--	--	--	--	--	--	--	--
	03/24/99	5.58	92.00	0.00	1,250	ND	51.0	1.17	ND	ND	1.02	--
	08/31/99	9.38	88.20	0.00	68,500	ND[10]	119	8.06	ND[10]	2.69	ND[10]	--
	03/17-18/00	5.94	91.64	Sheen	3,510	ND	237	6.97	7.56	5.70	15.5	--
	10/06/00	10.15	87.43	0.00	8,570	1,790[15]	494	9.85	3.54	23.5	32.9	--
	04/01/01	7.04	90.54	0.00	5,920	1,880	<50.0	1.43	<0.500	<0.500	<1.00	--
	09/27/01	9.93	87.65	0.00	12,200	<2,500	492	8.52	2.84	11.9	12.5	--
	03/28/02	6.80	90.77***	0.03	NOT SAMPLED DUE TO THE PRESENCE OF SPH				--	--	--	--
	09/30/02	9.35	88.22***	0.03	NOT SAMPLED DUE TO THE PRESENCE OF SPH				--	--	--	--
	03/07/03	7.58	90.00***	0.02	NOT SAMPLED DUE TO THE PRESENCE OF SPH				--	--	--	--
	09/10/03	**9.37**	**88.23****	**0.02**	**NOT SAMPLED DUE TO THE PRESENCE OF SPH**				--	--	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Bulk Terminal #1001351

1310 Highland Avenue

Bremerton, Washington

WELL ID/ TOC*(ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-15												
97.46	09/10/88	--	--	--	--	--	--	--	--	--	--	--
	03/09-10/89	--	--	--	--	--	--	--	--	--	--	--
	04/04/89	--	--	--	--	--	--	--	--	--	--	--
	08/07/89	--	--	--	--	--	--	--	--	--	--	--
	09/21/89	9.90	87.56	--	--	--	--	--	--	--	--	--
	05/20/93	6.91	90.55	--	--	--	4,600	63	31	420	280	--
	09/20/93	9.22	88.24	--	7,000	ND	4,600	67	24	360	77	14
	12/23/93	6.61	90.85	--	2,400	760	190	2.7	0.5	4.1	4.9	9.8
	03/25/94	--	--	--	--	--	--	--	--	--	--	--
	05/04/94	7.44	90.02	--	1,500	ND	450	3.5	ND	2.0	3.4	4.9
	09/28/94	--	--	--	--	--	--	--	--	--	--	--
	12/09/94	6.40	91.06	--	4,300	ND	350	2.2	ND	2.2	2.3	6.7
	03/15/95	--	--	--	--	--	--	--	--	--	--	--
	06/22/95	8.48	88.98	--	4,600	1,200	96	1.5	ND	1.6	1.9	--
	09/11/95	9.34	88.12	--	--	--	--	--	--	--	--	--
	12/06/95	5.15	92.31	--	640	ND	72	1.3	ND	ND	ND	--
	03/11/96	6.35	91.11	--	--	--	--	--	--	--	--	--
	06/05/96	7.50	89.96	--	4,160	ND	233	1.54	ND	0.769	ND	--
	09/04/96	9.25	88.21	--	--	--	--	--	--	--	--	--
	12/23/96	5.78	91.68	--	--	--	--	--	--	--	--	--
	04/15/97	--	--	--	--	--	--	--	--	--	--	--
	09/15/97	9.00	88.46	--	1,510	ND	266	1.24	ND	ND	ND	--
	12/29/97	7.79	89.67	--	--	--	--	--	--	--	--	--
	03/18/98	7.65	89.81	--	--	--	--	--	--	--	--	--
	06/23/98	8.58	88.88	--	582	ND	120	3.91	0.522	ND	1.11	--
	03/24/99	5.20	92.26	0.00	894	ND	ND	3.16	ND	ND	1.48	--
	08/31/99	9.12	88.34	0.00	2,640	823	143	ND[10]	0.681	ND	1.27	--
	03/17-18/00	5.62	91.84	0.00	846	ND	269	1.22	ND[10]	ND	ND[10]	--
	10/06/00	9.78	87.68	0.00	2,000[14]	ND[10]	358	ND	3.14	0.606	1.07	--
	04/01/01	6.39	91.07	0.00	445	<750	210	2.90	<0.500	<0.500	1.66	--
	09/27/01	9.35	88.11	0.00	2,930	730	653	5.96	1.73	<1.00	4.42	--

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Bulk Terminal #1001351
1310 Highland Avenue
Bremerton, Washington

WELL ID/ TOC* (ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-15	03/28/02	6.51	90.95	0.00	840[20]	<750[20]	<50	<0.50	<0.50	<0.50	<1.5	--
(cont)	09/30/02	8.84	88.61***	0.03	NOT SAMPLED DUE TO THE PRESENCE OF SPH				--	--	--	--
	03/07/03	7.19	90.26***	0.03	NOT SAMPLED DUE TO THE PRESENCE OF SPH				--	--	--	--
	09/10/03	**8.96**	**88.50**	**0.00**	**540[20]**	**<250[20]**	**110**	**0.8**	**<0.5**	**<0.5**	**<1.5**	--
MW-16												
108.03	09/20/93	16.23	91.80	--	6,200	1,400	670	ND	1.1	1.7	4.1	3.7
	12/23/93	12.26	95.77	--	8,400	1,100	1,300	6.9	1.8	2.2	7.0	ND
	03/25/94	9.23	99.10**	0.37	--	--	--	--	--	--	--	--
	05/04/94	12.92	95.44**	0.41	--	--	--	--	--	--	--	--
	09/28/94	17.29	90.92**	0.22	--	--	--	--	--	--	--	--
	12/09/94	12.49	95.54	--	39,000	ND[10]	1,800	2.0	2.1	4.3	6.3	ND[10]
	03/15/95	8.35	99.68	--	3,900	ND	1,500	2.2	ND	1.3	1.9	--
	06/22/95	14.20	93.83	--	--	--	--	--	--	--	--	--
	09/11/95	16.42	91.61	--	220,000	14,000	170,000	ND[10]	ND[10]	ND[10]	ND[10]	--
	12/06/95	9.23	98.80	--	5,800	ND[10]	210,000	ND[10]	ND[10]	ND[10]	43	--
	03/14/96	9.11	98.92	--	110,000	3,800	590,000	ND[10]	ND[10]	100	240	--
	06/05/96	--	--	--	--	--	--	--	--	--	--	--
	09/04/96	15.90	92.13	--	--	--	--	--	--	--	--	--
	12/23/96	--	--	--	--	--	--	--	--	--	--	--
	04/15/97	--	--	--	--	--	--	--	--	--	--	--
	09/15/97	--	--	--	--	--	--	--	--	--	--	--
	12/29/97	--	--	--	--	--	--	--	--	--	--	--
	03/18/98	--	--	--	--	--	--	--	--	--	--	--
	06/23/98	14.90	93.13	Sheen	--	--	--	--	--	--	--	--
	08/31/99	16.10	91.93	Sheen	8,820	ND	2,830[11]	ND[10]	ND[10]	ND[10]	ND[10]	--
	03/17-18/00[13]	9.01	99.02	0.00	2,010	ND	1,870	ND[10]	ND[10]	ND	ND[10]	--
	10/06/00	16.25	91.78	0.00	2,880[16]	ND	2,030	ND	2.44	4.11	6.40	--
	04/01/01[19]	12.37	95.66	0.00	168,000	<7,880	2,550	1.44	1.25	2.39	9.90	--
	09/27/01	16.86	91.17	0.00	32,700	<5,500	2,340	6.51	<10.0	<10.0	<15.0	--
	03/28/02	9.60	98.43	0.00	46,000[20]	<10,000[20]	1,800	<1.0	<1.0	<5.0	7.6	--

As of 09/10/03

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Bulk Terminal #1001351
1310 Highland Avenue
Bremerton, Washington

WELL ID/ TOC* (ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-16	09/30/02	17.00	91.03	0.00	140,000[20]	<5,000[20]	970	<0.50	<0.50	0.59	1.9	--
(cont)	03/07/03	11.40	96.62***	0.06	NOT SAMPLED DUE TO THE PRESENCE OF SPH				--	--	--	--
	09/10/03	**16.60**	**91.45****	**0.02**	**NOT SAMPLED DUE TO THE PRESENCE OF SPH**				--	--	--	--
MW-17												
108.97	09/20/93	19.38	89.59	--	280	ND	ND	ND	ND	ND	ND	16
	12/23/93	17.92	91.05	--	ND	ND	ND	ND	ND	ND	ND	ND
	03/25/94	21.12	87.85	--	ND	ND	ND	ND	ND	ND	ND	ND
	05/04/94	20.33	88.64	--	ND	ND	ND	ND	ND	ND	ND	ND
	09/28/94	22.96	86.01	--	ND	ND	ND	ND	ND	ND	ND	ND
	12/09/94	18.34	90.63	--	ND	ND	ND	ND	ND	ND	ND	ND
	03/15/95	18.87	90.10	--	ND	ND	ND	ND	ND	ND	ND	--
	06/22/95	21.84	87.13	--	ND	910	ND	ND	ND	ND	ND	--
	09/11/95	21.90	87.07	--	ND	ND	ND	ND	ND	ND	ND	--
	12/06/95	20.00	88.97	--	ND	ND	ND	ND	ND	ND	ND	--
	03/14/96	18.73	90.24	--	ND	ND	ND	ND	ND	ND	ND	--
	06/05/96	--	--	--	--	--	--	--	--	--	--	--
	09/04/96	20.80	88.17	--	--	--	--	--	--	--	--	--
	12/23/96	--	--	--	--	--	--	--	--	--	--	--
	04/15/97	--	--	--	--	--	--	--	--	--	--	--
	09/15/97	--	--	--	--	--	--	--	--	--	--	--
	12/29/97	--	--	--	--	--	--	--	--	--	--	--
	03/18/98	--	--	--	--	--	--	--	--	--	--	--
	06/23/98	24.77	84.20	--	ND	ND	ND	ND	ND	ND	ND	--
	08/31/99	--	--	--	--	--	--	--	--	--	--	--
	03/17-18/00	18.53	90.44	0.00	--	--	--	--	--	--	--	--
	10/06/00	--	--	--	--	--	--	--	--	--	--	--
	04/01/01	19.49	89.48	0.00	--	--	--	--	--	--	--	--
	09/27/01	17.01	91.96	0.00	--	--	--	--	--	--	--	--
	03/28/02	19.25	89.72	0.00	--	--	--	--	--	--	--	--

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Bulk Terminal #1001351
1310 Highland Avenue
Bremerton, Washington

WELL ID/ TOC*(ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D, Lead (ppb)
MW-17	09/30/02	22.96	86.01	0.00	--	--	--	--	--	--	--	--
(cont)	03/07/03	20.86	88.11	0.00	--	--	--	--	--	--	--	--
	09/10/03	**22.82**	**86.15**	**0.00**	--	--	--	--	--	--	--	--
MW-18												
104.88	09/20/93	11.67	93.21	--	3.0	ND	ND	ND	ND	ND	1.2	46
	12/23/93	8.38	96.50	--	8,300	1,700	1,300	6.3	1.3	4.3	3.8	ND
	03/25/94	5.91	98.97	--	4,600	ND	760	4.2	1.0	4.1	6.4	ND
	05/04/94	8.15	96.73	--	9,500	ND	1,100	ND	0.9	2.2	2.6	ND
	09/28/94	12.18	92.70	--	3,500	760	460	ND	1.1	1.2	1.4	ND
	12/09/94	10.15	94.73	--	31,000	ND	ND	ND	ND	ND	ND	ND
	03/15/95	5.02	99.86	--	2,800	1,100	1,300	3.0	1.3	2.3	2.9	--
	06/22/95	9.92	94.96	--	15,000	1,500	870	0.57	ND	0.56	2.0	--
	09/11/95	11.60	93.28	--	5,500	2,700	1,200	ND	0.58	ND	3.3	--
	12/06/95	7.00	97.88	--	3,400	ND	1,800	0.96	0.72	1.2	3.0	--
	03/14/96	6.55	98.33	Sheen	4,600	790	11,000	ND[10]	ND[10]	ND[10]	ND[10]	--
	06/05/96	7.70	97.18	--	--	--	--	--	--	--	--	--
	09/04/96	10.85	94.03	--	--	--	--	--	--	--	--	--
	12/23/96	10.85	94.03	--	--	--	--	--	--	--	--	--
	04/15/97	7.48	97.40	--	--	--	--	--	--	--	--	--
	09/15/97	11.10	93.78	--	14,800	1,360	641	ND[10]	ND[10]	ND[10]	ND[10]	--
	12/29/97	--	--	--	--	--	--	--	--	--	--	--
	03/18/98	--	--	--	--	--	--	--	--	--	--	--
	06/23/98	10.18	94.70	Sheen	--	--	--	--	--	--	--	--
	03/24/99	5.89	98.99	0.00	2,490	ND	647	0.943	ND	0.792	4.21	--
	08/31/99	19.59	85.29	0.00	ND	ND	ND	ND	ND	ND	ND	--
	03/17-18/00	6.54	98.34	Sheen	3,000	ND	999	ND[10]	ND[10]	ND	ND[10]	--
	10/06/00	12.07	92.81	0.00	1,850[17]	539[14]	462	ND	0.601	0.727	1.42	--
	04/01/01	8.46	96.42	0.00	121,000	<30,800	1,390	0.791	<0.500	0.806	3.90	--
	09/27/01	12.29	92.59	0.00	5,610	856	494	1.06	<1.00	<1.00	3.08	--
	03/28/02	8.60	96.28	0.00	68,000[20]	<10,000[20]	1,300	<1.0	<1.0	<1.0	5.3	--

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Bulk Terminal #1001351
1310 Highland Avenue
Bremerton, Washington

WELL ID/ TOC* (ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-18	09/30/02	12.42	92.46	0.00	28,000[20]	<5,000[20]	730	<0.50	<0.50	<0.50	<1.5	--
(cont)	03/07/03	10.52	94.36	0.00	80,000[20]	<10,000[20]	810	<1.0	<1.0	<0.50	<1.5	--
	09/10/03	**11.91**	**92.97**	**0.00**	**32,000[20]**	**<5,200[20]**	**760**	**<0.5**	**<0.5**	**<0.5**	**<3.0**	--
MW-19												
107.39	09/20/93	15.73	91.66	--	4,900	1,200	400	4.1	1.0	1.3	3.1	ND
	12/23/93	10.31	97.08	--	6,700	1,700	1,600	25	3.8	9.7	10	ND
	03/25/94	--	--	--	--	--	--	--	--	--	--	--
	05/04/94	10.95	96.44	--	45,000	ND	3,500	41	3.7	19	9.8	4.9
	09/28/94	--	--	--	--	--	--	--	--	--	--	--
	12/09/94	8.69	98.70	--	16,000	ND[10]	2,800	12	1.9	6.7	7.0	ND[10]
	03/15/95	--	--	--	--	--	--	--	--	--	--	--
	06/22/95	13.53	93.86	--	12,000	1,400	3,800	17	2.6	8.7	8.7	--
	09/11/95	15.73	91.66	--	--	--	--	--	--	--	--	--
	12/06/95	6.00	101.39	--	3,300	820	1,900	8.2	1.1	3.6	3.3	--
	03/14/96	7.13	100.26	--	--	--	--	--	--	--	--	--
	06/05/96	11.15	96.24	--	4,350	ND	1,700	12.5	1.58	6.75	4.40	--
	09/04/96	15.45	91.94	--	--	--	--	--	--	--	--	--
	12/23/96	7.85	99.54	--	--	--	--	--	--	--	--	--
	04/15/97	--	--	--	--	--	--	--	--	--	--	--
	09/15/97	15.35	92.04	--	8,510	1,280	3,260	3.51	2.12	2.54	5.74	--
	12/29/97	8.23	99.16	--	--	--	--	--	--	--	--	--
	03/18/98	7.50	99.89	--	2,580	ND[10]	1,250	ND[10]	ND[10]	ND[10]	ND[10]	--
	06/23/98	13.90	93.49	Sheen	--	--	--	--	--	--	--	--
	03/24/99	6.49	100.90	0.00	2,010	ND	780	ND[10]	ND[10]	ND[10]	ND[10]	--
	08/31/99	--	--	--	--	--	--	--	--	--	--	--
	03/17-18/00	6.41	100.98	0.00	--	--	--	--	--	--	--	--
	10/06/00	--	--	--	--	--	--	--	--	--	--	--
	04/01/01	8.80	98.59	0.00	--	--	--	--	--	--	--	--
	09/27/01	16.12	91.27	0.00	--	--	--	--	--	--	--	--
	03/28/02	8.05	99.34	0.00	--	--	--	--	--	--	--	--

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Bulk Terminal #1001351
1310 Highland Avenue
Bremerton, Washington

WELL ID/ TOC* (ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-19	09/30/02	15.76	91.63	0.00	--	--	--	--	--	--	--	--
(cont)	03/07/03	13.87	93.52	0.00	--	--	--	--	--	--	--	--
	09/10/03	**19.01**	**88.38**	**0.00**	--	--	--	--	--	--	--	--
MW-20												
97.25	09/20/93	8.86	88.47**	0.10	--	--	--	--	--	--	--	--
	12/23/93	7.91	89.34	--	590	760	ND	ND	ND	ND	ND	ND
	03/25/94	5.85	91.40	--	740	ND	ND	ND	ND	ND	ND	ND
	05/04/94	7.22	90.03	--	1,900	1,900	ND	ND	ND	ND	ND	ND
	09/28/94	9.29	87.96	--	780	910	ND	ND	1.5	ND	ND	ND
	12/09/94	6.63	90.62	--	490	ND	ND	ND	ND	ND	ND	ND
	03/15/95	4.32	92.93	--	580	ND	66	ND	ND	ND	ND	--
	06/22/95	8.14	89.11	--	700	ND	ND	ND	ND	ND	ND	--
	09/11/95	8.87	88.38	--	1,300	1,900	84	ND	ND	ND	ND	--
	12/07/95	5.27	91.98	--	ND	ND	83	ND	ND	ND	ND	--
	03/14/96	6.32	90.93	--	440	ND	66	ND	ND	ND	ND	--
	06/05/96	7.30	89.95	--	636	ND	752	ND	ND	ND	ND	--
	09/04/96	8.85	88.40	--	557	763	76.2	ND	ND	ND	ND	--
	12/23/96	5.82	91.43	--	1,140	865	63.1	ND	ND	ND	ND	--
	04/15/97	6.40	90.85	--	385	ND	56.8	ND	ND	ND	ND	--
	09/15/97	8.55	88.70	--	412	ND	178	ND	ND	ND	ND	--
	12/29/97	5.82	91.43	--	614	ND	56.7	ND	ND	ND	ND	--
	03/18/98	5.80	91.45	--	ND	ND	ND	ND	ND	ND	ND	--
	06/23/98	8.12	89.13	--	269	ND	58.1	ND	ND	ND	ND	--
	03/24/99	5.28	91.97	0.00	318	ND	ND	0.581	ND	ND	ND	--
	08/31/99	--	--	--	--	--	--	--	--	--	--	--
	03/17-18/00	5.61	91.64	0.00	--	--	--	--	--	--	--	--
	10/06/00	--	--	--	--	--	--	--	--	--	--	--
	04/01/01	6.68	90.57	0.00	--	--	--	--	--	--	--	--
	09/27/01	7.93	89.32	0.00	--	--	--	--	--	--	--	--
	03/28/02	6.34	90.91	0.00	--	--	--	--	--	--	--	--

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Bulk Terminal #1001351
1310 Highland Avenue
Bremerton, Washington

WELL ID/ TOC*(ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-20	09/30/02	8.52	88.73	0.00	--	--	--	--	--	--	--	--
(cont)	03/07/03	7.17	90.08	0.00	--	--	--	--	--	--	--	--
	09/10/03	**7.61**	**89.64**	**0.00**	--	--	--	--	--	--	--	--
MW-21												
97.27	09/20/93	9.10	88.17	--	2,200	ND[10]	45,000	470	8,300	890	6,500	49
	12/23/93	8.11	89.16	--	3,000	930	12,000	120	2,200	410	2,400	32
	03/25/94	7.92	89.35	--	2,800	ND[10]	12,000	89	1,400	450	1,900	11
	05/04/94	8.72	88.55	--	4,900	940	20,000	150	4,200	480	3,800	14
	09/28/94	9.73	87.54	--	2,600	ND	52,000	170	4,500	1,600	6,800	12
	12/09/94	8.08	89.19	--	1,700	ND[10]	40,000	120	2,100	910	3,800	13
	03/15/95	6.50	90.77	--	1,000	ND	19,000	71	1,400	670	2,800	--
	06/22/95	9.16	88.11	--	4,100	890	35,000	130	4,600	740	4,100	--
	09/11/95	9.25	88.02	--	3,600	11,000	40,000	92	3,100	1,200	5,800	--
	12/07/95	7.27	90.00	--	1,200	ND	960	2.3	50	30	150	--
	03/14/96	8.36	88.91	--	2,800	ND	25,000	110	1,200	1,600	4,000	--
	06/05/96	8.83	88.44	--	3,580	ND[10]	47,400	ND[10]	3,700	2,160	8,780	--
	09/04/96	9.25	88.02	--	3,460	815	42,500	71.6	2,570	1,780	7,780	--
	12/23/96	7.64	89.63	--	2,250	887	31,900	59.7	1,500	1,300	5,230	--
	04/15/97	8.40	88.87	--	404	ND	4,870	12.1	231	207	649	--
	09/15/97	9.10	88.17	--	1,800	ND[10]	65,300	ND[10]	2,130	2,160	10,200	--
	12/29/97	7.69	89.58	--	4,960	859	31,600	59	992	1,190	4,760	--
	03/18/98	8.00	89.27	--	275	ND	2,410	20.3	10.4	30.3	66.9	--
	06/23/98	9.10	88.17	--	756	ND	31,000	63.2	1,150	1,390	5,990	--
	03/24/99	7.16	90.11	0.00	774	ND	34,600	46.0	600	1,680	3,820	--
	08/31/99	9.29	87.98	0.00	547	ND	31,000	ND[10]	748	1,260	4,920	--
	03/17-18/00	7.88	89.39	0.00	732	ND[10]	24,200	47.5	503	1,530	4,500	--
	10/06/00	9.84	87.43	0.00	1,150[18]	ND	34,800	56.5	588	1,500	6,050	--
	04/01/01	8.41	88.86	0.00	2,870	<750	41,100	191	633	1,890	7,570	--
	09/27/01	9.49	87.78	0.00	6,560	4,170	36,100	91.4	494	1,890	7,430	--
	03/28/02	8.30	88.97	0.00	700[20]	<750[20]	5,200	5.3	130	360	970	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Bulk Terminal #1001351

1310 Highland Avenue

Bremerton, Washington

WELL ID/ TOC* (ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-21	09/30/02	9.09	88.18	0.00	1,200[20]	280[20]	34,000	<50	360	1,500	6,200	--
(cont)	03/07/03	8.45	88.82	0.00	970[20]	<250[20]	6,500	<20	110	530	600	--
	09/10/03	**8.84**	**88.43**	**0.00**	**600[20]**	**<250[20]**	**9,000**	**14**	**82**	**370**	**1,100**	--
MW-22												
96.47	09/20/93	8.04	88.43	--	95,000	15,000	450	24	1.3	2.6	3.4	30
	12/23/93	7.38	89.09	--	14,000	ND	5,100	20	ND	ND	9.7	ND
	03/25/94	7.98	88.49	--	91,000	8,000	410	15	3.6	14	11	ND
	05/04/94	8.49	87.98	--	55,000	ND	2,500	3.0	ND	3.0	5.3	ND
	09/28/94	9.48	86.99	--	9,500	ND	280	0.5	1.3	1.2	1.3	ND
	12/09/94	8.11	88.36	--	43,000	ND[10]	210	ND[10]	0.7	ND[10]	0.8	ND[10]
	03/15/95	6.67	89.80	--	2,200	770	220	1.2	ND	11	2.0	--
	06/22/95	8.99	87.48	--	4,500	1,000	430	ND	1.4	ND	1.6	--
	09/11/95	8.59	87.88	--	9,300	4,600	570	1.1	1.8	ND	2.6	--
	12/07/95	7.12	89.35	--	3,100	ND	350	ND	ND	ND	ND	--
	03/14/96	7.25	89.22	--	4,700	780	670	ND[10]	ND[10]	ND[10]	ND[10]	--
	06/05/96	8.40	88.07	--	8,850	998	535	0.559	ND	ND	ND	--
	09/04/96	8.35	88.12	--	15,600	2,440	1,450	ND	ND	ND	ND	--
	12/23/96	7.00	89.47	--	19,100	2,790	1,350	ND	ND	ND	ND	--
	04/15/97	7.95	88.52	--	2,040	ND	63.8	0.876	ND	ND	ND	--
	09/15/97	8.50	87.97	--	2,200	ND	774	5.02	ND	ND	ND	--
	12/29/97	7.00	89.47	--	2,180	ND	202	1.47	ND	ND	ND	--
	03/18/98	7.97	88.50	--	870	ND	84.7	ND	ND	ND	ND	--
	06/23/98	8.75	87.72	--	1,010	ND	133	2.59	ND	ND	1.20	--
	03/24/99	6.12	90.35	0.00	1,150	ND	187	6.33	3.20	4.77	8.66	--
	08/31/99	8.26	88.21	0.00	966	ND	57.2	1.53	ND	ND	ND[10]	--
	03/17-18/00	7.49	88.98	0.00	797	ND	144	ND[10]	ND	ND	ND[10]	--
	10/06/00	9.50	86.97	0.00	1,110[14]	ND	216	0.619	1.09	0.611	2.36	--
	04/01/01	7.50	88.97	0.00	--	--	--	--	--	--	--	--
	09/27/01	8.96	87.51	0.00	--	--	--	--	--	--	--	--
	03/28/02	8.05	88.42	0.00	5,600[20]	<1,100[20]	250	1.3	<0.50	<0.50	1.8	--

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Bulk Terminal #1001351
1310 Highland Avenue
Bremerton, Washington

WELL ID/ TOC* (ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-22	09/30/02	8.23	88.24	0.00	SAMPLED ANNUALLY		--	--	--	--	--	--
(cont)	03/07/03	8.18	88.29	0.00	1,500[20]	500[20]	100	0.89	<1.0	<0.50	<1.5	--
	09/10/03	**8.58**	**87.89**	**0.00**	**SAMPLED ANNUALLY**		--	--	--	--	--	--
MW-23												
108.07	09/20/93[7]	18.22	89.85	--	4,300	970	900	20	2.6	4.0	2.8	ND
	12/23/93	17.11	90.96	--	3,700	1,200	370	8.6	1.9	0.9	3.9	ND
	03/25/94	20.39	87.68	--	4,300	880	880	14	2.3	3.0	3.5	ND
	05/04/94	19.31	88.76	--	3,900	ND	1,000	12	1.9	2.1	1.3	ND
	09/28/94	21.54	86.53	--	2,500	ND	750	7.7	1.5	1.1	1.0	4.2
	12/09/94	17.25	90.82	--	3,400	ND	430	5.7	1.5	1.0	1.2	ND
	03/15/95	19.32	88.75	--	4,100	1,600	1,700	14	2.6	3.4	4.5	--
	06/22/95	20.77	87.30	--	5,100	2,100	850	7.8	1.4	1.1	2.4	--
	09/11/95	22.37	85.70	--	8,300	5,700	ND	0.57	ND	ND	ND	--
	12/06/95	18.95	89.12	--	2,100	ND	ND	ND	ND	ND	ND	--
	03/14/96	14.15	93.92	--	2,600	1,100	970	5.7	0.63	0.70	1.4	--
	06/05/96	20.45	87.62	--	--	--	--	--	--	--	--	--
	09/04/96	18.80	89.27	--	--	--	--	--	--	--	--	--
	12/23/96	17.81	90.26	--	5,660	2,500	378	2.23	0.626	ND	1.19	--
	04/15/97	18.55	89.52	--	2,910	914	1,260	9.22	1.50	1.61	3.15	--
	09/15/97	22.20	85.87	--	2,330	1,110	462	ND	ND	ND	ND	--
	12/29/97	19.15	88.92	--	2,710	890	155	0.728	ND	ND	ND	--
	03/18/98	21.60	86.47	--	2,570	ND[10]	1,460	ND[10]	ND[10]	ND[10]	ND[10]	--
	06/23/98	23.68	84.39	--	2,370	ND	784	2.02	0.774	ND	2.21	--
	03/24/99	15.65	92.42	0.00	2,150	ND	553	2.16	1.08	2.04	4.93	--
	08/31/99	18.88	89.19	0.00	1,220	ND	264	ND[10]	ND	ND[10]	ND[10]	--
	03/17-18/00	16.90	91.17	0.00	2,070	ND	1,240	1.57	ND[10]	ND[10]	ND[10]	--
	10/06/00	19.84	88.23	0.00	7,970[14]	2,560[14]	919	0.926	1.57	1.39	3.38	--
	04/01/01	20.40	87.67	0.00	1,400	<750	146	0.769	<0.500	<0.500	<1.00	--
	09/27/01	17.76	90.31	0.00	5,050	1,040	1,030	10.2	1.74	4.22	13.1	--
	03/28/02	17.49	90.58	0.00	2,500[20]	<750[20]	1,100	<1.0	<1.0	1.7	<3.0	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Bulk Terminal #1001351

1310 Highland Avenue

Bremerton, Washington

WELL ID/ TOC* (ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-23	09/30/02	19.03	89.04	0.00	2,300[20]	1,000[20]	190	<0.50	<0.50	<0.50	<1.5	--
(cont)	03/07/03	21.33	86.74	0.00	270[20]	<250[20]	<50	<0.50	<0.50	<0.50	<1.5	--
	09/10/03	**23.33**	**84.74**	**0.00**	**530[20]**	**<250[20]**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<1.5**	--
MW-24												
100.65	09/20/93[7]	10.53	90.12	--	340	ND	ND	0.6	ND	ND	ND	5.0
	12/23/93	9.61	91.04	--	ND	ND	ND	ND	ND	ND	ND	ND
	03/25/94	--	--	--	--	--	--	--	--	--	--	--
	05/04/94	11.32	89.33	--	ND	ND	ND	ND	ND	ND	ND	ND
	09/28/94	--	--	--	--	--	--	--	--	--	--	--
	12/09/94	9.99	90.66	--	310	ND	ND	ND	ND	ND	ND	ND
	03/15/95	--	--	--	--	--	--	--	--	--	--	--
	06/22/95	12.96	87.69	--	2,000	ND	ND	ND	ND	ND	ND	--
	09/11/95	--	--	--	--	--	--	--	--	--	--	--
	12/06/95	10.68	89.97	--	ND	ND	ND	ND	ND	ND	ND	--
	03/14/96	10.25	90.40	--	ND	ND	ND	ND	ND	ND	ND	--
	06/05/96	12.20	88.45	--	--	--	--	--	--	--	--	--
	09/04/96	11.75	88.90	--	--	--	--	--	--	--	--	--
	12/23/96	10.60	90.05	--	--	--	--	--	--	--	--	--
	04/15/97	10.60	90.05	--	--	--	--	--	--	--	--	--
	09/15/97	14.34	86.31	--	504	ND	94.7	ND	ND	ND	ND	--
	12/29/97	9.95	90.70	--	--	--	--	--	--	--	--	--
	03/18/98	12.65	88.00	--	--	--	--	--	--	--	--	--
	06/23/98	15.15	85.50	--	ND	ND	ND	ND	ND	ND	ND	--
	03/24/99	8.11	92.54	0.00	267	ND	ND	ND	ND	ND	ND	--
	08/31/99	--	--	--	--	--	--	--	--	--	--	--
	03/17-18/00	9.92	90.73	0.00	--	--	--	--	--	--	--	--
	10/06/00	--	--	--	--	--	--	--	--	--	--	--
	04/01/01	13.91	86.74	0.00	--	--	--	--	--	--	--	--
	09/27/01	11.67	88.98	0.00	--	--	--	--	--	--	--	--
	03/28/02	11.04	89.61	0.00	--	--	--	--	--	--	--	--

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Bulk Terminal #1001351
1310 Highland Avenue
Bremerton, Washington

WELL ID/ TOC* (ft.)	DATE	DTW/P (ft.)	GWE (ft.)	SPHT (ft.)	TPH-D (ppb)	TPH-O (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	D. Lead (ppb)
MW-24	09/30/02	12.99	87.66	0.00	--	--	--	--	--	--	--	--
(cont)	03/07/03	11.03	89.62	0.00	--	--	--	--	--	--	--	--
	09/10/03	**12.43**	**88.22**	**0.00**	--	--	--	--	--	--	--	--
Trip Blank												
TB-LB	06/23/98	--	--	--	--	--	ND	ND	ND	ND	ND	--
	03/24/99	--	--	--	--	--	ND	ND	ND	ND	ND	--
	08/31/99	--	--	--	--	--	ND	ND	ND	ND	ND	--
	03/17-18/00	--	--	--	--	--	113	ND[10]	ND[10]	ND[10]	ND	--
	10/06/00	--	--	--	--	--	ND	ND	ND	ND	ND	--
	04/01/01	--	--	--	--	--	<50.0	<0.500	<0.500	<0.500	<1.00	--
	09/27/01	--	--	--	--	--	<100	<0.500	<1.00	<1.00	<1.50	--
	03/28/02	--	--	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	--
QA	09/30/02	--	--	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	--
	03/07/03	--	--	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	--
	09/10/03	--	--	--	--	--	**<50**	**<0.5**	**<0.5**	**<0.5**	**<1.5**	--

	TPH-D	TPH-O	TPH-G	B	T	E	X	D. Lead
Standard Laboratory Reporting Limits:	250	250	50	0.5	0.5	0.5	1.5	--
MTCA Method A Cleanup Levels:	500	500	800/1,000	5	1,000	700	1,000	15
Current Method:	NWTPH-D + Extended		NWTPH-G and EPA 8021B					EPA 7421

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Bulk Terminal #1001351

1310 Highland Avenue

Bremerton, Washington

EXPLANATIONS:

Groundwater monitoring data and laboratory analytical results prior to March 24, 1999, were compiled from reports prepared by Pacific Environmental Group, Inc.

TOC = Top of Casing
(ft.) = Feet
DTW/P = Depth to Water or Product
GWE = Groundwater Elevation
SPHT = Separate Phase Hydrocarbon Thickness
TPH-D = Total Petroleum Hydrocarbons as Diesel
TPH-O = Total Petroleum Hydrocarbons as Oil

TPH-G = Total Petroleum Hydrocarbons as Gasoline
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes
(ppb) = Parts per billion
ND = Not Detected

-- = Not Measured/Not Analyzed
D. Lead = Dissolved Lead - Analysis by EPA Method 7421
QA = Quality Assurance/Trip Blank
MTCA = Model Toxics Control Act Cleanup Regulations [WAC 173-340-720(2)(a)(I), as amended 02/01]

* TOC in feet relative to an arbitrary datum.

** GWE has been corrected for the presence of SPH; correction factor: [(TOC - DTW) + (SPHT x 0.80)].

*** GWE has been corrected for the presence of SPH; correction factor: [(TOC - DTP - SPHT) + (SPHT x 0.80)]; Historical data has been altered to correct error in original reporting of depth to product as depth to water.

1 Total Petroleum Hydrocarbons (TPH) Modified EPA Method 8015 was detected at 46,400 ppb.

2 TPH Modified EPA Method 8015 was detected at 36,700 ppb.

3 TPH Modified EPA Method 8015 was detected at 76,700 ppb.

4 TPH Modified EPA Method 8015 was detected at 1,742,000 ppb.

5 TPH Modified EPA Method 8015 was detected at 38,900 ppb.

6 TPH Modified EPA Method 8015 was detected at 150,000 ppb.

7 TPH Modified EPA Method 8015 was ND.

8 Well obstructed at approximately 5.2 feet.

9 Well obstructed at approximately 4.5 feet.

10 Detection limit raised. Refer to analytical reports.

11 Laboratory report indicates sample appears to contain extractable diesel range organics.

12 Absorbent sock installed in well.

13 Replaced absorbent sock.

14 Laboratory report indicates detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

15 Laboratory report indicates detected hydrocarbons in the heavy/oil range appear to be due to overlap of diesel range hydrocarbons.

16 Laboratory report indicates detected hydrocarbons appear to be due to biogenic interference as well as weathered diesel; cleanup recommended.

17 Laboratory report indicates hydrocarbon pattern and range have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference, however, there is some heavily weathered diesel.

18 Laboratory report indicates detected hydrocarbons are mainly due to overlap from the gasoline range; however, there is some weathered diesel detected.

19 Absorbent sock present.

20 TPH-D and TPH-O with silica gel cleanup.

Table 2

Separate Phase Hydrocarbon Thickness/Removal Data

Former Chevron Bulk Terminal #1001351

1310 Highland Avenue

Bremerton, Washington

WELL ID	DATE	DTP (ft.)	DTW (ft.)	SPH THICKNESS (ft.)	AMOUNT BAILED (SPH + WATER) (gallons)
MW-14	03/28/02	6.80	6.83	0.03	0.00
	09/30/02	9.35	9.38	0.03	0.00
	03/07/03	7.58	7.60	0.02	0.00
	09/10/03	**9.35**	**9.37**	**0.02**	**0.00**
MW-15	09/30/02	8.84	8.87	0.03	0.00
	03/07/03	7.19	7.22	0.03	0.00
	09/10/03	**--**	**8.96**	**0.00**	**0.00**
MW-16	03/07/03	11.40	11.46	0.06	0.00
	09/10/03	**16.58**	**16.60**	**0.02**	**0.00**

EXPLANATIONS:

DTP = Depth to Product

DTW = Depth to Water

(ft.) = Feet

SPH = Separate Phase Hydrocarbons

Note: Historical data has been altered to correct error in original reporting of depth to product as depth to water.

ATTACHMENT - 3

Supplemental Environmental Site Assessment

Decommissioned Chevron Bulk Terminal
No. 61001351
1310 Highland Avenue
Bremerton, Washington

Prepared for

Chevron U.S.A. Products Company

March 10, 1994

Prepared by

Pacific Environmental Group, Inc.
4020 148th Avenue NE, Suite B
Redmond, Washington 98052

Project 520-041.01

PACIFIC
ENVIRONMENTAL
GROUP, INC.

TABLE 2
SOIL ANALYTICAL RESULTS
DECOMMISSIONED CHEVRON BULK TERMINAL 61001351
TPH as Gasoline-Method WTPH-G
TPH as Diesel and Oil-Method WTPH-D+extended
BTEX Compounds-Method 8020
Total Lead-Method 7420
Concentrations in mg/kg (ppm)

		PARAMETER							
Sample I.D.	Date	TPH-Gasoline	TPH-Diesel	TPH-Oil	Benzene	Toluene	Ethyl-benzene	Xylenes	Total Lead
MW-16 (20')	8/23/93	ND	ND	ND	ND	ND	ND	ND	ND
MW-17 (27')	8/24/93	ND	13	ND	ND	ND	ND	ND	8.2
MW-17 (30')	8/24/93	ND	ND	ND	ND	ND	ND	ND	ND
MW-18 (15.5')	8/25/93	ND	ND	ND	ND	ND	ND	ND	ND
MW-19 (13.5')	8/25/93	420	630	ND	ND	0.12	0.38	1.4	ND
MW-20 (11.5')	8/25/93	69	34	110	ND	0.26	0.24	0.42	26
MW-21 (10')	8/26/93	120	170	ND	0.43	2.2	1.8	12	ND
MW-22 (10')	8/26/93	1,300	11,000	ND	3.7	4.1	17	21	49
MW-23 (25.5')	9/13/93	ND	ND	ND	ND	ND	ND	ND	ND

(continued)

TABLE 2
SOIL ANALYTICAL RESULTS
DECOMMISSIONED CHEVRON BULK TERMINAL 61001351
TPH as Gasoline-Method WTPH-G
TPH as Diesel and Oil-Method WTPH-D+extended
BTEX Compounds-Method 8020
Total Lead-Method 7420
Concentrations in mg/kg (ppm)

		PARAMETER							
Sample I.D.	Date	TPH-Gasoline	TPH-Diesel	TPH-Oil	Benzene	Toluene	Ethyl-benzene	Xylenes	Total Lead
MW-23 (35')	9/13/93	ND	ND	ND	ND	ND	ND	ND	2.8
MW-23 (42')	9/14/93	ND	38	74	ND	ND	ND	ND	5.7
MW-24 (21.5')	9/13/93	ND	44	210	0.12	ND	ND	0.047	14
MW-24 (34')	9/14/93	ND	42	120	ND	ND	ND	ND	4.3
MTCA Method A Cleanup Level:	-	100.0	200.0	200.0	0.5	40.0	20.0	20.0	250.0
Reporting Limit:	-	5 - 7	10 - 13	40 - 49	0.027 - 0.033	0.027 - 0.033	0.027 - 0.033	0.027 - 0.033	1.5 - 6.2

NOTES: ND - Not Detected

3/8/94

TABLE 3
SOIL ANALYTICAL RESULTS
DECOMMISSIONED CHEVRON BULK TERMINAL # 61001351

Polynuclear Aromatic Hydrocarbons (PAHs) - EPA Method 8310
Concentrations in mg/kg (ppm)

		PARAMETER							
Sample I.D.	Date	Napthalene	1-Methyl-napthalene	2-Methyl-napthalene	Fluorene	Phenan-threne	Anthracene	Fluor-anthene	Pyrene
MW-23 (35')	9/13/93	ND	ND	ND	ND	ND	ND	ND	ND
MW-23 (42')	9/14/93	ND	ND	ND	ND	ND	ND	ND	ND
MW-24 (21.5')	9/13/93	ND	ND	ND	ND	ND	ND	ND	ND
MW-24 (34')	9/14/93	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limits:	-	0.083-0.11	0.17-0.22	0.17-0.22	0.017-0.022	0.0083-0.011	0.0083-0.011	0.017-0.022	0.017-0.022

NOTES: ND - Not Detected
Detected concentrations of PAHs are non-carcinogenic PAHs only.
See CARs for reporting limits for MW-22 (10') and for PAHs analyzed for not shown on this table.
The MTCA Method A cleanup level for total carcinogenic PAHs is 1 ppm.
Certified Analytical Results are attached

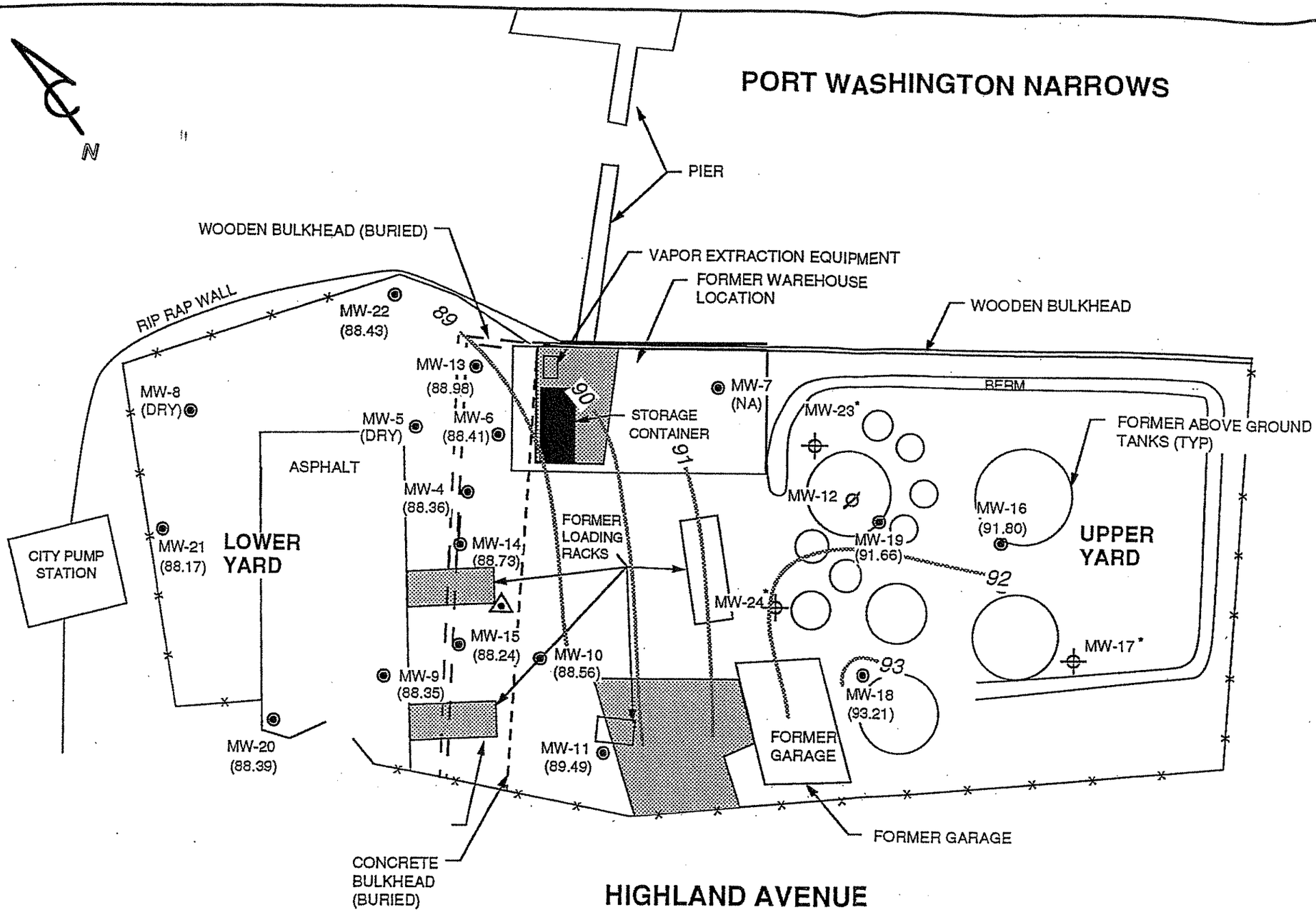
3/8/94

TABLE 3
SOIL ANALYTICAL RESULTS
DECOMMISSIONED CHEVRON BULK TERMINAL # 61001351

Polynuclear Aromatic Hydrocarbons (PAHs) - EPA Method 8310
Concentrations in mg/kg (ppm)

		PARAMETER							
Sample I.D.	Date	Napthalene	1-Methyl-napthalene	2-Methyl-napthalene	Fluorene	Phenan-threne	Anthracene	Fluor-anthene	Pyrene
MW-16 (20')	8/23/93	ND	ND	ND	ND	ND	ND	ND	ND
MW-17 (27')	8/24/93	ND	ND	ND	ND	ND	ND	ND	ND
MW-17 (30')	8/24/93	ND	ND	ND	ND	ND	ND	ND	ND
MW-18 (15.5')	8/25/93	ND	ND	ND	ND	ND	ND	ND	ND
MW-19 (13.5')	8/25/93	ND	2.7	0.27	0.76	1.2	ND	ND	ND
MW-20 (11.5')	8/25/93	ND	ND	ND	ND	ND	ND	ND	ND
MW-21 (10')	8/26/93	0.15	ND	0.31	0.031	0.075	0.013	0.14	0.087
MW-22 (10')	8/26/93	24	65	53	5.7	14	1.2	ND	2.2
MW-23 (25.5')	9/13/93	ND	ND	ND	ND	ND	ND	ND	ND

(continued)



LEGEND

- MW-4 ◉ GROUNDWATER MONITORING WELL CONSTUCTED IN FIRST WATER-BEARING UNIT LOCATION AND DESIGNATION
- MW-17 ⌖ GROUNDWATER MONITORING WELL CONSTRUCTEDDEEPER IN WATER-BEARING UNIT LOCATION AND DESIGNATION
- MW-12 Ø ABANDONED GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- (88.36) GROUNDWATER ELVATION IN FEET, PROJECT DATUM, 9-20-93
- (NA) WELL INACCESSIBLE, 9-20-93
- 91 GROUNDWATERELEVATION IN FEET, PROJECT DATUM, 9-20-93
- MW-17* DUE TO SCREENING PLACEMENT, THESE WELLS WERE NOT USED FOR CONTOURING
- AREAS OF CONCRETE PADS
- △ SURVEY BENCHMARK LOCATION, ARBITRARY ELEVATION = 100.00 FEET

PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE
0 40 80 FEET

DECOMMISSIONED CHEVRON BULK TERMINAL 61001351
1310 Highland Avenue
Bremerton, Washington

GROUNDWATER ELEVATION CONTOUR MAP - SHALLOW WATER BEARING UNIT

FIGURE: 3
PROJECT: 520-41.01

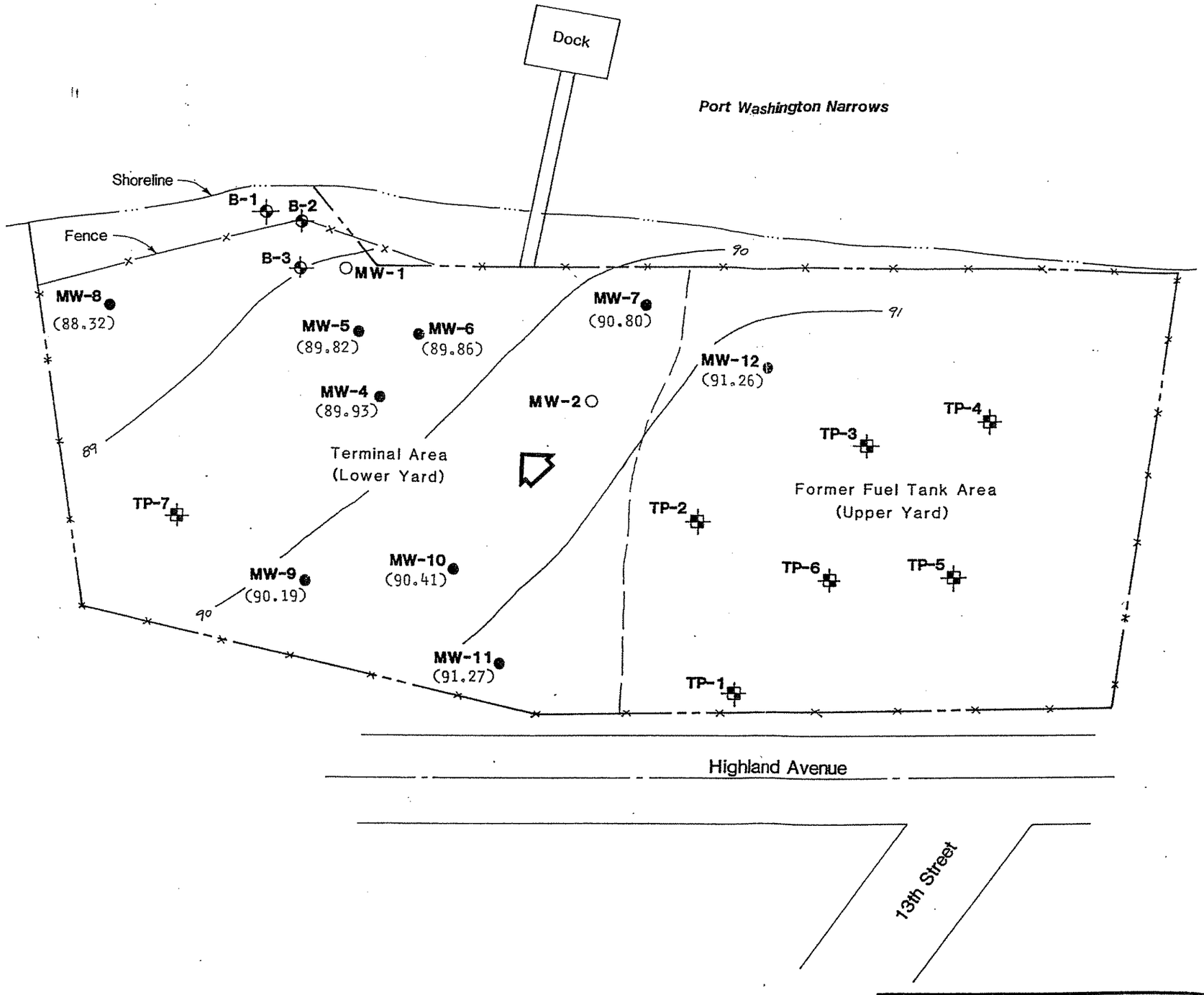
6100135

REPORT OF GEOTECHNICAL SERVICES
SUBSURFACE CONTAMINATION STUDY
CHEVRON BULK FUEL TERMINAL
BREMERTON, WASHINGTON
FOR CHEVRON, U.S.A.
FILE NO. 0372-34-4

TABLE 1

SUMMARY OF SOIL ANALYTICAL CHEMISTRY DATA

Location	Gasoline (ppm)	Diesel #1 (ppm)	Diesel #2 (ppm)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)
B-3	66	<10	<10				
MW-4	630	<10	100	<10	15,000	3,100	12,400
MW-5	4,300	17,000	<10	3,400	9,400	2,600	6,800
MW-6	230	71	<10	<10	8,700	2,300	10,500
MW-7	<1	<10	<10	<10	27	66	<10
MW-8	900	<10	200	<10	39,000	110,000	37,000
MW-9	<1	<10	<10	<10	<10	<10	29
MW-10	<1	<10	<10	<10	<10	<10	<10
MW-11	3	<10	480	<10	<10	<10	<10
MW-12	220	<10	210	<10	<10	<10	520
TP-1	250	<10	1,400	<10	<10	169	15
TP-2	31	<10	74	<10	<10	201	15
TP-3	81	<10	250	<10	<10	88	680
TP-4	<1	<10	<10	<1	<1	<1	<1
TP-5	<1	<10	<10	<1	<1	<1	<1
TP-6	4	<10	82	<10	<10	<10	41
TP-7	280	<10	47	<10	6,100	2,400	2,300



N

0 40 80

SCALE IN FEET

EXPLANATION:

- B-1 — BORING LOCATION AND NUMBER
- MW-4 — MONITOR WELL LOCATION AND NUMBER
- TP-1 — BACKHOE PIT LOCATION AND NUMBER
- (89.92) RELATIVE GROUND WATER ELEVATION ON 10/12/88
- GROUND WATER FLOW DIRECTION
- MW-1 — MONITOR WELL INSTALLED JULY, 1976 BY GEOENGINEERS
- 91 WATER TABLE ELEVATION CONTOURS BASED ON 10/12/88 MEASUREMENTS

REFERENCE: DRAWING ENTITLED "GROUND PLAN", DATED 10/16/70 REVISED, BY STANDARD OIL COMPANY OF CALIFORNIA.

GeoEngineers

SITE PLAN

FIGURE 2

0372-04-4 Land:KU 10-1-08

ATTACHMENT - 4

HARTCROWSER

Earth and Environmental Technologies

FACILITY NUMBER 6001351
GENERAL CORR.
SERVICE REQS./PROPOSALS
PERMITS/LICS
DRAWINGS/PHOTOS/NOTES
SPILL & LEAK REPORTS
LEGAL/EASEMENTS/LIC.
REPORTS X

Status Report
Interim Remedial Action
Vapor Extraction System
Chevron Former Bulk Terminal
Bremerton, Washington

Prepared for
Chevron U.S.A., Inc.

December 16, 1991
J-2365-01

Table 1 – Summary of Analytical Results for Soil Samples

Sample ID	Depth in Feet	EPA Method 8020 Benzene	Ethylbenzene	Toluene	Total Xylenes	EPA Method 8015 mod. Petroleum Hydrocarbons as gasoline	as diesel
		Concentration in mg/kg					
EX-2	7.5 to 9	ND	21	23	130	3800	ND
EX-3	7.5 to 9	0.16	1.6	1.6	11	250	310
EX-4	7.5 to 9	ND	38	33	190	3200	2200
EX-5	7.5 to 9	ND	28	17	180	660	1100
EX-6	7.5 to 9	1.4	ND	3.2	8.1	125	790
EX-7	7.5 to 9	ND	3.6 J	0.31 J	14 J	600	530
EX-8	7.5 to 9	ND	28 J	16 J	140 J	540	935
EX-9	7.5 to 9	51	200	570	1000	9663	ND
EX-10	6.5 to 8	ND	59	6.2	140	2400	9100
EX-11	7 to 8.5	0.65	39	14	210	7200	ND

ND – not detected above the laboratory detection limit, see attached Laboratory Certificates for specific limits
J – Estimated value; QA/QC review of laboratory data revealed problems in analysis, See Appendix B for explanation.
Sample locations are shown on Figures 2 and 3.
Chemical analysis was performed by Analytical Technologies, Inc., in Renton, Washington.

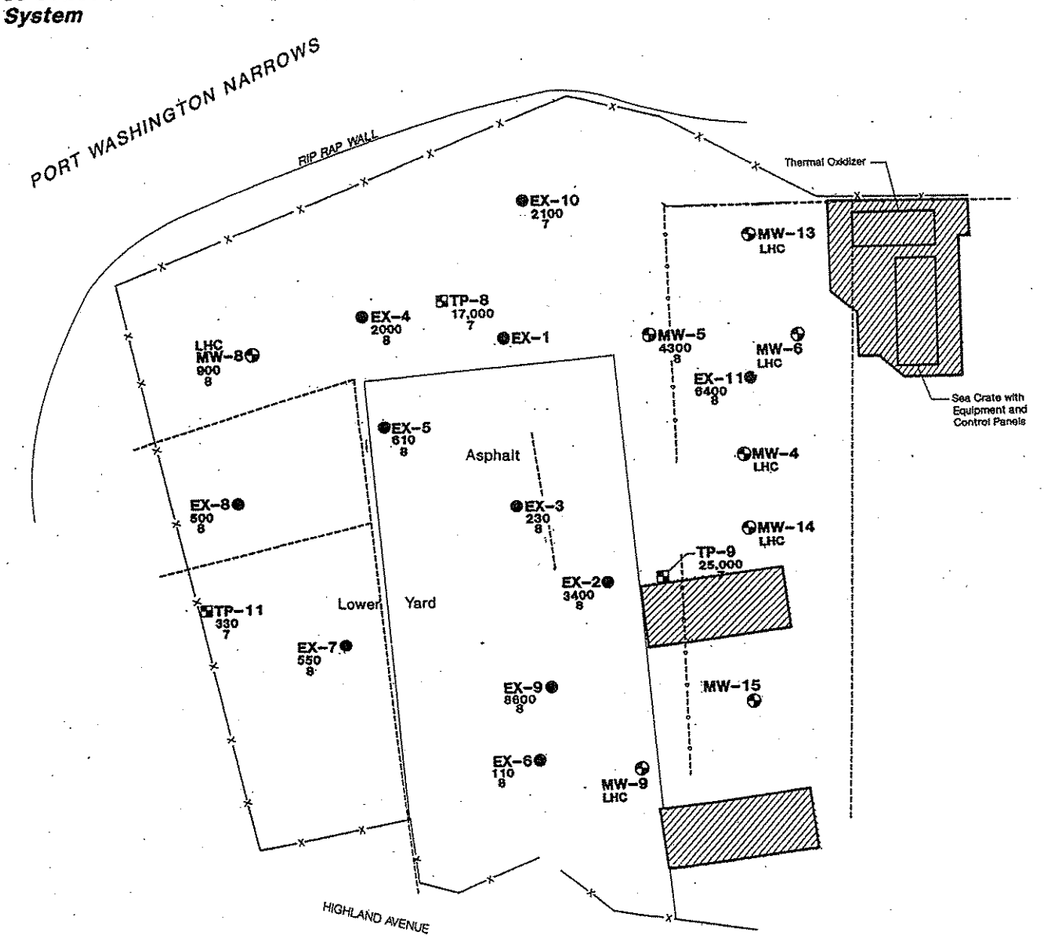
Table 2 - Summary of Vapor Extraction System Monitoring Parameters

Date of	Calculated Emissions in Pounds/day++				Percent LEL+				Percent Oxygen+		
Measurement	SP-1	SP-2	VP-1	SP1 & SP2	SP-1	SP-2	VP-1	SP-3	SP-1	SP-2	VP-1
11/07/90	365	3730		4095				43			
11/09/90	1580	10536		12116							
11/16/90	492	3802		4294				27			
11/27/90	143	105		248				31			
12/20/90	18	117		135				2			
12/27/90	0	265		265				22			
03/02/91	1	23		24		5	1	1	19.7	18.5	19.6
03/30/91	33	1217		1250	3	15	5	5	20.3	19.7	20.2
05/01/91	99	151	127	250	2	24	8	8	20.5	18.3	20.5
06/24/91	23	1024	960	1047	1	29	7	7	19.8	16.7	18.9
07/23/91	6	58	9	64	1	27	8	8	20.4	16.4	19.1
08/23/91	6	33	20	39	1	4	2	2	22.3*	20.6*	21.4*

* MSA 361 not calibrated properly for oxygen measurements.
+ Measurements made using a MSA 361 combustable gas monitor.
++ Samples collected using a charcoal collection tube (Appendix A) and analyzed using NIOSH Method 1500 (GC/FID).

Concentration of Gasoline – Range Petroleum Hydrocarbons in Soil

Soil Samples Collected between Depths of 6 Feet and Water Table Prior to Installation of Vapor Extraction System



MW-8	Monitoring Well Location and Number
EX-1	Extraction Well Location and Number
TP-8	Test Pit Location and Number (Hart Crowser 1989)
900	Petroleum Hydrocarbon Concentration in mg/kg as Gasoline in Soil (EPA Method 8015 Modified)
LHC	Liquid Hydrocarbon in Monitoring Well
8	Soil Sample Depth in Feet (Presented as Midpoint of Sample Interval)
	Concrete Bulkhead
	Wooden Bulkhead
	Concrete Pad

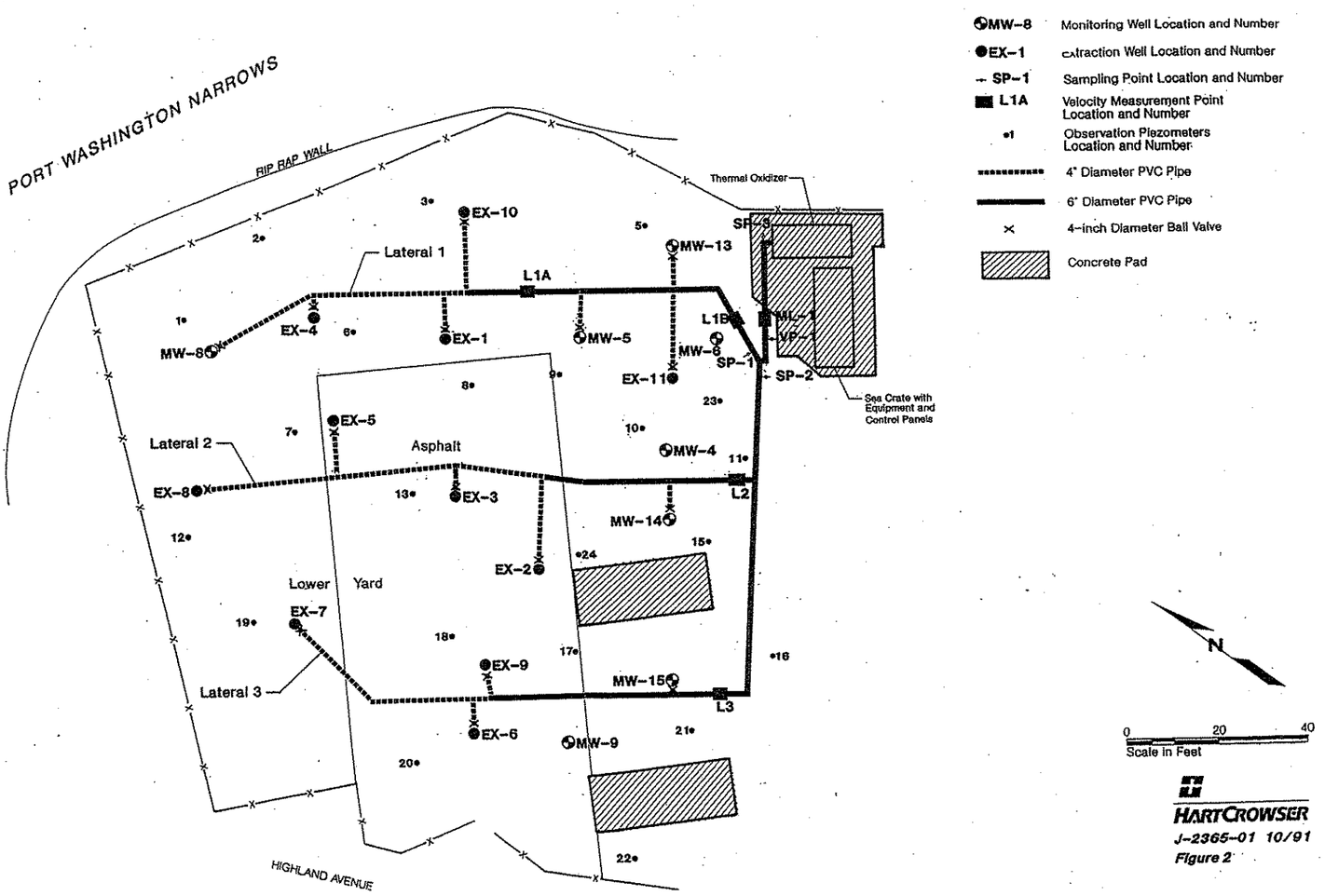
Note: All concrete and wooden bulkheads were encountered during excavation.

N

0 20 40
Scale in Feet

HARTCROWSER
J-2365-01 10/91
Figure 3

Vapor Extraction System Plan



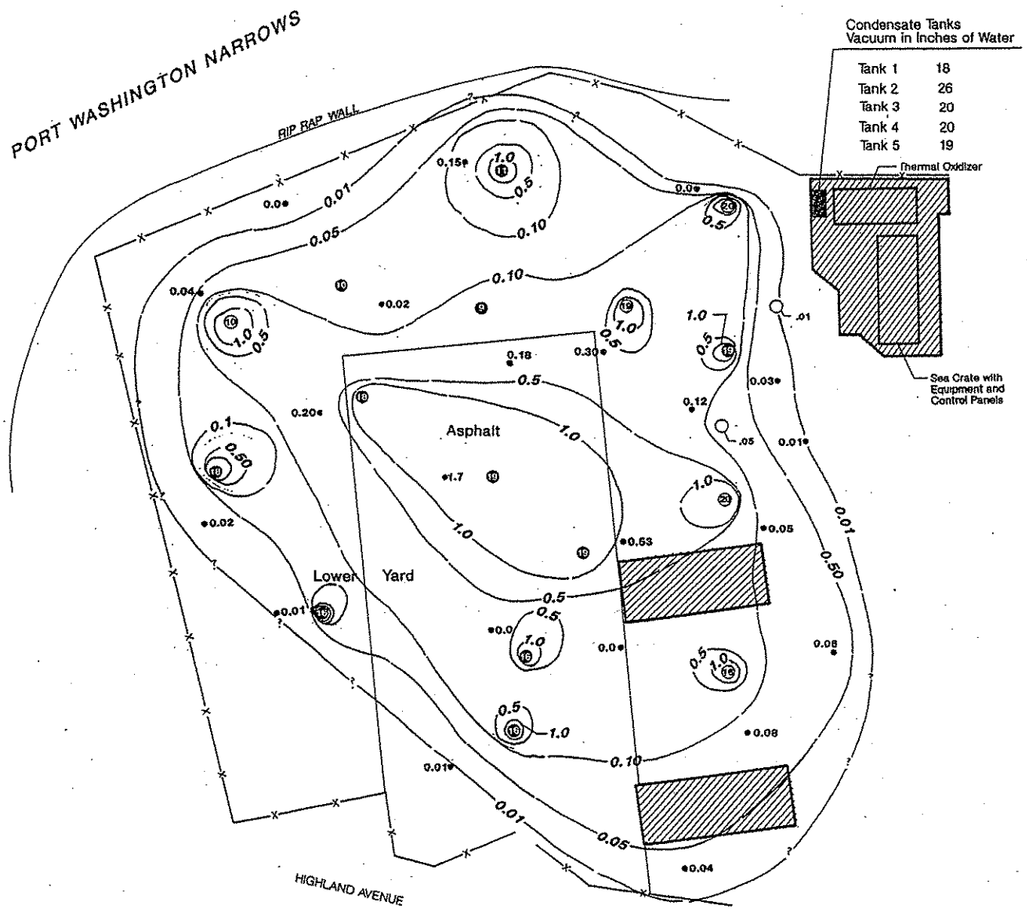
HARTCROWSER

J-2365-01 10/91

Figure 2

Contour Map of Equal Vacuum Measurements in Extraction Wells and Piezometers

Date of Measurements: June 25, 1991



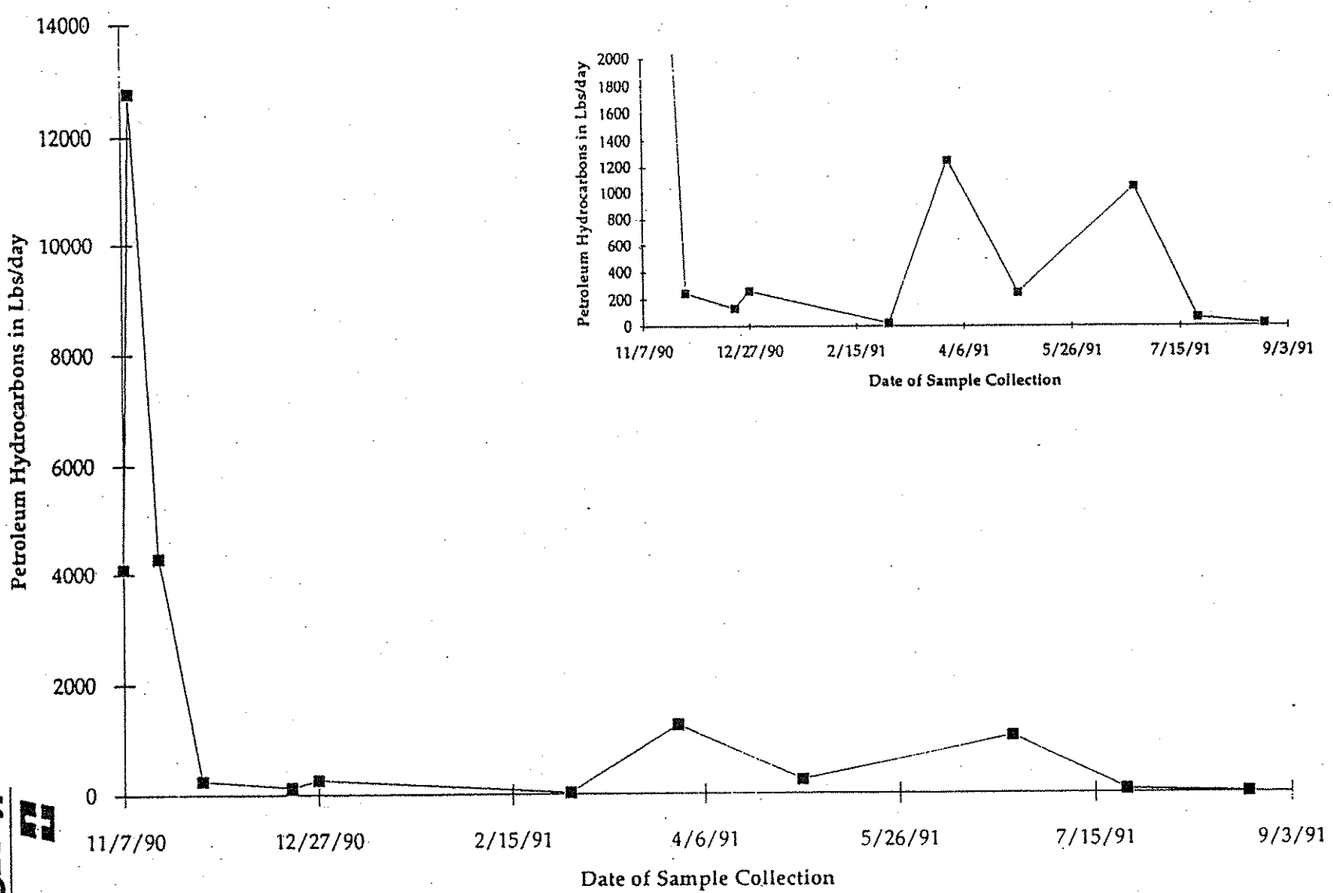
Notes: (1) Vacuum at extraction and monitoring well heads were measured by using a 0– to 100–inch water equivalent vacuum gauge.
(2) Vacuum at piezmeter was measured using an Alnor Velometer.
(3) Vacuum at the condensate tanks was measured by direct reading 0– to 100–inch water equivalent vacuum gauge dedicated to each tank.

N

0 20 40
Scale in Feet

HARTCROWSER
J–2365–01 10/91
Figure 4

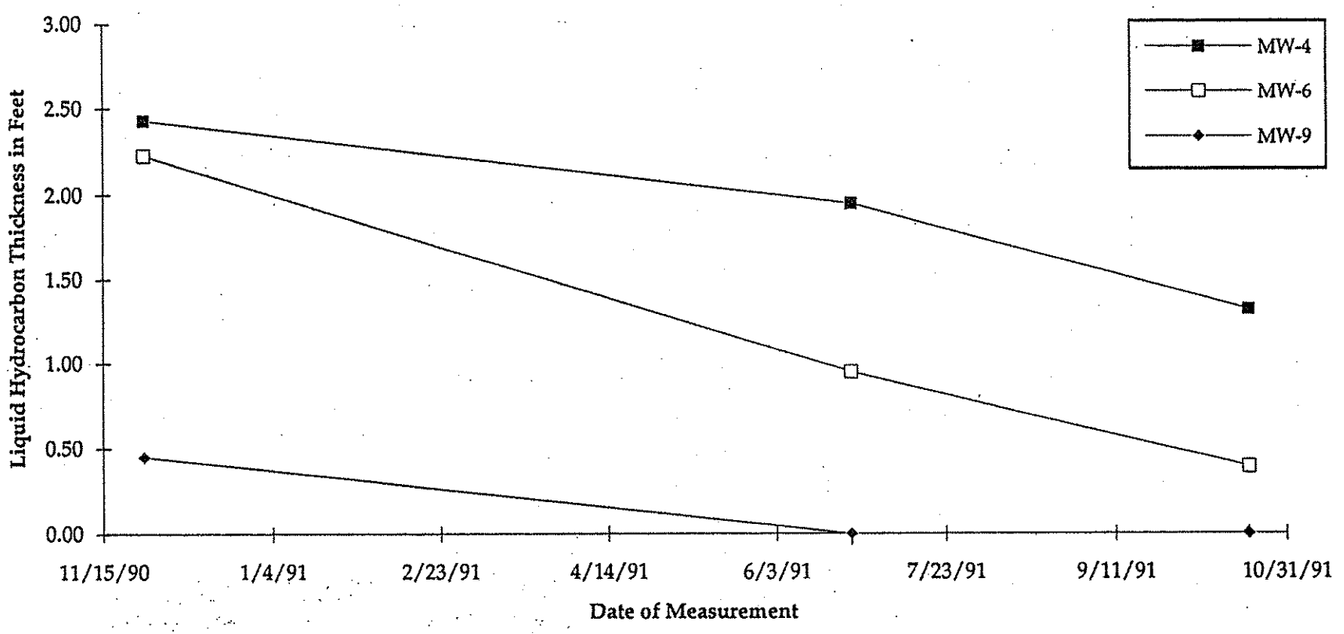
Volatile Petroleum Hydrocarbon Extraction Rates



Note: Pounds per day measurements presented in this graph were the total pounds per day extracted as calculated from charcoal tube samples collected in sampling ports SP-1 and SP-2 (See Table 2).

HARTCROWSER
J-2365-01 10/91
Figure 5

Liquid Hydrocarbon Thickness
Monitoring Wells MW-4, MW-6 and MW-9



HARTCROWSER
J-2365-01 10/91
Figure 6

ATTACHMENT - 5

SITE HAZARD ASSESSMENT

SUMMARY REPORT

FOR

CHEVRON TANK FARM

BREMERTON, WASHINGTON

JULY 1991

Prepared for:

Washington Department of Ecology
Mail Stop PU-7
Olympia, Washington 98504

Prepared By:

Parametrix, Inc.
13020 Northup Way
Bellevue, Washington 98005

&

SAIC
626 Columbia Street NW, Suite 1C
Olympia, Washington 98501

Contract Number: C0089006
Work Assignment No. 49

6.0 SAMPLING RESULTS AND DISCUSSION

6.1 Groundwater and Free Product Sampling Results

Semi-volatile organic compounds (carcinogenic and noncarcinogenic) were detected in the groundwater sample (monitoring well MW-4) at concentrations up to 152 parts-per-billion (ppb) (nitrobenzene) (Table 2).

The groundwater sample from MW-4 also contains 353 ppm total petroleum hydrocarbons (TPH, EPA Method 418.1), 5,660 ppb Benzene, 2,420 ppb Toluene, and 4,390 ppb Xylene (total). The free product sample from monitoring well MW-4 contains 90% diesel.

A water sample was not available from monitoring well MW-8 because of the lack of water in the well (see Section 4.1).

6.2 Sediment Sampling Results

Results from sediment sampling (SD-1, SD-2, and SD-3) are summarized in Table 3. As can be seen in this table, all compounds are below quantification limits, although concentrations of some compounds have been estimated (shown as a "J"). Laboratory data validation activities indicated that there were extremely low surrogate recoveries for all samples. The lab indicated that this was due to "matrix interferences". The lab did not elect to reanalyze or dilute these samples. Based on this information, it is not considered valid to attempt a comparison with sediment management standards. However, trends in the data are present. It is clear that at least the following compounds are present in the sediment samples:

- Acenaphthylene
- Fluorene
- Anthracene
- Fluoranthene
- Chrysene
- 2,6-Dinitrotoluene
- Di-n-Butyl Phthalate
- Bis(2-ethylhexyl) Phthalate
- Acenaphthene
- Phenanthrene
- 2-Methylnaphthalene
- Pyrene
- Dimethyl Phthalate
- Diethyl Phthalate
- Di-n-Octyl Phthalate
- Phenol

Based on the quantification limits utilized by the laboratory, it is expected that these compounds may be at or above the Marine Sediment Management Standards (WAC 173-204).

Sediment samples from the Chevron site also contain TPH (EPA Method 418.1) concentrations of 100, 145, and 412 ppm for SD-1, SD-2, and SD-3 respectively. Lead was also detected at concentrations of 11.3, 25.8, and 53.3 ppm for SD-1, SD-2, and SD-3 respectively. Xylene (total) was detected in SD-1 at 103 ppb and in SD-2 at 78 ppb.

Table 2.

Groundwater and Free Product
Semi-volatile and Volatile Organics, TPH, and Diesel Analysis Summary
Chevron Tank Farm, Bremerton, Washington

Analyte	Units	Sample Number	Carcinogen or Noncarcinogen[1]
Groundwater			
Semi-volatile Organics		MW-4	
Phenol	ug/L	24	NC
Bis(2-chloroethyl)ether	ug/L	22	C
4-Methylphenol	ug/L	34	UNK
Nitrobenzene	ug/L	152	NC
Isophorone	ug/L	22	NC
Bis(2-chloroethoxy)methane	ug/L	3 J	UNK
Naphthalene	ug/L	5 J	NC
4-Chloroanaline	ug/L	134	NC
4-Chloro-3-methylphenol	ug/L	22	UNK
2-Methylnaphthalene	ug/L	14	UNK
2-Nitroanaline	ug/L	4 J	UNK
Dimethylphthalate	ug/L	3 J	NC
Acenaphthylene	ug/L	6 J	NC
2,6-Dinitrotoluene	ug/L	9 J	C
3-Nitroanaline	ug/L	7 J	UNK
Acenaphthene	ug/L	5 J	NC
4-Nitrophenol	ug/L	11 J	UNK
Dibenzofuran	ug/L	2 J	NC
2,4-Dinitrotoluene	ug/L	15	C
Diethylphthalate	ug/L	3 J	NC
4-chlorophenyl-phenylether	ug/L	3 J	NC
Fluorene	ug/L	17	NC
N-Nitrosodiphenylamine	ug/L	3 J	C
4-Bromophenyl-phenylether	ug/L	3 J	UNK
Phenanthrene	ug/L	17	UNK
Anthracene	ug/L	17	NC
Di-n-butylphthalate	ug/L	4 J	NC
Fluoranthene	ug/L	5 J	NC
Pyrene	ug/L	9 J	NC
Bis(2-ethylhexyl)phthalate	ug/L	49	C

Table 2 continued.

Groundwater
Semi-volatile and Volatile Organics, TPH, and Diesel Analysis Summary
Chevron Tank Farm, Bremerton, Washington

Analyte	Units	Sample Number	Carcinogen or Noncarcinogen[1]
Groundwater			
Volatile Organics		MW-4	
Benzene	ug/L	5660	C
Toluene	ug/L	2420	NC
Xylene (total)	ug/L	4390	NC
TPH (418.1)	mg/L	353	UNK
Free Product			
Diesel	Percent	90	UNK

1 From the Health Effects Assessment Summary Tables, Third Quarter - FY-1990. U.S. Environmental Protection Agency, Washington, D.C. July 1990, as updated.

ug/L Micrograms per liter (parts-per-billion [ppb]).

NC Compound is a noncarcinogen.

C Compound is a carcinogen.

UNK Unknown whether compound is a carcinogen or a noncarcinogen.

J Indicates the compound was detected but at a level below the quantification limit. The number preceding J indicates the approximate concentration of the compound.

mg/L Milligrams per liter (parts-per-million [ppm]).

ATTACHMENT - 6

HARTCROWSER

Earth and Environmental Technologies

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
FAX 206.328.5581
206.324.9530

Phase I–Remediation Services
Bremerton Bulk Plant
Bremerton, Washington

Prepared for
Chevron U.S.A., Inc.

May 15, 1989
J-2365-01

water from MW-11 was predominantly fresh water with little or no salt water influence. This is consistent with a groundwater flow direction from the site toward the Port of Washington Narrows.

GROUNDWATER AND FREE PHASE HYDROCARBON LEVEL MEASUREMENTS - TASK 1.2

Measurements Taken

Groundwater and free phase hydrocarbon level measurements were made in all wells available on March 30, 1989. We observed that six out of nine wells had measurable free phase hydrocarbons. We then bailed off the hydrocarbons from four of the wells (MW-4, MW-6, MW-7, and MW-8) and measured groundwater levels and free phase hydrocarbon thicknesses again on April 4, 1989.

Our measurements are presented in Table 1. For comparison purposes, we have also included in Table 1 the groundwater level and product thickness measurements from the previous study in September and October 1988.

Table 1 - Water Levels and Free Phase Hydrocarbon Thickness

Date	9/88, 10/88 (GeoEngineers)			3/29, 3/30/89			4/4/89		
Well	Product Level	Water Level	Product Thickness	Product Level	Water Level	Product Thickness	Product Level	Water Level	Product Thickness
MW-4	9.64	10.99	1.35	8.81	12.76	3.95	8.54	12.56	4.02
MW-5		10.05			8.56			8.22	
MW-6		11.08		8.47	12.76	4.29	8.40	12.21	3.81
MW-7		9.93		7.83	8.36	0.53	7.33	7.64	0.31
MW-8	7.16	7.18	0.02	7.54	8.28	0.74	12.63	13.33	0.70
MW-9		9.88		6.93	8.34	1.41	7.24	8.74	1.50
MW-10		9.37			6.54			6.51	
MW-11		8.45			6.03			6.47	
MW-12		17.62		14.91	15.10	0.19	14.71	14.97	0.26

All measurements in feet; product level and water level measured as depth below top of casing.

Table 2 - Results of Chemical Analyses of Soils

Sample Number		Depth in Feet	Concentrations in ppm Fuel Hydrocarbons Gasoline	Diesel	TPH (418.1)
TP-8	S-2	2 to 4	58	ND	
	S-4	6 to 8	17,000	ND	
TP-9	S-2	2 to 4	760	5,800	
	S-4	6 to 8	25,000	ND	
TP-10	S-2	2 to 4	30	ND	
	S-4	6 to 8&	400	ND	
TP-11	S-2	2 to 4	ND	ND	
	S-4	6 to 8	330	1,100	
TP-12	S-2	2 to 4	ND	ND	
	S-4	6 to 8	ND	210	
TP-13	S-2	2 to 4			700
	S-4	6 to 8	757	ND	
TP-14	S-2	2 to 4	ND	ND	
	S-5	8 to 10	ND	ND	
TP-15	S-3	4 to 6			1,900
	S-4	6 to 8			30
TP-16	S-2	2 to 4			1,300
	S-4	6 to 8			3

ND = not detected in sample

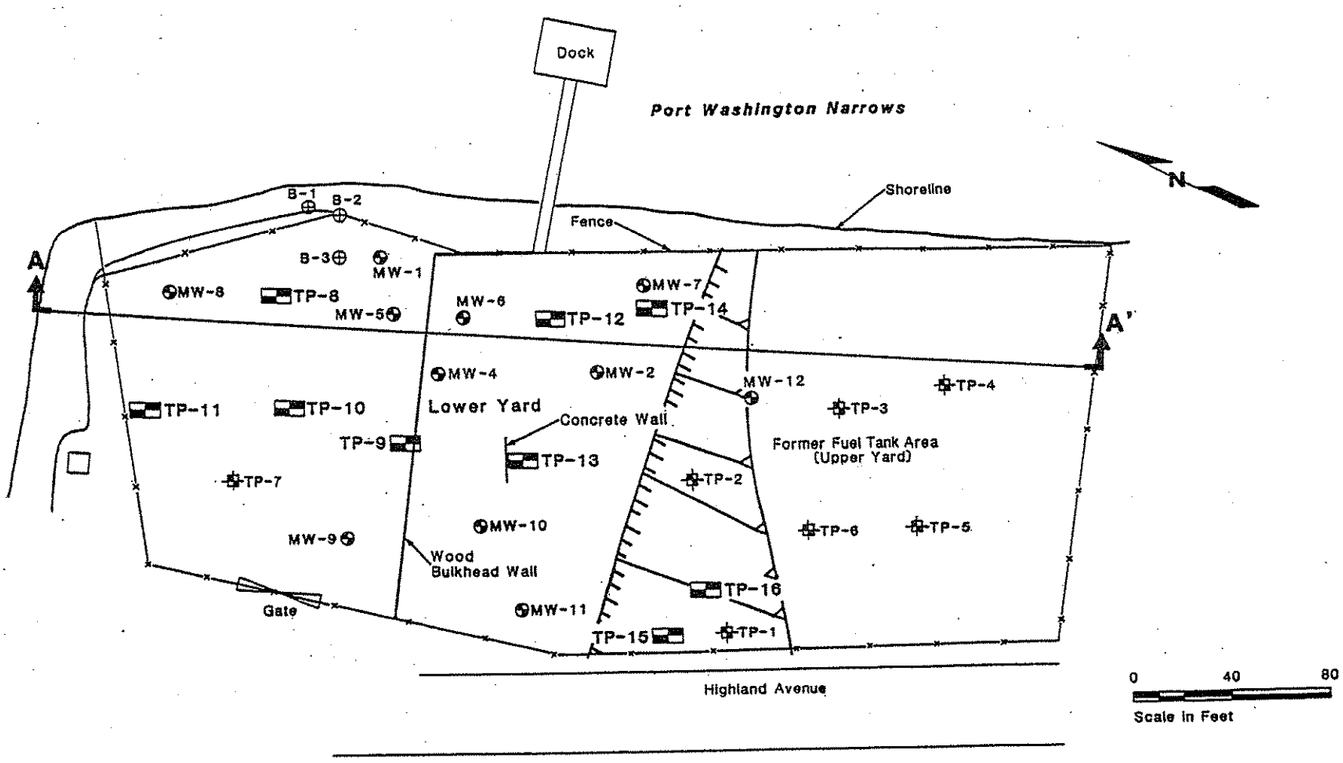
Soil hydrocarbon concentration results summarized. Soil hydrocarbon concentrations are summarized on Figure 5 for soils within 6 feet of the ground surface and on Figure 6 for deeper soils. Also included on these figures are the results of chemical analyses performed in the previous study.

Soil hydrocarbon concentration - upper yard. Soil hydrocarbon concentrations in the upper yard area appears to be:

- predominantly diesel fuel;
- generally restricted to a relatively small area around TP-1;
- less than 2,000 ppm concentration; and
- highest in the upper 6 feet of soil.

Soil hydrocarbon concentration - lower yard. Soil hydrocarbon concentration in the lower yard can be considered in two separate zones: shallow soils less than 6 feet deep, and deeper

Site and Exploration Plan



TP-11 Test Pit Location and Number (Current Study)

MW-1 Monitoring Well Location and Number (Previous Study)

B-1 Boring Location and Number (Previous Study)

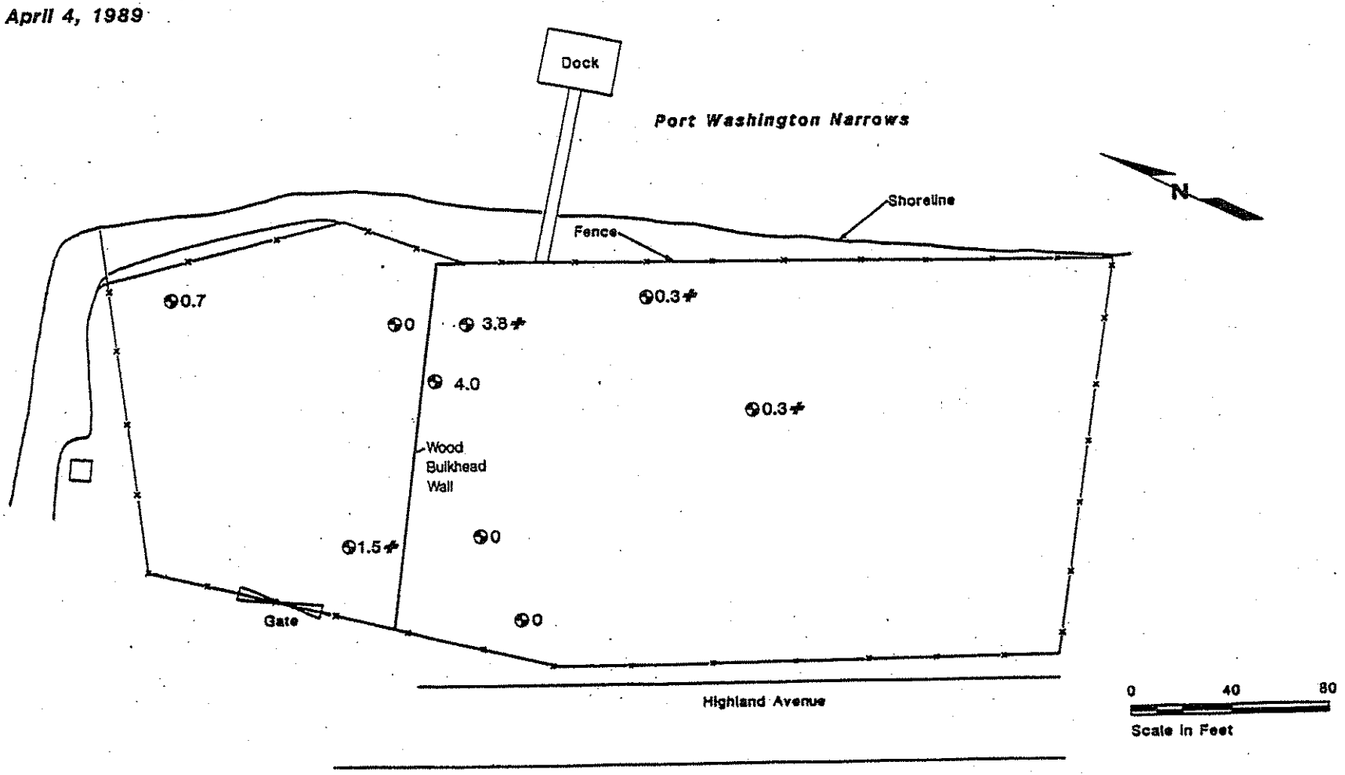
TP-1 Test Pit Location and Number (Previous Study)

A A' Geologic Cross Section Location and Designation

HARTCROWSER
J-2365-01 4/89
Figure 2

Free Phase Hydrocarbon Thickness Measurements

April 4, 1989



Monitoring Well Location

1.5 Free Phase Hydrocarbon Thickness in Feet Measured in Well

* Indicates Well Not Previously Reported to Contain Free Phase Hydrocarbon

HARTCROWSER

J-2365-01 4/89

Figure 4

ATTACHMENT - 7

REPORT OF GEOTECHNICAL SERVICES
SUBSURFACE CONTAMINATION STUDY
CHEVRON BULK FUEL TERMINAL
BREMERTON, WASHINGTON
FOR CHEVRON, U.S.A.
FILE NO. 0372-34-4

Geo Engineers

TABLE 1

SUMMARY OF SOIL ANALYTICAL CHEMISTRY DATA

Location	Gasoline (ppm)	Diesel #1 (ppm)	Diesel #2 (ppm)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)
B-3	66	<10	<10				
MW-4	630	<10	100	<10	15,000	3,100	12,400
MW-5	4,300	17,000	<10	3,400	9,400	2,600	6,800
MW-6	230	71	<10	<10	8,700	2,300	10,500
MW-7	<1	<10	<10	<10	27	66	<10
MW-8	900	<10	200	<10	39,000	110,000	37,000
MW-9	<1	<10	<10	<10	<10	<10	29
MW-10	<1	<10	<10	<10	<10	<10	<10
MW-11	3	<10	480	<10	<10	<10	<10
MW-12	220	<10	210	<10	<10	<10	520
TP-1	250	<10	1,400	<10	<10	169	15
TP-2	31	<10	74	<10	<10	201	15
TP-3	81	<10	250	<10	<10	88	680
TP-4	<1	<10	<10	<1	<1	<1	<1
TP-5	<1	<10	<10	<1	<1	<1	<1
TP-6	4	<10	82	<10	<10	<10	41
TP-7	280	<10	47	<10	6,100	2,400	2,300

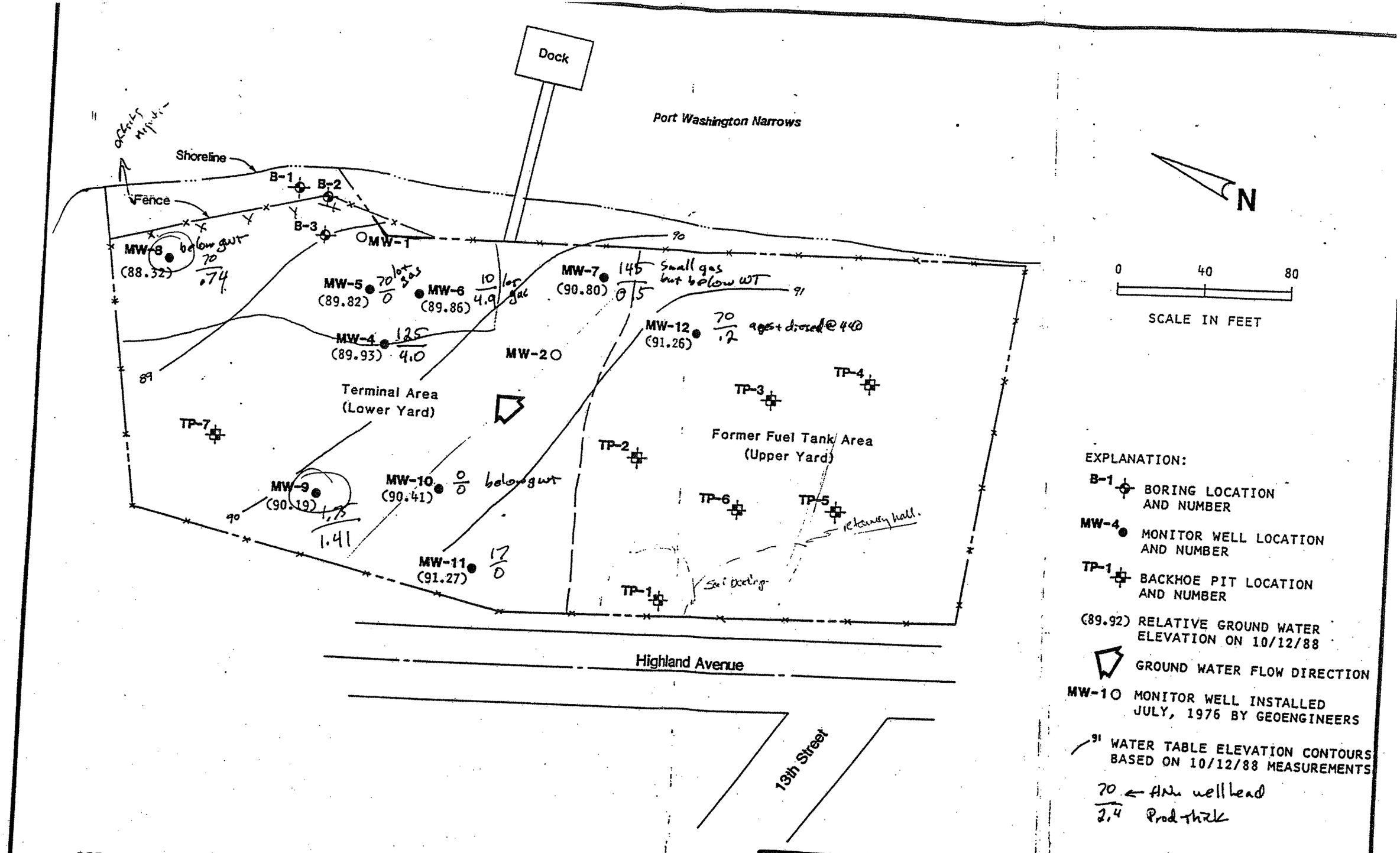
TABLE 2

SUMMARY OF GROUND WATER ANALYTICAL CHEMISTRY DATA

Location	Total Petroleum Hydrocarbons (ppm)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Total Xylenes (ppb)
MW-4	a.	<100	<100	3,600	23,000
MW-5	46.4	1,900	360	290	1,900
MW-6	36.7	2,000	1,500	150	4,300
MW-7	76.7	<1	<1	62	21
MW-8	1,742	3,900	19,000	2,900	18,000
MW-9	38.9	6,100	11,000	1,400	9,800
MW-10	150	<1	<1	350	110
MW-11	<10	<1	<1	<1	<1
MW-12	<10	<1	<1	11	<1

Notes:

a. Sample contained 75% naptha



REFERENCE: DRAWING ENTITLED "GROUND PLAN", DATED 10/16/70 REVISED, BY STANDARD OIL COMPANY OF CALIFORNIA.

GeoEngineers

SITE PLAN

FIGURE 2

8. Sediment Sampling Data Shall be Submitted to Ecology Using the SEDQUAL Data Entry Templates.

At a minimum, the following SEDQUAL data entry templates must be completed:

1. **Reference & Bibliography:** Describes lab reports and publications that relate to the data being entered;
2. **Survey:** Sample number;
3. **Station:** Specifies geographic location of the sediment sample. Sample latitude/longitude coordinates must be entered using the North American Datum of 1983 in U.S. Survey feet (NAD 83, U.S. feet);
4. **Sample:** Describes sample characteristics such as depth; and
5. **Sediment Chemistry:** Reports chemical concentration data in dry weight units.

The following additional templates must also be completed where these measurements/observations have been made:

1. **Bioassay:** Bioassay test results;
2. **Bioassay Control:** Bioassay control test results;
3. **Benthic Infauna:** Species abundance & diversity;
4. **Tissue:** Describes the organism collected;
5. **Bioaccumulation:** Reports tissue chemical concentrations; and
6. **Histopathology:** Reports tissue pathology such as tumors or lesions.

9. Electronic Data Formats Shall be Verified to be Compatible with SEDQUAL Prior to Submittal.

Because SEDQUAL uses ASCII protocol and comma delimited text files, data format verification shall be conducted prior to submittal to Ecology. Data shall be verified by downloading the SEDQUAL database, importing the data into the database, correcting errors, and then exporting the corrected templates.

For additional information on sediment sampling and analysis plan requirements, see Ecology publication 03-09-043 "Sediment Sampling and Analysis Plan Appendix", April, 2003. A copy of this document can be obtained from Ecology's publication office or downloaded from the following web site: http://www.ecy.wa.gov/biblio/0309043.html
Additional information on SEDQUAL can be found at:
http://www.ecy.wa.gov/programs/tcp/smu/sedqualfirst.htm. TCP's SEDQUAL Coordinator is also available for technical assistance to site managers and consultants using SEDQUAL.

10. Sediment Sampling Data Shall Also be Submitted to Ecology in a Printed Report.

Printed reports shall present the data in both dry weight and total organic carbon normalized units in data tables that compare the results to applicable state regulatory criteria.

submitter. These reports generally should not be reviewed until that information is provided. The assistant attorney general assigned to the site should be consulted in these situations.

3. Reports on Independent Remedial Actions Submitted for Review After October 1, 2005, Under Ecology's Voluntary Cleanup Program Shall Not be Reviewed Until the Data Have Been Submitted in Compliance with this Policy.

Such reports shall be deemed incomplete, and a notice to this effect provided to the submitter.

4. Grants, Contracts, Interagency Agreements or Memoranda of Understanding Issued After the Effective Date of this Policy Shall Include a Condition that Site-Specific Data be Submitted in Compliance with this Policy.

Reports on such work shall not be accepted as complete until the data have been submitted in compliance with this policy. If a payment or transfer of funds is involved in the transaction, the relevant payment or transfer shall be withheld until this requirement has been met.

Example language to include in these documents is attached in Appendix A.

5. Data Generated During Upland Investigations and Cleanups Shall be Submitted Electronically Using Ecology's Environmental Information Management System (EIM).

EIM is Ecology's main database for environmental monitoring data. Proper submission of data through this system meets the requirement of submitting such data in an electronic format. Electronic data shall be submitted to Ecology simultaneously with the accompanying printed report.

Additional information on EIM, including instructions for data submittal, can be found on Ecology's EIM web site at http://www.ecy.wa.gov/eim/. TCP's EIM Coordinator also is available for technical assistance to site managers and consultants using EIM.

6. Data Submitted Electronically Using EIM Shall be Checked by the Toxics Cleanup Program's EIM Coordinator Prior to Loading the Data into EIM.

Normally, notice that data have been submitted through EIM will come to TCP's EIM Coordinator. Upon receipt of such a notice the EIM Coordinator should notify the site manager. Similarly, if the Ecology site manager receives a notice of an EIM submittal, they should notify TCP's EIM Coordinator. Upon receipt of the data, TCP's EIM Coordinator reviews the submittal for quality control and officially loads the data into the system.

7. Data Generated During Sediment Investigations and Cleanups shall be Submitted Electronically Using Ecology's Sediment Quality Information System (SEDQUAL).

SEDQUAL is Ecology's data management system for sediment-related data. Proper submission of data through this system meets the requirement of submitting such data in an electronic format. Electronic data shall be submitted to Ecology simultaneously with the accompanying printed report.

Toxics Cleanup Program Policy

Policy 840

Resource Contact: Policy and Technical Support Staff *Effective* *August 1, 2005*
References. *WAC 173-340-840(5)* *Revised* *September 9, 2005*
http://www.ecy.wa.gov/eim/
http://www.ecy.wa.gov/programs/tcp/smu/sedqualfirst.htm
http://www.ecy.wa.gov/biblio/0309043.html
Replaces: Procedure 840

Policy 840: Data Submittal Requirements

Purpose: Contaminated site investigations and cleanups generate a large volume of environmental monitoring data that need to be properly managed to facilitate regulatory decisions and access to this data by site owners, consultants, and the general public. The purpose of this policy is to describe the requirements for submitting environmental monitoring data generated/collected during the investigation and cleanup of contaminated sites under the Model Toxics Control Act (MTCA) and the Sediment Management Standards.

Application: This policy applies to Ecology staff, potentially liable parties, prospective purchasers, state and local agencies, and Ecology contractors that investigate or manage the cleanup of contaminated sites.

1. Unless Otherwise Specified by Ecology, all Environmental Monitoring Data Generated during Contaminated Site Investigations and Cleanups shall be Required to be Submitted to Ecology in both a Written and Electronic Format.

Environmental monitoring data include biological, chemical, physical, and radiological data generated during site investigations and cleanups under the Model Toxics Control Act Cleanup Regulation (WAC 173-340) and the Sediment Management Standards (WAC 173-204).

Data generated/collected during site investigations and cleanups conducted under an order, agreed order or consent decree, permit, grant, loan, contract, interagency agreement, memorandum of understanding or during an independent remedial action, are considered environmental monitoring data under this policy.

Data generated/collected for non site-specific studies, site hazard assessments that result in no further action and initial site investigations are not considered environmental monitoring data under this policy.

2. Orders, Agreed Orders, Consent Decrees, or Permits Issued After the Effective Date of this Policy Shall Include a Condition that Site-Specific Data be Submitted in Compliance with this Policy.

Reports on such work that do not include documentation that the data have been submitted in compliance with this policy shall be deemed incomplete and a notice of such provided to the

EXHIBIT - D

CHEVRON BULK PLANT PORT WASHINGTON NARROWS SITE
APPLICABLE RELEVANT AND APPROPRIATE REQUIREMENTS

Chapter 70.105D (Model Toxics Control Act0, and Chapter 173-340 WAC (MTCA Regulations)

Chapter 173-204 WAC (Sediment Management Standards)

Chapter 173-XXX WAC (State Environmental Policy Act)

Chapter 90.48 RCW (State Water Pollution Control Act)

Chapter 70.105 RCW (Washington State Hazardous Waste Management Act), and Chapter 173-303 WAC (State Dangerous Waste Regulations)

Chapter 70.95 RCW (Solid Waste Management-Reduction and Recycling)

Chapter 173-201A WAC (Washington Surface Water Quality Standards)

Shoreline Management Act, Chapter 173-14-28 WAC

National Toxics Rule; 40 CFR 131.36.

Chapter 173-160 RCW (Minimum Standards for Construction and Maintenance of Wells)

Occupational Safety and Health Act (OSHA), 29 CFR Subpart 1910.120

Washington Industrial Safety and Health Act (WISHA)

EXHIBIT - C

Former Chevron Property
Cleanup Action Work Plan

DRAFT

Prepared for

City of Bremerton
3037 Olympus Drive
Bremerton, WA 98310

Prepared by

Parametrix
4660 Kitsap Way, Suite A
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T. 360.377.0014 F. 360.479.5961
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April 2012 | 233-1896-098

CITATION

Parametrix. 2012. Former Chevron Property Cleanup Action Work Plan. Prepared by Parametrix, Bremerton, Washington. April 2012.

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CERTIFICATION

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned.

DRAFT

_____

Prepared by Lara Linde, LG

_____

Checked by David Dinkuhn, P.E.

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2 Cleanup Levels

3 Proposed Initial Groundwater Sampling Program

4 Proposed Schedule

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KEY TERMS AND ABBREVIATIONS

ASTs	aboveground storage tanks
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CAP	Cleanup Action Plan
City	City of Bremerton
COCs	Contaminants of concern
DCAP	Draft Cleanup Action Plan
Ecology	Washington State Department of Ecology
HASP	Health and Safety Plan
IA	Interim Action
ICP	Institutional Controls Plan
LTGMP	Long-Term Groundwater Monitoring Plan
mg/kg	milligrams per kilogram
MTCA	Model Toxics Control Act
ORC	oxygen release compound
PAHs	Polycyclic aromatic hydrocarbons
RI/FS	Remedial Investigation/ Feasibility Study
Site	Former Chevron Property site
SMP	Soil Monitoring Plan
ug/L	Micrograms per liter
WAC	Washington Administrative Code

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1. INTRODUCTION

This Work Plan has been prepared as part of the Cleanup Action to be performed at the Former Chevron Property site (Site) located at 1310 Highland Avenue in Bremerton, Washington (Figure 1). Preparation of this Work Plan is a requirement of the site's Agreed Order (DE-07TCPHQ-5024) established between the Washington State Department of Ecology (Ecology) and the City of Bremerton (City). To date, the City has performed a Remedial Investigation/ Feasibility Study (RI/FS) and Interim Action at the site in order to address soil and groundwater contamination related to historical releases of petroleum products (Parametrix 2011).

1.1 PURPOSE

This Work Plan was completed per the Agreed Order and Washington Administrative Code (WAC) 173-340-380, Model Toxics Control Act (Ecology 2007). The purpose of the Work Plan is to present tasks to be performed at the site as part of a Cleanup Action. This plan also includes a general description of the documents required as part of cleanup actions developed under the RI/FS (Parametrix 2011). The Work Plan includes:

- A brief summary of RI/FS and Interim Action (IA) activities performed at the site.
- Requirements for development of planning documents including a Long-Term Groundwater Monitoring Plan, Soil Monitoring Plan and an Institutional Controls Plan.
- Requirements for securing a restrictive or environmental covenant for the site.
- A schedule for implementation of the Cleanup Action.

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2. SUMMARY OF SITE CONDITIONS

2.1 SITE DESCRIPTION AND HISTORY

The Former Chevron Property is a 1.4-acre waterfront property located adjacent to Evergreen Rotary Park on the Port Washington Narrows. The historical bulk fuel tank farm operated at the site from prior to 1946 until circa 1988 (Figure 2). Based on aerial photographs, the facility was expanded northward to its present boundaries between 1946 and 1963 (Figure 3) by the placement of fill in the intertidal zone. This filling created a relatively level "lower yard" area where commercial fueling operations were conducted. The site uplands or "upper yard" are the former location of the aboveground bulk fuel tanks (Figure 4). The majority of the site's shoreline is armored with concrete rubble or steel and wooden bulkheads.

Products handled at the tank farm consisted primarily of diesel and gasoline (Hart Crowser 1989). Fuel was offloaded from barges at a fueling pier in the Port Washington Narrows and pumped through piping to 12 aboveground storage tanks (ASTs) located in the upper yard. Fuel transfer likely occurred through underground piping as evidenced by observations made during the IA, when corroded steel piping was exposed in soil excavations conducted to remove hot spot soils in the lower yard. Leaks from this underground piping are the likely source of the majority of the subsurface contamination at the site. Fuel was loaded from the ASTs to tank trucks at four loading racks located in the lower yard. All aboveground structures were removed by the end of 1988 (GeoEngineers 1998).

Environmental work at the site began in 1988 following demolition of the bulk fuel facility (GeoEngineers 1988). Since this time, Parametrix has performed an Interim Action and an RI/FS report (Parametrix 2011).

2.2 SUMMARY OF ENVIRONMENTAL CONDITIONS

2.2.1 Existing Soil Conditions

Following the IA, residual contaminated soils with concentrations exceeding cleanup levels remain in some lower yard areas; however, residual concentrations are significantly reduced from pre-IA levels (Figures 5, 6, and 7). Contaminants that currently exceed cleanup levels in lower yard subsurface soils consist of:

- Gasoline (up to 1,000 milligrams per kilogram [mg/kg]).
- Benzene (up to 5.4 mg/kg).
- Ethylbenzene (up to 20 mg/kg).
- Total xylenes (up to 94 mg/kg).
- Polycyclic aromatic hydrocarbons (PAHs) (up to 2.7 mg/kg by toxicity equivalency method).

As described previously, all upper yard contaminated soils in excess of cleanup levels were removed during the IA.

2.2.2 Existing Groundwater Conditions

The approximate extent of groundwater contamination exceeding cleanup levels during remedial investigation sampling is shown on Figure 8. The most recent performance monitoring data is shown on Figure 9.

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The performance monitoring shows a generally decreasing trend in concentrations with two exceptions: MW-09R and MW-21R exhibited increasing concentrations in the second through fourth performance monitoring sampling events. Concentrations then decreased following the supplemental oxygen release compound (ORC) injection. The increasing concentrations are apparently due to residual gasoline contamination present in the soils within the vicinity of the wells. As the oxygen released by the ORC declined with time, the associated aerobic biodegradation also declined. Once aerobic respiration was no longer occurring, concentrations in groundwater increased to equilibrium levels associated with anaerobic conditions.

Evidence that aerobic respiration has occurred in the wells is demonstrated by elevated alkalinity and decreasing dissolved oxygen concentrations following both injection events. Evidence that anaerobic biodegradation is occurring is provided by elevated dissolved methane concentrations with associated negative oxidation reduction potential values (Table 1).

Testing was conducted for both total and dissolved lead during the sampling events; the only results that exceeded cleanup levels were total lead results from wells MW-09R, MW-20, and MW-21R (Table 1). In general, corresponding dissolved results did not exceed cleanup levels, indicating that the total results were biased high by the presence of suspended sediment. An exception is a single dissolved lead result from well MW-09R in August 2010, which slightly exceeded the cleanup level.

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3. CLEANUP REQUIREMENTS

3.1 INDICATOR HAZARDOUS SUBSTANCES

Contaminants of concern (COCs) at the site remaining in site soils consist of:

- Gasoline (up to 1,000 mg/kg).
- Benzene (up to 5.4 mg/kg).
- Ethylbenzene (up to 20 mg/kg).
- Total xylenes (up to 94 mg/kg).
- PAHs (up to 2.7 mg/kg by toxicity equivalency method).

COCs remaining in site groundwater consist of:

- Gasoline (up to 2,100 ug/L).
- Diesel (up to 1,300 ug/L).
- Benzene (up to 310 ug/L).

3.2 CLEANUP LEVELS

Applicable cleanup levels for the site were established in the RI/FS and IA work plan (Parametrix 2007) and consist of:

- Model Toxics Control Act (MTCA) Method A Soil Cleanup Levels for Unrestricted Land Use (WAC 173-340, Table 740-1).
- MTCA Method A Cleanup Levels for Groundwater (WAC 173-340, Table 720-1).
- MTCA Method A cleanup levels are listed in Table 2.

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4. SELECTED CLEANUP ACTION SCOPE OF WORK

IA activities performed at the site to date have resulted in a substantial reduction in contaminant mass. Natural attenuation is occurring at the site and should continue to reduce contaminant concentrations over time. Long-term groundwater monitoring will be performed to verify that natural attenuation is ongoing. It is anticipated that once groundwater concentrations reach cleanup levels at the point of compliance, groundwater monitoring will be discontinued. In addition to groundwater monitoring, institutional controls will be implemented to reduce exposure risk for contaminants remaining in site soil and groundwater.

The proposed future cleanup action scope of work for the site includes the following submittals:

- A Long-Term Groundwater Monitoring Plan (LTGMP) to monitor groundwater concentrations and to verify that natural attenuation is continuing to occur.
- Soil Monitoring Plan (SMP) should the City require removal of institutional controls to redevelop the site at a later date.
- An Institutional Controls Plan (ICP) to help ensure protection of human health and the environment.
- An environmental covenant to limit activities and land use of the site will be prepared as part of the ICP.

Each of these elements is described in further detail below.

4.1 LONG-TERM GROUNDWATER MONITORING PLAN

A detailed groundwater monitoring plan will be developed by the City and submitted to Ecology. A summary of the anticipated future groundwater monitoring plan is provided below. The monitoring plan shall include the following elements presented in WAC 173-340-820 (3):

- Purpose and objective(s).
- Organization and responsibilities.
- Identification and justification of location, frequency of sampling, and selected analytical parameters.
- Specific sampling and handling procedures including sample labeling and completion of chains-of-custody.
- Requirements for decontamination and investigation derived waste.
- Analytical requirements such as detection or quantitation limits and identification of selected analytical methods.
- Quality assurance plan.
- Data reporting and validation procedures.
- Site-specific health and safety plan.

A draft and final version of this plan will be submitted for Ecology review and approval before sampling begins.

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4.1.1 Summary of Plan

A brief summary of the work activities under the Long-term Groundwater Monitoring Plan to be completed has been included for reference.

- **Additional Well Installation** – An additional well will be installed to replace former well MW-20 at the location shown on Figure 9. Well MW-20R will be included in long-term monitoring to provide more complete coverage of downgradient groundwater conditions.
- **Groundwater Monitoring** – Groundwater monitoring will be conducted on a semi-annual basis in all 11 lower yard wells (MW-4R, MW-9R, MW-10R, MW-11, MW-13R, MR-20R, MW-21R, MW-22R, MW-25, MW-26R, and MW-27) for an initial period of 4 years. The semi-annual events will occur in the spring and fall to assess both wet and dry weather conditions. The three upper yard wells (MW-16R, MW-18R, and MW-19R) will not be monitored since COCs were not detected above cleanup levels in these wells during four consecutive rounds of monitoring (Table 1). All samples will be analyzed for gasoline; benzene, toluene, ethylbenzene, and total xylenes (BTEX); diesel, lube oil, field parameters; and natural attenuation parameters (Table 3). In addition, MW-9R will be analyzed for total and dissolved lead. Four quarterly groundwater monitoring events will be conducted during the fifth year. At the completion of each sampling event, a technical memorandum will be prepared and submitted presenting the groundwater results. A 5-year summary monitoring report will be prepared at the end of the initial 5-year monitoring period, which will include recommendations for any follow on monitoring. Recommendations may include proposed changes to the monitoring program such as a reduction in the total number of wells sampled or a reduction in the number of analytes. A proposed monitoring schedule is provided in Table 4. An updated site specific Health and Safety Plan (HASP) will developed as part of the field preparation for the long-term groundwater monitoring.

4.2 SOIL MONITORING PLAN

Although it is not anticipated, development of the site beyond what is currently planned could occur at a future date. Future development may require removal of proposed land use restrictions described in Section 4.3. Should this time come, the City will develop a Soil Monitoring Plan that will address cleanup of existing soil contamination and submit a draft and final plan for Ecology review and approval. The soil monitoring plan should include the following:

- Similar elements described in the Long Term Monitoring Plan in Section 4.1.
- Proposed site development requiring environmental restrictions to be removed.
- Proposed confirmation soil sampling methodology.
- Proposed reporting which supports removal of land use restrictions.

4.3 INSTITUTIONAL CONTROLS PLAN

WAC 173-340-360(2)(e) requires cleanup actions to use institutional controls to limit or prohibit activities that may interfere with the integrity of a cleanup action or that may result in exposure of hazardous substances at a site. They are required to ensure the continued protection of human health and the environment and the integrity of the cleanup. Institutional controls may include physical measures (such as fences), restrictions on the use of the property, maintenance requirements for engineering controls (e.g., maintenance of caps), education programs, and financial assurances.

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An Institutional Controls Plan will be developed by the City which will address the following:

- Existing institutional controls for the site, if any.
- Institutional controls or procedures to be implemented on the site including restrictive or environmental covenant.
- Timetable for establishment of new institutional controls or procedures.
- Identification of entity responsible for implementation, maintenance, and enforcement of selected institutional controls.
- Details on how protectiveness will be measured for each implemented institutional control.

A draft and final version of the Institutional Control Plan will be submitted for Ecology review and approval.

4.3.1 Restrictive Covenant

Land use restrictions are proposed for the site in which a restrictive covenant (or Ecology-approved equivalent such as an environmental covenant) will be executed by the City and recorded with the register of deeds for Kitsap County. At a minimum, the restrictive covenant will describe procedures to be followed during any future site excavation activities that could result in worker exposure or the transfer of contaminated soils to the ground surface. Such procedures shall include worker health and safety training requirements and contaminated soil management procedures. Use of site groundwater for any purpose will be prohibited. Future sites use shall be restricted to that of an outdoor recreational park. The restrictive covenant will also require that Ecology be notified of the City's intent to convey any interest in the site or to change land use from an outdoor recreational park to some other use. Final requirements for the restrictive covenant (or equivalent) will be negotiated by Ecology and the City.

4.4 SCHEDULE

Implementation of the Work Plan will begin upon Ecology approval. It is anticipated that the first plan elements (development of a Long Term Groundwater Monitoring Plan and the first quarter groundwater monitoring event) will occur during the summer 2012. A proposed project schedule is provided in Table 4.

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5. REFERENCES

Ecology. 2007. Model toxics control act cleanup regulations. Washington Administrative Code (WAC) 173-340. November 2007.

GeoEngineers. 1988. Report of geotechnical services, subsurface contamination study, Chevron Bulk Fuel Terminal, Bremerton, Washington. Prepared for Chevron U.S.A. November.

Hart Crowser. 1989. Summary of work accomplished to date and pending, former Chevron Bremerton Bulk Plant, Bremerton, Washington. Prepared for Chevron U.S.A., Inc., Seattle, Washington. November.

Parametrix. 2011. Former Chevron property remedial investigation/feasibility report. Prepared for The City of Bremerton. September.

Parametrix. 2007. Work plan for remedial investigation/feasibility study, interim action, and shoreline restoration former Chevron property, Bremerton, Washington. Prepared for the City of Bremerton. September.

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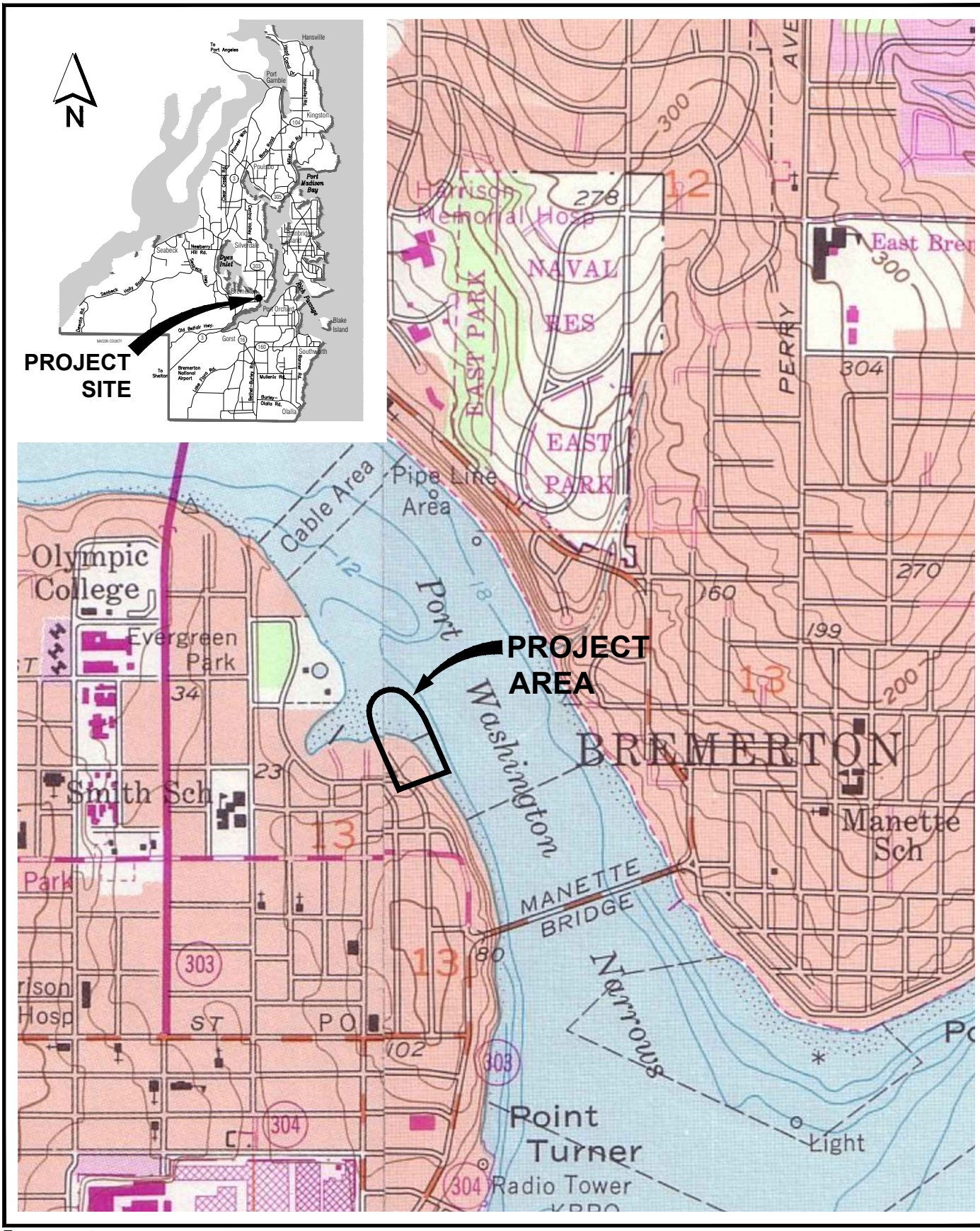
FIGURES



Parametrix DATE: Apr 13, 2012 FILE: BR1896063P04T1304 098 F01

Figure 1
Former Chevron Property
Cleanup Action Work Plan
Project Vicinity

Parametrix DATE: Apr 13, 2012 FILE: BR1896063P04T1304 098 F02

N

0

NO SCALE

Figure 2
Former Chevron Property
Cleanup Action Work Plan
1963 Aerial Photograph

Parametrix DATE: Apr 13, 2012 FILE: BR1896063P04T1304 098 F02

N

0

NO SCALE

Figure 3
Former Chevron Property
Cleanup Action Work Plan
CIRCA 2005 Aerial Photograph

C-4
C-2
C-1
PIER
A
Fig 1-8
C-6
C-6-S
C-11
C-12
C-8
C-8-S
BIOASSAY
SAMPLE
C-9
C-9-S
METAL
SHEETPILES
WOODEN
BULKHEAD
C-10
C-10-S
C-13
C-7
C-7-S
SEWER PUMP
STATION
MW 22
MW 13
MW 8
TP-8
MW 5
BURIED WOODEN
BULKHEAD
MW 6
FORMER
WAREHOUSE
PLATFORM
MW 7
TP-14
TP-12
LOWER YARD
C-3
C-5
MW 21
TP-10
TP-9
MW 4
TP-11
MW 14
MW 23
TP-4
MW 12
TP-3
UPPER YARD
MW 19
TP-13
FORMER
LOADING
RACKS
TP-7
TP-2
MW 16
MW 15
MW 9
MW 24
TP-6
TP-5
MW 10
FORMER
GARAGE
MW 20
MW 17
MW 18
TP-16
MW 11
TP-15
TP-1
TOWER PEDESTALS
FOOTBRIDGE
HIGHLAND AVE
PLUMBER'S
UNION HALL
13TH ST

NOTES

CONTOUR DATUM NAVD 88
LOCATIONS OF FORMER TANKS, PIPING AND BUILDINGS
FROM HART CROWSER DRAWING DATED 11/89

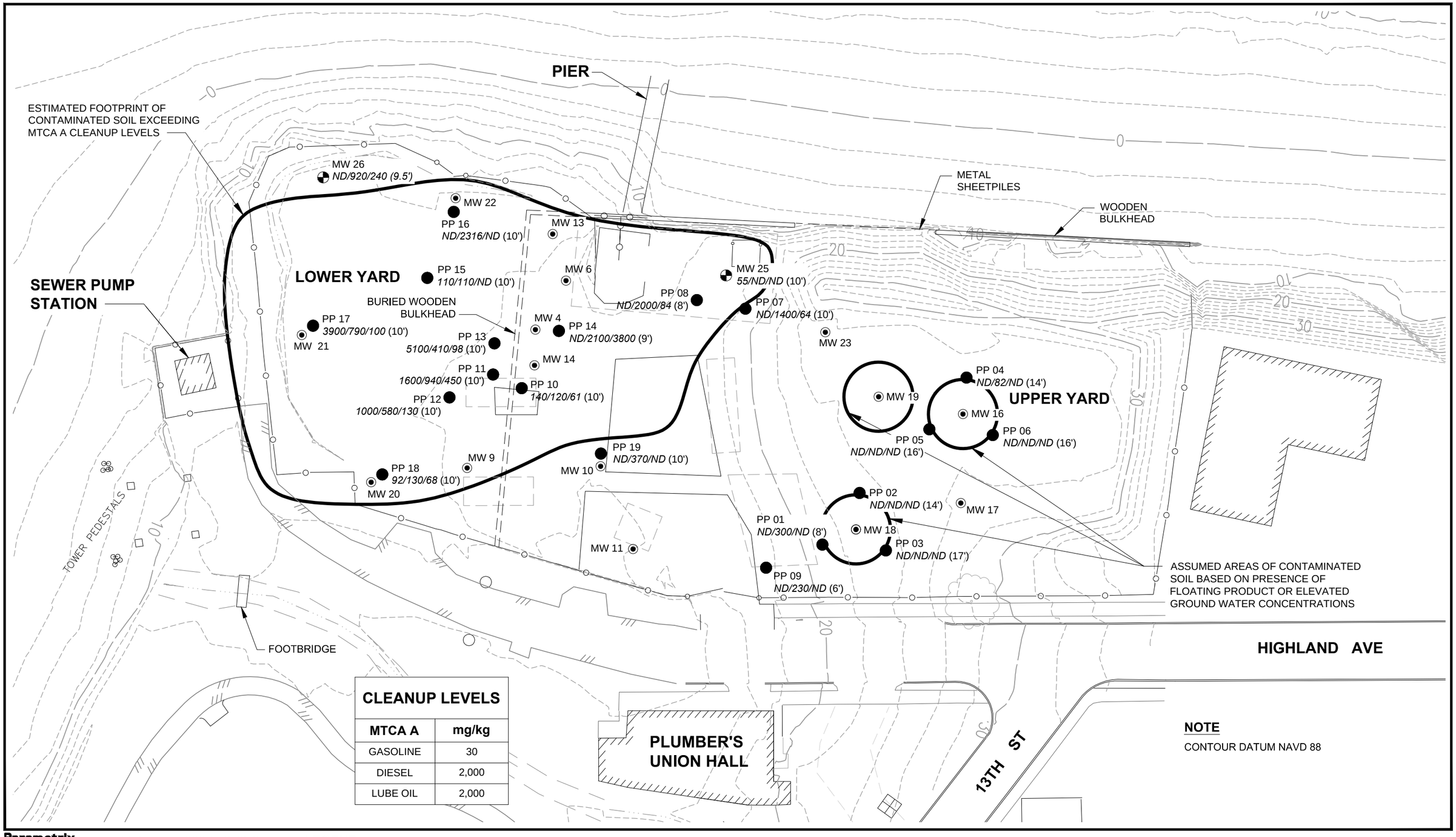
Parametrix DATE: Apr 13, 2012 FILE: BR1896063P04T1304 098 F04

N
0 50
SCALE IN FEET

LEGEND

- INTERTIDAL SEDIMENT SAMPLE
- SUBTIDAL SEDIMENT SAMPLE
- EXISTING MONITORING WELL
- TEST PIT , GEO ENGINEERS 1988
- TEST PIT, HART CROWSER 1989
- DESTROYED MONITORING WELL
- EXISTING CONCRETE PAD
- EXISTING BUILDING
- CHAIN LINK FENCE
- DRAINAGE DITCH
- FORMER PIPING/BUILDING/ LOADING RACK
- C-6 SURFACE SEDIMENT SAMPLE
- C-6-S SEDIMENT SAMPLE COLLECTED AT 2 FT DEPTH
- FORMER ABOVEBROUND STORAGE TANK
- GENERAL GROUNDWATER FLOW DIRECTION

Figure 4
Former Chevron Property
Cleanup Action Work Plan
Historical Site Features



CLEANUP LEVELS	
MTCA A	**mg/kg**
GASOLINE	30
DIESEL	2,000
LUBE OIL	2,000

Parametrix DATE: Apr 13, 2012 FILE: BR1896063P04T1304 098 F06

N

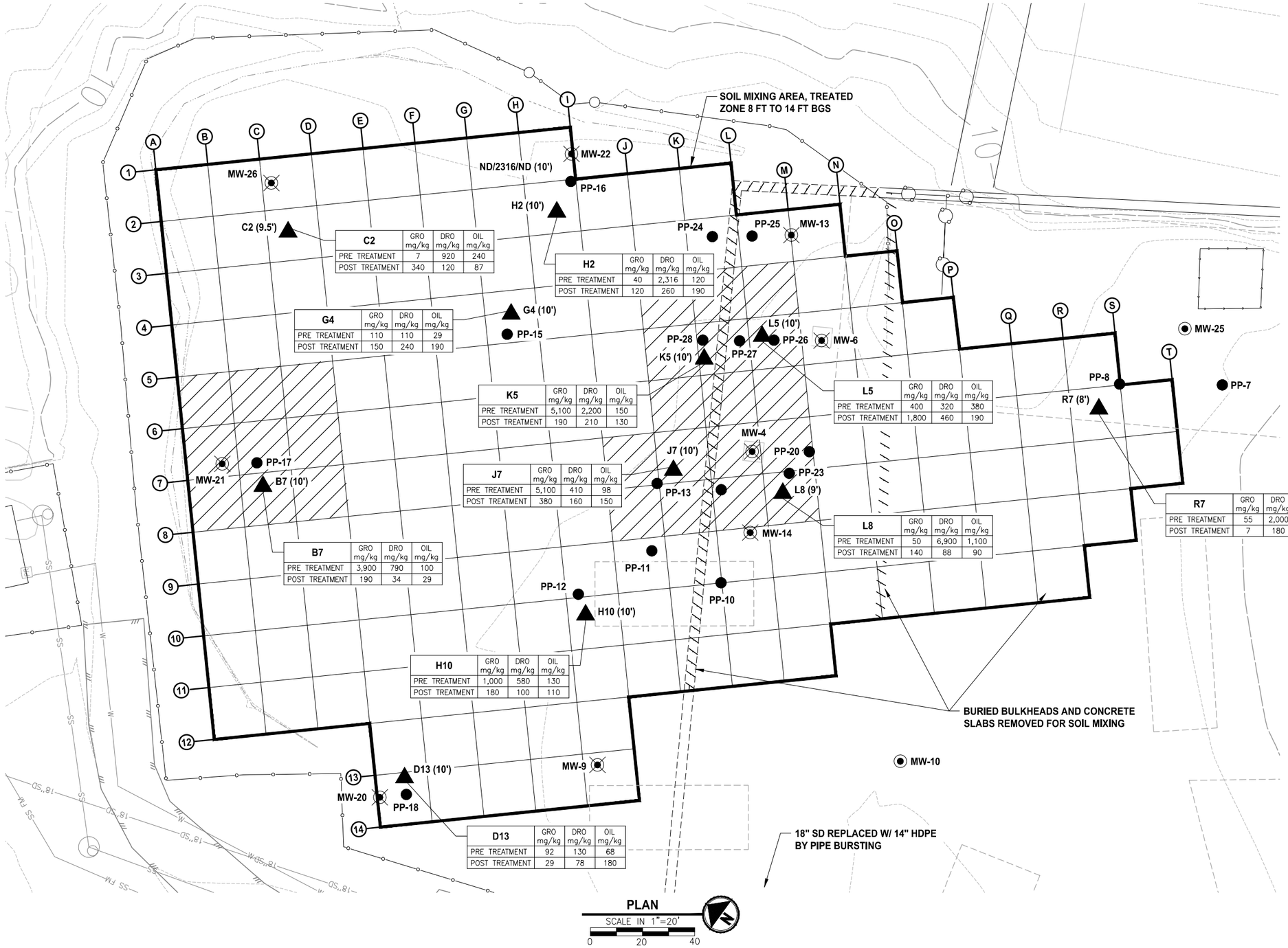
0 40

SCALE IN FEET

LEGEND

- EXISTING BUILDING
- CHAIN LINK FENCE
- DRAINAGE DITCH
- *ND* NOT DETECTED
- EXISTING MONITORING WELL
- NEW RI/FS PUSH PROBE
- RI/FS MONITORING WELL
- *ND/920/240* (9.5') RI/FS SOIL RESULTS FOR: *GASOLINE/DIESEL/LUBE OIL* (SAMPLE DEPTH) RESULTS IN mg/kg

Figure 5
Former Chevron Property
Cleanup Action Work Plan
RI/FS Subsurface Soil Sampling Locations



C2	GRO mg/kg	DRO mg/kg	OIL mg/kg
PRE TREATMENT	7	920	240
POST TREATMENT	340	120	87

H2	GRO mg/kg	DRO mg/kg	OIL mg/kg
PRE TREATMENT	40	2,316	120
POST TREATMENT	120	260	190

G4	GRO mg/kg	DRO mg/kg	OIL mg/kg
PRE TREATMENT	110	110	29
POST TREATMENT	150	240	190

K5	GRO mg/kg	DRO mg/kg	OIL mg/kg
PRE TREATMENT	5,100	2,200	150
POST TREATMENT	190	210	130

L5	GRO mg/kg	DRO mg/kg	OIL mg/kg
PRE TREATMENT	400	320	380
POST TREATMENT	1,800	460	190

J7	GRO mg/kg	DRO mg/kg	OIL mg/kg
PRE TREATMENT	5,100	410	98
POST TREATMENT	380	160	150

L8	GRO mg/kg	DRO mg/kg	OIL mg/kg
PRE TREATMENT	50	6,900	1,100
POST TREATMENT	140	88	90

R7	GRO mg/kg	DRO mg/kg	OIL mg/kg
PRE TREATMENT	55	2,000	98
POST TREATMENT	7	180	150

B7	GRO mg/kg	DRO mg/kg	OIL mg/kg
PRE TREATMENT	3,900	790	100
POST TREATMENT	190	34	29

H10	GRO mg/kg	DRO mg/kg	OIL mg/kg
PRE TREATMENT	1,000	580	130
POST TREATMENT	180	100	110

D13	GRO mg/kg	DRO mg/kg	OIL mg/kg
PRE TREATMENT	92	130	68
POST TREATMENT	29	78	180

LEGEND

PP-11 ●	RI/FS PUSH-PROBE LOCATION
MW-10 ◉	EXISTING MONITORING WELL
B7(10') ▲	CONFIRMATION SAMPLE LOCATION AND DEPTH
▭	TREATMENT CELL-BASLINE DOSE (10LB/CY REGENOX)
▨	AGGRESSIVE DOSE TREATMENT AREA (20LB/CY REGENOX)
⊗	MONITORING WELL REMOVED FOR SOIL MIXING
GRO	GASOLINE RANGE ORGANICS
DRO	DIESEL RANGE ORGANICS
OIL	LUBE OIL RANGE ORGANICS
mg/kg	MILLIGRAMS PER KILOGRAM
400	SAMPLE RESULT IN mg/kg

CLEANUP LEVELS	
MTCA A	mg/kg
GASOLINE	30
DIESEL	2,000
LUBE OIL	2,000

PLAN
SCALE IN 1"=20'
0 20 40

REVISIONS NO.	DESCRIPTION	DATE	BY

ENGINEER STAMP

0 1" 2"
TWO INCHES AT FULL SCALE
IF NOT SCALE ACCORDINGLY

SCALE
HORIZ. 1"=10' VERT. N/A

FIELD BOOK

DRAWING NO. 2

CITY OF BREMERTON
DEPARTMENT OF PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

DRAWN BY: JLP DATE 4/10
DESIGN BY: DLD WASH. P.E. # DATE 4/10
CHECKED BY: WASH. P.E. # DATE

FORMER CHEVRON PROPERTY
CLEANUP ACTION WORK PLAN
INTERIM ACTION SOIL MIXING AREA AND CONFIRMATION SAMPLE RESULTS

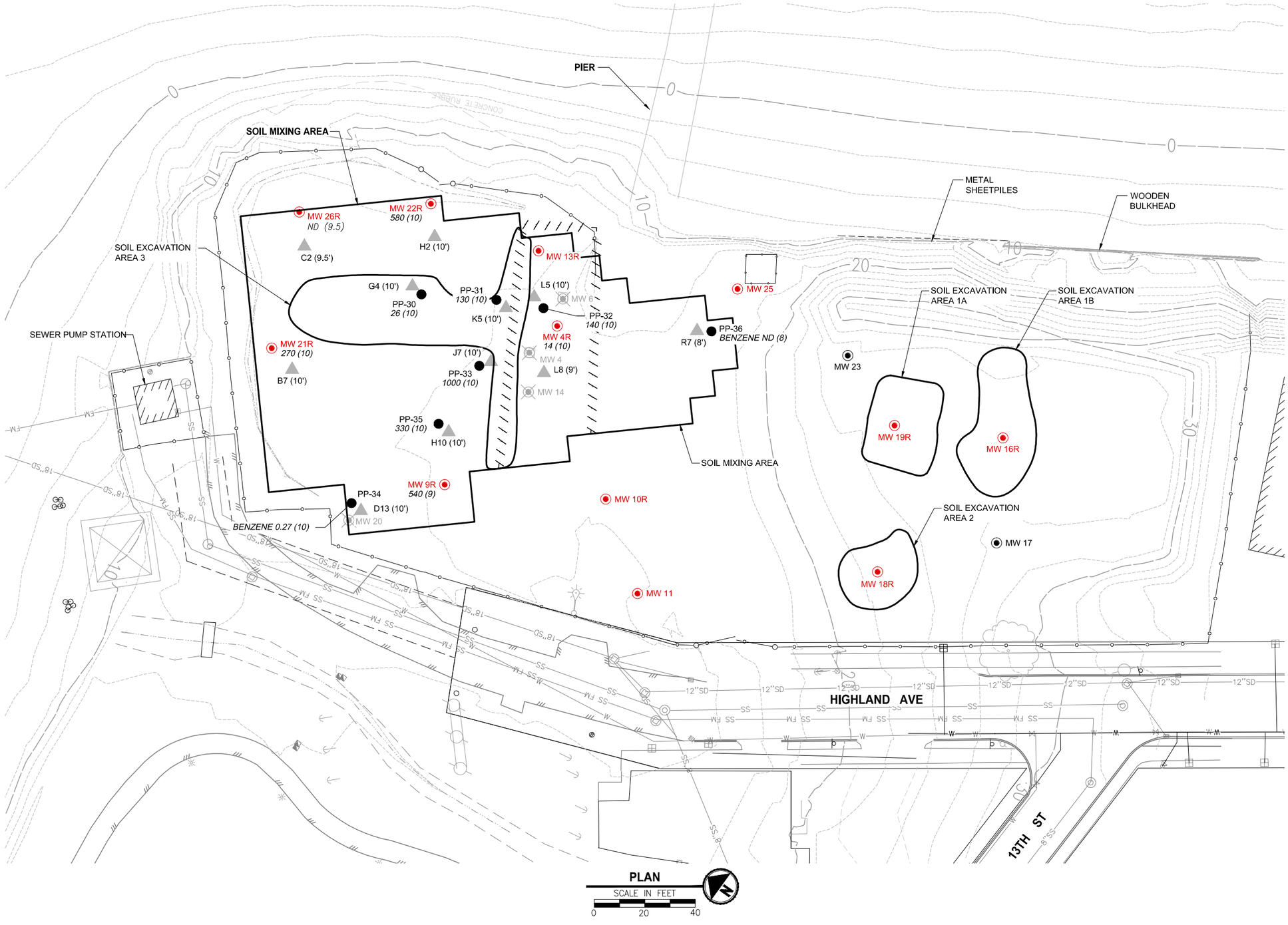
FIG. NO. 6

PN: 255-1896-063

SHEET 1 OF 1

BREMERTON BOARDWALK PROJECT

FILE: BR189606JP0471304 G98 F09
DATE: Apr 13, 2012 - 9:11am PLOTTED BY: rasmuste
IMAGES: Chevron Property FIG1 |
XREFS: XB-BREM_WTRFRNT-BA-SV-061201 | XBR189606JP0471301F-BA



LEGEND

——o——	EXISTING CHAIN LINK FENCE
◉	EXISTING MONITORING WELL
H2 (10') ▲	SOIL MIXING AREA CONFIRMATION SOIL SAMPLE LOCATION (DEPTH)
●	PUSH-PROBE LOCATION
▭	SOIL EXCAVATION AREA
MW 14 ⊗	WELL DESTROYED DURING INTERIM ACTION
MW 19R ◉	WELL INCLUDED IN CONFIRMATION SAMPLING PROGRAM
R	INDICATES REPLACEMENT WELL INSTALLED FOR POST TREATMENT GROUNDWATER MONITORING
540	GASOLINE OR BENZENE CONCENTRATION IN mg/kg
ND	NOT DETECTED
mg/kg	MILLIGRAMS PER KILOGRAM
(6)	SAMPLE DEPTH IN FEET

GENERAL NOTES:

1. CONTOUR DATUM NAVD 88

CLEANUP LEVELS	
MTCA A	**mg/kg**
GASOLINE	30
BENZENE	0.03

REVISIONS NO.	DESCRIPTION	DATE	BY

ENGINEER STAMP

0 1" 2"
TWO INCHES AT FULL SCALE
IF NOT SCALE ACCORDINGLY

SCALE
HORIZ. 1"=20' VERT. N/A

FIELD BOOK

DRAWING NO. 3

CITY OF BREMERTON
DEPARTMENT OF PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

DRAWN BY: JLP DATE 4/10
DESIGN BY: DLD WASH. P.E. # DATE 4/10
CHECKED BY: WASH. P.E. # DATE

FORMER CHEVRON PROPERTY
CLEANUP ACTION WORK PLAN
INTERIM ACTION WELL LOCATION PLAN AND 6-MONTH POST TREATMENT SOIL RESULTS

FIG. NO. 7

PN: 255-1896-063

SHEET 1 OF 1

BREMERTON BOARDWALK PROJECT

FILE: BR189606JP0411304 098 F10
DATE: Apr 13, 2012 – 9:13am PLOTTED BY: rasmuste
IMAGES:
XREFS: XB-BREM_WTRFRNT-BA-SV-061201 | XB-BREM_WTRFRNT-BA-SV-061201

PIER

ESTIMATED CONTAMINATED GROUNDWATER PLUME EXCEEDING MTCA A CLEANUP LEVELS

METAL SHEETPILES

WOODEN BULKHEAD

MW 22
ND/ND/ND (7.9')

MW 26
1300/1300/ND (9.0')

MW 13

MW 6

MW 25
1600/1200/ND (8.3')

LOWER YARD

SEWER PUMP STATION

BURIED WOODEN BULKHEAD

MW 4
5400/27000/2300 (12')
(SAMPLE HIGHLY TURBID)

MW 21
9200/1700/ND (8.9')

MW 14

MW 23
530/ND/ND (20.5')

MW 19
ND/8100/ND (10.9')

UPPER YARD

MW 16

MW 20
ND/ND/ND (7.5')

MW 9

MW 10
ND/160,000/ND (8.4')

MW 17

MW 18

MW 11
ND/270/ND (6.9')

TOWER PEDESTALS

FOOTBRIDGE

HIGHLAND AVE

13TH ST

PLUMBER'S UNION HALL

CLEANUP LEVELS	
MTCA A	**ug/L**
GASOLINE	800
DIESEL	500
LUBE OIL	500

NOTE

CONTOUR DATUM NAVD 88

Parametrix DATE: Apr 13, 2012 FILE: BR1896063P04T1304 098 F07

N

0 40

SCALE IN FEET

LEGEND

EXISTING BUILDING

CHAIN LINK FENCE

DRAINAGE DITCH

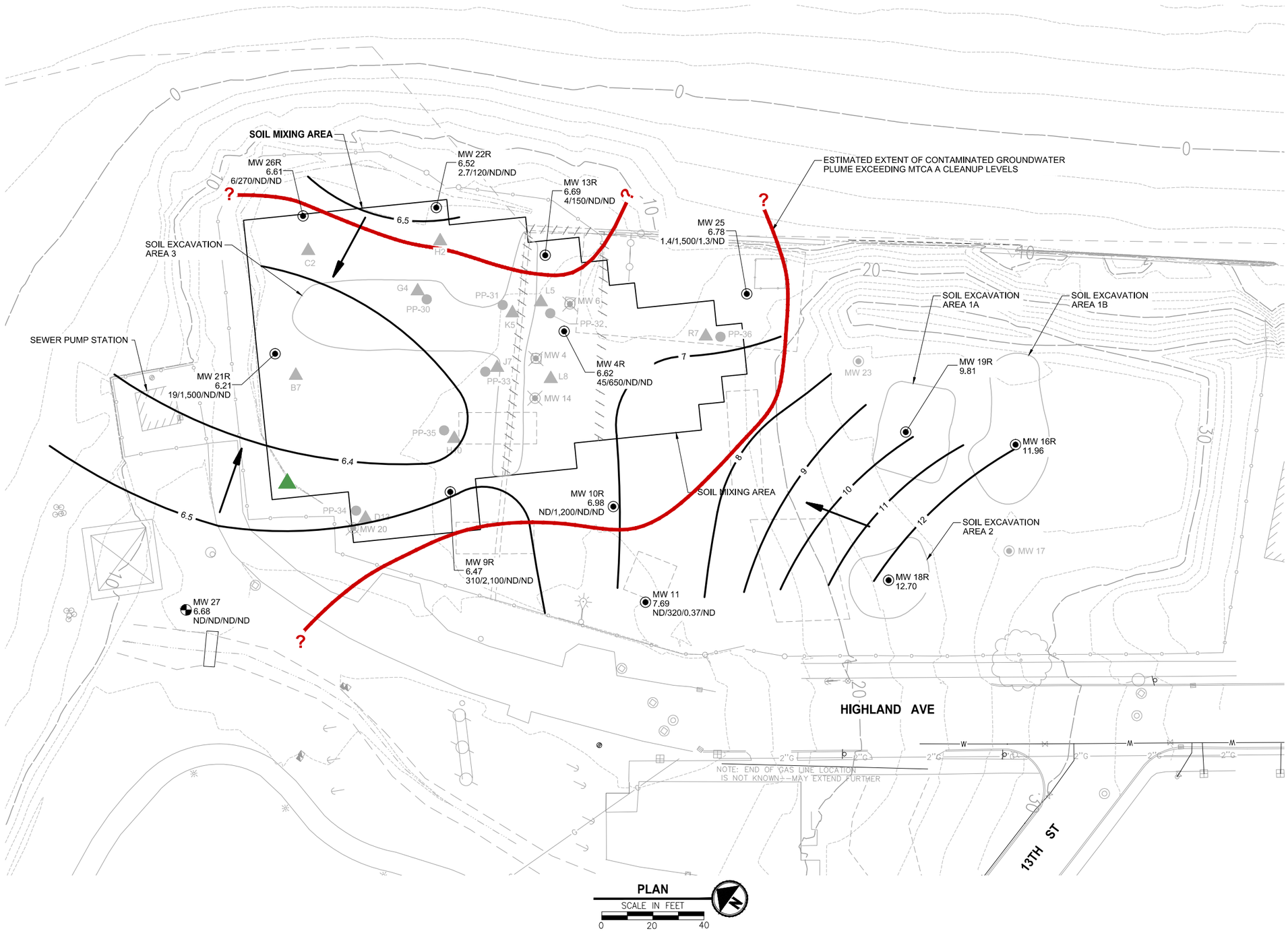
ND NOT DETECTED

EXISTING MONITORING WELL

RI/FS MONITORING WELL

ND/920/240 (10') RI/FS GROUNDWATER RESULTS FOR: *GASOLINE/DIESEL/LUBE OIL*
(GROUNDWATER DEPTH BELOW TOP OF WELL CASING)
RESULTS IN ug/L

Figure 8
Former Chevron Property
Cleanup Action Work Plan
RI/FS Groundwater Sampling Locations



PLAN
SCALE IN FEET
0 20 40

LEGEND

- EXISTING CHAIN LINK FENCE
- EXISTING MONITORING WELL
- SOIL MIXING AREA CONFIRMATION SOIL SAMPLE LOCATION (DEPTH)
- PUSH-PROBE LOCATION
- SOIL EXCAVATION AREA
- MW 14 — WELL DESTROYED DURING INTERIM ACTION
- MW 19R — QUARTERLY MONITORING WELL LOCATION
- R — INDICATES REPLACEMENT WELL INSTALLED FOR PERFORMANCE MONITORING
- 10 — GROUNDWATER ELEVATION
- GROUNDWATER FLOW DIRECTION
- 15.11 — GROUNDWATER ELEVATION AT TIME OF SAMPLING
- ESTIMATED CONTAMINATED GROUNDWATER PLUME EXCEEDING MTCA A CLEANUP LEVELS
- 19/1,500/ND/ND — GW RESULTS FOR BENZENE GASOLINE/DIESEL/LUBE OIL RESULTS IN ug/L
- NEW WELL INSTALLED FOR PERFORMANCE MONITORING IN MARCH 2011
- ND — NOT DETECTED
- PROPOSED NEW MONITORING WELL MW-20R

GENERAL NOTES:

1. CONTOUR DATUM NAVD 88

CLEANUP LEVELS	
MTCA A	**ug/L**
BENZENE	5
GASOLINE	800
DIESEL	500
LUBE OIL	500

REVISIONS NO.	DESCRIPTION	DATE	BY

ENGINEER STAMP

0 1" 2"
TWO INCHES AT FULL SCALE IF NOT SCALE ACCORDINGLY

SCALE
HORIZ. 1"=20' VERT. N/A

FIELD BOOK

DRAWING NO. 3

CITY OF BREMERTON
DEPARTMENT OF PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

DRAWN BY: SBR DATE 9/10
DESIGN BY: DLD WASH. P.E. # DATE 4/10
CHECKED BY: WASH. P.E. # DATE

FORMER CHEVRON PROPERTY
CLEANUP ACTION WORK PLAN
SAMPLING RESULTS
SEPTEMBER 2011

FIG. NO. 9

PN: 255-1896-063

SHEET OF

BREMERTON BOARDWALK PROJECT

FILE: BR189606JP041304 098 F17a
DATE: Apr 13, 2012 - 9:17am PLOTTED BY: rasmuste
IMAGES: Chevron Property FIG1 |
XREFS: XB-BREM_WTRFRNT-BA-SV-06120I | XBR189606JP041301F-BA

TABLES

Table 1 Groundwater Results Summary, RI 1st through 4th Monitoring Events and Performance Monitoring (February, May, and August 2010, and April and September 2011)

PARAMETERS	Units	Monitoring Well No.	MW-04R									MW-09R							MW-10R						MW-11						
		Sample Date	3/19/08[1]	1/21/10	6/1/10	6/1/10*	8/11/10	8/11/10*	4/5/11	4/5/11*	9/29/11	1/20/10	5/25/10	5/25/10*	8/11/10	4/7/11	4/7/11 Z	9/28/11	3/17/08[1]	1/20/10	5/25/10	8/10/10	4/5/11	9/30/11	3/13/08	1/20/10	5/25/10	8/10/10	8/10/10*	4/5/11	4/5/11*	9/30/11
		MTCA A																													
VOLATILE ORGANICS (BTEX)																															
Benzene	ug/L	5	160	60 J	58	--	52	--	39	--	45	120 J	160	170	360	280	170	310	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	ug/L	1,000	10 U	2.0 J	1.0 U	--	1.0 U	--	4.0 U	--	1.0 U	4 U	3.2	3.6	11	11	7.6	13	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	700	45	31 J	45	--	40	--	17	--	20	89 J	89	97	230	220	120	150	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
m,p-Xylene	ug/L	1,000	86	15 J	7.6	--	4.7	--	9.4	--	2.1	170 J	120	140	400	300	180	190	6.8	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
o-Xylene	ug/L	1,000	12	1.8 J	1.0 U	--	1.0 U	--	4.0	--	1.0 U	4 U	3.5	3.9	8.1	11	6.7	10	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOTAL PETROLEUM HYDROCARBONS																															
Gasoline	ug/L	800	5,400	1,200 J	1,100	--	1,000	--	960	--	650	1,800 J	1,500	1,700	3,100	4,800	3,100	2,100	400 U	400 U	1,100	780	830	1200	100 U	100 U	100 U	140	130	100 U	100 U	320
Diesel	mg/L	0.5	27	0.64 M	0.34 U	--	0.62 M	--	0.46	--	0.34 U	0.31 U	0.29 U	0.69	0.45 M	0.82	--	0.33 U	160	0.27 U	0.61 U	0.42 U	0.45 U	0.81 U	0.27	0.17 U	0.26 U	0.25 U	0.25 U	0.26 U	0.26 U	0.37
Lube Oil	mg/L	0.5	2.3	0.45 U	0.42 U	--	0.41 U	--	0.42 U	--	0.42 U	0.49 U	0.47 U	0.66	0.42 U	0.43 U	--	0.42 U	8.8 U	0.44 U	0.42 U	0.45 U	0.43 U	0.43 U	0.40 U	0.27 U	0.42 U	0.41 U	0.41 U	0.42 U	0.42 U	0.42 U
METALS																															
Total Lead	ug/L	15	--	8.2	--	--	--	--	--	--	--	80	36 J	74 J	21 J	170	--	--	--	3.8	--	--	--	--	--	4.7	--	--	--	--	--
Dissolved Lead	ug/L	15	--	1.0 U	--	--	--	--	--	--	--	13	12	14	17	3.0	--	--	--	2.2	--	--	--	--	--	1.4	--	--	--	--	--
Dissolved Iron	ug/L		--	4,200	--	--	--	--	--	--	--	34,000	--	--	--	--	--	--	--	6,400	--	--	--	--	--	270	--	--	--	--	--
Total Ferrous Iron	mg/L		--	--	7.36	--	9.75	--	5.4	--	--	--	46.2	42.1	29.2	49.4	--	--	--	--	25.2	34.4	12.4	--	--	--	19.0	30.4	30.0	2.66	2.74	--
Dissolved Manganese	ug/L		--	3,000	4,600	--	4,400	--	3,400	--	--	5,000	3,600	3,900	4,200	4,500	--	--	--	1,100	1,400	2,000	1,500	--	--	300	1,400	2,600	2,600	400	400	--
PAHs								--																							
Naphthalene	ug/L		--	1.4	--	--	--	--	1.0 U	1.0 U	--	6.4	--	--	--	--	--	--	--	0.14	--	--	--	--	--	0.13 U	--	--	--	--	--
2-Methylnaphthalene	ug/L		--	0.20	--	--	--	--	1.0 U	1.0 U	--	2.8	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	0.13 U	--	--	--	--	--
1-Methylnappthalene	ug/L		--	3.2	--	--	--	--	4.7	4.9	--	2.2	--	--	--	--	--	--	--	21	--	--	--	--	--	0.13 U	--	--	--	--	--
Acenaphthylene	ug/L		--	0.23	--	--	--	--	1.0 U	1.0 U	--	0.11 U	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	0.13 U	--	--	--	--	--
Acenaphthene	ug/L		--	1.9	--	--	--	--	3.3	3.4	--	0.18	--	--	--	--	--	--	--	0.23	--	--	--	--	--	0.13 U	--	--	--	--	--
Flourene	ug/L		--	1.8	--	--	--	--	2.3	2.3	--	0.14	--	--	--	--	--	--	--	0.32	--	--	--	--	--	0.13 U	--	--	--	--	--
Phenanthrene	ug/L		--	0.15	--	--	--	--	1.0 U	1.0 U	--	0.17	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	0.13 U	--	--	--	--	--
Anthracene	ug/L		--	0.44	--	--	--	--	1.0 U	1.0 U	--	0.11 U	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	0.13 U	--	--	--	--	--
Fluoranthene	ug/L		--	0.39	--	--	--	--	1.0 U	1.0 U	--	0.11 U	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	0.13 U	--	--	--	--	--
Pyrene	ug/L		--	0.26	--	--	--	--	1.0 U	1.0 U	--	0.11 U	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	0.13 U	--	--	--	--	--
Benzo(a)anthracene	ug/L		--	0.047	0.032	0.03	0.050 U	0.042	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.014	--	--	--	--	--	0.013 U	--	--	--	--	--
Chrysene	ug/L		--	0.033	0.010 U	0.010 U	0.050 U	0.023	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	0.013 U	--	--	--	--	--
Benzo(b)fluoranthene	ug/L		--	0.013	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	0.013 U	--	--	--	--	--
Benzo(k)fluoranthene	ug/L		--	0.028	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	0.013 U	--	--	--	--	--
Benzo(a)pyrene	ug/L	0.1	--	0.020	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	0.013 U	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L		--	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	0.013 U	--	--	--	--	--
Dibenz(a,h)anthracene	ug/L		--	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	0.013 U	--	--	--	--	--
Benzo[g,h,i]perylene	ug/L		--	0.010 U	--	--	--	--	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	0.013 U	--	--	--	--	--
GENERAL CHEMISTRY																															
Alkalinity	mg/L		--	190	1,900	--	2,100	--	2,300	--	--	700	720	730	800	730	--	--	220	190	200	210	230	--	170	52	210	120	110	70	66	--
Nitrate (as Nitrogen)	mg/L		--	0.050 U	0.050 U	--	0.050 U	--	0.050 U	--	--	0.050 U	0.050 U	0.050 U	0.14	0.050 U	--	--	0.050 U	0.77	0.094	0.050 U	0.050 U	--	0.050 U	0.050 U	0.070	0.086	0.1	0.050 U	0.050 U	--
Sulfate	mg/L		--	250	150	--	120	--	110	--	--	30	7.5	7.4	5.0 U	5.0 U	--	--	5.0 U	10	10 U	5.0 U	5.0 U	--	5.0 U	8.8	10 U	25 U	25 U	5.0 U	5.0 U	--
Chloride	mg/L		--	290	250	--	250	--	230	--	--	77	120	120	78	91	--	--	2.5	10	10	14	6.8	--	5.2	3.1	7.9	8.8	9.4	6.0	5.5	--
Dissolved Methane	ug/L		--	710	590	--	670	--	740	--	--	2,100	8,600	7,800	6,600	9,900	--	--	--	170	510	260	590	--	--	15	1,200	870	730	310	340	--
BOD5	mg/L		--	8.97	8.1	--	8.6	--	--	--	--	5.46	3.0	4.3	12.3	--	--	--	--	3.06	2.0	12 U	--	--	--	3.36	3.1	12 U	12 U	--	--	--
FIELD PARAMETERS																															
Turbidity	NTU		--	333	5.3	5.3	106	106	9.0	9.0	116.0	146	57.9	57.9	>1000	>1000	>1000	106.0	208	54.7	3.0	235	2.7	6.5	12.6	165	1.5	32.9	32.9	3.4	3.4	21.1
pH	--		--	6.63	6.90	6.90	7.01	7.01	7.09	7.09	7.11	6.36	6.77	6.77	6.94	6.78	6.78	7.05	6.38	6.00	6.32	6.05	6.50	6.52	6.20	5.27	6.20	6.27	6.27	6.17	6.17	6.41
Specific Conductance	mS/cm		--	3.50	3.42	3.42	32.6	32.6	35.1	35.1	5.48	1.52	1.42	1.42	2.65	1.81	1.81	1.91	53.4	35.9	51.2	90	90	81.2	63.5	10.3	32.0	90	90	64.3	64.3	89.0
Dissolved Oxygen	mg/L		--	4.91	4.55	4.55	0.0	0.0	4.02	4.02	0.06	9.65	0.96	0.96	0.0	0.40	0.40	6.68	0.0	5.38	6.31	2.38	2.20	6.16	0.0	5.87	0.90	0.0	0.0	2.67	2.67	0.00
ORP	mV		--	-136	-115	-115	-161	-161	-149	-149	-163	-124	-136.8	-136.8	-169	-134	-134	-152	-35	-64	-19.0	-79	-110	-96	62	169	-49.3	-110	-110	-31	-31	-106

Notes:

1 Sample collected from original well decommissioned during 2009 Interim Action.

* Duplicate collected.

CAL = Value out of calibration range.

J = Analyte was detected. Reported concentration should be considered an estimate.

M = Hydrocarbons in the gasoline range are impacting the diesel range result.

mg/L= Milligrams per liter.

mS/cm= Millisiemens per centimeter.

mV = Millivolts.

NC = Parameter not collected due to malfunctioning equipment.

NTU = Nephalometric turbidity units.

O = Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

ORP = Oxidation reduction potential.

R = Replacement well.

µg/L = Micrograms per liter.

U = Analyte not detected above practical quantitation limit given.

U1 = The practical quantitation limit is elevated due to interferences present in the sample.

Z = Sample collected was unpreserved and allowed to settle prior to analysis. Results provided to assess affects of suspended sediment in the samples.

Exceeds MTCA A cleanup level.

Table 1 Groundwater Results Summary, RI 1st through 4th Monitoring Events and Performance Monitoring (February, May, and August 2010, and April and September 2011)

PARAMETERS	Units	Monitoring Well No. / Sample Date	MW-13R 2/15/10	MW-13R 5/26/10	MW-13R 8/11/10	MW-13R 4/6/11	MW-13R 4/6/11 Z	MW-13R 9/29/11	MW-16R 2/16/10	MW-16R 5/27/10	MW-16R 8/10/10	MW-16R 4/6/11	MW-16R 4/6/11 Z
		MTCA A											
VOLATILE ORGANICS (BTEX)													
Benzene	ug/L	5	35 J	33	22	11	17	4	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U
Toluene	ug/L	1,000	4.0 U	1.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U
Ethylbenzene	ug/L	700	13 J	15	10	2.6	3.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U
m,p-Xylene	ug/L	1,000	4.0 U	1.4	1.7	1.0 U	1.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U
o-Xylene	ug/L	1,000	4.0 U	1.0 U	1.0 U	1.0 U	1.1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U
TOTAL PETROLEUM HYDROCARBONS													
Gasoline	ug/L	800	680 J	560	510	420	470	150	100 U	100 U	100 U	100 U	400 U
Diesel	mg/L	0.5	0.49 U1	0.43	0.39 U	0.41	--	0.26 U	0.28 U	0.27 U	0.37	0.28 U	--
Lube Oil	mg/L	0.5	0.70 J	0.45 U	0.43 U	0.42 U	--	0.42 U	0.44 U	0.43 U	0.39 U	0.44 U	--
METALS													
Total Lead	ug/L	15	5.2	--	--	--	--	--	1.4	--	--	--	--
Dissolved Lead	ug/L	15	1.1	--	--	--	--	--	1.0 U	--	--	--	--
Dissolved Iron	ug/L		3,600	--	--	--	--	--	56 U	--	--	--	--
Total Ferrous Iron	mg/L		--	15.2	9.31	7.94	--	--	--	1.66	0.336	0.094	--
Dissolved Manganese	ug/L		1,500	1,300	2,000	1,800	--	--	10 U	3,800	11,000	10 U	--
PAHs													
Naphthalene	ug/L		15	--	--	0.35	--	--	0.11 U	--	--	--	--
2-Methylnaphthalene	ug/L		1.1	--	--	0.10 U	--	--	0.11 U	--	--	--	--
1-Methylnappthalene	ug/L		4.7	--	--	0.38	--	--	0.11 U	--	--	--	--
Acenaphthylene	ug/L		1.1	--	--	0.40	--	--	0.11 U	--	--	--	--
Acenaphthene	ug/L		48	--	--	22	--	--	0.11 U	--	--	--	--
Flourene	ug/L		21	--	--	7.6	--	--	0.11 U	--	--	--	--
Phenanthrene	ug/L		3.2	--	--	0.70	--	--	0.11 U	--	--	--	--
Anthracene	ug/L		1.9	--	--	1.2	--	--	0.11 U	--	--	--	--
Fluoranthene	ug/L		1.5	--	--	1.2	--	--	0.11 U	--	--	--	--
Pyrene	ug/L		0.91	--	--	0.58	--	--	0.11 U	--	--	--	--
Benzo(a)anthracene	ug/L		0.15	0.057	0.061	0.058	--	--	0.011 U	--	--	--	--
Chrysene	ug/L		0.15	0.040	0.050 U	0.044	--	--	0.011 U	--	--	--	--
Benzo(b)fluoranthene	ug/L		0.093	0.010 U	0.010 U	0.018	--	--	0.011 U	--	--	--	--
Benzo(k)fluoranthene	ug/L		0.083	0.010 U	0.010 U	0.014	--	--	0.011 U	--	--	--	--
Benzo(a)pyrene	ug/L	0.1	0.092	0.010 U	0.010 U	0.017	--	--	0.011 U	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L		0.041	0.010 U	0.010 U	0.010 U	--	--	0.011 U	--	--	--	--
Dibenz(a,h)anthracene	ug/L		0.013	0.010 U	0.010 U	0.010 U	--	--	0.011 U	--	--	--	--
Benzo[g,h,i]perylene	ug/L		0.053	--	--	0.010 U	--	--	0.011 U	--	--	--	--
GENERAL CHEMISTRY													
Alkalinity	mg/L		1,300	1,400	1,600	1,500	--	--	20 U	450	710	20 U	--
Nitrate (as Nitrogen)	mg/L		0.050 U	0.050 U	0.050 U	0.050 U	--	--	0.087	0.25 U	0.050 U	0.050 U	--
Sulfate	mg/L		460	460	560	280	--	--	5.9	5.0 U	5.0 U	5.0 U	--
Chloride	mg/L		710	670	750	420	--	--	4.2	8.3	8.4	8.7	--
Dissolved Methane	ug/L		280	580	680	290	--	--	0.83	3,100	590	4.1	--
BOD5	mg/L		4.47	2.2	5.1	--	--	--	2.00 U	1.0 U	12 U	--	--
FIELD PARAMETERS													
Turbidity	NTU		366	275.3	106	>1000	>1000	170.0	86.3	2565	>1000	704	704
pH	--		6.96	6.81	6.89	6.99	6.99	7.42	6.16	6.53	6.87	6.37	6.37
Specific Conductance	mS/cm		57.3	4.53	55.2	438	438	5.99	4.9	64.9	1.38	18.6	18.6
Dissolved Oxygen	mg/L		7.56	3.07	0.0	4.82	4.82	7.70	10.09	2.32	6.27	14.10	14.10
ORP	mV		-13	-96.3	-146	-103	-103	-133	290	-20.3	-38	147	147

PARAMETERS	Units	MW-18R 2/16/10	MW-18R 5/25/10	MW-18R 8/10/10	MW-18R 4/6/11	MW-19R 3/12/08[1]	MW-19R 2/16/10	MW-19R 5/26/10	MW-19R 8/12/10	MW-19R 4/7/11	MW-19R 4/7/11 Z	MW-20 3/13/08	MW-21R 3/18/08[1]	MW-21R 2/15/10	MW-21R 6/1/10	MW-21R 8/11/10	MW-21R 8/11/10*	MW-21R 4/6/11	MW-21R 4/6/11*	MW-21R 9/28/11
VOLATILE ORGANICS (BTEX)																				
Benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	15	46 J	34	27	--	45	--	19
Toluene	ug/L	1.0 U	1.0 U	3.7	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	91	5.0 J	2.9	1.7	--	6.7	--	1.0 U
Ethylbenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	620	230 J	240	120	--	340	--	34
m,p-Xylene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.5	1.0 U	910	190 J	210	100	--	290	--	21
o-Xylene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	110	8.9 J	2.3	1.9	--	4.0 U	--	1.0 U
TOTAL PETROLEUM HYDROCARBONS																				
Gasoline	ug/L	100 U	100 U	180 O	100 U	400 U	640 J	380	620 O	130	280	100 U	9,200	4,400 J	4,400	2,800	--	5,100	--	1500
Diesel	mg/L	0.27 U	0.26 U	0.27 U	0.27 U	8.1	0.29 U	0.26 U	0.42 M	0.26 U	--	0.27 U	1.7	0.89 U1	0.79 U	0.87 M	--	0.68 U	--	0.42 U
Lube Oil	mg/L	0.43 U	0.42 U	0.43 U	0.43 U	0.42 U	0.46 U	0.42 U	0.42 U	0.42 U	--	0.44 U	0.40 U	0.46 U	0.42 U	0.41 U	--	0.42 U	--	0.42 U
METALS																				
Total Lead	ug/L	1.6	--	--	--	4.5	5.7	--	--	--	--	15	10	15	2.8 J	10 J	5.5 J	1.1	1.1 U	--
Dissolved Lead	ug/L	1.0 U	--	--	--	1.0 U	1.0 U	--	--	--	--	1.0 U	8.9	2.3	1.4	1.4	1.0	1.0 U	1.0 U	--
Dissolved Iron	ug/L	830	--	--	--	--	5,100	--	--	--	--	--	--	18,000	--	--	--	--	--	--
Total Ferrous Iron	mg/L	--	12.1	17.8	1.48	--	--	15.4	17.4	0.839	--	--	--	--	16.2	17.9	--	10.1	--	--
Dissolved Manganese	ug/L	1,200	2,800	9,500	1,900	--	2,200	2,400	3,500	1,600	--	--	--	4,100	4,500	3,500	--	4,200	--	--
PAHs																				
Naphthalene	ug/L	1.0	--	--	--	0.88	0.43	--	--	--	--	0.12 U	18	18	--	--	--	--	--	--
2-Methylnaphthalene	ug/L	0.10 U	--	--	--	0.11 U	0.17	--	--	--	--	0.12 U	32	7.3	--	--	--	--	--	--
1-Methylnappthalene	ug/L	0.10 U	--	--	--	15	4.3	--	--	--	--	0.12 U	20	18	--	--	--	--	--	--
Acenaphthylene	ug/L	0.10 U	--	--	--	0.42	0.12	--	--	--	--	0.12 U	0.099	1.1 U	--	--	--	--	--	--
Acenaphthene	ug/L	0.10 U	--	--	--	0.96	0.58	--	--	--	--	0.38	1.1	1.3	--	--	--	--	--	--
Flourene	ug/L	0.10 U	--	--	--	5.2	1.5	--	--	--	--	0.12 U	0.96	0.61	--	--	--	--	--	--
Phenanthrene	ug/L	0.10 U	--	--	--	2.9	0.31	--	--	--	--	0.12 U	0.65	0.44	--	--	--	--	--	--
Anthracene	ug/L	0.10 U	--	--	--	0.15	0.10 U	--	--	--	--	0.12 U	0.095 U	0.26	--	--	--	--	--	--
Fluoranthene	ug/L	0.10 U	--	--	--	0.11 U	0.10 U	--	--	--	--	0.12 U	0.11	0.12	--	--	--	--	--	--
Pyrene	ug/L	0.10 U	--	--	--	0.11 U	0.10 U	--	--	--	--	0.12 U	0.095 U	0.11 U	--	--	--	--	--	--
Benzo(a)anthracene	ug/L	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.015	0.012	0.011 U	--	--	--	--	--	--
Chrysene	ug/L	0.010 U	--	--	--	0.021	0.010 U	--	--	--	--	0.013	0.011	0.011 U	--	--	--	--	--	--
Benzo(b)fluoranthene	ug/L	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.012 U	0.010	0.011 U	--	--	--	--	--	--
Benzo(k)fluoranthene	ug/L	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.012 U	0.011	0.011 U	--	--	--	--	--	--
Benzo(a)pyrene	ug/L	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.012 U	0.012	0.011 U	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.012 U	0.0099	0.011 U	--	--	--	--	--	--
Dibenz(a,h)anthracene	ug/L	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.012 U	0.0095 U	0.011 U	--	--	--	--	--	--
Benzo[g,h,i]perylene	ug/L	0.010 U	--	--	--	0.11 U	0.010 U	--	--	--	--	0.12 U	0.013	0.011 U	--	--	--	--	--	--
GENERAL CHEMISTRY																				
Alkalinity	mg/L	200	420	870	250	160	170	200	190	120	--	180	150	140	1,400	1,500	--	2,000	--	--
Nitrate (as Nitrogen)	mg/L	0.16	0.050 U	0.050 U	0.35	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	--	0.050 U	0.050 U	0.050 U	0.050 U	0.057	--	0.27	--	--
Sulfate	mg/L	26	7.8	5.0 U	7.4	5.0 U	10 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	230	170	120	--	110	--	--
Chloride	mg/L	3.7	4.3	14	2.4	3.4	4.7	2.5	3.1	2.0 U	--	11	28	140	120	110	--	100	--	--
Dissolved Methane	ug/L	420	2,100	5,400	4300	--	32	44	350	61	--	--	--	5,700	4,200	4,800	--	3,200	--	--
BOD5	mg/L	2.52	8.1	12 U	--	--	4.20	1.1	2.9	--	--	--	--	17	8.4	16.2	--	--	--	--
FIELD PARAMETERS																				
Turbidity	NTU	58.1	16.7	221	28.6	NC	340	319	32.7	>1000		NC	168	303	8.9	384	384	52.2	52.2	646.0
pH	--	6.03	6.49	6.61	6.51	6.00	6.40	6.68	6.34	6.41		6.56	6.39	6.56	6.83	7.00	7.00	7.06	7.06	7.06
Specific Conductance	mS/cm	51.6	58.0	2.20	90	34.5	48.2	38.0	CAL	82.1		79.1	44.4	33.3	2.50	4.47	4.47	430	430	3.33
Dissolved Oxygen	mg/L	2.79	1.29	0.0	3.39	0.0	3.00	5.05	0.01	4.10	--	0.0	0.0	0.00	4.92	0.0	0.0	1.80	1.80	0.00
ORP	mV	143	-2.1	-156	-27	-35	1	-49.8	-84	4	--	-44	15	-107	-140.0	-162	-162	-160	-160	-195

Notes:

1 Sample collected from original well decommissioned during 2009 Interim Action.

* Duplicate collected.

CAL = Value out of calibration range.

J = Analyte was detected. Reported concentration should be considered an estimate.

M = Hydrocarbons in the gasoline range are impacting the diesel range result.

mg/L= Milligrams per liter.

mS/cm= Millisiemens per centimeter.

mV = Millivolts.

NC = Parameter not collected due to malfunctioning equipment.

NTU = Nephalometric turbidity units.

O = Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

ORP = Oxidation reduction potential.

R = Replacement well.

µg/L = Micrograms per liter.

U = Analyte not detected above practical quantitation limit given.

U1 = The practical quantitation limit is elevated due to interferences present in the sample.

Z = Sample collected was unpreserved and allowed to settle prior to analysis. Results provided to assess affects of suspended sediment in the samples.

Exceeds MTCA A cleanup level.

Table 1 Groundwater Results Summary, RI 1st through 4th Monitoring Events and Performance Monitoring (February, May, and August 2010, and April and September 2011)

PARAMETERS	Units	Monitoring Well No. / Sample Date	MW-22R 3/17/08[1]	MW-22R 1/20/10	MW-22R 5/26/10	MW-22R 8/12/10	MW-22R 4/6/11	MW-22R 9/29/11	MW-23 3/12/08	MW-25 3/18/08	MW-25 3/18/08	MW-25 1/21/10	MW-25 5/27/10	MW-25 8/12/10	MW-25 4/6/11	MW-25 9/29/11	MW-26R 3/18/08[1]	MW-26R 1/20/10	MW-26R 5/26/10	MW-26R 8/11/10	MW-26R 4/6/11	MW-26R 9/28/11	MW-27 4/7/11	MW-27 9/30/11
		MTCA A																						
VOLATILE ORGANICS (BTEX)																								
Benzene	ug/L	5	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	2.7	1.1	4.0 U	4.0	10 J	4.0 U	1.3	4.0 U	1.4	17	4.0 U	17	3.9	1.0 U	6.0	1.0 U	1.0 U
Toluene	ug/L	1,000	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	4.0	7.2 J	4.0 U	2.1	4.0 U	2.5	4.0 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	700	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	56	56	74 J	4.0 U	6.1	5.3	11	4.0 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
m,p-Xylene	ug/L	1,000	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.2	4.1	140 J	4.0 U	5.0 U	8.4	1.2	4.0 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
o-Xylene	ug/L	1,000	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	4.0	200 U1	4.0 U	1.0 U	4.0 U	1.0 U	4.0 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOTAL PETROLEUM HYDROCARBONS																								
Gasoline	ug/L	800	400 U	400 U	100 U	100 U	100 U	120	530	1,600	1,700	2,000 U	1,400	1,300 O	1,500	1500	1,300	400 U	530	240	100 U	270	100 U	100 U
Diesel	mg/L	0.5	0.26 U	0.26 U	0.27 U	0.25 U	0.27 U	0.26 U	0.26 U	1.2	1	0.49	0.92	2 M	7.0	1.3	1.3	0.27 U	0.26 U	0.31 U	0.27 U	0.26 U	0.26 U	0.26 U
Lube Oil	mg/L	0.5	0.41 U	0.41 U	0.43 U	0.41 U	0.43 U	0.41 U	0.42 U	0.48 U	0.46 U	0.42 U	0.42 U	0.41 U	0.42 U	0.41 U	0.40 U	0.43 U	0.41 U	0.40 U	0.43 U	0.41 U	0.41 U	0.42 U
METALS																								
Total Lead	ug/L	15	1.1 U	1.3	--	--	--	--	--	1.2	1.3	1.1 U	--	--	--	--	3.3	1.1 U	--	--	--	--	--	--
Dissolved Lead	ug/L	15	1.0 U	1.0 U	--	--	--	--	--	1.0 U	1.0 U	1.0 U	--	--	--	--	1.0 U	1.0 U	--	--	--	--	--	--
Dissolved Iron	ug/L		--	220	--	--	--	--	--	--	--	2,000	--	--	--	--	--	56 U	--	--	--	--	--	--
Total Ferrous Iron	mg/L		--	--	0.295	1.29	0.043	--	--	--	--	--	0.352	3.78	1.39	--	--	--	0.758	0.8	0.059	--	27.6	--
Dissolved Manganese	ug/L		--	1,400	890	3,200	840	--	--	--	--	120	220	130	170	--	--	11 U	66	560	10 U	--	3,900	--
PAHs																								
Naphthalene	ug/L		0.098 U	0.10 U	--	--	--	--	--	1.2	1.4	0.27	--	--	--	--	0.80	0.10 U	--	--	--	--	--	--
2-Methylnaphthalene	ug/L		0.098 U	0.10 U	--	--	--	--	--	0.11 U	0.11 U	0.10 U	--	--	--	--	0.10 U	0.10 U	--	--	--	--	--	--
1-Methylnappthalene	ug/L		0.098 U	0.10 U	--	--	--	--	--	22	25	0.67	--	--	--	--	69	0.10 U	--	--	--	--	--	--
Acenaphthylene	ug/L		0.098 U	0.10 U	--	--	--	--	--	0.17	0.17	0.10 U	--	--	--	--	0.45	0.15 U	--	--	--	--	--	--
Acenaphthene	ug/L		0.52	0.10 U	--	--	--	--	--	0.98	0.96	0.15	--	--	--	--	23	0.17 U	--	--	--	--	--	--
Flourene	ug/L		0.098 U	0.10 U	--	--	--	--	--	1.6	1.7	0.18	--	--	--	--	4.8	0.10 U	--	--	--	--	--	--
Phenanthrene	ug/L		0.098 U	0.10 U	--	--	--	--	--	0.11 U	0.11 U	0.10 U	--	--	--	--	10	0.10 U	--	--	--	--	--	--
Anthracene	ug/L		0.098 U	0.10 U	--	--	--	--	--	0.11 U	0.11 U	0.10 U	--	--	--	--	2.4	0.17 U	--	--	--	--	--	--
Fluoranthene	ug/L		0.098 U	0.10 U	--	--	--	--	--	0.11 U	0.11 U	0.10 U	--	--	--	--	0.88	0.10 U	--	--	--	--	--	--
Pyrene	ug/L		0.098 U	0.10 U	--	--	--	--	--	0.11 U	0.11 U	0.10 U	--	--	--	--	1.2	0.10 U	--	--	--	--	--	--
Benzo(a)anthracene	ug/L		0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.10	0.016 U	--	--	--	--	--	--
Chrysene	ug/L		0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.098	0.010 U	--	--	--	--	--	--
Benzo(b)fluoranthene	ug/L		0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.022	0.010 U	--	--	--	--	--	--
Benzo(k)fluoranthene	ug/L		0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.027	0.010 U	--	--	--	--	--	--
Benzo(a)pyrene	ug/L	0.1	0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.051	0.010 U	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L		0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.017	0.010 U	--	--	--	--	--	--
Dibenz(a,h)anthracene	ug/L		0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.010 U	0.010 U	--	--	--	--	--	--
Benzo[g,h,i]perylene	ug/L		0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.11 U	0.010 U	--	--	--	--	0.020	0.010 U	--	--	--	--	--	--
GENERAL CHEMISTRY																								
Alkalinity	mg/L		340	160	320	240	310	--	230	420	410	140	190	260	200	--	190	180	270	210	300	--	310	--
Nitrate (as Nitrogen)	mg/L		0.050 U	0.50	0.050 U	0.17	0.41	--	0.051	0.052	0.050 U	3.4	0.73	0.050 U	1.4	--	0.050 U	1.0	0.16	0.050 U	0.050 U	--	0.050 U	--
Sulfate	mg/L		22	1,200	75	200	39	--	5.0 U	36	36	13	8.0	26	5.0 U	--	1,400	1,200	1,400	2,200	1,300	--	25 U	--
Chloride	mg/L		370	9,100	390	1,600	97	--	3.0	980	910	38	31	610	24	--	9,400	9,100	10,000	20,000	8,400	--	9.8	--
Dissolved Methane	ug/L		--	6.3	21	10	6.8	--	--	--	--	220	190	330	190	--	--	3.0	68	5.0	29	--	8,600	--
BOD5	mg/L		--	2.00 U	1.0 U	1.2 U	--	--	--	--	--	2.00 U	1.9	4.3	--	--	--	2.00 U	1.7	1.5	--	--	--	--
FIELD PARAMETERS																								
Turbidity	NTU		212	56.3	4.1	132	0.8	112.0	29	120	120	164	4.8	32.6	65.5	60.0	85.7	70.2	3.8	38.0	0.1	82.3	49.2	>1000
pH	--		6.62	6.32	6.82	6.69	7.03	7.65	6.49	6.31	6.31	5.81	6.28	6.96	6.20	6.21	6.24	6.19	6.31	6.53	6.88	6.52	6.58	6.53
Specific Conductance	mS/cm		19.6	17.9	1.37	CAL	128	6.04	52.4	19.8	19.8	31.8	28.9	5.13	90	51.6	3.25	16.6	22.42	CAL	CAL	CAL	92	1.18
Dissolved Oxygen	mg/L		0.0	7.55	4.90	0.01	1.75	8.48	0.0	0.0	0.0	4.96	1.10	0.0	0.57	0.00	0.0	6.75	5.52	0.01	0.36	0.00	0.27	0.00
ORP	mV		148	54	62.0	-36	32	-139	19	-56	-56	-14	85.6	-120	-30	-99	48	58	-64.5	-98	-84	-275	-88	-111

Notes:

1 Sample collected from original well decommissioned during 2009 Interim Action.

* Duplicate collected.

CAL = Value out of calibration range.

J = Analyte was detected. Reported concentration should be considered an estimate.

M = Hydrocarbons in the gasoline range are impacting the diesel range result.

mg/L= Milligrams per liter.

mS/cm= Millisiemens per centimeter.

mV = Millivolts.

NC = Parameter not collected due to malfunctioning equipment.

NTU = Nephalometric turbidity units.

O = Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

ORP = Oxidation reduction potential.

R = Replacement well.

µg/L = Micrograms per liter.

U = Analyte not detected above practical quantitation limit given.

U1 = The practical quantitation limit is elevated due to interferences present in the sample.

Z = Sample collected was unpreserved and allowed to settle prior to analysis. Results provided to assess affects of suspended sediment in the samples.

Exceeds MTCA A cleanup level.

Table 2. Cleanup Levels

	Medium	
	Soil	**Groundwater**
Hazardous Substance	**MTCA A (mg/kg)**	**MTCA A (ug/L)**
Benzene	0.030	5
Diesel	2,000	500
Motor Oil	2,000	500
Gasoline	30/100[a]	800/1,000[b]
Lead	250	15
Benzo(a) pyrene	0.1	.01

[a] 100 if no benzene and gas <1% TEX; 30 for other mixtures.

[b] 1 if no benzene; 0.8 if benzene.

ug/L = Micrograms per liter.

Table 3. Proposed Initial Groundwater Sampling Program

	Gasoline/BTEX	Diesel/Lube Oil	Field Parameters[a]	Conventionals[b]	Dissolved Methane	Total Lead	Dissolved Lead[c]	Total Ferrous Iron	Dissolved Manganese[c]
MW-4R	X	X	X	X	X	–	–	X	X
MW-9R	X	X	X	X	X	X	X	X	X
MW-10R	X	X	X	X	X	–	–	X	X
MW-11	X	X	X	X	X	–	–	X	X
MW-13R	X	X	X	X	X	–	–	X	X
MW-16R	–	–	–	–	–	–	–	–	–
MW-18R	–	–	–	–	–	–	–	–	–
MW-19R	–	–	–	–	–	–	–	–	–
MW-20R	X	X	X	X	X	–	–	X	X
MW-21R	X	X	X	X	X	–	–	X	X
MW-22R	X	X	X	X	X	–	–	X	X
MW-25	X	X	X	X	X	–	–	X	X
MW-26R	X	X	X	X	X	–	–	X	X
MW-27	X	X	X	X	X	–	–	X	X

[a] Turbidity, dissolved oxygen, ORP, pH, and specific conductance.

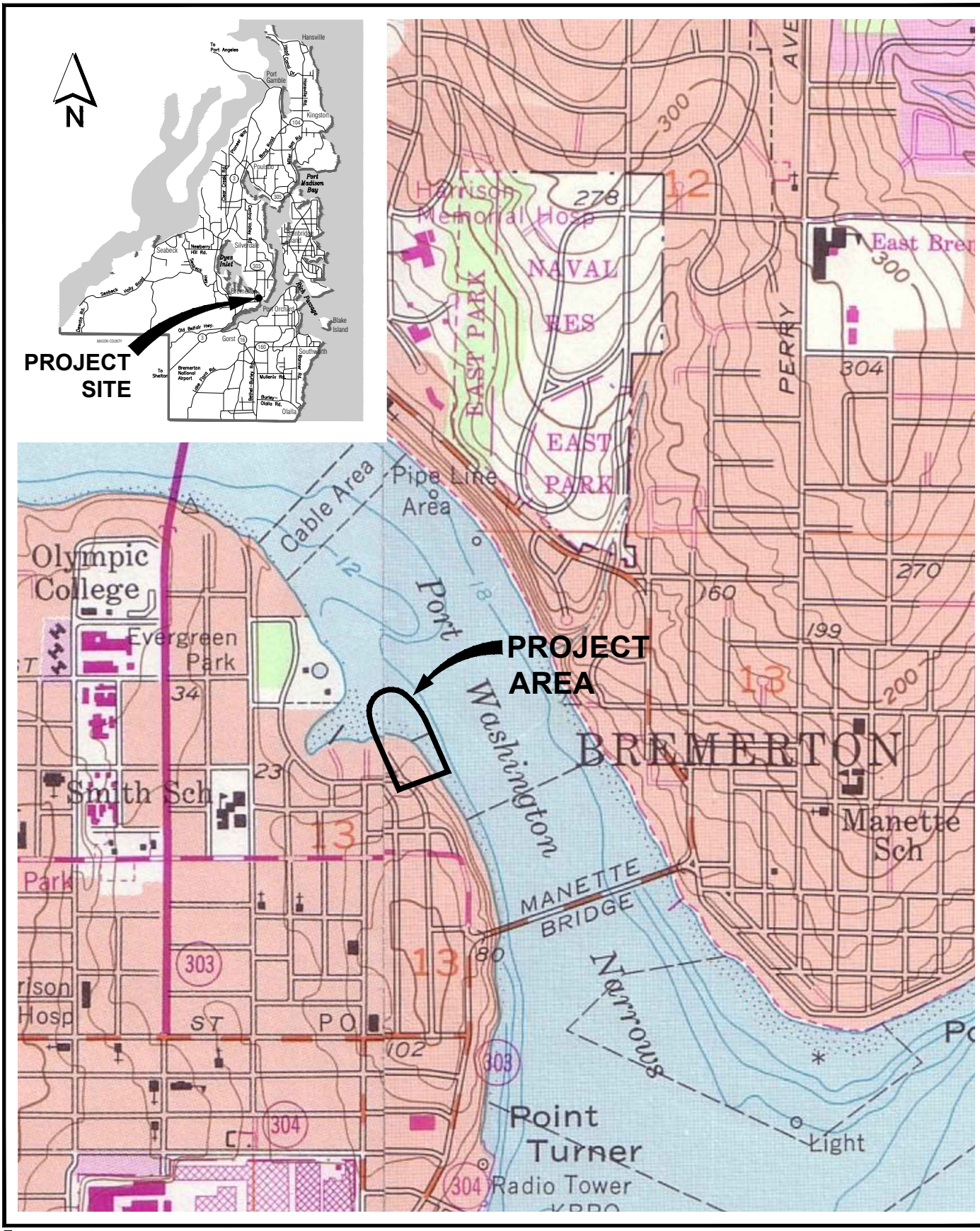
[b] nitrate, sulfate, alkalinity, chloride.

[c] field filtered.

Table 4. Proposed Schedule

Work Element	Submitted or Completed By
Long Term Groundwater Monitoring Plan & Health and Safety Plan	June 2012
Draft Cleanup Action Plan (DCAP) public comment period	June 2012
Environmental Covenant	July 2012
Institutional Controls Plan	July 2012
1st semi-annual groundwater sampling event	July 2012
DCAP finalized as Cleanup Action Plan (CAP)	September 2012
2nd Agreed Order finalized	November 2012
2nd semi-annual groundwater sampling event	January 2013
3rd semi-annual groundwater sampling event	July 2013
4th semi-annual groundwater sampling event	January 2014
5th semi-annual groundwater sampling event	July 2014
6th semi-annual groundwater sampling event	January 2015
7th semi-annual groundwater sampling event	July 2015
8th semi-annual groundwater sampling event	January 2016
1st quarterly groundwater sampling event	April 2016
2nd quarterly groundwater sampling event	July 2016
3rd quarterly groundwater sampling event	October 2016
4th quarterly groundwater sampling event	January 2017
5-Year Summary Monitoring Report	February 2017
First 5-Year Review	March 2017

Note: Groundwater monitoring memoranda will be submitted within 6 weeks following completion of each groundwater monitoring event.



Parametrix DATE: Mar 22, 2012 FILE: BR1896063P04T1304 098 F01

N

0 1000

SCALE IN FEET

Figure 1
Former Chevron Property
Project Vicinity

C-4
C-2
C-1
PIER
FIG 1-8
C-6
C-6-S
C-11
C-12
C-8
C-8-S
BIOASSAY
SAMPLE
C-9
C-9-S
METAL
SHEETPILES
WOODEN
BULKHEAD
C-10
C-10-S
C-13
MW 22
MW 8
MW 13
C-7
C-7-S
SEWER PUMP
STATION
TP-8
BURIED WOODEN
BULKHEAD
MW 5
MW 6
FORMER
WAREHOUSE
PLATFORM
MW 7
TP-14
TP-12
LOWER YARD
C-3
C-5
MW 21
TP-10
TP-9
MW 4
MW 14
TP-11
MW 23
TP-4
MW 12
TP-3
UPPER YARD
MW 19
TP-7
TP-13
FORMER
LOADING
RACKS
TP-2
MW 16
MW 15
MW 9
MW 24
TP-6
TP-5
MW 10
FORMER
GARAGE
MW 17
MW 20
MW 18
TP-16
MW 11
TP-15
TP-1
TOWER PEDESTALS
FOOTBRIDGE
HIGHLAND AVE
PLUMBER'S
UNION HALL
13TH ST

NOTES

CONTOUR DATUM NAVD 88
LOCATIONS OF FORMER TANKS, PIPING AND BUILDINGS FROM HART CROWSER DRAWING DATED 11/89

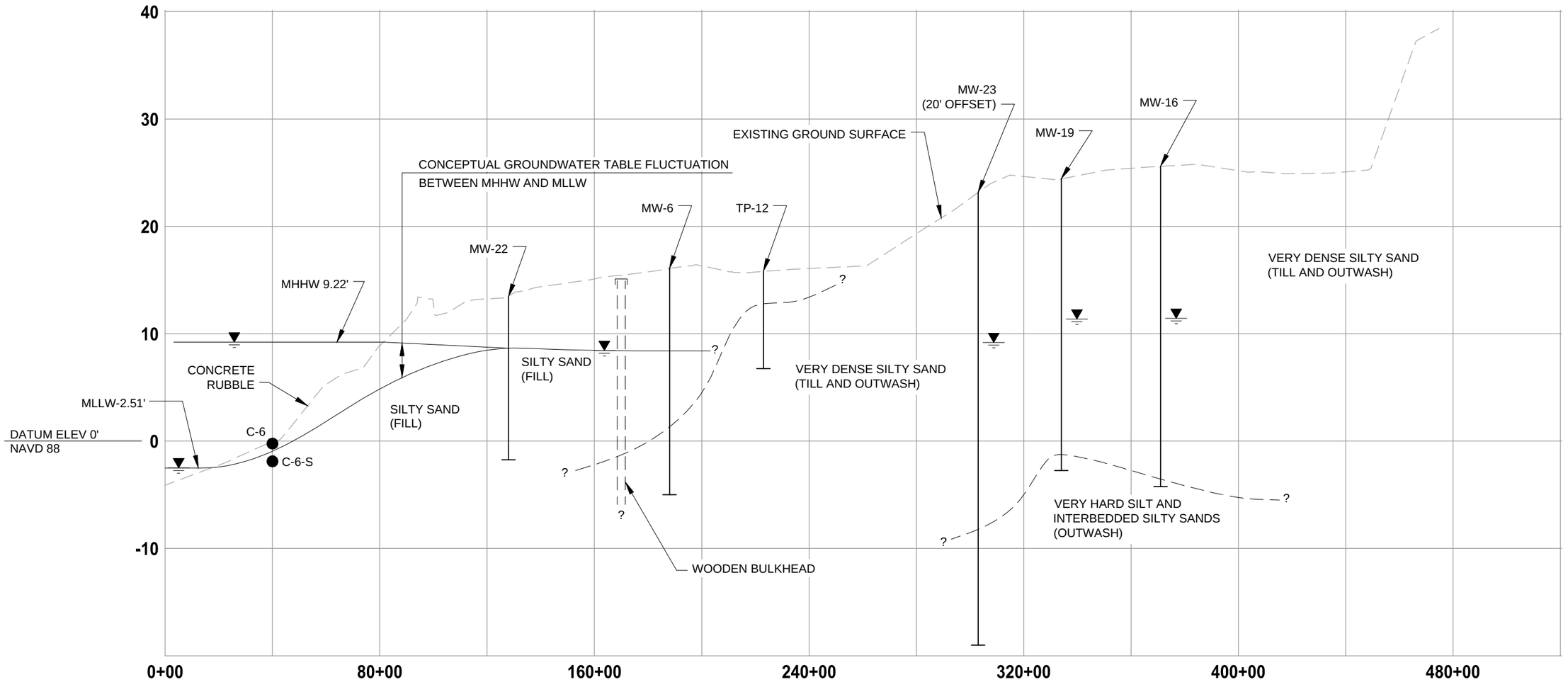
Parametrix DATE: Mar 22, 2012 FILE: BR1896063P04T1304 098 F04

N
0 50
SCALE IN FEET

LEGEND

- INTERTIDAL SEDIMENT SAMPLE
- SUBTIDAL SEDIMENT SAMPLE
- EXISTING MONITORING WELL
- TEST PIT , GEO ENGINEERS 1988
- TEST PIT, HART CROWSER 1989
- DESTROYED MONITORING WELL
- EXISTING CONCRETE PAD
- EXISTING BUILDING
- CHAIN LINK FENCE
- DRAINAGE DITCH
- FORMER PIPING/BUILDING/ LOADING RACK
- C-6 SURFACE SEDIMENT SAMPLE
- C-6-S SEDIMENT SAMPLE COLLECTED AT 2 FT DEPTH
- FORMER ABOVEBROUND STORAGE TANK
- GENERAL GROUNDWATER FLOW DIRECTION

Figure 2
Former Chevron Property DCAP
Historical Site Features



SECTION A

HORIZ: 1"=40'
VERT: 1"=10'

Parametrix DATE: Mar 22, 2012 FILE: BR1896063P04T1304 098 F05

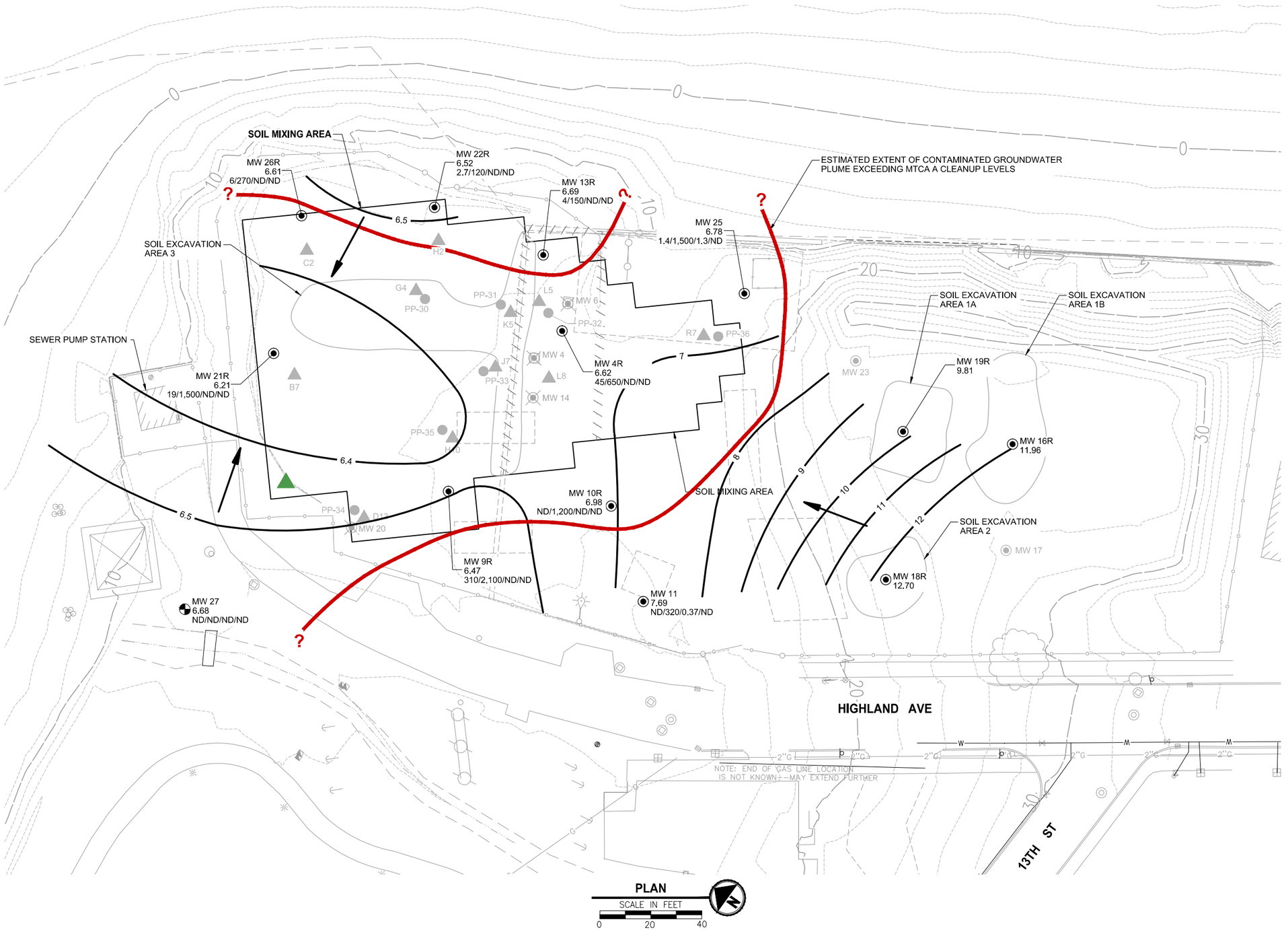
NOTES:

MEAN HIGHER HIGH WATER (MHHW) AND MEAN LOWER LOW WATER (MLLW) ELEVATIONS OBTAINED FROM NOAA RECORDS FOR TIDAL STATION BREMERTON, WA, ID NO. 9445958

LEGEND

- GROUNDWATER TABLE ELEVATION MEASURED 10/24/06
- SEDIMENT SAMPLES

Figure 3
Former Chevron Property
Section A



LEGEND

- EXISTING CHAIN LINK FENCE
- EXISTING MONITORING WELL
- SOIL MIXING AREA CONFIRMATION SOIL SAMPLE LOCATION (DEPTH)
- PUSH-PROBE LOCATION
- SOIL EXCAVATION AREA
- MW 14 — WELL DESTROYED DURING INTERIM ACTION
- MW 19R — QUARTERLY MONITORING WELL LOCATION
- R — INDICATES REPLACEMENT WELL INSTALLED FOR PERFORMANCE MONITORING
- 10 — GROUNDWATER ELEVATION
- GROUNDWATER FLOW DIRECTION
- 15.11 — GROUNDWATER ELEVATION AT TIME OF SAMPLING
- ESTIMATED CONTAMINATED GROUNDWATER PLUME EXCEEDING MTCA A CLEANUP LEVELS
- 19/1,500/ND/ND — GW RESULTS FOR BENZENE GASOLINE/DIESEL/LUBE OIL RESULTS IN ug/L
- NEW WELL INSTALLED FOR PERFORMANCE MONITORING IN MARCH 2011
- ND — NOT DETECTED
- PROPOSED NEW MONITORING WELL MW-20R

GENERAL NOTES:

1. CONTOUR DATUM NAVD 88

CLEANUP LEVELS	
MTCA A	**ug/L**
BENZENE	5
GASOLINE	800
DIESEL	500
LUBE OIL	500

PLAN
SCALE IN FEET
0 20 40

REVISIONS NO.	DESCRIPTION	DATE	BY

ENGINEER STAMP

0 1" 2"
TWO INCHES AT FULL SCALE IF NOT SCALE ACCORDINGLY
SCALE
HORIZ. 1"=20' VERT. N/A

FIELD BOOK
DRAWING NO. 3

CITY OF BREMERTON
DEPARTMENT OF PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

DRAWN BY: SBR DATE 9/10
DESIGN BY: DLD WASH. P.E. # DATE 4/10
CHECKED BY: WASH. P.E. # DATE

FORMER CHEVRON PROPERTY DCAP
SAMPLING RESULTS
SEPTEMBER 2011

FIG. NO. 4
PN: 255-1896-063
SHEET OF

BREMERTON BOARDWALK PROJECT

FILE: BR189606JP041304 038 F17a
DATE: Mar 22, 2012 - 12:58pm PLOTTED BY: peterjul
IMAGES: Chevron Property FIG1 |
XREFS: XB-BREM_WTRFRNT-BA-SV-06120I | XBR189606JP041301F-BA

11. Data Submitted Electronically Using SEDQUAL Shall be Checked by the Toxics Cleanup Program's SEDQUAL Coordinator Prior to Loading the Data into SEDQUAL.

Normally, SEDQUAL data submittals will come to TCP's SEDQUAL Coordinator. Upon receipt of a submittal, the Coordinator should notify the site manager. Similarly, if the Ecology site manager receives a SEDQUAL submittal, they should notify TCP's SEDQUAL Coordinator. Upon receipt of the data, TCP's SEDQUAL Coordinator reviews the submittal for quality control and officially loads the data into the system.

Approved

James J. Pendowski, Program Manager
Toxics Cleanup Program

Policy Disclaimer: This policy is intended solely for the guidance of Ecology staff. It is not intended, and cannot be relied on, to create rights, substantive or procedural, enforceable by any party in litigation with the state of Washington. Ecology may act at variance with this policy depending on site-specific circumstances, or modify or withdraw this policy at any time.