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**Sampling and Analysis Plan
Evergreen Park/Chevron Bulk Plant
Bremerton, Washington**

**Prepared for
Washington State Department of Ecology**

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Prepared by
Hart Crowser, Inc.

Roger McGinnis

Roger N. McGinnis
Senior Associate
Environmental Chemist

Sonia Fernandez

Sonia Fernandez, P.G.
Project
Environmental Specialist

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SAMPLING AND ANALYSIS PLAN EVERGREEN PARK/CHEVRON BULK PLANT BREMERTON, WASHINGTON

1.0 INTRODUCTION

The Evergreen Park/Chevron Bulk plant site (the Site) consists of two properties: City of Bremerton's Evergreen Park and the Former Chevron Bulk Plant. Both properties are located on Highland Drive and along the south shore of Port Washington Narrows in Bremerton, Washington.

The scope of work described in this Sampling and Analysis Plan is designed to acquire the necessary amount of data to accurately characterize sediment quality in Smith Cove located along the shores of at Evergreen Park and in the section of Port Washington Narrows adjacent to the former Chevron bulk fuel depot. The results of the sampling event will be compared to Washington State Department of Ecology (Ecology) Sediment Management Standards (SMS; Chapter 173-204 WAC).

2.0 SITE BACKGROUND

The Evergreen Park property is located adjacent to Smith Cove on Port Washington Narrows (Figure 1), a saline water body subject to moderate daily tidal fluctuations. This property consists of five parcels (different businesses) that included an incinerator/landfill owned by the City of Bremerton. The City operated the sanitation receptacle facility, including an incinerator and an oil house, in the southern portion of Evergreen Park. The City purchased the other four private parcels, removed six underground storage tanks (USTs; some of them were leaking), and the property was covered with 2 feet of soil and converted into a city park.

The Evergreen Park shoreline was historically filled with both clean and waste materials from 1918 to the 1950s. The property's soils and groundwater have been impacted with total petroleum hydrocarbon (TPH)-related contamination exceeding Model Toxics Control Act (MTCA) cleanup levels. In addition, petroleum product was discovered during the closure of USTs. However, not all product and contaminated soils were removed during the USTs closure. No sediment investigations were conducted in the adjacent sediments (Smith Cove) to determine whether sediments have been impacted as the result of migration of upland contamination.

The Chevron Bulk Plant property is approximately 1.5 acres in area and is located at 1310 Highland Avenue, Bremerton, Washington, just south of Evergreen Park. From 1928 until 1988, Chevron USA operated a bulk storage and distribution center for petroleum products on the property including a fuel distribution dock. The property's soil and groundwater have been impacted by TPH-related contamination including light non-aqueous phase liquid (LNAPL). Approximately 45 gallons of LNAPL were removed by bailing and 195,000 pounds of hydrocarbons were removed using a soil vapor extraction system. However, a small quantity of LNAPL is still present at a few locations beneath the property. Potential migration and discharge of LNAPL and dissolved hydrocarbons into the adjacent marine environment may have impacted sediment quality along the adjacent Port Washington Narrows sediment.

The City of Bremerton conducted several sediment investigations adjacent to the Chevron property. However, the data generated were insufficient to make any conclusive determinations regarding the sediment impacts based on the requirements of Ecology's SMS.

The Department of Natural Resources (DNR) owns Smith Cove and the Port Washington Narrows subtidal lands. However, small portions might have been leased by the City of Bremerton from DNR.

3.0 PROJECT OBJECTIVES

The sediment characterization program objectives are summarized below:

- Collect, analyze, and characterize subtidal sediment from three locations immediately offshore from the former Chevron bulk fuel facility located at Evergreen Park;
- Collect, analyze, and characterize intertidal and subtidal sediment from five locations in Smith Cove adjacent to Evergreen Park;
- Collect and archive intertidal and subtidal sediment from five locations in Smith Cove adjacent to Evergreen Park for potential chemical analysis, if deemed appropriate by Ecology;
- Analyze selected representative sediment samples in accordance with protocols and QA/QC requirements outlined in the PSEP Recommended Protocols for Measuring Selected Environmental Variables in Puget Sound;

- Compare analytical results to Washington State SMS to determine whether sediment at the site is potentially impacted; and
- Based on sediment analytical chemistry results and with Ecology's authorization, perform bioassay toxicity tests on sediment samples that exceed SMS criteria to determine whether sediment quality has been impacted.

4.0 PROJECT TEAM AND RESPONSIBILITIES

Key staff members for this task order are listed below with their project functions.

- Mike Ehlebracht, L.H.G., Program Management and Technical Oversight;
- Roger McGinnis, Ph.D., Project Management and Environmental Chemistry;
- Sonia Fernández, L.G., Sediment sampling and field coordination; and
- Anne Conrad, Staff Chemist/Laboratory coordination/oversight and data validation and review.

Subcontractors will include Anchor Environmental for technical review support associated with the marine sediment investigation. Research Support Services, Inc., will perform site and reference location sediment sampling. Chemical analysis will be performed by Analytical Resources, Inc. (ARI) of Seattle, Washington. Bioassay toxicity testing, if required and authorized by Ecology, will be performed by New Fields Laboratory of Port Gamble, Washington.

5.0 SAMPLING LOCATIONS

Samples will be collected from three subtidal locations in the Port Washington Narrows adjacent to the former Chevron bulk fuel facility. Ten intertidal and subtidal sediment samples will be collected from locations within Smith Cove adjacent to Evergreen Park (Figure 2). Proposed sample location coordinates are presented in Table 1; however, due to the gravelly, cobbly nature of the sediment surface observed in Smith Cove during the site visit, sample locations may have to be moved or multiple deployments may be required at each location to achieve adequate sediment volume.

5.1 Positioning on Location

Once the vessel is at the sampling location, a 3-point anchor system will be deployed to maintain position throughout sample acquisition.

A differential global positioning system (DGPS) will be used aboard the sampling vessel in conjunction with visual triangulation methods for location positioning. The DGPS receiver will be placed above the block on the sampling device deployment boom to accurately record the sampling location position. Once the sampler has been deployed, the actual position will be recorded when the sampler is on the bottom and the deployment cable is in a vertical position. Horizontal coordinates will be referenced to latitude and longitude to the nearest 0.1 second.

5.2 Water Depth Measurement

Water depths will be measured directly by lead-line and converted to mudline elevations using the predictive tide charts. The lead-line measurements also serve as a check on location positioning, as the actual water depth at the location coordinates should closely match the predicted depth at those locations.

6.0 FIELD SAMPLING METHODS

6.1 Sampling Equipment

Based on proposed sampling locations, it is anticipated that samples from subtidal areas will be collected using the equipment and methods described in the subsections below. However, if sample locations become exposed during extreme low tides, locations may be accessed from the shore and samples may be collected using a hand corer.

6.1.1 Pneumatic Power Grab

This 0.2-square-meter surface grab sampler is used to collect large volume surface sediment samples (approximately 3 gallons from the top 10 centimeters). A pneumatic ram closes the grab around debris and substrate that may make van Veen grabs impractical. The absence of hydraulic fluid reduces the likelihood of sample contamination. During processing the ram swings away from the grab and the doors are removed, allowing unobstructed access to the sample for photos and visual characterization. In areas where sampling is complicated by large quantities of debris, such as log ponds or scrap metal

facilities, a camera can be attached to the grab. This live video allows the vessel operator to select the location closest to the target coordinates where a successful sample can be obtained.

6.1.2 Diver-Operated 10-cm Hand Core

This alternative to grab sampling allows collection of surface samples in areas with restricted access or in substrates and debris that may make van Veen power grabs impractical. The Hand Core is vented at the top and open on the bottom. The diver inserts the sampler into the substrate, closes the vent, and excavates a small trough beside the sampler. The sample is retained by sliding a plate through a slit near the bottom edge of the sampler (the trough allows insertion of the plate without moving the sampler). The sample is brought out of the water and placed in a bowl, the door removed, and the sampler lifted away from its contents. The large 20-cm-diameter means very little friction is introduced by the sides of the sampler during insertion, so there is virtually no compaction and the top 10 cm are very accurately represented. Since insertion is vertical and closure is by means of a horizontal plate, there is no mounding and no risk of over-penetration. Stratification is preserved and fines are retained.

6.2 Sample Acceptance Criteria

Sediment samples collected with the power grab sampler will be carefully inspected to ensure that the following acceptability criteria are satisfied:

- The sampler is not over-filled with sample so that the sediment surface is pressed against the top of the sampler
- Overlying water is present (indicating minimal leakage)
- The overlying water is not excessively turbid (indicating minimal sample disturbance)
- The sediment surface is relatively flat (indicating minimal disturbance or winnowing)
- The desired penetration depth is achieved (e.g., several centimeters more than the targeted sample depth).

If sediment acceptance criteria are not achieved, the sample will be rejected and the location resampled. If unable to obtain a sample that meets the appropriate acceptance criteria within 25 feet of the proposed location, the sample will be relocated as determined by the Project Manager or Task Manager, as

appropriate. If rejection is due to debris, the depth, location, and type of debris, if known, will be recorded in the field log.

6.3 Equipment Decontamination Procedures

The stainless steel power grab sampling equipment and sampling utensils will be thoroughly cleaned prior to use according to the following procedure:

- The grab sampler and sampling spoons/tools will be initially rinsed with sea water to dislodge remaining sediments. If sediment remains, the equipment will be brushed and rinsed again with sea water; and
- After rinsing with sea water, non-disposable sampling utensils and mixing bowls will then be decontaminated using an Alconox wash with deionized water rinse.

Solvents and acids will not be used as part of the decontamination procedure because a high degree of sediment contamination is not expected. Acid or solvent washes will not be used in the field or sample processing because the use of acids and organic solvents on a congested sampling vessel deck may pose a safety hazard to the crew. In addition, disposal and spillage of acids or solvents during field activities may pose an environmental concern. All hand work will be conducted with disposable nitrile gloves, which will be rinsed with distilled water before and after handling each individual sample, as appropriate, to prevent sample contamination. Gloves will be disposed of between samples to prevent cross contamination.

6.4 Sediment Processing

Sediment samples that meet the acceptance criteria described in Section 6.2 will be processed in the following manner:

- Water overlying sediment in the sampler will be decanted or siphoned off, taking care to avoid sample disturbance.
- The depth of the sediment from the top of the sampler will be measured and the condition of the sediment surface such as biological activity or vegetation will be documented prior to sampling.
- The sediment will be visually classified using ASTM D 2488 and the description recorded on the Sediment Sampling Form.

- The upper 10 cm of the sediment will be collected from the sampler using a stainless steel spoon or other disposable sampling tool, taking care to exclude material in contact with the sampler.
- If gravel and cobbles are present, sediment submitted for chemistry and bioassay analysis will be screened through a 4 mm sieve. Samples submitted for grain size analysis will not be sieved.
- The collected sediment will be placed in a stainless steel bowl and thoroughly homogenized with the spoon or sampling tool until the sample is uniform in color and texture. Note that samples for sulfide analysis will be removed immediately prior to mixing (sulfides could be lost during mixing). The sample (approximately 50 grams) will be immediately placed into a pre-cleaned 4-ounce glass jar containing 8 ml of 2N zinc acetate. The jar will be capped and shaken vigorously to completely expose the sediment to the zinc acetate.
- Labeled glassware will be temporarily stored in an insulated cooler with ice away from the immediate work area. Sample storage criteria are listed in Table 2.

6.5 Sample Containers and Labels

Sample container requirements vary according to analyte and sample matrix. Precleaned sample containers will be obtained from the analytical laboratory. Sample containers shall be cleaned following the requirements described in Specifications and Guidance for Contaminant-Free Sample Containers (EPA 1992, OSWER Directive 92.0-05a). Required sample containers, preservatives, and holding times are summarized in Table 2.

6.6 Field Documentation

Field notes will be maintained during sampling and processing operations. The following will be included in the field notes:

- Names of the field sampling crew, including vessel operator and person(s) collecting and logging the samples;
- Weather conditions;
- GPS coordinates of each sampling location;

- Mudline elevation of each sampling location as measured from mean lower low water;
- Date and time of collection of each sample;
- The sample location;
- Calculated elevation of each sediment sample location;
- Descriptions of cores; and
- Any deviation from the approved sampling plan.

6.7 Excess Sediment Disposal

Any remaining excess sediment (material deeper than 10 cm, leftover in the power grab or hand corer sediment after sample containers are filled, etc.) will be returned to the location from which it was collected.

7.0 SAMPLE HANDLING PROCEDURES

7.1 Sample Preservation and Holding Times

7.1.1 Chemical and Physical Analyses

Samples will be preserved according to the requirements of the specific analytical methods to be employed, and all samples will be extracted and analyzed within method-specified holding times. Required sample containers, preservatives, and holding times are summarized in Table 2.

7.1.2 Bioassay Toxicity Testing

All sediment samples for potential bioassays will be stored at 4° C, with headspace purged with nitrogen, pending completion of chemical analyses and initiation of biological testing, if required and authorized by Ecology. All bioassay analyses, including retests, will commence within 8 weeks (56 days) after collection of sediment samples.

7.2 Chain of Custody and Shipping Procedures

7.2.1 Chain of Custody Procedures

Chain of custody forms will be used to document the collection, custody, and transfer of samples from their initial collection location to the laboratory, and their ultimate use and disposal. Entries for each sample will be made on the custody form immediately after each sample is collected.

Sample custody procedures will be followed to provide a documented record that can be used to follow possession and handling of a sample from collection through analysis. A sample is considered to be in custody if it meets at least one of the following conditions:

- The sample is in someone's physical possession or view;
- The sample is secured to prevent tampering (i.e., custody seals); and/or
- The sample is locked or secured in an area restricted to authorized personnel.

A chain of custody form will be completed in the field as samples are packaged. At a minimum, the information on the custody form shall include the sample number, date and time of sample collection, sampler, analyses, and number of containers. Two copies of the custody form will be placed in the cooler prior to sealing for delivery to the laboratory with the respective samples. The other copy will be retained and placed in the project files after review by the Project Chemist. Custody seals will be placed on each cooler or package containing samples so the package cannot be opened without breaking the seals.

7.2.2 Sample Shipping Procedures

After sample containers have been filled, they will be packed on ice in coolers. The coolers will be transferred to Analytical Resources for chemical analysis. Archive samples for potential bioassay toxicity analysis, if required, will be stored at Hart Crowser's facility. Archive samples will be stored under a nitrogen atmosphere in the dark at 4°C. Chain of custody procedures will commence in the field and will track delivery of the samples to the analytical laboratories. Specific procedures are as follows:

- Samples will be packaged and shipped in accordance with U.S. Department of Transportation regulations as specified in 49 CFR 173.6 and 49 CFR 173.24;
- Individual sample containers will be packed to prevent breakage;

- The coolers will be clearly labeled with sufficient information (name of project, time and date container was sealed, person sealing the cooler, and the Hart Crowser office name and address) to enable positive identification;
- A sealed envelope containing custody forms will be enclosed in a plastic bag and taped to the inside lid of the cooler;
- Signed and dated custody seals will be placed on all coolers prior to shipping;
- Samples will either be shipped by overnight courier or will be hand delivered to the laboratory by Hart Crowser personnel; and
- Upon transfer of sample possession to the testing laboratories, the custody form will be signed by the persons transferring custody of the coolers. Upon receipt of samples at the laboratory, the shipping container custody seal will be broken and the laboratory sample-receiving custodian will compare samples to information on the chain of custody form and record the condition of the samples received.

8.0 LABORATORY METHODS

Samples will be analyzed according to EPA methods as described in Update III to Test Methods for Evaluating Solid Waste; Physical/Chemical Methods, SW-846 (EPA 1986), Methods for Chemical Analysis of Water and Wastes (EPA 1983), and the Puget Sound Estuary Program Protocols (PSEP 1991 and updates), as referenced in Ecology's Sediment Sampling and Analysis Plan Appendix (SAPA; Ecology 2003).

8.1 Physical and Chemical Analysis

Sediment samples will be analyzed for the parameters listed in Table 3. Sediment chemistry analytical results will be compared to Ecology SMS criteria that are also presented in Table 3. It should be noted that for sediment with total organic carbon (TOC) concentrations outside the range of 0.5 to 4.0 percent, that carbon normalized SMS criteria default to the Apparent Effects Thresholds (AETs). Failure to achieve this may result in a requirement to re-analyze. The testing laboratory will be specifically cautioned by Hart Crowser to make certain that it complies with the detection limit requirements. All reasonable means, including additional cleanup steps and method modifications, will be used to bring detection limits below SMS criteria. In addition, an aliquot

of each sediment sample for analysis will be archived for additional analysis, if necessary.

In all cases, to avoid potential problems and leave open the option for retesting, sediments or extracts will be kept under proper storage conditions until the chemistry data are deemed acceptable.

8.1.1 Physical Parameters

Analysis of total solids will follow the PSEP (1986) method. Solids results will be used to correct sediment sample results to a dry weight basis.

While there are no SMS criteria for grain size, samples will be analyzed to evaluate appropriate reference sediment locations and test organisms for bioassay toxicity analyses, if required. Particle size will be determined by ASTM Method D 422, using the following sieve numbers: 4, 10, 20, 40, 60, 140, and 230. The fine-grained fraction will be classified by phi size (+5, +6, +7, +8, >8) using hydrometer analysis. Hydrogen peroxide will not be used in preparations for grain size analysis.

8.1.2 Chemical Analysis

Laboratory testing will include the following standard analytes listed in the Washington State SMS (Chapter 173-204 WAC). In addition, petroleum hydrocarbon analysis will be performed to assess site-specific sources. Sulfide and ammonia analyses will be performed to evaluate potential confounding factors in bioassay testing.

- Total Organic Carbon (Ecology/EPA Method 9060);
- Gasoline-range petroleum hydrocarbons (Ecology NWTPH-G);
- Diesel and oil-range petroleum hydrocarbons (Ecology NWTPH-Dx). Sample extracts may undergo silica gel cleanup, if required, to remove interfering biogenic compounds;
- SMS Metals – arsenic, cadmium, chromium, copper, lead, silver, and zinc (EPA Method 6010 or 6020), and mercury (EPA Method 7471A);
- Semivolatile Organic Compounds (EPA Method 8270C, low-level);
- Total PCBs (EPA Method 8082);

- Total sulfides (PSEP/EPA Method 9030B) to evaluate potential confounding factors in bioassay toxicity analyses, if required; and
- Ammonia (EPA Method 350.1) to evaluate potential confounding factors in bioassay toxicity analyses, if required.

8.2 Bioassay Toxicity Testing

Bioassay toxicity testing has not yet been authorized by Ecology. If sediment analytical chemistry results exceed SMS criteria and Ecology authorizes bioassay testing, the following tests will be performed according to the procedures in the following subsections.

8.2.1 General Biological Testing Procedures

Overlying Water Quality Monitoring

Water quality monitoring will be conducted for the amphipod, sediment larval, and *Neanthes* bioassays. This consists of daily measurements of salinity, temperature, pH, and dissolved oxygen for the amphipod and sediment larval tests. These measurements will be made every 3 days for the *Neanthes* bioassay. Ammonia and sulfides will be determined at test initiation and termination for the three tests. Monitoring will be conducted for test and reference sediments and negative controls (including seawater controls). Parameter measurements must be within the limits specified for each bioassay. Measurements for each treatment will be made on a separate chemistry beaker set up to be identical to the other replicates within the treatment group, including the addition of test organisms.

8.2.2 Amphipod Bioassay

This test involves exposing the amphipod *Rhepoxynius abronius* to test sediment for 10 days and counting the surviving animals at the end of the exposure period. Daily emergence data and the number of amphipods failing to rebury at the end of the test will be recorded as well. The control sediment has a performance standard of 10 percent mortality. The reference sediment has a mortality performance standard of 20 percent greater than control.

8.2.3 Sediment Larval Bioassay

This test monitors larval development of a suitable echinoderm species in the presence of test sediment. The test is run until the appropriate stage of development is achieved in a sacrificial seawater control. At the end of the test,

larvae from each test sediment exposure are examined to quantify abnormality and mortality.

The seawater control has a performance standard of 30 percent combined mortality and abnormality. The reference sediment has a performance standard of 35 percent combined mortality and abnormality normalized to seawater control.

Initial counts will be made for a minimum of five 10-ml aliquots. Final counts for seawater control, reference sediment, and test sediment will be made on 10-ml aliquots.

The sediment larval bioassay has a variable endpoint (not necessarily 48 hours) that is determined by the developmental stage of organisms in a sacrificial seawater control.

Ammonia and sulfides toxicity may interfere with test results for this bioassay. Aeration will be conducted throughout the test to minimize these effects.

8.2.4 *Neanthes* Growth Test

This test utilizes the polychaete *Neanthes arenaceodentata* in a 20-day growth test. The growth rate of organisms exposed to test sediments is compared to the growth rate of organisms exposed to reference sediment. The control sediment has a performance standard of 10 percent mortality. The reference sediment has a performance standard of 80 percent of the control growth rate. The reference sediment has a performance standard of 20 percent mortality greater than the control.

9.0 QUALITY ASSURANCE AND QUALITY CONTROL REQUIREMENTS

9.1 Chemical and Physical Analyses

The quality of analytical data generated is controlled by the frequency and type of internal QC checks developed for analysis type. The quality of laboratory measurements will be assessed by reviewing results for analysis of method blanks, matrix spikes, duplicate samples, laboratory control samples, surrogate compound recoveries, instrument calibrations, performance evaluation samples, interference checks, etc., as specified in the analytical methods to be used. The following general procedures will be followed for all laboratory analyses:

- Laboratory blank measurements at a minimum frequency of 5 percent or one per batch of 20 samples or fewer for each matrix;
- Matrix spike (MS) and matrix spike duplicate (MSD) analysis, for organic analyses, to assess accuracy and precision at a minimum frequency of 5 percent or one per batch of 20 samples or fewer for each matrix;
- Analysis of surrogate compounds, for all organic analyses, to assess accuracy; and
- Laboratory control sample analysis to assess accuracy in the absence of any matrix effect at a minimum frequency of 5 percent or one per batch of 20 samples or fewer for each matrix.

Analytical method specific requirements and criteria are summarized in Tables 4 through 9.

9.2 Bioassay Toxicity Testing

9.2.1 General Testing Criteria

The following quality control procedures and criteria will be used for bioassay toxicity tests.

Negative Controls

Negative control sediments are used in the amphipod and *Neanthes* bioassays to check laboratory performance. Negative control sediments are clean sediments in which the test organism normally lives and that are expected to produce low mortality. The sediment larval test uses a negative seawater control rather than control sediment.

Reference Sediment

Bioassay reference sediments must closely match the grain size characteristics of the test sediments so results can be used for test comparison and interpretation. The reference sediment is used to check for physical effects of the test sediment.

Reference sediment will be collected from Carr Inlet using a van Veen grab sampler. Reference area sediments will be collected as soon as possible prior to biological testing. Reference sediment will be wet-sieved in the field to find an appropriate grain size match with test sediment. The location of the reference sediment sampling location will be recorded to the nearest 0.1 second.

Reference sediments will be analyzed for complete suite of SMS chemicals as well as total solids, total organic carbon, bulk ammonia, bulk sulfides, and grain size.

Replication

Five laboratory replicates of test sediments, reference sediments, and negative controls will be run for each bioassay.

Positive Controls

A positive control will be run for each bioassay. Positive controls are chemicals known to be toxic to the test organism and that provide an indication of the sensitivity of the particular organisms used in a bioassay. Cadmium chloride will be used for the amphipod, sediment larval, and *Neanthes* bioassays.

9.2.2 Specific Bioassay Test Criteria

Amphipod Bioassay

The control sediment has a performance standard of 10 percent mortality. The reference sediment has a mortality performance standard of 20 percent greater than control.

Sediment Larval Bioassay

The seawater control has a performance standard of 30 percent combined mortality and abnormality. The reference sediment has a performance standard of 35 percent combined mortality and abnormality normalized to seawater control.

Neanthes Growth Test

The control sediment has a performance standard of 10 percent mortality. The reference sediment has a performance standard of 80 percent of the control growth rate. The reference sediment has a performance standard of 20 percent mortality greater than the control.

9.3 Data Quality Assurance Review

A project chemist at Hart Crowser will perform an independent data quality review of the chemical analytical results provided by ARI. This report will assess the adequacy of the reported detection limits in achieving the project screening

levels for sediment; the precision, accuracy, representativeness, and completeness of the data; and the usability of the analytical data for project objectives. Exceedances of analytical control limits will be summarized and evaluated.

A data evaluation review will be performed on all results using QC summary sheet results provided by the laboratory for each data package. The data evaluation review is based on the Quality Control Requirements previously described and follows the format of the EPA National Functional Guidelines for Organic (EPA 1994a) and Inorganic (EPA 1994b) Data Review modified to include specific criteria of individual analytical methods. Raw data (instrument tuning, calibrations, chromatograms, spectra, instrument printouts, bench sheets and laboratory worksheets) will be available for review if any problems or discrepancies are discovered during the routine evaluation or if Ecology desires a more comprehensive data validation be performed. The following is an outline of the data evaluation review format:

- Verify sample numbers and analyses match the chain of custody request;
- Verify sample preservation and holding times;
- Verify instrument tuning, calibration, and performance criteria were achieved;
- Verify that laboratory blanks were performed at the proper frequency and that no analytes were present in the blanks;
- Verify field and laboratory duplicates, matrix spikes, and laboratory control samples were run at the proper frequency and that control limits were met;
- Verify surrogate compound analyses have been performed and that results met the QC criteria; and
- Verify required detection limits have been achieved.

Data qualifier flags, beyond any applied by the laboratory, will be added to sample results that fall outside the QC acceptance criteria. An explanation of data qualifiers to be applied during the review is provided below:

- U. The compound was analyzed for but was not detected. The associated numerical value is the sample reporting limit.
- J. The associated numerical value is an estimated quantity because QC criteria were slightly exceeded or because reported concentrations were less than the practical quantitation limit (lowest calibration standard).

- UJ. The compound was analyzed for, but not detected. The associated numerical value is an estimated reporting limit because QC criteria were not met.
- R. Data are not usable because of significant exceedance of QC criteria. The analyte may or may not be present; resampling and/or re-analysis are necessary for verification.

10.0 DATA ANALYSIS AND REPORTING

10.1 Data Analysis

10.1.1 Sediment Chemistry and Physical Parameters

Sediment chemistry results will be compared to Ecology SMS criteria to determine whether there may be impacts to sediment quality. In the event that TOC concentrations are outside the normalization range of 0.5 to 4.0 percent, chemistry results will also be compared to the lowest apparent effects threshold (LAET) and second lowest apparent effects threshold (2LAET).

10.1.2 Bioassay Toxicity Testing

Data analysis will consist of endpoint comparisons to controls and reference on an absolute percentage basis as well as statistical comparison to reference.

Bioassay testing results will be evaluated to determine whether there are statistically significant differences between test, control, and reference samples.

10.2 Reporting

10.2.1 Physical and Chemical Analysis Laboratory Reports

The laboratory data reports will consist of complete data packages that will contain complete documentation and all raw data to allow independent data reduction and verification of analytical results from laboratory bench sheets, instrument raw data outputs, and chromatograms. Each laboratory data report will include the following:

- Case narrative identifying the laboratory analytical batch number, matrix and number of samples included, analyses performed and analytical methods used, and description of any problems or exceedance of QC criteria and corrective action taken. The laboratory manager or their designee must sign the narrative.

- Copy of chain of custody forms for all samples included in the analytical batch.
- Tabulated sample analytical results with units, data qualifiers, percent solids, sample weight or volume, dilution factor, laboratory batch and sample number, Hart Crowser sample number, and dates sampled, received, extracted, and analyzed all clearly specified. Surrogate percent recoveries will be included for organic analyses.
- Surrogate spike recoveries will be reported in all organic reports where appropriate. The reports shall also specify the control limits for surrogate spike results, as well as the spiking concentration. Any out-of-control recoveries will be reported immediately to the Project QA Manager. Any out-of-control recoveries (as defined in the method) will result in the sample being rerun (both sets of data are to be reported).
- All calibration, quality control, and sample raw data including chromatograms, quantitation reports, and other instrument output data.
- Blank summary results indicating samples associated with each blank.
- Matrix spike/matrix spike duplicates result summaries with calculated percent recovery and relative percent differences.
- Laboratory control sample results, when applicable, with calculated percent recovery.
- Electronically formatted data deliverable (diskette) results.

10.2.2 Bioassay Testing Laboratory Reports

A written report will be prepared by the biological laboratory documenting the activities associated with sample analyses. As a minimum, the following will be included in the report:

- Results of the laboratory bioassay analyses and QA/QC results, reported both in hard copy and in Ecology's SEDQUAL data format. Raw data will be legible or typed.
- All protocols used during analyses, including explanation of any deviation from the Recommended Protocols and the approved sampling plan.
- The location of all bioassay testing organisms will be reported.
- Chain of custody procedures, including explanation of any deviation from the identified protocols.

- Location and availability of data, laboratory notebooks and chain of custody forms.

10.2.3 Reports to Ecology

Hart Crowser will prepare a report summarizing sediment sampling procedures and laboratory testing results. The report will include a map with confirmed sediment sampling locations, tabulated analytical testing data with comparisons to SMS criteria, and complete laboratory analytical documentation.

At a minimum, the report will include the following sections

- Introduction/Purpose;
- Results of sediment chemistry and bioassay tests;
- Discussion and interpretation of results with respect to the Sediment Management Standards; and
- Conclusions and recommendations.

Sediment sampling analytical data will also be submitted to Ecology electronically in SEDQUAL data entry templates.

11.0 REFERENCES

Ecology 2003. Sediment Sampling and Analysis Appendix. Guidance on the Development of Sediment Sampling and Analysis Plans Meeting the Requirements of the Sediment Management Standards (Chapter 173-203 WAC). Ecology Publication No. 03-09-043. Revised April 2003.

EPA 1983. U.S. Environmental Protection Agency Methods for Chemical Analysis of Water and Wastes. EPA-600/4-79-020.

EPA 1986. Test Methods for Evaluating Solid Waste; Physical/Chemical Methods, SW-846, 3rd Update.

EPA, 1990. U.S. Environmental Protection Agency, Region 10, *Recommended Protocols for Conducting Laboratory Bioassays on Puget Sound Sediments*, April 1990.

EPA 1992. Specifications and Guidance for Contaminant-Free Sample Containers. OSWER Directive 92.0-05A.

EPA 1994a. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. EPA-540/R-94-012, February 1994.

EPA 1994b. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. EPA-540/R-94-013, February 1994

EPA 2001. Guidance on Environmental Data Verification and Validation. EPA QA/G-8.

PSEP 1986. Recommended Protocols for Measuring Conventional Sediment Variables in Puget Sound. Final Report. Prepared for U.S. Environmental Protection Agency, Seattle, WA.

PSEP 1997a. Recommended Protocols for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples. Final Report. Prepared for U.S. Environmental Protection Agency, Seattle, WA.

PSEP 1997b. Recommended Guidelines for Measuring Organic Compounds in Puget Sound Water, Sediment, and Tissue Samples. Final Report. Prepared for U.S. Environmental Protection Agency, Seattle, WA.

PSEP 1997c. Recommended Guidelines for Sampling Marine Sediment, Water Column, and Tissue in Puget Sound. Final Report. Prepared for U.S. Environmental Protection Agency, Seattle, WA.

J:\jobs\1733006\Evergreen Park SAP.doc

Table 1 - Sample Location Coordinates

Sample ID	LAT	LONG
ES1	47.573569	-122.628147
ES2	47.573665	-122.627865
ES3	47.573809	-122.627612
ES4	47.573629	-122.627546
ES5	47.573617	-122.627102
ES6	47.573893	-122.627126
ES7	47.574145	-122.627156
ES8	47.573833	-122.626567
ES9	47.574049	-122.626616
ES10	47.574302	-122.626868
CS1	47.573492	-122.625353
CS2	47.573288	-122.625173
CS3	47.573102	-122.625023

Table 2 – Sample Containers, Preservation, and Holding Times

Analysis	Matrix	Container	Preservation	Holding Time ^a
Metals	Sediment	1 – 4 oz glass jar	cool to 4°C	6 months 28 days (mercury)
TPH-Diesel extended ^b	Sediment	1 – 8 oz glass jar	cool to 4°C	14 days
TPH-Gasoline	Sediment	2 – 2 oz glass jar with septa	cool to 4°C	7 days
Semivolatiles Organics ^b	Sediment	1 – 8 oz. Glass jar	cool to 4°C	7 days (extraction) 40 days (analysis)
PCBs ^b	Sediment	1 – 8 oz. Glass jar	cool to 4°C	7 days (extraction) 40 days (analysis)
Total Organic Carbon ^b	Sediment	1 – 8 oz. Glass jar	cool to 4°C	28 days
Grain Size	Sediment	1 – 16 oz. Glass jar	cool to 4°C	28 days
Total Sulfide	Sediment	1 – 4 oz. Glass jar	8 mL 2 N zinc acetate cool to 4°C	28 days
Ammonia	Sediment	1 – 4 oz. Glass jar	cool to 4°C	7 days
Bioassay Archive	Sediment	1 – 1 gal. Glass jar	Fill head space with N ₂ cool to 4°C	8 weeks

- a. Holding times are from date of sample collection.
b. Analytes may be combined into a single container.

Table 4 - Methods of Analysis and Apparent Effects Threshold (dry weight) Sediment Quality Criteria

Parameter		Prep Method	Analysis Method	AETs	
				LAET	2LAET
CONVENTIONALS:					
Total Solids in %		—	PSEP	—	—
Total Organic Carbon in %		—	EPA 9060/Ecology (1)	—	—
Ammonia as N in mg/kg		—	EPA 350.1	—	—
Total Sulfide in mg/kg		—	PSEP (EPA 9030B)	—	—
Grain Size		—	PSEP (Mod ASTM D422 with Hydrometer)	—	—
PETROLEUM HYDROCARBONS					
Gasoline-Range		—	NWTPH-G	—	—
Diesel- and Heavy Oil-Range		—	NWTPH-DX	—	—
METALS					
Arsenic		PSEP/ EPA 3050B	EPA 6010B	mg/kg dw 57	mg/kg dw 93
Cadmium		PSEP/ EPA 3050B	EPA 6010B	5.1	6.7
Chromium		PSEP/ EPA 3050B	EPA 6010B	260	270
Copper		PSEP/ EPA 3050B	EPA 6010B	390	390
Lead		PSEP/ EPA 3050B	EPA 6010B	450	530
Mercury		7471	EPA 7471	0.41	0.59
Silver		PSEP/ EPA 3050B	EPA 6010B	6.1	6.1
Zinc		PSEP/ EPA 3050B	EPA 6010B	410	960
SEMIVOLATILE ORGANICS (SVOC)					
LPAH				µg/kg dw	µg/kg dw
Naphthalene		EPA 3540C	EPA 8270C	2100	2400
Acenaphthylene		EPA 3540C	EPA 8270C	670	1400
Acenaphthene		EPA 3540C	EPA 8270C	1300	1300
Fluorene		EPA 3540C	EPA 8270C	500	730
Phenanthrene		EPA 3540C	EPA 8270C	540	1000
Anthracene		EPA 3540C	EPA 8270C	1500	5400
2-Methylnaphthalene		EPA 3540C	EPA 8270C	960	4400
Total LPAH				5200	13000
HPAH				µg/kg dw	µg/kg dw
Fluoranthene		EPA 3540C	EPA 8270C	1700	2500
Pyrene		EPA 3540C	EPA 8270C	2600	3300
Benzo(a)anthracene		EPA 3540C	EPA 8270C	1300	1600
Chrysene		EPA 3540C	EPA 8270C	1400	2800
Benzofluoranthenes		EPA 3540C	EPA 8270C	3200	3600
Benzo(a)pyrene		EPA 3540C	EPA 8270C	1600	3000
Indeno(1,2,3-c,d)pyrene		EPA 3540C	EPA 8270C	600	690
Dibenzo(a,h)anthracene		EPA 3540C	EPA 8270C	230	540
Benzo(g,h,i)perylene		EPA 3540C	EPA 8270C	670	720
Total HPAH				12000	17000
CHLORINATED HYDROCARBONS					
1,4-Dichlorobenzene		EPA 3540C	EPA 8270C	110	120
1,2-Dichlorobenzene		EPA 3540C	EPA 8270C	35	50
1,2,4-Trichlorobenzene		EPA 3540C	EPA 8270C	31	51
Hexachlorobenzene (HCB)		EPA 3540C	EPA 8270C	22	70
PHTHALATES					
Dimethyl phthalate		EPA 3540C	EPA 8270C	71	160
Diethyl phthalate		EPA 3540C	EPA 8270C	200	200
Di-n-butyl phthalate		EPA 3540C	EPA 8270C	1400	1400
Butyl benzyl phthalate		EPA 3540C	EPA 8270C	63	900
Bis(2-ethylhexyl)phthalate		EPA 3540C	EPA 8270C	1300	1900
Di-n-octyl phthalate		EPA 3540C	EPA 8270C	6200	6200
ACID EXTRACTABLES					
Phenol		EPA 3540C	EPA 8270C	—	—
2 Methylphenol		EPA 3540C	EPA 8270C	—	—
4 Methylphenol		EPA 3540C	EPA 8270C	—	—
2,4-Dimethylphenol		EPA 3540C	EPA 8270C	—	—
Pentachlorophenol		EPA 3540C	EPA 8270C	—	—
Benzyl alcohol		EPA 3540C	EPA 8270C	—	—
Benzoic acid		EPA 3540C	EPA 8270C	—	—
MISCELLANEOUS EXTRACTABLES					
Dibenzofuran		EPA 3540C	EPA 8270C	µg/kg dw 540	µg/kg dw 700
Hexachlorobutadiene		EPA 3540C	EPA 8270C	11	120
N-Nitrosodiphenylamine		EPA 3540C	EPA 8270C	28	40
PCBs					
Total PCBs		3540C	EPA 8081	µg/kg dw 130	µg/kg dw 1000

Notes:

- a - Dash indicates no SMS criterion. Analysis will be performed for site-specific sources or to evaluate bioassay confounding factors.
1. Recommended Methods for Measuring TOC in Sediments, Kathryn Bragdon-Cook, Clarification Paper, Puget Sound Dredged Disposal Analysis Annual Review, May 1993.

Table 3 - Methods of Analysis and SMS (Organic Carbon Normalized) Sediment Quality Criteria

Parameter		Prep Method	Analysis Method	SMS	
				SQS	CSL
CONVENTIONAL:					
Total Solids in %		—	PSEP	—	—
Total Organic Carbon in %		—	EPA 9060/Ecology (1)	—	—
Ammonia as N in mg/kg		—	EPA 350.1	—	—
Total Sulfide in mg/kg		—	PSEP (EPA 9030B)	—	—
Grain Size		—	PSEP (Mod ASTM D422 with Hydrometer)	—	—
PETROLEUM HYDROCARBONS					
Gasoline-Range		—	NWTPH-G	mg/kg dw	mg/kg dw
Diesel- and Heavy Oil-Range		—	NWTPH-Dx	—	—
METALS					
Arsenic		PSEP/ EPA 3050B	EPA 6010B	mg/kg dw 57	mg/kg dw 93
Cadmium		PSEP/ EPA 3050B	EPA 6010B	5.1	6.7
Chromium		PSEP/ EPA 3050B	EPA 6010B	260	270
Copper		PSEP/ EPA 3050B	EPA 6010B	390	390
Lead		PSEP/ EPA 3050B	EPA 6010B	450	530
Mercury		7471	EPA 7471A	0.41	0.59
Silver		PSEP/ EPA 3050B	EPA 6010B	6.1	6.1
Zinc		PSEP/ EPA 3050B	EPA 6010B	410	960
SEMIVOLATILE ORGANICS (SVOC)					
LPAH				mg/kg oc	mg/kg oc
Naphthalene		EPA 3540C	EPA 8270C	99	170
Acenaphthylene		EPA 3540C	EPA 8270C	66	66
Acenaphthene		EPA 3540C	EPA 8270C	16	57
Fluorene		EPA 3540C	EPA 8270C	23	79
Phenanthrene		EPA 3540C	EPA 8270C	100	480
Anthracene		EPA 3540C	EPA 8270C	220	1200
2-Methylnaphthalene		EPA 3540C	EPA 8270C	38	64
Total LPAH				370	780
HPAH				mg/kg oc	mg/kg oc
Fluoranthene		EPA 3540C	EPA 8270C	160	1200
Pyrene		EPA 3540C	EPA 8270C	1000	1400
Benzo(a)anthracene		EPA 3540C	EPA 8270C	110	270
Chrysene		EPA 3540C	EPA 8270C	110	460
Benzofluoranthenes (b,k,j)		EPA 3540C	EPA 8270C	230	450
Benzo(a)pyrene		EPA 3540C	EPA 8270C	99	210
Indeno(1,2,3-c,d)pyrene		EPA 3540C	EPA 8270C	34	88
Dibenzo(a,h)anthracene		EPA 3540C	EPA 8270C	12	33
Benzo(g,h,i)perylene		EPA 3540C	EPA 8270C	31	78
Total HPAH				960	5300
CHLORINATED HYDROCARBONS					
1,4-Dichlorobenzene		EPA 3540C	EPA 8270C	mg/kg oc 3.1	mg/kg oc 9
1,2-Dichlorobenzene		EPA 3540C	EPA 8270C	2.3	2.3
1,2,4-Trichlorobenzene		EPA 3540C	EPA 8270C	0.81	1.8
Hexachlorobenzene (HCB)		EPA 3540C	EPA 8270C	0.38	2.3
PHTHALATES					
Dimethyl phthalate		EPA 3540C	EPA 8270C	mg/kg oc 53	mg/kg oc 53
Diethyl phthalate		EPA 3540C	EPA 8270C	61	110
Di-n-butyl phthalate		EPA 3540C	EPA 8270C	220	1700
Butyl benzyl phthalate		EPA 3540C	EPA 8270C	4.9	64
Bis(2-ethylhexyl)phthalate		EPA 3540C	EPA 8270C	47	78
Di-n-octyl phthalate		EPA 3540C	EPA 8270C	58	4500
ACID EXTRACTABLES					
Phenol		EPA 3540C	EPA 8270C	mg/kg dw 0.42	mg/kg dw 1.2
2 Methylphenol		EPA 3540C	EPA 8270C	0.063	0.063
4 Methylphenol		EPA 3540C	EPA 8270C	0.67	0.67
2,4-Dimethylphenol		EPA 3540C	EPA 8270C	0.029	0.029
Pentachlorophenol		EPA 3540C	EPA 8270C	0.36	0.69
Benzyl alcohol		EPA 3540C	EPA 8270C	0.057	0.073
Benzoic acid		EPA 3540C	EPA 8270C	0.65	0.65
MISCELLANEOUS EXTRACTABLES					
Dibenzofuran		EPA 3540C	EPA 8270C	mg/kg oc 15	mg/kg oc 58
Hexachlorobutadiene		EPA 3540C	EPA 8270C	3.9	6.2
N-Nitrosodiphenylamine		EPA 3540C	EPA 8270C	11	11
PCBs					
Total PCBs		3540C	EPA 8081	mg/kg oc 12	mg/kg oc 65

Notes:

- a - WA SMS criteria for non-polar organics are TOC normalized for TOC between 0.5 and 4.0 percent. If TOC is outside this range, SQS criteria default to the LAET.
- b - Dash indicates no SMS criterion. Analysis will be performed for site-specific sources or to evaluate bioassay confounding factors.
- c - mg/kg oc indicates results are organic carbon normalized
- 1. Recommended Methods for Measuring TOC in Sediments, Kathryn Bragdon-Cook, Clarification Paper, Puget Sound Dredged Disposal Analysis Annual Review, May 1993.

Table 5 – Quality Control Procedures, Criteria, and Corrective Actions for Metals Analysis

Inorganics			
Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Field Quality Control			
Duplicate	1 every 10 or fewer field samples	Sediment < 50% RPD	Evaluate data for usability
Laboratory Quality Control			
Initial calibration verification	Daily or each time instrument is set up	90 to 110% of initial calibration	Recalibrate instrument
Initial calibration blank	Following each instrument calibration	All analytes < reporting limit	Correct source of contamination
Continuing calibration verification	Every 10 analytical samples or every 2 hours and at the beginning and end of each run	90 to 110% of initial calibration	Correct instrument calibration and re-analyze affected samples
Continuing calibration blank	Following each continuing calibration verification	All analytes < reporting limit	Correct source of contamination
Method blank	1 per batch of every 20 or fewer samples	All analytes < reporting limit	Re-extract and re-analyze associated samples unless concentrations are > 3 times the blank level
Matrix spike	1 per batch of every 20 or fewer samples	75 to 125% recovery	Evaluate data for usability
Laboratory duplicate	1 per batch of every 20 or fewer samples	≤ 25% RPD	Evaluate data for usability
Laboratory control sample	1 per batch of every 20 or fewer samples	80 to 120% recovery	Evaluate data for usability

Table 6 – Quality Control Procedures, Criteria, and Corrective Actions for SVOC Analysis

Semivolatile Organics EPA 8270C GC/MS			
Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Field Quality Control			
Duplicate	1 every 10 or fewer field samples	≤ 50% RPD (soil)	Evaluate data for usability
Laboratory Quality Control			
Method blank	1 per batch of every 20 or fewer samples	All analytes < reporting limit	Re-extract and re-analyze associated samples unless concentrations are > 5 times the blank level
Initial calibration	Calibration prior to analysis of samples	Average RRF > 0.05 %RSD < 25%	Recalibrate instrument
Continuing calibration	Every 12 hours with mid-range standard	% Difference ≤ 20% of initial calibration	Recalibrate instrument and re-analyze affected samples
Instrument performance check (tuning)	DFTPP; Daily prior to sample analysis or each 12-hour period, whichever is more frequent	SW-846, Method 8270C, Section 7.3.1.1, Table 4	Retune and recalibrate instrument; re-analyze affected samples
Internal standards	Every sample and calibration standard mix	Areas within -50% to +100% of initial calibration	Re-analyze affected samples
System monitoring compounds (surrogates)	Every lab and field sample	Laboratory control chart limits	Evaluate data for usability

Table 6 – Quality Control Procedures, Criteria, and Corrective Actions for SVOC Analysis

Semivolatile Organics EPA 8270C GC/MS			
Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Retention time windows	All samples and continuing calibration checks	±0.06 relative retention time units (sample and standard)	Re-analyze affected samples
Qualitative identification (ion intensity ratios)	All samples	SW-846, Method 8270C, Section 7.6	Evaluate data for usability
Matrix spike	1 per batch of every 20 or fewer samples	Laboratory control chart limits	Evaluate data for usability
Matrix spike duplicate	1 per batch of every 20 or fewer samples	Laboratory control chart limits	Evaluate data for usability
Laboratory control sample	1 per batch of every 20 or fewer samples	Laboratory control chart limits	Evaluate data for usability

Table 7 – Quality Control Procedures, Criteria, and Corrective Actions for PCB Analysis

PCBs - EPA 8082 GC/ECD				
Quality Control Check	Frequency	Acceptance Criteria	Corrective Action	
Field Quality Control				
Duplicate	1 every 20 or fewer field samples	Sediment ≤ 50% RPD	Evaluate data for usability	
Laboratory Quality Control				
Method blank	1 per batch of every 20 or fewer samples	All analytes < reporting limit	Re-extract and re-analyze associated samples unless concentrations are > 5 times the blank level	
Initial calibration	5-point external calibration prior to analysis of samples	%RSD < 25%	Recalibrate instrument	
Continuing calibration	Every 10 samples with mid-range standard	% Difference ≤ 20% of initial calibration	Recalibrate instrument and re-analyze affected samples	
System monitoring compounds (surrogates)	Every lab and field sample	<i>Tetrachloro-m-xylene</i> 35 to 112% recovery <i>Decachlorobiphenyl</i> 14 to 126% recovery	Evaluate data for usability	
Retention time windows	All samples and continuing calibration checks	±0.06 relative retention time units (sample and standard)	Re-analyze affected samples	
Matrix spike/MS duplicate	1 per batch of every 20 or fewer samples	40 to 150% recovery %RPD < 25%	Evaluate data for usability	
Laboratory control sample	1 per batch of every 20 or fewer samples	60 to 140% recovery	Evaluate data for usability	

Table 8 – Quality Control Procedures, Criteria, and Corrective Actions for TPH-G Analysis

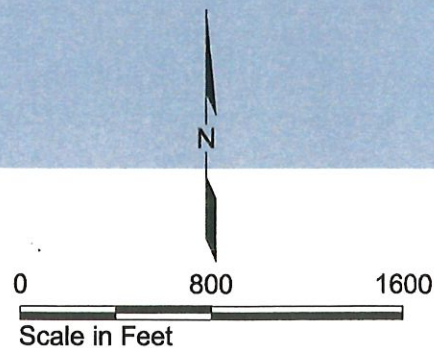
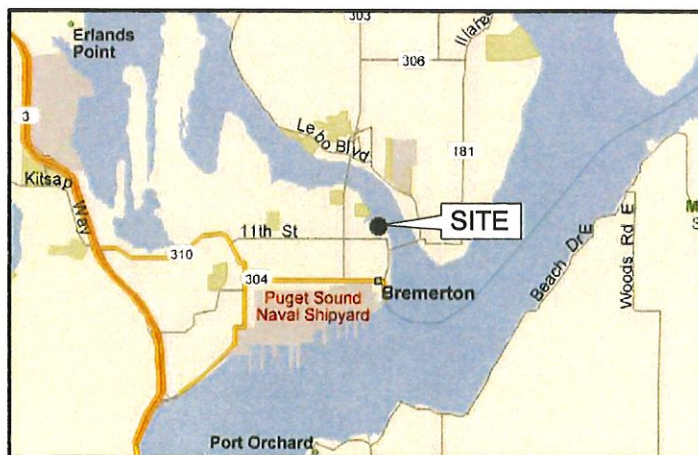
Gasoline Range Hydrocarbons NWTPH-G			
Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Field Quality Control			
Duplicate	1 every 20 or fewer field samples	< 50% RPD (soil)	Evaluate data for usability
Laboratory Quality Control			
Method blank	1 per batch of every 20 or fewer samples	All analytes < reporting limit	Re-extract and re-analyze associated samples unless concentrations are > 5 times the blank level
Initial calibration	4-point external calibration prior to analysis of samples	%RSD < 25%	Recalibrate instrument
Continuing calibration	Every 10 samples with mid-range standard	% Difference < 20% of initial calibration	Recalibrate instrument and re-analyze affected samples
System monitoring compounds (surrogates)	Bromofluorobenzene; Every lab and field sample	Soil 50 to 150% recovery	Evaluate data for usability
Retention time windows	All samples and continuing calibration checks	±0.06 relative retention time units (sample and standard)	Re-analyze affected samples

Table 9 – Quality Control Procedures, Criteria, and Corrective Actions for TPH-Dx Analysis

Hydrocarbons NWTPH-Dx			
Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Field Quality Control			
Duplicate	1 every 10 or fewer field samples	< 35% RPD (water) < 50% RPD (soil)	Evaluate data for usability
Laboratory Quality Control			
Method blank	1 per batch of every 20 or fewer samples	All analytes < reporting limit	Re-extract and re-analyze associated samples unless concentrations are > 5 times the blank level
Initial calibration	4-point external calibration prior to analysis of samples	%RSD < 25%	Recalibrate instrument
Continuing calibration	Every 10 samples with mid-range standard	% Difference < 20% of initial calibration	Recalibrate instrument and re-analyze affected samples
System monitoring compounds (surrogates)	o-Terphenyl; Every lab and field sample	Soil 50 to 150% recovery	Evaluate data for usability
Retention time windows	All samples and continuing calibration checks	±0.06 relative retention time units (sample and standard)	Re-analyze affected samples

Table 10 – Quality Control Procedures, Criteria, and Corrective Actions for Conventionals Analysis

Sulfide PSEP; Ammonia - EPA 350.1; TOC - EPA 9060			
Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Field Quality Control			
Duplicate	1 every 20 or fewer field samples	≤ 50% RPD	Evaluate data for usability
Laboratory Quality Control			
Initial calibration	Daily or each time instrument is set up		
Initial calibration verification	Following each instrument calibration	90 to 110% of initial calibration	Recalibrate instrument
Continuing calibration verification	Every 10 analytical samples or every 2 hours and at the beginning and end of each run	90 to 110% of initial calibration	Recalibrate instrument and re-analyze affected samples
Method blank	1 per batch of every 20 or fewer samples	All analytes < reporting limit	Re-extract and re-analyze associated samples unless concentrations are > 5 times the blank level
Matrix spike	1 per batch of every 20 or fewer samples	75 to 125% recovery	Evaluate data for usability
Laboratory duplicate	1 per batch of every 20 or fewer samples	≤ 35% RPD	Evaluate data for usability



Evergreen Park Bremerton, Washington	
Vicinity Map	
17330-06	4/07
 HARTCROWSER	Figure 1

**HEALTH AND SAFETY PLAN
PRELIMINARY SURFACE SEDIMENT QUALITY ASSESSMENT
EVERGREEN PARK AND CHEVRON PROPERTY
PREPARED 4/2/2007**

Emergency Contingency Information

SITE LOCATION	Evergreen Park and Chevron Property, Bremerton, Washington
NEAREST HOSPITAL	Harrison Medical Center 2520 Cherry Avenue Bremerton, WA 98310 (360) 377-3911/800-281-4024 (The route from the facility to the hospital is depicted on Figure 1) EMT/Ambulance 911
EMERGENCY RESPONDERS	ALL EMERGENCY SERVICES. 911 Poison Control 1-800-222-1222
EMERGENCY CONTACTS	Hart Crowser, Seattle Office (206) 324-9530 Hart Crowser - Sonia Fernandez (206) 826-4566 (Project Health and Safety Manager) Cell (206) 419-2401
IN EVENT OF EMERGENCY, CALL FOR HELP AS SOON AS POSSIBLE	Give the following information: ➔ Where You Are. Address, cross streets, or landmarks ☎ Phone Number you are calling from ?? What Happened. Type of injury, accident # How many persons need help ?? What is being done for the victim(s) !! You hang up last. Let whomever you called hang up first

1.0 Site Health and Safety Plan Summary

SITE NAME: Evergreen Park and Chevron Property

LOCATION: 1310 Highland Avenue Bremerton, WA 98310

CLIENT: Washington State Department of Ecology

PROPOSED DATES OF ACTIVITIES: April 26 through 27, 2007

TYPE OF FACILITY: Shoreline Park

LAND USE OF AREA SURROUNDING FACILITY: Residential/Commercial

SITE ACTIVITIES: Collection of sediment samples

POTENTIAL SITE CONTAMINANTS: TPH, PAHs, and heavy metals.

ROUTES OF ENTRY: Skin contact with sediment or water and incidental ingestion of sediment.

PROTECTIVE MEASURES: Engineering controls, safety glasses, safety boots, hardhat, gloves, protective clothing, and floatation devices (in boat only).

MONITORING EQUIPMENT: None

2.0 Introduction

2.1 Purpose and Regulatory Compliance

This site-specific Health and Safety Plan (H&S Plan) addresses procedures to minimize the risk of chemical exposures, physical accidents to on-site workers, and environmental contamination. The H&S Plan covers each of the required plan elements as specified in 29 CFR 1910.120 or equivalent state regulations. Table 1 lists the sections of this plan that apply to each of these required elements.

Table 1 - Location of Required Health and Safety Plan Elements

Required H&S Plan Element	Section in this H&S Plan
Decontamination	10.0 Decontamination
Emergency response plan	13.0 Emergency Response Plan
Medical surveillance	14.0 Medical Surveillance
Monitoring program	3.3 Air Monitoring and Action Levels
Names of key personnel	2.3 Chain of Command
Personal protective equipment	6.0 Protective Equipment, 7.0 Safety Equipment List
Safety and hazard analysis	5.0 Hazard Analysis and Applicable Safety Procedures by Task
Site control	8.0 Exclusion Areas, 11.0 Site Security and Control
Spill containment	12.0 Spill Containment
Training	15.0 Training Requirements

2.2 Distribution and Approval

This H&S Plan will be made available to all Hart Crowser personnel involved in fieldwork on this project. The plan has been approved by Hart Crowser's Corporate Health and Safety (H&S) Manager. By signing the documentation form provided with this plan (Table 3 located at the end of plan), all project workers also certify their approval and agreement to comply with the plan.

2.3 Chain of Command

The chain of command for health and safety on this project involves the following individuals:

Project Manager: Roger McGinnis

The Project Manager has overall responsibility for the successful outcome of the project. The Project Manager, in consultation with the Corporate H&S Manager, makes final decisions regarding questions concerning the implementation of the site-specific H&S Plan. The Project Coordinator may delegate this authority and responsibility to the Project and/or Field H&S Managers.

Corporate H&S Manager: Mike Ehlebracht

The Hart Crowser Corporate H&S Manager has overall responsibility for preparation and modification of this H&S Plan. In the event that health and safety issues arise during site operations, he will attempt to resolve them in discussion with the appropriate members of the project team.

Project H&S Manager: Sonia Fernández

The Project H&S Manager has overall responsibility for health and safety on this project. This individual ensures that everyone working on this project understands this H&S Plan. This individual will maintain liaison with the Hart Crowser Project Manager so that all relevant health and safety issues are communicated effectively to project workers.

Field H&S Manager: Sonia Fernández

The Field H&S Manager is responsible for implementing this H&S Plan in the field. The Field H&S Manager will also assure that proper protective equipment is available and used in the correct manner, decontamination activities are carried out properly, and that employees have knowledge of the local emergency medical system, should it be necessary.

2.4 Site Work Activities

The following work tasks will be accomplished:

- Sediment sampling at 13 or more locations.

Sample collection is to be conducted from a small boat along the Park's shoreline on Port Washington Narrows. The samples will be collected in one of three ways depending on location and substrate conditions. Some samples may be collected by walking on the intertidal sediments at low tide, most will be collected with a hydraulically powered power grab, and some will be collected by a diver subcontracted by Hart Crowser.

The expected time frame of this project is April 2007.

2.5 Site Description

Evergreen Park site is located adjacent to Smith Cove along Port Washington Narrows in downtown Bremerton, Washington. The Site consists of six properties, which included a landfill and incinerator operated by the City of Bremerton, four private properties/businesses, and the former Chevron Port Washington Narrows Bulk Plant.

The Site was redeveloped as a municipal park (Evergreen Park), with recreational facilities, restrooms, a boat ramp, a shoreline trail, and open spaces. There are no above-ground structures present on the adjacent Chevron property; however, the property is fenced and several underground structures remain.

3.0 Hazard Evaluation and Control Measures

3.1 Chemicals of Concern

Based on review of the site history, there are several potential historical sources of contaminants to the Evergreen Park and Chevron Property location. In the early 2000s, the City discontinued use of the landfill and incinerator, acquired the four private properties, removed several leaking underground storage tanks (USTs) from them, and capped the property with approximately 2 feet of soil to construct the park. The adjacent Chevron petroleum distribution bulk plant and fuel distribution dock operated from 1928 to 1988. TPH-impacted groundwater and soil, as well as liquid non-aqueous phase liquid (LNAPL) are recorded at the facility.

Although environmental impacts from historical uses of these properties have been recorded, and impact to Smith Cove sediments are suspected, no sediment sampling and analysis have been conducted at the Site.

Based on our past experience at similar sites, the following chemicals of concern may be present. This health and safety plan addresses those compounds in the

event that the limited field screening indicates the potential presence of the following:

- Polycyclic aromatic hydrocarbons (PAHs);
- Total Petroleum Hydrocarbons (TPH); and
- Heavy Metals.

Health hazards of these chemicals are discussed below. This information covers potential toxic effects that might occur if relatively significant acute and/or chronic exposure were to happen. This information does not mean that such effects will occur from the planned site activities. In general, the chemicals, which may be encountered at this site, are expected to be present, not at concentrations that could produce significant exposures. The types of planned work activities and use of monitoring procedures and protective measures will limit potential exposures at this site.

These standards are presented using the following abbreviations:

PEL	Permissible exposure limit.
TWA	Time-weighted average exposure limit for any 8-hour work shift.
STEL	Short-term exposure limit expressed as a 15-minute time-weighted average and not to be exceeded at any time during a workday.

Polycyclic Aromatic Hydrocarbons (PAHs)

Exposure to PAHs can occur via inhalation of vapors, ingestion, and skin and eye contact. Skin contact can result in reddening or corrosion. Ingestion can cause nausea, vomiting, blood pressure fall, abdominal pain, convulsions, and coma. Damage to the central nervous system can also occur. The U.S. Department of Health and Human Services (1989) has classified 15 PAHs compounds as having sufficient evidence for carcinogenicity, while the U.S. EPA (1990) has classified at least five of the identified PAHs as human carcinogens. There is no currently assigned PEL-TWA for PAHs, but the closely related material coal tar is listed as coal tar pitch volatiles with a PEL-TWA of 0.2 mg/m³.

Total Petroleum Hydrocarbons

Total petroleum hydrocarbons (TPH) is a generic term based on analytical test procedures for the range of hydrocarbon materials from gasoline through

heavier fuel oils. These materials typically consist of n-paraffins, isoparaffins, naphthenes, and aromatics in the boiling point range from approximately 50 to 250°C. Based on materials such as gasoline and fuel oils, TPH can be expected to typically act as a central nervous system depressant, resulting in slurred speech and mental confusion. Higher doses can result in unconsciousness and possibly death from respiratory failure. Skin contact can result in irritation, dermatitis, and defatting. Liver and kidney damage can also result following acute or chronic exposure. No PEL has been established for TPH.

Heavy Metals

Exposure to metals may occur via inhalation or accidental ingestion of metal-containing dust. Certain metals, such as organic mercury, may be absorbed through the skin. Hazardous metals have not been confirmed on site, but may be considered a potential contaminant on any former industrial site. Heavy metals typically present on industrial properties include lead, mercury, arsenic, cadmium, and others.

Metals have been shown to exhibit a wide range of adverse acute and chronic health effects in humans and animals. Lead may affect the blood-forming system, kidneys, and nervous system. Organic mercury may cause birth defects and nervous system damage. Inorganic mercury and cadmium exhibit toxic effects in the kidneys. Exposure to arsenic may cause liver damage and skin lesions, and is also associated with cancers of the lung, liver, and skin. Nickel and chromium have also been identified as human carcinogens. The PELs for metals vary by element. If metals are discovered on site, activities should be tailored to protect against exposure to the specific metals and concentrations encountered.

3.2 Potential Exposure Routes

Skin Contact

Exposure via this route could occur if contaminated sediment, water, or product contacts the skin or clothing. Protective clothing and decontamination activities specified in this plan will minimize the potential for skin contact with the contaminants.

Ingestion

Exposure via this route could occur if individuals eat, drink, or perform other hand-to-mouth contact in the contaminated (exclusion) zones. Decontamination

procedures established in this plan will minimize the inadvertent ingestion of contaminants.

3.3 Air Monitoring and Action Levels

Based on the wetted nature of sediment samples, no air monitoring will be necessary during the outdoor activities. Samples will be transferred to jars for chemical analysis as soon after retrieval as possible.

4.0 Physical Hazards

4.1 Fire and Explosion Hazard

Care will be exercised at all times during field activities where flammables are known or suspected to be present. Flammable gases or vapors are not expected to be encountered during sampling activities. An ABC dry chemical fire extinguisher with a minimum charge of 10 pounds shall be a part of the sampling equipment brought to the site. Observe basic precautions such as no smoking or creating sparks or open flames.

4.2 Cold and Heat Stress

Use of impermeable clothing reduces the cooling ability of the body due to evaporation reduction. This may lead to heat stress. Heat stress can occur in cold temperatures if excessive clothing is worn during heavy exertion. Cold stress, or hypothermia, can result from abnormal cooling of the core body temperature.

Signs of Heat Stress

"Heat stress" is a term that is used to describe progressively more serious symptoms, as follows:

- An initial rise in skin temperature due to increased blood flow to the skin (skin redness);
- Increase in heart rate, to more than 30 beats/minute above the resting level;
- Collapse, or heat exhaustion, due to inadequate blood flow to the brain;
- Dehydration, due to excessive sweating;

- Hyperventilation, resulting in a reduction of the normal blood carbon dioxide concentrations;
- Tingling around the lips, dizziness, cramping of muscles of hands and feet, and blackout; and finally
- "Heat stroke," characterized by unconsciousness, hot dry skin, and absence of sweating.

Control of Heat Stress

If using impermeable work clothing, maintain appropriate work-rest cycles (progressively longer rest breaks in a cool location or the shade as temperature and work tasks increase) and drink water or electrolyte-rich fluids (Gatorade or equivalent) to minimize heat stress effects. Impermeable clothing will only be worn when absolutely necessary for control of hazardous chemicals.

Treatment of Heat Stress

Individuals affected by mild forms of heat stress (heat cramps, heat exhaustion, dehydration) should take a break in a cool or shaded area, removing protective and cold weather clothing. Individuals should drink liquids, and sit or lay down until feeling better. Shorter work periods should be used until temperature cools off.

Individuals affected by heat stroke are in critical condition. Heat stroke is the most serious of health problems associated with working in hot environments. It occurs when the body's temperature regulatory system fails and sweating becomes inadequate. The body's only effective means of removing excess heat is compromised with little warning to the victim that a crisis stage has been reached. A heat stroke victim's skin is hot, usually dry, red, or spotted.

Body temperature is usually 105° F or higher, and the victim is mentally confused, delirious, perhaps in convulsions, or unconscious. Unless the victim receives quick and appropriate treatment, death can occur. Summon emergency aid immediately, remove clothing, and bathe individual in cool water continually to bring down body temperature.

Signs of Hypothermia

Hypothermia can result from abnormal cooling of the core body temperature. It is caused by exposure to a cold environment and wind-chill and wetness or

water immersion can play a significant role. The following discusses signs and symptoms as well as treatment for hypothermia.

Typical warning signs of hypothermia include fatigue, weakness, loss of coordination, apathy, irrational behavior, and drowsiness. Shivering is the first sign that a person is cooling down. A confused state is a key symptom of hypothermia. Shivering and pallor are usually absent, and the face may appear puffy and pink. Body temperatures below 90° F require immediate treatment to restore temperature to normal.

Treatment of Hypothermia

Current medical practice recommends slow re-warming as treatment for hypothermia, followed by professional medical care. This can be accomplished by moving the person into a sheltered area and wrapping with blankets in a warm room. Giving the person warm, not hot, liquids will help them warm up. In emergency situations where body temperature falls below 90° F, the person will be immediately transferred to a clinic to receive appropriate medical care.

4.3 Water Safety Requirements

Sampling will be conducted from a small boat. There will be an inherent risk of falling off the skiff and being immersed in water, with a risk of drowning or hypothermia. To minimize the risk of drowning hazards the following will be performed:

- All Hart Crowser personnel on the boat and the docks will be required to wear a Personal Flotation Device (type III or type IV).
- The deck of the boat will be kept free of loose tools and equipment to minimize tripping hazards. Tools and equipment will be organized in a manner to minimize trip/fall hazards.

Sinking/Flooding

In the unlikely event a skiff hull is compromised, personnel will immediately evacuate the boat and go to shore. All Hart Crowser personnel will be required to wear personal flotation devices when on the boat. Under no circumstances will personnel endanger one's own life to attempt to save another.

4.4 Other Physical Hazards

Trips/Falls

As with all field work sites, caution will be exercised to prevent slips on wet slick surfaces, stepping on sharp objects, etc. Work will not be performed on elevated platforms without fall protection. Employees will wear flotation devices while working on the boat where trips may result in their falling into the water.

Noise

Loud noises are not expected during project field work.

4.5 Housekeeping

Responsibility for good housekeeping rests with each employee and shall be enforced by the Field H&S Manager. Keep all work areas clear (including all inside and outside areas). Supplies and material to be used, salvaged, or scrapped shall be stacked out of the way. Cleanup all chemical spills immediately to prevent, slipping, fire, or other hazards.

When using hoses, cables, or electrical extension cords, which must extend across decks, walkways, or stairs, position them in such a manner as to offer the least interference to people passing. Provide protection such as barricades or an inverted "V" device to prevent damage to the hose, cable, or electrical extension cord.

Cleanup the area after each job. Remove tools, surplus material, and scrap to their proper places. No job is complete until this has been done.

4.6 Heavy Equipment

A winch and a hydraulically powered grab sampler will be used to collect most of the sediment samples along Port Washington Narrows. Hardhat and steel-toed boots will be used during sampling to protect Hart Crowser employees from head injuries (due to overhead hazards such as the winch or the Power Grab) or from crushing or pinching injuries while bringing the Power Grab on-board. In addition, care will be exercised to maintain safe distance from the winch and power grab as it is being deployed or being brought on-board. Whenever possible, mechanical devices will be used to help guide the Power Grab on-board and hands will be kept at a distance until the unit is secured and powered off.

5.0 Hazard Analysis and Applicable Safety Procedures by Task

The work tasks and associated hazards, which may be anticipated during the operations described elsewhere in this H&S Plan, and suitable control measures are presented in Table 2.

Table 2 - Hazard Analysis by Task

Work Task	Hazards	Protective Measures
Sediment Sampling	Skin contact, moving equipment, water immersion.	Level D PPE, caution around moving equipment, floatation gear
Sample Preparation	Skin contact, splashes, moving equipment.	Level D PPE; caution around moving equipment.
Equipment Decontamination	Splashes, skin contact, moving equipment.	Level D PPE, caution around moving equipment.

In addition, special task requirements include the following.

Sediment Sampling

All sampling activities will be conducted under the assumption that the media is contaminated and appropriate personal protective equipment (PPE) will be required.

6.0 Protective Equipment

Table 2 presents a summary of minimum PPE requirements based on the potential route of contact and the potential contaminants. These requirements are classified in the designated Level D categories as discussed below. In this plan, situations requiring Level A, B, or C protections are not anticipated for this project.

6.1 Level D Activities

Workers performing general site activities where skin contact with free product or contaminated materials is not likely and inhalation risks are not expected will wear regular work clothes or regular or polyethylene-coated Tyvek®, eye protection and hard hat (as required), hearing protection (as required), nitrile or

neoprene-coated work gloves (as required), floatation devices, and steel-toed safety boots.

A hardhat and steel-toed boots are required where risk of striking overhead objects or crushing injuries exists, such as the boat deck working around the winch and the Power Grab.

7.0 Safety Equipment List

The following Safety Equipment must be available on site:

- First Aid Kit;
- Safety Glasses;
- PVC (or similar) Rain Suit;
- Neoprene or Rubber Steel-Toed Boots;
- Nitrile or Latex Gloves; and
- Personal Flotation Device (when on boat).

8.0 Exclusion Areas

Exclusion zones will be established around each sample, jar transfer, and decontamination location. Only persons with appropriate training and authorization from the Field H&S Manager will enter this perimeter while work is being conducted there.

9.0 Minimization of Contamination

To make the work zone procedure function effectively, the amount of equipment and number of personnel allowed in contaminated areas must be minimized. In addition, the amounts of sediment collected should not exceed what is needed for laboratory analysis and record samples. Do not perform any practice that increases the probability of hand-to-mouth transfer of contaminated materials. Use plastic drop cloths and equipment covers where appropriate. Eating, drinking, chewing gum, smoking, or using smokeless tobacco are forbidden in the exclusion zone.

10.0 Decontamination

Decontamination is necessary to limit the migration of contaminants from the work zone(s) onto the site or from the site into the surrounding environment. Equipment and personnel decontamination are discussed in the following sections. Additional equipment will be available as needed:

- Boot and Glove Wash Bucket and Rinse Bucket;
- Scrub Brushes - Long Handled;
- Spray Rinse Applicator; and
- 5-Gallon Container Alkaline Decontamination Solution.

11.0 Site Security and Control

Site security and control will be the responsibility of the Project Manager. Any security or control problems will be reported to appropriate authorities.

12.0 Spill Containment

Sources of bulk chemicals subject to spillage are not expected to be encountered in this project. Accordingly, a spill containment plan is not required for this project.

13.0 Emergency Response Plan

The Project Emergency Response Plan outlines the steps necessary for appropriate response to emergency situations.

On-Site Medical Emergency

1. Assess location and conditions near the victim for potential hazards to rescue personnel.
2. Render first aid to the victim.
3. Call 911 or contact hospital and medical services as needed.

14.0 Medical Surveillance

A medical surveillance program has been instituted for Hart Crowser employees having exposure to hazardous substances. Exams are given before assignment, annually thereafter, and upon termination. Content of exams is determined by the Occupational Medicine physician in compliance with applicable regulations and is detailed in the General H&S Plan.

Each team member will have undergone a physical examination as noted above to verify that he/she is physically able to use PPE, work in hot environments, and not be predisposed to occupationally induced disease. Additional exams may be needed to evaluate specific exposures or unexplainable illness.

15.0 Training Requirements

All employees who perform site work must understand potential health and safety hazards. All employees potentially exposed to hazardous substances, health hazards, or safety hazards will have completed 40 hours of off-site initial hazardous materials health and safety training or will possess equivalent training by past experience. They will also have a minimum of three days of actual field experience under the direct supervision of a trained supervisor. Employees will also complete annual refresher, supervisor, and other training as required by applicable regulations.

Prior to the start of each workday, the Field H&S Manager will review applicable health and safety issues with all employees and subcontractors working on the site, as appropriate. These briefings will also review the work to be accomplished, with an opportunity for questions to be asked.

16.0 Reporting, Reports, and Documentation

The Field Health and Safety Report (Figure 2) will be completed daily by the Field H&S Manager or designated individual. In the event that accidents or injuries occur during site work, the Project Manager will be informed, who will notify the client immediately. Hart Crowser staff and subcontractors on this site will sign the Record of H&S Communication document (Table 3), which will be kept on site during work activities and recorded in the project files.

Air Monitoring Log

Meter Number 1, Type _____ Calibrated _____ Checked _____
 Meter Number 2, Type _____ Calibrated _____ Checked _____
 Background Reading: Meter 1 _____ Meter 2 _____

[illegible]

Field Health & Safety Report

Job No. _____
 Date _____ S M T W Th F S
 Arrival Time: _____
 Departure Time: _____

Job _____
Location _____
Client _____
Field Representative _____ Project Manager _____
Field H&S Manager _____ Project H&S Manager _____
Names of personnel on site _____
Site Activities _____
Potential Hazards _____
Hazard Control Used _____
Protective Measures Taken _____
Comments or Observations _____

**Sketch position of equipment relative to exploration
Indicate monitoring point(s) and prevailing wind direction**

Exploration No. _____

Evergreen Park
Bremerton, Washington

Field Health & Safety Report

17330-06

4/07



Figure
2
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Table 3 - Record of Health and Safety Communication

PROJECT NAME: Evergreen Park Sediment Sampling		Contract Number 17330-06	
SITE CONTAMINANTS: PAHs, TPH, heavy metals			
PPE REQUIREMENTS (check all that apply):			
☒ Safety glasses	Gloves - Latex/Nitrile		
☒ Safety boots	Clothing - Work Clothing		
☒ Hard hat	Respirator - Contingency		
	Other (specify): Flotation devices		
The following personnel have reviewed a copy of the Site-specific Health and Safety Plan. By signing below, these personnel indicate that they have read the plan, including all referenced information, and that they understand the requirements that are detailed for this project.			
PRINTED NAME	SIGNATURE	PROJECT DUTIES	DATE

PROJECT MANAGER: PLEASE ROUTE A COPY OF THIS FORM TO THE CORPORATE H&S MANAGER WHEN COMPLETED.

J:\jobs\1733006\Evergreen Park HASP.DOC