Integrated Assessment
Kitsap Rifle and Revolver Club

Bremerton, Washington

November 2011

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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List of Abbreviations and Acronyms

Term	Definition
bgs	Below Ground Surface
BS	Blank Spike
CDM	Camp Dresser & McKee
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
CRQL	Contract-Required Quantitation Limits
DOC	United States Department of Commerce
DQO	Data Quality Objective
E & E	Ecology and Environment, Inc.
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
ESU	Evolutionarily Significant Unit
FEMA	Federal Emergency Management Agency
gdp/ft	gallons per day per foot
gpm	Gallons per Minute
GPS	Global Positioning System
IA	Integrated Assessment
IDW	Investigation-Derived Waste
ITRC	Interstate Technology and Regulatory Council
KPUD	Kitsap Public Utility District
KRRC	Kitsap Rifle and Revolver Club
µg/kg	Micrograms per Kilogram
mg/kg	Milligrams per Kilogram
MS	Matrix Spike
MSD	Matrix Spike Duplicate

List of Abbreviations and Acronyms (cont.)

Term	Definition
MTCA	Model Toxics Control Act
NG	Nitroglycerin
NOAA	National Oceanic and Atmospheric Administration
OSC	On-Scene Coordinator
PAHs	Polycyclic Aromatic Hydrocarbons
PM	Project Manager
PO	Project Officer
PPE	Probable Point of Entry
QA	Quality Assurance
QC	Quality Control
RAL	Removal Action Level
RPD	Relative Percent Difference
RSET	Regional Sediment Evaluation Team
RSL	Regional Screening Level
sf	Square Feet
Soundview	Soundview Consultants, Inc.
SPAF	Sample Plan Alteration Form
SQAP	Sampling and Quality Assurance Plan
SQG	Sediment Quality Guideline
SQL	Sample Quantitation Limit
START	Superfund Technical Assessment and Response Team
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TDL	Target Distance Limit
TM	Task Monitor
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
USPSA	United Stated Practical Shooting Association
VOC	Volatile Organic Compound
WAC	Washington Administrative Code
WDFW	Washington State Department of Fish and Wildlife

List of Abbreviations and Acronyms (cont.)

Term	Definition
WDNR	Washington State Department of Natural Resources
WDOH	Washington State Department of Health
WRCC	Western Regional Climate Center

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1 Introduction

Ecology and Environment, Inc., (E & E) was tasked by the United States Environmental Protection Agency (EPA) to provide technical support for completion of an Integrated Assessment (IA) at the Kitsap Rifle and Revolver Club (KRRC) located in Bremerton, Washington (Figure 1-1). E & E completed IA activities under Technical Direction Document Number 10-11-0011, issued under EPA, Region 10, Superfund Technical Assessment and Response Team (START)-3 Contract Number EP-S7-06-02.

The specific goals for the KRRC IA, identified by the EPA, are to:

- Determine the potential threat to public health or the environment posed by the site;
- Determine the potential for a release of hazardous constituents into the environment;
- Determine the potential for placement of the site on the National Priorities List; and
- Determine if a Removal Action is necessary.

Completion of the IA included reviewing existing site information, determining regional characteristics, collecting receptor information within the range of site influence, executing a sampling plan, and producing this report. This report is organized as follows:

- Section 1, Introduction – Authority for performance of this work, goals for the project, and summary of the report contents;
- Section 2, Site Background – Site description, site operations and waste characteristics, and a summary of investigation locations;
- Section 3, Field Activities and Analytical Protocol – Summary of the field effort;
- Section 4, Quality Assurance/Quality Control (QA/QC) – Summary of the laboratory data;

- Section 5, Analytical Results Reporting and Background Samples – Discussion of results reporting criteria, background sample locations, and analytical results;
- Section 6, Potential Sources – Discussion of site sources, sample locations, and analytical results;
- Section 7, Migration/Exposure Pathways and Targets – Discussion of the migration/exposure pathways, sample locations, and analytical results;
- Section 8, Removal Assessment – Comparison of sample results to screening levels and removal assessment;
- Section 9, Summary and Conclusions – Summary of the investigation and recommendations for the site based on the information gathered during the investigation; and
- Section 10, References – Alphabetical listing of the references cited throughout the text.

2 Site Background

This section describes the background of the site including location, description, ownership history, operations and source characteristics, previous investigations, and a summary of the site investigation locations.

2.1 Site Location

Site Name:	Kitsap Rifle and Revolver Club
CERCLIS ID Number:	WAN001002908
Site Address:	4900 Seabeck Highway
Latitude:	47^{o} 36’ 28.35”
Longitude:	-122^{o} 44’46.96”
Legal Description:	Township 25 North, Range 1 West, Section 36
County:	Kitsap
Congressional District:	1st
Site Owner/Operator(s):	Kitsap Rifle and Revolver Club
Site Contact(s):	Marcus Carter 4900 Seabeck Highway Bremerton, WA 98312

2.2 Site Description

The KRRC is located approximately 5 miles northwest of Bremerton, Washington, on the Kitsap Peninsula (Figure 1-1).

The KRRC is an active shooting range located on a 72-acre tax parcel (Kitsap County ID# 362501-4-002-1006; Kitsap County Assessor 2011). Approximately 8 of the 72 acres are used for range purposes. Multiple ranges have been e established at the site by the KRRC, which was initially formed on November 11, 1926 (Figure 2-1; Pierce 2010a).

Access to the site is via Seabeck Highway, which also forms the site’s southern boundary. Private property borders the site to the east and to the north. Property owned by Kitsap County boarders the site to the west. The closest residences to the site are located to the east and south. Land use surrounding the site is predominantly rural. Portions of the site bordered by Seabeck Highway are secured by a signed fence. It is not known, but assumed, that the entire perimeter of the site is secured by a fenced.

Topography at the range is relatively flat, with an approximate elevation of 370 feet above mean sea level. However, the site does slope to the south-southwest. A large wetland that serves as the headwaters of Wildcat Creek is located directly north of gun ranges at the site.

2.3 Site Ownership History

After the KRRC was established in 1926, the club created ranges on land leased from the Washington State Department of Natural Resources (WDNR). In 2008, the WDNR planned to exchange over 500 acres with Kitsap County, including the 72 acres leased by the KRRC. The KRRC submitted a proposal to Kitsap County to purchase the 72 acres upon the completion of the land exchange (Pierce 2010a, 2010b).

Kitsap County risk assessors and appraisers conducted an assessment of the 72 acres to determine their value. This assessment evaluated the risk related to the KRRC stopping operations and the range being removed. It was determined that if the range was to be removed, the cost of a potential cleanup would outweigh the value of the land (Pierce 2010a). Additionally, the KRRC was informed that, unless the land was valued at less than $2,500, public hearings would be required to approve the sale (Pierce 2010a).

As a result of the assessment, Kitsap County offered the 72 acres to the KRRC by way of a bargain and sale agreement. According to this agreement, the KRRC would receive the 72-acre property for $10. In exchange, the KRRC would agree to indemnify Kitsap County regarding lead issues on the property. Additionally, the purpose of the bargain and sale agreement was to clarify the non-conforming uses of the property already in place and recognized at the time of the sale. The sale agreement also stated that the KRRC would confine its active shooting facility to the historic use of the approximately 8 acres, with the balance of the property serving as a safety and noise buffer. Any additional use outside of the 8 acres would require permits and be subject to the rules and regulations of Kitsap County for the development of private land (Pierce 2010a).

Deeds were recorded on June 18, 2009, showing that the Kitsap County auditor's office transferred the property first from the State of Washington to Kitsap County and then from Kitsap County to the KRRC (Pierce 2010b). Currently, KRRC owns the land on which the range is located.

2.4 Historic and Current Site Operations

Small-arms firing ranges are defined as ranges that allow 50-caliber or smaller, non-exploding ammunition, including shotgun ammunition (Interstate Technology and Regulatory Council [ITRC] 2003). The KRRC was established on November 11, 1926 (Pierce 2010a); however, the club may not have begun using the property as a shooting range until the 1940's (Pierce 2010b). Currently, the site has one 200-yard rifle range, one 50-yard pistol range, and nine sport pistol ranges (Figure 2-1).

The 200-yard rifle range is oriented southwest to northeast and has a covered firing line with approximately 10 shooting benches (Figure 2-1). This range has impact berms located at 25, 50, 100, 150, and 200 yards. Shotguns, centerfire rifles, and pistols are allowed on the rifle line (KRRC 2011a).

The 50-yard pistol range is orientated south to north and has impact berms located at 25 and 50 yards (Figure 2-1). There are approximately 24 shooting bays on the pistol range. Generally, only pistols are allowed on the 50-yard pistol range, with the only exception being rifles chambered for 22LR ammunition. Shotguns and centerfire rifles are not allowed on the pistol line (KRRC 2011a).

In addition to the rifle and pistol lines, nine sport pistol ranges are present at site (Figure 2-1). These sport pistol ranges allow for 180-, 270-, and 360-degree shooting and can be set up for United Stated Practical Shooting Association (USPSA) shooting events (KRRC 2011a).

Currently, there is no trap range at site; however, aerial shotgun shooting was a larger part of range use decades ago. As interest in that activity lessened at the KRRC, and as other ranges in the area provided specialized environments for trap and skeet shooting, less trap and skeet shooting occurred at the KRRC (Pierce 2010a). The former locations of trap and skeet shooting activities at the KRRC are not known.

The KRRC offers weekly USPSA practical classes and falling plate matches. Falling plate matches are head-to-head competitions in which targets (metal plate racks/poppers with five targets) are set at 30 feet and shot. The KRRC also offers monthly USPSA pistol matches and steel matches (a timed competition in which shooters shoot at steel plates). In addition to the matches, the KRRC offers personal protection classes, range officer classes, training and qualifications to military and law enforcement agencies, and Washington State Department of Fish and Wildlife's (WDFW) Hunter Education courses (KRRC 2011a). KRRC has approximately 1,000 active members and is open to the public (E & E 2010).

Additionally, KRRC maintains certification as a military small-arms training range, and has supplemental qualification training (KRRC 2011a). The United States Navy has used the range for training military personnel in the safe handling and use of pistols, rifles, and machine guns (KRRC 2011b). It is not clear if fully automatic fire occurs when the military trains at the KRRC (E & E 2010).

Aerial photographs are provided in Appendix A. A review of these photographs indicates the following:

- August 2, 1966 – Photo is blurry; however, the 50-yard pistol range appears to have been established, as has the rifle range in the middle of the site. It cannot be determined from this photo whether impact berms are present.
- July 24, 1982 – The site's footprint remains the same; the rifle range firing line appears to be in its present day location.
- June 21, 1990 – Photo is blurry, no changes are apparent.
- June 7, 1994 – Covers appear to have been constructed over firing lines at the 50-yard pistol range and the rifle range. Extensive logging on the surrounding properties and vegetation growth on site is evident. It cannot be determined from this photo whether impact berms are present at the site.
- July 30, 2003 – Extensive changes at the site are evident. Several berms have been constructed on the rifle range and 50-yard pistol range. Six sport pistol ranges are present. The overall footprint of the site appears to have remained the same.
- March 14, 2005 – No apparent changes to the site.
- August 1, 2005 – Site appears to have remained the same; however, a large rectangular area to the northeast of the site has been cleared.
- June 24, 2006 – No apparent changes to the site; however, a small area north of the site adjacent to the wetland has been cleared.
- July 1, 2006 – No apparent changes to the site.
- August 7, 2006 – What appears to be a small berm has been built extending northeast from the rifle range firing line, past the sport pistol ranges, near the wetlands.
- March 1, 2007 – The berm that extended from the rifle firing line past the sport pistol ranges has been lengthened, additional clearing has occurred near the center of the site, and structures are present in the cleared area north of the site adjacent to the wetland.
- May 1, 2009 – Two additional sport pistol ranges have been built north of the rifle range. Additional development north of the site adjacent to the wetland is evident. It appears that roads have been established in the area north of the site.
- June 26, 2009 – No apparent changes to the site.

- May 15, 2010 – Further development and clearing north of the site. Additional structures are present and further road development has occurred. The cleared area east of the site, which was previously vegetated, appears to have been cleared again and is being used as a storage area.

- June 12, 2010 – No apparent changes to the site.

2.5 Previous Investigations

2.5.1 START Site Visit

On December 16, 2010, the EPA Task Monitor (TM) and On-Scene Coordinator (OSC), the START Project Manager (PM), and a biologist with the Suquamish Tribe visited the site. During the initial site visit, these three met with three representatives of the KRRC, one of whom is the KRRC environmental steward. The intent of the site visit was to discuss the site, review maps of the site, walk the grounds, and identify potential areas for sampling.

During the discussion held prior to walking the site, the KRRC environmental steward mentioned that soil samples have been collected from the site for laboratory analysis (the analytical suite applied is not known).

Included in the discussion was the KRRC lead removal program. Site representatives mentioned that the KRRC members remove lead from impact berms using homemade sifting devices. Members use the lead for recasting. The KRRC keeps records of reclaimed lead in a lead log, which records when the lead was removed, where it was removed from, how much was removed, and who removed it. Recovered lead is stored in a locked conex box on site (E & E 2010).

Site representatives also noted that clay targets are used on the impact berms. This was evident during the site walk, as large amounts of clay target fragment were present on impact berms. Additionally, it was noted that the KRRC uses tannerite for special events and large matches. Tannerite is used in or for exploding targets to confirm a hit (E & E 2010).

At the time of the site visit, the site was flooded due to recent heavy rain. Representatives from KRRC asked that no photos be taken, thus photos of the December 2010 flooding are not presented in this report. However, photos from the KRRC web page presented in Appendix B, show that the site flooded in December 2007.

2.5.2 Critical Areas Study Report: Existing Conditions, Kitsap Rifle and Revolver Club, Kitsap County, Washington

A Critical Areas Study of the Kitsap Rifle and Revolver Club property was prepared by TALASAEA Consultants, Inc. in February of 2011 for Kitsap County. Information in this section came from this report (TALASAEA 2011).

The purpose of the report was to identify and describe wetlands and streams on and adjacent to the property, identify potential impacts to Waters of the United States, and provide a regulatory review of Kitsap County Code Title 19 – Critical Areas Ordinance. The first part of the study consisted of a preliminary assessment of the site and its immediate surroundings using published information, including: wetland and soil maps, orthophotography, sensitive areas maps from Kitsap County, and stereo pairs of aerial photographs. The second part of the study involved a field survey in which direct observations and measurements of soils, hydrology, and vegetation were made to determine whether wetlands and streams were present, their classifications, and the extent of their boundaries. As a result of the Critical Areas Study, four wetlands (Wetland A, Wetland B, Wetland C, and Wetland D) and two streams (Stream 1 and Stream 2) were identified at the site (Figure 2-2). TALASAEA's Critical Areas Study is presented in Appendix C.

2.5.3 Kitsap County Rifle and Revolver Club Preliminary Wetland Delineation and Fish and Wildlife Habitat Assessment Technical Memorandum

A Preliminary Wetland Delineation and Fish and Wildlife Habitat Assessment Technical Memorandum was prepared by Soundview Consultants (Soundview) for the KRRC in May of 2011. This assessment was completed to provide ongoing technical support for resolution of alleged critical areas violations at the site. The Technical Memorandum was prepared as a precursor to final assessment efforts in connection with mediation (Soundview 2011). Information in this section was obtained from this Technical Memorandum.

In preparation of their site investigation, Soundview obtained background information from various federal, state, and local agencies and private resources. Data collected and reviewed prior to the site investigation included national and local wetland and other critical areas inventory maps, site topography and drainage basin data, Natural Resources Conservation Services soils data, WDFW Priority Habitat and Species List, precipitation data, and orthophotographic information. Special emphasis was given to investigation of potential critical areas closest to site operations during the site inspections.

Soundview's primary site visits occurred on January 19, January 20, and March 17, 2011. Wetlands, drainages, and other potentially regulated fish and wildlife habitat within the KRRC and/or within 250 feet of the southern property boundaries were delineated and assessed. Special emphasis was given to the wetlands and drainages identified in the southern portions of the site. As a result of their site investigation, Soundview identified two on-site wetlands (Wetlands A and B), one ephemeral drainage (Drainage Z) near the south property boundary, one split drainage associated with Wetlands A and B (Drainage Y), one split seasonal drainage on the eastern portion of the subject property (Drainage X), and two depressions on the eastern portion of the subject property that appear to be developing wetland conditions, but do not appear to satisfy regulatory criteria at this time. Soundview's preliminary Wetland Delineation and Fish and Wildlife Habitat Assessment is presented in Appendix D.

2.6 Potential Sources and Potential Source Characteristics

2.6.1 Potential Sources

Potential sources of contamination at the KRRC include the firing lines, range floors, and impact berms. There are 11 active gun ranges, comprised of one 200-yard rifle range, one 50-yard pistol range, and nine sport pistol ranges (numbered 1 through 9). The impact berm of the 50-yard pistol range and sport pistol ranges 1 through 3 are located adjacent to wetlands on site (Figure 2-1). Most berms are configured as steeply sloped piles with the exceptions being at the 150-yard and 200-yard impact berms at the rifle range, and the berms at sport ranges 8 and 9. At these locations, the berms were constructed by cutting into the land creating a more vertical berm face. Approximate source dimensions as measured with GIS are as follows:

- Rifle Range:
  - Range floor area: 54,660 square feet (sf)
  - 25-yard impact berm (north): 35 feet long, 6 feet high, 26 feet thick (at base)
  - 25-yard impact berm (south): 50 feet long, 6 feet high, 26 feet thick (at base)
  - 50-yard impact berm (north): 35 feet long, 6 feet high, 25 feet thick (at base)
  - 50-yard impact berm (south): 67 feet long, 6 feet high, 25 feet thick (at base)
  - 100-yard impact berm: 70 feet long, 6 feet high, 35 feet thick (at base)
  - 150-yard impact berm: 70 feet long and 12 feet high (impact berm cut into side of hill, thickness not measurable)
  - 200-yard impact berm: 100 feet long and 12 feet high (impact berm cut into side of hill, thickness not measurable)

- Pistol Range:
  - Range floor area: 15,370 sf
  - 50-yard impact berm: 115 feet long, 12 feet high, 26 feet thick (at the base)

- Sport Ranges 1, 2, 3, 4:
  - Range floor areas: 1 (2,242 sf), 2 (2,161 sf), 3 (1,363 sf), 4 (2,685 sf)
  - Impact berm (total for sport ranges 1 through 3): 591 feet long, 12 feet high, 25 feet thick
  - Impact berm (total for sport range 4): 125 feet long, 12 feet high, 25 feet thick

- Sport Ranges 5, 6, 7:
  - Range floor area: 5 (2,958 sf), 6 (3,930 sf), 7 (2,957 sf)
  - Impact berm (total for sport ranges 5, 6, and 7): 735 feet long, 12 feet high, and 30 feet thick (at base)

- Sport Range 8:
  - Range floor area: 4,131 sf
  - Impact berm: 350 feet long and 12 feet high (impact berm cut into side of hill, thickness not measurable)

- Sport Range 9:
  - Range floor area: 2,040 sf
  - Impact berm: 144 feet long and 12 feet high (impact berm cut into side of hill, thickness not measurable)

2.6.2 Source Characteristics

Small arms firing ranges may contain lead, antimony, arsenic, copper, and zinc from bullets and bullet jackets and polycyclic aromatic hydrocarbons (PAHs) from clay targets. Lead accounts for 85 percent of the weight of a bullet. If the bullet fragments upon impact, it creates lead dust, which can migrate via either wind or water erosion. The heat of firing bullets can also atomize lead in a vapor form, which can precipitate or condense on soil particles at the firing line. At rifle and pistol ranges, most firing is done with fixed or stationary targets at known distances. Under these conditions, "bullet pockets" can form on the face of the impact berm. These are localized areas with a high volume of bullets. Incoming bullets impacting rounds in the bullet pockets can result in significant fragmentation and ricochet. The form and distribution of particulate lead varies based on range use and size, the impact velocity of the round, soil characteristics, and past range maintenance practices (ITRC 2003).

Lead can be introduced into the environment at shooting ranges by oxidizing when exposed to air or dissolving when exposed to acidic water or soil. Bullets, bullet particles, or dissolved lead also can be moved by surface water runoff, and dissolved lead can migrate through soils to ground water. When lead is exposed to acidic water and/or soil, it breaks down by weathering into lead oxides, carbonates, and other soluble compounds. With each rainfall, these compounds may be dissolved, and lead may move in solution in the surface water runoff (EPA 2005).

Increases in acidity (i.e., lower pH values) increase the solubility of lead. Alternately, decreases in water acidity (i.e., increases in its pH) will cause dissolved lead to precipitate out of solution. Lead concentrations in solution are reduced by this precipitation. At pH values above 7.5, very little lead remains in solution. Increased time of contact between lead and acidic water generally results in an increase in the amount of dissolved lead in storm water runoff. The five factors that most influence the dissolving of lead are: annual precipitation rate, pH of rain and surface water, contact time, soil cover, and pH of ground water (EPA 2005).

The ability of water to transport lead is influenced by two factors: velocity of the water and weight or size of the lead fragment. Water's capacity to carry small particles is proportional to the square of the water's velocity. Clear water moving at a velocity of 100 feet per minute can carry a lead particle 10,000 times heavier than water moving at a velocity of 10 feet per minute. Muddy water can carry even larger particles. The five factors that most influence velocity of runoff are: rainfall intensity, topographic slope, soil type, velocity, and vegetative cover and man-made structures (EPA 2005).

The disk-like, flying clay targets used on impact berms, including those used at the KRRC, contain PAHs, although these PAHs may not leach appreciatively from the clay matrix (ITRC 2003; E & E 2010). PAHs contained in clay targets include, but are not limited to benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and pyrene (Lobb 2006).

Beyond bullets and clay targets, propellants used for firing small arms can result in contamination at the firing lines (United States Army Corps of Engineers [USACE] 2008). Solid propellants are classified into three categories based on oxidizer composition: single-base, double-base, and triple-base. Both single-base and double-base propellants are used for small arms, while triple-based propellants are used for artillery such as cannons. Single-base propellant primarily consists of nitrocellulose. Double-base propellant consists of nitrocellulose infused with nitroglycerin (NG; Regional Sediment Evaluation Team [RSET] 2006).

The second largest constituent of double-base propellants used in small arms weapons is NG. 2,4-Dinitrotoluene also can be present at low concentrations and is the second largest constituent in single-base propellants after nitrocellulose. In a recent study, the major accumulation of propellant residues at small arms firing ranges was within 65 feet in front of the firing line (USACE 2008).

2.7 Summary of IA Investigation Locations

Sampling under the KRRC IA was conducted at possible sources of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) -regulated substances and at areas (i.e., targets) that may have been contaminated through the migration of hazardous substances from site sources. The features identified for inspection under the IA were determined based on a site visit, interviews with range staff, residences, and a review of background information. These features are discussed below:

Sources

Impact Berms: Potential sources of contamination at the KRRC include the firing lines, range floors, and impact berms at the 11 current gun ranges. These ranges consist of one 200-yard rifle range, one 50-yard pistol range, and nine sport pistol ranges (numbered 1 through 9). The impact berm of the 50-yard pistol range and sport pistol ranges 1 through 4 are located adjacent to wetlands on site (Figure 2-1). The size of these impact berms and range floors could not be measured during the site visit due to flooding. These features were measured utilizing GIS and are described above in Section 2.6.1. Hazardous substances may be migrating from these impact berms to the wetlands located directly north of the site. The contaminants of concern include target analyte list (TAL) metals, semivolatile organic compounds (SVOCs, including PAHs), and explosives/propellant residues.

Targets

Wetlands: A large wetland is located adjacent to the KRRC. Contaminants from on-site sources may be migrating to the sediments and surface water of this wetland located directly north of the site. This IA was designed to help determine whether contaminants are impacting wetlands. The contaminants of concern are TAL metals, SVOCs, and explosives/propellant residues.

3 Field Activities and Analytical Protocol

A sampling and quality assurance plan (SQAP) for the KRRC IA was developed by the START prior to field sampling (E & E 2011a). The SQAP describes the sampling strategy, sampling methodology, and analytical program used to investigate potential hazardous substance sources and potential targets. With few exceptions, the IA field activities were conducted in accordance with the approved SQAP. Deviations from the SQAP are described, when applicable, in this section and in the sampling location discussions in Section 6 (source areas) and Section 7 (target areas). All deviations to this SQAP were pre-approved by the EPA TM during the field sampling event.

The IA field sampling event was conducted on June 3, 2011. A total of 27 samples, including four background samples and one QA (rinsate) sample were collected for the IA. Sample types and methods of collection are described below. A list of all samples collected for laboratory analysis under this IA is contained in Table 3-1. Photographic documentation of IA field activities is included as Appendix E.

Alphanumeric identification numbers applied by the START to each sample location (e.g., PR01) are used in the report as the sample identifiers. Sample locations are provided in Figure 3-1.

This section describes sampling methodology, analytical protocol, global positioning system (GPS), and investigation-derived waste (IDW).

3.1 Sampling Methodology

Grass, leaves, and other vegetative material, rocks, and other debris unsuitable for analysis were removed from samples before being placed into sample containers. Samples were stored on ice in coolers continuously maintained under the custody of START personnel. Sampling methods used for each sample type are described below.

3.1.1 Surface Soil Sampling

A total of 16 surface soil samples (including one background) were collected as part of this IA (Figure 3-1). Surface soil samples were collected from selected impact berms and the range floor from approximately 12 to 18 inches below ground surface (bgs). Sample material was collected using dedicated stainless steel spoons and placed into a non-dedicated #10 sieve. Sample material was then sieved into a dedicated stainless steel bowl where it was thoroughly homogenized before being placed into a pre-labeled sample container. Sieving of the surface soil samples ensured that all lead fragments larger than 2 millimeters (0.0787 inches) would be removed from the soil prior to sampling. Sieving the surface soil samples represented a change to the SQAP; this change is outlined in a sample plan alteration form (SPAF) presented in Appendix F. All surface soil samples were analyzed for SVOCs and TAL metals.

3.1.2 Sediment Sampling

A total of eight sediment samples (including two backgrounds) were collected from the wetland north of the site (Figure 3-1). To ensure sediment samples were collected within the wetland, the wetland boundaries delineated by both TALASAEA (TALASAEA 2011) and Soundview (Soundview 2011) were confirmed by an experienced START wetland biologist using three indicators: vegetation, hydrology, and soils. E & E then gathered sediment samples within the wetland adjacent to the firing range (E & E 2011b).

Sediment samples were collected from 0 to 6 inches bgs. With the exception of one sample, seven samples were collected using dedicated stainless steel spoons and one sample was collected with a pre-cleaned hand auger (see SPAF in Appendix F). At each sample location, collected material was placed into a dedicated stainless steel bowl where it was thoroughly homogenized before being placed into pre-labeled sample containers. All sediment samples were analyzed for explosives/propellant residues, SVOCs (including PAHs), and TAL metals. Additionally, all sediment samples were submitted for grain size analysis.

3.1.3 Surface Water Sampling

A total of three surface water samples (including one background) were collected from the wetland north of the site. These samples were co-located with sediment samples (Figure 3-1). Surface water was collected directly into pre-labeled sample containers by hand-dipping the sample container into the water. Samples were preserved as required upon sample collection completion. All surface water samples were analyzed for explosives/propellant residues, SVOCs (including PAHs), and TAL metals.

3.2 Analytical Protocol

Analytical protocols applied to the IA samples included off-site fixed laboratory analysis of explosives/propellant residues, grain size, SVOCs, and TAL metals. Analyses applied to the samples are presented in Table 3-1.

The following samples were submitted to Contract Laboratory Program (CLP), EPA, and subcontract laboratories for analysis:

- **Explosives/Propellant Residues:** 13 samples (9 soil/sediment and 4 water), including QA/QC samples, were submitted to the EPA Manchester Environmental Laboratory of Port Orchard, Washington.

- **Grain Size:** 8 samples were submitted to Analytical Resources, Inc. of Tukwila, Washington, a START subcontracted laboratory.

- **SVOCs:** 28 samples (24 soil/sediment and 4 water), including QA/QC samples, were submitted to ALS Laboratories, Inc. of Salt Lake City, Utah, a CLP laboratory.

- **TAL Metals:** 28 samples (24 soil/sediment and 4 water), including QA/QC samples, were submitted to ChemTech Consulting Group of Mountainside, New Jersey, a CLP laboratory.

3.3 Global Positioning System

A Trimble Pathfinder Professional GPS unit was used by the START personnel to approximate the sample location coordinates of the IA samples. Attempts were made to collect GPS points for the samples collected from the wetland; however, the tree canopy was too dense to allow for point collection. Recorded sample coordinates by sample point are listed in Appendix G.

3.4 Investigation-Derived Waste

IDW generated during the IA sampling effort included dedicated sample equipment, personal protective equipment, and decontamination water. Dedicated sample equipment and personal protective equipment were bagged at the end of the field event and disposed of in a dumpster located at the Region 10 EPA warehouse. Approximately three gallons of decontamination water were generated and allowed to evaporate. No IDW remains at the site.

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4 Quality Assurance/ Quality Control

QA/QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of sampling equipment, glassware, and reagents. Specific QC requirements for laboratory analyses are incorporated in the *Contract Laboratory Program Statement of Work for Organic Analyses* (EPA 2007) and the *Contract Laboratory Program Statement of Work for Inorganic Analyses* (EPA 2010a). These QC requirements or equivalent requirements found in the analytical methods were followed for analytical work on the project. This section describes the QA/QC measures taken for the project and provides an evaluation of the usability of data presented in this report.

Data from the START-subcontracted commercial laboratory were reviewed and validated by a START chemist. Data qualifiers were applied as necessary according to guidance provided in *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (EPA 2010b).

In the absence of other QC guidance, method- and/or standard operating procedure-specific QC limits were also utilized to apply qualifiers to the data.

4.1 Satisfaction of Data Quality Objectives

EPA's *Guidance for the Data Quality Objectives Process* (EPA QA/G-4), EPA/600/R-96/055, (EPA 2000) was used to establish data quality objectives (DQOs) for this project:

The EPA TM determined that definitive data without error and bias determination would be used for the sampling and analyses conducted during the field activities. The data quality achieved during the field work produced sufficient data that met the DQOs stated in the SQAP (E & E 2011a). A detailed discussion of accomplished project objectives is presented in the following sections.

4.2 QA/QC Samples

Trip blank QA samples are only required for volatile organic compound (VOC) analyses and were not collected for this project. Rinsate blank QA samples were collected for each of the 20 samples collected using non-dedicated sampling equipment. QC samples included matrix spike/matrix spike duplicate (MS/MSD) and/or blank spike (BS) samples at a rate of one MS/MSD and/or BS per 20 samples per matrix.

4.3 Project-Specific Data Quality Objectives

The laboratory data were reviewed to ensure that DQOs for the project were met. The following describes the laboratories' abilities to meet project DQOs for precision, accuracy, and completeness, and the field team's ability to meet project DQOs for representativeness and comparability. The laboratories and the field team were able to meet DQOs for the project.

4.3.1 Precision

Precision measures the reproducibility of the sampling and analytical methodology. Laboratory and field precision is defined as the relative percent difference (RPD) between duplicate sample analyses. The laboratory duplicate samples or MS/MSD samples measure the precision of the analytical method. The RPD values were reviewed for all commercial laboratory samples. A total of 35 sample results (approximately 1.2 percent of the data) were qualified based on precision outliers; therefore, the project DQO for precision was met.

4.3.2 Accuracy

Accuracy indicates the conformity of the measurements to fact. Laboratory accuracy is defined as the surrogate spike percent recovery (%R) or the MS/MSD/BS %Rs for all laboratory analyses. The surrogate %R values were reviewed for all appropriate sample analyses. All surrogate results were within QC limits.

The %R values were reviewed for all MS/MSD/BS analyses. A total of 35 sample results (approximately 1.2 percent of the data) were qualified based on accuracy outliers; therefore, the project DQO for accuracy was met.

4.3.3 Completeness

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). All laboratory data were reviewed for data validation and usability. No sample results were rejected; therefore, the project DQO for completeness was met.

4.3.4 Representativeness

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or environmental condition. The number and selection of samples were determined in the field to accurately account for site variations and sample matrices. The DQO for representativeness was met.

4.3.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. Data produced for this site followed applicable field sampling techniques and specific analytical methodology. The DQO for comparability was met.

4.4 Laboratory QA/QC Parameters

The laboratory data also were reviewed for holding times/temperatures/sample containers, laboratory blank samples, serial dilution analyses, and rinsate blanks. These QA/QC parameters are summarized below. In general, the laboratory and field QA/QC parameters were considered acceptable.

4.4.1 Holding Times/Temperatures/Sample Containers

All holding times, sample temperatures, and containers were acceptable.

4.4.2 Laboratory Blanks

All laboratory blanks met the frequency criteria. The following potential contaminants of concern were detected in the laboratory blanks:

- Inorganics: Aluminum, cadmium, cobalt, chromium, iron, lead, manganese, selenium, sodium, thallium, and vanadium.

- SVOCs: Acetophenone, bis(2-ethylhexyl)phthalate, benzaldehyde, di-n- butylphthalate, and phenol.

See the data validation memoranda for results qualified based on blank contamination.

4.4.3 Serial Dilution Analyses

Serial dilution analyses met the frequency criteria. A total of 32 sample results (approximately 1.1 percent of the data) were qualified based on serial dilution outliers.

4.4.4 Rinsate Blanks

Rinsate blank analyses were performed at a frequency of one per 20 samples collected using non-dedicated sampling equipment. A rinsate sample was collected from the soil sieve. There were no detections in the rinsate blank analysis that affected sample results except bis(2-ethylhexyl)phthalate associated with samples SR02SS, SR06SS, and RF01SS; associated bis(2-ethylhexyl)phthalate results in these samples were qualified as not detected (U).

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5 Site Assessment Analytical Results Reporting and Background Samples

This section describes the reporting and methods applied to analytical results presented in Sections 6 (sources) and 7 (targets) of this report, and discusses background locations and sample results. Table 3-1 lists all samples collected for laboratory analysis.

5.1 Analytical Results Evaluation Criteria

Analytical results presented in the summary tables of Sections 6 and 7 show all analytes detected above laboratory detection limits in bold type. Analytical results indicating significant/elevated concentrations of contaminants in source samples (Section 6) and target samples (Section 7) with respect to background concentrations are shown underlined and in bold type. For the purposes of this investigation, significant/elevated concentrations are those concentrations that are:

- Equal to or greater than the sample's Contract-Required Quantitation Limit (CRQL) or the Sample Quantitation Limit (SQL) when a non-CLP laboratory was used; and

- Equal to or greater than the background sample's CRQL or SQL when the background concentration was below detection limits; or

- At least three times greater than the background concentration when the background concentration equals or exceeds the detection limits.

The analytical summary tables present all detected compounds, but only those detected analytes at potential sources and targets meeting the significant/elevated concentration criteria are discussed in the report text. All detected concentrations are also discussed for the background samples. When samples were diluted for re-analysis at a laboratory, the dilution results were considered for evaluation and are provided in the tables.

5.1.1 Sample Results Reporting

The analytes aluminum, calcium, iron, magnesium, potassium, and sodium are common earth crust elements. Based on EPA, Region 10 policy, these common earth crust elements will not be discussed in this report.

5.2 Background Samples

Background samples were collected for each of the naturally occurring media from which IA samples were collected. These media are surface soil, sediment, and surface water. Results for the appropriate background samples are shown in the first column of the analytical results summary tables in Sections 6 and 7 for comparison against source or target results.

5.2.1 Background Surface Soil Sample

5.2.1.1 Sample Location

One background surface soil sample (BK01SS) was collected from a cut bank in the southwest portion of the KRRC parking lot. Sample BK01SS was collected from an area expected to be unaffected by site activities and of similar lithology as source samples (Figure 3-1). This sample was collected following the procedure outlined in subsection 3.1.1 and analyzed for TAL metals and SVOCs.

5.2.1.2 Sample Results

Background surface soil sample results are presented in Table 6-1. Sample results indicate the presence of 12 TAL metals including: antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc. No other analytes were detected above the CRQL in the background surface soil sample.

5.2.3 Background Surface Water Sample

5.2.3.1 Sample Location

One background surface water sample (BK01WT) was collected from areas expected to be unaffected by site activities (Figure 3-1). Sample BK01WT was collected from the wetland north of the site, approximately 1,000 feet northeast of the core site area. This sample was collected following the procedure outlined in subsection 3.1.3 and analyzed for explosives/propellant residues, TAL metals, and SVOCs.

5.2.3.2 Sample Results

Background surface water sample results are presented in Table 8-3. Sample results indicate the presence of one common earth crust metal, iron. No other analytes were detected above the CRQL in the background surface water sample.

5.2.2 Background Sediment Samples

5.2.2.1 Sample Location

Two background sediment samples (BK01SD and BK02SD) were collected from areas expected to be unaffected by site activities (Figure 3-1). Sample BK01SD was collected from the wetland north of the site, approximately 1,000 feet northeast of the core site area. Sample BK02SD was collected upgradient of the culvert flowing to the north under the site between the inlet to the culvert and Seabeck Highway (Figure 3-1). These samples were collected following the procedure outlined in subsection 3.1.2 and analyzed for explosives/propellant residues, grain size, TAL metals, and SVOCs.

5.2.2.2 Sample Results

Background sediment sample results are presented in Table 7-5. Sample results indicate the presence of ten TAL metals including: arsenic, barium, cadmium, chromium, copper, lead, manganese, nickel, vanadium, and zinc. No other analytes were detected above the CRQL in the background sediment sample.

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6 Potential Sources

This section describes potential sources, sample locations, and analytical results of IA samples obtained from potential sources. Laboratory data sheets of analytical results for all samples are provided in Appendix H.

6.1 Rifle Range Impact Berms

The 200-yard rifle range is oriented southwest to northeast and has a covered firing line with approximately 10 shooting benches (Figure 2-1). This range has impact berms located at 25, 50, 100, 150, and 200 yards. The 150- and 200-yard impact berms were sampled as part of this IA. As discussed below, samples collected at 12 to 18 inches into the berm faces contained significant concentrations of hazardous substances. Using the maximum sample depth as the thickness of each berm allows for calculating a conservative estimate of the volume of each berm as follows:

- 150-yard berm: (70 feet x 12 feet x 1.5 feet)/27 cubic feet per cubic yard = 46.6 cubic yards.
- 200-yard berm: (100 feet x 12 feet x 1.5 feet)/27 cubic feet per cubic yard = 66.6 cubic yards.

6.1.1 Sample Locations

Four surface soil samples (RR01SS through RR04SS) were collected from the rifle range impact berms (Figure 3-1). Sample RR01SS was collected from the northern portion and sample RR02SS was collected from southern portion of the 200-yard impact berm. Sample RR03SS was collected from the northern portion and sample RR04SS was collected from southern portion of the 150-yard impact berm. All samples collected from the rifle range were analyzed for SVOCs and TAL metals.

6.1.2 Sample Results

Surface soil sample results are presented in Table 6-1. Sample results indicate the presence of three TAL metals (antimony, copper, and lead) and six SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, and pyrene) at significant concentrations with respect to background concentrations. Of the metals, both antimony and lead were detected at significant concentrations in all four samples. Significant SVOC concentrations were detected only in samples from the 150-yard impact berm.

6.2 Pistol Range Impact Berms

The 50-yard pistol range is orientated south to north and has impact berms located at 25 and 50 yards (Figure 2-1). There are approximately 24 shooting bays on the pistol range. Only the 50-yard impact berm was sampled as part of this IA. This berm measures approximately 115 feet long by 12 feet high by 26 feet thick and is configured as a steeply sloped pile. Using the equation of a triangular prism, a volume for this source of 664.4 cubic yards is derived [i.e., (115 feet x 12 feet x 26 feet x 0.5)/27 cubic feet per cubic yard].

6.2.1 Sample Locations

A total of four samples (PR01SS through PR04SS) were collected from the 50-yard pistol range impact berm (Figure 3-1). Sample PR01SS was collected from the western portion of the impact berm, sample PR02SS from the middle, and sample PR03SS from the eastern portion. All three of these samples were collected approximately 3.5 feet above the range floor. One additional sample (PR04SS) was added to the pistol range. This sample was collected at a lower elevation on the impact berm (approximately 2 feet above the range floor). The addition of this sample is outlined in a SPAF presented in Appendix F.

6.2.2 Sample Results

Surface soil sample results are presented in Table 6-1. Sample results indicate the presence of six TAL metals (antimony, arsenic, copper, lead, silver, and zinc) and nine SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene) at significant concentrations with respect to background concentrations. Of the metals, antimony, arsenic, copper, lead, and zinc were detected at significant concentrations in all four samples. Significant SVOC concentrations were detected in all samples collected from the pistol range impact berm. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, and pyrene were detected at significant concentrations in all four samples collected from this area.

6.3 Sport Pistol Range Impact Berms

In addition to the rifle and pistol lines, nine sport pistol ranges are located at KRRC (Figure 2-1). These sport pistol ranges allow for 180-, 270-, and 360-degree shooting and can be set up for USPSA shooting events. Only the north impact berms of sport ranges 1, 2, and 3 were sampled as part of this IA. These berms are configured as essentially one continuous, steeply sloped pile. Further, though not sampled, the berm at sport range 4 is simply an extension of this impact berm. The volume of these sources can be derived by using the equation of a triangular prism as follows:

- Sport ranges 1, 2, and 3: (591 feet long by 12 feet high by 25 feet thick x 0.5)/27 cubic feet per cubic yard = 3,283.3 cubic yards.
- Sport range 4: (125 feet long by 12 feet high by 25 feet thick x 0.5)/27 cubic feet per cubic yard = 694.4 cubic yards.

6.3.1 Sample Locations
A total of six samples were collected from sport ranges 1, 2, and 3 (Figure 3-1). Two samples (SR01SS and SR02SS) were collected from the north impact berm of sport range 1, two samples (SR03SS and SR04SS) were collected from the north impact berm of sport range 2, and two samples (SR05SS and SR06SS) were collected from the north impact berm of sport range 3 (Figure 3-1). All samples collected from the sport ranges were collected approximately 2 feet above the range floor.

6.3.2 Sample Results
Surface soil sample results are presented in Table 6-1. Sample results indicate the presence of five TAL metals (antimony, arsenic, copper, lead, and zinc) and 10 SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene) at significant concentrations with respect to background concentrations. Of the metals, antimony, arsenic, copper, and lead were detected at significant concentrations in all six samples collected from the sport range impact berms. Of the SVOCs, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, and pyrene were detected at significant concentrations in all six samples collected from this area.

6.4 Area Outside of Ranges
One surface soil sample (RF01SS) was collected outside of the active shooting areas just to the north of the 100 yard at the rifle range (Figure 3-1). During the field event it was discovered that the stream which currently flows under the site in two 24-inch culverts once flowed across the site and through this area. When in its former location, the stream may have transported contamination to this area. Further, a road currently traverses the rifle range and vehicles using it may be conveying contamination from the range to this area. After consulting with the TM, a decision was made to sample this location to determine whether it may also be impacted, either by the former stream or by use of the road through the rifle range.

6.3.1 Sample Locations
One sample was collected north of the rifle range and east of sport range 4 (Figure 3-1). This sample was collected from the middle the road that traverses the rifle range.

6.3.2 Sample Results
Surface soil sample results are presented in Table 6-1. Sample results indicate that no TAL metals or SVOCs were detected at significant concentrations with respect to background concentrations.

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7 Migration/Exposure Pathways and Targets

The following subsections describe migration pathways and potential targets within the site's range of influence (Figures 7-1 and 7-3). This section discusses the ground water migration pathway and surface water migration pathway,

7.1 Ground Water Migration Pathway

The target distance limit (TDL) for the ground water migration pathway is a 4-mile radius that extends from the sources at the site. Figure 7-1 depicts the ground water 4-mile TDL.

7.1.1 Geologic Setting

The KRRC is located near the center of Kitsap County, which lies entirely within the Puget Trough. The Puget Trough is along north/south trending lowland located between the Cascade Mountains to the east and the Olympic and Coast Range Mountains to the west. The Puget Trough extends south from Canada to the central part of western Oregon (Raisz 1965). The Puget Trough is a large structural basin in consolidated rocks of Tertiary and earlier age. It has been partly filled by unconsolidated deposits of clay, silt, sand, gravel, and glacial till. These unconsolidated sedimentary materials were deposited by water and ice during the Pleistocene glacial epoch (Ice Age), but recent alluvial deposits underlie the surface in some low-lying areas. The upper materials of this fill, except the recent deposits, were deposited by ice and glacial melt water streams during the latest glaciation of the area (Vashon glaciation). During that glaciation, a large tongue of ice moved southward from British Columbia and Vancouver Island and partly filled the Puget Sound basin (Bretz 1913).

Kitsap County lies on the northern portion of the Kitsap Peninsula, the largest peninsula in the Puget Sound region. The land area of Kitsap County consists of remnants of an upland plateau. The surface is composed on generally flat-topped rolling hills and ridges separated from one another by valleys. These plateau remnants rise to 400 to 600 feet and range in size from a few to several hundred square miles. The most prominent geologic feature on the Kitsap Peninsula is the Wildcat Hills (Green and Gold Mountains), located in the center of the peninsula (Sceva 1957).

7.1.2 Aquifer System

The sediments described above constitute the area's aquifers. In general, sandy, gravelly sediments act as aquifers, while the silty sediments act as aquitards.

7.1.2.1 Area Aquifers

As many as six aquifers have been identified on the Kitsap Peninsula (Kahle 1998). More recently, an investigation conducted in 2001 identified three effective aquifers in the area: Shallow, Intermediate, and Deep (Camp Dresser & McKee [CDM] 2001).

Shallow Aquifer

The shallow aquifer is generally unconfined and consists of water-bearing sand and gravelly sand. This unit may be confined locally where saturated sediments are overlain by glacial till. Where present, the till cap protects the underlying aquifer from contamination at the land surface. The aquifer's thickness varies from approximately 50 to 500 feet. The shallow aquifer is an important aquifer for both domestic and municipal water supply and is the source of base flow to local streams. Due to the number of wells in the aquifer and its proximity to the surface, it is susceptible to surface sources of contamination (CDM 2001).

The shallow aquifer's transmissivity is highly variable, ranging from approximately 7,500 up to 250,000 gallons per day per foot (gdp/ft). Productivity in municipal ground water wells completed in this aquifer can range from 100 to 1,600 gallons per minute (gpm) (CDM 2001).

Intermediate Aquifer

The intermediate aquifer is confined in places and varies in texture from silty to sandy gravel. Its thickness ranges from approximately 25 to as much as 100 feet and has been described as being the permeable interbeds of non-glacial, glaciolacustrine deposits (Kahle 1998). In some areas, the intermediate aquifer is in direct contact with the overlying shallow aquifer sediments, and in others it is separated by fine-grained sediments. The intermediate aquifer's hydraulic connection with the shallow aquifer sediments increases the potential for contamination from surface sources (CDM 2001).

Wells in the intermediate aquifer indicate a transmissivity between 13,000 and 30,000 gpm per foot. Production rates range from 70 to 400 gpm. This aquifer is irregularly shaped and discontinuous throughout the Kitsap Peninsula (CDM 2001).

Deep Aquifer

The deep aquifer consists of water-bearing, silty sands to gravel that lie beneath the site and clays of at least one aquitard. Thickness ranges from 50 to nearly 500 feet. Transmissivity ranges from 5,000 to 80,000 gdp/ft, and production ranges from 200 to 2,000 gpm (CDM 2001).

7.1.2.2 Aquifer Characteristics

Aquifer Continuity and Hydraulic Connection

To produce significant quantities of water, aquifers must be composed of thick sequences of permeable sands and gravels and be in continuity with other extensive aquifers or sources of recharge. Geological characteristics indicating continuity between aquifers include similar elevations, stratigraphic position, and lithology. Hydraulic characteristics, which are a more reliable indicator of aquifer continuity, include water quality, water elevation, and parallel response to hydraulic stresses from pumping and recharge events and tidal and barometric pressure changes (CDM 2001).

Based on lithology and water quality data, wells completed in the deep aquifer west of Dyes Inlet are in hydraulic connection. Similar water chemistry and lack of mineralization indicate that these wells may receive recharge water rapidly. In contrast, wells east of Dyes Inlet completed in the deep aquifer exhibit much higher concentrations of dissolved minerals, indicating that recharge does not happen as rapidly and that the water is somewhat older (CDM 2001).

Horizontal Ground Water Gradient

Ground water elevations range from approximately 20 feet to over 300 feet above sea level. Ground water flows horizontally from areas of recharge to areas of discharge typically from inland topographic highs to the Puget Sound. Ground water flow near the site is south-southwest (KPUD 1997). The ground water gradient is shallow, ranging from 0.1 to 0.001 (CDM 2001).

Aquifer Recharge Areas

Recharge to the uppermost aquifer is controlled by various physical properties, such as quantity of precipitation, slope, soil permeability, and hydraulic conductivity of the underlying materials. Recharge to deeper aquifers is either by diffuse vertical ground water flow through aquitards with uniform permeability or localized vertical flow through areas of higher permeability known as hydraulic windows (Kitsap Public Utility District [KPUD] 1997; CDM 2001).

The Silverdale Critical Aquifer Recharge Areas map indicates that the soils around KRRC are highly permeable (Kitsap 2005). Based on the map description, soils that have a relativity high permeability have a high infiltration potential. These soils may provide for ground water recharge but also may enhance transfer of contaminants from the surface to ground water. For these reasons, the locations where surface soils are highly permeable and are considered Aquifer Recharge Areas of Concern (Kitsap 2005).

7.1.3 Drinking Water Targets

Ground water within the 4-mile TDL is used for drinking water (Figure 7-1). Approximately 19,330 people use ground water for drinking water within the 4-mile TDL. This population total includes people who receive their drinking water from domestic wells and from community water systems. Community water systems are classified by the Washington Administrative Code (WAC) as either Group A or Group B, which are defined as follows:

- **Group A:** (WAC 246-290). Group A water systems are systems having 15 or more service connections, regardless of the number of people served; or systems serving an average of 25 or more people per day for 60 or more days within a calendar year, regardless of the number of service connections. Group A water systems do not include systems serving fewer than 15 single family residences, regardless of the number of people.

- **Group B:** (WAC 246-291). Group B water systems serve fewer than 15 residential connections and fewer than 25 people per day; or 25 or more people per day fewer than 60 days per year. Group B water systems are public water systems that do not meet the definition of a Group A water system.

The Washington State Department of Health (WDOH) maintains records of all active public water systems. Public water systems, regardless of group designation, indicate the total number of wells in the system, number of connections, and total population served. A search of the WDOH Sentry Internet revealed the presence of 33 Group A community wells serving a total population of 15,465 and 115 Group B community wells serving a total population of 1,342 within the TDL (WDOH 2010). Lastly, the site is not located within a well head protection area. The number of community drinking water wells and associated populations within the 4-mile TDL by distance ring are presented in Table 7-1.

In addition, based on a search of the Washington State Department of Ecology's (Ecology) water well log database, a total of 970 domestic drinking water wells are present within the TDL (Ecology 2003). The average number of people per household for Kitsap County, Washington is 2.60 (United States Department of Commerce [DOC] 2001). Based on this value, it is estimated that approximately 2,522 people use drinking water from a domestic well source within the 4-mile TDL. Drinking water populations by distance ring are presented in Table 7-1.

Ground water within the 4-mile TDL is not used for irrigation of five or more acres for commercial food crops or commercial forage crops, watering of commercial livestock, as an ingredient in commercial food preparation, as a supply for commercial aquaculture, or as a supply for a major or designated water recreation area.

7.2 Surface Water Migration Pathway

The surface water migration pathway TDL begins at the probable point of entry of surface water runoff from the site to a surface water body and extends downstream for 15 miles. Figure 7-2 depicts the surface water migration TDL.

7.2.1 Overland Pathway

With the exception of man-made impact berms, there is little topographic relief at the site. However, the site does generally slope down to the southwest. During times of heavy rain or flooding, surface water can travel off site. One location in which surface water can travel off site is the culvert that originates at the south end of the site and extends underground to the north, where it outfalls into the wetland located north of the site. Another is in the northern portion of the site. During times of flooding, flood waters from the site are able to come into direct contact with waters of the wetland located north of the site.

Once surface water leaves the wetland located north of the site, it flows south 0.7 mile in an unnamed stream to its confluence with Wildcat Creek. Once in Wildcat Creek, surface water flows southwest for approximately 1.9 miles before joining Chico Creek and flowing an additional 2.4 miles into Chico Bay. The 15-mile TDL includes Dyes Inlet, Phinney Bay, Oyster Bay, Mud Bay, and Ostrich Bay and extends through the Port Washington Narrows, terminating approximately at Illahee State Park to the north, Point Glover to the east, and at the end of Sinclair Inlet to the southwest. Figure 7-2 presets the 15-mile TDL.

The average annual flow rate for Wildcat Creek was not available. The average annual flow rate for Chico Creek is 35.87 cubic feet per second (United States Geological Survey [USGS] 2011).

Depths in Puget Sound within the 15-mile TDL range from one foot to 210 feet (National Oceanic and Atmospheric Administration [NOAA] 2003). Dyes Inlet, Phinney Bay, Oyster Bay, Ostrich Bay, the Port Washington Narrows, and Sinclair Inlet are considered moderate-depth ocean zones. No depths were given for Mud Bay, which fits the definition of costal tidal waters (EPA 1990).

Average annual precipitation in the vicinity of the site is 45.12 inches, measured at Bremerton, Washington (Western Regional Climate Center [WRCC] 2010). The site is not located in a floodplain (Federal Emergence Management Agency [FEMA] 2005). Based on FEMA maps, the site is not located within a flood zone; however, the site is known to have flooded in December 2007 and December 2010.

7.2.2 Drinking Water Targets

Surface water is not used as a drinking water source within the 15-mile TDL for the site; nor is it useable for drinking water purposes. Additionally, surface water is not used for irrigation of five or more acres of commercial food crops or commercial forage crops, watering of commercial livestock, as an ingredient in commercial food preparation, or as a major or designated water recreation area.

7.2.3 Human Food Chain Targets

Sport Harvest

Sport fishing is known to occur within the 15-mile TDL. Sport catch harvest data were obtained through a request for public records from the WDFW (WDFW 2010). The most recent data available were for calendar year 2009. Sport fish catch data are reported by catch reporting area. The TDL is located within catch reporting area 10, which encompasses the waters south of a line projected from Apple Cove to Edwards Point, and north of a true east-west line projected through the north tip of Vashon Island (WDFW 2011). START estimates that approximately 15 percent of catch reporting area 10 is located within the 15-mile TDL.

Sport harvest data are presented as the number of fish harvested. To calculate the total pounds of fish harvested within the TDL, START multiplied the number of fish harvested in catch reporting area 10 by the percentage of catch reporting area 10 located within the 15-mile TDL (15 percent). START then multiplied the number of fish harvested within catch reporting area 10 by the average weight of each fish species. Sport harvest data, by fish species, are presented in Table 7-2.

Sport shellfish harvest is also reported for catch reporting area 10. With the exception of oysters (whose harvest is reported by number harvested), shellfish harvest is reported by pounds harvested. Shellfish harvest for the percentage of catch reporting area 10 located within the 15-mile TDL is calculated by multiplying the total pounds harvested from catch reporting area 10 by the percentage of catch reporting area 10 falling within the 15-mile TDL (15 percent). Sport shellfish harvest data are presented in Table 7-2.

Subsistence and Commercial Harvest

Tribal subsistence and non-tribal commercial fishing occurs within the 15-mile TDL. Unlike sport fishing, subsistence commercial fish and shell fish harvest is reported as pounds harvested. Tribal subsistence and non-tribal commercial fishing data were obtained through a request for public records from the WDFW (WDFW 2010). Additionally, commercial harvest is separated into several statistical areas according to the species harvested.

Commercial salmon catch data are reported by catch reporting area; area 10E is located within the 15-mile TDL. START estimates that approximately 50 percent of catch reporting area 10E falls within the 15-mile TDL. To calculate the total pounds caught within the 15-mile TDL, START multiplied the total pounds caught by the percentage of statistical area (50 percent) falling within the 15-mile TDL. Commercial harvest of salmon and other fish within the 15-mile TDL for each species is presented in Table 7-3.

Subsistence and commercial harvest of shellfish also occurs within the 15-mile TDL. Commercial shellfish harvest within the 15-mile TDL is reported for Marine Fish-Shellfish Management Catch Reporting Area 26C and Southern

Puget Sound Region Aquaculture Management Catch Reporting Area 42A. Geoduck (*Panopea generosa*) and Manila clams (*Venerupis philippinarum*) are commercially harvested from catch reporting area 26C. START estimates that 50 percent of catch reporting area 26C falls within the 15-mile TDL. The total pounds of shellfish harvested from catch reporting area 26C are calculated the same way as above. Native little neck clams (*Leukoma staminea*), Manila clams, and Pacific oysters (*Crassostrea gigas*) are harvested from catch reporting area 42A. Catch reporting area 42A is wholly contained within the 15-mile TDL. Combined subsistence and commercial shellfish harvest within the 15-mile TDL for each species is presented in Table 7-3.

In addition, sea cucumber (*Parastichopus californicus*) is commercially harvested within the 15-mile TDL. Sea cucumber harvest data were provided for catch reporting area 26C. START estimates that 50 percent of catch reporting area 26C falls within the 15-mile TDL. Sea cucumber commercial harvest information is presented in Table 7-3.

7.2.4 Environmental Targets

There are approximately 1.62 miles of wetland frontage present along the 15-mile TDL (Zawistoski 2010). Wetland frontage by surface water body is as follows:

- Chico Creek 0.172 mile
- Chico Bay 0.540 mile
- Dyes Inlet 0.204 mile
- Mud Bay 0.101 mile
- Oyster Bay 0.243 mile
- Phinney Bay 0.044 mile
- Sinclair Bay 0.212 mile
- Port Orchard Bay 0.106 miles

As stated in Section 2.2, the wetlands north of the KRRC serve as the headwaters of Wildcat Creek. Wildcat Creek is located in the Chico Creek watershed, which drains 16.3 square miles of land into Dyes Inlet (Figure 7-3) (Kitsap 2006; Parametrix 2007). Wildcat Creek is a tributary to Chico Creek, which has an important run of both coho salmon (*Oncorhynchus kisutch*) and chum salmon (*Oncorhynchus keta*), with spawning occurring throughout the entire main stream and lower portions of all tributaries (KPUD 1997). This run has the highest natural production of coho and chum salmon in east Kitsap County and also produces significant steelhead trout (*Oncorhynchus mykiss*) and cutthroat trout (*Oncorhynchus clarkii*) runs. Wildcat Creek is the largest tributary to Chico

Creek and drains approximately one-third of the watershed (Parametrix 2007). Figure 7-3 shows how the site, the unnamed stream, Wildcat Creek, and Chico Creek are interconnected.

The federally listed threatened Puget Sound evolutionarily significant unit (ESU) steelhead trout and the federally listed threatened Puget Sound ESU Chinook salmon (*Oncorhynchus tshawytsch*) are both present within the 15-mile TDL (Zawistoski 2010).

Based on WDFW information, the state listed threatened western pond turtle (*Clemmys marmorata*) is present within the 15-mile TDL. Washington State priority habitat also is present within the 15-mile TDL. These are areas of importance to the maintenance of unique biotic communities and include:

- **Chico Bay**: Surf smelt (*Hypomesus pretiosus*) spawning area and bay/estuarine zone.
- **Dyes Inlet**: Pacific sand lance (*Ammodytes hexapterus*) spawning area, surf smelt spawning area, waterfowl wintering site, and bay/estuarine zone.
- **Ostrich Bay**: Pacific sand lance spawning area and surf smelt spawning area.
- **Phinney Bay**: Surf smelt spawning area and waterfowl wintering site.
- **Port Orchard Bay**: Pacific sand lance spawning area and waterfowl wintering site.
- **Port of Washington Narrows**: Pacific sand lance spawning area and surf smelt spawning area, waterfowl wintering site.
- **Sinclair Inlet**: Pacific sand lance spawning area and surf smelt spawning area, waterfowl wintering site, bay/estuarine zone. Additionally, the Gorst aquatic preserve is located within Sinclair Inlet (Zawistoski 2010).

The Puget Sound is listed as critical habitat for the federally listed threatened Puget Sound ESU Chinook salmon (DOC 2005).

7.2.5 Sample Locations and Analytical Results

Two surface water and six sediment samples were collected as a part of this IA from the surface water migration pathway. Sample locations and analytical results are described below.

7.2.5.1 Surface Water Sample Locations
Two surface water samples (WL01WT and WL02WT) were collected from the wetland north of the pistol range and sport ranges 1, 2, and 3 (Figure 3-1). Sample WL01WT was co-located with sediment sample WL04SD, located approximately 100 feet north of the north impact berm of sport ranges 1 and 2. Sample WL02WT was co-located with sediment sample WL06SD, located in the wetland at the outfall of the culvert running under the site. Both surface water samples were analyzed for explosives/propellant residue, TAL metals, and SVOCs

7.2.5.2 Surface Water Sample Results
Sample results are presented in Table 7-4. No analytes were detected at elevated concentrations with respect to background in surface water samples collected from the site.

7.2.5.3 Sediment Sample Locations
A total of six samples were collected from the wetland north of the pistol range and sport ranges 1, 2, and 3 (Figure 3-1). Sample collection began with sample WL01SD and moved east to sample location WL06SD. Samples were collected from within the wetland at approximately 100 feet north of the impact berms of the pistol range and sport pistol ranges. All sediment samples were analyzed for explosives/propellant residue, SVOCs, and TAL metals.

7.2.5.4 Sediment Sample Results
Sample results are presented in Table 7-5. Four TAL metals (antimony, cobalt, copper, and lead) were detected at elevated concentrations with respect to background concentrations. No other analytes were detected at elevated concentrations with respect to background. Lead was detected at elevated concentrations in five of six sediment samples. Based on these sample results, approximately 0.14 mile of wetland frontage has been impacted. No analytes were detected at elevated concentrations in the furthest east sediment sample (WL06SD).

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8 Removal Assessment

The following subsections describe the removal assessment of on-site surface soil contamination (subsection 8.2.1), on-site sediment contamination (subsection 8.2.2), and on-site surface water contamination (subsection 8.2.3). Samples were collected and analyzed for the contaminants of concern to determine if the migration of hazardous substances from the KRRC site has become a potential threat to human health and/or the environment.

8.1 Screening Levels

For soil samples, Model Toxics Control Act (MTCA) Method A cleanup levels for unrestricted land uses established under WAC 173-340-740(2) have been selected for the site. MTCA Method A cleanup levels are based upon default criteria that can be applied to sites with a limited number of hazardous substances present, to routine cleanups, or where Method A values exist for all contaminants of concern. Method A values are usually the most protective and generally take into account all possible pathways of exposure. When no MTCA Method A cleanup value exists for an analyte, or the value is below the applicable CRQLs, the result were compared to EPA Regional Screening Levels (RSLs).

The RSLs are risk-based concentrations that the EPA uses at cleanup sites to determine whether levels of contamination may warrant further investigation or site cleanup, and they can be used to identify initial cleanup goals at a site. In this role, the RSLs provide initial values to use during the analysis of different cleanup alternatives (EPA 2010c). They are developed in accordance with the EPA soil screening exposure scenarios (EPA 1996). The SQAP indicated that EPA Removal Action Levels (RALs) would be applied in cases where no MTCA Method A cleanup level or EPA RSL was available for an analyte; however, RALs also were not available for analytes falling into this group. Other than common earth crust elements (i.e., calcium and magnesium), the only detected analytes that had no corresponding screening level were benzo(g,h,i)perylene and phenanthrene. These analytes were compared to background concentrations to qualitatively determine whether they are present in soils at the site at concentrations that may be of concern.

For sediment and surface water, MTCA and RSL values do not apply. Instead, sediment quality guidelines (SQGs) developed for the Northwest Regional Sediment Evaluation Framework were used for sediment. These freshwater sediment SQGs were developed in 2006 (RSET 2006). For surface water, the

EPA's National Recommended Water Quality Criteria were used. These criteria are published pursuant to Section 304(a) of the Clean Water Act and are the recommended water quality criteria for the protection of aquatic life and human health in surface water (EPA 2011).

8.2 Removal Assessment Screening Results

8.2.1 Surface Soil Sample Results

Surface soil sample results compared to screening levels are presented in Table 8-1 and on Figure 8-1. There were a total of 16 surface soil samples, including one background surface soil sample, four surface soil samples collected from the rifle range, four surface soil samples collected from the pistol range, six surface soil samples collected from the sport range, and one surface soil sample collected from north of the rifle range in an area where a stream once flowed and where a road is now present. With the exception of the background sample and the sample from north of the rifle range, all soil samples were collected from the impact berms. All samples were submitted for TAL metals and SVOC analyses, and sample results were compared to MTCA Method A and EPA RSLs as noted in subsection 8.1.

Antimony, arsenic, copper, and lead results were detected above their associated screening levels in one or more surface soil sample collected from selected impact berms at the site.

Antimony exceeded the RSL of 31 milligrams per kilogram (mg/kg) in the two samples collected from the 150-yard rifle range impact berm (RR03SS and RR04SS), all samples collected from the pistol range (PR01SS through PR04SS), and all samples collected from the sport ranges (SR01SS through SR06SS). Antimony was not detected in samples collected from the 200-yard rifle range impact berm (RR01SS and RR02SS). The maximum concentration of antimony was detected in sample PR04SS at 1,100 mg/kg.

Arsenic exceeded the MTCA Method A soil cleanup level of 20 mg/kg in three of the samples collected from the pistol range (PR02SS through PR04SS) and all samples collected from the sport ranges (SR01SS through SR06SS). Arsenic did not exceed the MTCA Method A soil cleanup level in samples collected from either the 150-yard or 200-yard impact berms of the rifle range (RR01SS through RR04SS). The maximum concentration of arsenic was detected in sample PR04SS at 46 mg/kg.

Copper exceeded the RSL of 3,100 mg/kg in one sample collected from the pistol range (PR01SS). Copper was detected in this sample at 4,430 mg/kg.

Lead exceeded the MTCA Method A soil cleanup level of 250 mg/kg in all samples collected from the rifle range (RR01SS through RR04SS), all samples collected from the pistol range (PR01SS through PR04SS), and all samples collected from the sport ranges (SR01SS through SR06SS). The maximum concentration of lead was detected in sample PR03SS at 53,400 mg/kg

No TAL metals were detected at concentrations that exceeded screening levels in either the background sample (BK01SS) or the sample (RF01SS) collected from the dirt road that traverses the 100-yard rifle range impact berm and that is in the area of a former streambed.

The following SVOCs had multiple exceedances of screening levels in the impact berms: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene. All SVOCs detected were PAHs.

At the rifle range, no PAHs exceeded screening levels at the 200-yard impact berm, although four PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and chrysene) exceeded screening levels at the 150-yard impact berm in at least one of the two samples collected from this berm (RR03SS and RR04SS). The maximum concentration of a PAH detected in this impact berm was benzo(a)pyrene at 1,900 micrograms per kilogram (μg/kg) in sample PR03SS.

At the 50-yard impact berm at the pistol range, seven PAHs exceeded screening levels, including five PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, and pyrene) that exceeded in all four sampled locations (PR01SS through PR04SS). The maximum concentration of a PAH detected in this impact berm was benzo(a)pyrene at 10,000 μg/kg in samples PR02SS and PR04SS.

At the sport pistol impact berms, eight PAHs exceeded screening levels, including three PAHs (benzo(a)pyrene, benzo(b)fluoranthene, and chrysene) that exceeded at all six sampled locations (SR01SS through SR06SS). The maximum concentration of a PAH detected in these impact berms was benzo(b)fluoranthene at 4,400 μg/kg in sample SR01SS, collected from sport range 1.

No SVOCs (including PAHs) were detected in the background sample, and no SVOCs or PAHs were detected at concentrations that exceeded screening levels in the sample collected from the range floor (RF01SS).

Since screening levels do not exist for benzo(g,h,i)perylene or phenanthrene, detections of these compounds were compared to background concentrations. Benzo(g,h,i)perylene and phenanthrene were not detected in the background sample above the detection limit of 200 micrograms per kilogram (μg/kg). These two compounds were detected in multiple soil samples at concentrations more than 10 times the background detection limit.

8.2.2 Sediment Samples

Sediment sample results compared to SQGs are presented in Table 8-2 and Figure 8-1. There were a total of eight sediment samples, including two background sediment samples and six sediment samples collected from the wetland north of the ranges. All samples were submitted for TAL metals, SVOC, and explosives/propellant residue analyses and sample results were compared to SQGs. Additionally, sediment samples were submitted for grain size analysis to ensure samples were collected from like materials.

Sediment results exceeding SQG concentrations include lead in samples WL02SD (1,030 mg/kg), WL03SD (1,170 mg/kg), WL04SD (780 mg/kg), and WL05SD (1,260 mg/kg). Cadmium was detected in sample WL01SD at a concentration equal to the SQG lower screening level (SL 1) of 1.1 mg/kg. No explosives/propellant residue or SVOCs were detected in sediment samples collected from the wetland.

8.2.3 Surface Water Samples

A total of three surface water samples, including one background surface water sample and two surface water samples, were collected from the wetland. All samples were submitted for TAL metals, SVOC, and explosives/propellant residue analyses and sample results were compared to EPA's National Recommended Water Quality Criteria as noted in subsection 8.1. With the exception of iron, no analytes were detected in surface water samples. No surface water sample results exceeded the water quality criteria (Table 8-3).

9 Summary and Conclusions

The KRRC (an active shooting range) is located approximately 5 miles northwest of Bremerton, Washington, on the Olympic Peninsula. The site consists of a 72-acre tax parcel, of which eight of those acres are used for range activities. Shooting activities have taken place at the site as early as the 1940's, and possibly as early as 1926 (the year in which the KRRC was established).

The IA field sampling event was conducted on June 3, 2011. Surface soil, surface water, and sediment samples were collected as a part of this IA. A total of 27 samples, including four background samples and one QA (rinsate) sample were collected for the IA. All samples were analyzed for SVOCs and TAL metals, while surface water and sediment samples were also analyzed for explosives/propellant residue.

9.1 Sources

Sources of contamination at the site include the impact berms. Impact berms are located at the rifle range, the 50-yard pistol range, and sport pistol ranges 1 through 9. A total of 14 surface soil samples were collected from select impact berms. Sample results from sampled impact berms indicate the presence of both SVOCs and, as expected, TAL metals at significant concentrations with respect to background concentrations. In particular, antimony, arsenic, copper, and lead, and to some extent zinc, were prevalent in impact berms at the site. Although not all impact berms were sampled as part of this IA, it is likely that SVOCs and TAL metals may be present at similar concentrations in the impact berms not sampled. The known volume of impacted soil at the site is as follows: 46.6 cubic yards for the 150-yard rifle range impact berm, 66.6 cubic yards for the 200-yard rifle range impact berm, 664.4 for the 50-yard pistol range impact berm, and 3,283.3 cubic yards for sport ranges 1, 2, and 3 impact berms. Further, the impact berm at sport range 4 is also most likely impacted with a volume of 694.4 cubic yards.

9.2 Targets

Wetlands are present north of the site adjacent to the 50-yard pistol range and sport ranges 1, 2, 3, and 4. Six sediment and two surface water samples were collected from within these wetlands. Results from the surface water samples did not indicate the presence of contamination relative to background concentrations; however, results from the sediment samples indicate the presence of four TAL metals at elevated concentrations with respect to background concentrations. These analytes were also similarly detected in source samples and can be attributed to the site. In particular, lead was prevalent in the sediment samples. No SVOCs or explosives/propellant residues were detected at elevated concentrations in sediment samples. Based on sample results from this IA, approximately 0.14 mile of wetland frontage has been impacted by the site; though additional wetland frontage likely has been affected.

9.3 Removal Assessment

Four TAL metals (antimony, arsenic, copper, and lead) were detected in impact berms at the site at concentrations which exceeded screening levels. Lead was detected above screening levels at concentrations ranging from 364 mg/kg (RR02SS) to 53,400 mg/kg (PR03SS). Eight PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene) had multiple exceedances of screening levels in the impact berms. Benzo(a)pyrene was detected above screening levels concentrations ranging from 470 ug/kg (RR04SS) to 10,000 ug/kg (PR02SS and PR04SS). Additionally, the PAHs benzo(g,h,i)perylene and phenanthrene, which do not have corresponding screening levels, were also present in the impact berm samples at concentrations exceeding background concentrations.

Lead was detected above SQGs in four of the six wetland sediment samples at concentrations ranging from 780 to 1,260 mg/kg. Cadmium was detected in one of the six wetland sediment samples at a concentration equal to an SQG. No SVOCs or explosives/propellant residues were detected in any of the sediment samples collected. Lastly, no analytes (TAL metals, SVOCs, or explosives/propellant residues) were detected in the two wetland surface water samples, with the exception of iron, which was below the water quality criteria.

9.4 Conclusions

Based on the results of the IA field sampling events, it appears that the KRRC site contains sources of CERCLA hazardous substances which are migrating to adjacent wetlands. Sediment samples collected from wetlands at the site indicate the presence of TAL metals at elevated concentrations with respect to background concentrations and at levels exceeding screening levels. Impact berms are the likely source of TAL metals contamination.

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Tables

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Table 3-1 Sample Analysis Summary

Sample Location ID	EPA Sample ID	CLP Sample ID	Matrix	Sample Depth (Inches bgs)	Sample Time	Sample Analysis: TAL Metals	Semivolatiles	Nitroaromatics	Grain Size	Sample Description
PR01SS	11224000	JDQT4	Surface Soil	6-12	8:28	X	X	NA	NA	Light brown sandy loam
PR02SS	11224001	JDQT5	Surface Soil	6-12	8:50	X	X	NA	NA	Light brown sandy loam
PR03SS	11224002	JDQT6	Surface Soil	6-12	8:45	X	X	NA	NA	Light brown sandy loam
PR04SS	11224012	JDQW6	Surface Soil	6-12	9:06	X	X	NA	NA	Light brown sandy loam
SR01SS	11224006	JDQW0	Surface Soil	6-12	9:34	X	X	NA	NA	Light brown sandy loam
SR02SS	11224007	JDQW1	Surface Soil	6-12	9:45	X	X	NA	NA	Light brown sandy loam
SR03SS	11224008	JDQW2	Surface Soil	6-12	10:07	X	X	NA	NA	Light brown sandy loam
SR04SS	11224009	JDQW3	Surface Soil	6-12	10:25	X	X	NA	NA	Light brown sandy loam
SR05SS	11224010	JDQW4	Surface Soil	6-12	12:20	X	X	NA	NA	Light brown sandy loam
SR06SS	11224011	JDQW5	Surface Soil	6-12	12:16	X	X	NA	NA	Light brown sandy loam
RR01SS	11224003	JDQT7	Surface Soil	6-12	11:40	X	X	NA	NA	Light grey silty sand
RR02SS	11224004	JDQT8	Surface Soil	6-12	11:38	X	X	NA	NA	Light grey silty sand
RR03SS	11224005	JDQT9	Surface Soil	6-12	11:57	X	X	NA	NA	Light brown sandy loam
RR04SS	11224013	JDQW7	Surface Soil	6-12	11:57	X	X	NA	NA	Light brown sandy loam
RF01SS	11224014	JDQW8	Surface Soil	6-12	16:28	X	X	NA	NA	Light brown sandy loam
WL01SD	11224015	JDQW9	Sediment	0-6	12:57	X	X	X	X	Dark brown silt, high organics
WL02SD	11224016	JDQX0	Sediment	0-6	13:43	X	X	X	X	Dark brown silt
WL03SD	11224017	JDQX1	Sediment	0-6	13:36	X	X	X	X	Dark brown silt
WL04SD	11224018	JDQX2	Sediment	0-6	14:10	X	X	X	X	Dark brown silt
WL05SD	11224019	JDQX3	Sediment	0-6	14:20	X	X	X	X	Dark brown silt
WL06SD	11224020	JDQX4	Sediment	0-6	14:56	X	X	X	X	Dark brown silt
WL01WT	11224021	JDQX5	Water	NA	14:20	X	X	X	X	Surface water, Co-located with WL04SD
WL02WT	11224022	JDQX6	Water	NA	14:45	X	X	X	X	Surface water, Co-located with WL06SD
BK01SS	11224023	JDQX7	Surface Soil	6-12	15:45	X	X	X	X	Light brown sandy loam, MS/MSD
BK01SD	11224024	JDQX8	Sediment	0-6	15:20	X	X	X	X	Dark brown silt
BK02SD	11224029	JDQY0	Sediment	0-6	16:00	X	X	X	X	Dark brown silt, MS/MSD
BK01WT	11224025	JDQX9	Water	NA	15:17	X	X	X	NA	Surface water, MS/MSD
RI01WT	11224027	JDQY1	Water	NA	11:03	X	X	X	NA	Rinsate

Notes: All samples collected on June 3, 2011

Key:

bgs = below ground surface
BK = Background
CLP = Contract Laboratory Program.
EPA = United States Environmental Protection Agency.
ID = Identification.
MS = Matrix spike
MSD = Matrix spike duplicate
NA = Not applicable
PR = Pistol Range
RF = Range Floor
RR = Rifle Range
SR = Sport Range
SS = Surface soil
TAL = Target Analyte List

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Table 6-1 Site Assessment Surface Soil Analytical Results

EPA Sample ID CLP Sample ID Station Location	11224023 JDQX7 BK01SS	11224003 JDQT7 RR01SS	11224004 JDQT8 RR02SS	11224005 JDQT9 RR03SS	11224013 JDQW7 RR04SS	11224000 JDQT4 PR01SS	11224001 JDQT5 PR02SS	11224002 JDQT6 PR03SS	11224012 JDQW6 PR04SS	11224006 JDQW0 SR01SS	11224007 JDQW1 SR02SS	11224008 JDQW2 SR03SS	11224009 JDQW3 SR04SS	11224010 JDQW4 SR05SS	11224011 JDQW5 SR06SS	11224014 JDQW8 RF01SS
		Rifle Range				Pistol Range				Sport Ranges						Range Floor
Description	Background	200-Yard Impact Berm		150-Yard Impact Berm		50-Yard Impact Berm				Sport Range 1		Sport Range 2		Sport Range 3		
Target Analyte List Metals (mg/kg)																
Aluminum	14400	10600	11900	16800	11800	16500	17200	14500	13800	14400	14600	13300	13500	14200	14700	12000
Antimony	0.75 JL	29.3 JL	5.1 JL	283 JL	112 JL	249 JL	1080 JL	1000 JL	1100 JL	463 JL	502 JL	459 JL	364 JL	416 JL	322 JL	0.48 JL
Arsenic	2.9	1.9	1.5	6.4	2.5	15.4	36.2	39.8	46	35.5	34.1	43.3	39.5	27.4	31.6	1.3
Barium	51.6	28.4	40.0	37.9	43.3	59.2	54.1	49.0	46.8	40.0	38.7	33.6	35.5	32.5	36.4	33.2
Beryllium	0.53 JQ (SQL = 0.61)	0.31 JQ	0.33 JQ	0.43	0.33 JQ	0.44 JQ	0.49	0.37 JQ	0.42 JQ	0.37 JQ	0.38 JQ	0.35 JQ	0.36 JQ	0.4 JQ	0.39 JQ	0.32 JQ
Cadmium	1.1	0.58	0.59	0.95	0.63	0.85	1.0	0.95	0.96	0.81	0.78	0.69	0.71	0.71	0.72	0.57
Calcium	2090	3860	4780	3930	3170	4240	5680	6870	7160	3840	2630	3420	2770	2670	2760	3570
Chromium	39.8	22.8	21.2	28.5	21.8	29.4	29.8	26.8	27.2	28.8	25.6	24.3	24.2	27.9	24.8	22.1
Cobalt	6.6 JL	4.1 JL	4.1 JL	6.3 JL	5.2 JL	5.9 JL	6.3 JL	5.9 JL	5.6 JL	5.5 JL	5.6 JL	4.8 JL	5.2 JL	5.4 JL	5.3 JL	4.7 JL
Copper	14.6	40.3	19.8	522	96.6	4430	1440	1430	2340	681	3050	421	634	303	423	14.0
Iron	27600	12900	14700	17700	14000	17600	20100	18200	18400	15900	15800	14700	15100	15700	15500	14000
Lead	4.7	1750	364	22500	5420	17200	37000	53400	46400	21700	18500	20600	15600	18700	12900	13.5
Magnesium	4620	3980	4190	4770	4500	4010	4540	4730	4470	4620	4670	4210	4370	4530	4550	3890
Manganese	227	183	198	271	186	418	402	279	298	243	253	259	249	259	259	198
Nickel	33.1 JL	30.1 JL	29.4 JL	37.7 JL	32.4 JL	31.8 JL	34.5 JL	31.9 JL	29.9 JL	33.0 JL	34.8 JL	30.3 JL	30.9 JL	34.4 JL	32.7 JL	27.7 JL
Silver	1.2 U	0.86 U	0.83 U	0.5 JQ	0.06 JQ	0.38 JQ	1.4	2.1	1.8	0.85 JQ	0.69 JQ	0.73 JQ	0.44 JQ	0.39 JQ	0.3 JQ	0.91 U
Vanadium	88.6	40.8	46.0	46.2	37.7	46.9	54.1	50.5	46.7	41.7	40.7	37.3	38.8	39.7	39.9	39.1
Zinc	32.0	24.4	22.6	88.1	36.2	251	366	348	381	149	222	121	141	90.4	95.6	23.9
Semivolatile Organic Compounds (µg/kg)																
Benzo(a)anthracene	200 U	11 JQ	8 JQ	1100 JQ	280	2600	6300	4700	6300	2300	550 JK	2700	1500 JQ	610	1800	8.4 JQ
Benzo(a)pyrene	200 U	180 U	6.8 JQ	1900	470	4300	10000	7700	10000	3400	860	3800	2300	870	2400	11 JQ
Benzo(b)fluoranthene	200 U	10 JQ	180 U	1200 JQ	210	3000	6500	4400	7100	4400	750	3400	2000	1100	3100	7.6 JQ
Benzo(g,h,i)perylene	200 U	180 U	180 U	1100 JQ	200	2900	6400	4600	5800	2200	480	2100	1200 JQ	470	1400	180 U
Benzo(k)fluoranthene	200 U	180 U	180 U	340 JQ	39 JQ	910 JQ	1900 JQ	1100 JQ	1700 JQ	1200	210	1100 JQ	760 JQ	330	880	180 U
Chrysene	200 U	12 JQ	6.4 JQ	1400 JQ	400	3500	8600	6600	8400	2800	690 JK	3200	1900	720	1900	9.8 JQ
Fluoranthene	200 U	7.2 JQ	180 U	840 JQ	120 JQ	1800 JQ	4100	2600	4700	3300	460 JK	2900	1700 JQ	820	2400	180 U
Indeno(1,2,3-cd)pyrene	200 U	180 U	180 U	710 JQ	110 JQ	1900 JQ	3900	2500	3800	2400	440	2000	1300 JQ	590	1600	180 U
Phenanthrene	200 U	5.5 JQ	180 U	520 JQ	130 JQ	900 JQ	1800 JQ	1300 JQ	2100	1300	210	1200 JQ	680 JQ	360	1100	180 U
Pyrene	200 U	14 JQ	6.6 JQ	1600 JQ	420	3400	7800	5300	7600	3000	600 JK	3500	2100	770	2200	7.9 JQ

Notes:		Bold type indicates the sample result is above the Contract-Required Quantitation Limit.
		Underline type indicates the sample result is significant as defined in Section 5.

Key:

BK =	Background
CLP =	Contract Laboratory Program
CRQL =	Contract Required Quanititation Limit
EPA =	United States Environmental Protection Agency
ID =	Identification
J =	The analyte was positively identified, the associated numerical value is an estimate.
K =	Unknown bias
L =	Low bias
NA =	Not applicable
mg/kg =	Milligrams per kilogram
µg/kg =	Micrograms per kilogram
PR =	Pistol Range
Q =	The result is estimated because the concentration is below the CRQL
RF =	Range Floor
RR =	Rifle Range
SR =	Sport Range
SS =	Surface Soil
SQL =	Sample Quantitation Limit
U =	The analyte was not detected at or above the associated value.

Table 7-1 Drinking Water Population by Distance Ring

Distance Ring	Number of Wells	Population	Total Population for Distance Ring
0 to ¼ mile	Domestic - 1	2.6	36.6
	Group A - 0	0	
	Group B - 3	34	
¼ to ½ mile	Domestic - 6	15.6	23.6
	Group A - 0	0	
	Group B - 1	8	
½ to 1 mile	Domestic - 95	247	382
	Group A - 0	0	
	Group B - 11	135	
1 to 2 miles	Domestic - 168	436.8	6,165.3
	Group A - 11	5,312.50	
	Group B - 33	416	
2 to 3 miles	Domestic - 270	702	4,083
	Group A - 7	2,997.66	
	Group B - 31	383	
3 to 4 miles	Domestic - 430	1,118	8,639
	Group A - 15	7,154.83	
	Group B - 36	366	
TOTAL			**19,329.5**

Source: WDOH 2010; DOC 2001; WDOE 2010.

Table 7-2 Sport Harvest Data Within the 15-mile TDL

Species	Number Harvested From Area 10	Number Harvested From Area 10 X 15%	Average Pounds per Fish	Pounds Harvested
Salmonidae				
Chinook Salmon (Oncorhynchus tshawytscha)	4,348	652.2	22	14,348.4
Coho Salmon (Oncorhynchus kisutch)	12,266	1,839.9	10	18,399
Pink Salmon	14,695	2,204.25	4	8,817
Chum Salmon (Oncorhynchus keta)	112	16.8	9	151.2
Steelhead (Oncorhynchus mykiss)	37	5.55	7.5	41.63
Bottom/Other Fish				
Pacific Herring (Clupea pallasii)	7,632	1,144.8	0.2	228.96
White Sturgeon (Acipenser transmontanus)	7	1.05	50	52.5
Rockfish - General	333	49.95	4.8	239.76
Black Rockfish (Sebastes melanops)	86	12.9	4.8	61.92
Brown Rockfish (Sebastes auriculatus)	221	33.15	4.8	159.12
Copper Rockfish (Sebastes caurinis)	551	82.65	4.8	396.72
Quillback Rockfish (Sebastes maliger)	289	43.35	4.8	208.08
Lingcod (Ophiodon elongatus)	157	23.55	7	164.85
Pacific Cod (Gadus macrocephalus)	17	2.55	25	63.75
Cod - General	3	0.45	25	11.25
Sablefish (Anoplopoma fimbria)	5	0.75	25	18.75
Flatfish - General	8,089	1,213.4	2	2,426.7
English Sole (Parophrys vetulus)	18	2.7	2	5.4
Rock Sole (Pleuronectes bilineatus)	1,073	160.95	2	321.9
Starry Flounder (Platichthys stellatus)	52	7.8	2	15.6
Shiner Surfperch (Cymatogaster aggregata)	101	15.15	1	15.15
Spiny Dogfish (Squalus acanthias)	769	115.35	20	2,307

Table 7-2 Sport Harvest Data Within the 15-mile TDL

Species	Number Harvested From Area 10	Number Harvested From Area 10 X 15%	Average Pounds per Fish	Pounds Harvested
Shell Fish (pounds harvested)				
Dungeness Crab (Metacarcinus magister)	40,128	6,019.2	NA	6,019.20
Littleneck/Manila Clams (Venerupis philippinarum)/ Venerupis philippinarum)	1,503	225.45	NA	225.45
Butter Clams (Saxidomus gigantea)	304	45.6	NA	45.6
Horse Clams (Tresus nuttallii)	794	119.1	NA	119.1
Geoduck Clam (Panopea generosa)	3,052	457.8	NA	457.8
Softshell Clams (Mya arenaria)	18	2.7	NA	2.7
Pacific Oysters (Crassostrea gigas)	16134*	2,420.1*	NA	2,420.1*
Total				**55,324.49**

Note: The total pounds of fish and shellfish harvested from within the TDL does not inlclude oysters

* Number harvested

Sources:

Wydoski and Whitney, 2003

http://hmsc.oregonstate.edu/projects/msap/PS/masterlist/fish/lingcod.html

http://hmsc.oregonstate.edu/projects/msap/PS/masterlist/fish/blackrockfish.html

http://www.nwfsc.noaa.gov/publications/techmemos/tm45/tm45.htm

http://www.nwfsc.noaa.gov/publications/techmemos/tm45/figures/f37ab.htm

http://www.fishbase.org/Summary/SpeciesSummary.php?ID=308&genusname=Gadus&speciesname=macrocephalus

http://www.adfg.alaska.gov/index.cfm?adfg=sablefish.main

Table 7-3 Subsistence and Commercial Harvest Data Within the 15-mile TDL

Species	Pounds Harvested	Catch Reporting Area	% Statistical Area	Pounds Harvested Within TDL
Salmonidae				
Chinook salmon (Oncorhynchus tshawytscha)	2,104	10E	50%	1,052
Chum salmon (Oncorhynchus keta)	1,645	10E	50%	822.5
Coho salmon (Oncorhynchus kisutch)	9	10E	50%	4.5
Other Fish				
Silver smelt (Argentina Silus)	3,513	26C	50%	1,756.50
Shellfish				
Geoduc clam (Panopea generosa)	111,637	26C	50%	55,818.5
Manila clam (Venerupis philippinarum)	54,524	26C	50%	27,262
Native littleneck clam (Leukoma staminea)	1,454	42A	100%	1,454
Manila clam (Venerupis philippinarum)	42,911	42A	100%	42,911
Pacific oyster (Crassostrea gigas)	4,565	42A	100%	4,565
Other				
Sea cucumber	21,261	26C	50%	10,630.5
Total				**146,276.5**

Source:
Washington Department of Fish and Wildlife request for public record

Table 7-4 Site Assessment Wetland Surface Water Sample Analytical Results

EPA Sample ID	11224025	11224021	11224022
CLP Sample ID	JDQX9	JDQX5	JDQX6
Station Location	BK01WT	WL01WT	WL02WT
Description	Background	Wetland	
Target Analyte List Metals (µg/L)			
Iron	**102**	**133**	100 U

Notes: Bold type indicates the sample result is above the Contract-Required Quantitation Limit.

Key:

BK = Background
CLP = Contract Laboratory Program
EPA = United States Environmental Protection Agency
ID = Identification
µg/L = Micrograms per liter
U = The analyte was not detected at or above the associated value.
WL = Wetland
WT = Water

Table 7-5 Site Assessment Wetland Sediment Sample Analytical Results

EPA Sample ID	11224024	11224029	11224015	11224016	11224017	11224018	11224019	11224020
CLP Sample ID	JDQX8	JDQY0	JDQW9	JDQX0	JDQX1	JDQX2	JDQX3	JDQX4
Station Location	BK01SD	BK02SD	WL01SD	WL02SD	WL03SD	WL04SD	WL05SD	WL06SD
Description	Background		Wetland					
Target Analyte List Metals (mg/kg)								
Aluminum	**11800 JK**	**18400 JK**	**14400 JK**	**13100 JK**	**12000 JK**	**17100 JK**	**16900 JK**	**17900 JK**
Antimony	0.65 JQ (SQL = 7.54)	0.91 JQ (SQL = 7.43)	2.7 JQ	6.7 JQ	5.9 JQ	**21.8**	3.3 JQ	0.56 JQ
Arsenic	**1.9**	**2.6**	**3.0**	**4.5**	**2.3**	**4.0**	**2.8**	**2.1**
Barium	**43.0**	**52.7**	**106**	**68.6**	**66.8**	**100**	**78.1**	**54.7**
Cadmium	0.63 U	**0.69**	**1.1**	0.76 U	0.72 U	**0.89**	**0.82**	**0.56**
Calcium	**2990**	**2630**	**7310**	**4290**	**2610**	**5300**	**4280**	**2300**
Chromium	**23.0**	**31.7**	**30.0**	**23.1**	**19.9**	**31.0**	**16.6**	**24.6**
Cobalt	6.3 U	6.2 U	**5.9**	7.6 U	7.2 U	4.9 U	**7.6**	**5.8**
Copper	**10.3**	**13.1**	**26.4**	**39.3**	**67**	**26.8**	**26.8**	**19.3**
Iron	**13300 JK**	**16900 JK**	**18100 JK**	**14700 JK**	**14100 JK**	**17400 JK**	**18800 JK**	**14200 JK**
Lead	**4.3 JL**	**16.6 JL**	**162 JL**	**1030 JL**	**1170 JL**	**780 JL**	**1260 JL**	**34.3 JL**
Magnesium	**3280**	**3620**	**3830**	**3130**	**2860**	**4450**	**3980**	**3040**
Manganese	**205 JK**	**607 JK**	**1040 JK**	**567 JK**	**227 JK**	**266 JK**	**470 JK**	**887 JK**
Nickel	**26.2**	**44.8**	**29.4**	**21.8**	**23.2**	**35.2**	**33.7**	**33.6**
Vanadium	**37.1 JK**	**45 JK**	**64.0 JK**	**39.5 JK**	**38 JK**	**49.4 JK**	**40.8 JK**	**41.6 JK**
Zinc	**28.0**	**52.9**	**89.1**	**63.2**	**46.0**	**76.2**	**73.4**	**44.2**

Table 7-5 Site Assessment Wetland Sediment Sample Analytical Results

EPA Sample ID	11224024	11224029	11224015	11224016	11224017	11224018	11224019	11224020
CLP Sample ID	JDQX8	JDQY0	JDQW9	JDQX0	JDQX1	JDQX2	JDQX3	JDQX4
Station Location	BK01SD	BK02SD	WL01SD	WL02SD	WL03SD	WL04SD	WL05SD	WL06SD
Description	Background		Wetland					
Grain Size (Precent Retained)								
Gravel	**14.2**	**27.2**	**10.0**	**33.7**	**2.1**	**1.2**	**32.1**	**13.1**
Very Coarse Sand	**4.8**	**7.2**	**11.9**	**5.5**	**1.1**	**3.5**	**10.6**	**4.2**
Coarse Sand	**6.8**	**5.3**	**14.8**	**8.1**	**2.7**	**8.3**	**16.8**	**5.4**
Medium Sand	**23.5**	**12.7**	**19.5**	**9.3**	**14.6**	**16.3**	**21.0**	**15.4**
Fine Sand	**31.2**	**14.5**	**15.5**	**10.3**	**26.0**	**30.2**	**5.5**	**18.9**
Very Fine Sand	**8.3**	**11**	**8.7**	**11.1**	**25.0**	**20.7**	**2.6**	**17.0**
Coarse Silt	**2.7**	**11.6**	**5.2**	**6.2**	**12.9**	**10.0**	**3.4**	**9.6**
Medium Silt	**2.2**	**5.0**	**5.3**	**6.0**	**6.4**	**4.2**	**2.9**	**6.0**
Fine Silt	**2.0**	**2.2**	**3.7**	**3.7**	**3.3**	**2.4**	**2.0**	**3.9**
Very Fine Silt	**1.5**	**1.5**	**2.5**	**2.7**	**1.9**	**1.5**	**1.5**	**2.4**
> 10 Phi Clay	**0.8**	**0.5**	**0.5**	**0.3**	**0.5**	**0.4**	**0.3**	**1.1**
8-9 Phi Clay	**1.2**	**0.9**	**1.5**	**2.1**	**1.1**	**0.9**	**0.8**	**1.7**
9-10 Phi Clay	**0.7**	**0.5**	**0.9**	**1.2**	**2.4**	**0.3**	**0.4**	**1.2**
Total Fines	**11.2**	**22.2**	**19.6**	**22.2**	**28.5**	**19.7**	**11.4**	**26.0**

Notes:	Bold type indicates the sample result is above the Contract-Required Quantitation Limit.
	Underline type indicates the sample result is elevated as defined in Section 5.

Key:

BK =	Background
CLP =	Contract Laboratory Program.
CRQL =	Contract Required Quanititation Limit
EPA =	United States Environmental Protection Agency
ID =	Identification
J =	The analyte was positively identified, the associated numerical value is an estimate.
K =	Unknown bias
L =	Low bias.
mg/kg =	Milligrams per kilogram
Q =	The result is estimated because the concentration is below the CRQL.
SD =	Sediment
SQL =	Sample Quantitation Limit
U =	The analyte was not detected at or above the associated value
WL =	Wetland

Table 8-1 Removal Assessment Surface Soil Sample Analytical Results

EPA Sample ID CLP Sample ID Station Location		11224023 JDQX7 BK01SS	11224003 JDQT7 RR01SS	11224004 JDQT8 RR02SS	11224005 JDQT9 RR03SS	11224013 JDQW7 RR04SS	11224000 JDQT4 PR01SS	11224001 JDQT5 PR02SS	11224002 JDQT6 PR03SS	11224012 JDQW6 PR04SS	11224006 JDQW0 SR01SS	11224007 JDQW1 SR02SS	11224008 JDQW2 SR03SS	11224009 JDQW3 SR04SS	11224010 JDQW4 SR05SS	11224011 JDQW5 SR06SS	11224014 JDQW8 RF01SS
			Rifle Range				Pistol Range				Sport Ranges						Range Floor
Description	Screening Levels	Background	200-Yard Impact Berm		150-Yard Impact Berm		50-Yard Impact Berm				Sport Range 1		Sport Range 2		Sport Range 3		
Target Analyte List Metals (mg/kg)																	
Aluminum	77000[b]	14400	10600	11900	16800	11800	16500	17200	14500	13800	14400	14600	13300	13500	14200	14700	12000
Antimony	31[b]	0.75 JL	29.3 JL	5.1 JL	283 JL	112 JL	249 JL	1080 JL	1000 JL	1100 JL	463 JL	502 JL	459 JL	364 JL	416 JL	322 JL	0.48 JL
Arsenic	20[a]	2.9	1.9	1.5	6.4	2.5	15.4	36.2	39.8	46	35.5	34.1	43.3	39.5	27.4	31.6	1.3
Barium	15000[b]	51.6	28.4	40.0	37.9	43.3	59.2	54.1	49.0	46.8	40.0	38.7	33.6	35.5	32.5	36.4	33.2
Beryllium	160[b]	0.53 JQ (SQL = 0.61)	0.31 JQ	0.33 JQ	0.43	0.33 JQ	0.44 JQ	0.49	0.37 JQ	0.42 JQ	0.37 JQ	0.38 JQ	0.35 JQ	0.36 JQ	0.4 JQ	0.39 JQ	0.32 JQ
Cadmium	2[a]	1.1	0.58	0.59	0.95	0.63	0.85	1.0	0.95	0.96	0.81	0.78	0.69	0.71	0.71	0.72	0.57
Calcium	NA	2090	3860	4780	3930	3170	4240	5680	6870	7160	3840	2630	3420	2770	2670	2760	3570
Chromium	2000[a(1)]	39.8	22.8	21.2	28.5	21.8	29.4	29.8	26.8	27.2	28.8	25.6	24.3	24.2	27.9	24.8	22.1
Cobalt	23[b]	6.6 JL	4.1 JL	4.1 JL	6.3 JL	5.2 JL	5.9 JL	6.3 JL	5.9 JL	5.6 JL	5.5 JL	5.6 JL	4.8 JL	5.2 JL	5.4 JL	5.3 JL	4.7 JL
Copper	3100[b]	14.6	40.3	19.8	522	96.6	4430	1440	1430	2340	681	3050	421	634	303	423	14.0
Iron	55000[b]	27600	12900	14700	17700	14000	17600	20100	18200	18400	15900	15800	14700	15100	15700	15500	14000
Lead	250[a]	4.7	1750	364	22500	5420	17200	37000	53400	46400	21700	18500	20600	15600	18700	12900	13.5
Magnesium	NA	4620	3980	4190	4770	4500	4010	4540	4730	4470	4620	4670	4210	4370	4530	4550	3890
Manganese	1800[b]	227	183	198	271	186	418	402	279	298	243	253	259	249	259	259	198
Nickel	1500[b(2)]	33.1 JL	30.1 JL	29.4 JL	37.7 JL	32.4 JL	31.8 JL	34.5 JL	31.9 JL	29.9 JL	33.0 JL	34.8 JL	30.3 JL	30.9 JL	34.4 JL	32.7 JL	27.7 JL
Silver	390[b]	1.2 U	0.86 U	0.83 U	0.5 JQ	0.06 JQ	0.38 JQ	1.4	2.1	1.8	0.85 JQ	0.69 JQ	0.73 JQ	0.44 JQ	0.39 JQ	0.3 JQ	0.91 U
Vanadium	390[b]	88.6	40.8	46.0	46.2	37.7	46.9	54.1	50.5	46.7	41.7	40.7	37.3	38.8	39.7	39.9	39.1
Zinc	23000[b]	32.0	24.4	22.6	88.1	36.2	251	366	348	381	149	222	121	141	90.4	95.6	23.9
Semivolatile Organic Compounds (µg/kg)																	
Benzo(a)anthracene	0.15[b]	200 U	11 JQ	8 JQ	1100 JQ	280	2600	6300	4700	6300	2300	550 JK	2700	1500 JQ	610	1800	8.4 JQ
Benzo(a)pyrene	0.1[a]	200 U	180 U	6.8 JQ	1900	470	4300	10000	7700	10000	3400	860	3800	2300	870	2400	11 JQ
Benzo(b)fluoranthene	0.15[b]	200 U	10 JQ	180 U	1200 JQ	210	3000	6500	4400	7100	4400	750	3400	2000	1100	3100	7.6 JQ
Benzo(g,h,i)perylene	NA	200 U	180 U	180 U	1100 JQ	200	2900	6400	4600	5800	2200	480	2100	1200 JQ	470	1400	180 U
Benzo(k)fluoranthene	1.5[b]	200 U	180 U	180 U	340 JQ	39 JQ	910 JQ	1900 JQ	1100 JQ	1700 JQ	1200	210	1100 JQ	760 JQ	330	880	180 U
Chrysene	15[b]	200 U	12 JQ	6.4 JQ	1400 JQ	400	3500	8600	6600	8400	2800	690 JK	3200	1900	720	1900	9.8 JQ
Fluoranthene	2300[b]	200 U	7.2 JQ	180 U	840 JQ	120 JQ	1800 JQ	4100	2600	4700	3300	460 JK	2900	1700 JQ	820	2400	180 U
Indeno(1,2,3-cd)pyrene	0.15[b]	200 U	180 U	180 U	710 JQ	110 JQ	1900 JQ	3900	2500	3800	2400	440	2000	1300 JQ	590	1600	180 U
Phenanthrene	NA	200 U	5.5 JQ	180 U	520 JQ	130 JQ	900 JQ	1800 JQ	1300 JQ	2100	1300	210	1200 JQ	680 JQ	360	1100	180 U
Pyrene	1700[b]	200 U	14 JQ	6.6 JQ	1600 JQ	420	3400	7800	5300	7600	3000	600 JK	3500	2100	770	2200	7.9 JQ

Notes:

Surface soil samples were analyzed for TAL metals and SVOCs. Only the analytes detected are presented in this table.
Bold type indicates the sample result is above the Contract-Required Quantitation Limit.
Shaded cells inidicate analyte was detected above reglatory standard.
[a]MTCA Method A Soil Cleanup Levels for Unrestricted Land Use.
[b]USEPA Regional Screening Level for Residential Soil
(1) No MTCA Cleanup standard is available for total chromium. The MTCA value for trivalent chromium was used.
(2)The Regional Screening Level for nickel soluble salts was used.

Key:

BK = Background
CLP = Contract Laboratory Program
CRQL = Contract Required Quanititation Limit
EPA = United States Environmental Protection Agency
ID = Identification.
J = The analyte was positively identified, the associated numerical value is an estimate.
K = Unknown bias
L = Low bias
NA = Not applicable
mg/kg = Milligrams per kilogram
µg/kg = Micrograms per kilogram
PR = Pistol Range
Q = The result is estimated because the concentration is below the CRQL
RF = Range Floor
RR = Rifle Range
SR = Sport Range
SS = Surface Soil
SQL = Sample Quantitation Limit
U = The analyte was not detected at or above the associated value.

Table 8-2 Removal Assessment Wetland Sediment Sample Analytical Results

EPA Sample ID CLP Sample ID Station Location	Freshwater Sediment Quality Guidelines		11224024 JDQX8 BK01SD	11224029 JDQY0 BK02SD	11224015 JDQW9 WL01SD	11224016 JDQX0 WL02SD	11224017 JDQX1 WL03SD	11224018 JDQX2 WL04SD	11224019 JDQX3 WL05SD	11224020 JDQX4 WL06SD
Description	SL 1 (dry weight)	SL 2 (dry weight)	Background		Wetland					
Target Analyte List Metals (mg/kg)										
Aluminum	NA	NA	**11800 JK**	**18400 JK**	**14400 JK**	**13100 JK**	**12000 JK**	**17100 JK**	**16900 JK**	**17900 JK**
Antimony	NA	NA	0.65 JQ (SQL = 7.54)	0.91 JQ (SQL = 7.43)	2.7 JQ	6.7 JQ	5.9 JQ	**21.8**	3.3 JQ	0.56 JQ
Arsenic	20	51	**1.9**	**2.6**	**3.0**	**4.5**	**2.3**	**4.0**	**2.8**	**2.1**
Barium	NA	NA	**43.0**	**52.7**	**106**	**68.6**	**66.8**	**100**	**78.1**	**54.7**
Cadmium	1.1	1.5	0.63 U	**0.69**	**1.1**	0.76 U	0.72 U	**0.89**	**0.82**	**0.56**
Calcium	NA	NA	**2990**	**2630**	**7310**	**4290**	**2610**	**5300**	**4280**	**2300**
Chromium	95	100	**23.0**	**31.7**	**30.0**	**23.1**	**19.9**	**31.0**	**16.6**	**24.6**
Cobalt	NA	NA	6.3 U	6.2 U	**5.9**	7.6 U	7.2 U	4.9 U	**7.6**	**5.8**
Copper	80	830	**10.3**	**13.1**	**26.4**	**39.3**	**67**	**26.8**	**26.8**	**19.3**
Iron	NA	NA	**13300 JK**	**16900 JK**	**18100 JK**	**14700 JK**	**14100 JK**	**17400 JK**	**18800 JK**	**14200 JK**
Lead	340	430	**4.3 JL**	**16.6 JL**	**162 JL**	**1030 JL**	**1170 JL**	**780 JL**	**1260 JL**	**34.3 JL**
Magnesium	NA	NA	**3280**	**3620**	**3830**	**3130**	**2860**	**4450**	**3980**	**3040**
Manganese	NA	NA	**205 JK**	**607 JK**	**1040 JK**	**567 JK**	**227 JK**	**266 JK**	**470 JK**	**887 JK**
Nickel	60	70	**26.2**	**44.8**	**29.4**	**21.8**	**23.2**	**35.2**	**33.7**	**33.6**
Vanadium	NA	NA	**37.1 JK**	**45 JK**	**64.0 JK**	**39.5 JK**	**38 JK**	**49.4 JK**	**40.8 JK**	**41.6 JK**
Zinc	130	400	**28.0**	**52.9**	**89.1**	**63.2**	**46.0**	**76.2**	**73.4**	**44.2**

Table 8-2 Removal Assessment Wetland Sediment Sample Analytical Results

EPA Sample ID CLP Sample ID Station Location	Freshwater Sediment Quality Guidelines		11224024 JDQX8 BK01SD	11224029 JDQY0 BK02SD	11224015 JDQW9 WL01SD	11224016 JDQX0 WL02SD	11224017 JDQX1 WL03SD	11224018 JDQX2 WL04SD	11224019 JDQX3 WL05SD	11224020 JDQX4 WL06SD
Description	SL 1 (dry weight)	SL 2 (dry weight)	Background		Wetland					
Grain Size (Precent Retained)										
Gravel	NA	NA	**14.2**	**27.2**	**10.0**	**33.7**	**2.1**	**1.2**	**32.1**	**13.1**
Very Coarse Sand	NA	NA	**4.8**	**7.2**	**11.9**	**5.5**	**1.1**	**3.5**	**10.6**	**4.2**
Coarse Sand	NA	NA	**6.8**	**5.3**	**14.8**	**8.1**	**2.7**	**8.3**	**16.8**	**5.4**
Medium Sand	NA	NA	**23.5**	**12.7**	**19.5**	**9.3**	**14.6**	**16.3**	**21.0**	**15.4**
Fine Sand	NA	NA	**31.2**	**14.5**	**15.5**	**10.3**	**26.0**	**30.2**	**5.5**	**18.9**
Very Fine Sand	NA	NA	**8.3**	**11**	**8.7**	**11.1**	**25.0**	**20.7**	**2.6**	**17.0**
Coarse Silt	NA	NA	**2.7**	**11.6**	**5.2**	**6.2**	**12.9**	**10.0**	**3.4**	**9.6**
Medium Silt	NA	NA	**2.2**	**5.0**	**5.3**	**6.0**	**6.4**	**4.2**	**2.9**	**6.0**
Fine Silt	NA	NA	**2.0**	**2.2**	**3.7**	**3.7**	**3.3**	**2.4**	**2.0**	**3.9**
Very Fine Silt	NA	NA	**1.5**	**1.5**	**2.5**	**2.7**	**1.9**	**1.5**	**1.5**	**2.4**
> 10 Phi Clay	NA	NA	**0.8**	**0.5**	**0.5**	**0.3**	**0.5**	**0.4**	**0.3**	**1.1**
8-9 Phi Clay	NA	NA	**1.2**	**0.9**	**1.5**	**2.1**	**1.1**	**0.9**	**0.8**	**1.7**
9-10 Phi Clay	NA	NA	**0.7**	**0.5**	**0.9**	**1.2**	**2.4**	**0.3**	**0.4**	**1.2**
Total Fines	NA	NA	**11.2**	**22.2**	**19.6**	**22.2**	**28.5**	**19.7**	**11.4**	**26.0**

Source:
http://www.nwp.usace.army.mil/regulatory/docs/RSET_Interim_Final.pdf

Notes: Sediment samples were analyzed for explosive residue, grain size, SVOCs, and TAL metals. Only the analytes detected are presented in this table.
Bold type indicates the sample result is above the Contract-Required Quantitation Limit.
Shaded cells inidicate analyte was detected above reglatory standard.
SL 1 - The lower screening level (SL1) corresponds to a concentration below which adverse effects to benthic organisms would not be expected.
SL 2 - The upper screening level (SL2) corresponds to a concentration at which minor adverse effects may be observed in the more sensitive groups of benthic organisms.

Key:

BK = Background
CLP = Contract Laboratory Program
CRQL = Contract Required Quanititation Limit
EPA = United States Environmental Protection Agency
ID = Identification
J = The analyte was positively identified, the associated numerical value is an estimate.
K = Unknown bias
L = Low bias
mg/kg = Milligrams per kilogram
Q = The result is estimated because the concentration is below the CRQL.
SD = Sediment
SQL = Sample Quantitation Limit
U = The analyte was not detected at or above the associated value.
WL = Wetland

8-3 Removal Assessment Wetland Surface Water Sample Analytical Results

EPA Sample ID CLP Sample ID Station Location	National Recommended Water Quality Criteria			11224025 JDQX9 BK01WT	11224021 JDQX5 WL01WT	11224022 JDQX6 WL02WT
Description	Human Health for the Consumption of Water + Organisms (ug/L)	Freshwater CMC (Acute) ug/L	Freshwater CCC (Chronic) ug/L	Background	Wetland	
Target Analyte List Metals (µg/L)						
Iron	300	NA	1,000	**102**	**133**	100 U

Source:

http://water.epa.gov/scitech/swguidance/standards/current/index.cfm

Notes: Surface water samples were analyzed for explosive residue, SVOCs, and TAL metals. Only the analytes detected are presented in this table.
Bold type indicates the sample result is above the Contract-Required Quantitation Limit.

Key:

BK = Background
CCC = Criterion continuous concentration "chronic" criteria is the 4-day average concentration not to be exceeded more than once every three years.
CMC =
CLP = Contract Laboratory Program
EPA = United States Environmental Protection Agency
ID = Identification
NA = Not available
µg/L = Micrograms per liter
U = The analyte was not detected at or above the associated value
WL = Wetland
WT = Water

Figures

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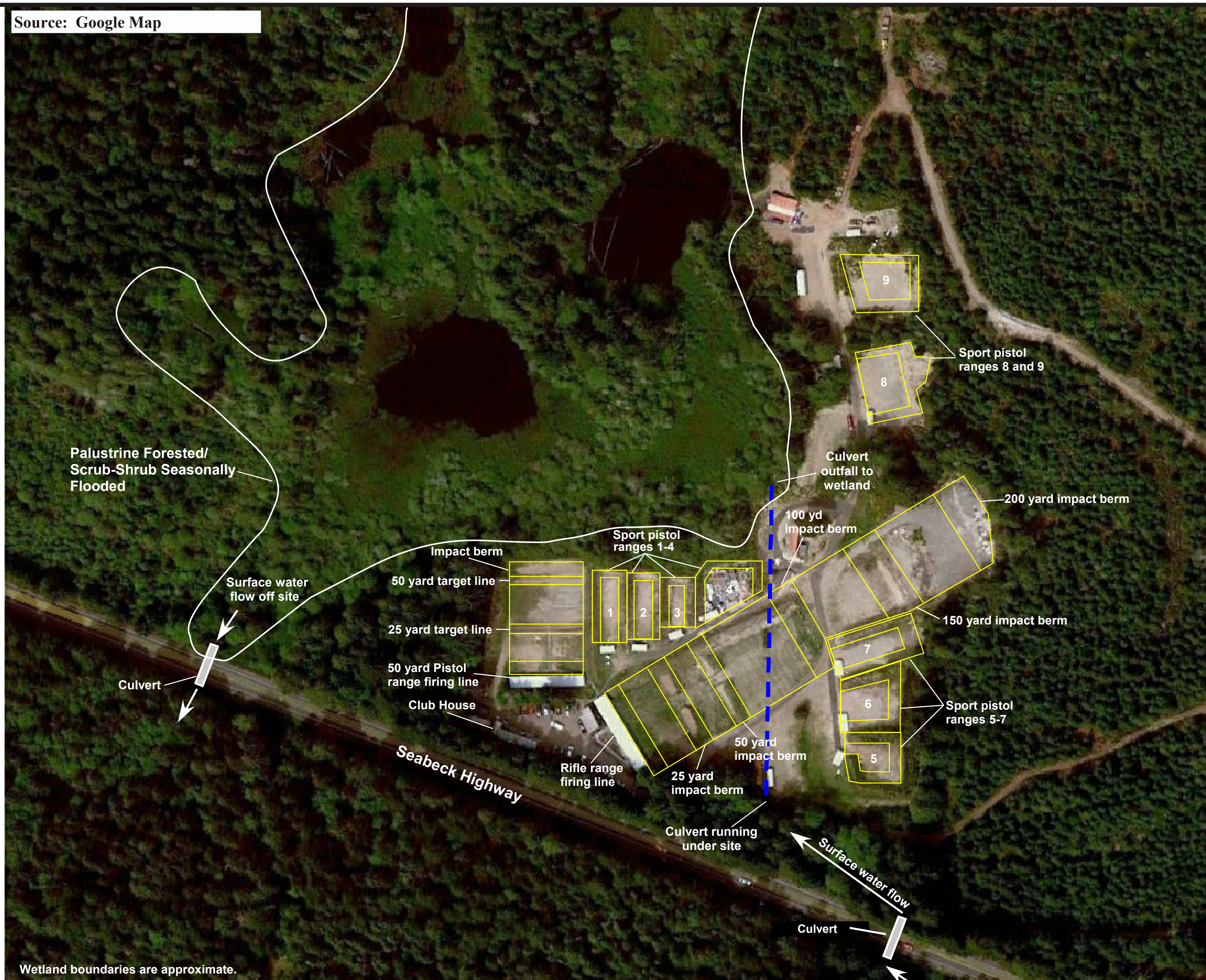
ecology and environment, inc. Global Specialists in the Environment Seattle, Washington	KITSAP RIFLE AND REVOLVER CLUB INTEGRATED ASSESSMENT Bremerton, Washington	Figure 1-1 SITE VICINITY MAP
	0 1333 2666 Approximate Scale in Feet	Date: 10-27-11 | Drawn by: AES | 10:START-3\10110011\fig 1-1



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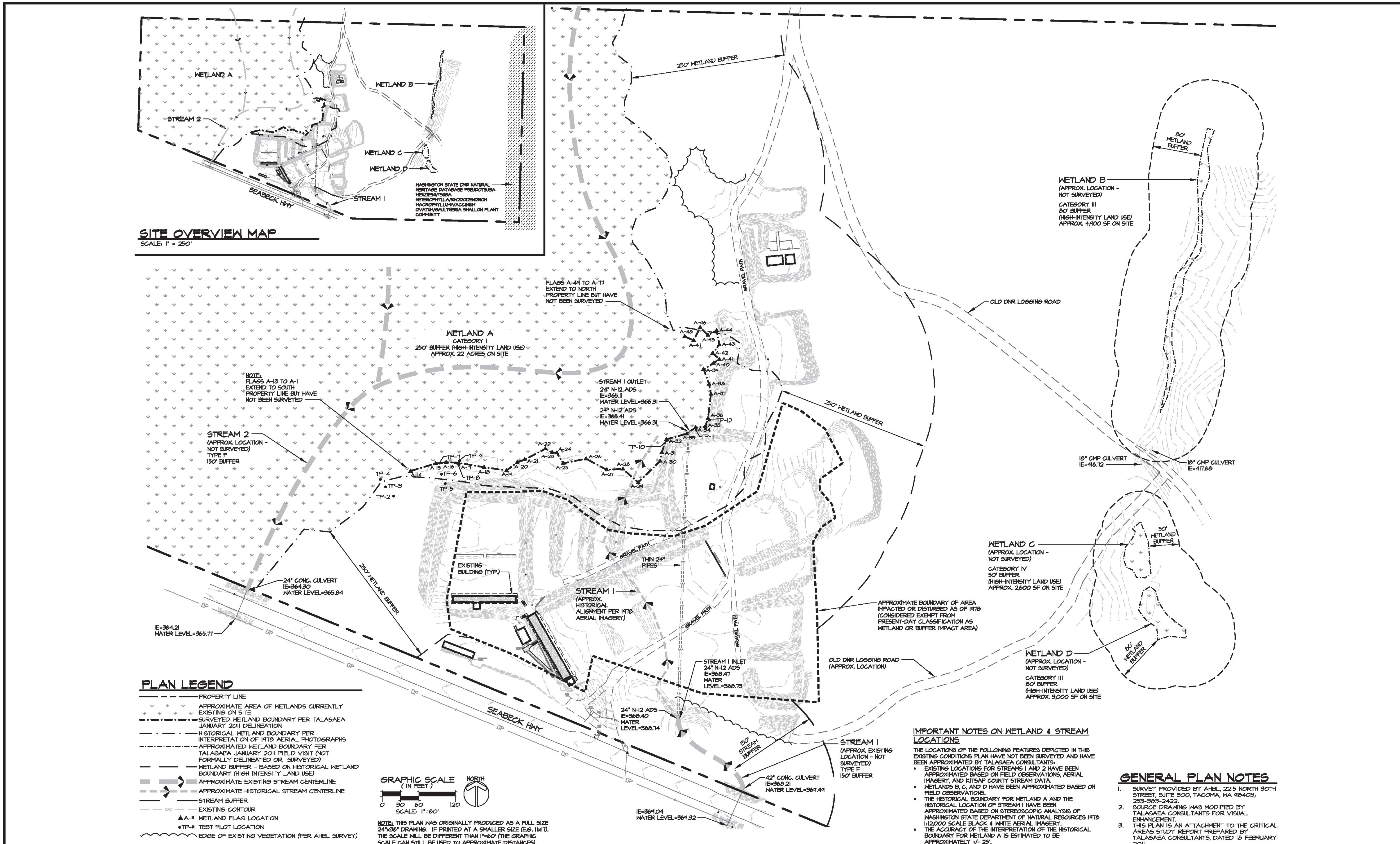
Seattle, Washington

KITSAP RIFLE AND
REVOLVER CLUB
INTEGRATED ASSESSMENT
Bremerton, Washington

Figure 2-1
SITE MAP

Date:	Drawn by:	
3/22/11	AES	10:START-3\10110011\fig 1-2



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Seattle, Washington

Source: Talasaea Consultants, Inc. 2011.

KITSAP RIFLE AND REVOLVER CLUB
INTEGRATED ASSESSMENT
Bremerton, Washington

Figure 2-2
CRITICAL AREAS MAP

Date:	Drawn by:	
10/27/11	AES	10:START-3\10110011\fig 2-2

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Seattle, Washington

0 75 150
Approximate Scale in Feet

KITSAP RIFLE AND REVOLVER CLUB
Bremerton, Washington

Figure 3-1
SAMPLE LOCATION MAP

Date:	Drawn by:	
9/20/11		10:START-3\10110011\fig 3-1

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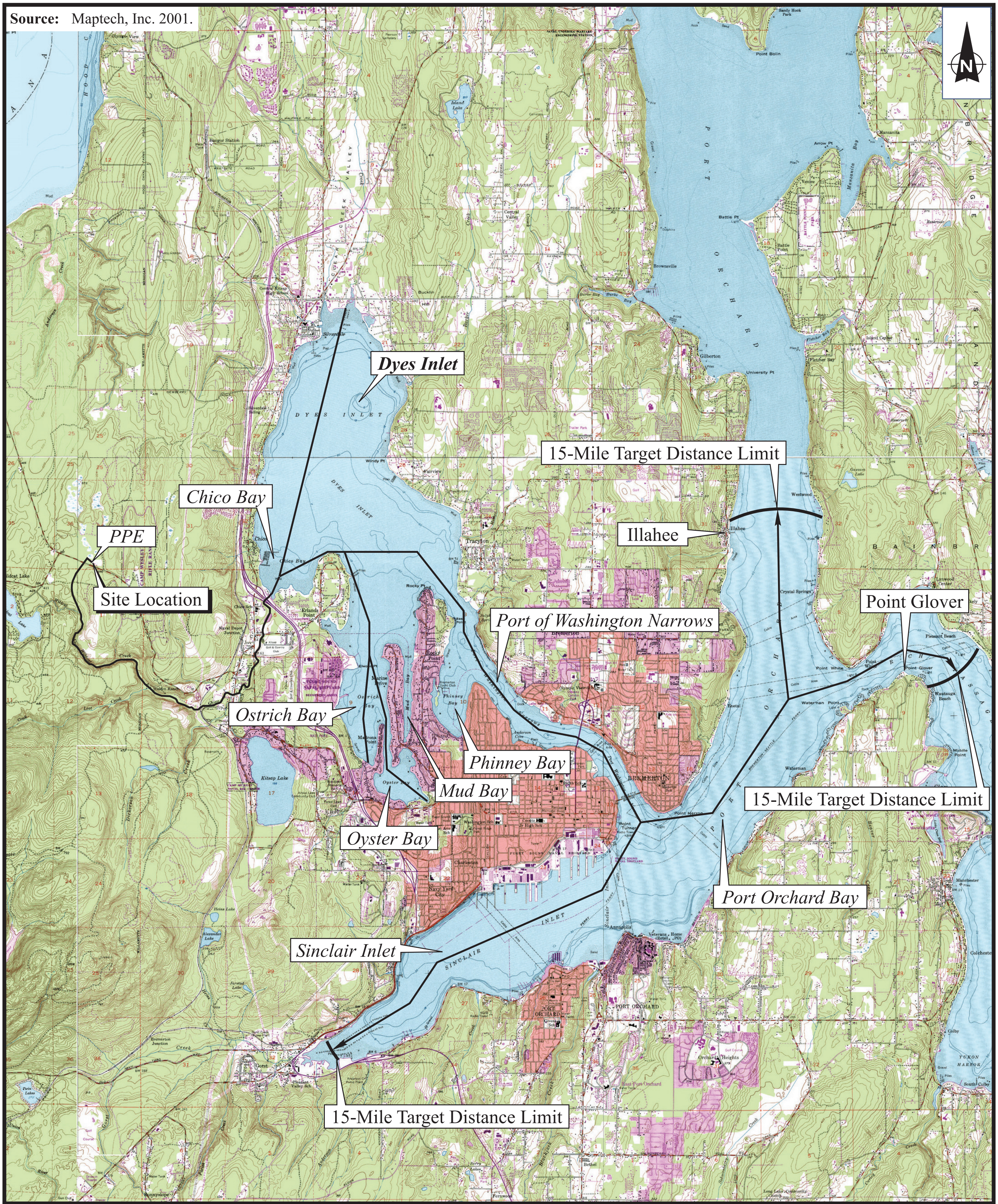
INTEGRATED ASSESSMENT
Bremerton, Washington

0 .5 1
Approximate Scale in Miles

Figure 7-1

4-MILE MAP

Date:	Drawn by:	
10-27-11	AES	10:START-3\10110011\fig 7-1



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Seattle, Washington

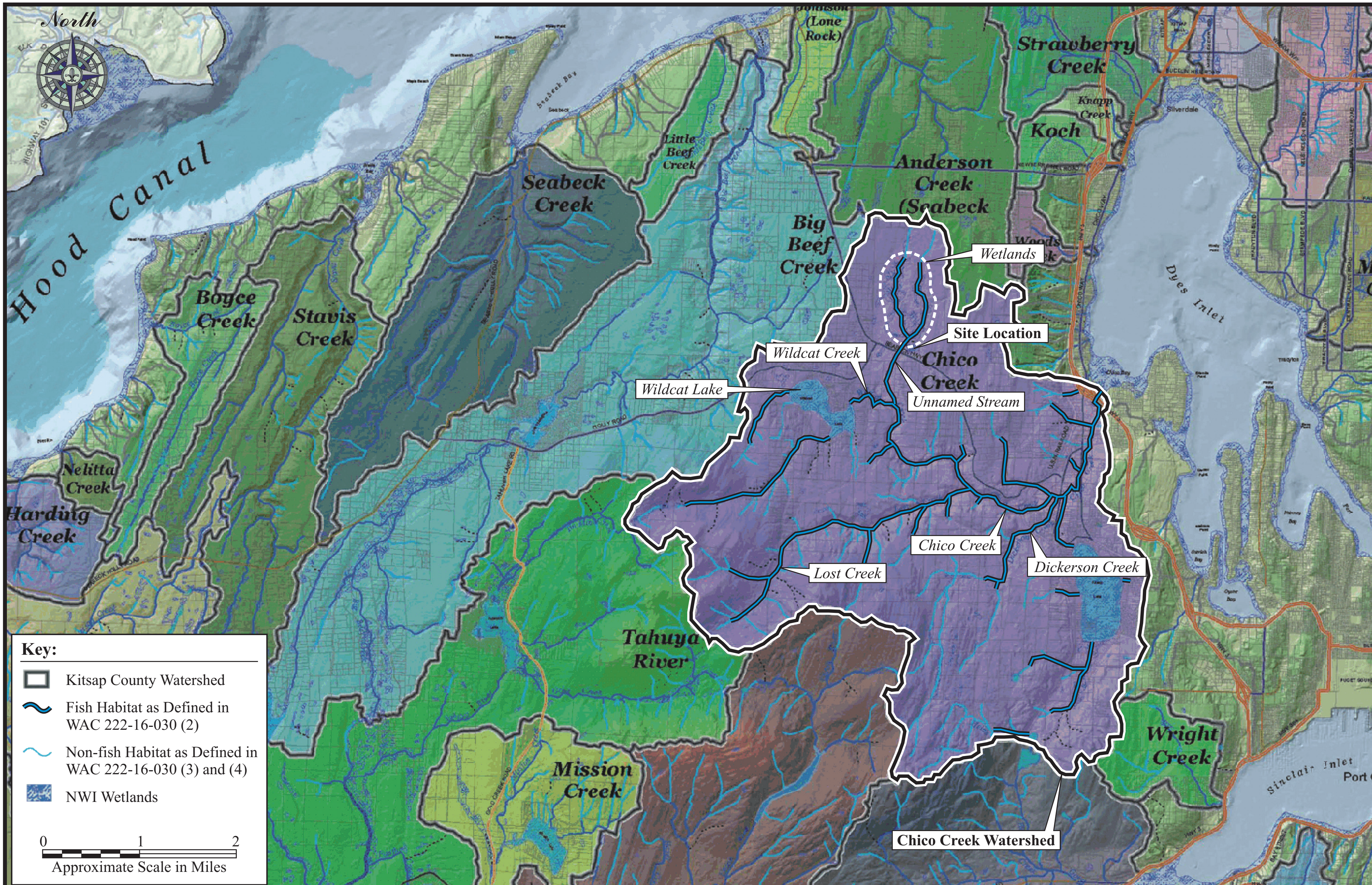
KITSAP RIFLE AND
REVOLVER CLUB
INTEGRATED ASSESSMENT
Bremerton, Washington

0 .75 1.5
Approximate Scale in Miles

Figure 7-2

15-MILE MAP

Date:	Drawn by:	
10-27-11	AES	10:START-3\10110011\fig 7-2



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KITSAP RIFLE AND REVOLVER CLUB
INTEGRATED ASSESSMENT
Bremerton, Washington

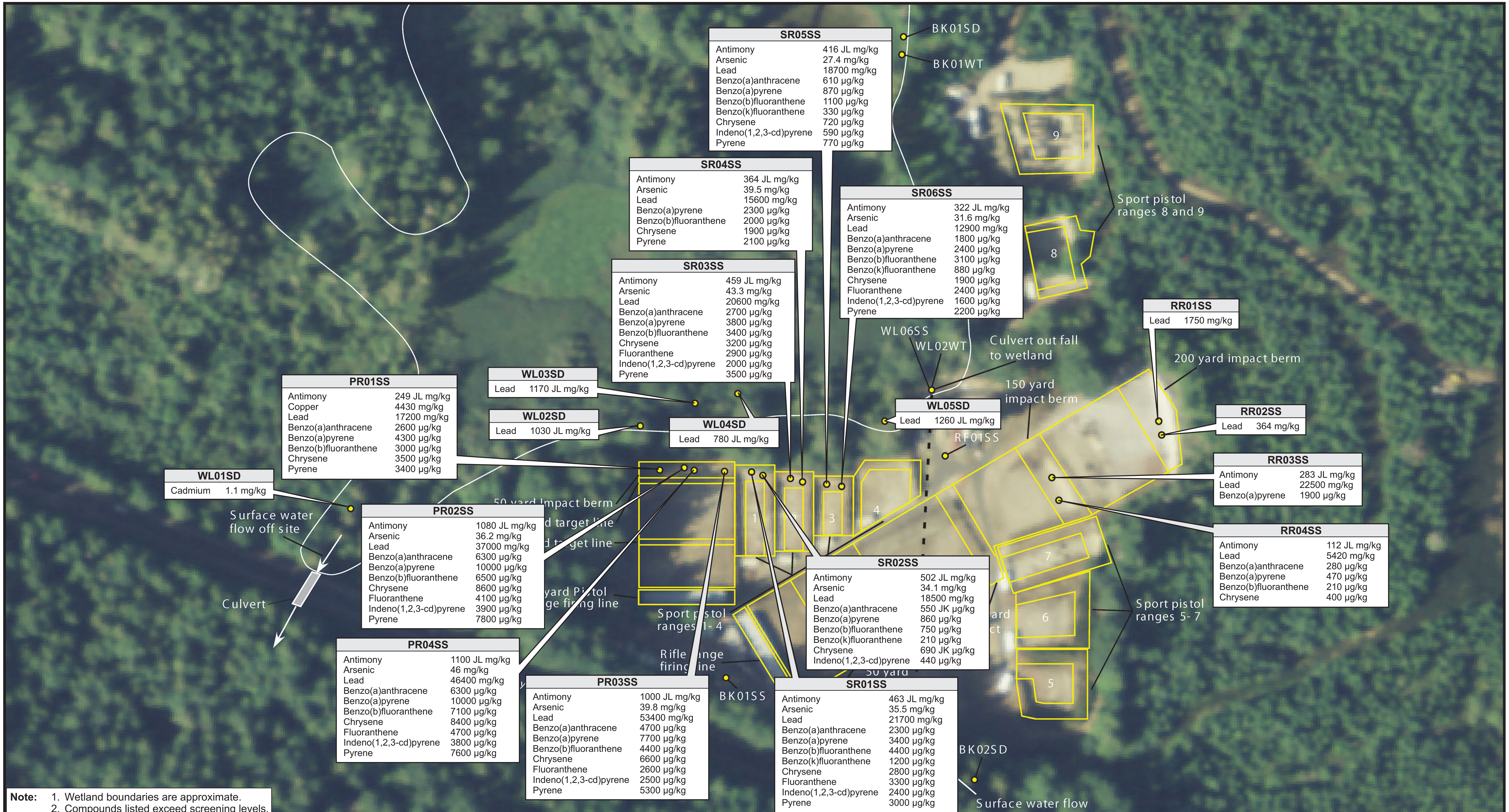
Figure 7-3
CHICO CREEK WATERSHED

Source: Kitsap County Department of Community Development, January 2006.

Date: 10/27/11

Drawn by: AES

10:START-3\10110011\fig 7-3



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Bremerton, Washington

Figure 8-1
REMOVAL ASSESSMENT SCREENING RESULTS MAP

Date:	Drawn by:	
10/27/11		10:START-3\10110011\fig 8-1

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A Aerial Photographs

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Jun 21, 1990
N
© 2010 Google
Image U.S. Geological Survey
Image NASA
©2010 Google
Imagery Date: Jun 21, 1990
47°36'30.90" N
122°44'45.43" W
elev 379 ft
Eye alt 2416 ft


Jul 7, 1994
N
© 2010 Google
Image U.S. Geological Survey
©2010 Google
Imagery Date: Jul 7, 1994
47°36'30.90" N
122°44'45.43" W
elev 379 ft
Eye alt 2416 ft

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Mar 14, 2005
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Image © 2010 DigitalGlobe
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Imagery Date: Mar 14, 2005
47°36'30.90" N 122°44'45.43" W elev 379 ft
Eye alt 2416 ft


Aug 1, 2005
N
© 2010 Google
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Imagery Date: Aug 1, 2005
47°36'30.90" N
122°44'45.43" W
elev 379 ft
Eye alt 2416 ft


Aug 18, 2006
N
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Image USDA Farm Service Agency
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Imagery Date: Jun 24, 2006
47°36'30.90" N 122°44'45.43" W elev 379 ft
Eye alt 2416 ft


Jul 31, 2006
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Image U.S. Geological Survey
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Imagery Date: Jul 1, 2006
47°36'30.90" N
122°44'45.43" W
elev 379 ft
Eye alt 2416 ft


Aug 7, 2006
N
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Image © 2010 DigitalGlobe
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Imagery Date: Aug 7, 2006
47°36'30.90" N 122°44'45.43" W elev 379 ft
Eye alt 2416 ft


Mar 31, 2007
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Image U.S. Geological Survey
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Imagery Date: Mar 1, 2007
47°36'30.90" N 122°44'45.43" W elev 379 ft
Eye alt 2416 ft


May 31, 2009
N
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Image U.S. Geological Survey
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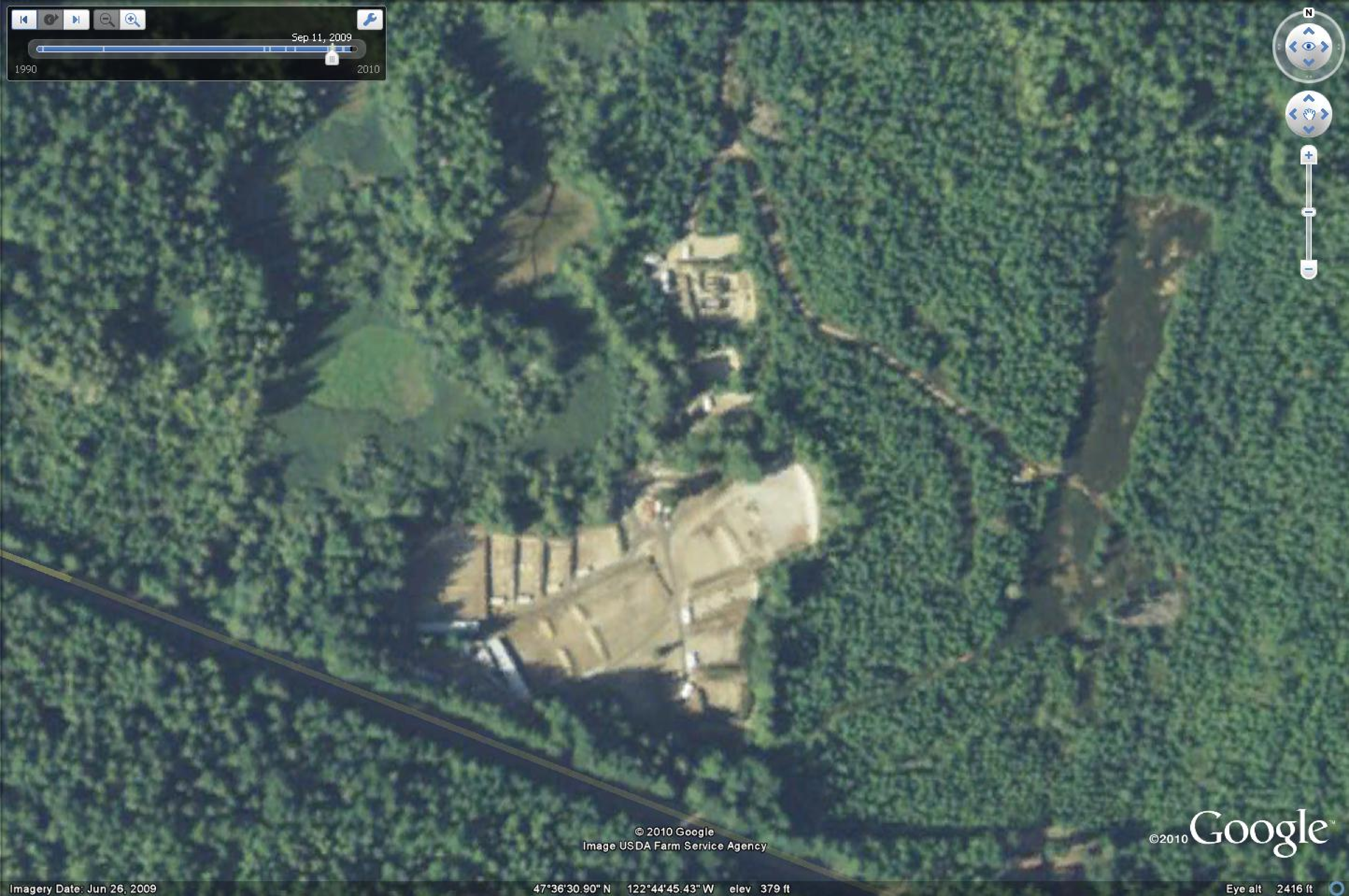
Imagery Date: May 1, 2009
47°36'30.90" N
122°44'45.43" W
elev 379 ft
Eye alt 2416 ft


Sep 11, 2009
1990
2010
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© 2010 Google
Image USDA Farm Service Agency
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Imagery Date: Jun 26, 2009
47°36'30.90" N 122°44'45.43" W elev 379 ft
Eye alt 2416 ft


May 15, 2010
N
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Imagery Date: May 15, 2010
47°36'30.90" N 122°44'45.43" W elev 379 ft
Eye alt 2416 ft


Jun 12, 2010
1990
2010
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©2010 Google
Imagery Date: Jun 12, 2010
47°36'30.90" N 122°44'45.43" W elev 379 ft
Eye alt 2416 ft

B December 2007 Flooding Photos

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Photo 1 Pistol range.

Direction: *Northwest* *Date: 12/03/07*

Photo 2 Pistol range.

Direction: *Northwest* *Date: 12/03/07*

Photo 3 Rifle range firing line.

Direction: *Southeast* *Date: 12/03/07*

Photo 4 Rifle range firing line.

Direction: *Down* *Date: 12/03/07*

Photo 5 Rifle range firing line.

Direction: *Down* *Date: 12/03/07*

Photo 6 Rifle range.

Direction: *East* *Date: 12/03/07*

Photo 7 Rifle range.

Direction: *East* *Date: 12/03/07*

Photo 8 Rifle range.

Direction: *Northeast* *Date: 12/03/07*

Photo 9 Rifle range above firing line.

Direction: *Northeast* *Date: 12/03/07*

Photo 10 Rifle range above firing line.

Direction: *Northeast* *Date: 12/03/07*

Photo 11 Rifle range above firing line.

Direction: *Northeast* *Date: 12/03/07*

Photo 12 Sport range #1.

Direction: *North* *Date: 12/03/07*

Photo 13 Sport range #1 and #2.

Direction: *Northeast* *Date: 12/03/07*

Photo 14 Sport range #2.

Direction: *Northeast* *Date: 12/03/07*

Photo 15 Between sport ranges and rifle range.

Direction: *Northeast* *Date: 12/03/07*

C

Critical Areas Study Report: Existing Conditions, Kitsap Rifle and Revolver Club, Kitsap County, Washington

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CRITICAL AREAS STUDY REPORT: EXISTING CONDITIONS

KITSAP RIFLE AND REVOLVER CLUB KITSAP COUNTY, WASHINGTON

Prepared For:
Kitsap County
Port Orchard, Washington

Prepared By:

TALASAEA CONSULTANTS, INC.
Woodinville, Washington

18 February 2010

Critical Areas Study
Existing Conditions

Kitsap Rifle and Revolver Club
Kitsap County, Washington

Prepared for:

Kitsap County
Port Orchard, Washington

Prepared by:

Talasaea Consultants, Inc.
15020 Bear Creek Road N.E.
Woodinville, WA 98077
(425) 861-7550

18 February 2011

EXECUTIVE SUMMARY

SITE NAME: Kitsap Rifle and Revolver Club

CLIENT: Kitsap County

SITE LOCATION: The approximate 70-acre site is located in unincorporated Kitsap County. The property address is 4900 Seabeck Highway NW, Bremerton, WA 98312. The Kitsap County tax parcel identification number is 36250140021006. The Public Land Survey System location for this property is the SE ¼ of Section 36, Township 25 North, Range 1 West, W.M.

PROJECT STAFF: Bill Shiels, Principal; Ann Olsen, Senior Project Manager; David Teesdale, Wetland Biologist; Erin Ericson, Ecologist and Planner; Adam DeWolfe, Landscape Designer; Jose Zuniga, Field Technician

FIELD SURVEY: Field work conducted on 4 January and 20 January 2011.

<u>DETERMINATION</u>: Four wetlands (Wetland A, Wetland B, Wetland C, and Wetland D) and two streams (Stream 1 and Stream 2) were identified on the subject parcel. Wetlands were classified in accordance with the *Washington State Wetland Rating System for Western Washington* (Hruby, 2004), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountain, Valleys, and Coast Regions* (U.S. Army Corps of Engineers, 2010), and Kitsap County Code Title 19. Wetland A (approximately 22-acres on-site) was classified as a Category I wetland and provided a base buffer width of 200 feet, with a final 250-foot buffer based on an existing high-intensity land use and its high habitat score. Wetland B (approximately 4,925 sf) and Wetland D (approximately 2,986 sf) were classified as Category III wetlands and provided a base buffer width of 50 feet, and a final 80-foot buffer. Wetland C (approximately 2,634 sf) was classified as a Category IV wetland and provided a base buffer width of 30 feet, and a final 50-foot buffer. Stream 1 and Stream 2 were both classified as Type F (fish-bearing) waters and provided a standard 150-foot buffer with an additional 15-foot building setback.

<u>HYDROLOGY</u>: The western portion of the parcel includes a large wetland complex (Wetland A) that drains via Stream 2 to Wildcat Creek, which drains to Chico Creek and Dyes Inlet. The eastern half of the parcel consists of a series of wetland areas (Wetland B, C, and D) that drain in a southerly direction to merge with flows from the large, adjacent Camp Wesley Harris property, and eventually into the Stream 1 corridor. Stream 1 enters the property from under Seabeck Highway at the southeast corner and is piped through the Kitsap County Rifle and Revolver Club developed area to an outlet into Wetland A.

<u>SOILS</u>: The Natural Resources Conservation Service has mapped the eastern, and south central developed portion of the parcel as Alderwood very gravelly sandy loam, 0 to 6 percent, and 6 to 15 percent, slopes. The north central and eastern portions of the site are mapped as Grove very gravelly sandy loam, 0 to 3 percent slopes. Soils around the mapped water areas in the west central portion of the site are mapped as McKenna gravelly loam. There are small areas along Seabeck Highway mapped as Ragnar fine sandy loam, 0 to 6 percent, and 6 to15 percent, slopes. The National Technical Committee for Hydric Soils *2010 National Hydric List by State* for Kitsap County, Washington lists the McKenna soil series as hydric. The Alderwood soil series with a McKenna component is listed as hydric.

<u>VEGETATION</u>: The dominant wetland vegetation on the subject parcel includes red alder (*Alnus rubra*), western red cedar (*Thuja plicata*), salmonberry (*Rubus spectabilis*), slough sedge (*Carex obnupta*), Douglas' spirea (*Spiraea douglasii*), Pacific crabapple (*Malus fusca*), Nootka rose (*Rosa nutkana*), red-osier dogwood (*Cornus sericea*), and soft rush (*Juncus effusus*). The dominant vegetation in undisturbed forested areas on the subject parcel includes western red cedar, Douglas fir (*Pseudotsuga menziesii*), salal (*Galtheria shallon*), sword fern (*Polystichum munitum*), western hemlock(*Tsuga heterophylla*), Pacific rhododendron (*Rhododendron macrophyllum*), and evergreen huckleberry (*Vaccinium ovatum*).

<u>HABITAT AND SPECIES INFORMATION:</u> The Washington Department of Fish and Wildlife Priority Habitats and Species (PHS), Washington State Natural Heritage Program, StreamNet, SalmonScape,

and Washington Department of Natural Resources databases were reviewed for priority species and habitat information. There are no priority habitats or species mapped on the project site. The PHS database identifies fall chum, rainbow trout, resident cutthroat trout, and winter steelhead in Wildcat Creek, located south of the project site. Common loon (*Gavia immer*), a State Sensitive species, is mapped in Wildcat Lake. Two bald eagle (*Haliaeetus leucocephalus*) nests are mapped approximately 1 ½ miles northeast of the project site. Bald eagle is a State Sensitive species and Federal Species of Concern.

The WDFW SalmonScape database maps the presence of fall Chinook salmon (Federally Threatened Species) in the lowest reach of Chico Creek. Coho salmon (Federal Species of Concern) are mapped in the lowest reach of Chico Creek with spawning habitat through Wildcat Creek up to Wildcat Lake and rearing habitat in Wildcat Lake and smaller tributaries. Rearing habitat for winter steelhead trout (Federally Threatened Species) is mapped in the lowest reach of Chico Creek with spawning habitat up to Wildcat Lake. The PSMFC StreamNet database maps the presence of spawning and rearing habitat for coho salmon and winter steelhead trout in Chico and Wildcat Creeks with migration habitat in Wildcat Lake. Stream 1 and Stream 2 are hydrologically connected to Wildcat Creek.

The Washington Natural Heritage Program (WNHP) database maps one known high-quality/rare ecological community on the eastern boundary of the subject property (WNHP, 2011). The common name classification for the ecological community is Douglas-fir – Western hemlock/Pacific rhododendron – evergreen huckleberry. The updated 2009 state rank for this ecological community is S4. “S” is “Sensitive”, which includes any taxon that is vulnerable or declining and could become Endangered or Threatened in the state without active management or removal of threats. The “4” rank is defined as widespread, abundant, and apparently secure in state, with many occurrences, but the taxon is of long-term concern (usually more than 100 occurrences). Additional WNHP elements within the vicinity of the project site include a forested sphagnum bog and western hemlock– (western red cedar)/Labrador tea/sphagnum spp. woodland association north of the site.

<u>CRITICAL AREA IMPACTS:</u> Several areas of impacts to Waters of the United States (U.S.) were determined during the field investigation. These impact areas were preliminarily identified through the historical aerial photograph interpretation and verified during the field investigation. Waters of the U.S. are regulated under Section 404 of the Clean Water Act. These waters include Navigable Waters and other parts of the surface water tributary system down to the smallest of streams, lakes, ponds, or other water bodies on those streams, and adjacent wetlands (33 CFR 328 & 329). In addition to Section 404 of the Clean Water Act, other regulations governing clearing and grading activities within wetlands, streams, and wetland and stream buffer areas on the KRRC site include Kitsap County Code, the State Environmental Policy Act (SEPA), Section 401 of the Clean Water Act, the Forest Practices Act (FPA) and the Hydraulic Code (Chapter 77.55 RCW). The apparent critical area impacts identified on the KRRC site include: 1) 55,500 sf of Wetland A impact; 2) piping 475 feet of Stream 1 through the core developed area; 3) 85,700 sf of Wetland A buffer impact; and 4) 12,900 sf of Stream 1 buffer impact.

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Chapter 1. Introduction

This report is the result of a critical areas study conducted at the Kitsap Rifle and Revolver (KRRC) Club property, located in unincorporated Kitsap County, Washington (**Figure 1**). The site is the location of an existing public shooting range. The purpose of this report is to identify and describe wetlands and streams on and adjacent to the property, identify potential impacts to Waters of the United States (U.S.), and provide a regulatory review of Kitsap County Code (KCC) Title 19 – Critical Areas Ordinance.

Chapter 2. Site Description

This chapter describes the key elements of the Kitsap Rifle and Revolver Club site.

2.1. Project Location and Description

The approximate 70-acre site is located in unincorporated Kitsap County. The property address is 4900 Seabeck Highway NW, Bremerton, WA 98312. The Kitsap County tax parcel identification number is 36250140021006. The property is bounded by Seabeck Highway to the south. The Public Land Survey System location for this property is the Section 36, Township 25 North, Range 1 West, W.M.

The subject parcel is occupied by the KRRC, which was founded in 1926. The property to the north and west is an undeveloped parcel owned by Kitsap County. The property to the east is Camp Wesley Harris, a United States government parcel. There is one single-family residential parcel adjacent to the southeast portion of the property. Three additional parcels adjacent to the southeast corner of the property are undeveloped land.

The core developed portion of the Club includes a parking area, the Club's office, and a covered shooting area. The remainder of the core developed area is characterized by open, grass and bare dirt areas separated by high berms. A large wetland complex occupies the western portion of the property. A berm ranging in height from 6 to 11 feet separates the core developed area from the large wetland complex. The wetland complex extends from the property to the north, and is bisected at the southern end by Seabeck Highway. A 24-inch concrete pipe conveys wetland and stream flows under Seabeck Highway.

A gravel road extends from the core developed area north to the northern property boundary. Just south of the northern property boundary, the gravel road takes a hairpin turn and extends in a southeasterly direction through the eastern portion of the property. The eastern portion of the property was clear cut in approximately 1994 and subsequently planted. Several wetlands were identified in this portion of the property but were not delineated as part of this investigation.

Chapter 3. Methodology

The critical areas analysis of the site involved a two-part effort. The first part consisted of a preliminary assessment of the site and its immediate surroundings using published information about local environmental conditions. This information included: (1) wetland and soil maps from resource agencies, (2) sensitive areas maps from Kitsap County GIS, (3) ortho-photography, and (4) stereo pairs of aerial photographs. The second part involved a field survey in which direct observations and measurements of soils, hydrology, and vegetation were made to determine whether wetlands and streams were present, their classifications, and the extent of their boundaries (see **Section 3.2 - Field Investigation** below).

OVERVIEW MAP

MAP SOURCE: WWW.MAPQUEST.COM (accessed 1-31-11)

DRIVING DIRECTIONS FROM SEATTLE

- TAKE I-5 SOUTH, TAKE EXIT 132 AND MERGE ONTO WA-16 WEST (TOWARD TACOMA NARROWS BRIDGE/GIG HARBOR/BREMERTON)
- FOLLOW WA-16 WEST; WA-16 WEST BECOMES WA-3 NORTH AT GORST.
- FROM WA-3 NORTH, TAKE THE CHICO WAY EXIT TOWARD CHICO.
- TURN LEFT ONTO CHICO WAY NORTH.
- TURN RIGHT ONTO NORTH LAKE WAY NW.
- TURN SLIGHT RIGHT ONTO SEABECK HWY NW.
- SITE WILL BE ON THE RIGHT SEVERAL MILES AHEAD AT 4900 SEABECK HWY NW (PAST CAMP WESLEY HARRIS NAVAL RES. AND 0.3 MI. PAST CALAMITY LANE NW).

ENLARGEMENT MAP

MAP SOURCE: WWW.MAPS.GOOGLE.COM (accessed 1-31-11)

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FIGURE #1

VICINITY MAP
KITSAP RIFLE AND REVOLVER CLUB
BREMERTON, WASHINGTON

DRAWN	PROJECT
ATD	TAL-1331
SCALE	
NTS	
DATE	
1-31-2011	1
REVISED	

Z:\DRAWING\1300-1399\TAL1331\Plans\TAL1331-FIGURES.dwg

3.1. Background Data Reviewed

Background information was reviewed prior to field investigations and included the following:

- US Fish and Wildlife Service, Wetlands Online Mapper (http://www.fws.gov/wetlands/Data/Mapper.html) (Updated May 20th, 2010);
- Natural Resources Conservation Service, Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/);
- Natural Resources Conservation Service, National Hydric Soils List by State (http://soils.usda.gov/use/hydric/lists/state.html);
- Kitsap County GIS Database (Kitsap County, Last Updated January 3, 2011) (http://www.kitsapgov.com/gis/metadata/);
- Pacific States Marine Fisheries Commission (PSMFC) StreamNet (www.streamnet.org) and Washington State Department of Fish and Wildlife (WDFW) SalmonScape databases (http://wdfw.wa.gov/mapping/salmonscape/);
- Current Pacific Coast Salmon Species Listed as Protected Under the Federal Endangered Species Act (http://www.nwr.noaa.gov/ESA-Salmon-Listings/upload/snapshot-7-09.pdf) (NOAA's National Marine Fisheries Service, Updated July 1, 2009)
- Federally-Listed Endangered, Threatened, Proposed, and Candidate Species, Critical Habitat, and Species Of Concern In Kitsap County, Western Washington (http://www.fws.gov/wafwo/speciesmap/Kitsap082610.pdf) (USFWS, Revised August 26, 2010);
- Priority Habitats and Species (PHS) Database, WFDW (January 13, 2011), and
- Natural Heritage Database, Washington Department of Natural Resources (WDNR) (January 4, 2011);
- Washington State Department of Natural Resources (WDNR) Forest Practices Water Typing (FPARS) Database (http://fortress.wa.gov/dnr/app1/fpars/viewer.htm);
- 2008 Washington State Water Quality Assessment, Washington State Department of Ecology (January 29, 2009) (http://www.ecy.wa.gov/programs/wq/303d/index.html);
- Kitsap County Public Records Search, Kitsap County Auditor (http://kcwaimg.co.kitsap.wa.us/recorder/web/);
- Aerial Photograph Interpretation, Dr. Frank Westerlund, University of Washington (**Appendix C**).

3.2. Field Investigation

Talasaea Consultants evaluated the subject property on 4 January and 20 January 2011 at which time the wetlands and streams were identified. The eastern boundary of Wetland A was delineated on 20 January 2011. Wetlands B, C, and D, and Stream 1 and Stream 2, were identified and classified but not delineated. Observations were also made of the general plant communities and wildlife habitats present throughout the site. Present and past land use practices were also noted.

Wetlands were determined according to Kitsap County Code (KCC) 19.200.210.A.1 by using the routine approach described in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountain, Valleys, and Coast Regions (U.S. Army Corps of Engineers, 2010), and the Washington State Wetlands Identification and Delineation Manual (Washington State Department of Ecology, 1997), which is based principally on the Army Corps of Engineers Wetland Delineation Manual (1987).

Plant species were identified according to the taxonomy of Hitchcock and Cronquist (1973), and the wetland status of plant species was assigned according to the list of plant species that occur in wetlands for Region 9, published by the U.S. Fish and Wildlife Service (Reed 1988, 1993).

Wetland classes were determined with the U.S. Fish and Wildlife Service's system of wetland classification (Cowardin, *et al*., 1979).

Indicators of wetland hydrology may include, but are not necessarily limited to: drainage patterns, drift lines, sediment deposition, watermarks, stream gauge data and flood predictions, historic records, visual observation of saturated soils, and visual observation of inundation.

Appendix A contains current U.S. Army Corps of Engineers (ACOE) data forms, prepared by Talasaea, for representative locations in both the upland and wetland. These data forms document the vegetation, soils, and hydrology information that aided in the wetland boundary determination.

The condition of wetland buffers was qualitatively assessed using the following criteria:

- Dominant land use (e.g., agriculture, residential, commercial, industrial).
- Dominant buffer vegetation type (tree, shrub, herb, vine, un-vegetated).
- Estimated percent cover of invasive plants by species.

Chapter 4. Results

4.1. Analysis of Existing Information

National Wetland Inventory

The National Wetland Inventory (NWI) map, developed by the U.S. Fish and Wildlife Service (USFWS), maps one, large palustrine forested/palustrine scrub shrub seasonally flooded (PFO/SSC) wetland across the western portion of the property. This is the southern tip of the large wetland complex that is mapped across significant portions of the Kitsap County property north of the subject parcel (**Figure 2**).

Natural Resources Conservation Service

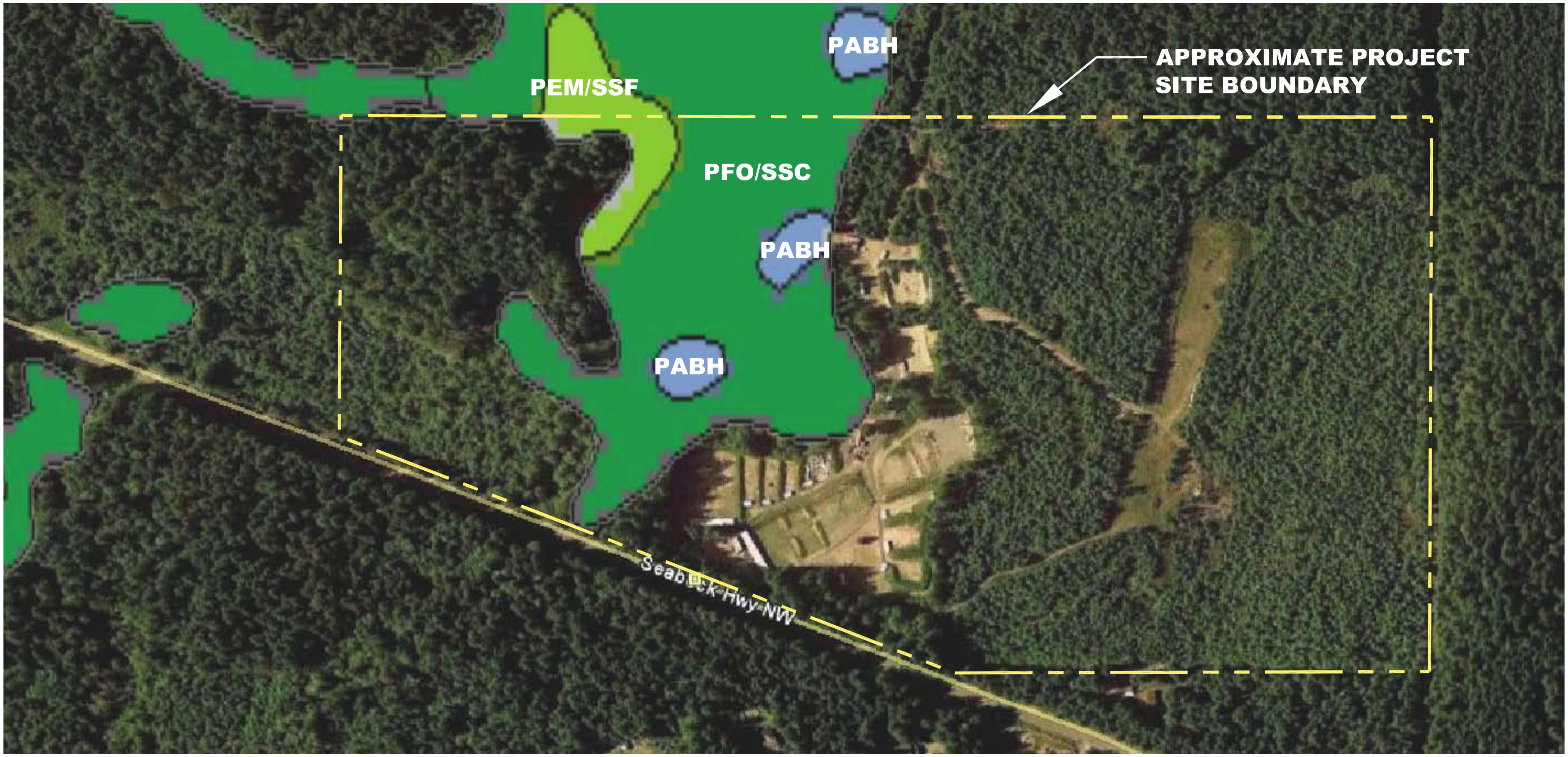
The Natural Resources Conservation Service has mapped the eastern, and south central developed portion of the parcel as Alderwood very gravelly sandy loam, 0 to 6 percent, and 6 to 15 percent, slopes (**Figure 3**). The north-central and eastern portions of the site are mapped as Grove very gravelly sandy loam, 0 to 3 percent slopes. Soils around the mapped water areas in the west central portion of the site are mapped as McKenna gravelly loam. There are small areas along Seabeck Highway mapped as Ragnar fine sandy loam, 0 to 6 percent, and 6 to15 percent, slopes.

The NRCS maps the Wetland A area with the McKenna soil series, which is described by the NRCS as consisting of moderately deep to dense till, poorly drained soils formed in glacial drift in depressions and drainageways with slopes of 0 to 5 percent, and native vegetation consisting of red alder, willow, western red cedar, and western hemlock, with an understory of salmonberry, sedges, Douglas spirea, forbs and water tolerant grasses. The NRCS describes the McKenna series as poorly drained with very slow or slow runoff, or ponded. A perched water table is at or near the surface during the November to March rainy season unless drained and water ponds on the surface in many areas.

The National Technical Committee for Hydric Soils *2010 National Hydric List by State* for Kitsap County, Washington lists the McKenna soil series as hydric. The Alderwood soil series with a McKenna component is listed as hydric. The Alderwood and Grove soil series are not listed as hydric soils.

WDFW Priority Habitat and Species Database

The WDFW PHS database was reviewed for the presence or absence of priority habitats or species on or in the vicinity of the project site. There are no priority habitats or species mapped



LEGEND

TYPE	DESCRIPTION
PFO/SSC	PALUSTRINE FORESTED/SCRUB-SHRUB, SEASONALLY FLOODED
PABH	PALUSTRINE AQUATIC BED, PERMANENTLY FLOODED
PEM/SSF	PALUSTRINE EMERGENT/SCRUB-SHRUB, SEMIPERMANENTLY FLOODED

NORTH

NWI MAP SOURCE: U.S. FISH AND WILDLIFE SERVICE, MAY 2008. NATIONAL WETLANDS INVENTORY MAP, U.S. DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE, WASHINGTON D.C. http://www.fws.gov/nwi/

BASE IMAGE SOURCE: GOOGLE EARTH (WWW.EARTH.GOOGLE.COM) IMAGE DATE: 6-11-10

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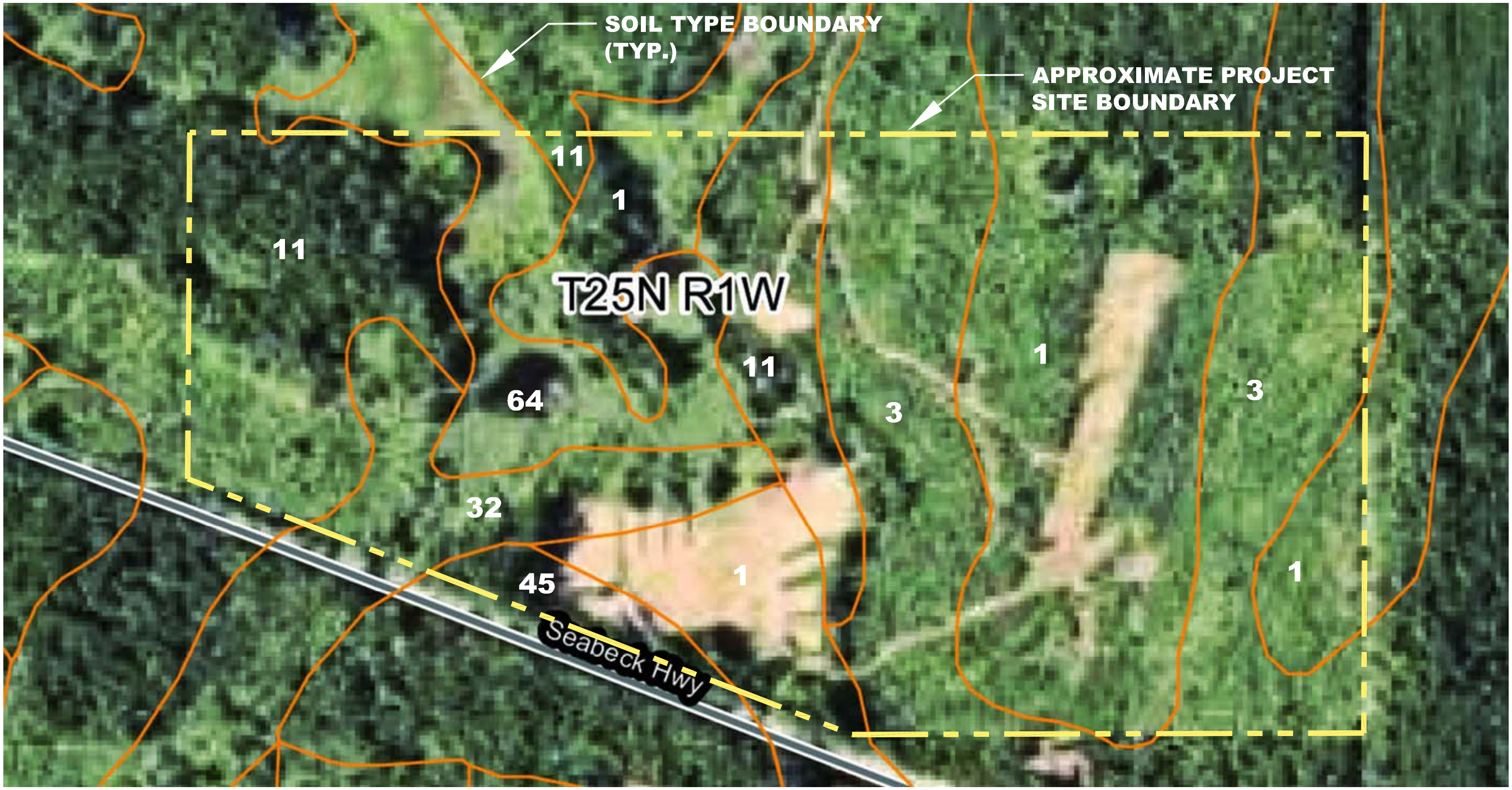
FIGURE #2

NATIONAL WETLANDS INVENTORY MAP
KITSAP RIFLE AND REVOLVER CLUB
BREMERTON, WASHINGTON

DRAWN	ATD
PROJECT	TAL-1331
SCALE	NTS
DATE	1-31-2011
REVISED	

2



LEGEND

SOIL TYPE	DESCRIPTION, SLOPES
1	ALDERWOOD VERY GRAVELLY SANDY LOAM, 0 TO 6 PERCENT SLOPES
3	ALDERWOOD VERY GRAVELLY SANDY LOAM, 15 TO 30 PERCENT SLOPES
11	GROVE VERY GRAVELLY SANDY LOAM, 0 TO 3 PERCENT SLOPES
32	MCKENNA GRAVELLY LOAM
45	RAGNAR FINE SANDY LOAM, 6 TO 15 PERCENT SLOPES
64	OPEN WATER

SOURCE:
SOIL SURVEY STAFF, NATURAL RESOURCE CONSERVATION SERVICE, U.S. DEPARTMENT OF AGRICULTURE, WEB SOIL SURVEY, AVAILABLE ONLINE AT http://websoilsurvey.nrcs.usda.gov/ ACCESSED 1-31-2011

NORTH

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FIGURE #3

NRCS SOILS MAP
KITSAP RIFLE AND REVOLVER CLUB
BREMERTON, WASHINGTON

DRAWN	PROJECT
ATD	TAL-1331
SCALE	
NTS	
DATE	
1-31-2011	3
REVISED	

on the project site. The PHS database identifies fall chum, rainbow trout, resident cutthroat trout, and winter steelhead in Wildcat Creek, located south of the project site. Common loon (*Gavia immer*), a State Sensitive species, is mapped in Wildcat Lake. Two bald eagle (*Haliaeetus leucocephalus*) nests are mapped approximately 1 ½ miles northeast of the project site. Bald eagle is a State Sensitive species and Federal Species of Concern.

WDNR Washington Natural Heritage Program

The Washington Natural Heritage Program (WNHP) manages site-specific and species/ecosystem-specific information on priority habitats and ecosystems. The WNHP database maps one known high-quality/rare ecological community on the eastern boundary of the subject property (WNHP, 2011). The common name classification for the ecological community is Douglas-fir – Western hemlock/Pacific rhododendron – evergreen huckleberry. The updated 2009 state rank for this ecological community is S4. “S” is “Sensitive”, which includes any taxon that is vulnerable or declining and could become Endangered or Threatened in the state without active management or removal of threats. The “4” rank is defined as widespread, abundant, and apparently secure in state, with many occurrences, but the taxon is of long-term concern (usually more than 100 occurrences). Additional WNHP elements within the vicinity of the project site include a forested sphagnum bog and western hemlock– (western red cedar)/Labrador tea/sphagnum spp. woodland association north of the site.

Kitsap County GIS Database

The Kitsap County wetland mosaic GIS layer indicated one large wetland feature on the western portion of the property, extending onto the property from the north. The metadata for this layer states:

> “This feature class is a combination of various wetland data sources into one comprehensive data layer for Kitsap County. Data sets used include DNR 2000 Hydrology, NWI Wetlands data, Bainbridge Island wetland inventory data, and survey delineated wetlands extracted from the County’s accurate parcel map sections. Polygons from all layers were individually evaluated against aerial photography. Polygons identifying wetlands where redevelopment has occurred were not included into the final product. Polygons that were spatially inaccurate were moved to correct location only in cases where intended spatial location was unambiguously obvious. Polygons from two or more data sets identifying wetlands in the same location were merged and are reflected as one polygon feature. All polygons are attributed for any modifications made (moved or merged), as well as originating data source(s) for each (e.g. as DNR, WNI, Parcel Map, or Bainbridge Island data).”

The source for the wetland mapped on the western portion of the property is identified as DNR 2000, NWI and Parcel Map. The notes state that the large wetland feature (Wetland A) was modified through merging.

The Kitsap County Streams and Surface Waters map (Kitsap County, 2007) was reviewed for the presence of streams on the subject parcel. The Streams and Surface Waters map represents the streams, surface waters, and wetlands as identified by WDNR. The Kitsap County Streams and Surface Waters map identifies a stream that originates in Wetland A, flows under Seabeck Highway, and into Wildcat Creek.

The building footprints layer identifies four buildings on the subject property. The building footprints layer states that it “contains building footprints for all unincorporated areas of Kitsap County and most of the incorporated cities therein. The footprint data is not based on any survey or legal description and is not intended to take the place of either.” The image source for the building footprints on the property is listed as 2005 Washington DNR.

Kitsap County Records Search

A search of Kitsap County records was conducted to obtain available information about critical areas and permit history for the subject and adjacent properties. A quit claim deed between the Washington State Department of Natural Resources (Grantor) and Kitsap County (Grantee) was filed June 17th, 2009 for tax parcel #362501-1-002-1002 and #362501-4-002-1006 by the Washington. A bargain and sale deed with restrictive covenants between Kitsap County (Grantor) and the Kitsap Rifle and Revolver Club (Grantee) was filed May 13th, 2009 for tax parcel #362501-4-002-1006. The bargain and sale deed states:

> "Grantee shall confine its active shooting range facilities on the property consistent with its historical use of approximately eight (8) acres of active shooting ranges with the balance of the property serving as safety and noise buffer zones; provided that Grantee may upgrade or improve the property and/or facilities within the historical approximately (8) acres in a manner consistent with "modernizing" the facilities consistent with management practices for a modern shooting range…Grantee may also apply to Kitsap County for expansion beyond the historical eight (8) acres for "supporting" facilities for the shooting ranges or additional recreational or shooting facilities provided that said expansion is consistent with public safety…and the rules and regulations of Kitsap County for development of private land."
>
> The bargain and sale deed also references an existing Habitat Conservation Plan (HCP) with Riparian Management Zones for the subject parcel, stating: "The existing Habitat Conservation Plan is to remain in effect, regardless of parcel segregation or aggregation or potential sale or land transfer…All activities within the Riparian Management Zone as defined in the existing and publicly-filed HCP and including that portion of the inner riparian ecosystem between the aquatic zone and the direct influence zone (upland) and including the outer wind buffer, must comply with and remain in compliance with the current HCP Procedures…All activities must provide for no overall net loss of naturally occurring wetland function."

WDNR Forest Practices Water Typing

The WDNR Forest Practices maintains and updates stream maps that show both modeled and field-verified stream types. The Forest Practices Application and Review System (FPARS) mapping website was reviewed to determine the presence of streams and typing of streams in the project area. The FPARS database maps a fish-bearing stream through the large wetland complex on the western portion of the subject parcel. The Type F stream is mapped as flowing under Seabeck Highway and into Wildcat Creek, south of Seabeck Highway.

SalmonScape and StreamNet Databases

The WDFW SalmonScape database maps the presence of fall chinook salmon in the lowest reach of Chico Creek (documented presence). Coho salmon are mapped in the lowest reach of Chico Creek (rearing) with spawning habitat through Wildcat Creek up to Wildcat Lake and rearing habitat in Wildcat Lake and smaller tributaries. Rearing habitat for winter steelhead trout is mapped in the lowest reach of Chico Creek with spawning habitat up to Wildcat Lake.
The PSMFC StreamNet database maps the presence of spawning and rearing habitat for coho salmon and winter steelhead trout in Chico and Wildcat Creeks with migration habitat in Wildcat Lake.

NMFS and USFWS Federally-Listed Species

The NMFS website provides the Endangered Species Act (ESA) status of West Coast salmon and steelhead, including Federally-listed threatened, endangered, proposed, and candidate species present in the Northwest region. The USFWS website provides Federally-listed and proposed endangered and threatened species and critical habitat, candidate species, and species of concern in Kitsap County. The ESA status of species known to be present on the KRRC site and/or downstream of the KRRC site is listed in **Table 1**. The defined project area includes the KRRC parcel and downstream receiving waters (Wildcat Creek and Chico Creek).

Table 1: Federally-Listed Species Potentially Present in the Project Area

SPECIES	STATUS	PRESENCE IN PROJECT AREA
Puget Sound Fall Chinook Salmon *(Oncorhynchus tshawytscha)*	Threatened/Critical Habitat/Essential Fish Habitat	Yes
Puget Sound Coho Salmon *(Oncorhynchus kisutch)*	Species of Concern/Essential Fish Habitat	Yes
Puget Sound Winter Steelhead Trout *(Oncorhynchus mykiss)*	Threatened	Yes

Washington State's Water Quality Assessment 303(d)

Washington State's Water Quality Assessment lists the status of water quality for a particular location in one of five categories. Category 5 represents waters placed on the 303(d) list requiring the preparation of a TMDL (water quality improvement project). Category 4A represents waters where the data show that a characteristic use is impaired by a pollutants but a TMDL addressing that impairment has already been developed and approved by the US EPA. The upper reaches of Chico Creek through Wildcat Creek and Wildcat Lake is listed as a Category 5 water for the pollutant fecal coliform on the 2008 Water Quality Assessment 303(d), which was approved by the Environmental Protection Agency (EPA) on January 29, 2009. The lower reaches of Chico Creek are listed as Category 5 waters for impairment of dissolved oxygen and temperature parameters.

Aerial Photograph Interpretation

Stereoscopic coverage of available aerial photographs (**Table 2**) was reviewed to determine land use changes on the project site. Stereoscopic coverage is the three-dimensional view which results when two overlapping photographs (stereo pair) are viewed using a stereoscope. Each photograph of the stereo pair provides a slight different view of the same area, which is able to be interpreted in a three-dimensional view. Monoscopic coverage of 2006 National Agriculture Imagery Program (NAIP) and 2009 NAIP digital aerial photographs, and Google Earth aerial photographs from 1990 to the present were also reviewed to provide a recent interpretation of land use changes.

Table 2: List of Aerial Photographs Reviewed for Land Use Interpretation

Title	Scale	Date	Interpretation	Color	Author
NW-78	1:12,000	5-18-78	Stereoscopic	black & white	Washington State Department of Natural Resources
OLP 95	1:12,000	5-18-95	Stereoscopic	black & white	Washington State Department of Natural Resources
OLC-03	1:12,000	7-3-03	Stereoscopic	color	Washington State Department of Natural Resources
NAIP 2006	Digital	2006	Monoscopic	color	National Agriculture Imagery Program
NAIP 2009	Digital	2009	Monoscopic	color	National Agriculture Imagery Program
Google Earth	Digital	1990-2010	Monoscopic	black and white; color	Google Earth

The aerial photograph interpretation is provided in **Appendix C**. A summary of observations specific to individual photographic years is provided in the following paragraphs.

NW-78: A large wetland complex is mapped in the west central portion of the property. Multiple vegetation classes are identified within the wetland, including open water, forested wetland, shrub wetland, and emergent wetland. A ditch/watercourse is mapped through the central portion of the property. The ditch/watercourse is mapped as originating in the emergent wetland area in the central portion of the property, flowing through the developed, central grassy portion of the property, and ending in an emergent wetland area located just north of the south central property boundary. Two buildings are identified in the south central portion of the property. There are no roads or development identified on the eastern half of the property. One dirt track is mapped in a north-south orientation through the central portion of the property.

OLP-95: The eastern half of the property was recently clear cut and there is a small network of roads visible on the eastern portion of the property (roads originate from the north). Bare, graded areas are mapped adjacent to the southern portion of the large wetland complex. The bare, graded areas are located at the northern portion of the developed area in the south central portion of the property. The previously mapped small, emergent wetland area located just north of the south central property boundary is also identified in the 1995 interpretation. The previously mapped ditch/watercourse identified within the south central portion of the property is not identified in 1995.

OL-C-03: The eastern portion of the property is beginning to grow back with low shrubs and young conifer seedlings. A large portion of the central developed area has been excavated and several dirt piles (berms) are identified within the excavated area.

NAIP 2006: A large rectangular swath has been cleared through the center of the eastern portion of the property (former clear cut and recently seeded area). The western portion of the core developed area consists of graded pads, dropping in elevation from west to east. A graded road appears through the center of the core developed area. A new road section connecting to the historical road at the north property line has been cleared; the new road section connects to the historical logging road through the eastern portion of the property and extends in a southerly direction to a newly cleared bare area just east of an open water area within the large wetland complex.

NAIP 2009: New dirt piles (berms) are identified in the core developed area. There is a freshly graded area at the northeastern portion of the core developed area.

Google Earth 2010: The 5/14/2010 Google Earth aerial photograph clearly shows a newer cleared area adjacent to the ponded wetland area at the northern portion of the KRRC parcel. The 6/11/2010 aerial photograph shows a boat at the wetland pond edge adjacent to the newly cleared area.

4.2. Analysis of Field Conditions

Wetland and streams were indentified and classified on the KRRC site. The eastern boundary of Wetland A was delineated on 20 January 2011. Wetlands B, C, and D, and Stream 1 and Stream 2, were identified and classified but not delineated (**Figure 4** and **Sheet W1.0** in **Appendix E**). All wetlands were categorized according to the rating system and criteria contained in the *Wetland Rating System for Western Washington – Revised* (Hruby, 2004). Wetland rating forms are included in **Appendix B**. The on-site features are described in the following sections.

<u>Wetlands Overview</u>

One depressional wetland feature (Wetland A) was identified and delineated on the project site (**Table 3**). Three additional depressional wetland features (Wetland B, Wetland C, and Wetland D) were described and categorized. Wetlands were classified using:

- USFWS system (Cowardin, 1979)
- Hydro-geomorphic (HGM) Classification system (Brinson, 1993)
- Washington State Wetlands Rating System for Western Washington - Revised (Hruby, 2004)
- Kitsap County Critical Areas Ordinance, Title 19 (Kitsap County, 2010)

Table 3: Wetlands within the Project Area

Wetland	Wetland Classification				Wetland Size (sf) (approx.)	Base Buffer Width (feet)[D]	High-Intensity Land Use Buffer Width (feet)[D]
	Cowardin[A]	HGM	Ecology[B]	Local Jurisdiction[C]			
Wetland A	PFO/PSS/PAB (on-site)	Depressional	I	I	961,097 (on-site)	200	250
Wetland B	PSS	Depressional	III	III	4,925	50	80
Wetland C	PEM	Depressional	IV	IV	2,634	30	50
Wetland D	PEM	Depressional	III	III	2,986	50	80

<u>Notes</u>:
[A]Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Unconsolidated Shore; PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested.
[B]Ecology rating according to Hruby (2004).
[C]Wetlands rated according to Kitsap County Critical Areas Ordinance (Kitsap County, 2010).
[D] Wetland buffer width according to Kitsap County Critical Areas Ordinance (Kitsap County, 2010).

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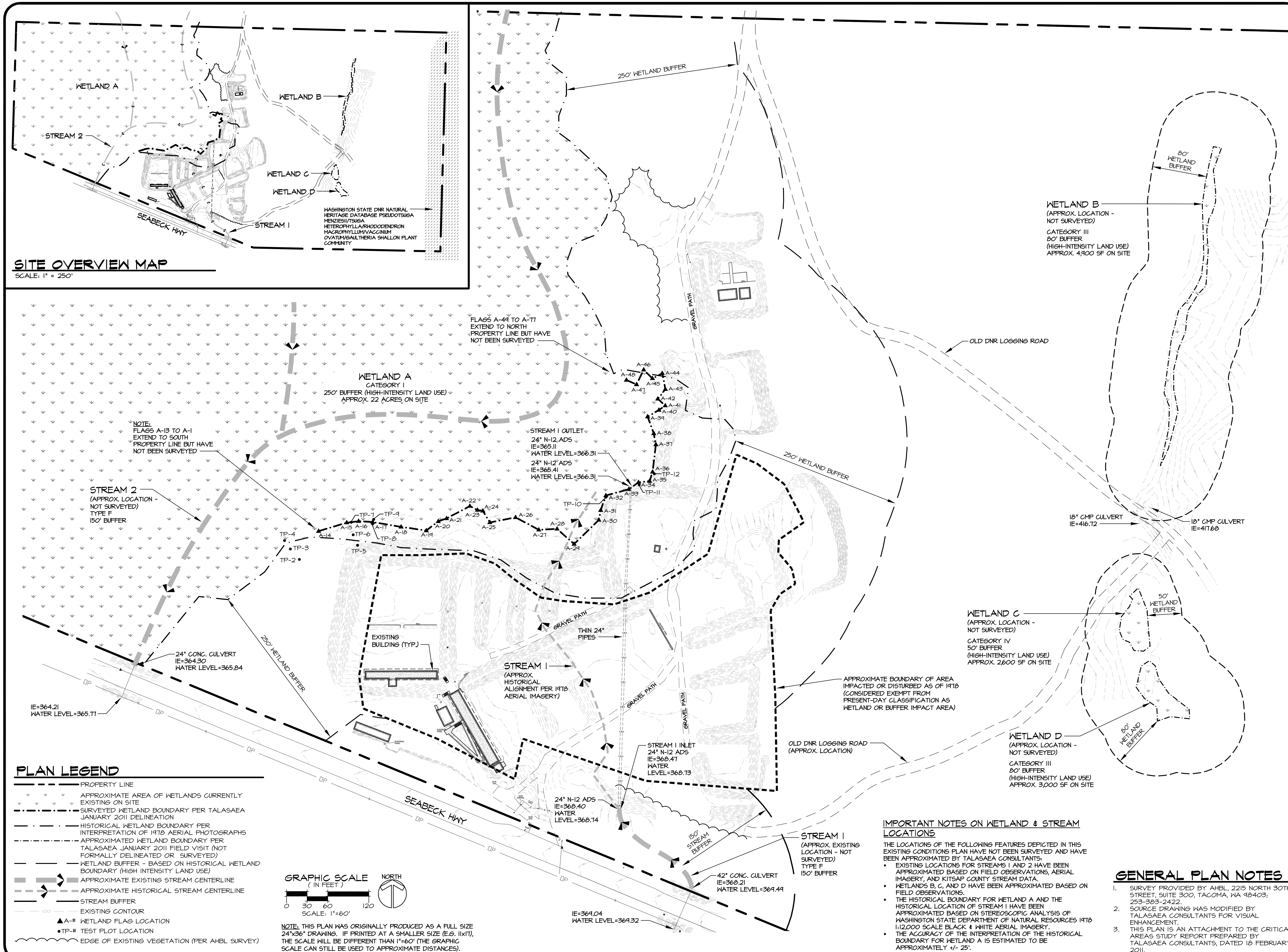

IMPORTANT NOTES ON WETLAND & STREAM LOCATIONS

THE LOCATIONS OF THE FOLLOWING FEATURES DEPICTED IN THIS EXISTING CONDITIONS PLAN HAVE NOT BEEN SURVEYED AND HAVE BEEN APPROXIMATED BY TALASAEA CONSULTANTS:

- EXISTING LOCATIONS FOR STREAMS 1 AND 2 HAVE BEEN APPROXIMATED BASED ON FIELD OBSERVATIONS, AERIAL IMAGERY, AND KITSAP COUNTY STREAM DATA.
- WETLANDS B, C, AND D HAVE BEEN APPROXIMATED BASED ON FIELD OBSERVATIONS.
- THE HISTORICAL BOUNDARY FOR WETLAND A AND THE HISTORICAL LOCATION OF STREAM 1 HAVE BEEN APPROXIMATED BASED ON STEREOSCOPIC ANALYSIS OF WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES 1978 1:12,000 SCALE BLACK & WHITE AERIAL IMAGERY.
- THE ACCURACY OF THE INTERPRETATION OF THE HISTORICAL BOUNDARY FOR WETLAND A IS ESTIMATED TO BE APPROXIMATELY +/- 25'.

GENERAL PLAN NOTES

1. SURVEY PROVIDED BY AHBL, 2215 NORTH 30TH STREET, SUITE 300, TACOMA, WA 98403; 253-383-2422.
2. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
3. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS STUDY REPORT PREPARED BY TALASAEA CONSULTANTS, DATED 18 FEBRUARY 2011.

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast • Woodinville, Washington 98077
Bus (425) 861-7550 • Fax (425) 861-7549

CRITICAL AREAS STUDY
EXISTING CONDITIONS PLAN
KITSAP RIFLE AND REVOLVER CLUB
BREMERTON, WASHINGTON

Revisions	Date	By

Date 2-18-2011
Scale AS NOTED
Designed ATD
Drawn ATD
Checked AO
Approved BS

Project # TAL-1331

FIGURE 4

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Wetland A

Wetland A is an approximate 22-acre (on-site area only) Category I wetland with several Cowardin wetland classes (Cowardin, *et al*.,1979). Wetland A is located over the western portion of the property (**Table 4**). Wetland A has several vegetation communities including forested, shrub, emergent and aquatic bed. The dominant vegetation in Wetland A includes red alder (*Alnus rubra*), western red cedar (*Thuja plicata*), salmonberry (*Rubus spectabilis*), slough sedge (*Carex obnupta*), Douglas' spirea (*Spiraea douglasii*), Pacific crabapple (*Malus fusca*), Nootka rose (*Rosa nutkana*), and red-osier dogwood (*Cornus sericea*). Soils in Wetland A are sandy and consist of either a dark (10 YR 2/1) sandy mucky mineral or a stripped matrix where iron-manganese oxides and/or organic matter have been stripped from the base matrix and the primary base color of the soil material has been exposed (unstripped - 2.5 Y 5/4, stripped – 10 YR 5/1). There are several hydroperiods present within Wetland A including permanently flooded (ponded), seasonally flooded, occasionally flooded, and saturated. There is a permanently flowing stream (Stream 2) through the interior of Wetland A; the stream exits through a 24-inch-diameter culvert under Seabeck Highway.

Wetland A was classified as a depressional wetland and rated as a Category I wetland (Hruby, 2004). According to Kitsap County Code (KCC) 19.200.220, Category I wetlands with a high habitat score (Wetland A habitat score = 32 points; KCC Table 19.220.220(F) high level of function for habitat score is 29-36 points), and a proposed high intensity land use, are provided a 250-foot buffer plus a 15-foot building/impervious surface setback.

Table 4: Wetland A Summary

<table>
<tr><th colspan="3">WETLAND A – INFORMATION SUMMARY</th></tr>
<tr><td>Location:</td><td colspan="2">4900 Seabeck Highway NW, Bremerton, WA</td></tr>
<tr><td rowspan="9" colspan="1"></td><td>Local Jurisdiction</td><td>Kitsap County</td></tr>
<tr><td>WRIA</td><td>15</td></tr>
<tr><td>Ecology Rating (Hruby, 2004)</td><td>Category I</td></tr>
<tr><td>Kitsap County Rating</td><td>Category I</td></tr>
<tr><td>Kitsap County High-Intensity Land Use Buffer Width</td><td>250 feet</td></tr>
<tr><td>Wetland Size (on-site)</td><td>Approx. 961,097 sf</td></tr>
<tr><td>Cowardin Classification</td><td>PFO/PSS/PAB (on-site)</td></tr>
<tr><td>HGM Classification</td><td>Depressional</td></tr>
<tr><td>Flag color</td><td>Pink</td></tr>
<tr><td>Dominant Vegetation</td><td colspan="2">red alder (Alnus rubra), western red cedar (Thuja plicata), salmonberry (Rubus spectabilis), slough sedge (Carex obnupta), Douglas' spirea (Spiraea douglasii), Pacific crabapple (Malus fusca), Nootka rose (Rosa nutkana), red-osier dogwood (Cornus sericea)</td></tr>
<tr><td>Soils</td><td colspan="2">Soils within Wetland A are sandy and generally consist of a dark (10 YR 2/1) layer of mucky modified sandy soil material. Additional hydric soil characteristics included a layer with a stripped matrix.</td></tr>
<tr><td>Hydrology</td><td colspan="2">Permanently flooded, Saturated, Occasionally flooded</td></tr>
<tr><td>Buffer Condition</td><td colspan="2">The buffer is well vegetated with western red cedar, Douglas fir (Pseudotsuga menziesii), salal (Galtheria shallon), and sword fern (Polystichum munitum), western hemlock (Tsuga heterophylla), Pacific rhododendron (Rhododendron macrophyllum), and evergreen huckleberry (Vaccinium ovatum). The buffer is widest at the southern and northern portions of Wetland A within the subject parcel. The buffer is narrow to non-existent within the central portion of the parcel, adjacent to the core developed area.</td></tr>
</table>

Wetland B, Wetland C, and Wetland D

Wetland B, Wetland C, and Wetland D are located on the eastern section of the subject parcel, in an area that was clear-cut in the early 1990's (**Figure 4** and **Sheet W1.0** in **Appendix E**). These three wetland areas were identified and categorized during the 20 January 2011 site visit, but the wetlands were not delineated or flagged in the field.

Wetland B is the northernmost wetland of the three wetland areas, originating just south of the northern property line. Wetland B is an approximate 4,925 sf headwater wetland that may have been manipulated into a ditch at one time. It is orientated on a slope, but due to the amount of ponding within the wetland area (>3 feet wide x 1 foot deep, based on Hruby, 2004), Wetland B is located on a slope but is categorized as a depressional wetland feature due to levels of ponding. Wetland B was classified as a palustrine scrub-shrub wetland (Cowardin, *et al*.,1979). The dominant vegetation within Wetland B is Douglas' spirea, slough sedge, and soft rush (**Table 5**). Wetland B was rated as a Category III wetland (Hruby, 2004). According to Kitsap County Code (KCC) 19.200.220, Category III wetlands with a proposed high intensity land use are provided an 80-foot buffer plus a 15-foot building/impervious surface setback.

Drainage through Wetland B extends generally from north to south along the west side of an area cleared for development of a 300-meter firing range. Wetland B ends at a culvert that extends beneath an old DNR logging road (see **Figure 4** and **Sheet W1.0** in **Appendix E**). Drainage appeared to infiltrate near the inlet to the culvert. However, during heavy rainfall events flows likely pass through the culvert and proceed in a southeasterly direction toward Wetland C.

Table 5: Wetland B Summary

<table>
<tr><th colspan="3">WETLAND B – INFORMATION SUMMARY</th></tr>
<tr><td>Location:</td><td colspan="2">4900 Seabeck Highway NW, Bremerton, WA</td></tr>
<tr><td rowspan="8"></td><td>Local Jurisdiction</td><td>Kitsap County</td></tr>
<tr><td>WRIA</td><td>15</td></tr>
<tr><td>Ecology Rating (Hruby, 2004)</td><td>Category III</td></tr>
<tr><td>Kitsap County Rating</td><td>Category III</td></tr>
<tr><td>Kitsap County High-Intensity Land Use Buffer Width</td><td>80 feet</td></tr>
<tr><td>Wetland Size</td><td>Approx. 4,925 sf</td></tr>
<tr><td>Cowardin Classification</td><td>PSS</td></tr>
<tr><td>HGM Classification</td><td>Depressional</td></tr>
<tr><td>Dominant Vegetation</td><td colspan="2">Slough sedge, soft rush (Juncus effusus), Douglas spirea</td></tr>
<tr><td>Soils</td><td colspan="2">No soil data forms were completed.</td></tr>
<tr><td>Hydrology</td><td colspan="2">Area of ponding is 3 feet wide x 1-foot deep.</td></tr>
<tr><td>Buffer Condition</td><td colspan="2">The buffer area is partially disturbed by a large, open, cleared area with a gravel/dirt road. The remainder of the buffer area consists of young conifer forest (previously a clear cut area).</td></tr>
</table>

Wetland C, an approximate 2,634 sf wetland, originates near the southern end of the old DNR logging road cross culvert. Wetland C was categorized as a depressional wetland feature and classified as a palustrine emergent wetland (Cowardin, *et al*.,1979) (**Table 6**). The dominant vegetation within Wetland C is soft rush. Wetland C was rated as a Category IV wetland (Hruby, 2004). According to Kitsap County Code (KCC) 19.200.220, Category IV wetlands with a proposed high intensity land use, are provided a 50-foot buffer plus a 15-foot building/impervious surface setback. Wetland C does not have a well-defined outlet and may, in fact, be contiguous with Wetland D. A wetland determination made during the growing season (after March 13th) could confirm or refute this possibility.

Table 6: Wetland C Summary

<table>
<tr><th colspan="4">WETLAND C – INFORMATION SUMMARY</th></tr>
<tr><td>Location:</td><td colspan="3">4900 Seabeck Highway NW, Bremerton, WA</td></tr>
<tr><td colspan="2" rowspan="8"></td><td>Local Jurisdiction</td><td>Kitsap County</td></tr>
<tr><td>WRIA</td><td>15</td></tr>
<tr><td>Ecology Rating (Hruby, 2004)</td><td>Category IV</td></tr>
<tr><td>Kitsap County Rating</td><td>Category IV</td></tr>
<tr><td>Kitsap County High-Intensity Land Use Buffer Width</td><td>50 feet</td></tr>
<tr><td>Wetland Size</td><td>Approx. 2,634 sf</td></tr>
<tr><td>Cowardin Classification</td><td>PEM</td></tr>
<tr><td>HGM Classification</td><td>Depressional</td></tr>
<tr><td>Dominant Vegetation</td><td colspan="3">Soft rush</td></tr>
<tr><td>Soils</td><td colspan="3">No soil data forms were completed.</td></tr>
<tr><td>Hydrology</td><td colspan="3">Ponded</td></tr>
<tr><td>Buffer Condition</td><td colspan="3">The buffer area is partially disturbed by a large, open, cleared area with a gravel/dirt road. The remainder of the buffer area consists of young conifer forest (previously a clear cut area).</td></tr>
</table>

Wetland D emerges just south of Wetland C as a ponded wetland area with shrubs and emergent vegetation. Wetland D, an approximate 2,986 sf wetland, was also categorized as a depressional wetland feature and classified as a palustrine emergent wetland (Cowardin, *et al*.,1979) (**Table 7**). The dominant vegetation within Wetland D is soft rush and slough sedge. Wetland D was rated as a Category III wetland (Hruby, 2004). According to Kitsap County Code (KCC) 19.200.220, Category III wetlands with a proposed high intensity land use are provided an 80-foot buffer plus a 15-foot building/impervious surface setback. Wetland D has an outlet at its eastern end that may flow only during periods of significant rainfall; the outlet was not flowing during the 20 January 2011 site visit.

Table 7: Wetland D Summary

<table>
<tr><th colspan="3">WETLAND D – INFORMATION SUMMARY</th></tr>
<tr><td>Location:</td><td colspan="2">4900 Seabeck Highway NW, Bremerton, WA</td></tr>
<tr><td rowspan="8"></td><td>Local Jurisdiction</td><td>Kitsap County</td></tr>
<tr><td>WRIA</td><td>15</td></tr>
<tr><td>Ecology Rating (Hruby, 2004)</td><td>Category III</td></tr>
<tr><td>Kitsap County Rating</td><td>Category III</td></tr>
<tr><td>Kitsap County High-Intensity Land Use Buffer Width</td><td>80 feet</td></tr>
<tr><td>Wetland Size</td><td>Approx. 2,986 sf</td></tr>
<tr><td>Cowardin Classification</td><td>PEM</td></tr>
<tr><td>HGM Classification</td><td>Depressional</td></tr>
<tr><td>Dominant Vegetation</td><td colspan="2">Soft rush, slough sedge</td></tr>
<tr><td>Soils</td><td colspan="2">No soil data forms were completed.</td></tr>
<tr><td>Hydrology</td><td colspan="2">Ponded.</td></tr>
<tr><td>Buffer Condition</td><td colspan="2">The buffer area is partially disturbed by a large, open, cleared area with a gravel/dirt road. The remainder of the buffer area consists of young conifer forest (previously a clear cut area).</td></tr>
</table>

Wetland Buffers

According to KCC 19.200.220 (Wetland buffer requirements), buffer widths shall be measured horizontally from a perpendicular line established at the wetland edge based on the base buffer width, and then any adjustments (increases or decreases to the base buffer width) shall be made from considerations such as land use impact intensity, and wetland characteristics. Based on the description of land uses provided in KCC Table 19.200.220(B), KRRC fits most accurately into the "High" land use impact intensity. The most similar example provided under "High" land use impacts is "High Intensity Recreation" (golf courses, ball fields). The "Moderate" land use impact intensity includes "Open Space" (parks), and the KRRC recreational use does not fit as well into this category because there is vehicle traffic and active rifle range activities more similar to activities described as "High Intensity Recreation" such as golf courses and ball fields.

The Kitsap County base buffer width (KCC Table 19.200.220(a)) for Wetland A, a Category I wetland, is 200 feet. This base buffer width for Wetland A was increased by 50 feet using Table 19.200.220(F) because Wetland A has a high level of function for habitat (score for habitat is 29-36 points) and an adjacent High impact land use. The final buffer width for Wetland A is 250 feet, plus a 15-foot building/impervious surface setback.

The undisturbed buffer width of Wetland A along the developed portion of the site (**Photo 1)** varies from 0 feet to 220 feet (the southwestern corner of the wetland adjacent to the core developed area). The western portion of the Wetland A buffer area consists of relatively undeveloped forest with some unpaved roads. The vegetated Wetland A buffer area on the subject parcel consists primarily of western red cedar, Douglas fir (*Pseudotsuga menziesii*), salal (*Galtheria shallon*), and sword fern (*Polystichum munitum*) (**Photo 2**).

Photo 1: Disturbed Wetland A Buffer Area (photograph taken from berm in southern area of KRRC site – looking northwest toward Wetland A)

Photo 2: Wetland A Buffer (photograph taken at "boat launching area" looking south into Wetland A buffer)

A distinct plant community consisting of Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), Pacific rhododendron (*Rhododendron macrophyllum*), and evergreen huckleberry (*Vaccinium ovatum*) was found between Talasaea Wetland Flags A-46 and A-77. This plant community was listed in the WDNR Natural Heritage Plan Lists of Priorities 2009 (WDNR, 2009) as a G4/S4 ecological community in the Puget Trough. The G4/S4 status is described by WDNR as widespread, abundant and apparently secure globally/locally, though the taxon is of long-term concern. Chappell (2006) provides management notes for this community as follows:

> "Stands that have not been previously harvested, especially mature and old-growth, should be considered for conservation status. These sites appear to be low or moderately low productivity for tree growth."

The Kitsap County base buffer width (KCC Table 19.200.220(a)) for Wetland B and Wetland D, Category III wetlands, is 50 feet. The base buffer width for these wetlands is increased by 30 feet using Table 19.200.220(D) because Wetland B and Wetland D do not have a high level of function for habitat (score for habitat between 20-28 points) but do have an adjacent High impact land use. The final buffer width for Wetland B and Wetland D is 80 feet, plus a 15-foot building/impervious surface setback.

The Kitsap County base buffer width (KCC Table 19.200.220(a)) for Wetland C, a Category IV wetland, is 30 feet. The base buffer width for Wetland C was increased by 20 feet using Table 19.200.220(C) because Wetland C has an adjacent High impact land use. The final buffer width for Wetland C is 50 feet, plus a 15-foot building/impervious surface setback.

The cleared (disturbed) portion of the Wetland B, C, D buffer area (**Photo 3**) is vegetated with Scot's broom, bracken fern, soft rush, sword fern, salal, and trailing blackberry. The undisturbed portion of the Wetland B, C, D buffer area (**Photo 4**) is vegetated with evergreen huckleberry, salal, cascara, Douglas fir, white pine, sword fern, and bracken fern.

Photo 3: Disturbed Buffer Area of Wetland B, C, D (photograph taken west of Wetland C, looking north)

Photo 4: Wetland C Looking Toward Undisturbed Buffer Area (photograph taken west of Wetland C, looking northeast)

Chapter 5. Streams

According to KCC 19.15.635 (Streams) –

> "Streams" means those areas in Kitsap County where the surface water flows are sufficient to produce a defined channel or bed. A defined channel or bed is an area which demonstrates clear evidence of the passage of water and includes but is not limited to bedrock channels, gravel beds, sand and silt beds and defined-channel swales. The channel or bed need not contain water year-round. This definition is not meant to include irrigation ditches, canals, storm or surface water runoff devices or other artificial watercourses **unless** they are used by fish or used to convey streams **naturally** occurring prior to construction."

Stream 1

Stream 1 is located in WRIA 15, (Kitsap watershed), and the Chico Creek sub-watershed (**Table 8**). The only open conveyance reach of Stream 1 on the subject property is located near the southeastern portion of the property, just north of Seabeck Highway (**Figure 4** and **Sheet W1.0** in **Appendix E**). Stream 1 originates on the Camp Wesley Harris property, located east of the subject parcel. Stream 1 also collects flows from the Wetland B, C, and D complex on the eastern portion of the subject property. The Wetland B, C, and D flows and Camp Wesley Harris flows converge and flow south under Seabeck Highway just prior to being conveyed north under Seabeck Highway the stream re-enters the subject property through a 42-inch diameter concrete pipe. Stream 1 flows through a mature forested area at the southeastern corner of the property, prior to entering two 24-inch-diameter N-12 corrugated polyethylene drainage pipes (**Photo 5**). The N-12 pipes convey Stream 1 in a northwesterly direction through the core developed area and discharges directly into Wetland A (**Photo 6**). Stream 1 exhibited relatively low flows at the time of the 20 January 2011 site visit.

Photo 5: Stream 1 inlet to eastern end of piped conveyance through Core Developed Area (photograph taken at westernmost segment of open conveyance portion of Stream 1 in mature forested area)

Photo 6: Outlet of piped conveyance of Stream 1 to Wetland A (photograph taken at Stream 1 outlet into Wetland A – the western end of piped Stream 1 segment)

The bed of Stream 1 in the mature forested area consists of sand and silt. The Stream 1 riparian area consists primarily of mature western red cedar and Douglas fir (*Pseduotsuga menziesii*) trees. The average diameter at breast height (dbh) of trees within the Stream 1 riparian area is 23-inches. A portion of the Stream 1 channel through the mature forested area appears to have been recently excavated and straightened (see **Photograph 7** in **Table 8**).

Stream 1 was not listed or shown on any background materials reviewed for this report. According to KCC 19.300.310, streams shall be classified according to the DNR Water Typing System defined in Washington Administrative Code (WAC) 222-16-030. A Type F water means segments of natural waters, other than Type S waters, which contain fish habitat. According to the Forest Practices Board Manual Section 13, the physical criteria of a stream must be used to determine the presence or absence of fish above human-made fish blockages. The current condition of the Stream 1 outlet to Wetland A (**Photo 6**), and piped conveyance through the core developed area, are not likely features that would be classified as fish blockages. However, if they were classified as blockages to fish passage, the physical characteristics of Stream 1 upstream of the subject property would need to be evaluated to determine whether the stream would warrant a Type F classification. The physical characteristics (WAC 222-16-031(3)) of a Type F water include stream segments with a defined channel of 2 feet or greater within the bankfull width in Western Washington, and with a gradient of 16 percent or less. Stream 1 meets the criteria of a Type F water because there is documented fish use downstream of Stream 1 and, above any potential human-made fish blockage through the subject property, Stream 1 meets the physical criteria of a Type F water. In accordance with KCC 19.300.310, Type F streams shall be provided a 150-foot standard buffer with an additional 15-foot building setback.

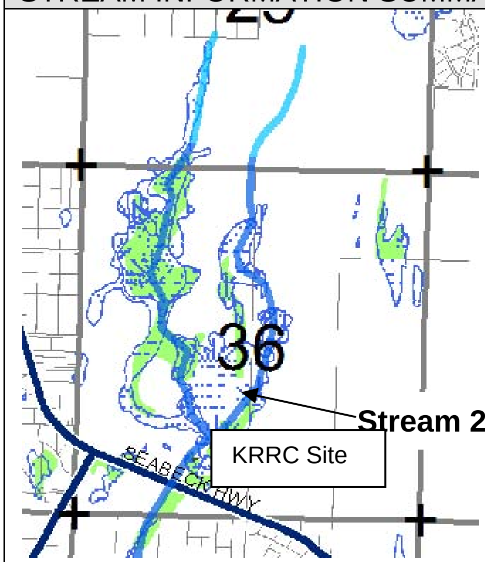
Table 8: Stream 1 Summary Table

<table>
<tr><th colspan="3">STREAM INFORMATION SUMMARY</th></tr>
<tr><td rowspan="8">
Photo 7: Dredged/channelized segment of Stream 1</td><td>**Stream Name**</td><td>Stream 1</td></tr>
<tr><td>**WRIA**</td><td>15</td></tr>
<tr><td>**WA Stream Catalog #**</td><td>Not listed</td></tr>
<tr><td>**Local Jurisdiction**</td><td>Kitsap County</td></tr>
<tr><td>**DNR Stream Type**</td><td>Type F</td></tr>
<tr><td>**Local Stream Rating**</td><td>Type F</td></tr>
<tr><td>**Buffer Width**</td><td>150 feet</td></tr>
<tr><td>**Documented Fish Use (includes Chico Creek and Wildcat Creek)**</td><td>Fall chinook salmon, coho salmon, winter steelhead trout</td></tr>
<tr><td>**Location of Stream Relative to Project Corridor**</td><td colspan="2">Stream 1 is an open conveyance at the southeastern corner of the property and is piped the length of the core developed area approximately 475 linear feet prior to its outfall into Wetland A.</td></tr>
<tr><td>**Connectivity (where stream flows from/to)**</td><td colspan="2">Stream 1 originates on the eastern portion of the subject property, and on the Camp Wesley Harris property, is conveyed south under Seabeck Highway, then north to the subject property, is piped through the core developed area, and outlets into Wetland A.</td></tr>
<tr><td>**Riparian/Buffer Condition**</td><td colspan="2">The on-site portion of the Wetland A buffer is dominated by mature western red cedar and Douglas fir trees. The northern outer buffer of Stream 1 consists of the core developed area. The southern outer buffer of Stream 1 includes Seabeck Highway.</td></tr>
</table>

Stream 2
Stream 2 is located in WRIA 15 (Kitsap watershed) and the Chico Creek sub-watershed (**Table 9**). Stream 2 originates within the Wetland A complex and exits the property through a 24-inch concrete pipe under Seabeck Highway at the southwestern corner of the KRRC facility.

Stream 2 is classified by the Washington State Department of Natural Resources (WDNR) and Kitsap County as a Type F tributary with anadromous or resident salmonids. According to KCC 19.300.310, Stream 2 would be provided a standard 150-foot buffer measured from the OHWM, with an additional 15-foot building setback.

Table 9: Stream 2 Summary Table

<table>
<tr><td colspan="4">STREAM INFORMATION SUMMARY</td></tr>
<tr><td colspan="2" rowspan="7">

Source: Kitsap County Streams and Surface Water Map (12-13-2007)</td><td>Stream Name</td><td>Stream 2</td></tr>
<tr><td>WRIA</td><td>15</td></tr>
<tr><td>Local Jurisdiction</td><td>Kitsap County</td></tr>
<tr><td>DNR Stream Type</td><td>Type F</td></tr>
<tr><td>Local Stream Rating</td><td>Type F</td></tr>
<tr><td>Buffer Width</td><td>150 feet</td></tr>
<tr><td>Documented Fish Use (includes Chico Creek and Wildcat Creek)</td><td>Fall chinook salmon, coho salmon, winter steelhead trout</td></tr>
<tr><td>Location of Stream Relative to Project Corridor</td><td colspan="3">Stream 2 flows through the Wetland A complex, located along the western border of the KRRC core developed area.</td></tr>
<tr><td>Connectivity (where stream flows from/to)</td><td colspan="3">Stream 2 originates within the Wetland A complex as a headwater stream and flows under Seabeck Highway into Wildcat Creek, which flows into Chico Creek, which flows into Dyes Inlet.</td></tr>
<tr><td>Riparian/Buffer Condition</td><td colspan="3">The western buffer of Stream 2 is well vegetated and relatively undisturbed. The majority of the eastern buffer of Stream 2 on the subject property consists of the core developed area.</td></tr>
</table>

Stream Buffers
The Stream 1 buffer on the subject parcel is disturbed by adjacent development. A portion of undisturbed buffer area directly adjacent to the stream corridor in the southeastern corner of the KRRC facility consists of a mature forest composed of western red cedar, Douglas fir, red alder (*Alnus rubra*), and western hemlock (*Tsuga heterophylla*), and an understory consisting of salmonberry, salal, vine maple, and wild ginger (*Asarum caudatum*). The disturbed portion of the Stream 1 buffer includes the core developed area of the KRRC.

The western buffer of Stream 2 is well vegetated. Vegetation in the undisturbed portions of the Stream 2 buffer includes western red cedar, twinberry (*Lonicera involucrata*), salmonberry, Dewey sedge (*Carex deweyana*), red alder, salal, Pacific crabapple (*Malus fusca*), paper birch (*Betula papyrifera*), Nootka rose, Pacific rhododendron (*Rhododendron macrophyllum*), bracken fern (*Pteridium aquilinum*), Douglas fir, slough sedge, western hemlock, western white pine (*Pinus monticola*), Douglas' spirea, and dull Oregon grape. The outer eastern buffer of Stream 2 consists of the core developed area of the KRRC.

According to KCC 19.300.310, Stream 1 and Stream 2, classified as Type F (fish-bearing) streams, shall be provided a 150-foot standard buffer with an additional 15-foot building setback.

Chapter 6. Wetland, Stream, and Buffer Impacts

6.1. Regulatory Impacts Summary

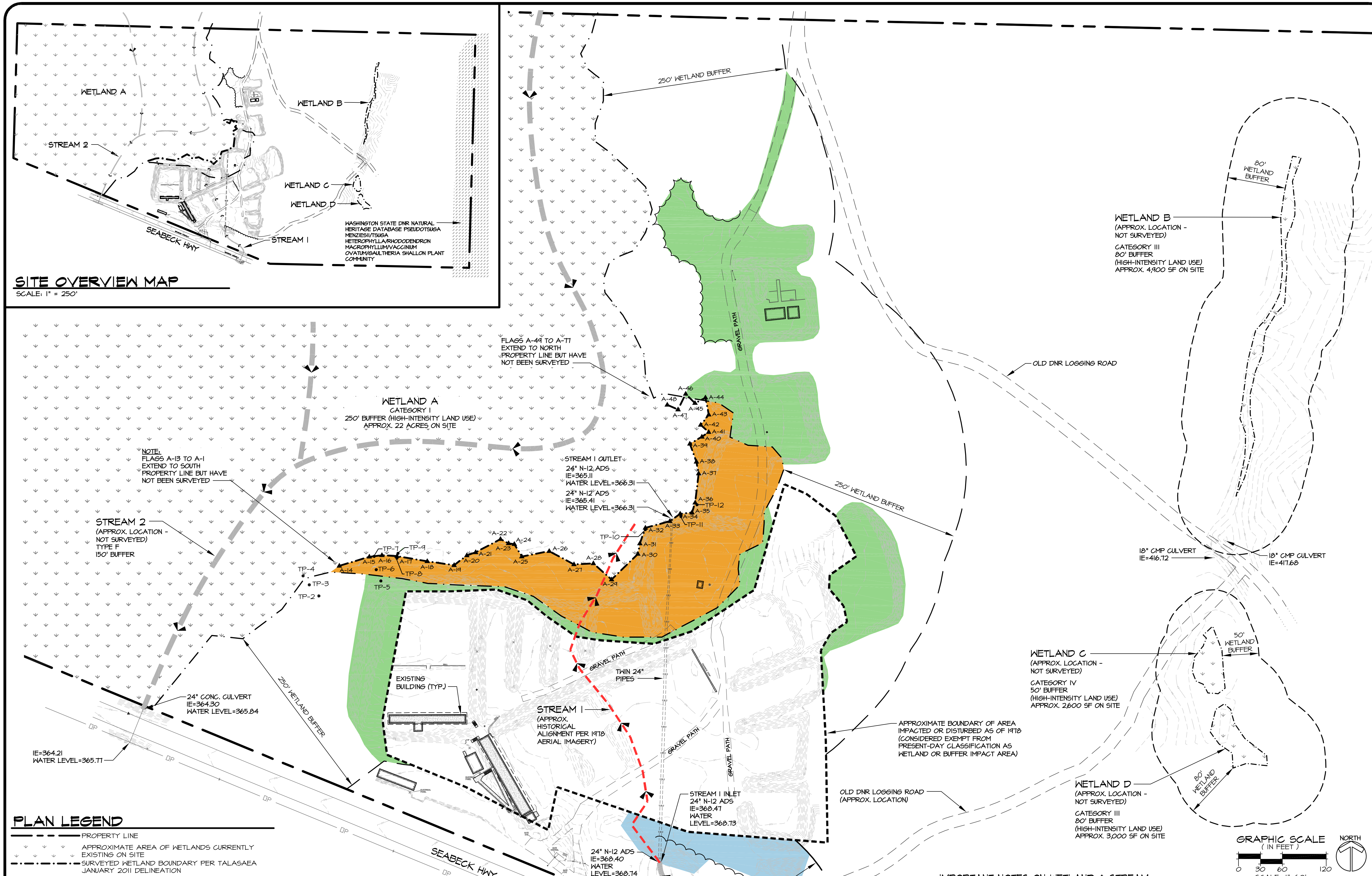
Several areas of impacts to Waters of the United States (U.S.), including wetlands and streams, were preliminarily identified through aerial photograph interpretation (see **Chapter 4** and **Appendix C**) and then verified during the field investigation. Waters of the U.S. are regulated under Section 404 of the Clean Water Act. These waters include Navigable Waters and other parts of the surface water tributary system down to the smallest of streams, lakes, ponds, or other water bodies on those streams, and adjacent wetlands (33 CFR 328 & 329). In addition to Section 404 of the Clean Water Act, other regulations governing clearing and grading activities within wetland, streams, and wetland and stream buffer areas include Kitsap County Code, the State Environmental Policy Act (SEPA), Section 401 of the Clean Water Act, the Forest Practices Act (FPA) and the Hydraulic Code (Chapter 77.55 RCW).

6.2. Critical Area Impact Summary

The critical area impacts on the KRRC site were estimated using a combination of data obtained during the field investigation and the historical aerial photograph interpretation. The impact areas identified during the field investigation included: 1) Three distinct areas of fill at the outer edge of Wetland A; 2) piping of Stream 1 through the core developed area (475-feet of pipe); 3) dredging and channelizing Stream 1 within the mature forested area; and 4) clearing vegetation within Wetland B, Wetland C, and Wetland D. Additional impacts identified during the field investigation (regulated by Kitsap County) include impacts to the wetland and stream buffers.

To determine the approximate extent of the critical area impacts, the following features were imported from the aerial photograph interpretation (**Appendix C**) into the 20 January 2011 surveyed drawing (**Figure 5** and **Sheet W1.1** in **Appendix E**): 1) The original wetland boundary delineated from the 1978 aerial photograph; 2) the historical watercourse through the core developed area; and 3) the footprint of the core developed area as established in 1978.

The following areas were quantified as apparent critical area impacts: 1) any developed (cleared/filled) areas between the wetland boundary delineated on 20 January 2011 and the wetland boundary delineated from the 1978 aerial photograph interpretation; 2) any developed (cleared/filled) wetland buffer area (as calculated from the 1978 wetland boundary); and 3) filled stream channel (**Table 10**). The critical area impacts calculated at the KRRC site include approximately: 1) 55,500 sf of fill in Wetland A; 2) piping 475 feet of Stream 1 through the core developed area; 3) 85,700 sf of impacted Wetland A buffer area; and 4) 12,900 sf of impacted Stream 1 buffer area.



PLAN LEGEND

- PROPERTY LINE
- APPROXIMATE AREA OF WETLANDS CURRENTLY EXISTING ON SITE
- SURVEYED WETLAND BOUNDARY PER TALASAEA JANUARY 2011 DELINEATION
- HISTORICAL WETLAND BOUNDARY PER INTERPRETATION OF 1978 AERIAL PHOTOGRAPHS
- APPROXIMATED WETLAND BOUNDARY PER TALASAEA JANUARY 2011 FIELD VISIT (NOT FORMALLY DELINEATED OR SURVEYED)
- WETLAND BUFFER - BASED ON HISTORICAL WETLAND BOUNDARY (HIGH INTENSITY LAND USE)
- APPROXIMATE EXISTING STREAM CENTERLINE
- APPROXIMATE HISTORICAL STREAM CENTERLINE
- STREAM BUFFER
- 100 EXISTING CONTOUR
- ▲A-# WETLAND FLAG LOCATION
- ●TP-# TEST PLOT LOCATION
- EDGE OF EXISTING VEGETATION (PER AHBL SURVEY)

IMPACTS LEGEND

APPARENT WETLAND IMPACTS (SUBJECT TO ADDITIONAL VERIFICATION)	± 55,500 SF
ESTIMATED WETLAND BUFFER IMPACTS (SUBJECT TO ADDITIONAL VERIFICATION AND FINAL WETLAND BOUNDARY DETERMINATION)	± 85,700 SF
ESTIMATED STREAM BUFFER IMPACTS (SUBJECT TO ADDITIONAL VERIFICATION AND SURVEYED STREAM LOCATION)	± 12,900 SF
APPROXIMATE STREAM IMPACTS (STREAM FILLED AND ROUTED THROUGH TWO 24" DIA. N-12 ADS PIPES)	± 475 LF

IMPORTANT NOTES ON WETLAND & STREAM LOCATIONS

THE LOCATIONS OF THE FOLLOWING FEATURES DEPICTED IN THIS EXISTING CONDITIONS PLAN HAVE NOT BEEN SURVEYED AND HAVE BEEN APPROXIMATED BY TALASAEA CONSULTANTS:

- EXISTING LOCATIONS FOR STREAMS 1 AND 2 HAVE BEEN APPROXIMATED BASED ON FIELD OBSERVATIONS, AERIAL IMAGERY, AND KITSAP COUNTY STREAM DATA.
- WETLANDS B, C, AND D HAVE BEEN APPROXIMATED BASED ON FIELD OBSERVATIONS.
- THE HISTORICAL BOUNDARY FOR WETLAND A AND THE HISTORICAL LOCATION OF STREAM 1 HAVE BEEN APPROXIMATED BASED ON STEREOSCOPIC ANALYSIS OF WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES 1978 1:12,000 SCALE BLACK & WHITE AERIAL IMAGERY.
- THE ACCURACY OF THE INTERPRETATION OF THE HISTORICAL BOUNDARY FOR WETLAND A IS ESTIMATED TO BE APPROXIMATELY +/- 25'.

NOTE: THIS PLAN WAS ORIGINALLY PRODUCED AS A FULL SIZE 24"x36" DRAWING. IF PRINTED AT A SMALLER SIZE (E.G. 11x17), THE SCALE WILL BE DIFFERENT THAN 1"=60' (THE GRAPHIC SCALE CAN STILL BE USED TO APPROXIMATE DISTANCES).

GENERAL PLAN NOTES

1. SURVEY PROVIDED BY AHBL, 2215 NORTH 30TH STREET, SUITE 300, TACOMA, WA 98403; 253-383-2422.
2. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
3. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS STUDY REPORT PREPARED BY TALASAEA CONSULTANTS, DATED 18 FEBRUARY 2011.

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast - Woodinville, Washington 98077
Bus (425) 861-7550 - Fax (425) 861-7549

CRITICAL AREAS STUDY
APPARENT CRITICAL AREAS IMPACTS PLAN
KITSAP RIFLE AND REVOLVER CLUB
BREMERTON, WASHINGTON

Date	2-18-2011
Scale	AS NOTED
Designed	ATD
Drawn	ATD
Checked	AO
Approved	BS
Project #	TAL-1331

Revisions | Date | By

FIGURE 5

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Table 10: Critical Area Impacts

Critical Area	Rating/Type		Wetland Area (sf) (approx.)	Wetland/Stream Impact (sf/lf) (approx.)	Buffer Width (feet) [C]	Buffer Impact Area (sf) (approx.)
	DOE Rating /DNR Water Typing[A]	Local Jurisdiction[B]				
Wetland A	I	I	961,097 (on-site)	55,500 sf	250	85,700
Wetland B	III	III	4,925	Not calculated	80	Not calculated
Wetland C	IV	IV	2,634	Not calculated	50	Not calculated
Wetland D	III	III	2,986	Not calculated	50	Not calculated
Stream 1	F	F	NA	475 linear feet	150 + 15-foot building setback	12,900
Stream 2	F	F	NA	none	150 + 15-foot building setback	NA

A - Ecology rating according to Hruby (2004); Department of Natural Resources Water Typing
B - Wetlands rated according to Kitsap County Code Chapter 30.62A (Kitsap County, 2007).
C - Kitsap County High Impact Land Use Intensity Buffer (Kitsap County, 2007)

The impact areas verified during the field investigation are described in the following sections.

6.3. Wetland Impacts

The locations of impacts (fill) in Wetland A, identified during the field investigation, were determined using the methods outlined for Atypical Situations in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual (Version 2.0) (USACOE, 2010). A complete delineation documenting the lateral extent of wetland fill was not completed during the 20 January 2011 field investigation due to the quantity of material placed over wetlands. The wetland boundary identified in the aerial photograph interpretation (**Chapter 4** and **Appendix C**) is consistent with the wetland fill found during the field investigation.

Section F of the 1987 Manual – Atypical Situations – states that the methods for Atypical Situations should be used only when a determination has already been made that positive indicators of hydrophytic vegetation, hydric soils, and/or wetland hydrology could not be found due to effects of recent human activities or natural events. The following procedures outlined in the 1987 Manual were used for determining wetland indicators in areas where it appeared unauthorized activities occurred:

Vegetation – The type of vegetation that previously occurred was determined using sources such as aerial photography, onsite inspection, and adjacent vegetation communities.

Soils – A hole was dug to reach the underlying original soil, looking for identifiable decomposing vegetation beneath the fill soils and also the presence of buried organic or hydric soil layers.
Hydrology – Field indicators of wetland hydrology were determined by examining adjacent undisturbed areas in the same topographic position and similarly influenced by the same sources of inundation.
A characterization of vegetation, soils, and hydrology was completed in locations where it appeared fill had been placed in wetlands without the authorization of the Corps of Engineers, and after the implementation of Section 404 of the Clean Water Act.

Impact Area #1: A soil berm that slopes down toward the Wetland A area was constructed around the outer edge of the core developed area. The berm is approximately 6 to 11 feet in height. At Impact Area #1 (**Figure 5** and **Sheet W1.1** in **Appendix E**), the downslope edge of the berm ends in an undisturbed portion of Wetland A, which prompted an investigation into this area of the berm. At this location, wetland data forms TP-E10 and TP-E11 (**Appendix A**) document approximately 36 inches of silty sandy fill over a distinct, dark (10 YR 2/1), organic layer. Hydrology was also present within the soil test plot that was consistent in elevation with hydrology in adjacent undisturbed areas of Wetland A. At one location, the roots of slough sedge, a wetland plant with obligate status (occurs almost always - estimated probability 99% - under natural conditions in wetlands) was collected at 30 inches below ground surface and preserved. Slough sedge is a dominant plant within the adjacent Wetland A vegetation community. **Photo 7** was taken adjacent to the undisturbed boundary of Wetland A.

Photo 8: Wetland Impact Area #1 (Soil Test Plot TP-E10)

Impact Area #2: The quantity of ponding and height of the berm did not allow for soil test plots to be dug at this location (**Figure 5 and Sheet W1.1 in Appendix E**). The wetland side of the berm is significantly ponded and ponding was also evident on the developed side of the berm (**Photo 8**).

Photo 9: Wetland Impact Area #2

Impact Area #3: Wetland Impact Area #3 (**Figure 5** and **Sheet W1.1** in **Appendix E**) was originally identified through the Aerial Photograph Interpretation (see **Chapter 4** and **Appendix C**) and through additional interpretation of more recent Google Earth photographs. The area on the northeastern edge of the large natural ponded area within Wetland A was cleared of vegetation and graded as a boat launching area (**Photo 9**).

Photo 10: Wetland Impact Area #3

6.4. Stream Impacts

The 1978 aerial photograph interpretation identified a watercourse through the central portion of the core developed area. During the field investigation, two 24-inch-diameter N-12 corrugated polyethylene drainage pipes were identified; the pipes pick up flows from Stream 1 in the mature forested area (**Figure 4** and **Sheet W1.0** in **Appendix E**) and convey Stream 1 in a northwesterly direction for 475-feet through the core developed area prior to discharging directly into Wetland A.

6.5. Wetland and Stream Buffer Impacts

In accordance with Kitsap County Code (KCC) 19.200.220, Wetland A was rated as a Category I wetland and provided a 250-foot buffer. The 250-foot buffer line was drawn from the wetland boundary determined by the aerial photograph interpretation (**Figure 5** and **Sheet W1.1** in **Appendix E**). The estimated impacts to the Wetland A buffer were determined by including developed areas (impact areas) outside of the KRRC footprint as established in the 1978 aerial photograph.

Wetland B and Wetland D were both rated as Category III wetlands and provided 80-foot buffers. Wetland C was rated as a Category IV wetland, and was provided a 50-foot buffer. All wetland buffers would include an additional 15-foot building/impervious surface setback. Stream 1 and Stream 2 were rated as Type F waters and provided a 150-foot buffer with an additional 15-foot building setback. The estimated impacts to the Stream 1 buffer were determined by including developed areas (impact areas) outside of the KRRC footprint as established in the 1978 aerial photograph.

Based on the Aerial Photograph Interpretation (**Chapter 4** and **Appendix C**), our recent field investigation, and the additional test pits provided by Kitsap County (**Appendix D**) we concluded that significant clearing and grading occurred within both the wetland and stream buffer areas. The documentation of fill in the buffer areas was made in the 20 January 2011 and is provided in **Appendix E**.

Chapter 7. Summary

Four wetlands (Wetland A, Wetland B, Wetland C, and Wetland D) and two streams (Stream 1 and Stream 2) were identified on the KRRC property during the 4 January and 20 January 2011 field investigations. Based on the County's Critical areas Ordinance (Title 19 of Kitsap County Code), Wetland A was classified as a Category I wetland with a base buffer width of 200 feet. However, a final 250-foot buffer may be appropriate based on an assumed high-intensity land use and the wetlands' high habitat score. Wetland B and Wetland D were classified as Category III wetlands and provided a base buffer width of 50 feet, and a final 80-foot buffer. Wetland C was classified as a Category IV wetland and provided a base buffer width of 30 feet, and a final 50-foot buffer. Stream 1 and Stream 2 were both classified as Type F (fish-bearing) waters and provided a standard 150-foot buffer with an additional 15-foot building setback.

Several areas of impacts to Waters of the U.S. were identified during the field investigation. These impact areas were preliminarily identified through the Aerial Photograph Interpretation and then verified during the field investigation. The apparent critical area impacts identified on the KRRC site include: 1) 55,500 sf of Wetland A impact; 2) piping 475 feet of Stream 1 through the core developed area; 3) 85,700 sf of Wetland A buffer impact; and 4) 12,900 sf of Stream 1 buffer impact.

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APPENDIX A

Wetland Determination Data Forms – Western Mountains, Valleys and Coast Region (2010), Talasaea Consultants, 2011

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 1331 City/County: Kitsap Sampling Date: 12-20-2011

Applicant/Owner: KRRC State: WA Sample Point: TP-E1

Investigator(s): E.Ericson Section, Township, Range: S.36, T.25N, R.1 West W.M.

Landform (hillslope, terrace, etc.): _____ Local Relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: 47.36.26 Long: 122.44.51 Datum: _____

Soil Map Unit Name: Alderwood very gravelly sandy loam NWI Classification: _____

Are Climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks)

Are Vegetation ☐, Soil ☐, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐	Is the Sampled Area within a Wetland?	Yes	☐	No	☒
Hydric Soil Present?	Yes	☐	No	☒					
Wetland Hydrology Present?	Yes	☐	No	☒					

Remarks: _____

VEGETATION – Use scientific names of plants.

		Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum	(Plot Size: 30')			
1. Thuja plicata		40	Y	FAC
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
		40 =	Total Cover	
Sapling/Shrub Stratum	(Plot Size: 5')			
1. Polystichum munitum		30	Y	FACU
2. Rubus spectabilis		20	Y	FAC
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
		50 =	Total Cover	
Herb Stratum	(Plot Size: 5')			
1. _____		_____	_____	_____
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
7. _____		_____	_____	_____
8. _____		_____	_____	_____
9. _____		_____	_____	_____
10. _____		_____	_____	_____
11. _____		_____	_____	_____
		_____ =	Total Cover	
Wood Vine Stratum	(Plot Size: _____)			
1. _____		_____	_____	_____
2. _____		_____	_____	_____
% Bare Ground in Herb Stratum _____				

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 =
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals _____	(A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is > 50%
- ☐ Prevalence Index is ≤ 3.0[1]
- ☐ Morphological Adadpatations[1] (Provide supporting Data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must Be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: TP 1-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0-6	10 YR 2/2						organic sandy loam	
6-18	10 YR 4/4						gravelly sandy loam	

[1] Type: C=Concentration, D=Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide3 (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (Except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (is present):

Type: _____

Depth: _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (C6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):
Water Table Present?	Yes	☐	No	☒	Depth (inches):
Saturation Present? (inches capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 1331 City/County: Kitsap Sampling Date: 12-20-2011

Applicant/Owner: KRRC State: WA Sample Point: TP-E2

Investigator(s): E.Ericson Section, Township, Range: S.36, T.25N, R.1 West W.M.

Landform (hillslope, terrace, etc.): _____ Local Relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: 47.36.26 Long: 122.44.51 Datum: _____

Soil Map Unit Name: Ragnat fine sandy loam, 0 to 6 percent slopes NWI Classification: _____

Are Climatic/hydrologic conditions on the site typical for this time of year? Yes ☐ No ☐ (If no, explain in Remarks)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☐	No	☒	Is the Sampled Area within a Wetland?	Yes	☐	No	☒
Hydric Soil Present?	Yes	☐	No	☒					
Wetland Hydrology Present?	Yes	☐	No	☒					

Remarks: _____

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja plicata	60	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
	60 =	Total Cover	
Sapling/Shrub Stratum (Plot Size: 5')			
1. Gaultheria shallon	20	Y	FACU
2. Mahonia nervosa	5	N	NL
3. Polystichum munitum	5	N	FACU
4. _____	_____	_____	_____
5. _____	_____	_____	_____
	30 =	Total Cover	
Herb Stratum (Plot Size: 5')			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
	_____ =	Total Cover	
Wood Vine Stratum (Plot Size: _____)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____

% Bare Ground in Herb Stratum _____

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	_____	x 1 =
FACW species	_____	x 2 = _____
FAC species	_____	x 3 = _____
FACU species	_____	x 4 = _____
UPL species	_____	x 5 = _____
Column Totals	_____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☐ Dominance Test is > 50%

☐ Prevalence Index is ≤ 3.0[1]

☐ Morphological Adadpatations[1] (Provide supporting Data in Remarks or on a separate sheet)

☐ Wetland Non-Vascular Plants[1]

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must Be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

SOIL

Sampling Point: TP E-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type ¹	Redox Features Loc ²	Texture	Remarks
0-4	10 YR 2/2						organic duff loamy sand	
4-22	10 YR 4/4						gravelly sandy loam	

¹ Type: C=Concentration, D=Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains.

² Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide3 (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (Except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils³

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (is present):

Type: _____

Depth: _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (C6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☐ No ☒ Depth (inches):

Saturation Present? Yes ☐ No ☒ Depth (inches):

(inches capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 1331 City/County: Kitsap Sampling Date: 12-20-2011

Applicant/Owner: KRRC State: WA Sample Point: TP-E3

Investigator(s): E.Ericson Section, Township, Range: S.36, T.25N, R.1 West W.M.

Landform (hillslope, terrace, etc.): _____ Local Relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: 47.36.26 Long: 122.44.51 Datum: _____

Soil Map Unit Name: McKenna gravelly loam NWI Classification: _____

Are Climatic/hydrologic conditions on the site typical for this time of year? Yes ☐ No ☐ (If no, explain in Remarks)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐	Is the Sampled Area within a Wetland?	Yes	☒	No	☐
Hydric Soil Present?	Yes	☒	No	☐					
Wetland Hydrology Present?	Yes	☒	No	☐					

Remarks: _____

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja plicata	60	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
	60 =	Total Cover	
Sapling/Shrub Stratum (Plot Size: 5')			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
	_____ =	Total Cover	
Herb Stratum (Plot Size: 5')			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
	_____ =	Total Cover	
Wood Vine Stratum (Plot Size: _____)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____

% Bare Ground in Herb Stratum 100

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 =
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is > 50%

☐ Prevalence Index is ≤ 3.0[1]

☐ Morphological Adadpatations[1] (Provide supporting Data in Remarks or on a separate sheet)

☐ Wetland Non-Vascular Plants[1]

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must Be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: TP-E-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0-4	10 YR 2/1						sandy mucky loam	
4-22	10 YR 5/6						sandy loam	

[1] Type: C=Concentration, D=Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide3 (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☒ Sandy Mucky Mineral
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (Except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (is present):

Type: _____

Depth: _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☒ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (C6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):
Water Table Present?	Yes	☒	No	☐	Depth (inches): 4
Saturation Present? (inches capillary fringe)	Yes	☒	No	☐	Depth (inches): 0

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 1331 City/County: Kitsap Sampling Date: 12-20-2011
Applicant/Owner: KRRC State: WA Sample Point: TP-E4
Investigator(s): E.Ericson Section, Township, Range: S.36, T.25N, R.1 West W.M.
Landform (hillslope, terrace, etc.): _____ Local Relief (concave, convex, none): _____ Slope (%): _____
Subregion (LRR): A Lat: 47.36.26 Long: 122.44.51 Datum: _____
Soil Map Unit Name: McKenna gravelly loam NWI Classification: _____
Are Climatic/hydrologic conditions on the site typical for this time of year? Yes ☐ No ☐ (If no, explain in Remarks)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐	Is the Sampled Area within a Wetland?	Yes	☒	No	☐
Hydric Soil Present?	Yes	☒	No	☐					
Wetland Hydrology Present?	Yes	☒	No	☐					

Remarks: _____

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot Size: 30')			
1. Thuja plicata	30	Y	FAC
2. Alnus rubra	20	Y	FAC
3. _____	_____	_____	_____
4. _____	_____	_____	_____
	50 =	Total Cover	
Sapling/Shrub Stratum (Plot Size: 5')			
1. Rubus spectabilis	60	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
	60 =	Total Cover	
Herb Stratum (Plot Size: 5')			
1. Rubus ursinus	5	N	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
	5 =	Total Cover	
Wood Vine Stratum (Plot Size: _____)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
% Bare Ground in Herb Stratum _____			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 =
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals _____	(A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is > 50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adadpatations[1] (Provide supporting Data in Remarks or on a separate sheet)
☐ Wetland Non-Vascular Plants[1]
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must Be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: TP-E4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0-	10 YR 3/2						muck	
-18	2.5 Y 3/1						clay loam	

[1] Type: C=Concentration, D=Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide3 (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☒ Sandy Mucky Mineral
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (Except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (is present):

Type: _____

Depth: _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☒ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (C6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☒	No	☐	Depth (inches): 0.25
Water Table Present?	Yes	☒	No	☐	Depth (inches): 0
Saturation Present? (inches capillary fringe)	Yes	☒	No	☐	Depth (inches): 0

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 1331 City/County: Kitsap Sampling Date: 12-20-2011
Applicant/Owner: KRRC State: WA Sample Point: TP-E5
Investigator(s): E.Ericson Section, Township, Range: S.36, T.25N, R.1 West W.M.
Landform (hillslope, terrace, etc.): _____ Local Relief (concave, convex, none): _____ Slope (%): _____
Subregion (LRR): A Lat: 47.36.26 Long: 122.44.51 Datum: _____
Soil Map Unit Name: McKenna gravelly loam NWI Classification: _____
Are Climatic/hydrologic conditions on the site typical for this time of year? Yes ☐ No ☐ (If no, explain in Remarks)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☐	No	☒	Is the Sampled Area within a Wetland?	Yes	☐	No	☒
Hydric Soil Present?	Yes	☐	No	☒					
Wetland Hydrology Present?	Yes	☐	No	☒					

Remarks: _____

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot Size: 30')			
1. Alnus rubra	10	Y	FAC
2. Pseudotsuga menziesii	5	N	FACU
3. _____	_____	_____	_____
4. _____	_____	_____	_____
	15 =	Total Cover	
Sapling/Shrub Stratum (Plot Size: 5')			
1. Polystichum munitum	10	Y	FACU
2. Gaultheria shallon	20	Y	FACU
3. Cytisus soparius	15	Y	NL
4. _____	_____	_____	_____
5. _____	_____	_____	_____
	45 =	Total Cover	
Herb Stratum (Plot Size: 5')			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
	_____ =	Total Cover	
Wood Vine Stratum (Plot Size: 5')			
1. Rubus armeniacus	10	Y	FACU
2. _____	_____	_____	_____
% Bare Ground in Herb Stratum _____			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	_____	x 1 =
FACW species	_____	x 2 = _____
FAC species	_____	x 3 = _____
FACU species	_____	x 4 = _____
UPL species	_____	x 5 = _____
Column Totals	_____	(A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☐ Dominance Test is > 50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adadpatations[1] (Provide supporting Data in Remarks or on a separate sheet)
☐ Wetland Non-Vascular Plants[1]
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must Be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

SOIL

Sampling Point: TP-E5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0-16	10 YR 3/4						loamy sand	
16 +	10 YR 5/1						silty sand	

[1] Type: C=Concentration, D=Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide3 (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (Except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (is present):

Type: _____

Depth: _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (C6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):
Water Table Present?	Yes	☐	No	☒	Depth (inches):
Saturation Present? (inches capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 1331 City/County: Kitsap Sampling Date: 12-20-2011

Applicant/Owner: KRRC State: WA Sample Point: TP-E6

Investigator(s): E.Ericson Section, Township, Range: S.36, T.25N, R.1 West W.M.

Landform (hillslope, terrace, etc.): _____ Local Relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: 47.36.26 Long: 122.44.51 Datum: _____

Soil Map Unit Name: McKenna gravelly loam NWI Classification: _____

Are Climatic/hydrologic conditions on the site typical for this time of year? Yes ☐ No ☐ (If no, explain in Remarks)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☐	No	☒	Is the Sampled Area within a Wetland?	Yes	☐	No	☒
Hydric Soil Present?	Yes	☐	No	☒					
Wetland Hydrology Present?	Yes	☐	No	☒					

Remarks: _____

VEGETATION – Use scientific names of plants.

		Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum	(Plot Size: 30')			
1. Alnus rubra		25	Y	FAC
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
		25 =	Total Cover	
Sapling/Shrub Stratum	(Plot Size: 5'5')			
1. Rubus spectabilis		60	Y	FAC
2. Gaultheria shallon		10	N	FACU
3. Polystichum munitum		20	Y	FACU
4. Sambucus racemosa		10	Y	FACU
5. _____		_____	_____	_____
		100 =	Total Cover	
Herb Stratum	(Plot Size: _____)			
1. _____		_____	_____	_____
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
7. _____		_____	_____	_____
8. _____		_____	_____	_____
9. _____		_____	_____	_____
10. _____		_____	_____	_____
11. _____		_____	_____	_____
		_____ =	Total Cover	
Wood Vine Stratum	(Plot Size: 5')			
1. Rubus ursinus		5	N	FACU
2. _____		_____	_____	_____

% Bare Ground in Herb Stratum _____

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 =
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals _____	(A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☐ Dominance Test is > 50%

☐ Prevalence Index is ≤ 3.0[1]

☐ Morphological Adadpatations[1] (Provide supporting Data in Remarks or on a separate sheet)

☐ Wetland Non-Vascular Plants[1]

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must Be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

SOIL

Sampling Point: TP-E6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type [1]	Loc [2]	Texture	Remarks
0-10	10 YR 2/1						oganic sandy loam	
10-18+	10 YR 3/4						gravelly sandy loam	

[1] Type: C=Concentration, D=Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide3 (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (Except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (is present):

Type: _____

Depth: _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (C6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ☐	No ☐	Depth (inches):	
Water Table Present?	Yes ☐	No ☐	Depth (inches):	
Saturation Present? (inches capillary fringe)	Yes ☐	No ☐	Depth (inches):	

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 1331 City/County: Kitsap Sampling Date: 12-20-2011

Applicant/Owner: KRRC State: WA Sample Point: TP-E7

Investigator(s): E.Ericson Section, Township, Range: S.36, T.25N, R.1 West W.M.

Landform (hillslope, terrace, etc.): _____ Local Relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: 47.36.26 Long: 122.44.51 Datum: _____

Soil Map Unit Name: _____ NWI Classification: _____

Are Climatic/hydrologic conditions on the site typical for this time of year? Yes ☐ No ☐ (If no, explain in Remarks)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐	Is the Sampled Area within a Wetland?	Yes	☒	No	☐
Hydric Soil Present?	Yes	☒	No	☐					
Wetland Hydrology Present?	Yes	☒	No	☐					

Remarks: _____

VEGETATION – Use scientific names of plants.

		Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum	(Plot Size: 30')			
1. Alnus rubra		30	Y	FAC
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
		_____ =	Total Cover	
Sapling/Shrub Stratum	(Plot Size: 5')			
1. Rubus spectabilis		60	Y	FAC
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
		_____ =	Total Cover	
Herb Stratum	(Plot Size: 5')			
1. Carex obnupta		10	Y	OBL
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
7. _____		_____	_____	_____
8. _____		_____	_____	_____
9. _____		_____	_____	_____
10. _____		_____	_____	_____
11. _____		_____	_____	_____
		_____ =	Total Cover	
Wood Vine Stratum	(Plot Size: _____)			
1. _____		_____	_____	_____
2. _____		_____	_____	_____

% Bare Ground in Herb Stratum _____

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	_____	x 1 =
FACW species	_____	x 2 = _____
FAC species	_____	x 3 = _____
FACU species	_____	x 4 = _____
UPL species	_____	x 5 = _____
Column Totals	_____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is > 50%

☐ Prevalence Index is ≤ 3.0[1]

☐ Morphological Adadpatations[1] (Provide supporting Data in Remarks or on a separate sheet)

☐ Wetland Non-Vascular Plants[1]

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must Be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: TP-E7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0-3	10 YR 3/1						mucky sandy loam	duff
3-12	10 YR 3/3						gravelly sand	

[1] Type: C=Concentration, D=Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide3 (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☒ Sandy Mucky Mineral
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (Except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (is present):

Type: _____

Depth: _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☒ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (C6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☐	No	☐	Depth (inches):
Water Table Present?	Yes	☒	No	☐	Depth (inches): 11
Saturation Present? (inches capillary fringe)	Yes	☒	No	☐	Depth (inches): 5

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 1331 City/County: Kitsap Sampling Date: 12-20-2011
Applicant/Owner: KRRC State: WA Sample Point: TP-E8
Investigator(s): E.Ericson Section, Township, Range: S.36, T.25N, R.1 West W.M.
Landform (hillslope, terrace, etc.): _____ Local Relief (concave, convex, none): _____ Slope (%): _____
Subregion (LRR): A Lat: 47.36.26 Long: 122.44.51 Datum: _____
Soil Map Unit Name: Grove very gravelly sandy loam NWI Classification: _____
Are Climatic/hydrologic conditions on the site typical for this time of year? Yes ☐ No ☐ (If no, explain in Remarks)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐	Is the Sampled Area within a Wetland?	Yes	☒	No	☐
Hydric Soil Present?	Yes	☒	No	☐					
Wetland Hydrology Present?	Yes	☒	No	☐					

Remarks: _____

VEGETATION – Use scientific names of plants.

		Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum	(Plot Size: 30')			
1. Alnus rubra		60	Y	FAC
2. _____				
3. _____				
4. _____				
		60 =	Total Cover	
Sapling/Shrub Stratum	(Plot Size: 5')			
1. Rubus spectabilis		60	Y	FAC
2. _____				
3. _____				
4. _____				
5. _____				
		60 =	Total Cover	
Herb Stratum	(Plot Size: 5')			
1. Carex obnupta		40	Y	OBL
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
		40 =	Total Cover	
Wood Vine Stratum	(Plot Size: _____)			
1. _____				
2. _____				

% Bare Ground in Herb Stratum _____

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	_____	x 1 =
FACW species	_____	x 2 = _____
FAC species	_____	x 3 = _____
FACU species	_____	x 4 = _____
UPL species	_____	x 5 = _____
Column Totals	_____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is > 50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adadpatations[1] (Provide supporting Data in Remarks or on a separate sheet)
☐ Wetland Non-Vascular Plants[1]
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must Be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: TP-E8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0-5	10 YR 3/2						loamy sand	
5-18+	2.5 Y 5/4						gravelly loamy sand	

[1] Type: C=Concentration, D=Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide3 (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☒ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (Except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (is present):

Type: _____

Depth: _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (C6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):
Water Table Present?	Yes	☒	No	☐	Depth (inches): 18
Saturation Present? (inches capillary fringe)	Yes	☒	No	☐	Depth (inches): 12

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 1331 City/County: Kitsap Sampling Date: 12-20-2011

Applicant/Owner: KRRC State: WA Sample Point: TP-E9

Investigator(s): E.Ericson Section, Township, Range: S.36, T.25N, R.1 West W.M.

Landform (hillslope, terrace, etc.): _____ Local Relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: 47.36.26 Long: 122.44.51 Datum: _____

Soil Map Unit Name: _____ NWI Classification: _____

Are Climatic/hydrologic conditions on the site typical for this time of year? Yes ☐ No ☐ (If no, explain in Remarks)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐	Is the Sampled Area within a Wetland?	Yes	☐	No	☒
Hydric Soil Present?	Yes	☐	No	☒					
Wetland Hydrology Present?	Yes	☐	No	☒					

Remarks: _____

VEGETATION – Use scientific names of plants.

		Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum	(Plot Size: 30')			
1. Alnus rubra		40	Y	FAC
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
		40 =	Total Cover	
Sapling/Shrub Stratum	(Plot Size: 5')			
1. Mahonia nervosa		40	Y	FACU
2. Rubus spectabilis		30	Y	FAC
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
		7- =	Total Cover	
Herb Stratum	(Plot Size: 5')			
1. Carex obnupta		2	N	OBL
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
7. _____		_____	_____	_____
8. _____		_____	_____	_____
9. _____		_____	_____	_____
10. _____		_____	_____	_____
11. _____		_____	_____	_____
		2 =	Total Cover	
Wood Vine Stratum	(Plot Size: 5')			
1. Rubus ursinus		5	N	FACI
2. _____		_____	_____	_____
% Bare Ground in Herb Stratum _____				

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 =
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals _____	(A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is > 50%

☐ Prevalence Index is ≤ 3.0[1]

☐ Morphological Adadpatations[1] (Provide supporting Data in Remarks or on a separate sheet)

☐ Wetland Non-Vascular Plants[1]

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must Be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: TP-E9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	10 YR 3/2						loamy sand	
8-18+	2.5 Y 4/6						gravelly loamy sand	

[1] Type: C=Concentration, D=Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains.
[2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide3 (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (Except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (is present):

Type: _____

Depth: _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (C6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):
Water Table Present?	Yes	☐	No	☒	Depth (inches):
Saturation Present? (inches capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 1331 | City/County: Kitsap | Sampling Date: 12-20-2011

Applicant/Owner: KRRC | State: WA | Sample Point: TP-E10

Investigator(s): E.Ericson | Section, Township, Range: S.36, T.25N, R.1 West W.M.

Landform (hillslope, terrace, etc.): _____ | Local Relief (concave, convex, none): _____ | Slope (%): _____

Subregion (LRR): A | Lat: 47.36.26 | Long: 122.44.51 | Datum: _____

Soil Map Unit Name: _____ | NWI Classification: _____

Are Climatic/hydrologic conditions on the site typical for this time of year? Yes ☐ No ☐ (If no, explain in Remarks)

Are Vegetation ☒, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☒

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐	Is the Sampled Area within a Wetland?	Yes	☒	No	☐
Hydric Soil Present?	Yes	☒	No	☐					
Wetland Hydrology Present?	Yes	☒	No	☐					

Remarks: Test pit location is area of fill (berm)

VEGETATION – Use scientific names of plants.

		Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum	(Plot Size: 30')			
1. Alnus rubra		60	Y	FAC
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
		_____ =	Total Cover	
Sapling/Shrub Stratum	(Plot Size: 5')			
1. Rubus spectabilis		50	Y	FAC
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
		_____ =	Total Cover	
Herb Stratum	(Plot Size: 5')			
1. Carex obnupta		40	Y	OBL
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
7. _____		_____	_____	_____
8. _____		_____	_____	_____
9. _____		_____	_____	_____
10. _____		_____	_____	_____
11. _____		_____	_____	_____
		_____ =	Total Cover	
Wood Vine Stratum	(Plot Size: _____)			
1. _____		_____	_____	_____
2. _____		_____	_____	_____
% Bare Ground in Herb Stratum _____				

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 =
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals _____	(A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is > 50%

☐ Prevalence Index is ≤ 3.0[1]

☐ Morphological Adadpatations[1] (Provide supporting Data in Remarks or on a separate sheet)

☐ Wetland Non-Vascular Plants[1]

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must Be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: TP-E10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0-36							silty sand	fill
36	10 YR 2/1						organic	

[1] Type: C=Concentration, D=Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide3 (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☒ Sandy Mucky Mineral
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (Except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (is present):

Type: _____

Depth: _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (C6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):
Water Table Present?	Yes	☒	No	☐	Depth (inches): 36
Saturation Present? (inches capillary fringe)	Yes	☒	No	☐	Depth (inches): 36

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area is disturbed (filled). Normal hydrology was determined by examining the adjacent undisturbed wetland area. In the adjacemt wetland, water was ponded at the surface during the site visit.

Project/Site: 1331 | City/County: Kitsap | Sampling Date: 12-20-2011
Applicant/Owner: KRRC | State: WA | Sample Point: TP-E11
Investigator(s): E.Ericson | Section, Township, Range: S.36, T.25N, R.1 West W.M.
Landform (hillslope, terrace, etc.): _____ | Local Relief (concave, convex, none): _____ | Slope (%): _____
Subregion (LRR): A | Lat: 47.36.26 | Long: 122.44.51 | Datum: _____
Soil Map Unit Name: _____ | NWI Classification: _____
Are Climatic/hydrologic conditions on the site typical for this time of year? Yes ☐ No ☐ (If no, explain in Remarks)
Are Vegetation ☒, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐	Is the Sampled Area within a Wetland?	Yes	☒	No	☐
Hydric Soil Present?	Yes	☒	No	☐					
Wetland Hydrology Present?	Yes	☒	No	☐					

Remarks: Test pit location is area of fill (berm)

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot Size: 30')			
1. Alnus rubra	40	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
	_____ =	Total Cover	
Sapling/Shrub Stratum (Plot Size: 5')			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
	_____ =	Total Cover	
Herb Stratum (Plot Size: 5')			
1. Carex obnupta	60	Y	OBL
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
	_____ =	Total Cover	
Wood Vine Stratum (Plot Size: _____)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____

% Bare Ground in Herb Stratum _____

Dominance Test Worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
Total Number of Dominant Species Across All Strata: _____ (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: _____(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 =
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals _____	(A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
☒ Dominance Test is > 50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adadpatations[1] (Provide supporting Data in Remarks or on a separate sheet)
☐ Wetland Non-Vascular Plants[1]
☐ Problematic Hydrophytic Vegetation[1] (Explain)
[1] Indicators of hydric soil and wetland hydrology must Be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: TP-11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0-36							silty sand	fill
36	10 YR 2/1						organic soils	

[1] Type: C=Concentration, D=Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide3 (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☒ Sandy Mucky Mineral
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (Except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (is present):

Type: _____

Depth: _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (C6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☐	No	☐	Depth (inches):
Water Table Present?	Yes	☐	No	☐	Depth (inches):
Saturation Present? (inches capillary fringe)	Yes	☒	No	☐	Depth (inches): 36

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area is disturbed (filled). Normal hydrology was determined by examining the adjacent undisturbed wetland area. In the adjacemt wetland, water was ponded at the surface during the site visit.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 1331 City/County: Kitsap Sampling Date: 12-20-2011
Applicant/Owner: KRRC State: WA Sample Point: TP-E12
Investigator(s): E.Ericson Section, Township, Range: S.36, T.25N, R.1 West W.M.
Landform (hillslope, terrace, etc.): _____ Local Relief (concave, convex, none): _____ Slope (%): _____
Subregion (LRR): A Lat: 47.36.26 Long: 122.44.51 Datum: _____
Soil Map Unit Name: _____ NWI Classification: _____
Are Climatic/hydrologic conditions on the site typical for this time of year? Yes ☐ No ☐ (If no, explain in Remarks)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐	Is the Sampled Area within a Wetland?	Yes	☒	No	☐
Hydric Soil Present?	Yes	☒	No	☐					
Wetland Hydrology Present?	Yes	☒	No	☐					

Remarks: Area of fill (berm)

VEGETATION – Use scientific names of plants.

		Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum	(Plot Size: 30')			
1. Alnus rubra		40	Y	FAC
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
		_____ =	Total Cover	
Sapling/Shrub Stratum	(Plot Size: 5')			
1. _____		_____	_____	_____
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
		_____ =	Total Cover	
Herb Stratum	(Plot Size: 5')			
1. Carex obnupta		60	Y	OBL
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
7. _____		_____	_____	_____
8. _____		_____	_____	_____
9. _____		_____	_____	_____
10. _____		_____	_____	_____
11. _____		_____	_____	_____
		_____ =	Total Cover	
Wood Vine Stratum	(Plot Size: _____)			
1. _____		_____	_____	_____
2. _____		_____	_____	_____
% Bare Ground in Herb Stratum _____				

Dominance Test Worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
Total Number of Dominant Species Across All Strata: _____ (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: _____(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 =
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals _____	(A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
- ☐ Dominance Test is > 50%
- ☐ Prevalence Index is ≤ 3.0[1]
- ☐ Morphological Adadpatations[1] (Provide supporting Data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must Be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Carex obnupta roots found at 36-inches

SOIL

Sampling Point: TP-12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0-36							sandy	fill
36	10 YR 2/1						mucky mineral	

[1] Type: C=Concentration, D=Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains.

[2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide3 (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☒ Sandy Mucky Mineral
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (Except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (is present):

Type: _____

Depth: _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (C6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☐ Depth (inches):

Water Table Present? Yes ☐ No ☐ Depth (inches):

Saturation Present? Yes ☒ No ☐ Depth (inches): 36

(inches capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area is disturbed (filled). Normal hydrology was determined by examining the adjacent undisturbed wetland area. In the adjacemt wetland, water was ponded at the surface during the site visit.

APPENDIX B

DOE Wetland Rating Forms
Talasaea Consultants, 2011

Wetland name or number C

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): TAL- 1331 Wetland C Date of site visit: 01/20/2011

Rated by DRT Trained by Ecology? Yes X No___ Date of training 10-05

SEC: 36 TWNSHP: 25N RNGE: 1W Is S/T/R in Appendix D? Yes X No___

Map of wetland unit: Figure ____ Estimated size ______

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV X

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	8
Score for Hydrologic Functions	6
Score for Habitat Functions	12
TOTAL score for Functions	**26**

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

Final Category (choose the "highest" category from above) **Cat. IV**

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	**YES**	**NO**
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		×
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		×
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		×
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		×

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
×NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

If your wetland can be classified as a Freshwater Tidal Fringe use the forms for ***Riverine*** *wetlands. If it is Saltwater Tidal Fringe it is rated as an* ***Estuarine*** *wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
×NO – go to 3 **YES** – The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
× NO – go to 4 **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?
__×__The wetland is on a slope (*slope can be very gradual*),
__×__The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
×NO - go to 5 **YES –** The wetland class is **Slope**

5. Does the entire wetland unit **meet all** of the following criteria?

____ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river

____ The overbank flooding occurs at least once every two years.

NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.

× NO - go to 6   **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7   × **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

× NO – go to 8   **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still to determine which of the above criteria apply to your wetland, or if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number C

D	Depressional and Flats Wetlands **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	*(see p.38)*
D	D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) points = 3 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 1 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Provide photo or drawing	Figure ___ 1
D	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions)* YES points = 4 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure ___ 3
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0 Map of Hydroperiods	Figure ___ 4
D	**Total for D 1** *Add the points in the boxes above*	8
D	**D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other________________ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	8

Comments:

D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 4 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 0	0
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 The wetland is a "headwater" wetland" points = 5 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft points = 0	3
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire unit is in the FLATS class points = 5	0
D	**Total for D 3** *Add the points in the boxes above*	3
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — Wetland drains to a river or stream that has flooding problems — Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems X Other Drains to stream on adjacent property. **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 49)*** multiplier 2
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	**6**

Comments:

R	**Riverine and Freshwater Tidal Fringe Wetlands** WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality	**Points** (only 1 score per box)
R	**R 1. Does the wetland unit have the potential to improve water quality?**	*(see p.52)*
R	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: Depressions cover >3/4 area of wetland points = 8 Depressions cover > 1/2 area of wetland points = 4 If depressions > ½ of area of unit draw polygons on aerial photo or map Depressions present but cover < 1/2 area of wetland points = 2 No depressions present points = 0	Figure ___ 0
R	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): Trees or shrubs > 2/3 the area of the unit points = 8 Trees or shrubs > 1/3 area of the unit points = 6 Ungrazed, herbaceous plants > 2/3 area of unit points = 6 Ungrazed herbaceous plants > 1/3 area of unit points = 3 Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit points = 0 Aerial photo or map showing polygons of different vegetation types	Figure ___ 0
R	*Add the points in the boxes above*	0
R	**R 2. Does the wetland unit have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 feet of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality — Other________________ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.53)* multiplier 1
R	**TOTAL - Water Quality Functions** Multiply the score from R 1 by R 2 ***Add score to table on p. 1***	**0**

Comments

R	**Riverine and Freshwater Tidal Fringe Wetlands** HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream erosion	**Points** (only 1 score per box)
	R 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.54)***
R	R 3.1 Characteristics of the overbank storage the unit provides: *Estimate the average width of the wetland unit perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit)/(average width of stream between banks).* If the ratio is more than 20 points = 9 If the ratio is between 10 – 20 points = 6 If the ratio is 5 - <10 points = 4 If the ratio is 1 - <5 points = 2 If the ratio is < 1 points = 1 Aerial photo or map showing average widths	**Figure ___**
R	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description.* (polygons need to have >90% cover at person height NOT Cowardin classes): Forest or shrub for >1/3 area OR herbaceous plants > 2/3 area points = 7 Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area points = 4 Vegetation does not meet above criteria points = 0 Aerial photo or map showing polygons of different vegetation types	**Figure ___**
R	*Add the points in the boxes above*	
R	**R 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* — There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. — There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding — Other___________________________________ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is **2** **NO** multiplier is **1**	***(see p.57)*** multiplier 1
R	**TOTAL - Hydrologic Functions** Multiply the score from R 3 by R 4 ***Add score to table on p. 1***	**0**

Comments

L	**Lake-fringe Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
L	**L 1. Does the wetland unit have the potential to improve water quality?**	*(see p.59)*
L	L 1.1 Average width of vegetation along the lakeshore *(use polygons of Cowardin classes)*: Vegetation is more than 33ft (10m) wide points = 6 Vegetation is more than 16 (5m) wide and <33ft points = 3 Vegetation is more than 6ft (2m) wide and <16 ft points = 1 Vegetation is less than 6 ft wide points = 0 Map of Cowardin classes with widths marked	Figure ___ 0
L	L 1.2 Characteristics of the vegetation in the wetland: *choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* Cover of herbaceous plants is >90% of the vegetated area points = 6 Cover of herbaceous plants is >2/3 of the vegetated area points = 4 Cover of herbaceous plants is >1/3 of the vegetated area points = 3 Other vegetation that is not aquatic bed or herbaceous covers > 2/3 unit points = 3 Other vegetation that is not aquatic bed in > 1/3 vegetated area points = 1 Aquatic bed vegetation and open water cover > 2/3 of the unit points = 0 Map with polygons of different vegetation types	Figure ___ 0
L	*Add the points in the boxes above*	0
L	**L 2. Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Wetland is along the shores of a lake or reservoir that does not meet water quality standards — Grazing in the wetland or within 150ft — Polluted water discharges to wetland along upland edge — Tilled fields or orchards within 150 feet of wetland — Residential or urban areas are within 150 ft of wetland — Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) — Power boats with gasoline or diesel engines use the lake — Other___ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.61)* multiplier 1
L	**TOTAL - Water Quality Functions** Multiply the score from L1 by L2 ***Add score to table on p. 1***	**0**

Comments

L	**Lake-fringe Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce shoreline erosion	**Points** (only 1 score per box)
L	**L 3. Does the wetland unit have the <u>potential</u> to reduce shoreline erosion?**	*(see p.62)*
L	L 3 Distance along shore and average width of Cowardin classes along the lakeshore (**do not** include aquatic bed): *(choose the highest scoring description that matches conditions in the wetland)* > ¾ of distance is shrubs or forest at least 33 ft (10m) wide — points = 6 > ¾ of distance is shrubs or forest at least 6 ft. (2 m) wide — points = 4 > ¼ distance is shrubs or forest at least 33 ft (10m) wide — points = 4 Vegetation is at least 6 ft (2m) wide (any type except aquatic bed) — points = 2 Vegetation is less than 6 ft (2m) wide (any type except aquatic bed) — points = 0 Aerial photo or map with Cowardin vegetation classes	Figure ___ 0
L	*Record the points from the box above*	0
L	**L 4. Does the wetland unit have the <u>opportunity</u> to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* — There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. — There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests other wetlands) than can be damaged by shoreline erosion — Other **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.63)* multiplier 1
L	**TOTAL - Hydrologic Functions** Multiply the score from L 3 by L 4 ***Add score to table on p. 1***	**0**

Comments

S	**Slope Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
S	**S 1. Does the wetland unit have the potential to improve water quality?**	*(see p.64)*
S	S 1.1 Characteristics of average slope of unit: Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance)* points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 Slope is greater than 5% points = 0	0
S	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES = 3 points NO = 0 points	0
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > ½ of area points = 2 Dense, uncut, herbaceous vegetation > 1/4 of area points = 1 Does not meet any of the criteria above for vegetation points = 0 Aerial photo or map with vegetation polygons	Figure ___ 0
S	**Total for S 1** *Add the points in the boxes above*	0
S	**S 2. Does the wetland unit have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields, logging, or orchards within 150 feet of wetland — Residential, urban areas, or golf courses are within 150 ft upslope of wetland — Other________________ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.67)* multiplier 1
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	0

Comments

S	Slope Wetlands HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream erosion	Points (only 1 score per box)
	S 3. Does the wetland unit have the potential to reduce flooding and stream erosion?	***(see p.68)***
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows)* Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. points = 6 Dense, uncut, **rigid** vegetation > 1/2 area of wetland points = 3 Dense, uncut, **rigid** vegetation > 1/4 area points = 1 More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0	0
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. YES points = 2 NO points = 0	0
S	*Add the points in the boxes above*	0
S	**S 4. Does the wetland have the opportunity to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* — Wetland has surface runoff that drains to a river or stream that has flooding problems — Other_______________ *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 70)*** multiplier 1
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	0

Comments

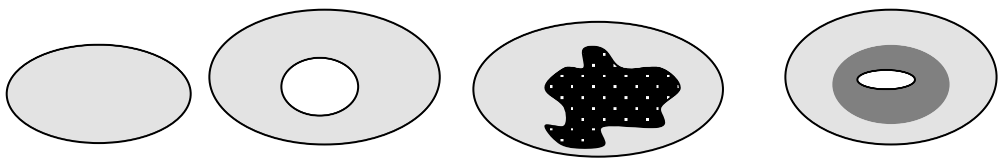
Wetland name or number C

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	Points (only 1 score per box)
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Vegetation structure ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed __X__Emergent plants __X__Scrub/shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes	Figure ___ 1
H 1.2. Hydroperiods ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present points = 3 __X__Seasonally flooded or inundated — 3 types present points = 2 ____Occasionally flooded or inundated — 2 types present point = 1 __X__Saturated only — 1 type present points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland* = 2 points** ____***Freshwater tidal wetland* = 2 points** Map of hydroperiods	Figure ___ 1
H 1.3. Richness of Plant Species ***(see p. 75)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle* If you counted: > 19 species points = 2 *List species below if you want to:* 5 - 19 species points = 1 Juef, Spdo, Poa, Ronu, Rusp < 5 species points = 0	1

Total for page 3

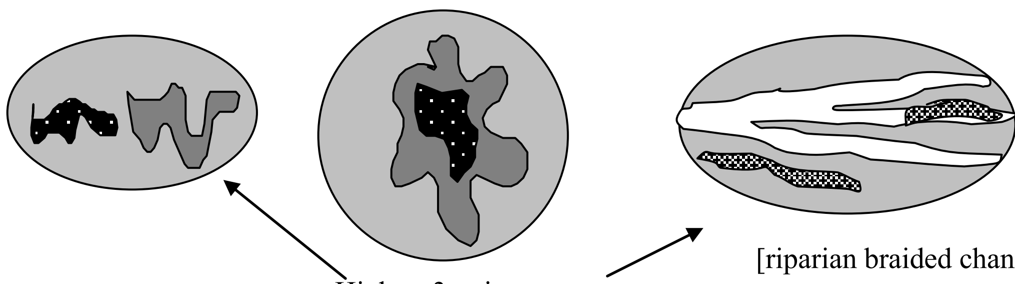
H 1.4. Interspersion of habitats ***(see p. 76)*** **Figure ___**

Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.



None = 0 points   Low = 1 point   × Moderate = 2 points

2



[riparian braided channels]

High = 3 points

NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes

H 1.5. Special Habitat Features: ***(see p. 77)***

Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.

____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).

____Standing snags (diameter at the bottom > 4 inches) in the wetland

____Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)

____Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)*

____At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. *(structures for egg-laying by amphibians)*

____ Invasive plants cover less than 25% of the wetland area in each stratum of plants

NOTE: The 20% stated in early printings of the manual on page 78 is an error.

0

H 1. TOTAL Score - potential for providing habitat
Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5

5

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** × No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure** ___ 2
H 2.2 Corridors and Connections *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors*, *heavily used gravel roads*, *paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? × YES = **2 points** (*go to H 2.3*) NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 4

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____**Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ____**Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____**Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. _____**Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ____**Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____**Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ____**Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ____**Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ____**Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	0

H 2.4 Wetland Landscape (*choose the **one** description of the landscape around the wetland that best fits*) ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	7
TOTAL for H 1 from page 14	5
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	**12**

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt. YES = Go to SC 1.1 NO X	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES = Category I NO go to SC 1.2	**Cat. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES = Category I NO = Category II — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating** **I/II**

SC 2.0 Natural Heritage Wetlands *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D ___ or accessed from WNHP/DNR web site ___ YES____ – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO ___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO __X__not a Heritage Wetland	**Cat. I**
SC 3.0 Bogs *(see p. 87)* Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 3 X No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes – Is a bog for purpose of rating X No - go to Q. 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No__X__ Is not a bog for purpose of rating	**Cat. I**

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* — **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. — **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO X not a forested wetland with special characteristics	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* YES = Go to SC 5.1 NO X not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than 1/10 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

SC 6.0 Interdunal Wetlands *(see p. 93)*	
Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO X not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula- lands west of SR 103 • Grayland-Westport- lands west of SR 105 • Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES = Category II NO – go to SC 6.2	**Cat. II**
SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES = Category III	**Cat. III**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	NA

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): TAL- 1331 Wetland B Date of site visit: 01/20/2011

Rated by DRT Trained by Ecology? Yes X No___ Date of training 10-05

SEC: 36 TWNSHP: 25N RNGE: 1W Is S/T/R in Appendix D? Yes X No___

Map of wetland unit: Figure ____ Estimated size ______

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	8
Score for Hydrologic Functions	16
Score for Habitat Functions	13
TOTAL score for Functions	**37**

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

Final Category **(choose the "highest" category from above)** **Cat. III**

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		×
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		×
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		×
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		×

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
×NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

If your wetland can be classified as a Freshwater Tidal Fringe use the forms for ***Riverine*** *wetlands. If it is Saltwater Tidal Fringe it is rated as an* ***Estuarine*** *wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
×NO – go to 3 **YES** – The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
× NO – go to 4 **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?
_×_The wetland is on a slope (*slope can be very gradual*),
_×_The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
×NO - go to 5 **YES –** The wetland class is **Slope**

5. Does the entire wetland unit **meet all** of the following criteria?

____ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river

____ The overbank flooding occurs at least once every two years.

NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.

×NO - go to 6 **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7 × **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

×NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still to determine which of the above criteria apply to your wetland, or if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

D	**Depressional and Flats Wetlands** **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	***(see p.38)***
D	D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) points = 3 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 1 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Provide photo or drawing	Figure ___ 1
D	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions)* YES points = 4 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure ___ 5
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0 Map of Hydroperiods	Figure ___ 2
D	**Total for D 1** *Add the points in the boxes above*	8
D	**D 2. Does the wetland unit have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other______ **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 44)*** multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	8

Comments:

D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 4 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 0	0
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 The wetland is a "headwater" wetland" points = 5 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft points = 0	5
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire unit is in the FLATS class points = 5	3
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — Wetland drains to a river or stream that has flooding problems — Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems X Other Drains to stream on adjacent property. **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 49)*** multiplier 2
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	**16**

Comments:

R	**Riverine and Freshwater Tidal Fringe Wetlands** WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality	**Points** (only 1 score per box)
R	**R 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.52)***
R	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: Depressions cover >3/4 area of wetland points = 8 Depressions cover > 1/2 area of wetland points = 4 If depressions > ½ of area of unit draw polygons on aerial photo or map Depressions present but cover < 1/2 area of wetland points = 2 No depressions present points = 0	**Figure** ___ 0
R	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): Trees or shrubs > 2/3 the area of the unit points = 8 Trees or shrubs > 1/3 area of the unit points = 6 Ungrazed, herbaceous plants > 2/3 area of unit points = 6 Ungrazed herbaceous plants > 1/3 area of unit points = 3 Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit points = 0 Aerial photo or map showing polygons of different vegetation types	**Figure** ___ 0
R	*Add the points in the boxes above*	0
R	**R 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity*. — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 feet of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality — Other________________________________ **YES** multiplier is **2** **NO** multiplier is **1**	***(see p.53)*** multiplier 1 ______
R	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from R 1 by R 2 ***Add score to table on p. 1***	**0**

Comments

R	**Riverine and Freshwater Tidal Fringe Wetlands** HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream erosion	**Points** (only 1 score per box)
	R 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.54)***
R	R 3.1 Characteristics of the overbank storage the unit provides: *Estimate the average width of the wetland unit perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit)/(average width of stream between banks).* If the ratio is more than 20 — points = 9 If the ratio is between 10 – 20 — points = 6 If the ratio is 5 - <10 — points = 4 If the ratio is 1 - <5 — points = 2 If the ratio is < 1 — points = 1 Aerial photo or map showing average widths	**Figure** ___
R	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description.* (polygons need to have >90% cover at person height NOT Cowardin classes): Forest or shrub for >1/3 area OR herbaceous plants > 2/3 area — points = 7 Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area — points = 4 Vegetation does not meet above criteria — points = 0 Aerial photo or map showing polygons of different vegetation types	**Figure** ___
R	*Add the points in the boxes above*	
R	**R 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* — There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. — There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding — Other____________________ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is **2** **NO** multiplier is **1**	***(see p.57)*** multiplier 1
R	**TOTAL - Hydrologic Functions** Multiply the score from R 3 by R 4 ***Add score to table on p. 1***	**0**

Comments

L	Lake-fringe Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
L	**L 1. Does the wetland unit have the potential to improve water quality?**	*(see p.59)*
L	L 1.1 Average width of vegetation along the lakeshore *(use polygons of Cowardin classes)*: Vegetation is more than 33ft (10m) wide points = 6 Vegetation is more than 16 (5m) wide and <33ft points = 3 Vegetation is more than 6ft (2m) wide and <16 ft points = 1 Vegetation is less than 6 ft wide points = 0 Map of Cowardin classes with widths marked	Figure ___ 0
L	L 1.2 Characteristics of the vegetation in the wetland: *choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* Cover of herbaceous plants is >90% of the vegetated area points = 6 Cover of herbaceous plants is >2/3 of the vegetated area points = 4 Cover of herbaceous plants is >1/3 of the vegetated area points = 3 Other vegetation that is not aquatic bed or herbaceous covers > 2/3 unit points = 3 Other vegetation that is not aquatic bed in > 1/3 vegetated area points = 1 Aquatic bed vegetation and open water cover > 2/3 of the unit points = 0 Map with polygons of different vegetation types	Figure ___ 0
L	*Add the points in the boxes above*	0
L	**L 2. Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Wetland is along the shores of a lake or reservoir that does not meet water quality standards — Grazing in the wetland or within 150ft — Polluted water discharges to wetland along upland edge — Tilled fields or orchards within 150 feet of wetland — Residential or urban areas are within 150 ft of wetland — Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) — Power boats with gasoline or diesel engines use the lake — Other______________ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.61)* multiplier 1
L	**TOTAL - Water Quality Functions** Multiply the score from L1 by L2 ***Add score to table on p. 1***	**0**

Comments

L	**Lake-fringe Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce shoreline erosion	**Points** (only 1 score per box)
L	**L 3. Does the wetland unit have the potential to reduce shoreline erosion?**	*(see p.62)*
L	L 3 Distance along shore and average width of Cowardin classes along the lakeshore (**do not** include aquatic bed): *(choose the highest scoring description that matches conditions in the wetland)* > ¾ of distance is shrubs or forest at least 33 ft (10m) wide points = 6 > ¾ of distance is shrubs or forest at least 6 ft. (2 m) wide points = 4 > ¼ distance is shrubs or forest at least 33 ft (10m) wide points = 4 Vegetation is at least 6 ft (2m) wide (any type except aquatic bed) points = 2 Vegetation is less than 6 ft (2m) wide (any type except aquatic bed) points = 0 Aerial photo or map with Cowardin vegetation classes	Figure ___ 0
L	*Record the points from the box above*	0
L	**L 4. Does the wetland unit have the opportunity to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* — There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. — There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests other wetlands) than can be damaged by shoreline erosion — Other **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.63)* multiplier 1
L	**TOTAL - Hydrologic Functions** Multiply the score from L 3 by L 4 ***Add score to table on p. 1***	**0**

Comments

S	**Slope Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
S	**S 1. Does the wetland unit have the potential to improve water quality?**	*(see p.64)*
S	S 1.1 Characteristics of average slope of unit: Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance)* points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 Slope is greater than 5% points = 0	0
S	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES = 3 points NO = 0 points	0
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > ½ of area points = 2 Dense, uncut, herbaceous vegetation > 1/4 of area points = 1 Does not meet any of the criteria above for vegetation points = 0 Aerial photo or map with vegetation polygons	Figure ___ 0
S	**Total for S 1** *Add the points in the boxes above*	0
S	**S 2. Does the wetland unit have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields, logging, or orchards within 150 feet of wetland — Residential, urban areas, or golf courses are within 150 ft upslope of wetland — Other___ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.67)* multiplier 1
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	0

Comments

S	Slope Wetlands HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream erosion	Points (only 1 score per box)
	S 3. Does the wetland unit have the potential to reduce flooding and stream erosion?	*(see p.68)*
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows)* Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. points = 6 Dense, uncut, **rigid** vegetation > 1/2 area of wetland points = 3 Dense, uncut, **rigid** vegetation > 1/4 area points = 1 More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0	0
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. YES points = 2 NO points = 0	0
S	*Add the points in the boxes above*	0
S	**S 4. Does the wetland have the opportunity to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* — Wetland has surface runoff that drains to a river or stream that has flooding problems — Other______________________________ *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 70)* multiplier 1
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	0

Comments

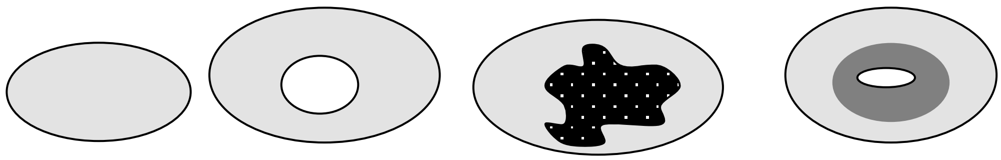
These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed _X_Emergent plants _X_Scrub/shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes	**Figure ___** 1
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present points = 3 _X_Seasonally flooded or inundated — 3 types present points = 2 ____Occasionally flooded or inundated — 2 types present point = 1 _X_Saturated only — 1 type present points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland _X_ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland* = 2 points** ____***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 2
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle* If you counted: > 19 species points = 2 *List species below if you want to:* 5 - 19 species points = 1 Juef, Spdo, Poa, Oesa, Ronu, Rusp, Caob, Carex sp. < 5 species points = 0	1

Total for page 4

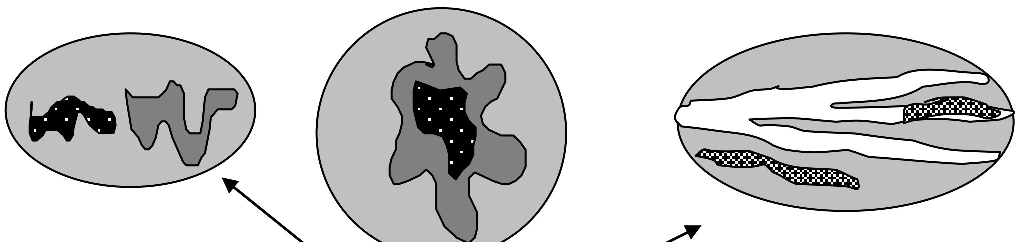
H 1.4. <u>Interspersion of habitats</u> ***(see p. 76)***

Figure ___

Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.



None = 0 points   Low = 1 point   × Moderate = 2 points



[riparian braided channels]

High = 3 points

NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes

2

H 1.5. <u>Special Habitat Features:</u> ***(see p. 77)***

Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.

____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).

____Standing snags (diameter at the bottom > 4 inches) in the wetland

____Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)

____Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)*

____At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. *(structures for egg-laying by amphibians)*

____ Invasive plants cover less than 25% of the wetland area in each stratum of plants

NOTE: The 20% stated in early printings of the manual on page 78 is an error.

0

H 1. TOTAL Score - potential for providing habitat
Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5

6

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** × — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure** ___ 2
H 2.2 Corridors and Connections *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors*, *heavily used gravel roads*, *paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? × YES = **2 points** (*go to H 2.3*) NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 4

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____**Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ____**Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____**Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. _____**Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ____**Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____**Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ____**Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ____**Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ____**Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	0

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	7
TOTAL for H 1 from page 14	6
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	**13**

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt. YES = Go to SC 1.1 NO X	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES = Category I NO go to SC 1.2	**Cat. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES = Category I NO = Category II — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating** **I/II**

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SC 2.0 Natural Heritage Wetlands ***(see p. 87)***
Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species.
SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)*
S/T/R information from Appendix D ___ or accessed from WNHP/DNR web site ___

YES____ – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO ___

SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species?
YES = Category I NO __X__not a Heritage Wetland

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Cat. I

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SC 3.0 Bogs ***(see p. 87)***
Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.***
1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2
2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond?
Yes - go to Q. 3 X No - Is not a bog for purpose of rating
3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the “bog” species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)?
Yes – Is a bog for purpose of rating X No - go to Q. 4
NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16” deep. If the pH is less than 5.0 and the “bog” plant species in Table 3 are present, the wetland is a bog.
1. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann’s spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?*
2. YES = Category I No__X__ Is not a bog for purpose of rating

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Cat. I

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SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* — **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. — **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO X not a forested wetland with special characteristics	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* YES = Go to SC 5.1 NO X not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than 1/10 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

SC 6.0 Interdunal Wetlands *(see p. 93)*	
Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO X not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula- lands west of SR 103 • Grayland-Westport- lands west of SR 105 • Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES = Category II NO – go to SC 6.2	**Cat. II**
SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES = Category III	**Cat. III**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	**NA**

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): TAL- 1331 Wetland A Date of site visit: 1-20-11

Rated by DRT Trained by Ecology? Yes × No___ Date of training 10-05

SEC: 36 TWNSHP: 25N RNGE: 1W Is S/T/R in Appendix D? Yes × No___

Map of wetland unit: Figure ____ Estimated size ______

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II × III___ IV___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	30
Score for Hydrologic Functions	14
Score for Habitat Functions	32
TOTAL score for Functions	**76**

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply ×

Final Category (choose the "highest" category from above) **Cat. I**

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	×
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above		Check if unit has multiple HGM classes present	

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	**YES**	**NO**
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		×
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		×
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		×
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		×

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
×NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

If your wetland can be classified as a Freshwater Tidal Fringe use the forms for ***Riverine*** *wetlands. If it is Saltwater Tidal Fringe it is rated as an* ***Estuarine*** *wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
×NO – go to 3 **YES** – The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
× NO – go to 4 **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
×NO - go to 5 **YES –** The wetland class is **Slope**

5. Does the entire wetland unit **meet all** of the following criteria?

____ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river

____ The overbank flooding occurs at least once every two years.

NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.

×NO - go to 6 **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7 × **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still to determine which of the above criteria apply to your wetland, or if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

D	**Depressional and Flats Wetlands** **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.38)***
D	D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) points = 3 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 1 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Provide photo or drawing	**Figure** ___ 2
D	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES points = 4 NO points = 0	4
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	**Figure** ___ 5
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0 Map of Hydroperiods	**Figure** ___ 4
D	**Total for D 1** *Add the points in the boxes above*	15
D	**D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150 ft X Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging X Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other____________ **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 44)*** multiplier 2
D	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	30

Comments:

Wetland name or number A

D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 4 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 0	2
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 The wetland is a "headwater" wetland" points = 5 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft points = 0	7
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire unit is in the FLATS class points = 5	5
D	**Total for D 3** *Add the points in the boxes above*	14
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — Wetland drains to a river or stream that has flooding problems — Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems — Other__________ **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 49)*** multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	**14**

Comments:

R	Riverine and Freshwater Tidal Fringe Wetlands WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality	Points (only 1 score per box)
R	**R 1. Does the wetland unit have the potential to improve water quality?**	*(see p.52)*
R	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: Depressions cover >3/4 area of wetland points = 8 Depressions cover > 1/2 area of wetland points = 4 If depressions > ½ of area of unit draw polygons on aerial photo or map Depressions present but cover < 1/2 area of wetland points = 2 No depressions present points = 0	Figure ___ 0
R	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): Trees or shrubs > 2/3 the area of the unit points = 8 Trees or shrubs > 1/3 area of the unit points = 6 Ungrazed, herbaceous plants > 2/3 area of unit points = 6 Ungrazed herbaceous plants > 1/3 area of unit points = 3 Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit points = 0 Aerial photo or map showing polygons of different vegetation types	Figure ___ 0
R	*Add the points in the boxes above*	0
R	**R 2. Does the wetland unit have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 feet of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality — Other_______________ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.53)* multiplier 1
R	**TOTAL - Water Quality Functions** Multiply the score from R 1 by R 2 ***Add score to table on p. 1***	**0**

Comments

Wetland name or number A

R	**Riverine and Freshwater Tidal Fringe Wetlands** HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream erosion	**Points** (only 1 score per box)
	R 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.54)***
R	R 3.1 Characteristics of the overbank storage the unit provides: *Estimate the average width of the wetland unit perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit)/(average width of stream between banks).* If the ratio is more than 20 points = 9 If the ratio is between 10 – 20 points = 6 If the ratio is 5 - <10 points = 4 If the ratio is 1 - <5 points = 2 If the ratio is < 1 points = 1 Aerial photo or map showing average widths	**Figure ___**
R	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description.* (polygons need to have >90% cover at person height NOT Cowardin classes): Forest or shrub for >1/3 area OR herbaceous plants > 2/3 area points = 7 Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area points = 4 Vegetation does not meet above criteria points = 0 Aerial photo or map showing polygons of different vegetation types	**Figure ___**
R	*Add the points in the boxes above*	
R	**R 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* — There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. — There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding — Other___________________________________ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is **2** **NO** multiplier is **1**	***(see p.57)*** multiplier 1
R	**TOTAL - Hydrologic Functions** Multiply the score from R 3 by R 4 ***Add score to table on p. 1***	**0**

Comments

L	Lake-fringe Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
L	**L 1. Does the wetland unit have the potential to improve water quality?**	*(see p.59)*
L	L 1.1 Average width of vegetation along the lakeshore *(use polygons of Cowardin classes)*: Vegetation is more than 33ft (10m) wide points = 6 Vegetation is more than 16 (5m) wide and <33ft points = 3 Vegetation is more than 6ft (2m) wide and <16 ft points = 1 Vegetation is less than 6 ft wide points = 0 Map of Cowardin classes with widths marked	Figure ___ 0
L	L 1.2 Characteristics of the vegetation in the wetland: *choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* Cover of herbaceous plants is >90% of the vegetated area points = 6 Cover of herbaceous plants is >2/3 of the vegetated area points = 4 Cover of herbaceous plants is >1/3 of the vegetated area points = 3 Other vegetation that is not aquatic bed or herbaceous covers > 2/3 unit points = 3 Other vegetation that is not aquatic bed in > 1/3 vegetated area points = 1 Aquatic bed vegetation and open water cover > 2/3 of the unit points = 0 Map with polygons of different vegetation types	Figure ___ 0
L	*Add the points in the boxes above*	0
L	**L 2. Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Wetland is along the shores of a lake or reservoir that does not meet water quality standards — Grazing in the wetland or within 150ft — Polluted water discharges to wetland along upland edge — Tilled fields or orchards within 150 feet of wetland — Residential or urban areas are within 150 ft of wetland — Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) — Power boats with gasoline or diesel engines use the lake — Other________________________________ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.61)* multiplier 1
L	**TOTAL - Water Quality Functions** Multiply the score from L1 by L2 ***Add score to table on p. 1***	**0**

Comments

L	**Lake-fringe Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce shoreline erosion	**Points** (only 1 score per box)
L	**L 3. Does the wetland unit have the <u>potential</u> to reduce shoreline erosion?**	***(see p.62)***
L	L 3 Distance along shore and average width of Cowardin classes along the lakeshore (**do not** include aquatic bed): *(choose the highest scoring description that matches conditions in the wetland)* > ¾ of distance is shrubs or forest at least 33 ft (10m) wide points = 6 > ¾ of distance is shrubs or forest at least 6 ft. (2 m) wide points = 4 > ¼ distance is shrubs or forest at least 33 ft (10m) wide points = 4 Vegetation is at least 6 ft (2m) wide (any type except aquatic bed) points = 2 Vegetation is less than 6 ft (2m) wide (any type except aquatic bed) points = 0 Aerial photo or map with Cowardin vegetation classes	Figure ___ 0
L	*Record the points from the box above*	0
L	**L 4. Does the wetland unit have the <u>opportunity</u> to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* — There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. — There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests other wetlands) than can be damaged by shoreline erosion — Other **YES** multiplier is **2** **NO** multiplier is **1**	***(see p.63)*** multiplier 1
L	**TOTAL - Hydrologic Functions** Multiply the score from L 3 by L 4 ***Add score to table on p. 1***	**0**

Comments

S	Slope Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
S	**S 1. Does the wetland unit have the potential to improve water quality?**	*(see p.64)*
S	S 1.1 Characteristics of average slope of unit: Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance)* points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 Slope is greater than 5% points = 0	0
S	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES = 3 points NO = 0 points	0
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > ½ of area points = 2 Dense, uncut, herbaceous vegetation > 1/4 of area points = 1 Does not meet any of the criteria above for vegetation points = 0 Aerial photo or map with vegetation polygons	**Figure ___** 0
S	**Total for S 1** *Add the points in the boxes above*	0
S	**S 2. Does the wetland unit have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields, logging, or orchards within 150 feet of wetland — Residential, urban areas, or golf courses are within 150 ft upslope of wetland — Other________________________ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.67)* multiplier 1
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	0

Comments

Wetland name or number A

S	Slope Wetlands HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream erosion	Points (only 1 score per box)
	S 3. Does the wetland unit have the potential to reduce flooding and stream erosion?	*(see p.68)*
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows)* Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. points = 6 Dense, uncut, **rigid** vegetation > 1/2 area of wetland points = 3 Dense, uncut, **rigid** vegetation > 1/4 area points = 1 More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0	0
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. YES points = 2 NO points = 0	0
S	*Add the points in the boxes above*	0
S	**S 4. Does the wetland have the opportunity to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* — Wetland has surface runoff that drains to a river or stream that has flooding problems — Other__________ *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 70)* multiplier 1
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	0

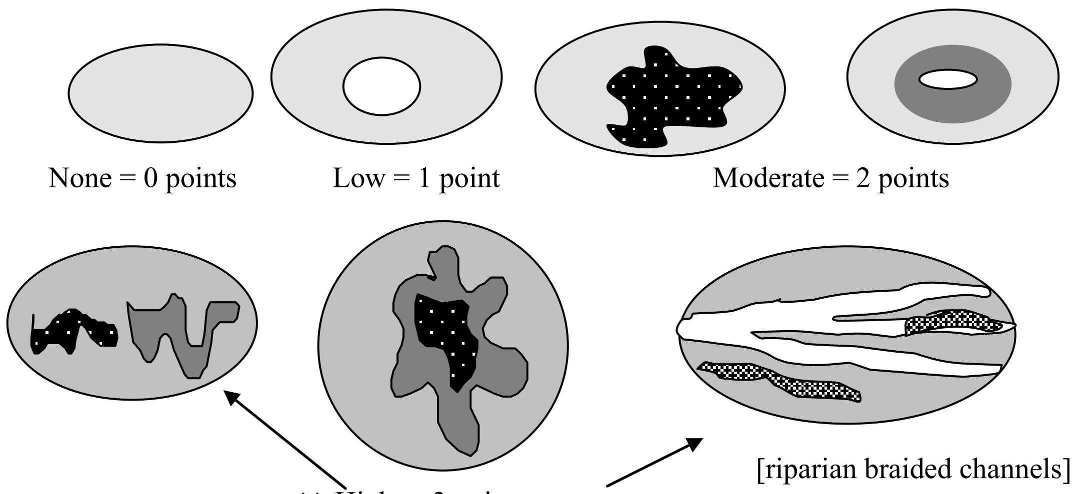
Comments

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Vegetation structure ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* __X__Aquatic bed __X__Emergent plants __X__Scrub/shrub (areas where shrubs have >30% cover) __X__Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* __X__The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more points = 4 Map of Cowardin vegetation classes 3 structures points = 2 2 structures points = 1 1 structure points = 0	**Figure** ___ 4
H 1.2. Hydroperiods ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* __X__Permanently flooded or inundated — 4 or more types present points = 3 __X__Seasonally flooded or inundated — 3 types present points = 2 __X__Occasionally flooded or inundated — 2 types present point = 1 __X__Saturated only — 1 type present points = 0 __X__ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland* = 2 points** ____***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure** ___ 3
H 1.3. Richness of Plant Species ***(see p. 75)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle* If you counted: > 19 species points = 2 *List species below if you want to:* 5 - 19 species points = 1 < 5 species points = 0	1

Total for page __8__

H 1.4. Interspersion of habitats ***(see p. 76)*** | Figure ___

Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.



× High = 3 points

NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes

3

H 1.5. Special Habitat Features: ***(see p. 77)***

Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.

__×__Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).

__×__Standing snags (diameter at the bottom > 4 inches) in the wetland

__×__Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)

__×__Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)*

__×__At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. *(structures for egg-laying by amphibians)*

__×__ Invasive plants cover less than 25% of the wetland area in each stratum of plants

NOTE: The 20% stated in early printings of the manual on page 78 is an error.

6

H 1. TOTAL Score - potential for providing habitat
Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5

17

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 <u>Buffers</u> ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** × — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure** ___ 4
H 2.2 <u>Corridors and Connections</u> ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors*, *heavily used gravel roads*, *paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? × YES = **2 points** (*go to H 2.3*) NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 6

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____**Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ____**Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. _X_**Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. _____**Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). _X_**Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____**Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). _X_**Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ____**Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ____**Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. _X_**Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	4

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	15
TOTAL for H 1 from page 14	17
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	**32**

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt. YES = Go to SC 1.1 NO X	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES = Category I NO go to SC 1.2	**Cat. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES = Category I NO = Category II — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating** **I/II**

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SC 2.0 Natural Heritage Wetlands ***(see p. 87)***
Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species.
SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)*
S/T/R information from Appendix D ___ or accessed from WNHP/DNR web site ___
YES____ – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO _X_
SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species?
YES = Category I NO _X_not a Heritage Wetland

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Cat. I

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SC 3.0 Bogs ***(see p. 87)***
Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.***
1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - X go to Q. 3 No - go to Q. 2
2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond?
Yes - go to Q. 3 X No - Is not a bog for purpose of rating
3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)?
Yes – Is a bog for purpose of rating No - go to Q. 4
NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog.
1. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?*
2. YES = Category I No_X_ Is not a bog for purpose of rating

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Cat. I

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SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* — **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. — **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO ___not a forested wetland with special characteristics	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* YES = Go to SC 5.1 NO_X_ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than 1/10 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

SC 6.0 Interdunal Wetlands *(see p. 93)* Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO × not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula- lands west of SR 103 • Grayland-Westport- lands west of SR 105 • Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES = Category III	**Cat. II** **Cat. III**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	NA

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): TAL- 1331 Wetland D Date of site visit: 01/20/2011

Rated by DRT Trained by Ecology? Yes × No___ Date of training 10-05

SEC: 36 TWNSHP: 25N RNGE: 1W Is S/T/R in Appendix D? Yes × No___

Map of wetland unit: Figure ____ Estimated size ______

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III × IV___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	9
Score for Hydrologic Functions	10
Score for Habitat Functions	12
TOTAL score for Functions	**31**

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply ×

Final Category (choose the "highest" category from above) **Cat. III**

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		**Wetland HGM Class used for Rating**	
Estuarine		**Depressional**	×
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	×	Check if unit has multiple HGM classes present	

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		×
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		×
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		×
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		×

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
×NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe** **NO – Saltwater Tidal Fringe (Estuarine)**

If your wetland can be classified as a Freshwater Tidal Fringe use the forms for ***Riverine*** *wetlands. If it is Saltwater Tidal Fringe it is rated as an* ***Estuarine*** *wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
×NO – go to 3 **YES** – The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
× NO – go to 4 **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?
_×_The wetland is on a slope (*slope can be very gradual*),
_×_The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
×NO - go to 5 **YES –** The wetland class is **Slope**

5. Does the entire wetland unit **meet all** of the following criteria?

____ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river

____ The overbank flooding occurs at least once every two years.

NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.

×NO - go to 6 **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7 × **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

×NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still to determine which of the above criteria apply to your wetland, or if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

D	Depressional and Flats Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) points = 3 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 1 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Provide photo or drawing	Figure ___ 2
D	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES points = 4 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure ___ 3
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0 Map of Hydroperiods	Figure ___ 4
D	**Total for D 1** *Add the points in the boxes above*	9
D	**D 2. Does the wetland unit have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	9

Comments:

Wetland name or number D

D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 4 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 0	2
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 The wetland is a "headwater" wetland" points = 5 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft points = 0	3
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire unit is in the FLATS class points = 5	0
D	**Total for D 3** *Add the points in the boxes above*	5
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — Wetland drains to a river or stream that has flooding problems — Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ×— Other Drains to stream on adjacent property. **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 49)*** multiplier 2
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	**10**

Comments:

R	**Riverine and Freshwater Tidal Fringe Wetlands** WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality	**Points** (only 1 score per box)
R	**R 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.52)***
R	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: Depressions cover >3/4 area of wetland points = 8 Depressions cover > 1/2 area of wetland points = 4 If depressions > ½ of area of unit draw polygons on aerial photo or map Depressions present but cover < 1/2 area of wetland points = 2 No depressions present points = 0	**Figure** ___ 0
R	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): Trees or shrubs > 2/3 the area of the unit points = 8 Trees or shrubs > 1/3 area of the unit points = 6 Ungrazed, herbaceous plants > 2/3 area of unit points = 6 Ungrazed herbaceous plants > 1/3 area of unit points = 3 Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit points = 0 Aerial photo or map showing polygons of different vegetation types	**Figure** ___ 0
R	*Add the points in the boxes above*	0
R	**R 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity*. — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 feet of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality — Other____________________ **YES** multiplier is **2** **NO** multiplier is **1**	***(see p.53)*** multiplier 1
R	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from R 1 by R 2 ***Add score to table on p. 1***	**0**

Comments

R	Riverine and Freshwater Tidal Fringe Wetlands HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream erosion	Points (only 1 score per box)
	R 3. Does the wetland unit have the potential to reduce flooding and erosion?	*(see p.54)*
R	R 3.1 Characteristics of the overbank storage the unit provides: *Estimate the average width of the wetland unit perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit)/(average width of stream between banks).* If the ratio is more than 20 points = 9 If the ratio is between 10 – 20 points = 6 If the ratio is 5 - <10 points = 4 If the ratio is 1 - <5 points = 2 If the ratio is < 1 points = 1 Aerial photo or map showing average widths	Figure ___
R	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description.* (polygons need to have >90% cover at person height NOT Cowardin classes): Forest or shrub for >1/3 area OR herbaceous plants > 2/3 area points = 7 Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area points = 4 Vegetation does not meet above criteria points = 0 Aerial photo or map showing polygons of different vegetation types	Figure ___
R	*Add the points in the boxes above*	
R	**R 4. Does the wetland unit have the opportunity to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* — There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. — There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding — Other_______________ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.57)* multiplier 1
R	**TOTAL - Hydrologic Functions** Multiply the score from R 3 by R 4 ***Add score to table on p. 1***	0

Comments

Wetland name or number D

L	**Lake-fringe Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
L	**L 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.59)***
L	L 1.1 Average width of vegetation along the lakeshore *(use polygons of Cowardin classes)*: Vegetation is more than 33ft (10m) wide points = 6 Vegetation is more than 16 (5m) wide and <33ft points = 3 Vegetation is more than 6ft (2m) wide and <16 ft points = 1 Vegetation is less than 6 ft wide points = 0 Map of Cowardin classes with widths marked	**Figure** ___ 0
L	L 1.2 Characteristics of the vegetation in the wetland: *choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* Cover of herbaceous plants is >90% of the vegetated area points = 6 Cover of herbaceous plants is >2/3 of the vegetated area points = 4 Cover of herbaceous plants is >1/3 of the vegetated area points = 3 Other vegetation that is not aquatic bed or herbaceous covers > 2/3 unit points = 3 Other vegetation that is not aquatic bed in > 1/3 vegetated area points = 1 Aquatic bed vegetation and open water cover > 2/3 of the unit points = 0 Map with polygons of different vegetation types	**Figure** ___ 0
L	*Add the points in the boxes above*	0
L	**L 2. Does the wetland have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Wetland is along the shores of a lake or reservoir that does not meet water quality standards — Grazing in the wetland or within 150ft — Polluted water discharges to wetland along upland edge — Tilled fields or orchards within 150 feet of wetland — Residential or urban areas are within 150 ft of wetland — Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) — Power boats with gasoline or diesel engines use the lake — Other____________________ **YES** multiplier is **2** **NO** multiplier is **1**	***(see p.61)*** multiplier 1
L	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from L1 by L2 ***Add score to table on p. 1***	**0**

Comments

L	**Lake-fringe Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce shoreline erosion	**Points** (only 1 score per box)
L	**L 3. Does the wetland unit have the <u>potential</u> to reduce shoreline erosion?**	***(see p.62)***
L	L 3 Distance along shore and average width of Cowardin classes along the lakeshore (**do not** include aquatic bed): *(choose the highest scoring description that matches conditions in the wetland)* > ¾ of distance is shrubs or forest at least 33 ft (10m) wide points = 6 > ¾ of distance is shrubs or forest at least 6 ft. (2 m) wide points = 4 > ¼ distance is shrubs or forest at least 33 ft (10m) wide points = 4 Vegetation is at least 6 ft (2m) wide (any type except aquatic bed) points = 2 Vegetation is less than 6 ft (2m) wide (any type except aquatic bed) points = 0 Aerial photo or map with Cowardin vegetation classes	**Figure** ___ 0
L	*Record the points from the box above*	0
L	**L 4. Does the wetland unit have the <u>opportunity</u> to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* — There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. — There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests other wetlands) than can be damaged by shoreline erosion — Other **YES** multiplier is **2** **NO** multiplier is **1**	***(see p.63)*** multiplier 1
L	**TOTAL - Hydrologic Functions** Multiply the score from L 3 by L 4 ***Add score to table on p. 1***	**0**

Comments

S	Slope Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
S	**S 1. Does the wetland unit have the potential to improve water quality?**	*(see p.64)*
S	S 1.1 Characteristics of average slope of unit: Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance)* points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 Slope is greater than 5% points = 0	0
S	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES = 3 points NO = 0 points	0
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > ½ of area points = 2 Dense, uncut, herbaceous vegetation > 1/4 of area points = 1 Does not meet any of the criteria above for vegetation points = 0 Aerial photo or map with vegetation polygons	Figure ___ 0
S	**Total for S 1** *Add the points in the boxes above*	0
S	**S 2. Does the wetland unit have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields, logging, or orchards within 150 feet of wetland — Residential, urban areas, or golf courses are within 150 ft upslope of wetland — Other___ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.67)* multiplier 1
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	0

Comments

S	Slope Wetlands HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream erosion	Points (only 1 score per box)
	S 3. Does the wetland unit have the potential to reduce flooding and stream erosion?	***(see p.68)***
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows)* Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. points = 6 Dense, uncut, **rigid** vegetation > 1/2 area of wetland points = 3 Dense, uncut, **rigid** vegetation > 1/4 area points = 1 More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0	0
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. YES points = 2 NO points = 0	0
S	*Add the points in the boxes above*	0
S	**S 4. Does the wetland have the opportunity to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* — Wetland has surface runoff that drains to a river or stream that has flooding problems — Other________________________________ *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 70)*** multiplier 1
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	0

Comments

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed _X_Emergent plants _X_Scrub/shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes	**Figure** ___ 1
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present points = 3 _X_Seasonally flooded or inundated — 3 types present points = 2 ____Occasionally flooded or inundated — 2 types present point = 1 _X_Saturated only — 1 type present points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland* = 2 points** ____***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure** ___ 1
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle* If you counted: > 19 species points = 2 *List species below if you want to:* 5 - 19 species points = 1 Juef, Spdo, Poa, Ronu, Rusp < 5 species points = 0	1

Total for page 3

<table>
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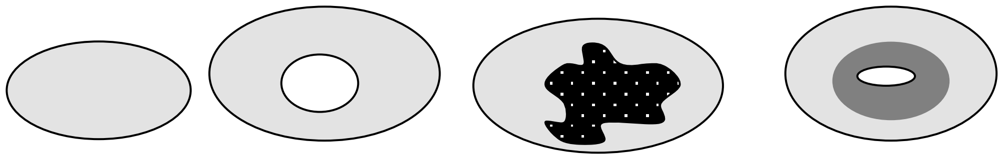
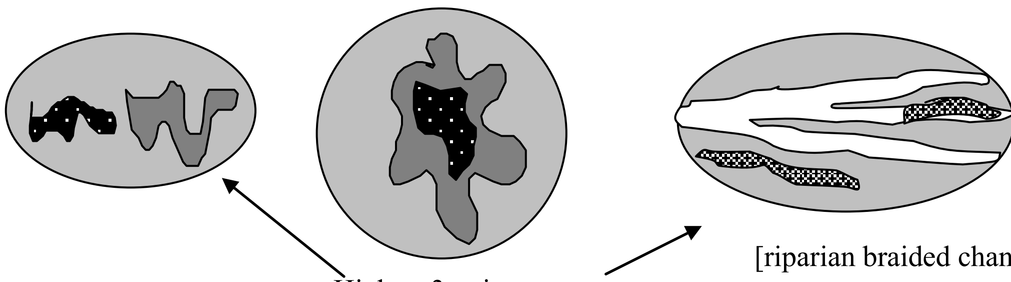
H 1.4. <u>Interspersion of habitats</u> ***(see p. 76)***

Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.



None = 0 points Low = 1 point ✕ Moderate = 2 points



[riparian braided channels]

High = 3 points

NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes

</td><td>

Figure ___

2

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H 1.5. <u>Special Habitat Features:</u> ***(see p. 77)***

Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.

____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).

____Standing snags (diameter at the bottom > 4 inches) in the wetland

____Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)

____Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)*

____At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. *(structures for egg-laying by amphibians)*

____ Invasive plants cover less than 25% of the wetland area in each stratum of plants

NOTE: The 20% stated in early printings of the manual on page 78 is an error.

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H 1. TOTAL Score - potential for providing habitat

Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5

</td><td>5</td></tr>
</table>

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** × — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure** ___ 2
H 2.2 Corridors and Connections *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors*, *heavily used gravel roads*, *paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? × YES = **2 points** (*go to H 2.3*) NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 4

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)***	
Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____**Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ____**Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____**Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. _____**Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ____**Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____**Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ____**Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ____**Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ____**Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	0

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	7
TOTAL for H 1 from page 14	5
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	**12**

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt. YES = Go to SC 1.1 NO X	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES = Category I NO go to SC 1.2	**Cat. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES = Category I NO = Category II — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating** **I/II**

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D ___ or accessed from WNHP/DNR web site ___ YES____ – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO ___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO _×_not a Heritage Wetland	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 3 × No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes – Is a bog for purpose of rating × No - go to Q. 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No_×_ Is not a bog for purpose of rating	**Cat. I**

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* — **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. — **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO _X_ not a forested wetland with special characteristics	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* YES = Go to SC 5.1 NO _X_ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than 1/10 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

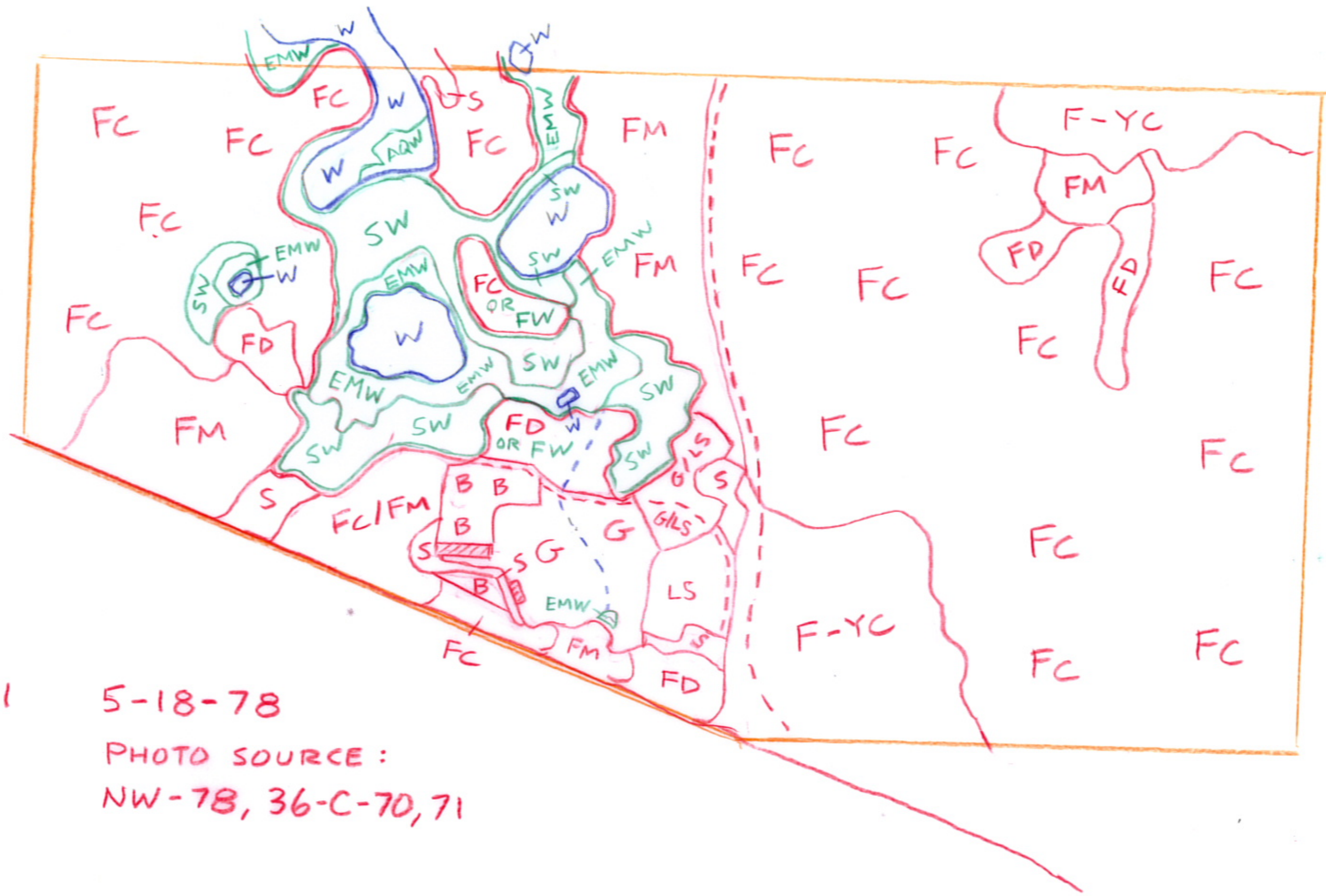
SC 6.0 Interdunal Wetlands *(see p. 93)* Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO _X_ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula- lands west of SR 103 • Grayland-Westport- lands west of SR 105 • Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES = Category III	 **Cat. II** **Cat. III**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	NA

APPENDIX C

Aerial Photograph Interpretation
(Dr. Frank Westerlund, 2010)

LAND COVER KEY, TAL 1331

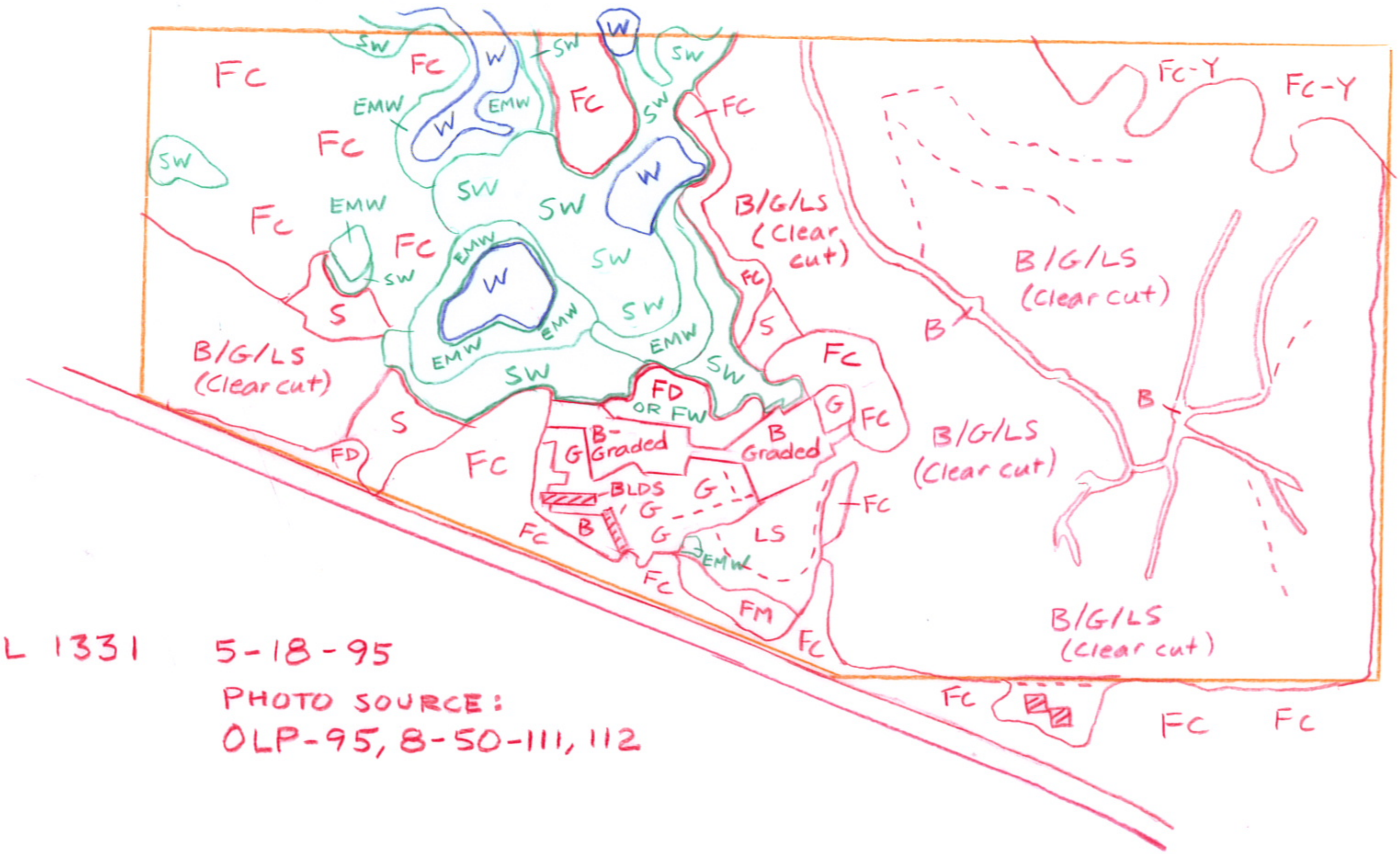
FC	Forest, coniferous
FC-Y	Forest, young conifer
FD	Forest, deciduous
FM	Forest, mixed
S	Shrub
LS	Low shrub
G	Grass
B	Bare
W	Water
AQW	Aquatic wetland
EMW	Emergent wetland
SW	Shrub wetland
FW	Forested wetland
- - - -	Ditch or watercourse
═══	Road
- - - -	Dirt track
	Building



TAL 1331

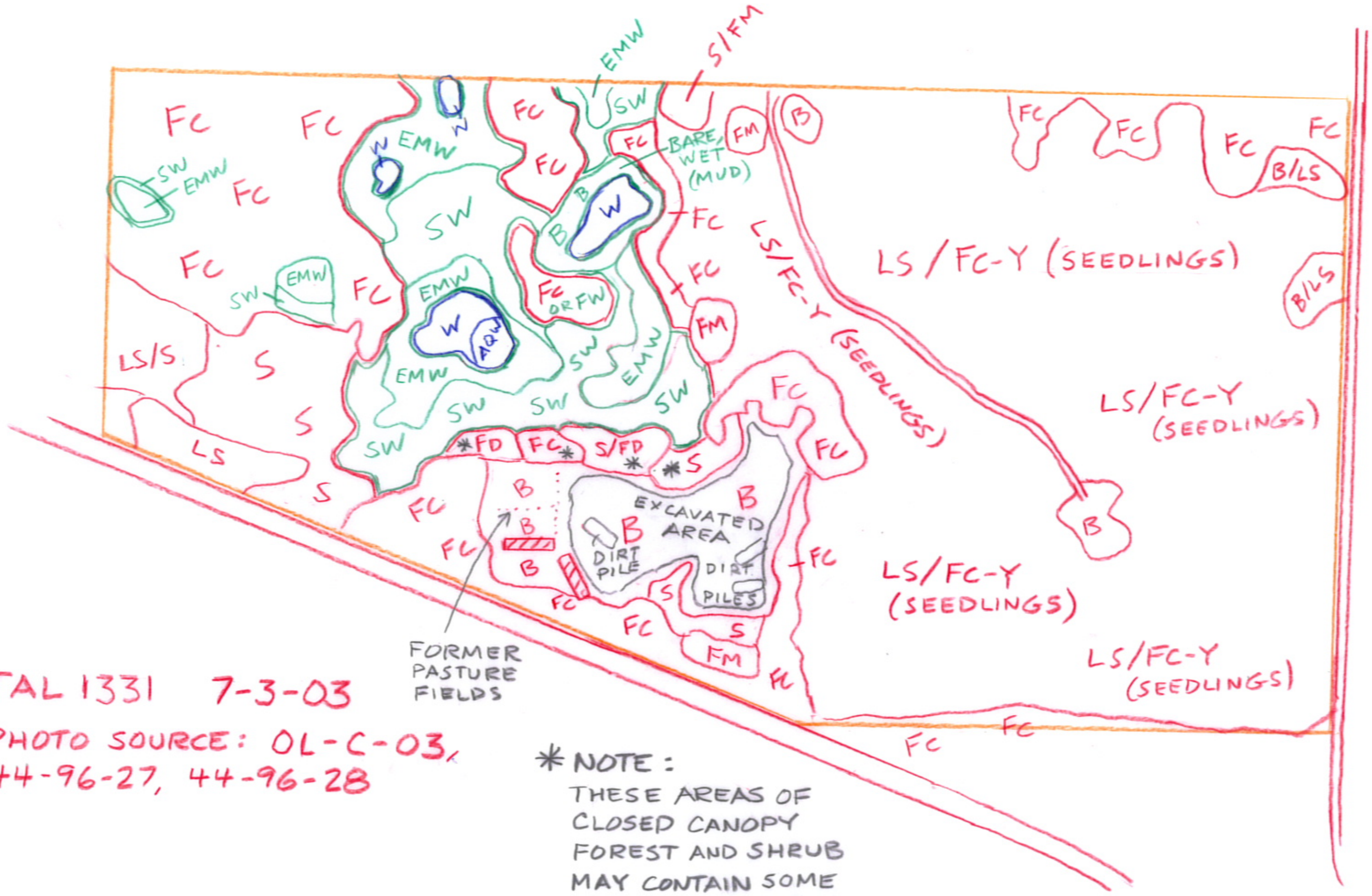
5-18-78

PHOTO SOURCE:
NW-78, 36-C-70,71



TAL 1331 5-18-95

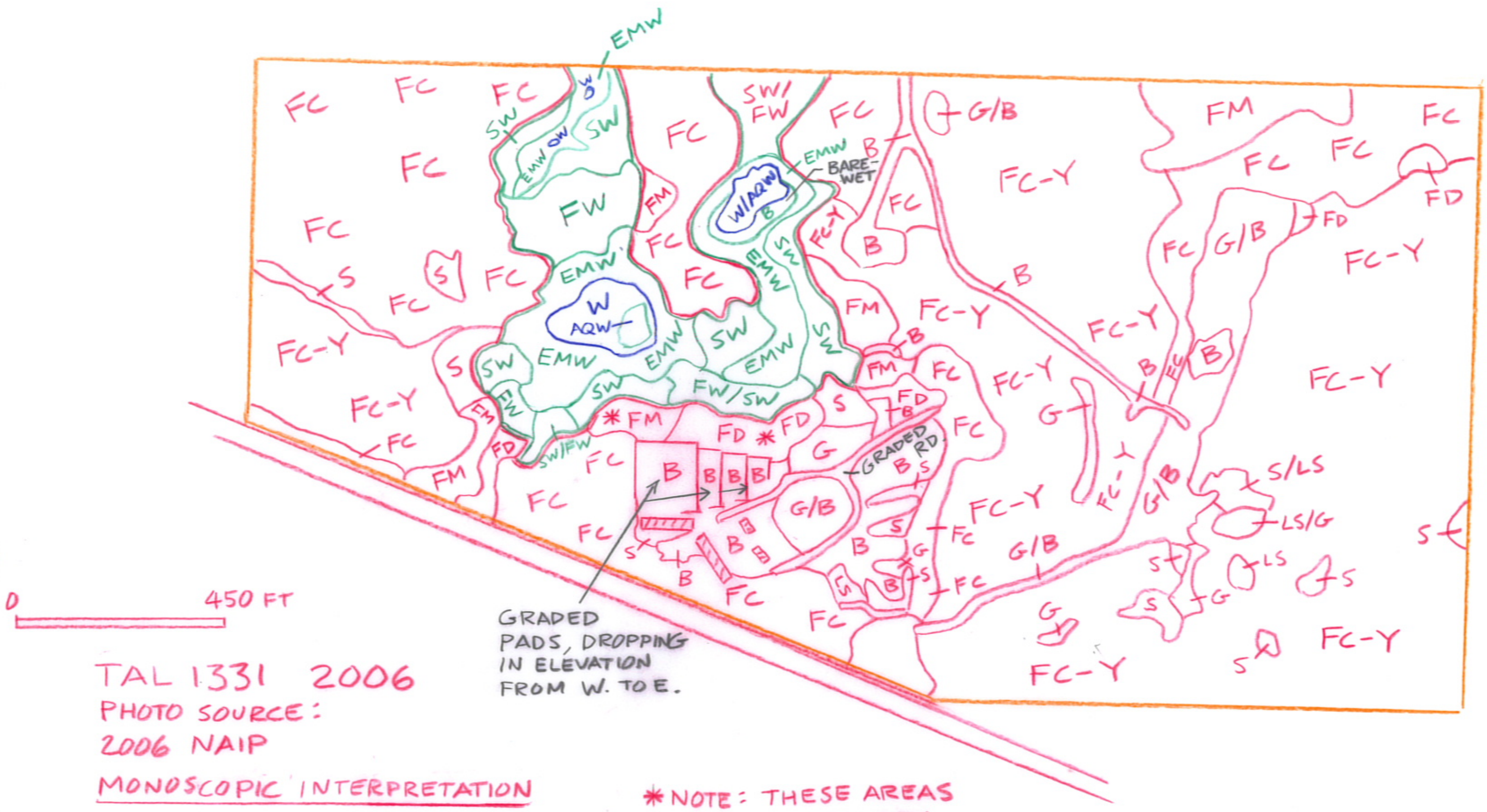
PHOTO SOURCE:
OLP-95, 8-50-111, 112



TAL 1331 7-3-03

PHOTO SOURCE: OL-C-03, 44-96-27, 44-96-28

* NOTE:
THESE AREAS OF CLOSED CANOPY FOREST AND SHRUB MAY CONTAIN SOME FOREST AND SHRUB WETLAND

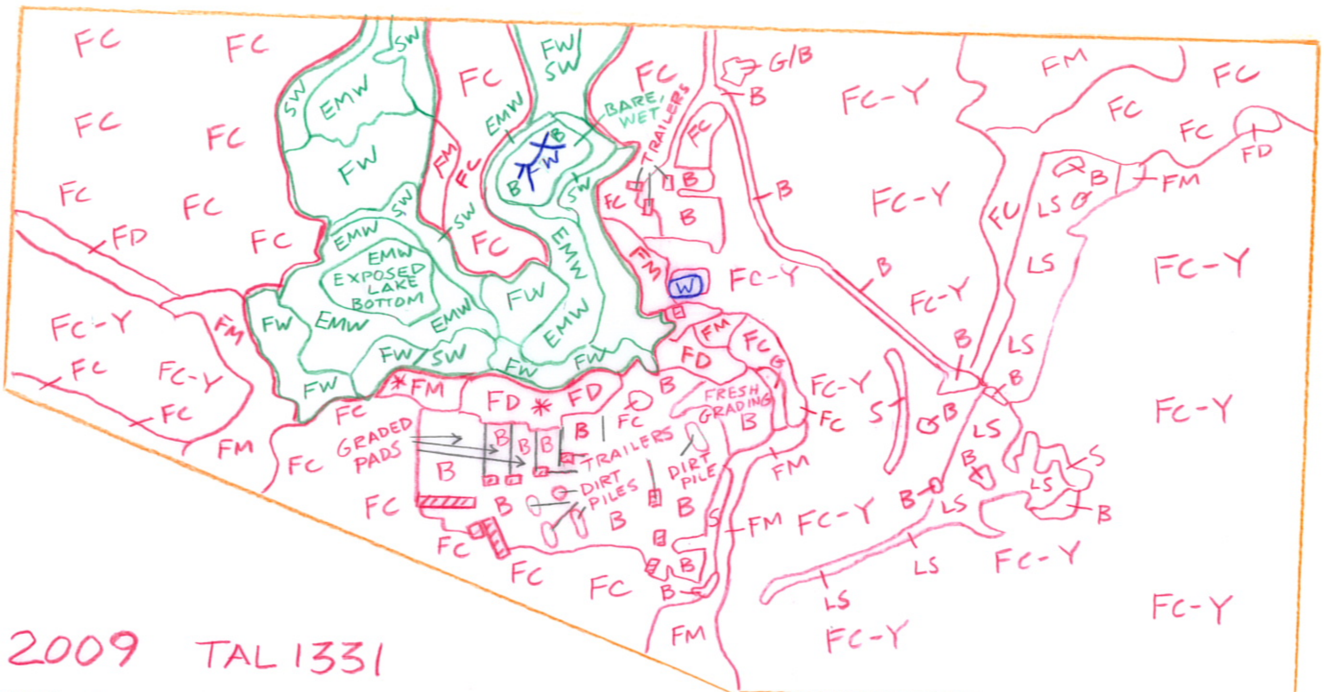


TAL 1331 2006

PHOTO SOURCE:
2006 NAIP

MONOSCOPIC INTERPRETATION

* NOTE: THESE AREAS
OF CLOSED CANOPY
FOREST MAY CONTAIN
FORESTED WETLAND



2009 TAL 1331

PHOTO SOURCE: 2009 NAIP

MONOSCOPIC INTERPRETATION

* NOTE: THESE AREAS OF CLOSED CANOPY FOREST MAY CONTAIN SOME FORESTED WETLAND

APPENDIX D

Soil Test Pits in Core Developed Area (Kitsap County Staff and Talasaea Consultants 20 January 2011)

January 20, 2011 KRRC site visit

Shawn Alire/Doug Frick

Test pit #1--------done with Bill Shields, 30” deep, all fill

Test pits#2-#8---done with Bill Shields, 30” plus deep, as pits move to the east the fill becomes deeper.

Test pit #9--------done with Doug Frick, 30” +deep, gravel at 25-26”, above that all sand, thinly bedded salt and pepper sand

Test pit #10-------done with Doug Frick, 30”+ deep, 9” down layer of clay, no vegetation

Test pit #11-------done with Doug Frick, 30” + deep, ground water observed

Test pit #12-------done with Doug Frick, native sand, no fill, 30” deep

Test pit #13-------done with Doug Frick, 24-30” organic content found, dark brown gravelly sand

Test pit #14-------done with Doug Frick, 30” deep, native, no evidence of fill over native

Test pit #15-------done with Doug Frick, 30” deep, native gravelly sand

Test pit #16-------done with Doug Frick, 30” deep, native gravelly sand

Test pits #17------done with Doug Frick, 30” deep, 24” plus of fill, color and texture change

A 3 person camera crew (Dennis Graham, Ron Barnett, and Adrian Eckstrom from Kitsap County Public Works) TV’d the twin 24” pipes that run to the north through the 175 yard shooting range. The pipes were found to be 475 feet long. On the day of the visit there was no flow entering the inlets and the outfalls were approximately ½ full. Over 200’ of the pipes were ½ filled with stormwater. After further examination the pipe was experiencing tail water conditions associated with the wetland.

I have provided calculations of pipe capacities using FlowMaster v5.13 software. Full flow capacity for a 24” ADS circular pipe is 19.57 cfs and for a 42” concrete circular pipe it is 113.69 cfs.

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15
13
17
16
12
10
9
← 24" PIPES
475' LONG
8
2
1
nagery Date: Jun 12, 2010
47°36'29.79" N
122°44'44.59" W
elev 383 ft

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APPENDIX E

Critical Areas Plans
(Talasaea Consultants, 2011)

Sheet W1.0: Existing Conditions Overview Plan
(Identified in Report as Figure 4)

Sheet W1.1: Critical Area Impacts
(Identified in Report as Figure 5)

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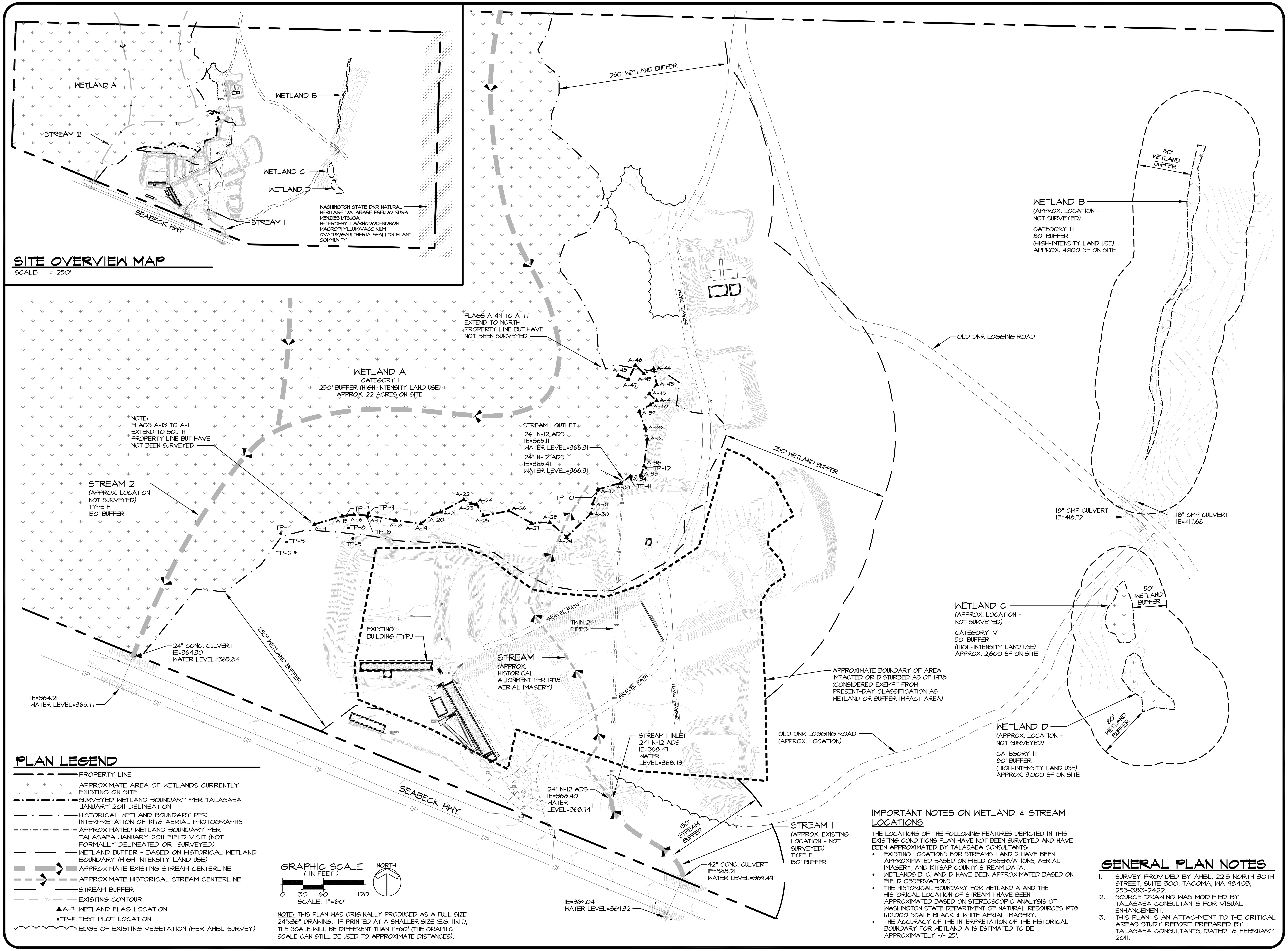

PLAN LEGEND

- PROPERTY LINE
- APPROXIMATE AREA OF WETLANDS CURRENTLY EXISTING ON SITE
- SURVEYED WETLAND BOUNDARY PER TALASAEA JANUARY 2011 DELINEATION
- HISTORICAL WETLAND BOUNDARY PER INTERPRETATION OF 1978 AERIAL PHOTOGRAPHS
- APPROXIMATED WETLAND BOUNDARY PER TALASAEA JANUARY 2011 FIELD VISIT (NOT FORMALLY DELINEATED OR SURVEYED)
- WETLAND BUFFER - BASED ON HISTORICAL WETLAND BOUNDARY (HIGH INTENSITY LAND USE)
- APPROXIMATE EXISTING STREAM CENTERLINE
- APPROXIMATE HISTORICAL STREAM CENTERLINE
- STREAM BUFFER
- EXISTING CONTOUR
- ▲A-# WETLAND FLAG LOCATION
- •TP-# TEST PLOT LOCATION
- EDGE OF EXISTING VEGETATION (PER AHBL SURVEY)

NOTE: THIS PLAN WAS ORIGINALLY PRODUCED AS A FULL SIZE 24"x36" DRAWING. IF PRINTED AT A SMALLER SIZE (E.G. 11x17), THE SCALE WILL BE DIFFERENT THAN 1"=60' (THE GRAPHIC SCALE CAN STILL BE USED TO APPROXIMATE DISTANCES).

IMPORTANT NOTES ON WETLAND & STREAM LOCATIONS

THE LOCATIONS OF THE FOLLOWING FEATURES DEPICTED IN THIS EXISTING CONDITIONS PLAN HAVE NOT BEEN SURVEYED AND HAVE BEEN APPROXIMATED BY TALASAEA CONSULTANTS:

- EXISTING LOCATIONS FOR STREAMS 1 AND 2 HAVE BEEN APPROXIMATED BASED ON FIELD OBSERVATIONS, AERIAL IMAGERY, AND KITSAP COUNTY STREAM DATA.
- WETLANDS B, C, AND D HAVE BEEN APPROXIMATED BASED ON FIELD OBSERVATIONS.
- THE HISTORICAL BOUNDARY FOR WETLAND A AND THE HISTORICAL LOCATION OF STREAM 1 HAVE BEEN APPROXIMATED BASED ON STEREOSCOPIC ANALYSIS OF WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES 1978 1:12,000 SCALE BLACK & WHITE AERIAL IMAGERY.
- THE ACCURACY OF THE INTERPRETATION OF THE HISTORICAL BOUNDARY FOR WETLAND A IS ESTIMATED TO BE APPROXIMATELY +/- 25'.

GENERAL PLAN NOTES

1. SURVEY PROVIDED BY AHBL, 2215 NORTH 30TH STREET, SUITE 300, TACOMA, WA 98403; 253-383-2422.
2. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
3. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS STUDY REPORT PREPARED BY TALASAEA CONSULTANTS, DATED 18 FEBRUARY 2011.

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast - Woodinville, Washington 98077
Bus (425) 861-7550 - Fax (425) 861-7549

CRITICAL AREAS STUDY
EXISTING CONDITIONS PLAN
KITSAP RIFLE AND REVOLVER CLUB
BREMERTON, WASHINGTON

Revisions	Date	By

Date 2-18-2011
Scale AS NOTED
Designed ATD
Drawn ATD
Checked AO
Approved BS

Project # TAL-1331

Sheet # W1.0

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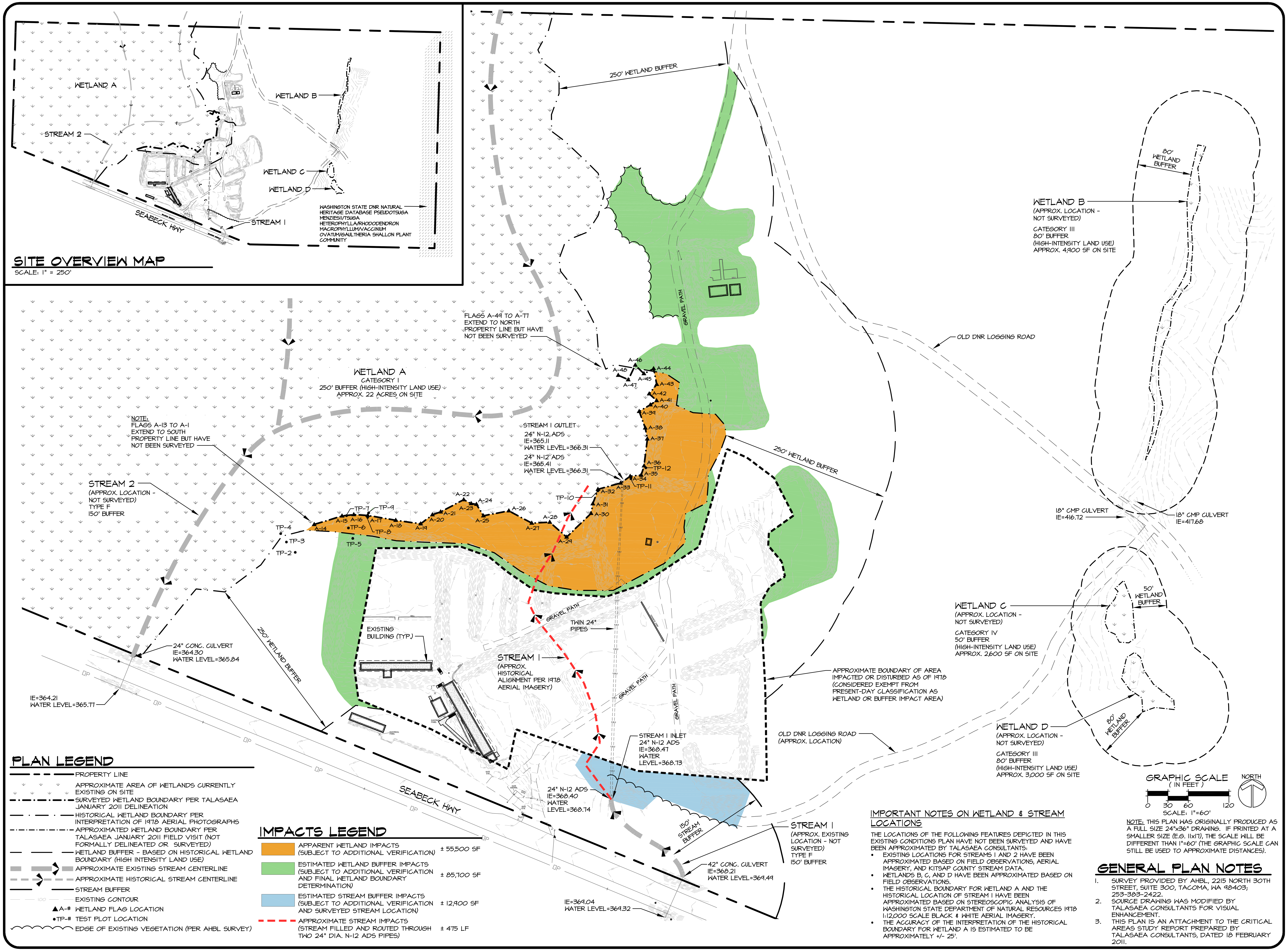

PLAN LEGEND

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- APPROXIMATE HISTORICAL STREAM CENTERLINE
- STREAM BUFFER
- 100 EXISTING CONTOUR
- ▲A-# WETLAND FLAG LOCATION
- •TP-# TEST PLOT LOCATION
- EDGE OF EXISTING VEGETATION (PER AHBL SURVEY)

IMPACTS LEGEND

APPARENT WETLAND IMPACTS (SUBJECT TO ADDITIONAL VERIFICATION)	± 55,500 SF
ESTIMATED WETLAND BUFFER IMPACTS (SUBJECT TO ADDITIONAL VERIFICATION AND FINAL WETLAND BOUNDARY DETERMINATION)	± 85,700 SF
ESTIMATED STREAM BUFFER IMPACTS (SUBJECT TO ADDITIONAL VERIFICATION AND SURVEYED STREAM LOCATION)	± 12,900 SF
APPROXIMATE STREAM IMPACTS (STREAM FILLED AND ROUTED THROUGH TWO 24" DIA. N-12 ADS PIPES)	± 475 LF

IMPORTANT NOTES ON WETLAND & STREAM LOCATIONS

THE LOCATIONS OF THE FOLLOWING FEATURES DEPICTED IN THIS EXISTING CONDITIONS PLAN HAVE NOT BEEN SURVEYED AND HAVE BEEN APPROXIMATED BY TALASAEA CONSULTANTS:

- EXISTING LOCATIONS FOR STREAMS 1 AND 2 HAVE BEEN APPROXIMATED BASED ON FIELD OBSERVATIONS, AERIAL IMAGERY, AND KITSAP COUNTY STREAM DATA.
- WETLANDS B, C, AND D HAVE BEEN APPROXIMATED BASED ON FIELD OBSERVATIONS.
- THE HISTORICAL BOUNDARY FOR WETLAND A AND THE HISTORICAL LOCATION OF STREAM 1 HAVE BEEN APPROXIMATED BASED ON STEREOSCOPIC ANALYSIS OF WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES 1978 1:12,000 SCALE BLACK & WHITE AERIAL IMAGERY.
- THE ACCURACY OF THE INTERPRETATION OF THE HISTORICAL BOUNDARY FOR WETLAND A IS ESTIMATED TO BE APPROXIMATELY +/- 25'.

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CRITICAL AREAS STUDY
APPARENT CRITICAL AREAS IMPACTS PLAN
KITSAP RIFLE AND REVOLVER CLUB
BREMERTON, WASHINGTON

Revisions	Date	By

Date 2-18-2011
Scale AS NOTED
Designed ATD
Drawn ATD
Checked AO
Approved BS

Project # TAL-1331

Sheet # W1.1

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D

Kitsap County Rifle and Revolver Club Preliminary Wetland Delineation and Fish and Wildlife Habitat Assessment Technical Memorandum

Soundview Consultants LLC

Environmental, Natural Resource, and Land Use Consulting
Comprehensive Assessment, Planning, and Permitting Services

2907 Harborview Drive
Gig Harbor, WA 98335
Phone: 253.514.8952
Fax: 253.514.8954

Technical Memorandum

To:	**Marcus Carter** **Kitsap County Rifle and Revolver Club**	File Number: **1061.0001**
From:	**Jeremy Downs, Soundview Consultants LLC**	Date: **May 26, 2011**
Re:	**Kitsap County Rifle and Revolver Club Preliminary Wetland Delineation and Fish and Wildlife Habitat Assessment**	

Dear Marcus,

Soundview Consultants LLC was hired by Kitsap County Rifle and Revolver Club (Club) to conduct a wetland and fish and wildlife habitat areas study and provide ongoing technical support for resolution of alleged critical areas violations at the Club's facility located at 4900 Seabeck Highway Northwest in Bremerton, Washington (Subject Property). The subject property is situated in part of the Southeast ¼ of the Southwest ¼ and part of the Southwest ¼ of the Southeast ¼ of Section 36, Township 25 North, Range 1 West W.M., within an unincorporated portion of Kitsap County, Washington (Kitsap County Tax Parcel Number 362501-4-002-1006). The primary study area included the area from the east property boundary to the area immediately west of the active shooting range. Two depressional areas and two drainage corridors were identified on the eastern portion of the property and two wetlands were identified west of the active range. These areas are identified in the Site Map in Appendix A (Appendix A).

This Technical Memorandum has been prepared as a precursor to final assessment efforts in connection with mediation. A summary of the current assessment efforts is presented along with preliminary site management recommendations. A full assessment report, compliance study, and mitigation plan will be prepared following completion of our investigation and compliance negotiation with Kitsap County, Washington Department of Fish and Wildlife (WDFW), Washington Department of Ecology (WDOE), and the U.S. Army Corps of Engineers (Corps) and development of civil engineering plans.

1.0 BACKGROUND

This study, which consists of field investigations and critical areas assessments by Soundview Consultants[LLC], is being conducted according to the standards set forth in the Kitsap County Code Title 19 and relevant State and Federal guidelines by Jeremy Downs, a Senior Wetland Scientist and Fisheries Biologist, and Jim Carsner, a certified Professional Wetland Scientist and Fisheries Biologist. Additional field support is being provided by Racheal Villa, a qualified Fisheries Biologist.

SVC was hired by the KRRC to evaluate allegations presented against the Club. These allegations, which include expansion of grand-fathered usage into new shooting areas; clearing and alteration of slopes/gradients without permitting; unpermitted clearing and filling of wetland areas and buffers with new berms and cleared areas; diversion of an on-site drainage into two 24 inch culverts; and voiding the grand-fathered non-conforming use in the Wooded Rural zone by engaging in commercial, and/or industrial activities. Additional allegations regarding range safety and public nuisance are not addressed in this study.

1.1 Background Research

Background data was obtained from various federal, state, and local agencies and private resources prior to conducting the site investigation. Data collected and reviewed prior to the site investigation included, but was not limited to, national and local wetland and other critical areas inventory maps, site topography and drainage basin data, Natural Resources Conservation Services soils data, Washington Department of Fish and Wildlife Priority Habitat and Species List, precipitation data, and orthophotographic information.

A preliminary inventory of potential critical areas was made during review of the background documents and research. Special emphasis was given to investigation of potential critical areas closest to Club operations during the site inspections.

National Wetlands Inventory

The U.S. Fish and Wildlife Service's (USFWS) National Wetlands Inventory (NWI) map identifies a large wetland complex in the northwest portion of the subject property. The wetlands identified are Palustrine Emergent, Palustrine Forested/Scrub-Shrub wetlands as well as two freshwater ponds within this wetland complex area. Appendix B contains the USFWS NWI map.

Local Critical Areas Inventory

The Kitsap County Buildable Lands map identifies potential wetland areas in the northwest portions of the subject property. Hydric soils and Frequently Flooded Areas, as mapped by FEMA Flood Zones, are also identified on the map within the northwest portions of the subject property. The eastern half of the subject property contains areas identified as Moderate Hazard Areas, containing either moderate slopes; soils classified as "highly/potentially highly erodible"; soils with springs or groundwater seepage; and/or soils subject to liquefaction from earthquakes. In addition, fish-bearing streams (Type F) are identified, crossing from offsite in the north to offsite in the south under Seabeck Highway Northwest. Appendix B contains the Kitsap County Buildable Lands maps.

Topography and Drainage Basin

The U.S. Geographic Survey (USGS) topographic map and Kitsap County LIDAR data of the vicinity of the subject property identifies the depressions located onsite, which includes most of the property, with a gradual elevation rise towards the northeastern portions of the site. Small hills offsite to both the north and southeast are approximately 500 feet in elevation, while onsite depression is at approximately 200 feet in elevation. Water flows offsite to the southwest through two culverts located under Seabeck Highway Northwest. Appendix B contains the USGS topographic map.

Soils

The Natural Resources Conservation Service (NRCS) Soil Survey of Kitsap County (McMurphy, 1980), identified several soil types on the subject property. Table 1 lists the soils identified on-site by the NRCS. Appendix B contains the NRCS soils map.

Table 1. Soil types mapped by NRCS on the subject property.

Unit #	Series	Slope (%)	Hydric	Hydric Inclusions
1	Alderwood very gravelly sandy loam	0 - 6	No	McKenna, Norma, Shalcar
2	Alderwood very gravelly sandy loam	6 – 15	No	None
3	Alderwood very gravelly sandy loam	15 – 30	No	Wet spots
11	Grove very gravelly sandy loam	0 – 3	No	Wet spots
32	McKenna gravelly loam	--	Yes	Norma, Unnamed
44	Ragnar fine sandy loam	0 – 6	No	Wet spots
45	Ragnar fine sandy loam	6 – 15	No	Wet spots
55	Shelton extremely gravelly sandy loam	0 – 6	No	McKenna, Wet spots
64	Water	NA	NA	NA

Alderwood series soils are considered non-hydric and are described as moderately deep and well drained soils formed in glacial till and found on uplands. When found in depressions, these soils are associated with hydric inclusions of McKenna, Norma, and Shalcar series. Permeability of Alderwood series soils is moderately rapid and depth to hardpan ranges between 20 inches to 40 inches. A typical pedon of the Alderwood series is: 0.0 inch to 0.5 inch is a brown gravelly sandy loam (10YR 5/3); and 0.5 inch to 22 inches is a brown very gravelly loam (10YR 4/3). The substratum to a depth of 60 inches or more is grayish brown gravelly sandy loam that is weakly-silica-cemented in the upper part. Depth to the silica-cemented hardpan ranges from 20 to 40 inches.

Grove series soils are considered non-hydric and described as deep, somewhat excessively drained soils formed in glacial outwash and found on outwash plains and terraces. There are no reported hydric inclusions for this soil series. A typical pedon of the Grove series is: 0.0 inch to 2 inches is a dark grayish brown very gravelly sandy loam (10YR 4/2); 2 inches to 12 inches is a brown very gravelly sandy loam (7.5YR 4/4); 12 inches to 17 inches is a light brown very gravelly sandy loam (7.5 YR 6/4); and 17 inches to 30 inches in a brown extremely gravelly loamy sand (10YR 4/3). The substratum is olive gray very gravelly sand to a depth of 60 inches or more.

McKenna series soils are considered hydric and described as moderately deep, poorly drained soils formed in glacial till and found in upland and terrace depressions along drainageways. A typical pedon of the McKenna series is: 0.0 inch to 6 inches is a dark reddish brown gravelly loam (5YR 2/2); 6 inches to 8 inches is a dark grayish brown gravelly silt loam (10YR 4/2); 8 inches to 16 inches is a grayish brown very gravelly loam (10YR 5/2); and 16 inches to 28 inches is a dark grayish brown gravelly loam (10YR 4/2) with medium distinct strong brown mottles (7.5YR 5/8). The lower part of the substratum to a depth of 60 inches is mottled, compacted, gravelly silty clay glacial till. Depth to the compact glacial till ranges from 30 to 40 inches.

Norma series soils are considered hydric and described as a deep poorly drained soils formed in mixed glacial alluvium and found on till plain depressions along drainageways in uplands. A typical pedon of the Norma series is: 0.0 inch to 8 inches is a very dark grayish brown fine sandy loam (10YR 3/2); 8 inches to 13 inches is a light olive brown find sandy loam (2.5Y 5/2) with medium distinct strong brown (7.5YR 5/8) and light olive brown (2.5Y 5/4) mottles. The substratum to a depth of 60 inches is mottled, olive gray and dark yellowish brown stratified sandy loam, clay loam, and loamy sand.

Ragnar series soils are considered non-hydric and described as deep, well drained soils that formed in sandy glacial outwash and found on terraces and tolling uplands. A typical pedon of the Ragnar series is: 0.0 inch to 4 inches is a dark brown fine sandy loam (7.5YR 3/3) an 4 inches to 23 inches is a dark yellowish brown fine sandy loam (10YR 4/4). The substratum to a depth of 60 inches is grayish brown and light brownish gray loamy sand.

Shalcar series soils are considered hydric and are described as deep, very poorly drained soils that formed in organic material over alluvium, found in valleys and upland depressions. A typical pedon of the Shalcar series is: 0.0 inch to 8 inches is a very dark brown sapric material (10YR 2/2) with many large prominent strong brown mottles ((7.5YR 5/6) and 8 inches to 32 inches is a very dark brown sapric material (10YR 2/2) with dark gray pocket of fine sand (5Y 4/1). The underlying material to a depth of 60 inches is grayish brown stratified silt loam, silty clay loam, sandy loam, and loamy sand.

Shelton series soils are considered non-hydric and described as moderately deep, moderately well drained soils formed in glacial till and found on moraines and till plains. A typical pedon of the Shelton series is: 0.0 inch to 3 inches is a dark reddish brown very gravelly sandy loam (5YR 3/3); 3 inches to 18 inches is a dark reddish brown very gravelly sandy loam (5YR 3/4); and 18 inches to 25 inches is a dark brown very gravelly sandy loam (7.5YR 3/4). The substratum is weakly-silica-cemented, very compact glacial till to a depth of 60 inches or more. Depth to hardpan ranges from 20 to 35 inches.

Precipitation

Local precipitation for two weeks prior to primary site investigations was almost twice the normal amount, or 190 percent of normal with 4.4 inches of precipitation by mid-March of 2011 (please see Table 2). Precipitation recorded for the water year on both of the primary site visit dates show amounts in excess of 120 percent of normal. Precipitation data presented in Table 2 includes data observed on the day of primary data collection efforts, the day before data collection, and precipitation for the water year (observed precipitation from October 22, 2010 to January 19, 2011). Normal precipitation data is taken from observed precipitation amounts averaged from 1971 to 2000. Precipitation data was taken from the station at SeaTac Airport in SeaTac, Washington, and presented in the National Oceanographic and Atmospheric Administration's (NOAA) website for the National Weather Service Forecast Office.

Table 2. Precipitation Summary

Time	Date of Site Visit	Normal	Observed	% of Normal
Day of[1]	1/19/2011	0.16	0.00	0
	3/17/2011	0.12	trace	<1
Day Before[1]	1/19/2011	0.16	0.08	50
	3/17/2011	0.12	0.09	75
1 Week Prior[1]	1/19/2011	--[2]	2.76	--
	3/17/2011	0.86	1.32	153
2 Weeks Prior[1]	1/19/2011	--	3.77	--
	3/17/2011	1.77	3.64	205
Month[1]	12/2010	5.62	8.69	155
	1/19/2011	3.21	3.80	118
	3/17/2011	2.30	4.44	190
Year to Date[1]	1/19/2011	3.21	3.80	118
	3/17/2011	11.61	12.48	107
Water Year[1]	1/19/2011	17.92	22.78	127
	3/17/2011	26.32	31.46	120

1. Data obtained from NOAA weather station at SeaTac Airport not numbered. (http://www.weather.gov/climate/index.php?wfo=sew).
2. -- means no data available.

It is relevant to this investigation that precipitation levels were above normal and that 2.76 inches of precipitation fell the week prior and 3.77 inches of precipitation fell the two weeks prior to the January 19, 2011 site investigation. In addition, precipitation for the month, year-to-date, and water year were also above normal levels. These higher than normal precipitation levels also suggests that the water table will be higher than normal, which requires significantly closer examination of the area in order to make an accurate determination of wetland jurisdiction and stream conditions.

Priority Habitats and Species

Washington Department of Fish and Wildlife's (WDFW) Priority Habitats and Species (PHS) maps identify the nearest bald eagle nest located approximately over a mile from the subject property. Palustrine wetlands are mapped in the northwest portion of the site, and the Wildcat Creek main stem, located offsite approximately one half mile south of the subject property, is identified as priority fish habitat, containing Coho salmon, fall chum salmon, rainbow trout, resident cutthroat trout, and winter steelhead. Due to the sensitive nature of the PHS data and licensing agreements, these maps are not presented in this report.

Orthophotography

Aerial photographs taken from Google Earth over several dates between July 6, 1994 and June 11, 2010 have recorded a timeline of changes in the landscape within and around the subject property. Main Club activities are readily observed in developed and cleared areas in the southern and central portions of the property. Aerial photographs taken from Bing (2010) provide a higher resolution of targeted landscape features; however, these aerial photographs do not show the more recent changes that have occurred in northern areas of the subject property. These changes are discussed further in the Preliminary Results section of this technical memorandum (Section 2.0). Appendix B contains a series of aerial photographs of the vicinity of the subject property used in the investigations.

Supplemental Reports

Kitsap County employed a private consultant, Talasaea Consultants, Inc. (Talasaea), to conduct a separate site investigation and prepare a report on their findings. The February 18, 2011 *Critical Areas Study Report: Existing Conditions* of the Kitsap Rifle and Revolver prepared by Talasaea was included in the background review.

1.2 Site Investigation

Wetlands, drainages, and other potentially regulated fish and wildlife habitat within the subject property and/or within 250 feet of the southern property boundaries were delineated and assessed by qualified wetlands specialists during the winter and spring of 2010/2011 (primary site visits occurred on January 19, January 20, and March 17, 2011). Potentially regulated areas were inspected on multiple occasions with special emphasis given to the wetlands and drainages identified in the southern portions of the site. All wetland determinations were made using observable vegetation, hydrology, and soils in conjunction with data from the NWI, Kitsap County Geographic Information Services, USFWS, the NRCS Soil Survey, and various orthophotographic resources.

Wetland boundaries were determined using the routine approach described in the Washington State Wetlands Identification and Delineation Manual (Ecology, 1997) and

U.S. Army Corps of Engineers' Wetlands Delineation Manual (USACE, 1987) and modified according to the guidelines established in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (USACE, 2010).

Potential wetland boundaries and drainages nearest Club operations were identified and delineated between January 19 and January 20, 2011. To mark the boundary between wetlands and uplands, orange surveyor's flagging was labeled alpha-numerically and tied to vegetation or wood lath along the wetland boundary. To mark the points where data was collected, pink surveyor's flagging was labeled alpha-numerically and tied at each sampling location. The locations and features of each delineated wetland are shown in the map in Appendix A and the data sheets are contained in Appendix C.

Wetlands were classified using both the hydrogeomorphic (Brinson, 1993) and Cowardin (Cowardin, 1979) classification systems, and assessed using the Wetland Functions Characterization Tool for Linear Projects (WSDOT, 2000). Following classification and assessment, all wetlands were rated and categorized using the Washington State Wetlands Rating System for Western Washington – Revised (Hruby, 2004) and guidelines established in the Kitsap County Code Title 19.200. The completed wetlands ratings sheets are found in Appendix D.

The fish and wildlife habitat assessment was conducted by qualified fisheries biologists during the same site visits. Publicly available background data was queried for documented fish and wildlife observations and/or the presence of potentially regulated fish and wildlife habitat on or near the site. In addition, high-resolution aerial photography of the surrounding area was carefully examined. Visual observations using stationary and walking survey methods were utilized for both aquatic and upland habitats. Publically accessible upstream and downstream reaches of potential drainages were inspected offsite as well, for fish habitat suitability and potential migration barriers. Any special habitat features or signs of wildlife activity were noted, and these areas were thoroughly re-inspected during morning, midday, and evening hours. Centerlines of potentially regulated drainage features were marked with orange surveyor's flagging, labeled alpha-numerically and tied to vegetation or wood lath. The locations of the identified drainages are shown in the map in Appendix A.

2.0 Preliminary Results

The southern property boundary abuts Seabeck Highway Northwest. Surrounding areas to the north, east, and west are forested parklands or Federal (Navy) military properties, with a single family residence north of Seabeck Highway Northwest and abutting the southeast corner of the subject property. Areas south of Seabeck Highway Northwest consist of natural forested areas and single-family residences. The general topography of the site consists of a broad flat depression encompassing the western half of the site with a gradual rise in elevation in the eastern half of the site. Nearby hills surround the subject property to the northeast and southeast. Water flows onto the site primarily from a wetland and stream complex to the north and an ephemeral drainage to the southeast. Water exits the site in the southwest corner of the subject property through two small culverts under Seabeck Highway.

Upland portions of the site are dominated by mixed deciduous/coniferous forest of Douglas fir, western red cedar, black cottonwood, and red alder over an understory of sword fern, salal, cascara, salmonberry, and evergreen huckleberry. The cleared area near the east center of the subject property is dominated by Scotch broom. Developed portions of the subject property are un-vegetated, contain sparse grasses and forbs or are dominated by Himalayan blackberry and Scotch broom.

Our site investigations and preliminary assessments have identified two on-site wetlands (Wetlands A and B), one ephemeral drainage (Drainage Z) near the south property boundary, one split drainage associated with Wetlands A and B (Drainage Y), one split seasonal drainage on the eastern portion of the subject property (Drainage X), and two depressions on the eastern portion of the subject property that appear to be developing wetland conditions, but do not appear to satisfy regulatory criteria at this time (Figure 1a-1c). Drainage X flows southward and off-site and appears to flow under Seabeck Highway approximately 0.2 mile east of the KRRC entrance then westerly in series of meanders and into Drainage Z south of Seabeck Highway.

A final wetland delineation and fish and wildlife habitat assessment report along with a preliminary mitigation plan will be completed as part of an after-the-fact permitting and compliance package agreed upon by the Club and Kitsap County during recent mediation. At this time, all critical areas determinations and assessments are subject to additional and ongoing investigations.

2.1 Buffers

Wetland buffers have a base buffer width depending on the cumulative rating score and are modified by the habitat function score and land use intensity (KCC: Chapter 19.200.220). Land use intensity for the KRRC would be considered a high intensity use, which could result in a buffer width increase. The exception is buffer areas impacted prior to implementation of the Kitsap County Critical Areas Ordinance, which is considered to be 1995.

Stream buffers are dependent on the stream type (KCC: 19.300.315). Drainage from Wetland A and Wetland B has been classified as Type F (fish bearing) waters with a 150-foot wide buffer that would extend landward from the ordinary high water mark. Other stream types that may be present on the KRRC property are Type Np (non-fish bearing, perennial) waters and Type Ns (non-fish bearing, seasonal) waters, both requiring a 50-foot wide buffer.

2.2 Wetlands

Wetlands are separated into separate Assessment Units (AUs) based on changes in the water regime. *Wetlands in depressions along stream or river corridors may contain constrictions where the wetland narrows between two or more depressions. The key consideration is the direction of flow through the constriction. … If the flow is unidirectional, down-gradient, with an elevation change from one part to the other* [as occurs on this site]*, then a separate unit should be created.* (Hruby 2004, page 13). The site investigation identified two wetlands on the subject property (Wetlands A & B). Wetland A extends offsite to the north, and Wetland B appears to be contained on-site (Appendix A). Only the eastern on-site boundaries of these wetlands nearest Club facilities and post-1995 disturbed areas were delineated. A short drainage and distinct elevation change located at an historic beaver dam connects Wetlands A and B. The beaver dam and drainage establishes a clear hydrologic break in the wetlands that allows Wetlands A and B to be rated as separate assessment units. Wetlands A and B both contain indicators of wetland hydrology, hydric soils, and a predominance of hydrophytic vegetation. Appendix C contains data forms used in the site investigation to assist with wetland and upland area identification. Appendix D includes wetland rating forms. Tables 3 and 4 summarize the wetlands identified on the subject property.

Wetland A

Wetland A is located in the northwestern portions of site and approximately one-third of the wetland appears to be on-site (map Appendix A). This wetland has been estimated to be approximately 0.40 acre on-site. Wetland A is generally dominated by Pacific crabapple and willow over an understory of hardhack, salmonberry and slough sedge. The wetland is classified as a Palustrine Scrub-Shrub, Seasonally Flooded/Saturated Wetland modified by beaver activity. A well-established beaver dam clearly separates Wetland A from Wetland B (Photograph 1). Wetland A is a Category II depressional wetland scoring 23 Habitat Function points.

The base buffer width is 100 feet and assuming the KRRC would be considered high-impact designated land use, the buffer width would be increased to 150 feet. A small southeastern portion of Wetland A buffer may have been cleared and graded as part of ongoing Club operations. In addition, two shipping containers appear to have been placed in the wetland buffer shared between Wetlands A and B (per KCC 17.110.692 or KCC 17.455.090(I)). Table 3 provides a detailed summary of Wetland A.

Wetland B

Wetland B is located to the south of Wetland A and in a western portion of the site (map Appendix A). Wetland B is dominated by open water, black cottonwood, hardhack, and salmonberry with sparse groundcover. The wetland consists of multiple classes of vegetative cover and hydrologic regimes and is classified as a Palustrine Forested/Scrub-Shrub/ Aquatic Bed/Seasonally Flooded/Saturated Wetland.

Wetland B drains through a 24-inch diameter concrete culvert under Seabeck Highway and approximately 600 feet west of the Club entrance. A second, 18-inch diameter corrugated steel culvert, located approximately 200 feet west and upslope of the concrete culvert, is used as an added overflow drainage way from Wetland B. The 24-inch culvert is at an elevation of 364.21 feet and during the January 2010 topographic survey performed by AHBL of Tacoma; Wetland B elevation was determined to be approximately 366 feet. During a March 17, 2011 site visit, water was observed to be at approximately 369 feet (approximately 4 feet below the road elevation of 373 feet). The high water level observed at the outlet culvert under Seabeck Highway during the March 17 site visit suggests the concrete culvert is undersized for the natural flow from this wetland and creates a higher than normal water levels within Wetland B, which, over time, would tend to artificially expand the boundary of this wetland.

Wetland B is a Category II depressional wetland scoring 27 Habitat Function points and is likely subject to a 150-foot wetland buffer assuming high impact designated land use. The southeast buffer areas of Wetland B are interrupted by historically constructed shooting berms along much of the perimeter nearest the Club facilities. The addition of two 24-inch culverts placed through an earthen berm and into Wetland B may have a limited effect on the wetland and buffer. Table 4 provides a summary of Wetland B.

Photograph 1: Showing outfall from beaver dam separating Wetland A and Wetland B.

Table 3. Wetland A Summary.

WETLAND A – INFORMATION SUMMARY	
Location:	Northwestern Portion of Property

Local Jurisdiction	Kitsap County
WRIA	15
Ecology Rating[A]	II
Kitsap County Rating[B]	II
Kitsap County Buffer Width[C]	150 feet (100 feet base buffer width)
Estimated Wetland Size[D]	Approximately: 0.40 ac. on-site; approximate total: 1.7 ac.
Cowardin Classification[E]	PSSEb
HGM Classification[F]	Depressional Outflow
Wetland Data Sheet(s)	DP 1
Upland Data Sheet (s)	DP 2
Boundary Flag color	Orange

Dominant Vegetation	Wetland is dominated by Pacific crabapple, willow, salmonberry, hardhack, and slough sedge.
Soils	Grove very gravelly sandy loam, wetland does not match mapped unit.
Hydrology	Surface inundation, water marks, wetland drainage patterns, inundation visible on aerial imagery, and water-stained leaves. Small drainage over beaver dam at identified outlet on-site.
Rationale for Delineation	Areas of well defined inundation and hydrophytic vegetation. Upland areas were determined by distinct topographic rise (terrace) and a predominance of upland plant species such as Douglas fir, salal, and bracken fern.
Rationale for Local Rating	Local rating is based upon Ecology's current rating system.

Wetland Functions Summary	
Water Quality	Wetland A has a moderately high potential to retain sediments and pollutants from surface runoff of undeveloped upslope areas due to the retention capability and vegetative cover.
Hydrologic	Observed ponding during January site reconnaissance and critical area maps suggests the wetland retains water seasonally.
Habitat	Wildlife habitat functions provided by the wetland may include small and large mammal forage and cover, small bird forage and nesting, amphibian breeding and rearing.
Buffer Condition	The buffer surrounding Wetland A is predominately undisturbed second/third growth forest.

Notes:

A. Ecology rating according to Washington State wetland rating system for Western Washington – Revised Hruby (2004).
B. Kitsap County Code Chapter 19.200.
C. Recommended wetland buffer width according to Kitsap County Code Chapter 19.200.220
D. Only the eastern portion of the wetland boundary was delineated and surveyed.
E. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; Modifiers (-C, -E, -H, -x, et cetera) = Water Regime or Special Situations
F. Brinson, M. M. (1993).

Table 4. Wetland B Summary.

WETLAND B – INFORMATION SUMMARY	
Location:	Northwest Portion of Property

Local Jurisdiction	Kitsap County
WRIA	15
Ecology Rating[A]	II
Kitsap County Rating[B]	II
Kitsap County Buffer Width[C]	150 feet (125 feet for moderate habitat function)
Estimated Wetland Size[D]	Approximately 6.2 ac
Cowardin Classification[E]	PFO/SS/ABEh
HGM Classification[F]	Depressional Outflow
Wetland Data Sheet(s)	DP 5, 7, 8
Upland Data Sheet (s)	DP 3, 4, 6, 9
Boundary Flag color	Orange

Dominant Vegetation	Wetland is dominated by Pacific crabapple and willow over salmonberry, hardhack, and slough sedge.
Soils	Grove very gravelly sandy loam, wetland does not match mapped unit.
Hydrology	Surface inundation, water marks, wetland drainage patterns, inundation visible on aerial imagery, and water-stained leaves. Inlet is at the beaver dam from Wetland A and a tributary of Wildcat Creek, and outlet is two small concrete culverts under Seabeck Highway Northwest.
Rationale for Delineation	Areas of defined inundation. Upland areas were determined by topographic rise and a predominance of upland plant species such as Douglas fir, western red cedar, salal, and sword fern.
Rationale for Local Rating	Local rating is based upon Ecology's current rating system.

Wetland Functions Summary	
Water Quality	Wetland B has a moderately high potential to retain sediments and pollutants from surface runoff of undeveloped upslope areas due to the retention capability and vegetative cover.
Hydrologic	Observed ponding during January site reconnaissance and critical area maps suggests the wetland retains water and may be seasonally ponded and permanently saturated. Restricted outlet helps wetland retain stormwater runoff during periods of high precipitation.
Habitat	Wildlife habitat functions provided by the wetland may include small and large mammal forge and cover, small bird forage and nesting, amphibian breeding and rearing.
Buffer Condition	Portions of the buffer to the southeast are interrupted by Club facilities; the remainder of buffer surrounding Wetland B is predominately undisturbed second/third growth forest.

Notes:

A. Ecology rating according to Washington State wetland rating system for Western Washington – Revised Hruby (2004).

B. Kitsap County Code Chapter 19.200.

C. Recommended wetland buffer width according to Kitsap County Code Chapter 19.200.220

D. Only the eastern portion of the wetland boundary was delineated and surveyed.

E. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; Modifiers (-C, -E, -H, -x, et cetera) = Water Regime or Special Situations

F. Brinson, M. M. (1993).

2.2 Drainages

The site investigation identified three drainages/streams on-site; an ephemeral drainage (Drainage Z) located east of the Club access, a perennial drainage (Drainage Y) located west of the active range area and drains Wetland B off-site, and a split seasonal drainage (Drainage X) located northeast of the clubhouse. Two of these drainages (Drainage X and Z) may in fact be one system that crosses Seabeck Highway several times; however, this connection could not be verified at this time as access was limited to public roads and the KRRC property.

Drainage Z

Drainage Z enters the subject property from the southeast through a 42-inch culvert under Seabeck Highway Northwest (Photograph 2). This culvert is located approximately 200 feet east of the Club entrance. This drainage flows from the 42-inch culvert into a defined channel for approximately 150 feet where water then enters two 24-inch culverts that drain into the eastern portion of Wetland B (Photograph 3).

Drainage Z was determined to be ephemeral due to lack of consistent flows observed during multiple site inspections. Water was observed flowing within the channel on January 19 during wet weather but not on January 20 once rainfall ceased. Water was not observed flowing within the drainage again until mid-March following significant rainfall. The current assessment of Drainage Z shows this drainage does not contain suitable fish habitat or consistent flows necessary to support fish migration and is likely a Type Ns (Non-Fish bearing, Seasonal Drainage). Drainage Z would likely require a standard 50-foot wide buffer.

Photograph 2: Showing 42-inch inlet culvert east of the Club entrance.

Photograph 3: Showing the two 24-inch culverts that drain into Wetland B.

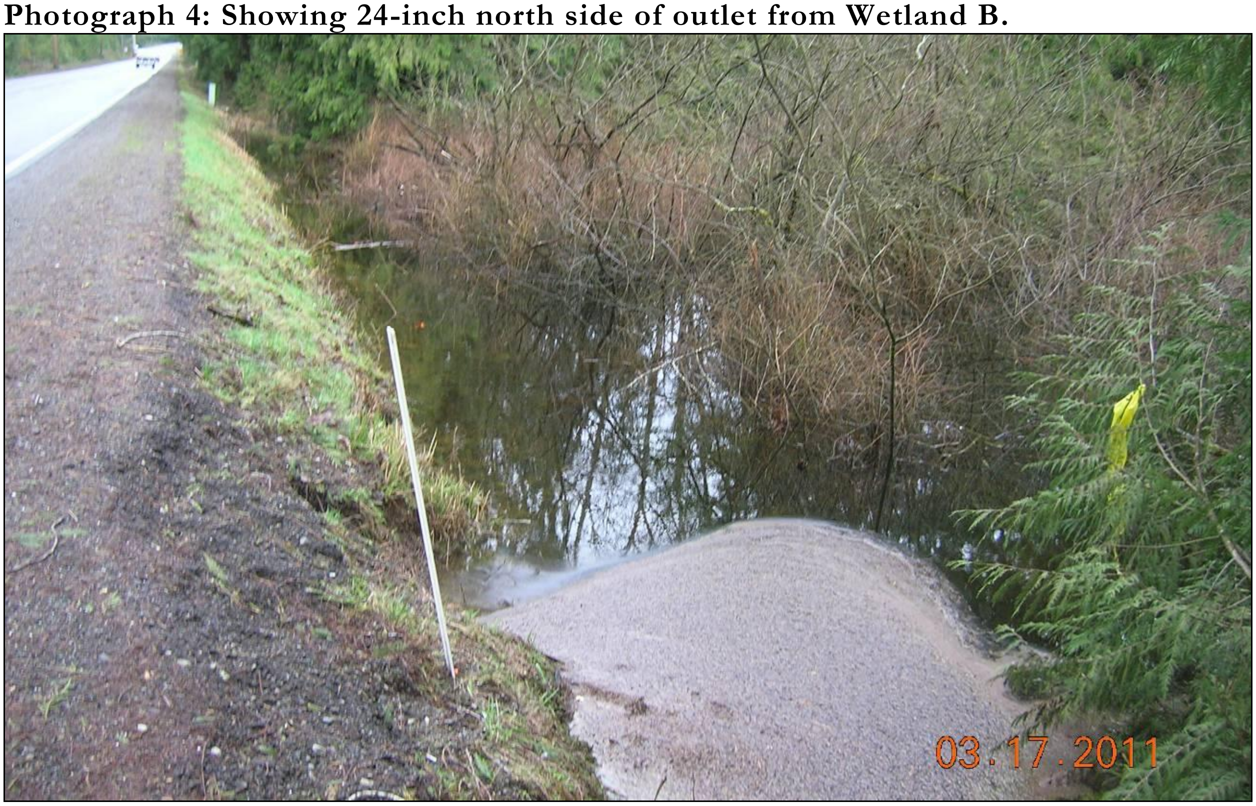
Drainage Y

Drainage Y originates off-site and enters the property from the north. This drainage is a tributary to Wildcat Creek, and considered perennial, flowing south through Wetland A, then merges with another from the west in Wetland B, exiting the site through a 24-inch concrete culvert placed under Seabeck Highway Northwest (Appendix A). The culverted outfall is approximately 200 feet west of the Club entrance. Photograph 4 shows this culvert's northern outlet from Seabeck Highway. Photograph 5 presents the outfall of Drainage Y from the southern side of the Seabeck right of way.

An additional 18-inch corrugated steel culvert that serves as an over flow drainage during high water periods is located approximately 200 feet west and upslope of the 24-inch culvert (Photograph 6). This smaller culvert is likely an overflow when storm events surge, increasing the storage capacity within the wetland system. The presence of this additional culvert, upslope of the main drainage way suggests the 24-inch culvert may be undersized, allowing for water to back up onto the KRRC range on a regular basis. This further suggests that the wetland area is being modified by increasing water depth and duration on the subject property.

Salmonid presence is documented in Wildcat Creek. Interviews with WDFW area habitat biologist (Piazza, 2011) and Kitsap County GIS data shows this drainage as a fish-bearing stream connected to Wildcat Creek, and no substantial fish passage barriers or topographic restrictions were identified between Wildcat Creek and the subject property. However, the site assessment did not identify any sensitive plant, fish, or wildlife species within the identified wetlands or streams. Flows within Drainage Y appear to be perennial but continued monitoring would be necessary to verify stream hydrology. This drainage would likely be considered a Type F Water and require a standard 150-foot wide buffer.

Photograph 4: Showing 24-inch north side of outlet from Wetland B.



Photograph 5: Showing 24-inch outlet from Wetland B, south side of Seabeck Highway Northwest.

Photograph 6: Showing 18-inch culvert and surrounding vegetation located west from the 24-inch culvert shown in Photograph 4.

Drainage X

Drainage X is a split drainage system with two tributaries (Drainage Xa and Drainage Xb). Drainage Xa, is the western channel of a split seasonal drainage and located along the eastern portion of the cleared area northeast of the Club access and Drainage Xb is the eastern channel of the split drainage that is located east of the cleared area (Appendix A). The western section of this seasonal drainage flows south along the tree line and through a Scotch broom dominated area (Photograph 7). The drainage in this upper reach is best defined as sheet flow and lacks a defined channel. Drainage Xa continues south along the western portion of the cleared area then under an old logging road (Photograph 8), and into two wetted depressions (Section 2.3). It is within this lower reach that surface waters become better confined to a discernable course. This drainage continues through the southern-most depression towards Drainage Xb, the eastern section of the observable drainage patterns (Appendix A).

Drainage Xb originates near the northeast corner of the subject property, continuing southward, merging with Drainage Xa. The drainage equally lacks the consistency of a defined channel. Rather the surface flow widens and confines within microtopographical features in and around vegetation and gradients. The confluence of Drainages Xa and Xb forms the main stem of the termed Drainage X. This drainage continues south and off-site along the south boundary. Drainage X is likely an upper reach of Drainage Z and most likely connects to Drainage Z off-site and south of Seabeck Highway. Drainage X would likely be considered Type Ns Water and likely require a standard 50-foot wide buffer.

Photograph 7: Looking south from north area if Drainage Xa.

Photograph 8: Looking north from old logging road showing Drainage Xa.

2.3 Depressions Developing Wetland Conditions

Two depressions were observed in the southeastern portion of the subject property that both appear to be developing wetland conditions. These depressions are located south of the old logging road, within the western section of Drainage X (Appendix A). These depressions were inundated at the time of the March 17th site investigation and were dominated by soft rush and various grasses. The ground within these depressions was found to be hard packed and appear to be the result of prior logging and clearing activities. The use of this area as a landing and use for burning of slash is indicated by remnant burn pile in the larger of the two depressions (Photograph 9).

Soils within these depressions were determined to be non-hydric (10YR 4/3 gravelly sandy loam) and typical of the Alderwood soil series. Therefore, these depressions do not meet the necessary criteria for wetland presence at this time.

Although soils were non-hydric, these depressions appear to be developing wetland characteristics because of the compacted nature of the soils and proximity to Drainage X. As such, the saturated limits of these depressions were flagged as Depression Area C and Depression Area D. Additional monitoring of these depressions is necessary to determine if actual wetlands and the appropriate regulatory status. Tables 5 and 6 summarize findings associated with these two depressions. Completed data forms are provided in Appendix C.

Photograph 9: Showing large depression within Drainage Xa and burn pile.

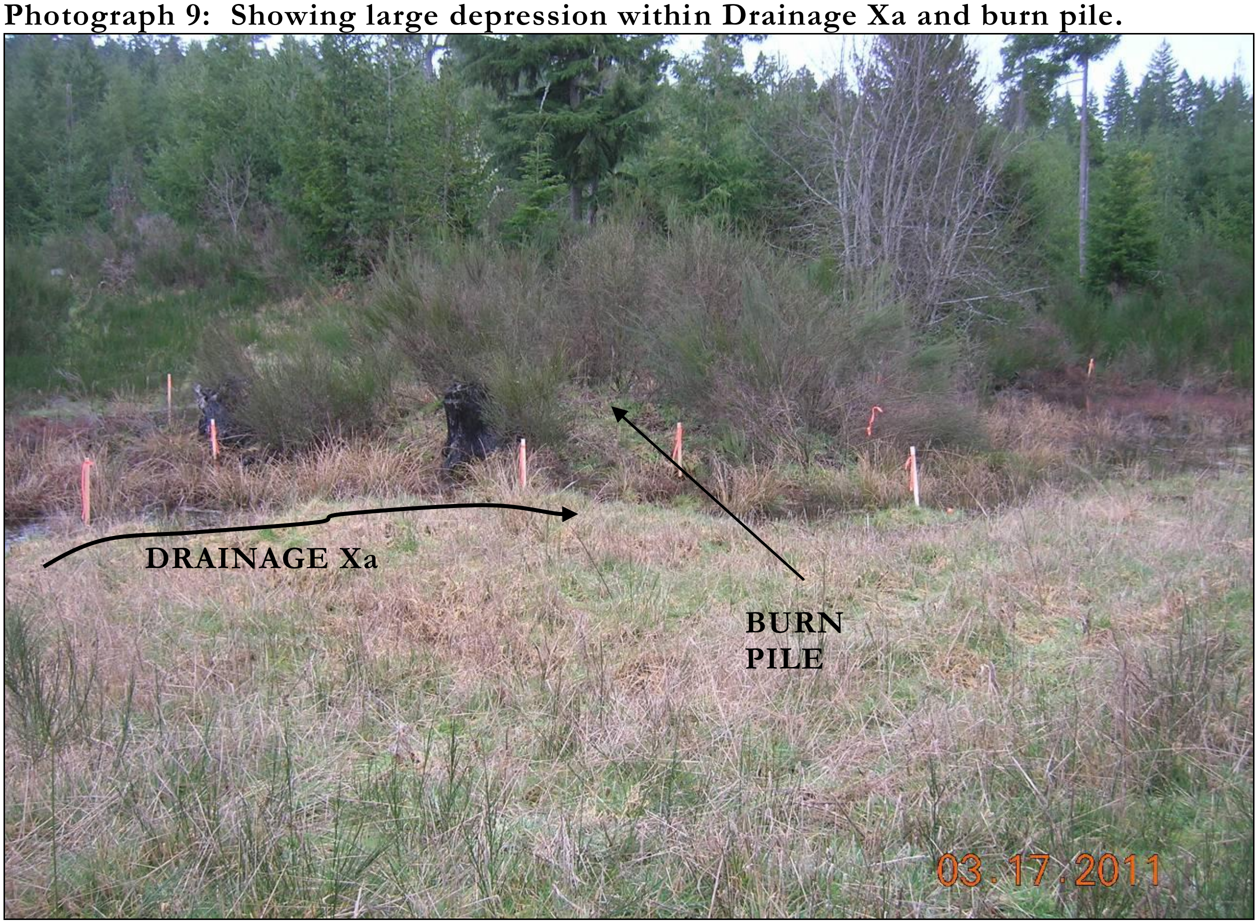


Table 5. Depression/Potential Wetland C Summary.

DEPRESSION AREA C – INFORMATION SUMMARY	
Location:	Eastern Portion of Property
	
Local Jurisdiction	Kitsap County
WRIA	15
Ecology Rating[A]	IV*
Kitsap County Rating[B]	IV*
Kitsap County Buffer Width[C]	50 feet*
Depression Size	213 sf
Cowardin Classification[D]	PEMJx*
HGM Classification[E]	Depressional Outflow*
Wetland Data Sheet(s)	DP 3A*
Upland Data Sheet (s)	DP 4A
Boundary Flag color	Orange*
Dominant Vegetation	This depression is dominated by herbaceous species including soft rush and bentgrass.
Soils	Alderwood gravelly sandy loam – soils determined to be non-hydric within depression
Hydrology	Surface inundation and high water table due to above normal (approximately 120% above normal) precipitation, drainage patterns, water flows into the depression from surface drainage. Area will require additional hydrology study to determine wetland presence.
Rationale for Delineation	Areas of defined inundation. Upland areas were determined by topographic rise and edge of saturation and upland vegetation.
Rationale for Local Rating	Preliminary local rating is based upon Ecology's current rating system.*

Notes:

A. Ecology rating according to Washington State wetland rating system for Western Washington – Revised Hruby (2004).
B. Kitsap County Code Chapter 19.200.
C. Recommended wetland buffer width according to Kitsap County Code Chapter 19.200.220
D. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; Modifiers (-C, -E, -H, -x, et cetera) = Water Regime or Special Situations
E. Brinson, M. M. (1993).

*For preliminary assessment purposes only. Depression may not be a jurisdictional.

Table 6. Depression/Potential Wetland D Summary.

<table>
<tr><th colspan="4">DEPRESSION AREA D – INFORMATION SUMMARY</th></tr>
<tr><td>Location:</td><td colspan="3">Eastern Portion of Property</td></tr>
<tr><td colspan="2" rowspan="11">
</td><td>Local Jurisdiction</td><td>Kitsap County</td></tr>
<tr><td>WRIA</td><td>15</td></tr>
<tr><td>Ecology Rating[A]</td><td>IV*</td></tr>
<tr><td>Kitsap County Rating[B]</td><td>IV*</td></tr>
<tr><td>Kitsap County Buffer Width[C]</td><td>50 feet*</td></tr>
<tr><td>Depression Size</td><td>3,758 sf</td></tr>
<tr><td>Cowardin Classification[D]</td><td>PEMJx*</td></tr>
<tr><td>HGM Classification[E]</td><td>Depressional Outflow*</td></tr>
<tr><td>Wetland Data Sheet(s)</td><td>DP 3A*</td></tr>
<tr><td>Upland Data Sheet (s)</td><td>DP 4A</td></tr>
<tr><td>Boundary Flag color</td><td>Orange</td></tr>
<tr><td colspan="2">Dominant Vegetation</td><td colspan="2">This depression is dominated by herbaceous species including soft rush and bentgrass.</td></tr>
<tr><td colspan="2">Soils</td><td colspan="2">Alderwood gravelly sandy loam – soils determined to be non-hydric within depression</td></tr>
<tr><td colspan="2">Hydrology</td><td colspan="2">Surface inundation and high water table due to above normal (approximately 120% above normal) precipitation, drainage patterns, water flows into the depression from surface drainage. Area will require additional hydrology study to determine wetland presence.</td></tr>
<tr><td colspan="2">Rationale for Delineation</td><td colspan="2">Areas of defined inundation. Upland areas were determined by topographic rise and edge of Scotch broom and salal.</td></tr>
<tr><td colspan="2">Rationale for Local Rating</td><td colspan="2">Local rating is based upon Ecology's current rating system.*</td></tr>
<tr><td colspan="4"><u>Notes</u>:
A. Ecology rating according to Washington State wetland rating system for Western Washington – Revised Hruby (2004).
B. Kitsap County Code Chapter 19.200.
C. Recommended wetland buffer width according to Kitsap County Code Chapter 19.200.220
D. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; Modifiers (-C, -E, -H, -x, et cetera) = Water Regime or Special Situations
E. Brinson, M. M. (1993).</td></tr>
</table>

*For preliminary assessment purposes only. Depression may not be jurisdictional.

3.0 Conclusions

Preliminary investigations identified some probable impacts to critical areas and associated buffers. These impacts include: an existing culvert under Seabeck Highway that cannot handle natural water flows and tends to back water onto the site creating an active range of hydroperiods; backup of water increases the extent, frequency, and duration of flooding north of Seabeck Highway, which has the effect of expanding the wetland area beyond its historic extent within Wetland B; some sloughing of recently maintained pistol shooting berms has intruded into expanded portions of Wetland B; some clearing and grading in wetland buffer areas has occurred north of the rifle range; and two 24-inch diameter culverts have been installed across the active range.

Depressions C and D contain non-hydric soils and the areas appear to be inundated during periods of unusually high precipitation. These depressions are most likely the result of recent logging activities that compacted the soils and appear to be developing wetland characteristics, but should not be considered wetlands at this time. Through minor manipulation of outlet structures and enhancement plantings, these depressions may be considered for use in remediation/mitigation actions to compensate for the impacts listed above; however, further assessment and planning efforts may be necessary at a later date to determine the suitability of these areas for such actions.

A review of the February 18, 2011 Talasaea Consultants, Inc. (Talasaea) *Critical Areas Study Report: Existing Conditions* of the Kitsap Rifle and Revolver Club appear to have several notable discrepancies; of which some of the most significant discrepancies are discussed below:

1. The old beaver dam that provides a distinct break in wetland boundaries was identified by Soundview Consultants[LLC] buts not by Talasaea. According to the *Washington State Wetland Rating System for Western Washington – Revised* (Hruby 2004), a beaver dam separates wetland units [*Wetlands in depressions along stream or river corridors may contain constrictions where the wetland narrows between two or more depressions. The key consideration is the direction of flow through the constriction. … If the flow is unidirectional, down-gradient, with an elevation change from one part to the other* (as occurs on this site)*, then a separate unit should be created.* (page 13)]; therefore, the two wetlands should have been rated separately. Had Talasaea properly identified this separation (which was clearly marked with blue flagging prior their inspection), their assessment would have resulted in a rating of Category II with lower habitat scores instead of a Category I with high habitat scores.

   It should be noted that this inaccurate assessment by Talasaea results in a significant expansion of wetland buffer widths over what should have been professionally recommended, and therefore, subsequent assertions of wetland buffer impacts by Talasaea are also likely over estimated.

2. The Talasaea assessment was conducted on January 20, 2011, at which time 'Drainage X' was dry, but the photograph shows water and ice within the channel; indicating the photograph was taken at a different time (likely during a preliminary inspection following significant storm events that caused atypical flooding situations onsite and throughout the Puget Sound region). Under standard professional protocols, photographs are taken the day of the site visit to document findings during the site investigation and if other photographs are used, the dates of

those photographs and an explanation are clearly provided within the report (especially if the photographs depict conditions dissimilar to what was observed during the assessment)

It should be noted that Soundview Consultants LLC conducted a wetland and stream investigation on January 19, 2011 and water was flowing within this channel following a recent storm. Soundview Consultants LLC staff was again on-site during the Talasaea investigation, at which time the inlet and channel was dry. These and continued observations during the winter and spring of 2011 indicate that the channel only conveys water during and/or shortly after storm events. The channel clearly conveys only ephemeral flows and is a non-fish bearing water, a condition that should have been discussed within the Talasaea report. It should also be noted that only in Appendix D did Talasaea mention that the inlet drainage was dry at the time of their January 20, 2011 site visit, a report location that could be easily overlooked during reviews and does not reflect their findings.

3. Figure 5 of the Talasaea report shows the existing wetland boundary flagged by Talasaea and identified a large area of 'apparent wetland impacts' to Wetland B north of the pistol range; however, Soundview Consultants LLC identified mature Douglas fir trees and other upland vegetation within this area that suggests the area is not, and likely never has been, a wetland. In fact, it appears that Talasaea provides no evidence to support this assertion other than the use of an aerial image from 1978 which is not provided in their report. An assessment of aerial photographs from 1966 and 1982 as well as a lack of disturbed soil conditions and well established upland vegetation found between the limits of the pistol range and Soundview Consultants LLC current wetland boundary as documented from data collected at upland sample plots that were flagged prior to the Talasaea assessment further appear to discredit their assertion of impacts.

   It should be noted that, in the area Talasaea asserts as having apparent wetland impacts, the presence of non-hydric mineral soils and low-gradient slopes similar to other upland areas contrasts with the conditions observed in most natural wetland areas outside the artificial flooding influence caused by the undersized culvert under Seabeck Highway. The natural depressional wetland areas contain organic soils with distinct topographic transitions where all indicators of wetland presence terminate abruptly at the wetland boundary (as can be observed in Wetland A and in many natural depressional wetlands within this watershed). The historic extent of Wetland B can be observed down slope of the current wetland boundary where this topographic transition and organic soils persist.

4. Many of the Talasaea data forms used to support their wetland delineation and assessment findings appear to be incomplete and/or inaccurate. The majority are missing climatic conditions, identification of normal, problematic, or significantly disturbed conditions, slope and relief, statements in the "remarks" section when marginal conditions exist, et cetera. In addition, Talasaea was observed inspecting the site during frozen conditions on January 4, 2011, and collecting data and conducting the wetland delineation on January 20, 2011, yet many of the data forms appear to have been completed prior to either site inspection.

5. Other apparent insufficiencies within the data forms a possible lack of documentation of less dominant plant species present, and the proper use of the

hydric soil indicators required in the current wetland delineation methodology allude to the use of recently discontinued wetland delineation methodology and a likely over-estimation of wetland extent such as in Test Plots 7 and 8 where a determination of hydric soil presence does not appear to be supported by the current methodology.

It should be noted that the hydric soil indicators used to confirm wetland presence in these plots do not match the clear technical definitions outlined in the current methodology. In addition, many field observations of wetland hydrology recorded in the data sheets do not appear to consistently meet the minimum standards set for wetland hydrology; for example, TP-E8, water table at 18 inches and saturation at 12 inches was incorrectly identified as meeting the hydrology criterion (especially considering the above-average precipitation and recent flooding that occurred during their assessment).

6. Although Talasaea identifies and maps three wetlands east of the rifle range, no data sheets are provided with their report to support this conclusion, and the rating forms used to assign a wetland ratings do not appear consistent with the hydrogeomorphic position of these areas. In addition, Talasaea did not apparently flag any wetland boundaries in these areas making their assertion difficult to physically confirm in the field. The minimum professional level of care requires a paired data plot for each wetland identified and a minimal number of flags or other markers placed along the boundary so as to allow reasonable confirmation by a third party. Considering Soundview Consultants LLC collected actual data that contradicts the Talasaea findings, the regulatory status of these areas and the buffers recommended by Talasaea appear quite inaccurate.
7. Talasaea did not completely identify and flag the wetland boundaries near the areas in question, and the wetland boundaries that were flagged were done so apparently erring on the side of pushing the wetland boundary farther upslope than necessary. Within any given section of wetland boundary, Talasaea identified and flagged considerably fewer wetland boundary points than did Soundview Consultants LLC, and many upland areas are included within their wetland boundary. This action results in a low-resolution depiction of the wetland boundary and an over-estimation of wetland and buffer impacts. In addition, Talasaea only flagged the wetland boundary in a portion of the area Soundview Consultants LLC identified as Wetland B, and the area Soundview Consultants LLC identified as Wetland A, including an important hydrologic separation between wetlands, was apparently missed even though considerable wetland buffer impacts are asserted by Talasaea to the east of this wetland area.

Considering the significant discrepancies and issues identified in the Talasaea report, we cannot support the use of their assessment in establishing a recommended wetland ratings and/or impacts to wetlands, streams, and/or regulated buffers. In addition, the apparent lack of quality control with data collection and use of inappropriate delineation methodology casts doubt as to the accuracy of their wetland delineation and assessment for the entire project. Soundview Consultants LLC exercised extreme care and effort in collecting accurate data and high-resolution flagging of the entire wetland boundaries near the areas in question. Further, we have had to place considerable effort in addressing the numerous insufficiencies of the Talasaea delineation and assessment.

A final determination of the extent of critical areas impacts is pending additional investigation and negotiation with local, State, and Federal regulatory authorities. Direct coordination with State and Federal authorities has been initiated voluntarily by the Kitsap Rifle and Revolver Club, and following confirmation of the findings recommended in this preliminary assessment, including a request for a Jurisdictional Determination of wetland boundaries by the US Army Corps of Engineers and Washington State Department of Ecology, a remediation plan will be prepared to resolve any unintentional impacts created by the maintenance actions and site improvements. All such remedies will be detailed in a Final Wetland Delineation and Fish and Wildlife Habitat Assessment Report and Mitigation Plan to be prepared at a later date. Additional project documentation and regulatory submittals, such as a project JARPA, Biological Assessment, SEPA Checklist, Site Plans, Geotechnical Report, et cetera, if necessary, will be prepared following accurate identification of impacts and remediation actions.

Any additional correspondence regarding critical areas review of this preliminary assessment should be directed to Jeremy Downs at Soundview Consultants[LLC].

Sincerely,

Jeremy Downs

Senior Biologist / Environmental Planner

Soundview Consultants LLC

jeremy@soundviewconsultants.com

James H. Carsner

JAMES H. CARSNER 001461 PROFESSIONAL WETLAND SCIENTIST

Jim Carsner, PWS

Senior Scientist

Soundview Consultants LLC

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Appendix A — Site Map

KRRC - PRELIMINARY SITE INVENTORY MAP

FORMAL LOCATION OF OUTLINED AREAS SUBJECT TO FIELD SURVEY

CONFIDENTIAL MEDIATION SUBMISSION

0 150 300 600

SCALE = 1:300

SOURCE: AES CONSULTANTS, INC.

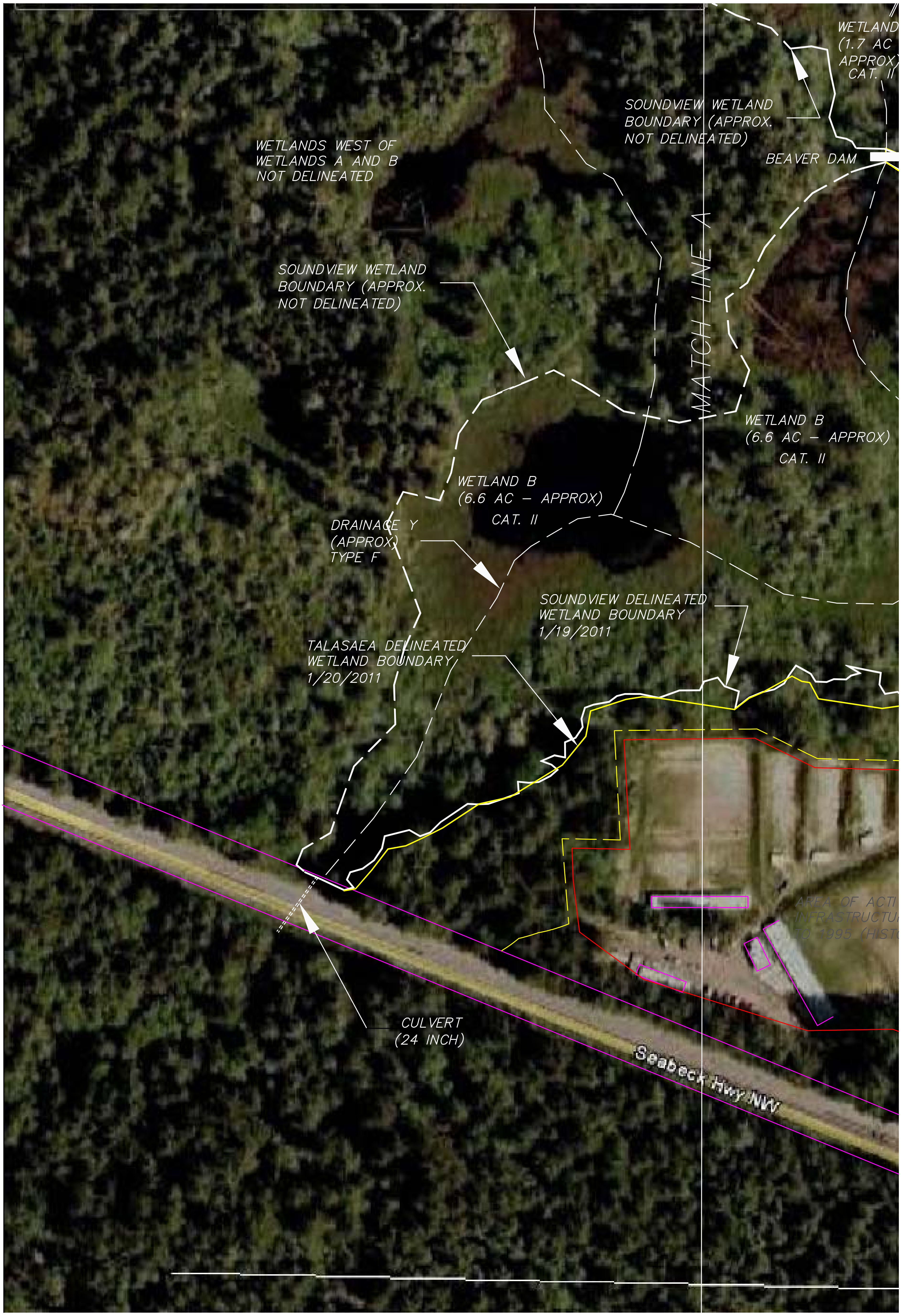
Soundview Consultants LLC
Environmental, Natural Resource, and Land Use Consultants
2907 Harborview Drive
Gig Harbor, WA 98335
Office 253.514.8952
Fax 253.514.8954
www.soundviewconsultants.com

KITSAP RIFLE & REVOLVER CLUB
4900 SEABECK HIGHWAY NORTHWEST
BREMERTON, WA 98312

SECTIONS 10 & 15, TWP. 18N, RGE. 12 W, W.M.

DATE:	05/26/11
JOB:	1061.0001
BY:	DB/JC
SCALE:	1"=300'
FIGURE	1 OF 4

KITSAP RIFLE & REVOLVER CLUB - SITE MAP DETAIL



FORMAL LOCATION OF OUTLINED AREAS SUBJECT TO FIELD SURVEY

CONFIDENTIAL MEDIATION SUBMISSION

0 50 100 200
SCALE = 1:100

Soundview Consultants LLC
Environmental, Natural Resource, and Land Use Consultants
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Gig Harbor, WA 98335
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Fax 253.514.8954
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SOURCE: AES CONSULTANTS, INC.

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4900 SEABECK HIGHWAY NORTHWEST
BREMERTON, WA 98312

SECTIONS 10 & 15, TWP. 18N, RGE. 12 W, W.M.

DATE: 05/26/11
JOB: 1061.0001
BY: DB/JC
SCALE: 1" = 100'
FIGURE 1a OF 4

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KITSAP RIFLE & REVOLVER CLUB - SITE MAP DETAIL

FORMAL LOCATION OF OUTLINED AREAS SUBJECT TO FIELD SURVEY

CONFIDENTIAL MEDIATION SUBMISSION

0 50 100 200
SCALE = 1:100

Soundview Consultants
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4900 SEABECK HIGHWAY NORTHWEST
BREMERTON, WA 98312
SECTIONS 10 & 15, TWP. 18N, RGE. 12 W, W.M.

DATE: 05/26/11
JOB: 1061.0001
BY: DB/JC
SCALE: 1" = 100'
FIGURE 1b OF 4

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KITSAP RIFLE & REVOLVER CLUB - SITE MAP DETAIL

FORMAL LOCATION OF OUTLINED
AREAS SUBJECT TO FIELD SURVEY

CONFIDENTIAL MEDIATION SUBMISSION

0 50 100 200
SCALE = 1:100

Soundview Consultants LLC
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BREMERTON, WA 98312

SECTIONS 10 & 15, TWP. 18N, RGE. 12 W, W.M.

DATE:	05/26/11
JOB:	1061.0001
BY:	DB/JC
SCALE:	1" = 100'
FIGURE	1c OF 4

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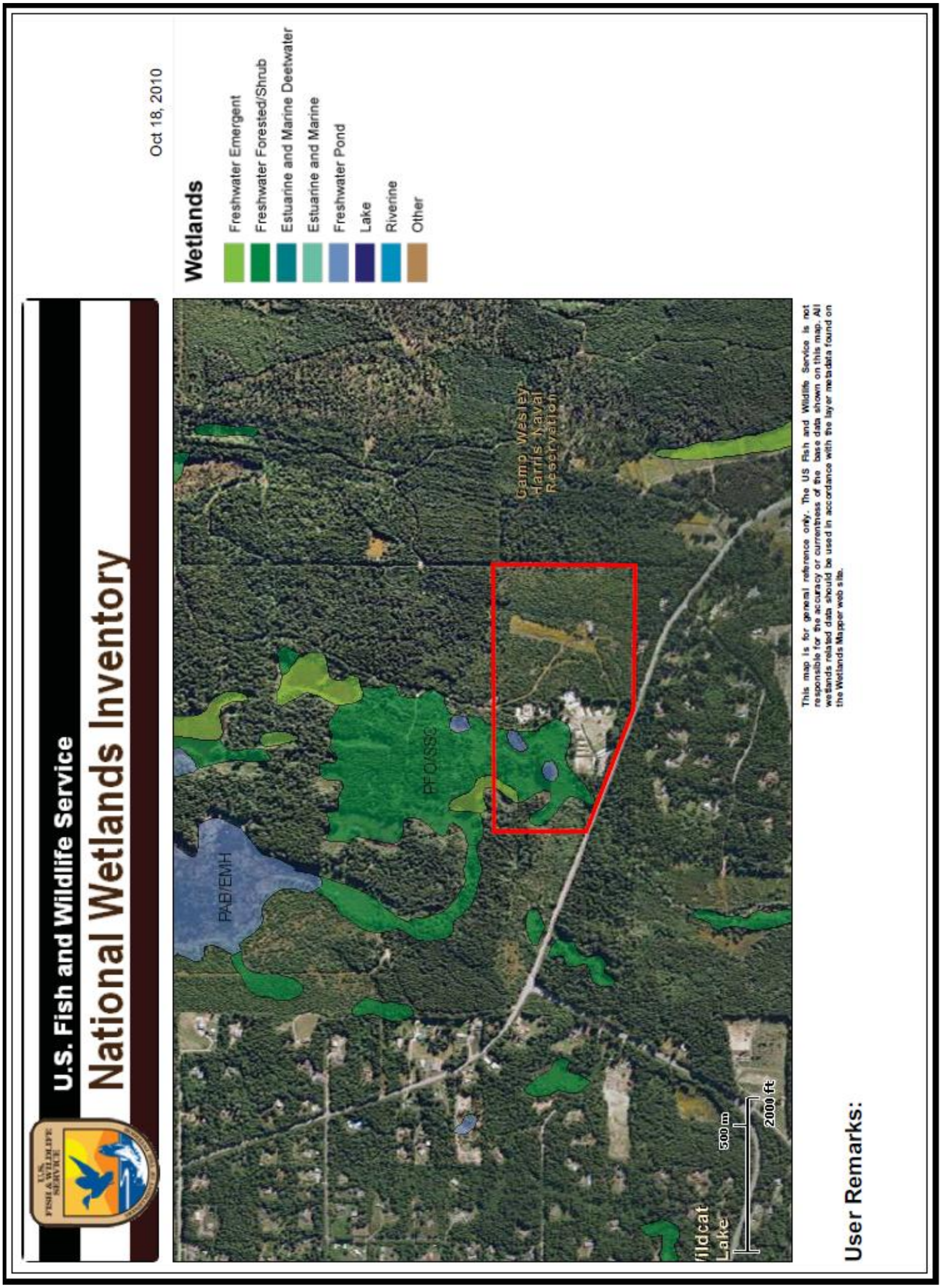
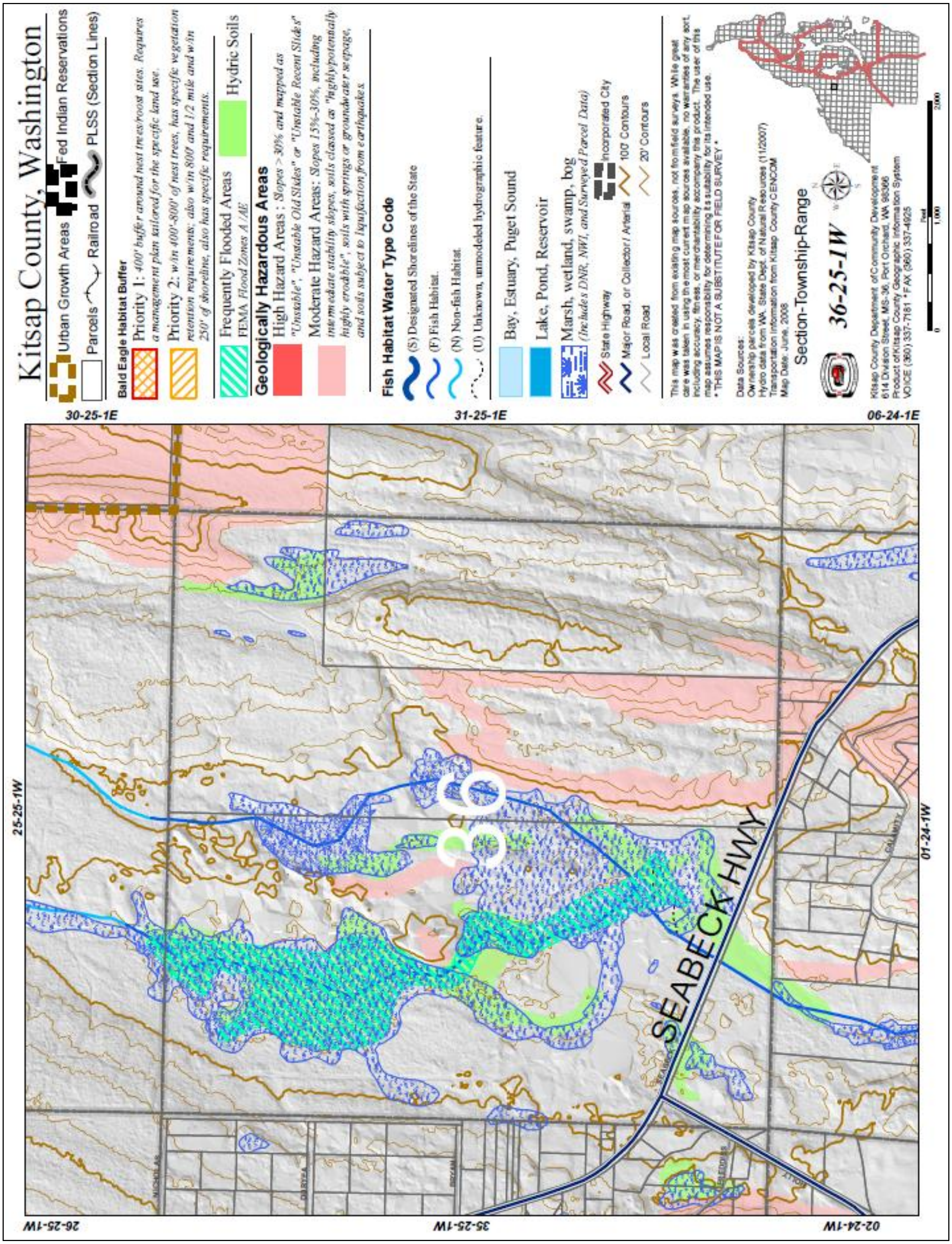
Appendix B — Background Data

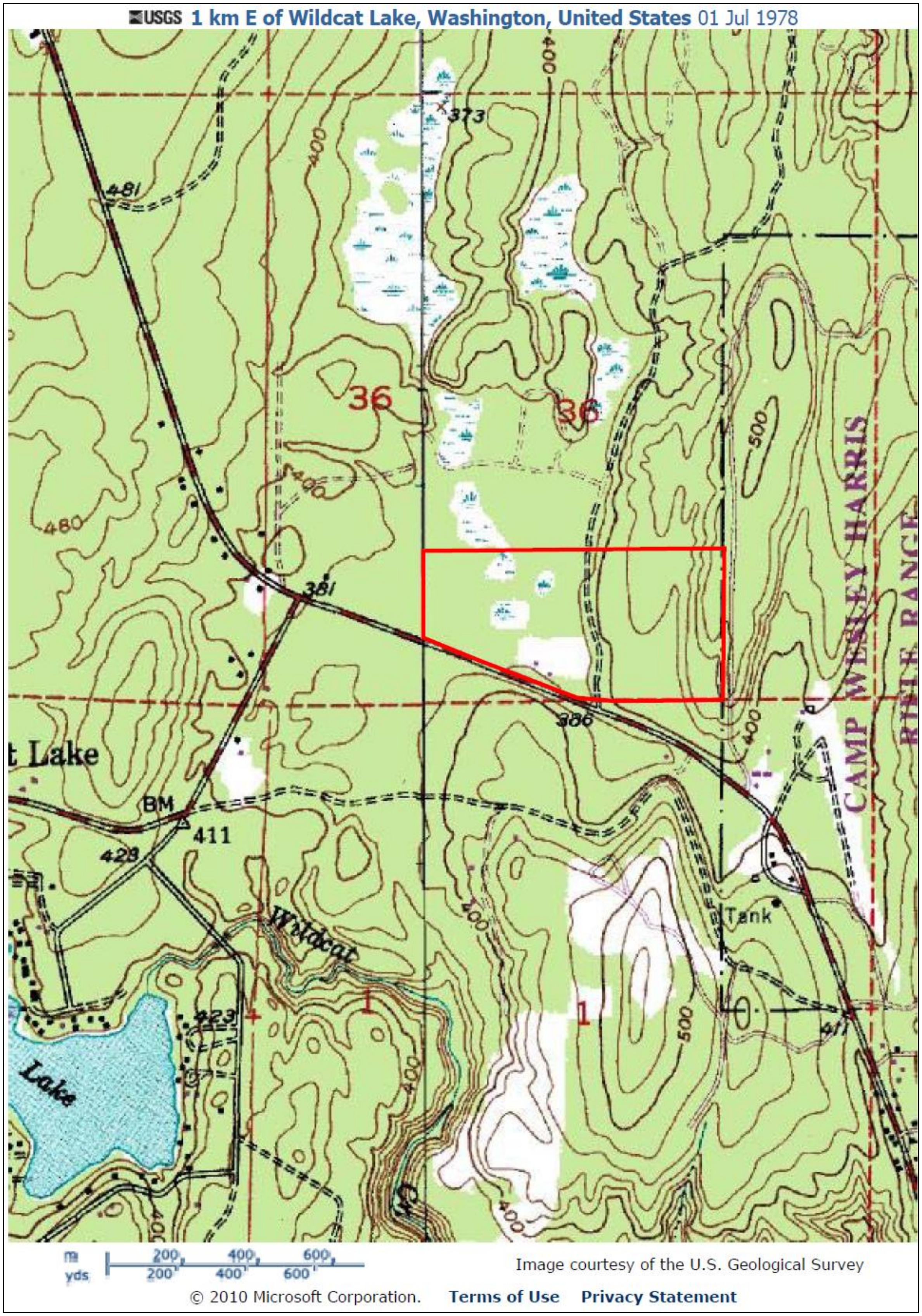
B1. National Wetland Inventory Map



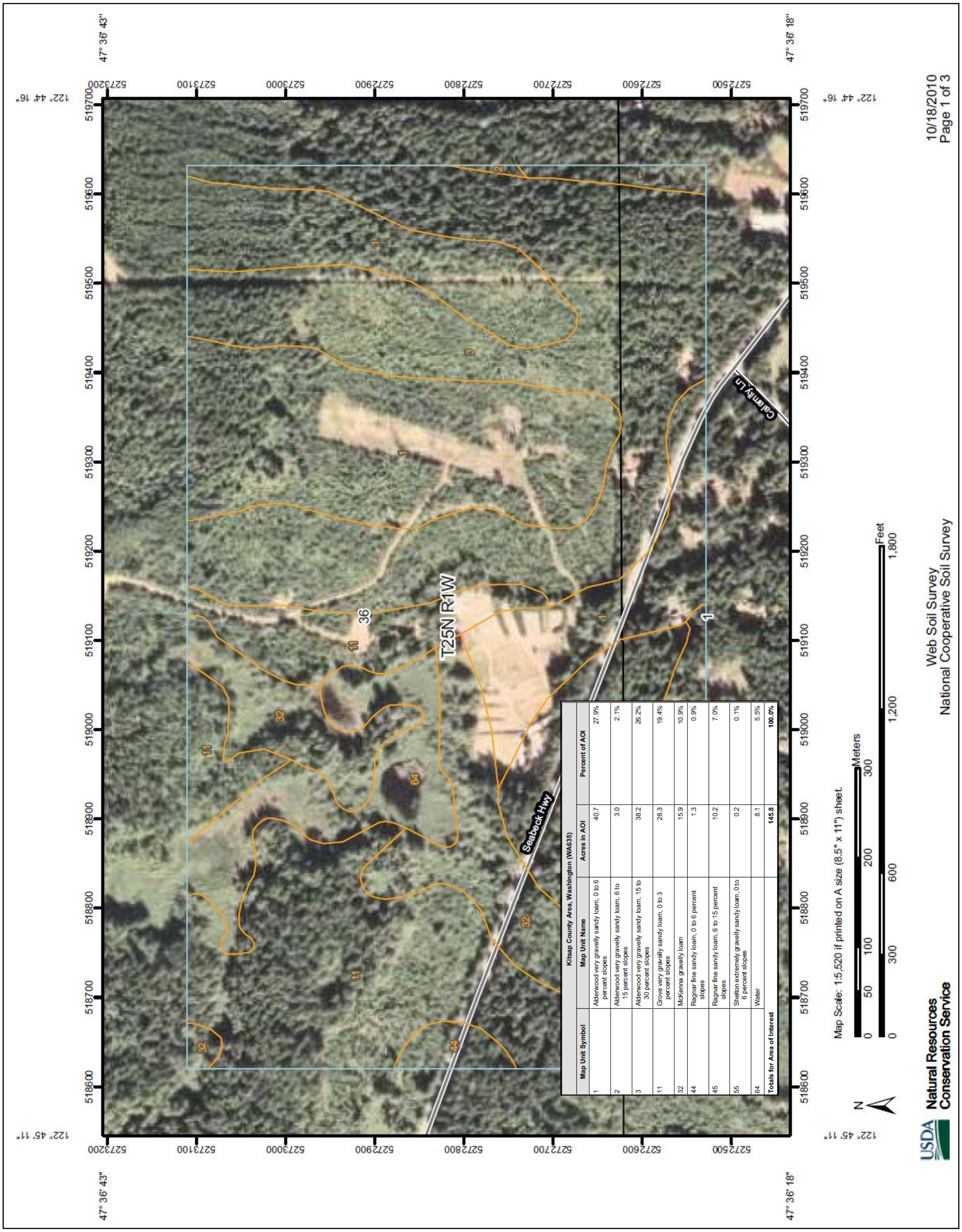
B2. Kitsap County Buildable Lands Map



B3. US Geologic Survey Topographic Map



B4. NRCS Soils Map



Kitsap County Area, Washington (WA635)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Alderwood very gravelly sandy loam, 0 to 6 percent slopes	40.7	27.9%
2	Alderwood very gravelly sandy loam, 6 to 15 percent slopes	3.0	2.1%
3	Alderwood very gravelly sandy loam, 15 to 30 percent slopes	38.2	26.2%
11	Grove very gravelly sandy loam, 0 to 3 percent slopes	28.3	19.4%
32	McKenna gravelly loam	15.9	10.9%
44	Ragnar fine sandy loam, 0 to 6 percent slopes	1.3	0.9%
45	Ragnar fine sandy loam, 6 to 15 percent slopes	10.2	7.0%
55	Shelton extremely gravelly sandy loam, 0 to 6 percent slopes	0.2	0.1%
64	Water	8.1	5.5%
Totals for Area of Interest		**145.8**	**100.0%**

Appendix C — Data Sheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kitsap County Rifle & Revolver Club City/County: Kitsap County Sampling Date: 1/19/2011

Applicant/Owner: Kitsap County Rifle & Revolver Club State: WA Sampling Point: DP-1w

Investigator(s): Jim Carsner/Jeremy Downs, Racheal Villa Section, Township, Range: S36, T25N, R1W

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): A Lat: 47°36'27.84" N Long: 122°44"47.33W Datum: NAD83

Soil Map Unit Name: Grove very gravelly sandy loam NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☒ No ☐	

Remarks: Precipitation, as recorded at SeaTac Airport (CDUS46 - KSEW - 200826) is 130% above normal for the water year and 118% above normal for the year. Soil presumed hydric based on October 2010 reconnaissance by jeremy Downs - area inundated at the time of the site visit.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Malus fusca	80	x	FACW
2. Salix sp.	20	x	FAC*
3.			
4.			
	100 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		
% Bare Ground in Herb Stratum ____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	80	x 2 =	160
FAC species	20	x 3 =	60
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	100 (A)		220 (B)

Prevalence Index = B/A = 2,20

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: * Salix sp. presumed FAC for dominance test. Dominated by FAC or wetter vegetation.

SOIL

Sampling Point: DP-1w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:__________

Depth (inches):__________

Hydric Soil Present? Yes ☒ No ☐

Remarks: Soil sample not collected due to high water level. Hydric soil presumed based on reconnaissance performed in October 2010 by Jeremy Downs.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): 8"

Water Table Present? Yes ☒ No ☐ Depth (inches): +8"

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): surface

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Surface inundated

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kitsap County Rifle & Revolver Club City/County: Kitsap County Sampling Date: 1/19/2011

Applicant/Owner: Kitsap County Rifle & Revolver Club State: WA Sampling Point: DP-2u

Investigator(s): Jim Carsner/Jeremy Downs, Racheal Villa Section, Township, Range: S36, T25N, R1W

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): A Lat: 47°36'27.84" N Long: 122°44"47.33W Datum: NAD83

Soil Map Unit Name: Grove very gravelly sandy loam NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒	
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks: Precipitation, as recorded at SeaTac Airport (CDUS46 - KSEW - 200826) is 130% above normal for the water year and 118% above normal for the year.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Malus fusca	10		FACW
2. Populus tremuloides	60	x	NL(upl)
3.			
4.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: ______)			
1. Gaultheria shallon	90	x	FACU
2. Vaccinium ovatum	5		NL (upl)
3.			
4.			
5.			
	95	= Total Cover	
Herb Stratum (Plot size: ______)			
1. Pteridium aquilinum	10	x	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
		= Total Cover	
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
		= Total Cover	
% Bare Ground in Herb Stratum ______			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	10	x 2 =	20
FAC species		x 3 =	
FACU species	100	x 4 =	400
UPL species	65	x 5 =	325
Column Totals:	175 (A)		745 (B)

Prevalence Index = B/A = 4.25

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Not dominated by hydrophytic vegetation.

SOIL

Sampling Point: DP-2u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100					duft	
2-20	10YR 3/3	100					GSL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☐ **No** ☒

Remarks: No hydric soil indicator observed

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☒ No ☐ Depth (inches): 20

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 16

Wetland Hydrology Present? Yes ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology did not meet wetland criteria.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kitsap County Rifle & Revolver Club City/County: Kitsap County Sampling Date: 1/19/2011

Applicant/Owner: Kitsam County Rifle & Revolver Club State: WA Sampling Point: 3u

Investigator(s): Jim Carsner/Jeremy Downs, Racheal Villa Section, Township, Range: S36, T25N, R1W

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): A Lat: 47°36'27.84" N Long: 122°44"47.33W Datum: NAD83

Soil Map Unit Name: Grove very gravelly sandy loam NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒	
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks: Precipitation, as recorded at SeaTac Airport (CDUS46 - KSEW - 200826) is 130% above normal for the water year and 118% above normal for the year.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ______)			
1. Populus balsamifera	10	x	FAC
2.			
3.			
4.			
	10	= Total Cover	
Sapling/Shrub Stratum (Plot size: ______)			
1. Rubus spectabilis	100	x	FACW
2. Malus fusca	10		FACW
3.			
4.			
5.			
	110	= Total Cover	
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
		= Total Cover	
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
		= Total Cover	
% Bare Ground in Herb Stratum ______			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	110	x 2 = 220
FAC species	10	x 3 = 30
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	120 (A)	250 (B)

Prevalence Index = B/A = 2.08

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Dominated by FAC or wetter vegetation. Hydrophytic criterion met.

SOIL

Sampling Point: 3u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/2	100					duft	
2-18	10YR 3/3	100					gsl	
18-20	7.5YR 4/4	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil indicator observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): ____

Water Table Present? Yes ☐ No ☒ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): ____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicator observed.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kitsap County Rifle & Revolver Club City/County: Kitsap County Sampling Date: 1/19/2011

Applicant/Owner: Kitsam County Rifle & Revolver Club State: WA Sampling Point: 4u

Investigator(s): Jim Carsner/Jeremy Downs, Racheal Villa Section, Township, Range: S36, T25N, R1W

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): A Lat: 47°36'27.84" N Long: 122°44"47.33W Datum: NAD83

Soil Map Unit Name: Grove very gravelly sandy loam NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒	
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks: Precipitation, as recorded at SeaTac Airport (CDUS46 - KSEW - 200826) is 130% above normal for the water year and 118% above normal for the year.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pseudotsuga menziesii	15	x	FACU
2.			
3.			
4.			
	15	= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. Gaultheria shallon	100	x	FACU
2. Physocarpus capitatus	50	x	FACW
3. Populus tremuioides	50	x	NL (upl)
4.			
5.			
	200	= Total Cover	
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
		= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	
% Bare Ground in Herb Stratum ____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	50	x 2 =	100
FAC species		x 3 =	
FACU species	115	x 4 =	460
UPL species	50	x 5 =	250
Column Totals:	215 (A)		810 (B)

Prevalence Index = B/A = 3.76

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☐

Remarks: Not dominated by FAC or wetter species.

SOIL

Sampling Point: 4u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/2	100					loam	
6-20	10YR 3/3	100					gsl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil indicator observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches):
Water Table Present?	Yes ☐	No ☒	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ☒	No ☐	Depth (inches): 16

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Saturation does not meet wetland criteria.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kitsap County Rifle & Revolver Club City/County: Kitsap County Sampling Date: 1/19/2011

Applicant/Owner: Kitsam County Rifle & Revolver Club State: WA Sampling Point: 5w

Investigator(s): Jim Carsner/Jeremy Downs, Racheal Villa Section, Township, Range: S36, T25N, R1W

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): A Lat: 47°36'27.84" N Long: 122°44"47.33W Datum: NAD83

Soil Map Unit Name: Grove very gravelly sandy loam NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☒ No ☐	

Remarks: Precipitation, as recorded at SeaTac Airport (CDUS46 - KSEW - 200826) is 130% above normal for the water year and 118% above normal for the year.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. Malus fusca	100	x	FACW
2. Spiraea douglasii	20	x	FACW
3. Rosa nutkana	20	x	FAC
4.			
5.			
	140	= Total Cover	
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
		= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	
% Bare Ground in Herb Stratum ____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	120	x 2 = 240
FAC species	20	x 3 = 60
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	140 (A)	300 (B)

Prevalence Index = B/A = 2.14

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Dominated by FAC or wetter vegetation. Hydrophytic vegetation criterion met.

SOIL

Sampling Point: 5w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	100					mucky peat	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: __________

Depth (inches): __________

Hydric Soil Present? Yes ☒ No ☐

Remarks: Area inundated. Surface soils appeared to be a black histic

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): 6

Water Table Present? Yes ☒ No ☐ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): ______

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Surface water present. Wetland hydrology criterion met.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kitsap County Rifle & Revolver Club City/County: Kitsap County Sampling Date: 1/19/2011

Applicant/Owner: Kitsam County Rifle & Revolver Club State: WA Sampling Point: 6u

Investigator(s): Jim Carsner/Jeremy Downs, Racheal Villa Section, Township, Range: S36, T25N, R1W

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): A Lat: 47°36'27.84" N Long: 122°44"47.33W Datum: NAD83

Soil Map Unit Name: Grove very gravelly sandy loam NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒	
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks: Precipitation, as recorded at SeaTac Airport (CDUS46 - KSEW - 200826) is 130% above normal for the water year and 118% above normal for the year.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1. Pseudotsuga menziesii	90	x	FACU
2.			
3.			
4.			
	90 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Alnus rubra	10		FAC
2. Gaultheria shallon	50	x	FACU
3.			
4.			
5.			
	60 = Total Cover		
Herb Stratum (Plot size: ____)			
1. Pteridium aquilium	10	x	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		
% Bare Ground in Herb Stratum ____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	10	x 3 = 30
FACU species	140	x 4 = 560
UPL species		x 5 =
Column Totals:	150 (A)	590 (B)

Prevalence Index = B/A = 3.9

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: Not dominated by FAC or wetter vegetation.

SOIL

Sampling Point: 6u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100					duft	
2-10	10YR 2/2	100					sandy loam	
10-20	7.5YR 3/4	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:____________________

Depth (inches):____________________

Hydric Soil Present? Yes ☐ **No** ☒

Remarks: No hydric soil indicator observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): ______

Water Table Present? Yes ☐ No ☒ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): ______

Wetland Hydrology Present? Yes ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicator observed.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kitsap County Rifle & Revolver Club City/County: Kitsap County Sampling Date: 1/19/2011

Applicant/Owner: Kitsam County Rifle & Revolver Club State: WA Sampling Point: 7w

Investigator(s): Jim Carsner/Jeremy Downs, Racheal Villa Section, Township, Range: S36, T25N, R1W

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): A Lat: 47°36'27.84" N Long: 122°44"47.33W Datum: NAD83

Soil Map Unit Name: Grove very gravelly sandy loam NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☒ No ☐	

Remarks: Precipitation, as recorded at SeaTac Airport (CDUS46 - KSEW - 200826) is 130% above normal for the water year and 118% above normal for the year.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. Rosa nutkana	1	x	FAC
2.			
3.			
4.			
5.			
	1	= Total Cover	
Herb Stratum (Plot size: ____)			
1. Carex sp.	100	x	FACW*
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1. Rubus ursinus	10	x	NI
2.			
	10	= Total Cover	
% Bare Ground in Herb Stratum ____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	100	x 2 =	200
FAC species	1	x 3 =	3
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	101 (A)		203 (B)

Prevalence Index = B/A = 2.0

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Dominated by FAC or wetter vegetation.

SOIL

Sampling Point: 7w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	100					sandy loam	
10-18	7.5YR 3/4	100					sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☒ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ☒ **No** ☐

Remarks: Low chroma within the upper 10 inches. Hydric soil criterion observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☒ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): ______

Water Table Present? Yes ☒ No ☐ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): surface

Wetland Hydrology Present? Yes ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Primary hydrology indicators observed.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kitsap County Rifle & Revolver Club City/County: Kitsap County Sampling Date: 1/19/2011

Applicant/Owner: Kitsam County Rifle & Revolver Club State: WA Sampling Point: 8w

Investigator(s): Jim Carsner/Jeremy Downs, Racheal Villa Section, Township, Range: S36, T25N, R1W

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): A Lat: 47°36'27.84" N Long: 122°44"47.33W Datum: NAD83

Soil Map Unit Name: Grove very gravelly sandy loam NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☒ No ☐	

Remarks: Precipitation, as recorded at SeaTac Airport (CDUS46 - KSEW - 200826) is 130% above normal for the water year and 118% above normal for the year.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1. Malus fusca	80	x	FACW
2. Rubus spectabilis	10		FACW
3. Rhamnus purshiana	10		FAC
4.			
5.			
= Total Cover	100		
Herb Stratum (Plot size: ____)			
1. Carex sp.	5	x	FACW*
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	5		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			
% Bare Ground in Herb Stratum ____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	95	x 2 = 190
FAC species	10	x 3 = 30
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	105 (A)	220 (B)

Prevalence Index = B/A = 2.09

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Dominated by FAC or wetter vegetation.

SOIL

Sampling Point: 8w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	100					gsl	
16-20	7.5YR 4/2	100					gravelly sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☒ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☒ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ☒ No ☐

Remarks: Hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):
Water Table Present? Yes ☒ No ☐ Depth (inches): 12
Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): surface

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Primary hydrology indicators observed.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kitsap County Rifle & Revolver Club City/County: Kitsap County Sampling Date: 1/19/2011

Applicant/Owner: Kitsap County Rifle & Revolver Club State: WA Sampling Point: 9u

Investigator(s): Jim Carsner/Jeremy Downs, Racheal Villa Section, Township, Range: S36, T25N, R1W

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): A Lat: 47°36'27.84" N Long: 122°44"47.33W Datum: NAD83

Soil Map Unit Name: Grove very gravelly sandy loam NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☒	Is the Sampled Area within a Wetland?	Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒		
Wetland Hydrology Present?	Yes ☐ No ☒		

Remarks: Precipitation, as recorded at SeaTac Airport (CDUS46 - KSEW - 200826) is 130% above normal for the water year and 118% above normal for the year.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1. Rhamnus purshiana	10	x	FAC
2.			
3.			
4.			
5.			
= Total Cover	10		
Herb Stratum (Plot size: ______)			
1. Pteridium aquilium	1	x	FACU
2. Gaultheria shallon	1	x	FACU
3. Carex sp.	1	x	FACW*
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	3		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			
% Bare Ground in Herb Stratum 90			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	1	x 2 =	2
FAC species	10	x 3 =	30
FACU species	2	x 4 =	8
UPL species		x 5 =	
Column Totals:	13 (A)		40 (B)

Prevalence Index = B/A = 3.07

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

SOIL

Sampling Point: 9u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/2	100					gsl	
16-20	7.5YR 4/2	100					gsl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil indicator observed

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☐ No ☒ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No primary or secondary hydrology indicators observed.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kitsap County Rifle and Revolver Club City/County: Kitsap Sampling Date: 3/17/11

Applicant/Owner: Kitsap County Rifle and Revolver Club State: WA Sampling Point: DP-1A

Investigator(s): AJim Carsner Section, Township, Range: 36, T25N, R1W, W.M

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 2

Subregion (LRR): A Lat: 47º36'34"N Long: 122º44'33.63"W Datum: NAD83

Soil Map Unit Name: Alderwood NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	**Is the Sampled Area within a Wetland?**	Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒		
Wetland Hydrology Present?	Yes ☒ No ☐		

Remarks: Precipitation at the SeaTac Airport (NOAA website) for month was reported at 190% of normal. Not all three wetland criteria observed.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: _____)			
1. Holcus lanatus	20	x	FAC
2. Agrostis stolonifera	60	x	FAC
3. Juncus effusus	5		FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	85	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	
% Bare Ground in Herb Stratum 15			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	5	x 2 =	10
FAC species	80	x 3 =	240
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	85 (A)		250 (B)

Prevalence Index = B/A = 2.9

Hydrophytic Vegetation Indicators:

☐ Rapid Test for Hydrophytic Vegetation
☒ Dominance Test is >50%
☒ Prevalence Index is ≤3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Wetland Non-Vascular Plants[1]
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Dominance and Prevalence Index test show a predominance of hydrophytic vegetation.

SOIL

Sampling Point: DP-1A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					GSL	
10-18	10YR 4/3	100					GSL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

☐ 2 cm Muck (A10)
☐ Red Parent Material (TF2)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type:________________
Depth (inches):____________

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

☒ Surface Water (A1)
☒ High Water Table (A2)
☒ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
☐ Salt Crust (B11)
☐ Aquatic Invertebrates (B13)
☐ Hydrogen Sulfide Odor (C1)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Stunted or Stressed Plants (D1) (**LRR A**)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ FAC-Neutral Test (D5)
☐ Raised Ant Mounds (D6) (**LRR A**)
☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): 3
Water Table Present? Yes ☒ No ☐ Depth (inches): +3
Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): surface

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Primary hydrology indicators observed.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kitsap County Rifle and Revolver Club City/County: Kitsap Sampling Date: 3/17/11

Applicant/Owner: Kitsap County Rifle and Revolver Club State: WA Sampling Point: DP-2A

Investigator(s): Jim Carsner Section, Township, Range: 36, T25N, R1W, W.M

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 2

Subregion (LRR): A Lat: 47º36'34"N Long: 122º44'33.63"W Datum: NAD83

Soil Map Unit Name: Alderwood NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒	
Wetland Hydrology Present?	Yes ☒ No ☐	

Remarks: Precipitation at the SeaTac Airport (NOAA website) for month was reported at 190% of normal. Not all three wetland criteria observed.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: _____)			
1. Gaultheria shallon	10	x	FACU
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: _____)			
1. Agrostis capilaris	40	x	FAC
2. Holcus lanatus	50	x	FAC
3. Agrostis stolonifera	10		FAC
4. Taraxacum officinale	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover			
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
= Total Cover			
% Bare Ground in Herb Stratum _____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	100	x 3 = 300
FACU species	15	x 4 = 60
UPL species		x 5 =
Column Totals:	115 (A)	360 (B)

Prevalence Index = B/A = 3.3

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks:

SOIL

Sampling Point: DP-2A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					GSL	
10-16	10YR 4/2	100					GSL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☒ No ☐ Depth (inches): 11

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): surface

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Primary hydrology indicators observed.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kitsap County Rifle and Revolver Club City/County: Kitsap Sampling Date: 3/17/11

Applicant/Owner: Kitsap County Rifle and Revolver Club State: WA Sampling Point: DP-3A

Investigator(s): Jim Carsner Section, Township, Range: 36, T25N, R1W, W.M

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 2

Subregion (LRR): A Lat: 47º36'29.59"N Long: 122º44'33.63"W Datum: NAD83

Soil Map Unit Name: Alderwood NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒	
Wetland Hydrology Present?	Yes ☒ No ☐	

Remarks: Precipitation at the SeaTac Airport (NOAA website) for month was reported at 190% of normal. Although flagged as wetland, this area is marginal, this is a depressional area that was inundated at the time of the site visit. Soils were bright (non-hydric) and compact, apparantely due to historic logging activities. The presence of standing water and Juncus effusus suggests this area may be developing wetland characteristics.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. Spiraea douglasii	30	x	FAC
2.			
3.			
4.			
5.			
	30	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Agrostis stolonifera	30	x	FAC
2. Agrostis capillaris	20	x	FAC
3. Juncus effusus	1		FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	51	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	
% Bare Ground in Herb Stratum 20			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	1	x 2 = 2
FAC species	80	x 3 = 240
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	81 (A)	242 (B)

Prevalence Index = B/A = 2.9

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Dominance andd Prevalence Index test show a predominance of hydrophytic vegetation.

SOIL

Sampling Point: DP-3A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/1	100					sandy loam	
2-16	10YR 4/3	100					GSL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:____________________

Depth (inches):____________________

Hydric Soil Present? Yes ☐ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ☒	No ☐	Depth (inches): 4
Water Table Present?	Yes ☒	No ☐	Depth (inches): +4
Saturation Present? (includes capillary fringe)	Yes ☒	No ☐	Depth (inches): surface

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Primary and secondary hydrology indicators observed.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kitsap County Rifle and Revolver Club City/County: Kitsap Sampling Date: 3/17/11

Applicant/Owner: Kitsap County Rifle and Revolver Club State: WA Sampling Point: DP-4A

Investigator(s): Jim Carsner Section, Township, Range: 36, T25N, R1W, W.M

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 2

Subregion (LRR): A Lat: 47º36'29.59"N Long: 122º44'35.09"W Datum: NAD83

Soil Map Unit Name: Alderwood NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒	
Wetland Hydrology Present?	Yes ☒ No ☐	

Remarks: Precipitation at the SeaTac Airport (NOAA website) for month was reported at 190% of normal. Not all three wetland criteria observed.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. Cytisus scoparius	20	x	FACU
2. Gaultheria shallon	1	x	FACU
3.			
4.			
5.			
	21	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Holcus lanatus	70	x	FAC
2. Agrostis capillaris	10		FAC
3. Festuca rubra	10		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	
% Bare Ground in Herb Stratum _____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	90	x 3 =	270
FACU species	21	x 4 =	84
UPL species		x 5 =	
Column Totals:	111 (A)		354 (B)

Prevalence Index = B/A = 3.19

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: Dominance and Prevalence Index test do not meet hydrophytic vegetation criteria.

SOIL

Sampling Point: DP-4A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/3	100					GSL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

☐ 2 cm Muck (A10)
☐ Red Parent Material (TF2)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:__________

Depth (inches):__________

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil criteria observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

☐ Surface Water (A1)
☒ High Water Table (A2)
☒ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
☐ Salt Crust (B11)
☐ Aquatic Invertebrates (B13)
☐ Hydrogen Sulfide Odor (C1)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Stunted or Stressed Plants (D1) (**LRR A**)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ FAC-Neutral Test (D5)
☐ Raised Ant Mounds (D6) (**LRR A**)
☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): ______

Water Table Present? Yes ☒ No ☐ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): surface

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Primary hydrolgoy indicators observed.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kitsap County Rifle and Revolver Club City/County: Kitsap Sampling Date: 3/17/11

Applicant/Owner: Kitsap County Rifle and Revolver Club State: WA Sampling Point: DP-5A

Investigator(s): Jim Carsner Section, Township, Range: 36, T25N, R1W, W.M

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 2

Subregion (LRR): A Lat: 47º36'28.66"N Long: 122º44'35.14"W Datum: NAD83

Soil Map Unit Name: Alderwood NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒	
Wetland Hydrology Present?	Yes ☒ No ☐	

Remarks: Precipitation at the SeaTac Airport (NOAA website) for month was reported at 190% of normal. Although flagged as wetland, this area is marginal, this is a depressional area that was inundated at the time of the site visit. Soils were bright (non-hydric) and compact, apparantely due to historic logging activities. The presence of standing water and Juncus effusus suggests this area may be developing wetland characteristics.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. Spiraea douglasii	10	x	FACw
2.			
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Juncus effusus	70	x	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	
% Bare Ground in Herb Stratum 20			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	80	x 2 = 160
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	80 (A)	160 (B)

Prevalence Index = B/A = 2.0

Hydrophytic Vegetation Indicators:

- ☒ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Dominance and Prevalence Index test show a predominance of hydrophytic vegetation.

SOIL

Sampling Point: DP-5A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/1	100					sandy loam	
4-16	10YR 4/3	100					GSL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:________________________________

Depth (inches):________________________

Hydric Soil Present? Yes ☐ No ☐

Remarks: Hard packed soils within upper 10 inches and dark surface soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): 9

Water Table Present? Yes ☒ No ☐ Depth (inches): +9

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): surface

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Primary and secondary hydrology indicators observed.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kitsap County Rifle and Revolver Club City/County: Kitsap Sampling Date: 3/17/11

Applicant/Owner: Kitsap County Rifle and Revolver Club State: WA Sampling Point: DP-6A

Investigator(s): Jim Carsner Section, Township, Range: 36, T25N, R1W, W.M.

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 2

Subregion (LRR): A Lat: 47º36'28.66"N Long: 122º44'35.14"W Datum: NAD83

Soil Map Unit Name: Alderwood NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒	
Wetland Hydrology Present?	Yes ☒ No ☐	

Remarks: Precipitation at the SeaTac Airport (NOAA website) for month was reported at 190% of normal. Not all three wetland criteria observed.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. Vaccinium ovatum	20	x	FACU
2. Gaultheria shallon	20	x	FACU
3. Cytisus scoparius	10	x	FACU
4.			
5.			
	50	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Holcus lanatus	30	x	FAC
2. Pteridium aquilinum	20	x	FACU
3. Agrostis stoloniferia	20	x	FAC
4. Verbascum thapsus	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	
% Bare Ground in Herb Stratum _____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	50	x 3 = 150
FACU species	75	x 4 = 300
UPL species		x 5 =
Column Totals:	125 (A)	450 (B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: Dominance and Prevalance Index tests not met.

SOIL

Sampling Point: DP-6A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/2	100					sandy loam	
3-16	10YR 4/3	100					gsl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☐ No ☒

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches):
Water Table Present?	Yes ☒	No ☐	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes ☒	No ☐	Depth (inches): surface

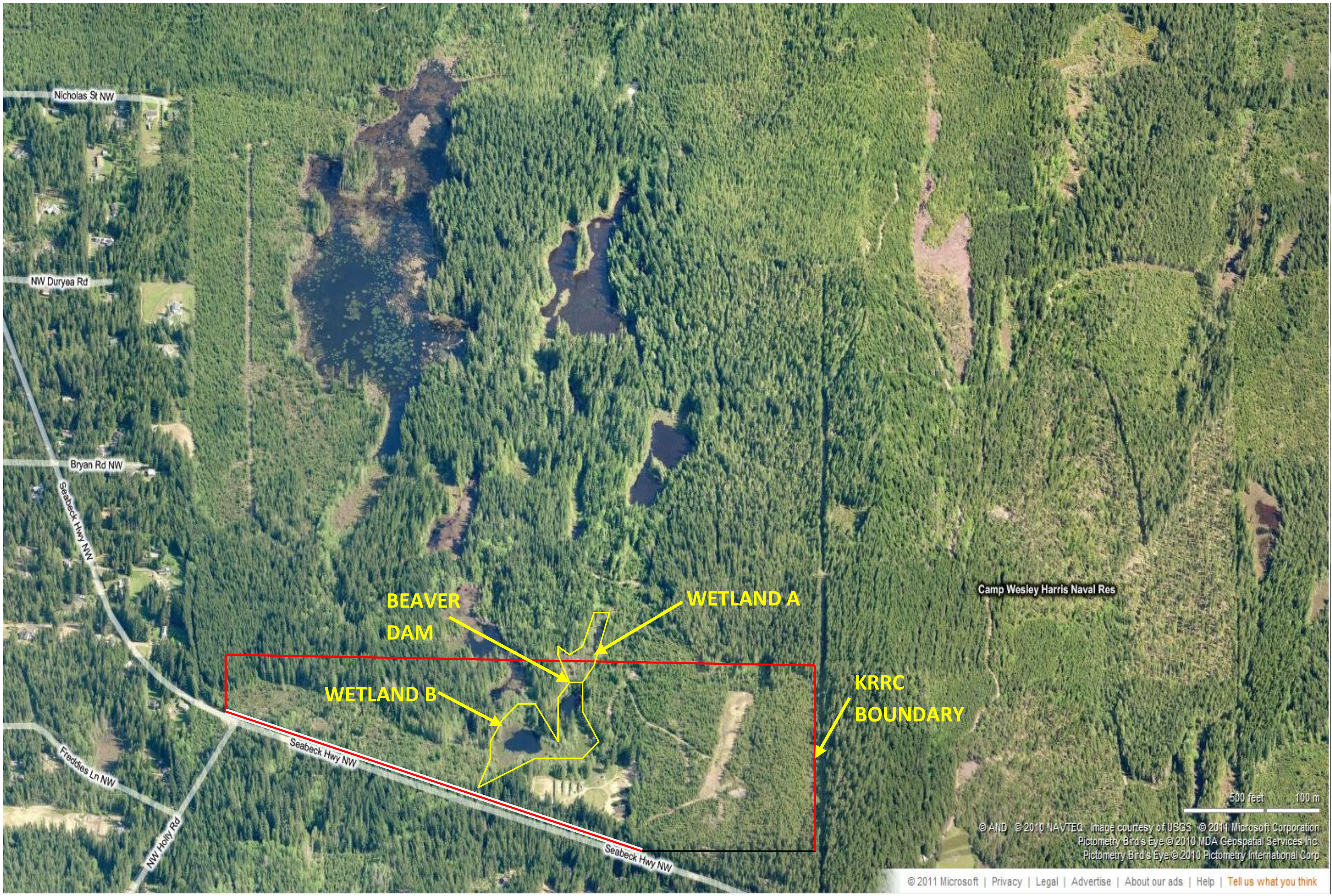
Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Primary hydrology indicators observed.

Appendix D — Wetland Rating Forms

WETLAND RATING FIGURE



WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Wetland A Date of site visit: 1/19/2011

Rated by: Jim Carsner Trained by Ecology? Yes X No ___ Date of training: 5/2007

SEC: 36 TWNSHP: 25N RNGE: 1W Is S/T/R in Appendix D? Yes ___ No X

Map of wetland unit: Figure ___ Estimated size ___

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland: I ___ II X III ___ IV ___

Category I =	Score > 70
Category II =	Score 51 - 69
Category III =	Score 30 – 50
Category IV =	Score < 30

Score for Water Quality Functions	11
Score for Hydrologic Functions	20
Score for Habitat Functions	23
TOTAL Score for Functions	54

Category based on SPECIAL CHARACTERISTCS of Wetland I ___ II ___ Does not apply X

Final Category (choose the "highest" category from above") II

Summary of basic information about the wetland unit.

Wetland Unit has Special Characteristics	
Estuarine	
Natural Heritage Wetland	
Bog	
Mature Forest	
Old Growth Forest	
Coastal Lagoon	
Interdunal	
None of the above	

Wetland HGM Class used for Rating	
Depressional	X
Riverine	
Lake-fringe	
Slope	
Flats	
Freshwater Tidal	
Check if unit has multiple HGM classes present	

Does the wetland being rated meet any of the criteria below? If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands that Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		X
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category 1 Natural Heritage Wetlands (see p. 19 of data form).		X
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		X
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands in to those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Vegetated Wetlands for Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
   NO – go to 2 **YES** – the wetland class is **Tidal Fringe**
   If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?
   YES – Freshwater Tidal Fringe **NO – Saltwater Tidal Fringe (Estuarine)**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is a Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were call estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. ______).

2. The entire wetland unit is flat and precipitation is only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland meet both of the following criteria?
   ______ The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) where at least 20 acres (8ha) in size;
   ______ At least 30% of the open water area is deeper than 6.6 (2 m)?
   NO – go to 4 **YES** – The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland meet all of the following criteria?
   ______ The wetland is on a slope *(slope can be very gradual)*.
   ______ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
   ______ The water leaves the wetland **without being impounded**?
   NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).*
   NO – go to 5 **YES** – The wetland class is **Slope**

5. Does the entire wetland meet all of the following criteria?
   ______ The unit is in a valley or stream channel where it gets inundated by overbank flooding from that stream or river.
   ______ The overbank flooding occurs at least once every two years.
   NOTE: *The riverine unit can contain depressions that are filled with water when the river is not flooding..*
   NO – go to 6 **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of the year. This means that any outlet, if present is higher than the interior of the wetland.
   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.
   No – go to 8 YES – The wetland class is Depressional

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

D	Depressional and Flat Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
D 1	**Does the wetland have the potential to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) .... points = 3 • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet .... points = 2 • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) .... points = 1 • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch .... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure** ___ **2**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) **YES** points = 4 **NO** points = 0	4
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area .... points = 5 • Wetland has persistent, ungrazed vegetation > = 1/2 of area .... points = 3 • Wetland has persistent, ungrazed vegetation > = 1/10 of area .... points = 1 • Wetland has persistent, ungrazed vegetation < 1/10 of area .... points = 0 **Map of Cowardin vegetation classes**	**Figure** ___ **1**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland .... points = 4 • Area seasonally ponded is > 1/4 total area of wetland .... points = 2 • Area seasonally ponded is < 1/4 total area of wetland .... points = 0 **Map of Hydroperiods**	**Figure** ___ **4**
	Total for D 1 *Add the points in the boxes above*	11
D 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft ____ Untreated stormwater discharges to wetland ____ Tilled fields or orchards within 150 ft. of wetland ____ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ____ Residential, urban areas, golf courses are within 150 ft. of wetland ____ Wetland is fed by groundwater high in phosphorus or nitrogen ____ Other ____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 44)* Multiplier 1
◆	**TOTAL – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	11
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) .... points = 4 • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet .... points = 2 • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch .... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* .... points = 0	2
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet .... points = 7 • The wetland is a "headwater" wetland .... points = 5 • Marks of ponding between 2 ft. to < 3 ft. from surface or bottom of outlet .... points = 5 • Marks are at least 0.5 ft. to < 2 ft. from surface or bottom of outlet .... points = 3 • Wetland is flat (yes to Q.2 or Q.7 on key)but has small depressions on the surface that trap water points = 1 • Marks of ponding less than 0.5 ft .... points = 0	5
	D 3.3 Contribution of wetland unit to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* • The area of the basin is less than 10 times the area of unit .... points = 5 • The area of the basin is 10 to 100 times the area of the unit .... points = 3 • The area of the basin is more than 100 times the area of the unit .... points = 0 • Entire unit is in the FLATS class .... points = 5	3
	Total for D 3 *Add the points in the boxes above*	10

D 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ____ Wetland is in a headwater of a river or stream that has flooding problems. __X__ Wetland drains to a river or stream that has flooding problems ____ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ____ Other ____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 49)* Multiplier 2
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	20

Comments:

R	Riverine and Freshwater Tidal Fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
R 1	**Does the wetland have the <u>potential</u> to improve water quality?** *(see p.52)*	
	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: • Depressions cover > 3/4 area of wetland .... points = 8 • Depressions cover > 1/2 area of wetland .... points = 4 **(If depressions > 1/2 of area of unit draw polygons on aerial photo or map)** • Depressions present but cover < 1/2 area of wetland .... points = 2 • No depressions present .... points = 0	**Figure ___**
	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): • Trees or shrubs > 2/3 area of the unit .... points = 8 • Trees or shrubs > 1/3 area of the wetland .... points = 6 • Ungrazed, herbaceous plants > 2/3 area of unit .... points = 6 • Ungrazed herbaceous plants > 1/3 area of unit .... points = 3 • Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit .... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 2	**Does the wetland have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft ____ Untreated stormwater discharges to wetland ____ Tilled fields or orchards within 150 ft. of wetland ____ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ____ Residential, urban areas, golf courses are within 150 ft. of wetland ____ The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality. ____ Other ________________ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 53)* Multiplier ________
◆	**<u>TOTAL</u> – Water Quality Functions** Multiply the score from R1 by R2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
R 3	**Does the wetland have the <u>potential</u> to reduce flooding and erosion?**	*(see p.54)*
	R 3.1 Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit) / (average width of stream between banks).* • If the ratio is more than 20 .... points = 9 • If the ratio is between 10 – 20 .... points = 6 • If the ratio is 5- <10 .... points = 4 • If the ratio is 1- <5 .... points = 2 • If the ratio is < 1 .... points = 1 **Aerial photo or map showing average widths**	**Figure ___**
	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description. (polygons need to have >90% cover at person height NOT Cowardin classes):* • Forest or shrub for > 1/3 area OR herbaceous plants > 2/3 area .... points = 7 • Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area .... points = 4 • Vegetation does not meet above criteria .... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* ____ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. ____ There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding ____ Other ________________ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is 2 **NO** multiplier is 1	*(see p.57)* Multiplier ________
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from R3 by R4; then ***add score to table on p. 1***	

Comments:

L	Lake-fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that the wetland unit functions to improve water quality.	(only 1 score per box)
L 1	**Does the wetland unit have the <u>potential</u> to improve water quality?** *(see p.59)*	
	L 1.1 Average width of vegetation along the lakeshore (use polygons of Cowardin classes): • Vegetation is more than 33 ft. (10m) wide .... points = 6 • Vegetation is more than 16 ft.(5m) wide and < 33 ft .... points = 3 • Vegetation is more than 6 ft. (2m) wide and < 16 ft .... points = 1 • Vegetation is less than 6 ft. wide........ points = 0 **Map of Cowardin classes with widths marked**	**Figure ___**
	L 1.2 Characteristics of the vegetation in the wetland: *Choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* • Cover of herbaceous plants is > 90% of the vegetated area........ points = 6 • Cover of herbaceous plants is > 2/3 of the vegetated area........ points = 4 • Cover of herbaceous plants is > 1/3 of the vegetated area........ points = 3 • Other vegetation that is not aquatic bed or herbaceous covers > 2/3 of the unit .... points = 3 • Other vegetation that is not aquatic bed in > 1/3 vegetated area .... points = 1 • Aquatic bed cover and open water > 2/3 of the unit........ points = 0 **Map with polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
L 2	**Does the wetland have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Wetland is along the shores of a lake or reservoir that does not meet water quality standards ____ Grazing in the wetland or within 150 ft ____ Polluted water discharges to wetland along upland edge ____ Tilled fields or orchards within 150 ft. of wetland ____ Residential or urban areas are within 150 ft. of wetland ____ Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) ____ Power boats with gasoline or diesel engines use the lake ____ Other ______________________ **YES** multiplier is 2 **NO** multiplier is 1	*(see p.61)* Multiplier ________
◆	**<u>TOTAL</u> – Water Quality Functions** Multiply the score from L1 by L2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce shoreline erosion.	
L 3	**Does the wetland have the <u>potential</u> to reduce shoreline erosion?**	*(see p.62)*
	L 3 Average width and characteristics of vegetation along the lakeshore *(do not include aquatic bed): (choose the highest scoring description that matches conditions in the wetland)* • 3/4 of distance is shrubs or forest at least 33 ft. (10m) wide .... points = 6 • 3/4 of distance is shrubs or forest at least 6 ft. (2m) wide. .... points = 4 • 1/4 of distance is shrubs or forest at least 33 ft. (10m) wide. .... points = 4 • Vegetation is at least 6 ft. (2m) wide (any type except aquatic bed)........ points = 2 • Vegetation is less than 6 ft. (2m) wide (any type except aquatic bed) .... points = 0 **Aerial photo or map with Cowardin vegetation classes**	**Figure ___**
	Record the points in the boxes above	
L 4	**Does the wetland have the <u>opportunity</u> to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* ____ There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. ____ There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests, other wetlands) that can be damaged by shoreline erosion. ____ Other ______________________ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 64)* Multiplier ________
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from L3 by L4; then ***add score to table on p. 1***	

Comments:

S	Slope Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
S 1	**Does the wetland have the potential to improve water quality?**	*(see p.64)*
	S 1.1 Characteristics of average slope of unit: • Slope is 1% or less *(a 1% slope has a 1 ft. vertical drop in elevation for every 100 ft. horizontal distance)*......... points = 3 • Slope is 1% - 2% .... points = 2 • Slope is 2% - 5%. .... points = 1 • Slope is greater than 5% .... points = 0	
	S 1.2 The soil 2 inches below the surface (or duff layer) is clay, organic *(Use NRCS definitions).* **YES** = 3 points **NO** = 0 points	
	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* • Dense, uncut, herbaceous vegetation > 90% of the wetland area........ points = 6 • Dense, uncut, herbaceous vegetation > 1/2 of area .... points = 3 • Dense, woody, vegetation > 1/2 of area........ points = 2 • Dense, uncut, herbaceous vegetation > 1/4 of area .... points = 1 • Does not meet any of the criteria above for vegetation .... points = 0 **Aerial photo or map with vegetation polygons**	**Figure ___**
	Total for S 1 *Add the points in the boxes above*	
S 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft ____ Untreated stormwater discharges to wetland ____ Tilled fields, logging, or orchards within 150 ft. of wetland ____ Residential, urban areas, or golf courses are within 150 ft. upslope of wetland ____ Other ____________________ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 67)* Multiplier _______
◆	**TOTAL – Water Quality Functions** Multiply the score from S1 by S2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
S 3	**Does the wetland have the potential to reduce flooding and stream erosion?**	*(see p.68)*
	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms: *Choose the points appropriate for the description that best fits conditions in the wetland (stems of plants should be thick enough (usually > 1/8in), or dense enough to remain erect during surface flows).* • Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland .... points = 6 • Dense, uncut, **rigid** vegetation> 1/2 area of wetland .... points = 3 • Dense, uncut, **rigid** vegetation > 1/4 area........ points = 1 • More than 1/4 of area is grazed, mowed, tilled, or vegetation is not rigid .... points = 0	
	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows. The slope has small surface depressions that can retain water over at least 10% of its area. **YES** = 2 points **NO** = 0 points	
	Add the points in the boxes above	
S 4	**Does the wetland have the opportunity to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* ____ Wetland has surface runoff that drains to a river or stream that has flooding problems ____ Other ____________________ *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 70)* Multiplier _______
◆	**TOTAL – Hydrologic Functions** Multiply the score from S3 by S4; then ***add score to table on p. 1***	

Comments:

These questions apply to wetlands of all HGM classes.		**Points**
	HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.	(only 1 score per box)
H 1	**Does the wetland have the potential to provide habitat for many species?**	

H 1.1 Vegetation structure *(see P. 72)*:

Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.

__X__ Aquatic Bed
__X__ Emergent plants
__X__ Scrub/shrub (areas where shrubs have > 30% cover)
____ Forested (areas where trees have > 30% cover)

If the unit has a forested class check if:

____ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon.

Add the number of vegetation types that qualify. If you have: **Map of Cowardin vegetation classes**

4 structures or more .... points = 4
3 structures .... points = 2
2 structures .... points = 1
1 structure .... points = 0

Figure ___ Points: **2**

H 1.2 Hydroperiods *(see p.73)*:

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).

__x__ Permanently flooded or inundated
__x__ Seasonally flooded or inundated
____ Occasionally flooded or inundated
____ Saturated only
__x__ Permanently flowing stream or river in, or adjacent to, the wetland
____ Seasonally flowing stream in, or adjacent to, the wetland
____ **Lake-fringe wetland .... = 2 points**
____ **Freshwater tidal wetland .... = 2 points**

4 or more types present .... points = 3
3 or more types present ...... points = 2
2 types present .... points = 1
1 type present .... points = 0

Map of hydroperiods

Figure ___ Points: **2**

H 1.3 Richness of Plant Species *(see p. 75)*:

Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)*

You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle. If you counted:

> 19 species .... points = 2
5 – 19 species .... points = 1
< 5 species .... points = 0

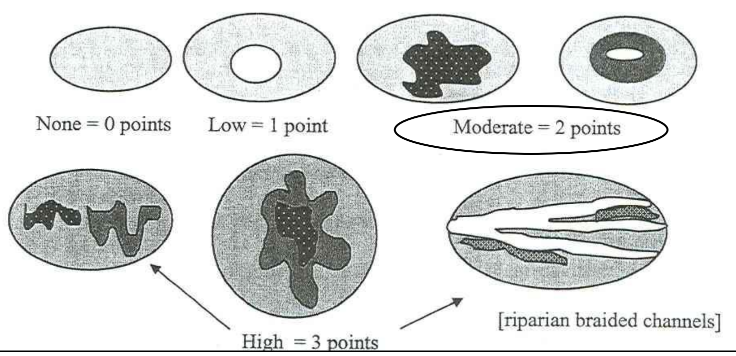
List species below if you want to:

____
____
____
____

Points: 1

H 1.4 Interspersion of Habitats *(see p. 76)*:

Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.



Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always "high".

Use map of Cowardin classes.

Figure ___ Points: **2**

H 1.5 Special Habitat Features *(see p. 77)*:

Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.

__x__ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft. long)
__x__ Standing snags (diameter at the bottom > 4 inches) in the wetland
____ Undercut banks are present for at least 6.6 ft. (2m) and/or overhanging vegetation extends at least 3.3 ft. (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft. (10m)
____ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)*
__x__ At least 1/4 acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)*
__x__ Invasive plants cover less than 25% of the wetland area in each stratum of plants
NOTE: The 20% stated in early printings of the manual on page 78 is an error.

Points: 4

	H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	11

<table>
<tr><td>H 2</td><td>Does the wetland have the <u>opportunity</u> to provide habitat for many species?</td><td>(only 1 score per box)</td></tr>
<tr><td></td><td>H 2.1 <u>Buffers</u> (see P. 80):
Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed".
____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% of circumference. No structures are within the undisturbed part of buffer (relatively undisturbed also means no grazing, no landscaping, no daily human use)............ points = 5
____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference .... points = 4
____ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% circumference .... points = 4
____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference .... points = 3
____ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference .... points = 3
If buffer does not meet any of the criteria above:
____ No paved areas (except paved trails) or buildings within 25m (80 ft) of wetland > 95% circumference. Light to moderate grazing or lawns are OK .... points = 2
____ No paved areas of buildings within 50m of wetland for > 50% circumference. Light to moderate grazing or lawns are OK .... points = 2
____ Heavy grazing in buffer .... points = 1
____ Vegetated buffers are < 2m wide (6.6 ft) for more than 95% circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland) .... points = 0
____ Buffer does not meet any of the criteria above .... points = 1
Arial photo showing buffers</td><td>Figure ___

4</td></tr>
<tr><td></td><td>H 2.2 <u>Corridors and Connections</u> (see p. 81)
H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft. wide, has at least a 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (Dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor).
YES = 4 points (go to H 2.3)   NO = go to H 2.2.2
H. 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50 ft. wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? OR a Lake-fringe wetland, if it does not have an undisturbed corridor as in the question above?
YES = 2 points (go to H 2.3)   NO = go to H 2.2.3
H. 2.2.3 Is the wetland:
• Within 5 mi (8km) of a brackish or salt water estuary OR
• Within 3 miles of a large field or pasture (> 40 acres) OR   YES = 1 point
• Within 1 mile of a lake greater than 20 acres?   NO = 0 points</td><td>4</td></tr>
</table>

Comments:

	H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)* Which of the following priority habitats are within 330 ft. (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ____ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ____ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ____ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ____ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ____ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ____ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ____ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. __X__ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If we~~tland has 2 priority habitats = 3 points~~ If wetland has **1** priority habitat **= 1 point** No habitats = 0 points Note: All vegetated ~~wetlands are by definition~~ a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)	1
	H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)* • There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development ....points = 5 • The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile ....points = 5 • There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. ....points = 3 • The wetland fringe on a lake **with** disturbance and there are 3 other lake-fringe wetlands within 1/2 mile ....points = 3 • There is at least 1 wetland within 1/2 mile ....points = 2 • There are no wetlands within 1/2 mile.......points = 0	5
	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	14
	TOTAL for H 1 from page 8	11
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	25

Comments:

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type – *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*

SC1 **Estuarine wetlands?** *(see p.86)*

Does the wetland unit meet the following criteria for Estuarine wetlands?

____ The dominant water regime is tidal,

____ Vegetated, and

____ With a salinity greater than 0.5 ppt.

YES = Go to SC 1.1 **NO** X

SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? **YES** = Category I **NO** = go to SC 1.2 — **Cat. 1**

SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions?

YES = Category I **NO** = Category II — **Cat. I**

____ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp,. are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category 1. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — **Cat. II**

____ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland

____ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. — **Dual Rating I/II**

SC2 **Natural Heritage Wetlands** *(see p. 87)*

Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species.

SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? *(This question is used to screen out most sites before you need to contact WNHP/DNR.)*

S/T/R information from Appendix D X or accessed from WNHP/DNR web site ____

YES _____ Contact WNHP/DNR (see p. 79) and go to SC 2.2 **NO** X

SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species?

YES = Category 1 **NO** X not a Heritage Wetland — **Cat I**

SC3 **Bogs** *(see p. 87)*

Does the wetland **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. ***If you answer yes you will still need to rate the wetland based on its function.***

1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? **YES** = go to question 3 **NO** = go to question 2
2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? **YES** = go to question 3 **NO** = is not a bog for purpose of rating
3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)?
   YES = Is a bog for purpose of rating **NO** = go to question 4
   NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog.
4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)*?
   YES = Category I **NO** = Is not a bog for purpose of rating — **Cat. I**

SC4	**Forested Wetlands** *(see p. 90)* Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its function.* ____ **Old-growth forests**: (west of Cascade Crest) Stands of at least two three species forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm or more). NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ____ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have an average diameters (dbh) exceeding 21 inches (53 cm); crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. **YES** = Category I **NO** = __X__ not a forested wetland with special characteristics	**Cat. I**
SC5	**Wetlands in Coastal Lagoons** *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ____ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks. ____ The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom.)* **YES** = Go to SC 5.1 **NO** __X__ not a wetland in a coastal lagoon SC 5.1 Does the wetland meet all of the following three conditions? ____ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing) and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ____ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland. ____ The wetland is larger than 1/10 acre (4350 square ft.) **YES** = Category I **NO** = Category II	**Cat. I** **Cat. II**
SC6	**Interdunal Wetlands** *(see p. 93)* Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? **YES** = Go to SC 6.1 **NO** __X__ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula -- lands west of SR 103 • Grayland-Westport -- lands west of SR 105 • Ocean Shores-Copalis – lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger? **YES** = Category II **NO** = go to SC 6.2 SC 6.2 Is the wetland between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? **YES** = Category III	**Cat. II** **Cat. III**
◆	**Category of wetland based on Special Characteristics** *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered **NO** for all types enter "Not Applicable" on p. 1	**NA**

Comments:

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Wetland B Date of site visit: 1/19/2011

Rated by: Jim Carsner Trained by Ecology? Yes X No___ Date of training: 5/2007

SEC: 36 TWNSHP: 25N RNGE: 1W Is S/T/R in Appendix D? Yes___ No X

Map of wetland unit: Figure______ Estimated size______

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland: I___ II X III___ IV___

Category I =	Score > 70	Score for Water Quality Functions	26
Category II =	Score 51 - 69	Score for Hydrologic Functions	14
Category III =	Score 30 – 50	Score for Habitat Functions	27
Category IV =	Score < 30	TOTAL Score for Functions	67

Category based on SPECIAL CHARACTERISTCS of Wetland I___ II___ Does not apply X

Final Category (choose the "highest" category from above") **II**

Summary of basic information about the wetland unit.

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above		Check if unit has multiple HGM classes present	

Does the wetland being rated meet any of the criteria below? If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands that Need Additional Protection (in addition to the protection recommended for its category)	**YES**	**NO**
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		X
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category 1 Natural Heritage Wetlands (see p. 19 of data form).		X
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		X
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

<u>To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.</u>

The hydrogeomorphic classification groups wetlands in to those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Vegetated Wetlands for Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
   NO – go to 2 **YES** – the wetland class is **Tidal Fringe**
   If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?
   YES – Freshwater Tidal Fringe **NO – Saltwater Tidal Fringe (Estuarine)**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is a Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were call estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. ______).

2. The entire wetland unit is flat and precipitation is only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland meet both of the following criteria?
   ______ The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) where at least 20 acres (8ha) in size;
   ______ At least 30% of the open water area is deeper than 6.6 (2 m)?
   NO – go to 4 **YES** – The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland meet all of the following criteria?
   ______ The wetland is on a slope *(slope can be very gradual)*.
   ______ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
   ______ The water leaves the wetland **without being impounded**?
   NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).*
   NO – go to 5 **YES** – The wetland class is **Slope**

5. Does the entire wetland meet all of the following criteria?
   ______ The unit is in a valley or stream channel where it gets inundated by overbank flooding from that stream or river.
   ______ The overbank flooding occurs at least once every two years.
   NOTE: *The riverine unit can contain depressions that are filled with water when the river is not flooding..*
   NO – go to 6 **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of the year. This means that any outlet, if present is higher than the interior of the wetland.
   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.
   No – go to 8 YES – The wetland class is Depressional

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number B

D	Depressional and Flat Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
D 1	**Does the wetland have the <u>potential</u> to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) .... points = 3 • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet .... points = 2 • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) .... points = 1 • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch .... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure ___** **2**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) **YES** points = 4 **NO** points = 0	4
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area .... points = 5 • Wetland has persistent, ungrazed vegetation > = 1/2 of area .... points = 3 • Wetland has persistent, ungrazed vegetation > = 1/10 of area .... points = 1 • Wetland has persistent, ungrazed vegetation < 1/10 of area .... points = 0 **Map of Cowardin vegetation classes**	**Figure ___** **3**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland .... points = 4 • Area seasonally ponded is > 1/4 total area of wetland .... points = 2 • Area seasonally ponded is < 1/4 total area of wetland .... points = 0 **Map of Hydroperiods**	**Figure ___** **4**
	Total for D 1 *Add the points in the boxes above*	13
D 2	**Does the wetland have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft ____ Untreated stormwater discharges to wetland ____ Tilled fields or orchards within 150 ft. of wetland _X_ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ____ Residential, urban areas, golf courses are within 150 ft. of wetland ____ Wetland is fed by groundwater high in phosphorus or nitrogen ____ Other ____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 44)* Multiplier 2
◆	**<u>TOTAL</u> – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	26
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the <u>potential</u> to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) .... points = 4 • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet .... points = 2 • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch .... points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* .... points = 0	2
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet .... points = 7 • The wetland is a "headwater" wetland .... points = 5 • Marks of ponding between 2 ft. to < 3 ft. from surface or bottom of outlet .... points = 5 • Marks are at least 0.5 ft. to < 2 ft. from surface or bottom of outlet .... points = 3 • Wetland is flat (yes to Q.2 or Q.7 on key)but has small depressions on the surface that trap water points = 1 • Marks of ponding less than 0.5 ft .... points = 0	3
	D 3.3 Contribution of wetland unit to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* • The area of the basin is less than 10 times the area of unit .... points = 5 • The area of the basin is 10 to 100 times the area of the unit .... points = 3 • The area of the basin is more than 100 times the area of the unit .... points = 0 • Entire unit is in the FLATS class .... points = 5	3
	Total for D 3 *Add the points in the boxes above*	7

D 4	**Does the wetland have the opportunity to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ____ Wetland is in a headwater of a river or stream that has flooding problems. X Wetland drains to a river or stream that has flooding problems ____ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ____ Other ____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 49)* Multiplier 2
◆	**TOTAL – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	14

Comments:

Wetland name or number ___B____________________

R	Riverine and Freshwater Tidal Fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
R 1	**Does the wetland have the <u>potential</u> to improve water quality?** *(see p.52)*	
	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: • Depressions cover > 3/4 area of wetland .... points = 8 • Depressions cover > 1/2 area of wetland .... points = 4 **(If depressions > 1/2 of area of unit draw polygons on aerial photo or map)** • Depressions present but cover < 1/2 area of wetland. .... points = 2 • No depressions present .... points = 0	**Figure ___**
	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): • Trees or shrubs > 2/3 area of the unit .... points = 8 • Trees or shrubs > 1/3 area of the wetland .... points = 6 • Ungrazed, herbaceous plants > 2/3 area of unit .... points = 6 • Ungrazed herbaceous plants > 1/3 area of unit .... points = 3 • Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit .... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 2	**Does the wetland have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft ____ Untreated stormwater discharges to wetland ____ Tilled fields or orchards within 150 ft. of wetland ____ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ____ Residential, urban areas, golf courses are within 150 ft. of wetland ____ The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality. ____ Other ________________________ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 53)* Multiplier ________
◆	**<u>TOTAL</u> – Water Quality Functions** Multiply the score from R1 by R2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
R 3	**Does the wetland have the <u>potential</u> to reduce flooding and erosion?**	*(see p.54)*
	R 3.1 Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit) / (average width of stream between banks).* • If the ratio is more than 20 .... points = 9 • If the ratio is between 10 – 20 .... points = 6 • If the ratio is 5- <10 .... points = 4 • If the ratio is 1- <5 .... points = 2 • If the ratio is < 1 .... points = 1 **Aerial photo or map showing average widths**	**Figure ___**
	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description. (polygons need to have >90% cover at person height NOT Cowardin classes):* • Forest or shrub for > 1/3 area OR herbaceous plants > 2/3 area .... points = 7 • Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area .... points = 4 • Vegetation does not meet above criteria .... points = 0 **Aerial photo or map showing polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
R 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* ____ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. ____ There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding ____ Other ________________________ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is 2 **NO** multiplier is 1	*(see p.57)* Multiplier ________
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from R3 by R4; then ***add score to table on p. 1***	

Comments:

L	Lake-fringe Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that the wetland unit functions to improve water quality.	(only 1 score per box)
L 1	**Does the wetland unit have the potential to improve water quality?** *(see p.59)*	
	L 1.1 Average width of vegetation along the lakeshore (use polygons of Cowardin classes): • Vegetation is more than 33 ft. (10m) wide .... points = 6 • Vegetation is more than 16 ft.(5m) wide and < 33 ft .... points = 3 • Vegetation is more than 6 ft. (2m) wide and < 16 ft .... points = 1 • Vegetation is less than 6 ft. wide.......... points = 0 **Map of Cowardin classes with widths marked**	**Figure ___**
	L 1.2 Characteristics of the vegetation in the wetland: *Choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* • Cover of herbaceous plants is > 90% of the vegetated area.......... points = 6 • Cover of herbaceous plants is > 2/3 of the vegetated area.......... points = 4 • Cover of herbaceous plants is > 1/3 of the vegetated area.......... points = 3 • Other vegetation that is not aquatic bed or herbaceous covers > 2/3 of the unit .... points = 3 • Other vegetation that is not aquatic bed in > 1/3 vegetated area .... points = 1 • Aquatic bed cover and open water > 2/3 of the unit.......... points = 0 **Map with polygons of different vegetation types**	**Figure ___**
	Add the points in the boxes above	
L 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Wetland is along the shores of a lake or reservoir that does not meet water quality standards ____ Grazing in the wetland or within 150 ft ____ Polluted water discharges to wetland along upland edge ____ Tilled fields or orchards within 150 ft. of wetland ____ Residential or urban areas are within 150 ft. of wetland ____ Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) ____ Power boats with gasoline or diesel engines use the lake ____ Other ____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p.61)* Multiplier ____
◆	**TOTAL – Water Quality Functions** Multiply the score from L1 by L2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce shoreline erosion.	
L 3	**Does the wetland have the potential to reduce shoreline erosion?**	*(see p.62)*
	L 3 Average width and characteristics of vegetation along the lakeshore *(do not include aquatic bed): (choose the highest scoring description that matches conditions in the wetland)* • 3/4 of distance is shrubs or forest at least 33 ft. (10m) wide .... points = 6 • 3/4 of distance is shrubs or forest at least 6 ft. (2m) wide. .... points = 4 • 1/4 of distance is shrubs or forest at least 33 ft. (10m) wide. .... points = 4 • Vegetation is at least 6 ft. (2m) wide (any type except aquatic bed).......... points = 2 • Vegetation is less than 6 ft. (2m) wide (any type except aquatic bed) .... points = 0 **Aerial photo or map with Cowardin vegetation classes**	**Figure ___**
	Record the points in the boxes above	
L 4	**Does the wetland have the opportunity to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* ____ There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. ____ There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests, other wetlands) that can be damaged by shoreline erosion. ____ Other ____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 64)* Multiplier ____
◆	**TOTAL – Hydrologic Functions** Multiply the score from L3 by L4; then ***add score to table on p. 1***	

Comments:

S	Slope Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
S 1	**Does the wetland have the <u>potential</u> to improve water quality?**	*(see p.64)*
	S 1.1 Characteristics of average slope of unit: • Slope is 1% or less *(a 1% slope has a 1 ft. vertical drop in elevation for every 100 ft. horizontal distance)* .... points = 3 • Slope is 1% - 2% .... points = 2 • Slope is 2% - 5%. .... points = 1 • Slope is greater than 5% .... points = 0	
	S 1.2 The soil 2 inches below the surface (or duff layer) is clay, organic *(Use NRCS definitions).* **YES** = 3 points **NO** = 0 points	
	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* • Dense, uncut, herbaceous vegetation > 90% of the wetland area .... points = 6 • Dense, uncut, herbaceous vegetation > 1/2 of area .... points = 3 • Dense, woody, vegetation > 1/2 of area........ points = 2 • Dense, uncut, herbaceous vegetation > 1/4 of area .... points = 1 • Does not meet any of the criteria above for vegetation .... points = 0 **Aerial photo or map with vegetation polygons**	**Figure ___**
	Total for S 1 *Add the points in the boxes above*	
S 2	**Does the wetland have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ____ Grazing in the wetland or within 150 ft ____ Untreated stormwater discharges to wetland ____ Tilled fields, logging, or orchards within 150 ft. of wetland ____ Residential, urban areas, or golf courses are within 150 ft. upslope of wetland ____ Other ________________ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 67)* Multiplier _______
◆	**<u>TOTAL</u> – Water Quality Functions** Multiply the score from S1 by S2; then ***add score to table on p. 1***	
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
S 3	**Does the wetland have the <u>potential</u> to reduce flooding and stream erosion?**	*(see p.68)*
	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms: *Choose the points appropriate for the description that best fits conditions in the wetland (stems of plants should be thick enough (usually > 1/8in), or dense enough to remain erect during surface flows).* • Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland .... points = 6 • Dense, uncut, **rigid** vegetation> 1/2 area of wetland .... points = 3 • Dense, uncut, **rigid** vegetation > 1/4 area........ points = 1 • More than 1/4 of area is grazed, mowed, tilled, or vegetation is not rigid .... points = 0	
	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows. The slope has small surface depressions that can retain water over at least 10% of its area. **YES** = 2 points **NO** = 0 points	
	Add the points in the boxes above	
S 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* ____ Wetland has surface runoff that drains to a river or stream that has flooding problems ____ Other ________________ *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 70)* Multiplier _______
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from S3 by S4; then ***add score to table on p. 1***	

Comments:

These questions apply to wetlands of all HGM classes.		**Points**
	HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.	(only 1 score per box)
H 1	**Does the wetland have the potential to provide habitat for many species?**	

H 1.1 Vegetation structure *(see P. 72)*:
Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.

- ____ Aquatic Bed
- __X__ Emergent plants
- __X__ Scrub/shrub (areas where shrubs have > 30% cover)
- __X__ Forested (areas where trees have > 30% cover)

If the unit has a forested class check if:
__x__ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon.

Add the number of vegetation types that qualify. If you have: **Map of Cowardin vegetation classes**

4 structures or more .... points = 4
3 structures .... points = 2
2 structures .... points = 1
1 structure .... points = 0

Figure ___ **4**

H 1.2 Hydroperiods *(see p.73)*:
Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).

- __x__ Permanently flooded or inundated
- __x__ Seasonally flooded or inundated
- ____ Occasionally flooded or inundated
- ____ Saturated only
- __x__ Permanently flowing stream or river in, or adjacent to, the wetland
- ____ Seasonally flowing stream in, or adjacent to, the wetland
- ____ **Lake-fringe wetland .... = 2 points**
- ____ **Freshwater tidal wetland .... = 2 points**

4 or more types present points = 3
3 or more types present......points = 2
2 types present..................points = 1
1 type present ....points = 0

Map of hydroperiods

Figure ___ **2**

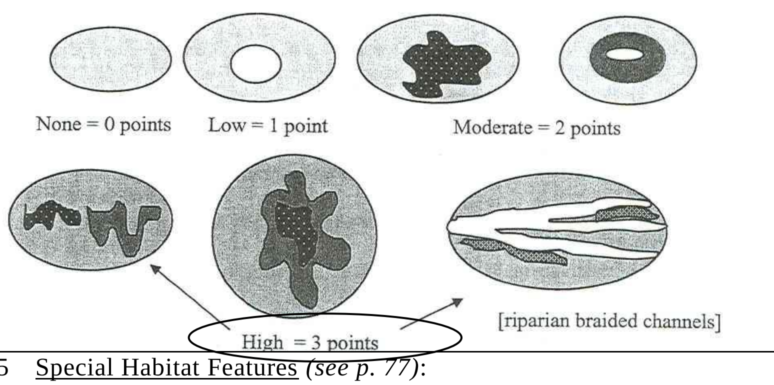
H 1.3 Richness of Plant Species *(see p. 75)*:
Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)*
You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle. If you counted:

> 19 species .... points = 2
5 – 19 species.................... points = 1
< 5 species .... points = 0

List species below if you want to:
____
____
____
____

1

H 1.4 Interspersion of Habitats *(see p. 76)*:
Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.



Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always "high".

Use map of Cowardin classes.

Figure ___ **3**

H 1.5 Special Habitat Features *(see p. 77)*:
Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.

- __x__ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft. long)
- __x__ Standing snags (diameter at the bottom > 4 inches) in the wetland
- ____ Undercut banks are present for at least 6.6 ft. (2m) and/or overhanging vegetation extends at least 3.3 ft. (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft. (10m)
- ____ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)*
- __x__ At least 1/4 acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)*
- __x__ Invasive plants cover less than 25% of the wetland area in each stratum of plants
  NOTE: The 20% stated in early printings of the manual on page 78 is an error.

4

H 1 TOTAL Score – potential for providing habitat *Add the points in the column above* 14

H 2	Does the wetland have the opportunity to provide habitat for many species?	(only 1 score per box)
	H 2.1 Buffers *(see P. 80)*: *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed".* ____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% of circumference. No structures are within the undisturbed part of buffer (relatively undisturbed also means no grazing, no landscaping, no daily human use)............ **points = 5** ____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference .... **points = 4** ____ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% circumference .... **points = 4** ____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference .... **points = 3** ____ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference .... **points = 3** **If buffer does not meet any of the criteria above:** ____ No paved areas (except paved trails) or buildings within 25m (80 ft) of wetland > 95% circumference. Light to moderate grazing or lawns are OK .... **points = 2** ____ No paved areas of buildings within 50m of wetland for > 50% circumference. Light to moderate grazing or lawns are OK .... **points = 2** ____ Heavy grazing in buffer .... **points = 1** ____ Vegetated buffers are < 2m wide (6.6 ft) for more than 95% circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland) .... **points = 0** ____ Buffer does not meet any of the criteria above .... **points = 1** **Arial photo showing buffers**	**Figure ___** **3**
	H 2.2 Corridors and Connections *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft. wide, has at least a 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? *(Dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor).* **YES** = **4 points** (go to H 2.3) **NO** = go to H 2.2.2 H. 2.2.2 Is the wetland ~~part of a relatively~~ undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50 ft. wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR a Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? **YES** = **2 points** (go to H 2.3) **NO** = go to H 2.2.3 H. 2.2.3 Is the wetland: • Within 5 mi (8km) of a brackish or salt water estuary OR • Within 3 miles of a large field or pasture (> 40 acres) OR **YES** = 1 point • Within 1 mile of a lake greater than 20 acres? **NO** = 0 points	4

Comments:

	H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)* Which of the following priority habitats are within 330 ft. (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ____ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ____ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ____ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ____ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ____ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ____ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ____ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. __X__ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)	1
	H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)* • There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development ....points = 5 • The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile ....points = 5 • There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. ....points = 3 • The wetland fringe on a lake **with** disturbance and there are 3 other lake-fringe wetlands within 1/2 mile ....points = 3 • There is at least 1 wetland within 1/2 mile ....points = 2 • There are no wetlands within 1/2 mile.........points = 0	5
	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	13
	TOTAL for H 1 from page 8	14
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	27

Comments:

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

	Wetland Type – *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	
SC1	**Estuarine wetlands?** *(see p.86)* Does the wetland unit meet the following criteria for Estuarine wetlands? ____ The dominant water regime is tidal, ____ Vegetated, and ____ With a salinity greater than 0.5 ppt. **YES** = Go to SC 1.1 **NO** X	
	SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? **YES** = Category I **NO** = go to SC 1.2	**Cat. 1**
	SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions? **YES** = Category I **NO** = Category II ____ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp,. are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category 1. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ____ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland ____ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual Rating I/II**
SC2	**Natural Heritage Wetlands** *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? *(This question is used to screen out most sites before you need to contact WNHP/DNR.)* S/T/R information from Appendix D X or accessed from WNHP/DNR web site ____ **YES** ____ Contact WNHP/DNR (see p. 79) and go to SC 2.2 **NO** X SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? **YES** = Category 1 **NO** X not a Heritage Wetland	**Cat I**
SC3	**Bogs** *(see p. 87)* Does the wetland **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. ***If you answer yes you will still need to rate the wetland based on its function.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? **YES** = go to question 3 **NO** = go to question 2 2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? **YES** = go to question 3 **NO** = is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? **YES** = Is a bog for purpose of rating **NO** = go to question 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)*? **YES** = Category I **NO** = Is not a bog for purpose of rating	**Cat. I**

SC4	**<u>Forested Wetlands</u>** *(see p. 90)* Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its function.* ____ **Old-growth forests**: (west of Cascade Crest) Stands of at least two three species forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm or more). NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ____ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have an average diameters (dbh) exceeding 21 inches (53 cm); crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. **YES** = Category I **NO** = __X__ not a forested wetland with special characteristics	**Cat. I**
SC5	**<u>Wetlands in Coastal Lagoons</u>** *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ____ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks. ____ The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom.)* **YES** = Go to SC 5.1 **NO** __X__ not a wetland in a coastal lagoon SC 5.1 Does the wetland meet all of the following three conditions? ____ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing) and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ____ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland. ____ The wetland is larger than 1/10 acre (4350 square ft.) **YES** = Category I **NO** = Category II	**Cat. I** **Cat. II**
SC6	**<u>Interdunal Wetlands</u>** *(see p. 93)* Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? **YES** = Go to SC 6.1 **NO** __X__ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula -- lands west of SR 103 • Grayland-Westport -- lands west of SR 105 • Ocean Shores-Copalis – lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger? **YES** = Category II **NO** = go to SC 6.2 SC 6.2 Is the wetland between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? **YES** = Category III	**Cat. II** **Cat. III**
◆	**Category of wetland based on Special Characteristics** *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered **NO** for all types enter "Not Applicable" on p. 1	**NA**

Comments:

E Photographic Documentation

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Photo 1 Sample PR01SS.

Direction: Down *Date: 6/03/11* *Time: 08:29*

Photo 2 Sample PR03SS.

Direction: Down *Date: 6/03/11* *Time: 08:46*

Photo 3 Sample PR02SS.
Note: Photo indicated sample is PR04SS but this is incorrect.

Direction: Down *Date: 6/03/11* *Time: 08:51*

Photo 4 Sample PR04SS.

Direction: Down *Date: 6/03/11* *Time: 09:06*

Photo 5 Sample SR01SS.

Direction: Down *Date: 6/03/11* *Time: 09:34*

Photo 6 Sample SR02SS.

Direction: Down *Date: 6/03/11* *Time: 09:45*

Photo 7 Sample SR03SS.

Direction: Down *Date: 6/03/11* *Time: 10:06*

Photo 8 Sample SR04SS.

Direction: Down *Date: 6/03/11* *Time: 10:25*

Photo 9 Sample RR01SS.

Direction: Down *Date: 6/03/11* *Time: 11:38*

Photo 10 Sample RR02SS.

Direction: Down *Date: 6/03/11* *Time: 11:40*

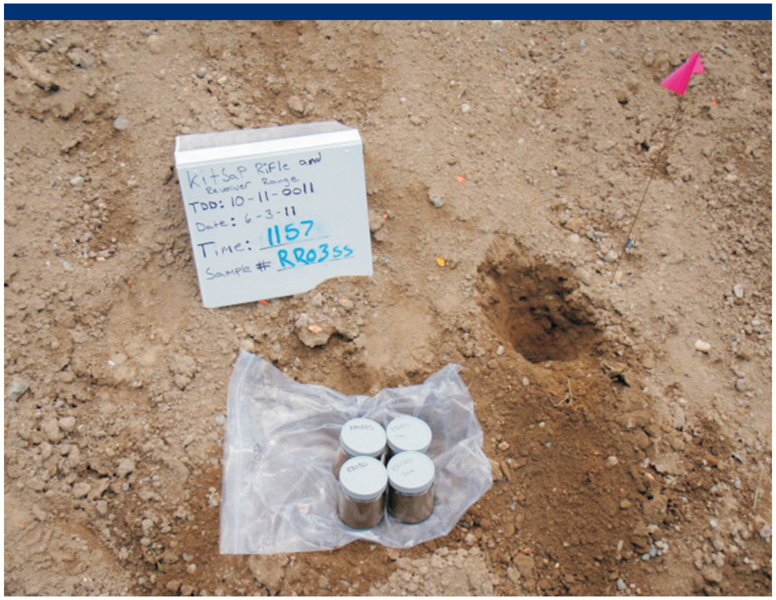

Photo 11 Sample RR03SS.

Direction: Down *Date: 6/03/11* *Time: 11:58*

Photo 12 Sample RR04SS.

Direction: Down *Date: 6/03/11* *Time: 11:58*

Photo 13 Sample SR06SS.

Direction: Down *Date: 6/03/11* *Time: 12:16*

Photo 14 Photo of ground in SR#3.

Direction: Down *Date: 6/03/11* *Time: 12:16*

Photo 15 Sample SR05SS.

Direction: Down *Date: 6/03/11* *Time: 12:20*

Photo 16 Sample WL01SD.

Direction: Down *Date: 6/03/11* *Time: 13:03*

Photo 17   Sample WL01SD.

Direction: Down   *Date: 6/03/11*   *Time: 13:04*

Photo 18   Sample WL03SD.

Direction: Down   *Date: 6/03/11*   *Time: 13:38*

Photo 19   Sample WL03SD.

Direction: Down   *Date: 6/03/11*   *Time: 13:39*

Photo 20   Sample WL03SD.

Direction: Down   *Date: 6/03/11*   *Time: 13:39*

Photo 21 Sample WL03SD.

Direction: Down *Date: 6/03/11* *Time: 13:39*

Photo 22 Sample WL02SD.

Direction: Down *Date: 6/03/11* *Time: 13:46*

Photo 23 Sample WL02SD.

Direction: Down *Date: 6/03/11* *Time: 13:46*

Photo 24 Sample WL04SD.

Direction: Down *Date: 6/03/11* *Time: 14:10*

Photo 25 Sample WL01WT.

Direction: Down *Date: 6/03/11* *Time: 14:19*

Photo 26 Sample WL05SD.

Direction: Down *Date: 6/03/11* *Time: 14:25*

Photo 27 Sample WL06SD.

Direction: Down *Date: 6/03/11* *Time: 14:57*

Photo 28 Sample BK01WT.

Direction: Down *Date: 6/03/11* *Time: 15:17*

Photo 29 Sample BK01SD.

Direction: Down *Date: 6/03/11* *Time: 15:18*

Photo 30 Sample BK01SS.

Direction: Down *Date: 6/03/11* *Time: 15:51*

Photo 31 Sample BK01SS.

Direction: Down *Date: 6/03/11* *Time: 15:52*

Photo 32 Sample BK02SD.

Direction: Down *Date: 6/03/11* *Time: 16:05*

Photo 33 Inlet to culverts flowing under site.

Direction: Down *Date: 6/03/11* *Time: 16:06*

Photo 34 Dry stream channel flowing from under Seabeck Highway to culverts running under site.

Direction: North *Date: 6/03/11* *Time: 16:06*

Photo 35 Dry stream channel flowing from under Seabeck Highway to culverts running under site.

Direction: South *Date: 6/03/11* *Time: 16:07*

Photo 36 Sample collected from range floor.

Direction: Down *Date: 6/03/11* *Time: 16:28*

Photo 37 Sample collected from range floor.

Direction: North *Date: 6/03/11* *Time: 16:28*

F Sample Plan Alteration Form

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SAMPLE PLAN ALTERATION FORM

Project Name and Number: Kitsap Rifle and Revolver Club; TDD: 10-11-0011

Material to be sampled:

Surface soil from rifle, pistol, and sport pistol range back stops.

Measurement Parameters:

Analysis of surface soil and sediment for: explosive residue, SVOCs, and TAL Metals.

Standard Procedure for Field Collection and Laboratory Analysis (cite references):

Three surface soil samples were to be collected from the pistol range backstop berm; sport ranges 1, 2, and 3 berms; and the 200 yard rifle range backstop berm. Additionally, six sediment samples were to be collected from the wetland north of the site. Each surface soil and sediment sample were to be collected utilizing dedicated stainless steel spoons All surface soil samples were to be analyzed for SVOCs and TAL Metals. All sediment samples were to be analyzed for explosive residue, SVOCs, and TAL Metals.

Reason for Change in Field Procedure or Analytical Variation:

To ensure large bullet fragments were not sampled, each surface soil sample was sieved with a #10 sieve.

One additional surface soil sample (PR04SS) was added to the pistol range backstop berm. A shooting target was present and this sample was collected directly behind it. This sample was added to assess the area of the berm directly behind a target. Two surface soil samples (RR03SS and RR04SS) were added to the 100 yard target line backstop berm located on the rifle range. These samples were added to assess lead contamination in this berm. One surface soil sample (RF01SS) was collected from the range floor near the outfall of the culverts flowing under the site. This sample was collected at approximately 12 inches below ground surface to assess the area in which a historical stream flowed across the site. All samples discussed above were analyzed for SVOCs and TAL Metals.

Due to the small size of the sport pistol ranges, only two surface soil samples (rather than three samples) were collected from each of the backstop berms adjacent to the wetland. Additionally, only two surface soil samples (rather than three samples) were collected from the 200 yard line backstop berm of the rifle range.

Lastly, because non-dedicated soil sieves were utilized to sieve each surface soil sample, the sieves required decontamination between each sample point. Enough sieves were available so that each sieve only needed to be decontaminated once. Once decontamination was complete, one rinsate sample (RI01SS) was collected. This sample was added to ensure decontamination procures were adequate and was analyzed for SVOCs and TAL Metals.

One sediment sample (WL06SD) was collected utilizing a hand auger instead of a stainless steel spoon.

Variation from Field or Analytical Procedure:

Each surface soil sample was sieved with a #10 sieve prior to collection.

Sediment sample WL06SD was collected utilizing a hand auger due to approximately 2-feet of standing water at the sample location. This sample collected from the hand auger with a dedicated stainless steel spoon.

SAMPLE PLAN ALTERATION FORM

Special Equipment, Materials, or Personnel Required:

No additional personnel were required. A hand auger and soil sieves were required to complete the sampling.

CONTACT	APPROVED SIGNATURE	DATE
Initiator: Jeff Fetters	Jeff Fetters	6/13/11
START PL: Linda Costello	Linda E. Costello	6/13/11
EPA TM: Mark Ader	Mark Ader	10/27/11
EPA QA Manager : Gina Grepa-Grove	Mark Ader for	10/27/11

G Sample Coordinates

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Sample Location	Latitude	Longitude
BK01SD	47.609660	-122.746376
BK01SS	47.607437	-122.747346
BK01WT	47.609610	-122.746399
BK02SD	47.607079	-122.746032
PR01SS	47.608163	-122.747692
PR02SS	47.608173	-122.747560
PR03SS	47.608158	-122.747348
PR04SS	47.608158	-122.747518
RF01SS	47.608211	-122.746184
RR01SS	47.608326	-122.745046
RR02SS	47.608299	-122.745045
RR03SS	47.608132	-122.745614
RR04SS	47.608055	-122.745576
SR01SS	47.608150	-122.747206
SR02SS	47.608142	-122.747146
SR03SS	47.608133	-122.747003
SR04SS	47.608120	-122.746936
SR05SS	47.608112	-122.746805
SR06SS	47.608104	-122.746727
WL01SD	47.608034	-122.749335
WL02SS	47.608314	-122.747787
WL03SD	47.608394	-122.747504
WL04SD	47.608429	-122.747280
WL05SD	47.608330	-122.746503
WL06SS	47.608438	-122.746245

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H Data Validation Memoranda and Chain of Custody Forms

ecology and environment, inc.
International Specialists in the Environment
720 Third Avenue, Suite 1700, Seattle, WA 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 28, 2011

TO: Jeff Fetters, START-3 Project Manager, E & E, Seattle, WA

FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, WA MW

SUBJ: **Data Quality Assurance Review, Kitsap Rifle and Revolver Range Site, Bremerton, Washington**

REF: TDD: 10-11-0011 PAN: 002233.0621.01IA

The data quality assurance review of 8 sediment samples collected from the Kitsap Rifle and Revolver Range site in Bremerton, Washington, has been completed. Grain size (Puget Sound Estuary Protocol method) analyses were performed by Analytical Resources, Inc., Tukwila, Washington.

The samples were numbered:

BK01SD	BD02SD	WL01SD	WL02SD	WL03SD
WL04SD	WL05SD	WL06SD		

Data Qualifications:

The samples were collected on June 3, 2011, and were analyzed by June 21, 2011. Some sample contained woody or other organic matter with may have broken down during the sieving process and affecting the analyses. These samples weren't noted, so no action was taken based on these discrepancies. Two samples were mis-split in the first step of the procedure due to the amount of fines being outside the 5 to 25 gram range. One of these samples was the triplicate sample, therefore not enough sample was available to resplit the entire triplicate. One triplicate sample was resplit and was acceptable. No action was taken based on this discrepancy. No other discrepancies were noted in the laboratory case narrative.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004) and the analytical method. Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Ecology and Enviroment, Inc.
41282

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			Total Fines
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	<4
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	<230 (<62)
BK02SD	27.2	7.2	5.3	12.7	14.5	11.0	11.6	5.0	2.2	1.5	0.9	0.5	0.5	22.2
	~~29.3~~	~~6.5~~	~~5.1~~	~~13.0~~	~~14.7~~	~~11.7~~	~~9.3~~	~~5.3~~	~~2.3~~	~~1.2~~	~~1.0~~	~~0.4~~	~~0.1~~	~~19.7~~ MM
	~~25.1~~	~~7.6~~	~~5.4~~	~~13.5~~	~~15.1~~	~~12.0~~	~~10.6~~	~~5.2~~	~~2.5~~	~~1.5~~	~~1.0~~	~~0.4~~	~~0.2~~	~~21.4~~ MM
BK01SD	14.2	4.8	6.8	23.5	31.2	8.3	2.7	2.2	2.0	1.5	1.2	0.7	0.8	11.2
WL01SD	10.0	11.9	14.8	19.5	15.5	8.7	5.2	5.3	3.7	2.5	1.5	0.9	0.5	19.6
WL02SD	33.7	5.5	8.1	9.3	10.3	11.1	6.2	6.0	3.7	2.7	2.1	1.2	0.3	22.2
WL03SD	2.1	1.1	2.7	14.6	26.0	25.0	12.9	6.4	3.3	1.9	1.1	2.4	0.5	28.5
WL04SD	1.2	3.5	8.3	16.3	30.2	20.7	10.0	4.2	2.4	1.5	0.9	0.3	0.4	19.7
WL05SD	32.1	10.6	16.8	21.0	5.5	2.6	3.4	2.9	2.0	1.5	0.8	0.4	0.3	11.4
WL06SD	13.1	4.2	5.4	15.4	18.9	17.0	9.6	6.0	3.9	2.4	1.7	1.2	1.1	26.0

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.

SZ69

SZ69 : 00008

MM 11-20-08

Ecology and Enviroment, Inc.
41282

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 (4750)	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (63)	31.00	15.60	7.80	3.90	2.00	1.00
BK02SD	100.0	88.7	72.8	65.7	60.4	47.7	33.3	22.2	10.6	5.6	3.4	1.9	0.9	0.5
	100.0	88.6	70.7	64.2	59.0	46.0	31.3	19.7	10.3	5.0	2.7	1.5	0.6	0.1
	100.0	90.4	74.9	67.3	61.9	48.4	33.3	21.4	10.8	5.6	3.1	1.6	0.6	0.2
BK01SD	100.0	94.4	85.8	80.9	74.1	50.7	19.5	11.2	8.5	6.2	4.2	2.7	1.5	0.8
WL01SD	100.0	94.8	90.0	78.1	63.3	43.9	28.3	19.6	14.4	9.1	5.4	2.9	1.4	0.5
WL02SD	100.0	73.0	66.3	60.9	52.8	43.5	33.2	22.2	16.0	10.0	6.3	3.6	1.5	0.3
WL03SD	100.0	99.3	97.9	96.8	94.1	79.5	53.5	28.5	15.5	9.1	5.8	3.9	2.9	0.5
WL04SD	100.0	100.0	98.8	95.2	86.9	70.7	40.4	19.7	9.7	5.5	3.1	1.6	0.7	0.4
WL05SD	100.0	77.8	67.9	57.3	40.5	19.5	14.0	11.4	7.9	5.0	3.0	1.5	0.7	0.3
WL06SD	100.0	92.5	86.9	82.7	77.4	61.9	43.0	26.0	16.3	10.3	6.4	4.1	2.4	1.1

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.

SZ69

QA SUMMARY

Client:	Ecology and Enviroment, Inc.	Client Project No.:	41282
ARI Trip. Sample ID:	SZ69B	Batch No.:	SZ69-1
Client Trip. Sample ID:	BK02SD	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
BK02SD	100.0	88.7	72.8	65.7	60.4	47.7	33.3	22.2	10.6	5.6	3.4	1.9	0.9	0.5
	100.0	88.6	70.7	64.2	59.0	46.0	31.3	19.7	10.3	5.0	2.7	1.5	0.6	0.1
	100.0	90.4	74.9	67.3	61.9	48.4	33.3	21.4	10.8	5.6	3.1	1.6	0.6	0.2
AVE	NA	89.22	72.82	65.71	60.44	47.40	32.64	21.07	10.59	5.42	3.07	1.69	0.71	0.28
STDEV	NA	1.01	2.14	1.57	1.45	1.23	1.13	1.30	0.23	0.35	0.35	0.17	0.19	0.18
%RSD	NA	1.13	2.93	2.39	2.39	2.60	3.47	6.16	2.14	6.46	11.36	10.07	27.38	63.15

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)
BK02SD	6/3/2011	6/16/2011	6/21/2011	101.2		14.1
	6/3/2011	6/8/2011	6/21/2011	99.5		12.3
	6/3/2011	6/8/2011	6/21/2011	101.4		12.8
BK01SD	6/3/2011	6/8/2011	6/15/2011	100.0		8.6
WL01SD	6/3/2011	6/8/2011	6/15/2011	99.4		8.0
WL02SD	6/3/2011	6/8/2011	6/15/2011	96.8		10.9
WL03SD	6/3/2011	6/8/2011	6/15/2011	101.3		8.2
WL04SD	6/3/2011	6/8/2011	6/15/2011	101.9		8.1
WL05SD	6/3/2011	6/8/2011	6/15/2011	100.7		8.8
WL06SD	6/3/2011	6/8/2011	6/15/2011	99.1		8.0

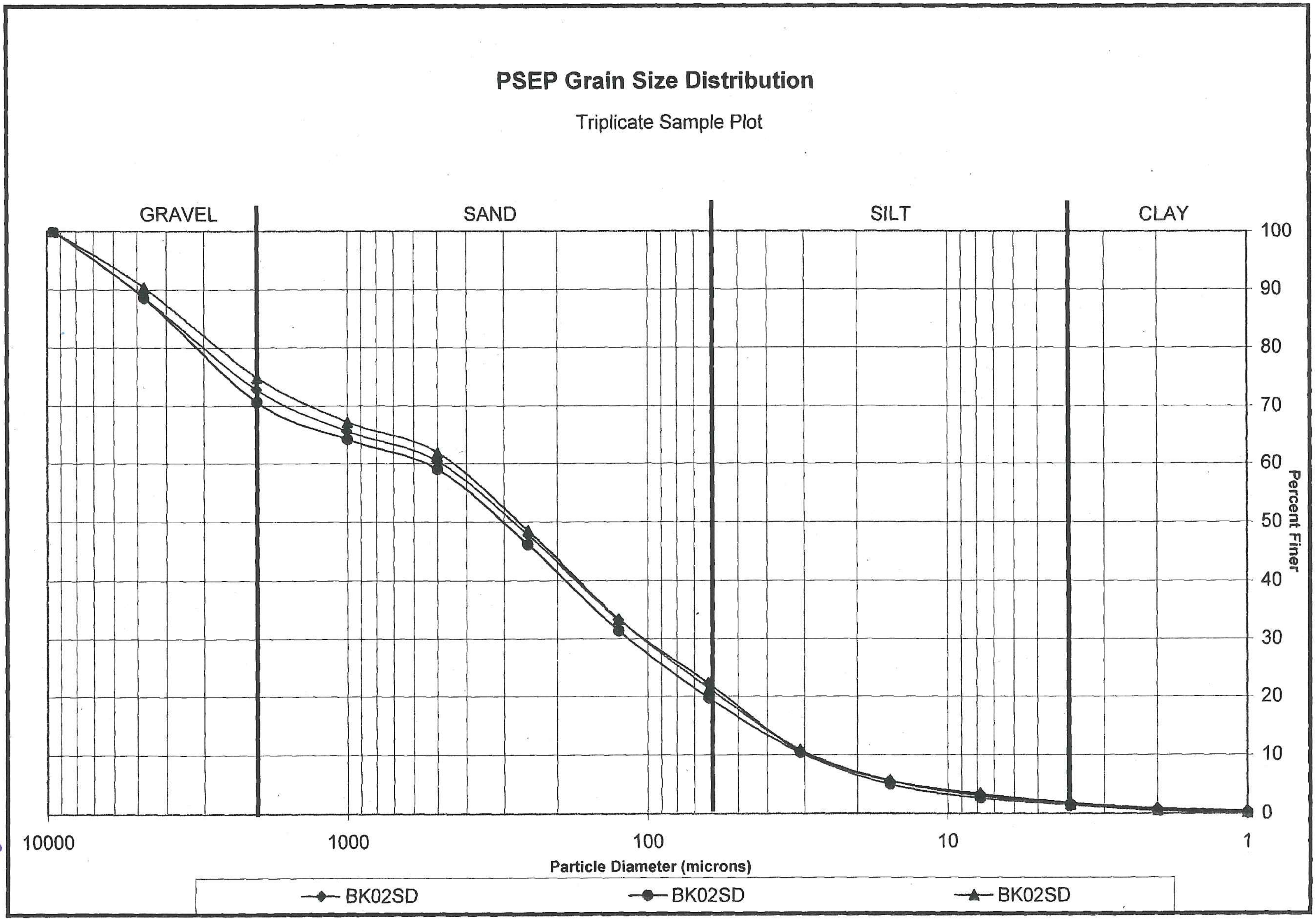
* ARI Internal QA limits = 95-105%

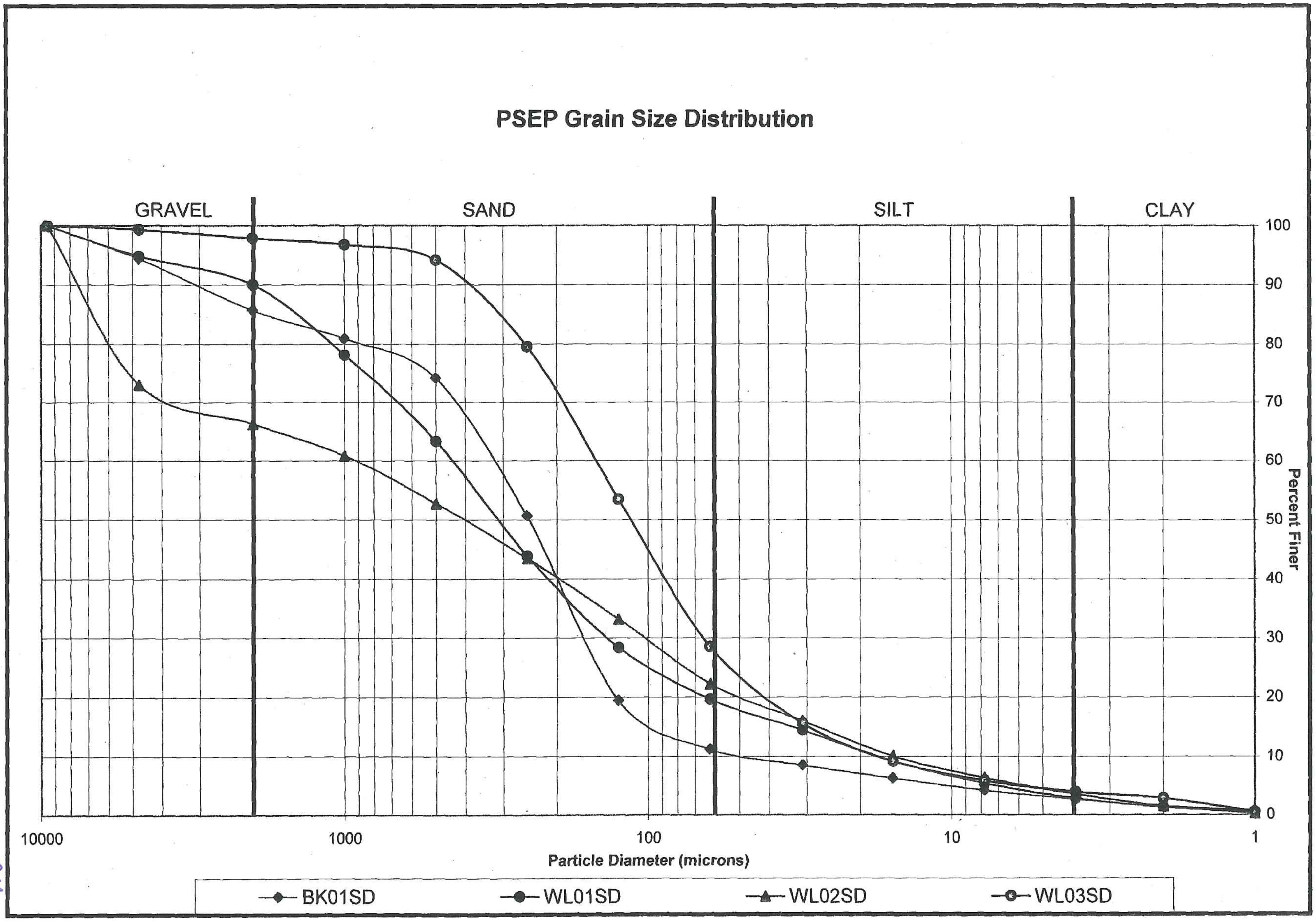
Notes to the Testing:

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.

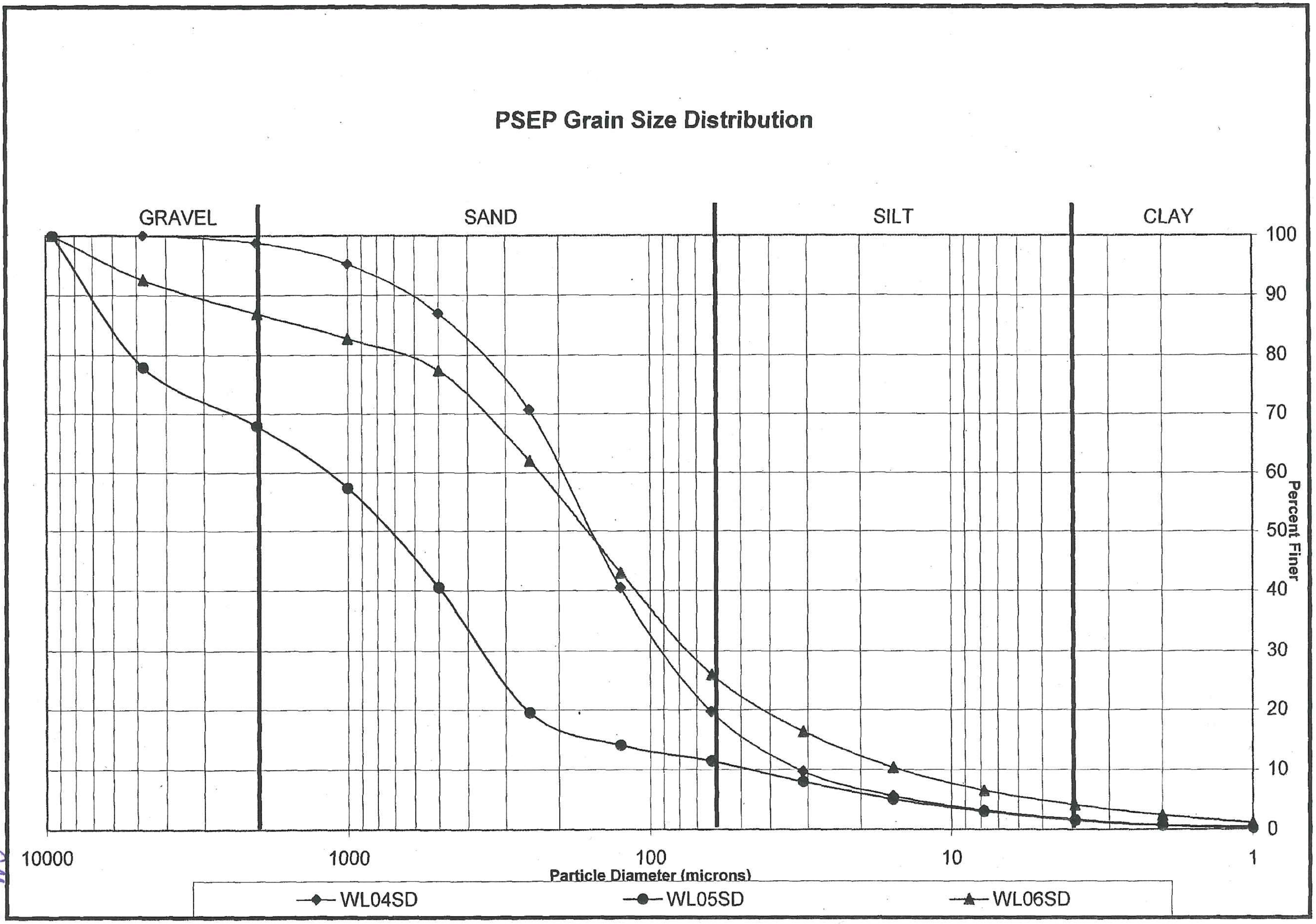
SZ69:00005

MW 6-28-11


PSEP Grain Size Distribution
Triplicate Sample Plot
GRAVEL
SAND
SILT
CLAY
100
90
80
70
60
50
40
30
20
10
0
Percent Finer
10000
1000
100
10
1
Particle Diameter (microns)
BK02SD
BK02SD
BK02SD


PSEP Grain Size Distribution
GRAVEL
SAND
SILT
CLAY
100
90
80
70
60
50
40
30
20
10
0
Percent Finer
10000
1000
100
10
1
Particle Diameter (microns)
BK01SD
WL01SD
WL02SD
WL03SD

MW 6-28-11



5269:00012

MW 6-28-11

ecology and environment, inc.
International Specialists in the Environment
720 Third Avenue, Suite 1700, Seattle, WA 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: July 21, 2011

FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, Washington MW

TO: Jeff Fetters, START-3 Project Manager, Seattle, Washington

SUBJ: **Organic Data Summary Check, Kitsap Rifle and Revolver Range Site, Bremerton, Washington**

REF: TDD: 10-11-0011 PAN: 002233.0621.01IA

The data summary check of 20 soil samples collected from the Kitsap Rifle and Revolver Range Site located in Bremerton, Washington, has been completed. Analyses for Semivolatile Organic Compounds (SVOCs; EPA CLP SOW SOM01.2) were performed by ALS Laboratory Group, Salt Lake City, Utah.

The samples were numbered:

JDQT4	JDQT5	JDQT6	JDQT7	JDQT8
JDQT9	JDQW0	JDQW1	JDQW2	JDQW3
JDQW4	JDQW5	JDQW6	JDQW7	JDQW8
JDQW9	JDQX0	JDQX1	JDQX2	JDQX7

No discrepancies were noted.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

Date: July 11, 2011

Reply to:
Attn of: OEA-095

MEMORANDUM

Subject: Data Validation Report for the Semivolatile Organic (SVOC) analyses of soil samples collected from the Kitsap Rifle & Revolving Range
Case Number: 41282 SDG: JDQT4

From: Raymond Wu, QA Chemist 7/11/11
Office of Environmental Assessment (OEA - 095), USEPA Region 10

To: Mark Ader, Task Monitor
Office of Environmental Clean-up (ECL – 115), USEPA Region 10

CC: Renee Nordeen, Project Manager
Ecology & Environment, Inc.

The quality assurance (QA) review of the analytical data generated from the analysis of 20 soil samples collected from the above referenced site has been completed. These samples were analyzed for SVOC in accordance with the USEPA Contract Laboratory Program (CLP) Statement of Work (SOW) for Multi-Media, Multi-Concentration Organic Analyses (SOM01.2) by ALS Laboratory Group (formerly known as DataChem Laboratories) located in Salt Lake City, Utah.

All sample analyses were evaluated following EPA's Stage 4 Data Validation Electronic/Manual Process (S4VEM). The validations were conducted and appropriate qualifiers were applied according to the Quality Control Specifications outlined in the Quality Assurance Project Plan for Kitsap Rifle & Revolver Range Site (@ Bremerton, WA) dated April 2011, the technical specifications of USEPA CLP SOW for Organic Data Review, the Contract Laboratory Program's National Functional Guidelines for Organic Data Review and the Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use (EPA-540-R08-005). Some of the data quality elements were qualified based on the professional judgment of the reviewer.

A summary of samples evaluated in this validation report and the pertinent dates for sample collection, sample receipt at the laboratory, extraction and analyses is listed in Sample Index Table found at the end of this report.

The conclusions presented herein are based on the information provided for the review.

I. DATA QUALIFICATIONS

Summary of Validation Qualifiers Applied:

Please find them in the "Sample Summary Report Section" of this report.

Data Qualifiers

The following is a list of validation qualifiers applied to the sample result(s) when needed to indicate associated out-of-control QA/QC results.

Data Qualifiers		
	U	The analyte was not detected at or above the reported result.
	J	The analyte was positively identified. The associated numerical result is an estimate.
	UJ	The analyte was not detected at or above the reported estimated result. The associated numerical value is an estimate of the quantitation limit of the analyte in this sample.
	R	The data are unusable for all purposes.
	N	There is evidence the analyte is present in this sample.
	JN	There is evidence that the analyte is present. The associated numerical result is an estimate.

For site assessment and investigations, the following bias qualifiers are applied to the data in addition to the above data qualifiers when necessary to allow for data analysis and interpretation using Pre-Score software calculations for National Priority Listing Hazard Rankling Scoring (NPL-HRS).

Bias Qualifiers		
	L	Low bias.
	H	High bias.
	Q	The result is estimated because the concentration is below the Contract Required Quantitation Limits (CRQLs).
	K	Unknown Bias

II. DATA REVIEW

The analytical data were evaluated following the recommended baseline checks used in the four stages of laboratory analytical data verification and validation for Superfund use listed as follows (EPA-540-R08-005, 2009):

Stage 1 – Data Validation				
	Verified		N/A	QC Procedure or Check
	YES	NO		
1	X			Documentation identifies the laboratory receiving and conducting analyses, and includes documentation for all samples submitted by the project or requester for analyses.
2	X			Requested analytical methods were performed and the analysis dates are present.
3	X			Requested target analyte results are reported along with the original laboratory data qualifiers and data qualifier definitions for each reported result
4	X			Requested target analyte result units are reported
5	X			Requested reporting limits for all samples are present and results at and below the requested (required) reporting limits are clearly identified (including sample detection limits if required).
6	X			Sampling dates (including times if needed), date and time of laboratory receipt of samples, and sample conditions upon receipt at the laboratory (including preservation, pH and temperature) are documented.
7	X			Sample results are evaluated by comparing sample conditions upon receipt at the laboratory (e.g., preservation checks) and sample characteristics (e.g., percent moisture) to the requirements and guidelines present in national or regional data validation documents, analytical method(s) or contract.

Stage 2A – Data Validation				
	Verified		N/A	QC Procedure or Check
	YES	NO		
8	X			Requested methods (handling, preparation, cleanup, and analytical) are performed.
9	X			Method dates (including dates, times and duration of analysis for radiation counting measurements and other methods, if needed) for handling (e.g., Toxicity Characteristic Leaching Procedure), preparation, cleanup and analysis are present, as appropriate.
10	X			Requested spike analytes or compounds (e.g., surrogate, DMCs, LCS spikes, post digestion spikes) have been added, as appropriate.
11	X			Sample holding times (from sampling date to preparation and preparation to analysis) are evaluated.
12	X			Frequency of QC samples is checked for appropriateness (e.g., one LCS per twenty samples in a preparation batch).
13	X			Sample results are evaluated by comparing holding times and sample-related QC data to the requirements and guidelines present in national or regional data validation documents, analytical method(s) or contract
				Stage 2A – Data Validation QC Data
14	X			method blanks
15	X			surrogate recoveries/deuterated monitoring compounds (DMC) recoveries
16	X			laboratory control sample (LCS) recoveries

17	X			matrix spike and matrix spike duplicate recoveries
18			X	serial dilutions
19			X	post digestion spikes
20	X			standard reference materials
21		X		equipment blanks
22	X			trip blanks

Stage 2B – Data Validation

Stage 2B validation builds on the validation conducted in Stage 2A. Stage 2B validation of the laboratory analytical data package consists of the Stage 2A validation plus the verification and validation checks for the compliance of instrument-related QC.

	Verified		N/A	QC Procedure or Check
	YES	NO		
23	X			Initial calibration data (e.g., ICAL standards, ICV standards, ICBs) are provided for all requested analytes and linked to field samples reported. For each initial calibration, the calibration type used is present along with the initial calibration equation used including any weighting factor(s) applied and the associated correlation coefficients, as appropriate. Recalculations of the standard concentrations using the initial calibration curve are present, along with their associated percent recoveries, as appropriate (e.g., if required by the project, method, or contract). For the ICV standard, the associated percent recovery (or percent difference, as appropriate) is present.
24	X			Appropriate number and concentration of initial calibration standards are present.
25	X			Continuing calibration data (e.g. CCV standards and CCBs) are provided for all requested analytes and linked to field samples reported, as appropriate. For the CCV standard(s), the associated percent recoveries (or percent differences, as appropriate) are present.
26				Reported samples are bracketed by CCV standards and CCBs standards as appropriate.
27	X			Method specific instrument performance checks are present as appropriate (e.g., tunes for mass spectrometry methods, DDT/Endrin breakdown checks for pesticides and aroclors, instrument blanks and interference checks for ICP methods).
28	X			Frequency of instrument QC samples is checked for appropriateness (e.g., gas chromatography-mass spectroscopy [GC-MS] tunes have been run every 12 hours).

Stage 3 – Data Validation

Stage 3 validation builds on the validation conducted in Stage 2B. Stage 3 validation of the laboratory analytical data package consists of the Stage 2B validation plus the recalculation of instrument and sample results from the laboratory instrument responses, and comparison of recalculated results to laboratory reported results.

	Verified		N/A	QC Procedure or Check
	YES	NO		
29	X			Instrument response data (e.g., GC peak areas, ICP corrected intensities) are reported for requested analytes, surrogates, internal standards, and DMCs for all requested field samples, matrix spikes, matrix spike duplicates, LCS, and method blanks as well as calibration data and instrument QC checks (e.g., tunes, DDT/Endrin breakdowns, inter-element correction factors, and Florisil cartridge checks).
30	X			Reported target analyte instrument responses are associated with appropriate internal standard analyte(s) for each (or selected) analyte(s) (for methods using internal standard for calibration).

31	X			Fit and appropriateness of the initial calibration curve used or required (e.g., mean calibration factor, regression analysis [linear or non-linear, with or without weighting factors, with or without forcing]) is checked with recalculation of the initial calibration curve for each (or selected) analyte(s) from the instrument response.
32	X			Comparison of instrument response to the minimum response requirements for each (or selected) analyte(s).
33	X			Recalculation of each (or selected) opening and closing CCV (and CCB) response from the peak data reported for each (or selected) analyte(s) from the instrument response, as appropriate.
34	X			Compliance check of recalculated opening and/or closing CCV (and CCB) response to recalculated initial calibration response for each (or selected) analyte(s).
35	X			Recalculation of percent ratios for each (or selected) tune from the instrument response, as appropriate.
36	X			Compliance check of recalculated percent ratio for each (or selected) tune from the instrument response.
37	X			Recalculation of each (or selected) instrument performance check (e.g., DDT/Endrin breakdown for pesticide analysis, instrument blanks, interference checks) from the instrument response.
38	X			Recalculation and compliance check of retention time windows (for chromatographic methods) for each (or selected) analyte(s) from the laboratory reported retention times..
39	X			Recalculation of reported results for each reported (or selected) target analyte(s) from the instrument response.
40	X			Recalculation of each (or selected) reported spike recovery (surrogate recoveries, DMC recoveries, LCS recoveries, duplicate analyses, matrix spike and matrix spike duplicate recoveries, serial dilutions, post digestion spikes, standard reference materials etc.) from the instrument response.
41	X			Each (or selected) sample result(s) and spike recovery(ies) are evaluated by comparing the recalculated numbers to the laboratory reported numbers according to the requirements and guidelines present in national or regional data validation documents, analytical method(s) or contract

Note: Selection of analytes, spikes, and performance evaluation checks for the Stage 3 validation checks for a laboratory analytical data package being verified and validated generally will depend on many factors including (but not limited to) the type of verification and validation being performed (manual or electronic), requirements and guidelines present in national or regional data validation documents, analytical method(s) or contract, the number of laboratories reporting the data, the number and type of analytical methods reported, the number of analytes reported in each method, and the number of detected analytes.

Stage 4 – Data Validation

Stage 4 validation builds on the validation conducted in Stage 3. Stage 4 validation of the laboratory analytical data package consists of the Stage 3 validation plus the evaluation of instrument outputs.

	Verified		N/A	QC Procedure or Check
	YES	NO		
42	X			All required instrument outputs (e.g., chromatograms, mass spectra, atomic emission spectra, instrument background corrections, and interference corrections) for evaluating sample and instrument performance are present.
43	X			Sample results are evaluated by checking each (or selected) instrument output (e.g., chromatograms, mass spectra, atomic emission spectra data, instrument background corrections, interference corrections) for correct identification and quantitation of analytes (e.g., peak integrations, use of appropriate internal standards for quantitation, elution order of analytes, and interferences).
44	X			Each (or selected) instrument's output(s) is evaluated for confirmation of non-detected or tentatively identified analytes.

Note: Selection of instrument outputs for the Stage 4 validation checks for a laboratory analytical data package being verified and validated generally will depend on many factors including, but not limited to, the type of verification and validation being performed (electronic or manual), requirements and guidelines present in national or regional data validation documents, analytical method(s) or contract, the number of laboratories reporting the data, the number and type of analytical methods reported, the number of analytes reported in each method, and the number of detected analytes.

Attachments:

Sample Index Table:

Sample Summary Report
Electronic Data Review Results (Report #3)
Analytical Sample Listing (Report #6)
Identification Summary for Single & Multi Component Analytes (Report #11)

Sample Summary Report

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC
Sample Number: JDQT4	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: PR01SS	pH: 7.2	Sample Date: 06032011	Sample Time: 08:28:00
% Moisture : 14.3566		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	2000	ug/kg	10.0	JB	U	Yes	S4VEM
Phenol	100	ug/kg	10.0	J	JQ	Yes	S4VEM
Bis(2-chloroethyl)ether	2000	ug/kg	10.0	U	U	Yes	S4VEM
2-Chlorophenol	2000	ug/kg	10.0	U	U	Yes	S4VEM
2-Methylphenol	2000	ug/kg	10.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	2000	ug/kg	10.0	U	U	Yes	S4VEM
Acetophenone	2000	ug/kg	10.0	JB	U	Yes	S4VEM
4-Methylphenol	2000	ug/kg	10.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	2000	ug/kg	10.0	U	U	Yes	S4VEM
Hexachloroethane	2000	ug/kg	10.0	U	U	Yes	S4VEM
Nitrobenzene	2000	ug/kg	10.0	U	U	Yes	S4VEM
Isophorone	2000	ug/kg	10.0	U	U	Yes	S4VEM
2-Nitrophenol	2000	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	2000	ug/kg	10.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	2000	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	2000	ug/kg	10.0	U	U	Yes	S4VEM
Naphthalene	2000	ug/kg	10.0	U	U	Yes	S4VEM
4-Chloroaniline	2000	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorobutadiene	2000	ug/kg	10.0	U	U	Yes	S4VEM
Caprolactam	2000	ug/kg	10.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	2000	ug/kg	10.0	U	U	Yes	S4VEM
2-Methylnaphthalene	2000	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	2000	ug/kg	10.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	2000	ug/kg	10.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	2000	ug/kg	10.0	U	U	Yes	S4VEM
1,1'-Biphenyl	2000	ug/kg	10.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Chloronaphthalene	2000	ug/kg	10.0	U	U	Yes	S4VEM
2-Nitroaniline	3800	ug/kg	10.0	U	U	Yes	S4VEM
Dimethylphthalate	2000	ug/kg	10.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	2000	ug/kg	10.0	U	U	Yes	S4VEM
Acenaphthylene	2000	ug/kg	10.0	U	U	Yes	S4VEM
3-Nitroaniline	3800	ug/kg	10.0	U	U	Yes	S4VEM
Acenaphthene	110	ug/kg	10.0	J	JQ	Yes	S4VEM
2,4-Dinitrophenol	3800	ug/kg	10.0	U	UJK	Yes	S4VEM
4-Nitrophenol	3800	ug/kg	10.0	U	U	Yes	S4VEM
Dibenzofuran	2000	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	2000	ug/kg	10.0	U	U	Yes	S4VEM
Diethylphthalate	2000	ug/kg	10.0	U	U	Yes	S4VEM
Fluorene	2000	ug/kg	10.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	2000	ug/kg	10.0	U	U	Yes	S4VEM
4-Nitroaniline	3800	ug/kg	10.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	3800	ug/kg	10.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	120	ug/kg	10.0	J	JQ	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	2000	ug/kg	10.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	2000	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorobenzene	2000	ug/kg	10.0	U	U	Yes	S4VEM
Atrazine	2000	ug/kg	10.0	U	U	Yes	S4VEM
Pentachlorophenol	3800	ug/kg	10.0	U	U	Yes	S4VEM
Phenanthrene	900	ug/kg	10.0	J	JQ	Yes	S4VEM
Anthracene	190	ug/kg	10.0	J	JQ	Yes	S4VEM
Carbazole	130	ug/kg	10.0	J	JQ	Yes	S4VEM
Di-n-butylphthalate	2000	ug/kg	10.0	U	U	Yes	S4VEM
Fluoranthene	1800	ug/kg	10.0	J	JQ	Yes	S4VEM
Pyrene	3400	ug/kg	10.0			Yes	S4VEM
Butylbenzylphthalate	2000	ug/kg	10.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	2000	ug/kg	10.0	U	U	Yes	S4VEM
Benzo(a)anthracene	2600	ug/kg	10.0			Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Chrysene	3500	ug/kg	10.0			Yes	S4VEM
Bis(2-ethylhexyl)phthalate	170	ug/kg	10.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	2000	ug/kg	10.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	3000	ug/kg	10.0			Yes	S4VEM
Benzo(k)fluoranthene	910	ug/kg	10.0	J	JQ	Yes	S4VEM
Benzo(a)pyrene	4300	ug/kg	10.0			Yes	S4VEM
Indeno(1,2,3-cd)pyrene	1900	ug/kg	10.0	J	JQ	Yes	S4VEM
Dibenzo(a,h)anthracene	730	ug/kg	10.0	J	JQ	Yes	S4VEM
Benzo(g,h,i)perylene	2900	ug/kg	10.0			Yes	S4VEM
2,3,4,6-Tetrachlorophenol	2000	ug/kg	10.0	U	U	Yes	S4VEM
Benz[j]aceanthrylene, 3-methyl-			10.0	JN		Yes	S4VEM
Benzo[b]naphtho[2,3-d]thiophene, 6-methyl-			10.0	JN		Yes	S4VEM
Triphenylene, 2-methyl-			10.0	JN		Yes	S4VEM
Pyrene, 1,3-dimethyl-			10.0	JN		Yes	S4VEM
Benzo[c]phenanthrene, 5,8-dimethyl-			10.0	JN		Yes	S4VEM
1,1':3',1"-Terphenyl, 5'-phenyl-			10.0	JN		Yes	S4VEM
Perylene			10.0	JN		Yes	S4VEM
Chrysene, 5-methyl-			10.0	JN		Yes	S4VEM
Benz(a)anthracene, 6,12-dimethyl-			10.0	JN		Yes	S4VEM
Pyrene, 1-methyl-			10.0	JN		Yes	S4VEM
o-Terphenyl			10.0	JN		Yes	S4VEM
11H-Benzo[b]fluoren			10.0	JN		Yes	S4VEM
Pyrene, 1-methyl-			10.0	JN		Yes	S4VEM
Benz(a)anthracene, 3,9-dimethyl-			10.0	JN		Yes	S4VEM
Benz[j]aceanthrylene, 3-methyl-			10.0	JN		Yes	S4VEM
Pyrene, 4-methyl-			10.0	JN		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC
Sample Number: JDQT5	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: PR02SS	pH: 7.1	Sample Date: 06032011	Sample Time: 08:50:00
% Moisture : 11.8265		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	1900	ug/kg	10.0	JB	U	Yes	S4VEM
Phenol	1900	ug/kg	10.0	U	U	Yes	S4VEM
Bis(2-chloroethyl)ether	1900	ug/kg	10.0	U	U	Yes	S4VEM
2-Chlorophenol	1900	ug/kg	10.0	U	U	Yes	S4VEM
2-Methylphenol	1900	ug/kg	10.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	1900	ug/kg	10.0	U	U	Yes	S4VEM
Acetophenone	1900	ug/kg	10.0	JB	U	Yes	S4VEM
4-Methylphenol	1900	ug/kg	10.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	1900	ug/kg	10.0	U	U	Yes	S4VEM
Hexachloroethane	1900	ug/kg	10.0	U	U	Yes	S4VEM
Nitrobenzene	1900	ug/kg	10.0	U	U	Yes	S4VEM
Isophorone	1900	ug/kg	10.0	U	U	Yes	S4VEM
2-Nitrophenol	1900	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	1900	ug/kg	10.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	1900	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	1900	ug/kg	10.0	U	U	Yes	S4VEM
Naphthalene	1900	ug/kg	10.0	U	U	Yes	S4VEM
4-Chloroaniline	1900	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorobutadiene	1900	ug/kg	10.0	U	U	Yes	S4VEM
Caprolactam	1900	ug/kg	10.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	1900	ug/kg	10.0	U	U	Yes	S4VEM
2-Methylnaphthalene	1900	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	1900	ug/kg	10.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	1900	ug/kg	10.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	1900	ug/kg	10.0	U	U	Yes	S4VEM
1,1'-Biphenyl	1900	ug/kg	10.0	U	U	Yes	S4VEM
2-Chloronaphthalene	1900	ug/kg	10.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	3700	ug/kg	10.0	U	U	Yes	S4VEM
Dimethylphthalate	1900	ug/kg	10.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	1900	ug/kg	10.0	U	U	Yes	S4VEM
Acenaphthylene	1900	ug/kg	10.0	U	U	Yes	S4VEM
3-Nitroaniline	3700	ug/kg	10.0	U	U	Yes	S4VEM
Acenaphthene	260	ug/kg	10.0	J	JQ	Yes	S4VEM
2,4-Dinitrophenol	3700	ug/kg	10.0	U	UJK	Yes	S4VEM
4-Nitrophenol	3700	ug/kg	10.0	U	U	Yes	S4VEM
Dibenzofuran	1900	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	1900	ug/kg	10.0	U	U	Yes	S4VEM
Diethylphthalate	1900	ug/kg	10.0	U	U	Yes	S4VEM
Fluorene	84	ug/kg	10.0	J	JQ	Yes	S4VEM
4-Chlorophenyl-phenylether	1900	ug/kg	10.0	U	U	Yes	S4VEM
4-Nitroaniline	3700	ug/kg	10.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	3700	ug/kg	10.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	180	ug/kg	10.0	J	JQ	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	1900	ug/kg	10.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	1900	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorobenzene	1900	ug/kg	10.0	U	U	Yes	S4VEM
Atrazine	1900	ug/kg	10.0	U	U	Yes	S4VEM
Pentachlorophenol	3700	ug/kg	10.0	U	U	Yes	S4VEM
Phenanthrene	1800	ug/kg	10.0	J	JQ	Yes	S4VEM
Anthracene	360	ug/kg	10.0	J	JQ	Yes	S4VEM
Carbazole	240	ug/kg	10.0	J	JQ	Yes	S4VEM
Di-n-butylphthalate	70	ug/kg	10.0	J	JQ	Yes	S4VEM
Fluoranthene	4100	ug/kg	10.0			Yes	S4VEM
Pyrene	7800	ug/kg	10.0			Yes	S4VEM
Butylbenzylphthalate	1900	ug/kg	10.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	1900	ug/kg	10.0	U	U	Yes	S4VEM
Benzo(a)anthracene	6300	ug/kg	10.0			Yes	S4VEM
Chrysene	8600	ug/kg	10.0			Yes	S4VEM
Bis(2-ethylhexyl)	220	ug/kg	10.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	220	ug/kg	10.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	1900	ug/kg	10.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	6500	ug/kg	10.0			Yes	S4VEM
Benzo(k)fluoranthene	1900	ug/kg	10.0	J	JQ	Yes	S4VEM
Benzo(a)pyrene	10000	ug/kg	10.0			Yes	S4VEM
Indeno(1,2,3-cd)pyrene	3900	ug/kg	10.0			Yes	S4VEM
Dibenzo(a,h)anthracene	1600	ug/kg	10.0	J	JQ	Yes	S4VEM
Benzo(g,h,i)perylene	6400	ug/kg	10.0			Yes	S4VEM
2,3,4,6-Tetrachlorophenol	1900	ug/kg	10.0	U	U	Yes	S4VEM
Perylene, 3-methyl-			10.0	JN		Yes	S4VEM
Benzo[b]naphtho[2,3-d]thiophene, 6-methyl-			10.0	JN		Yes	S4VEM
Pyrene, 2-methyl-			10.0	JN		Yes	S4VEM
Pyrene, 1,3-dimethyl-			10.0	JN		Yes	S4VEM
Triphenylene, 2-methyl-			10.0	JN		Yes	S4VEM
10-Methylbenzo(a)p			10.0	JN		Yes	S4VEM
o-Terphenyl			10.0	JN		Yes	S4VEM
Pyrene, 1-methyl-			10.0	JN		Yes	S4VEM
Benzo[ghi]perylene, 4-methyl-			10.0	JN		Yes	S4VEM
Anthracene, 1,4-dimethyl-			10.0	JN		Yes	S4VEM
Benzo[c]phenanthrene, 5,8-dimethyl-			10.0	JN		Yes	S4VEM
Triphenylene, 2-methyl-			10.0	JN		Yes	S4VEM
Benzo[j]fluoranthene			10.0	JN		Yes	S4VEM
Benz(a)anthracene, 4,7,12-trimethyl-			10.0	JN		Yes	S4VEM
Benz(a)anthracene, 6,12-dimethyl-			10.0	JN		Yes	S4VEM
Benzo[c]phenanthrene, 5,8-dimethyl-			10.0	JN		Yes	S4VEM
Benz(a)anthracene, 3,9-dimethyl-			10.0	JN		Yes	S4VEM
Pyrene, 1-methyl-			10.0	JN		Yes	S4VEM
7,10-Dimethylbenzo			10.0	JN		Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
(a)pyrene			10.0	JN		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC
Sample Number: JDQT6	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: PR03SS	pH: 7.1	Sample Date: 06032011	Sample Time: 08:45:00
% Moisture : 10.738		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	1800	ug/kg	10.0	JB	U	Yes	S4VEM
Phenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Bis(2-chloroethyl)ether	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Chlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Methylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	1800	ug/kg	10.0	U	U	Yes	S4VEM
Acetophenone	1800	ug/kg	10.0	JB	U	Yes	S4VEM
4-Methylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachloroethane	1800	ug/kg	10.0	U	U	Yes	S4VEM
Nitrobenzene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Isophorone	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Nitrophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Naphthalene	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Chloroaniline	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorobutadiene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Caprolactam	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Methylnaphthalene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
1,1'-Biphenyl	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Chloronaphthalene	1800	ug/kg	10.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	3500	ug/kg	10.0	U	U	Yes	S4VEM
Dimethylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Acenaphthylene	1800	ug/kg	10.0	U	U	Yes	S4VEM
3-Nitroaniline	3500	ug/kg	10.0	U	U	Yes	S4VEM
Acenaphthene	150	ug/kg	10.0	J	JQ	Yes	S4VEM
2,4-Dinitrophenol	3500	ug/kg	10.0	U	UJK	Yes	S4VEM
4-Nitrophenol	3500	ug/kg	10.0	U	U	Yes	S4VEM
Dibenzofuran	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Diethylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
Fluorene	58	ug/kg	10.0	J	JQ	Yes	S4VEM
4-Chlorophenyl-phenylether	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Nitroaniline	3500	ug/kg	10.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	3500	ug/kg	10.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	78	ug/kg	10.0	J	JQ	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorobenzene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Atrazine	1800	ug/kg	10.0	U	U	Yes	S4VEM
Pentachlorophenol	3500	ug/kg	10.0	U	U	Yes	S4VEM
Phenanthrene	1300	ug/kg	10.0	J	JQ	Yes	S4VEM
Anthracene	260	ug/kg	10.0	J	JQ	Yes	S4VEM
Carbazole	150	ug/kg	10.0	J	JQ	Yes	S4VEM
Di-n-butylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
Fluoranthene	2600	ug/kg	10.0			Yes	S4VEM
Pyrene	5300	ug/kg	10.0			Yes	S4VEM
Butylbenzylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	1800	ug/kg	10.0	U	U	Yes	S4VEM
Benzo(a)anthracene	4700	ug/kg	10.0			Yes	S4VEM
Chrysene	6600	ug/kg	10.0			Yes	S4VEM
Bis(2-ethylhexyl)	210	ug/kg	10.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	210	ug/kg	10.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	4400	ug/kg	10.0			Yes	S4VEM
Benzo(k)fluoranthene	1100	ug/kg	10.0	J	JQ	Yes	S4VEM
Benzo(a)pyrene	7700	ug/kg	10.0			Yes	S4VEM
Indeno(1,2,3-cd)pyrene	2500	ug/kg	10.0			Yes	S4VEM
Dibenzo(a,h)anthracene	1200	ug/kg	10.0	J	JQ	Yes	S4VEM
Benzo(g,h,i)perylene	4600	ug/kg	10.0			Yes	S4VEM
2,3,4,6-Tetrachlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Dibenzo[def,mno]chrysene			10.0	JN		Yes	S4VEM
5-Methylbenzo[b]naphtho[2,1-			10.0	JN		Yes	S4VEM
Perylene, 3-methyl-			10.0	JN		Yes	S4VEM
Pyrene, 1-methyl-			10.0	JN		Yes	S4VEM
Pyrene, 1,3-dimethyl-			10.0	JN		Yes	S4VEM
10-Methylbenzo(a)p			10.0	JN		Yes	S4VEM
Pyrene, 4-methyl-			10.0	JN		Yes	S4VEM
Pyrene, 1,3-dimethyl-			10.0	JN		Yes	S4VEM
Benz(a)anthracene, 4,7,12-trimethyl-			10.0	JN		Yes	S4VEM
Chrysene, 2-methyl-			10.0	JN		Yes	S4VEM
7,10-Dimethylbenzo(a)pyrene			10.0	JN		Yes	S4VEM
Benzo[c]phenanthrene, 5,8-dimethyl-			10.0	JN		Yes	S4VEM
Perylene			10.0	JN		Yes	S4VEM
Benz(a)anthracene, 3,9-dimethyl-			10.0	JN		Yes	S4VEM
7,10-Dimethylbenzo(a)pyrene			10.0	JN		Yes	S4VEM
Benz[j]aceanthrylene, 3-methyl-			10.0	JN		Yes	S4VEM
Pyrene, 1-methyl-			10.0	JN		Yes	S4VEM
Triphenylene, 2-methyl-			10.0	JN		Yes	S4VEM
o-Terphenyl			10.0	JN		Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzo[ghi]perylene, 4-methyl-			10.0	JN		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC

Sample Number:	JDQT7	Method:	BNA	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	RR01SS	pH:	7.2	Sample Date:	06032011	Sample Time:	11:40:00
% Moisture :	8.5975			% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	180	ug/kg	1.0	JB	U	Yes	S4VEM
Phenol	6.1	ug/kg	1.0	J	JQ	Yes	S4VEM
Bis(2-chloroethyl)ether	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Chlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	180	ug/kg	1.0	U	U	Yes	S4VEM
Acetophenone	180	ug/kg	1.0	JB	U	Yes	S4VEM
4-Methylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachloroethane	180	ug/kg	1.0	U	U	Yes	S4VEM
Nitrobenzene	180	ug/kg	1.0	U	U	Yes	S4VEM
Isophorone	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitrophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
Naphthalene	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloroaniline	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	180	ug/kg	1.0	U	U	Yes	S4VEM
Caprolactam	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	180	ug/kg	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	340	ug/kg	1.0	U	U	Yes	S4VEM
Dimethylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	180	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthylene	180	ug/kg	1.0	U	U	Yes	S4VEM
3-Nitroaniline	340	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthene	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	340	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	340	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzofuran	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	180	ug/kg	1.0	U	U	Yes	S4VEM
Diethylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
Fluorene	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitroaniline	340	ug/kg	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	340	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	180	ug/kg	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	180	ug/kg	1.0	U	U	Yes	S4VEM
Atrazine	180	ug/kg	1.0	U	U	Yes	S4VEM
Pentachlorophenol	340	ug/kg	1.0	U	UJK	Yes	S4VEM
Phenanthrene	5.5	ug/kg	1.0	J	JQ	Yes	S4VEM
Anthracene	180	ug/kg	1.0	U	U	Yes	S4VEM
Carbazole	180	ug/kg	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
Fluoranthene	7.2	ug/kg	1.0	J	JQ	Yes	S4VEM
Pyrene	14	ug/kg	1.0	J	JQ	Yes	S4VEM
Butylbenzylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	11	ug/kg	1.0	J	JQ	Yes	S4VEM
Chrysene	12	ug/kg	1.0	J	JQ	Yes	S4VEM
Bis(2-ethylhexyl)	16	ug/kg	1.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	16	ug/kg	1.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	10	ug/kg	1.0	J	JQ	Yes	S4VEM
Benzo(k)fluoranthene	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	180	ug/kg	1.0	U	U	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	180	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	180	ug/kg	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC
Sample Number: JDQT8	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: RR02SS	pH: 7.4	Sample Date: 06032011	Sample Time: 11:38:00
% Moisture : 8.2673		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	180	ug/kg	1.0	JB	U	Yes	S4VEM
Phenol	180	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethyl)ether	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Chlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	180	ug/kg	1.0	U	U	Yes	S4VEM
Acetophenone	180	ug/kg	1.0	JB	U	Yes	S4VEM
4-Methylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachloroethane	180	ug/kg	1.0	U	U	Yes	S4VEM
Nitrobenzene	180	ug/kg	1.0	U	U	Yes	S4VEM
Isophorone	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitrophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
Naphthalene	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloroaniline	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	180	ug/kg	1.0	U	U	Yes	S4VEM
Caprolactam	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	180	ug/kg	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	350	ug/kg	1.0	U	U	Yes	S4VEM
Dimethylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	180	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthylene	180	ug/kg	1.0	U	U	Yes	S4VEM
3-Nitroaniline	350	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthene	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	350	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	350	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzofuran	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	180	ug/kg	1.0	U	U	Yes	S4VEM
Diethylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
Fluorene	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitroaniline	350	ug/kg	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	350	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	180	ug/kg	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	180	ug/kg	1.0	U	U	Yes	S4VEM
Atrazine	180	ug/kg	1.0	U	U	Yes	S4VEM
Pentachlorophenol	350	ug/kg	1.0	U	UJK	Yes	S4VEM
Phenanthrene	180	ug/kg	1.0	U	U	Yes	S4VEM
Anthracene	180	ug/kg	1.0	U	U	Yes	S4VEM
Carbazole	180	ug/kg	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
Fluoranthene	180	ug/kg	1.0	U	U	Yes	S4VEM
Pyrene	6.6	ug/kg	1.0	J	JQ	Yes	S4VEM
Butylbenzylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	8.0	ug/kg	1.0	J	JQ	Yes	S4VEM
Chrysene	6.4	ug/kg	1.0	J	JQ	Yes	S4VEM
Bis(2-ethylhexyl)	43	ug/kg	1.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	43	ug/kg	1.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(k)fluoranthene	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	6.8	ug/kg	1.0	J	JQ	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	180	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	180	ug/kg	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
Total Alkanes			1.0	J		Yes	S4VEM
Squalene			1.0	JN		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC
Sample Number: JDQT9	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: RR03SS	pH: 7.2	Sample Date: 06032011	Sample Time: 11:57:00
% Moisture : 7.7373		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	1800	ug/kg	10.0	U	U	Yes	S4VEM
Phenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Bis(2-chloroethyl)ether	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Chlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Methylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	1800	ug/kg	10.0	U	U	Yes	S4VEM
Acetophenone	1800	ug/kg	10.0	JB	U	Yes	S4VEM
4-Methylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachloroethane	1800	ug/kg	10.0	U	U	Yes	S4VEM
Nitrobenzene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Isophorone	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Nitrophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Naphthalene	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Chloroaniline	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorobutadiene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Caprolactam	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Methylnaphthalene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
1,1'-Biphenyl	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Chloronaphthalene	1800	ug/kg	10.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	3400	ug/kg	10.0	U	U	Yes	S4VEM
Dimethylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Acenaphthylene	1800	ug/kg	10.0	U	U	Yes	S4VEM
3-Nitroaniline	3400	ug/kg	10.0	U	U	Yes	S4VEM
Acenaphthene	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	3400	ug/kg	10.0	U	UJK	Yes	S4VEM
4-Nitrophenol	3400	ug/kg	10.0	U	U	Yes	S4VEM
Dibenzofuran	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Diethylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
Fluorene	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Nitroaniline	3400	ug/kg	10.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	3400	ug/kg	10.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	1800	ug/kg	10.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorobenzene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Atrazine	1800	ug/kg	10.0	U	U	Yes	S4VEM
Pentachlorophenol	3400	ug/kg	10.0	U	U	Yes	S4VEM
Phenanthrene	520	ug/kg	10.0	J	JQ	Yes	S4VEM
Anthracene	130	ug/kg	10.0	J	JQ	Yes	S4VEM
Carbazole	1800	ug/kg	10.0	U	U	Yes	S4VEM
Di-n-butylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
Fluoranthene	840	ug/kg	10.0	J	JQ	Yes	S4VEM
Pyrene	1600	ug/kg	10.0	J	JQ	Yes	S4VEM
Butylbenzylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	1800	ug/kg	10.0	U	U	Yes	S4VEM
Benzo(a)anthracene	1100	ug/kg	10.0	J	JQ	Yes	S4VEM
Chrysene	1400	ug/kg	10.0	J	JQ	Yes	S4VEM
Bis(2-ethylhexyl)	180	ug/kg	10.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	180	ug/kg	10.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	1200	ug/kg	10.0	J	JQ	Yes	S4VEM
Benzo(k)fluoranthene	340	ug/kg	10.0	J	JQ	Yes	S4VEM
Benzo(a)pyrene	1900	ug/kg	10.0			Yes	S4VEM
Indeno(1,2,3-cd)pyrene	710	ug/kg	10.0	J	JQ	Yes	S4VEM
Dibenzo(a,h)anthracene	310	ug/kg	10.0	J	JQ	Yes	S4VEM
Benzo(g,h,i)perylene	1100	ug/kg	10.0	J	JQ	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Pyrene, 1-methyl-			10.0	JN		Yes	S4VEM
Benz(a)anthracene, 6,12-dimethyl-			10.0	JN		Yes	S4VEM
Benzo[e]pyrene			10.0	JN		Yes	S4VEM
Pyrene, 4-methyl-			10.0	JN		Yes	S4VEM
Triphenylene, 2-methyl-			10.0	JN		Yes	S4VEM
Pyrene, 1,3-dimethyl-			10.0	JN		Yes	S4VEM
Pyrene, 1-methyl-			10.0	JN		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC
Sample Number: JDQW0	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: SR01SS	pH: 7.2	Sample Date: 06032011	Sample Time: 09:34:00
% Moisture : 11.0398		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	750	ug/kg	4.0	JB	U	Yes	S4VEM
Phenol	750	ug/kg	4.0	U	U	Yes	S4VEM
Bis(2-chloroethyl)ether	750	ug/kg	4.0	U	U	Yes	S4VEM
2-Chlorophenol	750	ug/kg	4.0	U	U	Yes	S4VEM
2-Methylphenol	750	ug/kg	4.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	750	ug/kg	4.0	U	U	Yes	S4VEM
Acetophenone	750	ug/kg	4.0	JB	U	Yes	S4VEM
4-Methylphenol	750	ug/kg	4.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	750	ug/kg	4.0	U	U	Yes	S4VEM
Hexachloroethane	750	ug/kg	4.0	U	U	Yes	S4VEM
Nitrobenzene	750	ug/kg	4.0	U	U	Yes	S4VEM
Isophorone	750	ug/kg	4.0	U	U	Yes	S4VEM
2-Nitrophenol	750	ug/kg	4.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	750	ug/kg	4.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	750	ug/kg	4.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	750	ug/kg	4.0	U	U	Yes	S4VEM
Naphthalene	23	ug/kg	4.0	J	JQ	Yes	S4VEM
4-Chloroaniline	750	ug/kg	4.0	U	U	Yes	S4VEM
Hexachlorobutadiene	750	ug/kg	4.0	U	U	Yes	S4VEM
Caprolactam	750	ug/kg	4.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	750	ug/kg	4.0	U	U	Yes	S4VEM
2-Methylnaphthalene	750	ug/kg	4.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	750	ug/kg	4.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	750	ug/kg	4.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	750	ug/kg	4.0	U	U	Yes	S4VEM
1,1'-Biphenyl	750	ug/kg	4.0	U	U	Yes	S4VEM
2-Chloronaphthalene	750	ug/kg	4.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	1400	ug/kg	4.0	U	U	Yes	S4VEM
Dimethylphthalate	750	ug/kg	4.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	750	ug/kg	4.0	U	U	Yes	S4VEM
Acenaphthylene	750	ug/kg	4.0	U	U	Yes	S4VEM
3-Nitroaniline	1400	ug/kg	4.0	U	U	Yes	S4VEM
Acenaphthene	150	ug/kg	4.0	J	JQ	Yes	S4VEM
2,4-Dinitrophenol	1400	ug/kg	4.0	U	UJK	Yes	S4VEM
4-Nitrophenol	1400	ug/kg	4.0	U	U	Yes	S4VEM
Dibenzofuran	43	ug/kg	4.0	J	JQ	Yes	S4VEM
2,4-Dinitrotoluene	750	ug/kg	4.0	U	U	Yes	S4VEM
Diethylphthalate	750	ug/kg	4.0	U	U	Yes	S4VEM
Fluorene	94	ug/kg	4.0	J	JQ	Yes	S4VEM
4-Chlorophenyl-phenylether	750	ug/kg	4.0	U	U	Yes	S4VEM
4-Nitroaniline	1400	ug/kg	4.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	1400	ug/kg	4.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	24	ug/kg	4.0	J	JQ	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	750	ug/kg	4.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	750	ug/kg	4.0	U	U	Yes	S4VEM
Hexachlorobenzene	750	ug/kg	4.0	U	U	Yes	S4VEM
Atrazine	750	ug/kg	4.0	U	U	Yes	S4VEM
Pentachlorophenol	1400	ug/kg	4.0	U	U	Yes	S4VEM
Phenanthrene	1300	ug/kg	4.0			Yes	S4VEM
Anthracene	210	ug/kg	4.0	J	JQ	Yes	S4VEM
Carbazole	270	ug/kg	4.0	J	JQ	Yes	S4VEM
Di-n-butylphthalate	750	ug/kg	4.0	U	U	Yes	S4VEM
Fluoranthene	3300	ug/kg	4.0			Yes	S4VEM
Pyrene	3000	ug/kg	4.0			Yes	S4VEM
Butylbenzylphthalate	750	ug/kg	4.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	750	ug/kg	4.0	U	U	Yes	S4VEM
Benzo(a)anthracene	2300	ug/kg	4.0			Yes	S4VEM
Chrysene	2800	ug/kg	4.0			Yes	S4VEM
Bis(2-ethylhexyl)	56	ug/kg	4.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	56	ug/kg	4.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	750	ug/kg	4.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	4400	ug/kg	4.0			Yes	S4VEM
Benzo(k)fluoranthene	1200	ug/kg	4.0			Yes	S4VEM
Benzo(a)pyrene	3400	ug/kg	4.0			Yes	S4VEM
Indeno(1,2,3-cd)pyrene	2400	ug/kg	4.0			Yes	S4VEM
Dibenzo(a,h)anthracene	560	ug/kg	4.0	J	JQ	Yes	S4VEM
Benzo(g,h,i)perylene	2200	ug/kg	4.0			Yes	S4VEM
2,3,4,6-Tetrachlorophenol	750	ug/kg	4.0	U	U	Yes	S4VEM
Dibenzo[def,mno]chrysene			4.0	JN		Yes	S4VEM
Triphenylene, 2-methyl-			4.0	JN		Yes	S4VEM
Fluoranthene, 2-methyl-			4.0	JN		Yes	S4VEM
Benzo[b]naphtho[2,1-d]thiophene			4.0	JN		Yes	S4VEM
Benz(a)anthracene, 6,8-dimethyl-			4.0	JN		Yes	S4VEM
7H-Benzo[c]carbazo			4.0	JN		Yes	S4VEM
1,2:7,8-Dibenzophenanthrene			4.0	JN		Yes	S4VEM
Fluoranthene, 2-methyl-			4.0	JN		Yes	S4VEM
o-Terphenyl			4.0	JN		Yes	S4VEM
Fluoranthene, 2-methyl-			4.0	JN		Yes	S4VEM
Perylene			4.0	JN		Yes	S4VEM
Benzo[e]pyrene			4.0	JN		Yes	S4VEM
Benzo[b]triphenylene			4.0	JN		Yes	S4VEM
Perylene			4.0	JN		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC
Sample Number: JDQW1	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: SR02SS	pH: 7.3	Sample Date: 06032011	Sample Time: 09:45:00
% Moisture : 9.9169		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	180	ug/kg	1.0	JB	U	Yes	S4VEM
Phenol	9.3	ug/kg	1.0	J	JQ	Yes	S4VEM
Bis(2-chloroethyl)ether	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Chlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	180	ug/kg	1.0	U	U	Yes	S4VEM
Acetophenone	180	ug/kg	1.0	JB	U	Yes	S4VEM
4-Methylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachloroethane	180	ug/kg	1.0	U	U	Yes	S4VEM
Nitrobenzene	180	ug/kg	1.0	U	U	Yes	S4VEM
Isophorone	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitrophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
Naphthalene	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloroaniline	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	180	ug/kg	1.0	U	U	Yes	S4VEM
Caprolactam	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	180	ug/kg	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	360	ug/kg	1.0	U	U	Yes	S4VEM
Dimethylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	180	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthylene	180	ug/kg	1.0	U	U	Yes	S4VEM
3-Nitroaniline	360	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthene	22	ug/kg	1.0	J	JQ	Yes	S4VEM
2,4-Dinitrophenol	360	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	360	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzofuran	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	180	ug/kg	1.0	U	U	Yes	S4VEM
Diethylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
Fluorene	13	ug/kg	1.0	J	JQ	Yes	S4VEM
4-Chlorophenyl-phenylether	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitroaniline	360	ug/kg	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	360	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	35	ug/kg	1.0	J	JQ	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	180	ug/kg	1.0	U	U	Yes	S4VEM
Atrazine	180	ug/kg	1.0	U	U	Yes	S4VEM
Pentachlorophenol	360	ug/kg	1.0	U	U	Yes	S4VEM
Phenanthrene	210	ug/kg	1.0			Yes	S4VEM
Anthracene	36	ug/kg	1.0	J	JQ	Yes	S4VEM
Carbazole	34	ug/kg	1.0	J	JQ	Yes	S4VEM
Di-n-butylphthalate	14	ug/kg	1.0	J	JQ	Yes	S4VEM
Fluoranthene	460	ug/kg	1.0		JK	Yes	S4VEM
Pyrene	600	ug/kg	1.0		JK	Yes	S4VEM
Butylbenzylphthalate	22	ug/kg	1.0	J	JQ	Yes	S4VEM
3,3'-Dichlorobenzidine	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	550	ug/kg	1.0		JK	Yes	S4VEM
Chrysene	690	ug/kg	1.0		JK	Yes	S4VEM
Bis(2-ethylhexyl)	25	ug/kg	1.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	25	ug/kg	1.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	750	ug/kg	1.0			Yes	S4VEM
Benzo(k)fluoranthene	210	ug/kg	1.0			Yes	S4VEM
Benzo(a)pyrene	860	ug/kg	1.0			Yes	S4VEM
Indeno(1,2,3-cd)pyrene	440	ug/kg	1.0			Yes	S4VEM
Dibenzo(a,h)anthracene	150	ug/kg	1.0	J	JQ	Yes	S4VEM
Benzo(g,h,i)perylene	480	ug/kg	1.0			Yes	S4VEM
2,3,4,6-Tetrachlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
Pyrene, 4-methyl-			1.0	JN		Yes	S4VEM
Benz(a)anthracene, 3,9-dimethyl-			1.0	JN		Yes	S4VEM
Dibenzo[def,mno]chrysene			1.0	JN		Yes	S4VEM
Benzo[b]naphtho[2,3-d]thiophene, 6-methyl-			1.0	JN		Yes	S4VEM
Benzo[e]pyrene			1.0	JN		Yes	S4VEM
Benz[a]anthracene, 7-methyl-			1.0	JN		Yes	S4VEM
Anthracene, 1,4-dimethyl-			1.0	JN		Yes	S4VEM
Benzo[c]phenanthrene, 5,8-dimethyl-			1.0	JN		Yes	S4VEM
Anthra(1,2-b)thiophene			1.0	JN		Yes	S4VEM
Fluoranthene, 2-methyl-			1.0	JN		Yes	S4VEM
Benz(a)anthracene, 5,7,12-trimethyl-			1.0	JN		Yes	S4VEM
10-Methylbenzo(a)p			1.0	JN		Yes	S4VEM
Chrysene, 5-methyl-			1.0	JN		Yes	S4VEM
Phenanthrene, 2-methyl-			1.0	JN		Yes	S4VEM
Total Alkanes			1.0	J		Yes	S4VEM
Benz(a)anthracene, 6,12-dimethyl-			1.0	JN		Yes	S4VEM
Benzo[c]phenanthrene, 1-methyl-			1.0	JN		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC
Sample Number: JDQW2	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: SR03SS	pH: 7.2	Sample Date: 06032011	Sample Time: 10:07:00
% Moisture : 8.9222		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	1800	ug/kg	10.0	U	U	Yes	S4VEM
Phenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Bis(2-chloroethyl)ether	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Chlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Methylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	1800	ug/kg	10.0	U	U	Yes	S4VEM
Acetophenone	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Methylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachloroethane	1800	ug/kg	10.0	U	U	Yes	S4VEM
Nitrobenzene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Isophorone	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Nitrophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Naphthalene	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Chloroaniline	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorobutadiene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Caprolactam	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Methylnaphthalene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
1,1'-Biphenyl	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Chloronaphthalene	1800	ug/kg	10.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	3600	ug/kg	10.0	U	U	Yes	S4VEM
Dimethylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Acenaphthylene	1800	ug/kg	10.0	U	U	Yes	S4VEM
3-Nitroaniline	3600	ug/kg	10.0	U	U	Yes	S4VEM
Acenaphthene	210	ug/kg	10.0	J	JQ	Yes	S4VEM
2,4-Dinitrophenol	3600	ug/kg	10.0	U	UJK	Yes	S4VEM
4-Nitrophenol	3600	ug/kg	10.0	U	U	Yes	S4VEM
Dibenzofuran	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Diethylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
Fluorene	59	ug/kg	10.0	J	JQ	Yes	S4VEM
4-Chlorophenyl-phenylether	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Nitroaniline	3600	ug/kg	10.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	3600	ug/kg	10.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	240	ug/kg	10.0	J	JQ	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorobenzene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Atrazine	1800	ug/kg	10.0	U	U	Yes	S4VEM
Pentachlorophenol	3600	ug/kg	10.0	U	U	Yes	S4VEM
Phenanthrene	1200	ug/kg	10.0	J	JQ	Yes	S4VEM
Anthracene	230	ug/kg	10.0	J	JQ	Yes	S4VEM
Carbazole	160	ug/kg	10.0	J	JQ	Yes	S4VEM
Di-n-butylphthalate	150	ug/kg	10.0	J	JQ	Yes	S4VEM
Fluoranthene	2900	ug/kg	10.0			Yes	S4VEM
Pyrene	3500	ug/kg	10.0			Yes	S4VEM
Butylbenzylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	1800	ug/kg	10.0	U	U	Yes	S4VEM
Benzo(a)anthracene	2700	ug/kg	10.0			Yes	S4VEM
Chrysene	3200	ug/kg	10.0			Yes	S4VEM
Bis(2-ethylhexyl)	100	ug/kg	10.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	100	ug/kg	10.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	3400	ug/kg	10.0			Yes	S4VEM
Benzo(k)fluoranthene	1100	ug/kg	10.0	J	JQ	Yes	S4VEM
Benzo(a)pyrene	3800	ug/kg	10.0			Yes	S4VEM
Indeno(1,2,3-cd)pyrene	2000	ug/kg	10.0			Yes	S4VEM
Dibenzo(a,h)anthracene	600	ug/kg	10.0	J	JQ	Yes	S4VEM
Benzo(g,h,i)perylene	2100	ug/kg	10.0			Yes	S4VEM
2,3,4,6-Tetrachlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Perylene, 3-methyl-			10.0	JN		Yes	S4VEM
Benz[a]anthracene, 11-methyl-			10.0	JN		Yes	S4VEM
Fluoranthene, 2-methyl-			10.0	JN		Yes	S4VEM
Benzo[e]pyrene			10.0	JN		Yes	S4VEM
Benzoxazole, 2-[2-(4-piperidyl)pyrimi			10.0	JN		Yes	S4VEM
Benzo[c]phenanthrene, 5,8-dimethyl-			10.0	JN		Yes	S4VEM
Benz(a)anthracene, 6,12-dimethyl-			10.0	JN		Yes	S4VEM
Pyrene, 1-methyl-			10.0	JN		Yes	S4VEM
2-Methylbenzo[b]naphtho[2,1-			10.0	JN		Yes	S4VEM
Benz(a)anthracene, 3,9-dimethyl-			10.0	JN		Yes	S4VEM
Pyrene, 1,3-dimethyl-			10.0	JN		Yes	S4VEM
11H-Benzo[a]fluorene			10.0	JN		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC

Sample Number:	JDQW3	Method:	BNA	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	SR04SS	pH:	7.3	Sample Date:	06032011	Sample Time:	10:25:00
% Moisture :	9.2766			% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	1800	ug/kg	10.0	U	U	Yes	S4VEM
Phenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Bis(2-chloroethyl)ether	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Chlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Methylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	1800	ug/kg	10.0	U	U	Yes	S4VEM
Acetophenone	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Methylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachloroethane	1800	ug/kg	10.0	U	U	Yes	S4VEM
Nitrobenzene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Isophorone	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Nitrophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Naphthalene	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Chloroaniline	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorobutadiene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Caprolactam	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Methylnaphthalene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
1,1'-Biphenyl	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Chloronaphthalene	1800	ug/kg	10.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	3600	ug/kg	10.0	U	U	Yes	S4VEM
Dimethylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Acenaphthylene	1800	ug/kg	10.0	U	U	Yes	S4VEM
3-Nitroaniline	3600	ug/kg	10.0	U	U	Yes	S4VEM
Acenaphthene	170	ug/kg	10.0	J	JQ	Yes	S4VEM
2,4-Dinitrophenol	3600	ug/kg	10.0	U	UJK	Yes	S4VEM
4-Nitrophenol	3600	ug/kg	10.0	U	U	Yes	S4VEM
Dibenzofuran	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Diethylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
Fluorene	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Nitroaniline	3600	ug/kg	10.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	3600	ug/kg	10.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	110	ug/kg	10.0	J	JQ	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorobenzene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Atrazine	1800	ug/kg	10.0	U	U	Yes	S4VEM
Pentachlorophenol	3600	ug/kg	10.0	U	U	Yes	S4VEM
Phenanthrene	680	ug/kg	10.0	J	JQ	Yes	S4VEM
Anthracene	150	ug/kg	10.0	J	JQ	Yes	S4VEM
Carbazole	96	ug/kg	10.0	J	JQ	Yes	S4VEM
Di-n-butylphthalate	55	ug/kg	10.0	J	JQ	Yes	S4VEM
Fluoranthene	1700	ug/kg	10.0	J	JQ	Yes	S4VEM
Pyrene	2100	ug/kg	10.0			Yes	S4VEM
Butylbenzylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	1800	ug/kg	10.0	U	U	Yes	S4VEM
Benzo(a)anthracene	1500	ug/kg	10.0	J	JQ	Yes	S4VEM
Chrysene	1900	ug/kg	10.0			Yes	S4VEM
Bis(2-ethylhexyl)	99	ug/kg	10.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	99	ug/kg	10.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	2000	ug/kg	10.0			Yes	S4VEM
Benzo(k)fluoranthene	760	ug/kg	10.0	J	JQ	Yes	S4VEM
Benzo(a)pyrene	2300	ug/kg	10.0			Yes	S4VEM
Indeno(1,2,3-cd)pyrene	1300	ug/kg	10.0	J	JQ	Yes	S4VEM
Dibenzo(a,h)anthracene	380	ug/kg	10.0	J	JQ	Yes	S4VEM
Benzo(g,h,i)perylene	1200	ug/kg	10.0	J	JQ	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
1H-Benz[f]indene, 2-phenyl-			10.0	JN		Yes	S4VEM
Perylene			10.0	JN		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC
Sample Number: JDQW4	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: SR05SS	pH: 7.3	Sample Date: 06032011	Sample Time: 12:20:00
% Moisture : 9.1726		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	180	ug/kg	1.0	JB	U	Yes	S4VEM
Phenol	8.9	ug/kg	1.0	J	JQ	Yes	S4VEM
Bis(2-chloroethyl)ether	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Chlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	180	ug/kg	1.0	U	U	Yes	S4VEM
Acetophenone	180	ug/kg	1.0	JB	U	Yes	S4VEM
4-Methylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachloroethane	180	ug/kg	1.0	U	U	Yes	S4VEM
Nitrobenzene	180	ug/kg	1.0	U	U	Yes	S4VEM
Isophorone	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitrophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
Naphthalene	9.1	ug/kg	1.0	J	JQ	Yes	S4VEM
4-Chloroaniline	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	180	ug/kg	1.0	U	U	Yes	S4VEM
Caprolactam	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	180	ug/kg	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	350	ug/kg	1.0	U	U	Yes	S4VEM
Dimethylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	180	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthylene	180	ug/kg	1.0	U	U	Yes	S4VEM
3-Nitroaniline	350	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthene	46	ug/kg	1.0	J	JQ	Yes	S4VEM
2,4-Dinitrophenol	350	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	350	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzofuran	16	ug/kg	1.0	J	JQ	Yes	S4VEM
2,4-Dinitrotoluene	180	ug/kg	1.0	U	U	Yes	S4VEM
Diethylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
Fluorene	32	ug/kg	1.0	J	JQ	Yes	S4VEM
4-Chlorophenyl-phenylether	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitroaniline	350	ug/kg	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	350	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	32	ug/kg	1.0	J	JQ	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	180	ug/kg	1.0	U	U	Yes	S4VEM
Atrazine	180	ug/kg	1.0	U	U	Yes	S4VEM
Pentachlorophenol	350	ug/kg	1.0	U	U	Yes	S4VEM
Phenanthrene	360	ug/kg	1.0			Yes	S4VEM
Anthracene	68	ug/kg	1.0	J	JQ	Yes	S4VEM
Carbazole	77	ug/kg	1.0	J	JQ	Yes	S4VEM
Di-n-butylphthalate	9.8	ug/kg	1.0	J	JQ	Yes	S4VEM
Fluoranthene	820	ug/kg	1.0			Yes	S4VEM
Pyrene	770	ug/kg	1.0			Yes	S4VEM
Butylbenzylphthalate	9.9	ug/kg	1.0	J	JQ	Yes	S4VEM
3,3'-Dichlorobenzidine	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	610	ug/kg	1.0			Yes	S4VEM
Chrysene	720	ug/kg	1.0			Yes	S4VEM
Bis(2-ethylhexyl)	24	ug/kg	1.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	24	ug/kg	1.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	1100	ug/kg	1.0			Yes	S4VEM
Benzo(k)fluoranthene	330	ug/kg	1.0			Yes	S4VEM
Benzo(a)pyrene	870	ug/kg	1.0			Yes	S4VEM
Indeno(1,2,3-cd)pyrene	590	ug/kg	1.0			Yes	S4VEM
Dibenzo(a,h)anthracene	150	ug/kg	1.0	J	JQ	Yes	S4VEM
Benzo(g,h,i)perylene	470	ug/kg	1.0			Yes	S4VEM
2,3,4,6-Tetrachlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
1,1':3',1"-Terphenyl, 5'-phenyl-			1.0	JN		Yes	S4VEM
Benz(a)anthracene, 4,7-dimethyl-			1.0	JN		Yes	S4VEM
Benzo[b]triphenylene			1.0	JN		Yes	S4VEM
Pyrene, 1-methyl-			1.0	JN		Yes	S4VEM
Benzo[c]phenanthrene, 5,8-dimethyl-			1.0	JN		Yes	S4VEM
Benzo[j]fluoranthene			1.0	JN		Yes	S4VEM
Pyrene, 1-methyl-			1.0	JN		Yes	S4VEM
Perylene			1.0	JN		Yes	S4VEM
11H-Benzo[b]fluoren			1.0	JN		Yes	S4VEM
Chrysene, 1-methyl-			1.0	JN		Yes	S4VEM
Benz(a)anthracene, 6,12-dimethyl-			1.0	JN		Yes	S4VEM
11H-Benzo[a]fluorene			1.0	JN		Yes	S4VEM
Benzo[b]naphtho[2,1-d]thiophene			1.0	JN		Yes	S4VEM
Pyrene, 1,3-dimethyl-			1.0	JN		Yes	S4VEM
Perylene			1.0	JN		Yes	S4VEM
Total Alkanes			1.0	J		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC
Sample Number: JDQW5	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: SR06SS	pH: 7.3	Sample Date: 06032011	Sample Time: 12:16:00
% Moisture : 9.5399		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	720	ug/kg	4.0	JB	U	Yes	S4VEM
Phenol	720	ug/kg	4.0	U	U	Yes	S4VEM
Bis(2-chloroethyl)ether	720	ug/kg	4.0	U	U	Yes	S4VEM
2-Chlorophenol	720	ug/kg	4.0	U	U	Yes	S4VEM
2-Methylphenol	720	ug/kg	4.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	720	ug/kg	4.0	U	U	Yes	S4VEM
Acetophenone	720	ug/kg	4.0	U	U	Yes	S4VEM
4-Methylphenol	720	ug/kg	4.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	720	ug/kg	4.0	U	U	Yes	S4VEM
Hexachloroethane	720	ug/kg	4.0	U	U	Yes	S4VEM
Nitrobenzene	720	ug/kg	4.0	U	U	Yes	S4VEM
Isophorone	720	ug/kg	4.0	U	U	Yes	S4VEM
2-Nitrophenol	720	ug/kg	4.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	720	ug/kg	4.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	720	ug/kg	4.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	720	ug/kg	4.0	U	U	Yes	S4VEM
Naphthalene	24	ug/kg	4.0	J	JQ	Yes	S4VEM
4-Chloroaniline	720	ug/kg	4.0	U	U	Yes	S4VEM
Hexachlorobutadiene	720	ug/kg	4.0	U	U	Yes	S4VEM
Caprolactam	720	ug/kg	4.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	720	ug/kg	4.0	U	U	Yes	S4VEM
2-Methylnaphthalene	720	ug/kg	4.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	720	ug/kg	4.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	720	ug/kg	4.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	720	ug/kg	4.0	U	U	Yes	S4VEM
1,1'-Biphenyl	720	ug/kg	4.0	U	U	Yes	S4VEM
2-Chloronaphthalene	720	ug/kg	4.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	1400	ug/kg	4.0	U	U	Yes	S4VEM
Dimethylphthalate	720	ug/kg	4.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	720	ug/kg	4.0	U	U	Yes	S4VEM
Acenaphthylene	720	ug/kg	4.0	U	U	Yes	S4VEM
3-Nitroaniline	1400	ug/kg	4.0	U	U	Yes	S4VEM
Acenaphthene	130	ug/kg	4.0	J	JQ	Yes	S4VEM
2,4-Dinitrophenol	1400	ug/kg	4.0	U	UJK	Yes	S4VEM
4-Nitrophenol	1400	ug/kg	4.0	U	U	Yes	S4VEM
Dibenzofuran	41	ug/kg	4.0	J	JQ	Yes	S4VEM
2,4-Dinitrotoluene	720	ug/kg	4.0	U	U	Yes	S4VEM
Diethylphthalate	720	ug/kg	4.0	U	U	Yes	S4VEM
Fluorene	92	ug/kg	4.0	J	JQ	Yes	S4VEM
4-Chlorophenyl-phenylether	720	ug/kg	4.0	U	U	Yes	S4VEM
4-Nitroaniline	1400	ug/kg	4.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	1400	ug/kg	4.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	720	ug/kg	4.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	720	ug/kg	4.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	720	ug/kg	4.0	U	U	Yes	S4VEM
Hexachlorobenzene	720	ug/kg	4.0	U	U	Yes	S4VEM
Atrazine	720	ug/kg	4.0	U	U	Yes	S4VEM
Pentachlorophenol	1400	ug/kg	4.0	U	U	Yes	S4VEM
Phenanthrene	1100	ug/kg	4.0			Yes	S4VEM
Anthracene	210	ug/kg	4.0	J	JQ	Yes	S4VEM
Carbazole	230	ug/kg	4.0	J	JQ	Yes	S4VEM
Di-n-butylphthalate	720	ug/kg	4.0	U	U	Yes	S4VEM
Fluoranthene	2400	ug/kg	4.0			Yes	S4VEM
Pyrene	2200	ug/kg	4.0			Yes	S4VEM
Butylbenzylphthalate	720	ug/kg	4.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	720	ug/kg	4.0	U	U	Yes	S4VEM
Benzo(a)anthracene	1800	ug/kg	4.0			Yes	S4VEM
Chrysene	1900	ug/kg	4.0			Yes	S4VEM
Bis(2-ethylhexyl)	49	ug/kg	4.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	49	ug/kg	4.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	720	ug/kg	4.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	3100	ug/kg	4.0			Yes	S4VEM
Benzo(k)fluoranthene	880	ug/kg	4.0			Yes	S4VEM
Benzo(a)pyrene	2400	ug/kg	4.0			Yes	S4VEM
Indeno(1,2,3-cd)pyrene	1600	ug/kg	4.0			Yes	S4VEM
Dibenzo(a,h)anthracene	400	ug/kg	4.0	J	JQ	Yes	S4VEM
Benzo(g,h,i)perylene	1400	ug/kg	4.0			Yes	S4VEM
2,3,4,6-Tetrachlorophenol	720	ug/kg	4.0	U	U	Yes	S4VEM
Benzo[j]fluoranthene			4.0	JN		Yes	S4VEM
Fluoranthene, 2-methyl-			4.0	JN		Yes	S4VEM
Chrysene, 1-methyl-			4.0	JN		Yes	S4VEM
Perylene			4.0	JN		Yes	S4VEM
Pyrene, 2-methyl-			4.0	JN		Yes	S4VEM
Pyrene, 1-methyl-			4.0	JN		Yes	S4VEM
Benzo[b]naphtho[2,1-d]thiophene			4.0	JN		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC
Sample Number: JDQW6	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: PR04SS	pH: 7.1	Sample Date: 06032011	Sample Time: 09:06:00
% Moisture : 10.3746		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	1800	ug/kg	10.0	JB	U	Yes	S4VEM
Phenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Bis(2-chloroethyl)ether	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Chlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Methylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	1800	ug/kg	10.0	U	U	Yes	S4VEM
Acetophenone	1800	ug/kg	10.0	JB	U	Yes	S4VEM
4-Methylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachloroethane	1800	ug/kg	10.0	U	U	Yes	S4VEM
Nitrobenzene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Isophorone	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Nitrophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Naphthalene	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Chloroaniline	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorobutadiene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Caprolactam	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Methylnaphthalene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
1,1'-Biphenyl	1800	ug/kg	10.0	U	U	Yes	S4VEM
2-Chloronaphthalene	1800	ug/kg	10.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	3600	ug/kg	10.0	U	U	Yes	S4VEM
Dimethylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Acenaphthylene	1800	ug/kg	10.0	U	U	Yes	S4VEM
3-Nitroaniline	3600	ug/kg	10.0	U	U	Yes	S4VEM
Acenaphthene	220	ug/kg	10.0	J	JQ	Yes	S4VEM
2,4-Dinitrophenol	3600	ug/kg	10.0	U	UJK	Yes	S4VEM
4-Nitrophenol	3600	ug/kg	10.0	U	U	Yes	S4VEM
Dibenzofuran	1800	ug/kg	10.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Diethylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
Fluorene	98	ug/kg	10.0	J	JQ	Yes	S4VEM
4-Chlorophenyl-phenylether	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Nitroaniline	3600	ug/kg	10.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	3600	ug/kg	10.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	110	ug/kg	10.0	J	JQ	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	1800	ug/kg	10.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	1800	ug/kg	10.0	U	U	Yes	S4VEM
Hexachlorobenzene	1800	ug/kg	10.0	U	U	Yes	S4VEM
Atrazine	1800	ug/kg	10.0	U	U	Yes	S4VEM
Pentachlorophenol	3600	ug/kg	10.0	U	U	Yes	S4VEM
Phenanthrene	2100	ug/kg	10.0			Yes	S4VEM
Anthracene	430	ug/kg	10.0	J	JQ	Yes	S4VEM
Carbazole	280	ug/kg	10.0	J	JQ	Yes	S4VEM
Di-n-butylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
Fluoranthene	4700	ug/kg	10.0			Yes	S4VEM
Pyrene	7600	ug/kg	10.0			Yes	S4VEM
Butylbenzylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	1800	ug/kg	10.0	U	U	Yes	S4VEM
Benzo(a)anthracene	6300	ug/kg	10.0			Yes	S4VEM
Chrysene	8400	ug/kg	10.0			Yes	S4VEM
Bis(2-ethylhexyl)	200	ug/kg	10.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	200	ug/kg	10.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	1800	ug/kg	10.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	7100	ug/kg	10.0			Yes	S4VEM
Benzo(k)fluoranthene	1700	ug/kg	10.0	J	JQ	Yes	S4VEM
Benzo(a)pyrene	10000	ug/kg	10.0			Yes	S4VEM
Indeno(1,2,3-cd)pyrene	3800	ug/kg	10.0			Yes	S4VEM
Dibenzo(a,h)anthracene	1600	ug/kg	10.0	J	JQ	Yes	S4VEM
Benzo(g,h,i)perylene	5800	ug/kg	10.0			Yes	S4VEM
2,3,4,6-Tetrachlorophenol	1800	ug/kg	10.0	U	U	Yes	S4VEM
Pyrene, 4-methyl-			10.0	JN		Yes	S4VEM
Indeno[1,2,3-cd]fluoranthene			10.0	JN		Yes	S4VEM
Benz(a)anthracene, 6,12-dimethyl-			10.0	JN		Yes	S4VEM
9-Octadecenamide, (Z)-			10.0	JN		Yes	S4VEM
Perylene, 3-methyl-			10.0	JN		Yes	S4VEM
8H-Indeno[2,1-b]phenanthrene			10.0	JN		Yes	S4VEM
7,10-Dimethylbenzo(a)pyrene			10.0	JN		Yes	S4VEM
Benz(a)anthracene, 6,7,8-trimethyl-			10.0	JN		Yes	S4VEM
Pyrene, 2-methyl-			10.0	JN		Yes	S4VEM
Benz[a]anthracene, 7-methyl-			10.0	JN		Yes	S4VEM
10-Methylbenzo(a)p			10.0	JN		Yes	S4VEM
Pyrene, 1,3-dimethyl-			10.0	JN		Yes	S4VEM
Pyrene, 1-methyl-			10.0	JN		Yes	S4VEM
Total Alkanes			10.0	J		Yes	S4VEM
Pyrene, 1,3-dimethyl-			10.0	JN		Yes	S4VEM
Benz(a)anthracene, 6,8-dimethyl-			10.0	JN		Yes	S4VEM
Benz(a)anthracene, 3,9-dimethyl-			10.0	JN		Yes	S4VEM
Triphenylene, 2-methyl-			10.0	JN		Yes	S4VEM
Benzo[e]pyrene			10.0	JN		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC

Sample Number:	JDQW7	Method:	BNA	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	RR04SS	pH:	7.2	Sample Date:	06032011	Sample Time:	11:57:00
% Moisture :	9.6061			% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	190	ug/kg	1.0	JB	U	Yes	S4VEM
Phenol	190	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethyl)ether	190	ug/kg	1.0	U	U	Yes	S4VEM
2-Chlorophenol	190	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylphenol	190	ug/kg	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	190	ug/kg	1.0	U	U	Yes	S4VEM
Acetophenone	190	ug/kg	1.0	JB	U	Yes	S4VEM
4-Methylphenol	190	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	190	ug/kg	1.0	U	U	Yes	S4VEM
Hexachloroethane	190	ug/kg	1.0	U	U	Yes	S4VEM
Nitrobenzene	190	ug/kg	1.0	U	U	Yes	S4VEM
Isophorone	190	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitrophenol	190	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	190	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	190	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	190	ug/kg	1.0	U	U	Yes	S4VEM
Naphthalene	190	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloroaniline	190	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	190	ug/kg	1.0	U	U	Yes	S4VEM
Caprolactam	190	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	190	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	190	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	190	ug/kg	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	190	ug/kg	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	190	ug/kg	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	190	ug/kg	1.0	U	U	Yes	S4VEM
2-Chloronaphthale	190	ug/kg	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
ne	190	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitroaniline	360	ug/kg	1.0	U	U	Yes	S4VEM
Dimethylphthalate	190	ug/kg	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	190	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthylene	190	ug/kg	1.0	U	U	Yes	S4VEM
3-Nitroaniline	360	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthene	190	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	360	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	360	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzofuran	190	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	190	ug/kg	1.0	U	U	Yes	S4VEM
Diethylphthalate	190	ug/kg	1.0	U	U	Yes	S4VEM
Fluorene	190	ug/kg	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	190	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitroaniline	360	ug/kg	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	360	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	190	ug/kg	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	190	ug/kg	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	190	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	190	ug/kg	1.0	U	U	Yes	S4VEM
Atrazine	190	ug/kg	1.0	U	U	Yes	S4VEM
Pentachlorophenol	360	ug/kg	1.0	U	U	Yes	S4VEM
Phenanthrene	130	ug/kg	1.0	J	JQ	Yes	S4VEM
Anthracene	36	ug/kg	1.0	J	JQ	Yes	S4VEM
Carbazole	6.5	ug/kg	1.0	J	JQ	Yes	S4VEM
Di-n-butylphthalate	190	ug/kg	1.0	U	U	Yes	S4VEM
Fluoranthene	120	ug/kg	1.0	J	JQ	Yes	S4VEM
Pyrene	420	ug/kg	1.0			Yes	S4VEM
Butylbenzylphthalate	190	ug/kg	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	190	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	280	ug/kg	1.0			Yes	S4VEM
Chrysene	400	ug/kg	1.0			Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Bis(2-ethylhexyl)phthalate	16	ug/kg	1.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	190	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	210	ug/kg	1.0			Yes	S4VEM
Benzo(k)fluoranthene	39	ug/kg	1.0	J	JQ	Yes	S4VEM
Benzo(a)pyrene	470	ug/kg	1.0			Yes	S4VEM
Indeno(1,2,3-cd)pyrene	110	ug/kg	1.0	J	JQ	Yes	S4VEM
Dibenzo(a,h)anthracene	77	ug/kg	1.0	J	JQ	Yes	S4VEM
Benzo(g,h,i)perylene	200	ug/kg	1.0			Yes	S4VEM
2,3,4,6-Tetrachlorophenol	190	ug/kg	1.0	U	U	Yes	S4VEM
7-Benzhydrylidene-5-methylenebicyclo[2.2.1]hept-			1.0	JN		Yes	S4VEM
Phenanthrene, 2,5-dimethyl-			1.0	JN		Yes	S4VEM
o-Terphenyl			1.0	JN		Yes	S4VEM
Benzo[c]phenanthrene, 5,8-dimethyl-			1.0	JN		Yes	S4VEM
Benz[a]anthracene, 7,12-dimethyl-			1.0	JN		Yes	S4VEM
Benzo[e]pyrene			1.0	JN		Yes	S4VEM
Pyrene, 1-methyl-			1.0	JN		Yes	S4VEM
Pyrene, 4-methyl-			1.0	JN		Yes	S4VEM
Benz(a)anthracene, 3,9-dimethyl-			1.0	JN		Yes	S4VEM
Benz[a]anthracene, 7,12-dimethyl-			1.0	JN		Yes	S4VEM
Benz[a]anthracene, 1-methyl-			1.0	JN		Yes	S4VEM
Pyrene, 1,3-dimethyl-			1.0	JN		Yes	S4VEM
Benz[a]anthracene, 7-methyl-			1.0	JN		Yes	S4VEM
Chrysene, 5-methyl-			1.0	JN		Yes	S4VEM
Benzoxazole, 2-[2-(4-piperidyl)pyrimi			1.0	JN		Yes	S4VEM
Pyrene, 1-methyl-			1.0	JN		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC

Sample Number:	JDQW8	Method:	BNA	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	RF01SS	pH:	7.4	Sample Date:	06032011	Sample Time:	16:28:00
% Moisture :	6.5954			% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	180	ug/kg	1.0	JB	U	Yes	S4VEM
Phenol	8.0	ug/kg	1.0	J	JQ	Yes	S4VEM
Bis(2-chloroethyl)ether	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Chlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	180	ug/kg	1.0	U	U	Yes	S4VEM
Acetophenone	180	ug/kg	1.0	JB	U	Yes	S4VEM
4-Methylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachloroethane	180	ug/kg	1.0	U	U	Yes	S4VEM
Nitrobenzene	180	ug/kg	1.0	U	U	Yes	S4VEM
Isophorone	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitrophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
Naphthalene	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloroaniline	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	180	ug/kg	1.0	U	U	Yes	S4VEM
Caprolactam	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Chloronaphthale	180	ug/kg	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
ne	180	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitroaniline	350	ug/kg	1.0	U	U	Yes	S4VEM
Dimethylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	180	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthylene	180	ug/kg	1.0	U	U	Yes	S4VEM
3-Nitroaniline	350	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthene	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	350	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	350	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzofuran	180	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	180	ug/kg	1.0	U	U	Yes	S4VEM
Diethylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
Fluorene	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitroaniline	350	ug/kg	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	350	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	180	ug/kg	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	180	ug/kg	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	180	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	180	ug/kg	1.0	U	U	Yes	S4VEM
Atrazine	180	ug/kg	1.0	U	U	Yes	S4VEM
Pentachlorophenol	350	ug/kg	1.0	U	UJK	Yes	S4VEM
Phenanthrene	180	ug/kg	1.0	U	U	Yes	S4VEM
Anthracene	180	ug/kg	1.0	U	U	Yes	S4VEM
Carbazole	180	ug/kg	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
Fluoranthene	180	ug/kg	1.0	U	U	Yes	S4VEM
Pyrene	7.9	ug/kg	1.0	J	JQ	Yes	S4VEM
Butylbenzylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	8.4	ug/kg	1.0	J	JQ	Yes	S4VEM
Chrysene	9.8	ug/kg	1.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Bis(2-ethylhexyl)phthalate	16	ug/kg	1.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	7.6	ug/kg	1.0	J	JQ	Yes	S4VEM
Benzo(k)fluoranthene	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	11	ug/kg	1.0	J	JQ	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	180	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	180	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	180	ug/kg	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	180	ug/kg	1.0	U	U	Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC
Sample Number: JDQW9	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: WL01SD	pH: 7.3	Sample Date: 06032011	Sample Time: 12:57:00
% Moisture : 72.5155		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	570	ug/kg	1.0	JB	U	Yes	S4VEM
Phenol	48	ug/kg	1.0	J	JQ	Yes	S4VEM
Bis(2-chloroethyl)ether	570	ug/kg	1.0	U	UJK	Yes	S4VEM
2-Chlorophenol	570	ug/kg	1.0	U	UJK	Yes	S4VEM
2-Methylphenol	570	ug/kg	1.0	U	UJK	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Acetophenone	570	ug/kg	1.0	JB	U	Yes	S4VEM
4-Methylphenol	570	ug/kg	1.0	U	UJK	Yes	S4VEM
N-Nitroso-di-n-propylamine	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Hexachloroethane	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Nitrobenzene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Isophorone	570	ug/kg	1.0	U	UJK	Yes	S4VEM
2-Nitrophenol	570	ug/kg	1.0	U	UJK	Yes	S4VEM
2,4-Dimethylphenol	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Bis(2-chloroethoxy)methane	570	ug/kg	1.0	U	UJK	Yes	S4VEM
2,4-Dichlorophenol	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Naphthalene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Chloroaniline	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Hexachlorobutadiene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Caprolactam	570	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Chloro-3-methylphenol	570	ug/kg	1.0	U	UJK	Yes	S4VEM
2-Methylnaphthalene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Hexachlorocyclopentadiene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
2,4,6-Trichlorophenol	570	ug/kg	1.0	U	UJK	Yes	S4VEM
2,4,5-Trichlorophenol	570	ug/kg	1.0	U	UJK	Yes	S4VEM
1,1'-Biphenyl	570	ug/kg	1.0	U	UJK	Yes	S4VEM
2-Chloronaphthalene	570	ug/kg	1.0	U	UJK	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	1100	ug/kg	1.0	U	UJK	Yes	S4VEM
Dimethylphthalate	570	ug/kg	1.0	U	UJK	Yes	S4VEM
2,6-Dinitrotoluene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Acenaphthylene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
3-Nitroaniline	1100	ug/kg	1.0	U	UJK	Yes	S4VEM
Acenaphthene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
2,4-Dinitrophenol	1100	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	1100	ug/kg	1.0	U	UJK	Yes	S4VEM
Dibenzofuran	570	ug/kg	1.0	U	UJK	Yes	S4VEM
2,4-Dinitrotoluene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Diethylphthalate	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Fluorene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Chlorophenyl-phenylether	570	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Nitroaniline	23	ug/kg	1.0	J	JQ	Yes	S4VEM
4,6-Dinitro-2-methylphenol	1100	ug/kg	1.0	U	UJK	Yes	S4VEM
N-Nitrosodiphenylamine	570	ug/kg	1.0	U	UJK	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Bromophenyl-phenylether	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Hexachlorobenzene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Atrazine	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Pentachlorophenol	1100	ug/kg	1.0	U	UJK	Yes	S4VEM
Phenanthrene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Anthracene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Carbazole	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Di-n-butylphthalate	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Fluoranthene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Pyrene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Butylbenzylphthalate	570	ug/kg	1.0	U	UJK	Yes	S4VEM
3,3'-Dichlorobenzidine	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Benzo(a)anthracene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Chrysene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Bis(2-ethylhexyl)	250	ug/kg	1.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	250	ug/kg	1.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Benzo(b)fluoranthene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Benzo(k)fluoranthene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Benzo(a)pyrene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Dibenzo(a,h)anthracene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Benzo(g,h,i)perylene	570	ug/kg	1.0	U	UJK	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	570	ug/kg	1.0	U	UJK	Yes	S4VEM
Total Alkanes			1.0	J		Yes	S4VEM
2-Phenanthrenol, 4b,5,6,7,8,8a,9,10-octahydro-4b			1.0	JN		Yes	S4VEM
3H-3a,7-Methanoazulene, 2,4,5,6,7,8-hexahydro-1,			1.0	JN		Yes	S4VEM
2-Phenanthrenol, 4b,5,6,7,8,8a,9,10-octahydro-4b			1.0	JN		Yes	S4VEM
Longifolenaldehyde			1.0	JN		Yes	S4VEM
1,4-Methanoazulene, decahydro-4,8,8-trimethyl-9-			1.0	JN		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC
Sample Number: JDQX0	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: WL02SD	pH: 7.4	Sample Date: 06032011	Sample Time: 13:43:00
% Moisture : 32.0626		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	240	ug/kg	1.0	JB	U	Yes	S4VEM
Phenol	20	ug/kg	1.0	J	JQ	Yes	S4VEM
Bis(2-chloroethyl)ether	240	ug/kg	1.0	U	U	Yes	S4VEM
2-Chlorophenol	240	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylphenol	240	ug/kg	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	240	ug/kg	1.0	U	U	Yes	S4VEM
Acetophenone	240	ug/kg	1.0	JB	U	Yes	S4VEM
4-Methylphenol	240	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	240	ug/kg	1.0	U	U	Yes	S4VEM
Hexachloroethane	240	ug/kg	1.0	U	U	Yes	S4VEM
Nitrobenzene	240	ug/kg	1.0	U	U	Yes	S4VEM
Isophorone	240	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitrophenol	240	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	240	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	240	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	240	ug/kg	1.0	U	U	Yes	S4VEM
Naphthalene	240	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloroaniline	240	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	240	ug/kg	1.0	U	U	Yes	S4VEM
Caprolactam	240	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	240	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	240	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	240	ug/kg	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	240	ug/kg	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	240	ug/kg	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	240	ug/kg	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	240	ug/kg	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	460	ug/kg	1.0	U	U	Yes	S4VEM
Dimethylphthalate	240	ug/kg	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	240	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthylene	240	ug/kg	1.0	U	U	Yes	S4VEM
3-Nitroaniline	460	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthene	240	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	460	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	460	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzofuran	240	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	240	ug/kg	1.0	U	U	Yes	S4VEM
Diethylphthalate	240	ug/kg	1.0	U	U	Yes	S4VEM
Fluorene	240	ug/kg	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	240	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitroaniline	460	ug/kg	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	460	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	240	ug/kg	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	240	ug/kg	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	240	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	240	ug/kg	1.0	U	U	Yes	S4VEM
Atrazine	240	ug/kg	1.0	U	U	Yes	S4VEM
Pentachlorophenol	460	ug/kg	1.0	U	UJK	Yes	S4VEM
Phenanthrene	240	ug/kg	1.0	U	U	Yes	S4VEM
Anthracene	240	ug/kg	1.0	U	U	Yes	S4VEM
Carbazole	240	ug/kg	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	240	ug/kg	1.0	U	U	Yes	S4VEM
Fluoranthene	240	ug/kg	1.0	U	U	Yes	S4VEM
Pyrene	9.4	ug/kg	1.0	J	JQ	Yes	S4VEM
Butylbenzylphthalate	240	ug/kg	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	240	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	9.2	ug/kg	1.0	J	JQ	Yes	S4VEM
Chrysene	9.0	ug/kg	1.0	J	JQ	Yes	S4VEM
Bis(2-ethylhexyl)	33	ug/kg	1.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	33	ug/kg	1.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	240	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	9.4	ug/kg	1.0	J	JQ	Yes	S4VEM
Benzo(k)fluoranthene	240	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	12	ug/kg	1.0	J	JQ	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	240	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	240	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	240	ug/kg	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	240	ug/kg	1.0	U	U	Yes	S4VEM
.gamma.-Sitosterol			1.0	JN		Yes	S4VEM
Squalene			1.0	JN		Yes	S4VEM
Oxirane, heptadecyl-			1.0	JN		Yes	S4VEM
n-Hexadecanoic acid			1.0	JN		Yes	S4VEM
1-Octadecanesulphonyl chloride			1.0	JN		Yes	S4VEM
Total Alkanes			1.0	J		Yes	S4VEM
Octadecanal			1.0	JN		Yes	S4VEM
1,19-Eicosadiene			1.0	JN		Yes	S4VEM
2,2,6-Trimethyl-1-(2-methyl-cyclobut-2-enyl)-hep			1.0	JN		Yes	S4VEM
Oxirane, tetradecyl-			1.0	JN		Yes	S4VEM
1-Heneicosanol			1.0	JN		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC
Sample Number: JDQX1	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: WL03SD	pH: 7.4	Sample Date: 06032011	Sample Time: 13:36:00
% Moisture : 33.3063		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	240	ug/kg	1.0	JB	U	Yes	S4VEM
Phenol	240	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethyl)ether	240	ug/kg	1.0	U	U	Yes	S4VEM
2-Chlorophenol	240	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylphenol	240	ug/kg	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	240	ug/kg	1.0	U	U	Yes	S4VEM
Acetophenone	240	ug/kg	1.0	JB	U	Yes	S4VEM
4-Methylphenol	240	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	240	ug/kg	1.0	U	U	Yes	S4VEM
Hexachloroethane	240	ug/kg	1.0	U	U	Yes	S4VEM
Nitrobenzene	240	ug/kg	1.0	U	U	Yes	S4VEM
Isophorone	240	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitrophenol	240	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	240	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	240	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	240	ug/kg	1.0	U	U	Yes	S4VEM
Naphthalene	240	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloroaniline	240	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	240	ug/kg	1.0	U	U	Yes	S4VEM
Caprolactam	240	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	240	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	240	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	240	ug/kg	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	240	ug/kg	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	240	ug/kg	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	240	ug/kg	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	240	ug/kg	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	460	ug/kg	1.0	U	U	Yes	S4VEM
Dimethylphthalate	240	ug/kg	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	240	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthylene	240	ug/kg	1.0	U	U	Yes	S4VEM
3-Nitroaniline	460	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthene	240	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	460	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	460	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzofuran	240	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	240	ug/kg	1.0	U	U	Yes	S4VEM
Diethylphthalate	240	ug/kg	1.0	U	U	Yes	S4VEM
Fluorene	240	ug/kg	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	240	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitroaniline	460	ug/kg	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	460	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	240	ug/kg	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	240	ug/kg	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	240	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	240	ug/kg	1.0	U	U	Yes	S4VEM
Atrazine	240	ug/kg	1.0	U	U	Yes	S4VEM
Pentachlorophenol	460	ug/kg	1.0	U	UJK	Yes	S4VEM
Phenanthrene	240	ug/kg	1.0	U	U	Yes	S4VEM
Anthracene	240	ug/kg	1.0	U	U	Yes	S4VEM
Carbazole	240	ug/kg	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	240	ug/kg	1.0	U	U	Yes	S4VEM
Fluoranthene	240	ug/kg	1.0	U	U	Yes	S4VEM
Pyrene	240	ug/kg	1.0	U	U	Yes	S4VEM
Butylbenzylphthalate	240	ug/kg	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	240	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	240	ug/kg	1.0	U	U	Yes	S4VEM
Chrysene	240	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-ethylhexyl)	17	ug/kg	1.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	17	ug/kg	1.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	240	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	240	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(k)fluoranthene	240	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	240	ug/kg	1.0	U	U	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	240	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	240	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	240	ug/kg	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	240	ug/kg	1.0	U	U	Yes	S4VEM
Trichloroacetic acid, hexadecyl ester			1.0	JN		Yes	S4VEM
(Z)-14-Tricosenyl formate			1.0	JN		Yes	S4VEM
Total Alkanes			1.0	J		Yes	S4VEM
Octadecanal			1.0	JN		Yes	S4VEM
Behenic alcohol			1.0	JN		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC
Sample Number: JDQX2	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: WL04SD	pH: 7.4	Sample Date: 06032011	Sample Time: 14:10:00
% Moisture : 49.0528		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	310	ug/kg	1.0	JB	U	Yes	S4VEM
Phenol	310	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethyl)ether	310	ug/kg	1.0	U	U	Yes	S4VEM
2-Chlorophenol	310	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylphenol	310	ug/kg	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	310	ug/kg	1.0	U	U	Yes	S4VEM
Acetophenone	310	ug/kg	1.0	JB	U	Yes	S4VEM
4-Methylphenol	310	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	310	ug/kg	1.0	U	U	Yes	S4VEM
Hexachloroethane	310	ug/kg	1.0	U	U	Yes	S4VEM
Nitrobenzene	310	ug/kg	1.0	U	U	Yes	S4VEM
Isophorone	310	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitrophenol	310	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	310	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	310	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	310	ug/kg	1.0	U	U	Yes	S4VEM
Naphthalene	310	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloroaniline	310	ug/kg	1.0	U	UJK	Yes	S4VEM
Hexachlorobutadiene	310	ug/kg	1.0	U	U	Yes	S4VEM
Caprolactam	310	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	310	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	310	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	310	ug/kg	1.0	U	UJK	Yes	S4VEM
2,4,6-Trichlorophenol	310	ug/kg	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	310	ug/kg	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	310	ug/kg	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	310	ug/kg	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	600	ug/kg	1.0	U	U	Yes	S4VEM
Dimethylphthalate	310	ug/kg	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	310	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthylene	310	ug/kg	1.0	U	U	Yes	S4VEM
3-Nitroaniline	600	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthene	310	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	600	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	600	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzofuran	310	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	310	ug/kg	1.0	U	U	Yes	S4VEM
Diethylphthalate	310	ug/kg	1.0	U	U	Yes	S4VEM
Fluorene	310	ug/kg	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	310	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitroaniline	600	ug/kg	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	600	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	310	ug/kg	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	310	ug/kg	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	310	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	310	ug/kg	1.0	U	U	Yes	S4VEM
Atrazine	310	ug/kg	1.0	U	U	Yes	S4VEM
Pentachlorophenol	600	ug/kg	1.0	U	U	Yes	S4VEM
Phenanthrene	310	ug/kg	1.0	U	U	Yes	S4VEM
Anthracene	310	ug/kg	1.0	U	U	Yes	S4VEM
Carbazole	310	ug/kg	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	310	ug/kg	1.0	U	U	Yes	S4VEM
Fluoranthene	310	ug/kg	1.0	U	U	Yes	S4VEM
Pyrene	310	ug/kg	1.0	U	U	Yes	S4VEM
Butylbenzylphthalate	310	ug/kg	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	310	ug/kg	1.0	U	UJK	Yes	S4VEM
Benzo(a)anthracene	310	ug/kg	1.0	U	U	Yes	S4VEM
Chrysene	310	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-ethylhexyl)	60	ug/kg	1.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	60	ug/kg	1.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	310	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	310	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(k)fluoranthene	310	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	310	ug/kg	1.0	U	U	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	310	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	310	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	310	ug/kg	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	310	ug/kg	1.0	U	U	Yes	S4VEM
n-Hexadecanoic acid			1.0	JN		Yes	S4VEM
1,19-Eicosadiene			1.0	JN		Yes	S4VEM
n-Heptanoic acid,methyl(tetramethylene)silyl est			1.0	JN		Yes	S4VEM
.gamma.-Sitosterol			1.0	JN		Yes	S4VEM
Tricyclo[5.4.0.0(2,8)]undec-9-ene, 2,6,6,9-tetra			1.0	JN		Yes	S4VEM
Bis[m-nitrophenyl]ether			1.0	JN		Yes	S4VEM
Bicyclo[3.1.0]hexane, 4-methylene-1-(1-methyleth			1.0	JN		Yes	S4VEM
1,19-Eicosadiene			1.0	JN		Yes	S4VEM
Naphthalene, 1,2,3,5,6,8a-hexahydro-4,7-dimethyl			1.0	JN		Yes	S4VEM
1,4-Cyclohexadiene, 1-methyl-4-(1-methylethyl)-			1.0	JN		Yes	S4VEM
Ferruginol			1.0	JN		Yes	S4VEM
1,4-Methano-1H-indene, octahydro-4-methyl-8-meth			1.0	JN		Yes	S4VEM
1,4-Methanoazulene, decahydro-4,8,8-trimethyl-9-			1.0	JN		Yes	S4VEM
Longifolenaldehyde			1.0	JN		Yes	S4VEM
Naphthalene, 1,2,3,4,4a,5,6,8a-octahydro-7-methy			1.0	JN		Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Total Alkanes			1.0	J		Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQT4	Lab Code: DATAC
Sample Number: JDQX7	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: BK01SS	pH: 7.5	Sample Date: 06032011	Sample Time: 15:45:00
% Moisture : 18.5733		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	200	ug/kg	1.0	JB	U	Yes	S4VEM
Phenol	6.5	ug/kg	1.0	J	JQ	Yes	S4VEM
Bis(2-chloroethyl)ether	200	ug/kg	1.0	U	U	Yes	S4VEM
2-Chlorophenol	200	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylphenol	200	ug/kg	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	200	ug/kg	1.0	U	U	Yes	S4VEM
Acetophenone	200	ug/kg	1.0	JB	U	Yes	S4VEM
4-Methylphenol	200	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	200	ug/kg	1.0	U	U	Yes	S4VEM
Hexachloroethane	200	ug/kg	1.0	U	U	Yes	S4VEM
Nitrobenzene	200	ug/kg	1.0	U	U	Yes	S4VEM
Isophorone	200	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitrophenol	200	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	200	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	200	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	200	ug/kg	1.0	U	U	Yes	S4VEM
Naphthalene	200	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloroaniline	200	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	200	ug/kg	1.0	U	U	Yes	S4VEM
Caprolactam	200	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	200	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	200	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	200	ug/kg	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	200	ug/kg	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	200	ug/kg	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	200	ug/kg	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	200	ug/kg	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	390	ug/kg	1.0	U	U	Yes	S4VEM
Dimethylphthalate	200	ug/kg	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	200	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthylene	200	ug/kg	1.0	U	U	Yes	S4VEM
3-Nitroaniline	390	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthene	200	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	390	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	390	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzofuran	200	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	200	ug/kg	1.0	U	U	Yes	S4VEM
Diethylphthalate	200	ug/kg	1.0	U	U	Yes	S4VEM
Fluorene	200	ug/kg	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	200	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitroaniline	390	ug/kg	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	390	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	200	ug/kg	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	200	ug/kg	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	200	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	200	ug/kg	1.0	U	U	Yes	S4VEM
Atrazine	200	ug/kg	1.0	U	U	Yes	S4VEM
Pentachlorophenol	390	ug/kg	1.0	U	UJK	Yes	S4VEM
Phenanthrene	200	ug/kg	1.0	U	U	Yes	S4VEM
Anthracene	200	ug/kg	1.0	U	U	Yes	S4VEM
Carbazole	200	ug/kg	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	200	ug/kg	1.0	U	U	Yes	S4VEM
Fluoranthene	200	ug/kg	1.0	U	U	Yes	S4VEM
Pyrene	200	ug/kg	1.0	U	U	Yes	S4VEM
Butylbenzylphthalate	200	ug/kg	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	200	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	200	ug/kg	1.0	U	U	Yes	S4VEM
Chrysene	200	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-ethylhexyl)	26	ug/kg	1.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	26	ug/kg	1.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	200	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	200	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(k)fluoranthene	200	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	200	ug/kg	1.0	U	U	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	200	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	200	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	200	ug/kg	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	200	ug/kg	1.0	U	U	Yes	S4VEM
2-Phenanthrenol, 4b,5,6,7,8,8a,9,10-octahydro-4b			1.0	JN		Yes	S4VEM
Squalene			1.0	JN		Yes	S4VEM

National Functional Guidelines Report #03

Lab DATAC(ALS Environmental) **SDG** JDQT4 **Case** 41282 **Contract** EPW11037 **Region** 10 **DDTID** 124690 **SOW** SOM01.2

Data Review Reports

Blanks

Blanks	**BNA**
BLB14	The following semivolatile samples have common contaminant concentrations reported less than 5x the CRQL. The associated method blank concentration is less than 5x the concentration criteria. Detected compounds are qualified U. Nondetected compounds are not qualified. Reported sample concentrationshave been elevated to the CRQL.
	JDQX7MS, JDQX7MSD
	Bis(2-ethylhexyl)phthalate JDQX7MS, JDQX7MSD
Blanks	**BNA**
BLB8	The following semivolatile samples have analyte concentrations reported less than the CRQL. The associated method blank concentration is less than the concentration criteria. Detected compounds are qualified U. Nondetected compounds are not qualified. Reported sample concentrations have been elevated to the CRQL.
	JDQT4, JDQT5, JDQT6, JDQT7, JDQT8, JDQT9, JDQW0, JDQW1, JDQW4, JDQW5, JDQW6, JDQW7, JDQW8, JDQW9, JDQX0, JDQX1, JDQX2, JDQX7, JDQX7MS, JDQX7MSD
	Di-n-butylphthalate JDQX7MS
	Benzaldehyde JDQT4, JDQT5, JDQT6, JDQT7, JDQT8, JDQW0, JDQW1, JDQW4, JDQW5, JDQW6, JDQW7, JDQW8, JDQW9, JDQX0, JDQX1, JDQX2, JDQX7, JDQX7MS, JDQX7MSD
	Acetophenone JDQT4, JDQT5, JDQT6, JDQT7, JDQT8, JDQT9, JDQW0, JDQW1, JDQW4, JDQW6, JDQW7, JDQW8, JDQW9, JDQX0, JDQX1, JDQX2, JDQX7
Blanks	**BNA**
BLB9	The following semivolatile samples have analyte concentrations reported greater than or equal to the CRQL. The associated method blank concentration is less than or equal to the concentration criteria. Detected and nondetected compounds are not qualified.
	JDQX7MS, JDQX7MSD
	Phenol JDQX7MS, JDQX7MSD

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Continuing Calibration Verification

Continuing Calibration Verification	BNA
BC10	The following semivolatile samples are associated with incorrect initial calibration sequence. Detected compounds are qualified J. Nondetected compounds are qualified UJ. Use professional judgment to qualify the data.
	JDQT7, JDQT8, JDQW8, JDQW9, JDQX0, JDQX1, JDQX7, SBLK88
	Pentachlorophenol SSTD020E7
	JDQT7, JDQT8, JDQW8, JDQW9, JDQX0, JDQX1, JDQX7, SBLK88

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DMC/Surrogate

DMC/Surrogate	BNA
BDSS15	The following semivolatile samples have deuterated monitoring compound recovery below the lower limit of the criteria window. Detected compounds are qualified J. Nondetected compounds are qualified UJ.
	JDQW1, JDQW9, JDQX2
	Benzo(a)pyrene-d12 JDQW9
	Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene
	4-Chloroaniline-d4 JDQX2
	3,3'-Dichlorobenzidine, 4-Chloroaniline, Hexachlorocyclopentadiene
	Pyrene-d10 JDQW1, JDQW9, JDQX2
	Benzo(a)anthracene, Chrysene, Fluoranthene, Pyrene
	Fluorene-d10 JDQW9
	4-Bromophenyl-phenylether, 4-Chlorophenyl-phenylether, Carbazole, Dibenzofuran, Fluorene

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Detection Limit

Detection Limit	BNA
BDL1	The following semivolatile samples have analyte concentrations below the quantitaion limit (CRQL). Detected compounds are qualified J. Nondetected compounds are not qualified.
	JDQT4, JDQT5, JDQT6, JDQT7, JDQT8, JDQT9, JDQW0, JDQW1, JDQW2, JDQW3, JDQW4, JDQW5, JDQW6, JDQW7, JDQW8, JDQW9, JDQX0, JDQX1, JDQX2, JDQX7, JDQX7MS, JDQX7MSD, SBLK07, SBLK88
	Benzo(k)fluoranthene JDQT4, JDQT5, JDQT6, JDQT9, JDQW2, JDQW3, JDQW6, JDQW7
	Anthracene JDQT4, JDQT5, JDQT6, JDQT9, JDQW0, JDQW1, JDQW2, JDQW3, JDQW4, JDQW5, JDQW6, JDQW7
	2,3,4,6-Tetrachlorophenol JDQX7MS, JDQX7MSD
	Phenol JDQT4, JDQT7, JDQW1, JDQW4, JDQW8, JDQW9, JDQX0, JDQX7, SBLK07
	Pyrene JDQT7, JDQT8, JDQT9, JDQW8, JDQX0
	Di-n-butylphthalate JDQT5, JDQW1, JDQW2, JDQW3, JDQW4, JDQX7MS, SBLK07
	Benzaldehyde JDQT4, JDQT5, JDQT6, JDQT7, JDQT8, JDQW0, JDQW1, JDQW4, JDQW5, JDQW6, JDQW7, JDQW8, JDQW9, JDQX0, JDQX1, JDQX2, JDQX7, JDQX7MS, JDQX7MSD, SBLK07, SBLK88
	Bis(2-ethylhexyl)phthalate JDQT4, JDQT5, JDQT6, JDQT7, JDQT8, JDQT9, JDQW0, JDQW1, JDQW2, JDQW3, JDQW4, JDQW5, JDQW6, JDQW7, JDQW8, JDQW9, JDQX0, JDQX1, JDQX2, JDQX7, JDQX7MS, JDQX7MSD, SBLK07
	Fluoranthene JDQT4, JDQT7, JDQT9, JDQW3, JDQW7
	4-Nitroaniline JDQW9
	Benzo(g,h,i)perylene JDQT9, JDQW3
	Fluorene JDQT5, JDQT6, JDQW0, JDQW1, JDQW2, JDQW4, JDQW5, JDQW6
	N-Nitrosodiphenylamine JDQT4, JDQT5, JDQT6, JDQW0, JDQW1, JDQW2, JDQW3, JDQW4, JDQW6
	Naphthalene JDQW0, JDQW4, JDQW5
	Indeno(1,2,3-cd)pyrene JDQT4, JDQT9, JDQW3, JDQW7
	Benzo(a)anthracene JDQT7, JDQT8, JDQT9, JDQW3, JDQW8, JDQX0
	Chrysene JDQT7, JDQT8, JDQT9, JDQW8, JDQX0
	Phenanthrene JDQT4, JDQT5, JDQT6, JDQT7, JDQT9, JDQW2, JDQW3, JDQW7
	Butylbenzylphthalate JDQW1, JDQW4
	Acenaphthene JDQT4, JDQT5, JDQT6, JDQW0, JDQW1, JDQW2, JDQW3, JDQW4, JDQW5, JDQW6
	Carbazole JDQT4, JDQT5, JDQT6, JDQW0, JDQW1, JDQW2, JDQW3, JDQW4, JDQW5, JDQW6, JDQW7
	Benzo(b)fluoranthene JDQT7, JDQT9, JDQW8, JDQX0
	Dibenzofuran JDQW0, JDQW4, JDQW5
	Benzo(a)pyrene JDQT8, JDQW8, JDQX0

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Detection Limit

Detection Limit	BNA
	Acetophenone JDQT4, JDQT5, JDQT6, JDQT7, JDQT8, JDQT9, JDQW0, JDQW1, JDQW4, JDQW6, JDQW7, JDQW8, JDQW9, JDQX0, JDQX1, JDQX2, JDQX7, JDQX7MS, JDQX7MSD, SBLK88
	Dibenzo(a,h)anthracene JDQT4, JDQT5, JDQT6, JDQT9, JDQW0, JDQW1, JDQW2, JDQW3, JDQW4, JDQW5, JDQW6, JDQW7

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Initial Calibration

Initial Calibration	BNA
BC5	The following semivolatile samples are associated with an initial calibration percent relative standard deviation (%RSD) outside criteria. Detected compounds are qualified J. Nondetected compounds are not qualified. Use professional judgement to qualify non-detected compounds.
	JDQT4, JDQT5, JDQT6, JDQT7, JDQT8, JDQT9, JDQW0, JDQW1, JDQW2, JDQW3, JDQW4, JDQW5, JDQW6, JDQW7, JDQW8, JDQW9, JDQX0, JDQX1, JDQX2, JDQX7, JDQX7MS, JDQX7MSD, SBLK07, SBLK88
	Pentachlorophenol SSTD020HX
	JDQT4, JDQT5, JDQT6, JDQT7, JDQT8, JDQT9, JDQW0, JDQW1, JDQW2, JDQW3, JDQW4, JDQW5, JDQW6, JDQW7, JDQW8, JDQW9, JDQX0, JDQX1, JDQX2, JDQX7, JDQX7MS, JDQX7MSD, SBLK07, SBLK88

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Percent Moisture

Percent Moisture	**BNA**
BPM1	Percent moisture content of the following semivolatile soil samples exceeds primary criteria. Detected compounds are qualified J. Nondetected compounds are qualified UJ.
	JDQW9

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TIC

TIC	BNA
BTIC1	A library search indicates a match at or above 85% for a TIC compound in the semivolatile sample Detected compounds are qualified NJ. Nondetected compounds are not qualified.
	JDQT4, JDQT5, JDQT6, JDQT8, JDQT9, JDQW0, JDQW1, JDQW2, JDQW3, JDQW4, JDQW5, JDQW6, JDQW7, JDQW9, JDQX0, JDQX1, JDQX2, JDQX7
	8H-Indeno[2,1-b]phenanthrene JDQW6
	Benzo[j]fluoranthene JDQT5, JDQW4, JDQW5
	Indeno[1,2,3-cd]fluoranthene JDQW6
	2-Phenanthrenol, 4b,5,6,7,8,8a,9,10-octahydro-4b JDQW9, JDQX7
	1H-Benz[f]indene, 2-phenyl- JDQW3
	1,4-Methano-1H-indene, octahydro-4-methyl-8-meth JDQX2
	Chrysene, 5-methyl- JDQT4, JDQW1, JDQW7
	7H-Benzo[c]carbazole JDQW0
	Longifolenaldehyde JDQW9, JDQX2
	Benz[a]anthracene, 11-methyl- JDQW2
	Benzo[b]triphenylene JDQW0, JDQW4
	1-Heneicosanol JDQX0
	1,2:7,8-Dibenzophenanthrene JDQW0
	Phenanthrene, 2-methyl- JDQW1
	Benzo[b]naphtho[2,1-d]thiophene JDQW0, JDQW4, JDQW5
	Chrysene, 1-methyl- JDQW4, JDQW5
	Benz[a]anthracene, 7,12-dimethyl- JDQW7
	Oxirane, tetradecyl- JDQX0
	.gamma.-Sitosterol JDQX0, JDQX2
	Naphthalene, 1,2,3,5,6,8a-hexahydro-4,7-dimethyl JDQX2
	Benz(a)anthracene, 3,9-dimethyl- JDQT4, JDQT5, JDQT6, JDQW1, JDQW2, JDQW6, JDQW7
	Octadecanal JDQX0, JDQX1
	7-Benzhydrylidene-5-methylenebicyclo[2.2.1]hept- JDQW7
	Anthracene, 1,4-dimethyl- JDQT5, JDQW1
	Bicyclo[3.1.0]hexane, 4-methylene-1-(1-methyleth JDQX2

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TIC

	(Z)-14-Tricosenyl formate JDQX1
	11H-Benzo[b]fluorene JDQT4, JDQW4
	Tricyclo[5.4.0.0(2,8)]undec-9-ene, 2,6,6,9-tetra JDQX2
	5-Methylbenzo[b]naphtho[2,1-d]thiophene JDQT6
	Benz(a)anthracene, 4,7,12-trimethyl- JDQT5, JDQT6
	Benzoxazole, 2-[2-(4-piperidyl)pyrimid-5-yl]- JDQW2, JDQW7
	Pyrene, 1,3-dimethyl- JDQT4, JDQT5, JDQT6, JDQT9, JDQW2, JDQW4, JDQW6, JDQW7
	Perylene, 3-methyl- JDQT5, JDQT6, JDQW2, JDQW6
	Dibenzo[def,mno]chrysene JDQT6, JDQW0, JDQW1
	10-Methylbenzo(a)pyrene JDQT5, JDQT6, JDQW1, JDQW6
	Benzo[c]phenanthrene, 5,8-dimethyl- JDQT4, JDQT5, JDQT6, JDQW1, JDQW2, JDQW4, JDQW7
	Anthra(1,2-b)thiophene JDQW1
	n-Heptanoic acid,methyl(tetramethylene)silyl est JDQX2
	2-Methylbenzo[b]naphtho[2,1-d]thiophene JDQW2
	Pyrene, 1-methyl- JDQT4, JDQT5, JDQT6, JDQT9, JDQW2, JDQW4, JDQW5, JDQW6, JDQW7
	Benz(a)anthracene, 5,7,12-trimethyl- JDQW1
	Squalene JDQT8, JDQX0, JDQX7
	Benz(a)anthracene, 4,7-dimethyl- JDQW4
	2,2,6-Trimethyl-1-(2-methyl-cyclobut-2-enyl)-hep JDQX0
	Benz[a]anthracene, 1-methyl- JDQW7
	Benzo[ghi]perylene, 4-methyl- JDQT5, JDQT6
	Ferruginol JDQX2
	1,4-Cyclohexadiene, 1-methyl-4-(1-methylethyl)- JDQX2
	Perylene JDQT4, JDQT6, JDQW0, JDQW3, JDQW4, JDQW5
	Pyrene, 2-methyl- JDQT5, JDQW5, JDQW6
	Trichloroacetic acid, hexadecyl ester JDQX1
	Bis[m-nitrophenyl]ether JDQX2
	Pyrene, 4-methyl- JDQT4, JDQT6, JDQT9, JDQW1, JDQW6, JDQW7

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	7,10-Dimethylbenzo(a)pyrene JDQT5, JDQT6, JDQW6
	Behenic alcohol JDQX1
	3H-3a,7-Methanoazulene, 2,4,5,6,7,8-hexahydro-1, JDQW9
	Naphthalene, 1,2,3,4,4a,5,6,8a-octahydro-7-methy JDQX2
	1,4-Methanoazulene, decahydro-4,8,8-trimethyl-9- JDQW9, JDQX2
	11H-Benzo[a]fluorene JDQW2, JDQW4
	1-Octadecanesulphonyl chloride JDQX0
	9-Octadecenamide, (Z)- JDQW6
	Phenanthrene, 2,5-dimethyl- JDQW7
	1,1':3',1''-Terphenyl, 5'-phenyl- JDQT4, JDQW4
	o-Terphenyl JDQT4, JDQT5, JDQT6, JDQW0, JDQW7
	Benz[j]aceanthrylene, 3-methyl- JDQT4, JDQT6
	Triphenylene, 2-methyl- JDQT4, JDQT5, JDQT6, JDQT9, JDQW0, JDQW6
	Benz(a)anthracene, 6,8-dimethyl- JDQW0, JDQW6
	Fluoranthene, 2-methyl- JDQW0, JDQW1, JDQW2, JDQW5
	Benz(a)anthracene, 6,7,8-trimethyl- JDQW6
	1,19-Eicosadiene JDQX0, JDQX2
	n-Hexadecanoic acid JDQX0, JDQX2
	Benz[a]anthracene, 7-methyl- JDQW1, JDQW6, JDQW7
	Benzo[e]pyrene JDQT9, JDQW0, JDQW1, JDQW2, JDQW6, JDQW7
	Chrysene, 2-methyl- JDQT6
	Oxirane, heptadecyl- JDQX0
	Benzo[b]naphtho[2,3-d]thiophene, 6-methyl- JDQT4, JDQT5, JDQW1
	Benzo[c]phenanthrene, 1-methyl- JDQW1
	Benz(a)anthracene, 6,12-dimethyl- JDQT4, JDQT5, JDQT9, JDQW1, JDQW2, JDQW4, JDQW6
TIC	**BNA**
BTIC2	A library search indicates a match below 85% for a TIC compound in the semivolatile sample Detected compounds are qualified J. Nondetected compounds are not qualified.
	JDQT4, JDQT5, JDQT6, JDQT7, JDQT8, JDQT9, JDQW0, JDQW1, JDQW2, JDQW3, JDQW4, JDQW5, JDQW6, JDQW7, JDQW8, JDQW9, JDQX0, JDQX1, JDQX2, JDQX7, SBLK07, SBLK88

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TIC

	Unknown Pregn-4-ene-3,20-dione, (9.beta.,10.alpha.)- JDQW0, JDQX1
	Unknown Dibenzo[def,mno]chrysene JDQT4, JDQT5, JDQW4, JDQW5, JDQW6
	Unknown Oxalic acid, cyclobutyl pentadecyl ester JDQX0
	Unknown 3-Methylphenanthro[9,10-b]thiophene JDQW1, JDQW6
	Unknown [2]Benzopyrano[4,3-b][1]benzopyran-6a(7H)-ol, 5, JDQW1
	Unknown 3-Hexadecanol JDQX0
	Unknown 1R,4S,7S,11R-2,2,4,8-Tetramethyltricyclo[5.3.1.0 JDQW9
	Unknown N-Benzylformamide JDQW9
	Unknown 4H-1,2,4-Triazole-3-thiol, 4-methyl-5-[5-(1-pent JDQW1
	Unknown 8H-Indeno[2,1-b]phenanthrene JDQT4, JDQW7
	Unknown 1H-Inden-5-ol, 2,3-dihydro-3-(4-hydroxyphenyl)-1 JDQW8
	Unknown trans, cis-2-Ethylbicyclo[4.4.0]decane JDQT8
	Unknown Plumbane, diethyldimethyl- JDQW6
	Unknown Benzo[ghi]perylene, 4-methyl- JDQT4, JDQW1, JDQW4, JDQW6
	Unknown Naphthalene, 1,2,3,5,6,7,8,8a-octahydro-1,8a-dim JDQW9
	Unknown Pentacene, 6,13-dihydro- JDQT4
	Unknown 1H-Cycloprop[e]azulene, 1a,2,3,4,4a,5,6,7b-octah JDQW9
	Unknown Silane, dimethyldi(4-acetylphenoxy)- JDQT4
	Unknown 2-Butenal, 2-methyl-4-(2,6,6-trimethyl-1-cyclohe JDQW9
	Unknown 4H-Cyclopenta[def]phenanthrene JDQW0, JDQW4
	Unknown Benz(a)anthracene, 4,7,12-trimethyl- JDQT6
	Unknown 3,5-Dibromo-4-hydroxybenzaldehyde JDQW0
	Unknown o-Terphenyl JDQT5, JDQT6, JDQT9, JDQW7
	Unknown Pyrene, 1-methyl- JDQW9
	Unknown 2,3-Dihydro-7-methyl-5-phenyl-1H-1,4-benzodiazep JDQT4
	Unknown Benzo[c]phenanthrene, 1-methyl- JDQT4
	Unknown Stigmast-4-en-3-one JDQW1, JDQW4, JDQX0
	Unknown N,N'-Bis(2-hydroxy-alpha-methylbenzylidene)ethyl JDQW9, JDQX0

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	Unknown Naphthalene, 1,2,3,4,4a,5,6,8a-octahydro-4a,8-di JDQX0
	Unknown Benzo[1,2-b:4,5-b']bis[1]benzothiophene JDQW0
	Unknown 2,3-Dihydrooxazole-3-carboxylic acid, 2-(t-butyl JDQX2
	Unknown [2.2]Paracyclophane JDQX1, SBLK88
	Unknown 4b,10b-Dihydro-4b,10b-methanochrysene JDQW2
	Unknown 1-Naphthalenepropanol, .alpha.-ethyldecahydro-.a JDQX0
	Unknown 6-Isopropylquinoline SBLK07
	Unknown 1,1'-Biphenyl, 2-(phenylmethyl)- JDQT5, JDQW6
	Unknown Methoxsalen JDQX2
	Unknown 1-Cyclohexene-1-carboxaldehyde, 4-(1-methylethyl JDQX2
	Unknown 10-Methylbenzo[b]naphtho[2,1-d]thiophene JDQT6, JDQW7
	Unknown Diboron(.mu.-selenium)diethylbis[.mu.-(1H-pyrazo JDQW0
	Unknown Benzo[b]triphenylene JDQW5
	Unknown Pyrene, 1,3-dimethyl- JDQT4, JDQW1, JDQW2, JDQW4
	Unknown Thujopsene-I3 JDQX2
	Unknown Hyoscyamine JDQX7
	Unknown 11-Isopropylidene-tricyclo[4.3.1.1(2,5)]undecan- JDQX2
	Unknown Isoaromadendrene epoxide JDQX2
	Unknown 6,8-Dimethyl-2-phenylthiochromen-4-one JDQW4
	Unknown 9(1H)-Phenanthrenone, 2,3,4,4a,10,10a-hexahydro- JDQW9
	Unknown Benzo[c]thiophen-1(3H)-one, 3-(3-oxobenzo[c]thie JDQT8, JDQW8, JDQX7
	Unknown Benzo[b]naphtho[2,3-d]thiophene, 6-methyl- JDQT9, JDQW6
	Unknown 2,5-Bis(1-methyl-1-silacyclobutyl)-p-xylene JDQW9
	Unknown 11H-Indeno[2,1-a]phenanthrene JDQW1, JDQW7
	Unknown 2,4-Quinazolinediamine, 6-(phenylsulfonyl)- JDQX2
	Unknown 7-Isopropyl-1,1,4a-trimethyl-1,2,3,4,4a,9,10,10a JDQW9, JDQX2, JDQX7
	Unknown Phenyl t-butyl telluride JDQW0
	Unknown Phosphorothioic acid, O-methyl O,O-diphenyl este JDQW0

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TIC

	Unknown Benzidine, 3,3'-dimethoxy- JDQT4
	Unknown 5.alpha.-Androstan-17.beta.-ol, 1.beta.-methyl- JDQT4
	Unknown Benzo[1,2-b:4,3-b']dithiophene, 1-phenyl- JDQW7
	Unknown 1H-Isoindole-1,3(2H)-dione, 2-(2-propynyloxy)- JDQW7, JDQX2
	Unknown 2-Phenanthrenol, 4b,5,6,7,8,8a,9,10-octahydro-4b JDQX2, JDQX7
	Unknown Benzo[c]phenanthrene JDQW5
	Unknown 1-Hydroxymethyl-5,8,9-endo-10-exo-tetramethyltri JDQW9
	Unknown 1-(Phenylethynyl)-4-(trans-styryl)benzene JDQT6
	Unknown Benz[a]anthracene, 7,12-dihydro- JDQW1
	Unknown Benzo[1,2-b:5,4-b']bis[1]benzothiophene JDQT5
	Unknown 1-Pyrenecarboxaldehyde hydrazone JDQT9
	Unknown 4H-1-Benzopyran-4-one, 2-(2,6-dimethoxyphenyl)-5 JDQT4
	Unknown Dithianone JDQW0
	Unknown Quinazolin-4(3H)-one, 3-(3-trifluoromethylphenyl JDQW4
	Unknown Ninhydrin JDQW4, JDQX1
	Unknown Furo[3',4':6,7]naphtho[2,3-d]-1,3-dioxol-6(5aH)- JDQX2
	Unknown 6-Octadecenoic acid, (Z)- JDQX0
	Unknown Benz[j]aceanthrylene, 3-methyl- JDQT4, JDQT5, JDQT6, JDQT9, JDQW0, JDQW1, JDQW6
	Unknown 2,6-Bis(4-nitro-phenylthio)pyridine JDQW4, JDQW5
	Unknown Bithiophthalide JDQW1, JDQW5
	Unknown 7,10-Dimethylbenzo(a)pyrene JDQT4, JDQT5, JDQW1, JDQW6, JDQW7
	Unknown (4-Nitrophenyl)diphenylamine JDQW4
	Unknown 10-Methylbenzo(a)pyrene JDQT4, JDQW2, JDQW4, JDQW7
	Unknown (4,6-Dichloro[1,3,5]triazin-2-yl)-phenyl-amine JDQW3
	Unknown Benz(a)anthracene, 4,7-dimethyl- JDQW5
	Unknown 1-Benzothieno[3,2-f]quinazoline-1,3-diamine JDQW4
	Unknown 1H-Pyrazole-4-sulfonamide, N-[(4-fluorophenyl)me JDQW9
	Unknown 1,3,5-Triazine-2(1H)-thione, 4-(diethylamino)-6- JDQW0, JDQW4

National Functional Guidelines Report #03

Lab DATAC(ALS Environmental) **SDG** JDQT4 **Case** 41282 **Contract** EPW11037 **Region** 10 **DDTID** 124690 **SOW** SOM01.2

Data Review Reports

TIC

	Unknown Ferruginol JDQW9
	Unknown D:C-Friedoolean-8-en-3-one JDQW9
	Unknown Benzaldehyde, 3,5-dichloro-2-hydroxy- JDQW5
	Unknown Cycloisolongifolene, 9,10-dehydro- JDQX0
	Unknown Perylene, 3-methyl- JDQT5, JDQT9
	Unknown Crinan-3-ol, 1,2-didehydro-, (3.alpha.)- JDQX7
	Unknown Tricyclo[4.3.0.0(7,9)]non-3-ene, 2,2,5,5,8,8-hex JDQX1
	Unknown 4,4-Dimethyl-3-(3-methylbut-3-enylidene)-2-methy JDQX2
	Unknown 3-Ethenyl-6-dimethylaminomethyleneaminobenzonitr JDQW9
	Unknown Diepicedrene-1-oxide JDQW9
	Unknown Chrysene, 6-methyl- JDQT5, JDQT6, JDQW6
	Unknown Phthalic acid, monoethyl ester SBLK88
	Unknown Furazano[3,4-g]benzimidazole, 7-benzyl- JDQW0
	Unknown Cyclohexane-1-methanol, 3,3-dimethyl-2-(3-methyl JDQW9
	Unknown Octadecanal JDQX0
	Unknown Benzoxazole, 2,2'-(1,2-ethenediyl)bis[5-methyl- JDQW7
	Unknown Thiazole, 4-phenyl-2-(4-tolylamino)- JDQT5
	Unknown Pyrazine, 2,6-diethyl- JDQW9, JDQX2
	Unknown Benzoxazole, 2-[2-(4-piperidyl)pyrimid-5-yl]- JDQW4, JDQW6
	Unknown 4-Phenyldibenzofuran JDQW2
	Unknown 1,1-Dimethyl-2,5-diphenyl-3-ethyl-silacyclopenta JDQW7
	Unknown Octadecanoic acid, ethenyl ester JDQX7
	Unknown 1,1':4',1''-Terphenyl-, 3'-methyl- JDQW7
	Unknown Hexadecanoic acid, 4-nitrophenyl ester JDQX0
	Unknown 2(1H)-Phenanthrenone, 3,4,4a,4b,5,6,7,8,10,10a-d JDQW9
	Unknown 2-Naphthalenol, 4-ethyl-3-ethylidene-1,2,3,4-tet JDQW9
	Unknown Benzo[1,2-b:3,4-b']bis[1]benzothiophene JDQT6, JDQT9, JDQW1, JDQW2, JDQW5, JDQW6
	Unknown 9-Hexadecenoic acid JDQX2

Data Review Reports

TIC

	Unknown Phenanthrene, 7-ethenyl-1,2,3,4,4a,4b,5,6,7,8,8a JDQW9
	Unknown o-Hydroxyacetophenonylidene-4,5-dimethyl-O-pheny JDQX1
	Unknown Phthalic anhydride JDQT7, JDQT8, JDQW1, JDQW7, JDQW8, JDQW9, JDQX0, JDQX2, JDQX7, SBLK07
	Unknown 4-Methyl-2H-benzopyrane JDQW9
	Unknown Thiazole, 4-(4-methylphenyl)-2-phenylamino- JDQW6
	Unknown 6,6-Diphenylfulvene JDQW7
	Unknown 10-Bromo-1,2,3,4-tetrahydro-phenanthren-9-ol JDQW0
	Unknown Picolinyl 8-(5-hexyl-2-furyl)-octanoate JDQW0
	Unknown 2,2'-Dimthoxy-biphenyl-4,4'-diamine JDQT6, JDQT9, JDQW7
	Unknown 3-Eicosene, (E)- JDQW9
	Unknown Octacosyl trifluoroacetate JDQX0
	Unknown 1-Hentetracontanol JDQX1
	Unknown Caryophyllene JDQW9

Mon, 27 Jun 2011 19:07:18

National Functional Guidelines Report #06

Lab DATAC(ALS Environmental) **SDG** JDQT4 **Case** 41282 **Contract** EPW11037 **Region** 10 **DDTID** 124690 **SOW** SOM01.2

Analytical Sample Listing

BNA

						Extraction		Analysis		
Sample Number	**Sample Type**	**Matrix**	**Level**	**Sampling Date**	**Date Received**	**Type**	**Date/Time**	**Date/Time**	**GC Column**	**Instrument**
JDQT4	Field_Sample	Soil	Low	06032011 08:28:00	06072011 10:04:00	Sonication	06072011 19:29:00	06162011 04:27:00	DB5MS	5975-H
JDQT5	Field_Sample	Soil	Low	06032011 08:50:00	06072011 10:04:00	Sonication	06072011 19:29:00	06162011 05:02:00	DB5MS	5975-H
JDQT6	Field_Sample	Soil	Low	06032011 08:45:00	06072011 10:04:00	Sonication	06072011 19:29:00	06162011 05:37:00	DB5MS	5975-H
JDQT7	Field_Sample	Soil	Low	06032011 11:40:00	06072011 10:04:00	Sonication	06072011 19:29:00	06152011 22:01:00	DB5MS	5975-H
JDQT8	Field_Sample	Soil	Low	06032011 11:38:00	06072011 10:04:00	Sonication	06072011 19:29:00	06152011 22:35:00	DB5MS	5975-H
JDQT9	Field_Sample	Soil	Low	06032011 11:57:00	06072011 10:04:00	Sonication	06072011 19:29:00	06162011 06:11:00	DB5MS	5975-H
JDQW0	Field_Sample	Soil	Low	06032011 09:34:00	06072011 10:04:00	Sonication	06072011 19:29:00	06162011 09:05:00	DB5MS	5975-H
JDQW1	Field_Sample	Soil	Low	06032011 09:45:00	06072011 10:04:00	Sonication	06072011 19:29:00	06162011 09:40:00	DB5MS	5975-H
JDQW2	Field_Sample	Soil	Low	06032011 10:07:00	06072011 10:04:00	Sonication	06072011 19:29:00	06162011 06:46:00	DB5MS	5975-H
JDQW3	Field_Sample	Soil	Low	06032011 10:25:00	06072011 10:04:00	Sonication	06072011 19:29:00	06162011 07:21:00	DB5MS	5975-H
JDQW4	Field_Sample	Soil	Low	06032011 12:20:00	06072011 10:04:00	Sonication	06072011 19:29:00	06162011 07:55:00	DB5MS	5975-H
JDQW5	Field_Sample	Soil	Low	06032011 12:16:00	06072011 10:04:00	Sonication	06072011 19:29:00	06162011 10:15:00	DB5MS	5975-H
JDQW6	Field_Sample	Soil	Low	06032011 09:06:00	06072011 10:04:00	Sonication	06072011 19:29:00	06162011 10:50:00	DB5MS	5975-H
JDQW7	Field_Sample	Soil	Low	06032011 11:57:00	06072011 10:04:00	Sonication	06072011 19:29:00	06162011 11:26:00	DB5MS	5975-H
JDQW8	Field_Sample	Soil	Low	06032011 16:28:00	06072011 10:04:00	Sonication	06072011 19:29:00	06152011 23:11:00	DB5MS	5975-H
JDQW9	Field_Sample	Soil	Low	06032011 12:57:00	06072011 10:04:00	Sonication	06072011 19:29:00	06152011 23:46:00	DB5MS	5975-H
JDQX0	Field_Sample	Soil	Low	06032011 13:43:00	06072011 10:04:00	Sonication	06072011 19:29:00	06162011 00:21:00	DB5MS	5975-H
JDQX1	Field_Sample	Soil	Low	06032011 13:36:00	06072011 10:04:00	Sonication	06072011 19:29:00	06162011 00:57:00	DB5MS	5975-H
JDQX2	Field_Sample	Soil	Low	06032011 14:10:00	06072011 10:04:00	Sonication	06072011 19:29:00	06162011 08:30:00	DB5MS	5975-H
JDQX7	Field_Sample	Soil	Low	06032011 15:45:00	06072011 10:04:00	Sonication	06072011 19:29:00	06162011 01:32:00	DB5MS	5975-H
JDQX7MS	Matrix_Spike	Soil	Low	06032011 15:45:00	06072011 10:04:00	Sonication	06172011 14:55:00	06212011 11:01:00	DB5MS	5975-H
JDQX7MSD	Matrix_Spike_Duplicate	Soil	Low	06032011 15:45:00	06072011 10:04:00	Sonication	06172011 14:55:00	06212011 11:35:00	DB5MS	5975-H

National Functional Guidelines Report #11

Lab DATAC(ALS Environmental) **SDG** JDQT4 **Case** 41282 **Contract** EPW11037 **Region** 10 **DDTID** 124690 **SOW** SOM01.2

Identification Summary for Single & Multi Component Analytes

NONE FOUND

ecology and environment, inc.
International Specialists in the Environment
720 Third Avenue, Suite 1700, Seattle, WA 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: July 21, 2011

FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, Washington MW

TO: Jeff Fetters, START-3 Project Manager, Seattle, Washington

SUBJ: **Organic Data Summary Check,**
Kitsap Rifle and Revolver Range Site, Bremerton, Washington

REF: TDD: 10-11-0011 PAN: 002233.0621.01IA

The data summary check of 4 soil and 4 water samples collected from the Kitsap Rifle and Revolver Range Site located in Bremerton, Washington, has been completed. Analyses for Semivolatile Organic Compounds (SVOCs; EPA CLP SOW SOM01.2) were performed by DataChem Laboratories, Inc., Salt Lake City, Utah.

The samples were numbered:

JDQX3	JDQX4	JDQX5	JDQX6	JDQX8
JDQX9	JDQY0	JDQY1		

No discrepancies were noted.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

July 12, 2011

Reply to: Donald M. Brown
Attn of: OEA-095

MEMORANDUM

Subject: Data Validation Report for the Semivolatile Analysis of the Samples Collected from the Kitsap Rifle & Revolver Range Site - Case Number 41282, SDG JDQX3

From: Donald M. Brown, QA Chemist DMB
USEPA Region 10, Office of Environmental Assessment, Environmental Services Unit

To: Mark Ader, Site Assessment Manager
Jeffry Rodin, On-Scene Coordinator
Office of Environmental Cleanup

CC: Renee Nordeen, Ecology & Environment, Inc.

The quality assurance (QA) review of the analytical data generated from the analysis of four (4) water samples and four (4) soil samples collected from the above referenced site has been completed. These samples were analyzed for Semivolatile Organic Compounds (SVOCs) by DataChem Laboratories, Inc. located in Salt Lake City, Utah.

All sample analyses were evaluated following EPA's Stage 4 Data Validation Electronic/Manual Process (S4VEM). The validation was conducted and appropriate qualifiers were applied according to the Quality Control Specifications outlined in the Sampling & Quality Assurance Project Plan for the Kitsap Rifle and Revolver Range (April 2011); the technical specifications of the EPA Contract Laboratory Program's (CLP) Statement of Work (SOW) for Multi-Media, Multi-Concentration Organic Analyses (SOM01.2); the Contract Laboratory Program's National Functional Guidelines for Organic Data Review; and the Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use (EPA-540-R08-005). Some of the data quality elements were qualified using the reviewer's professional judgment. The conclusions presented herein are based on the information provided for the review.

A summary of samples evaluated in this validation report and the pertinent dates for sample collection, sample receipt at the laboratory, extraction and analyses is attached along with the validated data.

I. DATA QUALIFICATIONS

Summary of Validation Qualifiers Applied:

Please find these in the "Sample Summary Report Section" of this report.

Data Qualifiers

The following is a list of validation qualifiers applied to the sample result(s) when needed to indicate associated out-of-control QA/QC results.

Data Qualifiers		
	U	The analyte was not detected at or above the reported result.
	J	The analyte was positively identified. The associated numerical result is an estimate.
	UJ	The analyte was not detected at or above the reported estimated result. The associated numerical value is an estimate of the quantitation limit of the analyte in this sample.
	R	The data are unusable for all purposes.
	N	There is evidence the analyte is present in this sample.
	JN	There is evidence that the analyte is present. The associated numerical result is an estimate.

For site assessment and investigations, the following bias qualifiers are applied to the data in addition to the above data qualifiers when necessary to allow for data analysis and interpretation using Pre-Score software calculations for National Priority Listing Hazard Rankling Scoring (NPL-HRS).

Bias Qualifiers		
	L	Low bias.
	H	High bias.
	Q	The result is estimated because the concentration is below the Contract Required Quantitation Limits (CRQLs).
	K	Unknown bias.

Attachments:

Sample Summary Report
Electronic Data Review Results (Report #3)
Analytical Sample Listing (Report #6)
Identification Summary for Single & Multi Component Analytes (Report #11)

Sample Summary Report

Case No: 41282	Contract: EPW11037	SDG No: JDQX3	Lab Code: DATAC
Sample Number: JDQX3	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: WL05SD	pH: 7.5	Sample Date: 06032011	Sample Time: 14:20:00
% Moisture : 25.1776		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	220	ug/kg	1.0	JB	U	Yes	S4VEM
Phenol	220	ug/kg	1.0	JB	U	Yes	S4VEM
Bis(2-chloroethyl)ether	220	ug/kg	1.0	U	U	Yes	S4VEM
2-Chlorophenol	220	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylphenol	220	ug/kg	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	220	ug/kg	1.0	U	U	Yes	S4VEM
Acetophenone	220	ug/kg	1.0	JB	U	Yes	S4VEM
4-Methylphenol	220	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	220	ug/kg	1.0	U	U	Yes	S4VEM
Hexachloroethane	220	ug/kg	1.0	U	U	Yes	S4VEM
Nitrobenzene	220	ug/kg	1.0	U	U	Yes	S4VEM
Isophorone	220	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitrophenol	220	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	220	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	220	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	220	ug/kg	1.0	U	U	Yes	S4VEM
Naphthalene	220	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloroaniline	220	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	220	ug/kg	1.0	U	U	Yes	S4VEM
Caprolactam	220	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	220	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	220	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	220	ug/kg	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	220	ug/kg	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	220	ug/kg	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	220	ug/kg	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Chloronaphthalene	220	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitroaniline	420	ug/kg	1.0	U	U	Yes	S4VEM
Dimethylphthalate	220	ug/kg	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	220	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthylene	220	ug/kg	1.0	U	U	Yes	S4VEM
3-Nitroaniline	420	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthene	220	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	420	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	420	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzofuran	220	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	220	ug/kg	1.0	U	U	Yes	S4VEM
Diethylphthalate	220	ug/kg	1.0	U	U	Yes	S4VEM
Fluorene	220	ug/kg	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	220	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitroaniline	420	ug/kg	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	420	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	220	ug/kg	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	220	ug/kg	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	220	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	220	ug/kg	1.0	U	U	Yes	S4VEM
Atrazine	220	ug/kg	1.0	U	U	Yes	S4VEM
Pentachlorophenol	420	ug/kg	1.0	U	UJK	Yes	S4VEM
Phenanthrene	220	ug/kg	1.0	U	U	Yes	S4VEM
Anthracene	220	ug/kg	1.0	U	U	Yes	S4VEM
Carbazole	220	ug/kg	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	220	ug/kg	1.0	U	U	Yes	S4VEM
Fluoranthene	220	ug/kg	1.0	U	U	Yes	S4VEM
Pyrene	11	ug/kg	1.0	J	JQ	Yes	S4VEM
Butylbenzylphthalate	220	ug/kg	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	220	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	220	ug/kg	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Chrysene	220	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-ethylhexyl)phthalate	220	ug/kg	1.0	JB	U	Yes	S4VEM
Di-n-octylphthalate	220	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	220	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(k)fluoranthene	220	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	7.3	ug/kg	1.0	J	JQ	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	220	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	220	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	220	ug/kg	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	220	ug/kg	1.0	U	U	Yes	S4VEM
1,4-Methanoazulene, decahydro-4,8,8-trimethyl-9-			1.0	JN	JN	Yes	S4VEM
n-Hexadecanoic acid			1.0	JN	JN	Yes	S4VEM
Longifolenaldehyde			1.0	JN	JN	Yes	S4VEM
Naphthalene, 1,2,3,5,6,7,8,8a-octahydro-1,8a-dim			1.0	JN	JN	Yes	S4VEM
.gamma.-Sitosterol			1.0	JN	JN	Yes	S4VEM
9(1H)-Phenanthrenone, 2,3,4,4a,10,10a-hexahydro-			1.0	JN	JN	Yes	S4VEM
Oxirane, hexadecyl-			1.0	JN	JN	Yes	S4VEM
2-Phenanthrenol, 4b,5,6,7,8,8a,9,10-octahydro-4b			1.0	JN	JN	Yes	S4VEM
1,19-Eicosadiene			1.0	JN	JN	Yes	S4VEM
Furo[3',4':6,7]naphtho[2,3-d]-1,3-dioxol-6(5aH)-			1.0	JN	JN	Yes	S4VEM
Total Alkanes			1.0	J	JN	Yes	S4VEM
1,19-Eicosadiene			1.0	JN	JN	Yes	S4VEM
1,19-Eicosadiene			1.0	JN	JN	Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQX3	Lab Code: DATAC
Sample Number: JDQX4	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: WL06SD	pH: 7.4	Sample Date: 06032011	Sample Time: 14:56:00
% Moisture : 29.8232		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	230	ug/kg	1.0	JB	U	Yes	S4VEM
Phenol	230	ug/kg	1.0	JB	U	Yes	S4VEM
Bis(2-chloroethyl)ether	230	ug/kg	1.0	U	U	Yes	S4VEM
2-Chlorophenol	230	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylphenol	230	ug/kg	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	230	ug/kg	1.0	U	U	Yes	S4VEM
Acetophenone	230	ug/kg	1.0	JB	U	Yes	S4VEM
4-Methylphenol	230	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	230	ug/kg	1.0	U	U	Yes	S4VEM
Hexachloroethane	230	ug/kg	1.0	U	U	Yes	S4VEM
Nitrobenzene	230	ug/kg	1.0	U	U	Yes	S4VEM
Isophorone	230	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitrophenol	230	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	230	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	230	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	230	ug/kg	1.0	U	U	Yes	S4VEM
Naphthalene	230	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloroaniline	230	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	230	ug/kg	1.0	U	U	Yes	S4VEM
Caprolactam	230	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	230	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	230	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	230	ug/kg	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	230	ug/kg	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	230	ug/kg	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	230	ug/kg	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	230	ug/kg	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	450	ug/kg	1.0	U	U	Yes	S4VEM
Dimethylphthalate	230	ug/kg	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	230	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthylene	230	ug/kg	1.0	U	U	Yes	S4VEM
3-Nitroaniline	450	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthene	230	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	450	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	450	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzofuran	230	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	230	ug/kg	1.0	U	U	Yes	S4VEM
Diethylphthalate	230	ug/kg	1.0	U	U	Yes	S4VEM
Fluorene	230	ug/kg	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	230	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitroaniline	450	ug/kg	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	450	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	230	ug/kg	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	230	ug/kg	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	230	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	230	ug/kg	1.0	U	U	Yes	S4VEM
Atrazine	230	ug/kg	1.0	U	U	Yes	S4VEM
Pentachlorophenol	450	ug/kg	1.0	U	UJK	Yes	S4VEM
Phenanthrene	230	ug/kg	1.0	U	U	Yes	S4VEM
Anthracene	230	ug/kg	1.0	U	U	Yes	S4VEM
Carbazole	230	ug/kg	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	230	ug/kg	1.0	U	U	Yes	S4VEM
Fluoranthene	230	ug/kg	1.0	U	U	Yes	S4VEM
Pyrene	230	ug/kg	1.0	U	U	Yes	S4VEM
Butylbenzylphthalate	230	ug/kg	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	230	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	230	ug/kg	1.0	U	U	Yes	S4VEM
Chrysene	230	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-ethylhexyl)	230	ug/kg	1.0	JB	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	230	ug/kg	1.0	JB	U	Yes	S4VEM
Di-n-octylphthalate	230	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	230	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(k)fluoranthene	230	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	230	ug/kg	1.0	U	U	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	230	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	230	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	230	ug/kg	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	230	ug/kg	1.0	U	U	Yes	S4VEM
Tetradecyl trifluoroacetate			1.0	JN	JN	Yes	S4VEM
1-Heneicosanol			1.0	JN	JN	Yes	S4VEM
Total Alkanes			1.0	J	JN	Yes	S4VEM
17-Norkaur-15-ene, 13-methyl-, (8.beta.,13.beta.			1.0	JN	JN	Yes	S4VEM
2-Phenanthrenol, 4b,5,6,7,8,8a,9,10-octahydro-4b			1.0	JN	JN	Yes	S4VEM
Phenanthrene, 1-methyl-7-(1-methylethyl)-			1.0	JN	JN	Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQX3	Lab Code: DATAC
Sample Number: JDQX5	Method: BNA	Matrix: Water	MA Number: DEFAULT
Sample Location: WL01WT	pH: 6.0	Sample Date: 06032011	Sample Time: 14:20:00
% Moisture :		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	5.0	ug/L	1.0	JB	U	Yes	S4VEM
Phenol	5.0	ug/L	1.0	JB	U	Yes	S4VEM
Bis(2-chloroethyl)ether	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Chlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Methylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	5.0	ug/L	1.0	U	U	Yes	S4VEM
Acetophenone	5.0	ug/L	1.0	JB	U	Yes	S4VEM
4-Methylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachloroethane	5.0	ug/L	1.0	U	U	Yes	S4VEM
Nitrobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Isophorone	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Nitrophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Naphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chloroaniline	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Caprolactam	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	10	ug/L	1.0	U	U	Yes	S4VEM
Dimethylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Acenaphthylene	5.0	ug/L	1.0	U	U	Yes	S4VEM
3-Nitroaniline	10	ug/L	1.0	U	U	Yes	S4VEM
Acenaphthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	10	ug/L	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	10	ug/L	1.0	U	U	Yes	S4VEM
Dibenzofuran	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Diethylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Fluorene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Nitroaniline	10	ug/L	1.0	U	UJK	Yes	S4VEM
4,6-Dinitro-2-methylphenol	10	ug/L	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	5.0	ug/L	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Atrazine	5.0	ug/L	1.0	U	U	Yes	S4VEM
Pentachlorophenol	10	ug/L	1.0	U	U	Yes	S4VEM
Phenanthrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Carbazole	5.0	ug/L	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Pyrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Butylbenzylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Chrysene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Bis(2-ethylhexyl)	1.8	ug/L	1.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	1.8	ug/L	1.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(k)fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Bicyclo[3.1.0]hexan-3-one, 4-methyl-1-(1-methyle			1.0	JN	JN	Yes	S4VEM

Case No:	41282	Contract:	EPW11037	SDG No:	JDQX3	Lab Code:	DATAC
Sample Number:	JDQX6	Method:	BNA	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	WL02WT	pH:	6.0	Sample Date:	06032011	Sample Time:	14:45:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	5.0	ug/L	1.0	JB	U	Yes	S4VEM
Phenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Bis(2-chloroethyl)ether	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Chlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Methylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	5.0	ug/L	1.0	U	U	Yes	S4VEM
Acetophenone	5.0	ug/L	1.0	JB	U	Yes	S4VEM
4-Methylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachloroethane	5.0	ug/L	1.0	U	U	Yes	S4VEM
Nitrobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Isophorone	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Nitrophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Naphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chloroaniline	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Caprolactam	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	10	ug/L	1.0	U	U	Yes	S4VEM
Dimethylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Acenaphthylene	5.0	ug/L	1.0	U	U	Yes	S4VEM
3-Nitroaniline	10	ug/L	1.0	U	U	Yes	S4VEM
Acenaphthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	10	ug/L	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	10	ug/L	1.0	U	U	Yes	S4VEM
Dibenzofuran	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Diethylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Fluorene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Nitroaniline	10	ug/L	1.0	U	UJK	Yes	S4VEM
4,6-Dinitro-2-methylphenol	10	ug/L	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	5.0	ug/L	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Atrazine	5.0	ug/L	1.0	U	U	Yes	S4VEM
Pentachlorophenol	10	ug/L	1.0	U	U	Yes	S4VEM
Phenanthrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Carbazole	5.0	ug/L	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Pyrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Butylbenzylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Chrysene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Bis(2-ethylhexyl)	1.9	ug/L	1.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	1.9	ug/L	1.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(k)fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQX3	Lab Code: DATAC

Sample Number:	JDQX8	Method:	BNA	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	BK01SD	pH:	7.4	Sample Date:	06032011	Sample Time:	15:20:00
% Moisture :	19.1028			% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	200	ug/kg	1.0	JB	U	Yes	S4VEM
Phenol	200	ug/kg	1.0	JB	U	Yes	S4VEM
Bis(2-chloroethyl)ether	200	ug/kg	1.0	U	U	Yes	S4VEM
2-Chlorophenol	200	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylphenol	200	ug/kg	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	200	ug/kg	1.0	U	U	Yes	S4VEM
Acetophenone	200	ug/kg	1.0	JB	U	Yes	S4VEM
4-Methylphenol	20	ug/kg	1.0	J	JQ	Yes	S4VEM
N-Nitroso-di-n-propylamine	200	ug/kg	1.0	U	U	Yes	S4VEM
Hexachloroethane	200	ug/kg	1.0	U	U	Yes	S4VEM
Nitrobenzene	200	ug/kg	1.0	U	U	Yes	S4VEM
Isophorone	200	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitrophenol	200	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	200	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	200	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	200	ug/kg	1.0	U	U	Yes	S4VEM
Naphthalene	200	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloroaniline	200	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	200	ug/kg	1.0	U	U	Yes	S4VEM
Caprolactam	200	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	200	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	200	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	200	ug/kg	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	200	ug/kg	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	200	ug/kg	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	200	ug/kg	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	200	ug/kg	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	400	ug/kg	1.0	U	U	Yes	S4VEM
Dimethylphthalate	200	ug/kg	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	200	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthylene	200	ug/kg	1.0	U	U	Yes	S4VEM
3-Nitroaniline	400	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthene	200	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	400	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	400	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzofuran	200	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	200	ug/kg	1.0	U	U	Yes	S4VEM
Diethylphthalate	200	ug/kg	1.0	U	U	Yes	S4VEM
Fluorene	200	ug/kg	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	200	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitroaniline	400	ug/kg	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	400	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	200	ug/kg	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	200	ug/kg	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	200	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	200	ug/kg	1.0	U	U	Yes	S4VEM
Atrazine	200	ug/kg	1.0	U	U	Yes	S4VEM
Pentachlorophenol	400	ug/kg	1.0	U	UJK	Yes	S4VEM
Phenanthrene	200	ug/kg	1.0	U	U	Yes	S4VEM
Anthracene	200	ug/kg	1.0	U	U	Yes	S4VEM
Carbazole	200	ug/kg	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	200	ug/kg	1.0	U	U	Yes	S4VEM
Fluoranthene	200	ug/kg	1.0	U	U	Yes	S4VEM
Pyrene	200	ug/kg	1.0	U	U	Yes	S4VEM
Butylbenzylphthalate	200	ug/kg	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	200	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	200	ug/kg	1.0	U	U	Yes	S4VEM
Chrysene	200	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-ethylhexyl)	200	ug/kg	1.0	JB	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	200	ug/kg	1.0	JB	U	Yes	S4VEM
Di-n-octylphthalate	200	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	200	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(k)fluoranthene	200	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	200	ug/kg	1.0	U	U	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	200	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	200	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	200	ug/kg	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	200	ug/kg	1.0	U	U	Yes	S4VEM
Total Alkanes			1.0	J	JN	Yes	S4VEM
Bromoacetic acid, hexadecyl ester			1.0	JN	JN	Yes	S4VEM
n-Hexadecanoic acid			1.0	JN	JN	Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQX3	Lab Code: DATAC

Sample Number:	JDQX9	Method:	BNA	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	BK01WT	pH:	6.0	Sample Date:	06032011	Sample Time:	15:17:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	5.0	ug/L	1.0	JB	U	Yes	S4VEM
Phenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Bis(2-chloroethyl)ether	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Chlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Methylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	5.0	ug/L	1.0	U	U	Yes	S4VEM
Acetophenone	5.0	ug/L	1.0	JB	U	Yes	S4VEM
4-Methylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachloroethane	5.0	ug/L	1.0	U	U	Yes	S4VEM
Nitrobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Isophorone	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Nitrophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Naphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chloroaniline	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Caprolactam	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	10	ug/L	1.0	U	U	Yes	S4VEM
Dimethylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Acenaphthylene	5.0	ug/L	1.0	U	U	Yes	S4VEM
3-Nitroaniline	10	ug/L	1.0	U	U	Yes	S4VEM
Acenaphthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	10	ug/L	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	10	ug/L	1.0	U	U	Yes	S4VEM
Dibenzofuran	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Diethylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Fluorene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Nitroaniline	10	ug/L	1.0	U	UJK	Yes	S4VEM
4,6-Dinitro-2-methylphenol	10	ug/L	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	5.0	ug/L	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Atrazine	5.0	ug/L	1.0	U	U	Yes	S4VEM
Pentachlorophenol	10	ug/L	1.0	U	U	Yes	S4VEM
Phenanthrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Carbazole	5.0	ug/L	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Pyrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Butylbenzylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Chrysene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Bis(2-ethylhexyl)	1.2	ug/L	1.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	1.2	ug/L	1.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(k)fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQX3	Lab Code: DATAC
Sample Number: JDQX9MS	Method: BNA	Matrix: Water	MA Number: DEFAULT
Sample Location: BK01WT	pH: 6.0	Sample Date: 06032011	Sample Time: 15:17:00
% Moisture :		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	5.0	ug/L	1.0	JB	U	Yes	S4VEM
Phenol	16	ug/L	1.0	B		Yes	S4VEM
2-Chlorophenol	19	ug/L	1.0			Yes	S4VEM
N-Nitroso-di-n-propylamine	21	ug/L	1.0			Yes	S4VEM
Bis(2-chloroethyl)ether	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	21	ug/L	1.0			Yes	S4VEM
Acenaphthene	22	ug/L	1.0			Yes	S4VEM
2-Methylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Nitrophenol	21	ug/L	1.0			Yes	S4VEM
2,4-Dinitrotoluene	24	ug/L	1.0			Yes	S4VEM
Acetophenone	5.0	ug/L	1.0	JB	U	Yes	S4VEM
4-Methylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Pentachlorophenol	20	ug/L	1.0		J	Yes	S4VEM
Pyrene	23	ug/L	1.0			Yes	S4VEM
Hexachloroethane	5.0	ug/L	1.0	U	U	Yes	S4VEM
Nitrobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Isophorone	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Nitrophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Naphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chloroaniline	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Caprolactam	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	5.0	ug/L	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2,4,6-Trichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Nitroaniline	10	ug/L	1.0	U	U	Yes	S4VEM
Dimethylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Acenaphthylene	0.21	ug/L	1.0	J	J	Yes	S4VEM
3-Nitroaniline	10	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	10	ug/L	1.0	U	U	Yes	S4VEM
Dibenzofuran	5.0	ug/L	1.0	U	U	Yes	S4VEM
Diethylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Fluorene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Nitroaniline	10	ug/L	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	10	ug/L	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	5.0	ug/L	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Atrazine	5.0	ug/L	1.0	U	U	Yes	S4VEM
Phenanthrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Carbazole	5.0	ug/L	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Butylbenzylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Chrysene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Bis(2-ethylhexyl)	0.96	ug/L	1.0	J	J	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	0.96	ug/L	1.0	J	J	Yes	S4VEM
Di-n-octylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(k)fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	0.26	ug/L	1.0	J	J	Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQX3	Lab Code: DATAC

Sample Number: JDQX9MSD	Method: BNA	Matrix: Water	MA Number: DEFAULT
Sample Location: BK01WT	pH: 6.0	Sample Date: 06032011	Sample Time: 15:17:00
% Moisture :		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	5.0	ug/L	1.0	JB	U	Yes	S4VEM
Phenol	22	ug/L	1.0	B		Yes	S4VEM
2-Chlorophenol	23	ug/L	1.0			Yes	S4VEM
N-Nitroso-di-n-propylamine	26	ug/L	1.0			Yes	S4VEM
Bis(2-chloroethyl)ether	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	26	ug/L	1.0			Yes	S4VEM
Acenaphthene	28	ug/L	1.0			Yes	S4VEM
2-Methylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Nitrophenol	28	ug/L	1.0			Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	30	ug/L	1.0			Yes	S4VEM
Acetophenone	5.0	ug/L	1.0	JB	U	Yes	S4VEM
Pentachlorophenol	27	ug/L	1.0		J	Yes	S4VEM
4-Methylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Pyrene	30	ug/L	1.0			Yes	S4VEM
Hexachloroethane	5.0	ug/L	1.0	U	U	Yes	S4VEM
Nitrobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Isophorone	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Nitrophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Naphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chloroaniline	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Caprolactam	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	5.0	ug/L	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2,4,6-Trichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Nitroaniline	10	ug/L	1.0	U	U	Yes	S4VEM
Dimethylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Acenaphthylene	0.20	ug/L	1.0	J	J	Yes	S4VEM
3-Nitroaniline	10	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	10	ug/L	1.0	U	U	Yes	S4VEM
Dibenzofuran	5.0	ug/L	1.0	U	U	Yes	S4VEM
Diethylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Fluorene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Nitroaniline	10	ug/L	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	10	ug/L	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	5.0	ug/L	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Atrazine	5.0	ug/L	1.0	U	U	Yes	S4VEM
Phenanthrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Carbazole	5.0	ug/L	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Butylbenzylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Chrysene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Bis(2-ethylhexyl)	0.97	ug/L	1.0	J	J	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	0.97	ug/L	1.0	J	J	Yes	S4VEM
Di-n-octylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(k)fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	0.26	ug/L	1.0	J	J	Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQX3	Lab Code: DATAC
Sample Number: JDQY0	Method: BNA	Matrix: Soil	MA Number: DEFAULT
Sample Location: BK02SD	pH: 7.4	Sample Date: 06032011	Sample Time: 16:00:00
% Moisture : 21.2586		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	210	ug/kg	1.0	JB	U	Yes	S4VEM
Phenol	210	ug/kg	1.0	JB	U	Yes	S4VEM
Bis(2-chloroethyl)ether	210	ug/kg	1.0	U	U	Yes	S4VEM
2-Chlorophenol	210	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylphenol	210	ug/kg	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	210	ug/kg	1.0	U	U	Yes	S4VEM
Acetophenone	210	ug/kg	1.0	JB	U	Yes	S4VEM
4-Methylphenol	210	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	210	ug/kg	1.0	U	U	Yes	S4VEM
Hexachloroethane	210	ug/kg	1.0	U	U	Yes	S4VEM
Nitrobenzene	210	ug/kg	1.0	U	U	Yes	S4VEM
Isophorone	210	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitrophenol	210	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	210	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	210	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	210	ug/kg	1.0	U	U	Yes	S4VEM
Naphthalene	210	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloroaniline	210	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	210	ug/kg	1.0	U	U	Yes	S4VEM
Caprolactam	210	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	210	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	210	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	210	ug/kg	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	210	ug/kg	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	210	ug/kg	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	210	ug/kg	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	210	ug/kg	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	400	ug/kg	1.0	U	U	Yes	S4VEM
Dimethylphthalate	210	ug/kg	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	210	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthylene	210	ug/kg	1.0	U	U	Yes	S4VEM
3-Nitroaniline	400	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthene	210	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	400	ug/kg	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	400	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzofuran	210	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	210	ug/kg	1.0	U	U	Yes	S4VEM
Diethylphthalate	210	ug/kg	1.0	U	U	Yes	S4VEM
Fluorene	210	ug/kg	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	210	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitroaniline	400	ug/kg	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	400	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	210	ug/kg	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	210	ug/kg	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	210	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	210	ug/kg	1.0	U	U	Yes	S4VEM
Atrazine	210	ug/kg	1.0	U	U	Yes	S4VEM
Pentachlorophenol	400	ug/kg	1.0	U	UJK	Yes	S4VEM
Phenanthrene	210	ug/kg	1.0	U	U	Yes	S4VEM
Anthracene	210	ug/kg	1.0	U	U	Yes	S4VEM
Carbazole	210	ug/kg	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	210	ug/kg	1.0	U	U	Yes	S4VEM
Fluoranthene	210	ug/kg	1.0	U	U	Yes	S4VEM
Pyrene	210	ug/kg	1.0	U	U	Yes	S4VEM
Butylbenzylphthalate	210	ug/kg	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	210	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	210	ug/kg	1.0	U	U	Yes	S4VEM
Chrysene	210	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-ethylhexyl)	210	ug/kg	1.0	JB	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	210	ug/kg	1.0	JB	U	Yes	S4VEM
Di-n-octylphthalate	210	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	210	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(k)fluoranthene	210	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	210	ug/kg	1.0	U	U	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	210	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	210	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	210	ug/kg	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	210	ug/kg	1.0	U	U	Yes	S4VEM
9(1H)-Phenanthrenone, 2,3,4,4a,10,10a-hexahydro-			1.0	JN	JN	Yes	S4VEM
Total Alkanes			1.0	J	JN	Yes	S4VEM
1,4-Methanoazulene, decahydro-4,8,8-trimethyl-9-			1.0	JN	JN	Yes	S4VEM
2-Phenanthrenol, 4b,5,6,7,8,8a,9,10-octahydro-4b			1.0	JN	JN	Yes	S4VEM
2-Phenanthrenol, 4b,5,6,7,8,8a,9,10-octahydro-4b			1.0	JN	JN	Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQX3	Lab Code: DATAC

Sample Number:	JDQY0MS	Method:	BNA	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	BK02SD	pH:	7.4	Sample Date:	06032011	Sample Time:	16:00:00
% Moisture :	21.2586			% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	220	ug/kg	1.0	JB	U	Yes	S4VEM
Phenol	920	ug/kg	1.0	B		Yes	S4VEM
2-Chlorophenol	1000	ug/kg	1.0			Yes	S4VEM
N-Nitroso-di-n-propylamine	1100	ug/kg	1.0			Yes	S4VEM
Bis(2-chloroethyl)ether	220	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	1000	ug/kg	1.0			Yes	S4VEM
Acenaphthene	1200	ug/kg	1.0			Yes	S4VEM
2-Methylphenol	220	ug/kg	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	220	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitrophenol	1100	ug/kg	1.0			Yes	S4VEM
Acetophenone	15	ug/kg	1.0	J	J	Yes	S4VEM
2,4-Dinitrotoluene	1100	ug/kg	1.0			Yes	S4VEM
4-Methylphenol	220	ug/kg	1.0	U	U	Yes	S4VEM
Pentachlorophenol	790	ug/kg	1.0		J	Yes	S4VEM
Pyrene	1200	ug/kg	1.0			Yes	S4VEM
Hexachloroethane	220	ug/kg	1.0	U	U	Yes	S4VEM
Nitrobenzene	220	ug/kg	1.0	U	U	Yes	S4VEM
Isophorone	220	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitrophenol	220	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	220	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	220	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	220	ug/kg	1.0	U	U	Yes	S4VEM
Naphthalene	220	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloroaniline	220	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	220	ug/kg	1.0	U	U	Yes	S4VEM
Caprolactam	220	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	220	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	220	ug/kg	1.0	U	U	Yes	S4VEM

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Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2,4,6-Trichlorophenol	220	ug/kg	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	220	ug/kg	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	220	ug/kg	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	220	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitroaniline	420	ug/kg	1.0	U	U	Yes	S4VEM
Dimethylphthalate	220	ug/kg	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	220	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthylene	220	ug/kg	1.0	U	U	Yes	S4VEM
3-Nitroaniline	420	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	420	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzofuran	220	ug/kg	1.0	U	U	Yes	S4VEM
Diethylphthalate	220	ug/kg	1.0	U	U	Yes	S4VEM
Fluorene	220	ug/kg	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	220	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitroaniline	420	ug/kg	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	420	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	220	ug/kg	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	220	ug/kg	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	220	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	220	ug/kg	1.0	U	U	Yes	S4VEM
Atrazine	220	ug/kg	1.0	U	U	Yes	S4VEM
Phenanthrene	220	ug/kg	1.0	U	U	Yes	S4VEM
Anthracene	220	ug/kg	1.0	U	U	Yes	S4VEM
Carbazole	220	ug/kg	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	220	ug/kg	1.0	U	U	Yes	S4VEM
Fluoranthene	220	ug/kg	1.0	U	U	Yes	S4VEM
Butylbenzylphthalate	220	ug/kg	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	220	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	220	ug/kg	1.0	U	U	Yes	S4VEM
Chrysene	220	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-ethylhexyl)	220	ug/kg	1.0	JB	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	220	ug/kg	1.0	JB	U	Yes	S4VEM
Di-n-octylphthalate	220	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	220	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(k)fluoranthene	220	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	220	ug/kg	1.0	U	U	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	220	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	220	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	220	ug/kg	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	9.6	ug/kg	1.0	J	J	Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQX3	Lab Code: DATAC

Sample Number:	JDQY0MSD	Method:	BNA	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	BK02SD	pH:	7.4	Sample Date:	06032011	Sample Time:	16:00:00
% Moisture :	21.2586			% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Phenol	940	ug/kg	1.0	B		Yes	S4VEM
Benzaldehyde	220	ug/kg	1.0	JB	U	Yes	S4VEM
2-Chlorophenol	1000	ug/kg	1.0			Yes	S4VEM
Bis(2-chloroethyl)ether	220	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	1100	ug/kg	1.0			Yes	S4VEM
4-Chloro-3-methylphenol	1100	ug/kg	1.0			Yes	S4VEM
2-Methylphenol	220	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthene	1200	ug/kg	1.0			Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	220	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitrophenol	1100	ug/kg	1.0			Yes	S4VEM
2,4-Dinitrotoluene	1200	ug/kg	1.0			Yes	S4VEM
Acetophenone	63	ug/kg	1.0	J	J	Yes	S4VEM
4-Methylphenol	220	ug/kg	1.0	U	U	Yes	S4VEM
Pentachlorophenol	870	ug/kg	1.0		J	Yes	S4VEM
Pyrene	1200	ug/kg	1.0			Yes	S4VEM
Hexachloroethane	220	ug/kg	1.0	U	U	Yes	S4VEM
Nitrobenzene	220	ug/kg	1.0	U	U	Yes	S4VEM
Isophorone	220	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitrophenol	220	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	220	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	220	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	220	ug/kg	1.0	U	U	Yes	S4VEM
Naphthalene	220	ug/kg	1.0	U	U	Yes	S4VEM
4-Chloroaniline	220	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	220	ug/kg	1.0	U	U	Yes	S4VEM
Caprolactam	220	ug/kg	1.0	U	U	Yes	S4VEM
2-Methylnaphthalene	220	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	220	ug/kg	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2,4,6-Trichlorophenol	220	ug/kg	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	220	ug/kg	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	220	ug/kg	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	220	ug/kg	1.0	U	U	Yes	S4VEM
2-Nitroaniline	420	ug/kg	1.0	U	U	Yes	S4VEM
Dimethylphthalate	220	ug/kg	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	220	ug/kg	1.0	U	U	Yes	S4VEM
Acenaphthylene	220	ug/kg	1.0	U	U	Yes	S4VEM
3-Nitroaniline	420	ug/kg	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	420	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzofuran	220	ug/kg	1.0	U	U	Yes	S4VEM
Diethylphthalate	220	ug/kg	1.0	U	U	Yes	S4VEM
Fluorene	220	ug/kg	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	220	ug/kg	1.0	U	U	Yes	S4VEM
4-Nitroaniline	420	ug/kg	1.0	U	U	Yes	S4VEM
4,6-Dinitro-2-methylphenol	420	ug/kg	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	220	ug/kg	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	220	ug/kg	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	220	ug/kg	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	220	ug/kg	1.0	U	U	Yes	S4VEM
Atrazine	220	ug/kg	1.0	U	U	Yes	S4VEM
Phenanthrene	220	ug/kg	1.0	U	U	Yes	S4VEM
Anthracene	220	ug/kg	1.0	U	U	Yes	S4VEM
Carbazole	220	ug/kg	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	220	ug/kg	1.0	JB	U	Yes	S4VEM
Fluoranthene	220	ug/kg	1.0	U	U	Yes	S4VEM
Butylbenzylphthalate	220	ug/kg	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	220	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	220	ug/kg	1.0	U	U	Yes	S4VEM
Chrysene	220	ug/kg	1.0	U	U	Yes	S4VEM
Bis(2-ethylhexyl)	220	ug/kg	1.0	JB	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	220	ug/kg	1.0	JB	U	Yes	S4VEM
Di-n-octylphthalate	220	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	220	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(k)fluoranthene	220	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	220	ug/kg	1.0	U	U	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	220	ug/kg	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	220	ug/kg	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	220	ug/kg	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	9.0	ug/kg	1.0	J	J	Yes	S4VEM

Case No: 41282	Contract: EPW11037	SDG No: JDQX3	Lab Code: DATAC
Sample Number: JDQY1	Method: BNA	Matrix: Water	MA Number: DEFAULT
Sample Location: RI01WT	pH: 6.0	Sample Date: 06032011	Sample Time: 11:03:00
% Moisture :		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Benzaldehyde	5.0	ug/L	1.0	JB	U	Yes	S4VEM
Phenol	5.0	ug/L	1.0	JB	U	Yes	S4VEM
Bis(2-chloroethyl)ether	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Chlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Methylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,2'-Oxybis(1-chloropropane)	5.0	ug/L	1.0	U	U	Yes	S4VEM
Acetophenone	5.0	ug/L	1.0	JB	U	Yes	S4VEM
4-Methylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
N-Nitroso-di-n-propylamine	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachloroethane	5.0	ug/L	1.0	U	U	Yes	S4VEM
Nitrobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Isophorone	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Nitrophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dimethylphenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Bis(2-chloroethoxy)methane	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Naphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chloroaniline	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorobutadiene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Caprolactam	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chloro-3-methylphenol	20	ug/L	1.0			Yes	S4VEM
2-Methylnaphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorocyclopentadiene	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4,6-Trichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4,5-Trichlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
1,1'-Biphenyl	5.0	ug/L	1.0	U	U	Yes	S4VEM
2-Chloronaphthalene	5.0	ug/L	1.0	U	U	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
2-Nitroaniline	10	ug/L	1.0	U	U	Yes	S4VEM
Dimethylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,6-Dinitrotoluene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Acenaphthylene	5.0	ug/L	1.0	U	U	Yes	S4VEM
3-Nitroaniline	10	ug/L	1.0	U	U	Yes	S4VEM
Acenaphthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dinitrophenol	10	ug/L	1.0	U	UJK	Yes	S4VEM
4-Nitrophenol	10	ug/L	1.0	U	U	Yes	S4VEM
Dibenzofuran	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,4-Dinitrotoluene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Diethylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Fluorene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Chlorophenyl-phenylether	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Nitroaniline	10	ug/L	1.0	U	UJK	Yes	S4VEM
4,6-Dinitro-2-methylphenol	10	ug/L	1.0	U	U	Yes	S4VEM
N-Nitrosodiphenylamine	5.0	ug/L	1.0	U	U	Yes	S4VEM
1,2,4,5-Tetrachlorobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
4-Bromophenyl-phenylether	5.0	ug/L	1.0	U	U	Yes	S4VEM
Hexachlorobenzene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Atrazine	5.0	ug/L	1.0	U	U	Yes	S4VEM
Pentachlorophenol	10	ug/L	1.0	U	U	Yes	S4VEM
Phenanthrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Carbazole	5.0	ug/L	1.0	U	U	Yes	S4VEM
Di-n-butylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Pyrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Butylbenzylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
3,3'-Dichlorobenzidine	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(a)anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Chrysene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Bis(2-ethylhexyl)	3.7	ug/L	1.0	J	JQ	Yes	S4VEM

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
phthalate	3.7	ug/L	1.0	J	JQ	Yes	S4VEM
Di-n-octylphthalate	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(b)fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(k)fluoranthene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(a)pyrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Indeno(1,2,3-cd)pyrene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Dibenzo(a,h)anthracene	5.0	ug/L	1.0	U	U	Yes	S4VEM
Benzo(g,h,i)perylene	5.0	ug/L	1.0	U	U	Yes	S4VEM
2,3,4,6-Tetrachlorophenol	5.0	ug/L	1.0	U	U	Yes	S4VEM
Pentaethylene glycol			1.0	JN	JN	Yes	S4VEM

National Functional Guidelines Report #03

Lab DATAC(ALS Environmental) **SDG** JDQX3 **Case** 41282 **Contract** EPW11037 **Region** 10 **DDTID** 124687 **SOW** SOM01.2

Data Review Reports

Blanks

Blanks	**BNA**
BLB14	The following semivolatile samples have common contaminant concentrations reported less than 5x the CRQL. The associated method blank concentration is less than 5x the concentration criteria. Detected compounds are qualified U. Nondetected compounds are not qualified. Reported sample concentrationshave been elevated to the CRQL.
	JDQX3, JDQX4, JDQX8, JDQY0, JDQY0MS, JDQY0MSD
	Bis(2-ethylhexyl)phthalate JDQX3, JDQX4, JDQX8, JDQY0, JDQY0MS, JDQY0MSD
Blanks	**BNA**
BLB8	The following semivolatile samples have analyte concentrations reported less than the CRQL. The associated method blank concentration is less than the concentration criteria. Detected compounds are qualified U. Nondetected compounds are not qualified. Reported sample concentrations have been elevated to the CRQL.
	JDQX3, JDQX4, JDQX5, JDQX6, JDQX8, JDQX9, JDQX9MS, JDQX9MSD, JDQY0, JDQY0MS, JDQY0MSD, JDQY1
	Di-n-butylphthalate JDQY0MSD
	Benzaldehyde JDQX3, JDQX4, JDQX5, JDQX6, JDQX8, JDQX9, JDQX9MS, JDQX9MSD, JDQY0, JDQY0MS, JDQY0MSD, JDQY1
	Phenol JDQX3, JDQX4, JDQX5, JDQX8, JDQY0, JDQY1
	Acetophenone JDQX3, JDQX4, JDQX5, JDQX6, JDQX8, JDQX9, JDQX9MS, JDQX9MSD, JDQY0, JDQY1
Blanks	**BNA**
BLB9	The following semivolatile samples have analyte concentrations reported greater than or equal to the CRQL. The associated method blank concentration is less than or equal to the concentration criteria. Detected and nondetected compounds are not qualified.
	JDQY0MS, JDQY0MSD
	Phenol JDQY0MS, JDQY0MSD

National Functional Guidelines Report #03

Lab DATAC(ALS Environmental) **SDG** JDQX3 **Case** 41282 **Contract** EPW11037 **Region** 10 **DDTID** 124687 **SOW** SOM01.2

Data Review Reports

Continuing Calibration Verification

Continuing Calibration Verification	**BNA**
BC10	The following semivolatile samples are associated with incorrect initial calibration sequence. Detected compounds are qualified J. Nondetected compounds are qualified UJ. Use professional judgment to qualify the data.
	JDQX3, JDQX4, JDQX8, JDQY0
	Pentachlorophenol SSTD020E7
	JDQX3, JDQX4, JDQX8, JDQY0

National Functional Guidelines Report #03

Lab DATAC(ALS Environmental) **SDG** JDQX3 **Case** 41282 **Contract** EPW11037 **Region** 10 **DDTID** 124687 **SOW** SOM01.2

Data Review Reports

Detection Limit

Detection Limit	BNA
BDL1	The following semivolatile samples have analyte concentrations below the quantitaion limit (CRQL). Detected compounds are qualified J. Nondetected compounds are not qualified.
	JDQX3, JDQX4, JDQX5, JDQX6, JDQX8, JDQX9, JDQX9MS, JDQX9MSD, JDQY0, JDQY0MS, JDQY0MSD, JDQY1, SBLK07, SBLK09, SBLK89
	Di-n-butylphthalate JDQY0MSD, SBLK07
	Benzaldehyde JDQX3, JDQX4, JDQX5, JDQX6, JDQX8, JDQX9, JDQX9MS, JDQX9MSD, JDQY0, JDQY0MS, JDQY0MSD, JDQY1, SBLK07, SBLK09, SBLK89
	2,3,4,6-Tetrachlorophenol JDQX9MS, JDQX9MSD, JDQY0MS, JDQY0MSD
	4-Methylphenol JDQX8
	Phenol JDQX3, JDQX4, JDQX5, JDQX8, JDQY0, JDQY1, SBLK07, SBLK09, SBLK89
	Benzo(a)pyrene JDQX3
	Pyrene JDQX3
	Acetophenone JDQX3, JDQX4, JDQX5, JDQX6, JDQX8, JDQX9, JDQX9MS, JDQX9MSD, JDQY0, JDQY0MS, JDQY0MSD, JDQY1, SBLK09, SBLK89
	Acenaphthylene JDQX9MS, JDQX9MSD
	Bis(2-ethylhexyl)phthalate JDQX3, JDQX4, JDQX5, JDQX6, JDQX8, JDQX9, JDQX9MS, JDQX9MSD, JDQY0, JDQY0MS, JDQY0MSD, JDQY1, SBLK07, SBLK89

National Functional Guidelines Report #03

Lab DATAC(ALS Environmental) **SDG** JDQX3 **Case** 41282 **Contract** EPW11037 **Region** 10 **DDTID** 124687 **SOW** SOM01.2

Data Review Reports

Initial Calibration

Initial Calibration	BNA
BC5	The following semivolatile samples are associated with an initial calibration percent relative standard deviation (%RSD) outside criteria. Detected compounds are qualified J. Nondetected compounds are not qualified. Use professional judgement to qualify non-detected compounds.
	JDQX3, JDQX4, JDQX5, JDQX6, JDQX8, JDQX9, JDQX9MS, JDQX9MSD, JDQY0, JDQY0MS, JDQY0MSD, JDQY1, SBLK07, SBLK09, SBLK89
	Pentachlorophenol SSTD020HX
	JDQX3, JDQX4, JDQX5, JDQX6, JDQX8, JDQX9, JDQX9MS, JDQX9MSD, JDQY0, JDQY0MS, JDQY0MSD, JDQY1, SBLK07, SBLK09, SBLK89

National Functional Guidelines Report #03

Lab DATAC(ALS Environmental) **SDG** JDQX3 **Case** 41282 **Contract** EPW11037 **Region** 10 **DDTID** 124687 **SOW** SOM01.2

Data Review Reports

TIC

TIC	BNA
BTIC1	A library search indicates a match at or above 85% for a TIC compound in the semivolatile sample Detected compounds are qualified NJ. Nondetected compounds are not qualified.
	JDQX3, JDQX4, JDQX5, JDQX8, JDQY0, JDQY1
	Pentaethylene glycol JDQY1
	.gamma.-Sitosterol JDQX3
	1,4-Methanoazulene, decahydro-4,8,8-trimethyl-9- JDQX3, JDQY0
	Tetradecyl trifluoroacetate JDQX4
	Furo[3',4':6,7]naphtho[2,3-d]-1,3-dioxol-6(5aH)- JDQX3
	Bromoacetic acid, hexadecyl ester JDQX8
	9(1H)-Phenanthrenone, 2,3,4,4a,10,10a-hexahydro- JDQX3, JDQY0
	Oxirane, hexadecyl- JDQX3
	2-Phenanthrenol, 4b,5,6,7,8,8a,9,10-octahydro-4b JDQX3, JDQX4, JDQY0
	17-Norkaur-15-ene, 13-methyl-, (8.beta.,13.beta. JDQX4
	n-Hexadecanoic acid JDQX3, JDQX8
	1,19-Eicosadiene JDQX3
	Naphthalene, 1,2,3,5,6,7,8,8a-octahydro-1,8a-dim JDQX3
	Longifolenaldehyde JDQX3
	1-Heneicosanol JDQX4
	Phenanthrene, 1-methyl-7-(1-methylethyl)- JDQX4
	Bicyclo[3.1.0]hexan-3-one, 4-methyl-1-(1-methyle JDQX5
TIC	**BNA**
BTIC2	A library search indicates a match below 85% for a TIC compound in the semivolatile sample Detected compounds are qualified J. Nondetected compounds are not qualified.
	JDQX3, JDQX4, JDQX5, JDQX8, JDQX9, JDQY0, JDQY1, SBLK07, SBLK09, SBLK89
	Unknown 2-Methyl-1,5-heptadiene (c,t) JDQX9
	Unknown Heneicosyl heptafluorobutyrate JDQX3
	Unknown 2,7-Diphenylindole JDQY0
	Unknown 2,2,6.beta.,7-Tetramethylbicyclo[4.3.0]nona-1(9) JDQX3
	Unknown Eicosyl pentafluoropropionate JDQX4

	Unknown Longifolene-(V4) JDQX4
	Unknown 5(1H)-Azulenone, 2,4,6,7,8,8a-hexahydro-3,8-dime JDQX8
	Unknown Naphthalene, decahydro-1,1,4a-trimethyl-6-methyl JDQX4
	Unknown Furan, 2,2'-methylenebis[5-methyl- JDQX3, JDQY0
	Unknown 2,6-Dimethyl-1,3,5,7-octatetraene, E,E- JDQX5
	Unknown 2,4-Diamino-6-[[p-methoxyphenyl]thio]pteridine JDQY0
	Unknown .beta.-Carboline, 1,2,3,4-tetrahydro-1-carboxy-6 JDQX3
	Unknown Ferruginol JDQX4, JDQY0
	Unknown 1-Ethanone, 1-[5-methyl-1-(1,4,6-trimethyl-1H-py JDQX8
	Unknown 1,2,3,4-Tetrahydro-1-phenyl-1,2,3-methanonaphtha JDQX8
	Unknown Hexagol JDQY1
	Unknown 1',2'-Dihydro-2,2'-dimethyl-4,4'-biquinoline JDQX3
	Unknown N,N'-(2-Hydroxytrimethylene)diphthalimide JDQY0
	Unknown 2(1H)-Benzocyclooctenone, decahydro-10a-methyl-, JDQX8
	Unknown Benzene, 1,1'-(1,2-diethyl-1,2-ethenediyl)bis[4- JDQX4
	Unknown n-Heptadecanol-1 JDQX3
	Unknown 3-Ethenyl-6-dimethylaminomethyleneaminobenzonitr JDQX3
	Unknown Stigmast-4-en-3-one JDQX3, JDQX8, JDQY0
	Unknown Squalene JDQX3, JDQY0
	Unknown 1,5-Cycloundecadiene, 8,8-dimethyl-9-methylene- JDQX3
	Unknown N,N'-Bis(2-hydroxy-alpha-methylbenzylidene)ethyl JDQX8, SBLK89
	Unknown .beta.-Sitosterol JDQX8
	Unknown [2.2]Paracyclophane JDQY0
	Unknown 6-Isopropylquinoline SBLK07, SBLK89
	Unknown 1-Phenanthrenemethanol, 1,2,3,4,4a,9,10,10a-octa JDQX4
	Unknown 2-Pentacosanone JDQX3
	Unknown 4-Octyne, 2-methyl- JDQX8
	Unknown n-Heptanoic acid,methyl(tetramethylene)silyl est JDQX3

National Functional Guidelines Report #03

Lab DATAC(ALS Environmental) **SDG** JDQX3 **Case** 41282 **Contract** EPW11037 **Region** 10 **DDTID** 124687 **SOW** SOM01.2

Data Review Reports

TIC

	Unknown Thiophene-2-sulfonic acid, (3-fluoro-2-methylphe JDQX4
	Unknown Octadecanoic acid, ethenyl ester JDQX3
	Unknown Kauren-18-ol, acetate, (4.beta.)- JDQX4, JDQX5, JDQY0
	Unknown Benzo[c]thiophen-1(3H)-one, 3-(3-oxobenzo[c]thie SBLK09
	Unknown Octacosyl heptafluorobutyrate JDQY0
	Unknown Estra-1,3,5(10)-trien-17-one, 3-hydroxy-15-metho JDQX3
	Unknown Palmitic acid vinyl ester SBLK09
	Unknown 7-Isopropyl-1,1,4a-trimethyl-1,2,3,4,4a,9,10,10a JDQX3, JDQY0
	Unknown Phthalic anhydride JDQX3, JDQX4, JDQX8, SBLK07
	Unknown Cadina-1(10),6,8-triene JDQX3
	Unknown Silane, dimethylisobutoxyoctadecyloxy- SBLK09
	Unknown 3-Ethyl-6-methyl-2-thioxo-2,3-dihydro-6H-thiazol JDQY0
	Unknown Cyclopropa[d]naphthalen-2(4aH)-one, 1,1a,5,6,7,8 JDQX8
	Unknown Androstan-17-one, 3-ethyl-3-hydroxy-, (5.alpha.) JDQY0
	Unknown Ethanol, 2,2'-[oxybis(2,1-ethanediyloxy)]bis- JDQY1
	Unknown 1H-Isoindole-1,3(2H)-dione, 2-(2-propynyloxy)- JDQX3
	Unknown Undecanal, 2-methyl- JDQX5
	Unknown 2-Phenanthrenol, 4b,5,6,7,8,8a,9,10-octahydro-4b JDQY0
	Unknown Picolinyl 8-(5-hexyl-2-furyl)-octanoate SBLK89
	Unknown Octaethylene glycol JDQY1
	Unknown 16-Hexadecanoyl hydrazide JDQY1

National Functional Guidelines Report #06

Lab DATAC(ALS Environmental) **SDG** JDQX3 **Case** 41282 **Contract** EPW11037 **Region** 10 **DDTID** 124687 **SOW** SOM01.2

Analytical Sample Listing

BNA

						Extraction		Analysis		
Sample Number	**Sample Type**	**Matrix**	**Level**	**Sampling Date**	**Date Received**	**Type**	**Date/Time**	**Date/Time**	**GC Column**	**Instrument**
JDQX3	Field_Sample	Soil	Low	06032011 14:20:00	06072011 10:04:00	Sonication	06072011 19:37:00	06152011 17:24:00	DB5MS	5975-H
JDQX4	Field_Sample	Soil	Low	06032011 14:56:00	06072011 10:04:00	Sonication	06072011 19:37:00	06152011 17:59:00	DB5MS	5975-H
JDQX5	Field_Sample	Water	Low	06032011 14:20:00	06072011 10:04:00	Liq_Liq	06082011 15:00:00	06152011 12:53:00	DB5MS	5975-H
JDQX6	Field_Sample	Water	Low	06032011 14:45:00	06072011 10:04:00	Liq_Liq	06082011 15:00:00	06152011 13:27:00	DB5MS	5975-H
JDQX8	Field_Sample	Soil	Low	06032011 15:20:00	06072011 10:04:00	Sonication	06072011 19:37:00	06152011 18:33:00	DB5MS	5975-H
JDQX9	Field_Sample	Water	Low	06032011 15:17:00	06072011 10:04:00	Liq_Liq	06082011 15:00:00	06152011 14:02:00	DB5MS	5975-H
JDQX9MS	Matrix_Spike	Water	Low	06032011 15:17:00	06072011 10:04:00	Liq_Liq	06082011 15:00:00	06152011 14:36:00	DB5MS	5975-H
JDQX9MSD	Matrix_Spike_Duplicate	Water	Low	06032011 15:17:00	06072011 10:04:00	Liq_Liq	06082011 15:00:00	06152011 15:10:00	DB5MS	5975-H
JDQY0	Field_Sample	Soil	Low	06032011 16:00:00	06072011 10:04:00	Sonication	06072011 19:37:00	06152011 19:08:00	DB5MS	5975-H
JDQY0MS	Matrix_Spike	Soil	Low	06032011 16:00:00	06072011 10:04:00	Sonication	06172011 14:55:00	06212011 12:10:00	DB5MS	5975-H
JDQY0MSD	Matrix_Spike_Duplicate	Soil	Low	06032011 16:00:00	06072011 10:04:00	Sonication	06172011 14:55:00	06212011 12:44:00	DB5MS	5975-H
JDQY1	Field_Sample	Water	Low	06032011 11:03:00	06072011 10:04:00	Liq_Liq	06082011 15:00:00	06152011 15:44:00	DB5MS	5975-H

National Functional Guidelines Report #11

Lab DATAC(ALS Environmental) **SDG** JDQX3 **Case** 41282 **Contract** EPW11037 **Region** 10 **DDTID** 124687 **SOW** SOM01.2

Identification Summary for Single & Multi Component Analytes

NONE FOUND

ecology and environment, inc.
International Specialists in the Environment
720 Third Avenue, Suite 1700, Seattle, WA 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: July 21, 2011

FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, Washington MW

TO: Jeff Fetters, START-3 Project Manager, Seattle, Washington

SUBJ: **Inorganic Data Summary Check,**
Kitsap Rifle and Revolver Range Site, Bremerton, Washington

REF: TDD: 10-11-0011 PAN: 002233.0621.01IA

The data summary check of 16 soil samples collected from the Kitsap Rifle and Revolver Range Site located in Bremerton, Washington, has been completed. Analyses for Target Analyte List (TAL) metals (EPA CLP SOW ISM01.2) were performed by Chemtech Consulting, Inc., Mountainside, New Jersey.

The samples were numbered:

MJDQT4	MJDQT5	MJDQT6	MJDQT7	MJDQT8	MJDQT9
MJDQW0	MJDQW1	MJDQW2	MJDQW3	MJDQW4	MJDQW5
MJDQW6	MJDQW7	MJDQW8	MJDQX7		

No discrepancies were noted.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

July 11, 2011

Reply To
Attn. Of: **OEA-095**

MEMORANDUM

SUBJECT: Data Validation Report for Metals Analysis of Samples Collected for the Kitsap Rifle & Revolver Range Integrated Assessment - Case 41282, SDG: MJDQT4

FROM: Donald Matheny, Chemist DM
Office of Environmental Assessment, Environmental Services Unit

TO: Mark Ader, Site Assessment Manager
Jeffry Rodin, On-Scene Coordinator
Office of Environmental Clean-up

CC: Renee Nordeen, Ecology & Environment, Inc.

The quality assurance (QA) review of the analytical data generated from the analysis of sixteen (16) soil samples, collected from the above referenced site, has been completed. These samples were analyzed for total metals by Chemtech Consulting located in Mountainside, NJ.

All sample analyses were evaluated following EPA's Stage 4 Data Validation Electronic/Manual Process (S4VEM). The validation was conducted according to the Quality Control Specifications outlined in the Sampling & Quality Assurance Project Plan for the *Sampling and Quality Assurance Plan for the Kitsap Rifle and Revolver Range* (April, 2011), the EPA Contract Laboratory Program's (CLP) Statement of Work (SOW) for Multi-Media, Multi-Concentration Inorganic Analyses (ISM01.2), the National Functional Guidelines for Inorganic Data Review, and the Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. Some data may be qualified using the reviewer's professional judgment. The conclusions presented herein are based on the information provided for the review.

A summary of samples evaluated in this validation report and the pertinent dates for sample collection, sample receipt at the laboratory, extraction and analyses is attached along with the validated data.

I. QUALITY CONTROL RESULTS SUMMARY

Quality Control Test	Result Ranges	Outliers?	Evaluation Criteria
Blanks	Within criteria	Y*	Non-detect or <10% of Sample
Matrix Spike (MJDQX7)	70 – 91%	Y*	75 - 125%
Sample Duplicate (MJDQX7)	≤ 12%	N	≤ 20% RPD or ± CRQL
LCS (blank spike)	95 – 113%	N	70 - 130%; (Ag, Sb 50 - 150%)
Serial Dilution (MJDQX7)	≤ 10%	Y*	≤ 10% Difference

*See the "*Data Qualifications*" section below for excursions and qualification of affected data.

II. DATA QUALIFICATIONS

Summary of Validation Qualifiers Applied

After the manual and electronic data review, the following data qualifications were applied:

Blanks
The following samples have analyte results greater than or equal to MDLs but less than CRQLs. The associated calibration and/or preparation blank analyte results are greater than or equal to MDLs but less than or equal to CRQLs. Detected analytes are qualified U. Non-detected analytes are not qualified. Sample results are elevated at CRQLs.
Sodium - All samples
Detection Limit
The following samples have results greater than or equal to MDLs but less than CRQLs. Detected analytes are qualified JQ.
Beryllium - MJDQT4, MJDQT6 - MJDQT8, MJDQW0 - MJDQW4, MJDQW6 - MJDQW8, MJDQX7 **Potassium** – All samples **Selenium** – All samples **Silver** - MJDQT4, MJDQT9 – MJDQW5, MJDQW7
Matrix Spike
The following Matrix Spike samples have percent recoveries in the range of 30-74% and post-digestion spike samples have percent recoveries greater than 75%. Detected analytes are qualified JL.
Antimony – All samples
ICP - Serial Dilution
The following ICP-MS Serial Dilution (SD) samples have percent difference (%D) greater than 10% and initial sample results are greater than 50xMDLs. The detected analytes in samples with results greater than or equal to MDLs are qualified JL.
Cobalt - All samples **Nickel** – All samples

Data Qualifiers

The following is a list of validation qualifiers applied to the sample result(s) when needed to indicate associated out-of-control QA/QC results.

Data Qualifiers	
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The associated value is an estimated quantity.
UJ	The analyte was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The data are unusable. The analyte may or may not be present in the sample.
Project Specific Data Qualifiers	
L	Low bias.
H	High bias.
K	Unknown Bias.
Q	Detected concentration is below the method reporting limit / Contract Required Quantitation Limit, but is above the method detection limit.

III. SAMPLE INDEX

Sample Number	Matrix	Sampling Date	Date Received	ICP-AES Analysis	
				Prep. Date	Analysis Date
MJDQT4	Soil	06/03/2011	06/07/2011	06/08/2011	06/14 – 17/2011
MJDQT5	Soil	06/03/2011	06/07/2011	06/08/2011	06/14 – 17/2011
MJDQT6	Soil	06/03/2011	06/07/2011	06/08/2011	06/14 – 17/2011
MJDQT7	Soil	06/03/2011	06/07/2011	06/08/2011	06/14/2011
MJDQT8	Soil	06/03/2011	06/07/2011	06/08/2011	06/14/2011
MJDQT9	Soil	06/03/2011	06/07/2011	06/08/2011	06/14 – 17/2011
MJDQW0	Soil	06/03/2011	06/07/2011	06/08/2011	06/14 – 17/2011
MJDQW1	Soil	06/03/2011	06/07/2011	06/08/2011	06/14 – 17/2011
MJDQW2	Soil	06/03/2011	06/07/2011	06/08/2011	06/14 – 17/2011
MJDQW3	Soil	06/03/2011	06/07/2011	06/08/2011	06/14 – 17/2011
MJDQW4	Soil	06/03/2011	06/07/2011	06/08/2011	06/14 – 17/2011
MJDQW5	Soil	06/03/2011	06/07/2011	06/08/2011	06/14 – 17/2011
MJDQW6	Soil	06/03/2011	06/07/2011	06/08/2011	06/14 – 17/2011
MJDQW7	Soil	06/03/2011	06/07/2011	06/08/2011	06/14 – 17/2011
MJDQW8	Soil	06/03/2011	06/07/2011	06/08/2011	06/14 – 17/2011
MJDQX7	Soil	06/03/2011	06/07/2011	06/08/2011	06/14 – 17/2011

Sample Summary Report

Case No: 41282	Contract: EPW09038	SDG No: MJDQT4	Lab Code: CHEM
Sample Number: MJDQT4	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: PR01SS	pH: 2	Sample Date: 06032011	Sample Time: 08:28:00
% Moisture :		% Solids : 79.6	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	16500	mg/kg	1			Yes	S4VEM
Antimony	249	mg/kg	1		JL	Yes	S4VEM
Arsenic	15.4	mg/kg	1			Yes	S4VEM
Barium	59.2	mg/kg	1			Yes	S4VEM
Beryllium	0.44	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.85	mg/kg	1			Yes	S4VEM
Calcium	4240	mg/kg	1			Yes	S4VEM
Chromium	29.4	mg/kg	1			Yes	S4VEM
Cobalt	5.9	mg/kg	1		JL	Yes	S4VEM
Copper	4430	mg/kg	20			Yes	S4VEM
Iron	17600	mg/kg	1			Yes	S4VEM
Lead	17200	mg/kg	20			Yes	S4VEM
Magnesium	4010	mg/kg	1			Yes	S4VEM
Manganese	418	mg/kg	1			Yes	S4VEM
Nickel	31.8	mg/kg	1		JL	Yes	S4VEM
Potassium	351	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	1.6	mg/kg	1	J	JQ	Yes	S4VEM
Silver	0.38	mg/kg	1	J	JQ	Yes	S4VEM
Sodium	561	mg/kg	1	J	U	Yes	S4VEM
Thallium	2.8	mg/kg	1	U	U	Yes	S4VEM
Vanadium	46.9	mg/kg	1			Yes	S4VEM
Zinc	251	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQT4	Lab Code: CHEM

Sample Number:	MJDQT5	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	PR02SS	pH:	2	Sample Date:	06032011	Sample Time:	08:50:00
% Moisture :				% Solids :	87.3		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	17200	mg/kg	1			Yes	S4VEM
Antimony	1080	mg/kg	20		JL	Yes	S4VEM
Arsenic	36.2	mg/kg	1			Yes	S4VEM
Barium	54.1	mg/kg	1			Yes	S4VEM
Beryllium	0.49	mg/kg	1			Yes	S4VEM
Cadmium	1.0	mg/kg	1			Yes	S4VEM
Calcium	5680	mg/kg	1			Yes	S4VEM
Chromium	29.8	mg/kg	1			Yes	S4VEM
Cobalt	6.3	mg/kg	1		JL	Yes	S4VEM
Copper	1440	mg/kg	1			Yes	S4VEM
Iron	20100	mg/kg	1			Yes	S4VEM
Lead	37000	mg/kg	20			Yes	S4VEM
Magnesium	4540	mg/kg	1			Yes	S4VEM
Manganese	402	mg/kg	1			Yes	S4VEM
Nickel	34.5	mg/kg	1		JL	Yes	S4VEM
Potassium	305	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	1.6	mg/kg	1	J	JQ	Yes	S4VEM
Silver	1.4	mg/kg	1			Yes	S4VEM
Sodium	455	mg/kg	1	J	U	Yes	S4VEM
Thallium	2.3	mg/kg	1	U	U	Yes	S4VEM
Vanadium	54.1	mg/kg	1			Yes	S4VEM
Zinc	366	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQT4	Lab Code: CHEM
Sample Number: MJDQT6	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: PR03SS	pH: 2	Sample Date: 06032011	Sample Time: 08:45:00
% Moisture :		% Solids : 88.4	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	14500	mg/kg	1			Yes	S4VEM
Antimony	1000	mg/kg	20		JL	Yes	S4VEM
Arsenic	39.8	mg/kg	1			Yes	S4VEM
Barium	49.0	mg/kg	1			Yes	S4VEM
Beryllium	0.37	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.95	mg/kg	1			Yes	S4VEM
Calcium	6870	mg/kg	1			Yes	S4VEM
Chromium	26.8	mg/kg	1			Yes	S4VEM
Cobalt	5.9	mg/kg	1		JL	Yes	S4VEM
Copper	1430	mg/kg	1			Yes	S4VEM
Iron	18200	mg/kg	1			Yes	S4VEM
Lead	53400	mg/kg	20			Yes	S4VEM
Magnesium	4730	mg/kg	1			Yes	S4VEM
Manganese	279	mg/kg	1			Yes	S4VEM
Nickel	31.9	mg/kg	1		JL	Yes	S4VEM
Potassium	298	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	1.3	mg/kg	1	J	JQ	Yes	S4VEM
Silver	2.1	mg/kg	1			Yes	S4VEM
Sodium	456	mg/kg	1	J	U	Yes	S4VEM
Thallium	2.3	mg/kg	1	U	U	Yes	S4VEM
Vanadium	50.5	mg/kg	1			Yes	S4VEM
Zinc	348	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQT4	Lab Code: CHEM

Sample Number:	MJDQT7	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	RR01SS	pH:	2	Sample Date:	06032011	Sample Time:	11:40:00
% Moisture :				% Solids :	91		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	10600	mg/kg	1			Yes	S4VEM
Antimony	29.3	mg/kg	1		JL	Yes	S4VEM
Arsenic	1.9	mg/kg	1			Yes	S4VEM
Barium	28.4	mg/kg	1			Yes	S4VEM
Beryllium	0.31	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.58	mg/kg	1			Yes	S4VEM
Calcium	3860	mg/kg	1			Yes	S4VEM
Chromium	22.8	mg/kg	1			Yes	S4VEM
Cobalt	4.1	mg/kg	1	J	JL	Yes	S4VEM
Copper	40.3	mg/kg	1			Yes	S4VEM
Iron	12900	mg/kg	1			Yes	S4VEM
Lead	1750	mg/kg	1			Yes	S4VEM
Magnesium	3980	mg/kg	1			Yes	S4VEM
Manganese	183	mg/kg	1			Yes	S4VEM
Nickel	30.1	mg/kg	1		JL	Yes	S4VEM
Potassium	222	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	0.64	mg/kg	1	J	JQ	Yes	S4VEM
Silver	0.86	mg/kg	1	U	U	Yes	S4VEM
Sodium	429	mg/kg	1	J	U	Yes	S4VEM
Thallium	2.1	mg/kg	1	U	U	Yes	S4VEM
Vanadium	40.8	mg/kg	1			Yes	S4VEM
Zinc	24.4	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQT4	Lab Code: CHEM
Sample Number: MJDQT8	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: RR02SS	pH: 2	Sample Date: 06032011	Sample Time: 11:38:00
% Moisture :		% Solids : 91	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	11900	mg/kg	1			Yes	S4VEM
Antimony	5.1	mg/kg	1		JL	Yes	S4VEM
Arsenic	1.5	mg/kg	1			Yes	S4VEM
Barium	40.0	mg/kg	1			Yes	S4VEM
Beryllium	0.33	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.59	mg/kg	1			Yes	S4VEM
Calcium	4780	mg/kg	1			Yes	S4VEM
Chromium	21.2	mg/kg	1			Yes	S4VEM
Cobalt	4.1	mg/kg	1	J	JL	Yes	S4VEM
Copper	19.8	mg/kg	1			Yes	S4VEM
Iron	14700	mg/kg	1			Yes	S4VEM
Lead	364	mg/kg	1			Yes	S4VEM
Magnesium	4190	mg/kg	1			Yes	S4VEM
Manganese	198	mg/kg	1			Yes	S4VEM
Nickel	29.4	mg/kg	1		JL	Yes	S4VEM
Potassium	251	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	1.2	mg/kg	1	J	JQ	Yes	S4VEM
Silver	0.83	mg/kg	1	U	U	Yes	S4VEM
Sodium	413	mg/kg	1	J	U	Yes	S4VEM
Thallium	2.1	mg/kg	1	U	U	Yes	S4VEM
Vanadium	46.0	mg/kg	1			Yes	S4VEM
Zinc	22.6	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQT4	Lab Code: CHEM

Sample Number:	MJDQT9	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	RR03SS	pH:	2	Sample Date:	06032011	Sample Time:	11:57:00
% Moisture :				% Solids :	91.6		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	16800	mg/kg	1			Yes	S4VEM
Antimony	283	mg/kg	1		JL	Yes	S4VEM
Arsenic	6.4	mg/kg	1			Yes	S4VEM
Barium	37.9	mg/kg	1			Yes	S4VEM
Beryllium	0.43	mg/kg	1			Yes	S4VEM
Cadmium	0.95	mg/kg	1			Yes	S4VEM
Calcium	3930	mg/kg	1			Yes	S4VEM
Chromium	28.5	mg/kg	1			Yes	S4VEM
Cobalt	6.3	mg/kg	1		JL	Yes	S4VEM
Copper	522	mg/kg	1			Yes	S4VEM
Iron	17700	mg/kg	1			Yes	S4VEM
Lead	22500	mg/kg	20			Yes	S4VEM
Magnesium	4770	mg/kg	1			Yes	S4VEM
Manganese	271	mg/kg	1			Yes	S4VEM
Nickel	37.7	mg/kg	1		JL	Yes	S4VEM
Potassium	283	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	1.1	mg/kg	1	J	JQ	Yes	S4VEM
Silver	0.50	mg/kg	1	J	JQ	Yes	S4VEM
Sodium	382	mg/kg	1	J	U	Yes	S4VEM
Thallium	1.9	mg/kg	1	U	U	Yes	S4VEM
Vanadium	46.2	mg/kg	1			Yes	S4VEM
Zinc	88.1	mg/kg	1			Yes	S4VEM

Case No:	41282	Contract:	EPW09038	SDG No:	MJDQT4	Lab Code:	CHEM
Sample Number:	MJDQW0	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	SR01SS	pH:	2	Sample Date:	06032011	Sample Time:	09:34:00
% Moisture :				% Solids :	88.5		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	14400	mg/kg	1			Yes	S4VEM
Antimony	463	mg/kg	1		JL	Yes	S4VEM
Arsenic	35.5	mg/kg	1			Yes	S4VEM
Barium	40.0	mg/kg	1			Yes	S4VEM
Beryllium	0.37	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.81	mg/kg	1			Yes	S4VEM
Calcium	3840	mg/kg	1			Yes	S4VEM
Chromium	28.8	mg/kg	1			Yes	S4VEM
Cobalt	5.5	mg/kg	1		JL	Yes	S4VEM
Copper	681	mg/kg	1			Yes	S4VEM
Iron	15900	mg/kg	1			Yes	S4VEM
Lead	21700	mg/kg	20			Yes	S4VEM
Magnesium	4620	mg/kg	1			Yes	S4VEM
Manganese	243	mg/kg	1			Yes	S4VEM
Nickel	33.0	mg/kg	1		JL	Yes	S4VEM
Potassium	326	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	0.53	mg/kg	1	J	JQ	Yes	S4VEM
Silver	0.85	mg/kg	1	J	JQ	Yes	S4VEM
Sodium	452	mg/kg	1	J	U	Yes	S4VEM
Thallium	2.3	mg/kg	1	U	U	Yes	S4VEM
Vanadium	41.7	mg/kg	1			Yes	S4VEM
Zinc	149	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQT4	Lab Code: CHEM
Sample Number: MJDQW1	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: SR02SS	pH: 2	Sample Date: 06032011	Sample Time: 09:45:00
% Moisture :		% Solids : 89.3	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	14600	mg/kg	1			Yes	S4VEM
Antimony	502	mg/kg	1		JL	Yes	S4VEM
Arsenic	34.1	mg/kg	1			Yes	S4VEM
Barium	38.7	mg/kg	1			Yes	S4VEM
Beryllium	0.38	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.78	mg/kg	1			Yes	S4VEM
Calcium	2630	mg/kg	1			Yes	S4VEM
Chromium	25.6	mg/kg	1			Yes	S4VEM
Cobalt	5.6	mg/kg	1		JL	Yes	S4VEM
Copper	3050	mg/kg	20			Yes	S4VEM
Iron	15800	mg/kg	1			Yes	S4VEM
Lead	18500	mg/kg	20			Yes	S4VEM
Magnesium	4670	mg/kg	1			Yes	S4VEM
Manganese	253	mg/kg	1			Yes	S4VEM
Nickel	34.8	mg/kg	1		JL	Yes	S4VEM
Potassium	305	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	0.89	mg/kg	1	J	JQ	Yes	S4VEM
Silver	0.69	mg/kg	1	J	JQ	Yes	S4VEM
Sodium	427	mg/kg	1	J	U	Yes	S4VEM
Thallium	2.1	mg/kg	1	U	U	Yes	S4VEM
Vanadium	40.7	mg/kg	1			Yes	S4VEM
Zinc	222	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQT4	Lab Code: CHEM
Sample Number: MJDQW2	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: SR03SS	pH: 2	Sample Date: 06032011	Sample Time: 10:07:00
% Moisture :		% Solids : 89.6	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	13300	mg/kg	1			Yes	S4VEM
Antimony	459	mg/kg	1		JL	Yes	S4VEM
Arsenic	43.3	mg/kg	1			Yes	S4VEM
Barium	33.6	mg/kg	1			Yes	S4VEM
Beryllium	0.35	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.69	mg/kg	1			Yes	S4VEM
Calcium	3420	mg/kg	1			Yes	S4VEM
Chromium	24.3	mg/kg	1			Yes	S4VEM
Cobalt	4.8	mg/kg	1		JL	Yes	S4VEM
Copper	421	mg/kg	1			Yes	S4VEM
Iron	14700	mg/kg	1			Yes	S4VEM
Lead	20600	mg/kg	20			Yes	S4VEM
Magnesium	4210	mg/kg	1			Yes	S4VEM
Manganese	259	mg/kg	1			Yes	S4VEM
Nickel	30.3	mg/kg	1		JL	Yes	S4VEM
Potassium	279	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	0.77	mg/kg	1	J	JQ	Yes	S4VEM
Silver	0.73	mg/kg	1	J	JQ	Yes	S4VEM
Sodium	404	mg/kg	1	J	U	Yes	S4VEM
Thallium	2.0	mg/kg	1	U	U	Yes	S4VEM
Vanadium	37.3	mg/kg	1			Yes	S4VEM
Zinc	121	mg/kg	1			Yes	S4VEM

Case No:	41282	Contract:	EPW09038	SDG No:	MJDQT4	Lab Code:	CHEM
Sample Number:	MJDQW3	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	SR04SS	pH:	2	Sample Date:	06032011	Sample Time:	10:25:00
% Moisture :				% Solids :	89.3		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	13500	mg/kg	1			Yes	S4VEM
Antimony	364	mg/kg	1		JL	Yes	S4VEM
Arsenic	39.5	mg/kg	1			Yes	S4VEM
Barium	35.5	mg/kg	1			Yes	S4VEM
Beryllium	0.36	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.71	mg/kg	1			Yes	S4VEM
Calcium	2770	mg/kg	1			Yes	S4VEM
Chromium	24.2	mg/kg	1			Yes	S4VEM
Cobalt	5.2	mg/kg	1		JL	Yes	S4VEM
Copper	634	mg/kg	1			Yes	S4VEM
Iron	15100	mg/kg	1			Yes	S4VEM
Lead	15600	mg/kg	20			Yes	S4VEM
Magnesium	4370	mg/kg	1			Yes	S4VEM
Manganese	249	mg/kg	1			Yes	S4VEM
Nickel	30.9	mg/kg	1		JL	Yes	S4VEM
Potassium	298	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	1.0	mg/kg	1	J	JQ	Yes	S4VEM
Silver	0.44	mg/kg	1	J	JQ	Yes	S4VEM
Sodium	424	mg/kg	1	J	U	Yes	S4VEM
Thallium	2.1	mg/kg	1	U	U	Yes	S4VEM
Vanadium	38.8	mg/kg	1			Yes	S4VEM
Zinc	141	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQT4	Lab Code: CHEM
Sample Number: MJDQW4	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: SR05SS	pH: 2	Sample Date: 06032011	Sample Time: 12:20:00
% Moisture :		% Solids : 89.6	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	14200	mg/kg	1			Yes	S4VEM
Antimony	416	mg/kg	1		JL	Yes	S4VEM
Arsenic	27.4	mg/kg	1			Yes	S4VEM
Barium	32.5	mg/kg	1			Yes	S4VEM
Beryllium	0.40	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.71	mg/kg	1			Yes	S4VEM
Calcium	2670	mg/kg	1			Yes	S4VEM
Chromium	27.9	mg/kg	1			Yes	S4VEM
Cobalt	5.4	mg/kg	1		JL	Yes	S4VEM
Copper	303	mg/kg	1			Yes	S4VEM
Iron	15700	mg/kg	1			Yes	S4VEM
Lead	18700	mg/kg	20			Yes	S4VEM
Magnesium	4530	mg/kg	1			Yes	S4VEM
Manganese	259	mg/kg	1			Yes	S4VEM
Nickel	34.4	mg/kg	1		JL	Yes	S4VEM
Potassium	308	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	0.63	mg/kg	1	J	JQ	Yes	S4VEM
Silver	0.39	mg/kg	1	J	JQ	Yes	S4VEM
Sodium	461	mg/kg	1	J	U	Yes	S4VEM
Thallium	2.3	mg/kg	1	U	U	Yes	S4VEM
Vanadium	39.7	mg/kg	1			Yes	S4VEM
Zinc	90.4	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQT4	Lab Code: CHEM

Sample Number:	MJDQW5	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	SR06SS	pH:	2	Sample Date:	06032011	Sample Time:	12:16:00
% Moisture :				% Solids :	89.5		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	14700	mg/kg	1			Yes	S4VEM
Antimony	322	mg/kg	1		JL	Yes	S4VEM
Arsenic	31.6	mg/kg	1			Yes	S4VEM
Barium	36.4	mg/kg	1			Yes	S4VEM
Beryllium	0.39	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.72	mg/kg	1			Yes	S4VEM
Calcium	2760	mg/kg	1			Yes	S4VEM
Chromium	24.8	mg/kg	1			Yes	S4VEM
Cobalt	5.3	mg/kg	1		JL	Yes	S4VEM
Copper	423	mg/kg	1			Yes	S4VEM
Iron	15500	mg/kg	1			Yes	S4VEM
Lead	12900	mg/kg	20			Yes	S4VEM
Magnesium	4550	mg/kg	1			Yes	S4VEM
Manganese	259	mg/kg	1			Yes	S4VEM
Nickel	32.7	mg/kg	1		JL	Yes	S4VEM
Potassium	310	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	0.99	mg/kg	1	J	JQ	Yes	S4VEM
Silver	0.30	mg/kg	1	J	JQ	Yes	S4VEM
Sodium	388	mg/kg	1	J	U	Yes	S4VEM
Thallium	1.9	mg/kg	1	U	U	Yes	S4VEM
Vanadium	39.9	mg/kg	1			Yes	S4VEM
Zinc	95.6	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQT4	Lab Code: CHEM
Sample Number: MJDQW6	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: PR04SS	pH: 2	Sample Date: 06032011	Sample Time: 09:06:00
% Moisture :		% Solids : 88.6	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	13800	mg/kg	1			Yes	S4VEM
Antimony	1100	mg/kg	20		JL	Yes	S4VEM
Arsenic	46.0	mg/kg	1			Yes	S4VEM
Barium	46.8	mg/kg	1			Yes	S4VEM
Beryllium	0.42	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.96	mg/kg	1			Yes	S4VEM
Calcium	7160	mg/kg	1			Yes	S4VEM
Chromium	27.2	mg/kg	1			Yes	S4VEM
Cobalt	5.6	mg/kg	1		JL	Yes	S4VEM
Copper	2340	mg/kg	1			Yes	S4VEM
Iron	18400	mg/kg	1			Yes	S4VEM
Lead	46400	mg/kg	20			Yes	S4VEM
Magnesium	4470	mg/kg	1			Yes	S4VEM
Manganese	298	mg/kg	1			Yes	S4VEM
Nickel	29.9	mg/kg	1		JL	Yes	S4VEM
Potassium	293	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	1.5	mg/kg	1	J	JQ	Yes	S4VEM
Silver	1.8	mg/kg	1			Yes	S4VEM
Sodium	478	mg/kg	1	J	U	Yes	S4VEM
Thallium	2.4	mg/kg	1	U	U	Yes	S4VEM
Vanadium	46.7	mg/kg	1			Yes	S4VEM
Zinc	381	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQT4	Lab Code: CHEM

Sample Number:	MJDQW7	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	RR04SS	pH:	2	Sample Date:	06032011	Sample Time:	11:57:00
% Moisture :				% Solids :	89.7		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	11800	mg/kg	1			Yes	S4VEM
Antimony	112	mg/kg	1		JL	Yes	S4VEM
Arsenic	2.5	mg/kg	1			Yes	S4VEM
Barium	43.3	mg/kg	1			Yes	S4VEM
Beryllium	0.33	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.63	mg/kg	1			Yes	S4VEM
Calcium	3170	mg/kg	1			Yes	S4VEM
Chromium	21.8	mg/kg	1			Yes	S4VEM
Cobalt	5.2	mg/kg	1		JL	Yes	S4VEM
Copper	96.6	mg/kg	1			Yes	S4VEM
Iron	14000	mg/kg	1			Yes	S4VEM
Lead	5420	mg/kg	20			Yes	S4VEM
Magnesium	4500	mg/kg	1			Yes	S4VEM
Manganese	186	mg/kg	1			Yes	S4VEM
Nickel	32.4	mg/kg	1		JL	Yes	S4VEM
Potassium	365	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	0.50	mg/kg	1	J	JQ	Yes	S4VEM
Silver	0.060	mg/kg	1	J	JQ	Yes	S4VEM
Sodium	498	mg/kg	1	J	U	Yes	S4VEM
Thallium	2.5	mg/kg	1	U	U	Yes	S4VEM
Vanadium	37.7	mg/kg	1			Yes	S4VEM
Zinc	36.2	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQT4	Lab Code: CHEM
Sample Number: MJDQW8	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: RF01SS	pH: 2	Sample Date: 06032011	Sample Time: 16:28:00
% Moisture :		% Solids : 91.9	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	12000	mg/kg	1			Yes	S4VEM
Antimony	0.48	mg/kg	1	J	JL	Yes	S4VEM
Arsenic	1.3	mg/kg	1			Yes	S4VEM
Barium	33.2	mg/kg	1			Yes	S4VEM
Beryllium	0.32	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.57	mg/kg	1			Yes	S4VEM
Calcium	3570	mg/kg	1			Yes	S4VEM
Chromium	22.1	mg/kg	1			Yes	S4VEM
Cobalt	4.7	mg/kg	1		JL	Yes	S4VEM
Copper	14.0	mg/kg	1			Yes	S4VEM
Iron	14000	mg/kg	1			Yes	S4VEM
Lead	13.5	mg/kg	1			Yes	S4VEM
Magnesium	3890	mg/kg	1			Yes	S4VEM
Manganese	198	mg/kg	1			Yes	S4VEM
Nickel	27.7	mg/kg	1		JL	Yes	S4VEM
Potassium	214	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	1.2	mg/kg	1	J	JQ	Yes	S4VEM
Silver	0.91	mg/kg	1	U	U	Yes	S4VEM
Sodium	453	mg/kg	1	J	U	Yes	S4VEM
Thallium	2.3	mg/kg	1	U	U	Yes	S4VEM
Vanadium	39.1	mg/kg	1			Yes	S4VEM
Zinc	23.9	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQT4	Lab Code: CHEM

Sample Number:	MJDQX7	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	BK01SS	pH:	2	Sample Date:	06032011	Sample Time:	15:45:00
% Moisture :				% Solids :	81.9		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	14400	mg/kg	1			Yes	S4VEM
Antimony	0.75	mg/kg	1	J	JL	Yes	S4VEM
Arsenic	2.9	mg/kg	1			Yes	S4VEM
Barium	51.6	mg/kg	1			Yes	S4VEM
Beryllium	0.53	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	1.1	mg/kg	1			Yes	S4VEM
Calcium	2090	mg/kg	1			Yes	S4VEM
Chromium	39.8	mg/kg	1			Yes	S4VEM
Cobalt	6.6	mg/kg	1		JL	Yes	S4VEM
Copper	14.6	mg/kg	1			Yes	S4VEM
Iron	27600	mg/kg	1			Yes	S4VEM
Lead	4.7	mg/kg	1			Yes	S4VEM
Magnesium	4620	mg/kg	1			Yes	S4VEM
Manganese	227	mg/kg	1			Yes	S4VEM
Nickel	33.1	mg/kg	1		JL	Yes	S4VEM
Potassium	284	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	2.1	mg/kg	1	J	JQ	Yes	S4VEM
Silver	1.2	mg/kg	1	U	U	Yes	S4VEM
Sodium	611	mg/kg	1	J	U	Yes	S4VEM
Thallium	3.1	mg/kg	1	U	U	Yes	S4VEM
Vanadium	88.6	mg/kg	1			Yes	S4VEM
Zinc	32.0	mg/kg	1			Yes	S4VEM

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MEMORANDUM

DATE: July 21, 2011

FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, Washington MW

TO: Jeff Fetters, START-3 Project Manager, Seattle, Washington

SUBJ: **Inorganic Data Summary Check,**
Kitsap Rifle and Revolver Range Site, Bremerton, Washington

REF: TDD: 10-11-0011 PAN: 002233.0621.01IA

The data summary check of 8 sediment samples collected from the Kitsap Rifle and Revolver Range Site located in Bremerton, Washington, has been completed. Analyses for Target Analyte List (TAL) metals (EPA CLP SOW ISM01.2) were performed by Chemtech Consulting, Inc., Mountainside, New Jersey.

The samples were numbered:

MJDQW9	MJDQX0	MJDQX1	MJDQX2	MJDQX3	MJDQX4
MJDQX8	MJDQY0				

No discrepancies were noted.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

July 5, 2011

Reply To
Attn. Of: **OEA-095**

MEMORANDUM

SUBJECT: Data Validation Report for Metals Analysis of Samples Collected for the Kitsap Rifle & Revolver Range Integrated Assessment - Case 41282, SDG: MJDQW9

FROM: Donald Matheny, Chemist
Office of Environmental Assessment, Environmental Services Unit

TO: Mark Ader, Site Assessment Manager
Jeffry Rodin, On-Scene Coordinator
Office of Environmental Clean-up

CC: Renee Nordeen, Ecology & Environment, Inc.

The quality assurance (QA) review of the analytical data generated from the analysis of eight (8) sediment samples, collected from the above referenced site, has been completed. These samples were analyzed for total metals by Chemtech Consulting located in Mountainside, NJ.

All sample analyses were evaluated following EPA's Stage 4 Data Validation Electronic/Manual Process (S4VEM). The validation was conducted according to the Quality Control Specifications outlined in the Sampling & Quality Assurance Project Plan for the *Sampling and Quality Assurance Plan for the Kitsap Rifle and Revolver Range* (April, 2011), the EPA Contract Laboratory Program's (CLP) Statement of Work (SOW) for Multi-Media, Multi-Concentration Inorganic Analyses (ISM01.2), the National Functional Guidelines for Inorganic Data Review, and the Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. Some data may be qualified using the reviewer's professional judgment. The conclusions presented herein are based on the information provided for the review.

A summary of samples evaluated in this validation report and the pertinent dates for sample collection, sample receipt at the laboratory, extraction and analyses is attached along with the validated data.

I. QUALITY CONTROL RESULTS SUMMARY

Quality Control Test	Result Ranges	Outliers?	Evaluation Criteria
Blanks	Within criteria	Y*	Non-detect or <10% of Sample
Matrix Spike (MJDQY0)	79 – 112%	Y*	75 - 125%
Sample Duplicate (MJDQY0)	≤ 18%	Y*	≤ 20% RPD or ± CRQL
LCS (blank spike)	102 – 127%	N	70 - 130%; (Ag, Sb 50 - 150%)
Serial Dilution (MJDQY0)	≤ 9%	N	≤ 10% Difference

*See the "*Data Qualifications*" section below for excursions and qualification of affected data.

II. DATA QUALIFICATIONS

Summary of Validation Qualifiers Applied

After the manual and electronic data review, the following data qualifications were applied:

Blanks
The following samples have analyte results greater than or equal to MDLs but less than CRQLs. The associated calibration and/or preparation blank analyte results are greater than or equal to MDLs but less than or equal to CRQLs. Detected analytes are qualified U. Non-detected analytes are not qualified. Sample results are elevated at CRQLs.
Cadmium - MJDQX1, MJDQX8, MJDQX0 **Cobalt** - MJDQX1, MJDQX2, MJDQX8, MJDQY0, MJDQX0 **Selenium** – All Samples
Detection Limit
The following samples have results greater than or equal to MDLs but less than CRQLs. Detected analytes are qualified JQ.
Antimony - MJDQX0, MJDQX1, MJDQX3, MJDQX4, MJDQX8, MJDQY0, MJDQW9 **Beryllium** - All Samples **Potassium** - All Samples **Sodium** - All Samples
Matrix Spike
The following Matrix Spike samples have percent recoveries in the range of 30-74% and post-digestion spike samples have percent recoveries greater than 75%. Detected analytes are qualified JL. Non-detected analytes are qualified UJL.
Lead - All samples
Duplicates
The following Duplicate or original sample results are less than or equal to 5xCRQL and the absolute difference between duplicate and original samples are greater than CRQL. The original sample results are greater than or equal to MDLs. Detected analytes are qualified JK.
Aluminum – All samples **Iron** – All samples **Manganese** - All samples **Vanadium** - All samples

Data Qualifiers

The following is a list of validation qualifiers applied to the sample result(s) when needed to indicate associated out-of-control QA/QC results.

Data Qualifiers	
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The associated value is an estimated quantity.
UJ	The analyte was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The data are unusable. The analyte may or may not be present in the sample.
Project Specific Data Qualifiers	
L	Low bias.
H	High bias.
K	Unknown Bias.
Q	Detected concentration is below the method reporting limit / Contract Required Quantitation Limit, but is above the method detection limit.

III. SAMPLE INDEX

Sample Number	Matrix	Sampling Date	Date Received	ICP-AES Analysis	
				Prep. Date	Analysis Date
MJDQW9	Sed.	06/03/2011	06/07/2011	06/15/2011	06/17/2011
MJDQX0	Sed.	06/03/2011	06/07/2011	06/15/2011	06/17/2011
MJDQX1	Sed.	06/03/2011	06/07/2011	06/15/2011	06/17/2011
MJDQX2	Sed.	06/03/2011	06/07/2011	06/15/2011	06/17/2011
MJDQX3	Sed.	06/03/2011	06/07/2011	06/15/2011	06/17/2011
MJDQX4	Sed.	06/03/2011	06/07/2011	06/15/2011	06/17/2011
MJDQX8	Sed.	06/03/2011	06/07/2011	06/15/2011	06/17/2011
MJDQY0	Sed.	06/03/2011	06/07/2011	06/15/2011	06/17/2011

Sample Summary Report

Case No: 41282	Contract: EPW09038	SDG No: MJDQW9	Lab Code: CHEM
Sample Number: MJDQW9	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: WL01SD	pH: 2	Sample Date: 06032011	Sample Time: 12:57:00
% Moisture :		% Solids : 33.3	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	14400	mg/kg	1		JK	Yes	S4VEM
Antimony	2.7	mg/kg	1	J	JQ	Yes	S4VEM
Arsenic	3.0	mg/kg	1			Yes	S4VEM
Barium	106	mg/kg	1			Yes	S4VEM
Beryllium	0.48	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	1.1	mg/kg	1			Yes	S4VEM
Calcium	7310	mg/kg	1			Yes	S4VEM
Chromium	30.0	mg/kg	1			Yes	S4VEM
Cobalt	5.9	mg/kg	1			Yes	S4VEM
Copper	26.4	mg/kg	1			Yes	S4VEM
Iron	18100	mg/kg	1		JK	Yes	S4VEM
Lead	162	mg/kg	1		JL	Yes	S4VEM
Magnesium	3830	mg/kg	1			Yes	S4VEM
Manganese	1040	mg/kg	1		JK	Yes	S4VEM
Nickel	29.4	mg/kg	1			Yes	S4VEM
Potassium	366	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	3.4	mg/kg	1	J	U	Yes	S4VEM
Silver	0.98	mg/kg	1	U	U	Yes	S4VEM
Sodium	254	mg/kg	1	J	JQ	Yes	S4VEM
Thallium	2.4	mg/kg	1	U	U	Yes	S4VEM
Vanadium	64.0	mg/kg	1		JK	Yes	S4VEM
Zinc	89.1	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQW9	Lab Code: CHEM

Sample Number:	MJDQX0	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	WL02SD	pH:	2	Sample Date:	06032011	Sample Time:	13:43:00
% Moisture :				% Solids :	61.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	13100	mg/kg	1		JK	Yes	S4VEM
Antimony	6.7	mg/kg	1	J	JQ	Yes	S4VEM
Arsenic	4.5	mg/kg	1			Yes	S4VEM
Barium	68.6	mg/kg	1			Yes	S4VEM
Beryllium	0.33	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.76	mg/kg	1	J	U	Yes	S4VEM
Calcium	4290	mg/kg	1			Yes	S4VEM
Chromium	23.1	mg/kg	1			Yes	S4VEM
Cobalt	7.6	mg/kg	1	J	U	Yes	S4VEM
Copper	39.3	mg/kg	1			Yes	S4VEM
Iron	14700	mg/kg	1		JK	Yes	S4VEM
Lead	1030	mg/kg	1		JL	Yes	S4VEM
Magnesium	3130	mg/kg	1			Yes	S4VEM
Manganese	567	mg/kg	1		JK	Yes	S4VEM
Nickel	21.8	mg/kg	1			Yes	S4VEM
Potassium	276	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	5.3	mg/kg	1	J	U	Yes	S4VEM
Silver	1.5	mg/kg	1	U	U	Yes	S4VEM
Sodium	357	mg/kg	1	J	JQ	Yes	S4VEM
Thallium	3.8	mg/kg	1	U	U	Yes	S4VEM
Vanadium	39.5	mg/kg	1		JK	Yes	S4VEM
Zinc	63.2	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQW9	Lab Code: CHEM

Sample Number: MJDQX1	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: WL03SD	pH: 2	Sample Date: 06032011	Sample Time: 13:36:00
% Moisture :		% Solids : 68.2	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	12000	mg/kg	1		JK	Yes	S4VEM
Antimony	5.9	mg/kg	1	J	JQ	Yes	S4VEM
Arsenic	2.3	mg/kg	1			Yes	S4VEM
Barium	66.8	mg/kg	1			Yes	S4VEM
Beryllium	0.27	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.72	mg/kg	1	J	U	Yes	S4VEM
Calcium	2610	mg/kg	1			Yes	S4VEM
Chromium	19.9	mg/kg	1			Yes	S4VEM
Cobalt	7.2	mg/kg	1	J	U	Yes	S4VEM
Copper	67.0	mg/kg	1			Yes	S4VEM
Iron	14100	mg/kg	1		JK	Yes	S4VEM
Lead	1170	mg/kg	1		JL	Yes	S4VEM
Magnesium	2860	mg/kg	1			Yes	S4VEM
Manganese	227	mg/kg	1		JK	Yes	S4VEM
Nickel	23.2	mg/kg	1			Yes	S4VEM
Potassium	347	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	5.0	mg/kg	1	J	U	Yes	S4VEM
Silver	1.4	mg/kg	1	U	U	Yes	S4VEM
Sodium	265	mg/kg	1	J	JQ	Yes	S4VEM
Thallium	3.6	mg/kg	1	U	U	Yes	S4VEM
Vanadium	38.0	mg/kg	1		JK	Yes	S4VEM
Zinc	46.0	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQW9	Lab Code: CHEM

Sample Number:	MJDQX2	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	WL04SD	pH:	2	Sample Date:	06032011	Sample Time:	14:10:00
% Moisture :				% Solids :	39.7		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	17100	mg/kg	1		JK	Yes	S4VEM
Antimony	21.8	mg/kg	1			Yes	S4VEM
Arsenic	4.0	mg/kg	1			Yes	S4VEM
Barium	100	mg/kg	1			Yes	S4VEM
Beryllium	0.41	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.89	mg/kg	1			Yes	S4VEM
Calcium	5300	mg/kg	1			Yes	S4VEM
Chromium	31.0	mg/kg	1			Yes	S4VEM
Cobalt	4.9	mg/kg	1	J	U	Yes	S4VEM
Copper	26.8	mg/kg	1			Yes	S4VEM
Iron	17400	mg/kg	1		JK	Yes	S4VEM
Lead	780	mg/kg	1		JL	Yes	S4VEM
Magnesium	4450	mg/kg	1			Yes	S4VEM
Manganese	266	mg/kg	1		JK	Yes	S4VEM
Nickel	35.2	mg/kg	1			Yes	S4VEM
Potassium	436	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	3.5	mg/kg	1	J	U	Yes	S4VEM
Silver	0.99	mg/kg	1	U	U	Yes	S4VEM
Sodium	265	mg/kg	1	J	JQ	Yes	S4VEM
Thallium	2.5	mg/kg	1	U	U	Yes	S4VEM
Vanadium	49.4	mg/kg	1		JK	Yes	S4VEM
Zinc	76.2	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQW9	Lab Code: CHEM
Sample Number: MJDQX3	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: WL05SD	pH: 2	Sample Date: 06032011	Sample Time: 14:20:00
% Moisture :		% Solids : 65.2	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	16900	mg/kg	1		JK	Yes	S4VEM
Antimony	3.3	mg/kg	1	J	JQ	Yes	S4VEM
Arsenic	2.8	mg/kg	1			Yes	S4VEM
Barium	78.1	mg/kg	1			Yes	S4VEM
Beryllium	0.49	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.82	mg/kg	1			Yes	S4VEM
Calcium	4280	mg/kg	1			Yes	S4VEM
Chromium	16.6	mg/kg	1			Yes	S4VEM
Cobalt	7.6	mg/kg	1			Yes	S4VEM
Copper	26.8	mg/kg	1			Yes	S4VEM
Iron	18800	mg/kg	1		JK	Yes	S4VEM
Lead	1260	mg/kg	1		JL	Yes	S4VEM
Magnesium	3980	mg/kg	1			Yes	S4VEM
Manganese	470	mg/kg	1		JK	Yes	S4VEM
Nickel	33.7	mg/kg	1			Yes	S4VEM
Potassium	207	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	5.2	mg/kg	1	J	U	Yes	S4VEM
Silver	1.5	mg/kg	1	U	U	Yes	S4VEM
Sodium	272	mg/kg	1	J	JQ	Yes	S4VEM
Thallium	3.7	mg/kg	1	U	U	Yes	S4VEM
Vanadium	40.8	mg/kg	1		JK	Yes	S4VEM
Zinc	73.4	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQW9	Lab Code: CHEM

Sample Number:	MJDQX4	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	WL06SD	pH:	2	Sample Date:	06032011	Sample Time:	14:56:00
% Moisture :				% Solids :	75.9		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	17900	mg/kg	1		JK	Yes	S4VEM
Antimony	0.56	mg/kg	1	J	JQ	Yes	S4VEM
Arsenic	2.1	mg/kg	1			Yes	S4VEM
Barium	54.7	mg/kg	1			Yes	S4VEM
Beryllium	0.46	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.56	mg/kg	1			Yes	S4VEM
Calcium	2300	mg/kg	1			Yes	S4VEM
Chromium	24.6	mg/kg	1			Yes	S4VEM
Cobalt	5.8	mg/kg	1			Yes	S4VEM
Copper	19.3	mg/kg	1			Yes	S4VEM
Iron	14200	mg/kg	1		JK	Yes	S4VEM
Lead	34.3	mg/kg	1		JL	Yes	S4VEM
Magnesium	3040	mg/kg	1			Yes	S4VEM
Manganese	887	mg/kg	1		JK	Yes	S4VEM
Nickel	33.6	mg/kg	1			Yes	S4VEM
Potassium	243	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	3.8	mg/kg	1	J	U	Yes	S4VEM
Silver	1.1	mg/kg	1	U	U	Yes	S4VEM
Sodium	166	mg/kg	1	J	JQ	Yes	S4VEM
Thallium	2.7	mg/kg	1	U	U	Yes	S4VEM
Vanadium	41.6	mg/kg	1		JK	Yes	S4VEM
Zinc	44.2	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQW9	Lab Code: CHEM

Sample Number:	MJDQX8	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	BK01SD	pH:	2	Sample Date:	06032011	Sample Time:	15:20:00
% Moisture :				% Solids :	79.6		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	11800	mg/kg	1		JK	Yes	S4VEM
Antimony	0.65	mg/kg	1	J	JQ	Yes	S4VEM
Arsenic	1.9	mg/kg	1			Yes	S4VEM
Barium	43.0	mg/kg	1			Yes	S4VEM
Beryllium	0.31	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.63	mg/kg	1	J	U	Yes	S4VEM
Calcium	2990	mg/kg	1			Yes	S4VEM
Chromium	23.0	mg/kg	1			Yes	S4VEM
Cobalt	6.3	mg/kg	1	J	U	Yes	S4VEM
Copper	10.3	mg/kg	1			Yes	S4VEM
Iron	13300	mg/kg	1		JK	Yes	S4VEM
Lead	4.3	mg/kg	1		JL	Yes	S4VEM
Magnesium	3280	mg/kg	1			Yes	S4VEM
Manganese	205	mg/kg	1		JK	Yes	S4VEM
Nickel	26.2	mg/kg	1			Yes	S4VEM
Potassium	297	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	4.4	mg/kg	1	J	U	Yes	S4VEM
Silver	1.3	mg/kg	1	U	U	Yes	S4VEM
Sodium	221	mg/kg	1	J	JQ	Yes	S4VEM
Thallium	3.1	mg/kg	1	U	U	Yes	S4VEM
Vanadium	37.1	mg/kg	1		JK	Yes	S4VEM
Zinc	28.0	mg/kg	1			Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQW9	Lab Code: CHEM

Sample Number:	MJDQY0	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	BK02SD	pH:	2	Sample Date:	06032011	Sample Time:	16:00:00
% Moisture :				% Solids :	80.8		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	18400	mg/kg	1		JK	Yes	S4VEM
Antimony	0.91	mg/kg	1	J	JQ	Yes	S4VEM
Arsenic	2.6	mg/kg	1			Yes	S4VEM
Barium	52.7	mg/kg	1			Yes	S4VEM
Beryllium	0.45	mg/kg	1	J	JQ	Yes	S4VEM
Cadmium	0.69	mg/kg	1			Yes	S4VEM
Calcium	2630	mg/kg	1			Yes	S4VEM
Chromium	31.7	mg/kg	1			Yes	S4VEM
Cobalt	6.2	mg/kg	1	J	U	Yes	S4VEM
Copper	13.1	mg/kg	1			Yes	S4VEM
Iron	16900	mg/kg	1		JK	Yes	S4VEM
Lead	16.6	mg/kg	1		JL	Yes	S4VEM
Magnesium	3620	mg/kg	1			Yes	S4VEM
Manganese	607	mg/kg	1		JK	Yes	S4VEM
Nickel	44.8	mg/kg	1			Yes	S4VEM
Potassium	224	mg/kg	1	J	JQ	Yes	S4VEM
Selenium	4.3	mg/kg	1	J	U	Yes	S4VEM
Silver	1.2	mg/kg	1	U	U	Yes	S4VEM
Sodium	261	mg/kg	1	J	JQ	Yes	S4VEM
Thallium	3.1	mg/kg	1	U	U	Yes	S4VEM
Vanadium	45.0	mg/kg	1		JK	Yes	S4VEM
Zinc	52.9	mg/kg	1			Yes	S4VEM

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International Specialists in the Environment
720 Third Avenue, Suite 1700, Seattle, WA 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: July 21, 2011

FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, Washington MW

TO: Jeff Fetters, START-3 Project Manager, Seattle, Washington

SUBJ: **Inorganic Data Summary Check,**
Kitsap Rifle and Revolver Range Site, Bremerton, Washington

REF: TDD: 10-11-0011 PAN: 002233.0621.01IA

The data summary check of 4 water samples collected from the Kitsap Rifle and Revolver Range Site located in Bremerton, Washington, has been completed. Analyses for Target Analyte List (TAL) metals (EPA CLP SOW ISM01.2) were performed by Chemtech Consulting, Inc., Mountainside, New Jersey.

The samples were numbered:

MJDQX5 MJDQX6 MJDQX9 MJDQY1

No discrepancies were noted.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

July 21, 2011

Reply To
Attn. Of: **OEA-095**

MEMORANDUM

SUBJECT: Revised Data Validation Report for Metals Analysis of Samples Collected for the Kitsap Rifle & Revolver Range Integrated Assessment - Case 41282, SDG: MJDQX5

FROM: Donald Matheny, Chemist
Office of Environmental Assessment, Environmental Services Unit

TO: Mark Ader, Site Assessment Manager
Jeffry Rodin, On-Scene Coordinator
Office of Environmental Clean-up

CC: Renee Nordeen, Ecology & Environment, Inc.

The revised quality assurance (QA) review of the analytical data generated from the analysis of four (4) water samples, collected from the above referenced site, has been completed. The revision was due to the removal of a system applied "J" qualifier to a non-detected manganese result and clarification in the data qualifications table. These samples were analyzed for total metals by Chemtech Consulting located in Mountainside, NJ.

All sample analyses were evaluated following EPA's Stage 4 Data Validation Electronic/Manual Process (S4VEM). The validation was conducted according to the Quality Control Specifications outlined in the Sampling & Quality Assurance Project Plan for the *Sampling and Quality Assurance Plan for the Kitsap Rifle and Revolver Range* (April, 2011), the EPA Contract Laboratory Program's (CLP) Statement of Work (SOW) for Multi-Media, Multi-Concentration Inorganic Analyses (ISM01.2), the National Functional Guidelines for Inorganic Data Review, and the Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. Some data may be qualified using the reviewer's professional judgment. The conclusions presented herein are based on the information provided for the review.

A summary of samples evaluated in this validation report and the pertinent dates for sample collection, sample receipt at the laboratory, extraction and analyses is attached along with the validated data.

I. QUALITY CONTROL RESULTS SUMMARY

Quality Control Test	Result Ranges	Outliers?	Evaluation Criteria
Blanks	Within criteria	Y*	Non-detect or <10% of Sample
Matrix Spike (MJDQY0)	90 – 103%	N	75 - 125%
Sample Duplicate (MJDQY0)	≤ 2%	N	≤ 20% RPD or ± CRQL
LCS (blank spike)	95 – 111%	N	70 - 130%; (Ag, Sb 50 - 150%)
Serial Dilution (MJDQY0)	≤ 8%	Y*	≤ 10% Difference

*See the "*Data Qualifications*" section below for excursions and qualification of affected data.

II. DATA QUALIFICATIONS

Summary of Validation Qualifiers Applied

After the manual and electronic data review, the following data qualifications were applied:

Blanks
The following samples have analyte results greater than or equal to MDLs but less than CRQLs. The associated calibration and/or preparation blank analyte results are greater than or equal to MDLs but less than or equal to CRQLs. Detected analytes are qualified U. Non-detected analytes are not qualified. Sample results are elevated at CRQLs.
Aluminum - MJDQX6, MJDQX9, MJDQX5 **Chromium** – MJDQX9 **Iron** - MJDQX6, MJDQY1 **Lead** - MJDQX6, MJDQY1, MJDQX5 **Manganese** - MJDQY1 **Sodium** – All samples **Thallium** - MJDQX6, MJDQX9 **Vanadium** - MJDQX6, MJDQY1
Detection Limit
The following samples have results greater than or equal to MDLs but less than CRQLs. Detected analytes are qualified JQ.
Arsenic - MJDQX6 **Barium** - MJDQX6, MJDQX9, MJDQX5 **Calcium** – All samples **Lead** - MJDQX6, MJDQY1, MJDQX5 **Nickel** - MJDQX6, MJDQY1, MJDQX5 **Magnesium** – All samples **Potassium** - MJDQX6, MJDQX5 **Zinc** - MJDQX6, MJDQX9, MJDQX5
Serial Dilution
The following ICP-AES Serial Dilution (SD) samples have percent difference (%D) greater than 10% and initial sample results are greater than 50xMDLs. The detected analytes in samples with results greater than or equal to MDLs are qualified JL.
Manganese – MJDQX6, MJDQX6, MJDQX9

Data Qualifiers

The following is a list of validation qualifiers applied to the sample result(s) when needed to indicate associated out-of-control QA/QC results.

Data Qualifiers	
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The associated value is an estimated quantity.
UJ	The analyte was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The data are unusable. The analyte may or may not be present in the sample.
Project Specific Data Qualifiers	
L	Low bias.
H	High bias.
K	Unknown Bias.
Q	Detected concentration is below the method reporting limit / Contract Required Quantitation Limit, but is above the method detection limit.

III. SAMPLE INDEX

Sample Number	Matrix	Sampling Date	Date Received	ICP-AES Analysis	
				Prep. Date	Analysis Date
MJDQX5	Water	06/03/2011	06/07/2011	06/09/2011	06/14/2011
MJDQX6	Water	06/03/2011	06/07/2011	06/09/2011	06/14/2011
MJDQX9	Water	06/03/2011	06/07/2011	06/09/2011	06/14/2011
MJDQY1	Water	06/03/2011	06/07/2011	06/09/2011	06/14/2011

Sample Summary Report

Case No: 41282	Contract: EPW09038	SDG No: MJDQX5	Lab Code: CHEM
Sample Number: MJDQX5	Method: ICP_AES	Matrix: Water	MA Number: DEFAULT
Sample Location: WL01WT	pH: 2	Sample Date: 06032011	Sample Time: 14:20:00
% Moisture :		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1	J	U	Yes	S4VEM
Antimony	60.0	ug/L	1	U	U	Yes	S4VEM
Arsenic	10.0	ug/L	1	U	U	Yes	S4VEM
Barium	7.4	ug/L	1	J	JQ	Yes	S4VEM
Beryllium	5.0	ug/L	1	U	U	Yes	S4VEM
Cadmium	5.0	ug/L	1	U	U	Yes	S4VEM
Calcium	3170	ug/L	1	J	JQ	Yes	S4VEM
Chromium	10.0	ug/L	1	U	U	Yes	S4VEM
Cobalt	50.0	ug/L	1	U	U	Yes	S4VEM
Copper	25.0	ug/L	1	U	U	Yes	S4VEM
Iron	133	ug/L	1			Yes	S4VEM
Lead	10.0	ug/L	1	J	U	Yes	S4VEM
Magnesium	1020	ug/L	1	J	JQ	Yes	S4VEM
Manganese	44.1	ug/L	1		JL	Yes	S4VEM
Nickel	0.92	ug/L	1	J	JQ	Yes	S4VEM
Potassium	467	ug/L	1	J	JQ	Yes	S4VEM
Selenium	35.0	ug/L	1	U	U	Yes	S4VEM
Silver	10.0	ug/L	1	U	U	Yes	S4VEM
Sodium	5000	ug/L	1	J	U	Yes	S4VEM
Thallium	25.0	ug/L	1	U	U	Yes	S4VEM
Vanadium	50.0	ug/L	1	U	U	Yes	S4VEM
Zinc	10.1	ug/L	1	J	JQ	Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQX5	Lab Code: CHEM
Sample Number: MJDQX6	Method: ICP_AES	Matrix: Water	MA Number: DEFAULT
Sample Location: WL02WT	pH: 2	Sample Date: 06032011	Sample Time: 14:45:00
% Moisture :		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1	J	U	Yes	S4VEM
Antimony	60.0	ug/L	1	U	U	Yes	S4VEM
Arsenic	3.5	ug/L	1	J	JQ	Yes	S4VEM
Barium	7.2	ug/L	1	J	JQ	Yes	S4VEM
Beryllium	5.0	ug/L	1	U	U	Yes	S4VEM
Cadmium	5.0	ug/L	1	U	U	Yes	S4VEM
Calcium	2450	ug/L	1	J	JQ	Yes	S4VEM
Chromium	10.0	ug/L	1	U	U	Yes	S4VEM
Cobalt	50.0	ug/L	1	U	U	Yes	S4VEM
Copper	25.0	ug/L	1	U	U	Yes	S4VEM
Iron	100	ug/L	1	J	U	Yes	S4VEM
Lead	10.0	ug/L	1	J	U	Yes	S4VEM
Magnesium	847	ug/L	1	J	JQ	Yes	S4VEM
Manganese	21.3	ug/L	1		JL	Yes	S4VEM
Nickel	0.70	ug/L	1	J	JQ	Yes	S4VEM
Potassium	148	ug/L	1	J	JQ	Yes	S4VEM
Selenium	35.0	ug/L	1	U	U	Yes	S4VEM
Silver	10.0	ug/L	1	U	U	Yes	S4VEM
Sodium	5000	ug/L	1	J	U	Yes	S4VEM
Thallium	25.0	ug/L	1	J	U	Yes	S4VEM
Vanadium	50.0	ug/L	1	J	U	Yes	S4VEM
Zinc	6.0	ug/L	1	J	JQ	Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQX5	Lab Code: CHEM

Sample Number:	MJDQX9	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	BK01WT	pH:	2	Sample Date:	06032011	Sample Time:	15:17:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1	J	U	Yes	S4VEM
Antimony	60.0	ug/L	1	U	U	Yes	S4VEM
Arsenic	10.0	ug/L	1	U	U	Yes	S4VEM
Barium	4.9	ug/L	1	J	JQ	Yes	S4VEM
Beryllium	5.0	ug/L	1	U	U	Yes	S4VEM
Cadmium	5.0	ug/L	1	U	U	Yes	S4VEM
Calcium	2730	ug/L	1	J	JQ	Yes	S4VEM
Chromium	10.0	ug/L	1	J	U	Yes	S4VEM
Cobalt	50.0	ug/L	1	U	U	Yes	S4VEM
Copper	25.0	ug/L	1	U	U	Yes	S4VEM
Iron	102	ug/L	1			Yes	S4VEM
Lead	10.0	ug/L	1	U	U	Yes	S4VEM
Magnesium	897	ug/L	1	J	JQ	Yes	S4VEM
Manganese	29.8	ug/L	1		JL	Yes	S4VEM
Nickel	40.0	ug/L	1	U	U	Yes	S4VEM
Potassium	5000	ug/L	1	U	U	Yes	S4VEM
Selenium	35.0	ug/L	1	U	U	Yes	S4VEM
Silver	10.0	ug/L	1	U	U	Yes	S4VEM
Sodium	5000	ug/L	1	J	U	Yes	S4VEM
Thallium	25.0	ug/L	1	J	U	Yes	S4VEM
Vanadium	50.0	ug/L	1	U	U	Yes	S4VEM
Zinc	13.0	ug/L	1	J	JQ	Yes	S4VEM

Case No: 41282	Contract: EPW09038	SDG No: MJDQX5	Lab Code: CHEM
Sample Number: MJDQY1	Method: ICP_AES	Matrix: Water	MA Number: DEFAULT
Sample Location: RI01WT	pH: 2	Sample Date: 06032011	Sample Time: 11:03:00
% Moisture :		% Solids :	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1	U	U	Yes	S4VEM
Antimony	60.0	ug/L	1	U	U	Yes	S4VEM
Arsenic	10.0	ug/L	1	U	U	Yes	S4VEM
Barium	200	ug/L	1	U	U	Yes	S4VEM
Beryllium	5.0	ug/L	1	U	U	Yes	S4VEM
Cadmium	5.0	ug/L	1	U	U	Yes	S4VEM
Calcium	699	ug/L	1	J	JQ	Yes	S4VEM
Chromium	10.0	ug/L	1	U	U	Yes	S4VEM
Cobalt	50.0	ug/L	1	U	U	Yes	S4VEM
Copper	25.0	ug/L	1	U	U	Yes	S4VEM
Iron	100	ug/L	1	J	U	Yes	S4VEM
Lead	10.0	ug/L	1	J	U	Yes	S4VEM
Magnesium	75.4	ug/L	1	J	JQ	Yes	S4VEM
Manganese	15.0	ug/L	1	J	U	Yes	S4VEM
Nickel	0.71	ug/L	1	J	JQ	Yes	S4VEM
Potassium	5000	ug/L	1	U	U	Yes	S4VEM
Selenium	35.0	ug/L	1	U	U	Yes	S4VEM
Silver	10.0	ug/L	1	U	U	Yes	S4VEM
Sodium	5000	ug/L	1	J	U	Yes	S4VEM
Thallium	25.0	ug/L	1	U	U	Yes	S4VEM
Vanadium	50.0	ug/L	1	J	U	Yes	S4VEM
Zinc	60.0	ug/L	1	U	U	Yes	S4VEM

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Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: July 21, 2011

FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, Washington MW

TO: Jeff Fetters, START-3 Project Manager, Seattle, Washington

SUBJ: **Organic Data Summary Check,**
Kitsap Rifle and Revolver Range Site, Bremerton, Washington

REF: TDD: 10-11-0011 PAN: 002233.0621.01IA

The data summary check of 8 soil and 3 water samples collected from the Kitsap Rifle and Revolver Range Site located in Bremerton, Washington, has been completed. Analyses for nitroaromatics, nitramines, and nitrate esters (EPA Method 8330B) were performed at the Manchester Environmental Laboratory, Port Orchard, Washington.

The samples were numbered:

Soil	11224015	11224016	11224017	11224018	11224019
	11224020	11224024	11224029		
Water	11224021	11224022	11224025		

No discrepancies were noted. The bias qualifier "L" was added by the secondary reviewer to applicable estimated results to indicate that the associated sample quantitation limit has a low bias.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 LABORATORY
7411 Beach Dr. East
Port Orchard, Washington 98366

MEMORANDUM

SUBJECT:	Data Release for Nitroaromatics, Nitramines, and Nitrate Esters Analysis Results from the USEPA Region 10 Laboratory
PROJECT NAME:	Kitsap Rifle and Revolver Range
PROJECT CODE:	TEC-991A
FROM:	Gerald Dodo, Supervisory Chemist Office of Environmental Assessment, USEPA Region 10 Laboratory
TO:	Don Mathaney, OEA Office of Environmental Cleanup, USEPA Region 10
CC:	Mark Ader USEPA, Jeff Rodin USEPA Renee Nordeen (rnordeen@ene.com)

I have authorized release of this data package. Attached you will find the Nitroaromatics, Nitramines, and Nitrate Esters results for the Kitsap Firing Range project for the samples collected on 06/06/10. For further information regarding the attached data, contact Dana Walker at 360-871-8704.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 LABORATORY
7411 Beach Dr. East
Port Orchard, Washington 98366

QUALITY ASSURANCE MEMORANDUM FOR ORGANIC CHEMICAL ANALYSES

Date: July 14, 2011

To: Don Matheny
Office of Environmental Assessment, USEPA Region 10

From: Dana Walker, Chemist
Office of Environmental Assessment, USEPA Region 10 Laboratory

Subject: Quality Assurance Review for the Kitsap Rifle and Revolver Range Project
Project Code: TEC-991A
Account Code: 2011T10P302DD2C10ZZLA00

CC: Mark Ader USEPA, Jeff Rodin USEPA,
Renee Nordeen (rnordeen@ene.com)

The following is a quality assurance review of the data for nitroaromatics, nitramines, and nitrate esters analysis of 8 soil and 3 water samples from the above referenced site. The analyses were performed by the EPA Region 10 Laboratory ESAT contractor using EPA SW846 method 8330B.

This review was conducted for the following samples:

Soil:					
	11224015	11224016	11224017	11224018	11224019
	11224020	11224024	11224029		
Water:					
	11224021	11224022	11224025		

1. Data Qualifications

Comments below refer to the quality control specifications outlined in the Laboratory's current Quality Assurance Manual, Standard Operating Procedures (SOPs) and the Quality Assurance Project Plan (QAPP). No excursions were required from the method Standard Operating Procedure.

The quality control measures that did not meet Laboratory/QAPP criteria are annotated in the title of each affected subsection with "L*aboratory/QAPP Criteria Not Met*".

For those tests for which the EPA Region 10 Laboratory has been accredited by the National Environmental Laboratory Accreditation Conference (NELAC), all requirements of the current NELAC Standard have been met.

2. Sample Transport and Receipt

Upon sample receipt, no conditions were noted that would impact data quality.

3. Sample Holding Times

The concentration of an analyte in a sample or extract of a sample may increase or decrease over time depending on the nature of the analyte. The holding time maximum criteria applied for the extraction of soil samples is 14 days and water samples is 7 days from the time of collection. Extracts have a holding time maximum of 40 days from the time of preparation. All samples were extracted and analyzed within these criteria.

4. Sample Preparation

Samples were prepared according to the method.

5. Initial Calibration/Continuing Calibration Verification (CCV)

Initial calibration was performed on 05/04/11. Correlation coefficients met the criteria of $\geq$0.99. Due to coelution of a number of analytes, two standards and spiking solutions were used. Also, a second source calibration verification was analyzed and passed the required 70-130% recovery.

The CCVs for samples met the criteria for frequency of analysis. The percent accuracies were 85-115% of the true value except for the following.

6. Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD) - *Laboratory/QAPP Criteria Not Met*

LCS/LCSD are generated to provide information on the accuracy and precision of the analytical method and the laboratory performance. The LCS/LCSD recoveries were within the criteria of 70-130% with a relative percent difference (RPD) of $\leq$30 for waters and soils with the exception of Tetryl. There was a low recovery problem for Tetryl because it breaks down while in a mixed solvent system (e.g., water/organic solvent). Based on this all results for samples and QC for Tetryl have been flagged with a J (the identification of the analyte is acceptable; the reported value is an estimate.). No Tetryl was detected in any water or soil sample.

7. Blank Analysis

Method blanks were analyzed with each sample batch to evaluate the potential for laboratory contamination and effects on the sample results. Target analytes were not detected in method blanks.

8. Surrogate Spikes

Surrogate recoveries are used to help in the evaluation of laboratory performance on individual samples. The surrogate compound used for these analyses was 1,2-dinitrobenzene. All surrogate recoveries were within the criteria of 70-130%.

9. Matrix Spike/Matrix Spike Duplicate Analysis (MS/MSD) - *Laboratory/QAPP Criteria Not Met*

MS/MSD analyses are performed to provide information on the effects of sample matrices toward the analytical method. An MS/MSD analysis was performed using water sample 11224025 for waters and 11224020 for soils. The recoveries met the criteria of 50-150% for soil samples for all analytes, however, for water samples Tetryl, 1,3,5-Trinitrobenzene, and 2,4,6-Trinitrotoluene recoveries were low for both the MS and MSD. For the associated sample (11224025) and MS/MSD, those analytes were flagged with a J (the identification of the analyte is acceptable; the reported value is an estimate.).

10. Compound Quantitation

The initial calibration functions from the primary column were used for calculations. Reported quantitation limits and detected analyte results were based on the initial calibration standards and sample size used for the analysis.

Do to poor low level calibration response, TETRYL and PETN were reported at elevated reporting limits.

All manual integrations have been reviewed and found to comply with acceptable integration practices.

11. Identification

Method 8330B analytes and the surrogate were identified based on chromatographic retention times of two dissimilar liquid chromatography columns.

12. Data Qualifiers

All requirements for data qualifiers from the preceding sections were accumulated. Each sample data summary sheet and each compound was checked for positive or negative results. From this, the overall need for data qualifiers for each analysis was determined. In cases where more than one of the preceding sections required data qualifiers, the most restrictive qualifier has been added to the data.

The usefulness of qualified data should be treated according to the severity of the qualifier in light of the project's data quality objectives. Should questions arise regarding the data, contact Dana Walker at the Region 10 Laboratory, phone number (360) 871 - 8704.

Qualifier	Definition
U	The analyte was not detected at or above the reported value.
J	The identification of the analyte is acceptable; the reported value is an estimate.
UJ	The analyte was not detected at or above the reported value. The reported value is an estimate.
R	The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable. No value is reported with this qualification.
NA	Not Applicable, the parameter was not analyzed for, or there is no analytical result for this parameter. No value is reported with this qualification.

US EPA Region 10 Laboratory

Multi-Analyte Final Report

TEC-991A KITSAP RIFLE AND REVOLVER RANGE

Project Code : TEC-991A

Contact : Don Matheny — **Lab Name :** Region 10 Lab

Account : 11T10P302DD2C10ZZLA00 — **Lab eRLN ID :** USEPA Region 10 Laboratory

Sample Information

11224015

Description : WL01SD

Sampling Date/Time : 6/3/2011 12:57:00PM

Matrix : Sediment

Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment — **Data Package :**PKG# 1163

Weight Basis :

Preparation Method(s):

8330B - Explosives by HPLC

Analytical Method:

8330B - Explosives by HPLC

Target Results

Analyte Code	Analyte Name	Result	Unit	Qual.
99354	1,3,5-Trinitrobenzene	80	ug/kg	U
99650	1,3-Dinitrobenzene	80	ug/kg	U
118967	2,4,6-Trinitrotoluene	80	ug/kg	U
121142	2,4-Dinitrotoluene	80	ug/kg	U
606202	2,6-Dinitrotoluene	80	ug/kg	U
35572782	2-amino, 4,6-Dinitrotoluene	80	ug/kg	U
88722	2-Nitrotoluene	80	ug/kg	U
99081	3-Nitrotoluene	80	ug/kg	U
1946510	4-amino,2,6-Dinitrotoluene	80	ug/kg	U
99990	4-Nitrotoluene	80	ug/kg	U
618871	BENZENAMINE, 3,5-DINITRO-	80	ug/kg	U
2691410	HMX	80	ug/kg	U
98953	Nitrobenzene	80	ug/kg	U
55630	Nitroglycerine	80	ug/kg	U
78115	PETN	400	ug/kg	U
121824	RDX	160	ug/kg	U
479458	TETRYL	1000	ug/kg	UJ L

Explosives

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**69**	%Rec	

Sample Information

11224016

Description : WL02SD

Sampling Date/Time : 6/3/2011 1:43:00PM

Matrix : Sediment

Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):

8330B - Explosives by HPLC

Analytical Method:

8330B - Explosives by HPLC

Target Results

Analyte Code	Analyte Name	Result	Unit	Qual.
99354	1,3,5-Trinitrobenzene	80	ug/kg	U
99650	1,3-Dinitrobenzene	80	ug/kg	U
118967	2,4,6-Trinitrotoluene	80	ug/kg	U
121142	2,4-Dinitrotoluene	80	ug/kg	U
606202	2,6-Dinitrotoluene	80	ug/kg	U
35572782	2-amino, 4,6-Dinitrotoluene	80	ug/kg	U
88722	2-Nitrotoluene	80	ug/kg	U
99081	3-Nitrotoluene	80	ug/kg	U
1946510	4-amino,2,6-Dinitrotoluene	80	ug/kg	U
99990	4-Nitrotoluene	80	ug/kg	U
618871	BENZENAMINE, 3,5-DINITRO-	80	ug/kg	U
2691410	HMX	80	ug/kg	U
98953	Nitrobenzene	80	ug/kg	U
55630	Nitroglycerine	80	ug/kg	U
78115	PETN	400	ug/kg	U
121824	RDX	160	ug/kg	U
479458	TETRYL	1000	ug/kg	UJ L

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**99**	%Rec	

Sample Information

11224017

Description : WL03SD

Sampling Date/Time : 6/3/2011 1:36:00PM
Matrix : Sediment
Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Target Results

Analyte Code	Analyte Name	Result	Unit	Qual.
99354	1,3,5-Trinitrobenzene	80	ug/kg	U
99650	1,3-Dinitrobenzene	80	ug/kg	U
118967	2,4,6-Trinitrotoluene	80	ug/kg	U
121142	2,4-Dinitrotoluene	80	ug/kg	U
606202	2,6-Dinitrotoluene	80	ug/kg	U
35572782	2-amino, 4,6-Dinitrotoluene	80	ug/kg	U
88722	2-Nitrotoluene	80	ug/kg	U
99081	3-Nitrotoluene	80	ug/kg	U
1946510	4-amino,2,6-Dinitrotoluene	80	ug/kg	U
99990	4-Nitrotoluene	80	ug/kg	U
618871	BENZENAMINE, 3,5-DINITRO-	80	ug/kg	U
2691410	HMX	80	ug/kg	U
98953	Nitrobenzene	80	ug/kg	U
55630	Nitroglycerine	80	ug/kg	U
78115	PETN	400	ug/kg	U
121824	RDX	160	ug/kg	U
479458	TETRYL	1000	ug/kg	UJ L

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**82**	%Rec	

Sample Information

11224018

Description : WL04SD

Sampling Date/Time : 6/3/2011 2:10:00PM
Matrix : Sediment
Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Target Results

Analyte Code	Analyte Name	Result	Unit	Qual.
99354	1,3,5-Trinitrobenzene	80	ug/kg	U
99650	1,3-Dinitrobenzene	80	ug/kg	U
118967	2,4,6-Trinitrotoluene	80	ug/kg	U
121142	2,4-Dinitrotoluene	80	ug/kg	U
606202	2,6-Dinitrotoluene	80	ug/kg	U
35572782	2-amino, 4,6-Dinitrotoluene	80	ug/kg	U
88722	2-Nitrotoluene	80	ug/kg	U
99081	3-Nitrotoluene	80	ug/kg	U
1946510	4-amino,2,6-Dinitrotoluene	80	ug/kg	U
99990	4-Nitrotoluene	80	ug/kg	U
618871	BENZENAMINE, 3,5-DINITRO-	80	ug/kg	U
2691410	HMX	80	ug/kg	U
98953	Nitrobenzene	80	ug/kg	U
55630	Nitroglycerine	80	ug/kg	U
78115	PETN	400	ug/kg	U
121824	RDX	160	ug/kg	U
479458	TETRYL	1000	ug/kg	UJ L

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**91**	%Rec	

Sample Information

11224019

Description : WL05SD

Sampling Date/Time : 6/3/2011 2:20:00PM
Matrix : Sediment
Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment

Data Package : PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Target Results

Analyte Code	Analyte Name	Result	Unit	Qual.
99354	1,3,5-Trinitrobenzene	80	ug/kg	U
99650	1,3-Dinitrobenzene	80	ug/kg	U
118967	2,4,6-Trinitrotoluene	80	ug/kg	U
121142	2,4-Dinitrotoluene	80	ug/kg	U
606202	2,6-Dinitrotoluene	80	ug/kg	U
35572782	2-amino, 4,6-Dinitrotoluene	80	ug/kg	U
88722	2-Nitrotoluene	80	ug/kg	U
99081	3-Nitrotoluene	80	ug/kg	U
1946510	4-amino,2,6-Dinitrotoluene	80	ug/kg	U
99990	4-Nitrotoluene	80	ug/kg	U
618871	BENZENAMINE, 3,5-DINITRO-	80	ug/kg	U
2691410	HMX	80	ug/kg	U
98953	Nitrobenzene	80	ug/kg	U
55630	Nitroglycerine	80	ug/kg	U
78115	PETN	400	ug/kg	U
121824	RDX	160	ug/kg	U
479458	TETRYL	1000	ug/kg	UJ L

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**90**	%Rec	

Sample Information

11224020

Description : WL06SD

Sampling Date/Time : 6/3/2011 2:56:00PM
Matrix : Sediment
Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment

Data Package : PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Target Results

Analyte Code	Analyte Name	Result	Unit	Qual.
99354	1,3,5-Trinitrobenzene	80	ug/kg	U
99650	1,3-Dinitrobenzene	80	ug/kg	U
118967	2,4,6-Trinitrotoluene	80	ug/kg	U
121142	2,4-Dinitrotoluene	80	ug/kg	U
606202	2,6-Dinitrotoluene	80	ug/kg	U
35572782	2-amino, 4,6-Dinitrotoluene	80	ug/kg	U
88722	2-Nitrotoluene	80	ug/kg	U
99081	3-Nitrotoluene	80	ug/kg	U
1946510	4-amino,2,6-Dinitrotoluene	80	ug/kg	U
99990	4-Nitrotoluene	80	ug/kg	U
618871	BENZENAMINE, 3,5-DINITRO-	80	ug/kg	U
2691410	HMX	80	ug/kg	U
98953	Nitrobenzene	80	ug/kg	U
55630	Nitroglycerine	80	ug/kg	U
78115	PETN	400	ug/kg	U
121824	RDX	160	ug/kg	U
479458	TETRYL	1000	ug/kg	UJ L

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**101**	%Rec	

Sample Information

11224021

Description : WL01WT

Sampling Date/Time : 6/3/2011 2:20:00PM

Matrix : Water

Field Sample ID :

Explosives

Method Information

Lab Matrix : Water

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):

8330B - Explosives by HPLC

Analytical Method:

8330B - Explosives by HPLC

Target Results

Analyte Code	Analyte Name	Result	Unit	Qual.
99354	1,3,5-Trinitrobenzene	0.82	ug/L	U
99650	1,3-Dinitrobenzene	0.82	ug/L	U
118967	2,4,6-Trinitrotoluene	0.82	ug/L	U
121142	2,4-Dinitrotoluene	0.82	ug/L	U
606202	2,6-Dinitrotoluene	0.82	ug/L	U
35572782	2-amino, 4,6-Dinitrotoluene	0.82	ug/L	U
88722	2-Nitrotoluene	0.82	ug/L	U
99081	3-Nitrotoluene	0.82	ug/L	U
1946510	4-amino,2,6-Dinitrotoluene	0.82	ug/L	U
99990	4-Nitrotoluene	0.82	ug/L	U
618871	BENZENAMINE, 3,5-DINITRO-	0.82	ug/L	U
2691410	HMX	0.82	ug/L	U
98953	Nitrobenzene	0.82	ug/L	U
55630	Nitroglycerine	0.82	ug/L	U
78115	PETN	4.1	ug/L	U
121824	RDX	1.6	ug/L	U
479458	TETRYL	10	ug/L	UJ L

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**99**	%Rec	

Sample Information

11224022

Description : WL02WT

Sampling Date/Time : 6/3/2011 2:45:00PM
Matrix : Water
Field Sample ID :

Explosives

Method Information

Lab Matrix : Water

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Target Results

Analyte Code	Analyte Name	Result	Unit	Qual.
99354	1,3,5-Trinitrobenzene	0.76	ug/L	U
99650	1,3-Dinitrobenzene	0.76	ug/L	U
118967	2,4,6-Trinitrotoluene	0.76	ug/L	U
121142	2,4-Dinitrotoluene	0.76	ug/L	U
606202	2,6-Dinitrotoluene	0.76	ug/L	U
35572782	2-amino, 4,6-Dinitrotoluene	0.76	ug/L	U
88722	2-Nitrotoluene	0.76	ug/L	U
99081	3-Nitrotoluene	0.76	ug/L	U
1946510	4-amino,2,6-Dinitrotoluene	0.76	ug/L	U
99990	4-Nitrotoluene	0.76	ug/L	U
618871	BENZENAMINE, 3,5-DINITRO-	0.76	ug/L	U
2691410	HMX	0.76	ug/L	U
98953	Nitrobenzene	0.76	ug/L	U
55630	Nitroglycerine	0.76	ug/L	U
78115	PETN	3.8	ug/L	U
121824	RDX	1.5	ug/L	U
479458	TETRYL	9.5	ug/L	UJ L

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	77	%Rec	

Sample Information

11224024

Description : BK01SD

Sampling Date/Time : 6/3/2011 3:20:00PM
Matrix : Sediment
Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment **Data Package :** PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Target Results

Analyte Code	Analyte Name	Result	Unit	Qual.
99354	1,3,5-Trinitrobenzene	80	ug/kg	U
99650	1,3-Dinitrobenzene	80	ug/kg	U
118967	2,4,6-Trinitrotoluene	80	ug/kg	U
121142	2,4-Dinitrotoluene	80	ug/kg	U
606202	2,6-Dinitrotoluene	80	ug/kg	U
35572782	2-amino, 4,6-Dinitrotoluene	80	ug/kg	U
88722	2-Nitrotoluene	80	ug/kg	U
99081	3-Nitrotoluene	80	ug/kg	U
1946510	4-amino,2,6-Dinitrotoluene	80	ug/kg	U
99990	4-Nitrotoluene	80	ug/kg	U
618871	BENZENAMINE, 3,5-DINITRO-	80	ug/kg	U
2691410	HMX	80	ug/kg	U
98953	Nitrobenzene	80	ug/kg	U
55630	Nitroglycerine	80	ug/kg	U
78115	PETN	400	ug/kg	U
121824	RDX	160	ug/kg	U
479458	TETRYL	1000	ug/kg	UJ L

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**100**	%Rec	

Sample Information

11224025

Description : BK01WT

Sampling Date/Time : 6/3/2011 3:17:00PM
Matrix : Water
Field Sample ID :

Explosives

Method Information

Lab Matrix : Water

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Target Results

Analyte Code	Analyte Name	Result	Unit	Qual.
99354	1,3,5-Trinitrobenzene	0.76	ug/L	UJ L
99650	1,3-Dinitrobenzene	0.76	ug/L	U
118967	2,4,6-Trinitrotoluene	0.76	ug/L	UJ L
121142	2,4-Dinitrotoluene	0.76	ug/L	U
606202	2,6-Dinitrotoluene	0.76	ug/L	U
35572782	2-amino, 4,6-Dinitrotoluene	0.76	ug/L	U
88722	2-Nitrotoluene	0.76	ug/L	U
99081	3-Nitrotoluene	0.76	ug/L	U
1946510	4-amino,2,6-Dinitrotoluene	0.76	ug/L	U
99990	4-Nitrotoluene	0.76	ug/L	U
618871	BENZENAMINE, 3,5-DINITRO-	0.76	ug/L	U
2691410	HMX	0.76	ug/L	U
98953	Nitrobenzene	0.76	ug/L	U
55630	Nitroglycerine	0.76	ug/L	U
78115	PETN	3.8	ug/L	U
121824	RDX	1.5	ug/L	U
479458	TETRYL	9.5	ug/L	UJ L

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**84**	%Rec	

Sample Information

11224029

Description : BK02SD

Sampling Date/Time : 6/3/2011 4:00:00PM

Matrix : Sediment

Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment

Data Package : PKG# 1163

Weight Basis :

Preparation Method(s):

8330B - Explosives by HPLC

Analytical Method:

8330B - Explosives by HPLC

Target Results

Analyte Code	Analyte Name	Result	Unit	Qual.
99354	1,3,5-Trinitrobenzene	80	ug/kg	U
99650	1,3-Dinitrobenzene	80	ug/kg	U
118967	2,4,6-Trinitrotoluene	80	ug/kg	U
121142	2,4-Dinitrotoluene	80	ug/kg	U
606202	2,6-Dinitrotoluene	80	ug/kg	U
35572782	2-amino, 4,6-Dinitrotoluene	80	ug/kg	U
88722	2-Nitrotoluene	80	ug/kg	U
99081	3-Nitrotoluene	80	ug/kg	U
1946510	4-amino,2,6-Dinitrotoluene	80	ug/kg	U
99990	4-Nitrotoluene	80	ug/kg	U
618871	BENZENAMINE, 3,5-DINITRO-	80	ug/kg	U
2691410	HMX	80	ug/kg	U
98953	Nitrobenzene	80	ug/kg	U
55630	Nitroglycerine	80	ug/kg	U
78115	PETN	400	ug/kg	U
121824	RDX	160	ug/kg	U
479458	TETRYL	1000	ug/kg	UJ L

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**87**	%Rec	

Sample Information

11224020 Matrix Spike

Description : WL06SD

Sampling Date/Time : 6/3/2011 2:56:00PM
Matrix : Sediment
Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**76**	%Rec	
99354	1,3,5-Trinitrobenzene	**69**	%Rec	
99650	1,3-Dinitrobenzene	**72**	%Rec	
118967	2,4,6-Trinitrotoluene	**66**	%Rec	
121142	2,4-Dinitrotoluene	**71**	%Rec	
606202	2,6-Dinitrotoluene	**70**	%Rec	
35572782	2-amino, 4,6-Dinitrotoluene	**60**	%Rec	
88722	2-Nitrotoluene	**73**	%Rec	
99081	3-Nitrotoluene	**73**	%Rec	
1946510	4-amino,2,6-Dinitrotoluene	**58**	%Rec	
99990	4-Nitrotoluene	**73**	%Rec	
2691410	HMX	**57**	%Rec	
98953	Nitrobenzene	**75**	%Rec	
121824	RDX	**62**	%Rec	
479458	TETRYL	**59**	%Rec	J

Sample Information

11224025 Matrix Spike

Description : BK01WT

Sampling Date/Time : 6/3/2011 3:17:00PM
Matrix : Water
Field Sample ID :

Explosives

Method Information

Lab Matrix : Water **Data Package :**PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**78**	%Rec	
99354	1,3,5-Trinitrobenzene	**27**	%Rec	J
99650	1,3-Dinitrobenzene	**79**	%Rec	
118967	2,4,6-Trinitrotoluene	**41**	%Rec	J
121142	2,4-Dinitrotoluene	**83**	%Rec	
606202	2,6-Dinitrotoluene	**96**	%Rec	
35572782	2-amino, 4,6-Dinitrotoluene	**78**	%Rec	
88722	2-Nitrotoluene	**77**	%Rec	
99081	3-Nitrotoluene	**78**	%Rec	
1946510	4-amino,2,6-Dinitrotoluene	**78**	%Rec	
99990	4-Nitrotoluene	**124**	%Rec	
2691410	HMX	**78**	%Rec	
98953	Nitrobenzene	**80**	%Rec	
121824	RDX	**83**	%Rec	
479458	TETRYL	**14**	%Rec	J

Sample Information

11224020 Matrix Spike#2

Description : WL06SD

Sampling Date/Time : 6/3/2011 2:56:00PM
Matrix : Sediment
Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment

Data Package : PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**76**	%Rec	
99354	1,3,5-Trinitrobenzene	**66**	%Rec	
99650	1,3-Dinitrobenzene	**70**	%Rec	
118967	2,4,6-Trinitrotoluene	**64**	%Rec	
121142	2,4-Dinitrotoluene	**69**	%Rec	
606202	2,6-Dinitrotoluene	**69**	%Rec	
35572782	2-amino, 4,6-Dinitrotoluene	**61**	%Rec	
88722	2-Nitrotoluene	**70**	%Rec	
99081	3-Nitrotoluene	**72**	%Rec	
1946510	4-amino,2,6-Dinitrotoluene	**57**	%Rec	
99990	4-Nitrotoluene	**73**	%Rec	
2691410	HMX	**55**	%Rec	
98953	Nitrobenzene	**76**	%Rec	
121824	RDX	**60**	%Rec	
479458	TETRYL	**58**	%Rec	J

Sample Information

11224025 Matrix Spike#2

Description : BK01WT

Sampling Date/Time : 6/3/2011 3:17:00PM
Matrix : Water
Field Sample ID :

Explosives

Method Information

Lab Matrix : Water

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**77**	%Rec	
99354	1,3,5-Trinitrobenzene	**31**	%Rec	J
99650	1,3-Dinitrobenzene	**79**	%Rec	
118967	2,4,6-Trinitrotoluene	**48**	%Rec	J
121142	2,4-Dinitrotoluene	**85**	%Rec	
606202	2,6-Dinitrotoluene	**96**	%Rec	
35572782	2-amino, 4,6-Dinitrotoluene	**75**	%Rec	
88722	2-Nitrotoluene	**83**	%Rec	
99081	3-Nitrotoluene	**79**	%Rec	
1946510	4-amino,2,6-Dinitrotoluene	**73**	%Rec	
99990	4-Nitrotoluene	**133**	%Rec	
2691410	HMX	**77**	%Rec	
98953	Nitrobenzene	**80**	%Rec	
121824	RDX	**83**	%Rec	
479458	TETRYL	**5.8**	%Rec	J

Sample Information

11224020 Matrix Spike#3

Description : WL06SD

Sampling Date/Time : 6/3/2011 2:56:00PM
Matrix : Sediment
Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**100**	%Rec	
618871	BENZENAMINE, 3,5-DINITRO-	**89**	%Rec	
55630	Nitroglycerine	**94**	%Rec	
78115	PETN	**72**	%Rec	

Sample Information

11224025 Matrix Spike#3

Description : BK01WT

Sampling Date/Time : 6/3/2011 3:17:00PM
Matrix : Water
Field Sample ID :

Explosives

Method Information

Lab Matrix : Water

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**94**	%Rec	
618871	BENZENAMINE, 3,5-DINITRO-	**108**	%Rec	
55630	Nitroglycerine	**104**	%Rec	
78115	PETN	**61**	%Rec	

Sample Information

11224020 Matrix Spike#4

Description : WL06SD

Sampling Date/Time : 6/3/2011 2:56:00PM
Matrix : Sediment
Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment

Data Package : PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**108**	%Rec	
618871	BENZENAMINE, 3,5-DINITRO-	**93**	%Rec	
55630	Nitroglycerine	**102**	%Rec	
78115	PETN	**87**	%Rec	

Sample Information

11224025 Matrix Spike#4

Description : BK01WT

Sampling Date/Time : 6/3/2011 3:17:00PM
Matrix : Water
Field Sample ID :

Explosives

Method Information

Lab Matrix : Water

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**100**	%Rec	
618871	BENZENAMINE, 3,5-DINITRO-	**95**	%Rec	
55630	Nitroglycerine	**115**	%Rec	
78115	PETN	**112**	%Rec	

Sample Information

OBS1160A Blank

Description : Blank

Sampling Date/Time :

Matrix : Sediment

Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):

8330B - Explosives by HPLC

Analytical Method:

8330B - Explosives by HPLC

Target Results

Analyte Code	Analyte Name	Result	Unit	Qual.
99354	1,3,5-Trinitrobenzene	80	ug/kg	U
99650	1,3-Dinitrobenzene	80	ug/kg	U
118967	2,4,6-Trinitrotoluene	80	ug/kg	U
121142	2,4-Dinitrotoluene	80	ug/kg	U
606202	2,6-Dinitrotoluene	80	ug/kg	U
35572782	2-amino, 4,6-Dinitrotoluene	80	ug/kg	U
88722	2-Nitrotoluene	80	ug/kg	U
99081	3-Nitrotoluene	80	ug/kg	U
1946510	4-amino,2,6-Dinitrotoluene	80	ug/kg	U
99990	4-Nitrotoluene	80	ug/kg	U
618871	BENZENAMINE, 3,5-DINITRO-	80	ug/kg	U
2691410	HMX	80	ug/kg	U
98953	Nitrobenzene	80	ug/kg	U
55630	Nitroglycerine	80	ug/kg	U
78115	PETN	400	ug/kg	U
121824	RDX	160	ug/kg	U
479458	TETRYL	1000	ug/kg	UJ

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**119**	%Rec	

Sample Information

OBS1160B Blank

Description : Blank

Sampling Date/Time :

Matrix : Sediment

Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):

8330B - Explosives by HPLC

Analytical Method:

8330B - Explosives by HPLC

Target Results

Analyte Code	Analyte Name	Result	Unit	Qual.
99354	1,3,5-Trinitrobenzene	80	ug/kg	U
99650	1,3-Dinitrobenzene	80	ug/kg	U
118967	2,4,6-Trinitrotoluene	80	ug/kg	U
121142	2,4-Dinitrotoluene	80	ug/kg	U
606202	2,6-Dinitrotoluene	80	ug/kg	U
35572782	2-amino, 4,6-Dinitrotoluene	80	ug/kg	U
88722	2-Nitrotoluene	80	ug/kg	U
99081	3-Nitrotoluene	80	ug/kg	U
1946510	4-amino,2,6-Dinitrotoluene	80	ug/kg	U
99990	4-Nitrotoluene	80	ug/kg	U
618871	BENZENAMINE, 3,5-DINITRO-	80	ug/kg	U
2691410	HMX	80	ug/kg	U
98953	Nitrobenzene	80	ug/kg	U
55630	Nitroglycerine	80	ug/kg	U
78115	PETN	400	ug/kg	U
121824	RDX	160	ug/kg	U
479458	TETRYL	1000	ug/kg	UJ

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**117**	%Rec	

Sample Information

OBW1161A Blank

Description : Blank

Sampling Date/Time :

Matrix : Water

Field Sample ID :

Explosives

Method Information

Lab Matrix : Water

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Target Results

Analyte Code	Analyte Name	Result	Unit	Qual.
99354	1,3,5-Trinitrobenzene	0.8	ug/L	U
99650	1,3-Dinitrobenzene	0.8	ug/L	U
118967	2,4,6-Trinitrotoluene	0.8	ug/L	U
121142	2,4-Dinitrotoluene	0.8	ug/L	U
606202	2,6-Dinitrotoluene	0.8	ug/L	U
35572782	2-amino, 4,6-Dinitrotoluene	0.8	ug/L	U
88722	2-Nitrotoluene	0.8	ug/L	U
99081	3-Nitrotoluene	0.8	ug/L	U
1946510	4-amino,2,6-Dinitrotoluene	0.8	ug/L	U
99990	4-Nitrotoluene	0.8	ug/L	U
618871	BENZENAMINE, 3,5-DINITRO-	0.8	ug/L	U
2691410	HMX	0.8	ug/L	U
98953	Nitrobenzene	0.8	ug/L	U
55630	Nitroglycerine	0.8	ug/L	U
78115	PETN	4	ug/L	U
121824	RDX	1.6	ug/L	U
479458	TETRYL	10	ug/L	UJ

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**111**	%Rec	

Sample Information

OBW1161B Blank

Description : Blank

Sampling Date/Time :

Matrix : Water

Field Sample ID :

Explosives

Method Information

Lab Matrix : Water

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Target Results

Analyte Code	Analyte Name	Result	Unit	Qual.
99354	1,3,5-Trinitrobenzene	0.8	ug/L	U
99650	1,3-Dinitrobenzene	0.8	ug/L	U
118967	2,4,6-Trinitrotoluene	0.8	ug/L	U
121142	2,4-Dinitrotoluene	0.8	ug/L	U
606202	2,6-Dinitrotoluene	0.8	ug/L	U
35572782	2-amino, 4,6-Dinitrotoluene	0.8	ug/L	U
88722	2-Nitrotoluene	0.8	ug/L	U
99081	3-Nitrotoluene	0.8	ug/L	U
1946510	4-amino,2,6-Dinitrotoluene	0.8	ug/L	U
99990	4-Nitrotoluene	0.8	ug/L	U
618871	BENZENAMINE, 3,5-DINITRO-	0.8	ug/L	U
2691410	HMX	0.8	ug/L	U
98953	Nitrobenzene	0.8	ug/L	U
55630	Nitroglycerine	0.8	ug/L	U
78115	PETN	4	ug/L	U
121824	RDX	1.6	ug/L	U
479458	TETRYL	10	ug/L	UJ

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**113**	%Rec	

Sample Information

LCS1160A Lab Control Std

Description : Lab Control Standard

Sampling Date/Time :

Matrix : Sediment

Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):

8330B - Explosives by HPLC

Analytical Method:

8330B - Explosives by HPLC

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**112**	%Rec	
99354	1,3,5-Trinitrobenzene	**108**	%Rec	
99650	1,3-Dinitrobenzene	**105**	%Rec	
118967	2,4,6-Trinitrotoluene	**106**	%Rec	
121142	2,4-Dinitrotoluene	**106**	%Rec	
606202	2,6-Dinitrotoluene	**105**	%Rec	
35572782	2-amino, 4,6-Dinitrotoluene	**105**	%Rec	
88722	2-Nitrotoluene	**101**	%Rec	
99081	3-Nitrotoluene	**103**	%Rec	
1946510	4-amino,2,6-Dinitrotoluene	**105**	%Rec	
99990	4-Nitrotoluene	**102**	%Rec	
2691410	HMX	**104**	%Rec	
98953	Nitrobenzene	**104**	%Rec	
121824	RDX	**106**	%Rec	
479458	TETRYL	**113**	%Rec	J

Sample Information

LCS1160C Lab Control Std

Description : Lab Control Standard

Sampling Date/Time :

Matrix : Sediment

Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment

Data Package : PKG# 1163

Weight Basis :

Preparation Method(s):

8330B - Explosives by HPLC

Analytical Method:

8330B - Explosives by HPLC

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**121**	%Rec	
618871	BENZENAMINE, 3,5-DINITRO-	**108**	%Rec	
55630	Nitroglycerine	**115**	%Rec	
78115	PETN	**89**	%Rec	

Sample Information

LCS1161A Lab Control Std

Description : Lab Control Standard

Sampling Date/Time :

Matrix : Water

Field Sample ID :

Explosives

Method Information

Lab Matrix : Water

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**105**	%Rec	
99354	1,3,5-Trinitrobenzene	**98**	%Rec	
99650	1,3-Dinitrobenzene	**103**	%Rec	
118967	2,4,6-Trinitrotoluene	**104**	%Rec	
121142	2,4-Dinitrotoluene	**103**	%Rec	
606202	2,6-Dinitrotoluene	**104**	%Rec	
35572782	2-amino, 4,6-Dinitrotoluene	**102**	%Rec	
88722	2-Nitrotoluene	**103**	%Rec	
99081	3-Nitrotoluene	**101**	%Rec	
1946510	4-amino,2,6-Dinitrotoluene	**101**	%Rec	
99990	4-Nitrotoluene	**100**	%Rec	
2691410	HMX	**96**	%Rec	
98953	Nitrobenzene	**102**	%Rec	
121824	RDX	**100**	%Rec	
479458	TETRYL	**55**	%Rec	J

Sample Information

LCS1161C Lab Control Std

Description : Lab Control Standard

Sampling Date/Time :

Matrix : Water

Field Sample ID :

Explosives

Method Information

Lab Matrix : Water

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):

8330B - Explosives by HPLC

Analytical Method:

8330B - Explosives by HPLC

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**111**	%Rec	
618871	BENZENAMINE, 3,5-DINITRO-	**105**	%Rec	
55630	Nitroglycerine	**101**	%Rec	
78115	PETN	**95**	%Rec	

Sample Information

LCS1160B Lab Control Std#2

Description : Lab Control Standard Dup.

Sampling Date/Time :

Matrix : Sediment

Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**112**	%Rec	
99354	1,3,5-Trinitrobenzene	**107**	%Rec	
99650	1,3-Dinitrobenzene	**105**	%Rec	
118967	2,4,6-Trinitrotoluene	**105**	%Rec	
121142	2,4-Dinitrotoluene	**105**	%Rec	
606202	2,6-Dinitrotoluene	**105**	%Rec	
35572782	2-amino, 4,6-Dinitrotoluene	**105**	%Rec	
88722	2-Nitrotoluene	**101**	%Rec	
99081	3-Nitrotoluene	**103**	%Rec	
1946510	4-amino,2,6-Dinitrotoluene	**105**	%Rec	
99990	4-Nitrotoluene	**99**	%Rec	
2691410	HMX	**103**	%Rec	
98953	Nitrobenzene	**104**	%Rec	
121824	RDX	**106**	%Rec	
479458	TETRYL	**109**	%Rec	J

Sample Information

LCS1160D Lab Control Std#2

Description : Lab Control Standard Dup.

Sampling Date/Time :

Matrix : Sediment

Field Sample ID :

Explosives

Method Information

Lab Matrix : Sediment

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):
8330B - Explosives by HPLC

Analytical Method:
8330B - Explosives by HPLC

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**115**	%Rec	
618871	BENZENAMINE, 3,5-DINITRO-	**107**	%Rec	
55630	Nitroglycerine	**111**	%Rec	
78115	PETN	**98**	%Rec	

Sample Information

LCS1161B Lab Control Std#2

Description : Lab Control Standard Dup.

Sampling Date/Time :

Matrix : Water

Field Sample ID :

Explosives

Method Information

Lab Matrix : Water

Data Package :PKG# 1163

Weight Basis :

Preparation Method(s):

8330B - Explosives by HPLC

Analytical Method:

8330B - Explosives by HPLC

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**104**	%Rec	
99354	1,3,5-Trinitrobenzene	**95**	%Rec	
99650	1,3-Dinitrobenzene	**102**	%Rec	
118967	2,4,6-Trinitrotoluene	**102**	%Rec	
121142	2,4-Dinitrotoluene	**102**	%Rec	
606202	2,6-Dinitrotoluene	**102**	%Rec	
35572782	2-amino, 4,6-Dinitrotoluene	**100**	%Rec	
88722	2-Nitrotoluene	**100**	%Rec	
99081	3-Nitrotoluene	**99**	%Rec	
1946510	4-amino,2,6-Dinitrotoluene	**99**	%Rec	
99990	4-Nitrotoluene	**100**	%Rec	
2691410	HMX	**91**	%Rec	
98953	Nitrobenzene	**101**	%Rec	
121824	RDX	**92**	%Rec	
479458	TETRYL	**58**	%Rec	J

Sample Information

LCS1161D Lab Control Std#2

Description : Lab Control Standard Dup.

Sampling Date/Time :

Matrix : Water

Field Sample ID :

Explosives

Method Information

Lab Matrix : Water

Data Package : PKG# 1163

Weight Basis :

Preparation Method(s):

8330B - Explosives by HPLC

Analytical Method:

8330B - Explosives by HPLC

Surrogate Compounds

Analyte Code	Analyte Name	Result	Unit	Qual.
528290	1,2-Dinitrobenzene	**108**	%Rec	
618871	BENZENAMINE, 3,5-DINITRO-	**100**	%Rec	
55630	Nitroglycerine	**99**	%Rec	
78115	PETN	**95**	%Rec	

USEPA Contract Laboratory Program
Generic Chain of Custody

Case No: 41282
DAS No:
SDG No:

L

Date Shipped:	6/6/2011
Carrier Name:	Hand Delivery
Airbill No:	
Shipped to:	Analytical Resources, Inc 4611 S 134th PL Tukwila WA 98168

Chain Of Custody Record

Sampler Signature:

	Relinquished By	(Date/Time)	Received By	(Date/Time)
1		6/6/11 1635		6/6/11 1635
2				
3				
4				

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
BK01SD	Sediment/ Jeff Fetters	G	Grain Size (21)	11224024 (Ice Only) (2)	BK01SD	S: 06/03/2011 15:20		
BK02SD	Sediment/ Jeff Fetters	G	Grain Size (21)	11224029 (Ice Only) (2)	BK02SD	S: 06/03/2011 16:00		
WL01SD	Sediment/ Jeff Fetters	G	Grain Size (21)	11224015 (Ice Only) (2)	WL01SD	S: 06/03/2011 12:57		
WL02SD	Sediment/ Jeff Fetters	G	Grain Size (21)	11224016 (Ice Only) (2)	WL02SD	S: 06/03/2011 13:43		
WL03SD	Sediment/ Jeff Fetters	G	Grain Size (21)	11224017 (Ice Only) (2)	WL03SD	S: 06/03/2011 13:36		
WL04SD	Sediment/ Jeff Fetters	G	Grain Size (21)	11224018 (Ice Only) (2)	WL04SD	S: 06/03/2011 14:10		
WL05SD	Sediment/ Jeff Fetters	G	Grain Size (21)	11224019 (Ice Only) (2)	WL05SD	S: 06/03/2011 14:20		

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number :
N	BK02SD			

Analysis Key: **Concentration :** L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B **Custody Seal Intact?** ___ **Shipment Iced?** ___

Grain Size = Grain Size

COC Number : 10-4097213-060611-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

FORMS II Lite Help Desk, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602; e-Mail f2lite@fedcsc.com

USEPA Contract Laboratory Program
Generic Chain of Custody

Case No: 41282
DAS No:
SDG No:

L

Date Shipped: 6/6/2011
Carrier Name: Hand Delivery
Airbill No:
Shipped to: Analytical Resources, Inc
4611 S 134th PL
Tukwila WA 98168

Chain Of Custody Record

Sampler Signature:

	Relinquished By	(Date/Time)	Received By	(Date/Time)
1	[signature]	6/6/11 1635	[signature]	6/6/11 1635
2				
3				
4				

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
WL06SD	Sediment/ Jeff Fetters	G	Grain Size (21)	11224020 (Ice Only) (2)	WL06SD	S: 06/03/2011 14:56		

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number :
N	BK02SD			

Analysis Key: **Concentration :** L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B **Custody Seal Intact?** ___ **Shipment Iced?** ___

Grain Size = Grain Size

COC Number : 10-4097213-060611-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

FORMS II Lite Help Desk, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602; e-Mail f2lite@fedcsc.com

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case: 41282
Client No:

R

Region:	10	**Date Shipped:**	6/6/2011
Project Code:	TEC-991A	**Carrier Name:**	Hand Delivery
Account Code:		**Airbill:**	
CERCLIS ID:		**Shipped to:**	Manchester Environmental Laboratory 7411 Beach Drive East Port Orchard WA 98366 3608718747
Spill ID:			
Site Name / City/State:	Kitsap Rifle and Revolver Range Bremerton, AK		
Project Leader:	Jeff Fetters		
Action:	Intergrated Assessment		
Sampling Co:	Ecologh and Environmnet		

Chain of Custody Record JF

Sampler Signature: J Fetters

	Relinquished By	(Date/Time)	Received By	(Date/Time)
1	J Fetters	6/6/11 1400	K Nagy	6/6/11 1400
2				
3				
4				

SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
BK01SD	Sediment/ Jeff Fetters	G	NIT_ARO (21)	11224024 (Ice Only) (1) N1	BK01SD	S: 06/03/2011 15:20	--
BK02SD	Sediment/ Jeff Fetters	G	NIT_ARO (21)	11224029 (Ice Only) (1) N1	BK02SD	S: 06/03/2011 16:00	--
WL01SD	Sediment/ Jeff Fetters	G	NIT_ARO (21)	11224015 (Ice Only) (1) N1	WL01SD	S: 06/03/2011 12:57	--
WL02SD	Sediment/ Jeff Fetters	G	NIT_ARO (21)	11224016 (Ice Only) (1) N1	WL02SD	S: 06/03/2011 13:43	--
WL03SD	Sediment/ Jeff Fetters	G	NIT_ARO (21)	11224017 (Ice Only) (1) N1	WL03SD	S: 06/03/2011 13:36	--
WL04SD	Sediment/ Jeff Fetters	G	NIT_ARO (21)	11224018 (Ice Only) (1) N1	WL04SD	S: 06/03/2011 14:10	--

3°C

Shipment for Case Complete? N	**Sample (s) to be used for laboratory QC:** BK02SD	**Additional Sampler Signature (s):**	**Chain Of Custody Seal Number :**
Analysis Key:	**Concentration :** L = Low, M = Medium, H = High, L/M = Low/Medium	**Type/Designate :** Composite = C, Grab = G, Both = B	**Shipment Iced?**

NIT_ARO = Nitroaromatics

COC Number : 10-4097213-060611-0002

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case: 41282
Client No:

R

Region:	10	Date Shipped:	6/6/2011
Project Code:	TEC-991A	Carrier Name:	Hand Delivery
Account Code:		Airbill:	
CERCLIS ID:		Shipped to:	Manchester Environmental Laboratory 7411 Beach Drive East Port Orchard WA 98366 3608718747
Spill ID:			
Site Name / City/State:	Kitsap Rifle and Revolver Range Bremerton, AK		
Project Leader:	Jeff Fetters		
Action:	Intergrated Assessment		
Sampling Co:	Ecologh and Environmnet		

Chain of Custody Record

Sampler Signature: [signature]

	Relinquished By	(Date/Time)	Received By	(Date/Time)
1	[signature]	6/6/11 1400	[signature]	6/6/11 1400
2				
3				
4				

SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
WL05SD	Sediment/ Jeff Fetters	G	NIT_ARO (21)	11224019 (Ice Only) (1) NI	WL05SD	S: 06/03/2011 14:20	--
WL06SD	Sediment/ Jeff Fetters	G	NIT_ARO (21)	11224020 (Ice Only) (1) NI	WL06SD	S: 06/03/2011 14:56	--

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Chain Of Custody Seal Number :
N	BK02SD		

Analysis Key: **Concentration :** L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B **Shipment Iced?** ____________

NIT_ARO = Nitroaromatics

COC Number : 10-4097213-060611-0002

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case: 41282
Client No:

R

Region:	10	Date Shipped:	6/6/2011
Project Code:	TEC-991A	Carrier Name:	Hand Delivery
Account Code:		Airbill:	
CERCLIS ID:		Shipped to:	Manchester Environmental Laboratory 7411 Beach Drive East Port Orchard WA 98366 3608718747
Spill ID:			
Site Name / City/State:	Kitsap Rifle and Revolver Range Bremerton, AK		
Project Leader:	Jeff Fetters		
Action:	Intergrated Assessment		
Sampling Co:	Ecologh and Environmnet		

Chain of Custody Record

Sampler Signature: [signature]

	Relinquished By	(Date/Time)	Received By	(Date/Time)
1	[signature]	6/6/11 1400	K Newton	6/6/11 1400
2				
3				
4				

SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
BK01WT	Surface Water/ Jeff Fetters	G	NIT_ARO (21)	11224025 (Ice Only) (2) N1, N2, N3, N4, N5, N6	BK01WT	S: 06/03/2011 15:17	--
~~RI01WT~~	~~Water/ Jeff Fetters~~	~~G~~	~~NIT_ARO (21)~~	~~11224027 (Ice Only) (2)~~ N1, N2	~~RI01WT~~	~~S: 06/03/2011 11:03~~	~~Rinsate~~
WL01WT	Surface Water/ Jeff Fetters	G	NIT_ARO (21)	11224021 (Ice Only) (2) N1, N2	WL01WT	S: 06/03/2011 14:20	--
WL02WT	Surface Water/ Jeff Fetters	G	NIT_ARO (21)	11224022 (Ice Only) (2) N1, N2	WL02WT	S: 06/03/2011 14:45	--

4°C

Shipment for Case Complete?	**Sample (s) to be used for laboratory QC:**	**Additional Sampler Signature (s):**	**Chain Of Custody Seal Number :**
N	BK01WT		

Analysis Key: **Concentration :** L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B **Shipment Iced?** ____________

NIT_ARO = Nitroaromatics

COC Number : 10-4097213-060611-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

REGION COPY

W

1115824 ... Contract Laboratory Program

Organic Traffic Report & Chain of Custody Record

Copy original in SDG JDQT4

Case No: 41282
DAS No:
SDG No: JDQX3

L

Date Shipped: 6/6/2011
Carrier Name: FedEx
Airbill No: 862302348450
Shipped to: Datachem Laboratories, Inc.
960 West LeVoy Drive
Salt Lake City UT 84123
8012667700

Chain Of Custody Record

Sampler Signature: [signature]

	Relinquished By (Date/Time)	Received By (Date/Time)
1	[signature] 6/6/11 1200	Merall Edwards 6/7/11 1004
2		
3		
4		

For Lab Use Only
Lab Contract No: EPW 11037
Unit Price: n/a
Transfer To:
Lab Contract No:
Unit Price:
ME 6/7/11

ORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	INORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
JDQW8	Soil (0"-6")/ Jeff Fetters	G	BNA (21)	11224014 (Ice Only) (1)	RF01SS	S: 06/03/2011 16:28		
JDQW9	Sediment/ Jeff Fetters	G	BNA (21)	11224015 (Ice Only) (1)	WL01SD	S: 06/03/2011 12:57		
JDQX0	Sediment/ Jeff Fetters	G	BNA (21)	11224016 (Ice Only) (1)	WL02SD	S: 06/03/2011 13:43		ME 6/7/11
JDQX1	Sediment/ Jeff Fetters	G	BNA (21)	11224017 (Ice Only) (1)	WL03SD	S: 06/03/2011 13:36		
JDQX2	Sediment/ Jeff Fetters	G	BNA (21)	11224018 (Ice Only) (1)	WL04SD	S: 06/03/2011 14:10		
JDQX3	Sediment/ Jeff Fetters	G	BNA (21)	11224019 (Ice Only) (1)	WL05SD	S: 06/03/2011 14:20		
JDQX4	Sediment/ Jeff Fetters	G	BNA (21)	11224020 (Ice Only) (1)	WL06SD	S: 06/03/2011 14:56		

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number :
Y			3.	

Analysis Key: Concentration : L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B **Custody Seal Intact?** y **Shipment Iced?** y

BNA = CLP TCL Semivolatiles

COC Number : 10-4097213-060611-0005

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

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LABORATORY COPY

000005

USEPA Contract Laboratory Program
Organic Traffic Report & Chain of Custody Record

Copy original in SDG JDQT4

Case No: 41282
DAS No:
SDG No: JDQX3

L

Date Shipped:	6/6/2011
Carrier Name:	FedEx
Airbill No:	862302348450
Shipped to:	Datachem Laboratories, Inc. 960 West LeVoy Drive Salt Lake City UT 84123 8012667700

Chain Of Custody Record

Sampler Signature: JF

	Relinquished By	(Date/Time)	Received By	(Date/Time)
1	JF	6/6/11 1200		6/7/11 1014
2				
3				
4				

For Lab Use Only

Lab Contract No: EPW 11037
Unit Price: n/a
Transfer To:
Lab Contract No:
Unit Price:

ORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	INORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
JDQX7	Soil (0"-6")/ Jeff Fetters	G	BNA (21)	11224023 (Ice Only) (1)	BK01SS	S: 06/03/2011 15:45		
JDQX8	Sediment/ Jeff Fetters	G	BNA (21)	11224024 (Ice Only) (1)	BK01SD	S: 06/03/2011 15:20		
JDQY0	Sediment/ Jeff Fetters	G	BNA (21)	11224029 (Ice Only) (1)	BK02SD	S: 06/03/2011 16:00		

Shipment for Case Complete? Y	**Sample (s) to be used for laboratory QC:** JDQX7, JDQY0	**Additional Sampler Signature (s):**	**Cooler Temperature Upon Receipt:** 5	**Chain of Custody Seal Number :**

Analysis Key: Concentration : L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B **Custody Seal Intact?** y **Shipment Iced?** y

BNA = CLP TCL Semivolatiles

COC Number : 10-4097213-060611-0005

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

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LABORATORY

000057

USEPA Contract Laboratory Program
Organic Traffic Report & Chain of Custody Record

Case No: 41282
DAS No:
SDG No: JDQX3

L

Date Shipped:	6/6/2011
Carrier Name:	FedEx
Airbill No:	862302348438
Shipped to:	Datachem Laboratories, Inc. 960 West LeVoy Drive Salt Lake City UT 84123 8012667700

Chain Of Custody Record

Sampler Signature: JFetters

Relinquished By (Date/Time)	Received By (Date/Time)
1 JFetters 6/6/11	Merrill Edward 6/7/11/1004
2	
3	
4	

For Lab Use Only

Lab Contract No: EPW 1187
Unit Price: n/a
Transfer To:
Lab Contract No:
Unit Price:
ME 6/7/11

ORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	INORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
JDQX5	Surface Water/ Jeff Fetters	G	CLP SVSIM (21)	11224021 (Ice Only) (2)	WL01WT	S: 06/03/2011 14:20		
JDQX6	Surface Water/ Jeff Fetters	G	CLP SVSIM (21)	11224022 (Ice Only) (2)	WL02WT	S: 06/03/2011 14:45		ME 6/7/11
JDQX9	Surface Water/ Jeff Fetters	G	CLP SVSIM (21)	11224025 (Ice Only) (2)	BK01WT	S: 06/03/2011 15:17		
JDQY1	Water/ Jeff Fetters	G	CLP SVSIM (21)	11224027 (Ice Only) (2)	RI01WT	S: 06/03/2011 11:03		SDG Final Sample

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number :
N	JDQX9		3.	

Analysis Key: Concentration : L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B

Custody Seal Intact? y Shipment Iced? y

CLP SVSIM = CLP TCL Semivolatiles-SIM

COC Number : 10-4097213-060611-0006

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00000

USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 41282
DAS No:
SDG No: MJDQT4

L

Date Shipped: 6/6/2011 Carrier Name: FedEx Airbill No: 866782041597 Shipped to: ChemTech Consulting Group (CHEM) 284 Sheffield Street Mountainside NJ 07092	**Chain Of Custody Record** Relinquished By (Date/Time) 1 [signature] 6/6/11 1200 2 3 4	Sampler Signature: [signature] Received By (Date/Time) [signature] 6/07/11 9:35	**For Lab Use Only** Lab Contract No: EPW09038 Unit Price: Transfer To: Lab Contract No: Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
MJDQT4	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224000 (Ice Only) (1)	PR01SS	S: 06/03/2011 08:28		
MJDQT5	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224001 (Ice Only) (1)	PR02SS	S: 06/03/2011 08:50		
MJDQT6	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224002 (Ice Only) (1)	PR03SS	S: 06/03/2011 08:45		
MJDQT7	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224003 (Ice Only) (1)	RR01SS	S: 06/03/2011 11:40		
MJDQT8	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224004 (Ice Only) (1)	RR02SS	S: 06/03/2011 11:38		
MJDQT9	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224005 (Ice Only) (1)	RR03SS	S: 06/03/2011 11:57		
MJDQW0	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224006 (Ice Only) (1)	SR01SS	S: 06/03/2011 09:34		

Shipment for Case Complete? Y	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt: 4°C	Chain of Custody Seal Number : N/A
Analysis Key:	Concentration : L = Low, M = Medium, H = High, L/M = Low/Medium	Type/Designate : Composite = C, Grab = G, Both = B	Custody Seal Intact? Yes	Shipment Iced? Yes

TM = CLP TAL Total Metals

COC Number : 10-4097213-060611-0004

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USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 41282
DAS No: MJDQT4 L~~O~~
SDG No:

Date Shipped: 6/6/2011
Carrier Name: FedEx
Airbill No: 866782041597
Shipped to: ChemTech Consulting Group (CHEM)
284 Sheffield Street
Mountainside NJ 07092

Chain Of Custody Record

Sampler Signature: [signature] 6/6/11 1200

	Relinquished By	(Date/Time)	Received By	(Date/Time)
1	[signature]	6/6/11 1200	[signature]	6/07/11 9:35
2				
3				
4				

For Lab Use Only
Lab Contract No: EPW09038
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
MJDQW1	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224007 (Ice Only) (1)	SR02SS	S: 06/03/2011 09:45		
MJDQW2	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224008 (Ice Only) (1)	SR03SS	S: 06/03/2011 10:07		
MJDQW3	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224009 (Ice Only) (1)	SR04SS	S: 06/03/2011 10:25		
MJDQW4	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224010 (Ice Only) (1)	SR05SS	S: 06/03/2011 12:20		
MJDQW5	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224011 (Ice Only) (1)	SR06SS	S: 06/03/2011 12:16		
MJDQW6	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224012 (Ice Only) (1)	PR04SS	S: 06/03/2011 09:06		
MJDQW7	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224013 (Ice Only) (1)	RR04SS	S: 06/03/2011 11:57		

Shipment for Case Complete? Y	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt: 4°C	Chain of Custody Seal Number : N/A

Analysis Key: Concentration : L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B
Custody Seal Intact? yes **Shipment Iced?** yes

TM = CLP TAL Total Metals

COC Number : 10-4097213-060611-0004

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USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 41282
DAS No:
SDG No: MJDQT4

LO

Date Shipped: 6/6/2011
Carrier Name: FedEx
Airbill No: 866782041597
Shipped to: ChemTech Consulting Group (CHEM)
284 Sheffield Street
Mountainside NJ 07092

Chain Of Custody Record

Sampler Signature: [signature]

	Relinquished By	(Date/Time)	Received By	(Date/Time)
1	[signature]	6/6/11 1200	[signature]	6/07/11 9:35
2				
3				
4				

For Lab Use Only
Lab Contract No: EPW09038
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
MJDQW8	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224014 (Ice Only) (1)	RF01SS	S: 06/03/2011 16:28		
MJDQW9	Sediment/ Jeff Fetters	G	TM (21)	11224015 (Ice Only) (1)	WL01SD	S: 06/03/2011 12:57		
MJDQX0	Sediment/ Jeff Fetters	G	TM (21)	11224016 (Ice Only) (1)	WL02SD	S: 06/03/2011 13:43		
MJDQX1	Sediment/ Jeff Fetters	G	TM (21)	11224017 (Ice Only) (1)	WL03SD	S: 06/03/2011 13:36		
MJDQX2	Sediment/ Jeff Fetters	G	TM (21)	11224018 (Ice Only) (1)	WL04SD	S: 06/03/2011 14:10		
MJDQX3	Sediment/ Jeff Fetters	G	TM (21)	11224019 (Ice Only) (1)	WL05SD	S: 06/03/2011 14:20		
MJDQX4	Sediment/ Jeff Fetters	G	TM (21)	11224020 (Ice Only) (1)	WL06SD	S: 06/03/2011 14:56		

(Except: MJDQW8 all samples are in SDG# MJDQW9)

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number :
Y/N			4°C	N/A

Analysis Key: Concentration : L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B **Custody Seal Intact?** Yes **Shipment Iced?** Yes

TM = CLP TAL Total Metals

COC Number : 10-4097213-060611-0004

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 41282
DAS No:
SDG No: MJDQT4 LQ

Date Shipped: 6/6/2011
Carrier Name: FedEx
Airbill No: 866782041597
Shipped to: ChemTech Consulting Group (CHEM)
284 Sheffield Street
Mountainside NJ 07092

Chain Of Custody Record

Sampler Signature:

	Relinquished By	(Date/Time)	Received By	(Date/Time)
1		6/6/11 [illegible]		6/07/11 9:35
2				
3				
4				

For Lab Use Only
Lab Contract No: EPW09038
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
MJDQX5	Surface Water/ Jeff Fetters	G	TM (21)	11224021 (HNO3) (1)	WL01WT	S: 06/03/2011 14:20		
MJDQX6	Surface Water/ Jeff Fetters	G	TM (21)	11224022 (HNO3) (1)	WL02WT	S: 06/03/2011 14:45		
MJDQX7	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224023 (Ice Only) (1)	BK01SS	S: 06/03/2011 15:45		
MJDQX8	Sediment/ Jeff Fetters	G	TM (21)	11224024 (Ice Only) (1)	BK01SD	S: 06/03/2011 15:20		
MJDQX9	Surface Water/ Jeff Fetters	G	TM (21)	11224025 (HNO3) (1)	BK01WT	S: 06/03/2011 15:17		
MJDQY0	Sediment/ Jeff Fetters	G	TM (21)	11224029 (HNO3) (2)	BK02SD	S: 06/03/2011 16:00		
MJDQY1	Water/ Jeff Fetters	G	TM (21)	11224027 (HNO3) (2)	RI01WT	S: 06/03/2011 11:03		

(except: MJDQX7 all samples are in SDGs: MJDQW9 and MJDQX5)

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number :
N / Y	MJDQX7, MJDQX9, MJDQY0		4°C	N/A

Analysis Key: Concentration : L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B
Custody Seal Intact? yes **Shipment Iced?** yes

TM = CLP TAL Total Metals

COC Number : 10-4097213-060611-0004

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PR provides preliminary results. Requests for preliminary results will increase analytical costs.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 LABORATORY

7411 Beach Dr. East
Port Orchard, Washington 98366

CORRECTIVE ACTION NOTICE

Project Name:	Kitsap Rifle & Revolver Range	Date Received:	6/6/2011
Project Code:	TEC-991A	Sampling Agency	E&E
Account Code:	11T10P302DD2C10ZZLA00	Sampler(s):	Jeff Fetters
Project Officer:	Mark Ader		
Phone:	206-553-1849	Recorder:	Jeff Fetters

Sample Numbers: 10224015-22, 24, 25, 29

2	**Number of shipping containers received**
0	**Number of shipping containers received with errors**
3	**Number of chains of custody received**
1	**Number of chains of custody received with errors**

# Containers	Description of Shipment/Chain of Custody Container Issues Noted:
0	Shipping Container - Addressed incorrectly (must be addressed to 'Sample Custodian')
0	Shipping Container - Samples improperly packed for shipment
0	Shipping Container - Cooler Return information not provided
0	Custody Seals - Custody Samples received with seals missing/broken
0	Chain of Custody - Missing/Outdated Form
0	Chain of Custody - Missing/Incorrect chain of custody header information

11	**Number of samples received in this shipment**
0	**Number of samples received with critical and/or non-critical errors**
0	**Number of samples received with critical errors**

# Samples	Description of Shipment/Chain of Custody/Sample Container Issues Noted:
0	Chain of Custody - Missing/Incorrect EPA numbers
0	Chain of Custody - No analysis/Incorrect analysis listed for received samples
0	Chain of Custody - Samples listed not included in shipment
0	Unique Container ID* - Missing on COC and/or Not written on the container
0	Unique Container ID* - Incorrectly assigned
0	Sample Container - Labels Missing/Damaged/Illegible
0	Sample Container - EPA Sample Numbers Missing/Incorrect
0	Custody Seals - Criminal Samples received with seals missing/broken
0	Sample Container - Received at elevated temperature (above 6°C)
0	Sample Container - Sample preservation requirements not met
0	Sample Container - Broken/Leaking
0	Sample Container- Insufficient sample volume and/or incorrect sample container
1.	Chain of Custody- Sample #11224027 was listed on the chain of custody, but was not included in the shipment. ***See below**

* per Region 10 Sample Receiving SOP

Additional Information

***** It appeared that sample 11224027 was missing from the shipment, however the sampler was contacted and apparently the sample was never meant to be shipped to Manchester Lab. That sample was shipped to the CLP lab.**

The sample number was crossed off the chain of custody.

Transmitted By: Karen Norton/ ESAT

Date: 6/6/2011

Original: File

RSCC Contact: Jennifer Crawford

Project Officer: Mark Ader

Laboratory Director: Barry Pepich

Laboratory Staff: Gerald Dodo, Chris Pace, Carol Haines, Dave Dobb, Dan Jacobsen, Kim Wood

cc: Renee Nordeen- E&E

/

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case: 41282
Client No:

R

Region:	10	**Date Shipped:**	6/6/2011
Project Code:	TEC-991A	**Carrier Name:**	Hand Delivery
Account Code:		**Airbill:**	
CERCLIS ID:		**Shipped to:**	Manchester Environmental Laboratory 7411 Beach Drive East Port Orchard WA 98366 3608718747
Spill ID:			
Site Name / City/State:	Kitsap Rifle and Revolver Range Bremerton, AK		
Project Leader:	Jeff Fetters		
Action:	Intergrated Assessment		
Sampling Co:	Ecologh and Environmnet		

Chain of Custody Record

Sampler Signature:

	Relinquished By	(Date/Time)	Received By	(Date/Time)
1		6/6/11 1400		6/6/11 1400
2				
3				
4				

SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
BK01SD	Sediment/ Jeff Fetters	G	NIT_ARO (21)	11224024 (Ice Only) (1) N1	BK01SD	S: 06/03/2011 15:20	--
BK02SD	Sediment/ Jeff Fetters	G	NIT_ARO (21)	11224029 (Ice Only) (1) N1	BK02SD	S: 06/03/2011 16:00	--
WL01SD	Sediment/ Jeff Fetters	G	NIT_ARO (21)	11224015 (Ice Only) (1) N1	WL01SD	S: 06/03/2011 12:57	--
WL02SD	Sediment/ Jeff Fetters	G	NIT_ARO (21)	11224016 (Ice Only) (1) N1	WL02SD	S: 06/03/2011 13:43	--
WL03SD	Sediment/ Jeff Fetters	G	NIT_ARO (21)	11224017 (Ice Only) (1) N1	WL03SD	S: 06/03/2011 13:36	--
WL04SD	Sediment/ Jeff Fetters	G	NIT_ARO (21)	11224018 (Ice Only) (1) N1	WL04SD	S: 06/03/2011 14:10	--

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Chain Of Custody Seal Number :
N	BK02SD		

Analysis Key: **Concentration :** L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B **Shipment Iced?**

NIT_ARO = Nitroaromatics

COC Number : 10-4097213-060611-0002

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

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2

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case: 41282
Client No:

R

Region:	10	Date Shipped:	6/6/2011	**Chain of Custody Record**	Sampler Signature: [signature]
Project Code:	TEC-991A	Carrier Name:	Hand Delivery		
Account Code:		Airbill:		Relinquished By (Date/Time)	Received By (Date/Time)
CERCLIS ID:		Shipped to:	Manchester Environmental Laboratory 7411 Beach Drive East Port Orchard WA 98366 3608718747	1 [signature] 6/6/11 1400	K Nuestro 6/6/11 1400
Spill ID:				2	
Site Name / City/State:	Kitsap Rifle and Revolver Range Bremerton, AK			3	
Project Leader:	Jeff Fetters			4	
Action:	Intergrated Assessment				
Sampling Co:	Ecologh and Environmnet				

SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
WL05SD	Sediment/ Jeff Fetters	G	NIT_ARO (21)	11224019 (Ice Only) (1) N/	WL05SD	S: 06/03/2011 14:20	--
WL06SD	Sediment/ Jeff Fetters	G	NIT_ARO (21)	11224020 (Ice Only) (1) N/	WL06SD	S: 06/03/2011 14:56	--

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Chain Of Custody Seal Number :
N	BK02SD		
Analysis Key:	**Concentration :** L = Low, M = Medium, H = High, L/M = Low/Medium	**Type/Designate :** Composite = C, Grab = G, Both = B	**Shipment Iced?**

NIT_ARO = Nitroaromatics

COC Number : 10-4097213-060611-0002

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

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USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case: 41282
Client No:

R

Region:	10	Date Shipped:	6/6/2011
Project Code:	TEC-991A	Carrier Name:	Hand Delivery
Account Code:		Airbill:	
CERCLIS ID:		Shipped to:	Manchester Environmental Laboratory 7411 Beach Drive East Port Orchard WA 98366 3608718747
Spill ID:			
Site Name / City/State:	Kitsap Rifle and Revolver Range Bremerton, AK		
Project Leader:	Jeff Fetters		
Action:	Intergrated Assessment		
Sampling Co:	Ecologh and Environmnet		

Chain of Custody Record

Sampler Signature: [signature]

	Relinquished By	(Date/Time)	Received By	(Date/Time)
1	[signature]	6/6/11 1400	[signature] N[illegible]	
2				6/6/11
3				1400
4				

SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
BK01WT	Surface Water/ Jeff Fetters	G	NIT_ARO (21)	11224025 (Ice Only) (2) N1, N2, N3, N4, N5, N6	BK01WT	S: 06/03/2011 15:17	--
~~RI04WT~~	~~Water/ Jeff Fetters~~	~~G~~	~~NIT_ARO (21)~~	~~11224027 (Ice Only) (2) N1, N2~~	~~RI04WT~~	~~S: 06/03/2011 11:03~~	~~Rinsate~~
WL01WT	Surface Water/ Jeff Fetters	G	NIT_ARO (21)	11224021 (Ice Only) (2) N1, N2 –	WL01WT	S: 06/03/2011 14:20	--
WL02WT	Surface Water/ Jeff Fetters	G	NIT_ARO (21)	11224022 (Ice Only) (2) N1, N2 –	WL02WT	S: 06/03/2011 14:45	--

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Chain Of Custody Seal Number :
1F N/Y	BK01WT		

Analysis Key: **Concentration :** L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B **Shipment Iced?**

NIT_ARO = Nitroaromatics

COC Number : 10-4097213-060611-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No:	41282
DAS No:	
SDG No:	MJDQW9

LA

Date Shipped:	6/6/2011
Carrier Name:	FedEx
Airbill No:	866782041597
Shipped to:	ChemTech Consulting Group (CHEM) 284 Sheffield Street Mountainside NJ 07092

Chain Of Custody Record

Sampler Signature: [signature]

	Relinquished By	(Date/Time)	Received By	(Date/Time)
1	[signature]	6/6/11 1200	[signature]	6/07/11 9:35
2				
3				
4				

For Lab Use Only

Lab Contract No:	EPW09038
Unit Price:	
Transfer To:	
Lab Contract No:	
Unit Price:	

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
MJDQW8	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224014 (Ice Only) (1)	RF01SS	S: 06/03/2011 16:28		
MJDQW9	Sediment/ Jeff Fetters	G	TM (21)	11224015 (Ice Only) (1)	WL01SD	S: 06/03/2011 12:57		
MJDQX0	Sediment/ Jeff Fetters	G	TM (21)	11224016 (Ice Only) (1)	WL02SD	S: 06/03/2011 13:43		
MJDQX1	Sediment/ Jeff Fetters	G	TM (21)	11224017 (Ice Only) (1)	WL03SD	S: 06/03/2011 13:36		
MJDQX2	Sediment/ Jeff Fetters	G	TM (21)	11224018 (Ice Only) (1)	WL04SD	S: 06/03/2011 14:10		
MJDQX3	Sediment/ Jeff Fetters	G	TM (21)	11224019 (Ice Only) (1)	WL05SD	S: 06/03/2011 14:20		
MJDQX4	Sediment/ Jeff Fetters	G	TM (21)	11224020 (Ice Only) (1)	WL06SD	S: 06/03/2011 14:56		

(EPA sample: MJDQW8 is in SDG# MJDQT4)

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number :
Y/N			4°C	N/A

Analysis Key: Concentration : L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B **Custody Seal Intact?** Yes **Shipment Iced?** Yes

TM = CLP TAL Total Metals

COC Number : 10-4097213-060611-0004

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 41282
DAS No:
SDG No: MJDQW9 L00

Date Shipped: 6/6/2011
Carrier Name: FedEx
Airbill No: 866782041597
Shipped to: ChemTech Consulting Group (CHEM)
284 Sheffield Street
Mountainside NJ 07092

Chain Of Custody Record

Sampler Signature: [signature]

	Relinquished By (Date/Time)	Received By (Date/Time)
1	[signature] 6/6/11 1200	[signature] 6/07/11 9:35
2		
3		
4		

For Lab Use Only
Lab Contract No: EPW09038
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
MJDQX5	Surface Water/ Jeff Fetters	G	TM (21)	11224021 (HNO3) (1)	WL01WT	S: 06/03/2011 14:20		
MJDQX6	Surface Water/ Jeff Fetters	G	TM (21)	11224022 (HNO3) (1)	WL02WT	S: 06/03/2011 14:45		
MJDQX7	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224023 (Ice Only) (1)	BK01SS	S: 06/03/2011 15:45		
MJDQX8	Sediment/ Jeff Fetters	G	TM (21)	11224024 (Ice Only) (1)	BK01SD	S: 06/03/2011 15:20		
MJDQX9	Surface Water/ Jeff Fetters	G	TM (21)	11224025 (HNO3) (1)	BK01WT	S: 06/03/2011 15:17		
MJDQY0	Sediment/ Jeff Fetters	G	TM (21)	11224029 (HNO3) (2)	BK02SD	S: 06/03/2011 16:00		
MJDQY1	Water/ Jeff Fetters	G	TM (21)	11224027 (HNO3) (2)	RI01WT	S: 06/03/2011 11:03		

(Except: MJDQX8 and MJDQY0 all samples are in SDGs: MJDQT4 + MJDQX5)

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number :
N/Y	MJDQX7, MJDQX9, MJDQY0		4°C	N/A

Analysis Key: Concentration : L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B **Custody Seal Intact?** yes **Shipment Iced?** yes

TM = CLP TAL Total Metals

COC Number : 10-4097213-060611-0004

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 41282
DAS No:
SDG No: MJDQX5

L

Date Shipped:	6/6/2011
Carrier Name:	FedEx
Airbill No:	866782041597
Shipped to:	ChemTech Consulting Group (CHEM) 284 Sheffield Street Mountainside NJ 07092

Chain Of Custody Record

Sampler Signature: [signature]

	Relinquished By	(Date/Time)	Received By	(Date/Time)
1	[signature]	6/6/11 1200	Ken Rivera	6/07/11 9:35
2				
3				
4				

For Lab Use Only

Lab Contract No: EPW09038
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
MJDQX5	Surface Water/ Jeff Fetters	G	TM (21)	11224021 (HNO3) (1)	WL01WT	S: 06/03/2011 14:20		
MJDQX6	Surface Water/ Jeff Fetters	G	TM (21)	11224022 (HNO3) (1)	WL02WT	S: 06/03/2011 14:45		
MJDQX7	Soil (0"-6")/ Jeff Fetters	G	TM (21)	11224023 (Ice Only) (1)	BK01SS	S: 06/03/2011 15:45		
MJDQX8	Sediment/ Jeff Fetters	G	TM (21)	11224024 (Ice Only) (1)	BK01SD	S: 06/03/2011 15:20		
MJDQX9	Surface Water/ Jeff Fetters	G	TM (21)	11224025 (HNO3) (1)	BK01WT	S: 06/03/2011 15:17		
MJDQY0	Sediment/ Jeff Fetters	G	TM (21)	11224029 (HNO3) (2)	BK02SD	S: 06/03/2011 16:00		
MJDQY1	Water/ Jeff Fetters	G	TM (21)	11224027 (HNO3) (2)	RI01WT	S: 06/03/2011 11:03		

(Except: MJDQX5, MJDQX6 AND MJDQX9 + MJDQY1 all samples are in SDG# MJDQT7 + MJDQW9)

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number :
N/Y	MJDQX7, MJDQX9, MJDQY0		4°C	N/A

Analysis Key: Concentration : L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B **Custody Seal Intact?** Yes **Shipment Iced?** Yes

TM = CLP TAL Total Metals

COC Number : 10-4097213-060611-0004

PR provides preliminary results. Requests for preliminary results will increase analytical costs.