GeoEngineers

January 12, 2007

OliverMcMillan Everett LLC
733 8th Avenue
San Diego, California 92101

Attention: Robert Mueller

Subject: Letter
Ordinary High Water Mark Delineation
Everett Riverfront Plan and Redevelopment Project
Everett, Washington
File No. 6191-002-01

INTRODUCTION

GeoEngineers, Inc. (GeoEngineers) was contracted by OliverMcMillan Everett LLC to perform an Ordinary High Water Mark (OHWM) delineation of the property proposed for the Everett Riverfront Redevelopment project. The project is located in Sections 29 and 32 of Township 29 North, Range 5 East of the Willamette Meridian east of Interstate 5, south of Pacific Avenue and north of Lowell Snohomish River Road in Everett, Washington (see Vicinity Map, Figure 1). The proposed project is located adjacent to the western shoreline of the Snohomish River within the tidally influenced lower section of the river. Project details and property boundaries are based on information obtained during our recent discussions with the project team (Mark Wolken Consulting, OliverMcMillan Everett LLC Team and City of Everett, Washington Representatives). The OHWM delineation is the first step in establishing shoreline jurisdictions, building setbacks and shoreline buffers for the proposed project according to the City of Everett's Shoreline Master Program (SMP) (updated November 17, 2005). A licensed professional surveyor will need to be employed to survey the OHWM as flagged in the field by GeoEngineers and detailed in this letter.

METHODS

GeoEngineers conducted a site visit on November 3, 2006, and on December 12 and 21, 2006, to determine the location of OHWM along the project corridor. We examined site maps, available reports, tide predictions and United States Geological Survey gauge data prior to the field reconnaissance. Upon arrival at the site, we traversed the river shoreline and investigated stream channels, culverts, wetlands and/or levee breaches that may have occurred along the river, adjacent to the project area. We also observed conditions characteristic of the OHWM such as sediment lines, topographic breaks, drift lines, watermarks and changes in vegetation communities along the river channel. The Mean Higher High Water (MHHW) line was determined as reference to the OHWM with tidal influence as defined below for high energy environments. GeoEngineers based the determination of the OHWM upon the methods and techniques described for tidal systems in the Washington State Department of Ecology's manual entitled "How to Determine Ordinary High Water Mark" (2003), as well as the guidelines set forth in Chapter 173-22 of the Washington Administrative Code (WAC).

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The WAC defines OHWM as:

> *Ordinary High Water Mark on all lakes, streams, and tidal water is that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation as that condition exists on June 1, 1971, as it may naturally change thereafter, or as it may change thereafter in accordance with permits issued by a local government or the department. [WAC 173-22-030]*

The OHWM is further defined for tidal shorelines as:

> *In high energy environments where the action of waves or currents is sufficient to prevent vegetation establishment below mean higher high tide, the ordinary high water mark is coincident with the line of vegetation. Where there is no vegetative cover for less than one hundred feet parallel to the shoreline, the ordinary high water mark is the average tidal elevation of the adjacent lines of vegetation. Where the ordinary high water mark cannot be found, it is the elevation of mean higher high tide. [WAC 173-22-030]*

WAC 173-22-030 also states:

> *Where a stream enters the tidal water, the tidal water is bounded by the extension of the elevation of the marine OHWM within the stream. [WAC 173-22-030(16)]*

Where distinguishable watermark elevations at the same approximate elevation across the width of the property were consistent with the same elevation indicated by on-site vegetation shifts and topographic breaks were considered to be the OHWM. Once the OHWM elevation was determined along the banks of the river, a laser level was used to help mark the OHWM in areas that did not contain definitive indicators. The OHWM was staked, marked with orange flags and identified on a map by using a handheld global positioning system with 0.5 to 5 meter accuracy.

RESULTS

OHWM DETERMINATION

On November 3, 2006, we arrived at the site at 9:00 AM during a +3.8-foot Mean Lower Low Water (MLLW) tide, according to the predicted tide at Everett, Washington. During this low tide event, we were able to visually inspect the banks of the Snohomish River, Bigelow Creek and adjacent wetlands and culverts to determine the conditions and topographic breaks that limit the extent of the tidal influence within each area. We remained on-site through the tide shift to the daily high tide of +11.8 feet. The MHHW for this area is +11.1- foot MLLW, according to the U.S. Army Corps of Engineers tidal datums, and therefore we observed the full extent of the tidal influence for the area. On December 12 and 21, 2006, we visited the area during the daily high tide events to observe areas that required further investigation and to finalize our OHWM delineation.

Figure 2 shows the OHWM delineation and the shorelines that, in our opinion, are subject to shoreline regulation and jurisdiction as measured from the OHWM of the tidal influence of Snohomish River in the SMP. The shoreline jurisdiction includes but is not limited to all lands extending landward for 200 feet in all directions as measured on a horizontal plane from the OHWM.

SNOHOMISH RIVER

The project area is bordered on the east by the Snohomish River. Uses along the river include heavy equipment storage, aggregate storage, solid waste landfills, railroads and Rotary Park with pedestrian paths at the south end of the site. The portion of the river within the project area, as indicated in Figure 1, is described in the SMP based on its degree of fresh water and marine influence and is included in Ecological Management Unit 1. The river currently consists of steeply diked banks with areas of riprap protection and occasional pilings. These extensive man-made earthen dikes have been in place since the mid-1930s and confine the limits and influence of the river. The water surface elevation of the Snohomish River within the project area is controlled by tides and raises and lowers with the flow and ebb of the tides. However, salt-sensitive plant species characterize the area adjacent to OHWM, indicating that salt concentrations in this portion of the river are low because of weak salt wedge influence. The areas below OHWM are mostly void of vegetation and consist of sandy silts (mud).

The OHWM was marked utilizing 13 stakes and/or orange flags indicating the horizontal and vertical elevation of OHWM on the waterward face of the dike (Figure 2). OHWM indicators were consistent throughout the length of the dike. A topographic break and vegetation shift were present where the OHWM existed along the dike bank. The areas above OHWM consisted primarily of Himalayan blackberry (*Rubus armeniacus*), Sitka willow (*Salix sitchensis*), Pacific willow (*Salix lasiandra*), salmonberry (*Rubus spectabilis*) red alder (*Alnus rubra*) and big-leaf maple (*Acer macrophyllum*). Sediment marks on vegetation from high tide occurrences have left a distinctive line relating to the same elevation on the dike where topography and vegetation shifts were observed (Attachment A – Photographs 1-4).

BIGELOW CREEK

Bigelow Creek enters the west bank of the Snohomish River north of the Simpson Development Pad and southeast of TireFire/Land Fill site. The creek flows through the partially filled North Wetland Complex prior to entering the Snohomish River (see Figure 2). The creek flows through an old mill site, where it was heavily altered from natural conditions. Extensive fill was placed in historical wetlands, and the creek was ditched, channelized and culverted through the mill site and along the railroad (Chamblin 2002, Metzgar 2002). Some of the channel characteristics have been restored where the creek flows along the railroad tracks, including open wetlands in the denser vegetated areas (Haring 2002). A tide gate through the dike at the mouth of Bigelow Creek previously impaired access into the creek, but has been removed (Haring 2002). Since the removal of the tide gate, the creek experiences tidal influence from the Snohomish River. However, topography and natural conditions limit the continuity of the creek with the river. Tidal influence of Bigelow Creek from the Snohomish River is not in direct continuity with adjacent wetlands when the creek is below OHWM.

Based on observations during our site visit, we determined that the tidal influence of Bigelow Creek is limited to the lower segment of the creek, as indicated on Figure 2. We placed 20 flags indicating the OHWM mark of the river and the extent of tidal influence within the creek. During high tide events, water flows from the river into the creek (Attachment A – Photographs 5 through 10). However, the elevation of the water in the creek beyond the OHWM did not change as a result of a mean high or low tide. As depicted in Figure 2, there are four side channels where the creek has been ditched and/or channeled outside of the centerline of the creek (Attachment A – Photographs 11 through 13). Two of these side channels and the creek are further limited by large and extensive beaver (*Castor canadensis*) dams (Attachment A – Photographs 14 and 15). The extent of tidal influence (and OHWM) was determined in these areas based on topographic breaks and vegetation lines.

WETLAND COMPLEXES AND DRAINAGE DITCHES

The project area contains wetlands and drainage ditches that have been previously delineated and/or described in Pentec 1994 and The Watershed Company 2005. The wetland complexes are identified in these studies based on their positions relative to the Simpson Development Pad (see Figure 2).

These wetlands are interrupted from the river by a series of levees and dikes. These dikes run the entire length of the river (with the exceptions listed below), separating it from the on-site wetlands. Thus, most of the on-site wetlands are not in direct continuity with the river or tidal influence according to the WAC tidal definition.

There are four areas located along the dike that have been interrupted and do not fully separate the wetlands from the river (see Figure 2). These areas allow a possible water connection during flood events or tidal inundation and required extensive investigation. The flow of tidally influenced riverine water into the wetland complexes or drainage ditches during high tide events is limited within these areas as described below.

Stormwater Outfall

A stormwater outfall and drop structure is located in the southeastern portion of the site near the South Wetland Complex (see Figure 2). This outfall is configured to convey stormwater into the river and is set at an elevation that prevents tidal influence from reaching the South Wetland Complex. The exact OHWM within the culvert could not be determined, but based on the length of the culvert and watermarks within the culvert and on the adjacent banks, the OHWM is located inside the culvert a short distance from the river.

South Wetland Complex Culverts

Hydrologic connectivity of the South Wetland Complex to the Snohomish River is limited to two culvert outlets (see Figure 2). The first culvert connects the river to an unnaturally steep, narrow backwater channel. The OHWM was flagged in this area based on visual observations of watermarks and drift lines. West of this channel is the second culvert, which connects to the South Wetland Complex. At the time of the site visit, the second (landward most) culvert was blocked by debris. This was deemed a temporary blockage. Definitive indicators of OHWM were not present within the South Wetland Complex. Therefore, the OHWM in this area was determined by elevation based on the OHWM along the adjacent Snohomish River Shoreline (WAC 173-22-030).

The South Wetland Complex was inundated with ponded water during the field reconnaissance (Attachment A – Photograph 16). The MHHW elevation of the river was referenced to the wetland using a laser level. Flags were placed throughout the wetland at the measured elevation OHWM. A slight topographic break was observed at most of the OHWM flags.

North Wetland Complex Outlet

South of Bigelow Creek, a backwater channel was observed near the edge of the North Wetland Complex (Attachment A – Photographs 17 through 19). Water flows in and out of this area during flood and tidal events, but river water is not in continuity with the wetland below OHWM. The OHWM of this area was determined from topographic breaks and watermarks as indicated in Figure 2.

Railroad Drainage Ditches

Railroad tracks presently bound the west side of the North Wetland Complex. It is our understanding that these tracks are currently active but will be abandoned in the future. Two drainage ditches parallel these

tracks, the "Middle Ditch" or Bigelow Creek set between the tracks and the "West Ditch" set on the west side of the tracks (see Figure 2). These ditches serve to capture and redirect stormwater and redirect some of the flow from Bigelow Creek. There are two culverts that connect these ditches to the Snohomish River. The first culvert connects the river to the Middle Ditch and to a backwater area where a second culvert connects to the West Ditch (Attachment A – Photographs 20 through 22). Because of the elevation, depth and confined widths of the ditches, river influence is experienced for approximately 600 feet inland. The OHWM was marked according to watermarks, vegetation lines and topographic breaks as indicated in Figure 2.

CONCLUSION

Figure 2 shows the OHWM delineation and the presumed jurisdictional shorelines that are subject to regulations and jurisdictions as defined from the OHWM of the Snohomish River in the SMP. The shoreline jurisdiction includes but is not limited to all lands extending landward for 200 feet in all directions as measured on a horizontal plane from the OHWM.

Snohomish River water level adjacent to the site is influenced by the ebb and flow of tides, but does not contain a high salinity level. Thus, the vegetation in the river within the project corridor is characteristic of freshwater environments and does not contain characteristics of saltwater environments. Therefore, the OHWM of the Snohomish River within the project area was based on definitions as outlined in the WAC for high energy environments. In areas were distinguishing marks were not visible; the MHHW elevation of the river was used. The OHWM was identified and delineated along the dike of the western bank of the Snohomish River at various location within the project area and was flagged as indicated in Figure 2. Bigelow Creek and three additional areas were determined to be influenced by the influx of river water and thus within the OHWM of the Snohomish River. The OHWM was delineated and mapped for these areas.

The primary objectives of preparing this letter were:

- Document investigations into the extent of OHWM of the Snohomish River within the project area,
- delineate and mark in the field the OHWM of the Snohomish River and create a preliminary map indicating the OHWM, and
- establish shoreline jurisdiction based on the OHWM of the Snohomish River as required to complete the Environmental Review.

The OHWM delineation is the first step in establishing shoreline jurisdiction and building setbacks and buffers associated with the Snohomish River for the proposed project. OliverMcMillan will need to employ a licensed professional surveyor to survey the flags placed by GeoEngineers. The surveyed map should indicate the river boundary as well as shoreline jurisdiction based on the location of OHWM. This survey will be required for submittal and completion of the environmental review by the City of Everett and Washington State Department of Ecology to verify this OHWM delineation for jurisdictional purposes.

LIMITATIONS

GeoEngineers has prepared this letter in general accordance with the scope and limitations of our proposal. Within the limitations of scope, schedule and budget, our services have been executed in

accordance with the generally accepted practices for OHWM delineations in this area at the time this letter was prepared. No warranty or other conditions, express or implied, should be understood.

This letter has been prepared for the exclusive use of OliverMcMillan Everett LLC and its authorized agents and regulatory agencies, following the described methods and information available at the time of the work. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. The information contained herein should not be applied for any purpose or project except the one originally contemplated.

REFERENCES

Chamblin, M. 2002. Washington Department of Fish and Wildlife, Mill Creek office. *Cited in*: Haring, D. 2002. Salmonid Habitat Limiting Factors Anaylsis Snohomish River Watershed Water Resources Inventory Area 7 Final Report. Washington State Conservation Commission.

Haring, D. 2002. Salmonid Habitat Limiting Factors Anaylsis Snohomish River Watershed Water Resources Inventory Area 7 Final Report. Washington State Conservation Commission.

Metzgar, R. 2002. City of Everett. *Cited in*: Haring, D. 2002. Salmonid Habitat Limiting Factors Anaylsis Snohomish River Watershed Water Resources Inventory Area 7 Final Report. Washington State Conservation Commission.

Pentec Environmental, Inc. 1994. Wetland Delineation, City of Everett, Tire Fire Property, Snohomish County, Washington. December 14, 1994.

The Watershed Company. 2005. Snohomish Riverfront Properties at Bigelow Creek: Conceptual Enhancement Program. Prepared for the City of Everett Department of Engineering and Public Services. July 2005.

United States Geological Survey. 2002. Aerial Photograph. http://www.terraserverusa.com/image.aspx?T=4&S=10&Z=10&X=2825&Y=26562&W=3> (Accesssed November 2, 2006)

Washington Administrative Code (WAC). Chapter 173-22. 1997. Adoptions and Designations of Shorelands and Wetlands Associated with Shorleines of the State. http://apps.leg.wa.gov/WAC/default.aspx?cite=173-22 (Accessed November 02, 2006)

Washington State Department of Ecology (Ecology). 2003. *How To Determine the Ordinary High Water Mark.* Training manual from October 9 seminar by Coastal Training Program in Olympia, Washington.

Thank you for the opportunity to work with you and the project team on this project. Please contact Wayne A. Wright at (360) 265-1340 or Jason Poulsen at (208) 433-8098 if you have any questions or concerns regarding this letter.

Sincerely,

GeoEngineers, Inc.

Kelly A. Brock
Environmental Scientist

Jason E. Poulsen
Environmental Scientist

Wayne S. Wright, PWS
Principal

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Attachments: Figure 1 – Vicinity Map
Figure 2 – Ordinary High Water Mark Delineation Map
Attachment A – Site Photographs
Attachment B – Washington Department of Ecology OHWM Verification Letter

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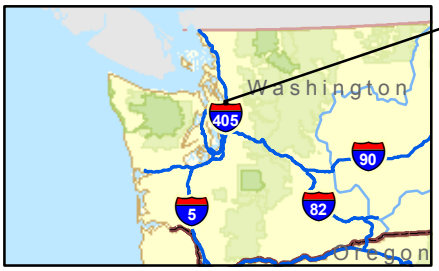

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Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps, Street Maps 2005

Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

Vicinity Map

Everett Riverfront Redevelopment
Everett, Washington

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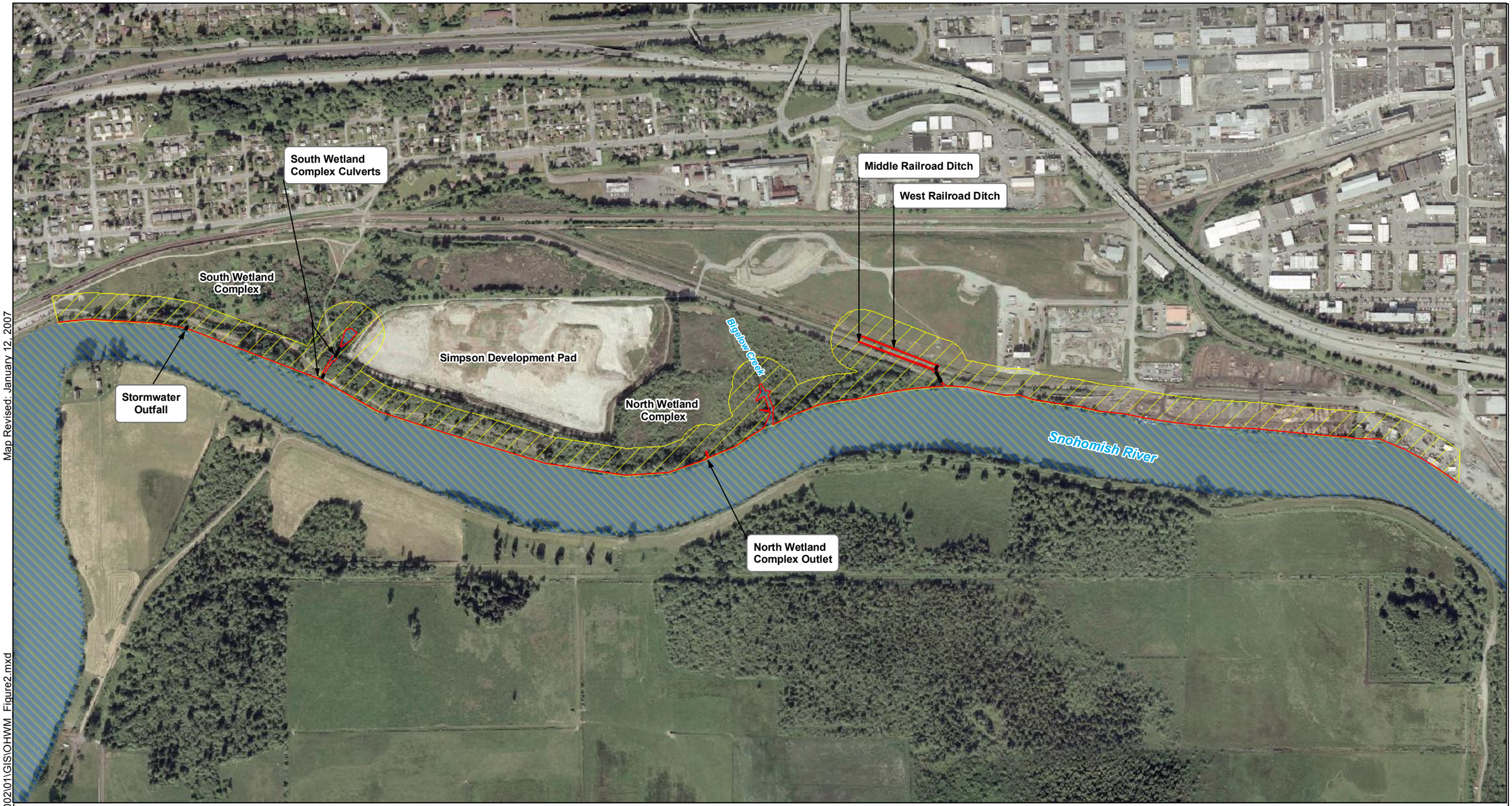
Figure 1

Office: ORCH Path: P:\6\6191002\01\GIS\6191002\01Figure1.mxd Map Revised: January 6, 2007



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3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources:
Aerial image obtained from TerraServer dated Thursday, June 13, 2002.
OHWM and Snohomish River delineated from sketch provided by GeoEngineers field staff, aerial image and GPS data collected with Trimble GeoXT unit by field crew on December 12 and 22, 2006.
Universal Transverse Mercator, Zone 10, North American Datum 1983

Legend

- Ordinary High Water Mark
- Culvert
- Snohomish River
- 200 foot Shoreline Jurisdiction (Approximate)

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Feet

Ordinary High Water Mark Delineation

Everett Riverfront Redevelopment
Everett, Washington

GeoEngineers

Figure 2

Office: BOIS Path: P:\06\0619100\2\01\GIS\OHWM_Figure2.mxd Map Revised: January 12, 2007

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Attachment A
Site Photographs

ATTACHMENT A
SITE PHOTOGRAPHS

Photograph 1
Snohomish River during a low tide

Photograph 2
Snohomish River during a low tide

Photograph 3
Snohomish River: water mark on bank

Photograph 4
Snohomish River during an incoming tide

Photograph 5
Bigelow Creek during a low tide

Photograph 6
Bigelow Creek during a high tide

Photograph 7
Bigelow Creek during a low tide

Photograph 8
Bigelow Creek during a high tide

Photograph 9
Bigelow Creek during a low tide

Photograph 10
Bigelow Creek during a low tide

Photograph 11
Bigelow Creek Side Channel during a low tide

Photograph 12
Bigelow Creek Side Channel during a high tide

Photograph 13
Bigelow Creek Side Channel during a high tide

Photograph 14
Extent of river influence on Bigelow Creek: photographed during a low tide

Photograph 15
Extent of River Influence on Bigelow Creek: photographed during a high tide

Photograph 16
South Wetland Complex

Photograph 17
North Wetland Complex backwater channel during a low tide

Photograph 18
North Wetland Complex backwater channel during a high tide

Photograph 19
North Wetland Complex backwater channel during a high tide

Photograph 20
Outlet from Railroad Drainages during an outgoing tide

Photograph 21
Middle Railroad Drainage Ditch during an outgoing tide looking south

Photograph 22
West Railroad Drainage Ditch during an outgoing tide looking south

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Attachment B
Washington Department of Ecology OHWM Verification Letter

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office 3190 160th SE Bellevue, Washington 98008-5452 (425) 649-7000

September 18, 2007

Mary Cunningham
Senior Planner
City of Everett
2930 Wetmore Avenue, Suite 8A
Everett, WA 98201

Dear Ms. Cunningham:

RE: Verification of the Ordinary High Water Mark Determination for the Everett Riverfront Master Plan and Redevelopment Project

Thank you for contacting the Washington State Department of Ecology (Ecology) about verification of the ordinary high water mark (OHWM) determination conducted by GeoEngineers, Inc. (GeoEngineers) for the Everett Riverfront Master Plan and Redevelopment Project. I apologize for the delay in providing a letter to you following our June 14, 2007 site visit.

I have reviewed the draft OHWM report prepared by GeoEngineers (January 12, 2007). Based on our site visit and my review of GeoEngineers' report, I concur with the OHWM determination as flagged in the field and the results described in the draft report.

If you have any questions or would like to discuss these conditions, please give me a call at (425) 649-7148 or send an email to paan461@ecy.wa.gov.

Sincerely,

Paul Anderson
Wetland Specialist
Shorelands and Environmental Assistance Program

PSA: ca

cc: Erik Stockdale, Ecology 401/Wetlands Unit Supervisor
David Pater, Ecology Shoreline Planner