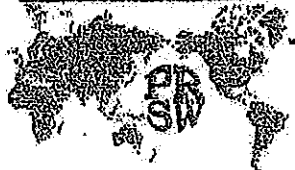


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**RECEIVED**

DEC 23 2014

CP&D  
City of Olympia  
December 23, 2006

Report File Number: W04-0041 update  
Report Subject: Wetland delineation report.  
Location: The study site is located east of Cooper Point Road, south of 28<sup>th</sup> Avenue NW in Olympia's UGA, Thurston County, Washington. It is located in Section 9, Township 18N, Range 2W. Tax Parcel Numbers: 50400100100, 50400200100, 50400300100, 50400400100, 50400402100, 50400402300, 50400402500, 74202500100, 74202900000, 74202500200, 81700000000.

**Introduction and Project History**

An onsite wetland delineation of a system in the southeastern portion of the site (Wetland A) was originally carried out by PRSW staff (Lisa Palazzi, CPSS, PWS) in 1994. That delineation survey was unavailable for this project, so that same wetland edge was redelineated on June 9, 2004.

In response to project expansion needs, on December 3, 2004, wetlands on a parcel lying west of the study site were also evaluated and delineated (Wetlands B and C) – although for Wetland B, the delineation was preliminary since the hydrology in was not developed at the time of the early December field work, making its jurisdictional status questionable. It had been a relatively dry winter to that point and continued to be dry. So we prepared a wetlands report in February of 2005 without being able to adequately verify the jurisdictional status of Wetland B. And that report was provided with earlier project applications to the City.

During December of 2006, PRSW staff (Lisa Palazzi, CPSS, PWS) revisited Wetland B to make a final jurisdictional determination. The winter to that point had well above average precipitation totals, and wetland hydrology in other nearby areas was very well developed. So it was an appropriate time to make a jurisdictional determination in that if there still was no developed hydrology, we could confidently assert that the area was not a wetland. There was no hydrology, so we can confidently state that the area previously called "Wetland B" is not a jurisdictional wetland. It appears to have been an area that was dug out during gravel mining activities, and possibly had excess water sent to it from the gravel mine. But there is no current hydrology, and the subsoils are disturbed from mining activities.

The purpose of this report is to describe results of that work, and to replace and update all previous reports.

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### WETLAND REGULATIONS

The following overview of wetland regulations is provided for the client's information. It is intended to provide general information and a framework to help one be aware of situations of overlapping authority.

#### Local Wetland Regulations: City of Olympia

To qualify as a regulated wetland in the City of Olympia, an area must meet criteria defined in the Manual For Identifying and Delineating Wetlands (as amended) adopted by the State Department of Ecology and written into state law pursuant to RCW 90.58.380 (i.e., the 1987 Army Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, and all subsequent Regulatory Guidance Letters). Those criteria require that an area must 1) predominantly support wetland vegetation, 2) must have hydric soils, and 3) must have wetland hydrology characteristics defined for the onsite soil type – in this case, evidence or observation of a long-duration water table at 12 inches or less depth.

Recent guidance from the Washington State Department of Ecology indicates that there is no scientifically valid way to define a minimum wetland size since even very small wetlands sometimes have very important local functions and values. So, in an attempt to respond to that issue, the recently updated Olympia Municipal Code Chapter 18.32.5, defines regulatory approaches to these small systems as follows.

Wetlands and "small lakes" less than 1,000 sqft in area are exempt from regulation as long as they are:

- 1) not associated with a riparian corridor;
- 2) are not part of a wetland mosaic, and
- 3) do not contain documented (by WDFW) priority species habitat.

Wetlands and "small lakes" between 1,000 and 4,000 sqft in area are also exempt from regulation, as long as they meet all three requirements listed above, but also:

- 1) are rated as a Category III or IV wetland (i.e., not Cat. I or II);
- 2) Do not score more than 19 points for habitat in 2004 Washington State Wetland Rating System for Western Washington (WRSWW);
- 3) are mitigated for as described in a wetland mitigation report (as required by OMC 18.32.590.)

Wetlands are "rated" using the recently updated and revised 2004 edition (as amended) of the Wetland Rating System for Western Washington (Ecology Publication #04-06-014). The 2004 rating system asks a series of questions and assigns points to determine wetland functional value. Depending on site specific, pre-development wetland vegetation, soils, hydrology, buffer characteristics, and landscape setting, the wetland functions are awarded greater or lesser values. The result of that rating (or score) is used to assign varying levels of protection in the form of wetland buffers. Wetlands buffer areas shall be maintained between all regulated activities and wetlands to retain the wetlands' natural functions and values. The required width of the wetland buffer shall be determined as provided in the tables below. Wetland buffers are based upon the rating of the wetland pursuant to OMC 18.32.585.

Table X: Wetland Buffer Widths

Wetland Characteristics	Wetland Buffer Width
Natural Heritage Wetlands and Bogs	Not less than 250 feet
Estuarine – Category I	250 feet
Estuarine – Category II	150 feet
Habitat score: 31 pts and more	300 feet
Habitat score: 30 pts	280 feet
Habitat score: 29 pts	260 feet
Habitat score: 28 pts	240 feet
Habitat score: 27 pts	220 feet
Habitat score: 26 pts	200 feet
Habitat score: 25 pts	180 feet
Habitat score: 24 pts	160 feet
Habitat score: 23 pts	140 feet
Habitat score: 22 pts	120 feet
Habitat score: 21 pts	100 feet
Habitat score: 20 pts	100 feet
Habitat score: 19 pts	100 feet
Water Quality Improvement Score: 24 – 32 pts, and Habitat score: 19 pts or less	100 feet
Category I or II Wetland – Not meeting any of the above criteria	100 feet
Category III Wetland – Not meeting any of the above criteria	80 feet
Category IV Wetland – Score for all three wetland functions is less than 30 pts	50 feet

These buffer widths assume a relatively intact, native vegetation buffer. If that is not the case, the buffer may need to be planted with native species to a density equivalent to 400 tree units/acre.

Buffer averaging may be allowed when **all** of the following conditions are met:

- 1) The wetland has significant differences in characteristics that affect its habitat functions,
- 2) The buffer is increased adjacent to the higher-functioning area of habitat or more sensitive portion of the wetland and decreased adjacent to the lower functioning or less sensitive portion,

- 3) The total area of the buffer after averaging is equal to the area required without averaging, and
- 4) The buffer at its narrowest point is never less than seventy five percent (75%) of the required width.

Buffer reduction may be allowed under the following conditions:

- 1) For wetlands that score 20 points or more for habitat functions, a 25% buffer reduction may be allowed if **both** of the following criteria are met:
  - a. A relatively undisturbed, vegetated corridor at least one hundred (100) feet wide is protected (with a conservation easement) between the wetland and any other priority habitats;
  - b. Measures to minimize impacts on wetlands are applied – such as directing lighting away from wetland, or densely planting the buffer to act as a barrier.
- 2) For wetlands that score 19 points or less for habitat function, a 25% buffer reduction may be allowed as described in (1)b. above -- if measures are used to minimize impacts on wetlands are applied.

Through a Public Hearing process, the Hearing Examiner may allow greater buffer reductions on a case-by-case basis when:

- 1) There is a Wetland Mitigation Report, **and**
- 2) The proposed wetland buffer width will protect the wetlands' functions and values.

Through a Public Hearing process, the Hearing Examiner may allow buffer averaging up to 50% of the required width on a case-by-case basis<sup>1</sup> when:

- 1) It will not reduce wetland functions or values according to a Wetland Mitigation Report, **and**
- 2) Measures to minimize impacts on wetlands are applied – such as directing lighting away from wetland, or densely planting the buffer to act as a barrier;
- 3) The total area contained in the buffer area after averaging is no less than that which would be contained within the standard buffer; **and**
- 4) The wetland buffer has been placed in a critical areas tract or a conservation easement.

According to the Olympia Municipal Code Chapter 18.32.4, streams are Classified as to Type using the definition supplied in WAC 222-16-031 (as amended from WAC 222-16-030). Streams are grouped into categories according to the Washington Department of Natural Resources - Water Typing System. Type 1 and 2 streams (larger fish-bearing streams) are given a 250-foot buffer; Type 3 streams (smaller fish-bearing streams) are given a 200-foot buffer; and Type 4 and 5 streams (non-fish bearing, perennial and non-perennial respectively), are given a 150-foot buffer.

*It is important to note that any stream wider than 2 feet with a gradient of less than 20 percent that drains to a Type 1, 2 or 3 stream may meet requirements to be classified as a Type 3 stream, even if it only has seasonal flow and there is no documented fish use. It is also important to note that man-made blockages to fish passage (such as a poorly installed culvert) are considered temporary, so will not affect stream typing. The area within the stream buffers is generally considered unavailable for development, unless there is no reasonable alternative to a proposed activity.*

Buffer reduction and averaging is possible, under similar but not identical conditions as described above for wetlands.

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<sup>1</sup> This does not apply to a Category IV wetland since it already has minimal buffers.

### **Federal Regulations: Army Corps of Engineers**

Any direct impacts to a wetland are regulated by the Army Corps of Engineers (COE). The COE regulates wetlands of any size, i.e., there is no minimum size for a federal jurisdictional wetland. Furthermore, the COE must be notified of all impacts to wetlands. There are about 40 Nationwide Permits that define certain allowed impacts to wetlands. As a rule, the COE should be contacted and the proposed activity described. They will let the applicant know if one of the Nationwide Permits fits, or if no permit is required. If no permit is required, they will still require that a standard report be filled out and submitted that describes the activity in detail.

A recent Supreme Court ruling determined that COE authority did not extend to isolated wetland systems, but rather those that are associated with streams or rivers -- i.e., potentially navigable waters defined as Waters of the United States. Under those circumstances, if a site has what appears to be an isolated wetland, a representative from the COE will make an onsite determination on whether that wetland meets the definition of "isolated".

If the COE is not notified of a wetland impact prior to the event, the action may be treated as a violation of federal law. Impacts of 0.1 to 2 acres are typically regulated under one of the Nationwide Permits with concurrent permit review by the COE and the Washington State Department of Ecology. If the impact falls within the allowed impact definition of a Nationwide Permit, the action will be allowed as long as all the details of the permit are carried out as described. Impacts not covered by one of the Nationwide Permits will require an individual permit. Under that condition, a detailed assessment of the project will be required, including an alternatives analysis and detailed justification of the proposed impacts with no guarantee of permission to perform the proposed activity.

In response to recent listings of some salmonid species in the Puget Sound, a Biological Assessment will also be required as part of the COE permitting process. The Biological Assessment is a detailed report describing whether there are any endangered species on or near the site and the potential impacts of the project on those species. If the report indicates an impact on endangered species, additional work will be needed to obtain even a Nationwide Permit. That work would involve making changes to the project proposal that would eliminate or at least reduce those impacts.

### **Other Regulatory State Agencies**

Other potentially involved agencies include (but are not limited to) the Washington State Department of Fish and Wildlife (WDFW), and the Washington State Department of Natural Resources (DNR) Natural Heritage Program. The WDFW will be involved if there are any wetland or stream crossings that would require a Hydraulics Permit (a permit that defines how the crossing will be completed to minimize impacts to resident fish and other species), or if there are any endangered or threatened animal species in or near the wetlands or the project site. The DNR Natural Heritage Program will be involved if there are any endangered or threatened plant species in or near the wetlands or the project site.

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## METHODS & MATERIALS

### Wetland Delineation

The wetlands were delineated as described in the Manual For Identifying and Delineating Wetlands adopted by the State Department of Ecology and written into state law pursuant to RCW 90.58.380 (i.e., the 1987 Army Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, and all subsequent Regulatory Guidance Letters). The manual requires examination of characteristics and indicators of hydrophytic vegetation, hydric soils, and wetland hydrology. Positive wetland indicators of all three characteristics must be normally present to make a positive wetland determination. The method used to evaluate each characteristic is summarized in Appendix I. Data at selected points were recorded on the Routine Wetland Determination Data Form 1, which are presented in Appendix II.

Streams are typed according to guidance provided in WAC 222-16-031. Type 1 streams are generally inventoried as "shorelines of the state", and are typically salmon-bearing if draining to the Pacific Ocean. Type 2 and 3 streams have high to slight fish, wildlife, and human use. Type 4 streams are perennial, non-fish habitat streams. Type 5 streams are seasonal, non-fish habitat streams in which surface flow is not present for at least some portion of the year. Type 5 streams must be physically connected by an above-ground channel system to Type 1, 2, 3, or 4 streams.

### Evaluation of Field Conditions

The site was first evaluated for wetlands in May of 1994. At that time, PRSW delineated wetlands in a swale in the eastern portion of the site. The same wetland was re-delineated in June of 2004 since the original survey was unavailable for a newly proposed project. Additional wetlands on a parcel west of the main site were also delineated in December of 2004. A final check (for jurisdictional status) on one of those western wetlands was carried out in December of 2006.

In areas that appeared to have wetland characteristics, a representative observation point for each plant community was selected; vegetation, soils, and hydrology were evaluated; and a wetland/non-wetland determination was made. If an area was determined to be wetland, the boundary was marked with a pink flag labeled "wetland delineation", assigned a letter, then numbered sequentially.

The delineated wetland edge was surveyed (by Hatton Godat Pantier), and the survey map is provided in Appendix V.

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## RESULTS & DISCUSSION

### General Study Site Description

The study site (about 53 acres) is located in the Olympia, Washington Urban Growth Area. The site includes several parcels (listed above) located southeast of the intersection of Cooper Point Road and 28<sup>th</sup> Avenue NW (Vicinity Map, Appendix V). It is proposed to subdivide the site into about 200 lots.

There are two wetland onsite – Wetland A located in the southeastern portion of the site; and Wetland C located in the northwestern portion. A questionable area located southeast of Wetland C – described as "Wetland B" in a previous report – was rechecked in early December of 2006 – after an extended period of above average rainfall. As in previous years, it had no current hydrology, so we can confidently assert that it is not a jurisdictional wetland.

No direct impacts to wetlands are currently proposed, but buffer averaging may be proposed. The majority of the site is an old gravel pit, but includes a couple of forested swales in the eastern portions that are relatively un-impacted in their interiors, although considerably impacted around their perimeters. The gravel pit portions of the site consist of either bare ground or a variety of weedy groundcover, including mixed pasture grasses, Himalayan blackberry, and Scot's broom. The forested swales support a mostly native forest plant community with some weedy species included in the more disturbed portions.

The two swales at the eastern end of the site have quite different characteristics. The northern swale does not contain jurisdictional wetlands. It slopes to the north, and is the very top of that drainage basin. There is a road across the northern edge of the project area that cuts across the onsite southern extent of that swale, and there is no culvert or evidence of surface drainage across the road at the low point. The southern swale does contain wetlands, and a small spring emanates from its eastern edge. This forms the headwaters of an extensive southerly wetland swale system that eventually drains to Grass Lakes, albeit not before passing through several culverts, drains and roadside ditches.

The wetlands to the west are greatly affected and possibly partially created from old gravel mining practices. They drain to Cooper Point Road ditches, then to the north.

According to topography data obtained from the Thurston County Geodata system (provided in Appendix V), overall onsite relief is about 30-40 feet. Elevation ranges from a low of 226 feet at the exit point of the northern swale base; then 230 feet at the exit point of the southern swale base; and a variety of highs around the mined gravel pit area that range between 260 and 270 feet.

As mentioned above, the northeastern swale is the uppermost portion of a northerly basin that is expected to drain eventually to Butler Cove of Budd Inlet, about a mile north of the site. The northern majority of the site may drain that direction as well, but the severe impacts from mining make the offsite flow direction difficult to determine. The southeastern swale (and some southern portions of the site) form the headwaters of a basin that eventually flows (through several culverts, ditches and other wetlands) to Grass Lakes wetlands (about 2 miles away). Waters from the northwestern wetlands are assumed to eventually drain to Green Cove Creek.

### Soils

According to the Thurston County Soil Survey, the following soil series are mapped on the site:

- 1) Alderwood gravelly sandy loam (classified as a loamy-skeletal, mixed, mesic Dystric Entic Durochrept<sup>2</sup>). The Alderwood soils typically have a very gravelly sandy loam surface soil overlying cemented glacial till at 3-4 feet depth. These soil types are mapped across all the surrounding uplands both onsite and in the nearby neighborhood.
- 2) McKenna gravelly silt loam, 0-5% slopes (classified as a loamy-skeletal, mixed, non-acid, mesic Mollic Haplaquept<sup>3</sup>). The McKenna gravelly silt loams are hydric soils -- moderately deep, poorly-drained soils in depressions and drainage-ways. The McKenna series is mapped in the base of the southeastern swale, and along linear trending systems to the south, offsite.

<sup>2</sup> Loamy-skeletal, mixed, mesic Dystric Entic Durochrept, generally meaning the soil has minimal horizon development (ept and entic), has a pale-colored, low base saturation surface horizon (ochc), has an silicate-cemented subsurface layer (dur), has a low sub-surface base saturation, generally indicative of poor nutrient status (dystric), has a mesic temperature regime (mean annual temperature ranges from 8° to 15° C (47° - 59° F), has no specific mineralogic source (mixed), texture of the fine fraction is loam and coarse fragment content is greater than 35% (loamy-skeletal).

<sup>3</sup> Loamy-skeletal, mixed, non-acid, mesic Mollic Haplaquept, generally meaning the soil has limited horizon development (ept), is hydric or has a seasonal high water table (aqu), has a thick, dark colored surface horizon with a high base saturation (moll), has otherwise average characteristics (hapl), has a mesic temperature regime (mean annual temperature ranges from 8° to 15° C (47° - 59° F), has no specific mineralogic source (mixed), has a pH greater than 5.0, texture of the fine fraction is loam, and coarse fragment content is greater than 35% (loamy-skeletal).

3) Gravel pits. The gravel pit is mapped in a slightly smaller area than is currently being mined, but still in the western portions of the site.

Please refer to the soils map provided in Appendix V for details. For your information, standard characteristics of the mapped soil series are described in Appendix III. Please note that the SCS soil series maps and descriptions characterize expected characteristics in only the top 60 inches of soil. Furthermore, the map units can have extensive inclusions of other soil types, and in some rare cases, can be entirely in error.

The soils observed along the edge of the onsite wetlands were disturbed from erosional deposits in many areas, but a little farther out, had deep mucks to greater than 12 inches.

#### SOUTHEASTERN SWALE: WETLAND A

##### Wetland Vegetation

Wetland A (the southeastern swale) is a Palustrine Forested (PFO) system dominated by red alder and Oregon ash trees with an understory dominated by salmonberry, skunk cabbage, and buttercup. The majority of the onsite upland consists of mixed pasture grasses, Himalayan blackberry and Scot's broom. A list of the wetland and upland vegetation is provided below.

#### WETLAND A SPECIES LIST

<b>Tree species</b>	<b>Indicator status</b>
<i>Alnus rubra</i> (red alder)	FAC
<i>Salix lasiandra</i> (Pacific willow)	FACW+
<i>Fraxinus latifolia</i> (Oregon ash)	FACW
<i>Thuja plicata</i> (western redcedar)	FACW
<b>Shrub species</b>	<b>Indicator status</b>
<i>Spiraea douglasii</i> (Douglas spirea)	FACW
<i>Spiraea douglasii</i> (salmonberry)	FAC+
<i>Physocarpus capitatus</i> (Pacific ninebark)	FACW-
<b>Grasses, forbs and ferns species</b>	<b>Indicator status</b>
<i>Carex obnupta</i> (Slough sedge)	OBL
<i>Urtica dioica</i> (stinging nettle)	FAC+
<i>Lysichiton americanum</i> (skunk cabbage)	OBL
<i>Phalaris arundinacea</i> (reed canarygrass)	FACW
<i>Ranunculus spp</i> (Buttercup spp)	FAC-OBL
<i>Lemna minor</i> (duckweed)	OBL

#### UPLAND SPECIES LIST

<b>Trees</b>	
<i>Alnus rubra</i> (red alder)	FAC
<i>Pseudotsuga menziesii</i> (Douglas-fir)	FACU
<i>Rhamnus purshiana</i> (cascara)	FAC-
<b>Shrubs</b>	
<i>Rubus discolor</i> (Himalaya blackberry)	FACU
<i>Rubus ursinus</i> (trailing blackberry)	FACU
<i>Cytisus scoparius</i> (Scot's broom)	not listed
<i>Gaultheria shallon</i> (salal)	not listed



**Herbs**  
misc.grasses

unknown

### Soils

The soils were found to be very disturbed (old fill or eroded sediments) around the edges, but less disturbed in the interior portions of the system. They generally meet the description of the McKenna series, in that there appears to be an impervious gravelly layer at about 12-20 inches that restricts vertical percolation, creating a perched water table at the surface that persists for long periods following storm events. Soil colors ranged from black (10YR 2/1) at the surface to grayish brown (2.5Y5/2) with distinct mottles at about 6-12 inches depth. The transition to upland soils is rather abrupt as there is a steep edge-of-fill slope at the wetland edge for the most part.

### Site Hydrology

The hydrologic source for these wetlands appears to be seasonal runoff from a large basin that generally includes the eastern portion of the site. The wetland starts at a drainage divide, just south of a road that crosses the site at the drainage divide between the southeastern and the northeastern swales. Wetland A begins within about 50 feet of the top of the divide, indicating a spring-fed hydrology source as well. We did observe springs along the eastern edge of the wetland.

### Wetland Rating

The wetland was "rated" using the 2004 edition (as amended) of the Western Washington Wetlands Rating System. The forms that document the rating process are provided in the Appendices. The wetland scored 26 points for water quality treatment, 24 points for water quantity control, and 16 points for Habitat features – totaling 66 points. Wetlands with scores between 51 and 60 points are classified as Category II systems.

### Standard Buffers

The standard buffer for Category II wetlands in Olympia is 100 feet for systems that score less than 19 points for habitat and more than 24 for water quality. Please note that this buffer width assumes that the buffer is in relatively good condition and vegetated with native plants. If that is not the case, some replanting may be required as described in the regulatory section above.

### NORTHWESTERN WETLAND: (WETLAND C)

#### Wetland Vegetation

The northwestern wetland (Wetlands C) is quite different from the eastern one, even draining to a different basin. This wetland was severely disturbed in the past from gravel mining, so has vegetation typical of a disturbed system. A list of the wetland and upland vegetation is provided below.

#### WETLAND C SPECIES LIST

##### Tree species

*Alnus rubra* (red alder)  
*Salix lasiandra* (Pacific willow)  
*Malus fusca* (western crabapple)  
*Populus balsamifera* (black cottonwood)

##### Indicator status

FAC  
FACW+  
FACW  
FACW

##### Shrub species

*Spiraea douglasii* (salmonberry)

##### Indicator status

FAC+

Grasses, forbs, ferns species	Indicator status
<i>Urtica dioica</i> (stinging nettle)	FAC+
<i>Phalaris arundinacea</i> (reed canarygrass)	FACW
<i>Ranunculus spp</i> (Buttercup spp)	FAC-OBL

#### UPLAND SPECIES LIST

Tree species	Indicator status
<i>Alnus rubra</i> (red alder)	FAC
<i>Pseudotsuga menziesii</i> (Douglas-fir)	FACU
<i>Rhamnus purshiana</i> (cascara)	FAC-

Shrub species	Indicator status
<i>Rubus discolor</i> (Himalaya blackberry)	FACU
<i>Rubus ursinus</i> (trailing blackberry)	FACU
<i>Cytisus scoparius</i> (Scot's broom)	not listed
<i>Gaultheria shallon</i> (salal)	not listed

Grasses, forbs, ferns species	Indicator status
misc.grasses	unknown

#### Soils

As would be expected, the soils were found to be very disturbed. They generally meet the description of the Norma series, being relatively fine-textured silt loams with an organic cap. There appears to be an impervious layer at about 12-20 inches that restricts vertical percolation (possibly till), creating a perched water table at the surface that persists for long periods of time during winter months. Soil colors ranged from black (10YR2/1) at the surface to grayish brown (2.5Y5/2) with mottles at about 8-15 inches depth.

#### Site Hydrology

The hydrologic source for these wetlands appears to be seasonal runoff from the gravel mine. Indeed, there were several inflows that were from sediment pond overflows. There is also expected input from groundwater flow and precipitation.

#### Wetland Rating

The wetland was "rated" using the 2004 edition (as amended) of the Western Washington Wetlands Rating System. The forms that document the rating process are provided in the Appendices. Wetland C scored 26 points for water quality; 20 points for water quantity control features; and 22 points for habitat value – a total of 68 points. Wetlands with scores of between 51 and 69 are classified as Category II systems.

#### Standard Buffers

The standard buffer for Category II wetlands that score 22 points for habitat is 120 feet. Please note that this buffer width assumes that the buffer is in relatively good condition and vegetated with native plants. If that is not the case, some replanting may be required as described in the regulatory section above.

### Summary

There are two onsite wetlands. Wetland A lies in the base of a southeastern swale that drains south, eventually to the Grass Lakes system. Wetland C is in the northwestern portion of the site. Both systems are disturbed from past gravel mining activities, and still receive direct runoff from the gravel mine.

Wetlands A and C are Category II systems, having 100 and 120 foot standard buffers respectively. Please note that this buffer width assumes that the buffer is in relatively good condition and vegetated with native plants. If that is not the case, some replanting may be required as described in the regulatory section above.

I hope this report provides adequate information for you to proceed with project planning. If you have any questions, please feel free to call and discuss.

Thank You,

*Len Balli for Lisa Palazzi*  
Lisa Palazzi, CPSS, PWS

