



WETLAND BUFFER ENHANCEMENT/RESTORATION YEAR 1 MONITORING REPORT

SLAG DISPOSAL, BECKWITH PROPERTY SITE
SOUTH 218TH STREET AND 90TH AVENUE SOUTH
KENT, WASHINGTON

Prepared for

Farallon Consulting L.L.C.
975 5th Avenue NW
Issaquah, Washington 98027

Prepared by

Anchor QEA, LLC
1423 Third Avenue
Suite 300
Seattle, Washington 98101

November 2012

WETLAND BUFFER
ENHANCEMENT/RESTORATION
YEAR 1 MONITORING REPORT
SLAG DISPOSAL, BECKWITH PROPERTY
SITE
SOUTH 218TH STREET AND 90TH
AVENUE SOUTH
KENT, WASHINGTON

Prepared for

Farallon Consulting L.L.C.
975 5th Avenue NW
Issaquah, Washington 98027

Prepared by

Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle, Washington 98101

November 2012

TABLE OF CONTENTS

| | | |
|-------|--|----|
| 1 | INTRODUCTION | 1 |
| 2 | PROJECT WETLAND BUFFER ENHANCEMENT/RESTORATION MONITORING BACKGROUND AND STATUS | 3 |
| 2.1 | Existing Information | 3 |
| 3 | WETLAND BUFFER ENHANCEMENT/RESTORATION GOALS AND OBJECTIVES..... | 5 |
| 4 | MONITORING METHODS AND STANDARDS OF SUCCESS | 7 |
| 4.1 | Monitoring..... | 7 |
| 4.2 | Performance Measures, Standards of Success, and Contingency Plans | 9 |
| 5 | YEAR 1 MONITORING RESULTS | 11 |
| 5.1 | Vegetation..... | 11 |
| 5.1.1 | Planted Vegetation | 11 |
| 5.1.2 | Colonizing Vegetation..... | 14 |
| 5.1.3 | Summary | 17 |
| 5.2 | Wildlife..... | 20 |
| 5.3 | Human Intrusion/Vandalism..... | 21 |
| 6 | CONCLUSIONS AND RECOMMENDATIONS | 22 |
| 7 | REFERENCES | 24 |

List of Tables

| | | |
|---------|--|----|
| Table 1 | Wetland Buffer Enhancement/Restoration Monitoring Status – October 2012..... | 3 |
| Table 2 | Plant Species Identified in the Wetland Buffer Planting Plan..... | 7 |
| Table 3 | Species Composition and Percentage of Areal Cover of Planted Vegetation.. | 11 |
| Table 4 | Species Composition and Numbers of Planted Vegetation | 12 |
| Table 5 | Average Height of Planted Trees and Shrubs | 13 |
| Table 6 | Species Composition and Percentage of Areal Cover of Colonizing Tree and Shrub Vegetation | 15 |

| | | |
|----------|---|----|
| Table 7 | Species Composition and Numbers of Colonizing Tree and Shrub Vegetation | 15 |
| Table 8 | Average Height of Colonizing Trees and Shrubs | 16 |
| Table 9 | Colonizing Plant Species and Percent Areal Cover | 17 |
| Table 10 | Total Overall Native Tree, Shrub, and Groundcover Areal Cover | 18 |
| Table 11 | List of Wildlife Species Observed at the Restoration Site | 21 |

List of Figures

| | | |
|----------|--------------------|---|
| Figure 1 | Vicinity Map | 2 |
|----------|--------------------|---|

List of Appendices

| | |
|------------|--|
| Appendix A | Wetland Buffer Enhancement/ Restoration Drawings |
| Appendix B | Monitoring Site Photographs |

1 INTRODUCTION

This *Wetland Buffer Enhancement/Restoration Year 1 Monitoring Report* presents the 2012 Year 1 monitoring results for the Slag Disposal Project (Project) wetland buffer enhancement/restoration. Wetland buffer restoration was implemented in accordance with the approved *Wetland Buffer Enhancement/Restoration Plan* (Anchor QEA 2010a) for wetland buffer impacts associated with the Project. The *Wetland Buffer Enhancement/Restoration Plan* provided information necessary for code compliance and grading permit approval by the City of Kent (City). The wetland buffer enhancement/restoration planting area for the Project is located on an approximately 4.7-acre parcel of land located in the City of Kent, King County, Washington (Township 22 North, Range 5 East, Section 7). The Project site is located on the east side of Highway 167 at the intersection of South 218th Street and 88th Avenue South (Figure 1).

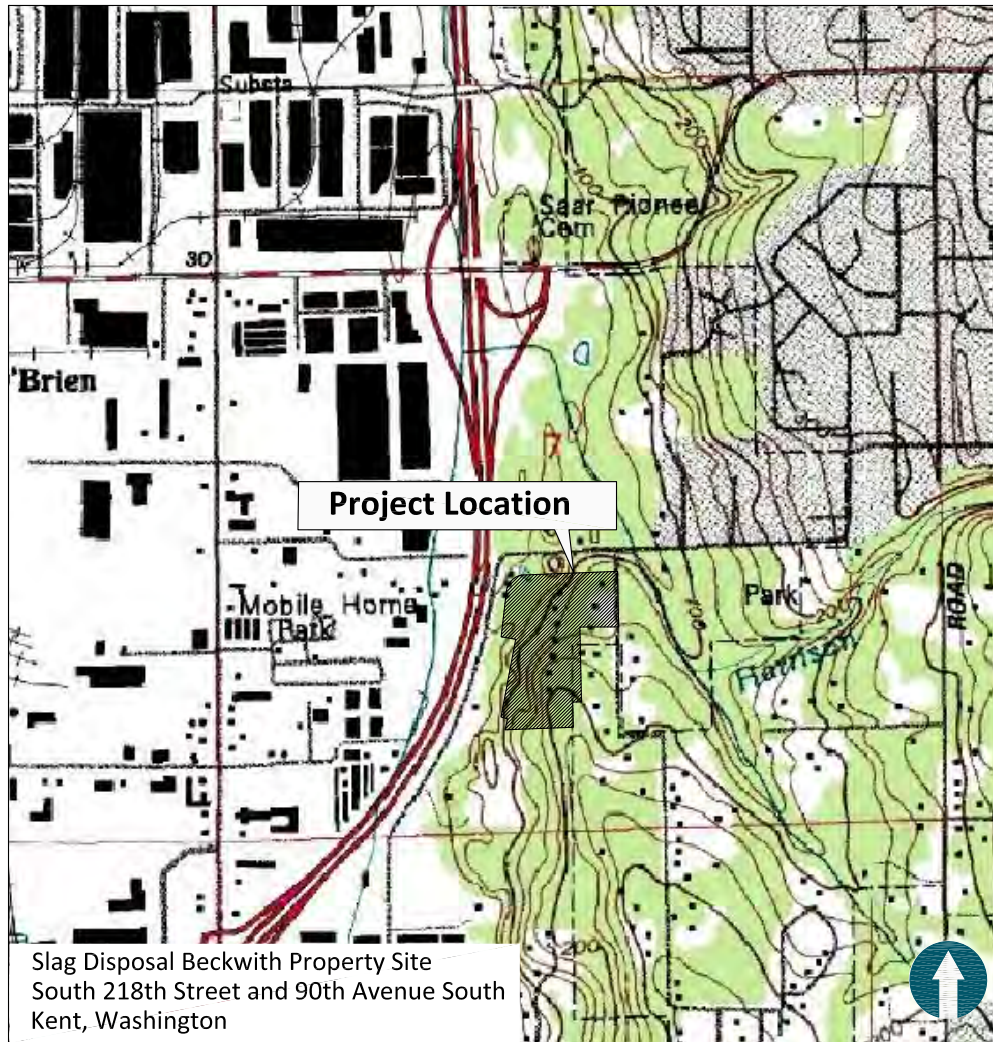
The purpose of this *Wetland Buffer Enhancement/Restoration Year 1 Monitoring Report* is to document Year 1 monitoring conditions and to serve as Year 1 conditions from which future monitoring can be compared.

Documentation of Year 1 monitoring conditions contained in this report includes a narrative of monitoring observations, data collected during the site visit, and site photographs. Information from the approved *Wetland Buffer Enhancement/Restoration Plan* (Anchor QEA 2010a) and *Wetland Buffer Enhancement/Restoration As-Built Report* (Anchor QEA 2011a) is summarized or included by reference in this report. With the submittal of this report, reporting requirements will be complete for the Year 1 monitoring of the wetland buffer enhancement/restoration area. In accordance with the specifications and commitments outlined in the plan (Anchor QEA 2010a), a 3-year monitoring effort of the wetland buffer enhancement/restoration is underway and will continue through 2014. The wetland buffer enhancement/restoration drawings from the *Wetland Buffer Enhancement/Restoration Plan* (Anchor QEA 2010a) are included in Appendix A. Year 1 monitoring site photographs are provided in Appendix B.

SOURCE: Base map prepared from Terrain Navigator Pro USGS 7.5 minute quadrangle map(s) of Kent, WA.



Not to Scale



K:\Jobs\100224-EMJ Slag\100224-01\100224-RP-001.dwg Layout1

Oct 15, 2012 3:13pm bbermingham

2 PROJECT WETLAND BUFFER ENHANCEMENT/RESTORATION MONITORING BACKGROUND AND STATUS

Wetland buffer enhancement/restoration actions described in this report occur in two locations on site, identified as the Wetland I and Wetland M buffer areas. Wetland buffer enhancement/restoration implementation for the Project was completed in February 2011, and the As-Built (Year 0) monitoring activities for the Project were completed in April 2011. The status of wetland buffer enhancement/restoration monitoring activities associated with the Project as of October 2012 is summarized in Table 1.

Table 1
Wetland Buffer Enhancement/Restoration Monitoring Status – October 2012

| Restoration Element | Wetland Buffer Enhancement/ Restoration Schedule |
|----------------------------|---|
| Planting Completion | February 2011 |
| As-Built (Year 0 Report) | April 2011 |
| Year 1 Monitoring | Summer/Fall 2012 |
| Year 2 Monitoring | Scheduled Summer/Fall 2013 |
| Year 3 Monitoring | Scheduled Summer/Fall 2014 |

2.1 Existing Information

Several reports and addenda have been completed relevant to wetland buffer enhancement/restoration activities for the Project. These documents provide a background summary of Project restoration activities. Information from these documents is included by reference in this report. These documents include:

- *South 224th Street Extension Wetland Technical Report* (ESA Adolfson 2006)
- *Beckwith Property Slag Disposal Site Wetland Delineation Report* (Springwood Associates, Inc. 1995)
- *Kent Slag Site Excavation Project Design Plans* (Farallon Consulting L.L.C. 2010a)
- *Cleanup Action Work Plan* (Farallon Consulting L.L.C. 2010b)
- *Wetland Buffer Enhancement/Restoration Plan* (Anchor QEA 2010a)
- *Wetland Buffer Planting Plan* (Anchor QEA 2010b)
- *Wetland Buffer Enhancement/Restoration Plan Addendum* (Anchor QEA 2010c)

- *Wetland Buffer Enhancement/Restoration As-Built Report* (Anchor QEA 2011a)
- *Inspection of Delivered Plants and Planting Procedures Field Report* (Anchor QEA 2011b)
- *Inspection of Planting Areas Field Report* (Anchor QEA 2011c)

3 WETLAND BUFFER ENHANCEMENT/RESTORATION GOALS AND OBJECTIVES

The goal of the wetland buffer restoration is to address replacement of wetland buffer functions impacted by the Project and to increase these functions at the Project site. To achieve this goal, wetland buffer enhancement/restoration included planting native vegetation to replace wetland buffer vegetation removed during construction. The impact area was dominated by grassland habitat with non-native shrub vegetation. Overall, impacted grassland habitat was replaced with native shrub and forested vegetation communities. The *Wetland Buffer Enhancement/Restoration Plan Drawings* are included in Appendix A.

Monitoring is performed to determine whether a project has met the ecological and functional goals of the design. To meet these goals, the following objectives were identified during the Project restoration planning process to compensate for loss and damage to the wetland buffer area:

- Provide demonstrable and qualitative replacements of functional elements of the natural system on the site
- Establish native wetland buffer plant communities by planting native species and removing invasive species
- Use native and naturalized plant species commonly found in wetland buffer habitats of the Pacific Northwest
- Simulate, with the plantings, Pacific Northwest native plant communities in terms of composition, cover, and structure
- Replace, at a ratio of at least 1:1, wetland buffer habitat lost due to Project impacts
- Remove any non-native invasive species, such as Scot's broom (*Cytisus scoparius*) and Himalayan blackberry (*Rubus armeniacus*), from the portion of Wetland I buffer bordering the portion to be enhanced/restored
- Plant 0.144 acre (6,260 square feet [sf]) of native vegetation associated with the wetland buffer of Wetland I in accordance with the *Wetland Buffer Planting Plan* (see Appendix A; this equates to slightly more than the 0.13 acre [5,440 sf] identified in the construction plans)
- Plant seven salmonberry shrubs in the approximately 0.006-acre (260-sf) area of wetland buffer for Wetland M in accordance with the plan addendum (Anchor QEA

2010c) for temporary buffer impacts that were not identified in the *Wetland Buffer Planting Plan* (see Appendix A)

- Adhere to performance standards as detailed in the Project wetland buffer enhancement/restoration plan (Anchor QEA 2010a)

4 MONITORING METHODS AND STANDARDS OF SUCCESS

The wetland buffer enhancement/restoration area was designed to function as a restored wetland buffer with plant communities similar to adjacent and existing systems that provide enhanced biological productivity and wildlife habitat. This restoration area will be evaluated on the success of the native plantings and forested and shrub native vegetation areal cover for 3 years after planting. Monitoring will also include photographic documentation of site features and the development of habitat on the site. Monitoring reports will be submitted annually to the City through 2014. The following sections provide information on the methods and standards of success for the wetland buffer enhancement/restoration area, as defined in the *Wetland Buffer Enhancement/Restoration Plan* (Anchor QEA 2010a).

4.1 Monitoring

Planting of the enhancement/restoration area was initiated and completed in February 2011 (Anchor QEA 2011b and 2011c). Species identified in the planting plan and planted in February 2011 are identified in Table 2.

Table 2
Plant Species Identified in the Wetland Buffer Planting Plan

| Scientific Name | Common Name |
|------------------------------|-------------------|
| Trees | |
| <i>Acer macrophyllum</i> | Big-leaf maple |
| <i>Alnus rubra</i> | Red alder |
| <i>Pseudotsuga menziesii</i> | Douglas fir |
| <i>Thuja plicata</i> | Western red cedar |
| Shrubs | |
| <i>Oemleria cerasiformis</i> | Indian plum |
| <i>Rosa nutkana</i> | Nootka rose |
| <i>Rubus spectabilis</i> | Salmonberry |
| <i>Symphoricarpos albus</i> | Snowberry |
| Groundcover | |
| <i>Polystichum munitum</i> | Sword fern |

Due to the relatively small size of the wetland buffer enhancement/restoration area (approximately 6,260 sf for Wetland I buffer and approximately 260 sf for Wetland M buffer), annual monitoring will include the entire enhancement/restoration area instead of being limited to sample plots within these small areas. Annual monitoring will take place near the end of the growing season (summer or early fall) prior to leaf drop.

Monitoring activities will focus on the collection of vegetation and wildlife data to evaluate, describe, and quantify (to the extent possible) wetland buffer functions and compliance with the performance measures. Monitoring will also include photographic documentation of site features and the development of habitat on the site. Specific monitoring methods are described as follows.

During the monitoring, areal cover of all planted and colonizing shrub and tree species within the wetland buffer enhancement/restoration area will be estimated and the number of shrubs and trees will be counted. Shrub and tree heights will be measured and averaged for each species. Plant heights that exceeded 7 feet will be estimated. General plant conditions will be evaluated.

Total shrub, tree, and overall herbaceous vegetation areal cover percentages will be estimated. A list of all colonizing species observed at the site during the monitoring will be recorded.

Using this information, annual growth and areal cover comparisons will be made. Monitoring visits will identify and record all tree and shrub species, whether planted or introduced since planting, and will record the areal cover of each species within the vegetative layers. Plant counts will be used to identify the survival of planted species and the colonization of additional species during the monitoring period.

The wetland buffer enhancement/restoration area was originally photographed from four designated photo point locations. To allow for growth comparisons from year to year and to provide a long-term photographic record, photographs will be taken during each monitoring period. Year 1 photographs are presented in Appendix B.

Wildlife observed during the monitoring site visits will be identified and recorded. Any breeding or nesting activity in the restoration area will be documented. No trapping or systematic surveys will be conducted. A cumulative list of all wildlife species observed in the restoration area during the monitoring periods will be presented.

Evidence of human intrusion and/or vandalism in the restoration area, if present, will be documented.

4.2 Performance Measures, Standards of Success, and Contingency Plans

Performance measures and success standards describe specific on-site characteristics that indicate a function is being provided. Performance measures are used to guide management of the restoration area. Success standards are thresholds to be measured during the monitoring period that demonstrate the restoration has complied with regulatory requirements and is providing intended functions. The enhancement/restoration will be monitored for 3 years to demonstrate that intended wetland buffer functions have been achieved. Specific performance measures and success standards will be the following:

- 20 percent cover of native trees, shrubs, and groundcover species after 1 year
- 50 percent cover of native trees, shrubs, and groundcover species after 2 years
- 80 percent cover of native trees, shrubs, and groundcover species after 3 years
- 80 percent survival of planted and colonizing native trees and shrubs after 3 years
- Less than 20 percent cover of invasive species

Contingency plans describe what actions can be taken to correct site deficiencies. If there is a significant problem with the enhancement/restoration area meeting its performance standards, a contingency plan will be developed. Contingency plans may include, but are not limited to, the following:

- Plant substitutions of type, species, quantity, and/or location
- Additional plant installation to address survival or cover problems
- Weeding and additional plant installation to address invasive weed cover
- Providing fencing or plant guards around plants to prevent animal damage

Contingency plans will be developed for review and approval by the City as appropriate. In addition, implemented contingency plans will be described in the monitoring report following each year's visit. Success of the wetland buffer enhancement/restoration will be based on the restoration goals, performance standards, and contingency measures.

5 YEAR 1 MONITORING RESULTS

5.1 Vegetation

5.1.1 *Planted Vegetation*

The site is planted with a variety of native plant species in approximate locations, as identified in the *Wetland Buffer Enhancement/Restoration Plan* (Anchor QEA 2010a) and *Wetland Buffer Enhancement/Restoration As-Built Report* (Anchor QEA 2011a). All planted species identified in the planting plan (Appendix A) and shown on Table 2 were observed within the restoration area. The overall condition of the planted species at the site ranges from good to poor. In the Wetland I restoration area, while the majority of the planted vegetation observed during the Year 1 monitoring appears to be in good health, several of the plants showed evidence of deer browsing and significantly fewer plants were identified during the Year 1 monitoring than were identified in the planting plan and As-Built report. In general terms, several dead tree species were present during the site visit, but very few dead shrub species were documented. In the Wetland M restoration area, planted vegetation is in good health and all planted species were accounted for. Monitoring photographs from the wetland buffer plantings for Wetlands M and I are shown in Appendix B. Table 3 lists species composition and cover values of planted vegetation. Table 4 lists species composition and numbers of individual planted species. Average heights of planted trees and shrubs are provided in Table 5.

Table 3
Species Composition and Percentage of Areal Cover of Planted Vegetation

| Species | Year 1 (2012) |
|------------------------------|---------------|
| Wetland I Buffer Area | |
| Trees | |
| <i>Acer macrophyllum</i> | 1% |
| <i>Alnus rubra</i> | 5% |
| <i>Pseudotsuga menziesii</i> | 5% |
| <i>Thuja plicata</i> | 5% |
| Shrubs | |
| <i>Oemleria cerasiformis</i> | 1% |
| <i>Rosa nutkana</i> | 10% |

| Species | Year 1 (2012) |
|------------------------------|---------------|
| <i>Rubus spectabilis</i> | 5% |
| <i>Symphoricarpos albus</i> | 15% |
| Groundcover | |
| <i>Polystichum munitum</i> | 5% |
| Wetland M Buffer Area | |
| Shrubs | |
| <i>Rubus spectabilis</i> | 20% |

Table 4
Species Composition and Numbers of Planted Vegetation

| Species | Year 0 (2011) | Year 1 (2012) | Variation from Year 0 to Year 1 |
|------------------------------|---------------|---------------|---------------------------------|
| Wetland I Buffer Area | | | |
| Trees | | | |
| <i>Acer macrophyllum</i> | 6 | 3 | -3 |
| <i>Alnus rubra</i> | 9 | 5 | -4 |
| <i>Pseudotsuga menziesii</i> | 8 | 7 | -1 |
| <i>Thuja plicata</i> | 5 | 3 | -2 |
| Total Trees | 28 | 18 | -10 |
| Shrubs | | | |
| <i>Oemleria cerasiformis</i> | 36 | 4 | -32 |
| <i>Rosa nutkana</i> | 28 | 22 | -6 |
| <i>Rubus spectabilis</i> | 45 | 19 | -26 |
| <i>Symphoricarpos albus</i> | 35 | 30 | -5 |
| Total Shrubs | 144 | 75 | -69 |
| Groundcover | | | |
| <i>Polystichum munitum</i> | 147 | 26 | -121 |
| Total Groundcover | 147 | 26 | -121 |
| Wetland M Buffer Area | | | |
| Shrubs | | | |
| <i>Rubus spectabilis</i> | 7 | 10 | 3 |
| Total Shrubs | 7 | 10 | 3 |

Table 5
Average Height of Planted Trees and Shrubs

| Species | Year 1 (2012) Height (feet) |
|------------------------------|--------------------------------|
| Wetland I Buffer Area | |
| Trees | |
| <i>Acer macrophyllum</i> | 8.7 |
| <i>Alnus rubra</i> | 8.5 |
| <i>Pseudotsuga menziesii</i> | 7.5 |
| <i>Thuja plicata</i> | 5.9 |
| Shrubs | |
| <i>Oemleria cerasiformis</i> | 2.5 |
| <i>Rosa nutkana</i> | 3.9 |
| <i>Rubus spectabilis</i> | 1.3 |
| <i>Symphoricarpos albus</i> | 4.1 |
| Groundcover | |
| <i>Polystichum munitum</i> | NA |
| Wetland M Buffer Area | |
| Shrubs | |
| <i>Rubus spectabilis</i> | 1.8 |

About 1 year after planting, individual tree plant species in the Wetland I buffer area showed trace (1 percent) to 5 percent areal cover and shrub species show 1 percent to 15 percent areal cover. Snowberry (*Symphoricarpos albus*) showed the highest areal cover with 15 percent and Nootka rose (*Rosa nutkana*) showed 10 percent areal cover. In the Wetland M buffer area, salmonberry (*Rubus spectabilis*), the only planted species, had 20 percent areal cover.

The average height of tree and shrub species within the Wetland I buffer area ranged from 5.9 feet to 8.7 feet for tree species and 1.3 feet to 4.1 feet for shrub species. The average height of salmonberry in the Wetland M buffer area was 1.8 feet.

The condition of trees and shrubs within the Wetland I buffer area ranged from good to poor health. While many of the species appeared to be in good health, evidence of browsing by deer was observed on many of the plants. Evidence of browsing was more common for two

shrub species, salmonberry and Indian plum (*Oemleria cerasiformis*), than for the other tree and shrub species. Within the Wetland M buffer area, planted shrubs were in good health with no evidence of browsing observed.

Planted tree and shrub species were counted for individual survival rates (see Table 4). The results of the 2012 monitoring identify plant mortality occurred in the Wetland I buffer area since the 2011 as-built report was completed. The number of plants observed during the Year 1 monitoring decreased for each of the four tree and four shrub species. Overall, the number of total planted trees decreased from 28 plants in 2011 to 18 plants in 2012. Planted shrubs decreased from 144 plants in 2011 to 75 plants in 2012. The planted groundcover species sword fern (*Polystichum munitum*) decreased from 147 plants in 2011 to 26 plants observed in 2012. However, as described in Section 5.1.3, a very dense layer of colonizing herbaceous cover was present at the site, which may be concealing some of the planted sword fern. In the Wetland M buffer area, the number of planted salmonberry shrubs increased from 7 to 10 plants due to colonizing species.

5.1.2 Colonizing Vegetation

Several tree and shrub species are colonizing the buffer restoration areas. In the Wetland I buffer area, a total of 52 red alder (*Alnus rubra*) and 46 Pacific willow (*Salix lasiandra*) saplings were documented. The average height of the saplings ranged from 0.9 feet to 1.4 feet. The high number of colonizing native trees is a positive element for the buffer restoration area. Colonizing shrub species observed within the Wetland I buffer area included the non-native species Himalayan blackberry, evergreen blackberry (*Rubus laciniatus*), Scot's broom, and butterflybush (*Buddleia davidii*). In the Wetland M buffer area, colonizing species included snowberry and Himalayan blackberry. Table 6 lists species composition and cover values for colonizing shrub and tree vegetation. Table 7 lists species composition and numbers of individual colonizing shrub and tree species. Average heights of colonizing trees and shrubs are provided in Table 8.

Table 6
Species Composition and Percentage of Areal Cover of Colonizing Tree and Shrub Vegetation

| Species | Year 1 (2012) |
|------------------------------|---------------|
| Wetland I Buffer Area | |
| Colonizing Trees | |
| <i>Alnus rubra</i> | 5% |
| <i>Salix lasiandra</i> | 5% |
| Colonizing Shrubs | |
| <i>Buddleia davidii</i> | 5% |
| <i>Cytisus scoparius</i> | 1% |
| <i>Rubus armeniacus</i> | 5% |
| <i>Rubus laciniatus</i> | 1% |
| Wetland M Buffer Area | |
| Colonizing Shrubs | |
| <i>Rubus armeniacus</i> | 5% |
| <i>Symphoricarpos albus</i> | 15% |

Table 7
Species Composition and Numbers of Colonizing Tree and Shrub Vegetation

| Species | Year 0 (2011) | Year 1 (2012) | Variation from Year 0 to Year 1 |
|--------------------------------------|---------------|---------------|---------------------------------|
| Wetland I Buffer Area | | | |
| Colonizing Trees | | | |
| <i>Alnus rubra</i> | 0 | 52 | 52 |
| <i>Salix lasiandra</i> | 0 | 46 | 46 |
| Total Colonizing Trees | 0 | 98 | 98 |
| Colonizing Shrubs | | | |
| <i>Buddleia davidii</i> | 0 | 3 | 3 |
| <i>Cytisus scoparius</i> | 0 | 5 | 5 |
| <i>Rubus armeniacus</i> ¹ | NA | NA | NA |
| <i>Rubus laciniatus</i> ¹ | NA | NA | NA |
| Total Colonizing Shrubs | 0 | 8 | 8 |
| Wetland M Buffer Area | | | |
| Colonizing Shrubs | | | |
| <i>Rubus armeniacus</i> ¹ | NA | NA | NA |
| <i>Symphoricarpos albus</i> | 0 | 6 | 6 |
| Total Colonizing Shrubs | 0 | 6 | 6 |

Note: 1 Species not applicable for counting number of individuals

Table 8
Average Height of Colonizing Trees and Shrubs

| Species | Year 1 (2012) Height (feet) |
|--------------------------------------|-----------------------------|
| Wetland I Buffer Area | |
| Colonizing Trees | |
| <i>Alnus rubra</i> | 1.4 |
| <i>Salix lasiandra</i> | 0.9 |
| Colonizing Shrubs | |
| <i>Buddleia davidii</i> | 3.5 |
| <i>Cytisus scoparius</i> | 1.6 |
| <i>Rubus armeniacus</i> ¹ | NA |
| <i>Rubus laciniatus</i> ¹ | NA |
| Wetland M Buffer Area | |
| Colonizing Shrubs | |
| <i>Rubus armeniacus</i> ¹ | NA |
| <i>Symphoricarpos albus</i> | 2.9 |

Note:

- 1 Species not applicable for averaging heights

A variety of grass and herbaceous species was observed at the site. Within the Wetland I buffer area, the native species fireweed (*Epilobium angustifolium*) was the most dominant groundcover vegetation, providing approximately 70 percent areal cover. This fireweed cover was very dense at the site and may be concealing planted sword ferns, influencing the number of sword ferns observed (Table 4). Additional frequently observed grass and herbaceous species included prickly lettuce (*Lactuca serriola*), colonial bentgrass (*Agrostis capillaris*), meadow fescue (*Festuca pratensis*), common velvetgrass (*Holcus lanatus*), common tansy (*Tanacetum vulgare*), and common dandelion (*Taraxacum officinale*). The Wetland M buffer area was dominated by bare ground, and field horsetail (*Equisetum arvense*) was the only herbaceous plant observed. A complete list of colonizing species observed at the site, and the percent areal cover within the buffer restoration areas, is presented in Table 9.

Table 9
Colonizing Plant Species and Percent Areal Cover

| Scientific Name | Common Name | Year 1 (2012) |
|--------------------------------|----------------------|---------------|
| Wetland I Buffer Area | | |
| <i>Agrostis capillaris</i> | Colonial bentgrass | 5% |
| <i>Buddleia davidii</i> | Butterflybush | 5% |
| <i>Carex obnupta</i> | Slough sedge | 1% |
| <i>Cirsium arvense</i> | Canada thistle | 1% |
| <i>Cytisus scoparius</i> | Scot's broom | 1% |
| <i>Epilobium angustifolium</i> | Fireweed | 70% |
| <i>Equisetum arvense</i> | Field horsetail | 1% |
| <i>Festuca pratensis</i> | Meadow fescue | 5% |
| <i>Holcus lanatus</i> | Common velvetgrass | 1% |
| <i>Juncus effusus</i> | Soft rush | 5% |
| <i>Lactuca serriola</i> | Prickly lettuce | 10% |
| <i>Lotus corniculatus</i> | Birds-foot trefoil | 5% |
| <i>Poa pratensis</i> | Kentucky bluegrass | 1% |
| <i>Rubus armeniacus</i> | Himalayan blackberry | 5% |
| <i>Rubus laciniatus</i> | Evergreen blackberry | 1% |
| <i>Salix lasiandra</i> | Pacific willow | 5% |
| <i>Tanacetum vulgare</i> | Common tansy | 5% |
| <i>Taraxacum officinale</i> | Common dandelion | 5% |
| <i>Trifolium pratense</i> | Red clover | 1% |
| <i>Trifolium repens</i> | White clover | 1% |
| Wetland M Buffer Area | | |
| <i>Equisetum arvense</i> | Field horsetail | 10% |
| <i>Rubus armeniacus</i> | Himalayan blackberry | 5% |

5.1.3 Summary

Total native tree, shrub, and groundcover areal cover was estimated for the Wetlands I and M buffer areas (Table 10). The information on Table 10 includes planted species and native colonizing tree, shrub, and groundcover species.

Table 10
Total Overall Native Tree, Shrub, and Groundcover Areal Cover

| Canopy | Year 1 (2012) |
|------------------------------|---------------|
| Wetland Buffer Area I | |
| Trees | 25% |
| Shrubs | 30% |
| Groundcover | 80% |
| Wetland Buffer Area M | |
| Trees | 0% |
| Shrubs | 35% |
| Groundcover | 10% |

As described previously, no plant mortality was observed within the Wetland M buffer area and several native colonizing shrubs were identified in this area. In the Wetland I buffer area, while existing vegetation appears to be in good health, a reduction in tree, shrub, and groundcover species occurred between the 2011 as-built report and the Year 1 2012 monitoring. For the planted tree species, the dead tree species were identified and accounted for during the site visit. However, the existing shrubs did not appear to be stressed or dying, and very few dead individual shrubs and groundcover plants were observed. The lack of dead shrub species to account for the missing plants was unusual because, typically, the main stems of deceased shrubs are present one year after planting. Based on observations during the Year 1 2012 monitoring, the following factors likely attributed to the plant mortality observed within the Wetland I buffer area.

A lack of irrigation at the restoration area may have contributed to some of the plant mortality, but does not appear to be the most significant factor accounting for shrub mortality based on the lack of dead plants observed and the general good health of existing shrub vegetation. If a lack of irrigation had caused a large reduction in plants, there typically would be visible evidence of stressed or dying plants among the remaining vegetation, but as noted previously, existing shrubs appear to be in good health. Lack of irrigation and exposure to sun is the more likely cause of tree mortality. Planted trees closer to the existing vegetation canopy associated with Wetland I to the east were generally in better health and had more survivors than the trees planted to the west that had less shade and more sun

exposure. Full sun exposure and lack of irrigation is a common cause of tree mortality at restoration sites.

Deer browsing of vegetation may have played a significant role in the reduction of planted shrubs at the Wetland I buffer area. While evidence of browsing was observed for several of the existing shrubs (and colonizing tree saplings), these plants appeared to be stunted in growth but not dying as a result of the browsing. It is possible that one year after planting, the existing shrubs are established enough to survive some browsing. However, if heavy deer browsing occurred on the planted vegetation in 2011 shortly after the planting occurred, the young, recently transplanted plants were likely more vulnerable at that point to the impacts of browsing. This phenomenon may account for the lack of dead shrubs present at the site if the newly planted vegetation was heavily browsed in the first season of growth after planting.

A final possible factor in the reduction of planted shrubs and groundcover within the Wetland I buffer area is the dense and relatively tall presence of herbaceous groundcover. Fireweed provided approximately 70 percent areal cover of the Wetland I buffer area during the Year 1 monitoring. The fireweed cover was typically 18 inches to 2 feet tall within the site. This groundcover is dense enough to potentially out-compete young shrub plantings, particularly shrubs that have been browsed by deer. In addition, if the dead shrubs were less than 2 feet tall, the herbaceous groundcover could also be concealing the dead shrubs. Only 26 of the 147 planted sword fern (17 percent) were documented during the Year 1 monitoring. Most of the observed sword fern were growing within the dense herbaceous groundcover vegetation, and none of the sword fern extended above the fireweed plants. While there may be several sword ferns present beneath the herbaceous groundcover, it is unlikely that a significant number is growing in the full shade of the herbaceous plants. Conditions at the site indicate that the dense fireweed groundcover is responsible for the low number of observed sword ferns at the site and may be contributing to sword fern mortality. While grass and herbaceous vegetation provide short-term erosion control measures at restoration sites, it appears that the dense groundcover vegetation may be contributing to the low success rate of planted material. However, fireweed is a native species, and per the performance goals and standards of success, colonizing native plants are a benefit to the

restoration effort and colonizing native plants are accounted for in evaluating the success of the restoration.

As described in Section 4.2 on performance standards, standards of success, and contingency plans, success of the wetland buffer enhancement/restoration area will be based on an 80 percent survival rate of planted and colonizing native trees and shrubs after 3 years.

Contingency measures for less than 80 percent plant survival and to achieve performance standards include: evaluating the reasons for mortality; making substitutions in plant type, species, quantity, and/or location; additional plant installation to address survival; weeding and additional plant installation to address invasive weed cover; and providing fencing or plant guards around plants to prevent animal damage. Based on the numbers of planted vegetation observed during the Year 1 2012 monitoring, current plant survival under existing conditions is significantly below the restoration performance goals and standards for shrub species. Due to colonizing native red alder and willow species, the tree canopy layer is meeting restoration performance goals and standards.

During the 2012 monitoring, the invasive shrub species Himalayan blackberry and Scot's broom were observed within the restoration area. Within the Wetland I buffer area, areal cover of Himalayan blackberry was 5 percent and Scot's broom was 1 percent. Within the Wetland M buffer area, areal cover of Himalayan blackberry was 5 percent. Blackberry bushes are growing along the roads on the north and west sides of the restoration site and are providing a seed source for colonizing blackberry shrubs within the site.

5.2 Wildlife

Wildlife data are collected during the annual monitoring. Four bird species commonly associated with urban areas in western Washington were observed during the Year 1 monitoring. Scat for two mammal species, coyote (*Canis latrans*) and black-tailed deer (*Odocoileus hemionus columbianus*), were observed in several locations of the site. As described previously, evidence of deer browsing of vegetation was also observed. A list of all wildlife species observed at the restoration site during the Year 1 monitoring period is presented in Table 11.

Table 11
List of Wildlife Species Observed at the Restoration Site

| Common Name | Scientific Name | August 2012 |
|------------------------|--|-------------|
| Birds | | |
| American crow | <i>Corvus brachyrhynchos</i> | x |
| American robin | <i>Turdus migratorius</i> | x |
| Black-capped chickadee | <i>Parus atricapillus</i> | x |
| Dark-eyed junco | <i>Junco hyemalis</i> | x |
| Mammals | | |
| Coyote | <i>Canis latrans</i> | x |
| Black-tailed deer | <i>Odocoileus hemionus columbianus</i> | x |

5.3 Human Intrusion/Vandalism

Evidence of human intrusion included litter, aluminum cans, plastic bags, and a fire pit located at the south end of the site near Wetland M. No evidence of human intrusion or vandalism was observed in the area of Wetland I.

6 CONCLUSIONS AND RECOMMENDATIONS

General findings of the Year 1 2012 monitoring identify a reduction in the numbers of vegetation plantings in the Wetland I buffer area since the 2011 as-built report was completed. The Wetland M buffer area vegetation is in good health with an increase in native plant numbers due to colonization.

While existing planted vegetation in the Wetland I buffer area generally appears healthy, the total number of planted trees decreased by 10 from the total of 28 plants in 2011, for a plant survival rate of 64 percent. A total of 98 colonizing red alder and Pacific willow saplings was also observed within the Wetland I buffer area during the monitoring. Per the restoration performance standards, colonizing native trees and shrubs can be applied to the plant survival rate.

Planted shrubs decreased by 69 from the total of 144 plants in 2011, for a plant survival rate of 52 percent. Based on the number of shrubs observed during the 2012 monitoring, the current Year 1 conditions already have shrub plant survival below the restoration performance standards of an 80 percent survival rate of planted and colonizing native trees and shrubs after 3 years. Restoration performance goals and standards do not include survival goals for groundcover plants (sword fern).

About 1 year after planting, in the Wetland M buffer area, total native tree areal cover was 25 percent, shrub areal cover was 30 percent, and groundcover areal cover was 90 percent (dominated by fireweed, not planted sword fern). In the Wetland I buffer area, tree areal cover was 0 percent, shrub areal cover was 35 percent, and groundcover areal cover was 10 percent. The Wetland I buffer area did not include tree and groundcover plantings. The Wetland I and M buffer areas currently meet the areal cover performance standard of 20 percent cover of native trees, shrubs, and groundcover species after 1 year.

The invasive shrub species Himalayan blackberry and Scot's broom were primarily observed on the perimeter of the site during the 2012 monitoring. Within the Wetland I buffer area, areal cover of Himalayan blackberry was 5 percent and Scot's broom was 1 percent. Within the Wetland M buffer area, areal cover of Himalayan blackberry was 5 percent. The

Wetlands I and M buffer areas currently meet the performance standard of less than 20 percent cover of invasive species. Maintenance of the site should include removal of invasive species to prevent their continued growth and establishment in the restoration area.

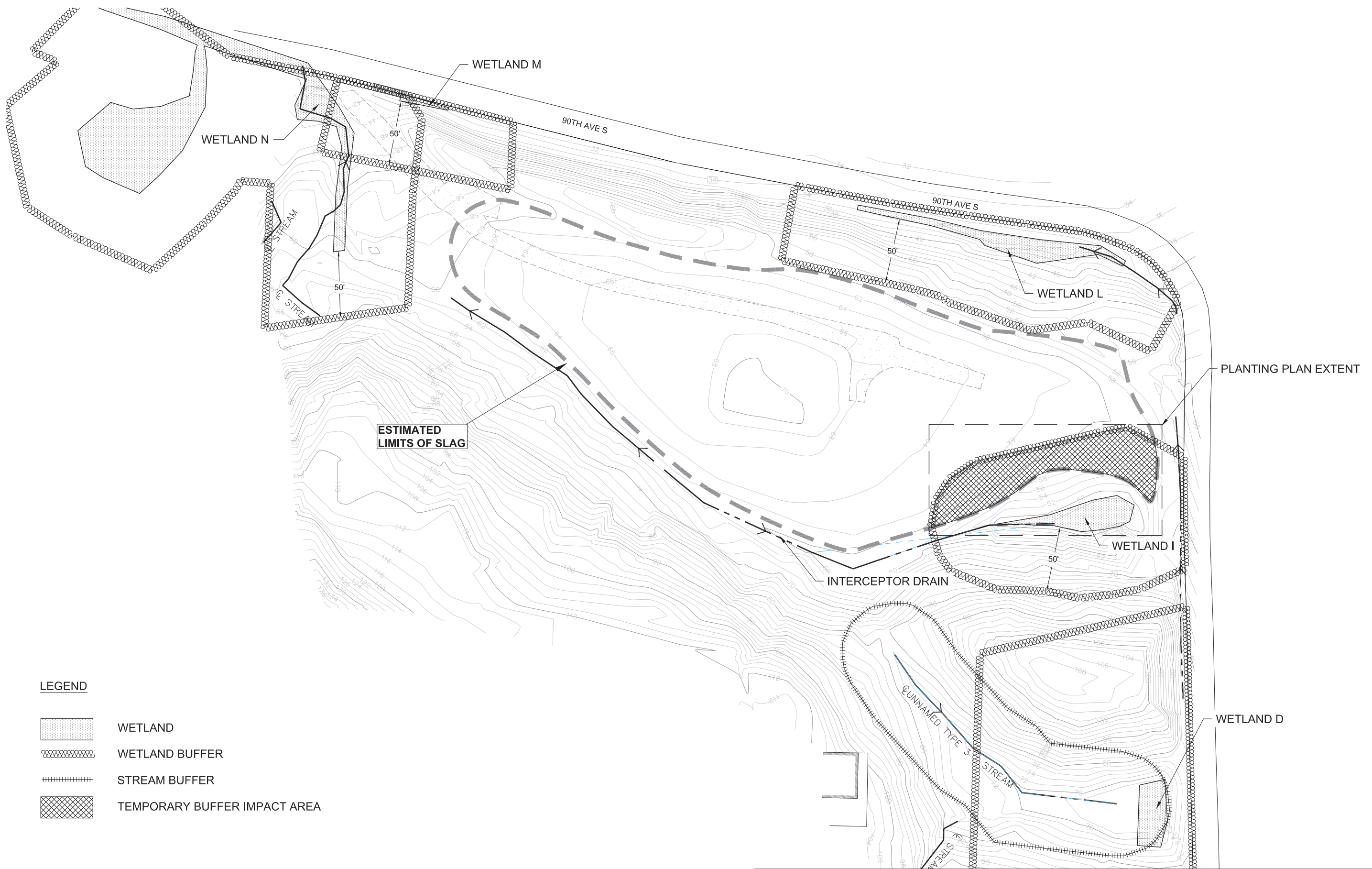
Numerous native and some non-native grass and herbaceous species have become established and have contributed to the groundcover present. While grass and herbaceous vegetation provide short-term erosion control measures, a decrease in grass and herbaceous species is a desired result at restoration sites. While the density of grass and herbaceous cover in the Wetland M buffer area is currently competing with, and may be restricting the growth of, planted shrubs and sword ferns, the dominant herbaceous groundcover at the site is fireweed, a native species, and colonizing native species are considered a benefit to the restoration effort.

The overall condition of the planted vegetation at the site ranges from good to poor. Many of the native plant species in the restoration areas are developing and are beginning to provide wildlife foraging, shelter, and resting habitat for terrestrial wildlife species; however, a significant reduction in the number of planted vegetation in the Wetland I buffer area has occurred since 2011. Based on the 2012 monitoring conditions, tree plant survival in the Wetland I buffer area is less than 65 percent, although a significant number of colonizing red alder and Pacific willow was observed during the 2012 monitoring. Shrub plant survival in the Wetland I buffer area is less than 55 percent, and groundcover (sword fern) plant survival is less than 20 percent. Due to the rate of shrub plant mortality at the site, additional shrub plantings are needed to meet the restoration site goals and performance standards. Planting additional sword ferns may not be necessary because restoration performance goals and standards do not include survival goals for groundcover plants, and during the Year 1 monitoring, the dominant groundcover vegetation was fireweed, a native species. Additional measures appear necessary for planted shrub species to survive at the restoration site, such as irrigation, mulching, soil amendments, maintenance of non-native vegetation around the planted vegetation, and fencing to prevent browsing of planted vegetation by deer.





7 REFERENCES

- Anchor QEA LLC (Anchor QEA). 2010a. *Wetland Buffer Enhancement/Restoration Plan Kent Slag Site Excavation Project*. Prepared for Farallon Consulting L.L.C, Seattle, Washington.
- Anchor QEA LLC (Anchor QEA). 2010b. *Wetland Buffer Planting Plan Kent Slag Site Excavation Project*. Prepared for Farallon Consulting L.L.C, Seattle, Washington.
- Anchor QEA LLC (Anchor QEA). 2010c. *Wetland Buffer Enhancement/Restoration Plan Addendum Kent Slag Site Excavation Project*. Prepared for Farallon Consulting L.L.C, Seattle, Washington.
- Anchor QEA LLC (Anchor QEA). 2011a. *Wetland Buffer Enhancement/Restoration As-Built Report*. Prepared for Farallon Consulting L.L.C, Seattle, Washington.
- Anchor QEA LLC (Anchor QEA). 2011b. *Inspection of Delivered Plants and Planting Procedures Field Report*. Prepared for Farallon Consulting L.L.C, Seattle, Washington.
- Anchor QEA LLC (Anchor QEA). 2011c. *Inspection of Planting Areas Field Report*. Prepared for Farallon Consulting L.L.C, Seattle, Washington.
- ESA Adolfson, 2006. *South 224th Street Extension Wetland Technical Report*. Prepared for City of Kent, Washington.
- Farallon Consulting, 2010a. *Kent Slag Site Excavation Project Design Plans*. Prepared for Earle M. Jorgensen Company, Lynwood, California.
- Farallon Consulting, 2010b. *Cleanup Action Work Plan*. Prepared for Earle M. Jorgensen Company, Lynwood, California.
- Springwood Associates, Inc., 1995. *Beckwith Property Slag Disposal Site Wetland Delineation Report*. Prepared for SECOR International, Inc. Bellevue, Washington.


APPENDIX A
WETLAND BUFFER ENHANCEMENT/
RESTORATION DRAWINGS



LEGEND

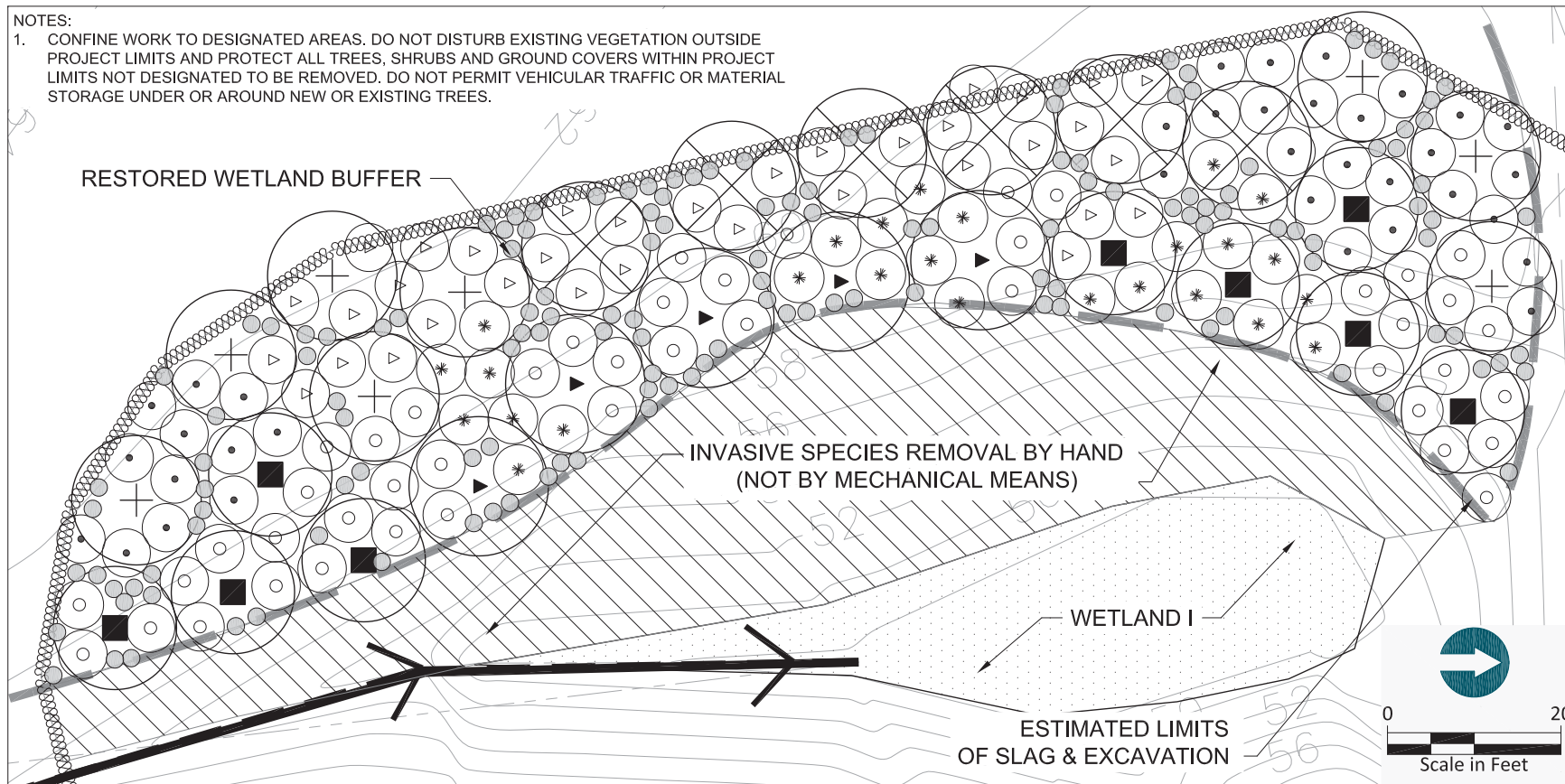
-  WETLAND
-  WETLAND BUFFER
-  STREAM BUFFER
-  TEMPORARY BUFFER IMPACT AREA



| | | | |
|--|---|--|--|
| PREPARED BY  | PREPARED FOR EARLE M. JORGENSEN COMPANY 10650 ALAMEDA STREET LYNWOOD, CALIFORNIA 90262 | SLAG DISPOSAL BECKWITH PROPERTY SITE KENT, WASHINGTON WETLAND BUFFER PLAN | SCALE AS SHOWN PROJECT NO. 831-022 FILE NAME: 100224-PL-001.dwg SHEET NO. OF W1 3 |
|--|---|--|--|

| DATE | DESCRIPTION | BY | CHKD. | APP. | DATE |
|---------|-------------------------|-----|-------|---------|------|
| 6/15/10 | ISSUED FOR CONSTRUCTION | BMB | PH | 6/22/10 | |
| | | | | | |

NOTES:
 1. CONFINE WORK TO DESIGNATED AREAS. DO NOT DISTURB EXISTING VEGETATION OUTSIDE PROJECT LIMITS AND PROTECT ALL TREES, SHRUBS AND GROUND COVERS WITHIN PROJECT LIMITS NOT DESIGNATED TO BE REMOVED. DO NOT PERMIT VEHICULAR TRAFFIC OR MATERIAL STORAGE UNDER OR AROUND NEW OR EXISTING TREES.



PLANTING SEQUENCE / NOTES:

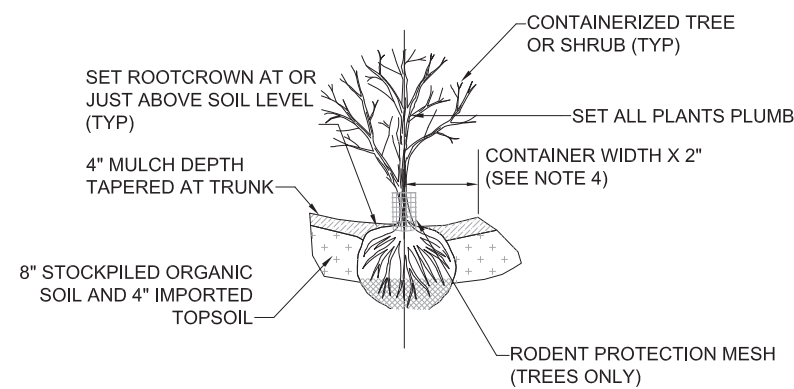
1. STRIP ORGANIC SOIL AND STOCKPILE SEPARATELY FROM SLAG AND OVERBURDEN.
2. RIP, DISC, OR SCARIFY SUBGRADE SOILS TO A MINIMUM DEPTH OF 12 INCHES. DO NOT SCARIFY WITHIN DRIP LINE OF EXISTING TREES TO BE RETAINED.
3. PLACE 8" OF STOCKPILED SOILS AND 4" OF IMPORTED TOPSOIL WITHIN WETLAND BUFFER PLANTING AREA.
4. DIG PLANTING PIT THAT IS AT LEAST TWICE THE DIAMETER OF CONTAINER. REMOVE ALL ROCKS, ROOTS, STICKS AND OTHER DEBRIS LARGER THAN 1" DIAMETER. SCARIFY THE PLANTING PIT BOTTOM AND SIDES TO A DEPTH OF 4 INCHES.
5. SET PLANT MATERIAL IN THE PLANTING PIT TO PROPER GRADE AND ALIGNMENT. SET PLANTS UPRIGHT, PLUMB, AND FACED TO GIVE THE BEST APPEARANCE OR RELATIONSHIP TO EACH OTHER. SET CROWN OF PLANT MATERIAL AT THE FINISH GRADE. NO FILLING WILL BE PERMITTED AROUND TRUNKS OR STEMS. BACKFILL THE PLANTING PIT WITH SOIL, DO NOT USE MUDDY MIXTURES FOR BACKFILLING.
6. SPACE PLANTS USING TRIANGULAR SPACING IN ACCORDANCE WITH PLANT SCHEDULE DIMENSIONS. PLANT GROUND COVERS TO WITHIN 18" OF THE TRUNKS OF TREES AND SHRUBS WITHIN PLANTING AREA AND TO WITHIN 12" OF THE EDGE OF PLANTING AREA. PLANT SHRUBS WITHIN 5' OF THE TRUNKS OF TREES WITHIN PLANTING AREA AND TO WITHIN 3' OF THE EDGE OF PLANTING AREA.
7. SHAPE SOIL TO PROVIDE WATERING RING WITH A DIAMETER EQUAL TO 2X THE CONTAINER WIDTH.
8. MULCH PLANTING BEDS IMMEDIATELY AFTER PLANTING. THOROUGHLY WATER MULCHED AREA. AFTER WATERING, RAKE MULCH TO PROVIDE A UNIFORM FINISHED SURFACE.

PLANTING PLAN

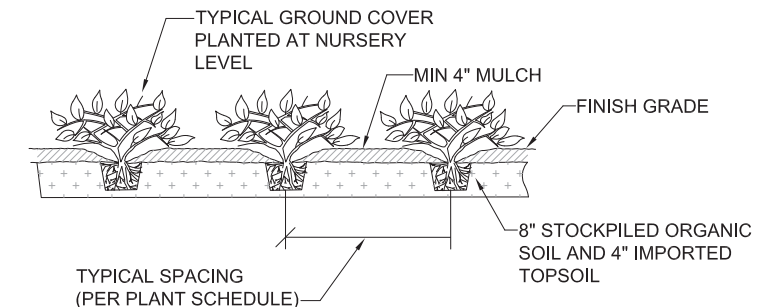
PLANTING SCHEDULE / LEGEND

| Common Name | Scientific Name | Size | Spacing | Quantity |
|---------------------|------------------------------|--------|----------|----------|
| TREES | | | | |
| Red Alder | <i>Alnus rubra</i> | 5 gal. | 15' O.C. | 9 |
| Big leaf Maple | <i>Acer macrophyllum</i> | 5 gal. | 15' O.C. | 6 |
| Douglas Fir | <i>Pseudotsuga menziesii</i> | 5 gal. | 15' O.C. | 8 |
| Western Red Cedar | <i>Thuja plicata</i> | 5 gal. | 15' O.C. | 5 |
| SHRUBS | | | | |
| Indian Plum | <i>Oemleria cerasiformis</i> | 1 gal. | 6' O.C. | 36 |
| Salmonberry | <i>Rubus spectabilis</i> | 1 gal. | 6' O.C. | 45 |
| Nootka Rose | <i>Rosa nutkana</i> | 1 gal. | 6' O.C. | 28 |
| Snowberry | <i>Symphoricarpos albus</i> | 1 gal. | 6' O.C. | 35 |
| GROUND COVER | | | | |
| Western Sword Fern | <i>Polystichum munitum</i> | 1 gal. | As Shown | 147 |

EXISTING WETLAND PREVIOUSLY RESTORED WITH NATIVE PLANTS



1 TYPICAL TREE AND SHRUB PLANTING DETAIL
SCALE: NTS



2 GROUND COVER PLANTING
SCALE: NTS



| | | | | |
|---------|-------------------------|-----|-------|---------|
| 6/15/10 | ISSUED FOR CONSTRUCTION | BMB | PH | 6/22/10 |
| DATE | DESCRIPTION | BY | CHKD. | APP. |

CONTOUR INTERVAL: 2 FOOT

| | | | |
|-----------------|---|--|--|
| PREPARED BY | PREPARED FOR EARLE M. JORGENSEN COMPANY 10650 ALAMEDA STREET LYNWOOD, CALIFORNIA 90262 | SLAG DISPOSAL BECKWITH PROPERTY SITE KENT, WASHINGTON | SCALE AS SHOWN PROJECT NO. 831-022 |
| | | PLANTING PLAN | FILE NAME: 100224-PL-002.dwg SHEET NO. OF W2 3 |

PLANTING SPECIFICATIONS

Submittals:

1. Topsoil analysis results of a 5 pound bag from soils testing laboratory, indicate source and obtain Owner's approval before hauling topsoil to site.
2. Source of the mulch supply and a 1 gallon sample for approval before installation.
3. List of nurseries supplying all plant species with Name and phone number of contact person. Submit representative color, dated photographs of each plant species.

Notifications:

Notify the Owner at least five working days prior to the installation of plant material.

Products:

Topsoil:

The Topsoil shall consist of 60 percent Sand Component and 40 percent Composted Organic Amendment by volume and shall meet or exceed the following specifications:

The Sand Component shall meet the following specifications within reasonable variations:

| Screen Size | Percent Passing |
|-------------|-----------------|
| 6.35 mm | 95 |
| #10 | 85 |
| #30 | 50 |
| #60 | 40 |
| #100 | 20 |
| #200 | 10 |

The Composted Organic Soil Amendment shall consist of 100 percent decomposed organic mulch material, and shall consist of yard waste debris or other organic waste materials that have been sorted, ground up, aerated, and aged, and shall be fully composted, stable, and mature (non-aerobic). The composting process shall be for at least 6 months' time and the organic amendment shall have a uniform dark, soil-like appearance and consist of 100 percent recycled content. In addition, the organic amendment shall have the following physical characteristics:

1. Shall be certified by the Process to Further Reduce Pathogens (PFRP) guideline for hot composting as established by EPA. Shall be fully mature and stable before usage.
2. Shall be screened using a sieve no finer than 1/4-inch and no greater than 1/2-inch. Based on dry weight of total organic amendment sample, it must comply with the following percent by weight passing:

| Sieve Size | Maximum % | Minimum % |
|--------------------|-----------|-----------|
| 12.7 mm (1/2 inch) | 0 | 100 |
| 6.35 mm (1/4 inch) | 100 | 95 |
| 4.76 mm | 100 | 90 |
| 2.38 mm | 100 | 75 |
| 1.00 mm | 45 | 70 |
| 500 micron | 30 | 0 |

3. Meets "composted materials" definition in WAC 173-350 Section 220, available at: <http://www.ecy.wa.gov/programs/swfa/compost/>
4. Has Organic Matter Content 35 to 65 percent and Carbon to Nitrogen ratio of 25:1.
5. Shall have heavy metal concentrations below the Washington State Department of Agriculture (WSDA) per year load limits as follows:

| Metal | WSDA-Maxium pounds per acre per year |
|------------|--------------------------------------|
| Arsenic | 0.297 |
| Cadmium | 0.079 |
| Cobalt | 0.594 |
| Lead | 1.981 |
| Mercury | 0.019 |
| Molybdenum | 0.079 |
| Nickel | 0.713 |
| Selenium | 0.055 |
| Zinc | 7.329 |

6. Shall be certified by PFRP guidelines for composting as established by the U.S. Environmental Protection Agency (EPA).

PLANTING SPECIFICATIONS CONTINUED

The topsoil mix shall also have the following characteristics:

1. The pH range shall be from 5.5 to 7.5.
2. The Sodium Adsorption Ratio shall be less than 6.0.
3. The Saturation Extract Concentration of Boron shall be less than 1.0 part per million (ppm).
4. The Water Percolation/Infiltration Rate of the disturbed soil sample shall be a minimum of 0.4 inches per hour.
5. The Soil Structure shall be loose, friable, and not subject to consolidation or compaction.
6. The soil mix shall contain less than 100 plant parasitic nematodes per 100 cubic centimeters (cc) of soil.
7. The soil mix shall be relatively free of soil-borne plant pathogens.
8. Minimal weed seed shall be present, based on germination testing of a representative sample.
9. Non-soil components shall be less than 1 percent by volume (i.e., plastic, sticks, glass, etc.).
10. The Final Topsoil Mix shall contain sufficient quantities of available nitrogen, phosphorus, potassium, calcium, magnesium, sulfate, copper, zinc, manganese, iron, and boron to support normal plant growth. In the event of nutrient inadequacies, provisions shall be made to add required materials prior to planting.

Mulch:

Bark or wood chip mulch shall be derived from Douglas fir, pine, or hemlock species. It shall be ground so that a minimum of 95% of the material will pass through a 2-inch sieve and no more than 25%, by loose volume, will pass through a No. 4 sieve. The mulch shall not contain resin, tannin, or other compounds in quantities that would be detrimental to plant life. Arborist woodchips, sawdust or wood shavings shall not be used as mulch.

Plants:

Comply with sizing and grading standards of th latest edition of "American Standards for Nursery Stock."

Protect existing native vegetation from damage caused by landscaping operations.

All plants shall by nursery grown and from a nursery with similar climatic conditions to the locality of the project. Stock furnished shall be at least the minimum size indicated.

Provide only sound, healthy, vigorous plants free from weeds, defects, sunscald injuries, and abrasions of the bark, plant diseases, insect eggs, borers, and all forms of infestation. All plants shall have a fully developed form without voids, open spaces, broken branches, bruised bark, flush cuts or stubs. No plants shall be loose in the container or pot bound.

Plants shall be packed, transported and handled with care. Cover plants transported on open vehicles with a protective covering to prevent wind burn. No plant material will be bound with rope or wire in a manner that would damage or break the branches. If plants cannot be planted immediately upon delivery, properly protect them with soil, wet peat moss, or in a manner acceptable to the Owner. Water heeled in plantings daily. Do not handle plants by trunks, stems or tops.

Plant material shall be inspected and approved by the Consultant and the Owner on site prior to installation. Remove unsatisfactory material from the site immediately.

Planting vegetation shall be performed during the period between October 1 and April 1.

Stock shall not be installed when ambient temperatures are below 35 degrees F or above 80 degrees, or when wind velocity exceeds 30 miles per hour.

Warrant plant material to remain alive and be in healthy, vigorous condition for a period of one year after the date of Physical Completion.

Rodent Protection Mesh:

Encircle woody trunks of planted trees with thin plastic mesh to protect against cambian damage by rodents. Extend mesh cylinder 3" below and 12" above the finished grade line. Assure that the guage of protective wrap is such that tree growth will split the material if it is not physically removed.

Maintenance:

Maintain planting until acceptance by Owner. Maintenance shall include cultivating, weeding, watering, pruning (only as directed), and application of appropriate insecticides and fungicides necessary to maintain plants free of insects and disease.

Reset settled plants to proper grade and position. Restore planting watering ring and adjacent material and remove dead material.

Water trees, shrub, and ground cover beds within the first 24 hours of initial planting, and not less than twice per week (including rain) until Physical Completion.

Physical Completion:

Inspection to determine Physical Completion of planted areas will be made by the Owner, upon the Contractor's request. Provide notification at least 10 working days before requested inspection date.

Planted areas will be accepted provided all requirements, including the maintenance period have been complied with and plant materials are alive and in a healthy vigorous condition.

Upon Physical Completion, the Owner will assume plant maintenance.



| | | | | |
|---------|-------------------------|-----|------|---------|
| 6/15/10 | ISSUED FOR CONSTRUCTION | BMB | PH | 6/22/10 |
| DATE | DESCRIPTION | BY | CKD. | APP. |

CONTOUR INTERVAL: 2 FOOT

| | | | | |
|--|----------------------------------|---|--|-----------------------------|
| | PREPARED BY ANCHOR QEA | PREPARED FOR EARLE M. JORGENSEN COMPANY 10650 ALAMEDA STREET LYNWOOD, CALIFORNIA 90262 | SLAG DISPOSAL BECKWITH PROPERTY SITE KENT, WASHINGTON PLANTING SPECIFICATIONS | SCALE AS SHOWN |
| | | | | SHEET NO. OF W3 3 |

APPENDIX B
MONITORING SITE PHOTOGRAPHS



Photograph 1

Photo Point 1: Wetland I Buffer Facing North from West Side of Buffer



Photograph 2

Photo Point 2: Wetland I Buffer Facing South from West Side of Buffer



Photograph 3

Photo Point 3: Wetland I Buffer Facing South from Middle of Buffer



Photograph 4

Photo Point 4: Wetland M Buffer Facing North from East Side of Buffer