



TECHNICAL MEMORANDUM

Prepared for: Kennedy/Jenks Consultants, Inc.
ATTN: Jarod Fisher
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Federal Way, WA 98001

March 17, 2015

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2102 North 30th Street, Ste A
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File No.: 304.007

Re: Cornet Bay Marina Model Toxic Control Act Cleanup Mitigation Plan: Contingency
Action Compliance Report

1 INTRODUCTION

Grette Associates, LLC is under contract to Kennedy/Jenks Consultants, Inc. to provide plant installation oversight and to perform a compliance survey for the contingency actions approved in the Cornet Bay Mitigation Plan As-Built Report (As-Built; Grette Associates 2014). A Grette Associates biologist completed a site visit on March 9th, 2015 to provide oversight while a landscape contractor installed the approved assortment of native shrubs and emergent vegetation species. Upon completion of the plant installation, Grette Associates completed a compliance survey to collect total plant counts for the vegetation planted on March 9th, 2015 and the previously planted vegetation. In addition, the site was assessed to document the health of the previously planted vegetation for comparison with the As-Built. This memorandum is intended to serve as the Compliance Report required in the approved As-Built.

The results of the post-construction inspection described in the As-Built determined that the planting plan was implemented according to the approved Cornet Bay Mitigation Plan (Plan; Grette Associates 2013). However, at the time of the post-construction inspection it was observed that many of the plants that were planted within the wetland enhancement area did not survive installation. A summary of the required Year 0 ("As-Built Year") performance standards within the approved Plan is presented in Table 1.

With the exception of the wetland enhancement survival performance standard, the mitigation site met all of the required performance standards for Year 0. Many of the shrub species that were planted within the wetland enhancement area did not survive. During the As-Built site assessment, 32 of the 65 plants installed did not survive. The survival rate within the wetland enhancement area was 49 percent.

Table 1. Year 0 (“As-Built Year”) performance standard summary

Performance Standards	Performance Standard met?
1a. A minimum of 1,300 square feet of aquatic area will be created by the end of the Cornet Bay cleanup.	Yes - 1,320 sq ft
2a. A minimum of two (2) species of native shrubs will be present by the end of the monitoring period within the wetland enhancement area.	Yes – 2 species present
2b. A minimum of 100% survival of planted shrub species in Year 0 within the wetland enhancement area. ¹	No - 49%
3a. A minimum of two (2) species of native shrubs will be present by the end of the monitoring period within the buffer enhancement area.	Yes – 4 species present
3b. A minimum of 100% survival of planted shrub species in Year 0 within the buffer enhancement area. ¹	Yes – 100%

¹ Year 0 requires 100% survival of planted stock. The remaining scheduled monitoring periods are required to have a minimum of 80% survival of planted stock within the enhancement areas.

The approved contingency actions are intended to correct the deficiencies observed after planting and to enable the mitigation site to achieve the goals and objectives defined in the approved Plan. Per the approved As-Built, the following contingency actions shall be completed for non-attainment of Performance Standard 2b:

- Substitute 15 of the shrubs that did not survive with seashore saltgrass (*Distichlis spicata*), saltmarsh bulrush (*Schoenoplectus maritimus*), and Lyngby’s sedge (*Carex lyngbyei*) in the lower portions of the wetland enhancement area where the shrubs did not survive. These emergent species should be planted in clusters, consisting of four (4) plugs of the same species per cluster, with the clusters planted two feet on center. Each cluster would substitute one shrub. The recommended substitution and planting of these emergent species should occur in bare areas and at the same elevation of existing emergent vegetation within the wetland. Once all emergent species are planted a temporary goose exclusion fence should be installed to protect the planted emergent vegetation. A typical goose exclusion fence consists of a grid like structure made with rebar and natural fiber twine that spans the planted emergent vegetation. Extending emergent vegetation within portions of the wetland will increase foraging opportunities for salmonids and waterfowl.
- Replant 17 of the shrubs that did not survive within the wetland enhancement area with sweet gale. Hooker’s willow is not recommended to be replanted because sweet gale generally has a higher salt tolerance. The plantings should occur along the upper perimeter of the wetland at the highest elevation while remaining within the boundaries of the wetland. Further, sweet gale should not be planted below the elevation where existing shrubs are surviving; any shrub that is planted below this elevation would likely not survive. Relocating this species to the upper extent of the wetland should increase

survival and reduce exposure to regular tidal inundation, while still providing vegetation complexity, wildlife habitat, shade, and the requirements of the approved Plan.

- It was anticipated that the cleanup project would not need to import amended soils within the mitigation area. However, based on the highly permeable, mineral soils within the northeast portion of the enhancement area, it is recommended that the shrubs that are to be replanted be placed in pits that contain organic soil amendments. Plant installation should consist of excavating a plant pit at least three times the diameter of the root system and backfilled with a mixture of topsoil and organic material (no manure). Refer to Section 5.2.5 of the approved Mitigation Plan for detailed instructions for installing plant material. Further, it is recommended that a biologist be present during the plant installation to ensure proper location and installation of the plants.
- A temporary irrigation system should be installed within the northeast portion of the enhancement area to provide water to the planted vegetation. The soils within the enhancement area adjacent to the cleanup consist of coarse sand and fine gravel. The highly permeable soil conditions will likely increase future mortality rates if the plants are not watered through at least the first summer and fall.

After approval of the As-Built, it was determined that Grette Associates’ recommended plant quantity should be doubled to assure the survival of the required quantity of shrubs within the wetland enhancement area as defined in the approved Plan. Furthermore, the landscape contractor had concerns with planting sweet gale in the highly permeable soils within the northeast portion of the wetland enhancement area. Grette Associates recommended substituting eight of the sweet gale with snowberry (*Symphoricarpos albus*) in this area. A revised and approved species list is provided in Table 2.

Table 2. Revised and approved species list

Common Name	Scientific Name	Quantity
Seashore saltgrass	<i>Distichlis spicata</i>	40
Saltmarsh bulrush	<i>Schoenoplectus maritimus</i>	40
Lyngby’s sedge	<i>Carex lyngbyei</i>	40
Snowberry	<i>Symphoricarpos albus</i>	8
Sweet gale	<i>Myrica gale</i>	26

2 RESULTS

A Grette Associates biologist completed a site visit on March 9, 2015 to provide oversight while the landscape contractor installed the approved assortment of native shrubs and emergent vegetation species within the wetland enhancement area. Prior to installation, the landscape contractor and crew were instructed by Grette Associates to plant all shrub species along the upper edge of the wetland boundary to increase survival and reduce exposure to regular tidal inundation.

According to NOAA (2015), the predicted morning tide for Cornet Bay on March 9, 2015 was

+10.0 feet Mean Lower Low Water (MLLW) which occurred at approximately 8:02am. Mean Higher High Water (MHHW) for Cornet Bay is approximately +11.30 feet MLLW. All work performed below MHHW was completed in the dry using hand tools. Furthermore, work did not begin until approximately 9:30am to allow adequate time for the tide to recede to assure that work would be completed in the dry.

Upon completion of the plant installation, the site was traversed to verify proper installation and to complete a compliance survey. The compliance survey consisted of collecting counts for the installed plants and previously planted vegetation, and documenting general observations within the mitigation site.

The landscape contractor installed the correct quantity of the approved assortment of shrubs and emergent vegetation species within the wetland enhancement area (Table 2). In addition, a goose exclusion fence was installed above the emergent species. The eight snowberry plants were installed in the northeast portion of the wetland enhancement area where highly permeable soils exist. Furthermore, all shrubs installed in the highly permeable soils were placed in pits that were excavated approximately three times the diameter of the root system and backfilled with organic soil amendments. A layer, approximately 3 inches thick, of mulch was placed around the base of the 34 shrub species planted.

During the compliance survey, a mortality assessment was completed to document the existing conditions of the planted species and for comparison to the As-Built. There are several Scouler's willow (*Salix scouleriana*) and oceanspray (*Holodiscus discolor*) that appear to be highly stressed or dead. However, due to the timing of the mortality assessment, these species are likely still in dormancy. Results of the mortality assessment compared to the As-Built are presented in Table 3.

Table 3. Mortality results

Common Name	Scientific Name	2014 As-Built Results		2015 Compliance Survey ²	
		Alive	Dead	Alive	Dead
Wetland Enhancement Area					
Hooker's willow	<i>Salix hookeriana</i>	21	18	20	19
Sweet gale	<i>Myrica gale</i>	10	14	9	15
Wetland Buffer Enhancement Area					
Nootka rose	<i>Rosa nutkana</i>	13	0	13	0
Scouler's willow	<i>Salix scouleriana</i>	41	1	37	5
Oceanspray	<i>Holodiscus discolor</i>	18	0	13	5
Sweet gale ¹	<i>Myrica gale</i>	6	0	6	0

¹ sweet gale was scheduled to be planted in the Wetland Enhancement Area only.

² The 2015 compliance survey does not include species installed on March 9th, 2015.

According the As-Built, the planting plan was implemented according to the approved Cornet Bay Mitigation Plan (Plan; Grette Associates 2013). A total of a 142 assorted shrubs were planted during the initial plant installation.

Collectively, a total of 176 assorted shrubs and 120 assorted emergent species were planted during the initial installation and the installation that occurred on March 9th, 2015. There are a total of 63 assorted shrubs and 120 assorted emergent species that are alive within the wetland enhancement area and 69 assorted shrubs alive within the wetland buffer enhancement area. Per the As-Built, the 120 assorted emergent species installed on March 9th, 2015 shall be the equivalent of 30 shrubs. Therefore, the vegetation installed within the wetland enhancement area represents a total of 93 shrubs thus meeting Performance Standard 2b (Table 4).

Table 4. Compliance survey performance standard summary

Performance Standards	Performance Standard met?	Time when Performance Standard was met.
1a. A minimum of 1,300 square feet of aquatic area will be created by the end of the Cornet Bay cleanup.	Yes - 1,320 sq ft	As-Built Survey
2a. A minimum of two (2) species of native shrubs will be present by the end of the monitoring period within the wetland enhancement area.	Yes – 2 species present	As-Built Survey
2b. A minimum of 100% survival of planted shrub species in Year 0 within the wetland enhancement area. ¹	Yes – 143%	Compliance Survey
3a. A minimum of two (2) species of native shrubs will be present by the end of the monitoring period within the buffer enhancement area.	Yes – 4 species present	As-Built Survey
3b. A minimum of 100% survival of planted shrub species in Year 0 within the buffer enhancement area. ¹	Yes – 100%	As-Built Survey

¹ Year 0 requires 100% survival of planted stock. The remaining scheduled monitoring periods are required to have a minimum of 80% survival of planted stock within the enhancement areas.

3 SUMMARY

In summary, the approved contingency actions were installed correctly and according to the specifications described above. A total of 34 assorted shrubs and 120 assorted emergents were planted within the wetland buffer enhancement area. All of the recently installed plants appear to be in good health and were installed in the upper extent of the wetland area. Photographs are attached at the end of this memorandum documenting the installation of the assorted vegetation and goose exclusion fence.

Upon completion of the contingency actions, the mitigation site is compliant with the performance standards defined in the approved Plan for Year 0. The wetland enhancement area has a 143 percent survival of the required shrub quantity within the approved Plan.

If you have any questions on the site assessment observations or stewardship recommendations, please contact me at (253) 573-9300, or by email at chadw@gretteassociates.com.

Regards,



Chad Wallin
Biologist

References:

Grette Associates, LLC. 2013. Cornet Bay Marina – Cornet Bay Marina Mitigation Plan: Model Toxic Control Act (MTCA) Cleanup. Prepared for Kennedy/Jenks Consultants, Inc. July 2013.

Grette Associates, LLC. 2014. Cornet Bay Marina Toxic Control Act Cleanup Mitigation Plan As-Built Report. Prepared for Kennedy/Jenks, Inc. August 2014.

National Oceanic and Atmospheric Administration (NOAA). 2015. NOAA Tides and Currents. Online Tide Prediction: Cornet Bay, Deception Pass, WA Station ID 9447995. March 9, 2015. Accessed [11 March 2015]. URL: http://tidesandcurrents.noaa.gov/tide_predictions.html

Photograph 1. Sweet gale installed along southeast portion of the wetland enhancement area



Photograph 2. Northeast portion of the wetland enhancement area

