

Miller Creek Riparian Corridor and Instream Enhancement Project

Wetland A17 Restoration

Seattle-Tacoma International Airport Master Plan Update Improvements



Port of Seattle

Parametrix, Inc.

November 2001

AR 052286

1299

**MILLER CREEK RIPARIAN CORRIDOR AND INSTREAM
ENHANCEMENT PROJECT**

WETLAND A17 RESTORATION

**SEATTLE-TACOMA INTERNATIONAL AIRPORT MASTER PLAN UPDATE
IMPROVEMENTS**

Prepared for

PORT OF SEATTLE
Seattle-Tacoma International Airport
P.O. Box 69727
Seattle, Washington 98168-0727

Prepared by

PARAMETRIX, INC.
5808 Lake Washington Blvd. N.E., Suite 200
Kirkland, Washington 98033-7350

November 2001
556-2912-001 (03B)

AR 052287

TABLE OF CONTENTS

	<u>Page</u>
1. INTRODUCTION.....	1-1
1.1 TEMPORARY IMPACTS AND WETLAND A17 MITIGATION.....	1-1
1.2 OTHER MITIGATION REQUESTED BY THE ARMY CORPS OF ENGINEERS	1-3
1.3 OVERALL MITIGATION	1-3
2. WETLAND A17 RESTORATION AND ENHANCEMENT	2-1
2.1 GOALS, OBJECTIVES, AND DESIGN CRITERIA	2-2
2.2 MITIGATION SITE DESCRIPTION	2-2
2.3 OWNERSHIP	2-4
2.4 RATIONALE FOR SELECTION	2-4
2.5 CONSTRAINTS	2-5
2.6 BUFFER AVERAGING	2-5
2.7 ECOLOGICAL ASSESSMENT OF THE MITIGATION SITE.....	2-5
2.7.1 Hydrology	2-6
2.7.2 Soils.....	2-6
2.7.3 Vegetation	2-6
3. MITIGATION DESIGN.....	3-1
3.1 GRADING AND/OR CLEARING	3-10
3.2 WATER D ENHANCEMENT	3-10
3.3 EXPECTED HYDROLOGY	3-11
3.4 HAZARD WILDLIFE CONSIDERATIONS.....	3-11
3.5 LANDSCAPE PLAN.....	3-11
3.5.1 Existing Wetlands to be Enhanced.....	3-11
3.5.2 Upland Buffers.....	3-12
3.6 IMPLEMENTATION	3-12
3.7 PERFORMANCE STANDARDS AND MONITORING	3-12
3.8 SITE PROTECTION	3-12
3.9 MAINTENANCE AND CONTINGENCY PLANS	3-13
4. REFERENCES.....	4-1

APPENDICES

- A SUMMARY OF EXISTING CONDITIONS AND PROPOSED MITIGATION
- B RESTRICTIVE COVENANT – MILLER CREEK MITIGATION AREA

LIST OF FIGURES

<u>Figure/Sheet</u>	<u>Page</u>
1 Location of Seattle-Tacoma International Airport and Wetland A17 Mitigation Site.....	1-2
2 Proposed Mitigation Areas at Wetland A17 and Water D	2-3
C12 Site Grading (south end of project area)	3-3
C13 Site Grading (north end of project area)	3-4
L5.1 Landscape Plan (south end of project area)	3-5
L5.2 Landscape Plan (south central portion of project area)	3-6
L5.3 Landscape Plan (north central portion of project area).....	3-7
L5.4 Landscape Plan (north end of project area)	3-8
L6 Planting Schedule and Details.....	3-9

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1 Summary of wetland mitigation credit for Seattle-Tacoma International Airport Master Plan Update improvements	1-4
2 Changes in wetland and aquatic habitat areas in the Miller, Walker, and Des Moines Creek basins.	1-5
3 Summary of mitigation areas and mitigation credit for Wetland A17 restoration.....	2-2
4 Mitigation goals, design objectives, and design criteria for the Wetland A17 restoration project.....	2-4
5 Wetland restoration and enhancement approach within the Wetland A17 mitigation area.	3-1
6 Final performance standards, evaluation approach, and contingency measures for wetland and buffer enhancement along Miller Creek.	3-14
7 Performance standards for vegetation cover (minimum percent) by vegetation zone and monitoring year.	3-16
8 Invasive plant species that will be monitored and controlled in the mitigation sites.	3-16
9 Wetland A17 mitigation monitoring methods and schedule.	3-16

1. INTRODUCTION

As currently configured, Seattle-Tacoma International Airport (STIA) is unable to efficiently meet existing and future regional air travel demands. In response to growth forecasts for passenger and cargo volumes at STIA, a variety of facility improvements are planned to meet travel demands in the Puget Sound Region and reduce aircraft arrival delays during poor weather. These improvements were developed through a master planning process, then updated to reflect revised growth forecasts for passenger use.

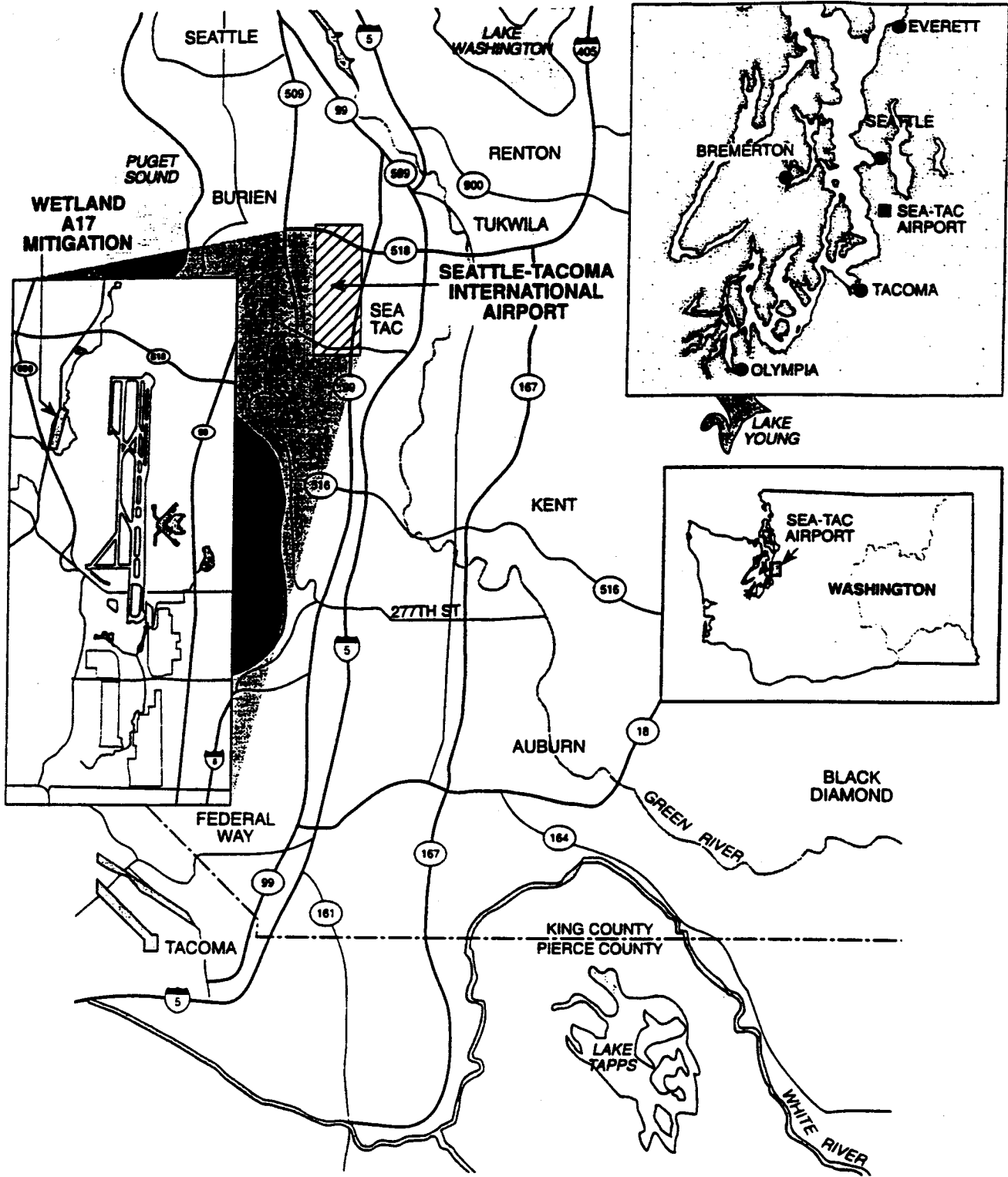
Master Plan Update improvements that directly affect streams and wetlands include extending runway safety areas at the north ends of two existing runways, developing the South Aviation Support Area (SASA), and constructing a new third runway. The Port of Seattle (Port) submitted a mitigation plan (*Natural Resource Mitigation Plan Master Plan Update Improvements Seattle Tacoma International Airport* [NRMP] [Parametrix 2000a]) as part of its request for Section 404 and Section 401 Clean Water Act approvals from the U.S. Army Corps of Engineers (ACOE) and the Washington State Department of Ecology (Ecology). The NRMP provides detailed mitigation designs for impacts to wetlands, streams, floodplains, and drainage channels that would occur during implementation of the STIA Master Plan Update improvement projects. The NRMP will be revised to reflect conditions in the Section 401 water quality certification and additional mitigation requested by ACOE. This report will be submitted to Ecology in advance of the date identified in the Section 401 water quality certification.

1.1 TEMPORARY IMPACTS AND WETLAND A17 MITIGATION

During review of the Master Plan Update improvements, Ecology (2001) requested that additional mitigation be provided to address impacts from temporary construction-related impacts, some of which could span a 5-year period¹. This additional mitigation consists of restoring wetland, channel, and buffer areas associated with Wetland A17. The minimum area of new mitigation (wetland and buffer) is 11.71 acres; however, this plan provides 12.01 acres of mitigation. The new mitigation reduces the temporal impacts to wetlands and wetland functions resulting from temporary impacts that extend for more than 1 year. As described in the NRMP, wetland areas subject to temporary impacts will be restored.

This report describes the additional in-basin mitigation on about 12 acres of property that is designed to restore and enhance physical and biological functions in Wetland A17 (including its sub-areas, Water D, Wetlands A17a, A17b, A17c, and A17d). Additionally, the upland buffers surrounding the wetland and Water D (a small intermittent stream that flows through the wetland) will be enhanced. The mitigation area is located in the Third Runway Acquisition Area, and is owned, or will be owned by the Port (Figure 1).

¹ Temporary construction impacts affect up to 2.05 acres of wetland.



Port of Seattle/Wetland A17 Mitigation Plan/556-2912-001/01(03) 9/01 (K)

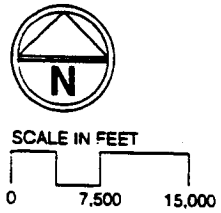


Figure 1
Location of Seattle-Tacoma
International Airport and
Wetland A17 Mitigation Site

AR 052291

In developing this plan, the Port used guidance from Ecology and ACOE to identify an appropriate in-basin mitigation activity that will compensate for project impacts to wetland and stream functions. Elements of this mitigation plan are specifically targeted to restore and increase organic carbon production and export functions the area may provide to Miller Creek located downstream of the Master Plan project area.

The mitigation described in this report represents an addition to the Miller Creek riparian corridor and instream enhancement projects described in Section 5.2 of the NRMP. Because Wetland A17 and Water D are located immediately adjacent to the Miller Creek mitigation site, and because it uses the same restoration and enhancement techniques, it will be integrated into the previously described mitigation plan and legally binding restrictive covenants.

1.2 OTHER MITIGATION REQUESTED BY THE ARMY CORPS OF ENGINEERS

In addition to mitigation at Wetland A17, ACOE has asked the Port to provide addition mitigation that further assures potential impacts to wetland functions are mitigated. The Port is evaluating addition mitigation at Lora Lake (including increased buffer and wetland restoration by removing historic fill) and at the Des Moines Way Nursery site² (to consist of wetland restoration, wetland enhancement, Miller Creek enhancement, and upland buffer enhancement).

1.3 OVERALL MITIGATION

As a result of the new mitigation described in Sections 1.1 and 1.2, over 112 acres of on-site mitigation in the Des Moines, Miller, and Walker Creek watersheds is provided (Table 1). The combination of wetland fill and restoration results in a 3 to 4 percent loss of wetland and aquatic habitat area for these watersheds (Table 2). The NRMP explains how the 112 acres of in-basin and 65 acres of off-site mitigation is designed to compensate for the loss of wetland functions associated with these impacts.

² The Des Moines Way Nursery site is located at the NE quadrant of the intersection of SR 518 and Des Moines Memorial Drive.

Table 1. Summary of wetland mitigation credit for Seattle-Tacoma International Airport Master Plan Update improvements.

Mitigation	Mitigation Area (ac)	Mitigation Credit
IN-BASIN		
<u>Wetland Restoration</u> - Credit ratio 1:1		
Remove Fill Adjacent to Lora Lake	1.00	1.00
Remove Fill at Des Moines Way Nursery Site	2.00	2.00
Remove Fill at Wetland A17	0.30	0.30
Vacca Farm (prior converted cropland and other upland)	6.60	6.60
Temporary Impacts	2.05	2.05
Subtotal	11.95	11.95
<u>Wetland Enhancement</u> - Credit ratio 1:2		
Des Moines Way Nursery	0.86	0.43
Vacca Farm (Farmed Wetland, Other Wetlands, Lora Lake)	5.70	2.85
Wetlands in Miller Creek Wetland and Riparian Buffer	10.25	5.12
Tyee Valley Golf Course	4.50	2.25
Wetland in Des Moines Creek Buffer	1.01	0.51
Subtotal	22.32	11.16
<u>Buffer Enhancement</u> - Credit ratio 1:5		
Miller Creek Buffer, South of Vacca Farm	40.86	8.17
Vacca Farm	4.58	0.92
Lora Lake	1.81	0.36
Tyee Valley Golf Course Mitigation Area Buffer	1.57	0.31
West Branch Des Moines Creek Buffer	3.38	0.68
Des Moines Way Nursery	2.73	0.55
Subtotal	54.93	10.99
<u>Preservation</u> - Credit Ratio 1:10		
Borrow Area 3 Wetland	2.35	0.24
Borrow Area 3 Buffer	21.20	2.10
Subtotal	23.55	2.34
Total In-Basin ^{a, b}	112.75	36.44
OUT-OF-BASIN		
<u>Wetland Creation^c</u> - Credit ratio 1:1		
Forest (17.20 acres), shrub (6.0 acres), emergent (6.20 acres), and open water (0.60 acres)	29.98	29.98
<u>Wetland Enhancement</u> - Credit ratio 1:2	19.50	9.75
<u>Buffer Enhancement</u> - Credit ratio 1:5	15.90	3.18
Total Out-of-Basin	65.38	42.91
TOTAL	177.43	79.35

^a Mitigation credit has not been assigned for relocating a portion of Miller Creek channel, instream enhancement projects, drainage channel replacement, Des Moines Creek buffer enhancement, or a \$300,000 trust fund for watershed restoration.

^b In-basin mitigation area divided by wetland impacts (18.37 acres permanent plus 2.05 acres temporary) provides a 5.5:1 aerial replacement ratio.

^c Based on maps of hydric soils, mitigation can be also characterized as restoration.

Table 2. Changes in wetland and aquatic habitat areas in the Miller, Walker, and Des Moines Creek basins.

Watershed and Sub-Area	Area	Impact	Restoration
Miller Creek Basin			
Arbor Lake	3.7	0.00	0.00
Lake Burien	30	0.00	0.00
Riparian wetlands near S. 144 th Way	2.00	0.00	0.00
Tub Lake Peatland/N. SeaTac Park Wetlands	21.01	0.00	0.00
North Employee Parking Lot Wetlands 1.2	0.81	0.00	0.00
Des Moines Way Nursery	0.86	0.00	2.00
Runway Safety Areas/North End	27.84	2.75	0.40
Vacca Farm Mitigation	8.07	0.00	6.60
Miller Creek Riparian	1.05	1.05	0.03
Third Runway Embankment	<u>15.74</u>	<u>11.03</u>	<u>1.2</u>
Total	111.08	14.83	10.23
NET CHANGE^a: -4.5 acres	4.0%		
Walker Creek Basin			
Wetland 43	33.43	0.00	0.00
Wetland 44	3.08	0.54	0.28
Miscellaneous	<u>0.99</u>	<u>0.99</u>	<u>0.00</u>
Total	37.5	1.53	0.28
NET CHANGE^a: -1.25 acres	3.3%		
Des Moines Creek Basin			
WSDOT Wetland B	6.60	0.00	0.00
Bow Lake Wetlands	25	0.00	0.00
SASA Area	7.22	2.95	0.17
Borrow Areas	24.24	1.04	0.00
Tyce Valley Golf Course	<u>38.51</u>	<u>0.07</u>	<u>0.00</u>
Total	101.57	4.06	0.17
NET CHANGE^a: -3.89 acres	3.8%		
PROJECT TOTAL	250.15	20.42	10.68
NET CHANGE -9.74 acres	3.9%		

^a Estimates of changes exceed actual changes, because they do not include riparian wetlands outside the project area, wetlands at the mouths of Miller, Walker, and Des Moines Creeks, or other wetlands that are likely to be present on undeveloped or developed areas. See Tables 4.1-2 and 4.1-3 in the NRMP (Parametrix 2000a) for a summary of the mitigation planned to compensate for wetland functions associated with these changes.

2. WETLAND A17 RESTORATION AND ENHANCEMENT

Existing residential development in Wetland A17 and its buffers includes about 34 buildings, several culverts and fill crossings, lawns, fences, driveways, gardens, retaining walls, and other impacts of human habitation. As a result of these land uses, native vegetation has been removed from most of Wetland A17 and its associated buffers. Native forest vegetation has been removed and replaced by impervious surfaces, buildings, lawn, or landscaping. These alterations have contributed to the reduced ability of the existing wetland and buffer to support biological and physical functions necessary to maintain functioning habitat in the wetland and adjacent stream.

The goal of this mitigation plan is to increase functional performance of Wetland A17 (which includes wetland fragments delineated as Wetlands A17a, A17b, A17c, and A17d, a ditch named Water D, and their associated upland buffers). Enhancement of the wetland, Water D, and buffers will improve the biological functions of the wetland and the riparian buffer, by restoring natural patterns of nutrient cycling and retention, and by increasing organic carbon export to Miller Creek. The mitigation will also improve the habitat and food resources in the area. The restoration and enhancement of these areas will improve the current degraded condition of the area by removing existing disturbances and pollutant sources. The mitigation will also remove invasive non-native plant species such as Himalayan blackberry (*Rubus discolor*), English ivy (*Hedera helix*), and reed canarygrass (*Phalaris arundinacea*).

To achieve the mitigation goal, restoration activities will include removing buildings, driveways, culverts, fences, and invasive non-native plants from the area. Areas within wetlands and buffers that contain buildings will be regraded to restore topographic contours and replanted with native trees and shrubs. A native forested buffer will be established along the entire length of Water D and by removing three portions from culverts, approximately 125 linear ft of channel will be restored.

This mitigation plan will add a total of 12.01 acres of mitigation to the Miller Creek riparian corridor (Table 3). The mitigation will consist of the following:

- Restoration of 0.30 acre of filled wetland that is adjacent to Wetland A17.
- Enhancement of 2.69 acres of Wetlands A17a, A17b, A17c, and A17c.
- Enhancement of 8.86 acres of upland buffer around the wetland and Water D channel
- Enhancement of 0.16 acre of the Water D channel.
- Restoration of 125 linear feet of the Water D channel by removing culverts and fill.

The report organization is based upon the *Guidelines for Developing Freshwater Wetlands Mitigation Plans and Proposals* (Ecology 1994). The mitigation plan, goals, and objectives are introduced first, followed by a description of the project site, existing ecological conditions, the rationale for selecting the project, and any constraints associated with the proposed mitigation. Finally, the mitigation design is described in detail including performance standards, monitoring schedules, and maintenance and contingency measures necessary to ensure mitigation success.

Table 3. Summary of mitigation areas and mitigation credit for Wetland A17 restoration.

Mitigation	Mitigation Area (acres)	Mitigation Credit (acres)
Wetland Restoration – Credit ratio 1:1		
Fill in Wetland A17	0.30	0.30
Wetland Enhancement – Credit ratio 1:2		
Wetland A17	2.69	1.35
Water D	0.16	0.08
Buffer Enhancement- Credit ratio 1:5		
Wetland A17 and Water D	8.86	1.77
TOTAL MITIGATION	12.01	3.50

2.1 GOALS, OBJECTIVES, AND DESIGN CRITERIA

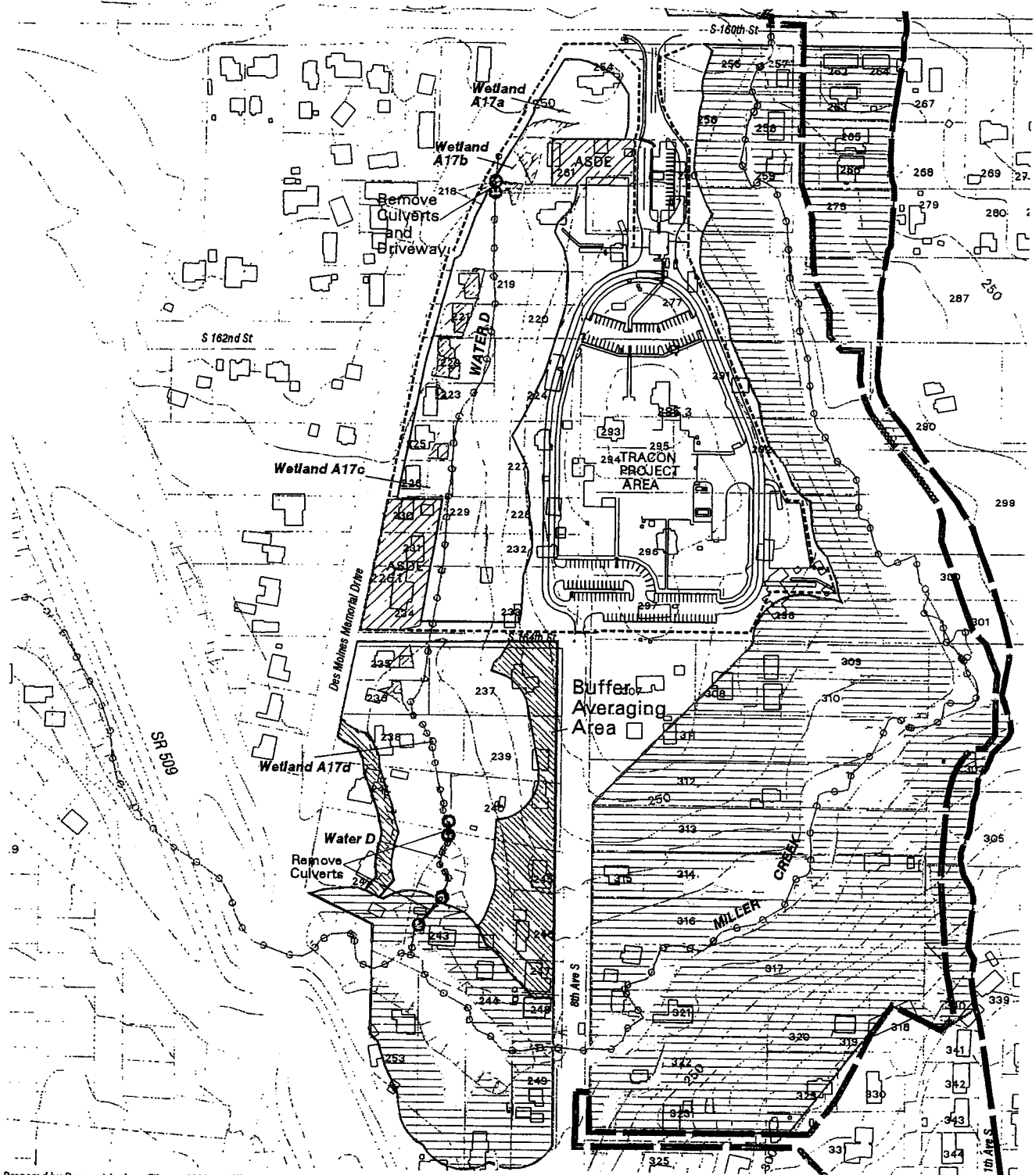
The primary goal of this plan is to restore non-avian habitat wetland functions to Wetland A17, Water D, and their associated buffers. The wetland functions to be enhanced include nutrient and sediment trapping, organic matter export, small mammal habitat, and amphibian habitat. These actions will also improve and support aquatic habitat functions in Miller Creek, which is located immediately downslope of the mitigation area. The specific design objectives and design criteria for the mitigation area are listed in Table 4.

Because of its proximity and similarity to the mitigation planned in the Miller Creek riparian corridor, the Wetland A17 mitigation area will be incorporated into the Miller Creek riparian corridor mitigation project. The NRMP, including Appendix B and the restrictive covenants, will be revised to reflect this new mitigation.

2.2 MITIGATION SITE DESCRIPTION

The mitigation area is located adjacent to the Miller Creek riparian corridor mitigation area and is within a portion of the third runway “acquisition area” (see Figure 1). The mitigation site is bounded by South 160th Street to the north, the main stem of Miller Creek to the south, 8th Avenue South to the east, and Des Moines Memorial Drive to the west. The mitigation site consists of Wetland A17, Water D, and associated uplands. Wetland A17 is located in a shallow swale, and is located generally within back yards of several houses (Figure 2). Water D is a small ditch with intermittent flow occurring within Wetland A17, ultimately draining into Miller Creek. The topography of the site is relatively flat in the western portion of the project area, generally from the eastern wetland boundary to Des Monies Memorial Drive. The eastern portion of the mitigation area slopes to the west from a topographic ridge situated outside of the project area.

Wetland A17 was delineated and surveyed by Parametrix. The boundaries were verified by ACOE as reported in the *Wetland Delineation Report Master Plan Update Improvements Seattle-Tacoma International Airport* (Parametrix 2000b).



Prepared by Parametrix, Inc. File: p_1008-wet17-mit.gra from seatac2\plot\mle2001\p-1008-wet17-mitigation.aml Date: November 08, 2001

Figure 2
Proposed Mitigation
Areas at Wetland
A17 and Water D

Table 4. Mitigation goals, design objectives, and design criteria for the Wetland A17 restoration project.

Design Objectives	Design Criteria
Enhance and restore 2.99 acres of riparian wetland (not including Water D).	<p>Demolish and remove structures located within the wetland and buffer. Remove fences, driveways, sidewalks, etc. from the wetland and buffer.</p> <p>Regrade portions of the wetland where residential structures have been located to establish historic topography in the wetland. Restore wetland conditions to these areas.</p> <p>Remove the driveway between Wetlands A17a and A17b and remove the driveway and culvert between Wetlands A17b and A17c. Restore the areas to wetland conditions.</p> <p>Plant native tree species at a density sufficient to achieve 280 trees per acre in identified areas.</p> <p>Plant native shrub species sufficient to achieve densities of at least 2,100 shrubs per acre in identified areas.</p> <p>Plant existing lawn areas and other areas dominated by non-native species with native forest and shrub vegetation.</p>
Enhance and restore approximately 8.86 acres of riparian buffer along Wetland A17 and Water D.	<p>Demolish and remove structures; driveways, sidewalks, fences, lawn, landscaping, and non-native vegetation located within the buffer of Wetland A17 and Water D.</p> <p>Remove potential water quality impacts such as septic systems (at least 14 of the 29 parcels have on-site septic systems) and on-site impervious surface that generates untreated stormwater runoff.</p> <p>Plant native forest vegetation along riparian buffer areas that are cleared or disturbed during demolition activities.</p>
Increase shade and detritus input to Water D (0.16 acre).	<p>Plant the buffer adjacent to the stream with native trees and shrubs, where applicable, to provide overhanging vegetation and provide future sources of large woody debris (LWD) and organic matter into the stream.</p> <p>Remove railroad ties retaining portions of the Water D stream bank. Add LWD to the Water D channel to increase and restore rates of in-channel processing of organic matter.</p>
Provide long-term protection to the mitigation area.	<p>Establish restrictive covenants to permanently protect Wetland A17, Water D, and their buffers.</p> <p>Install fencing and signs to designate the area as a protected mitigation site.</p>

2.3 OWNERSHIP

The Port owns all parcels subject to the mitigation actions described in this report. The mitigation site has been located to avoid potential conflicts with the design and siting of the TRACON and ASDE facilities.

2.4 RATIONALE FOR SELECTION

Restoring the riparian habitat in Wetland A17 and Water D provides on-site and in-kind opportunities to mitigate temporary impacts to wetland and stream functions from implementation of the Master Plan Update improvements. Despite historic degradation, the downstream reaches of Miller Creek contain salmonids in downstream areas. Acquisition, permanent protection, and

restoration of a significant portion of Miller Creek, including this mitigation area have the potential to significantly enhance wetland and aquatic habitats in the Miller Creek basin, including downstream segments not within the project area. Removing residential land uses and associated non-point source pollution and physical impacts, such as clearing and dumping, will enhance the wetland and riparian plant communities, as well as water quality and aquatic habitat within the stream.

The restoration and enhancements provide an exceptional opportunity to remove anthropogenic impacts, and to establish a large, contiguous riparian habitat corridor within a highly urbanized watershed. Few such opportunities exist to perform habitat restoration at this scale on significant salmonid-bearing streams in the Seattle area urban environment.

2.5 CONSTRAINTS

There are no implementation constraints to the mitigation plan as proposed.

2.6 BUFFER AVERAGING

A buffer averaging approach was used to establish protective buffers around Wetland A17 and Water D. Buffer averaging was necessary to provide sufficient area for two airport navigation facilities (see Figure 2). The navigation facilities are the Airport Surface Detection Equipment (ASDE) facility and a security fence and 20-ft setback associated with the Terminal Radar Approach Control (TRACON) facility.

The Federal Aviation Administration (FAA) has identified two potential sites where ASDE could be located. The FAA is currently evaluating the suitability of these two alternative locations, which total 0.93 acre. The potential sites have been removed from the mitigation area and (a minimum of) 0.93 acre is added to the buffer averaging areas.

The TRACON security fence is the only part of the TRACON site that conflicts with Wetland A17 mitigation. Because FAA security requirements include the clearing vegetation 20 ft away from the fence line, the area where this clearing is required (0.55 acre) has been excluded from the mitigation area. This area (0.55 acre) is also included in the buffer averaging areas.

Overall, as shown in Figure 2, to compensate for the reduction of buffer width described above, approximately 1.48 acres of additional buffer is established at the southeast and southwest portions of Wetland A17.

2.7 ECOLOGICAL ASSESSMENT OF THE MITIGATION SITE

The overall site conditions located within the project area were assessed and native and non-native plant communities were identified (Appendix A). The following section summarizes existing conditions found within the Wetland A17 project area.

2.7.1 Hydrology

Wetland hydrology in Wetland A17 is maintained by shallow groundwater sources and surface inflow from Water D, which originates in back yard ditches west of Des Moines Memorial Drive and north of South 160th Street. Soil saturation is present in portions of the wetland during much of the year. Short periods of shallow inundation occur during wet periods and were observed in several locations in the wetland during April and October 2000. Flowing water is generally present in Water D during much of the time between November and May.

2.7.2 Soils

Soils in the project area were mapped as Alderwood and Norma soil types by the 1952 soil survey of King County (USDA 1952). The Norma soil is a hydric (wetland) soil type that occurs in drainageways, while the Alderwood soil type formed in uplands on glacial till soils. The *Soil Survey of King County Area Washington* (Snyder et al. 1973) excluded the area from soil mapping. Field investigations found soils in the wetland to be alluvial soils with areas of high organic matter (sapric muck) near the center of Wetland A17, near Water D. Soils throughout the remainder of the wetland were sandy loam. The soil in the buffer typically consists of Alderwood series which, are primarily made up of moderately well drained soils forming on glacial till (Snyder et al. 1973). In some upland areas, the soils were predominantly a sandy loam, with a soil profile that corresponds to Indianola soils (Snyder et al. 1973).

2.7.3 Vegetation

Wetland A17 contains forest, shrub, and emergent wetland communities. Dominant vegetation in the forested portions of the wetland are black cottonwood (*Populus balsamifera*), red alder (*Alnus rubra*), western redcedar (*Thuja plicata*), and Pacific willow (*Salix lucida*). The shrub-dominated areas of the wetland primarily consist of Himalayan blackberry and salmonberry (*Rubus spectabilis*) with creeping buttercup (*Ranunculus repens*), reed canarygrass, common velvetgrass (*Holcus lanatus*), field morning glory (*Convolvulus arvensis*), and horsetail (*Equisetum* spp.) below. In several locations, especially in the western portion of the project area, the emergent communities consist of lawns associated with homes. The lawn areas contain red fescue (*Festuca rubra*), bluegrass (*Poa* spp.), common velvet-grass, and creeping buttercup. In the limited areas that are not mowed, small-fruited bulrush (*Scirpus microcarpus*), beaked sedge (*Carex stipata*), watercress (*Rorippa nasturtium-aquaticum*), and slough sedge (*Carex obnupta*) are present.

Upland vegetation on either side of Wetland A17 has been altered by residential development. For example, the upland vegetation on the west side of the wetland consists primarily of turf grass lawns, areas of ornamental non-native landscaping, or non-native invasive plant species such as Himalayan blackberry, reed canarygrass, English holly (*Ilex aquifolium*), or cherry laurel (*Prunus laurocerasus*). Several mature trees such as Douglas fir (*Pseudotsuga menziesii*), western redcedar, and other non-native tree species have been planted around houses and in maintained lawn area to create a park-like setting. The majority of the upland vegetation on the east side has been removed and replaced with lawn and landscaping; however, some parcels, such as parcels 228, 232, and 237 contain patches of native Pacific northwest forest vegetation. Common species identified in the canopy layer of these areas include Douglas fir, western redcedar, bigleaf maple (*Acer*

macrophyllum), and Pacific madrone (*Arbutus menziesii*) with Indian plum (*Oemleria cerasiformis*), hazelnut (*Corylus cornuta*), vine maple (*Acer circinatum*), swordfern (*Polystichum munitum*), and salal (*Gaultheria shallon*) in the understory.

3. MITIGATION DESIGN

As described earlier, the mitigation plan consists of enhancing Wetland A17, Water D, and associated upland buffers by restoring native plant communities (see Figure 2). Since vegetation conditions within Wetland A17 vary, four general enhancement actions will be implemented (Table 5). Additionally, Appendix A contains a table that describes mitigation actions that will occur on each parcel. Depending on existing conditions in a given part of the buffer, mitigation actions may include one of the following actions:

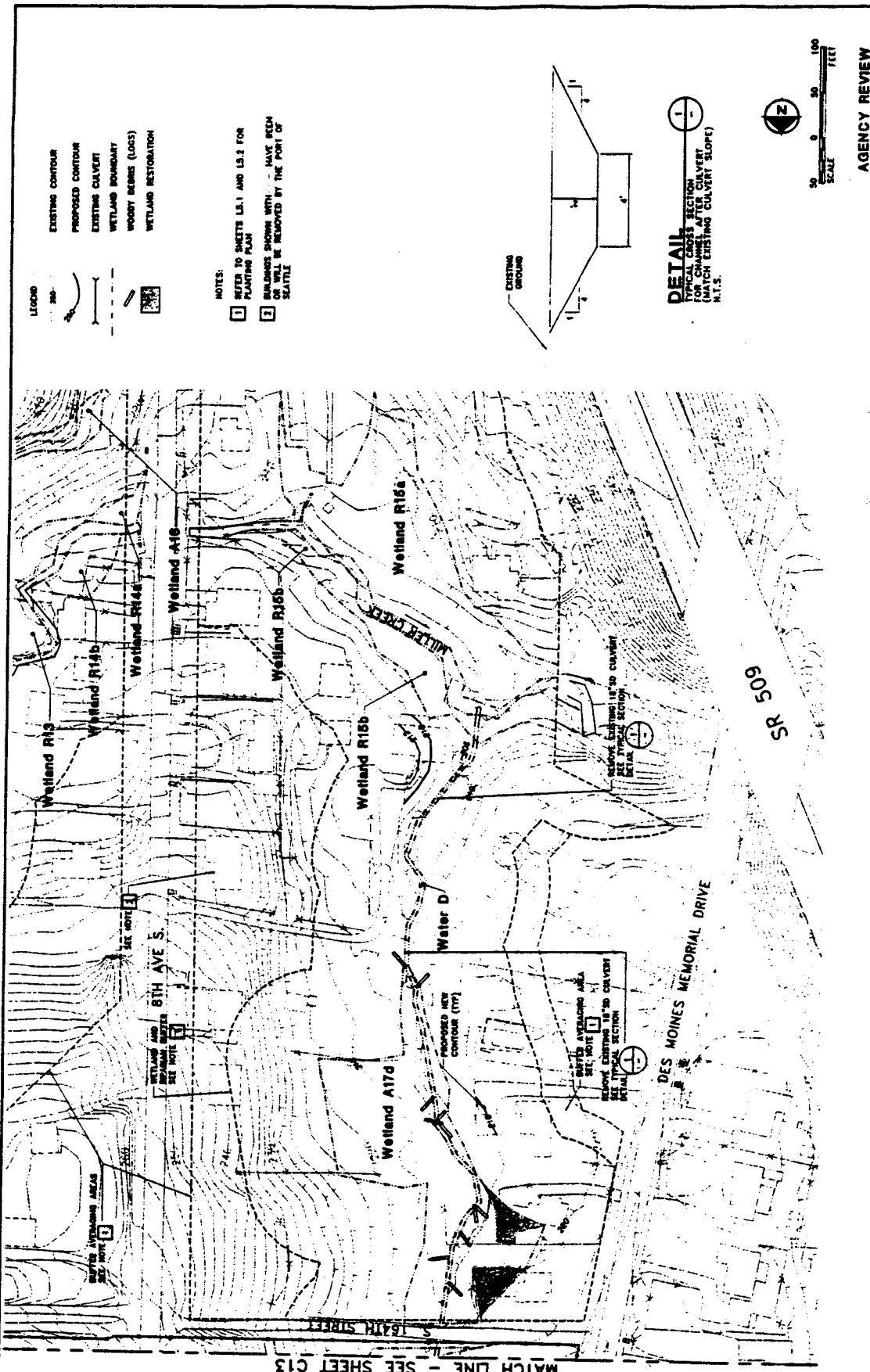
- Removing structures and/or existing non-native invasive vegetation, regrading the area, and re-planting with native vegetation (i.e., clearing and re-planting).
- Controlling and managing patches of non-native invasive vegetation and re-planting with native vegetation (i.e., invasive vegetation management and re-planting).
- Retaining the existing native vegetation matrix but infill planting to increase species diversity and habitat structure (i.e., infill planting).
- Retaining and protecting existing native vegetation with the designated buffer (i.e., protection).

Table 5. Wetland restoration and enhancement approach within the Wetland A17 mitigation area.

Activity	Explanation and Comments
Wetland Restoration	Wetland restoration will result by removing structures and foundations from the edge of the wetland (i.e., Parcels 219, 221, 222, 225, 235, and 236). Restoration also occurs by removing driveway fill and culverts between Wetland A17a and A17b and between A17b and A17c. In these restoration areas, topography will be restored to pre-development conditions and to elevations where seasonal wetland and stream hydrology will be present. These actions will restore about 0.30 acre of wetland, and is shown on Sheets C12 and C13.
Stream Channel Restoration	Stream channel restoration will occur as a result of removing the driveway fill and culverts located on Parcels 218 and 261. Additional restoration will occur by removing two culverts located on Parcels 240, 241 and 243. This work is shown on Sheets C12 and C13. Cross sections of the restored channel are shown on Sheet C12.
Stream Channel Enhancement	Stream enhancement will include, in addition to the revegetation described below, channel improvements to Water D. The channel improvements will include removing footbridges, removing railroad ties, removing other debris, and placing woody debris and logs in the channel. Placing LWD in the channel will reduce erosion and increase retention and processing of organic matter in the stream. In the long run, woody debris will promote channel migration and meandering in a more natural fashion compared to the existing ditched channel. The placement of woody debris is shown on Sheets C12 and C13.
Wetland Enhancement/ Buffer Restoration Plantings	Several strategies are taken in existing wetlands and buffers where enhancements are planned. These are described below.

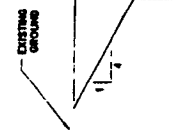
Table 5. Wetland restoration and enhancement approach within the Wetland A17 mitigation area (continued).

Activity	Explanation and Comments
Remove structures, driveways, and/or non-native invasive vegetation and replant the areas.	<p>Non-native invasive species such as Himalayan and evergreen blackberry (<i>Rubus laciniatus</i>), field morning glory, reed canarygrass, and English ivy will be removed from certain portions of the buffer; these areas are shaded in Sheets L5.1 through L5.4. Removing non-native invasive plants will depend upon vehicular access, the potential risk of sedimentation in wetlands or Water D from vegetation removal, and whether or not invasive species can be controlled adequately without removal. Areas of non-native invasive species will be wholly removed only where there is appropriate access and if existing desirable vegetation will not be adversely affected.</p> <p>Re-vegetation will consist of planting native trees and shrubs in areas, such as lawns associated with residences, that do not currently have an overstory of vegetation. Under planting will occur under existing tree canopies where an understory is absent or lacks diversity. Native trees and shrubs to be used in these enhancements are listed on Sheet L6.</p>
Control and/or manage invasive vegetation and re-plant with native vegetation.	<p>Non-native invasive species such as Himalayan and evergreen blackberry, field morning glory, and English ivy will be controlled and managed in certain portions of the buffer where removal is not necessary or possible. For example, invasive species within the buffer may be left in place if removal could cause erosion or sedimentation to the stream or adjacent wetlands.</p> <p>In some areas, patches of invasive species may be treated with herbicide and/or physically removed. These patches may range in size from approximately 200 to 600 ft². Coniferous tree species will be planted in the open area to promote reforestation that would eventually shade out invasive species. These plantings will also provide diversity, seed stock, and recruitment of LWD into the riparian buffer.</p>
Infill plant in existing native/non-native vegetation.	Native trees and shrubs will be planted to increase (1) the amount of shade over Water D, (2) LWD recruitment, and (3) colonization of native trees and shrubs.
Maintain existing conditions	These limited areas either contain well-vegetated buffer that does not require enhancement activities or are inaccessible and cannot be enhanced without causing harm to desirable vegetation.



- LEGEND
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING CULVERT
- WETLAND BOUNDARY
- WOODY DEBRIS (LOGS)
- WETLAND RESTORATION

- NOTES:
- 1 REFER TO SHEETS LS.1 AND LS.2 FOR PLANTING PLAN
 - 2 BUILDINGS SHOWN WITH - HAVE BEEN OR WILL BE REMOVED BY THE PORT OF SEATTLE



DETAIL
TYPICAL CROSS SECTION OF CULVERT (MATCH EXISTING CULVERT SLOPE).
N.T.S.

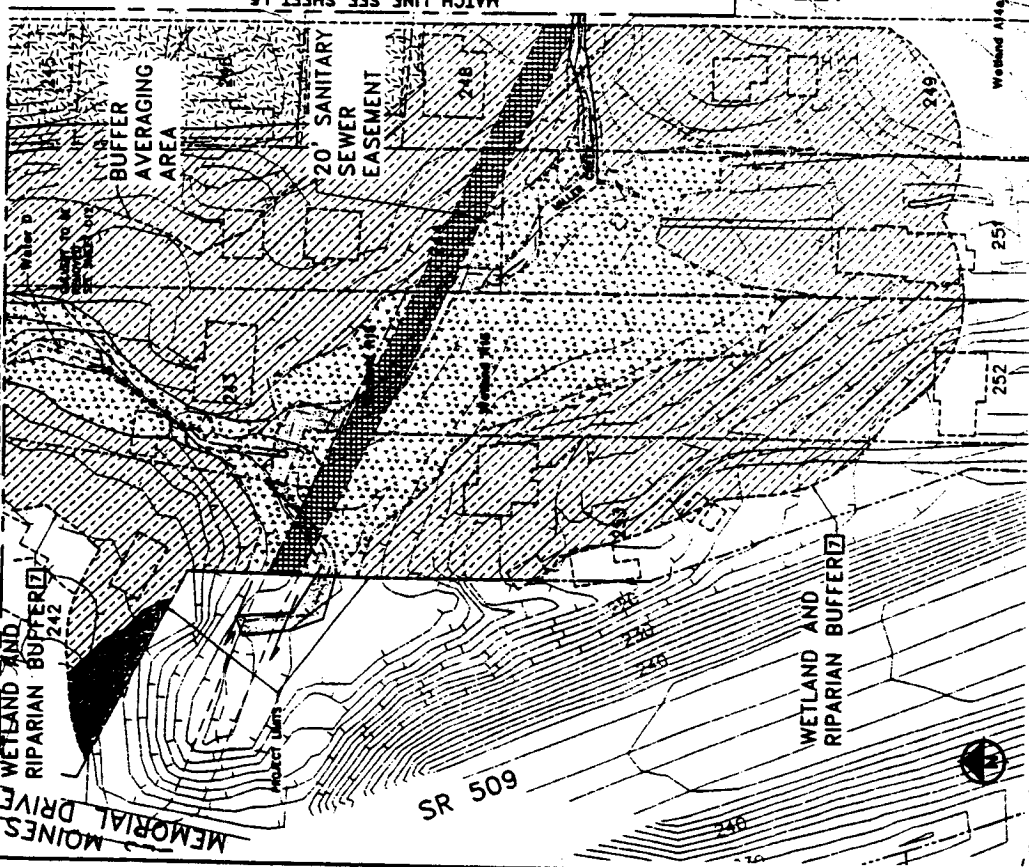


**AGENCY REVIEW
NOT FOR CONSTRUCTION**

<p>CALL OR FAX 1-800-424-8155</p>	<p>Parametric, Inc. 5800 N. N. Highway Blvd. #E Everett, WA 98203 Ph: (425) 822-8800 Fax: (425) 822-8801</p>	<p>DESIGNER SR 509 WETLAND MITIGATION SITE GRADING</p>	<p>SEA-TAC INTERNATIONAL AIRPORT WETLAND MITIGATION SITE GRADING</p>	<p>2015BIC-18 SIN-0008-C12 APPENDIX B</p>
---------------------------------------	--	--	--	---

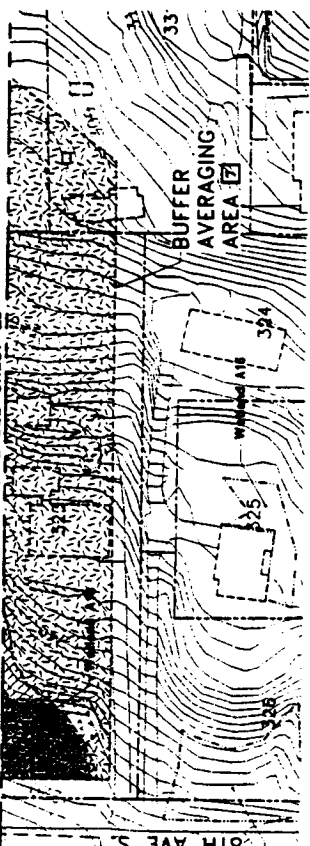
MATCH LINE SEE SHEET L5.2

MEMORIAL DRIVE
WETLAND AND RIPARIAN BUFFER



MATCH LINE SEE SHEET L5

MATCH LINE SEE SHEET L5



- NOTES:
- SEE SHEET L5 FOR PLANT SCHEDULE.
 - FRACES AND SIGNS WILL BE INSTALLED AT THE EDGE OF ALL WETLAND AND RIPARIAN BUFFER AREAS.
 - AREAS WITHOUT A PLANTING MATCH DO NOT REQUIRE SIGN OR TREE PLANTING TO MEET PROPOSED MITIGATION GOALS.
 - TREES GREATER THAN 4" DBH WILL NOT BE REMOVED DURING CONSTRUCTION OF THIS MITIGATION.
 - IN SOME LOCATIONS BLACKBERRY, JAPANESE KNOTWEED AND YELLOW FLAG REEDS WILL BE REMOVED BY HAND FROM AREAS OUTSIDE THE INDICATED CONSTRUCTION AREAS TO MEET PROPOSED MITIGATION GOALS.
 - 8th AVENUE S. SHALL BE REVEGETATED IF IT IS DETERMINED TO NOT BE NEEDED FOR ACCESS PURPOSES.
 - APPROXIMATELY 9 ACRES OF BUFFER AVERAGING AREA IS ADJACENT TO THE WETLAND AND RIPARIAN BUFFER TO COMPENSATE FOR ENHANCEMENTS AND THE EXISTING SANITARY SEWER EASEMENT. ALL BUFFER AREAS ARE PLACED IN RESTRICTIVE COVENANT.
 - PER COMPS OF ENGINEERS, SEWER EASEMENT WILL NOT BE REVEGETATED, BUT WILL BE HYDROSEEDED IF DISTURBED.

- LEGEND:
- HYDROSEED DISTURBED AREAS
 - FLOODPLAIN ZONE
 - RIPARIAN AND WETLAND ZONE
 - UPLAND ZONE #1
 - UPLAND ZONE #2
 - REMOVE UNDESIRABLE VEGETATION
 - EXISTING CALVERT
 - EXISTING CONTOUR
 - 159 PARCEL NUMBER
 - PARCEL BOUNDARY
 - WETLAND BOUNDARY

AGENCY REVIEW NOT FOR CONSTRUCTION

DATE: 08/11/15
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 PROJECT: MILLER CREEK WETLAND AND BUFFER ENHANCEMENT
 SHEET: L5.1
 TOTAL SHEETS: 1
 STA. 1000+00 TO 1000+00

LANDSCAPE PLAN

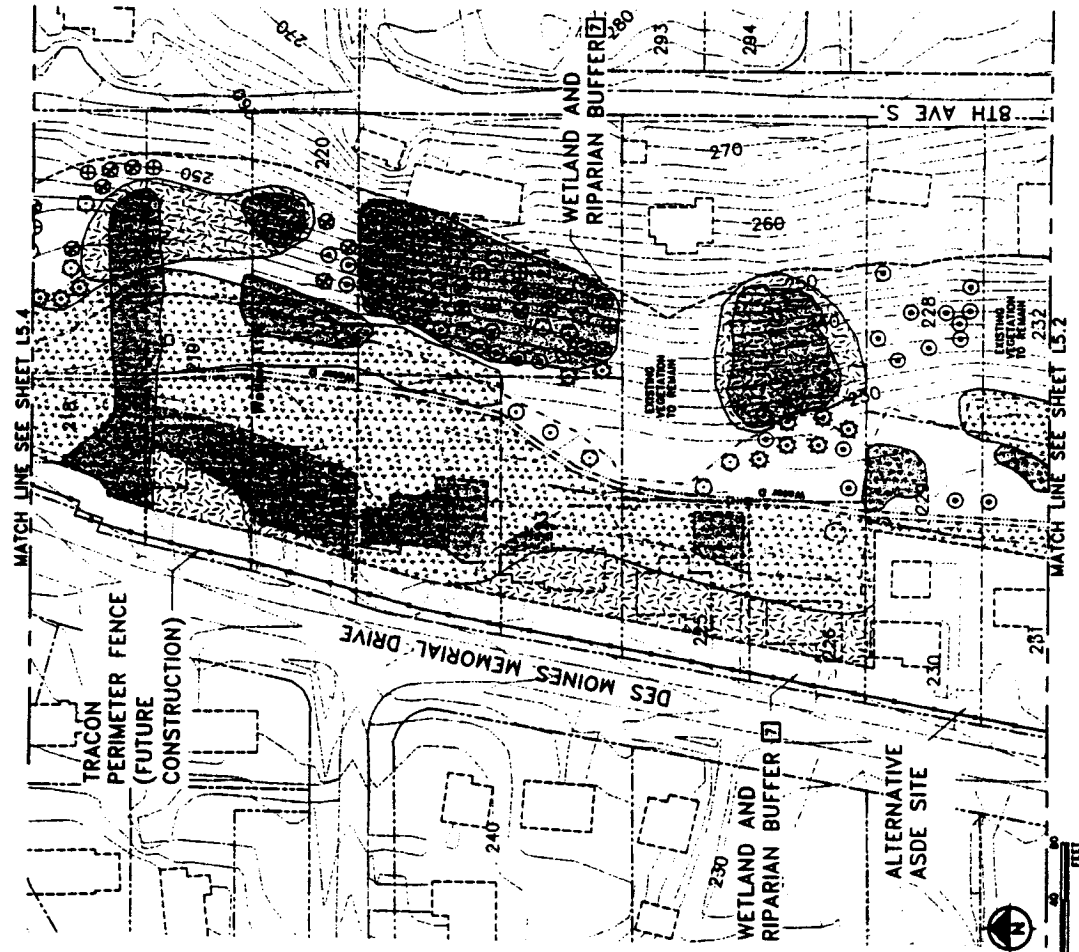
PROJECT: MILLER CREEK WETLAND AND BUFFER ENHANCEMENT
 SHEET: L5.1
 TOTAL SHEETS: 1
 STA. 1000+00 TO 1000+00

SCALE: 1" = 40'

Parametrix, Inc.
 2003 N. 1st Avenue, Suite 100
 Phoenix, AZ 85013
 P: (602) 827-8800
 F: (602) 827-8801
 www.parametrix.com

- NOTES:**
- SEE SHEET L5 FOR PLANT SCHEDULE.
 - FENCES AND SIGNS WILL BE INSTALLED AT THE EDGE OF ALL WETLAND AND RIPARIAN BUFFER AREAS.
 - AREAS WITHOUT A PLANTING MATCH DO NOT REQUIRE SHOWS OR TREE PLANTING TO MEET PROPOSED MITIGATION GOALS.
 - TREES GREATER THAN 4" DBH WILL NOT BE REMOVED DURING CONSTRUCTION OF THIS MITIGATION.
 - IN SOME LOCATIONS BLACKBERRY, JAPANESE SPANBERRY AND OTHER WEEDS WILL BE REMOVED BY HAND FROM AREAS OUTSIDE THE BUFFER AREAS TO MEET PROPOSED MITIGATION GOALS.
 - 114TH STREET SHALL BE REVEGETATED IF IT IS DETERMINED TO NOT BE NEEDED FOR ACCESS PURPOSES.
 - APPROXIMATELY 9 ACRES OF BUFFER AVERAGING AREA IS ADDED TO THE WETLAND AND RIPARIAN BUFFER TO COMPENSATE FOR REMOVAL OF BUFFER AREAS BY 114TH STREET RECONSTRUCTION. ALL BUFFER AREAS ARE PLACED IN RESTRICTIVE COVENANTS.

- LEGEND**
- ⊕ Alien grasslands / forest etc.
 - ⊙ Alien non-vascular plants / bryophytes
 - ⊙ Alien vascular plants / trees
 - ⊙ Populus trichocarpa / Black cottonwood
 - ⊙ Populus balsamifera / Black poplar
 - ⊙ Pseudotsuga mucronata / Douglas Fir
 - ▨ HYDROSEED DISTURBED AREAS
 - ▨ FLOODPLAIN ZONE
 - ▨ RIPARIAN AND WETLAND ZONE
 - ▨ UPLAND ZONE #1
 - ▨ UPLAND ZONE #2
 - ▨ REMOVE UNDESIRABLE VEGETATION
 - 260 EXISTING CONTOUR
 - 159 PARCEL NUMBER
 - - - PARCEL BOUNDARY
 - - - WETLAND BOUNDARY



**AGENCY REVIEW
NOT FOR CONSTRUCTION**

PROJECT:
BEA-TAC INTERNATIONAL AIRPORT
MILLER CREEK WETLAND AND BUFFER ENHANCEMENT
LANDSCAPE PLAN

DATE: 11/15/11
SCALE: 1" = 60'

PROJECT NO.: 11-000-011-01
DATE: 11/15/11

PROJECT NO.: 11-000-011-01
DATE: 11/15/11

PROJECT NO.: 11-000-011-01
DATE: 11/15/11

PROJECT NO.: 11-000-011-01
DATE: 11/15/11

PROJECT NO.: 11-000-011-01
DATE: 11/15/11

PROJECT NO.: 11-000-011-01
DATE: 11/15/11

PROJECT NO.: 11-000-011-01
DATE: 11/15/11

PROJECT NO.: 11-000-011-01
DATE: 11/15/11

PROJECT NO.: 11-000-011-01
DATE: 11/15/11

PROJECT NO.: 11-000-011-01
DATE: 11/15/11

PROJECT NO.: 11-000-011-01
DATE: 11/15/11

PROJECT NO.: 11-000-011-01
DATE: 11/15/11

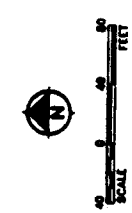
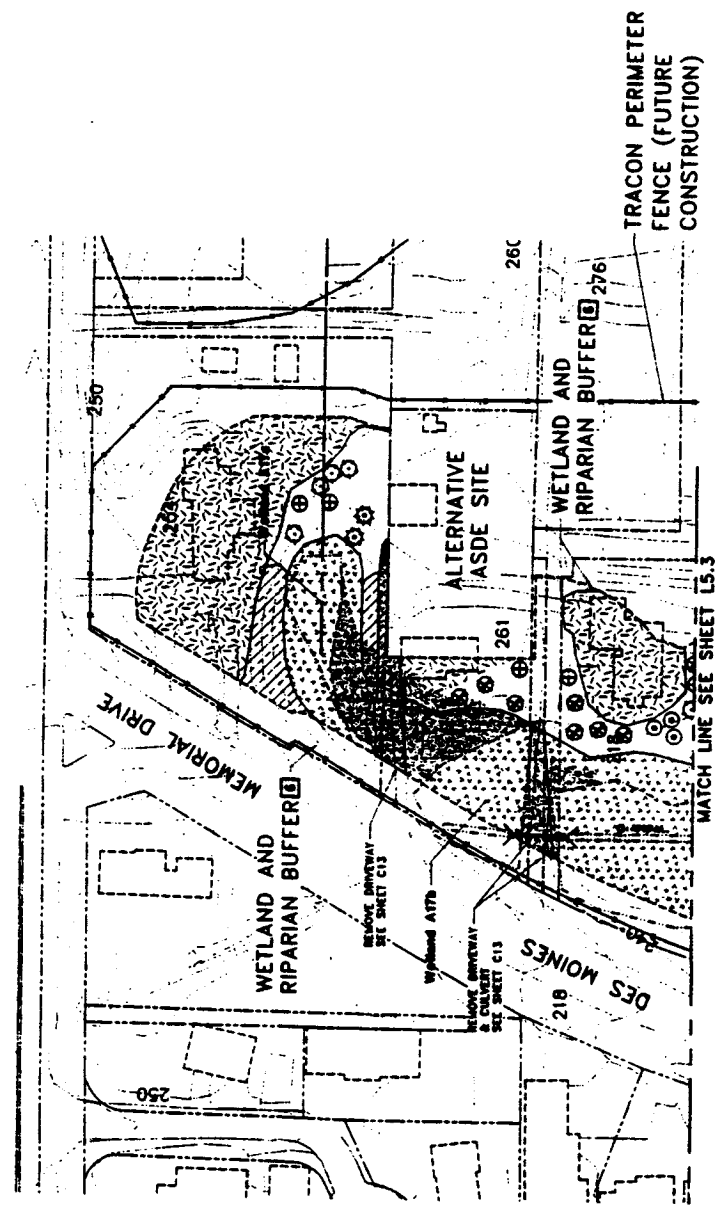
PROJECT NO.: 11-000-011-01
DATE: 11/15/11

AR 052308

NOTES:

- SEE SHEET L5 FOR PLANT SCHEDULE.
- FENCES AND SIGNS WILL BE INSTALLED AT THE EDGE OF ALL WETLAND AND RIPARIAN BUFFER AREAS.
- AREAS WITHOUT A PLANTING MATCH DO NOT REQUIRE SIGNS OR TREE PLANTING TO MEET PROPOSED MITIGATION GOALS.
- TREES GREATER THAN 4" DBH WILL NOT BE REMOVED DURING CONSTRUCTION OF THIS MITIGATION.
- IN SOME LOCATIONS BLACKBERRY, JAPANESE BROOMWEED AND WEEDS WILL BE REMOVED BY HAND FROM AREAS OUTSIDE THE WETLAND AND CONSTRUCTION AREAS TO MEET PROPOSED MITIGATION GOALS.
- APPROXIMATELY 8 ACRES OF BUFFER AVOIDING AREA IS ADDED TO THE BUFFER AVOIDING AREA AND BUFFER TO COMPENSATE FOR ENDEMICITY AND THE REMOVAL OF SANITARY SEWER ELEMENT. ALL BUFFER AREAS ARE PLACED IN RESTRICTIVE COVENANTS.

- LEGEND
- ⊕ Alnus gracilis /Forest 1c
 - ⊙ Acer macrophyllum /Forest maple
 - ⊙ Picea canadensis /Forest spruce
 - ⊙ Populus balsamifera /Forest cottonwood
 - ⊙ Thuja plicata /Western redcedar
 - ⊙ Pseudotsuga mucronata /Douglas Fir
 - ▨ HYDROSEED DISTURBED AREAS
 - ▨ FLOODPLAIN ZONE
 - ▨ RIPARIAN AND WETLAND ZONE
 - ▨ UPLAND ZONE #1
 - ▨ UPLAND ZONE #2
 - ▨ REMOVE UNDESIRABLE VEGETATION
 - EXISTING CALVERT
 - 260 EXISTING CONTOUR
 - 159 PARCEL NUMBER
 - PARCEL BOUNDARY
 - - - WETLAND BOUNDARY



**AGENCY REVIEW
NOT FOR CONSTRUCTION**

<p>CALL AT 800-855-8766 OFFICE 709 004 1-800-474-6885</p>	<p>Parametrix, Inc. 3600 U.S. Washington Blvd. SE Burien, WA 98133 P: (206) 835-8800 F: (206) 835-8801</p>	<p>City of Seattle Sea-Tac International Airport Miller Creek Wetland and Buffer Enhancement Sheet No. L5 LANDSCAPE PLAN</p>	<p>20120113_4 10/10/12</p>	<p>STL-1006-LS-0 APPENDIX B</p>
---	--	--	--------------------------------	-------------------------------------

3.1 GRADING AND/OR CLEARING

The mitigation site is a residential area that contains driveways, fences, and 34 buildings. Grading activities will include removing existing structures, fill material, driveways, and three culverts (totaling about 125 linear ft) in the designated wetland and buffer areas (see Sheets C12 and C13). Most of the buildings have already been demolished and removed, but several structures and foundations remain. The mitigation actions will remove all structures, underground storage tanks, septic systems, and driveways within the mitigation site. Several foundations and driveways are immediately adjacent wetlands, and their removal will result in land surfaces at or slightly below that of adjacent wetlands. These activities will restore about 0.30 acre of wetland.

Additional minor grading will remove landscape features such as retaining walls. Hand clearing of invasive plants from portions of Water D is also proposed. In some upland locations, the top 6 to 12 inches of topsoil may be tilled and removed as necessary to remove the rootstocks of invasive species.

There is little or no native vegetation near the structures to be demolished. However, when desirable vegetation is present, demolition will be designed to minimize disturbance to this native vegetation and soils. The contractor responsible for demolition of structures within the buffer areas will follow BMPs to prevent erosion and sedimentation to the stream. The Port has already demolished many residential structures within the buffer using sediment and erosion control BMPs to prevent erosion and sedimentation to the stream or wetlands. The standard practices implemented prior to any demolition activity include use of barrier and sediment fences between the demolition site and any wetland or water feature are effective at preventing indirect impacts from the demolition area. These standard BMPs will continue to be used throughout the demolition activities associated with the Miller Creek buffer enhancement plan. Materials removed from the buffer area during demolition will be disposed of off-site at an approved upland disposal facility.

3.2 WATER D ENHANCEMENT

Enhancement actions within Water D will consist of removing existing small footbridges, railroad ties, debris, and placing LWD within the channel. Placing LWD in the channel will promote organic matter and sediment retention and the in-channel processing of organic matter. In the longer run, the LWD will promote natural channel forming processes (e.g., channel meandering and migration) which would gradually convert the linear ditched channel to a more natural wetland/channel system.

LWD placement in Water D will generally conform to existing Washington State Department of Fish and Wildlife (WDFW) guidelines and be consistent with the Hydraulic Project Approval permit to be issued by WDFW. Western redcedar, Douglas fir, western hemlock, and bigleaf maple logs will be used. The general location where logs will be installed is shown on Sheets C3 through C7; however, they will be field-placed by the project engineer and/or habitat biologist during construction. The logs will not be anchored because Water D does not have high enough peak flows that would result in log movement. Much of the wood to be used in the restoration can be salvaged from existing on-site sources.

3.3 EXPECTED HYDROLOGY

In general, wetlands in the mitigation area will be maintained by existing groundwater and surface water sources. The wetland mitigation areas (including the areas where culverts and fill material will be removed) would be expected to continue to have saturated soils during the winter, early spring, and early summer months.

3.4 HAZARD WILDLIFE CONSIDERATIONS

The landscape approach has been developed to be consistent with the Wildlife Hazard Management Plan (WHMP) (USDA 2000) and the restoration actions identified in the Miller Creek riparian and instream enhancement projects (refer to Section 5.2 in the NRMP). Mitigation actions in the buffer, such as replacing the existing open areas (i.e., lawns and fields) with forest and shrub vegetation, will reduce hazard wildlife (i.e., flocking birds, waterfowl, and raptors) by covering and screening the mitigation areas with dense vegetation. Additionally, to minimize wildlife hazards, the plants to be installed produce few fruits, berries, or nuts that are used as food sources.

3.5 LANDSCAPE PLAN

The landscape plan for the Wetland A17 site is similar to that planned for the Miller Creek wetland and buffer enhancements (see Section 5.2 of the NRMP). A list of plant species similar to that identified for the Miller Creek wetland and buffer restoration (Parametrix 2000a) will be used in the Wetland A17 and buffer enhancement plan (see Sheet L6). Sun-tolerant species such as Douglas fir and red alder will generally be planted in open sunny areas, while species that prefer shade, such as vine maple, will generally be planted in shady areas under existing vegetation.

The proposed plant communities and specific planting zones are shown in detail on Sheets L5.1 through L5.4. Four general planting approaches will be used in the wetland and buffer enhancement area. Planting details that depict how the plants should be installed and spacing should occur are shown in Sheet L6.

Temporary irrigation will be provided within the buffer areas. Irrigation will only be used during the plant establishment phase and will either be removed (if installed above ground) or abandoned in place (if installed below ground).

3.5.1 Existing Wetlands to be Enhanced

Wetlands A17 will be enhanced by (1) removing non-native invasive species in selected areas, (2) infill planting with native tree and shrub species, and (3) removing driveways that bisect Wetlands A17a and A17b and between Wetlands A17b and A17c. Planting densities for infill tree planting will be targeted to achieve greater than 250 stems per acre and for shrub planting will be greater than 1,700 individuals per acre. Infill planting densities are slightly lower than planting densities in cleared and/or graded areas because some native vegetation already exists in areas to be infill planted.

3.5.2 Upland Buffers

Upland Buffers (see Sheets L5.1 through L5.4) are located east and west of the project area, and will be planted with species adapted to seasonally wet, upland soil conditions. The landscape plan for the upland area will focus on planting trees and shrubs in a dense vegetated buffer to protect the enhancement area from surrounding land uses. Trees will be installed to achieve at least 280 stems per acre and will be installed according to the planting plan. Field locations will be approved by the landscape architect or wetland biologist. Shrubs will be installed to achieve greater than 2,100 individuals per acre (see Table 4). The planting scheme in the upland areas will place coniferous and deciduous tree species in patches to create a mixed canopy.

3.6 IMPLEMENTATION

The Wetland A17 mitigation will be incorporated into the Miller Creek wetland and riparian buffer enhancement projects (see Section 5.2 of the NRMP).

3.7 PERFORMANCE STANDARDS AND MONITORING

Performance standards, monitoring approaches, and contingency measures for the Wetland A17 mitigation are listed in Table 6, and are the same as those for the Miller Creek riparian corridor mitigation. Interim vegetation cover standards that the mitigation areas must meet are listed in Table 7, and potentially invasive species that will be controlled on the mitigation are listed in Table 8. If performance standards are not met, specific contingency measures would be implemented, following the adaptive management approach described in Section 4 of the NRMP (Parametrix 2000a).

Monitoring the wetland and riparian buffer projects will be consistent with the monitoring approach and schedule outlined in Section 4 of the NRMP (Parametrix 2000a). Monitoring schedules specific to this project are provided in Table 9. Specific performance standards will be evaluated regularly during the monitoring period to ensure that the wetland and riparian buffer enhancement projects are meeting project goals and design criteria.

3.8 SITE PROTECTION

The Port will execute and file restrictive covenants for the mitigation area with King County no later than sixty (60) days after the issuance of the Section 404 permit by ACOE. The restrictive covenant area encompasses the wetland, buffer, and buffer averaging areas shown in Figure 2. A copy of the restrictive covenant language is included in Appendix B.

The mitigation area will be marked with permanent signs and protected by fencing. Signs will clearly mark the area as a protected wetland mitigation site. The Port will inspect and maintain signs and fencing on a regular basis.

3.9 MAINTENANCE AND CONTINGENCY PLANS

Routine maintenance tasks (e.g., maintaining irrigation system, removing trash) and adaptive management/contingency measures (e.g., weed management, replacing plants) will be implemented consistent with the approach outlined in Section 4 of the NRMP (Parametrix 2000a). Specific contingency actions for each wetland and riparian buffer performance standard are provided in Table 6.

Table 6. Final performance standards, evaluation approach, and contingency measures for wetland and buffer enhancement along Miller Creek.

Design Criteria	Performance Standard	Evaluation Approach	Contingency Measures
1. Riparian buffer areas that are cleared or disturbed during demolition will be planted with native forested and shrub vegetation (these are shaded in Appendix B, Sheets L.1 through L.5.1). Plant native tree species at densities of greater than 280 per acre. Plant native shrub species at densities of greater than 2,100 per acre.	Plant survival will be 100% following year 1. Average survival of planted stock will be at least 80% during the first 3 monitoring years. Tree density will be at least 280 stems/acre; shrub density will be at least 2,100 individuals per acre in monitoring years 3, 8, and 15. During monitoring years 3, 8, and 15, plant diversity will not decrease by more than 10% from the number of plant species installed at baseline. Cover of native species will be at least 80% at monitoring year 15. Cover of undesirable non-native, invasive species in cleared and planted areas will not exceed 10% in any monitoring year (see Appendix B, Sheets L.1 through L.5.4 for areas where undesirable vegetation will be removed).	Vegetation sampling (plots, transects, or plotless techniques) to estimate native species cover, density, mortality, and invasive species cover will be used.	If standards are not met: <ul style="list-style-type: none"> • Select species that are better adapted to existing hydrologic conditions. • Install additional plant material. • Install protective collars to reduce herbivore damage. • Control/reduce non-native invasive species.
2. Lawn and other areas dominated by non-native plant species will be enhanced by planting native forested vegetation.	Plant survival will be 100% following year 1. Average survival of planted stock will be at least 80% during the first 3 monitoring years. Tree density will be at least 280 stems/acre; shrub density will be at least 2,100 individuals per acre in monitoring years 3, 8, and 15. In monitoring years 3, 8, and 15, plant diversity will not decrease by more than 10% from the number of plant species installed at baseline. Cover of native species will be at least 80% at monitoring year 15.	See above.	See above.

Table 6. Final performance standards, evaluation approach, and contingency measures for wetland and buffer enhancement along Miller Creek (continued).

Design Criteria	Performance Standard	Evaluation Approach	Contingency Measures
<p>3. Densely plant the portion of the buffer adjacent to Miller Creek with native trees and shrubs where applicable to provide future sources of LWD to the stream.</p>	<p>Cover of non-native, invasive^b species in cleared and planted areas will not exceed 10% in any monitoring year.</p>	<p>See above.</p>	<p>See above.</p>
<p>5. Install fencing and signs to designate the buffer area as a protected mitigation site.</p>	<p>Signs and/or fencing will clearly mark the buffer edge as a protected mitigation site (see Appendix 0 for fencing specifications).</p>	<p>Check signs and fencing during annual monitoring visits.</p>	<p>Repair and/or re-install damaged or missing signs.</p>

^a See Table 4.2-1 for interim cover targets (i.e., from year 3 to year 15).

^b See Table 4.2-2 for list of invasive, non-native species to be monitored and controlled on the mitigation site.

Table 7. Performance standards for vegetation cover (minimum percent) by vegetation zone and monitoring year.

Monitoring Year	Vegetation Zone				Invasive Species
	Forest ^a	Shrub ^a	Emergent		
			Hydroseed	Planted	
0	-	-	0	0	<10
1	-	-	50	10	<10
2	-	-	60	20	<10
3	10	10	70	30	<10
5	25	40	80	50	<10
7	40	65	80	70	<10
10	80	80	80	80	<10
12	80	80	80	80	<10
15	80	80	80	80	<10

^a Vegetation cover will not be monitored in forest and shrub plant communities during monitoring year 0, 1, or 2. During these years, plant survival performance will be monitored and at year 3, survival must be 80 percent of the original numbers planted.

Table 8. Invasive plant species that will be monitored and controlled in the mitigation sites.

Scientific Name	Common Name
<i>Convolvulus sepium</i>	Hedge bindweed
<i>Cytisus scoparius</i>	Scotch Broom
<i>Lythrum salicaria</i>	Purple loosestrife
<i>Phalaris arundinacea</i>	Reed canarygrass
<i>Polygonum cuspidatum</i>	Japanese knotweed
<i>Polygonum sachalinense</i>	Sachaline
<i>Rubus discolor</i>	Himalayan blackberry
<i>Rubus laciniatus</i>	Evergreen blackberry

Table 9. Wetland A17 mitigation monitoring methods and schedule.

Feature	Activity	Duration	Years Following Mitigation Implementation									
			0	1	2	3	5	7	10	12	15	
Plant Survival	Calculate plant survival	Once late spring to early summer	X	X	X	X	X	X	X	X	X	X
Tree and shrub density/cover	Vegetation sampling	Once late spring to early summer	X	X	X	X	X	X	X	X	X	X
Vegetation structure	Describe from walk-through surveys, incorporating data from the above analysis as available	Once late spring to early summer	X	X	X	X	X	X	X	X	X	X

4. REFERENCES

- Ecology (Washington State Department of Ecology). 1994. Guidelines for developing freshwater wetlands mitigation plans and proposals. Olympia, Washington.
- Ecology (Washington State Department of Ecology). 2001. Water Quality Certification for U.S. Army Corps of Engineers public notice 1996-4-02325. Letter dated September 21, 2001.
- Parametrix. 2000a. Natural resource mitigation plan Master Plan Update improvements Seattle-Tacoma International Airport. Prepared by Parametrix for the Port of Seattle. Kirkland, Washington.
- Parametrix. 2000b. Wetland delineation report Master Plan Update improvements Seattle-Tacoma International Airport. Prepared by Parametrix for the Port of Seattle. Kirkland, Washington.
- Snyder, D.E., G.P. Philip, and R.F. Russell. 1973. Soil survey of King County area, Washington. United States Department of Agriculture, Soil Conservation Service. In cooperation with the Washington Agricultural Experiment Station.
- USDA (U.S. Department of Agriculture). 1952. Soil survey, King County, Washington. Series 38, No. 31. United States Department of Agriculture, Soil Conservation Service, in cooperation with the Washington Agricultural Experiment Station and Washington State Planning Council.
- USDA (U.S. Department of Agriculture). 2000. Wildlife hazard management plan Seattle-Tacoma International Airport. Seattle, Washington.

APPENDIX A

SUMMARY OF EXISTING CONDITIONS AND PROPOSED MITIGATION

AR 052319

Table A-1. Existing conditions and proposed mitigation actions by parcel for Wetland A17.

Sheet Number	Parcel Number	Location	Existing Conditions	Proposed Mitigation Actions
L5.3 and L5.4	218	Wetland / Stream	The area west of Water D is a young alder forest with relatively dense Himalayan blackberry and field morning glory in the understory. A driveway with a culvert has been placed in the wetland, at the north end of the wetland on this parcel.	Clear Himalayan blackberry from the wetland. Remove the driveway and culvert from the wetland. Regrade the area to match historic contours. Use BMPs and bioengineering techniques to stabilize the area after work is complete. Plant western redcedar and hemlock in red alder forest understory.
L5.3	219	Upland (House removed)	Upland areas are grassed or vegetated with red alder, western redcedar, big-leaf maple, or cherry laurel. A driveway crosses the upland.	Remove Himalayan blackberry and cherry laurel on southern property boundary. Remove driveway and associated fill, and regrade to match contours. Revegetate upland with tree and shrub species.
L5.3	219	Wetland / Stream	West of Water D, wetland vegetation consists of lady fern, soft rush, small-fruited bulrush, common velvetgrass, watercress, and creeping buttercup. East of Water D, wetland vegetation consists of field horsetail, field morning glory, and Himalayan blackberry.	Control blackberry and plant wetland trees and shrubs in emergent wetland area.
L5.3	220	Upland (House remains)	A house, shed, lawn, ornamental shrubs, and areas of blackberry are present on the west side of the parcel. East of the stream, Himalayan blackberry and hydroseeded areas are present on the north side.	Remove driveway, house, shed, and associated fill. Regrade to match historic conditions. Remove Himalayan blackberry and plant with trees. Near the wetland edge plant red alder and black cottonwood.
L5.3	220	Wetland / Stream	The wetlands consist of field horsetail, common velvetgrass, and creeping buttercup.	Infill plant with specified plant species.
L5.3	221	Upland (No house present)	The parcel is forested with some Himalayan blackberry in the understory.	Remove blackberry located on the north side of the parcel and near the wetland edge. Plant sun-tolerant native coniferous tree species.
L5.3	221	Wetland / Stream	Vegetation in the wetland consists of field horsetail, common velvetgrass, and creeping buttercup. Watercress is growing in Water D and three fruit trees are located in the wetland. Water D is lined with creosote railroad ties. Some reed canarygrass and Himalayan blackberry are located on the east property edge.	Remove creosote railroad ties, grade the area back to connect the stream with the floodplain, remove the blackberry, and replant the area with native wetland trees and shrubs.
L5.3	221	Upland (House remains)	This parcel is grassed with ornamental plantings around the house. The house is located at the wetland edge.	Remove the residential structures and associated fill. Regrade to match historic conditions. Remove Himalayan blackberry on the north side and near the wetland edge. Plant open areas with sun-tolerant coniferous tree species.

AR 052320

Table A-1. Existing conditions and proposed mitigation actions by parcel for Wetland A17 (continued).

Sheet Number	Parcel Number	Location	Existing Conditions	Proposed Mitigation Actions
L5.3	222	Wetland / Stream	On the west side of the channel, the wetland borders the north, south, and east sides of the house. The wetland is dominated by creeping buttercup, field horsetail, and small-fruited bulrush. The east side of the channel is dominated by reed canarygrass with field horsetail and creeping buttercup. Himalayan blackberry borders the southern portion of the wetland.	Remove Himalayan blackberry and reed canarygrass on the east side. Plant willows.
L5.3	223	Upland (House remains) Wetland / Stream	A house is adjacent to the wetland. The upland area is lawn with a mature Douglas fir and small ornamental trees. Small ornamental shrubs are planted around the house. A compacted gravel driveway is located on the south side of the parcel. Near the house, the wetland is dominated by lady fern, creeping buttercup, and field horsetail in the emergent layer and salmonberry and Himalayan blackberry in the shrub stratum. A 3.5 ft high fence is located parallel to the channel, behind the house.	Remove house, driveway, and associated fill. Regrade to smooth contours. Avoid damage to Douglas fir. Remove ornamental vegetation. Replant the area with native tree and shrub species. Remove fence. Remove blackberry. Plant wetland with willows.
L5.3	224	Upland (House remains) Wetland / Stream	The upland consists of a house, driveway, lawn, and ornamental shrubs. At the west edge of the wetland is a mature white oak tree and horse chestnut tree. In the SE corner, there is western redcedar, swordfern, creeping blackberry, ivy, and western hazelnut. Small areas of Himalayan blackberry, field morning glory, and English ivy are present in the understory of the forest. See description for Parcel 222.	Remove buildings, driveway, and associated fill. Regrade to smooth contours. Remove Himalayan blackberry, field morning glory, and ivy in the understory. Replant with native shade-tolerant shrub species (e.g., swordfern). Protect white oak and chestnut. See description for Parcel 222.
L5.3	225	Upland (House remains) Wetland / Stream (Garage and shed remain) Upland (House remains)	The west portion of the property consists of a closed canopy forest of western redcedar, black cottonwood, big-leaf maple, and Douglas fir. The understory is composed of Indian plum, swordfern, with a dense coverage of Himalayan blackberry, some ivy, and English holly. A house remains on upland. Half of the wetland is managed lawn and the other half is Himalayan blackberry and red alder trees. A garage and shed are located in the wetland. The upland consists of a house, driveway, and lawn with ornamental shrubs next to the house. A raised concrete wall is located on the south side of the parcel, next to Parcel 226.	Remove structures and associated fill. Regrade to smooth contours. Control Himalayan blackberry and ivy near wetland edge. Plant shade-tolerant coniferous trees in the understory; otherwise, little planting is required on this parcel. Remove buildings and Himalayan blackberry. Plant native trees and shrubs. Remove buildings, concrete wall, and driveways. Regrade to smooth contours. Remove some ornamentals and English laurel and plant with mixed deciduous and coniferous native forest vegetation.

Table A-1. Existing conditions and proposed mitigation actions by parcel for Wetland A17 (continued).

Sheet Number	Parcel Number	Location	Existing Conditions	Proposed Mitigation Actions
L5.3	226	Wetland / Stream (Shed remains)	The wetland area is primarily vegetated with lawn. Himalayan blackberry, field horsetail, field morning glory occur in patches and along east edge of the property. A shed is located in the wetland.	Remove buildings, driveway, and Himalayan blackberry; plant with willows.
L5.3	227	Upland (House remains outside buffer) Wetland / Stream	The upland consists of house, driveway, and lawn with ornamental shrubs. The wetland vegetation consists of alder trees and Himalayan blackberry.	Remove buildings, driveway, ornamental plants, and associated fill. Regrade to smooth contours. Plant with native trees and shrubs. Remove blackberry and plant additional coniferous trees to shade out blackberry.
L5.3	228	Upland (No structures) Wetland / Stream	Vegetation on the site consists predominantly of coniferous forest with a small area of lawn near the house and a patch of Himalayan blackberry west of the house. English ivy is present in the south central portion of the parcel. Small area of wetland in SE corner of parcel.	Remove the Himalayan blackberry and plant the area with specified trees and shrubs. Remove English ivy in the south central portion of the parcel. Plant with specified native trees and shrubs.
L5.3	229	Upland Wetland / Stream	The site is generally forested; however, some areas near the house are dominated by Himalayan blackberry. Wetland vegetation consists of creeping buttercup, reed canarygrass, and bentgrass. Black locust saplings/suckers are also present. A fence is located between the wetland and channel.	Remove Himalayan blackberry and interplant with native coniferous tree species. Remove fence. Remove reed canarygrass and locust. Plant willow trees and shrubs.
L5.3	230	Upland (No structures) Wetland / Stream	The small area of upland is located on the parcel and consists of grass and bare ground. A narrow fringe of palustrine emergent wetland is located near the east edge of the parcel (refer to the description of the wetland on Parcel 229).	Plant this small area with a shade-tolerant tree or a few shade-tolerant shrubs. Remove fence and locust saplings/suckers and plant this area with willow trees and shrubs.
L5.2 and L5.3	231	Upland (House remains) Wetland / Stream	Lawn and ornamental shrubs are planted around the house. Several trees are located along the channel and elsewhere. A house, garage, and concrete driveway are also present. The wetland vegetation includes watercress, common velvetgrass, and field horsetail. There are red alder saplings and some ornamentals on the west side. The east side of the wetland is lined with larger red alder, western redcedar, and a cherry tree. The parcel has been graded and hydroseeded and is dominated by clover. A tulip tree is also on the site.	Remove buildings, driveway, and associated fill. Regrade to smooth contours. Plant with native trees and shrubs. Remove reed canarygrass and blackberry. Plant with willow trees and shrubs. Plant entire upland area with native trees and shrubs.

Table A-1. Existing conditions and proposed mitigation actions by parcel for Wetland A17 (continued).

Sheet Number	Parcel Number	Location	Existing Conditions	Proposed Mitigation Actions
L5.2 and L5.3	232	Wetland / Stream	The wetland includes a western redcedar overstory and an understory of alder saplings. The ground cover is primarily native emergent plants.	No action is necessary on this parcel.
L5.2	233	Upland (No structure in buffer)	The parcel is largely vegetated with an alder forest. The understory consists predominantly of native species including western hazelnut, Indian plum, and swordfern. Some blackberry cover is present on the south central property boundary. House is located outside buffer enhancement area.	Remove Himalayan blackberry in the southern portion of the site and plant the area with native trees.
L5.2	234	Wetland / Stream	The wetland contains forest and emergent areas. Red alder and large black cottonwood trees are present in the wetland. In open areas, emergent wetland vegetation consists of field horsetail, Himalayan blackberry, and yellow flag iris.	Remove Himalayan blackberry and yellow flag iris. Plant with willows and other trees and shrubs.
L5.2	234	Upland (House remains)	Vegetation is a mixture of lawn, ornamental shrubs, and native species (such as western hazelnut, bitter cherry, a couple of young Douglas fir). A garbage pile is located behind the house. There are two driveways on the property.	Remove garbage, buildings, driveways, concrete stairs, and associated fill. Grade to smooth contours. Remove vegetation between the house and the wetland and plant with specified native trees. Replant disturbed areas with specified trees and shrubs.
L5.2	235	Wetland / Stream	See description for Parcel 233.	See description for Parcel 233.
L5.2	235	Upland (House remains)	This area is mostly all lawn with no other vegetation present. Uplands contain house and driveway.	Remove buildings, driveway, and associated fill. Grade to smooth contours. Plant the open area with native sun-tolerant trees and shrubs.
L5.2	236	Wetland / Stream	Wetland vegetation consists of soft rush, small-fruited bulrush, creeping buttercup, sawbeak sedge, and field horsetail. Some Himalayan blackberry is present along and east of Water D. There is good tree cover (red alder, black cottonwood) on the east side of Water D.	Remove driveways and foundations. Plant open areas with willow trees and shrubs.
L5.2	236	Upland (House removed)	This area is primarily lawn with several large western redcedars are present on the north side of the parcel. A large horse chestnut is also present on the parcel. A driveway and foundation remain.	Remove driveways, foundations, and associated fill. Protect and preserve cedars. Grade to smooth contours. Plant the open area with specified native sun-tolerant trees and shrubs.
L5.2	236	Wetland / Stream	The wetland vegetation consists of common velvetgrass, field horsetail, and lady fern. Some Himalayan blackberry and field morning glory is present near Water D.	Remove Himalayan blackberry and field morning glory. Plant open and disturbed areas with willow trees and shrubs.

Table A-1. Existing conditions and proposed mitigation actions by parcel for Wetland A17 (continued).

Sheet Number	Parcel Number	Location	Existing Conditions	Proposed Mitigation Actions
L5.2	237	Upland (Structures remain)	This area is predominantly lawn with scattered trees including Colorado blue spruce, mature western redcedar, and fruit trees (cherry and apple). A house, garage, and driveway remain on the east.	Remove structures, driveway, and associated fill. Grade to smooth contours. Plant lawn area with sun-tolerant coniferous tree species.
		Wetland / Stream	The wetland vegetation consists of wet meadow areas on the south side and red alder/black cottonwood forest, on the north side (near the road). In the open areas, some blackberry is present.	Remove Himalayan blackberry. Plant open areas with willow and underplant western redcedar trees.
		Upland	The majority of the upland area consists of relatively undisturbed Douglas fir and western redcedar forest. Understory consists of salal, Indian plum, western hazelnut, and swordfern. A small area of English ivy is located in the eastern portion of the parcel. Open, hydrosseeded area remains on former home site, in the central portion of the parcel. Red alder saplings are growing in the cleared and hydrosseeded areas.	Remove Himalayan blackberry and English ivy. Plant the open disturbed and open areas with native sun-tolerant trees.
L5.2	238	Wetland / Stream	Himalayan blackberry, field morning glory, climbing nightshade, and field horsetail are dominant in the wetland located near the east side of the parcel.	Remove Himalayan blackberry field morning glory, climbing nightshade. Plant disturbed areas with red alder, Sitka spruce, and black cottonwood.
		Upland (Structures remain)	A house, garage, and shed remain on the parcel. Lawn and ornamental shrubs are present near the house. Large pines and hemlock trees are also present on the site.	Remove building, driveway, and associated fill. Grade to smooth contours. Protect pines and hemlocks. Plant disturbed and open areas with native sun-tolerant coniferous trees. Remove ornamental shrubs and replant the area with vine maple.
L5.2	239	Wetland / Stream	This wetland contains some mature red alder and black cottonwood trees. Various grasses, soft rush, and field horsetail occur in the understory.	Remove Himalayan blackberry. Plant disturbed areas with western redcedar. Interplant western redcedar in forested areas.
		Upland (Structures removed)	Vegetation on the site includes grasses on the old house pad with Pacific madrone, red alder, cherry laurel, and western redcedar located around the perimeter of the house. Himalayan blackberry occurs in open areas, between the house and the wetland.	Remove Himalayan blackberry and field morning glory. Plant open and disturbed areas with specified native trees and shrubs.
L5.2	240	Wetland / Stream	The wetland vegetation includes an overstory of red alder and understory of Himalayan blackberry, field morning glory, and bentgrass. An approximately 30-ft segment of Water D has been placed in an 18-inch culvert, at the southern portion of the site.	Remove Himalayan blackberry and field morning glory. Daylight Water D by removing the 30-ft-long culvert. Stabilize the banks by using bioengineering techniques and replanting with willow stakes. Plant disturbed areas with western redcedar and willow.
		Upland (Shed remains)	Upland portion of the parcel is grassland. Ornamental trees and shrubs occur along the perimeter. Himalayan blackberry occurs in patches.	Remove driveway and Himalayan blackberry. Plant the open areas with native tree and shrub species.

Table A-1. Existing conditions and proposed mitigation actions by parcel for Wetland A17 (continued).

Sheet Number	Parcel Number	Location	Existing Conditions	Proposed Mitigation Actions
L5.2	241	Wetland / Stream	This area has a young red alder overstory with a thick Himalayan blackberry and stinging nettle understory. Field morning glory is also present.	Remove blackberry and replant disturbed areas with native trees and shrubs.
L5.1 and L5.2	242	Upland	This area is largely grassland. Several large Douglas fir, cherry laurel, and pine trees occur near the north property line. Hazelnut and fir trees are present around the perimeter of the lot. An area of mounded soil and concrete blocks is present, behind the former house pad.	Remove blackberry and field morning glory. Remove concrete blocks and block fragments. Remove cherry laurel and plant disturbed and open areas with native trees and shrubs.
L5.1 and L5.2	243	Wetland / Stream	A narrow fringe of wetland is located on this parcel and associated with Miller Creek. The wetland contains creeping buttercup, field horsetail, and jewelweed. Common tansy and western hazelnut are located immediately adjacent to the wetland edge. Areas of blackberry, climbing nightshade, and yellow flag iris are located near and in the wetland.	Control blackberry, yellow flag iris, and climbing nightshade. Plant native shrub species near the wetland.
L5.1 and L5.2	244	Upland (Structures removed)	Vegetation on this site is largely grass. Several trees are present near the perimeter, and cherry laurel and other ornamental species are also present.	Plant open areas with native trees and shrubs.
L5.1 and L5.2	243	Wetland / Stream	The wetland is a narrow fringe located immediately adjacent to the channel. Vegetation in the channel includes Pacific willow, creeping buttercup, and field horsetail. A few large black cottonwood trees are located adjacent to the channel. An approximately 75-ft segment of Water D, between the driveway and outbuildings, has been placed in a cement culvert.	Remove Water D from the culvert. Restore the banks of Water D by using BMPs, bioengineering techniques, and planting willow stakes.
L5.1 and L5.2	244	Upland (Structures remain)	A gravel driveway occurs within 10 ft of the stream. Patches of native and non-native trees are present in a grassy meadow. Pacific willows are located next to the stream. Small patches of blackberry are becoming established in the meadow. A house and several outbuildings are still present.	Remove structures and the gravel driveway after access is no longer needed. Remove patches of blackberry and plant the disturbed areas and the open meadow with native trees and shrubs.
L5.1 and L5.2	244	Wetland / Stream	No wetland or stream was found on this parcel	None.
L5.1 and L5.2	244	Upland (Structures present)	Grasses dominate this area with areas of Himalayan blackberry and field morning glory becoming established. Cattail and other wetland plants are becoming established on recently graded and compacted areas where residential structures were recently removed. Several fruit trees are also present. There is an existing gravel driveway and several mounds of gravel.	Remove driveway, house, gravel, and associated fill. Remove blackberry and field morning glory, and plant with native trees and shrubs.

Table A-1. Existing conditions and proposed mitigation actions by parcel for Wetland A17 (continued).

Sheet Number	Parcel Number	Location	Existing Conditions	Proposed Mitigation Actions
L5.4	254	Wetland / Stream	Creeping buttercup is dominant in the wetland, with some Himalayan blackberry on the south and north sides. A Douglas fir on the east and a western redcedar on the west border the area.	Remove Himalayan blackberry. Plant trees (western redcedar) in the wetland.
		Upland (Structures removed)	The area is vegetated with grasses and scattered trees (western hemlock, black cottonwood, and several fruit trees).	Remove buildings, driveway, and associated fill. Grade to smooth contours. Plant disturbed areas with trees and shrubs.
L5.4	261	Wetland / Stream	The wetland vegetation consists of creeping buttercup, field horsetail, and skunk cabbage, but a few red alder are also present. Blackberry is also present, especially along the perimeter of the wetland. A driveway has been constructed in the wetland, at the north edge of the wetland.	Remove Himalayan blackberry from wetland. Remove the driveway on the north side, between Parcel 254R and Parcel 261 and on the south side of the wetland between Parcels 261 and 218. Plant the open and disturbed areas with willow trees and shrubs.
		Upland (Structures removed)	Most of the area is grass. Coniferous trees are present on the south side, with big-leaf maple, western redcedar, and Douglas fir on the north side. Red alder saplings are becoming established on the parcel.	Protect existing conifers and big-leaf maple. Plant sun-tolerant trees and shrubs in open meadow areas.

APPENDIX B

**RESTRICTIVE COVENANT
MILLER CREEK MITIGATION AREA**

AR 052327

DRAFT
10/30/00

RECORDED AT THE REQUEST OF
AND AFTER RECORDING RETURN TO:

**DECLARATION OF RESTRICTIVE COVENANTS
(Miller Creek Mitigation Area)**

Grantor: Port of Seattle, a Washington municipal corporation.

Grantees: Port of Seattle, a Washington municipal corporation

Legal Description: _____
Official legal description attached on Exhibit A.

Assessor's Tax Parcel ID#: _____

Reference # (If applicable): N/A

This Declaration of Restrictive Covenants (this "Declaration") is made as of this _____ day of _____, _____, by the Port of Seattle, a Washington municipal corporation (the "Port") as required by the Washington State Department of Ecology ("Ecology") Order number _____ and the Seattle District Office of the U.S. Army Corps of Engineers ("Corps") Section 404 Permit Number _____, each as more particularly described in Recital C, below.

RECITALS

A. The Port is the owner of those certain real properties located in King County, Washington and described as follows: (i) the real property adjacent to or near Miller Creek (the "Miller Creek Mitigation Area"); (ii) the real property adjacent to or near Miller Creek, Lora Lake, and the former Vacca Farm (the "Miller Creek/Lora Lake/Vacca Farm Wetland and Floodplain Mitigation Area"); (iii) the real property adjacent to or near the Tyee Valley Golf Course property (the "Tyee Valley Golf Course Mitigation Area"); (iv) the real property comprising approximately 67-acres located in the City of Auburn (the "Auburn Wetland Mitigation Area"); (v) the real property adjacent to or near Des Moines Creek (the "Des Moines Creek Mitigation Area"); and (vi) the real property at and adjacent to the Tyee Detention Pond (the "Tyee Detention Pond Area") (collectively, the "Miller Creek Mitigation Area," the "Miller Creek/Lora Lake/Vacca Farm Wetland and Floodplain Mitigation Area," the "Tyee Valley Golf Course Mitigation Area," the "Des Moines Creek Mitigation Area," the "Tyee Detention Pond Area," and the "Auburn Wetland Mitigation Area" are referred to herein as the "Mitigation Sites"). This Declaration relates to the Miller Creek Mitigation Area, which is legally described in Exhibit A attached hereto and by this reference incorporated herein.

B. In connection with the construction of a third runway and other improvements at Seattle-Tacoma International Airport, the Port proposed certain mitigation activities for the Mitigation Sites that include: stream riparian/buffer enhancements, stream baseflow augmentation, floodplain and wetland enhancement, and construction of replacement wetlands.

C. In order to comply with Ecology's Order # _____ ("Ecology's Order"), and the Corps Section 404 Permit # _____ ("Corps Permit"), for the Port's mitigation activities at the Mitigation Sites, the Port has executed this Declaration regarding the Miller Creek Mitigation Area, and has executed similar Declarations for the other Mitigation Sites, to submit the Miller Creek Mitigation Area to the covenants, conditions, and restrictions herein.

NOW, THEREFORE:

1. Declaration. The Port hereby declares that the Miller Creek Mitigation Area (hereinafter, the "Mitigation Area") shall be subject to the covenants, conditions, and restrictions stated herein which shall be binding on all parties having any right, title, or interest in the Mitigation Area or any part thereof and shall inure to the benefit of each subsequent owner thereof.

2. **Purpose.** The purpose of this Declaration is to meet the requirements of the federal Clean Water Act and state water quality standards as set forth in Ecology's Order and the Corps Permit, and to restrict development and construction activities within the Mitigation Area.
3. **Restrictive Covenants.** The Mitigation Area shall be used as a natural vegetative buffer, and no development activity including clearing, grading, filling, or the construction of any building, structure, or other improvement shall occur in the Mitigation Area, except for the following:
 - a. Activities authorized in the Corps/Ecology-approved Natural Resource Mitigation Plan to construct and establish the mitigation. Existing uses in the Mitigation Area may continue until the uses are removed or halted during construction of the mitigation.
 - b. Wildlife management control actions pursuant to and governed by the current Wildlife Hazard Management Plan or any subsequent version of the Plan adopted by the Port in cooperation with the U.S. Department of Agriculture's Wildlife Services Program and the Federal Aviation Administration pursuant to Title 14 of the Code of Federal Regulations (Section 139.337). Prior to the adoption of any subsequent version of the Plan, the Plan shall be submitted to the Corps and Ecology for review and comment regarding potential impacts on the Mitigation Area. If during review and comment, the Corps or Ecology identifies any impacts to the functions and values of the Mitigation Area, the Port shall within 60 days submit to the Corps and Ecology a conceptual plan that compensates for the identified impacts and, within 90 days following Corps and Ecology approval of the conceptual plan, submit for approval a final compensation plan.
 - c. Monitoring, maintenance, and contingency actions pursuant to Ecology's Order and the Corps Permit, including but not limited to removal of exotic, non-native, invasive vegetation to satisfy the mitigation performance standards.
 - d. Construction of stormwater drainage channels as authorized in writing by the Corps and Ecology, and maintenance of those channels.
 - e. Continuation, including maintenance and reconstruction, of the existing underground sanitary sewer trunk line, owned and operated by the Southwest Suburban Sewer District or its successor; and partial relocation of this line as authorized in writing by the Corps and Ecology.

- f. Installation of water and air quality monitoring equipment as authorized in writing by the Corps and Ecology, and maintenance of the equipment.
- g. Vegetation height control to maintain FAA required approach slopes and radar coverage.
- h. Removal of trees that a certified arborist has recommended be removed to prevent a hazard to persons or property. The Port shall replant areas where trees are removed, as necessary to maintain consistency with the Corps/Ecology-approved Natural Resources Mitigation Plan.
- i. Other activities authorized in writing by the Corps and Ecology.

Following any activity in the Mitigation Area, as authorized above, the Port shall restore the Mitigation Area to the condition contemplated in the Corps/Ecology-approved Natural Resource Mitigation Plan (except for any authorized structure or use that will remain in the Mitigation Area).

- 4. **Default; Remedies.** Any violation of a covenant or condition in this Declaration shall be considered a violation of Ecology's Order and the Corps Permit, and this Declaration may be enforced pursuant to the terms of Ecology's Order and the Corps Permit.
- 5. **Binding Effect.** The Declaration shall run with the land and be binding upon the Port and its successors and assigns.
- 6. **Captions.** The captions and paragraph headings contained in this Declaration are for convenience and reference only and in no way define, describe, extend, or limit the scope or intent of this Declaration, nor the intent of any provision hereof.
- 7. **Recording.** This Declaration shall be recorded in the real property records of King County.
- 8. **No Third Party Rights.** Nothing in this Declaration, express or implied, is intended to confer upon any person, other than the Port and its successors and assigns any rights or remedies under or by reason of this Declaration; provided that this Declaration may be enforced by the Corps or Ecology as described herein.
- 9. **Governing Law.** This Declaration shall be governed by and construed in accordance with the laws of the state of Washington.

EXECUTED AND EFFECTIVE as of the date first written above.

PORT OF SEATTLE, a Washington municipal
corporation

By: _____
Name: _____
Its: _____

STATE OF WASHINGTON)
) ss.
COUNTY OF _____)

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that he was authorized to execute the instrument and acknowledged it as the _____ of the Port of Seattle, a Washington municipal corporation, to be the free and voluntary act of such municipal corporation for the uses and purposes mentioned in the instrument.

Dated this _____ day of _____, _____.

(Signature of Notary)

(Legibly Print or Stamp Name of Notary)

Notary public in and for the state of
Washington, residing at _____
My appointment expires: _____