

Kenny, Ann

From: Stockdale, Erik
Sent: Thursday, September 13, 2001 11:45 AM
To: Kenny, Ann
Subject: FW: MRNP Tables



Tables 4.1-1,
4.1-3.doc

Here's the latest NRMP mitigation summary tables. I gave them to Andy McMillan, per his request.

Erik

-----Original Message-----

From: Art Anderson [mailto:aanderson@parametrix.com]
Sent: Thursday, September 13, 2001 11:20 AM
To: Stockdale, Erik
Cc: Jim Kelley
Subject: MRNP Tables

As requested by Jim Kelley @ Parametrix
Table 4.1-1 and 4.1-3 of the Natural Resource Mitigation Plan, 2001

Table 4.1-1. Summary of mitigation actions and their relation to National Environmental Policy Act, State Environmental Policy Act, and Clean Water Act mitigation sequencing requirements.

Mitigation Requirement	Proposed Mitigation Action
New Third Runway	
Avoid the impact by not taking a certain action or parts of an action.	<p>Avoid fill in wetlands and Miller Creek by designing the runway to meet the minimum operational, engineering, safety, and maintenance standards.</p> <p>Locate, where feasible, permanent stormwater detention ponds in uplands. Avoid excavation within 50 ft of Category II and III wetlands in Borrow Area 3.</p> <p>Avoid wetlands in Borrow Area 1 where practical.</p> <p>Construct retaining walls at the northwest end of the runway to reduce impacts to Miller Creek and Category II wetlands (Wetlands 8, 9, and A1) located at the north end of the project.</p> <p>Install a retaining wall near the west-central portion of the embankment to reduce impacts to Category II Wetlands 18 and 37 and avoid relocating a second segment of Miller Creek.</p>
Minimize the impact by limiting the degree or magnitude of the action.	<p>Place a retaining wall near the southwest end of the runway to reduce impact to a Category II wetland (Wetland 44).</p> <p>Design Borrow Areas 1 and 3 with a 150- to 200-ft setback from Des Moines Creek to minimize potential impact to the stream and its buffers.</p> <p>Implement stormwater pollution prevention plans (SWPPPs) prior to any construction project.</p>
Rectify the impact by restoring the affected environment.	<p>Remove temporary stormwater management facilities located in wetlands following construction. These disturbed areas will be restored to pre-construction conditions</p>
Reduce the impact over time by preservation and maintenance actions during the life of the action.	<p>Establish and enhance a 100-ft average (minimum 50-ft) forested buffer on both banks of Miller Creek to reduce potential construction and operational impacts to riparian wetlands and aquatic resources.</p> <p>Maintain hydrology to wetlands by directing seepage water from the embankment to wetlands downslope of the embankment.</p> <p>Provide water quantity and water quality mitigation to protect aquatic habitat in Miller Creek from stormwater impacts during operation.</p>
Compensate for the impact by replacing, enhancing, or providing substitute resources.	<p>Restore the Vacca Farm wetland/floodplain area, including creating new floodplain, restoring wetland hydrology and vegetation, and providing protective buffers.</p> <p>Restore and enhance Miller Creek instream habitat in the Vacca Farm area.</p> <p>Restore natural channel morphology to a ditched and channelized reach of the stream.</p> <p>Enhance instream habitat and place LWD in Miller Creek and enhance adjacent riparian buffers between Vacca Farm and Des Moines Memorial Drive.</p> <p>Enhance wetlands along Miller Creek within the 100-ft buffer by restoring native vegetation and removing invasive non-native species.</p> <p>Construct replacement drainage channels west of the embankment to replace filled drainage channels.</p>

Table 4.1-1. Summary of mitigation actions and their relation to National Environmental Policy Act, State Environmental Policy Act, and Clean Water Act mitigation sequencing requirements (continued).

Mitigation Requirement	Proposed Mitigation Action
Compensate for the impact by replacing, enhancing, or providing substitute resources (continued).	<p>Restore wetlands on the Tye Valley Golf Course, including restoring wetland vegetation to reduce wildlife hazards and improve water quality.</p> <p>Enhance aquatic habitat in Des Moines Creek by restoring a 100-ft-wide forest/shrub buffer along the stream between the Northwest Ponds and the proposed SR 509 right-of-way (ROW).</p> <p>Provide a \$300,000 trust fund to enhance fisheries habitat in Miller and Des Moines Creeks.</p> <p>Create replacement wetlands at an off-site location for the loss of wildlife habitat within 10,000 ft of the airport runways.</p> <p>Monitor mitigation projects for compliance with performance standards and other permit conditions.</p> <p>Monitor stormwater runoff for compliance with National Pollutant Discharge Elimination System (NPDES) requirements.</p> <p>Monitor remaining wetlands downslope of the new embankment (i.e., between the embankment and Miller Creek) for indirect impacts to wetland hydrology.</p>
Runway Safety Areas	
Avoid the impact by not taking a certain action or parts of an action.	Construct retaining walls to support relocated South 154 th Street and avoid permanent fill in Wetlands 3 and 4.
Minimize the impact by limiting the degree or magnitude of the action.	Construct retaining walls to support relocated South 154 th Street and reduce permanent fill and minimize temporary impacts in Wetland 5.
Rectify the impact by restoring the affected environment.	Implement SWPPPs prior to any construction project.
Reduce the impact over time by preservation and maintenance actions during the life of the action.	Restore wetland areas temporarily impacted by required TESC facilities.
Compensate for the impact by replacing, enhancing, or providing substitute resources.	Provide water quantity and water quality mitigation to protect wetlands and other receiving waters from stormwater impacts during operation.
Monitor the impact and take appropriate corrective actions.	Restore the Vacca Farm wetland/floodplain area to provide hydrologic and water quality functions.
	Create replacement wetlands for wildlife habitat (greater than 10,000 ft from the airport runways at the Auburn site).
	Monitor remaining wetlands for indirect impacts to hydrology.
	Monitor mitigation projects for compliance with performance standards and other permit conditions.
	Monitor stormwater runoff for compliance with NPDES requirements.
South Aviation Support Area	
Avoid the impact by not taking a certain action or parts of an action.	Design the SASA footprint to avoid relocation of Des Moines Creek.
Minimize the impact by limiting the degree or magnitude of the action.	Temporary impacts to Des Moines Creek and Wetland 52 are not anticipated.
	Design the SASA to avoid direct impacts to forested wetland (Wetland 52) that provides groundwater discharge functions.

Table 4.1-1. Summary of mitigation actions and their relation to National Environmental Policy Act, State Environmental Policy Act, and Clean Water Act mitigation sequencing requirements (continued).

Mitigation Requirement	Proposed Mitigation Action
Reduce the impact over time by preservation and maintenance actions during the life of the action.	Design water quantity and water quality mitigation to protect wetlands from stormwater impacts.
Rectify the impact by restoring the affected environment.	Restore potential temporary impacts to Des Moines Creek and Wetland 52.
Compensate for the impact by replacing, enhancing, or providing substitute resources.	Restore wetlands on the Tyee Valley Golf Course to provide water quality and hydrologic benefits to replace lost wetland functions. Construct replacement wetlands for wildlife habitat (greater than 10,000 ft from the airport runways at the Auburn site). Enhance and restore a 100-ft-wide forest/shrub buffer along Des Moines Creek to enhance aquatic habitat. Provide a trust fund for enhancement of fisheries habitat of Des Moines Creek.
Monitor the impact and take appropriate corrective actions.	Monitor Wetland 52 for indirect impacts to wetland hydrology. Monitor mitigation projects for compliance with performance standards and other permit conditions. Monitor stormwater runoff for compliance with NPDES requirements.
On-site Borrow Source Areas	
Avoid the impact by not taking a certain action or parts of an action.	Redesign development areas within Borrow Areas 1 and 3 to avoid excavation of 12 wetlands (Wetlands B1, B4, B5, B6, B7, B9, B10, B15a, B15b, 29, 30, and 48).
Minimize the impact by limiting the degree or magnitude of the action.	Establish a 150- to 200-ft buffer between Borrow Area 1 and Des Moines Creek to avoid impacts to stream hydrology and riparian buffers. Follow a TESC Plan to eliminate siltation reaching wetlands or Des Moines Creek from excavation activities. Establish final surface grades in Borrow Area 1, and construct interceptor swale system in Borrow Area 3, to direct surface water runoff and groundwater seepage to wetlands near borrow areas, and minimize and avoid indirect hydrology impacts. Maintain BMPs throughout the operating period to ensure adjacent wetlands will be protected from adverse construction-related activities.
Reduce the impact over time by preservation and maintenance actions during the life of the action.	Maintain BMPs throughout the operating period to ensure adjacent wetlands will be protected from adverse construction-related activities.
Compensate for the impact by replacing, enhancing, or providing substitute resources.	Restore wetlands on the Tyee Valley Golf Course to compensate for water quality and hydrologic support functions impacted in the Des Moines Creek basin. Enhance a 100-ft-wide forest/shrub buffer along Des Moines Creek to enhance aquatic habitat. Provide a trust fund for enhancement of fisheries habitat of Des Moines Creek.
Monitor the impact and take appropriate corrective actions.	Monitor Wetlands B1, B4, B5, B6, B7, B9, B10, B15a, B15b 29, 30, and 48 for potential indirect impacts to wetland hydrology from excavation activities. Monitor stormwater runoff and TESC for compliance with NPDES requirements.

Table 4.1-3. Summary of wetland mitigation credit for Seattle-Tacoma International Airport Master Plan Update improvements

Mitigation	Mitigation Area (acres)	Mitigation Credit
In-Basin		
<u>Wetland Restoration</u> – Credit ratio 1:1		
Vacca Farm (prior converted cropland and other upland)	6.60	6.60
<u>Wetland Enhancement</u> – Credit ratio 1:2		
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
Wetland A17	2.85	1.43
Subtotal	30.91	18.76
<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	0.27	0.05
Tyee Valley Golf Course Mitigation Area Buffer	1.57	0.31
West Branch Des Moines Creek Buffer	3.38	0.68
Wetland A17	8.60	1.72
Subtotal	59.26	11.85
<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 Mitigation ^{a, b}	113.72	32.95
Out-of-Basin		
<u>Wetland Creation</u> ^c - 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 Mitigation	65.38	42.93
Total Mitigation ^d	179.1	75.86

^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 Mitigation areas in the Des Moines and Miller Creek watersheds are 34.01 acres and 68 acres, respectively; in-basin mitigation area divided by wetland impact (18.37 acres) provides 6.1:1 aerial replacement ratio.

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

^d Total mitigation area divided by wetland impact (18.37 acres) provides a 9.7:1 aerial replacement ratio; total mitigation credit divided by wetland impact (18.37 acres) provides a 4.1:1 replacement ratio.