Fernhill Regional Wetland Mitigation Bank Instrument

Clean Water Services

March 17, 2005

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FERNHILL REGIONAL WETLAND MITIGATION BANK

FOREST GROVE, WASHINGTON COUNTY, OREGON

MEMORANDUM OF AGREEMENT

TO

ESTABLISH A WETLAND MITIGATION BANK

BETWEEN

CLEAN WATER SERVICES (CWS), SPONSOR

AND

US ARMY CORPS OF ENGINEERS (CORPS)
OREGON DEPARTMENT OF STATE LANDS (DSL)
U.S. FISH AND WILDLIFE SERVICE (USFWS)
U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ)
OREGON DEPARTMENT OF FISH AND WILDLIFE (ODFW)
TUALATIN SOIL AND WATER CONSERVATION DISTRICT

FERNHILL REGIONAL WETLAND MITIGATION BANK

Forest Grove, Washington County, Oregon

Memorandum of Agreement

INTRODUCTION

The parties to this Memorandum of Agreement (the "Agreement") have participated in the development of the Mitigation Banking Instrument ("the Instrument") for the Fernhill Regional Wetland Mitigation Bank ("the Bank"). The Instrument, dated January 14, 2005, contains the details of the mitigation site plan, goals, objectives, performance standards, monitoring and contingency plans, and reference site information for Phase I of the Bank. By signing this agreement, the parties approve the Instrument and the mitigation site plan described within it. This agreement relies upon and supplements the commitments expressed in the Instrument by CWS, the Bank sponsor. Subsequent phases, if pursued by CWS, will undergo a similar review and approval process and will be addressed in amendments to the Instrument.

1. PURPOSE OF THE BANK

The purpose of the bank is to provide compensatory wetland mitigation for anticipated losses to wetland functions and values resulting from activities authorized by permit, or in certain cases, to resolve violations, from the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act and/or from Oregon Department of State Lands (DSL) under the State Removal-Fill Law. The bank is designed primarily to provide compensatory mitigation for impacts to emergent, scrub-shrub and forested wetlands in the riverine hydrogeomorphic class within the service area. The Corps and the DSL reserve the right to allow bank use for out-of-kind mitigation on a case-by-case basis, provided that the bank is replacing wetland functions lost on a given project.

2. GOALS

The long-term ecological goals of the Bank are:

1) To provide appropriate and adequate compensatory mitigation for permitted wetland impacts;
2) To emphasize natural hydrology while maintaining flexibility in water management;
3) To protect and enhance wildlife habitat;
4) To provide additional floodplain storage; and
5) To improve water quality.

3. MITIGATION BANK SITE

The Bank is located near the confluence of Gales Creek and the Tualatin River, approximately one mile south of Forest Grove, in Washington County, Oregon (see the Instrument, Figure 1). The property where the Bank is located covers approximately 362 acres. The use of the property for a mitigation bank is consistent with the local land use plan. Phase 1 of the Bank will consist of 27.94 acres, as shown in the site plan (see the Instrument, Figure 4).

4. SERVICE AREA

The Bank's service area is the Tualatin River Basin below 500 feet elevation (see the Instrument, Figure 5). The only exception to the Tualatin River Basin geographic limit is the potential use of the Bank for the Barney Reservoir Mitigation Project. The U.S. Army Corps of Engineers Permit 199201059 states that a portion of the area where the

Bank will be located may be used as a contingency mitigation site if there are mitigation failures at the Barney Reservoir requiring offsite mitigation actions (The Corps, 1992).

5. DEFINITIONS

The definitions contained in Oregon Revised Statutes 196.600 and Oregon Administrative Rules 141-085-0415 are hereby incorporated by reference.

6. PERFORMANCE STANDARDS

The performance standards for the Bank are stated in the Instrument under the heading "Performance Standards; Monitoring" (see pages 10-12). Performance standards are provided for vegetative structure, successional trajectory, hydrology, wildlife habitat, flood storage, and water quality.

7. MONITORING AND CONTINGENCY PLANS

Monitoring and contingency plans are stated in the Instrument under the heading "Performance Standards; Monitoring" and "Contingency Plan" (see pages 10-12).

CWS, as the Bank sponsor, acknowledges its responsibility to perform all actions necessary to correct any failure to meet the performance standards, and will provide the necessary financial assurance to allow the Corps and DSL to undertake any such corrective actions if CWS should fail or be unable to do so. The financial assurance shall be in the form of an agreement with Washington County, the treasurer of CWS' funds. Under the terms of the agreement, Washington County will deposit $100,000 in CWS funds in the State Investment Pool. These funds will serve as performance security for the Bank, and may be accessed only in accordance with the terms of the performance assurance agreement. Monitoring and maintenance costs will be paid out of a dedicated CWS budget fund for mitigation bank transactions.

8. CREDITS

The development of Phase I of the Bank as described in the Instrument will result in the establishment of 17.65 mitigation credits. The Mitigation Bank Review Team (MBRT) has agreed that wetland hydrology has been established within the "casper" area; 30% of the credits to be obtained within this area will be released once the Bank becomes effective. The remainder of the credits will become available for sale by CWS, the Bank sponsor, once the Corps and DSL certify them in writing. The certification of credits will be determined in accordance with the accounting procedures stated in the Instrument (see page 10).

In the event of vandalism or natural disasters, such as earthquakes, drought, or volcanic activity, which may interfere with CWS's ability to fulfill the terms of this agreement and the Instrument, no further credits will be sold unless the Bank site is restored. Proposed restoration measures are subject to prior approval by the Corps and DSL, with the advice of the MBRT.

9. REPORTS

Annual monitoring reports have been prepared since 1999 and will continue to be prepared until five years after the sale of the last remaining whole or partial mitigation bank credit. The monitoring reports will be submitted to the Corps, DSL and the MBRT by November 30 of each year. The reports will address progress toward meeting the performance standards and any actions taken to correct deficiencies.

Reports of credits earned, sold and remaining will be prepared annually and submitted to the Corps, DSL and the MBRT along with the monitoring reports. In addition, the Corps and DSL will be notified of each credit sale at the time it occurs, and will be sent a copy of the transaction document.

10. EFFECTIVE DATE

This agreement will become effective when all of the following conditions are met:

1. This agreement has been signed by CWS, the Corps and DSL;
2. A performance assurance in the amount of $100,000.00 has been obtained by CWS and approved by the Corps and DSL (Instrument, Appendix H); and
3. The Declaration of Covenants and Restrictions for Phase I of the Fernhill Regional Wetland Mitigation Bank has been signed by CWS and recorded in the Washington County Deed Records (Instrument, Appendix I).

11. AMENDMENTS; WAIVERS

No waiver of any portion of this Agreement and no amendment, modification or alteration of this Agreement shall be effective unless in writing and signed by CWS, the Corps and DSL, after having sought the advice of other parties.

12. TERMINATION

This agreement will terminate five (5) years after the date the last available whole or partial credit is sold. This agreement may also be terminated by the mutual written agreement of CWS, the Corps and DSL, with the advice of the MBRT. In the event of the voluntary termination of this agreement prior to the end of the sale of mitigation credits, CWS shall continue to be responsible, at its sole cost and expense, for preparing and submitting annual monitoring reports to the Corps, DSL and the MBRT in accordance with paragraph 10 of this Agreement, until five (5) years after the sale of the last whole or partial mitigation credit.

13. OBLIGATIONS AND ROLES OF THE PARTIES

CWS: CWS, the Bank sponsor, is responsible for the implementation of the mitigation site plan and for the monitoring, maintenance and remediation of the mitigation site. The mitigation site plan is contained in the Instrument. CWS will use its best efforts to ensure the success of Bank development efforts. CWS will report the results of the annual monitoring of the Bank site. CWS will manage and report mitigation bank credit sales and balances. CWS will comply with federal and state law, and the requirements of local zoning ordinances and land use plans. CWS will use its best efforts to obtain any water rights required to implement the mitigation site plan.

Corps and DSL: The Corps and DSL are the agencies with regulatory responsibility and authority for the Bank. The Corps and DSL shall: A) determine when and if mitigation bank credits can be certified and made available for sale; B) review all reports submitted by CWS; C) determine the adequacy of the mitigation site work; D) determine the need for remedial measures; E) determine the adequacy of completed remedial measures; F) undertake remedial measures when and if CWS fails to implement the required measures; and G) determine when and if mitigation bank credits can be used by permit applicants to satisfy the compensatory mitigation requirements of individual permits. The Corps and DSL will seek the advice of the MBRT, and will fully consider such advice before making decisions that pertain to this Agreement.

MBRT: The MBRT will serve as an advisory body. The MBRT members that sign this Agreement accept and approve the terms of this Agreement and the Instrument. The MBRT will review all reports submitted by CWS, will participate in meetings and site visits to review the success and operation of the Bank, and will advise the Corps and DSL before these agencies make decisions that pertain to this Agreement.

14. INTEGRATION

This document constitutes the entire agreement between the parties and supersedes all prior or contemporaneous written or oral understandings, representations or communications of every kind. No course of dealing between the parties and no usage of trade shall be relevant to supplement any term used in this Agreement. Acceptance or acquiescence in a course of performance rendered under this Agreement shall not be relevant to determine the

meaning of this Agreement and no waiver by a party of any right under this Agreement shall prejudice the waiving party's exercise of the right in the future.

15. INTERPRETATION OF AGREEMENT

The paragraph headings contained in this Agreement are for ease of reference only and shall not be used in constructing or interpreting this Agreement.

16. SEVERABILITY/SURVIVAL

If any of the provisions contained in this Agreement are held illegal, invalid or unenforceable, the enforceability of the remaining provisions shall not be impaired.

17. APPROVAL REQUIRED

This Agreement and all amendments shall not be effective until approved by CWS's General Manager or the General Manager's designee and, when required by applicable CWS rules, CWS's Board of Directors.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed the day and year first written above.

Bank Sponsor:

Bill Gaffi, General Manager
Clean Water Services

Date: 4/14/05

Authorizing Agencies:

Richard W. Hobernicht
Colonel, Corps of Engineers
District Engineer

Date

Ann Hanus
Director
Oregon Department of State Lands

6/14/05
Date

Fernhill Regional Wetland Mitigation Bank Review Team Member

_____ _____

Elbert Moore, Director Date
Office of Ecosystems and Communities
EPA-Region 10

Fernhill Regional Wetland Mitigation Bank Review Team Member

Kemper M. McMaster, Director Oregon State Office U.S. Fish and Wildlife Service	Date

Fernhill Regional Wetland Mitigation Bank Review Team Member

_____ _____

Stephanie Hallock, Director Date
Oregon Department of Environmental Quality

Fernhill Regional Wetland Mitigation Bank Review Team Member

_____ _____

Lindsay Ball, Director Date
Oregon Department of Fish and Wildlife

Fernhill Regional Wetland Mitigation Bank Review Team Member

Eldon Jossi, Chair Tualatin Soil & Water Conservation District	Date

Mitigation Bank Instrument

Preamble

The Fernhill Regional Wetland Mitigation Bank ("the Bank") will be established and operated in accordance with the *Oregon Administrative Rules for Compensatory Wetland Mitigation Banking* (OAR 141-085-0400 through OAR 141-085-0445) and the policies of the U.S. Army Corps of Engineers (the Corps), which are consistent with the Oregon rules. The Oregon rules include the following policies:

141-085-0410 Policies

1) Mitigation banks, as described under the Oregon Wetlands Mitigation Bank Act of 1987 (ORS 196.600 through 196.665), can only be used to provide compensatory wetland mitigation for anticipated losses in wetland function(s) and value(s) when on-site mitigation is not practicable or when off-site mitigation is environmentally preferable.

2) The availability or use of mitigation banks shall not:

   a) Create a presumption that the Division will be more willing to allow wetland losses under the Removal-Fill Law (ORS 196.800 through 196.990), or
   b) Eliminate the requirement to fully demonstrate that the applicant for a Removal-Fill Permit has considered alternatives that avoid and/or minimize losses to jurisdictional wetlands, or
   c) Eliminate the requirement to comply with 141-85-045, Removal Permit Policy, and 141-85-050, Fill Permit Policy.

The Bank will be located at the confluence of Gales Creek and the Tualatin River in Washington County, Oregon as shown in Figure 1. The Bank's service area is the Tualatin River Basin below 500 feet elevation as shown in Figure 2. The Bank will be used to provide compensatory mitigation for impacts to emergent, scrub-shrub and forested wetlands within the service area. The Bank is not intended to displace or transfer essential wetland, riparian, or corridor functions from a given subbasin or drainage of the Tualatin Basin to the Bank. Essential wetland functions unique to a certain location should not be transferred to the Bank.

In some cases, however, it may be appropriate to separate wetland functions, keeping certain functions (such as flood control) within a given subbasin or drainage, yet allowing certain other functions (such as waterfowl habitat) to be "transferred" to the Bank. These decisions shall remain within the purview of the DSL and the Corps, in conjunction with the other state and federal agencies involved in the wetland permitting process.

Phase 1 of the Bank will occupy 27.49 acres (see Figure 3) of the 362-acre site. A site plan for Phase 1 is shown in Figure 4. Of this amount, there will be 16.03 acres of created palustrine forested wetland, 2.00 acres of enhanced palustrine forested wetland, 3.26 acres of created palustrine scrub-shrub wetland, and 6.20 acres of created palustrine emergent wetland. Note: some acreage figures shown on maps in the appendices vary from the foregoing and should be disregarded.

Mitigation Bank Need

Clean Water Services (CWS) is developing the Bank to address the future mitigation needs of public and private sector organizations. These include CWS, the cities within Washington County, Washington County, the Joint Water Commission (which includes the Tualatin Valley Water District, and the cities of Beaverton, Forest Grove and Hillsboro), as well as private developers.

CWS provides wastewater treatment and surface water management services to the urban portion of Washington County. In that capacity, CWS is continually installing, rehabilitating and expanding sewer lines and surface and stormwater facilities. CWS must also continually build or replace pump stations and related utility infrastructure. Because of the unique needs of some of this work, the filling of wetlands and waterways is occasionally unavoidable and requires compensatory wetland mitigation.

The Tualatin Valley Water District and the Joint Water Commission are the suppliers of domestic and industrial water for most of Washington County. These utilities are continually constructing new pipelines and associated infrastructure to meet the needs of the public and industry. At times, the filling of wetlands and waterways is unavoidable and requires compensatory mitigation.

Washington County is one of the fastest growing counties in the State of Oregon. Urbanization within the Bank's service area (see Figure 5) is occurring at a rapid rate. According to DSL's Summary of Activities in the Removal-Fill Program July, 1, 1993 through June 30, 1995, there were between 75 and 100 permit actions or filings in Washington County that required wetland mitigation, most of which were located within the Bank's service area. There were six instances during this timeframe when applicants paid into the Wetlands Mitigation Bank Revolving Fund Account. As urban in-fill occurs under the 2040 Regional Land Use Plan, more wetland and riparian areas will experience development pressure because undeveloped land is often associated with a wetland or stream.

Discussions were held with a senior vice president from an international construction and investment firm, and with a leading land use attorney regarding the need for a wetland mitigation bank in the Tualatin Basin. Both strongly supported the concept of a mitigation bank that could be utilized "in the marketplace." Both indicated that there is a broad need for a mitigation bank to meet the growing demand of development and infrastructure. Each of these individuals had personally experienced instances where adequate or appropriate mitigation was not available onsite (to provide mitigation for the fill action) and a mitigation bank would have been preferable for ecological as well as economic reasons. In the words of one, "the cost of the mitigation credits is not the issue; the availability of mitigation credits is the issue."

Mitigation Bank Goals and Objectives

The goals and objectives of the Bank are as follows:

Goal #1: Provide appropriate and adequate compensatory mitigation for permitted wetland impacts

Objectives:

- Create 16.03 acres of palustrine forested wetland habitat, enhance 2 acres of palustrine forested wetland habitat, create 6.2 acres of palustrine emergent wetland habitat, and create 3.26 acres of palustrine scrub-shrub wetland habitat.
- Achieve a successional trajectory that will result in conditions that mimic the conditions found at the reference wetlands.

Goal #2: Emphasize natural hydrology

Objectives:

- Create seasonally saturated wetlands that will meet the hydrological needs of the desired vegetation communities
- Remove drain tile to restore natural hydrology
- Grade the site to encourage seasonal flooding

Goal #3: Protect and enhance wildlife habitat

Objectives:

- Create a diversity of wildlife habitats
- Improve existing wildlife corridors

- Enhance heron habitat
- Improve fish habitat

Goal #4: Provide additional floodplain storage

Objectives:

- Maintain levy breaches to re-connect floodplain with stream channel
- Re-grade floodplain to increase floodplain function

Goal #5: Improve water quality

- Restore wetland functions that benefit water quality, including vegetation that removes sediment and excess nutrients from runoff; restore vegetation that increases shade, thereby promoting cooler water temperatures

Land Ownership

The property that will be used for the Bank is located south of the City of Forest Grove near the confluence of Gales Creek and the Tualatin River (Figures 1 and 3). The property is bordered to the north by Bonneville Power Administration (BPA) transmission lines, to the south by the Tualatin River, to the east by Fernhill Road, and to the west by Gales Creek (these boundaries are approximate). Also to the south is an intake facility that provides water to the Joint Water Commission for drinking water, and to the Tualatin Valley Irrigation District for agricultural irrigation.

Proof of ownership of the property is provided by a Special Warranty Deed dated October 1993. The grantors are Multnomah School of the Bible, the Salvation Army, Northwest Good Shepherd Homes, George Fox College, Pacific University, Ava Zurcher, Peter J. Zurcher and Roger L. Zurcher. The deed was recorded in Washington County under Number 93090646. A copy of the deed is in Appendix A.

Land Use Approval

Washington County has approved the development of the Bank. A copy of the County's Notice of Decision is in Appendix K.

Geographic Service Area

The Bank's service area is the Tualatin River Basin below 500 feet elevation (see Figure 5). The Bank will be used to provide compensatory mitigation for impacts to emergent, scrub-shrub and forested wetlands within the service area. The only exception to the Tualatin River Basin geographic limit is the potential use of the Bank for the Barney Reservoir Mitigation Project. U.S. Army Corps of Engineers Permit 92-1059 states that a portion of the area where the Bank will be located may be used as a contingency mitigation site if there are mitigation failures at the Barney Reservoir that require offsite mitigation actions (The Corps, 1992).

Baseline Conditions

Historical and Existing Land Use

According to a Level 1 Environmental Site Assessment conducted by SRH Environmental Management (SRH), the property where the Bank will be located has been used primarily for farming since the early part of the 20th century. Irrigation water for the Bank site is purchased by CWS from the Tualatin Valley Irrigation District (TVID). In addition,

the property where the Bank will be located has natural flow water rights on the Tualatin River and Gales Creek. This water could be used at the Bank site if the TVID water were unavailable. The irrigation water is taken from Gales Creek and the Tualatin River and a natural flow water right is held for this purpose. Historically, the property where the Bank will be located has been utilized for various agricultural uses, such as dairy farming, pasture, truck farming, grain, and small fruit and nut orchards. Areas that were too wet for agriculture were either drained or altered in a manner that changed the hydrology, as indicated in Appendix B. Documents and photographs obtained from the Natural Resources Conservation Service (NRCS) indicate that the Bank site has been cultivated since at least 1964.

Diagrams dating back to 1964 indicate that extensive manipulation of the property where the Bank will be located was undertaken to improve agricultural productivity. The Zurcher brothers, who developed the property for crop production, participated in numerous agricultural assistance programs offered by the U.S. Department of Agriculture. Over three miles of levee were installed along Gales Creek and the Tualatin River to limit winter flooding. Over ten miles of agricultural tile was placed on the property to address wet soil and poor drainage conditions. Aerial photos show that portions of the property were forested prior to being converted to cropland.

There is no known contamination of the soils at the Bank site (SRH, 1991).

Hydrogeomorphic Setting

The Bank site is a riverine wetland according to the Hydrogeomorphic method (HGM) of wetland classification. Because of existing levee breaches, the site is seasonally flooded.

NWI Classification

According to the National Wetlands Inventory (NWI), the Bank site contains areas near the Tualatin River where palustrine forested wetlands extend slightly beyond the immediate riparian area (PFO1J). The NWI also indicates the presence of palustrine emergent wetlands (PEM5C) (Figure 5).

Hydrology

The soil at the Bank site is saturated because of a seasonally high water table, the ponding of precipitation from floodplain overflows, and from groundwater moving through the hyporheic zone between Gales Creek and the Tualatin River. Standing water is commonly observed from November through April. Fernhill Road is commonly closed due to flooding during the winter.

Over 53,300 linear feet of agricultural drainage tile was installed at the property where the Bank will be located through ASCS funding for "wet soil" problems. Tile installation began in 1964 and continued into the 1970's. Levee construction has substantially limited the ability of the Tualatin River to access its floodplain, reducing hydrologic contributions from the Tualatin River and Gales Creek.

Soils

The Soil Survey of Washington County indicates the presence of three soils at the Bank site: Chehalis (Unit 9), McBee (Unit 30), and Wapato (Unit 43). Wapato is a hydric soil, and the Chehalis and McBee soils have up to 15 percent Wapato soil inclusions. All of these soils are silty clay loams typically found in the Tualatin River floodplain.

A brief reconnaissance of the Bank site by David Evans and Associates in April of 1997 found indications of an extensive range of relic hydric soils. In particular, lower chromas, SIMs, and brighter mottles were commonly found 12"-18" below the ground surface. A wetland reconnaissance performed by Fishman Environmental Services in May of 1995 concluded that the site contained relic hydric soils. Additionally, a soils investigation by Brown and Caldwell Consultants in 1992 mapped hydric soils within a smaller area than indicated in the Soil Survey, presumably due to the agricultural tile and other site modifications.

In May of 1998 the NRCS identified the presence of existing wetlands, farmed wetlands, and prior converted wetlands at the property where the Bank will be located. This determination is shown in Figure 4 and in Appendix B. The NRCS found 2.1 acres of wetland, 12.9 acres of farmed wetland, and 37.2 acres of prior converted wetland.

Wildlife and Vegetation

The meandering character of the Tualatin River and Gales Creek provides habitat for a variety of reptiles, amphibians, birds, and fur bearers such as beaver, nutria, and mink. The adjacent riparian forest provides cover and nesting habitat for herons, wood ducks, mergansers, woodpeckers, red-tailed hawks, owls, and a variety of songbirds, including sparrows, finches, and warblers. Riparian vegetation species observed along Gales Creek and the Tualatin River include red alder (*Alnus rubra*), willow (*Salix* species), Oregon ash (*Fraxinus latifolia*), cottonwood (*Populus trichocarpa*), red osier dogwood (*Cornus stolonifera*), evergreen blackberry (*Rubus laciniatus*), Wood's rose (*Rosa woodsii*), Himalayan blackberry (*Rubus discolor*), snowberry (*Symphoricarpos albus*), reed canarygrass (*Phalaris arundinacea*), Queen Anne's lace (*Daucus carota*), and curly dock (*Rumex crispus*).

According to available NRCS records, clearing of the riparian forest at the property where the Bank will be located began in 1941, and by 1968 over 125 acres had been opened. A 1936 aerial photo is shown in Appendix B, indicating forested and shrub-scrub elements. A small remnant forested island remains, with a canopy that includes Oregon ash, black cottonwood, and big-leaf maple; a shrub layer that includes red-osier dogwood, elderberry, snowberry, and Himalayan blackberry, and groundcover that includes camas, pig-a-back plant, and Henderson's sedge. Otherwise, the property is currently an agricultural field used for corn and other row crop production. A proposed Voluntary Water Quality Farm Plan is shown in Appendix C. The Plan describes proposed Best Management Practices (BMPs) intended to protect wetland and aquatic resources.

Reference Wetlands

Palustrine Forested

The reference palustrine forested wetland (PFO) is a composite of two sites. The first is the forested grove of trees at the mitigation bank. The second is at the Jackson Bottom Wetlands Preserve. These wetlands serve as a substitute for a privately-owned wetland located on Geiger Slough. Permission to establish plots at the Geiger Slough wetland was denied by the property owner, so it cannot be used as a reference wetland. Species common to both wetlands are listed in Table 1. Percent coverage estimates are patterned after the Geiger Slough PFO, the forested grove PFO, and the Jackson Bottom PFO.

Table 1
Palustrine Forested Wetland

	Common Name	Stems/ Acre	Percent Cover	Wetland Indicator Status
Trees				
Alnus rubra	red alder	0-20	0-10	FAC
Fraxinus latifolia	Oregon ash	10-60	2-10	FACW
Salix spp.	Willow	20.-100	5-10	FACW+
Populous tricocarpa var. b	black cottonwood	5-15	2-10	FAC
Shrubs		--		
Cornus stolonifera	red-osier dogwood	--	5-15	FACW
Physocarpus capitatus	Pacific ninebark	--	0-5	FACW-
Symphoricarpos albus	common snowberry	--	5-25	FACU
Rosa nutkana	Nootka rose	--	0-5	FAC
Rosa pisocarpa	clustered rose		0-5	FACW
Rubus discolor	Himalayan blackberry	--	0-5	FACU
Spiraea douglasii	Douglas spiraea	--	5-15	FACW
Herbs				
Carex spp	all sedges	--	5-10 5-10	FACU-OBL
Juncus spp	all rush	--		FAC-FACW

	Common Name	Stems/ Acre	Percent Cover	Wetland Indicator Status
			5-10	
Glyceria elata	tall mannagrass	--	0-5	FACW+
Glyceria occidentalis	northwestern manna grass	--	0-5	OBL
Equisetum telmatiea	giant horsetail	--	0-5	FACW
Juncus ensifolius	daggerleaf rush	--	0-5	FACW
Phalaris arundinacea	reed canarygrass	--	5-15	FACW
Scirpus microcarpus	small-fruited bulrush	--	0-5	OBL
Camassia quamash	common camas	--	0-2	FACW
Rubus ursinus	trailing blackberry	--	0-2	FACU
Stachys cooleyae	great hedge-nettle	--	0-2	FACW
Tolmiea menziesii	piggy-back plant	--	0-2	FAC
Veronica americana	American brooklime	--	0-2	OBL
Solanum dulcamara	climbing nightshade	--	0-1	FAC+
Rumex salicifolius	willow dock	--	0-1	FACW
Oenanthe sarmentosa	water parsley	--	0-1	OBL
Athyrium filix-femina	lady fern	--	0-2	FAC

Canopy coverage in the Jackson Bottom wetland approaches 100 percent. Stem density is estimated to range from 100 to 150 per acre (17-to 20-feet on-center). The Geiger Slough PFO supports a much denser stand of slough sedge than that found at Jackson Bottom, where it occurs in widely-spaced clumps. The forested grove PFO canopy coverage also approaches 100 percent, with similar stem density.

Palustrine Scrub-Shrub

There are very few palustrine scrub shrub (PSS) wetlands identified on the National Wetlands Inventory maps of land surrounding the Fernhill site. Those which exist are small, isolated and occur on private property. Searches conducted throughout the Bank service area (Tualatin Hills Nature Park, Oregon Episcopal School, Jackson Bottom, Rood Bridge Road Park, and others) failed to locate an accessible reference scrub-shrub wetland. A 'typical' PSS reference wetland appears in Table 2, as derived from the scientific literature and observations of local conditions. The table lists species, stem density and coverage estimates common to this habitat.

Table 2
Palustrine Scrub-Shrub

Botanical Name	Common Name	Stems/ Acre	Percent Cover	Wetland Indicator Status
Trees				
Alnus rubra	red alder	0-20	0-10	FAC
Fraxinus latifolia	Oregon ash	100-150	0-10	FACW
Crataegus douglasii	black hawthorn	--	0-5	FAC
Salix lasiandra	Pacific willow	--	0-3	FACW+
Shrubs				
Cornus stolonifera	red-osier dogwood	100	20-30	FACW
Physocarpus capitatus	Pacific ninebark	50	10-20	FACW-
Spiraea douglasii	Douglas spiraea	50	10-20	FACW
Lonicera involucrata	Black twinberry	--	5-15	FAC+
Salix scouleriana	Scouler's willow	--	5-15	FAC

Rosa nutkana	Nootka rose	--	0-10	FAC
Rubus discolor	Himalayan blackberry	--	0-5	FACU
Symphoricarpos albus	Common snowberry	--	0-5	FACU
Herbs				
Carex obnupta	Slough sedge	--	5-15	OBL
Phalaris arundinacea	reed canarygrass	--	5-15	FACW
Glyceria occidentalis	Northwestern manna grass	--	0-5	OBL
Carex stipata	Sawbeak sedge	--	0-5	OBL
Scirpus microcarpus	Small-fruited bulrush	--	0-5	OBL
Veronica americana	American brooklime	--	0-5	OBL
Agrostis alba	Redtop bentgrass	--	0-2	FAC
Carex deweyana	Dewey's sedge	--	0-2	FACU
Epilobium watsonii	Watson's willow-weed	--	0-2	FACW-
Rumex salicifolius	Willow dock	--	0-2	FACW

In this representation, the tree layer is sparse, with black hawthorn and Pacific willow occurring only as widely spaced individuals. Shrub species distribution is clumpy, with individuals of the same species occurring within close proximity to each other. In the herb layer, sedges share dominance with other sedges.

Emergent Wetland

Palustrine emergent (PEM) wetlands are typically dominated by reed canarygrass. Emergent wetlands at Jackson Bottom and along Dawson Creek are virtually reed canarygrass monocultures. Because of this, these communities should not serve as reference wetlands. As with the PSS reference wetland, a 'typical' PEM reference community derived from the literature and local observations will be used (Table 3).

Table 3
Emergent Wetland

Botanical Name	Common Name	Percent Cover	Wetland Indicator Status
Herbs			
Hordeum brachyantherum	meadow barley	5-15	FACW
Glyceria occidentalis	northwestern manna grass	0-5	OBL
Carex obnupta	slough sedge	5-15	OBL
Phalaris arundinacea	reed canarygrass	5-15	FACW
Scirpus microcarpus	small-fruited bulrush	5-15	OBL
Beckmannia syzigachne	American sloughgrass	0-15	OBL
Deschampsia cespitosa	tufted hairgrass	5-15	FACW
Carex densa	dense sedge	0-5	OBL
Carex stipata	sawbeak sedge	0-5	OBL
Juncus effuses	common rush	0-5	FACW
Juncus ensifolius	dagger-leaf rush	0-5	FACW
Veronica americana	American brooklime	0-5	OBL
Camassia quamash	common camas	0-2	FACW

A mixture of native sedges, rushes, and grasses dominates this community. Reed canarygrass, while present, is limited to 5 to 25 percent areal cover. Soil saturation occurs for a minimum of fourteen days during the growing season (NCRS, 1992).

Methods for Determining Credits and Debits

Credits shall be established using the ratios listed in OAR 141-085-0135.

The Bank will be developed in phases according to market demand. Phasing will also allow improvements in Bank development and management over time as CWS acquires experience with these issues. Capital generated from the sale of credits will help fund subsequent phases. Table 4 is a ledger describing how the crediting was determined for Phase I. Figure 6 describes the mitigation plan.

Table 4

Fernhill Wetland Mitigation Bank Credit Ledger

Phase Number	Total acres	Total Credits	Date Approved	Instrument Approved Uncert. Credits Approved (max. 30 %)	Date	Wetland Hydrology Attained. Credits Approved (max 50%)	Date	Veg. Structure Attained. Credits Approved (max 80%)	Date	Succesional Trajectory Attained. Credits Approved (max 100%)	Date	Total Credits Sold	Credits Remain	
PFO(c)	16.03	10.68		0.00		0.00		0.00		10.68			10.68	Created
PFO(e)	2.00	.67		0.00		0.00		0.00		.67			.67	Enhanced
PSS(c)	3.26	2.17		0.00		0.00		0.00		2.17			2.17	Created
PEM(c)	6.20	4.13		0.00		0.00		0.00		4.13			4.13	Created
Totals	27.49	17.65		0.00		0.00		0.00					17.65	

(r) restored at 1:1
(e) enhanced at 3:1
(c) created at 1.5:1

Crediting to be approved by DSL and Corps

Clean Water Services

Appendix A: Revised Instrument Language (To replace sections on p 10-12 of instrument)

Accounting Procedures

The number of credits released will be determined in accordance with this section. The total percentages shown are cumulative. Anticipated credit amounts are contingent on approval of a delineation conducted on behalf of Clean Water Services using the Army Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987). That number can increase or decrease based on future delineations.

At the discretion of the Corps and DSL, up to 30% of the mitigation credits may be released upon the completion of construction grading.

50% credit release for acreage meeting hydrology per an approved 87 Manual delineation. Additional credits can be released based on updated and approved delineations.

100% of credits will be released when all performance standards have been met and maintained for 3 successive growing seasons without irrigation.

Performance Standards; Monitoring

This section contains performance standards that will serve as an objective tool for evaluating the environmental performance of Phase I of the Bank. This section also contains the monitoring procedures for determining whether the performance standards are being met. The failure to meet the performance standards will be an indication that remedial action is needed. All monitoring work will be conducted by Clean Water Services, Watershed Management Department or their contractors.

2550 SW Hillsboro Highway Hillsboro, Oregon 97123
Phone: (503) 681-3600 Fax: (503) 681-3603 www.CleanWaterServices.org

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Vegetative Structure

Performance Standards: The forested wetlands will have a major tree species density that is similar to the reference wetland. The native tree density will be approximately 200-300 stems per acre. Native shrubs will compose the shrub layer and shrub densities will be approximately 1050-1200 stems per acre. Monitoring will indicate a similarity of at least 80% of the aggregate species diversity relative to the reference wetland. No more than 5% of the relative live woody (trees & shrubs) stem count should be comprised of non-natives. Monitoring shall indicate: 1) a minimum of 55% of the relative plant cover (including substrate) is comprised of native species; 2) no more than 20% of the relative herbaceous plant cover is comprised of non-native invasive species; and 3) the prevalence index is equal to or less than 3.0.

The scrub-shrub wetlands will have major shrub and tree species density and composition that are similar to the reference wetland. The native tree density will be approximately 150-300 stems per acre. The native shrub density will be approximately 1200-1300 stems per acre. Monitoring will indicate a similarity of at least 80% of the aggregate species diversity relative to the reference wetland. No more than 5% of the relative live woody stem count should be comprised of non-natives. Monitoring indicates: 1) a minimum of 55% of the relative herbaceous plant cover (including substrate) is comprised of native species; 2) no more than 20% of the relative herbaceous plant cover is comprised of non-native invasive species; and 3) the prevalence index is equal to or less than 3.0.

Monitoring: In forested and scrub shrub wetland, roughly three 30 'X30' block transects per acre within the approved delineation will be set up to measure tree and shrub stem densities. See Figure A for plot location map. A 1 square meter plot will be nested in the Southeast corner of each transect to measure herbaceous cover. Recruited desirable species will be counted along with planted species to determine overall density and cover.

All plots will be located to provide a balance between collected data from existing plots, and consistency with the draft vegetation monitoring protocol proposed by the US Fish and Wildlife Service. Plots were marked with rebar placed in the southeast corner of each transect, the other 3 corners were marked with red wire pin flags; an orange cap and bright flagging was placed on top of the rebar to make it more visible. Each corner of the monitoring plot was mapped using a Trimble Global positioning system (GPS) unit with sub-meter accuracy.

2550 SW Hillsboro Highway Hillsboro, Oregon 97123
Phone: (503) 681-3600 Fax: (503) 681-3603 www.CleanWaterServices.org

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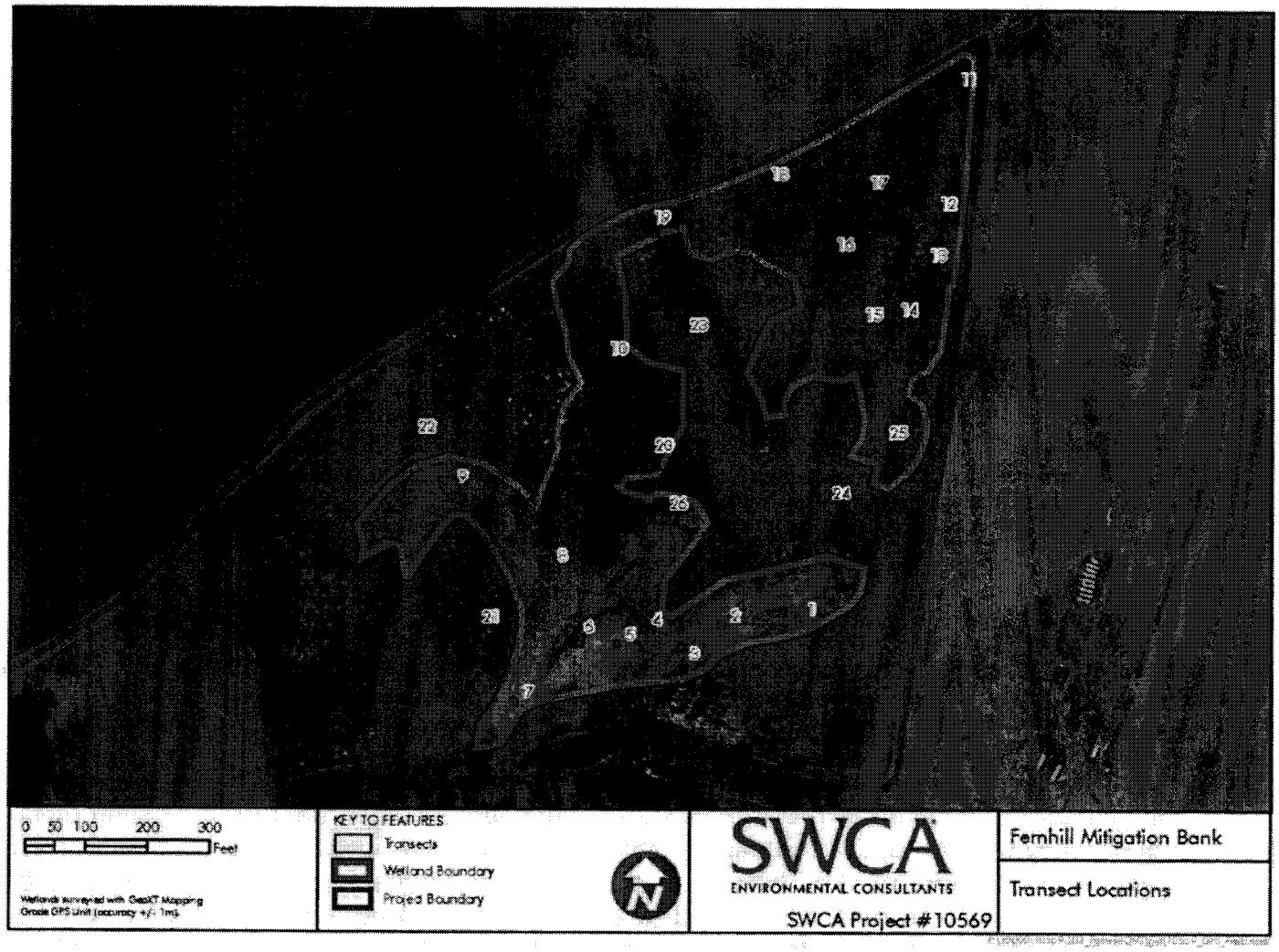
Figure A: Monitoring Location Map



Hydrology

Performance Standards: Hydrology is assumed to be present in the area delineated as wetland using the routine wetland determination methodology of the Army Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987).

Monitoring: A delineation was conducted in 2006-2007 using indicators for soils, vegetation and hydrology. The mapped wetland serves as the area determined to achieve hydrology. The delineation will be updated in three years or when deemed appropriate by Clean Water Services.

Clean Water Services

Flood Storage

Performance Standard: The stream will enter the floodplain through breaches in the levee during high flow periods.

Monitoring: USGS stream gauging records from the Dilly gage will be used to track over bank events. Over bank events occur with the river elevation at Dilly exceeds 162.3 feet.

Water Quality

Performance Standards: The Bank will contain established native trees, shrubs, and emergent vegetation that trap sediments and absorb excess nutrients.

Monitoring: Sediment accretion stakes will be placed strategically throughout the floodplain to measure the sediment deposition and/or erosion as a result of the levee breaches.

Contingency Plan

If monitoring were to indicate a failure to meet one or more performance standards in a timely fashion, or if vandalism, an act of god or another incident caused damage to the Bank, CWS would assemble a team of experts to analyze the situation and develop a contingency plan. Depending on the nature of the problem, the team could include wetland scientists, hydrologists, ecologists, botanists, soils scientists, geologists, or landscape architects, as well as the CWS project manager. Actions called for in the contingency plan could include replanting, re-grading, adding hydrologic control structures, and other hydrologic modifications.

If on-site solutions are not feasible, Clean Water Services can use restored, created, or enhanced wetlands from its other efforts within the service area as part of a contingency plan.

Upon completion, the contingency plan would be presented to the MBRT for review and comment. Implementation of the contingency plan would be subject to the approval of the Corps and DSL. Clean Water Services would be responsible for developing and implementing the contingency plan. Questions concerning these activities should be addressed as follows: General Manager, Clean Water Services, 2550 SW Hillsboro Highway, Hillsboro, Oregon 97123.

Accounting Procedures

The number of credits available for sale will be determined in accordance with this section. The total percentages shown are cumulative.

At the discretion of the Corps and DSL, up to 30% of the mitigation credits may be available for sale upon the completion of construction grading.

50% of the mitigation credits will be available for sale when saturated soils are present within a 25-acre area of the Bank from March 1 to April 30th during a normal rainfall year (37 inches of precipitation recorded at Portland International Airport), as measured by the six piezometers within the Phase I area, and nearby soil samples within 16" of the surface. (Note: the piezometer located near the eagle nest will be excluded from this requirement if eagle nesting activity is occurring. See "USFWS Biological Opinion," the Instrument, p. 12)

80% of the mitigation credits will be available for sale upon demonstrating a three-year survival rate of 150 trees (total for all species) per acre in forested wetlands, 325 shrubs (total for all species) per acre in scrub-shrub wetlands, and 80% coverage by desired herbaceous species in vegetated portions of emergent wetlands.

100% of the mitigation credits will be available for sale when the desired successional trajectory has been attained. The desired successional trajectory is 75% aerial cover by canopy species within the forested and scrub-shrub wetlands, and 90% aerial cover by desired herbaceous species in vegetated portions of emergent wetlands. A three-year trend of increasing Coefficient of Community values will also confirm the attainment of the desired successional trajectory.

Performance Standards; Monitoring

This section contains performance standards that will serve as an objective tool for evaluating the environmental performance of Phase I of the Bank. This section also contains the monitoring procedures for determining whether the performance standards are being met. The failure to meet the performance standards will be an indication that remedial action is needed. All monitoring work will be conducted by students from Pacific University, under the direction of Rob Stockhouse II, PhD., Professor of Biology.

Vegetative Structure

Performance Standards: The forested wetlands will have the major tree species density that is similar to the reference wetland. The tree density will be approximately 150 - 200 stems per acre or 80 percent cover. The species composition will include: 1) Oregon ash; 2) black cottonwood; 3) red alder; willow species. Native shrubs will compose the shrub layer (and include species listed below for scrub-shrub wetlands). Native sedges and rushes will compose approximately 5-10% of the herb layer as found at the reference site. The species composition will include: 1) slough sedge; 2) dense sedge; 3) Dewey's sedge; 4) spreading rush; 5) soft rush. Native grasses and forbs will compose approximately 20-40% of the herb layer as found at the reference site. The species composition will include: 1) native red fescue; 2) blue wildrye; 3) California brome; 4) piggy-back plant; 5) common camas. Non-native invasives will cover a maximum of 15% of the site.

The scrub-shrub wetlands will have major shrub and tree species density and composition that are similar to reference wetland. The shrub and tree density will be approximately 100 -200 stems per acre or 15-50 percent cover. The shrub species composition will include: 1) red-osier dogwood; 2) Pacific ninebark; 3) Douglas spiraea; 4) twinberry. Native sedges and rushes will compose approximately 10-20% of the herb layer as found at the reference site. The species composition will include: 1) slough sedge; 2) dense sedge; 3) Dewey's sedge; 4) spreading rush; 5) soft rush. Native grasses and forbs will compose approximately 40-50% of the herb layer as found at the reference site. The species composition will include: 1) native red fescue; 2) blue wildrye; 3) California brome; 4) common camas. Non-native invasives will cover a maximum of 15% of the site.

The emergent wetlands will have a major plant community composition that is similar to the reference wetland. The minimum mean plant cover will be 80%. The emergent species composition will include 15-40% native sedges and rushes, and 40-50% grasses and forbs. The species composition will include: 1) slough sedge; 2) small-fruited bulrush; 3) soft rush; 4) native red fescue; 5) meadow barley; 6) western mannagrass. Non-native invasives will cover a maximum of 15% of the site.

Monitoring: A minimum of three 0.23 acre (100 ft. by 100 ft.) quadrats will be established within each of the forested, scrub-shrub and emergent wetland communities. Tree stem density will be counted within each quadrat. Shrub stem density will be counted within a 0.02 acre (33 feet by 33 feet) nested plot located in the southwest corner of each quadrat. Herbaceous cover will be estimated in five one meter square plots (3.5 feet by 3.5 feet) located randomly within each quadrat. Recruited desirable species will be counted along with planted species to determine overall density.

Succesional Trajectory

Performance Standards: 1) Expansion of shade-tolerant herbs beyond their initial planted range; 2) no more than 15% total coverage of reed canarygrass at the end of the monitoring period; and 3) A minimum10% increase in the aerial coverage of planted and recruited species.

Monitoring: The aerial coverage and density of planted herbaceous species will be monitored within the three 0.23 acre quadrats during each monitoring period. These quadrats, as well as the site as a whole, will be inspected for recruitment of desired herbaceous species.

The planted wetland community components will be quantitatively compared to the reference community using Coefficient of Community. Trends of increasing similarity will show progress toward achieving the successional trajectory objective.

The reference wetland will be examined during each monitoring period for the presence and aerial extent of reed canarygrass. During each monitoring period, the entire Bank will be examined for the presence of reed canarygrass.

Hydrology

Performance Standards: Saturated soils will be present within 12" of the surface within a 25-acre area of the Bank from March 1 to April 15 during a normal or wetter rainfall year (37 inches of precipitation recorded at Portland International Airport – plus or minus 10%) as measured by the six shallow wells, and three recording piezometers within the Phase I area, and nearby soil samples within 16" of the surface.

Monitoring: Water depths will be measured at permanently established locations using six shallow wells and three recording piezometers. The depth and extent of saturation will be determined by using a soil auger or probe to a maximum depth of 16 inches and recording the depth to saturation approximately 10 feet north of each piezometer. As required by US Fish and Wildlife Bald Eagle Biological Assessment, access is limited between February and June.

Wildlife Habitat

Performance Standards: To increase wildlife diversity and improve corridors, 16.03 acres of PFO habitat, 3.26 acres of PSS habitat, and 6.2 acres of PEMs habitat will be created and approximately 2 acres of PFO habitat will be enhanced. These habitats will mimic the plant density of the reference sites.

Monitoring: Site observations will be performed in order to build an inventory of the bird species using the site, to assess species/habitat associations, and to monitor long-term regional bird populations. Sample points will be selected to represent the major habitat types, and will be shown on a monitoring sheet. Monitoring will be conducted between sunrise and the following 3-4 hours, once in the summer after June 15th and once in the fall.

A habitat-based amphibian survey will be conducted that will link amphibian community composition, species richness, species relative abundance and/or density with specific habitat features at each monitoring site. The monitoring will include a habitat inventory which consists of general habitat typing, a habitat map, and photo points. The amphibian survey will include three 45-minute visual surveys per station, to occur 7 days apart. The surveys will be conducted in the early summer after June 15th. Stations will be established in suitable habitat areas and shown on a monitoring map.

Woody debris and cover objects will be measured in riparian areas using a transect method to record branches and logs (>10 cm diameter), and large slabs of wood and bark (>15 cm wide and >50 cm long).

Flood Storage

Performance Standard: The stream will enter the floodplain through breaches in the levee during high flow periods.

Monitoring: USGS stream gaging records from the Dilly gage will be used to track over bank events.

Water Quality

Performance Standards: The Bank will contain masses of trees, shrubs, and emergent vegetation that trap sediments and absorb excess nutrients.

Monitoring: No water quality monitoring will be performed.

Contingency Plan

If monitoring were to indicate a failure to meet one or more performance standards in a timely fashion, or if vandalism, an act of god or another incident caused damage to the Bank, CWS would assemble a team of experts to analyze the situation and develop a contingency plan. Depending on the nature of the problem, the team could include wetland scientists, hydrologists, ecologists, botanists, soils scientists, geologists, or landscape architects, as well as the CWS project manager. Actions called for in the contingency plan could include replanting, re-grading, adding hydrologic control structures, and other hydrologic modifications. Upon completion, the contingency plan would be presented to the MBRT for review and comment. Implementation of the contingency plan would be subject to the approval of the Corps and DSL. Clean Water Services would be responsible for developing and implementing the contingency plan. Questions concerning these activities should be addressed as follows: General Manager, Clean Water Services, 2550 SW Hillsboro Highway, Hillsboro, Oregon 97123.

USFWS Biological Opinion

A bald eagle nest is located in a grove of trees near the Bank site. Because the bald eagle is listed as threatened under the federal Endangered Species Act, the U.S. Army Corps of Engineers (the Corps) initiated consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Act. Section 7 requires consultations concerning listed species when a federal action is contemplated. The federal action in this case is the approval of the Bank by the Corps.

The Corps submitted a biological assessment of the impact of the Bank on the eagles to the USFWS on July 17, 2001. On March 11, 2002, the USFWS issued a biological opinion that contained an incidental take statement and a list of terms and conditions that must be followed in order for the protections offered by the incidental take statement to apply. The incidental take statement, including the terms and conditions, appears in Appendix J.

On July 13, 2004, the Corps requested USFWS reinitiate formal consultation for several maintenance activities that need to be conducted in the spring at the Bank. The consultation requested these maintenance activities needed to be conducted prior to June 15 for successful management of the Bank for the years 2004-2006. The original Biological Opinion restricted access to portions of the Bank during the nesting season to avoid harassment of the eagles. A revised Biological Opinion allowing these activities was issued. A description of the allowed activities is included in Appendix J.

All activities at the Bank will be conducted in accordance with the terms and conditions contained in the incidental take statement. This includes all planting, irrigation, maintenance, and monitoring activities.

Financial Assurances

CWS was formed in 1970 under Chapter 451 of the Oregon Revised Statutes. It is a county service district governed by a Board of Directors comprised of the same members elected to serve on the Washington County Board of Commissioners. CWS is authorized to assess fees and issue bonds for sanitary sewer and surface water management operations and capital construction purposes. CWS's FY 2005-06 operating budget is $39 million, and its FY 2005-06 five-year capital improvement budget is also $39 million.

As of April 1, 2004 CWS had $213 million in bonded debt outstanding. All of CWS's bonded debt is insured. CWS currently enjoys credit ratings of A1 (Moody's) and AA- (Standard & Poors).

CWS prepares annual budgets in accordance with the provisions of the Oregon Local Budget Law, which specifies standard procedures for the preparation, presentation, administration and appraisal of budgets. Annual audits on the accounts and financial affairs of CWS are performed in accordance with the Oregon Municipal Audit Law (ORS Chapter 297).

CWS intends to establish a dedicated fund to account for and document the financial transactions of the Bank. The fund will be subject to the same budgetary, financial reporting and internal fiscal controls as all CWS funds. Funding sources will consist of initial appropriations for Bank construction, as well as funds from the sale of mitigation credits and interest. The fund will be used to pay for Bank operations, including maintenance, monitoring and any necessary remedial work. It is the intent of CWS to maintain the fund as 100% self-supporting. Any additional commitment of CWS revenues will be subject to normal budgetary and Bond Counsel review.

CWS will comply with all Division of State Lands requirements and Corps of Engineers guidance for financial assurance, including the provision of a $100,000 as performance security. The security is provided through a financial assurance agreement (Appendix J), which will remain in effect until five years after the sale of the last whole or partial mitigation credit.

Compensation Ratios

The Bank will use the compensation ratios set forth in OAR 141-085-0135.

Provisions for Long-term Management and Maintenance

The Bank site is one of several properties managed by CWS in the same area, including the Forest Grove Wastewater Treatment Plant and the Fernhill Wetlands. CWS will monitor the Bank and report its findings annually, just as it currently does at the Fernhill Wetlands with the assistance of staff and students from the Biology program at nearby Pacific University. Annual monitoring reports will be produced until five years after the sale of the last whole or partial mitigation credit.

The Bank will be managed along with the other nearby CWS properties in accordance with the Fernhill Concept Master Plan. A copy of the Executive Summary is provided in Appendices.

Bank management and maintenance activities will continue until five years after the sale of the last whole or partial mitigation credit. It is anticipated that the level of these activities will be reduced as the vegetation at the Bank matures. These activities will be paid for out of the Bank's dedicated fund.

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