Compensatory Wetland Mitigation Plan

Lithia Springs Property
555 Emigrant Creek Road
Ashland, Jackson County, Oregon
WD2014-0488

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Sign-off Sheet

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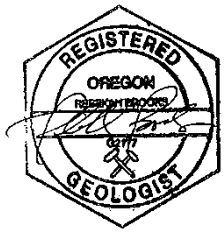

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Abbreviations

AMSL	Above Mean Sea Level
AGC	Ashland Gun Club
bgs	Below Ground Surface
BMP	Best Management Practices
City	City of Ashland
CWM	Compensatory Wetland Mitigation
DEQ	Department of Environmental Quality
DSL	Department of State Lands
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
HGM	Hydrogeomorphic
NOL	Upland (Not on List)
OAR	Oregon Administrative Rule
OBL	Obligate Wetland
PEM	Palustrine Emergent
Redox	Redoximorphic
RMG	*Routine Monitoring Guidance for Vegetation* (DSL, 2009)
UPL	Obligate Upland
USCOE	United States Army Corps of Engineers

1.0 COMPENSATORY MITIGATION PLAN OVERVIEW

This document provides a Compensatory Wetland Mitigation (CWM) Plan to be implemented by the City of Ashland, Oregon (City) at their Lithia Springs Property, resulting from remediation of a wetland impact area at an active shooting range. The shooting range is located on property owned by the City, but leased by the Ashland Gun Club (AGC) (***Figure 1***). This CWM Plan provides the ecological goals and objectives, the methods to accomplish these objectives, site information and existing site conditions, performance standards and monitoring plan, and long-term protection and financial security instruments.

1.1 ECOLOGICAL GOALS AND OBJECTIVES

The wetland impact area is situated within a shotfall zone at an active shooting range on a property leased by the AGC from the City (***Figure 2***). The wetland impact area includes two jurisdictional wetlands, herein referred to as Wetland 3b (***Appendix A***, ***Photographs 1*** and ***2***) and Wetland 5, as documented in the *Wetland Delineation Report* (Stantec 2014). The proposed CWM Site is a 0.8-acre plot containing fill, and located less than 700 feet from the farthest point in the wetland impact area. The CWM Site is on the same property as the wetlands impact area, but not within the shotfall zone. Every attempt has been made in the design stage to provide the lost services as close as practically possible to the impact site given the physical constraints of the active gun club property. The location and design of the proposed mitigation site will allow for an improved water quality function opportunity since the mitigation site is not within a shotfall zone of the shooting range.

1.1.1 Goals

The goals of the wetland mitigation are to offset the permanent loss of 0.65 acres of lead-impacted palustrine emergent wetland, using mitigation activities that would restore a minimum of 0.65 acres of wetland in an area that has direct connectivity to other wetlands at the Site, and nexus to Emigrant Creek (***Figure 2***). The mitigation activities would restore native-plant dominated scrub-shrub and emergent wetland characteristics to a former wetland that has historically been filled. The restoration activities would also increase nutrient cycling, amphibian habitat, and support of regionally-characteristic vegetation due to access to a new source of hydrology with improved water quality (see ***Section 2.2***).

1.1.2 Objectives

The objective of the wetland mitigation is to restore a minimum of 0.65 acres of former wetland in an area that is not negatively impacted by continual deposition of shot, or by a hydrology source with a high mineral content. Specifically, the wetland mitigation objectives related to ecological habitat, planting, and hydrology are provided below:

Habitat: To increase safe habitat, forage, and nesting opportunities for wildlife within the restored wetlands through establishment of native plant communities, and addition of woody trees and shrubs. Specifically, the restored wetland would have a net gain in wetland functions and values since the impacted area is currently irregularly vegetated and lacking vertical structure due to high mineral-content water originating from the Lithia mineral springs located on the easternmost portion of the Property and shooting range operations.

Planting: To revegetate the enhancement areas with native plants by planting native grasses, sedges, rushes, forbs and woody trees and shrubs to increase species diversity. Some of the plants would come from limited plant salvage in the impacted wetlands.

Hydrology: To develop and maintain hydrology characteristics that satisfies the 1987 Manual (USACE 1987), and the Arid West Regional Supplement (USACE 2008) within the mitigation area. Specifically, the restored wetlands would be saturated to the surface and/or a water table varying between a few inches of inundation and 12 inches below the surface, on average (five out of ten years). Based on conditions at the CWM Site, wetland hydrology would be met during the early part of the growing season.

1.2 DESCRIPTION OF CWM CONCEPT

The CWM Plan provides the methodologies to be used to offset the permanent loss of 0.65 acres of jurisdictional wetland due to lead remediation activities in a shotfall zone of an active shooting range. A remedial action, involving lead remediation within the impacted wetlands (Wetlands 3b and 5), would be followed by converting that impacted wetland into upland to minimize the threat of lead migration or contamination to human and ecological receptors, and to allow for ongoing management of lead using best management practices (BMPs) established for gun ranges. These BMPs include the planned re-use of lead-contaminated soil in upland areas of the active gun range for firing range backstop berms (***Appendix A***, ***Photograph 3***). The Remedial Action Plan (Stantec 2015) has been approved by the Oregon Department of Environmental Quality (DEQ) (DEQ 2015). The proposed mitigation site would involve restoration of a minimum of 0.65 acres of wetland adjacent to the wetland impact area and connected to other documented wetlands (***Figure 2***; ***Appendix A***, ***Photographs 4-8***). These two restored wetlands, named Wetland 1b and Wetland 2b in this plan, are proposed to mitigate the loss of the impacted wetlands in the active shotfall area.

The following table provides a list of the features of the impact and mitigation wetlands.

	Impact Wetland		Mitigation Wetland	
Wetland ID	3b	5	1b	2b
Acres	0.63	0.02	0.44	0.28
Mitigation Method	---	---	Restoration	Restoration
Mitigation Ratio	---	---	1:1	1:1
Cowardin Class	PEM	PEM	PEM	PEM
Hydrogeomorphic (HGM) Class	Slope	Slope	Slope	Slope
Credits Needed/ Generated	0.63	0.02	0.44	0.28

PEM: Palustrine Emergent

The restored wetlands typify the seasonally wet shrub-dominated meadows characteristic of native wetland systems in southern Oregon. The proposed planting pallet includes a diverse range of locally-acclimatized plant species, tolerant of a range of inundation conditions. Specifications call for plant materials to be purchased from Rogue Valley nurseries and therefore, adapted to the climate at the CWM Site. The proposed topography of the mitigation site and the planting pallet reflects naturally occurring local systems.

1.3 SUMMARY OF FUNCTION & VALUE GAINS AND LOSSES

The Side By Side Comparison of Assessment Results has been omitted from this document because a function and values assessment has been waived by DEQ under OAR 465.315. Because the wetland impacts will result from lead remediation and related activities during a DEQ-approved remedial action, the impacts are deemed unavoidable. The proposed mitigation is not based on the degree of functional lift or increase in values. However, since the proposed mitigation site is not in the active shotfall area, and the wetlands have hydrology sources that do not originate from the mineral springs, the restored wetland will have improved water quality and an inherently higher level of function. While Wetland 2b will receive some mineral springs water, the predominant hydrology source will be Wetland 1.

2.0 CWM SITE INFORMATION

2.1 SITE OWNER INFORMATION

The proposed CWM Site and the wetland impact area are located on property that is owned by the City (***Figure 1***). The key site manager for the City is Mike Morrison, Public Works Superintendent; 20 East Main Street, Ashland, Oregon. Phone: (541) 552-2325.

2.2 PHYSICAL LOCATION INFORMATION

The CWM Site is located within the southwestern portion of the Lithia Springs Property; 555 Emigrant Creek Road, Ashland, Jackson County, Oregon (***Figure 2***). A portion of the property to the east and south of the proposed CWM Site is used by the AGC as an active shooting range. The eastern most portion of the Property contains part of a mineral springs complex known as Lithia Springs.

The CWM Site, consisting of proposed wetland mitigation areas Wetland 1b and Wetland 2b, lies on a relatively level alluvial terrace along the south side of Emigrant Creek. The CWM Site is located within tax lot number 400 (Willamette Meridian), Township 39 South, Range 1 East, Section 12; Latitude: 42.18878, Longitude: -122.64141. The defined wetland impact area is located within the area of the Property used by the AGC for the trap and skeet shotgun range, and is less than 700 feet to the east of the CWM Site. The wetland impact area contains two jurisdictional wetlands: Wetland 3b (0.63 acres) and Wetland 5 (0.02 acres). Wetland 3b is within tax lot number 400 in (Willamette Meridian), Township 39 South, Range 1 East, Section 12, and Wetland 5 is 75 feet to the east of Wetland 3b in tax lot number 800 in (Willamette Meridian), Township 39 South, Range 2 East, Section 7 (***Figure 2***).

For purposes of discussion herein, jurisdictional Wetland 1, as defined in the *Wetland Delineation Report* (Stantec 2014), is referred to as Wetland 1a in this document; jurisdictional Wetland 2 is referred to as Wetland 2a. The proposed CWM Site extends the boundaries of these wetlands; these extensions are referred to Wetland 1b and Wetland 2b. The portion of jurisdictional Wetland 3 that is outside of the shotgun range (shotfall zone), and the fill area for the remedial action is referred to as Wetland 3a; the portion of Wetland 3 than is within the wetland impact area is referred to as Wetland 3b. Wetland 5 is the other wetland impact area, and is located completely within the shotfall zone outside of the CWM Site. Wetland 6 is located entirely to the east, and is also outside the CWM Site. There is no Wetland 4.

Access to the property from I-5 is as follows: take the Ashland Street (Hwy 66) exit east from I-5; turn left (north) on Dead Indian Memorial Road; turn right (east) on Emigrant Creek Road for 4,500 feet to a gravel road with a security gate on the left. Access to the Property must be provided by the City and coordinated with the AGC.

Review of the Soil Survey of Jackson County, (United States Department of Agriculture, Soil Conservation Service, 1993) indicates the CWM Site is mapped as Camas Newberg-Evans complex (23A) soil. The Camas Newberg-Evans complex soil is found on floodplains, and is composed of 40% Camas, 30% Newberg, and 20% Evans soils, none of which are hydric. The complex also has minor components of Aquolls, Cove and Riverwash, which are hydric. The surface may be gravelly or cobbly (***Figure 3***).

The CWM Site and immediate vicinity lies in a basin, and has a stream terrace landform. The north half of the Site is very gently sloping to the south (in stream terrace areas), and the south side slopes gently to the north. Surface elevations at the Property vary from about 1,895 feet above mean sea level (AMSL) to about 2,025 feet AMSL near Emigrant Creek Road to the south. The CWM Site is situated at 1,910 feet AMSL in a Loamy Floodplain physiographic area. Portions of the CWM Site nearest Emigrant Creek are within a Special Flood Hazard Zone (***Figure 4***). Emigrant Creek is impounded approximately 8 miles upstream of the Property by the Bureau of Reclamation's Emigrant Dam. Emigrant Lake drains 64 square miles of the 81 square mile Emigrant Creek watershed, set in the north slopes of the Siskiyou Mountains. Peak flows into Emigrant Lake typically occur between December and March.

3.0 HOW THE CWM ADDRESSES THE PRINCIPAL OBJECTIVES

3.1 FUNCTION AND VALUE REPLACEMENT

Evaluation of the replacement of functions or values of the impact site has been omitted from this document because a function and values assessment has been waived by DEQ under OAR 465.315. Because the wetland impacts will result from lead remediation and related activities during a DEQ-approved remedial action, the impacts are deemed unavoidable.

3.2 LOCAL REPLACEMENT OF LOCALLY IMPORTANT FUNCTIONS AND VALUES

The CWM Site is situated in close proximity to the wetland impact area, so that any replacement of lost wetland functions and values would occur locally (***Figure 2***). The proposed CWM site includes two wetland restoration areas. Mitigation Wetland 2b will be excavated between Wetlands 2a and 3a (***Appendix A, Photographs 4*** *and* ***5***). Mitigation Wetland 1b is located within about 120 feet of the impact site at their nearest proximity and will be excavated contiguous with Wetland 1a, which in turn flows directly into Wetland 2a (***Figure 2***; ***Appendix A, Photographs 6-8***). The effect of the proposed mitigation wetlands would be to provide direct connectivity to Wetlands 1a, 2a, and 3a, as shown on ***Figure 5***, Cross Sections.

Since the CWM Site is not located within the shotfall zone as the wetland impact area is, it will be a healthier environment for ecological receptors. The CWM Site is designed to improve habitat by introducing complex microtopography, hummocks, and coarse woody debris. Diversity in vertical structure will be provided by planting an assortment of trees, shrubs and forbs following construction (***Figure 6***).

The wetland impact area (Wetlands 3b and 5) offer only a *de minimis* expression of locally important functions in those settings. The heavily mineralized water is high in pH and leaves calcite deposits at the surface, resulting in very little vegetation diversity. The CWM Site gets its hydrology from seeps at the toe of the slope. It does not have a mineral spring as its hydrology source, and the soil will be able to support higher plant diversity.

Regulation of seasonal water temperatures is locally important, as Emigrant Creek is 303(d) listed for high water temperatures during summer months. Shortage of stream recharge reservoirs, such as wetlands, and agricultural-sourced discharges likely promote a modified higher temperature regime within the creek during the summer relative to historical baseline water temperatures. The CWM project would help improve thermal conditions in the Bear Creek Watershed and regulate water temperatures in the creek by incrementally increasing the present water storage capacity by ponding, increasing evaporative cooling by plant selection and density, and increasing surface shading by developing vertical structure, without negatively impacting in-stream temperatures.

3.3 SELF-SUSTAINING/MINIMUM MAINTENANCE NEEDS

The CWM Site is in an area that historically has demonstrated that it naturally can support wetlands as evidenced by the data presented in ***Section 4.8***. By removing the fill in this area to lower the base elevation, and creating impoundment areas through topographical relief, the volume and duration of wetland hydrology is anticipated to be restored to historic levels. The CWM Site is designed to not require irrigation to aid in vegetation establishment. Mulching and native vegetation density ~~is~~ are expected to restrict the opportunity for shade intolerant invasive plants to become established.

3.4 SITING CONSIDERATIONS

Several rationales were relied upon in choosing the CWM Site for wetland mitigation through restoration, which include:

- The CWM Site is publicly owned and available for wetland mitigation.
- The CWM Site is of sufficient size to accommodate the CWM requirements associated with the remedial action in the wetland impact area at a ratio of 1:1, plus a contingency of approximately 0.07 acres.
- The CWM Site is within the same Middle Rogue River drainage basin, and has direct nexus to the same tributary as the wetland impact area.
- The CWM Site has sufficient topography, soil characteristics and hydrologic conditions to achieve palustrine emergent conditions – similar classification as the impacted wetlands.
- The CWM Site is contiguous with other protected jurisdictional wetlands, and provides ecological continuity between them.
- There is a significant potential to restore lost wetland due to two separate perennial sources of hydrology. Restoration Wetland 2b will be in the direct flow of a perennial mineral spring flowing from Wetland 3a to Wetland 2a, and Wetland 1b will be fed by the discharge of Wetland 1a, whose source is a soft water spring and seeps emerging from the toe of the southern slope, as well as precipitation. The flows from the wetland restoration areas (Wetlands 1b and 2b) will merge in Wetlands 2a before discharging into Emigrant Creek.
- The CWM Site would have minimum significant long-term maintenance needs beyond the monitoring period. The CWM plan does not involve the construction and maintenance of engineered water control structures. Once the mitigation plantings are established and invasive weeds have been effectively controlled, maintenance needs should be minimal.

The proposed wetland mitigation site was chosen for its suitability in meeting these rationales.

3.5 MINIMIZE TEMPORAL LOSS

Remediation of lead impacts to Wetlands 3b and 5 for the remedial action is planned to be conducted concurrently with CWM site excavation to keep temporal loss to a minimum. The spoils from the excavation of the CWM Site will be used to fill the wetland impact site after the remedial action, including lead reclamation, soil removal, and drainage installation. The CWM Site is 0.8 acres, so the restoration area will be larger than the 0.65 acres of impacted wetland. The additional 0.15 acres provide some offset for expected temporal loss while plants establish, and provide some buffer in the event of an under-performing wetland.

4.0 CWM EXISTING SITE CONDITIONS

4.1 WETLAND DELINEATION OR DETERMINATION RESULTS

A wetland delineation including the AGC lease area and adjacent areas on the south side of Emigrant Creek was conducted in the spring of 2014 (WD 2014-0488), as documented in the *Wetland Delineation Report* (Stantec 2014). Oregon Department of State Lands (DSL) concurrence was provided for the delineation on May 1, 2015, (DSL 2015). ***Figure 2*** shows the proposed boundaries of the CWM Site in relation to the adjacent delineated wetlands. Data plots 7, 21, and 25 from that delineation study document~~s~~ upland conditions in the mitigation site. Two additional upland plots in the CWM site are documented on Data Forms A and B (***Appendix B***). The soil profiles recorded on data sheets 7, A, and B indicate obvious fill over native soil.

4.2 EXISTING HGM AND COWARDIN CLASSES ON-SITE

Existing HGM and Cowardin classes for each of the delineated wetlands on the Property are provided below:

Wetland 1a: located at the toe of the slope to the northwest of the AGC entrance road, and immediately outside the southwest corner of the CWM Site (***Appendix A, Photographs 6-8***). It contains 0.467 acres of palustrine emergent wetlands (HGM slope wetland) with fine silt loam topsoil underlain by a darker sand or clay loam. Evidence of significant surface flow from or across upgradient upland areas during precipitation events is lacking, indicating a groundwater hydrology source in Wetland 1a. Water was encountered at 8 to 12 inches below ground surface (bgs), and the soil contained distinct redoximorphic (redox) features in the matrix as soft masses. During the early part of the growing season (April and May), the soil is typically saturated at 6 to 10 inches bgs. The hydrophytic community was dominated with Armenian blackberry (*Rubus armeniacus*) and teasel (*Dipsacus fullonum*), with willow (*Salix spp*) and Baltic rush (*Juncus balticus*) replacing the blackberry on the south side of the area. The south and west boundaries of the triangular-shaped wetland are clearly defined by steep embankments, but the northeast side is defined by a gentle rise in shallow fill and a clear transition in vegetation. Restoration Wetland 1b is planned to enlarge this wetland.

Wetland 2a: lies along the south side of Emigrant Creek (***Appendix A, Photographs 4*** *and* ***5***). It contains 0.992 acres of palustrine emergent (HGM slope wetland) and riverine wetlands (HGM riverine wetland). It is characterized by deep sandy clay soils with prominent redox features in the matrix, saturation to the surface all year long, and a vegetation community dominated with broadleaf cattail (*Typha latifolia*) and Baltic rush. Portions of the wetland are inundated up to 6 inches during the early portion of the growing season. The wetland receives water from Wetlands 1a and 3a/3b, as well as from Emigrant Creek during high water. The riverine portion of Wetland 2a receives a significant portion of its hydrology from overbank flooding. The

palustrine wetlands, lying close in elevation to the stream, receive a significant portion of their hydrology from an elevated water table. Evidence of surface flow from or across adjacent upland areas during precipitation events is lacking due to rapid infiltration of the sandy berms for the firing range. Water discharges from the wetland directly into Emigrant Creek. The plan for Restoration Wetland 2b is to remove surface fill and the culvert, described below, to join Wetland 2a and Wetland 3a.

Wetland 3 (a and b) is palustrine emergent (HGM slope wetland), and located upstream (east) of Wetland 2a. The source of hydrology is mineral springs and precipitation. Wetland 3a/b directly discharges water into Wetland 2a through a culvert under a gravel road (***Appendix A, Photograph 4***). Wetland 3a/b is 0.845 acres, and is characterized by shallow, sandy/gravelly soils with a restrictive layer beginning between 8 and 21 inches bgs with prominent redox features and saturation to the surface. The vegetation community is dominated by Baltic rush, annual bluegrass (*Poa annua*), slender hairgrass (*Deschampsia elongata*), broadleaf cattail, and medusaehead rye (*Taeniatherum caput-medusae*), which may be a late season dominant in vernally wet areas. The portion of Wetland 3, designated Wetland 3b in this project, is planned for the remedial action, including lead reclamation activities and ultimate filling. Wetland 3a will be undisturbed.

4.3 DESCRIPTION OF EXISTING AND PROPOSED HYDROLOGY

Data Forms 7, 21, and 25 from the 2014 wetland delineation report describe existing conditions in the CWM Site (***Appendix B***). No water table, saturation, or redox features were found within 16 inches of the surface. Two additional plots (A and B) were established in previously unrepresented areas of the CWM Site in late spring 2015 to aid in characterizing the conditions more fully. The pits were advanced to 25 and 30 inches respectively since 2015 was a drought year, and no saturation, or redox features were encountered in the upper sixteen inches. Pits revealed that Plot A had 24 inches of very cobbly fill over the native silty clay, and Plot B had 18 inches of gravelly fill over the native clay. (Note that Plot B was originally within the proposed wetland mitigation area, but is now outside of this area because of the adjustments to the boundary based on the cultural survey; however, the observations at this location are representative of conditions throughout proposed mitigation Wetland 2b.) Pit 25 encountered saturation below sixteen inches, and pits A and B were saturated below twenty inches. Data Forms A and B are provided in ***Appendix B***.

The current subsurface hydrology within the AGC lease area (including the CWM Site), as documented by groundwater measurements in monitoring wells on January 6, 2012 is shown on ***Figure 7***. Since the shallow water table in this area is generally a subdued replica of surface topography, the final hydrology in the CWM Site can be inferred from the proposed topography as seen on ***Figure 5***.

The proposed CWM Site includes two wetland restoration areas, herein referred to as mitigation Wetlands 1b and 2b that will have two separate perennial sources of hydrology. Mitigation Wetland 1b will be located about 120 feet to the south and west from the wetland impact area

(Wetland 3b) at their nearest proximity, and will be contiguous with and fed by discharge from Wetland 1a, which in turn will flow directly into Wetlands 2a/2b (***Figure 2***). The primary source of hydrology will be lateral subsurface flow originating in soft water springs and seeps emerging from the toe of the southern slope into Wetland 1a, and will be supplemented by precipitation.

Mitigation Wetland 2b will begin adjacent and to the west of Wetland 3b, so Wetlands 2a and 3a will be contiguous with Wetland 2b. The primary source of hydrology will be the direct flow of a perennial mineral spring that is piped out of former Wetland 3b (installed during fill activities) into Wetland 3a and then flows from Wetland 3a to Wetland 2a via a culvert. To a lesser extent, hydrology will originate from surface and subsurface flow from Wetland 1a. Overbank flooding is expected to contribute indirectly by limiting discharge through Wetland 2a. The flows from the wetland restoration areas (Wetlands 1b and 2b) will merge in Wetlands 2a before discharging into Emigrant Creek.

The effect of the proposed mitigation wetlands would be to provide direct connectivity between the CWM Site (Wetlands 1b and 2b) to Wetlands 1a, 2a, and 3a. The culvert now connecting Wetland 2a to Wetland 3a will be removed during the excavation of Wetland 2b. Hydrology would be controlled by installing shallow berms in strategic areas to support a longer duration of ponding and/or soil saturation in the restored wetlands and in adjacent wetland areas.

4.4 EXISTING PLANT COMMUNITIES

In the upland CWM area the vegetation community consists of *Bromus tectorum* (Upland, Not on List [NOL]), *Hordeum jubatum* (Facultative [FAC]), *Schedonerus arundinaceus* (Facultative Upland [FACU]), *Bromus hordaceus* (FACU), *Rosa rubiginosa* (Obligate Upland [UPL]), *Rubus armeniacus* (FACU), *Poa bulbosa* (FACU), *Amsinckia menziesii* (NOL), *Taeniatherum caput-medusae* (NOL), *Cerastium vulgatum* (FACU), *Erodium cicutarium* (NOL), *Rumex crispus* (FAC), *Geranium disectum* (NOL), and *Senecio vulgaris* (FACU).

4.5 SITE CONSTRAINTS OR LIMITATIONS

The following constraints, limitations and assumptions apply to the proposed CWM Plan:

1. The mitigation enhancement activities assume that the current hydrologic conditions would not decrease in the future (such as reduced supply of mineral springs water).

2. The mitigation design assumes the frequency, and duration of precipitation would not decrease in the future.

3. Seeding and planting activities for the proposed restoration would take place during September, October or November, depending on weather.

4. AGC activities will not impact the CWM Site.

4.6 FACTORS LEADING TO LOSS OF WETLAND CHARACTERISTICS IN CWM SITE AND ADJCENT LAND

The wetland impact area is part of City-owned Property to the south of Emigrant Creek that has a history of disturbances of hydrology, soils, and vegetation. Very little of the original surface remains. As a result of historic resource extraction in the form of mineral water and carbon dioxide, the CWM Site and adjacent lands were modified with various roads, wells, stream re-alignment, filled areas, ditches, and concrete foundations. During the 80 years the City has owned the majority of the Property, most of the alluvial terrace has been filled. In the AGC lease area, approximately 33 acres were graded for firing ranges including berms up to 20 feet high (***Appendix B, Photo 3, 4,*** *and* **6**), and shrubby vegetation was cleared. Regular maintenance has included mowing of the firing range and keeping the ditches clear of vegetation and graded for drainage. The existing wetlands still have PVC pipes protruding from the surface in various areas from previous activities.

4.7 MEANS FOR REVERSAL OF DEGRADATION IN CWM SITE

Reversal of degradation on the CWM Site will require a two-fold restoration approach that consists of: 1) grading/earthwork, and 2) vegetation management. By excavating the fill within the CWM Site to the native soil elevation and decommissioning the existing drainage ditch, the finished grade is anticipated to bring the major portion of the root zone to within twelve inches of saturation for a minimum of fourteen consecutive days during the active growing season. The earthwork would also involve removal of the existing weedy upland plant community. The finished grade is intended to restore historic surface elevations. Hydrology would be controlled by installing shallow berms in strategic areas to support a longer duration of ponding and/or soil saturation in the restored wetlands and in adjacent wetland areas.

Once wetland hydrology is restored, the new soil surface would then be seeded and planted with native plant material. Vegetation management would continue after the native plant installation to discourage recolonization of the invasives within the CWM Site. By lowering the base elevation and capturing spring water and seeps, the restored wetlands within the CWM Site are expected to remain wet for a long enough time to discourage invasive upland vegetation.

4.8 DOCUMENTATION OF FORMER WETLAND CONDITION

DSL acknowledges the probability of fill in the vicinity (WD#2014-0488 Revised Concurrence Letter for Wetland Delineation Report for Lithia Springs Property; DSL 2015) by stating, "..berms placed in the vicinity of wetlands 2 and 3 in approximately 2002 may have been placed at least in part in wetlands."

Based on historical aerial photographs, it appears that the area proposed for the CWM Site was historically a wetland. The extent of this historical wetland appears to have been diminished by the placement of fill and backfill material at various times during the previous century.

- Historic aerial images from 1939, 1976, and 1991 show wetland signatures and surface irregularities (***Figures 8, 9,*** *and* ***10***).

- The 2014 wetland delineation report (WD#2014-0488) documents several instances of fill in and around wetlands in the area as follows:

  – Section 1.7: seeps along the fill/disturbed slopes around the potential wetlands

  – Section 5.1.1: "The south and west boundaries of the triangular-shaped wetland 1 are clearly defined by steep embankments and the northeast side by a gentle rise in shallow fill and a clear transition in vegetation."

  – Section 9: "The wetland boundaries are clearly defined in most parts by a sharp break in topography due to historic filling activities, and a transition from hydrophytic vegetation community to upland communities."

  – Data forms 7, A, and B report the presence of 18 inches to 24 inches of fill in areas adjacent to wetland (***Appendix B***).

5.0 FUNCTIONS AND VALUES ASSESSMENTS

5.1 RATIONALE FOR METHOD USED

The Function and Values Assessment has been omitted from this document because a permit waiver authorized under OAR 465.315 has been issued by DEQ (see ***Section 1.0***). Because the wetland impacts will result from lead remediation and related activities during a DEQ-approved remedial action, the impacts are deemed unavoidable. The proposed mitigation is not based on the strength of the potential uplift in functions or values. However, since the proposed mitigation site is not in the active shotfall area, and has a hydrology source that does not originate from the mineral springs, the restored wetland will have an inherently higher level of function.

5.2 SUMMARY OF EXPECTED GAINS AND LOSSES

The general wetland function in the CWM Site is expected to be at a higher ~~of~~ function than that of the impact wetland area. This is because the restored wetland is not fed directly by the mineral spring water that caused the calcification of surface soils and limited vegetation diversity and abundance in the impacted wetlands. Mineral spring water will be directed into Wetland 3a, and have an opportunity to precipitate before entering Wetlands 2a/b. Additionally, the restored wetlands will realize more value for their given function because the area is not subject to ongoing shot deposition from the firing range activities, and the resulting surface impacts.

5.3 CONSIDERATIONS TO ADDRESS EXPECTED LOSSES

It is expected that although hydrologic function will be restored immediately following construction, habitat functions provided by vegetation will lag behind until success criteria is met. This temporal loss is offset by restoring more area than is being impacted. There are 0.15 acres (23% more than the wetland impact area) available for surplus mitigation to account for under-performing areas and temporal loss.

Replacement of wetland functions currently existing in the wetland impact area are expected to occur through implementation of this CWM plan. However, if future monitoring indicates the potential for loss in function or opportunity to maximize functions, the mitigation design lends itself to several options such as:

1. Adjusting the degree of restriction in outlet flows through the gap in the earthen berms in Wetland 1b (***Figures 5*** *and* ***6***);

2. Re-planting, re-seeding or introducing different wetland vegetation species in following years.

6.0 CWM CONSTRUCTION MAPS AND DRAWINGS

6.1 GRADING PLAN OBJECTIVES

As discussed in ***Section 4.7***, CWM Site restoration involves earthwork/grading. The objectives of the proposed grading plan are to remove the existing fill overburden, so that wetland conditions are restored within the CWM Site. The CWM construction would include four phases to accomplish these objectives. All phases of construction would be supervised by a consulting wetland ecologist to ensure proper implementation of the CWM Plan.

1. Erosion and Sediment Control: Best management practices, including silt fences (or other comparable method) will be established downgradient of any excavation activity and the "staging area" ***(Figure 5***) before construction work begins to prevent erosion of soil into Emigrant Creek per the requirements of a NPDES 1200-C permit. Inspections will be conducted by a licensed Erosion and Sediment Control Inspector during construction to document and adjust (as necessary) erosion and sediment control methods.

2. Topsoil removal: The first phase of the CWM construction would be the removal of the upper six inches of topsoil for use as topsoil after filling the impact area following lead remediation. The topsoil would be removed with a Gradall®, an excavator equipped with a mud bucket, or similar equipment. Bulldozers, graders, and/or loaders may also be used if the contractor deems them necessary. The material would be loaded, transported and stored in an upland temporary location on the Property designated as the "staging area" on ***Figure 5***, Cross Sections.

3. Grading: The second phase of the CWM construction would include grading to establish the proper subgrade elevations. The Grading Plan and Cross Sections are shown on ***Figure 5***. The goal is to remove the fill (generally the upper 6 to 24 inches) to expose the native soil strata and develop design topography. Native soil consisting of heavy clay would be salvaged and deposited in water control berms for hydrology control (***Figures 5*** *and* ***6***). These berms are not included in wetland acreage and would be constructed with gaps in each berm, the depth and width of which could be adjusted using a shovel. The subsoil would be removed to the design depth and transported to the impact wetland area (Wetland 3b and Wetland 5) for use as fill. Once the subsoil has been placed, the salvaged topsoil would be spread on the surface of the impact area to create a substrate for the seeding.

4. Vegetation Planting: The third phase of the CWM construction involves planting of trees, shrubs and ground cover plants. The Planting Plan is provided on ***Figure 6***. After the vegetation is planted, piezometers will be installed to monitor groundwater levels. Finally, the open areas will be overseeded with grass and flower seed.

6.2 PLANTING LIST AND RATIONALE

A combination of native emergent forbs and grasses, shrubs and trees would be installed in the restored wetlands within the CWM Site (***Figure 6***). The species were selected based on their

natural occurrence in southern Oregon and their function in terms of shade, habitat, vertical structure and food source. All species selected for planting were either documented in the adjacent wetlands on the Property or are listed in the booklet entitled, "Stream & Wetland Enhancement Guide" published by the City of Ashland, Department of Community Development (City of Ashland, November 2011). The vegetation species list in ***Table 4*** represents the priority plants from which a limited number from each category (based on vertical structure) would be selected, depending on availability.

Table 4: Vegetation Species List for the CWM Wetland and Buffer

Scientific Name	Common Name	Indicator Status	Spacing (feet)	Quantity	Size
TALL TREES					
Alnus rhombifolia	White Alder	FACW	10	26 From **≥3** species	1 gallon
Fraxinus latifolia	Oregon Ash	FACW	10		
Populus balsamifera	Black cottonwood	FAC	10		
Betula occidentalis	Water birch	FACW	10		
Umbellularia californica	Oregon myrtle	FAC	10		
Acer macrophyllum	Big-leaf maple	FAC	10		
Salix lasiandra	Pacific willow	*FACW*	10		
Salix scouleriana	Scouler's willow	FAC	10		
SHORT TREES					
Cornus stolonifera	Red-stem (Redosier) dogwood	FACW	8	160 From **≥4** species	1 gallon
Crataegus douglasii	Black Hawthorne	FAC	8		
Physocarpus capitatus	Pacific ninebark	FACW	8		
Salix exigua	Dusky willow	FACW	8		
Salix geyeriana	Geyer's willow	OBL	8		
Salix hookeriana	Piper's willow, dune willow	FACW	8		
SHRUBS/TALL PLANTS					
Ribes aureum	Golden currant	FACW	6	295 From **≥4** species	1 gallon
Ribes triste	Red-flowering currant	FAC	6		
Rosa pisocarpa	Clustered rose	FAC	6		
Rosa woodsii	Woods rose	FAC	6		
Rubus parviflorus	Western thimbleberry	FAC	6		
Schenoplectus acutus	Hardstem bulrush	OBL	6		
Typha latifolia	Broadleaf Cattail	OBL	6		
UNDERSTORY					
Agrostis exerata	Spike bentgrass	FACW	3	2500 From **≥4** species	1500 4inch pots 1000 2-inch pots or plugs
Boisduvalia densiflora	Dense-spike primrose	FACW	3		
Carex nudata	Creek sedge	FACW	3		
Eleocharis palustris	common spikerush	OBL	3		
Juncus balticus	Baltic rush	FACW	3		
Juncus effusus	Soft rush	FACW	3		
Plagiobothrys figuratus	Fragrant popcornflower	FACW	3		
WILDFLOWERS	Rogue Valley wetland natives	Wet prairie	0.8 acres	$12x10^5$ seeds	

Scientific Name	Common Name	Indicator Status	Spacing (feet)	Quantity	Size
GRASSES I				18#/ac. = 14.4 lbs Include all four in mix	
Hordeum brachyantherum	Meadow barley	FACW			
Agrostis capillaris	Colonial bent	FAC			
Deschampsia cespitosa	Tufted hairgrass	FACW			
Deschampsia elongata	Slender hairgrass	FACW			

OBL: obligated wetland, >0.99 probability of occurrence in wetland
FACW: facultative wetland, 0.67 - 0.99 probability of occurrence in wetland
FAC: 0.34 – 0.66 probability of occurrence in wetland

Desirable plants in the CWM Site and in the wetland impact area will be salvaged where practical, and stored for replanting in the CWM Site. All plants will be set in clumps in a random arrangement. The vegetation species list (***Table 4***) shows only the largest size category for the designated polygon. Once each area is planted with the stipulated density, then remaining plants will be scattered in areas where they will eventually become the understory strata. Approximately 0.64 acres will be composed of understory-type grasses and forbs, including wildflowers, 0.24 acres of shrubs, 0.24 acres of shrubby trees, and 0.06 acres of trees.

Within each size category, species requiring varying hydrological regimes will be planted in the most appropriate landscape position. The finished grade will provide substantial microtopographical relief depending on the subsurface conditions encountered. The final decision on where individual species will be planted will be made following excavation and evaluation of post-construction hydrologic conditions.

6.3 CONSTRUCTION SCHEDULE

The following provides the construction schedule for implementing the CWM Plan. The schedule depends on receipt of the removal/fill permit and approval of the CWM Plan by DSL and United States Army Corps of Engineers (USCOE). Approximately 45 days will be required for contractor procurement, planning, and mobilization once the City receives the approved permit. Optimally, CMP Plan implementation would begin in the spring (March) of the year to optimize vegetation vitality. Otherwise excavation would occur during the summer and planting in the fall at the start of the rainy season.

Restoration Activities (Month 1):

- Layout excavation limits, install erosion control around excavation perimeter and storage site perimeter;
- Salvage any desirable plants in the CWM Site and the wetland impact area;
- Conduct surface scraping to remove topsoil and deliver to the upland staging and stockpile area (***Figure 5***);
- Excavate subsoil to design depths shown on the Plan and Cross Sections (***Figure 5***), and deliver to the Wetland 3b and 5 fill areas;
- Salvage heavy clay and place in water control berms, and;

- Conduct final grade surface, install piezometers, plant mulch, and broadcast seed.

Post construction hydrology monitoring and adjustment will be conducted on a reducing frequency over the following quarter as follows:

Month 2:

- Weekly hydrology monitoring and hydrology control adjustments.

Month 3:

- Bi-weekly hydrology monitoring;
- Site maintenance for invasive control, and;
- Hydrology control adjustments.

Month 4:

- Hydrology monitoring and adjustment if required during maintenance event, and;
- Site maintenance for invasive control and hydrology adjustments.

Month 5:

- Prepare as-built wetland map and report

In addition to the scheduled maintenance, the applicant would employ an adaptive management strategy to address unpredictable events such as die-off, vandalism, etc., should they occur. Such events would be addressed at the CWM Site as soon as is practicable and/or feasible following discovery.

7.0 MONITORING PLAN

7.1 PROPOSED PERFORMANCE STANDARDS

The proposed performance standards for monitoring activities would follow the routine standards described in the *Routine Monitoring Guidance (RMG) for Vegetation* (DSL, 2009). The routine standards are outlined below:

1. The CWM site will have a minimum of 0.65 acres of Palustrine Emergent (Cowardin) wetland by the end of year 5, as determined by a wetland delineation to be conducted during the spring of one of the monitoring years when precipitation has been near normal;
2. The cover of native species is at least 60%;
3. The cover of invasive species is no more than 10%;
4. Bare substrate represents no more than 20% cover;
5. By Year 3 and thereafter, there are at least 6 different native species. To qualify, a species must have at least 5% average cover in the habitat class (i.e., strata), and occur in at least 10% of the plots sampled, and;
6. Prevalence Index is ≤3.0.

7.2 MONITORING METHOD(S)

The methods that will be used to monitor the CWM Site will generally follow the *Routine Monitoring Guidance for Vegetation* (DSL, 2009). The sampling strategy for visual estimates of percent cover, minimum number of samples, and systematic sampling will be used from the RMG to determine the number of sample plots. The actual layout of the plots will be determined based on the final wetland configuration.

7.3 MONITORING SCHEDULE

Monitoring of the CWM Site will be required after the construction, seeding, and plantings are completed to verify that the performance standards are being met. The list below indicates the approximate timing of the monitoring field work and the reporting schedule.

Year 1:

- Bi-weekly hydrology monitoring at start of growing season and continuing until at least thirty days of consecutive wetland hydrology has been recorded; and
- Maintenance, weed control, re-planting or overseeding as necessary.

Year 2:

- Bi-weekly hydrology monitoring at start of growing season and continuing until at least thirty days of consecutive wetland hydrology has been recorded, and;

- Maintenance, weed control, re-planting or overseeding as necessary, and adaptive management measures.

Years 3 through 5:

- Bi-weekly hydrology monitoring at start of growing season and continuing until at least thirty days of consecutive wetland hydrology has been recorded, and;
- Maintenance, weed control, re-planting or overseeding as necessary.

Monitoring may be extended beyond five years if designed success criteria are not met.

7.4 RATIONALE FOR PLOT AND PHOTO-DOCUMENTATION LOCATIONS

The location of the monitoring plots will be determined in the field during the first monitoring event based on non-biased methods so that an accurate inventory of the vegetation communities is documented in the monitoring reports. Adaptive management dictates that these plots may need adjustment as the CWM Site matures.

Photo-documentation locations will be positioned to provide meaningful perspective and full coverage of the CWM Site. Overview photographs will also be taken from the top of the slopes on the south side of the Property. The photo documentation locations will be fixed such that photographs are taken from the same locations every year during the CWM Site monitoring visits.

8.0 LONG-TERM PROTECTION & FINANCIAL SECURITY INSTRUMENTS

8.1 DESCRIPTION OF PROPOSED PROTECTION INSTRUMENT

The CWM Site would be protected in perpetuity by use of a deed restriction. The deed restriction would be recorded after mitigation construction is complete, and would be submitted to DSL and the USACE with the As-built Construction Report. A Permit Compliance Certification will be prepared for the USCOE, and included in the As-Built Report sent to them. A copy of the draft Declaration of Covenants and Restrictions and the Compliance Certification is included in ***Appendix C*** of this report.

8.2 DESCRIPTION OF PROPOSED FINANCIAL SECURITY INSTRUMENT

A financial security instrument is not applicable to a publically owned CWM Site.

8.3 LONG-TERM MAINTENANCE PLAN

- Intensive long-term maintenance beyond the required maintenance period is not anticipated to be necessary because the mitigation wetlands are designed to be self-sustaining.
- The mitigation wetlands will continue to remain under regulatory jurisdiction, the purview of the State of Oregon's removal-fill laws and Section 404 of the federal Clean Water Act.
- As indicated in ***Section 8.1***, the property will be deed restricted to prevent incompatible project proposals in the future.
- Additionally, the CWM Site is protected long-term by its position among non-developable lands (i.e., proximity to an active firing range).

Minor long-term maintenance actions are anticipated. Such actions would likely be limited to periodic mowing or hand removal of weeds so that the CWM Site does not become colonized with Himalayan blackberry. Prescribed burning is not anticipated to be a viable maintenance technique due to the extreme fire danger that occurs in summer months in southern Oregon.

The CWM Plan does not involve the construction of mechanical water control structures, therefore long-term maintenance of this type of engineered feature will not be necessary. Due to the relatively secure nature of the property, repairs due to vandalism are not anticipated to be a significant long-term maintenance action. Vandalism repairs would occur as-needed and the extent of the repair would be highly dependent on the nature of the damage.

The City is anticipated to be the responsible party for long-term maintenance of the CWM Site. The funding source for long-term maintenance of the CWM Site is anticipated to be dedicated by the City as maintenance needs are identified. The amount of the maintenance funding

would be established on an annual basis and would be dependent on extent of the maintenance needs.

9.0 REFERENCES

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Other_Citation_Details: Map created as part of the research undertaken by the Pacific Northwest Ecosystem Research Consortium (<http://osu.orst.edu/dept/pnw-erc>) funded by the U.S. EPA under cooperative agreement with OSU #CR824682.

Abstract: This polygon coverage depicts "presettlement" vegetation in Oregon as described by surveyors for the General Land Office (1851–1909), when surveying township and section lines. Most low-elevation sites with arable land were surveyed

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Appendix A SITE PHOTOGRAPHS

Appendix B DATA FORMS

Appendix C PROTECTIVE INSTRUMENTS