2015 Wetland Monitoring Report

Introduction

This report summarizes the wetland mitigation monitoring conducted during 2015 at the Rocky Flats Site (Site), a U.S. Department of Energy (DOE) facility near Denver, Colorado (Figure 1).

Monitoring of mitigation wetlands begins as each project is completed, and for the first several years after initial wetland establishment, interim monitoring—consisting of qualitative and semiquantitative assessments of each of the wetland mitigation sites—is conducted. In addition, the wetlands are mapped annually, and noxious weeds are monitored and managed if necessary. About the fifth year after project completion, the mitigation wetlands are mapped and delineated following the current U.S. Army Corps of Engineers (USACE) wetland delineation procedure.

Background

Final wetland delineations and interim monitoring were conducted at several locations onsite in 2015. The general locations are described briefly below and shown in Figure 2. Figures 3–6 show close-up views of the areas. The figures show only wetlands monitored in 2015 and whether or not they met wetland criteria in 2015. The Geographic Information System (GIS) numbers (e.g., GIS #100) correlate with the numbers in the data summary tables that are discussed later in the report. Table 1 shows the seed mixes that were used at the various wetland areas.

A-3 and Present Landfill (PLF) Wetlands

In 2012, the pond A-3 and PLF dams were breached and recontoured to create wetlands and a more natural flow-through system and to reduce management and maintenance costs. Most of the disturbance during the breaching activities impacted upland or open water areas. Only 0.17 acre of emergent wetlands that surrounded the open water area was disturbed. Before the dams were breached, the perimeter wetlands were dominated by cattails (*Typha* ssp.), hardstem bulrush (*Schoenoplectus acutus*), arctic rush (*Juncus balticus*), and a few coyote willow (*Salix exigua*) at the PLF and barnyard grass (*Echinochloa crus-galli*), dock (*Rumex* spp.), and redtop (*Agrostis stolonifera*) at A-3 (USACE 1994). Spoil from the dams was placed in the open water areas to reduce the depth of water and create emergent wetlands across the former pond bottoms. The potential wetland areas were seeded with the Site's wetland seed mix (Table 1), and permanent turf reinforcement matting (TRM) was placed on top as an erosion control measure and to help hold the seed in place. At the A-3 wetland, approximately 310 coyote willow stakes, 49 peachleaf willow (*Salix amygdaloides*) stakes, and 7 plains cottonwood (*Populus deltoides*) poles were installed around the perimeter of the wetland after the TRM was installed and final water levels were reached. Woody plant stakes were installed at the PLF wetland in spring 2013 because they had already broken bud by the time the project was completed in 2012. Interim monitoring was conducted at the A-3 and PLF wetland locations (GIS #98a, 98b, 99, 100, 101, 102) (Figures 3 and 4) in 2015.

Point of Compliance (POC) Flume Wetlands

In late summer 2011, two new point of compliance flumes were installed at the Site in accordance with regulatory requirements in the *Rocky Flats Legacy Management Agreement* (DOE et al. 2007). One was installed in Walnut Creek (WALPOC), and the other was installed in Woman Creek (WOMPOC) (Figure 5). Small areas of wetland were disturbed along the stream where each flume was installed (Figure 5, GIS #94, 95, 96, and 97). Prior to construction, the wetland at WALPOC was dominated by coyote willow, arctic rush, spikerush (*Eleocharis* spp.), and Nebraska sedge (*Carex nebrascensis*) and at WOMPOC by cattails, coyote willow, and arctic rush (USACE 1994). The total wetland impact was approximately 0.13 acre at both WALPOC and WOMPOC combined. At project completion, the potential wetland mitigation areas were seeded with the Site's wetland seed mix (Table 1), and TRM was placed on top as an erosion control measure and to help hold the seed in place. Final wetland delineations were made at both wetland areas in 2015.

GS10 Project Area

In late summer 2013, the surface water monitoring flume at GS10 was replaced because the old flume had reached the end of its expected life (Figure 6, GIS #103 and 104). Approximately 0.04 acre of wetland was impacted by the project. The preexisting wetlands at GS10 were dominated by coyote willow, cattails, and common three-square (*Schoenoplectus pungens*) (USACE 1994). The project was completed on September 9, 2013, and completion activities included reseeding and installation of erosion controls. Interim monitoring was conducted in 2015.

Original Landfill Project (OLF)

During the spring of 2015, above-average rainfall saturated the hillside and areas above the OLF. As a result, several slumps and slides occurred on the OLF. Interim repairs were made in late summer 2015 by regrading the hillside to prevent water from pooling on the hillside and promote drainage. Several small wetland areas were disturbed during the regrading of the hillside. Approximately 0.05 acre of wetland was impacted by the project. These preexisting wetlands on the OLF were dominated by Torrey's rush (*Juncus torreyi*), peachleaf willow, coyote willow, cattails, and Canada thistle (*Circium arvensis*). The project was completed on September 22, 2015, and completion activities included reseeding and installation of erosion controls. No interim monitoring was conducted in 2015 because the project was still in progress when wetland monitoring was conducted and nothing had started to grow by the end of the growing season. Monitoring will begin in 2016 where wetlands begin to reestablish on the impacted areas of the OLF.

Methods

Wetland Delineations/Interim Monitoring

Final wetland delineations were conducted in late summer 2015 in accordance with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) (USACE 2010) and the 1987 *Corps of Engineers Wetland Delineation Manual* (USACE 1987), using the Wetland Determination Data Form for the Western Mountains, Valleys, and Coast Region. For those areas where final wetland delineations were not conducted, a Wetland Qualitative Revegetation Evaluation Form and a Wetland Determination Data Form were completed for each wetland. Sample forms are found on the DVD under the "Example Wetland Determination Data Forms" link.

On the basis of the USACE definition, an area is considered to be a wetland when the three indicators—hydric soils, hydrophytic vegetation, and wetland hydrology—are present. Part IV, Section F (b, c) of the 1987 *Corps of Engineers Wetland Delineation Manual* (USACE 1987) discusses atypical situations where natural or man-induced changes have resulted in new "normal circumstances" for an area. Because the areas that are being evaluated are mitigation areas where changes in land configuration, hydrologic conditions, soil conditions, and other factors have occurred, new "normal circumstances or conditions" are considered to be present at all of the locations.

Because the locations are mitigation wetlands, hydric soil indicators may not have had time to develop. Therefore, in accordance with the guidance on problematic soils in the Regional Supplement (USACE 2010) for mitigation wetlands, the soils were considered to be hydric when both hydrophytic vegetation and wetland hydrology were present.

Vegetation was monitored by creating a species list and foliar cover summary for each wetland area as a whole or for each designated wetland unit within a larger wetland. For each species, cover was estimated and recorded to the nearest percentage on the Wetland Determination Data Form. The percent absolute foliar cover was the estimated actual cover value for each species (percentage of ground surface covered by the leaves and stems) in a wetland area. For species that were estimated to have less than 1 percent cover, a value of 0.25 percent was used for analyses. Species were listed by species code (speccode) on the Wetland Determination Data Form. The scientific names for the speccodes can be found in the foliar cover summary tables or in the list of the Rocky Flats flora on the DVD (on the "Rocky Flats Site Flora" webpage).

The indicator status and scientific names for the wetland species was based on the State of Colorado 2014 Wetland Plant List (USACE 2014). Per this document, if no status was found for a species or a species was not listed, the species was considered to be an upland species. The newer scientific names were only used for those species with a wetland indicator status of obligate wetland plants (OBL), facultative wetland plants (FACW), facultative plants (FAC), or facultative upland plants (FACU).

Data from the "Vegetation" section of the Wetland Determination Data Forms were entered into an electronic database for analysis and summarized in tables. The foliar cover calculations, dominant species, the indicator status of each species, and worksheets were then transferred to the Wetland Determination Data Forms. The 50/20 rule was used to determine species dominance for hydrophytic vegetation, following the method provided in the Regional Supplement (USACE 2010). If the plant community fails the dominance test using the

50/20 rule, a score of 3.0 or less on the prevalence index indicates that hydrophytic vegetation is present.

Wetland hydrology was evaluated on the basis of water levels in soil pits, surface observations at the time of monitoring in late summer, and weekly visual observations at the various wetlands from April 13 through June 24, 2015.

The latitude and longitude on the Wetland Determination Data Forms was calculated from the GIS as the center point of the wetland polygon(s). The coordinate system used is the NAD 1927 State Plane Colorado Central FIPS 0502. The areal extent of wetlands in 2015 was mapped using a Trimble GPS unit and downloaded into ArcGIS (ESRI 2015). Acreages were calculated and summarized for each area surveyed. Maps were produced in ArcGIS. The maps generated for the various locations distinguish between areas that met wetland criteria after final delineations were made and those that were found to meet the criteria during interim monitoring (Figures 3–6). Completed Wetland Determination Data Forms along with the Wetland Qualitative Revegetation Evaluation Forms for each wetland are found on the DVD. Click on the "2015 Forms" link next to the wetland name or GIS # for the forms for that wetland.

Additional Wetland Monitoring

Noxious weed surveys were conducted monthly for most wetland sites during the height of the growing season from June through August 2015 (refer to the "Weed Survey Form" link for each wetland on the DVD). State-listed noxious weeds, as listed in 8 *Code of Colorado Regulations* 1206-2 (8 CCR 1206-2), and other problematic species at the Site were listed on these forms, along with a percent cover estimate.

In the past, counts were made to assess the survival of planted woody species. However, over time, accurate counts have become impossible because the plants have all grown together and new "volunteers" have come in. Thus, survival counts of planted individuals are no longer made. Instead, live woody plants (planted and volunteer) growing at each wetland mitigation location are counted when feasible.

Photo monitoring was conducted at each of the mitigation wetland sites. Photos were taken from established photopoints for each wetland. For new wetland areas monitored in 2015, new photopoints were established. These photo series show the development of the wetlands over time (refer to the "2015 Wetland Monitoring Photopoint Photos" link for each wetland on the DVD).

Results and Discussion

Woody Plant Species

Table 2 lists the number of woody plants of different species found at each monitored location in 2015. At most locations where the originally installed plants survived the first year (typically coyote willow), plants have begun to spread and fill in the surrounding areas. Where clumps of willows had intact root systems after project disturbance, plants have come up and continued to spread. At many locations, volunteers of false indigo (*Amorpha fruticosa*), coyote willow, peachleaf willow, plains cottonwood, snowberry (*Symphoricarpos occidentalis*), Arkansas rose (*Rosa arkansana*), and narrowleaf cottonwood (*Populus angustifolia*) seedlings have come in on

their own. The seed source was most likely nearby established plants or seed brought in by wildlife. Cottonwoods and willows require an open, scoured area for seedlings to germinate and survive; areas of open, bare ground that were available after wetland projects were completed created ideal germination conditions for these species.

Noxious Weed Species

Weed species recorded in 2015 at the various mitigation wetlands included Canada thistle, common mullein (*Verbascum thapsus*), and sowthistle (*Sonchus arvensis* ssp. *uliginosus*). These species are listed on the Colorado Noxious Weed list (8 CCR 1206-2). The weed surveys for each wetland are available on the DVD under the appropriate wetland link. Weed control activities in the mitigation wetlands are conducted as part of the normal natural resource management operations at the Site.

Climate Information

The average yearly precipitation received at the Site from 1992 to 2011 is 15.67 inches (based on data from the National Renewable Energy Laboratory [NREL] NWTC M2 Tower and former Rocky Flats Meteorological Tower). In 2012, the precipitation data from the NREL facility became inconsistent and were no longer found to be accurate due to missing data after storm events. Data from Boulder, Colorado, north of the Rocky Flats Site, are now used as an approximate measure of Site precipitation (USDC 2016). On the basis of a comparison of precipitation data from the Rocky Flats Site and Boulder locations from 1992 through 2011, the Site received an average of approximately 5 inches of rainfall per year less than Boulder, but rainfall patterns are generally the same. In 2015, Boulder received 26.92 inches of precipitation with the largest amounts coming in April (4.5 inches) and May (7.82 inches). The average annual precipitation in Boulder from 1894 through 2015 is 19.11 inches. Thus, Boulder and presumably the Site received above normal precipitation for 2015. In fact the total average annual precipitation was received by July in 2015 in Boulder.

Wetland Monitoring Data

Table 3 summarizes early growing-season water-level observations at the various wetlands for 2015. These data were collected from April 13 through June 24, 2015. In general, hydrologic conditions have been suitable for continued wetland establishment at each of the wetlands monitored in 2015 (with the exception of GS10-C). The specific hydrologic data for each wetland when it was monitored in 2015 can be found on each wetland's Wetland Determination Data Form on the DVD.

Table 4 summarizes the species richness and cover data collected in 2015 that were used to determine whether hydrophytic vegetation was present at each wetland. The yellow cells in the table represent the dominant species as determined by the 50/20 rule at each location. The orange cells represent locations where the total herbaceous, shrub, or tree cover, within each respective vegetation layer, was less than 5 percent and, therefore, below the threshold to be considered a separate vegetated layer.

The bottom of Table 4 summarizes the hydrophytic vegetation, hydric soils, and wetland hydrology results at the 13 locations monitored in 2015. Green cells represent locations where all wetland indicator criteria (hydrophytic vegetation, wetland hydrology, and hydric soils) were met, and pink cells represent locations where one or more wetland indicator criteria were not met. Final wetland delineations were conducted at the WALPOC (GIS# 94 and 95) and

WOMPOC (GIS# 96 and 97) wetland locations, each of which met all three wetland criteria. At the remaining 9 locations where interim monitoring was conducted, all but one location (GS10-C; GIS #103b) met all three wetland criteria. Table 5 summarizes the areal extent (in acres) of each of the interim monitored wetlands in 2015. The total potential wetland acreage is approximately 0.67 acres as of 2015. Wetland Determination Data Forms, Wetland Qualitative Revegetation Evaluation Forms, and weed surveys for each monitored wetland area are available through links on the DVD. Time-series photo monitoring for the wetlands is also available through the "2015 Wetland Monitoring Photopoint Photos" link on the DVD.

Wetland Delineations

Wetland mitigation at the Site is being done on a sitewide basis, rather than project by project, unless it can be completely done in situ (such as at the PLF and A-3 project areas), due to the difficulty of reestablishing wetlands where specific project activities have often highly altered the vegetation, hydrology, and soils. The overall goal is no net loss of wetlands at the Site. The mitigation ratio at the Site is conducted at a 1:1 ratio for comparable plant communities (Claggett 2005). A mitigation ratio of no greater than 1:1 is also important to satisfy the Colorado Division of Water Resources requirements, which require water rights for in situ mitigation greater than 1:1.

The *Annual Report of Site Surveillance and Maintenance Activities at the Rocky Flats, Colorado, Site, Calendar Year 2013* (DOE 2014) closed out the preclosure and selected postclosure wetland impacts and mitigation monitoring, along with the *Rocky Flats, Colorado, Site Wetland Mitigation Monitoring and Management Plan* (DOE 2006). That report included an accounting for the impacted and compensatory mitigation acreages.

Impacts to wetlands at the Site, during and since Site closure, have been classified as either Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-related or non-CERCLA related and tracked separately. Table 6 lists the wetland impacts from recent CERCLA-related or non-CERCLA-related projects for which mitigation monitoring has been ongoing. The total debit from both categories of impacts combined as of the end of 2015 is approximately −0.45 acre.

Final wetland delineations were made in 2015 for the WALPOC (GIS #94 and 95) and WOMPOC (GIS #96 and 97) wetland locations (Figure 5), each of which met all three wetland criteria. A total of 0.0531 acre of wetland credit was achieved from both of these locations combined (Table 7). This credit is also shown as a credit in Table 6 for the Point of Compliance Flume Project (the project that each of these flumes were part of), leaving a debit balance of approximately −0.40 acre. As the other wetland mitigation locations continue to establish, this debit should disappear over the next few years.

Summary

Mitigation wetlands at the Site continue to establish. Final delineations were made at two locations in 2015. Remaining areas will continue to be monitored in 2016.

References

8 CCR 1206-2. "Rules Pertaining to the Administration and Enforcement of the Colorado Noxious Weed Act," *Code of Colorado Regulations*.

Claggett, 2005. Richard Claggett, Tribal and Wetlands Unit, Ecosystem Protection Program, U.S. Environmental Protection Agency, letter (about Status of Rocky Flats Wetland Mitigation Requirements) to Cliff Franklin, Rocky Flats Project Office, U.S. Department of Energy, September 29.

DOE (U.S. Department of Energy), 2006. *Rocky Flats, Colorado, Site Wetland Mitigation Monitoring and Management Plan*, DOE-LM/GJ1207-2006, Office of Legacy Management, June.

DOE (U.S. Department of Energy), 2014. *Annual Report of Site Surveillance and Maintenance Activities at the Rocky Flats, Colorado, Site, Calendar Year 2013*, LMS/RFS/S11432, Office of Legacy Management, April.

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ESRI (Environmental Systems Research Institute), 2015. ArcGIS version 10.3.1, Environmental Systems Research Institute, Inc., Redlands, California.

USACE (U.S. Army Corps of Engineers), 1987. *Corps of Engineers Wetlands Delineation Manual*.

USACE (U.S. Army Corps of Engineers), 1994. *Rocky Flats Plant Wetlands Mapping and Resource Study*.

USACE (U.S. Army Corps of Engineers), 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region*, Version 2.0.

USACE (U.S. Army Corps of Engineers), 2014. *State of Colorado 2014 Wetland Plant List*.

USDC (U.S. Department of Commerce), 2016. "Boulder Monthly Climate Data: Precipitation," http://www.esrl.noaa.gov/psd/boulder/Boulder.mm.precip.html, accessed February 1, 2016.

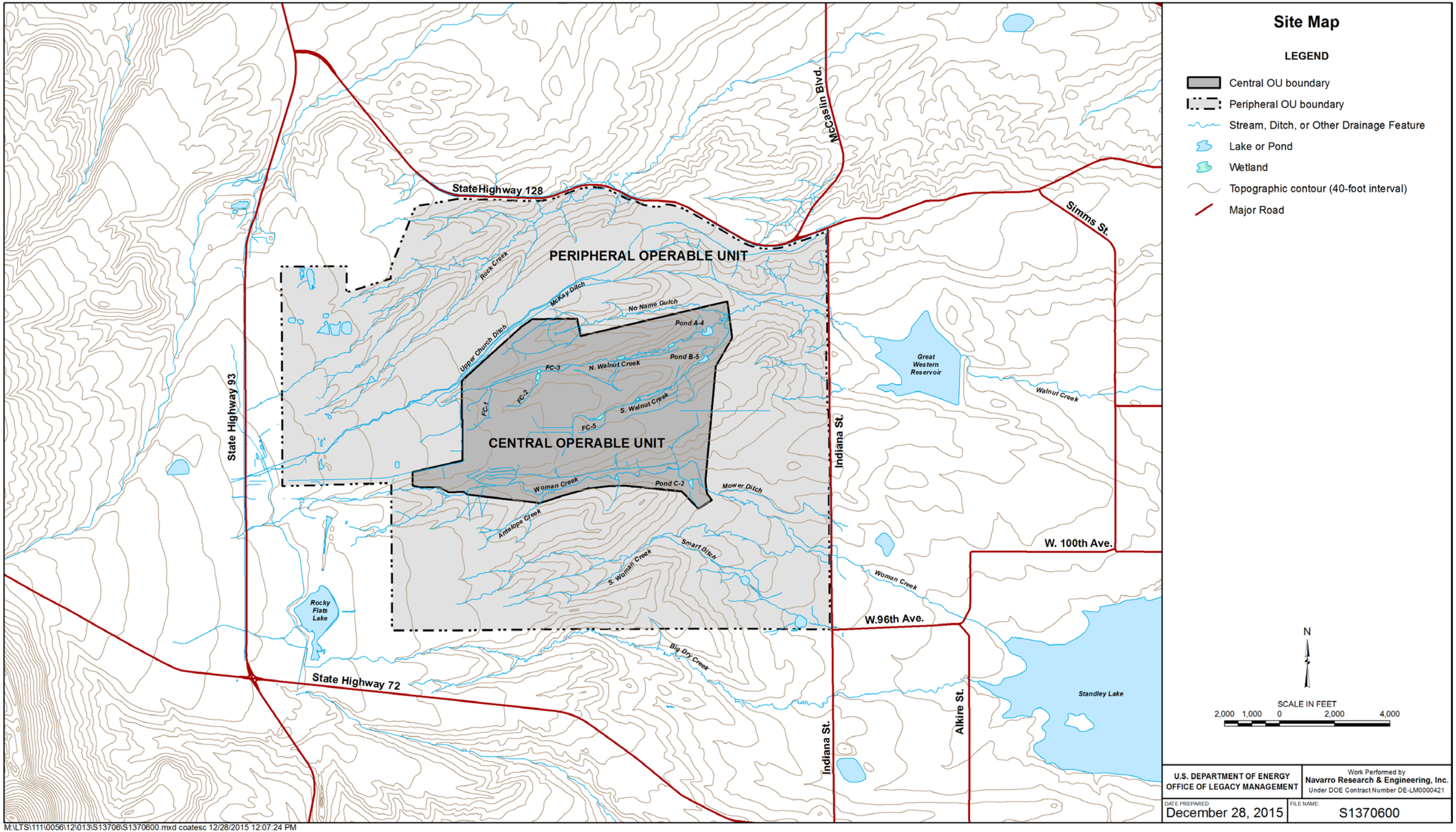

Figure 1. Site Map

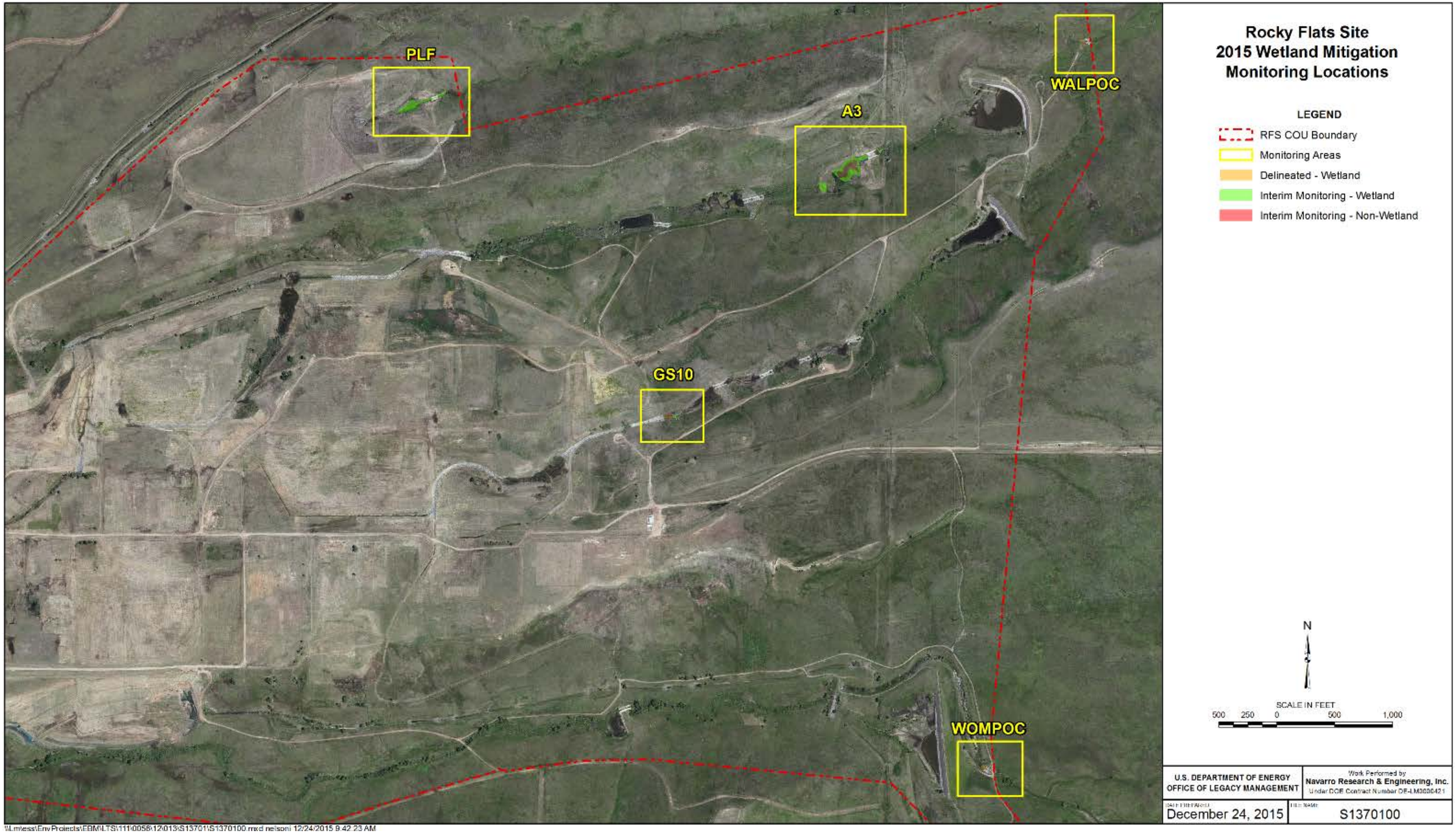

Figure 2. Rocky Flats Site 2015 Wetland Mitigation Monitoring Locations

Figure 3. Rocky Flats Site 2015 Wetland Mitigation Monitoring Locations A-3 Dam Breach Area

Figure 4. Rocky Flats Site 2015 Wetland Mitigation Monitoring Locations Present Landfill (PLF) Area

Rocky Flats Site
2015 Wetland Mitigation
Monitoring Locations
POC Flumes

LEGEND

Delineated 2015 - Wetland

RFS COU Boundary

Numbers represent GIS#'s found in the report and tables.

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Figure 5. Rocky Flats Site 2015 Wetland Mitigation Monitoring Locations POC Flumes

Figure 6. Rocky Flats Site 2015 Wetland Mitigation Monitoring Locations GS10

Table 1. Seed Mixes Used At Various Wetland Mitigation Areas

Functional Channel 1 Wetland Seed Mix

Scientific Name	Common Name	Wetland Designation	% of Mix (# Seeds)
Graminoids			
Agrostis scabra	Hair Grass	FAC	10
Carex lanuginosa	Wooly Sedge	OBL	0
Carex nebrascensis	Nebraska Sedge	OBL	5
Carex utriculata	Beaked Sedge	OBL	0
Eleocharis palustris	Longstem Spike Rush	OBL	15
Juncus balticus	Arctic Rush	FACW	10
Juncus torreyi	Torrey's Rush	FACW	15
Scirpus acutus	Hard-stem Bulrush	OBL	7
Scirpus americana	Three-Square	OBL	5
Scirpus validus	Softstem Bulrush	OBL	13
Spartina pectinata	Prairie Cordgrass	FACW	20

Wetland Seed Mix

Scientific Name	Common Name	Wetland Designation	% of Mix (# Seeds)
Graminoids			
Agrostis scabra	Hair Grass	FAC	10
Carex nebrascensis	Nebraska Sedge	OBL	5
Eleocharis palustris	Longstem Spike Rush	OBL	15
Juncus balticus	Arctic Rush	FACW	10
Juncus torreyi	Torrey's Rush	FACW	15
Scirpus acutus	Hard-stem Bulrush	OBL	7
Scirpus americana	Three-Square	OBL	5
Scirpus validus	Softstem Bulrush	OBL	13
Spartina pectinata	Prairie Cordgrass	FACW	20

Upland/Riparian Seed Mix

Scientific Name	Common Name	Wetland Designation	% of Mix (# Seeds)
Graminoids			
Agropyron smithii	Western Wheatgrass	FACU	15
Agropyron trachycaulum	Slender Wheatgrass	FACU	20
Andropogon gerardii	Big Bluestem	FACU	15
Bouteloua gracilis	Blue Grama		10
Elymus canadensis	Canada Wildrye	FACU	20
Panicum virgatum	Switchgrass	FAC	20

Table 2. 2015 Wood Plant Summary at Wetland Mitigation Locations

Location	GIS #	Coyote Willow (SAEX1)	Peach Leaf Willow (SAAM1)	False Indigo (Lead Plant) (AMFR1)	Snowberry (SYOC1)	Arkansas Rose (ROAR1)	Narrowleaf Cottonwood (POAN1)	Cottonwood (PODE1)
WALPOC Wetland - A	94	TN						
WALPOC Wetland - B	95					3		
WOMPOC Wetland - A	96	6	6	4				3
WOMPOC Wetland - B	97			12			1	
A-3 Wetland - A	98a	TN						
A-3 Wetland - B	99	20						
A-3 Wetland - C	100	TN						
A-3 Wetland - D	98b	24						
PLF Wetland - A	101	TN						1
PLF Wetland - B	102	17	5					6
GS10-A	103a	35						
GS10-B	104	12						
GS10-C	103b	TN			1			

TN = Too numerous to count.

Table 3. 2015 Wetland Water Levels Data Summary

		4/13/2015		4/20/2015		4/28/2015		5/5/2015		5/11/2015	
Location	GIS #	Water Depth (in.)	Saturated at Surface	Water Depth (in.)	Saturated at Surface	Water Depth (in.)	Saturated at Surface	Water Depth (in.)	Saturated at Surface	Water Depth (in.)	Saturated at Surface
WALPOC Wetland - A	94	0-4	Y	0-8	Y	0-8	Y	0-9	Y	0-14	Y
WALPOC Wetland - B	95	0-6	Y	0-10	Y	0-11	Y	0-10	Y	0-15	Y
WOMPOC Wetland - A	96	0-5	Y	0-6	Y	0-9	Y	0-10	Y	0-20	Y
WOMPOC Wetland - B	97	0-28	Y	0-24	Y	0-30	Y	0-36	Y	0-28	Y
A-3 Wetland - A	98a	0-8	Y	0-9	Y	0-10	Y	0-11	Y	0-11	Y
A-3 Wetland - B	99	0-36	Y	0-40	Y	0-40	Y	0-40	Y	0-42	Y
A-3 Wetland - C	100	0-2	Y	0-5	Y	0-5	Y	0-6	Y	0-6	Y
A-3 Wetland - D	98b	0-2	Y	0-3	Y	0-4	Y	0-5	Y	0-5	Y
PLF Wetland - A	101	0-6	Y	0-7	Y	0-8	Y	0-8	Y	0-9	Y
PLF Wetland - B	102	0-24	Y	0-25	Y	0-28	Y	0-26	Y	0-27	Y
GS10-A	103a	0-6	Y	0-6	Y	0-8	Y	0-8	Y	0-9	Y
GS10-B	104	0-6	Y	0-6	Y	0-8	Y	0-8	Y	0-8	Y
GS10-C	103b	0	N	0	N	0	N	0	N	0	N

		5/21/2015		5/26/2015		6/4/2015		6/8/2015		6/15/2015		6/24/2015	
Location	GIS #	Water Depth (in.)	Saturated at Surface	Water Depth (in.)	Saturated at Surface	Water Depth (in.)	Saturated at Surface	Water Depth (in.)	Saturated at Surface	Water Depth (in.)	Saturated at Surface	Water Depth (in.)	Saturated at Surface
WALPOC Wetland - A	94	0-12	Y	0-8	Y	0-6	Y	0-10	Y	0-7	Y	0-6	Y
WALPOC Wetland - B	95	0-12	Y	0-10	Y	0-6	Y	0-10	Y	0-8	Y	0-6	Y
WOMPOC Wetland - A	96	0-18	Y	0-14	Y	0-4	Y	0-8	Y	0-7	Y	0-4	Y
WOMPOC Wetland - B	97	0-36	Y	0-28	Y	0-30	Y	0-36	Y	0-28	Y	0-30	Y
A-3 Wetland - A	98a	0-10	Y	0-10	Y	0-8	Y	0-9	Y	0-8	Y	0-8	Y
A-3 Wetland - B	99	0-43	Y	0-41	Y	0-40	Y	0-40	Y	0-40	Y	0-38	Y
A-3 Wetland - C	100	0-5	Y	0-7	Y	0-3	Y	0-6	Y	0-3	Y	0-2	Y
A-3 Wetland - D	98b	0-4	Y	0-4	Y	0-2	Y	0-3	Y	0-2	Y	0-2	Y
PLF Wetland - A	101	0-7	Y	0-7	Y	0-7	Y	0-7	Y	0-7	Y	0-7	Y
PLF Wetland - B	102	0-28	Y	0-28	Y	0-25	Y	0-28	Y	0-24	Y	0-24	Y
GS10-A	103a	0-11	Y	0-8	Y	0-10	Y	0-10	Y	0-7	Y	0-7	Y
GS10-B	104	0-12	Y	0-8	Y	0-6	Y	0-10	Y	0-7	Y	0-7	Y
GS10-C	103b	0	N	0	N	0	N	0	N	0	N	0	N

— = No surface water observed.

NOTE: GIS#98b and GIS#103b water levels are estimated because these areas were split out during the wetland monitoring activities which were conducted later in the summer.

Table 4. 2015 Wetland Vegetation Data Summary

Herbaceous Cover					A-3 Wetlands				GS10			PLF		WALPOC		WOMPOC	
				GIS#	98a	99	100	98b	103a	104	103b	101	102	94	95	96	97
Scientific Name	Speccode	Growth Form	Noxious Weed	Wetland Indicator	A3-A	A3-B	A3-C	A3-D	GS10-A	GS10-B	GS10-C	PLF-A	PLF-B	WALPOC-A	WALPOC-B	WOMPOC-A	WOMPOC-B
Alisma triviale Pursh	ALTR1	F		OBL			0.25									0.25	
Ambrosia psilostachya DC.	AMPS1	F		FACU	0.25												
Barbarea vulgaris R. Br.	BAVU1	F		FAC		1											
Cirsium arvense (L.) Scop.	CIAR1	F	X	FAC	0.25	0.25	0.25		0.25		0.25	0.25			0.25	0.25	
Conyza canadensis (L.) Cronq.	COCA1	F		XX	0.25						0.25	0.25					0.25
Cynoglossum officinale L.	CYOF1	F	X	FACU							0.25						
Epilobium ciliatum Raf. ssp. glandulosum (Lehm.) Hock & Raven	EPCI1	F		FACW			0.25					0.25	0.25				
Hypericum perforatum L.	HYPE1	F	X	FACU							0.25						
Lactuca serriola L.	LASE1	F		FACU							0.25						
Lepidium campestre (L.) R. Br.	LECA1	F		XX									0.25				
Lycopus americanus Muhl. ex Barton	LYAM1	F		OBL								0.25					
Mentha arvensis L.	MEAR1	F		FACW							0.25	0.25	0.25			0.25	
Oenothera villosa Thunb. ssp. strigosa (Rydb.) Dietrich & Raven	OEVI1	F		FAC							0.25	0.25					
Plantago major L.	PLMA1	F		FAC	0.25												
Potamogeton natans L.	PONA1	F		OBL								1	0.25				
Rumex crispus L.	RUCR1	F		FAC	0.25		0.25				0.25		0.25	0.25		2	0.25
Rumex maritimus L.	RUMA1	F		FACW												0.25	
Sonchus arvensis L. ssp. uliginosus (Bieb.) Nyman	SOAR2	F	X	FACU								0.25					
Veronica anagallis-aquatica L.	VEAN1	F		OBL		0.25			2			0.25		0.25		25	
Verbascum thapsus L.	VETH1	F	X	FACU							0.25						
Xanthium strumarium L.	XAST1	F		FAC	0.25		2										
Agropyron caninum (L.) Beauv. ssp. majus (Vasey) C. L. Hitchc.	AGCA1	G		FAC			0.25		3	5	3			1			0.25
Agropyron repens (L.) Beauv.	AGRE1	G	X	FAC	0.25												
Agrostis stolonifera L.	AGST1	G		FAC					0.25			0.25	0.25	8		2	4
Bromus inermis Leyss. ssp. inermis	BRIN1	G		FAC	0.25						15						
Carex nebrascensis Dew.	CANE1	G		OBL	0.25							1	0.25	1			
Echinochloa crus-galli (L.) Beauv.	ECCR1	G		FAC	0.25	2	1							1			0.25
Eleocharis macrostachya Britt.	ELMA1	G		OBL	15		3		1	4		2	1	30		15	
Festuca pratensis Huds.	FEPR1	G		XX					0.25						0.25		
Hordeum jubatum L.	HOJU1	G		FAC	2	4	20					0.25		25			
Juncus balticus Willd.	JUBA1	G		FACW					0.25			0.25	10		8		
Juncus torreyi Cov.	JUTO1	G		FACW					1			15	10			3	
Panicum virgatum L.	PAVI1	G		FACW	0.25							0.25	1				
Poa compressa L.	POCO1	G		FACU	0.25		0.25								2		0.25
Polypogon monspeliensis (L.) Desf.	POMO1	G		FACW	1	22	35	65	40	50		0.25	0.25	0.25		0.25	8
Poa pratensis L.	POPR1	G		FAC											0.25		
Scirpus acutus Muhl.	SCAC1	G		OBL	1	1	0.25		14			35	25			2	
Scirpus maritimus L. var. paludosus (A. Nels.) Kukenth.	SCMA1	G		OBL	20		7					4	8	2			
Scirpus pallidus (Britt.) Fern	SCPA1	G		OBL												1	
Scirpus pungens Vahl	SCPU1	G		OBL									0.25				
Typha angustifolia L.	TYAN1	G		OBL	45	0.25	2		5	6		25	32	0.25		30	
Total Herbaceous Foliar Cover					87.00	30.75	71.75	65.00	67.00	65.00	20.25	86.25	89.25	69.00	10.75	81.25	13.25
50/20 Rule: 50% of Total Cover					43.50	15.38	35.88	32.50	33.50	32.50	10.13	43.13	44.63	34.50	5.38	40.63	6.63
50/20 Rule: 20% of Total Cover					17.40	6.15	14.35	13.00	13.40	13.00	4.05	17.25	17.85	13.80	2.15	16.25	2.65
Total Noxious Weed Cover					0.50	0.25	0.25	0.00	0.25	0.00	1.00	0.50	0.00	0.00	0.25	0.25	0.00

Values in the table represent absolute foliar cover.

Shrub/Sapling Cover					A-3 Wetlands				GS10			PLF		WALPOC		WOMPOC	
				GIS#	98a	99	100	98b	103a	104	103b	101	102	94	95	96	97
Scientific Name	Speccode	Growth Form	Noxious Weed	Wetland Indicator	A3-A	A3-B	A3-C	A3-D	GS10-A	GS10-B	GS10-C	PLF-A	PLF-B	WALPOC-A	WALPOC-B	WOMPOC-A	WOMPOC-B
Amorpha fruticosa L.	AMFR1	S		FACW												1	50
Populus angustifolia James	POAN3	S		FACW													2
Populus deltoides Marsh. ssp. monilifera (Ait.) Eckenw.	PODE1	S		FAC								0.25	0.25			0.25	
Rosa arkansana Porter	ROAR1	S		FACU											0.25		
Salix amygdaloides Anderss.	SAAM1	S		FACW									0.25			0.25	
Salix exigua Nutt. ssp. interior (Rowlee) Cronq.	SAEX1	S		FACW	25	15	20		8	7	85	7	0.25	15		0.25	
Symphoricarpos occidentalis Hook.	SYOC1	S		FAC							0.25						
Total Shrub/Sapling Foliar Cover					25.00	15.00	20.00	0.00	8.00	7.00	85.25	7.25	0.75	15.00	0.25	1.75	52.00
50/20 Rule: 50% of Total Cover					12.50	7.50	10.00	0.00	4.00	3.50	42.63	3.63	0.38	7.50	0.13	0.88	26.00
50/20 Rule: 20% of Total Cover					5.00	3.00	4.00	0.00	1.60	1.40	17.05	1.45	0.15	3.00	0.05	0.35	10.40
Total Noxious Weed Cover					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Values in the table represent absolute foliar cover.

Tree Cover					A-3 Wetlands				GS10			PLF		WALPOC		WOMPOC	
				GIS#	98a	99	100	98b	103a	104	103b	101	102	94	95	96	97
Scientific Name	Speccode	Growth Form	Noxious Weed	Wetland Indicator	A3-A	A3-B	A3-C	A3-D	GS10-A	GS10-B	GS10-C	PLF-A	PLF-B	WALPOC-A	WALPOC-B	WOMPOC-A	WOMPOC-B
Populus angustifolia James	POAN3	T		FACW													25
Total Tree Foliar Cover					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00
50/20 Rule: 50% of Total Cover					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50
50/20 Rule: 20% of Total Cover					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
Total Noxious Weed Cover					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Values in the table represent absolute foliar cover.

Hydrophytic Vegetation Indicator 1: Dominance Test					A-3 Wetlands				GS10			PLF		WALPOC		WOMPOC	
				GIS #	98a	99	100	98b	103a	104	103b	101	102	94	95	96	97
Wetland Indicator				Wetland Indicator	A3-A	A3-B	A3-C	A3-D	GS10-A	GS10-B	GS10-C	PLF-A	PLF-B	WALPOC-A	WALPOC-B	WOMPOC-A	WOMPOC-B
Obligate Species				OBL	2				1			2	2	1		2	
Facultative Wet Species				FACW	1	2	2	1	2	2	1	1		1	1		2
Facultative Species				FAC			1				1			1			1
Facultative Upland Species				FACU													
Upland Species (includes all species not listed as OBL, FACW, FAC, & FACU)				UPL													
# Dominant Species That Are OBL, FACW, or FAC					3	2	3	1	3	2	2	3	2	3	1	2	3
Total # Dominant Species Across All Strata					3	2	3	1	3	2	2	3	2	3	1	2	3
% of Dominant Species That Are OBL, FACW, or FAC					100	100	100	100	100	100	100	100	100	100	100	100	100

Values in the table represent the number of dominant species in each category.

					A-3 Wetlands				GS10			PLF		WALPOC		WOMPOC	
				GIS #	98a	99	100	98b	103a	104	103b	101	102	94	95	96	97
Wetland Determination					A3-A	A3-B	A3-C	A3-D	GS10-A	GS10-B	GS10-C	PLF-A	PLF-B	WALPOC-A	WALPOC-B	WOMPOC-A	WOMPOC-B
Hydophytic Vegetation Present? Y/N					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hdyric Soils Present? Y/N*					Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y
Wetland Hydrology Indicators Present? Y/N					Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y
Is the Sampled Area a Wetland? Y/N					Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y

Dominant Species based on 50/20 rule from the Western Mountains, Valleys, and Coast Region Regional Supplement - May 2010.
Total Absolute Vegetation Cover less than 5 percent.
Passed Test
Failed Test
* Mitigation area - interim monitoring conducted in 2015. No soil pits dug in 2015. Soils considered hydric if both hydrophytic vegetation and wetland hydrology present.

Table 5. Areal Extend of Interim Monitored Wetlands in 2015

Location	GIS#	Acres	Delineated in 2015
Non-CERCLA Mitigation Interim Monitoring			
A3-A	98a	0.2529	N
A3-B	99	0.0096	N
A3-C	100	0.0891	N
A3-D	98b	0.0514	N
PLF-A	101	0.2189	N
PLF-B	102	0.0277	N
	Total Potential Wetland	0.6497	

CERCLA Mitigation Interim Monitoring			
GS10-A	103a	0.0203	N
GS10-B	104	0.0030	N
GS10-C	103b	0.0099	N
	Total Potential Wetland	0.0233	
	Total Non-Wetland	0.0099	

Grand Total Potential Wetland	0.6730
Grand Total Non-Wetland	0.0099

Table 6. Current Wetland Impacts From CERCLA Related and Non-CERCLA Related Projects at Rocky Flats

CERCLA On-going Projects

Project Description	Actual Wetland Acres Disturbed (Debits)	Mitigation Wetland Acres (Credit)	Balance
Point of Compliance Flume Project	-0.1279	0.0531	-0.0748
GS10 Flume Project	-0.0409	In Process	-0.0409
OLF Project	-0.0451	In Process	-0.0451
Total	-0.2139	0.0531	-0.1608

Ongoing USACE Permitted Projects

Project	NWP #	Permit #	Permit Date	Specified Compensatory Mitigation	Mitigation Acres Required in NWP (Debits)	Actual Wetland Acres Disturbed	Mitigation Credit	Balance
PLF/A-3 Dam Breach	43	NOW-2011-2455-DEN	11/18/2011	Yes	0.24	-0.1703	In Process	-0.2400
				Total	0.24	-0.1703	0	-0.2400

Table 7. 2015 Wetland Mitigation Credit at the Rocky Flats Site

Delineation Year	Location	GIS#	Acres	Wetland Y/N
CERCLA Mitigation Credit				
2015	WALPOC-A	94	0.0286	Y
2015	WALPOC-B	95	0.0003	Y
2015	WOMPOC-A	96	0.0216	Y
2015	WOMPOC-B	97	0.0025	Y
		Total	0.0531	