

Appendix F

Erosion Control Plan for Rocky Flats Property Central Operable Unit

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**U.S. Department of Energy
Office of Legacy Management**

Rocky Flats Site

Erosion Control Plan for Rocky Flats Property Central Operable Unit

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Appendix

Appendix A Stormwater Best Management Practice (BMP)—Information Sheet

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1.0 Introduction

Two Operable Units (OUs) are within the boundaries of the Rocky Flats property: the Peripheral OU and the Central OU. The Central OU consolidates all areas of the site that require additional remedial/corrective actions, while also considering practicalities of future land management. The Peripheral OU includes the remaining, generally unimpacted portions of the site, and surrounds the Central OU.

The response action in the final Corrective Action Decision/Record of Decision (CAD/ROD) is no action for the Peripheral OU, and institutional and physical controls with continued monitoring for the Central OU. The requirements of the remedy are implemented in accordance with Rocky Flats Legacy Management Agreement (RFLMA) and the environmental covenant for the Central OU granted by the U.S. Department of Energy (DOE) to the Colorado Department of Public Health and the Environment (CDPHE). RFLMA includes a Site Map showing the Central and Peripheral OU boundaries.

DOE Legacy Management (LM) has jurisdiction and control of the Rocky Flats property until such time jurisdiction and control of a portion of the Peripheral OU is transferred to the US Fish and Wildlife Service for the purposes of establishing the Rocky Flats National Wildlife Refuge. The remainder of the Peripheral OU, which contains areas where owners or assignees of subsurface mineral rights are actively mining in accordance with their mining permit, will remain under DOE-LM jurisdiction and control for the foreseeable future.

The institutional controls (ICs) for the Central OU include the following prohibition, objective and rationale as specified in the CAD/ROD:

3) No grading, excavation, digging, tilling, or other disturbance of any kind of surface soils is permitted, except in accordance with an erosion control plan (including Surface Water Protection Plans submitted to EPA under the Clean Water Act) approved by CDPHE or EPA. Any such soil disturbance will restore the soil surface to preexisting grade. *(Objective: prevent migration of residual surface soil contamination to surface water. Rationale: Certain surface soil contaminants, notably plutonium-239/240, were identified in the fate and transport evaluation in the RI as having complete pathways to surface water if disturbed. This restriction minimizes the possibility of such disturbance and resultant impacts to surface water. Restoring the soil surface to preexisting grade maintains the current depth to subsurface contamination or contaminated structures.)*

The CAD/ROD notes as additional rationale, that ICs also result in achieving compliance with the CDPHE risk management policy of ensuring that residual risks to the site user are at or below 1×10^{-6} .

The surface water referred to is those portions of Walnut and Woman Creeks in the Central OU regulated as segment 5 (North and South Walnut Creek above the outlet of terminal ponds A-4 and B-5), segment 4b (North and South Walnut Creek downstream of the terminal ponds) and segment 4 a (Woman Creek) of the Big Dry Creek watershed.

Upon approval and as discussed in the Regulatory Approach section, below, this Erosion Control Plan (ECP) meets the requirements of IC number 3, above, for surface soil disturbance activities in the Central OU.

2.0 Regulatory Approach

In accordance with the CAD/ROD, the selected remedy must achieve compliance with Applicable or Relevant and Appropriate Requirements (ARARs). 40 CFR 122.26 Stormwater Permit for Construction Activities, and 40 CFR 122.28 General Permits, are identified as ARARs in CAD/ROD Table 21. The Table 21 comment in relation to these ARARs provides:

On-site remedial actions do not require permits, but remedies that discharge pollutants from point sources or that involve stormwater discharges must meet substantive requirements for a site-specific or general NPDES permit. Substantive requirements for an NPDES permit are included in the Present Landfill IM/IRA. These requirements will be carried forward into the final CAD/ROD.

The ECP addresses the best management practices (BMP) aspects of the regulatory requirements, which are designed to adequately control stormwater runoff of soils that could ultimately discharge into surface water. The purpose of these controls at Rocky Flats is to address the objective and rationale of the CAD/ROD IC that prohibits soil disturbing activities so that the RFLMA remedy performance standard for surface water is met.

While the stormwater permitting regulations do not specify a particular plan title, EPA's recent stormwater permitting guidance (EPA 2007)¹ refers to a Stormwater Pollution Prevention Plan (SWPPP). But the guidance recognizes that other plan titles, such as an erosion control plan and best management practices plan are commonly used.

Prior to the completion of cleanup and closure of Rocky Flats in accordance with the Rocky Flats Cleanup Agreement (RFCA), stormwater runoff requirements were addressed in RFCA decision documents and in the EPA approved SWPPP of the facility's National Pollution Discharge Elimination System Permit (NPDES) No. CO-0001333. The NPDES permit was terminated in accordance with regulatory requirements after inflows to the Sewage Treatment Plant (STP) were eliminated and the STP was demolished. Industrial stormwater discharges were eliminated by removal of all buildings and asphalt covered surfaces and related stormwater conveyances. The land was recontoured to approximate the conditions prior to industrialization of Rocky Flats and surface water flow was directed within functional channels. Revegetation of cleared areas was also implemented. The erosion control BMPs for these activities have been implemented and are continuing where required until the final stabilization/termination criteria in this ECP are met.

¹ Interim Guide, Developing Your Stormwater Pollution Prevention Plan, A Guide for Construction Sites, EPA 833R-060-04, January 2007.

3.0 Applicability

This post closure ECP applies to soil disturbing activities in the Central OU (i.e., “grading, excavation, digging, tilling, or other disturbance of any kind of surface soils”). These activities may also normally require stormwater discharge permitting because they are regulated as “construction activities” under 40 CFR 122. The ARAR permitting exemption requires the substantive requirements be met and the administrative permitting requirements are not required for construction activities performed within the Central OU.

DOE-LM does not anticipate that it will conduct any construction activities in the Peripheral OU area that would require a 40 CFR 122 stormwater discharge permit. But if such activities are to be conducted, the administrative and substantive requirements of 40 CFR 122 will be met.

4.0 Scope

A construction activity is regulated (i.e., must meet permit requirements) under 40 CFR 122 if it includes land disturbance (“clearing, grading, excavating”) of more than one acre. Between one and five acres of disturbance is a “small construction activity”.² A “small construction activity” does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity or original purpose of the facility.

Thus, the appropriate BMPs specified in this ECP must be implemented for any construction activity that includes land disturbance of more than one acre, unless it is a small construction activity (i.e., between one and five acres) that involves routine maintenance.

The BMPs specified in this ECP must be considered and will be implemented on a case by case basis for other soil disturbing activities.

5.0 Background

From 2001 through 2005 the effectiveness of erosion controls under the SWPPP was formally evaluated in annual reports (DOE 2005), based on surface water monitoring results for four storm water locations in Woman and Walnut Creeks. Although the large amount of soil disturbing work inherent in cleanup and closure activities was the likely cause of some observable soil erosion impacts to water quality, the BMPs and implementation practices used during that period were determined to be effective in mitigating pollution from storm water runoff. RFLMA required surface water monitoring includes three of the four stormwater locations used for effectiveness evaluations.

One of the locations was eliminated with the design and construction of the functional channels. Monitoring results and evaluation of the three remaining locations are included in RFLMA required quarterly and annual reports. These are GS-10 (South Walnut Creek), SW-027 (Woman Creek—South Interceptor Ditch) and SW093 (North Walnut Creek).

² 40 CFR 122.26(b)(14)(x) and (15).

Because of proven effectiveness, this ECP draws from the EPA approved SWPPP (DOE 2003) BMPs and implementing criteria, but is tailored to address Post Closure activities. It also based on the Rocky Flats Erosion Control Management System (ECMS) (K-H 2005) that was implemented to address erosion control measures during the final months of closure. The ECMS used a number of sources, including the Denver Urban Drainage and Flood Control District Drainage Criteria Manual (UDFDC 2001) and the Colorado Department of Transportation's Erosion Control and Stormwater Quality Guide (CDOT 2002), to develop recommended BMPs.

The final recontouring of the land incorporated many erosion control design features, including riprap, grade reduction, benched slopes, and ponding areas within functional channels. So, this ECP also presumes that BMPs used with success during the high soil disturbing activity period coupled with the final recontouring design features will continue to be successful post closure BMPs.

6.0 Planning Responsibility

Before a surface soil disturbance activity that is covered by this ECP may be conducted, an evaluation of potential stormwater runoff shall be performed and requirements for appropriate stormwater discharge controls identified using the Rocky Flats site specific work control procedures.

In situations where immediate stabilization for erosion control is needed, BMPs should be implemented as soon as practicable. After the initial actions, the information and planning aspects of this ECP shall be followed for continuing erosion controls.

The following information for the reasonable proximity of the soil disturbance activity shall be documented on maps and retained with the project files in accordance with Rocky Flats site specific records management requirements.

1. Drainage patterns.
2. Approximate slopes after major grading activities.
3. Areas of soil disturbance.
4. Outline of all areas not to be disturbed.
5. Location and type of all major structural and non-structure controls.
6. The location of expected stabilization practices.
7. Wetlands and surface waters.
8. Locations where stormwater may discharge to surface water.

In addition, because restoration to preexisting surface elevations is required, pre-soil disturbance and post soil disturbance elevations of the areas of soil disturbance shall be documented.

7.0 Best Management Practices

The following specific or general practices shall be used as appropriate to control erosion and prevent pollution of Walnut and Woman Creek stream segments 4 and 5 from stormwater runoff.

1. Install erosion control barriers around the perimeter of the construction area and up-slope of any surface water that might be impacted by stormwater flowing from the area.
2. Avoid excavation and grading activities during rain, snow, or high wind events.
3. Remove only the vegetation as required by project specifications.
4. Inspect, check, and maintain all erosion control features on a regular basis in accordance with this ECP.
5. When the ground surface has been stabilized by vegetation, remove all temporary erosion control features (if not biodegradable).
6. Stockpile materials on flat areas away from slopes and drainage ways and cover as necessary to prevent runoff of the materials.
7. Engineer excavations and phase construction activities to minimize exposed earthwork areas.
8. Avoid using straw bales when possible, but if necessary, orient bales perpendicular to overland flow, anchor, trench, and stake with 2-inch posts, not wood stakes. If used in a flow channel, they must be trenched in.
9. Silt fences are not recommended as a typical practice. They create more of an illusion of protection than actual protection and their removal may actually create additional soil disturbance. If used, silt fences need heavier stakes of 2 inches by 2 inches and pores need to be kept clean;
10. Reduce storm water runoff velocities by using straw wattles or georidges, where appropriate.
11. Immediately clean up leaks, drips, and other spills and use dry cleanup methods whenever possible and clean up and appropriately manage for disposal debris and waste material daily, in accordance with Rocky Flats site specific procedures.
12. Limit vehicle traffic to construction areas, staging areas, and existing roads.
13. Water or other approved dust suppressants may be applied to the surface of the soil during construction operations. Soil surfactants (e.g. lignin/magnesium chloride or "Pennz Suppress D") may be used during placement of aggregate surface on potential road upgrades.
14. If fuel or chemicals need to be stored for the work determine if a spill prevention plan is required and prepare the plan.

The most often used control products are included in Appendix A, which also contains a brief description of each product method, how it works, and how it is to be installed and maintained.. These methods are those most commonly applied for post closure soil disturbance, but other generally accepted control products may also be used.

7.1 General Measures and Best Management Practices to Protect the Preble's Mouse

When erosion controls are implemented under this ECP, general practices and BMPs to protect the Preble's mouse when applicable must also be included. The following conditions are required by the Rocky Flats Biological Opinion (FWS 2004).

1. Identify and prioritize Preble's habitat areas that are subject to disturbance and design activities to avoid areas of higher habitat value. For example, large willow patches will be avoided, except where the project cannot be completed without impacts.
2. Reduce the impact footprint (i.e., no walking in area beyond what is necessary to accomplish the work, minimizing lay down area and equipment storage locations).
3. Conduct activities during daylight hours, when the Preble's Mouse is less active, when scheduling during the hibernation season of the mouse cannot be accomplished.
4. Minimize the length of time spent in sensitive areas (getting work done as quickly as possible, and not reentering the area once work is completed).
5. Explore options with project designers to avoid and/or minimize impacts to the Preble's Mouse.
6. Use established roads (i.e., paved, gravel, two-track, historically-used routes to monitoring locations) for vehicle traffic. If an established road does not exist, use the safest and most direct route that minimizes impacts to the habitat and has been predetermined by an entity familiar with Preble's habitat use.
7. Limit equipment entrance/exit areas to the minimum number necessary to accomplish the work.
8. Limit vegetation disturbance through alternative actions. For example, prune trees/shrubs rather than remove trees/shrubs; cut shrub stems to allow re-growth rather than grubbing out the entire root system.
9. Remove trash and unnecessary equipment in project areas after work is completed.
10. Revegetate all disturbed Preble's habitat with suitable native species at 2:1 ratio in higher quality habitat, 1.5:1 in lower quality habitat, after the activity has been completed. Refer to Table 1 and Habitat Mitigation Techniques Plan (Appendix A, Part II of the PBA).
11. When revegetation activities cannot be completed immediately after project completion (i.e., outside optimum seeding window) use alternative erosion controls to control potential erosion and sedimentation problems. Use redundant erosion controls where appropriate.
12. Utilize erosion controls (i.e., silt fence, erosion blankets, hay bales, mulching, tackifiers, surface roughening) on all appropriate cleanup projects to control erosion and sedimentation problems. Utilize photo or biodegradable erosion blankets that will not entangle Preble's and other wildlife. For large areas, minimize exposed surfaces. Project personnel will be responsible to monitor erosion control effectiveness and modify control techniques as needed (especially after precipitation events). Monitoring will be conducted weekly or more frequently as needed (after precipitation events). Projects will maintain and repair erosion controls through project completion.

13. Monitoring of mitigation actions will be conducted according to the Mitigation Monitoring plan (Appendix B of Part II of the PBA).
14. Prevent spilled fuels, lubricants or other toxic materials from entering Preble's habitat through the use of spill containment devices.
15. Minimize project activities in wet areas and wet conditions to avoid damage to the habitat.
16. Use the least amount of and/or smallest equipment necessary to accomplish the work.
17. Do not clean equipment in Preble's Mouse habitat or in areas where runoff will enter Preble's Mouse habitat.
18. Staging areas will be located either outside of Preble's habitat, or within the defined project footprint.
19. Do not use Preble's Mouse habitat as borrow areas.
20. Inspect and clean equipment of weeds/seed to prevent the spread of noxious weeds to other locations.

8.0 Implementation

8.1 Documentation

The erosion controls implemented for each soil disturbance activity covered by this ECP shall be documented on maps and retained with the project files in accordance with the Rocky Flats site specific work control procedures and records management requirements.

8.2 Inspections

Implemented erosion control measures are inspected as part of the routine daily inspections of active soil disturbing work, or after a significant weather event has occurred. If active soil disturbing work is completed, erosion controls shall be inspected monthly until the final stabilization/termination criteria discussed below has been met.

The Present Landfill (PLF) Monitoring and Maintenance Plan (M&M Plan) requires inspection of PLF erosion controls after a significant weather event as defined in the PLF M&M Plan. Thus, when the PLF M&M Plan (which may be modified upon CDPHE approval) requires an inspection at the PLF after a significant weather event, the erosion controls covered by this ECP shall also be inspected..

Erosion control measures are inspected in terms of their placement, need for maintenance, and potential need for additional measures. Conditions needing repair or additional BMPs that are not corrected or implemented within 24 hours shall be entered into the Site Observation Log for follow up and to track close out.

8.3 Maintenance

Properly installed BMPs require routine maintenance. Appendix A describes the recommended maintenance for the BMPs.

9.0 Final Stabilization/Termination

Typically, the storm water discharge associated with a construction activity is eliminated when the area subject to erosion controls is finally stabilized.

The area is finally stabilized when all soil disturbing activities at the site have been completed and the combined foliar cover of grasses, forbs, and shrubs is at least 80% of the reference cover, or equivalent permanent stabilization measures have been employed. Reference areas are defined as adjacent undisturbed areas that will be used for comparison to the area of soil disturbance. Reference areas will have similar vegetation to what is desired for the soil disturbance area.

10.0 References

CDOT (Colorado Department of Transportation), 2002. *Erosion Control and Stormwater Quality Guide*, Colorado Department of Transportation, Denver, Colorado.

DOE (U.S. Department of Energy), 2005a. *Annual Comprehensive Site Compliance Evaluation Report, Rocky Flats Environmental Technology Site*, August.

DOE (U.S. Department of Energy), 2005b. *Present Landfill Monitoring and Maintenance Plan and Post-Closure Plan, Rocky Flats Environmental Technology Site*, May (including any subsequent modifications).

EPA (U.S. Environmental Protection Agency), 2007. *Interim Guide, Developing Your Stormwater Pollution Prevention Plan, A Guide for Construction Sites*, EPA 833R-060-04, January.

UDFDC (Urban Drainage and Flood Control District), 2001. *Urban Storm Drainage Criteria Manual*, Vol. 1–3, Urban Drainage and Flood Control District, Denver, Colorado.

USFWS (U.S. Fish and Wildlife Service), 2004. *Rocky Flats Programmatic Biological Assessment*, Part II, Biological Opinion, April.

Appendix A

Stormwater Best Management Practice (BMP)—Information Sheet

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BMPs typically used at the Rocky Flats Site include:

- Erosion bales (straw bales)
- Erosion logs (straw wattles)
- Georidge[®] product
- Erosion control blankets
- Turf Reinforcement Mats (TRM)
- Mulch Tackifiers/Tackifiers
- Mulching (includes straw crimping, hydromulching, and use of Flexible Growth Media [Flexterra[®] and similar products])

The following pages include general information about the different products. The general information pages were taken from the Erosion Control and Stormwater Quality Guide, Colorado Department of Transportation, 2002. The Georidge[®] and Flexterra[®] information is from the manufacturer.

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