



Mr. Carl Spreng  
Mr. Mark Aguilar  
05-DOE-00591

2

OCT 04 2005

cc w/Encl.:  
R. Birk, HQCPM, RFPO  
V. Moritz, USEPA  
Administrative Record

cc w/o Encl.:  
D. Shelton, K-H  
B. Davis, K-H  
K. Duncan, K-H

the overall cut/fill earthmoving yardages and include anticipated groundwater elevations and bedrock topography.

Control measures will be implemented during the grading process to prevent the spread and release of waste materials from the OLF. The control measures will include establishment of work zones, decontamination procedures, dust suppression methods, traction mats, visual inspections, and radiological surveys. Work will be suspended when environmental conditions could greatly increase the possibility of the spread of contaminated materials. Monitoring will be performed, as necessary, to verify that there has been no release of contaminated materials. Generally, the work will be conducted as if at a radiologically contaminated site using proper personal protective equipment (PPE), respiratory protection, and worker monitoring.

### **7.3 Buttness Fill**

A buttness fill will be constructed at the toe of the waste and re-graded slope. A conceptual depiction of the buttness fill is shown in Figure 7-2. The buttness fill consists of a buttness drain to drain water from behind the fill and a structural earthen fill. Rocky Flats alluvium-type material will be used as the structural earthen fill. The buttness drain will consist of graded natural rock and designed to allow the groundwater captured by the drain to infiltrate into the soils downgradient of the buttness fill. Approximately 60,000 cubic yards of these natural, stable materials will be required to build the buttness fill.

#### **7.3.1 Soil Cover**

After grading of the landfill surface and construction of the buttness fill, a soil cover will be placed over the landfill to a minimum thickness of 2 ft. Approximately 65,000 cubic yards of local or onsite soil will be used to construct the cover. The soil cover will be sufficiently compacted to provide a stable cover system to promote surface water runoff, reduce surface water ponding, increase overall slope stability, and provide a suitable soil surface for revegetation.

Revegetation of the soil cover with native species will reduce erosion and help prevent the intrusion of noxious weeds. This approach is in keeping with the current strategy to restore RFETS with the native prairie grasslands as closely as possible. The seeding will be conducted, along with using erosion control matting or mulch, to prevent erosion of the cover while allowing the vegetation to establish a strong stand.

The following plant properties will ensure healthy, productive, and long-term vegetative growth on the landfill cover:

- Locally-adapted, noninvasive or native species able to withstand Front Range drought and temperature extremes will be used as vegetative cover.
- Long-term fertilization and nutrient supplements are not planned at this time; therefore, it is critical that the vegetation be able to survive under existing soil conditions. Native grasses and forbs will thrive with little maintenance. Soil amendments may be provided to supplement borrow material to establish initial vegetation on the cover.
- Both cool and warm season species will be planted to provide transpiration throughout as much of the year as possible. Locally-adapted species of grasses and forbs normally transpire all available water in semiarid climates, such as that at RFETS.
- A strong stand of vegetation will limit cover erosion from both wind and water, and help prevent the intrusion of noxious weeds.

A draft seed mix will be developed during the design in consultation with the RFCA Parties, the RFETS Ecology Group, and other interested parties.

#### **7.4 Engineering Controls**

Engineering controls may be used to provide a physical barrier to protect the public and wildlife refuge workers from potential risks at the site. The engineering controls may include signage to limit public access. Signs to inform the public of limited access would be posted at 200-ft intervals.

#### **7.5 Site Monitoring**

Site monitoring will include a program to ensure that current conditions at the site do not change in an adverse manner. Surface water and groundwater monitoring will be instituted to identify impacts after the action has been implemented. An annual walkdown of the area will be conducted to identify areas of erosion of the soil cover and buttress fill for repair. A ground survey will also be completed to monitor slope stability. More details regarding site monitoring (including monitoring frequency and groundwater and surface water monitoring locations) are presented in Appendix B. Monitoring locations will be confirmed during the design of the accelerated action.

#### **7.6 Institutional Controls**

General and specific post-accelerated action institutional controls for RFETS as a whole are currently being evaluated by DOE and the regulatory agencies, and in consultation with the USFWS and the community.

The controls that will be implemented at the OLF for this proposed action are as follows:

1. Current Site-wide security and access controls will be maintained until completion of the RFETS Closure Project, currently scheduled for December 2006, but will be replaced by

4

## Appendix A – Applicable or Relevant and Appropriate Requirements

Requirement	Citation	Type	Comment
-------------	----------	------	---------

**NATIONAL WILDLIFE REFUGE ACT**

NATIONAL WILDLIFE REFUGE SYSTEM ADMINISTRATION ACT	16 USC 668 et seq.	L	Relevant and Appropriate. Prohibits interference with natural growth or wildlife, on National Wildlife Refuges administered by the USFWS, unless permitted.
--	--------------------	---	---

**COLORADO BASIC STANDARDS AND METHODOLOGIES FOR SURFACE WATER**

BASIC STANDARDS APPLICABLE TO SURFACE WATERS OF THE STATE	5CCR 1002-31	C/L	A basis for performance monitoring of surface water and groundwater.
---	--------------	-----	--

## **POST-ACCELERATED ACTION MONITORING AND LONG-TERM SURVEILLANCE AND MONITORING CONSIDERATIONS**

The objective of this section is to identify post-accelerated action monitoring and post-closure care requirements of the proposed accelerated action for the Original Landfill. These requirements are necessary for the long-term effectiveness of this remedy and include the following components: compliance with the Colorado Hazardous Waste Act (CHWA) post-closure requirements of 6 Colorado Code of Regulations (CCR) 1007-3, Part 265; information management; periodic review; and administrative jurisdiction. Other requirements necessary for the short- and long-term effectiveness of the remedy are identified in this Appendix, including institutional controls, inspection and maintenance, and environmental monitoring. These requirements are specific to the accelerated actions described in this IM/IRA and are summarized in Table 1. Additionally, these requirements will ultimately be captured (along with post-closure care requirements from other accelerated actions at Rocky Flats) in post-closure regulatory documents, which may include the final Corrective Action Decision/Record of Decision (CAD/ROD) for Rocky Flats, any post-closure Rocky Flats Cleanup Agreement (RFCA)-type agreement, and any post-closure Resource Conservation and Recovery Act (RCRA) permit (or other enforceable mechanism). DOE and CDPHE have not reached agreement as to whether a post-closure permit or, alternatively, an enforceable document as defined in 6 CCR 1007-3, Section 100.10(d) will be required for Rocky Flats, and if so, what requirements that permit or enforceable document will contain. The Parties will endeavor to resolve this matter. Failing an agreed-upon solution, each Party reserves its rights as provided in RFCA Part 18. Further, absent resolution of this matter consistent with the State Covenants Law, the CDPHE reserves the right to require a post-closure permit.

### **1.0 POST ACCELERATED ACTION CARE REQUIREMENTS**

Post-closure controls, monitoring, and maintenance requirements for the cover described in this Appendix will be implemented at the Original Landfill. Some of these requirements are also the subject of an environmental covenant for the site if it is determined that Colorado's law applies to the federal government (see Section 25-15-320, C.R.S.).

The RFCA Parties have not reached agreement on the applicability of the statute to the federal government. Failing an agreed-upon resolution, each Party reserves its rights as provided in RFCA Part 18. 6 CCR 1007-3 Part 265.310(b) details the maintenance and monitoring requirements that must be implemented throughout the post-closure care period. The regulations establish 30 years as the default post-closure care period. However, the Colorado Department of Public Health and Environment (CDPHE) has the authority to increase or decrease this time period, as appropriate. The following requirements consistent with Part 265.310(b) will be imposed in the post-closure permit or other enforceable mechanisms implemented for the Original Landfill:

- Maintain the integrity and effectiveness of the final cover, including making repairs to the cover as necessary to correct the effects of settling, subsidence, erosion, or other events;

- Maintain and monitor the groundwater monitoring system and comply with all other appropriate groundwater monitoring requirements; and
- Prevent run-on and run-off from eroding or otherwise damaging the final cover.

Each of these three requirements is discussed further below.

### **1.1 Maintain Integrity and Effectiveness of the Final Cover**

Current Sitewide security and access controls will be maintained until completion of the Rocky Flats Environment Technology Site (RFETS or Site) Closure Project. Additional institutional controls related to maintaining the integrity and effectiveness of the final cover are identified in the IM/IRA and summarized in Table 1.

Following construction of the cover and toe buttress, monitoring and maintenance activities will be performed quarterly. The cover and toe buttress will be inspected for signs of erosion, differential settling, subsidence, burrowing animals, weeds, and seepage areas. Signs of potential problems include, but are not limited to, deep rooting vegetation (trees), ponded water on the surface, and surface depressions.

Routine maintenance of the cover and toe buttress will include filling in and regrading any depressions, burrowing animal holes, or other disturbances. Where excessive erosion has occurred, soil will be replaced with similar cover soil and re-seeded. After restoration of the cover, the area prone to excessive erosion will be protected further with structural erosion controls such as erosion mats, silt fences, straw-bale sediment barriers, and straw-bale check dams. These controls will be installed and maintained as necessary to limit sediment transport.

Special attention will be provided on the slope of the landfill to monitor for any sloughing or movement. Monuments may be installed to monitor OLF movement.

Repairs and routine maintenance will be made to maintain the integrity and effectiveness of the cover, including the toe buttress. Inspection results, repairs, and routine maintenance will be documented in annual reports to the regulatory agencies which may be combined with future Sitewide maintenance and monitoring reports.

### **1.2 Maintain and Monitor the Groundwater Monitoring System**

A groundwater monitoring system will (6 CCR 1007-3; 265, Subpart F) be implemented after construction of the accelerated action is complete. A total of four (one upgradient and three downgradient) groundwater monitoring wells will be established for the Original Landfill as shown in Figure 1.0. These wells will be designated as RCRA groundwater monitoring wells. The effects of the accelerated action including changes in surface water and groundwater flow may occur which could impact the groundwater quality. The constituents that will be monitored are volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, and metals (including uranium). The purpose of this monitoring is to evaluate upgradient versus downgradient groundwater quality at the Original Landfill. Groundwater sampling results will be evaluated in accordance with the FY2005 IMP processes and procedures (see Table 1).

**Figure 1.0 Proposed Groundwater and Surface Water Monitoring at the Original Landfill**

In addition, the downgradient monitoring well sample results will be compared to the RFCAs Surface Water Standards (RFCAs Attachment 5, Section 3.0) consistent with Colorado Basic Standards and Methodologies for Surface Water and in accordance with the FY2005 IMP processes and procedures (see Table 1).

Upstream and downstream surface water quality will be monitored at the Original Landfill. Upstream and downstream surface water monitoring sampling stations are located on Figure 1.0. The surface water at these locations will be monitored for VOCs and metals (including uranium) to evaluate upstream and downstream surface water quality in accordance with the FY2005 IMP processes and procedures.

### **1.3 Prevent Run-on and Run-off from Eroding or Damaging the Cover**

Berms and swales will be designed to divert stormwater (flowing from the north) around the Original Landfill. The landfill will be graded to allow positive surface water drainage from the cover. Erosion of the cover and toe buttress from storm or wind events is extremely unlikely but will be monitored as part of the routine inspections of the cover. In addition, groundwater that is drained by the toe buttress drain will infiltrate into the existing groundwater system at the southern boundary of the OLF. This will prevent a build-up of water behind the toe buttress.

Following construction of the cover, inspection and maintenance activities of the run-on and run-off controls will be performed quarterly. Berms and swales will be visually inspected for signs of erosion and unwanted vegetation. Routine maintenance, as necessary, includes repairing areas with soil erosion blankets and reseeding.

Routine maintenance will be conducted to prevent run-on and run-off from eroding or damaging the cover and toe buttress. Inspection results, repairs, and routine maintenance will be documented in annual reports to the regulatory agencies which may be combined with future Sitewide maintenance and monitoring reports.

## **2.0 INFORMATION MANAGEMENT**

A successful stewardship program is dependent on retaining the necessary records about the history and residual contamination of the site. Retained information should include the history of the site, environmental data, selected remedies, use of controls and their associated monitoring and maintenance records, and any other information judged necessary for succeeding generations to understand the nature and extent of the residual contamination. At a minimum, the following records will be retained, stored, and retrievable for this accelerated action:

- This IM/IRA and any future modifications;
- The final design for the regraded surface, soil cover, buttress fill and surface drainage, and field change requests;
- The as-built drawings of the accelerated action;
- The monitoring and maintenance manual and subsequent revisions;
- Inspection records and logbooks;
- Maintenance records and logbooks;

- Annual performance assessment reports;
- Analytical Data;
- CERCLA 5-year review reports;
- Correspondence involving the regulatory agencies associated with modifications to the post-accelerated action care regime;
- The Memorandum of Understanding (MOU) between DOE and the U.S. Department of Interior (DOI) (identifying the controlling authority);
- The CAD/ROD; and
- The RFETS HRR and other relevant historical documentation.

**This information will be maintained in the Administrative Record (AR) File. Currently, the AR File is maintained onsite. DOE is currently looking at options for retention of permanent records following Site closure.**

**Table 1**  
**Summary of OLF Post-Accelerated Action Monitoring, Maintenance, and Institutional Control Requirements**

Area	Action	Frequency of Action	Criteria	Possible Follow-on Action
Cover	Visual Inspection	Quarterly	Differential Settling/Subsidence	Repair, as necessary.
			Erosion	Repair erosion areas with soil and rock, and reseed, as necessary.
			Unwanted Vegetation	Remove deep rooting trees or employ weed control measures, as necessary.
			Burrowing animals	Remove and repair damage, as necessary.
Berm and Swales	Visual Inspection	Quarterly	Erosion	Repair erosion areas with soil, erosion blankets and reseed, as necessary.
			Unwanted Vegetation	Remove deep rooting trees or employ weed control measures, as necessary.
Surface Water Sampling Stations	Sampling	Quarterly	Analyze for VOCs and metals (including uranium). Effluent limitations are the surface water standards. (RFCA Attachment 5, Table 1)	If a surface water standard is exceeded, sampling will increase to monthly for three consecutive months. If exceedances continue, the RFCA Parties will consult to determine whether a change in the remedy is required; additional parameters need to be analyzed; or if a different sampling frequency is required.
Groundwater	Sampling	Quarterly	Groundwater will be analyzed for VOCs, SVOCs, pesticides, and metals (including uranium).  A. Increasing trend in constituents in downgradient versus upgradient groundwater monitoring wells.  B. Downgradient monitoring well results compared to surface water standards: 1. 85 <sup>th</sup> percentile of data greater than surface water standards, and 2. Significant increasing trend at 95%	If either criteria A or B condition exists, initiate consultation between the RFCA parties.

<b>Area</b>	<b>Action</b>	<b>Frequency of Action</b>	<b>Criteria</b>	<b>Possible Follow-on Action</b>
			confidence	
Institutional and Physical Controls	Visual Inspection	Quarterly	Security and Access Controls; and overall site conditions	Check signs, fences (if required), markers, and overall condition of the OLF site to determine continuing effectiveness of institutional and physical controls.

### **3.0 PERIODIC ASSESSMENTS**

Periodic assessments are performed to determine whether the selected accelerated actions and controls continue to operate as designed, and ascertain whether new technologies might exist to eliminate remaining residual contamination in a safe and cost-effective manner. The CERCLA 5-year review process is required for all Superfund sites that leave residual contamination behind after closure, and establishes the minimum requirements for post-closure periodic assessments. The EPA Comprehensive Five-Year Review Guidance (2001) describes the format of the review and suggests mechanisms that can be implemented through the 5-year review process to ensure the protectiveness of the remedy.

DOE is responsible for conducting the five-year reviews. EPA then issues a finding of concurrence or nonconcurrence. The public has indicated an interest in performing reviews more frequently than the 5-year interval specified in CERCLA. DOE intends to work with its stakeholders to arrive at a review regimen that meets community needs.

The periodic assessment will include actions such as evaluating monitoring and maintenance records, verifying regulatory compliance, and determining whether land use assumptions are still valid. Specific topics for the periodic assessment for the OLF are likely to include cover performance, landfill stability, surface water quality, and groundwater quality; as well as the need to continue monitoring.

### **4.0 CONTROLLING AUTHORITY**

Long-term protection of human health and the environment necessitates that a controlling authority be established with responsibility for post-closure management. CERCLA mandates that DOE, as a responsible party, will retain responsibility for the contamination at RFETS resulting from its activities there, as well as responsibility for long-term maintenance of any remedies. The Rocky Flats National Wildlife Refuge Act of 2001 requires that, following certification by EPA that the cleanup and closure of Rocky Flats has been completed, certain lands of the current Site will be transferred from the Secretary of Energy to the Secretary of the Interior. These lands will be under administrative jurisdiction of the USFWS. The Act also requires the Secretary of Energy to retain administrative jurisdiction over Site lands required to carry out response actions required for the cleanup and closure of the Site. The MOU currently being negotiated between DOE and DOI will outline this process, although it is unlikely the final boundaries of the land to be transferred will be determined until the final cleanup and closure plans are approved. However, the OLF will remain under the administrative jurisdiction of the Secretary of Energy.

### **5.0 REPORTING REQUIREMENTS**

Annual reporting of data results, inspection results, repairs, and routine maintenance will be required. These requirements may be combined into one report and/or with future Sitewide maintenance and monitoring reports.