2.0 Site Operations and Maintenance

2.1 Annual Site Inspection

Evidence of significant erosion and IC violations must be inspected for annually, in accordance with RFLMA Attachment 2, Sections 5.3.4 and 5.3.6. The 2010 inspection was conducted on March 17, 2010, and reported in the *Rocky Flats Site Quarterly Report of Site Surveillance and Maintenance Activities First Quarter Calendar Year 2010* (DOE 2010c).

The following categories were monitored during the inspection:

- Evidence of significant erosion in the COU and evaluation of the proximity of significant erosion to subsurface features in RFLMA Attachment 2, Figures 3 and 4. This monitoring included visual observation for precursor evidence of significant erosion (e.g., cracks, rills, slumping, subsidence, sediment deposition);
- The effectiveness of ICs, as determined by any evidence of their being violated; and
- Evidence of adverse biological conditions, such as unexpected morbidity or mortality, observed during the inspection and monitoring activities.

As part of the IC inspection, the Environmental Covenant's presence in the Administrative Record and in Jefferson County records was verified. This verification is required annually. In addition, physical controls (signs placed along the COU fence) were also inspected.

Marker flags were placed where conditions showed evidence of the three condition categories listed above, to track their location for follow-up by Site subject matter experts. Areas that required evaluation were documented in the Site Observation Log for evaluation and follow up. Several areas with evidence of erosion, possible depressions, or holes were noted, but these imperfections appeared to be minor and of very limited areal extent. Rocky Flats field operations subject matter experts subsequently visited the areas, made minor repairs, collected debris, and determined that there was no significant indication of erosion or exposure of the subsurface.

No evidence of violations of ICs or physical controls was observed.

On March 19, 2010, a team member verified that the Environmental Covenant for the COU remains in the administrative record (AR #PD-A-000054) and on file with the Jefferson County land records, which are used by the Planning and Zoning Department.

No adverse biological conditions were noted during the inspection.

2.2 Colorado WQCC Proceedings Related to Rocky Flats

Based on the Colorado Water Quality Control Commission (WQCC) triennial review proceedings for the "Basic Standards and Methodologies for Surface Water," Regulation 31 (Title 5 *Code of Colorado Regulations* 1002-31) (Regulation 31) in 2010, the WQCC revised the Regulation 31 table value for uranium to the hyphenated value of 16.8–30 micrograms per liter (µg/L), effective January 1, 2011. The following footnote in Regulation 31, Section 31.16, Tables, applies to the hyphenated standard:

> Table III footnote (13) Whenever a range of standards is listed and referenced to this footnote, the first number in the range is a strictly health-based value, based on the Commission's established methodology for human health-based standards. The second number in the range is a maximum contaminant level, established under the federal Safe Drinking Water Act that has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. Control requirements, such as discharge permit effluent limitations, shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an "end-of-pipe" discharge level more restrictive than the second number in the range. Water bodies will be considered in attainment of this standard, and not included on the Section 303(d) List, so long as the existing ambient quality does not exceed the second number in the range. …
>
> Table III footnote (17) When applying the table value standards for uranium to individual segments, the Commission shall consider the need to maintain radioactive materials at the lowest practical level as required by Section 31.11(2) of the Basic Standards regulation.

Table III footnote (17) is consistent with Regulation 38, section 38.5 (3)(b), "Uranium level in surface waters shall be maintained at the lowest practicable level."

RFLMA surface water standards are not currently impacted as a result of the Regulation 31 adoption of the hyphenated standard for uranium.

2.3 Pond Operations

Five constructed ponds collect and manage surface-water runoff at the Site.[1] The ponds are grouped together in series based on the drainage in which they are located, with the A-Series Ponds in North Walnut Creek, the B-Series Ponds in South Walnut Creek, the C-Series Ponds in Woman Creek, and the Landfill Pond in No Name Gulch. Ponds A-4, B-5, and C-2 are referred to as "terminal ponds" because they are the farthest downstream ponds in their respective drainages, and because they are the ponds from which water is discharged off Site. Off-Site discharges of water from the terminal ponds are currently performed using a batch-release method.

During CY 2010, the Site performed three terminal pond discharges (one each at A-4, B-5, and C-2). Pond A-3 was discharged to Pond A-4 periodically during CY 2010 (Table 2). As of December 31, 2010, the Landfill Pond and Ponds A-3, A-4, B-5, and C-2 were holding a total of approximately 15.2 million gallons (15.3 percent of total capacity).

[1] Former Dams A-1, A-2, B-1, B-2, B-3, and B-4 were breached during 2008−2009.

Table 2. CY 2010 Pond Water Discharges and Transfers

Discharge/Transfer	Dates	Volume (million gallons)
Pond A-3 to A-4	1/25–2/4/10	2.36
Pond A-3 to A-4	2/9–2/11/10	0.40
Pond A-3 to A-4	2/23–2/24/10	0.16
Pond A-3 to A-4	3/8–4/6/10	13.8
Pond A-3 to A-4	4/23–4/27/10	6.60
Pond B-5 to South Walnut Creek	4/23–5/16/10	20.8
Pond A-4 to North Walnut Creek	5/1–5/19/10	32.4
Pond A-3 to A-4	5/7–8/11/10	21.6
Pond C-2 to Woman Creek	7/31–8/12/10	6.97
Pond A-3 to A-4	11/30–12/31/10	0.01

As described in Section 3.1.2.11, pre-discharge samples were collected during CY 2010 at Ponds A-4, B-5, and C-2 prior to discharge. All predischarge sample results suggested that released water would meet water quality standards at downstream POCs. Subsequent POC sampling during discharge also indicated acceptable water quality for the discharged water (see Section 3.1.2.1). The valves at Ponds A-4, B-5, and C-2 were all successfully exercised through their full travel at the end of each discharge. The Landfill Pond valve was also periodically exercised during CY 2010; the Landfill Pond is normally operated in a flow-through configuration.

Routine dam inspections, pond-level measurements, and piezometer measurements were performed as scheduled during the year. Annual dam mowing and vegetation removal was completed in September. Semiannual or quarterly (as applicable to specific dams) movement monument surveys and inclinometer readings were also performed as scheduled.

In compliance with the State of Colorado Rules and Regulations for Dam Safety and Dam Construction, a registered professional engineer conducted a formal dam safety inspection for Dams A-3, A-4, B-5, and C-2 and the Present Landfill Dam in September 2010. All inspected dams received a “satisfactory” condition rating and a recommended safe storage level of “full.” Several recommendations to improve dam safety were made:

- Monument and inclinometer data for Dam B-5 continue to indicate that apparent small movement and settling of the dam is occurring; monument and inclinometer monitoring should continue at the increased quarterly frequency;
- Shallow cracks were observed in the crests of A-4 and B-5 that are believed to be shrinkage cracks; these should be monitored for increase in size and vertical displacement;
- Visual inspection of the downstream slopes at A-4, B-5, and C-2 should be made regularly for slumping or bulging;
- One very shallow crack on the north end of the crest of C-2 should be monitored for further changes;
- Rodent activity has increased at A-4, B-5, and C-2; this activity should be monitored closely and controlled if necessary;

- Sediments should be regularly removed from the toe drains at A-3; and
- Spaces between the piezometer/inclinometer pads and the ground surface were noted at some locations; these spaces should be backfilled.

2.4 Landfills

The annual report of the results of inspections, monitoring data, and maintenance activities for the PLF and OLF is provided below.

2.4.1 Present Landfill

The PLF consists of an approximately 22-acre engineered RCRA Subtitle C–compliant cover over a former sanitary and construction debris landfill. A diversion channel surrounds the landfill and diverts storm water runoff away from the landfill to No Name Gulch. The landfill has a passive seep interception and treatment system (the Present Landfill Treatment System [PLFTS]), installed to treat landfill seep water and Groundwater Intercept System (GWIS) water that discharges into the Landfill Pond. A gas extraction system is also built into the landfill and allows subsurface gas to vent to the atmosphere.

Subsidence and consolidation at the PLF is monitored by visually inspecting the surface of the landfill cover for cracks, depressions, heaving, and sinkholes. The landfill final construction site conditions are used as a baseline for comparisons made during Site inspections. In addition to the visual inspection, settlement monuments are used to evaluate the actual settlement at these specific locations compared to the expected settlement calculated in the final design. Nine settlement monuments were installed across the top of the landfill cap, and an additional six monuments are located on the east face of the landfill. The monuments were monitored quarterly for the first year and annually thereafter.

Inspections and monitoring tasks follow the format and protocol established in the PLF M&M Plan and include groundwater and surface-water monitoring, and monitoring subsidence and consolidation, slope stability, soil cover, vegetation, storm water management structures, and erosion in surrounding features so that corrective actions can be taken in a timely manner. Monthly inspections were initiated in October 2005. Quarterly inspections were initiated in the fourth quarter of CY 2007 as described in RFLMA Contact Record 2007-08.

2.4.1.1 Inspection Results

Four inspections were performed at the PLF in CY 2010. The inspection process followed the format and protocol established in the PLF M&M Plan. No significant problems were observed during these inspections. Appendix C contains the landfill inspection forms for the fourth quarter of CY 2010; earlier 2010 inspection forms are included in the applicable quarterly reports.

PLF area surface-water and groundwater monitoring, and operation of the PLFTS, is covered in those respective sections of this report.

2.4.1.2 Slumps

On February 13, 2007, a slump was discovered on the south-facing hillside just east of the PLF. The slump is not on the PLF, and engineering review determined that it does not impact the PLF cover. The slump was likely caused by heavy snow conditions and influenced by the post-closure lower water levels in the Landfill Pond. Therefore, regrading the slump is not necessary; however, deep-rooted plants were planted in the slump area to promote stabilization. There were no significant changes to the slumping area in CY 2010.

2.4.1.3 Settlement Monuments

The annual survey was completed in December 2010. Results of the settlement monument survey indicate that settling at each monument does not exceed expected settlement calculated in the final design and does not trigger any maintenance activity under the PLF M&M Plan.

2.4.2 Original Landfill

The OLF consists of an approximately 20-acre soil cover over a former solid sanitary and construction debris landfill. The final cover consists of a 2-foot-thick Rocky Flats Alluvium soil cover that was constructed over both a regraded surface and a buttress fill, and revegetated. The original surface was regraded to provide a consistent slope. A 20-foot-high, 1,000-foot-long soil mass buttress fill was placed at the toe of the landfill. Erosion is controlled by a series of diversion berms that carry storm water runoff away from the cover to channels on the east and west perimeter of the cover.

The OLF is inspected monthly in accordance with the OLF M&M Plan (DOE 2009a).

2.4.2.1 Inspection Results

Twelve inspections were performed at the OLF in CY 2010. The inspection process followed the format and protocol established in the OLF M&M Plan. Appendix C contains the landfill inspection forms for the fourth quarter of CY 2010; earlier 2010 inspections forms are included in the applicable quarterly reports.

OLF area surface-water and groundwater monitoring is covered in those respective sections of this report.

2.4.2.2 Settlement Monuments

The settlement monuments were surveyed in March, June, September, and December 2010. Survey data indicate that settling at each monument does not exceed expected settling calculated in the final design and does not trigger any maintenance activity under the OLF M&M Plan.

2.4.2.3 Geotechnical Investigation and Repairs

Conditions that warranted further repair and that triggered further investigation were found at the OLF beginning in 2007. This resulted in a geotechnical investigation of the conditions and

repairs and maintenance actions to address conditions. This work is summarized in the RFLMA annual report for 2009 and quarterly reports for 2010 (DOE 2010d, 2010c, 2010e, 2011b)
In 2010 additional maintenance to address cracking in the vicinity of Berm 1 and to recontour the eastern end of Berm 7 where the berm was slumping into the eastern perimeter channel were completed. This work is fully described in the quarterly reports for the second and third quarters of CY 2010. (DOE 2010e, 2011b) Locations are shown on Figure 1.

In addition, a geotechnical evaluation of the impact on berm stability from runoff from Seep 7 due to heavy spring precipitation was completed in the fourth quarter of 2010. The evaluation concluded that the saturation from runoff did not adversely impact berm stability. The geotechnical evaluation in included in the November 2010 OLF Inspection Report, in Appendix C.

Inclinometers

Seven inclinometers were installed in boreholes at the OLF in 2008 as part of the geotechnical investigation (Figure 1).

Movement of the inclinometers has been monitored approximately monthly since installation. During the fourth quarter CY 2010, the inclinometers were monitored on October 28, November 18, and December 13. No noticeable deflection was indicated during the quarter.

Inclinometers deflect based on lateral movement of the ground in which the inclinometer is located and can deflect enough to cause the inclinometer tube to break. Once an inclinometer tube breaks, it will no longer be monitored. Inclinometer monitoring data provide information on localized soil movement and serve to focus periodic inspections of the soil cover surface for signs of potential instability, such as cracking, vertical displacement, and slumping. A deflection of more than 1 inch is used as a trigger for evaluation of the data by a qualified geotechnical engineer. The engineer determines the significance of the deflection in relation to recommendations for maintenance or repairs to address potential instability in accordance with the OLF M&M Plan (DOE 2009a).

During 2010, deflection of inclinometers 83208, 82308, and 82408, which are in the area of localized instability on the western portion of the OLF, triggered a geotechnical evaluation. A qualified geotechnical engineer has evaluated the inclinometer data, and the *Technical Memorandum Regarding Instrumentation and Monitoring at the Rocky Flats OLF* that discusses the evaluation is included as Appendix E.

The conclusion of the evaluation is that recommendations made in the 2008 geotechnical investigation remain valid. The instrumentation indicates that instability is caused by one or more weak layers in the shallow subsurface, and movement is exacerbated by precipitation events and elevated water levels. Slope stability modeling indicates the large-scale, overall slope is stable. However, localized failures have occurred on the OLF under elevated water level conditions, but continued monitoring and maintenance provide an effective course of action.

Figure 1. Original Landfill Observed Surface Cracking Location and Inclinometer Locations

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2.5 Groundwater Plume Treatment Systems Maintenance

The system-specific summaries below focus on the maintenance and operation of the Mound Site Plume Treatment System (MSPTS), the East Trenches Plume Treatment System (ETPTS), and the Solar Ponds Plume Treatment System (SPPTS) during CY 2010. Refer also to previous quarterly reports from 2010 (DOE 2010c, 2010e, 2011b).

Details of the monitoring of the systems, including the PLFTS, are presented in Section 3.1.2.10, and interpretations related to system operation and the corresponding contaminant plumes are provided in Section 3.1.5.3.

2.5.1 Mound Site Plume Treatment System

Routine maintenance activities continued at the MSPTS through CY 2010. The system was initially operating in a series, downflow configuration: all influent water entered Cell 1 at the top and flowed downward through the media to the bottom, where it exited and was routed to the top of Cell 2, where it flowed downward through the media and exited at the bottom. Routine activities under this configuration included weekly raking of the media to break up the surface crust that develops as a result of oxygenated groundwater contacting the native iron of the media. However, the uppermost media in Cell 1 grew increasingly solidified and raking efforts had no effect; in addition, water levels in Cell 1 began to rise, as flow through the increasingly clogged zero-valent iron (ZVI) media was impeded, particularly in Cell 1. This is to be expected: because the system had been run in series (almost exclusively in a downflow direction) for several years, with all water routed through Cell 1 before being routed through Cell 2; the media in Cell 1 had removed the bulk of the dissolved constituents that contribute to media fouling (such as dissolved oxygen, calcium, and carbonate). Water entering Cell 2 had been scrubbed of these constituents, so the ZVI media in that cell was not as clogged.

These clogged conditions led to a change in flow configuration: although still operated in series, Cell 1 was operated in upflow (water entered at the bottom and flowed upward through the media, exiting at the top), and Cell 2 still operated in downflow. Raking the top surface of the media ceased. Later in the year, again in response to rising water levels caused by clogged media, the system was reconfigured from series flow (upflow through Cell 1 and downflow in Cell 2) to parallel upflow for both treatment cells.

Additional routine, weekly activities included water level measurements and inspection of the influent and effluent flow conditions.

The discharge gallery that returns treated effluent to the subsurface clogged several times during CY 2010, requiring manual snaking of the pipes. Re-plumbing of this component is scheduled during the media replacement activity planned for early CY 2011.

To support the planned media replacement, several activities were undertaken. Flow through the system was halted, and the cells were partially dewatered beginning November 8, 2010, to allow for sample collection of the ZVI media for waste characterization purposes. Samples were collected from both cells on November 10. System flows were restored immediately following sample collection. Plumbing in the main instrumentation vault was modified to include an influent line air release and new flow meters.

2.5.2 East Trenches Plume Treatment System

Routine maintenance activities continued at the ETPTS through CY 2010. The flow configuration at this system continued to be parallel upflow (i.e., water is split between each cell, with a portion rising through the media in Cell 1 as the rest rises through the media in Cell 2, and these flows are commingled as they exit the system). This configuration has been in effect since the media replacement in late 2009 was completed and the system was put back online.

Routine weekly maintenance activities include inspection of influent and effluent flow conditions. Rising water levels and uneven flow rates between the cells indicated clogging, which was unexpected given that this media was installed in late CY 2009 (see DOE 2010d for details on the media design and system upgrades). Inspection within the cells indicated the observed conditions were not related to clogging within the media, but rather to biological growth accumulating on the surface of the standing water above the media in each cell. To address this, additional weekly maintenance items were undertaken: the surface of the water in each cell is skimmed to remove accumulations of biomass, the plumbing drain that routes the standing water out of each treatment cell is brushed, and the lines from the tops of each cell are purged. These activities address the biological growth build-up and allow effluent to flow from the cells. These biological growths are probably opportunistically colonizing the interface between the oxygenated air within the top of each treatment cell and the underlying water with its high concentrations of dissolved, reduced iron.

2.5.3 Solar Ponds Plume Treatment System

This section addresses the operation and optimization of the SPPTS. Routine inspections included monitoring water levels, line pressures, power consumption, and flow rates, and cleaning flow meters and lines. For a discussion of treatment system monitoring and performance, refer to Sections 3.1.2.10 and 3.1.5.3.

Due to the wet spring, water levels in the groundwater intercept trench rose, and the influent flow rate, maintained at a relatively even rate for months to support objectives associated with optimization of Phase II and the SPPTS as a whole, were increased. (Refer to Section 3.1.5.3 for a discussion of the results.) Conversely, dry conditions in late 2010 allowed water levels in the trench to be reduced, and in late December, the influent pump automatically shut off due to the low water level. This subsequently caused an automatic shutoff of the pump for Phase III Cells A and B. Incorporation of automated triggers such as these could potentially be vital, as they can prevent unacceptable overflow, equipment failure, or other undesirable effects.

During CY 2010, several maintenance issues were addressed within the original concrete structure (which contains Cell 1 and Cell 2, as well as the overburden covering the media in these treatment cells). These were almost exclusively related to hydraulics within the original treatment cells, Cell 1 and Cell 2.

Cell 1 is filled with a sawdust-based media (90 percent sawdust and 10 percent ZVI) and is designed to treat nitrate. The top of this media is approximately 12 feet below ground surface, and therefore both the media and the associated plumbing are inaccessible. (This is a primary reason for the SPPTS upgrades; refer to previous reports, such as DOE 2007c, 2008c, 2009d, and 2010d, for further information.) Flow through Cell 1 was increasingly impeded, causing water to

back up in the piping and spill out of a weep hole in one of the Cell 1 vents, creating a puddle of water on top of the Cell 1 overburden. This was attributed to excess carbon from Phase III Cell A flowing into the sawdust media and supporting an explosion in the population of the denitrifying bacteria within. To address this situation, a biocide application was tested in April 2010: a dilute bleach solution was applied to Cell 1 through an access point to the associated influent piping located between Phase III and the inlet to Cell 1. While it appeared that the biocide application had indeed killed biomass within the influent distribution piping in Cell 1, it was not successful because the plumbing/media was still clogged. A repeated application with a stronger biocide was considered but was not conducted due to operational, logistical, and safety reasons.

The puddle on the overburden within the original structure persisted throughout the year. Because access to the clogged Cell 1 distribution gallery was not available, an auxiliary distribution gallery was installed. This feature consisted of four steel pipes driven vertically through the overburden and into the Cell 1 media, and which incorporated several feet of slotted pipe in their deepest portions. These were plumbed together and tied into the influent piping. Initially, the water level in the puddle dropped, but within days the puddle was again deepening and it was evident that the auxiliary gallery had clogged. Through the use of standard groundwater techniques, the vertical pipes were redeveloped. This initially led to improved flow through Cell 1 and a reduced puddle size, but within a day or so the pipes clogged again. They were redeveloped again, but quickly became clogged. Additional efforts to optimize flow through Cell 1 were abandoned. The plumbing supporting the auxiliary gallery was later covered by mulch for freeze protection; in addition, this organic material would provide for some additional nitrate treatment.

Finally, in response to finding a dead bird in the puddle over the overburden in the original structure, the opening of the structure was covered with netting intended to prevent wildlife entry.

2.5.3.1 Phase I Operation

Phase I components were operated throughout CY 2010. Routine inspections of these components include monitoring water levels, power usage, effluent flow totals, and details of pump operation. During the fourth quarter, battery power storage issues (related to a combination of extreme cold and cloudy conditions) arose at the Interceptor Trench System Sump (ITSS). Adjustments were made in the ITSS Battery Vault that restored the system to full power. Thenceforth, similar conditions did not cause power issues.

2.5.3.2 Phase II/III Operation and Optimization

This section describes operation and optimization activities of the Phase II and Phase III treatment system components. Routine inspection activities include monitoring water levels, power usage, flow totals, and pumping operations.

Flow rates were a main focal point of optimization efforts conducted throughout the year. Flow rates were adjusted by varying both the control voltage delivered to the pumps installed within the system influent line (denoted as SPIN) and the Metering Vault (which delivers water to Cells A and B), essentially “turning them up” or “turning them down,” and adjusting the valves downstream of those pumps to open or constrict flows.

Phase II: Optimization efforts continued within the Phase II cell during CY 2010 largely in response to the reduced treatment effectiveness (as discussed in Section 3.1.5.3). A tracer test was performed in late 2009 to assess whether the influent water was short-circuiting the ZVI/gravel media, thereby reducing residence time within the treatment media and correspondingly reducing the level of treatment. Due to operational issues (DOE 2010d), the results from that test were inconclusive. In February 2010, a second tracer test was performed; the results of this test indicated there was not significant preferential flow through the media. Samples of the media were then collected using a Geoprobe and analyzed microscopically using a microprobe. Results of this analysis did not indicate the media was overly weathered or clogged.

Alternative approaches to the Phase II question—why had treatment effectiveness been reduced prematurely?—were then developed. A technical team of in-house and external scientists evaluated the problem and recommended the installation of several smaller-sized (e.g., 5-foot-diameter) treatment cells that would be operated in parallel. Each cell would incorporate a slightly different media design, and effluent from each would be carefully monitored so that the exact cause for reduced effectiveness could be determined. However, this would require significant cost, additional construction, and a lengthy period of study.

These combined results led to the Phase II ZVI media replacement in August 2010 to improve uranium treatment. The Phase II treatment cell was dewatered in early August to prepare for media replacement, and in order to bypass the cell, the plumbing was revised to route a portion of SPIN water to Phase III Cells A and B and the balance directly to the original treatment cells (Cell 1 and 2 in the large concrete structure). The media replacement activity entailed excavating the existing ZVI pea gravel mixture and replacing it with new ZVI and pea gravel, but a different ratio of ZVI to gravel was used, and the gravel was quartzitic rather than granitic. After the media was replaced, the plumbing was restored to the former flow configuration (i.e., the configuration in effect prior to the excavation).

Phase III: Throughout CY 2010, Phase III Cell A operation and optimization continued. As discussed at greater length in Section 3.1.5.3, operational parameters that were adjusted included liquid carbon dose rates, phosphorus solution dose rates, influent flow rates, and use of the recirculation pump. These adjustments were timed, and the duration of the changes were planned to allow the weekly to biweekly sample collection to provide analytical feedback on resulting changes in treatment effectiveness.

Cell A optimization of phosphorus dosing was successfully concluded. During the second quarter of 2010, separate phosphorus dosing was discontinued. Instead, from then on the liquid carbon with which the influent to Cell A was dosed was custom-blended to contain the empirically determined ratio of phosphorus.

The recirculation pump in Cell A was turned off during a 4-week period in the third quarter to evaluate its effectiveness. It was determined that this pump was helpful in the treatment of nitrate in this cell.

In November 2010, the inert plastic media clogged with biomass. This caused water within the cell to short-circuit the media, reducing the overall level of nitrate treatment. The recirculation

pump basket and associated Cell A piping had also clogged. The main plumbing components in and supporting Cell A were cleaned and cell operation resumed. Following this event, breaking up the biomass within Cell A became an additional routine maintenance activity.

Throughout the first half of CY 2010, Cell B was operated under a batch flow approach, rather than continuous flow (see Section 3.1.5.3), because the extremely low flow rate necessary to allow effective nitrate treatment by this cell could not be reliably achieved using the existing influent pumps and valves. Batch flow operation in 2010 entailed adding approximately 26 gallons of influent twice weekly. This was discontinued in the beginning of July, as discussed in Section 3.1.5.3, and the cell was subsequently operated under continuous flow conditions.

2.6 Erosion Control and Revegetation

The existing erosion controls are maintained and repaired to protect the bare soil areas until the vegetation can stabilize the soil. Areas lacking sufficient vegetation cover are assessed, and typically reseeded; however, in some cases, soil amendments are added to help establish the native vegetation. Additional information on the revegetation activities conducted at the Site during 2010 is provided in Section 3.2.2.3.

2.6.1 Erosion Control

Maintenance, repair, replacement, and monitoring of the Site erosion control features continued as needed through 2010. Assessing the erosion control is especially important following the high-wind events that are common at the Site and after significant precipitation events. Typical repairs included re-staking (or weighting with rocks) wattles or erosion blankets that had loosened. The *Erosion Control Plan for the Rocky Flats Property Central Operable Unit* (DOE 2007b) was followed for various projects conducted in 2010. The plan addresses the regulatory approach, monitoring inspections, and the applicability and scope of erosion control activities at the Site. It outlines the responsibilities, BMPs, and implementation aspects for erosion control activities before, during, and after projects.

2.7 General Site Maintenance and Operations

The Site is managed and maintained, and activities are conducted, pursuant to DOE's jurisdiction and control responsibilities. These activities help maintain the general condition of the Site through BMPs. The Site is assessed both according to a schedule and continuously. Highlights of the routine and nonroutine maintenance and operations are described below.

2.7.1 Site Road Upgrades

2.7.1.1 Emergency Repairs

On April 26, 2010, an emergency inspection of the Site was conducted following a 3-inch precipitation event that occurred over the weekend. Site roads showed minor erosion damage in a few locations. It was determined that repairs to these areas could not wait until the Site Road Upgrades 2010 Project scheduled to be completed in September. A Spring Road Repairs Project was immediately planned to prevent further erosion problems. The spring road repairs were completed on April 28. Several Site road locations that were eroded during the recent

precipitation event were regraded and compacted. Additional 3/4 inch rock was added to the more heavily eroded areas to help strengthen the road surface.

2.7.1.2 Annual Road Upgrades

The Site Road Upgrades 2010 Project was initiated on September 16. Various Site roads were regraded, had roadbase applied, and were compacted according to the engineering specifications and drawings. The ditches that run along Central Avenue and the OLF road were removed, and the ditches were reconstructed and had had new erosion matting installed. Some 3/4-inch recycled concrete was used to cover the surface of all regraded roads and act as a surfactant. The project was completed on September 27. Installation of all the required erosion controls was completed and approved by the Site ecologist.

2.7.2 Site Security

A USFWS officer has been assigned to the Rocky Flats Site to perform nonroutine security evaluations as well as respond to any security issues encountered by Site personnel.

No security infractions were noted during CY 2010.