

ROCKY FLATS STEWARDSHIP COUNCIL

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Jefferson County -- Boulder County -- City and County of Broomfield -- City of Arvada -- City of Boulder
City of Golden -- City of Northglenn -- City of Thornton -- City of Westminster -- Town of Superior
League of Women Voters -- Rocky Flats Cold War Museum -- Rocky Flats Homesteaders
Arthur Widdowfield

Board of Directors Meeting – Agenda

Monday, September 10, 2012, 8:30 AM – 11:30 AM

**Rocky Mountain Metropolitan Airport, Terminal Building, Mount Evans Room
11755 Airport Way, Broomfield, Colorado**

- 8:30 AM Convene/Introductions/Agenda Review
- 8:35 AM Chair's Review of August 7th Executive Committee meeting
- 8:40 AM Business Items
1. Consent Agenda
 - o Approval of meeting minutes and checks
 2. Executive Director's Report
- 8:50 AM Public Comment
- 9:00 AM Board Review of Stewardship Council Activities for 2012 and Initial Review of 2013 Work Plan (briefing memo attached)
- o The 2012 Stewardship Council work plan provides that the board shall review its work for the year. The review shall include an assessment of how the organization can improve in the coming year, focusing on areas of weakness and opportunities for improvement.
 - o The review is a first step the board will take in approving the 2013 work plan.
 - o The attached draft 2013 work plan contains minor updates to the 2012 plan.
 - o We will review and revise the draft 2013 plan at this meeting.
 - o Formal approval of the 2013 work plan will take place at the November 5th meeting.
- 9:20 AM FY 13 Budget – Initial Review (briefing memo attached)
- o The board will review the draft FY 13 budget.
 - o Formal budget hearings will take place at the November 5th meeting.
- 9:35 AM Host DOE Quarterly Meeting (briefing memo attached)
- o DOE will brief the Stewardship Council on site activities for the first quarter of 2012 (January – March).
 - o They will also update on the CERCLA Five-year Review.

- DOE has posted the report on their website and will provide a summary of its activities to the Stewardship Council.
- Activities include surface water monitoring, groundwater monitoring, ecological monitoring, and site operations (inspections, maintenance, etc.).

10:45 AM Briefing on Revegetation Work (briefing memo attached)

- This briefing builds on the actinide migration briefing from the June meeting.
- Revegetation is central to reducing the movement of actinides, and to achieving water quality standards.

11:15 AM Public comment

11:25 PM Big Picture Review/Updates

1. Review Big Picture
2. Member Updates

Adjourn

Next Meetings: November 5
February 4, 2013

Rocky Flats Acronym List
 Prepared by Rik Getty, Rocky Flat Stewardship Council
 March 2012

| Acronym or Term | Means | Definition |
|------------------------|--------------------------------------|---|
| Alpha Radiation | | A type of radiation that is not very penetrating and can be blocked by materials such as human skin or paper. Alpha radiation presents its greatest risk when it gets inside the human body, such as when a particle of alpha emitting material is inhaled into the lungs. Plutonium, the radioactive material of greatest concern at Rocky Flats, produces this type of radiation. |
| Am | americium | A man-made radioactive element which is often associated with plutonium. |
| AME | Actinide Migration Evaluation | An exhaustive years-long study by independent researchers who studied how actinides such as Pu, Am, and U move through the soil and water at Rocky Flats |
| AMP | Adaptive Management Plan | Additional analyses that DOE is performing beyond the normal environmental assessment for breaching the remaining site dams. |
| AOC well | Area of Concern well | A particular type of groundwater well |
| B | boron | Boron has been found in some surface water and groundwater samples at the site |
| Be | beryllium | A very strong and lightweight metal that was used at Rocky Flats in the manufacture of nuclear weapons. Exposure to beryllium is now known to cause respiratory disease in those persons sensitive to it |
| Beta Radiation | | A type of radiation more penetrating than alpha and hence requires more shielding. Some forms of uranium emit beta radiation. |
| BMP | best management practice | A term used to describe actions taken by DOE that are not required by regulation but warrant action. |
| BZ | Buffer Zone | The majority of the Rocky Flats site was open land that was added to provide a "buffer" between the neighboring communities and the industrial portion of the site. The buffer zone was approximately 6,000 acres. Most of the buffer zone lands now make up the Rocky Flats National Wildlife Refuge. |
| CAD/ROD | corrective action decision/record of | The complete final plan for cleanup and closure for Rocky Flats. The Federal/State |

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| | decision | laws that governed the cleanup at Rocky Flats required a document of this sort. |
| CCP | Comprehensive Conservation Plan | The refuge plan adopted by the U.S. Fish and Wildlife Service in 2007. |
| CDPHE | Colorado Department of Public Health and Environment | State agency that regulates the site. |
| CERCLA | Comprehensive Environmental Response, Compensation and Liability Act | Federal legislation that governs site cleanup. Also known as the Superfund Act |
| cfs | cubic feet per second | A volumetric measure of water flow. |
| COC | Contaminant of Concern | A hazardous or radioactive substance that is present at the site. |
| COU | Central Operable Unit | A CERCLA term used to describe the DOE-retained lands, about 1,500 acres comprised mainly of the former Industrial Area where remediation occurred |
| Cr | chromium | Potentially toxic metal used at the site. |
| CRA | comprehensive risk assessment | A complicated series of analyses detailing human health risks and risks to the environment (flora and fauna). |
| D&D | decontamination and decommissioning | The process of cleaning up and tearing down buildings and other structures. |
| DG | discharge gallery | This is where the treated effluent of the SPPTS empties into North Walnut Creek. |
| DOE | U.S. Department of Energy | The federal agency that manages portions of Rocky Flats. The site office is the Office of Legacy Management (LM). |
| EA | environmental assessment | Required by NEPA (see below) when a federal agency proposes an action that could impact the environment. The agency is responsible for conducting the analysis to determine what, if any, impacts to the environment might occur due to a proposed action. |
| EIS | environmental impact statement | A complex evaluation that is undertaken by a government agency when it is determined that a proposed action by the agency may have significant impacts to the environment. |
| EPA | U.S. Environmental Protection Agency | The federal regulatory agency for the site. |
| ETPTS | east trenches plume treatment system | The treatment system near the location of the east waste disposal trenches which treats |

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| | | groundwater contaminated with organic solvents emanating from the trenches. Treated effluent flows into South Walnut Creek. |
| FC | functional channel | Man-made stream channels constructed during cleanup to help direct water flow. |
| FACA | Federal Advisory Committee Act | This federal law regulated federal advisory boards. The law requires balanced membership and open meetings with published Federal Register meeting dates. |
| Gamma Radiation | | This type of radiation is very penetrating and requires heavy shielding to keep it from exposing people. Am is a strong gamma emitter. |
| GAO | Government Accountability Office | Congressional office which reports to Congress. The GAO did 2 investigations of Rocky Flats relating to the ability to close the site for a certain dollar amount and on a certain time schedule. The first study was not optimistic while the second was very positive. |
| g | gram | metric unit of weight |
| gpm | gallons per minute | A volumetric measure of water flow in the site's groundwater treatment systems and other locations. |
| GWIS | groundwater intercept system | Refers to a below ground system that directs contaminated groundwater toward the Solar Ponds and East Trenches treatment systems. |
| IA | Industrial Area | Refers to the central core of Rocky Flats where all production activities took place. The IA was roughly 350 of the total 6,500 acres at the site. |
| IC | Institutional Control | ICs are physical and legal controls geared towards ensuring the cleanup remedies remain in place and remain effective. |
| IHSS | Individual Hazardous Substance Site | A name given during cleanup to a discrete area of known or suspected contamination. There were over two hundred such sites at Rocky Flats. |
| ITPH | interceptor trench pump house | The location where contaminated groundwater collected by the interceptor trench is pumped to either the Solar Ponds and East Trenches treatment systems |
| L | liter | Metric measure of volume, a liter is slightly larger than a quart. |

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| LANL | Los Alamos National Laboratory | One of the US government's premier research institutions located near Santa Fe, NM. LANL is continuing to conduct highly specialized water analysis for Rocky Flats. Using sophisticated techniques, LANL is able to determine the percentages of both naturally-occurring and man-made uranium. That analysis helps inform water quality decisions. |
| LM | Legacy Management | DOE office responsible for overseeing activities at closed sites. |
| LMPIP | Legacy Management Public Involvement Plan | This plan follows DOE and EPA guidance on public participation and outlines the methods of public involvement and communication used to inform the public of site conditions and activities. It was previously known as the Post-Closure Public Involvement Plan (PCPIP). |
| M&M | monitoring and maintenance | Refers to ongoing activities at Rocky Flats. |
| MSPTS | Mound site plume treatment system | The treatment system for treating groundwater contaminated with organic solvents which emanates from the Mound site where waste barrels were buried. Treated effluent flows into South Walnut Creek. |
| NEPA | National Environmental Policy Act | Federal legislation that requires the federal government to perform analyses of environmental consequences of major projects or activities. |
| nitrates | | Contaminant of concern found in the North Walnut Creek drainage derived from Solar Ponds wastes. Nitrates are very soluble in water and move readily through the aquatic environment |
| Np | neptunium | A man-made radioactive isotope that is found as a by-product of nuclear reactors and plutonium production. |
| NPL | National Priorities List | A listing of Superfund sites. The refuge lands were de-listed from the NPL while the DOE-retained lands are still on the NPL due to ongoing groundwater contamination and associated remediation activities. |
| OLF | Original Landfill | Hillside dumping area of about 20 acres which was used from 1951 to 1968. It |

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| | | underwent extensive remediation with the addition of a soil cap and groundwater monitoring locations. |
| OU | Operable Unit | A term given to large areas of the site where remediation was focused. |
| PCE | perchloroethylene | A volatile organic solvent used in past operations at the site. PCE is also found in environmental media as a breakdown product of other solvents. |
| pCi/g | picocuries per gram of soil | A unit of radioactivity measure. The soil cleanup standard at the site was 50 pCi/g of soil. |
| pCi/L | picocuries per liter of water | A water concentration measurement. The State of Colorado has a regulatory limit for Pu and Am which is 0.15 pCi/L of water. This standard is 100 times stricter than the EPA's national standard. |
| PLF | Present Landfill | Landfill constructed in 1968 to replace the OLF. During cleanup the PLF was closed under RCRA regulations with an extensive cap and monitoring system. |
| PMJM | Preble's Meadow Jumping Mouse | A species of mouse found along the Front Range that is on the endangered species list. There are several areas in the Refuge and COU that provide an adequate habitat for the mouse, usually found in drainages. Any operations that are planned in potential mouse habitat are strictly controlled. |
| POC | Point of Compliance (surface water) | A surface water site that is monitored and must be found to be in compliance with federal and state standards for hazardous constituents. Violations of water quality standards at the points of compliance could result in DOE receiving financial penalties. |
| POE | Point of Evaluation (surface water) | These are locations at Rocky Flats at which surface water is monitored for water quality. There are no financial penalties associated with water quality exceedances at these locations, but the site may be required to develop a plan of action to improve the water quality. |
| POU | Peripheral Operable Unit | A CERCLA term used to describe the Wildlife Refuge lands of about 4,000 acres. |
| Pu | plutonium | Plutonium is a metallic substance that was fabricated to form the core or "trigger" of a |

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| | | nuclear weapon. Formation of these triggers was the primary production mission of the Rocky Flats site. Pu-239 is the primary radioactive element of concern at the site. There are different forms of plutonium, called isotopes. Each isotope is known by a different number. Hence, there are plutonium 239, 238, 241 and others. |
| RCRA | Resource Conservation and Recovery Act | Federal law regulating hazardous waste. In Colorado, the EPA delegates CDPHE the authority to regulate hazardous wastes. |
| RFCA | Rocky Flats Cleanup Agreement | The regulatory agreement which governed cleanup activities. DOE, EPA, and CDPHE were signors. |
| RFCAB | Rocky Flats Citizen Advisory Board | This group was formed as part of DOE's site-specific advisory board network. They provided community feedback to DOE on a wide variety of Rocky Flats issues from 1993-2006. |
| RFCLOG | Rocky Flats Coalition of Local Governments | The predecessor organization of the Rocky Flats Stewardship Council |
| RFETS | Rocky Flats Environmental Technology Site | The moniker for the site during cleanup years. |
| RFLMA | Rocky Flats Legacy Management Agreement | The post-cleanup regulatory agreement between DOE, CDPHE, and EPA which governs site activities. The CDPHE takes lead regulator role, with support from EPA as required. |
| RFNWR | Rocky Flats National Wildlife Refuge | The approximate 4,000 acres which compose the wildlife refuge. |
| RFSOG | Rocky Flats Site Operations Guide | The nuts-and-bolt guide for post-closure site activities performed by DOE and its contractors. |
| SPPTS | solar ponds plume treatment system | System used to treat groundwater contaminated with uranium and nitrates. The nitrates originate from the former solar evaporation ponds which had high levels of nitric acid. The uranium is primarily naturally-occurring with only a slight portion man-made. Effluent flows into North Walnut Creek |
| SVOCs | semi-volatile organic compounds | These compounds are not as volatile as the solvent VOCs. They tend to be similar to oils and tars. They are found in many |

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| | | environmental media at the site. One of the most common items to contain SVOCs is asphalt. |
| TCE | trichloroethylene | A volatile organic solvent used in past operations at the site. TCE is also found in environmental media as a breakdown product of other solvents. |
| U | uranium | Naturally occurring radioactive element. There were two primary isotopes of U used during production activities. The first was enriched U which contained a very high percentage (>90%) of U-235 which was used in nuclear weapons. The second isotope was U-238, also known as depleted uranium. This had various uses at the site and only had low levels of radioactivity.. |
| USFWS | United States Fish & Wildlife Service | An agency within the US Department of the Interior that is responsible for maintaining the nation-wide system of wildlife refuges, among other duties. The regional office is responsible for the RFNWR. |
| VOC | volatile organic compound | These compounds include cleaning solvents that were used in the manufacturing operations at Rocky Flats. The VOCs used at Rocky Flats include carbon tetrachloride (often called carbon tet), trichloroethene (also called TCE), perchloroethylene (also called PCE), and methylene chloride. |
| WCRA | Woman Creek Reservoir Authority | This group is composed of the three local communities, the Cities of Westminster, Northglenn, and Thornton, who use Stanley Lake as part of their drinking water supply network. Water from the site used to flow through Woman Creek to Stanley Lake but the reservoir severed that connection. The Authority has an operations agreement with DOE to manage the Woman Creek Reservoir. |
| WQCC | Water Quality Control Commission | State board within CDPHE tasked with overseeing water quality issues throughout the state. DOE has petitioned the WQCC several times in the last few years regarding water quality issues. |
| ZVI | zero valent iron | A type of fine iron particles used to treat VOC's in the ETPTS and MSPTS. |

Business Items

- June 4, 2012, draft board meeting minutes
- List of Stewardship Council checks

Draft 2013 Work Plan

- Cover memo
- Draft work plan

Draft 2013 Budget

- Cover memo
- Draft budget

ROCKY FLATS STEWARDSHIP COUNCIL

Monday, June 4, 2012, 8:30 AM – 11:30 AM

**Rocky Mountain Metropolitan Airport, Terminal Building, Mount Evans Room
11755 Airport Way, Broomfield, Colorado**

Board members in attendance: Jim McCarthy (Alternate, Arvada), Lisa Morzel (Director, City of Boulder), Tim Plass (Alternate, City of Boulder), Meagan Davis (Alternate, Boulder County), Greg Stokes (Director, Broomfield), Mike Shelton (Alternate, Broomfield), David Allen (Alternate, Broomfield), Dan Hartman (Alternate, Golden), Kate Newman (Alternate, Jefferson County), Joyce Downing (Director, Northglenn), Shelley Stanley (Alternate, Northglenn), Joe Cirelli (Director, Superior), Bob Briggs (Director, Westminster), Mary Fabisiak (Alternate, Westminster), Shirley Garcia (Director, Rocky Flats Cold War Museum), Roman Kohler (Director, Rocky Flats Homesteaders), Jeannette Hillery (Director, League of Women Voters), Arthur Widdowfield (citizen).

Stewardship Council staff members and consultants in attendance: David Abelson (Executive Director), Rik Getty (Technical Program Manager), Barb Vander Wall (Seter & Vander Wall, P.C), Erin Rogers (consultant).

Attendees: Vera Moritz (EPA), John Dalton (EPA), Carl Spreng (CDPHE), Marilyn Null (CDPHE), Charles Adams (CDPHE), Scott Surovchak (DOE-LM), Karen Reed (DOE), Bob Darr (Stoller), Rick DiSalvo (Stoller), Yvonne Deyo (Stoller), John Boylan (Stoller), Jody Nelson (Stoller), George Squibb (Stoller), Heidi Frasuk (Stoller), Linda Kaiser (Stoller), Tami Moon-Carlson (City of Thornton), Ian Paton (Wright Water Engineers), Robert Weiner (Wright Water Engineers), Jennifer Bohn (RFSC accountant).

Convene/Agenda Review

Chair Lisa Morzel convened the meeting at 8:34 a.m. She asked if there were any suggested changes to the agenda and there were not.

Chairman's Review of May 7 Executive Committee meeting

Chair Lisa Morzel noted that an Executive Committee meeting was held on May 7, 2012. Meeting attendees included the Executive Committee members (Bob Briggs, Lisa Morzel and Jeannette Hillery) along with David Abelson. The purpose was to develop the agenda for this meeting. These meetings are always open to public, and have been held at the Boulder Municipal Building.

Consent Agenda

Murph Widdowfield presented one minor editing change to the April Board meeting minutes (on page 8, it should say that plutonium decays into americium rather than the other way around). David Allen made one other minor edit that was recorded by staff.

Bob Briggs moved to approve the May Board meeting minutes as amended and the checks. The motion was seconded by Joe Cirelli. The motion to accept the minutes and checks passed 13-0.

Executive Director's Report

David Abelson was in Washington, D.C. in May. During this visit, he met with staff from DOE and the Energy Communities Alliance (ECA). A primary issue being discussed had to do with a provision stemming from the recent Congressional debt ceiling struggle. Over the next 10 years, Congress is tasked with figuring out how to cut \$917 billion from the budget. If Congress does not agree on what cuts to make, there will be automatic cuts. As part of this, there is a huge push to protect the Defense Department budget. David noted that there will be cuts to DOE, but no one is yet sure what they will look like. These decisions will start being made early next year. The House of Representatives recently discussed the energy and water appropriations bill, which includes DOE. There is a major split between renewable energy and fossil fuels programs, and no agreement on what to cut. David recommended that local governments begin a dialogue with their national contacts and advisors, as these budget cutting requirements may affect any number of federal funding programs.

David next moved on to a quick update regarding a book about Rocky Flats coming out in June, authored by Colorado native Kristin Iverson. Staff put together talking points for the Board to have available in case of media contact. He summarized the main points. One is that Board Members take their responsibilities very seriously. Also, although no one can change past actions, local government representatives and citizens are engaged and working hard to understand and monitor any risks, in order to make sure human health and the environment are protected. This includes making sure that DOE and regulators are doing their jobs. Finally, Board Members can report that all relevant data shows that regulatory standards are being met.

David noted that the State and Tribal Government Working Group will be having their annual meeting in Denver in late June. This organization, funded by DOE, was formed in the mid-1990s, and primarily addresses sites that have a Native American population (such as Hanford and Idaho). This meeting will incorporate a focus on Rocky Flats, including a site tour. David, Scott Surovchak and Carl Spreng will be on a panel discussing the Rocky Flats cleanup process. Joe Cirelli asked if these were public meetings. Scott said that much of it is open to the public.

Rik Getty spoke about the Board's annual site tour, which was to occur later in the week. Attendees were asked to arrive at the west entrance at 9 am for a 2-3 hour tour. They were asked to bring water, sunscreen, sturdy shoes, long pants, cameras, and binoculars. There is make-up date in case of weather issues. About 25 people signed up to go on the tour.

Public Comment

There was none.

Receive Stewardship Council 2011 Financial Audit

Eric Barnes, from Wagner Barnes, briefed the Board on the results of the recent audit, which covered calendar year 2011. While the Stewardship Council is not required to conduct an audit, the Board has had one done every year, based on staff recommendations. Since there are no employees, an independent review is a reliable way for the Board to make sure everything is in order with its finances.

Mr. Barnes complemented the Board's accountant Jennifer Bohn on her work of keeping the Board's records. He said that the audit resulted in a 'clean opinion', which is about as good as it gets in an audit report. He reviewed sections of the audit report, including the balance sheet, statement of revenues, budget-to-actual statement (which showed actual expenditures were less than what was budgeted), assets, and insurance. There were no proposed adjustments to the records. Overall, no material problems were found and the Stewardship Council was deemed to be in compliance with all applicable laws and regulations. Chair Lisa Morzel noted that she was glad the Board continues to have audits performed even though the annual budget is not large. She said it keeps everything clear about how all money is spent.

Roman Kohler moved to accept the 2011 audit. The motion was seconded by Murph Widdowfield. The motion passed 13-0.

Member Updates

The Board had a quick round-robin session, allowing each member an opportunity to provide a brief update about activities within their organization. Joe Cirelli noted that the Town of Superior was updating their comprehensive plan, and developing a town center plan. Bob Briggs said Westminster was working on the Westminster Center redevelopment, and recently hired a new Parks Director. Shirley Garcia said that the Rocky Flats Cold War Museum was in the second phase of their development and was about to finalize a new logo. Roman Kohler noted that the former workers were taking another stab at gaining special cohort status with NIOSH, and were hoping they will get community support. Lisa Morzel brought up the question of whether the Board should write another letter in support of the workers' efforts. David Abelson noted that the Charlie Wolf Act was not going to move forward, simply because of cost. Jeannette Hillery said that the Board needed to weigh in again, and asked Roman to let the Board know when this would be most timely. Lisa asked David Abelson to draft a letter before the next meeting. Murph Widdowfield noted that the Rocky Flats Cold War Museum had a booth at the People's Fair. He said many people stopped by the booth, and that there were many connections to former workers, even grandchildren. He reported a great deal of enthusiasm for the Refuge and the Museum, as family members were interested in learning what their parents and grandparents did at Rocky Flats.

Host DOE Annual Meeting

DOE was on hand to brief on site activities for calendar year 2011. DOE has posted the report on its website and will provide a summary of its activities to the Stewardship Council. Activities included surface water monitoring, groundwater monitoring, ecological monitoring, and site operations (inspections, maintenance, etc.).

Surface Water Monitoring – George Squibb

George began by showing a map of the current monitoring sites and then discussed pond operations. Terminal ponds A-4 and B-5 were discharged in March 2011 and started flow-through operations in September. The other terminal pond (C-2) started flow-through operations in November. Pond A-3 to A-4 operated in flow-through operations January 1 through October 12, and then pond A-3 was 'offline' for dam breach for the remainder of 2011. As of January 1, 2012, Ponds A-3, A-4, B-5, and C-2 and the Landfill Pond were holding approximately 6.7 MG

(6.8 percent of capacity). The Present landfill and A-3 ponds were recently put into flow through. Precipitation for the year was about average and flow rates were a little below average.

When showing the water quality plots, George noted that the newer flow-paced sampling was expected to show more variability than batch sampling. All Points of Compliance (POC's) showed levels below applicable standards. At the Points of Evaluation (POE's) monitoring, only GS10 and SW027 presented reportable conditions. Reportable 12-month rolling average values for uranium at GS10 were observed starting April 30, 2011. Additional sampling is being conducted both upstream of and downstream of GS10. Contact Records 2011-04 and 2011-05 can be found on the Rocky Flats website. Reportable 12-month rolling average values for americium at GS10 were observed starting August 31, 2011. Additional sampling is being conducted both upstream of and downstream of GS10. Contact Record 2011-08 can be found on the Rocky Flats website. Reportable 12-month rolling average values for plutonium at SW027 were initially observed starting April 30, 2010. Plutonium was no longer reportable at SW027 starting on April 30, 2011. Contact Record 2010-06 can be found on the Rocky Flats website.

David Abelson asked what these results are telling us on a macro level. George said that they are showing a lot of what was expected, and also prompts them to get a better understanding of what is going on in these areas. He re-iterated that that remedy was designed to include monitoring and that the contaminant levels are about a tenth of what was present during closure.

Reportable 12-month rolling average values for plutonium at SW027 were initially observed starting April 30, 2010. Plutonium was no longer reportable at SW027 starting on April 30, 2011.

Routine quarterly sampling at the Present Landfill (PLF) showed selenium and arsenic concentrations above the standard at the treatment system effluent. These concentrations triggered sampling at an increased frequency (monthly). Selenium and arsenic were not detected in the subsequent monthly samples, and the sampling frequency reverted back to quarterly.

David Abelson suggested that, given the impact of the Solar Ponds on much of the surface water contamination, it would make sense at future meeting to review the background of this area.

Groundwater monitoring – John Boylan

John noted that each type of monitoring (such as AOC, sentinel, RCRA, etc.) has particular objectives. RFLMA monitoring includes all AOC, Sentinel, and RCRA wells. AOC wells are monitored for the impact of groundwater on surface water. Sentinel wells provide indication of plume movement, and RCRA wells support the landfills (PLF, OLF). RFLMA monitoring also includes the treatment system locations. Non-RFLMA monitoring includes additional sampling at the Solar Ponds Plume Treatment System (SPPTS); continued evaluation of air stripper at Mound Site Plume Treatment System (MSPTS); confirmatory sampling at several locations; and extra sampling to support the GS10 evaluation.

During the calendar year, all RFLMA-required monitoring was performed. Analytical data was evaluated per RFLMA Attachment 2. Groundwater treatment systems continue to remove

contaminants from the groundwater. The MSPTS media was replaced and the prototype polishing component (solar-powered air stripper) was installed.

Seepage velocities (groundwater flow rates) were estimated from water levels measured across the COU. They used 22 well pairs for this analysis. The median velocity (127 ft/yr) and range (8 to 428 ft/yr) was very similar to results from 2010.

Locations where velocity is at least 200 ft/yr:

- Part of 881 hillside
- B771 hillside
- OLF
- Part of 903 Pad/Lip
- Oil Burn Pit #1

Locations where velocity is less than 50 ft/yr:

- South IA
- North side of solar ponds

Statistical analyses of groundwater quality data were performed per RFLMA. An analysis of variance (ANOVA) for RCRA wells looked at downgradient groundwater vs. upgradient groundwater. Statistical trending was used for Sentinel and RCRA wells, plus several evaluation wells were sampled for non-RFLMA purposes. Additional, non-RFLMA statistical analyses were performed on selected data from AOC wells. John recommended referring to the Annual Report text, tables, figures, and Appendix B for well- and chemical-specific details. He added that references to concentration trends in his presentation were for those calculated to have 95 percent statistical confidence.

John presented a summary of the statistical analysis for OLF groundwater. ANOVA results for 2011 were the same as for 2007–2010. Concentrations of two metals are higher in downgradient than upgradient groundwater - boron in all three wells, and uranium in one well (80205). All were below applicable RFLMA levels. These results may be attributable to natural sources. Uranium was characterized as 100 percent natural (2007). Statistical trending calculations were also the same as 2010, and showed no increasing trends at downgradient wells. Boron and uranium were decreasing at well 80005. Per RFLMA, higher downgradient concentration or an increasing trend trigger consultation – and boron and uranium conditions meet this requirement.

John moved on to a summary of the statistical analysis for PLF groundwater. ANOVA results for 2011 were very similar to preceding years. Concentrations of several metals are higher in downgradient than upgradient groundwater. Statistical trending calculations were also similar to preceding years. Boron concentrations at well 73105 and chromium and selenium at well 73005 are on increasing trends. John added that numerous non-detects in the dataset suggest that trends may not be real. Boron at 73105 and chromium and selenium at 73005 meet the RFLMA requirement to trigger consultation. As in 2008–2010, only selenium exceeded the applicable RFLMA level. This may be attributable to natural sources (such as ore mineralization or organic-rich sediments).

One VOC (and no SVOCs) were detected in downgradient OLF groundwater (1,1-DCE, second quarter, well 80105). The applicable RFLMA standard is 7 µg/L and the concentration is estimated at 0.48 µg/L. No VOCs were detected in downgradient PLF groundwater.

John moved on to an update on the Mound and Oil Burn Pit #2 (OBP #2) Plume. Source area evaluation wells were not scheduled for RFLMA sampling in 2011. OBP #2 well was sampled to support other evaluations. The results were generally consistent with previous data. Sentinel well 15699 is downgradient of the Mound source area and the MSPTS collection trench, and showed fourth-quarter increases in PCE, TCE. This may reflect water storage in the trench during MSPTS maintenance in 2011. Concentrations decreased in follow-up sample. Sentinel well 91299 is downgradient/side-gradient of the OBP #2 source area. Concentrations of several VOCs decreased in 2011 and several trends were identified and noted in the Annual Report.

The MSPTS treated approximately 546,000 gallons of water in 2011, which was the highest volume ever treated at this location. It continues the trend of higher volumes observed since closure, and is due to the addition of OBP #2 water, and continuing effects of a wet 2010. Influent concentrations of PCE and TCE remained higher in 2011 and influent continues to reflect presence of OBP #2-impacted groundwater.

System maintenance was performed at MSPTS in February and March 2011 (ZVI media replaced, subsurface discharge gallery repaired, and small solar-powered air stripper was installed in the effluent manhole). Optimization and testing continues. Effluent water quality has improved and results from surface water performance location GS10 also improved over 2010. Four detections of VOCs were reported, but none exceeded applicable RFLMA standards.

At the East Trenches Plume Treatment System (ETPTS), source area evaluation wells were not scheduled for sampling during the calendar year. Water quality at downgradient Sentinel and AOC wells was consistent with previous years. Downgradient Sentinel well 23296 (next to South Walnut Creek) showed increasing trends in main degradation byproducts, and decreasing trends in main parent compounds. There have also been higher water levels since the dam breach.

The ETPTS treated approximately 890,000 gallons, which was much lower than 2010 and more similar to previous post-closure years. Effects are still seen from the wet 2010.

Concentrations of some VOCs at the ETPTS system influent are higher, especially TCE. These are typically in the 2500 µg/L range, but have been greater than 3000 µg/L since fourth quarter 2010. The effluent showed much higher TCE concentrations in the fourth quarter sample. A follow-up sample showed similar results. To address this, the site reconfigured the flow from parallel upflow in both treatment cells to a series - upflow in the first cell and downflow in the second cell. They collected a sample in January 2012 to evaluate the flow reconfiguration, which showed that treatment effectiveness had been restored. Results from the surface water performance location POM2 included no VOC detections.

At the SPPTS, source-area evaluation wells were not scheduled for sampling. Three wells on the south/southeast portion of the source area were sampled to support the GS10 evaluation. Results were consistent with previous samples, including continued decreasing uranium in one well.

Overall patterns at downgradient sentinel wells showed that higher uranium was often not accompanied by higher nitrate. Wells nearer the source area (Sentinel well P210089) may be lower in uranium than wells farther away (Sentinel well 70099, AOC well 10594). This illustrates the importance of natural uranium.

The SPPTS treated approximately 507,000 gallons. The annual average volume treated has increased since Phase I upgrades in 2008. The average for 2006–2011 is more than twice the average from 2000–2005. The average for 2009–2011 is almost three times the 2000–2008 average.

Overall SPPTS trends include the finding that higher flow rates reduce residence time and treatment effectiveness. Also, average concentrations of nitrate and uranium remain much lower at the SPP Discharge Gallery than prior to site closure. Finally, results from surface water performance location GS13 indicate that the overall effectiveness of SPPTS is improving.

John also provided a summary of SPPTS upgrades:

- Phase I (October 2008) collects more contaminated groundwater and routes to treatment cells, routes effluent via new, nonperforated line
- Phase II (May 2009) moves uranium treatment to first step in easily accessible cell
- Phase III (May 2009) evaluates pilot-scale nitrate treatment

The main SPPTS activities were:

- Continued operation of Phase III components
- Cleaned media (biomass removal) in Phase III Cell A
- Conceptualization of revised approach to uranium treatment (“microcell”) to address reduced effectiveness of Phase II Cell
 - Shorten residence time and attempt to replicate successful lab results
 - Testing underway in 2012

Phase III optimization has concluded. The results showed that the organic media alternative requires a much larger treatment cell, and the active alternative requires much more maintenance and power.

John noted that only a few source-area evaluation wells were sampled in 2011:

- 903 Pad/Ryan’s Pit plume
- IA plume
- Vinyl chloride plume
- IHSS 118.1 plume
- Other areas - Former B991 and AOC well B206989 (No Name Gulch)

At the 903 Pad/Ryan’s Pit Plume, results from source-area evaluation wells were generally consistent with previous data. 903 Pad groundwater shows primarily carbon tetrachloride and PCE. Ryan’s Pit groundwater shows primarily TCE. Well 07391 (Ryan’s Pit) produces samples

with the highest VOC concentrations. AOC wells 10304 and 00193 do not suggest impacts to surface water.

The next area John discussed was the Industrial Area (IA) plume. In the southern portion, no evaluation wells were sampled. Sentinel well results were consistent with previous samples. The results for AOC well 11104 (at Woman Creek) do not suggest an impact to surface water. Uranium concentrations were also consistent with previous results and remain below the threshold. The central portion was not sampled. In the northern portion, biodegradation of VOCs is suggested at Evaluation well 21505 (located between two other areas that support biodegradation). Parent compounds (PCE, TCE) were decreasing, and daughter products were on an uncertain trend. VOCs in Sentinel well 52505 and Surface Water Support location SW018 were consistent with previous results (well below RFLMA standards). Also, no VOCs were detected in AOC well 42505.

At the Vinyl Chloride Plume, the site replaced the downgradient, kinked Sentinel well 33711 (original: 33703). Second-quarter results from the replacement well were higher than typical in the original well. Confirmatory sample and fourth quarter sample results were lower. Source-area results were consistent with previous years. Concentrations of daughter products are higher, and parent compounds lower. Biodegradation appears to be continuing.

At the IHSS 118.1 Plume, source-area Evaluation well 18199 was sampled. Results suggest some rebound of carbon tetrachloride and chloroform (main contaminants). Downgradient Evaluation well 20902 was not sampled in 2011. Downgradient Sentinel wells (north of B771) do not suggest impacts from this plume.

In the B991 area, uranium concentrations at well 99405 continued rebound after the 2009 low, but are still calculated to be on a decreasing trend. Uranium at well 99305 was calculated to be increasing. Both wells were characterized as natural uranium.

AOC well B206989 (east of Landfill Pond dam) had shown a reportable condition for nitrate in 2007. A decreasing trend was calculated, and results since early 2010 have been below the 10 mg/L standard.

John was asked how deep the wells onsite were. He said they range from 12-45 feet.

Site Operations – Rick DiSalvo

At the OLF, 12 monthly inspections were performed in 2011. Settlement monuments were surveyed in March, June, September, and December. Results were within the expected range per the Monitoring and Maintenance Plan, and did not trigger any maintenance. A biannual topographic survey was performed in March 2011. Berm height maintenance was conducted to meet minimum height criteria. Lisa Morzel asked how topographic surveys are conducted at the site. Rick said they are laser-based, and very accurate to a tenth of an inch. Lisa would like to see maps showing differences over time. He said that the 2009 survey map is in the landfill plan. Three surveys have been done to date – once after closure, and again in 2009 and 2011. These will be done every two years.

At the OLF, inclinometers were measured on October 20, November 22, and December 21, 2011. Very little deflection was noted in the fourth quarter (and all of 2011). A review of 2011 data by the geotechnical engineer was consistent with the 2008 Geotechnical Report. Localized slumping occurs as groundwater levels saturate the organic layer near bedrock. 2011 data support the conclusion that monitoring and implementing maintenance to fill and grade surface cracking is effective. Filling and grading to reduce the depth and slope of the west perimeter channel and to promote drainage of seeps in 2008 and 2009 may contribute to gradual stabilization. Shelley Stanley asked if they are seeing deflection in same inclinometers that showed movement before. He said they were, and these are in an area that historically shows slumping. Seven inclinometers were installed, but they cannot access data down to the original depth in three of these because soil movement has deformed the tubes. This was expected by the geotechnical engineer.

At the PLF, four quarterly inspections were completed in 2011. Nine settlement monuments and six side slope monitors were surveyed in December 2011. The results were within the expected range per Monitoring and Maintenance Plan and did not trigger any maintenance.

The annual site inspection of the Central Operable Unit was conducted on March 15, 2011. This annual project entails inspection and monitoring for evidence of significant erosion. Personnel conduct visual observation for precursors of significant erosion and evaluate proximity of any significant erosion to subsurface features. They also look for evidence of any adverse biological conditions. Finally, site officials inspect the effectiveness of institutional controls (ICs), evaluate any evidence of violation of ICs, determine whether required signs are in place, and verify that Environmental Covenant is in Administrative Record and on file with Jefferson County.

In order to perform the inspection, the COU was divided into five areas:

- A – Former 300 and 400 Areas
- B – Former 700 and 991 Areas
- C – Former 800 Area
- D – Former 903 Pad and East Trenches Area
- E – Former Ash Pits Area

The SW027 drainage area was also inspected, as erosion controls were added in 2010 as follow-up to elevated plutonium levels found that year. Landfills, treatment systems, and water monitoring stations are inspected during the year on a routine basis. The team walked down the surface of each area (A–E) and SW027 drainage area to observe conditions.

No significant erosion was noted, although there were some holes and surface debris. A deep hole was found above a stairwell in former B881. It was about 5 feet in diameter and 18 feet deep. It was filled with about four truckloads of soil. Tim Plass asked how this large of a hole could have developed. Rick said that the building had been imploded and filled in, but soil can move into voids. The other, smaller holes were also filled in, and all debris and trash was collected or flagged for pick up. No adverse biological conditions or evidence of IC violations were noted. All necessary signs were in place.

Ecology -- Jody Nelson

Project support for ecological issues was provided for the:

- A-3/PLF dam breach project
- POC flumes project
- Annual roads project
- Annual dam mowing and riprap spraying project
- OLF maintenance
- Pond bottom revegetation project (A-4, B-5, and C-2)
- Stoplog removal project
- Solar Ponds Plume Treatment System projects
- Annual weed control efforts

2011 ecological monitoring included:

- OLF and PLF vegetation surveys
- Weed and water level surveys in the mitigation wetlands
- Revegetation monitoring
- Weed monitoring and mapping
- Preble's mouse mitigation monitoring
- Wetland mitigation monitoring
- Bluebird box monitoring

2011 wildlife monitoring included:

- Prairie dogs – no active towns within COU
- Raptor nests
 - 1 Great Horned Owl nest – 3 young fledged
- Bluebird nest boxes
 - No bluebirds using nest boxes yet
 - Some boxes used by tree swallows

Jody showed maps for revegetation monitoring and weed monitoring, as well as a series of before-and-after photos of how different areas of the site have changed since closure.

Shelley Stanley asked whether the site would do anything if prairie dogs got into areas of concern. Jody said they would.

Briefing on the Actinide Migration

Since many new members have been added since closure, the Board has been making sure that these members are educated on basic Rocky Flats issues, so they can understand information in context. This briefing was designed provide an overview of the radioactive contaminants at Rocky Flats, the risks that they could pose in the environment.

The Actinide Migration Evaluation (AME) projects were commissioned at Rocky Flats in 1995 to address how actinide elements could potentially move in the local environment. Initially,

AME advisors were recruited to evaluate and provide guidance on environmental conditions (including actinide chemistry, geochemistry, migration, and erosion) at Rocky Flats. The charter was expanded to include recommendations of paths forward for long-term protection of surface-water quality as the primary technical and regulatory measure of remedial action quality. Understanding how actinides move in the environment is central to the cleanup and long-term protection strategies.

Ian Paton and Dr. Robert Weiner (retired professor of chemistry), both with Wright Water Engineers and the Actinide Migration Evaluation, were brought in to provide this presentation.

Dr Weiner began by stating that uranium (U), plutonium (Pu) and Americium (Am) were the main radionuclides of concern at Rocky Flats. Actinide elements (all are radioactive) are close together on the periodic table and have similar properties. Uranium is a naturally-occurring element, and was used in weapons manufacturing. Plutonium is produced artificially when making fissionable materials. Americium is produced by the radioactive decay of plutonium. An element's atomic structure is defined by a different number of electrons around the nucleus. The ratio of neutrons to protons determines the radioactive properties. The number of electrons and their spatial arrangement determines the chemical properties. Chemical properties determine the mobility of an element. Electron arrangement is described by a quantity called the oxidation state, which is essentially the number of electrons in the atom available for reaction with other atoms. Oxidation state values range from I-VIII. The oxidation state determines the chemical properties which in turn determine mobility. The two important chemical properties are solubility and sorption (when something adheres). A high oxidation state means high solubility, and less sorption; while a low oxidation state means lower solubility and greater sorption.

When looking at potential pathways for the movement of actinides, solubility and sorption may or may not apply. With the wind pathway, solubility is not applicable. Sorption is important because actinides can be sorbed on dust particles. In the surface water pathway, solubility is important, but sorption is also important, because of sediments and eroding solids. With the groundwater pathway, solubility is important, while sorption is not.

Plutonium and americium can be found almost everywhere on earth because of nuclear testing. Man-made background concentrations are as follows: Plutonium .04 pCi/g and americium .01 pCi/g. There are different possible oxidation states for actinides. The predominant forms at Rocky Flats had to be measured. They were found to be Pu(IV) and Am(III), which represent a low oxidation state. These have low solubility and high sorption strengths. Solubility tends to be between 1 -.01 ppb. Pu and Am have similar chemical properties and dispersal mechanisms.

Uranium is also found virtually everywhere. There is a high natural background across the Front Range, as well as a man-made background from nuclear testing. Near Rocky Flats, background levels are about 2.25 pCi/g. Uranium exists in two oxidation states at Rocky Flats – U(VI) is more soluble and U(IV) is less soluble. All transport pathways are possible for uranium.

Dr. Weiner provided a summary of mobility pathways at Rocky Flats:

- Wind - Pu, Am and U
- Surface water - Pu, Am and U (however, only U has significant solubility)

- Groundwater - only U (only with high solubility)

These specific conclusions drove remediation decisions.

Ian Paton explained how these principles and findings apply at Rocky Flats. In 1996, an Actinide Migration Evaluation (AME) group was formed, consisting of independent, internationally-recognized experts with various specialties. This project lasted through closure, which was almost ten years. They held regular meetings with stakeholder groups. One of the first activities was to develop pathway models, as well as more sophisticated models for Pu/Am and uranium. The AME experts worked on these for approximately six years. An example of one of their studies was looking at the 903 Pad, which had the highest Pu concentrations onsite. The AME team collected soil samples under the asphalt which was used to fix the contamination in place. They analyzed the atomic structure and confirmed that it was Pu(IV). This form of Pu is insoluble and only moves in particles in surface water and air. This supported data previously gathered regarding contamination patterns. 90% of the contamination was found to be in the first five inches of soil, and 100% was in first eight inches. Ian was asked about the potential for transport via colloids. He explained that colloids are very small, sub-micron particles and added that studies were done to look into this, but that very limited concentrations were found. He said that while this was potential pathway, it was not a dominant one.

This pathway data was used as a foundation for soil cleanup standards at the site. Because of the lack of mobility in soil, cleanup work was focused on the top three feet. This was intended to be conservative, since almost no contamination was found below eight inches. The bulk of the cleanup took place at and around the 903 Pad. During the cleanup, a tent/weather enclosure was constructed over the area being excavated, and then clean fill dirt was added on top. Once cleanup was confirmed through sampling, erosion 'blankets' were laid on to in order to reduce erosion. This cleanup effort took place over an area of approximately 34 acres. After remediation, the same pathways continue to apply for any residual material left in the soil and the goal is to prevent movement by controlling wind and water erosion. Tim Plass asked what volume of contamination was left onsite. Ian said this has not been quantified, but in the 903 Pad lip area, the average remaining contamination levels were about 13 pCi/g. There is a continuing focus on re-vegetation and erosion control, as well as ongoing monitoring. Lisa Morzel asked how much fill soil was used at the 903 Pad. Scott Surovchak said they replaced the same amount that was removed. She also asked if the site looked at soil column migration. Scott said they did not. Joe Cirelli asked how the extent of the lip area to be remediated was determined. Scott said it was determined prior to cleanup via sampling. He added that after the Actinide Migration Evaluation report, a more stringent soil standard was instituted, which in turn increased the area to be remediated. Scott said that soil characterization showed plutonium contamination only at 903 Pad and around building foundations, and this was only to a depth of about 6 inches. Mary Fabisiak asked if work done recently that would minimize projected plutonium loads in the South Interceptor Ditch (SID) for a 100-year rain event, as noted in the AME report. Ian pointed out that these calculations were done based on pre-remediation contamination levels on the lip area, and were no longer relevant.

Public comment

There was none

Updates/Big Picture Review

September 10, 2012 (second Monday)

Potential Business Items

- Initial review of 2013 budget
- Initial review of 2013 work plan

Potential Briefing Items

- Solar Ponds performance
- DOE Quarterly update
- Regulatory overview
- Update on CERCLA 5-year review

November 5, 2012

Potential Business Items

- Approve 2013 budget
- Approve 2013 work plan

Potential Briefing Items

- DOE Quarterly update
- NRD update
- Original landfill performance

Tim Plass asked if the Stewardship Council was planning to participate in Rocky Mountain Greenways discussions. David Abelson said that this was up to the Board. He said it could not be addressed under the Board's DOE grant, but that other funding was available. Barb Vander Wall noted that any work items need to fall under the Stewardship Council's IGA. David said that the IGA does address Refuge issues and this discussion could tie in. Lisa Morzel said a committee had been formed to work on a vision, get discussion going, and think about how to move forward with a regional open space network. She suggested that the Board could get a quick update on this topic at the next meeting.

Issues to watch:

Americium and uranium levels upstream of pond B-3
Re-vegetation efforts (especially if drought-like conditions continue)
Adaptive Management Plan water quality testing results

The meeting was adjourned at 11:42 a.m.

Respectfully submitted by Erin Rogers.

12:11 PM

08/23/12

Rocky Flats Stewardship Council
Check Detail
 May 22 through August 23, 2012

| Type | Num | Date | Name | Account | Paid Amount | Original Amount |
|------------------|-------------|------------------|----------------------------------|-----------------------------------|-------------|------------------|
| Check | | 5/25/2012 | | CASH-Wells Fargo-Operating | | -3.50 |
| | | | | Admin Services-Misc Services | -3.50 | 3.50 |
| TOTAL | | | | | -3.50 | 3.50 |
| Check | | 6/27/2012 | | CASH-Wells Fargo-Operating | | -3.50 |
| | | | | Admin Services-Misc Services | -3.50 | 3.50 |
| TOTAL | | | | | -3.50 | 3.50 |
| Check | 1559 | 6/3/2012 | Energy Communiti... | CASH-Wells Fargo-Operating | | -950.00 |
| | | | | Subscriptions/Memberships | -950.00 | 950.00 |
| TOTAL | | | | | -950.00 | 950.00 |
| Check | 1560 | 6/3/2012 | Century Link | CASH-Wells Fargo-Operating | | -26.13 |
| | | | | Telecommunications | -26.13 | 26.13 |
| TOTAL | | | | | -26.13 | 26.13 |
| Bill P... | 1561 | 6/3/2012 | Crescent Strategies... | CASH-Wells Fargo-Operating | | -8,356.94 |
| Bill | 5/31... | 5/31/2012 | | Personnel - Contract | -6,850.00 | 6,850.00 |
| | | | | Telecommunications | -148.35 | 148.35 |
| | | | | TRAVEL-Local | -87.14 | 87.14 |
| | | | | Postage | -15.99 | 15.99 |
| | | | | TRAVEL-Out of State | -1,039.46 | 1,039.46 |
| | | | | Printing | -216.00 | 216.00 |
| TOTAL | | | | | -8,356.94 | 8,356.94 |
| Bill P... | 1562 | 6/3/2012 | Jennifer A. Bohn | CASH-Wells Fargo-Operating | | -229.50 |
| Bill | 12-43 | 5/31/2012 | | Accounting Fees | -229.50 | 229.50 |
| TOTAL | | | | | -229.50 | 229.50 |
| Bill P... | 1563 | 6/3/2012 | Seter & Vander Wal... | CASH-Wells Fargo-Operating | | -2,423.52 |
| Bill | 63156 | 4/30/2012 | | Attorney Fees | -2,423.52 | 2,423.52 |
| TOTAL | | | | | -2,423.52 | 2,423.52 |
| Bill P... | 1564 | 6/3/2012 | The Hartford | CASH-Wells Fargo-Operating | | -500.00 |
| Bill | 341... | 5/7/2012 | | Insurance | -500.00 | 500.00 |
| TOTAL | | | | | -500.00 | 500.00 |
| Bill P... | 1565 | 6/3/2012 | Wagner Barnes, P.C. | CASH-Wells Fargo-Operating | | -4,058.68 |
| Bill | 17360 | 5/1/2012 | | Annual Audit | -4,058.68 | 4,058.68 |
| TOTAL | | | | | -4,058.68 | 4,058.68 |
| Bill P... | 1566 | 7/11/2012 | Blue Sky Bistro | CASH-Wells Fargo-Operating | | -220.85 |
| Bill | 1036 | 6/1/2012 | | Misc Expense-Local Government | -220.85 | 220.85 |
| TOTAL | | | | | -220.85 | 220.85 |
| Bill P... | 1567 | 7/11/2012 | Crescent Strategies... | CASH-Wells Fargo-Operating | | -7,117.03 |

12:11 PM

08/23/12

Rocky Flats Stewardship Council
Check Detail
 May 22 through August 23, 2012

| Type | Num | Date | Name | Account | Paid Amount | Original Amount |
|------------------|-------------|------------------|----------------------------------|-----------------------------------|-------------|------------------|
| Bill | 6/30... | 6/30/2012 | | Personnel - Contract | -6,850.00 | 6,850.00 |
| | | | | Telecommunications | -148.35 | 148.35 |
| | | | | TRAVEL-Local | -102.69 | 102.69 |
| | | | | Postage | -15.99 | 15.99 |
| TOTAL | | | | | -7,117.03 | 7,117.03 |
| Bill P... | 1568 | 7/11/2012 | Jennifer A. Bohn | CASH-Wells Fargo-Operating | | -467.50 |
| Bill | 12-49 | 6/30/2012 | | Accounting Fees | -467.50 | 467.50 |
| TOTAL | | | | | -467.50 | 467.50 |
| Bill P... | 1569 | 7/11/2012 | Seter & Vander Wal... | CASH-Wells Fargo-Operating | | -956.92 |
| Bill | 63569 | 6/30/2012 | | Attorney Fees | -956.92 | 956.92 |
| TOTAL | | | | | -956.92 | 956.92 |
| Bill P... | 1570 | 7/11/2012 | The Rogers Group, ... | CASH-Wells Fargo-Operating | | -550.00 |
| Bill | 7/9/... | 6/30/2012 | | Personnel - Contract | -550.00 | 550.00 |
| TOTAL | | | | | -550.00 | 550.00 |
| Check | 1571 | 7/11/2012 | Century Link | CASH-Wells Fargo-Operating | | -28.24 |
| | | | | Telecommunications | -28.24 | 28.24 |
| TOTAL | | | | | -28.24 | 28.24 |
| Bill P... | 1572 | 8/6/2012 | Crescent Strategies... | CASH-Wells Fargo-Operating | | -7,041.47 |
| Bill | 7/31... | 7/31/2012 | | Personnel - Contract | -6,850.00 | 6,850.00 |
| | | | | Telecommunications | -138.85 | 138.85 |
| | | | | TRAVEL-Local | -36.63 | 36.63 |
| | | | | Postage | -15.99 | 15.99 |
| TOTAL | | | | | -7,041.47 | 7,041.47 |
| Bill P... | 1573 | 8/6/2012 | Jennifer A. Bohn | CASH-Wells Fargo-Operating | | -314.50 |
| Bill | 12-57 | 7/31/2012 | | Accounting Fees | -314.50 | 314.50 |
| TOTAL | | | | | -314.50 | 314.50 |
| Check | 1574 | 8/6/2012 | Century Link | CASH-Wells Fargo-Operating | | -26.79 |
| | | | | Telecommunications | -26.79 | 26.79 |
| TOTAL | | | | | -26.79 | 26.79 |

ROCKY FLATS STEWARDSHIP COUNCIL

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City of Golden -- City of Northglenn -- City of Thornton -- City of Westminster -- Town of Superior
League of Women Voters -- Rocky Flats Cold War Museum -- Rocky Flats Homesteaders
Arthur Widdowfield

MEMORANDUM

TO: Board
FROM: David Abelson & Rik Getty
SUBJECT: Initial review of 2013 work plan
DATE: August 31, 2012

At this meeting the Board will evaluate its efforts for 2012 and start reviewing its 2013 work plan (draft plan attached). Any changes to the draft plan will be incorporated into a revised draft that will be reviewed, modified as necessary, and approved at the November 5th meeting.

Review of 2012 Activities

The 2012 work plan contains the following provision:

“How the Stewardship Council will measure its success is important. Many organizations use sophisticated techniques to measure success, but these are not necessary for the Stewardship Council. Rather each year the Stewardship Council will pause and reflect on its Work Plan elements to help determine its ability to accomplish the stated mission and objectives. The review shall include an assessment of how the organization can improve in the coming year, focusing on areas of weakness and opportunities for improvement.”

The first part of the conversation will be the Board’s assessment. That conversation will then be used to set goals for 2013 and to make changes to the draft 2013 plan.

Overview of Draft Plan

In consultation with the executive committee, the draft plan we are submitting for your discussion and edits stays the course for the current year. The primary changes we are proposing are:

1. Deleting the provisions about the CERCLA five-year review.
2. Adding the provisions about tracking issues related to the development of a regional trail network connecting the Rocky Flats National Wildlife Refuge with other Front Range refuges and Rocky Mountain National Park.

The other changes, we trust, are self-explanatory. Please let us know what questions you have, particularly if there are any items we did not include in the draft work plan.

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League of Women Voters -- Rocky Flats Cold War Museum -- Rocky Flats Homesteaders
Arthur Widdowfield

2013 Work Plan

Draft #1, September 2013

Mission:

The mission of the Rocky Flats Stewardship Council is to provide continuing local oversight of activities at the Rocky Flats site and to ensure local government and community interests are met with regards to long-term stewardship of residual contamination and refuge management. The mission also includes providing a forum to track issues related to former site employees and to provide an ongoing mechanism to maintain public knowledge of Rocky Flats, including educating successive generations of ongoing needs and responsibilities regarding contaminant management and refuge management.

Background:

The Stewardship Council occupies two roles: (1) serving as the Local Stakeholder Organization (LSO) for Rocky Flats, and (2) engaging USFWS on the management of the Rocky Flats National Wildlife Refuge.

Local Stakeholder Organization (LSO)

Legacy Management approved the LSO Plan for Rocky Flats on December 21, 2005. That Plan identifies how the main responsibilities Congress identified in the legislation authorizing the creation of LSO (Section 3120 of the Fiscal Year 2005 Defense Authorization bill) are to be carried out at Rocky Flats. These responsibilities are summarized as follows:

- Solicit and encourage public participation in appropriate activities relating to the closure and post-closure operations of the site.
- Disseminate information on the closure and post-closure operations of the site to the State and local and Tribal governments in the vicinity of the site, and persons and entities having a stake in the closure or post-closure operations of the site.
- Transmit to appropriate officers and employees of DOE questions and concerns of governments, persons, and entities referred to in the preceding bullet.

Deleted: Preface: 2012 Challenges and Opportunities

In 2012, the Stewardship Council will complete its 7th year of operations. At the start of the year, membership will expand to include the City of Thornton.

Some of the challenges and opportunities to address in 2012 will likely include:

- <#>Incorporating Thornton into the organization.
- <#>Participating in the CERCLA five-year review.
- <#>Addressing growing concerns amongst members and citizens with DOE management decisions.
- <#>Developing and circulating accurate information about protectiveness of Rocky Flats cleanup.
- <#>Maintaining public awareness and interest in the ongoing management needs at Rocky Flats.
- <#>Reviewing and modifying as necessary organizational systems to ensure members remain engaged and the Stewardship Council functions efficiently.

In fulfilling these responsibilities, the Stewardship Council has been tasked with helping DOE meet its public involvement obligations identified in the Legacy Management Public Involvement Plan (LMPIP) for Rocky Flats.

Deleted: Post-Closure

Deleted: PC

Rocky Flats National Wildlife Refuge

“The Rocky Flats National Wildlife Refuge Act of 2001” established that Rocky Flats shall become a national wildlife refuge following EPA certification that the site has been cleaned to the agreed-upon regulatory standards. In July 2007 DOE conveyed jurisdictional responsibility over nearly 4000 acres to the Department of the Interior for the Rocky Flats National Wildlife Refuge.

In April 2005, USFWS published the Rocky Flats Comprehensive Conservation Plan (CCP), the conservation plan for the Rocky Flats National Wildlife Refuge. The CCP describes the desired future conditions of the Refuge and provides long-range guidance and management direction. Per the CCP, in the coming years USFWS anticipates developing the following “step-down” management plans, which provide specific guidance for achieving the objectives established in the CCP:

1. Vegetation and Wildlife Management Plan
2. Integrated Pest Management Plan
3. Fire Management Plan
4. Visitors Services Plan
5. Health and Safety Plan
6. Historic Preservation Plan

Due to funding restrictions, USFWS has delayed implementation of the CCP, including delaying the timeline for opening the Refuge for public access. Should USFWS take steps to open the Refuge, the Stewardship Council would work with USFWS and DOE to ensure the current access restrictions to DOE-retained lands remain effective and to address issues as needed.

Work Plan Elements

The Work Plan is divided into the following five sections:

1. DOE Management Responsibilities
2. Former Rocky Flats Workforce
3. Outreach
4. Rocky Flats National Wildlife Refuge
5. Business Operations

DOE Management Responsibilities

Overview:

One of the key roles of the Stewardship Council continues to be to understand and engage the various issues regarding the cleanup and post-closure management of Rocky Flats, and to provide a forum to foster discussions among DOE, the regulatory agencies, and community members.

2013 Activities:

1. Review information regarding the long-term stewardship and management of the Rocky Flats site, including but not limited to the results of the operational and performance monitoring data of site operations and DOE status reports.
2. Work with DOE on implementing its Legacy Management Closure Public Involvement Plan (LMPIP), including the meetings DOE identified in the LMPIP.
3. Review DOE budgets for implementation of DOE responsibilities.
4. Participate in DOE, CDPHE and/or EPA assessment(s) of remedy operations and effectiveness.
5. As needed, evaluate legal and regulatory issues regarding implementation of RFLMA and related site documents, and provide information to the Stewardship Council and to the community.
6. Work with DOE and the regulators to understand technical data regarding implementation and effectiveness of cleanup remedies and long-term controls, and provide information to the Stewardship Council and to the community.
7. Transmit to appropriate officers and employees of the DOE questions and concerns of governments, persons and entities regarding Rocky Flats.
8. Continue to participate in Adaptive Management Plan meetings, including technical evaluations of data.
9. Support the Rocky Flats Cold War Museum efforts to establish a museum and on mechanisms for educating successive generations about the history of Rocky Flats, particularly about residual contamination and continued need for long-term stewardship.
10. Track issues related to transfer of administrative jurisdiction over former mineral parcels from DOE to Department of the Interior for inclusion in the Rocky Flats National Wildlife Refuge.
11. Track the development of Jefferson County Parkway as it relates to Rocky Flats.

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Deleted: <#>Participate in the CERCLA five-year review.¶

Former Rocky Flats Workforce

Overview:

One of DOE's primary post-closure responsibilities is to manage the health and pension benefits of former site workers. Many of these workers are the constituents of the Stewardship Council governments. Further, the Rocky Flats Homesteaders, which represents more than 1800 former site workers, sits on the Board of the Stewardship Council. For these and other reasons, as noted in the Stewardship Council's IGA, worker issues will continue to be an important focus of the Stewardship Council.

2013 Activities:

1. Track issues related to the implementation of the Energy Employee Occupational Illness Program Compensation Act (EEOIPCA). Respond as needed.
2. Communicate worker concerns to the Administration and to members of the Colorado Congressional delegation.

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Outreach

Overview:

As the LSO for Rocky Flats, a core responsibility for the Stewardship Council is reaching out to the community and providing a mechanism to educate people about Rocky Flats and the ongoing management needs. As part of this mission it remains essential that the Stewardship Council maintain close communications with DOE, EPA, CDPHE, USFWS and Congress.

The local communities have developed over the period of many years a very good working relationship with the two primary regulatory agencies that oversee the site, EPA and CDPHE. It is imperative that the Stewardship Council continue this tradition of partnership with these agencies.

The Colorado congressional delegation likewise played a critical role in addressing Rocky Flats issues. The Stewardship Council shall remain an important vehicle for addressing issues of concern to the delegation and for providing community interface with the delegation on the numerous site-specific issues and concerns.

2013 Activities:

1. Hold quarterly Board meetings and provide opportunity for public comment and public dialogue.
2. Communicate with other local officials, DOE, state and federal regulators, the Colorado congressional delegation, and other stakeholders about the Stewardship Council’s mission and activities, as appropriate.
3. Seek public input and involvement on issues related to DOE and USFWS responsibilities at Rocky Flats.
4. Evaluate Congressional action affecting DOE and USFWS and administrative action that could affect Rocky Flats.
5. Maintain communication with federal and state legislators, as appropriate, and track federal and state legislation as needed.
6. Provide opportunities at meetings and in between meetings for education and feedback.
7. Work with DOE to disseminate information on the cleanup and post-closure operations of Rocky Flats.
8. Participate in local, regional and national forums.
9. Implement mechanisms for the Stewardship Council and the general public to be informed of the results of the monitoring data and other relevant information, recognizing that not all communication between DOE and Rocky Flats constituencies will flow through the Stewardship Council. Options include:
 - o Periodic reports
 - o Email updates
 - o White papers
 - o Letters

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Rocky Flats National Wildlife Refuge

Overview:

A core function of the Stewardship Council is to engage on issues related to the development and management of the future Rocky Flats National Wildlife Refuge. This work includes tracking

and addressing issues related to the interface of the Refuge to lands that DOE will retain as part of its management responsibilities. Without funding for the Refuge, there will be little management activities for the foreseeable future.

2013 Activities:

1. Track agency and Congressional action affecting funding for USFWS.
2. Track issues related to the inclusion of Section 16 in the southwest corner of Rocky Flats into the Refuge.
3. Track issues related to the development of a trail network connecting Rocky Flats National Wildlife Refuge, Rocky Mountain Arsenal National Wildlife Refuge, Two Ponds National Wildlife Refuge, and Rocky Mountain National Park.

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Business Operations

Overview:

Business Operations refers to organizational management responsibilities – conducting the annual audit, submitting financial reports to DOE, adopting annual Work Plan and annual budget, etc.

2013 Activities:

1. Work with DOE to ensure the Stewardship Council continues to meet the needs as the LSO for Rocky Flats.
2. Operate Stewardship Council in compliance with state and federal regulations.
3. Conduct financial audit.
4. Prepare and adopt the annual work plan and the annual budget.
5. Submit financial reports to DOE.
6. Review and renew as necessary consulting agreements.
7. Provide annual report on activities.

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Deleted: <#>Conclude the Stewardship Council's triennial review¶
<#>Amend bylaws to account for expansion of organizational membership.¶
<#>Appoint non-governmental members to the Stewardship Council. ¶

Success Measurement Criteria

How the Stewardship Council will measure its success is important. Many organizations use sophisticated techniques to measure success, but these are not necessary for the Stewardship Council. Rather each year the Stewardship Council will pause and reflect on its Work Plan elements to help determine its ability to accomplish the stated mission and objectives. The review shall include an assessment of how the organization can improve in the coming year, focusing on areas of weakness and opportunities for improvement.

ROCKY FLATS STEWARDSHIP COUNCIL

P.O. Box 17670
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(303) 600-7773 (f)

Jefferson County -- Boulder County -- City and County of Broomfield -- City of Arvada -- City of Boulder
City of Golden -- City of Northglenn -- City of Thornton -- City of Westminster -- Town of Superior
League of Women Voters -- Rocky Flats Cold War Museum -- Rocky Flats Homesteaders
Arthur Widdowfield

MEMORANDUM

TO: Board
FROM: David Abelson
SUBJECT: Initial review of 2013 budget
DATE: August 31, 2012

In accordance with Colorado law, attached for your review is the first draft of the Stewardship Council's fiscal year 2013 budget. I have scheduled time at the meeting for you to discuss and modify as necessary this draft. As a unit of local government under the Colorado Constitution, the Stewardship Council must hold budget hearings prior to adopting a final budget. The budget hearings will be held at the November 5th meeting. You will adopt the budget at that meeting.

Overview: In accordance with the Board's direction in past years, the budget is for more than the anticipated costs (approximately 20% above projected costs for 2013). Over-budgeting gives the board latitude in how it manages the expenditures. Since its inception, each year the Stewardship Council's budget has declined; expenditures over the past few years, however, have remained fairly level. Accordingly, the executive committee and I agreed to present a flat budget for 2013, with the assumption that expenditures will remain relatively constant in 2013.

Please let me know what questions you have.

ROCKY FLATS STEWARDSHIP COUNCIL
2013 Budget -- Draft #1

| | | <u>2012 Budget</u> | <u>2012 Actual/ Projected Expenses*</u> |
|--|---------------------|---------------------|---|
| A. Personnel | \$ 93,000.00 | \$ 93,000.00 | \$ 82,200.00 |
| Executive Director and Technical Advisor (\$7750/month for 12 months) | | | |
| B. Fringe Benefits | \$ - | \$ - | \$ - |
| Benefits | \$ - | | |
| Staff are contract employees | | | |
| C. Travel | \$ 5,700.00 | | |
| Out of State | \$ 4,500.00 | \$ 4,500.00 | \$ 3,164.00 |
| National DOE-related trips \$1500/trip X 3 trips | | | |
| Local Travel | \$ 1,200.00 | \$ 1,200.00 | \$ 840.00 |
| \$100/month for 12 months | | | |
| D. Computer Equipment | \$ 500.00 | | |
| Purchase misc. hardware, software | \$ 500.00 | \$ 500.00 | \$ - |
| E. Supplies | \$ 1,200.00 | | |
| Supplies (\$100/month for 12 months) | \$ 1,200.00 | \$ 1,200.00 | \$ 400.00 |
| F. Contractual | \$ 40,100.00 | | |
| Attorney & Accounting Services | \$ 33,500.00 | | |
| Legal Services (\$1400/ month for 12 months) | \$ 16,800.00 | \$ 16,800.00 | \$ 15,753.00 |
| Accounting (\$850/month for 12 months) | \$ 10,200.00 | \$ 10,200.00 | \$ 4,862.00 |
| Audit Report | \$ 6,500.00 | \$ 6,500.00 | \$ 4,059.00 |
| Admin. Services | \$ 4,600.00 | | |
| Misc. Services: budget notices, etc. | \$ 1,000.00 | \$ 1,000.00 | \$ 900.00 |
| Minutes Preparation (6 meetings) | \$ 3,600.00 | \$ 3,600.00 | \$ 2,475.00 |
| Local Government Expenses | \$ 2,000.00 | \$ 2,000.00 | \$ 1,000.00 |
| Miscellaneous expenses not covered by DOE funds (includes meeting expenses) | | | |
| G. Construction | \$ - | \$ - | \$ - |
| None | | | |
| H. Other | \$ 14,300.00 | | |
| Printing & Copy | \$ 2,000.00 | \$ 2,000.00 | \$ 1,181.00 |
| Postage | \$ 1,500.00 | \$ 1,500.00 | \$ 812.00 |
| \$125/month for 12 months | | | |
| Liability Insurance | \$ 4,000.00 | \$ 4,000.00 | |
| Property Contents/General Liability | \$ 500.00 | | \$ 500.00 |
| Board Members | \$ 3,500.00 | | \$ 2,856.00 |
| Telephone, email, etc. | \$ 2,700.00 | \$ 2,700.00 | \$ 2,021.00 |
| Website | \$ 2,000.00 | \$ 2,000.00 | \$ 500.00 |

| | |
|------------|-------------|
| Hosting | \$ 500.00 |
| Web master | \$ 1,500.00 |

| | | | | |
|----------------------------------|-----------|--------------------|--------------------|------------------|
| Subscriptions/Memberships | | \$ 2,100.00 | \$ 2,100.00 | |
| ECA membership | \$ 950.00 | | | \$ 950.00 |
| Conference registration fees | \$ 500.00 | | | \$ 500.00 |
| Newspapers | \$ 650.00 | | | \$ 650.00 |

| | |
|--------------------------|-------------|
| J. Indirect Costs | \$ - |
|--------------------------|-------------|

N/A

| | | | |
|------------------------------|----------------------|----------------------|----------------------|
| TOTAL PROPOSED BUDGET | \$ 154,800.00 | \$ 154,800.00 | \$ 123,523.00 |
|------------------------------|----------------------|----------------------|----------------------|

REVENUE FOR 2013

| | |
|--------------------------------|----------------------|
| Local government contributions | \$ 10,000.00 |
| Department of Energy grant | \$ 125,000.00 |
| RFCLOG carry-over | \$ 19,800.00 |
| TOTAL | \$ 154,800.00 |

*2012 Actual/Projected Expenses = actual January through July; projected July through December

DOE Quarterly Briefing and CERCLA Five-Year Review

- Cover memo
- Table of contents from quarterly report
- Five Year Review Executive Summary

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City of Golden -- City of Northglenn -- City of Thornton -- City of Westminster -- Town of Superior
League of Women Voters -- Rocky Flats Cold War Museum -- Rocky Flats Homesteaders
Arthur Widdowfield

MEMORANDUM

TO: Stewardship Council Board
FROM: Rik Getty
SUBJECT: DOE Quarterly Report & CERCLA 5-year Review Briefing
DATE: August 27, 2012

We have scheduled seventy minutes for DOE to present its quarterly update for the first quarter of 2012 (January-March). The report (194 pages) can be found at: http://www.lm.doe.gov/Rocky_Flats/Documents.aspx The cover and table of contents are attached to this memo.

DOE will brief on the following topics in a format similar to past quarterly and annual report updates:

- surface water monitoring;
- groundwater monitoring;
- ecological monitoring; and,
- site operations (inspections, pond operations, security, general maintenance, etc.).

DOE will also brief on the recently completed 2012 CERCLA 5 year review (EPA Superfund requirement). DOE prepared the 5 year review and submitted it to EPA on June 23rd and EPA concurred with the report's findings on July 30th. The report can be found online at:

http://www.lm.doe.gov/Rocky_Flats/Regulations.aspx

The report is 140 pages long. The executive summary is attached.

FIRST QUARTER 2012 QUARTERLY REPORT

Highlights of the surveillance and maintenance activities are as follows (largely quoting from the document).

Water Monitoring Highlights

The RFLMA network consists of 10 automated gaging stations, 12 surface water grab-sampling locations, 8 treatment system locations, 97 wells, and 10 precipitation gages. During the first quarter, the water monitoring successfully met the targeted monitoring objectives as required by the RFLMA and was in conformance with RFSOG implementation guidance. 41 flow-paced

composite samples, 12 surface water grab samples, 10 treatment system samples, and 10 groundwater samples were collected (in accordance with RFLMA protocols) and submitted for analysis

Water quality data at the RFLMA Points of Compliance (POCs) remained well below the applicable standards through the quarter. As previously reported, reportable 12-month rolling average uranium concentrations were observed starting on April 30, 2011, in surface water at RFLMA Point of Evaluation (POE) monitoring station GS10, which is located on South Walnut Creek upstream of former Pond B-1. Reportable 12-month rolling average americium (Am) activities were also observed starting on August 31, 2011. As of the end of the first quarter 2012, both analytes were still reportable.

Annual site inspection

Annual inspection and monitoring for evidence of significant erosion and violation of institutional controls (ICs) is required in accordance with Rocky Flats Legacy Management Agreement (RFLMA). The inspection was conducted on March 12, 2012. The following categories were inspected or monitored during the inspection:

- Evidence of significant erosion in the COU, and the proximity of this erosion to subsurface features. This monitoring included observation for precursor evidence of significant erosion, such as cracks, rills, slumping, subsidence, and sediment deposition.
- The effectiveness of ICs as determined through any evidence of the violation of any of these controls.
- Evidence of adverse biological conditions, such as unexpected morbidity or mortality.

Marker flags were placed to indicate a potential issue, and to allow for follow-up by DOE and its contractors. Areas that required evaluation were documented in the Site Observation Log for evaluation and follow-up.

Several areas were noted as having evidence of erosion, possible depressions, or holes. Because of the deep subsidence-related hole found at former Building 881 during the 2011 annual inspection, inspections of areas with significant subsurface remnants of former buildings 371, 771, 881, and 991 are performed by site operations personnel quarterly. The surface locations coinciding with these subsurface features have also been marked with fence posts for ease of conducting surface observations. Most inspection observations were related to metal debris on the surface or trash that was either picked up or marked for subsequent removal and pickup.

No evidence of violations of institutional or physical controls was observed. On March 13, 2012, an inspection team member verified that the Environmental Covenant for the COU remains in the Administrative Record 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.

Landfills

Present Landfill (PLF)

The routine PLF inspection was performed on February 28, 2012. No significant problems were observed during this inspection.

Original Landfill

No new slumps or cracking were observed in the monthly OLF inspections.

Groundwater Treatment Systems

Mound Site Plume Treatment System (MSPTS)

Routine maintenance activities and optimization of the air stripper (a small effluent-polishing unit) continued through the quarter. As previously reported, because of the numerous variables and ongoing optimization of the unit, the component that was installed is designed for only half-time operation (during the daytime). Testing is being performed to identify adjustments needed to achieve optimal effectiveness.

East Trenches Plume Treatment System (ETPTS)

Routine maintenance activities continued at the ETPTS. Activities included checking influent and effluent flow conditions and water levels in the cells.

Solar Ponds Plume Treatment System (SPPTS)

Routine maintenance activities continued at the SPPTS. Activities included weekly inspections of the solar/battery systems that power the pumps, the operation of the pumps, and influent and effluent flow conditions. In addition, tests were initiated on the feasibility of treating uranium with a smaller-scale treatment component, referred to informally as a "microcell." These tests are expected to continue for the next several months.

Present Landfill Treatment System (PLFTS)

Routine maintenance activities continued at the PLFTS. These activities generally consisted of inspecting the system for potential problems.

Erosion Control and Revegetation

Maintenance of the site erosion control features required continued effort through the quarter, especially following high-wind or precipitation events. Erosion wattles and matting loosened and displaced by high winds or rain were repaired. Erosion controls were installed and maintained for the various projects that were ongoing during the first quarter of CY 2012. Several areas were interseeded with additional native species to increase vegetation cover.

CERCLA FIVE YEAR REVIEW

As David indicated in an email to you, the EPA approved the third CERCLA five-year review. CERCLA Section 121 requires that remedial actions which result in any hazardous substances, pollutants, or contaminants remaining at the site be subject to a five-year review.

In approving the review, the EPA stated in its cover letter that the EPA, in consultation with CDPHE, “concur with your assessment that the remedy for the Central Operable Unit is protective of human health and the environment.” The letter continues by noting

No issues or recommendations relating to this Five Year Review will be tracked in EPA’s Superfund Tracking database, CERCLIS. Although this report lists some issues and recommendations, none of these affect protectiveness, and therefore will not be tracked. The environmental indicator for this site is “current human exposure is controlled and a protective remedy is in place.” Environmental indicators include site wide human exposure control and contaminated groundwater migration.

The executive summary is attached.

Rocky Flats, Colorado, Site

**Quarterly Report of Site Surveillance
and Maintenance Activities
First Quarter Calendar Year 2012**

July 2012



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

Contents

| | |
|--|----|
| Abbreviations..... | v |
| 1.0 Introduction..... | 1 |
| 2.0 Site Operations and Maintenance..... | 2 |
| 2.1 Annual Site Inspection..... | 2 |
| 2.2 Landfills..... | 4 |
| 2.2.1 Present Landfill..... | 4 |
| 2.2.1.1 Inspection Results..... | 4 |
| 2.2.1.2 Settlement Monuments..... | 4 |
| 2.2.2 Original Landfill..... | 4 |
| 2.2.2.1 Inspection Results..... | 4 |
| 2.2.2.2 Settlement Monuments..... | 4 |
| 2.2.2.3 Inclinometers..... | 5 |
| 2.2.2.4 Slumps..... | 5 |
| 2.2.2.5 Seeps..... | 5 |
| 2.3 Groundwater Treatment Systems..... | 5 |
| 2.3.1 Mound Site Plume Treatment System..... | 6 |
| 2.3.2 East Trenches Plume Treatment System..... | 6 |
| 2.3.3 Solar Ponds Plume Treatment System..... | 6 |
| 2.3.4 Present Landfill Treatment System..... | 6 |
| 2.4 Erosion Control and Revegetation..... | 9 |
| 3.0 Environmental Monitoring..... | 9 |
| 3.1 Water Monitoring..... | 9 |
| 3.1.1 Water Monitoring Highlights..... | 9 |
| 3.1.2 POC Monitoring..... | 10 |
| 3.1.2.1 Monitoring Location GS01..... | 10 |
| 3.1.2.2 Monitoring Location GS03..... | 13 |
| 3.1.2.3 Monitoring Location WALPOC..... | 17 |
| 3.1.2.4 Monitoring Location WOMPOC..... | 20 |
| 3.1.3 POE Monitoring..... | 23 |
| 3.1.3.1 Monitoring Location GS10..... | 23 |
| 3.1.3.2 Monitoring Location SW027..... | 40 |
| 3.1.3.3 Monitoring Location SW093..... | 43 |
| 3.1.4 AOC Wells and Surface Water Location SW018..... | 45 |
| 3.1.5 Sentinel Wells..... | 45 |
| 3.1.6 Evaluation Wells..... | 45 |
| 3.1.7 PLF Monitoring..... | 45 |
| 3.1.8 OLF Monitoring..... | 46 |
| 3.1.9 Groundwater Treatment System Monitoring..... | 46 |
| 3.1.9.1 Mound Site Plume Treatment System..... | 46 |
| 3.1.9.2 East Trenches Plume Treatment System..... | 46 |
| 3.1.9.3 Solar Ponds Plume Treatment System..... | 46 |
| 3.1.9.4 PLF Treatment System..... | 47 |
| 3.1.10 Pre-Discharge Monitoring..... | 47 |
| 3.1.11 Additional Monitoring..... | 47 |
| 3.1.11.1 High-Resolution Inductively Coupled Plasma/Mass Spectrometry and Thermal Ionization Mass Spectrometry Analyses..... | 47 |

| | | |
|-----|-------------------------------------|----|
| 4.0 | Adverse Biological Conditions | 48 |
| 5.0 | Ecology Monitoring | 48 |
| 6.0 | References | 48 |

Figures

| | | |
|------------|--|----|
| Figure 1. | Original Landfill Observed Surface Cracking Location and Inclinometer Locations..... | 7 |
| Figure 2. | Volume-Weighted 30-Day Average Plutonium and Americium Activities at GS01: Calendar Year Ending First Quarter CY 2012 | 11 |
| Figure 3. | Volume-Weighted 30-Day Average Plutonium and Americium Activities at GS01: Post-Closure Period Ending First Quarter CY 2012..... | 11 |
| Figure 4. | Volume-Weighted 30-Day Average Total Uranium Concentrations at GS01: Calendar Year Ending First Quarter CY 2012..... | 12 |
| Figure 5. | Volume-Weighted 30-Day Average Total Uranium Concentrations at GS01: Post-Closure Period Ending First Quarter CY 2012..... | 12 |
| Figure 6. | Volume-Weighted 30-Day Average Plutonium and Americium Activities at GS03: Calendar Year Ending First Quarter CY 2012 | 13 |
| Figure 7. | Volume-Weighted 30-Day Average Plutonium and Americium Activities at GS03: Post-Closure Period Ending First Quarter CY 2012..... | 14 |
| Figure 8. | Volume-Weighted 30-Day Average Total Uranium Concentrations at GS03: Calendar Year Ending First Quarter CY 2012..... | 14 |
| Figure 9. | Volume-Weighted 30-Day Average Total Uranium Concentrations at GS03: Post-Closure Period Ending First Quarter CY 2012..... | 15 |
| Figure 10. | Volume-Weighted 30-Day Average Nitrate + Nitrite Concentrations at GS03: Calendar Year Ending First Quarter CY 2012..... | 15 |
| Figure 11. | Volume-Weighted 30-Day Average Nitrate + Nitrite Concentrations at GS03: Post-Closure Period Ending First Quarter CY 2012..... | 16 |
| Figure 12. | Volume-Weighted 30-Day Average Plutonium and Americium Activities at WALPOC: Calendar Year Ending First Quarter CY 2012..... | 17 |
| Figure 13. | Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at WALPOC: Calendar Year Ending First Quarter CY 2012 | 18 |
| Figure 14. | Volume-Weighted 30-Day Average Total Uranium Concentrations at WALPOC: Calendar Year Ending First Quarter CY 2012..... | 18 |
| Figure 15. | Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at WALPOC: Calendar Year Ending First Quarter CY 2012..... | 19 |
| Figure 16. | Volume-Weighted 30-Day Average Nitrate + Nitrite Concentrations at WALPOC: Calendar Year Ending First Quarter CY 2012..... | 19 |
| Figure 17. | Volume-Weighted 12-Month Rolling Average Nitrate + Nitrite as Nitrogen Concentrations at WALPOC: Calendar Year Ending First Quarter CY 2012..... | 20 |
| Figure 18. | Volume-Weighted 30-Day Average Plutonium and Americium Activities at WOMPOC: Calendar Year Ending First Quarter CY 2012..... | 21 |
| Figure 19. | Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at WOMPOC: Calendar Year Ending First Quarter CY 2012 | 21 |
| Figure 20. | Volume-Weighted 30-Day Average Total Uranium Concentrations at WOMPOC: Calendar Year Ending First Quarter CY 2012..... | 22 |
| Figure 21. | Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at WOMPOC: Calendar Year Ending First Quarter CY 2012..... | 22 |

| | |
|---|----|
| Figure 22. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at GS10: Calendar Year Ending First Quarter CY 2012 | 23 |
| Figure 23. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at GS10: Post-Closure Period Ending First Quarter CY 2012 | 24 |
| Figure 24. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at GS10: Calendar Year Ending First Quarter CY 2012 | 24 |
| Figure 25. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at GS10: Post-Closure Period Ending First Quarter CY 2012..... | 25 |
| Figure 26. Average Plutonium Activities at Locations Downstream of GS10 | 29 |
| Figure 27. Average Americium Activities at Locations Downstream of GS10..... | 29 |
| Figure 28. Pu/Am Evaluation Sampling Location Map for GS10 Drainage Area..... | 31 |
| Figure 29. Pu/Am Evaluation Sampling Location Map in FC-4 Upstream of GS10..... | 33 |
| Figure 30. Uranium Evaluation Sampling Location Map for GS10 Drainage Area..... | 36 |
| Figure 31. Average Uranium Concentrations at Locations Downstream of GS10 | 38 |
| Figure 32. Uranium and Nitrate+Nitrite as N Results for Grab Samples Collected in South Walnut Creek | 39 |
| Figure 33. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at SW027: Calendar Year Ending First Quarter CY 2012 | 41 |
| Figure 34. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at SW027: Post-Closure Period Ending First Quarter CY 2012 | 41 |
| Figure 35. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at SW027: Calendar Year Ending First Quarter CY 2012..... | 42 |
| Figure 36. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at SW027: Post-Closure Period Ending First Quarter CY 2012..... | 42 |
| Figure 37. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at SW093: Calendar Year Ending First Quarter CY 2012 | 43 |
| Figure 38. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at SW093: Post-Closure Period Ending First Quarter CY 2012 | 44 |
| Figure 39. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at SW093: Calendar Year Ending First Quarter CY 2012..... | 44 |
| Figure 40. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at SW093: Post-Closure Period Ending First Quarter CY 2012..... | 45 |

Tables

| | |
|---|----|
| Table 1. Calendar Years 2011–2012 Composite Sampling Results at GS10 | 26 |
| Table 2. Recent Pu and Am Flow-Paced Composite Sample Results | 28 |
| Table 3. Grab Sampling Results Upstream of GS10: November 25, 2011 | 30 |
| Table 4. Grab Sampling Results from SEEP995A | 31 |
| Table 5. Grab Sampling Results in FC-4 Upstream of GS10: March 6, 2012 | 32 |
| Table 6. Results for Filtered and Unfiltered Sample Pairs at GS10: 3/21/12 and 4/25/12 Composites | 33 |
| Table 7. Results for Time-Paced Composites at GS10 and FC4997: 5/22/12 to 5/28/12 | 34 |
| Table 8. Recent Uranium Flow-Paced Composite Sample Results | 37 |
| Table 9. Summary of Bi-Weekly Uranium Grab Sampling in South Walnut Creek..... | 38 |

Appendixes

- Appendix A Annual Inspection Checklist, Maps, and Photographs
- Appendix B Landfill Inspection Forms and Survey Data
- Appendix C Analytical Results for Water Samples—First Quarter CY 2012

Third Five-Year Review Report for the Rocky Flats Site Jefferson and Boulder Counties, Colorado

July 2012



U.S. DEPARTMENT OF
ENERGY

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8

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<http://www.epa.gov/region08>

JUL 30 2012

Ref: 8 EPR-F

Scott Surovchak
Rocky Flats Site Manager
US Department of Energy,
Office of Legacy Management
11025 Dover Street Suite 1000
Westminster, Colorado 80021

Re: Five Year Review Report for Rocky Flats US
DOE Site, Jefferson County, Colorado

Dear Mr. Surovchak:

Thank you for submitting the Five Year Review Report for the Rocky Flats US DOE Site, Jefferson County, Colorado. The US Environmental Protection Agency (EPA) in consultation with the State of Colorado concurs with your assessment that the remedy for the Central Operable Unit is protective of human health and the environment. We agree with your determination in the sitewide protectiveness statement that the remedy is protective of human health and the environment. This information will be included in the EPA's annual Superfund Five-Year Review Report to Congress.

No issues or recommendations relating to this Five Year Review will be tracked in the EPA's Superfund tracking system, CERCLIS. Although the report lists some issues and recommendations, none of these affect protectiveness, and therefore will not be tracked. The environmental indicator for this site is "current human exposure is controlled and a protective remedy is in place." Environmental indicators include site wide human exposure control and contaminated groundwater migration.

The due date for the next five year review report will be August 03, 2017.

Sincerely,

A handwritten signature in black ink that reads "Martin Hestmark".

Martin Hestmark
Acting Assistant Regional Administrator
Office of Ecosystems Protection
and Remediation

cc. Carl Spreng, CDPHE

Contents

| | |
|---|-----|
| Abbreviations..... | iv |
| Executive Summary..... | vii |
| 1.0 Introduction..... | 1 |
| 1.1 Period Covered by the Review and Related Information..... | 2 |
| 1.2 Contents of the Report..... | 6 |
| 1.3 Authority for Conducting the Five-Year Review..... | 7 |
| 1.4 Agency Conducting the Five-Year Review..... | 8 |
| 1.5 Other Review Components..... | 8 |
| 2.0 Rocky Flats Chronology..... | 9 |
| 2.1 Rocky Flats History..... | 9 |
| 2.2 Rocky Flats Regulatory Framework..... | 10 |
| 3.0 Background..... | 11 |
| 3.1 Physical Characteristics..... | 11 |
| 3.2 Land and Resource Use..... | 15 |
| 3.3 History of Contamination..... | 17 |
| 3.4 Initial Response..... | 19 |
| 3.5 Basis for Taking Action..... | 20 |
| 3.5.1 Nature and Extent of Contamination..... | 20 |
| 3.5.2 Summary of Risks..... | 20 |
| 3.5.3 Contaminant Fate and Transport..... | 33 |
| 3.5.4 Conclusions of the Remedial Investigation..... | 34 |
| 4.0 Remedial Actions..... | 37 |
| 4.1 Remedial Action Objectives..... | 37 |
| 4.2 Remedy Selection..... | 38 |
| 4.2.1 Alternative 1, No Further Action with Monitoring..... | 38 |
| 4.2.2 Alternative 2, Institutional and Physical Controls..... | 39 |
| 4.2.3 Alternative 3, Targeted Surface Soil Removal..... | 40 |
| 4.3 Selected Remedy for the Central OU..... | 40 |
| 4.3.1 Institutional Controls..... | 40 |
| 4.4 Remedy Implementation..... | 42 |
| 4.4.1 Institutional Controls..... | 49 |
| 4.4.2 Physical Controls..... | 49 |
| 4.5 Remedy Monitoring and Maintenance..... | 50 |
| 4.6 Water Monitoring..... | 50 |
| 4.6.1 Surface Water Standards and Application to Groundwater..... | 50 |
| 4.6.2 Water Monitoring Locations and Sampling Criteria..... | 51 |
| 4.7 Operational Monitoring..... | 53 |
| 4.8 Legacy Management Activities..... | 54 |
| 5.0 Progress Since the Last Five-Year Review..... | 57 |
| 6.0 Five-Year Review Process..... | 61 |
| 6.1 Administrative Components..... | 61 |
| 6.2 Community Notification and Involvement..... | 61 |
| 6.3 Document Review..... | 63 |
| 6.4 ARARs Review..... | 69 |
| 6.4.1 Promulgated ARAR Changes During This Review Period..... | 70 |
| 6.4.2 Recent WQCC Rulemaking for Nutrients..... | 75 |

| | | |
|-------|---|-----|
| 6.5 | CRA Review..... | 75 |
| 6.5.1 | Human Health..... | 75 |
| 6.5.2 | Ecological Risk Assessment..... | 79 |
| 6.6 | Environmental Monitoring Data Review..... | 81 |
| 6.6.1 | Water Monitoring Locations..... | 82 |
| 6.6.2 | Surface Water Monitoring Network..... | 82 |
| 6.6.3 | Groundwater Monitoring Network..... | 87 |
| 6.6.4 | Groundwater Treatment System Monitoring and Operations and Maintenance..... | 88 |
| 6.6.5 | Present Landfill Monitoring and Maintenance..... | 91 |
| 6.6.6 | Original Landfill Monitoring and Maintenance..... | 92 |
| 6.6.7 | Ecological Sampling..... | 93 |
| 6.7 | Inspection of the Central OU..... | 93 |
| 6.7.1 | Inspection of RCRA Well Sampling..... | 95 |
| 6.8 | Review of O&M Costs..... | 95 |
| 6.9 | Review of New Technologies..... | 97 |
| 7.0 | Technical Assessment..... | 99 |
| 7.1 | Question A: Is the Remedy Functioning as Intended?..... | 99 |
| 7.2 | Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and RAOs Still Valid?..... | 100 |
| 7.3 | Question C: Has Any Other Information Come to Light That Could Call Into Question the Protectiveness of the Remedy?..... | 102 |
| 8.0 | Issues, Recommendations, and Follow-Up Actions..... | 105 |
| 8.1 | Additional Recommendations Resulting From the Review..... | 110 |
| 9.0 | Protectiveness Statement..... | 111 |
| 10.0 | Next Review..... | 113 |
| 11.0 | References..... | 115 |

Figures

| | | |
|-----------|---|----|
| Figure 1. | Location of the Rocky Flats Site Map..... | 3 |
| Figure 2. | Site Map..... | 5 |
| Figure 3. | Central OU Features..... | 12 |
| Figure 4. | Human Health Exposure Units and Central OU Boundary..... | 25 |
| Figure 5. | Aquatic Exposure Units and Central OU Boundary..... | 26 |
| Figure 6. | Annual Discharge Summary from Major Site Drainages: CY 1997–2011..... | 83 |

Tables

| | | |
|----------|--|----|
| Table 1. | Nature and Extent of Contamination..... | 21 |
| Table 2. | Human Health Risk Estimates for Surface Soil/Surface Sediment COCs Following Accelerated Actions..... | 28 |
| Table 3. | Institutional Controls..... | 41 |
| Table 4. | Modifications to RFLMA Attachment 2..... | 43 |
| Table 5. | Status of the Second Five-Year Review Report Recommendations..... | 58 |
| Table 6. | Toxicity Values Used in CRA..... | 78 |

Table 7. Issues, Recommendations, and Follow-Up..... 105
Table 8. Results of the Evaluation of Remedy Components Under RFLMA 107

Appendixes

Appendix A *Rocky Flats Legacy Management Agreement* Attachment 2 Figures and Tables
Appendix B Inspection Information
Appendix C *Rocky Flats Legacy Management Agreement* Contact Records
Appendix D Selected Photographs
Appendix E Public Participation Summary

Abbreviations

| | |
|---------|---|
| AEA | Atomic Energy Act |
| AEU | Aquatic Exposure Unit |
| AL | action level |
| AMP | Adaptive Management Plan |
| AOC | Area of Concern |
| AOI | analyte of interest |
| ARAR | applicable or relevant and appropriate requirement |
| ATSDR | Agency for Toxic Substances Disease Registry |
| BZ | Buffer Zone |
| CAD/ROD | Corrective Action Decision/Record of Decision |
| CCP | Comprehensive Conservation Plan |
| CCR | <i>Code of Colorado Regulations</i> |
| CDPHE | Colorado Department of Public Health and Environment |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFR | <i>Code of Federal Regulations</i> |
| CGP | construction general permit |
| CHWA | Colorado Hazardous Waste Act |
| COC | contaminant of concern |
| CRA | Comprehensive Risk Assessment |
| CRS | Colorado Revised Statutes |
| CY | calendar year |
| DCF | dose-conversion factor |
| DOE | U.S. Department of Energy |
| DOI | U.S. Department of the Interior |
| ECOC | ecological contaminant of concern |
| ECOI | ecological contaminant of interest |
| ECOPC | ecological contaminant of potential concern |
| Eco-SSL | Ecological Soil Screening Level |
| ECOTOX | ECOTOXicology |
| EPA | U.S. Environmental Protection Agency |
| EPC | exposure point concentration |
| ERA | ecological risk assessment |
| ESL | ecological screening level |
| ETPTS | East Trenches Plume Treatment System |
| EU | Exposure Unit |
| FC | Functional Channel |
| FR | <i>Federal Register</i> |
| FY | fiscal year |
| HHRA | human health risk assessment |
| HI | hazard index |
| HQ | hazard quotient |
| HR | high resolution |
| IA | Industrial Area |
| ICP/MS | inductively coupled plasma/mass spectrometry |
| IHSS | Individual Hazardous Substance Site |
| IM/IRA | Interim Measure/Interim Remedial Action |

| | |
|----------------|--|
| IRIS | Integrated Risk Information System |
| LANL | Los Alamos National Laboratory |
| LHSU | lower hydrostratigraphic unit |
| LM | Office of Legacy Management |
| LOAEL | lowest observed adverse effects level |
| µg/L | micrograms per liter |
| m ³ | cubic meter |
| M&M | monitoring and maintenance |
| MCL | maximum contaminant level |
| MDC | maximum detected concentration |
| mg/kg | milligrams per kilogram |
| mg/L | milligrams per liter |
| mrem | millirems |
| MSPTS | Mound Site Plume Treatment System |
| NCP | National Contingency Plan |
| NOAEL | no observed adverse effects level |
| NOIPD | Notice of Intent for Partial Deletion |
| NPDES | National Pollutant Discharge Elimination System |
| NPL | National Priorities List |
| NRCPP | Natural Resource Compliance and Protection Program |
| NWP | nationwide permit |
| O&M | operation and maintenance |
| OLF | Original Landfill |
| OU | Operable Unit |
| PAC | Potential Area of Concern |
| PBA | Programmatic Biological Assessment |
| PCB | polychlorinated biphenyl |
| PCE | tetrachloroethene |
| pCi/g | picocuries per gram |
| pCi/L | picocuries per liter |
| PCOC | potential contaminant of concern |
| PIC | Potential Incident of Concern |
| PLF | Present Landfill |
| PLFTS | Present Landfill Treatment System |
| PMJM | Preble's meadow jumping mouse |
| POC | Point of Compliance |
| POE | Point of Evaluation |
| PQL | practical quantitation limit |
| PRG | preliminary remediation goal |
| RAO | remedial action objective |
| RCRA | Resource Conservation and Recovery Act |
| RFA | Rocky Flats Alluvium |
| RFCA | Rocky Flats Cleanup Agreement |
| RFETS | Rocky Flats Environmental Technology Site |
| RFI | RCRA Facility Investigation |
| RFLMA | Rocky Flats Legacy Management Agreement |
| RFSC | Rocky Flats Stewardship Council |
| RI | Remedial Investigation |

| | |
|-------|--|
| RI/FS | Remedial Investigation/Feasibility Study |
| SPPTS | Solar Ponds Plume Treatment System |
| STP | Sewage Treatment Plant |
| TCDD | Tetrachlorodibenzo-p-dioxin |
| TCE | trichloroethene |
| TEDE | total effective dose equivalent |
| TEF | Toxic Equivalency Factor |
| TEQ | toxicity equivalence |
| TIMS | thermal ionization mass spectrometry |
| TRV | toxicity reference value |
| UBC | Under Building Contamination |
| UCL | upper confidence level |
| UHSU | upper hydrostratigraphic unit |
| USACE | U.S. Army Corps of Engineers |
| USFWS | U.S. Fish and Wildlife Service |
| VOC | volatile organic compound |
| WBEU | Wind Blown Area Exposure Unit |
| WQCC | Water Quality Control Commission |
| WQCD | Water Quality Control Division |
| WRV | wildlife refuge visitor |
| WRW | wildlife refuge worker |
| ZVI | zero valent iron |

Executive Summary

The U.S. Department of Energy's (DOE's) Rocky Flats Site (Rocky Flats), which is located approximately 16 miles northwest of Denver, Colorado, was listed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List (NPL) in 1989. The final remedy was selected in the September 29, 2006, Corrective Action Decision/Record of Decision (CAD/ROD) after completion of cleanup and closure by DOE under the Rocky Flats Cleanup Agreement (RFCA). The CAD/ROD was based on the results of the July 2006 Remedial Investigation/Feasibility Study, which included a Comprehensive (Human Health and Ecological) Risk Assessment (CRA), and the July 2006 Proposed Plan.

Rocky Flats has two Operable Units (OUs) within the boundaries of the property: the 1,308-acre Central OU and the 4,883-acre Peripheral OU. The Central OU contains the areas of Rocky Flats that required additional remedial/response actions, within a boundary based on the practicalities of future land management. The Peripheral OU includes the remaining, generally unimpacted portions of Rocky Flats, and surrounds the Central OU. The Offsite Areas at Rocky Flats, known as OU 3, were addressed under a separate no action CAD/ROD dated June 3, 1997. Conditions in OU 3 and the Peripheral OU allow for unlimited use and unrestricted exposure and these OUs were deleted from the NPL in May 2007.

The response action in the final CAD/ROD is no action for the Peripheral OU, and institutional controls and physical controls with continued monitoring for the Central OU. A CAD/ROD amendment to clarify certain institutional controls and their implementation was approved on September 21, 2011. Because remaining contamination in the Central OU does not allow for unlimited use and unrestricted exposure, CERCLA requires that a periodic review be conducted at least every five years to determine whether the Central OU remedial actions remain protective of human health and the environment. This third five-year review covers May 2007 through April 2012 and evaluates the performance of the remedy implemented under the final CAD/ROD (as amended in September 2011) and RFLMA.

Most of the Rocky Flats property outside the Central OU was transferred on July 12, 2007, to the U.S. Department of the Interior for establishment of a National Wildlife Refuge managed by the U.S. Fish and Wildlife Service. The Central OU land was retained by DOE for remedy implementation and is managed consistent with the Refuge purposes.

The *Rocky Flats Legacy Management Agreement* (RFLMA), between DOE, the U.S. Environmental Protection Agency (EPA), and the Colorado Department of Public Health and Environment (CDPHE), provides the implementing regulatory framework for the Central OU remedy.

The primary contaminants, contaminated media, and waste present in the Central OU are:

- Wastes disposed in two closed landfills: the Present Landfill (PLF), and the Original Landfill (OLF).
- Some subsurface soils with residual volatile organic compounds (VOCs), metals, and radionuclide contamination and areas where former building and infrastructure components, debris, and incinerator ash remain well below the surface with low levels of uranium, plutonium, and americium contamination.

- Areas of groundwater that comprise contaminant plumes that contain VOCs, nitrates, and uranium at levels above Colorado’s surface water standards.
- Areas of surface soil contaminated with low levels of plutonium-239/240 and americium-241.
- Some subsurface areas with VOC contamination at levels that could lead to inhalation of unacceptable VOC concentrations by building occupants if buildings were constructed in these areas.

Institutional controls prohibit soil disturbance activities that are not appropriately controlled, activities that could damage the landfill covers or other remedy components, construction of buildings for human occupancy, and the non-remedy-related use of surface water or groundwater. Physical controls include no trespassing signage at access points to the Central OU listing the institutional controls and no trespassing signs around the Central OU perimeter prohibiting unauthorized access. Monitoring includes requirements to routinely inspect and maintain the landfill covers, treatment systems, and institutional controls; and sampling and analysis of groundwater and surface water at specified locations and frequencies.

This review was conducted in accordance with EPA’s *Comprehensive Five-Year Review Guidance* dated June 2001 and updates to the guidance regarding institutional controls dated September 2011. DOE, as the CERCLA federal lead agency under Executive Order 12580, conducted the review, using a team composed of knowledgeable DOE, DOE’s contractor, CDPHE, and EPA staff. The team conducted a site inspection as part of the review on March 12, 2012.

While this report provides background information on the Peripheral OU and OU 3, a five-year review for these OUs is not required. But, information about studies regarding levels of residual plutonium in soil for these areas is included in Appendix E, “Public Participation Summary,” because this report provides another opportunity to help inform stakeholders regarding this topic.

This report summarizes the progress made since the second five-year review, including the completion of all recommendations made for issues identified in the Second Five-Year Review Report, which was approved on September 14, 2007.

This report documents the technical evaluation of the performance of the remedy to determine the status of protectiveness of the remedy. The technical evaluation included consideration of monitoring and surveillance information reported in RFLMA quarterly and annual reports of site surveillance and maintenance activities and information on post-remedy decision-making documented in RFLMA Party contact records and amendments or modifications to remedy requirements. It also included review of the status of the remedial action objectives, any changes to the applicable or relevant and appropriate requirements the remedy must attain, any changes to toxicity factors or exposure parameters or assumptions that might affect the level of risk posed by residual contamination and any new information that may call into question the protectiveness of the remedy.

In accordance with RFLMA requirements, the review includes an evaluation of remedy implementation components to provide recommendations regarding continuing, discontinuing or modifying any components and whether any additional response actions based on new technologies could be taken. This evaluation resulted in a recommendation to discontinue

specific landfill vegetation monitoring because the vegetation meets success criteria, and continuation of groundwater treatment system optimization activities begun within the last five years.

The following Five-Year Review Summary Form provides further information related to the review including issues, recommendations, and follow-up actions that were identified.

Five-Year Review Summary Form

| SITE IDENTIFICATION | | |
|--|--|--|
| Site Name: Rocky Flats Site | | |
| EPA ID: CO7890010526 | | |
| Region: 8 | State: CO | City/County: Golden/Jefferson and Boulder |
| SITE STATUS | | |
| NPL Status: Final | | |
| Multiple OUs? Yes | Has the site achieved construction completion? Yes | |
| REVIEW STATUS | | |
| Lead agency: Other Federal Agency If "Other Federal Agency" was selected above, enter Agency name: U.S. Department of Energy | | |
| Author name (Federal or State Project Manager): Scott Surovchak, Site Manager | | |
| Author affiliation: U.S. Department of Energy, Office of Legacy Management | | |
| Review period: September 8, 2011- April 30, 2012 | | |
| Date of site inspection: March 12, 2102 | | |
| Type of review: Statutory | | |
| Review number: 3 | | |
| Triggering action date: September 14, 2007, Second Five-Year Review Report | | |
| Due date (five years after triggering action date): September 14, 2012 | | |

| OU(s) without Issues/Recommendations Identified in the Five-Year Review: |
|---|
| <p>There are no issues or recommendations for the Peripheral OU and OU3, Offsite Areas. Conditions in these OU's allow for unlimited use and unrestricted exposure. EPA published a Notice of Partial Deletion from the NPL for the Peripheral OU and OU3 on May 25, 2007. A five-year review is not required for these OU's.</p> |

Five-Year Review Summary Report (continued)

| Issues and Recommendations Identified in the Five-Year Review: | | | | |
|---|--|---------------------------|------------------------|--|
| OU(s): Central OU | Issue Category: Monitoring | | | |
| | Issue: Surface water Point of Evaluation (POE) GS10 uranium concentration has periodically exceeded the <i>Rocky Flats Legacy Management Agreement</i> (RFLMA) standard during this review period and exceeds the standard at the end of this review period. POEs are located upstream of surface water Points of Compliance (POCs) at the edge of the former Industrial Area within the Central OU to provide early indication of potential contaminant migration. | | | |
| | Recommendation: Continue to monitor in accordance with RFLMA requirements. Complete work in accordance with the Colorado Department of Public Health and Environment (CDPHE) - and EPA-approved evaluation plan. | | | |
| Affect Current Protectiveness | Affect Future Protectiveness | Implementing Party | Oversight Party | Milestone Date |
| No | No | Federal Facility | EPA/State | The RFLMA consultative process is effective in determining whether, and to what extent, any mitigating action may be recommended, and to establish the schedule to complete actions. |
| OU(s): Central OU | Issue Category: Monitoring | | | |
| | Issue: Surface water POE GS10 americium concentration began to exceed the RFLMA standard in 2011 and exceeds the standard at the end of this review period. | | | |
| | Recommendation: Continue to monitor in accordance with RFLMA requirements. Complete work in accordance with the CDPHE- and EPA-approved evaluation plan. | | | |
| Affect Current Protectiveness | Affect Future Protectiveness | Implementing Party | Oversight Party | Milestone Date |
| No | No | Federal Facility | EPA/State | The RFLMA consultative process is effective in determining whether, and to what extent, any mitigating action may be recommended, and to establish the schedule to complete actions. |

Five-Year Review Summary Report (continued)

| Issues and Recommendations Identified in the Five-Year Review: | | | | |
|---|--|---------------------------|------------------------|--|
| OU(s): Central OU | Issue Category: Monitoring | | | |
| | Issue: Surface water POE SW027 plutonium concentration exceeded the RFLMA standard in 2010 during a high precipitation event. Flow at SW027 is precipitation dependent. After mitigating actions to improve erosion controls in the drainage were completed in 2010, only very small volumes of infrequent, short-term, intermittent flows occurred at SW027. No samples have been able to be obtained for over a year. Because the RFLMA standard is based on 12 month rolling average of the results, and there are no sample results for averaging, the standard was no longer exceeded at the end of this review period. Samples will be obtained when there is sufficient flow to evaluate the effectiveness of the mitigating measures. | | | |
| | Recommendation: Continue to monitor in accordance with RFLMA requirements. | | | |
| Affect Current Protectiveness | Affect Future Protectiveness | Implementing Party | Oversight Party | Milestone Date |
| No | No | Federal Facility | EPA/State | When water flows at SW027 allowing sample collection and analysis again. |
| OU(s): Central OU | Issue Category: Institutional Controls | | | |
| | Issue: Institutional controls might not be easily enforceable against a utility easement holder who is not a party to the Environmental Covenant granted by DOE to CDPHE. While this is not a near-term issue (because the Office of Legacy Management (LM) maintains a good working relationship with the current easement holder), the lack of enforceability could become an issue in the future if LM and the easement holder (or any successor) do not maintain routine contact. | | | |
| | Recommendation: Replace the Environmental Covenant with a restrictive notice under Colorado law, as provided for in the 2011 Corrective Action Decision/Record of Decision amendment. While an environmental covenant might not be directly enforceable against a prior holder of an interest in land who is not a party to the covenant, a restrictive notice is enforceable by the CDPHE against any person in violation of the institutional controls. | | | |
| Affect Current Protectiveness | Affect Future Protectiveness | Implementing Party | Oversight Party | Milestone Date |
| No | No | Federal Facility | EPA/State | DOE and CDPHE will consult with a goal to replace the Environmental Covenant with a restrictive notice by end of 2012. |

Five-Year Review Summary Report (continued)

| Protectiveness Statement | | |
|--|--------------------------------------|---|
| Operable Unit: | Protectiveness Determination: | Addendum Due Date (if applicable): |
| Central OU | Protective | Not Applicable |
| Protectiveness Statement: | | |
| The remedy for the Central OU is protective of human health and the environment because surface water concentrations are meeting standards at points of compliance, and monitoring and maintenance plans and institutional controls are working to prevent unacceptable exposure to site contaminants. | | |

| Sitewide Protectiveness Statement | |
|---|---|
| Protectiveness Determination: | Addendum Due Date (if applicable): |
| Protective. | Not Applicable |
| Protectiveness Statement: | |
| Because the conditions at all OUs are protective, the site is protective of human health and the environment. | |

DOE Briefing on Revegetation Efforts

- Cover memo
- Selection of photographs

ROCKY FLATS STEWARDSHIP COUNCIL

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City of Golden -- City of Northglenn -- City of Thornton -- City of Westminster -- Town of Superior
League of Women Voters -- Rocky Flats Cold War Museum -- Rocky Flats Homesteaders
Arthur Widdowfield

MEMORANDUM

TO: Stewardship Council Board
FROM: Rik Getty
SUBJECT: Re-vegetation Status Briefing
DATE: August 27, 2012

We have scheduled 30 minutes for DOE to discuss its re-vegetation efforts. As mentioned in the actinide migration evaluation (AME) briefing at the June 4, 2012, board meeting, establishment of a robust re-vegetation cover in the soil surface is imperative to help minimize the transport of actinide contamination (plutonium, americium, and uranium) into surface water.

Importance of establishing robust re-vegetation for minimizing actinide migration from soil into surface water

The AME study indicated that the type of ground cover contributes significantly to the amount of actinide contamination introduced into the watersheds. For instance, the study showed the central Industrial Area, which contained building, parking lots, etc, contributed the most plutonium to any body of water, although it is not the area with the highest plutonium concentrations in surface soil. This fact suggests that the impervious asphalt cover in the Industrial Area facilitated runoff and thus erosion of contaminated soils into surface water.

On the other hand, the 903 Pad area, which had the highest known levels of plutonium activity in soil, was in a well-vegetated basin and therefore generated less runoff and contributed less actinide contamination to surface water than the Industrial Area did. Thus, reduction of the impervious cover (asphalt, sidewalks, etc.) in the Industrial Area post-closure is likely contributing to significant reductions in actinide loads to surface water by decreasing the potential for soil erosion into the watershed. At the same time it is important for new vegetation to be established in remediated areas.

The AME asserts that minimizing water erosion, coupled with re-vegetation efforts, should remain a high priority, particularly in areas with residual actinide activity. Planning for the long-term effectiveness of erosion control and re-vegetation measures, such as limiting soil disturbance and maintaining stable slopes, as well as establishing robust re-vegetation, should be of utmost importance.

Site activity

Since site closure in October 2005, DOE and its contractors have made erosion control and re-vegetation some of their most important duties. Throughout the year inspections are routinely conducted looking for areas which have either been re-vegetated or may need to be re-vegetated. In addition, erosion control inspections are routinely performed looking for areas where erosion controls need to be improved or added.

One of the latest examples of the coupling between re-vegetation and erosion control is in the area of surface water monitoring location SW027 on the South Interceptor Ditch (SID) just upstream from pond C-2 in the Woman Creek drainage. SW027 collects water on an intermittent basis. A portion of the water that collects there originates from the 903 Pad area, where extensive soil remediation was performed during cleanup. However, there are still areas of the 903 Pad where small amounts of residual soil contamination exist. It is believed that a recent plutonium exceedance in 2010-2011 at SW027 was likely from the 903 Pad area. After consultations with CDPHE and EPA, DOE installed a new series of erosion controls in this area to help mitigate future runoff. The erosion control was a new type of wattle, which also included seeds inside to help establish new vegetation.

Whenever DOE plans a project that will impact existing vegetation, either by directly removing vegetation or causing the potential for erosion to occur, a re-vegetation/erosion control plan is required. In the case of the recent and future dam breaches, extensive efforts were made to both re-vegetate and provide erosion control safeguards. DOE will provide a series of photos and discussion highlighting some of these efforts at recent dam breaches.

Photos of site in chronological progression

I have included a series of photos from the recently approved CERCLA 5-year review. These photos are presented in a chronological progression and show both aerial views and closer views of the vegetation as follows:

- aerial photo D1 of site in 1995 at the beginning of closure, and aerial photo D2 of site at the end of closure in October 2005;
- aerial photo D3 from June 2007, and aerial photo D4 from June 2011;
- photo D5 of Building 991 in foreground and 700 area (Buildings 707, 776, 777, etc) before closure in 2003, and photo D6 from the same location in 2010;
- photo D7 of drainage area between Building 771 and Building 374 in 2004, and photo D8 from the same location in 2010.

As can be seen in the photos, the vegetation has steadily improved since closure. These changes are also quite evident from our annual site tours. Since we began the tours in June 2006, perhaps the most impressive aspect of this year's tour, at least in my view, was the overall condition of the site's vegetation, which was dramatically improved.

Please contact me if you have any questions.



Photograph D1. Aerial photograph of the Site, 1995



Photograph D2. Aerial photograph of the Site, October 2005



Photograph D3. Aerial photograph of the Site, June 2007



Photograph D4. Aerial photograph of the Site, June 2011



Photograph D5. B991, 700 Area in background, 2003



Photograph D6. Former B991, 700 Area in background, 2010



Photograph D7. Drainage between B771 and B371, 2004



Photograph D8. Drainage between former B771 and B371, 2010



Photograph D9. Aerial photograph of the Original Landfill



Photograph D10. Rocky Flats Wildlife