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
Steven Franks

Board of Directors Meeting – Agenda

Monday, February 1, 2016, 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 Chairman's Review of December 14th Executive Committee meeting

8:40 AM Business Items (briefing memo attached)

1. Election of Stewardship Council Officers for 2016

   Action Item: Elect Officers

2. Consent Agenda
   - Approval of meeting minutes and checks

3. Approve 2016 Meeting Dates and Notice Provisions Resolution

   Action item: Adopt resolution and meeting notice provisions

4. Executive Director's Report

9:00 AM Public Comment

9:10 AM Host DOE Quarterly Meeting (briefing memo attached)
- DOE will brief the Stewardship Council on site activities for the third quarter of 2015 (July – September).
- Activities include surface water monitoring, groundwater monitoring, ecological monitoring, and site operations (inspections, maintenance, etc.).

10:00 AM Briefing/Discussion on Original Landfill (briefing memo attached)
- This briefing will provide a comprehensive review of the Original landfill – its use, closure strategy and ongoing maintenance.

- The briefing will prepare the foundation for the April meeting in which we will address the technical report DOE commissioned examining long-term stability needs and options.

11:00 AM Public comment

11:10 AM Board Roundtable – Big Picture/Additional Questions/Issue Identification
Adjourn

Upcoming Meetings: All dates are proposed and will be set at this meeting

April 4
June 6
September 12
October 31

Rocky Flats Acronym List
Prepared by Rik Getty, Rocky Flat Stewardship Council
October 2014

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. In a mass of Pu, Am increases in concentration over time which can pose personnel handling issues since Am is a gamma radiation-emitter which penetrates many types of protective shielding. During the production era at Rocky Flats, Am was chemically separated from Pu to reduce personnel exposures.
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 decision	The complete final plan for cleanup and closure for Rocky Flats. The Federal/State 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	Contact Record	A regulatory procedure where CDPHE reviews a proposed action by DOE and either approves the proposal as is or requires changes to the proposal before approval. CRs apply to a wide range of activities performed by DOE. After approval the CR is posted on the DOE-LM website and the public is notified via email.
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.
EEOICPA	energy employees occupational illness compensation program act	This act was passed by Congress in 2000 to compensate sick nuclear weapons workers and certain survivors. Unfortunately the program has been fraught with difficulties in getting benefits to these workers over the years.
ETPTS	east trenches plume treatment system	The treatment system near the location of the east waste disposal trenches which treats 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.
IGA	intergovernmental agreement	A cooperative agreement between local governments which sets up the framework of the Stewardship Council.
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.
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 which helps to inform water quality decisions.
LHSU	lower hydrostratigraphic unit	Hydrogeology term for deep unweathered bedrock which is hydraulically isolated from the upper hydrostratigraphic unit (see UHSU). Data shows that site contaminants have not contaminated the LHSU.
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.
MOU	Memorandum of Understanding	MOU refers to the formal agreement between EPA and CDPHE which provides that CDPHE is the lead post-closure regulator with EPA providing assistance when needed.
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 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	A unit of radioactivity measure. The soil

	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 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.
SEP	Solar Evaporation Ponds	In the 1950's when the site's liquid waste treatment capability was surpassed by the liquid waste generation rate, the site resulted to transferring liquid wastes to open-air holding ponds where solar energy was utilized to evaporate and concentrate the waste. The original SEPs were not impermeable and substantial quantities of uranium and nitrates made their way into groundwater. As a result the solar ponds plume treatment system was necessary to treat the contaminated groundwater before it emerged as surface water in North Walnut Creek.
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 environmental media at the site. One of the most common items to contain SVOCs is asphalt.
TCE	trichloroethlyene	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.
UHSU	upper hydrostratigraphic unit	A hydrogeology term describing the surficial materials and weathered bedrock found at Rocky Flats. The UHSU is hydraulically isolated from the lower hydrostratigraphic unit (see LHSU). Groundwater in some UHSU areas of the site is contaminated with various contaminants of concern while groundwater in other UHSU areas is not impacted. All groundwater in the UHSU emerges to surface water before it leaves the site.
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

- Cover memo
- October 26, 2015, draft board meeting minutes
- List of Stewardship Council checks
- 2016 meeting dates resolution

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MEMORANDUM

TO: Board
FROM: David Abelson
SUBJECT: Business Items
DATE: January 21, 2016

In addition to approving the consent agenda (minutes and checks), the Board will need to

1. Appoint officers for 2016
2. Adopt a resolution regarding 2016 meeting dates

Election of officers

In accordance with the Stewardship Council bylaws, "the Chair, Vice Chair, and Secretary/Treasurer shall be elected annually by the Board of Directors." The terms commence starting at this meeting. There are no limitations as to the number of terms one can serve. If you are interested in serving as an officer and have not yet let me know of your interest, please email or call me. That way I can notify your fellow board members of your interest. Additional names can be added for consideration at the meeting.

As of the drafting of this memo, the following people have expressed interest in serving on the executive committee:

Lisa Morzel (Boulder) – Chair
Joyce Downing (Northglenn) – Vice Chair
Jeannette Hillery (League of Women Voters) – Secretary/Treasurer

Action Item: Elect officers

Resolution Re: 2016 Meeting Dates and Notice Provisions

Each year, the Board is required to adopt a resolution establishing the meeting dates for the year. The proposed schedule, with the exception of the first meeting of the year, follows the Board's meeting dates for 2015. Accordingly, the 2016 proposed meeting dates are:

February 1 (first Monday of the month)
April 4 (first Monday of the month)

June 6 (first Monday of the month)
September 12 (second Monday of the month)
October 31 (fourth Monday of the month)

The attached notice provisions track the Stewardship Council's bylaws.

Action item: Adopt resolution and meeting notice provisions

ROCKY FLATS STEWARDSHIP COUNCIL
Monday, October 26, 2015, 8:30 AM – 12:15 PM
Rocky Mountain Metropolitan Airport, Terminal Building, Mount Evans Room
11755 Airport Way, Broomfield, Colorado

Board members in attendance: Mark McGoff (Director, Arvada), Sandra McDonald (Alternate, Arvada), Lisa Morzel (Director, City of Boulder), Tim Plass (Alternate, City of Boulder), Deb Gardner (Director, Boulder County), Mike Shelton (Director, Broomfield), David Allen (Alternate, Broomfield), Laura Weinberg (Director, Golden), Libby Szabo (Director, Jefferson County), Pat O'Connell (Alternate, Jefferson County), Joyce Downing (Director, Northglenn), Shelley Stanley (Alternate, Northglenn), Ray Reling (Alternate, Northglenn), Joe Cirelli (Director, Superior), Emily Hunt (Alternate, Thornton), Bob Briggs (Director, Westminster), Bruce Baker (Alternate, Westminster), Mary Fabisiak (Alternate, Westminster), Sue Vaughan (Alternate, League of Women Voters), Roman Kohler (Rocky Flats Homesteaders), Arthur Widdowfield (Director, Rocky Flats Cold War Museum), Ann Lockhart (Alternate, Rocky Flats Cold War Museum).

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

Attendees: Scott Surovchak (DOE-LM), Bob Darr (Navarro), Kurt Franzen (Navarro), Linda Kaiser (Navarro), David Ward (Navarro), Jody Nelson (Navarro), John Boylan (Navarro), George Squibb (Navarro), Shirley Garcia (Broomfield), Stuart Feinhor (Rep. Polis), Erik Sween (citizen), Bonnie Graham Reed (citizen), Marian Whitney (citizen), Jay Hormel (citizen), Jeff Gipe (citizen), LeRoy Moore (RMPJC), Anne Fenerty (citizen), Jon Lipsky (citizen), Leona Dunlap (citizen), Marc Roberson (citizen), Ted Ziegler (citizen), Cynthia Winslow (PCM), Nick Hansen (LSO applicant), Steven Franks (LSO applicant).

Convene/Agenda Review

Chair Joyce Downing convened the meeting at 8:34 a.m. The first order of business was introductions. Joyce noted that this would be Bob Briggs' last meeting as a member of the Stewardship Council. She took a moment to recognize Bob's many years of service as a county commissioner and city councilperson. She said he was always a strong advocate for everything the Stewardship Council has stood for. Bruce Baker also recognized Bob and the Stewardship Council for the work it was doing. He said he had learned from Bob about how the Board operates within its role, and added that Bob brought optimism to these issues.

Joyce noted that the Executive Committee had reviewed the agenda for this meeting.

Consent Agenda

Mark McGoff moved to approve the September 2015 Board minutes and the checks. The motion was seconded by Bob Briggs. The motion to accept the minutes and checks passed 13-0.

Review and Approve Colorado Open Records Act (CORA) Policy

At the last meeting, the Board had David Abelson and Barb Vander Wall to develop a policy related to the Colorado Open Records Act (CORA). Barb developed the policy with David's input. David said that they tried to make the draft policy simple, and to incorporate some flexibility in order to accommodate staff constraints. Mark McGoff referred to the sentence that read, "Documents that are prohibited from disclosure under CORA will not be released." He suggested that if came into play, that the Board provide an explanation to the person requesting the documents. Barb said that this had not been included in CORA policies for other public entities, but added that it was a good business practice. Mark McGoff moved to insert an additional statement to the Limitations section that reads "An explanation will be given for any documents that are not provided upon request." The motion was seconded by Bob Briggs. The motion to approve the CORA policy as modified passed 13-0.

Executive Director's Report

David Abelson began by noting that the new Rocky Flats contractor (replacing SN3) was Navarro Research and Engineering. He noted that there were no personnel changes at the local level, and that one of senior Navarro leaders would be based in Westminster.

David next discussed a strategic review that was being led by the Director of DOE-Legacy Management (LM). He said two additions to LM's plan concerned Rocky Flats. The first concerns an increased emphasis on government engagement at LM sites. David said this may involve looking at the Rocky Flats model in terms of what has been working and what could be done better. The second item stems from a presidential executive order directing agencies to examine the impacts of climate change. DOE-LM would be looking at the potential impacts on remedies and performance. David noted that this issue came to the Stewardship Council a few years ago, and that he would continue to keep the Board updated on these activities.

David next spoke about a question that Deb Gardner had posed to Rik Getty and him at the last meeting. She had asked about the staff's relationship with CDPHE and EPA, as well as the commitment to get different data points and explanations for issues. David explained that the Rocky Flats cleanup work involved both RCRA and CERCLA, which meant that both EPA and CDPHE were involved. He said that building cleanup was primarily regulated by CDPHE, and environmental remediation by EPA. David explained that at closure, due to resource limitations, EPA requested that CDPHE be the lead regulatory agency at Rocky Flats. EPA has been involved, but in a more limited role. David explained that because CDPHE has more day-to-day involvement, they are the ones who present to the Board and answer most of the questions. David said that he and Rik are in touch with CDPHE as often as they are with DOE and the site contractor. David said that there was a constant process of reaching out to all of the agencies in terms of making sure the Board always had complete information and perspectives. He noted

that with respect to historic events, different people often retained different information. Reaching out to several people allowed for a more a complete understanding of issues or events.

Deb Gardner followed up with another question to David. She was wondering in the event the Board was presented with data that felt incomplete, whether they could ask for more information to be gathered, such as additional monitoring. David responded that question could trigger a bigger question—re-opening a remedy decision that had already been made. This may involve asking DOE to go above and beyond what was required by the legal cleanup decision made under federal law. He explained that if the issue in question was related to DOE lands, flagging concerns about a particular sampling issue would be appropriate. However, because Refuge lands have been certified and released for any and all uses, any suggestions to sample or monitor in these areas would be in conflict with this legal prior determination and would be subject to USFWS' discretion. He added that CDPHE did have a regulatory role for air quality/permits for issues such as the construction of the Northwest Parkway or a prescribed fire.

Joe Cirelli noted that problems related to the remedies on the DOE lands, such as flooding, could impact the Refuge and Jefferson Parkway lands. David noted that this is exactly the type of issue that the Stewardship Council does look at, and is consistent with the Record of Decision. Deb Gardner pointed out that the ROD was approved quite a while ago, and that subsequent events (such as floods and fires) could have potentially changed the environmental conditions. She asked whether there were any prescribed triggers for revisiting the decision in the Refuge. David said he did not know if there were any triggers to revisit. He added that monitoring data was being closely tracked and they were not seeing anything that would warrant revisiting the CERCLA Record of Decision for the cleanup.

David Allen noted that Broomfield's primary concern was focusing on the DOE-controlled lands in order to make sure the remedies were performing well. He said the Board had the opportunity to go back to agencies to revisit remedy issues if anything was found to be not working. Bruce Baker said that this discussion went right to the history of trust issues at the site, and past misrepresentations. He said that while the official word was that the site was cleaned up, the very existence of a hierarchy of land use could be interpreted to mean that the risks were higher in certain areas. David Abelson noted that while this may be the perception, it was not why DOE land was structured the way it was. He recounted a huge number of public meetings taking place while these decisions were being made, and noted that it was easy for people who were not involved to not fully understand the issues. He explained that the Central Operable Unit was created because it was easier for DOE to manage one unit than several smaller ones, and not because this whole area brought a higher level of risk. David stated that there would always be a measure of distrust at Rocky Flats, and added that the local governments understood that there had been hard decisions to make. He noted that if there were significant problems at Rocky Flats, local governments would be first in line to bring up the issues and would not wait for the public to react. Bruce Baker asked why DOE kept a portion of the site if it was truly cleaned up. David explained that part of DOE's responsibility under the closure was to continue groundwater treatment under CERCLA. Also, they did not want to allow public access to these areas in case someone were to damage remedy components (such as monitoring points or landfill caps). For this reason, it made much more sense to have singular DOE unit set aside. Bruce asked why

DOE got rid of the Refuge lands. Scott Surovchak explained that an Act of Congress created the Refuge and mandated the transfer of land for the refuge following completion of the regulatory actions. Scott also noted that the local governments unanimously supported the Refuge Act.

David Allen noted that there was confusion due to interchanging terminology such as 'safe', 'closure and 'clean'. He said the site was not completely 'clean', otherwise there would be no need for monitoring and remedies.

Public Comment

Marion Whitney said that at the dedication for a new memorial at Rocky Flats, there was some discussion about a reservoir nearby. She said she hoped the water was not used for drinking. Mark McGoff said Arvada did not own the reservoir, and that it belonged to Consolidated Water Company. He said his understanding was that the water was shipped to Lakewood. Marion said she was still worried about this.

Jon Lipsky said he appreciated the opportunity to rebut certain information at the last meeting. He said that David and Rik claimed that parts of his presentation to the Stewardship Council at its September 2015 meeting were inconsistent with the administrative record and legal cases, and that David emailed him following the meeting asking for clarification. Jon said he highlighted parts of Stewardship Council's mission, including to 'act as spokesperson' for the public. He said this group was not intended to 'edit or filter comments from stakeholders'. He said that vital facts were not part of the proper CERCLA remedy, and that he trusted that openness would prevail. He said that the administrative record was from earlier era, and was without certain evidence. Jon said that the nature of document destruction was not disclosed when a moratorium was issued. He mentioned reading room documents being returned to DOE, because of personally identifying information. He referred back to the slides from his presentation to the Board. He said documents were locked away from the public and workers seeking benefits.

Jay Hormel said he was a resident of Boulder County. He thanked David for the explanation of the relationships between agencies. He said he felt like the system in place to make site decisions was designed to be impenetrable. He told the Stewardship Council that it was on them to monitor and raise flags if there were any questions about safety. He said the Board needed to use political pressure to make sure things are not being done that posed risk to the community.

Ted Ziegler said he worked at Rocky Flats for 13 years, and was on the safety committee for the union. He said he had thousands of unclassified documents that pertained to contamination and exposures. He brought a few as examples. He said there was no effort to encapsulate or remove widespread asbestos contamination. He said history should not repeat itself. Ted referred to Carl Spreng's presentation about risk comparisons, and said this was not in the best interest of local communities. He said that while they cannot change the past, what happens in future could be better.

Host DOE Quarterly Meeting

DOE briefed on site activities for second quarter 2015. The full report was posted on DOE's website. Activities included surface water monitoring, groundwater monitoring, ecological monitoring, and site operations (inspections, maintenance, etc.). DOE was also asked to include an overview of the recent events at the Original Landfill (OLF).

Surface Water Monitoring – George Squibb
George began by reviewing surface water activities for the quarter. He began with a quick review of the monitoring requirements and locations of the monitoring sites. He also described what constituents they monitor for.

He then reviewed performance monitoring at the Original and Present Landfills (OLF/PLF). At the OLF (Woman Creek – location GS59), between April 21-30, composite sampling results for lead and selenium were above the RFLMA standard.

- Lead results were 6.8 µg/L (RFLMA standard is 6.5 µg/L)
- Selenium results were 5.5 µg/L (RFLMA standard is 4.6 µg/L)

These results prompted an increased sampling frequency (monthly), per RFLMA evaluation protocols. Neither lead nor selenium were detected in the subsequent composite sample.

From June 12 through July 7, composite sampling results for selenium were above RFLMA standard. The levels were 5.8 µg/L (RFLMA standard is 4.6 µg/L). These results prompted increased sampling frequency (monthly), per RFLMA evaluation protocols. Selenium was not detected in the subsequent composite sample

At the Present Landfill (PLF), routine first quarter sampling results for vinyl chloride were 0.23 µg/L, which was above the RFLMA 0.2 µg/L standard. This result prompted an increased sampling frequency (monthly), per RFLMA evaluation protocols. Three consecutive monthly sampling results during the second quarter were above standard at 0.24 – 0.26 µg/L. These results prompted additional sampling at the former PLF Pond outfall to No Name Gulch (location NNG01). Vinyl chloride was not detected at this location, so the sampling frequency reverted to quarterly, per RFLMA protocols. Shelley Stanley asked if this sampling was done with an automatic or grab sample. George said it was grab sampling.

George next discussed Point of Evaluation (POE) SW027. He noted that many more details could be found in the Contact Record which is found on DOE's website. He also mentioned that there was a pretty detailed discussion of mitigating actions at last Stewardship Council meeting.

At SW027, the 12-month rolling average for plutonium was reportable as of April 30, 2015.
- Standard is 0.15 pCi/L12-month
- Rolling averages were 0.22 through 0.72 pCi/L
- Information compiled in RFLMA Contact Record 2015-05 (July 8, 2015)
- Mitigating actions include enhancing upstream erosion controls
- All results from downstream WOMPOC were less than applicable standards.

George noted that no other RFLMA POE analyte concentrations were reportable throughout second quarter, and that at the Points of Compliance (POC's), all concentrations remained below reporting levels throughout the quarter. George also mentioned that they were able to collect a lot of good samples due to the wet conditions during that timeframe. Pat O'Connell asked if vinyl chloride exceedances triggered sampling for others VOC's. George said that all others were sampled and not detected. Bruce Baker commented that the site had not changed anything it was doing based on these findings. George said they were looking at the data and for any potential impacts downstream. He said the results did trigger a more thorough evaluation, although this did not always require mitigating actions. Bruce asked if the site had implemented any mitigating actions. George said they had. Bruce asked who told them to do it. George explained that the steps were outlined in the Evaluation Protocols in RFLMA. George gave the example of GS51 in 2010, and explained what they did to mitigate that low-level source. Enhancing the vegetation helped to improve water quality. Bruce wanted to know who made these decisions. Joyce Downing interjected and noted that with newer Board members it was clear that there was not an understanding of the ongoing remedy monitoring process. She suggested a future educational session on this topic.

David Allen asked George what happened to the monitoring schedule for vinyl chloride after the downstream samples showed no exceedances. George said it reverted to quarterly. David said that seemed counterintuitive to him since the actual results had not gone back down. George said the process was designed to look for persistence, and he believed they were still collecting enough data to make informed decisions. David said he believed that monitoring should remain at a monthly interval. George said that was something they could evaluate. Linda Kaiser said she thought it would be a great idea to go through the RFLMA process at a future meeting. She added, to answer Bruce, that when they have something that triggers an action, they go through the process and have a specified amount of time to develop a proposed plan. The plan is reviewed with the regulators, and they either concur or make comments or suggestions. When all three parties are in concurrence, the plan is then implemented. Jon Lipsky asked if there was a mechanism to notify the public. Linda said she was not sure of the exact requirements are, but they do have to notify governments. Ted Ziegler noted the site sampled water for plutonium, but wondered why they did not monitor the soil as well. Linda said that she was not the best person to address this question, but that the CERCLA Record of Decision for the cleanup did not require soil sampling, and that RFLMA did not either. She said this decision was derived from risk-based scenarios.

Groundwater Monitoring – John Boylan
John spoke about groundwater monitoring for the quarter. He showed a photo that included some fresh slumps after heavy rains. He noted that the second quarter was a heavy sampling quarter that included:

- 10 RCRA wells (quarterly)
- 9 AOC wells and 1 Surface Water Support location (semiannual)
- 27 Sentinel wells (semiannual)
- 9 treatment system locations (semiannual)

He added that the results would be evaluated in the annual report. Anne Fenerty asked him to define the different types of wells. He noted that the primary objective of groundwater monitoring was the protection of surface water. He said that AOC wells were the furthest downgradient, where groundwater discharges to surface water. He said that wells were defined according to their location and requirements.

Bruce Baker asked if the TCE plume would be daylighting into Woman Creek. George said it may. Shelley Stanley asked where the closest stream sampling site was and whether TCE was monitored there. George said there was another AOC well downstream and nothing had been detected there. He said the closest surface water monitoring location was downstream of Pond C2 at WOMPOC.

John spoke next about RFLMA monitoring. He said higher results were typical, due to spring conditions. The volume for the quarter was about the same as in a typical year. Groundwater quality was also generally consistent with previous results. He said that the AOC well 10304 was one exception. This well is located in the Woman Creek valley downgradient of Ryan's Pit Plume. TCE was reported at 15 μg/L (RFLMA level is 2.5 μg/L). This was the first result above the RFLMA level at this location. John said that only AOC wells have RFLMA reportable conditions defined.

John noted that due to heavy spring precipitation, groundwater levels measured in monitoring wells were higher in many cases. One historically dry Sentinel well provided samples for the first time on record. He noted that treatment systems received higher than normal flows during the quarter, and were comparable to a normal year's entire flow volume. John explained that higher flows corresponded to shorter residence times in treatment media at the Mound Site Plume Treatment System (MSPTS) and Solar Ponds Plume Treatment System (SPPTS). The result of this is reduced treatment effectiveness. He said there were elevated VOCs in MSPTS effluent and at performance location GS10 (2.6 μg/L TCE at GS10, compared to RFLMA level of 2.5 μg/L) and elevated nitrate and uranium in SPPTS effluent. John noted that designs were in process to reconfigure the MSPTS and interim SPPTS.

John moved on to non-RFLMA monitoring, which included selected evaluation wells and the SPPTS. Evaluation wells were selected mostly to support the geochemistry study and most locations were associated with the former Solar Evaporation Pond. Several samples were submitted to Lawrence Berkeley National Lab for high-resolution uranium isotope analysis to determine natural versus anthropogenic content. At the SPPTS, the site continued microcell and lagoon testing, as well as bench tests of lagoon effluent clarifying and filtration.

John's next topic was treatment system activities. He said that all treatment systems experienced above-average flows.

Activities at the MSPTS included:

- Routine air stripper and other system maintenance

- Designing system reconfiguration
    - Will route MSPTS influent to ETPTS air stripper for treatment
    - Scheduled for construction in FY 2016

Activities at the ETPTS included:

- Reconfiguration project completed in first quarter 2015, routine RFLMA sampling begun in second quarter
- Added temporary, second pump in effluent tank to keep up with treated influent

Activities at the SPPTS included:

- Continued pilot-scale lagoon tests (including sampling)
- Replaced components damaged by rising groundwater in metering vault after prolonged heavy rainfall
- Installed automated sump pump in vault to manage shallow groundwater
    - Pumped water to treatment cells
- Began developing Statement of Work to empty original 'Big Box' structure
    - Will convert to interim configuration early in FY 2016
        - Includes full-scale lagoon

Site Operations – Kurt Franzen
During quarterly sign inspections, all were found to be in good condition.

At the Original Landfill (OLF), three monthly inspections were performed. One weather-related inspection occurred in April, two in May, and three in June. All weather-related inspections were due to precipitation events producing more than one inch of rain in a 24-hour period. Eight settlement monuments were monitored. Cracking and slumping was more pronounced on the OLF east and west sides, compared to March observations. Kurt said they carried out multiple efforts to minimize ponding and route water away from affected areas using heavy equipment and hand labor throughout the second quarter. CDPHE and EPA inspected the landfill on May 14 and 20, and the geotechnical engineer inspected the landfill on April 23, May 12, and May 20.

At the Present Landfill (PLF), one quarterly inspection and six weather-related inspections for precipitation events producing more than one inch of rain in a 24-hour period were performed. No issues were observed.

At the former building areas (371, 771, 881, and 991), inspections are performed quarterly and during weather events of one inch or more in a 24 hour period. Subsidences were observed near former buildings 881 and 771, and were filled when found. The size of the subsidences ranged from 1-5 feet wide, and 1-3 feet deep. Sue Vaughan asked if the site was still working with the geotechnical engineer regarding problems at the OLF and what the status was. Kurt said that the evaluation was continuing. Linda Kaiser said that DOE should receive the first draft in about a week, and that more iterations would be coming before the draft was finalized, perhaps in the December timeframe. David Allen noted that one of the subsidences sounded similar to one

found years ago near a stairwell at Building 881, and asked if the current one was close to that. Jody said it was pretty close.

Shelley Stanley referred to success criteria being met at the OLF, and inspections being discontinued. She asked if this would be re-started. Kurt said it would. Anne Fenerty said that it seemed like problems were always coming up with OLF. She asked if the PLF had RCRA cover. Kurt said it did. Linda noted that the steep slope at OLF led to many of the problems they were seeing. Scott Surovchak commented that a RCRA cover at the OLF would have added more weight and caused further hillside instability. David Abelson noted that one of reasons that local government did not push for a RCRA cover at the OLF was the slope stability issue, and that Woman Creek would have run underneath the cap. He noted that they would discuss this issue in more depth at the February meeting. Lisa Morzel said that some in the community had also pushed hard for a buttress at the base of the landfill. She said current buttressed areas were stable during recent precipitation events, and she would assume they would be looking at using buttresses in other areas. Linda said that was one of the options.

Site ecology – Jody Nelson
Jody spoke about activities during the quarter which involved getting started with some fieldwork for the summer. Activities included:

- Weed mapping
- Wetland delineations/mapping
- Conducted nest-box (20 nestboxes, 18 occupied, true sparrows, house-wrens) and prairie-dog surveys (none found on COU)
- Conducted wetland water-level surveys
- Installed and irrigated 45 woody plants as habitat enhancement
- Treated approximately 194 acres with herbicides for weed control
- Conducted hand-control and spot herbicide applications at some locations
- Prepared for third-quarter revegetation, wetland, and Preble's mouse mitigation monitoring

Sandra McDonald asked what the source of the irrigation water was. Jody said it just came from a tank they brought in from the office. Marion Whitney said she was an organic gardener, and had talked to Refuge Manager David Lucas about pesticide spraying also affecting broad leaf plants and soil organisms. Jody said he always tried to use ones that were most effective on the target species. He said that a lot of the areas where they spray are revegetation areas, which only contain a certain species and no desirable forbs. Bruce Baker said that the best way to control weeds at the site was to burn. Jody said that was one option, but also grazing, herbicides, and mowing. He said there was no one best method, and that the challenge was trying to balance with their ability to use different methods. He said he could not use grazing or burning on DOE areas. Bruce asked why they could not if the area was really clean. Jody said that they did not have permission. Mike Shelton asked if grazing was prohibited. Jody said it was more about practicality, as monitoring equipment could be damaged, and they would have to fence off so many areas.

Board Approval of 2016 Work Plan

The Board reviewed the 2016 Work Plan at the September meeting. One change was offered that was incorporated into the current draft. David Abelson asked if the Board had any questions. Tim Plass referred to the language that was added regarding reviewing the Rocky Flats National Wildlife Refuge site conservation plan, with an emphasis on the proposed trail plan. He asked if there were opportunities to impact or change the CCP. David said he did not know. He added that at the April meeting, the Board would be focusing on the Refuge, and would be inviting USFWS. David said he would be asking them in advance of that meeting what the opportunities for involvement were.

Roman Kohler moved to approve the 2016 Stewardship Council Work Plan. The motion was seconded Lisa Morzel. The motion passed 13-0.

Board Approval of 2016 Budget

The Board reviewed the draft budget at the September meeting. No changes were offered. The Board's attorney Barb Vander Wall explained the required budget review process. Prior to finalizing the budget, the Board must hold a budget hearing and allow time for public comment. Following the public hearing, the Board must approve the budget resolution. This must occur before the end of each year. She also noted that after the budget is approved, it is filed with the Division of Local Government by the end of January.

Mark McGoff suggested it would be worthwhile to explain the way the Board over-budgets. David Abelson explained that if changes were needed to the budget during the year, it required a two-meeting process. He noted that because the Board only had 5 meetings a year, this was not practical. Therefore, flexibility was built into the budget from the beginning. Tim Plass commented on the lower expenditure projections for 2016 and asked why this was the case. David explained that a staff contract change was approved in June, and there also was quite a bit of extra work for Barb (attorney) last year. Much of this was due to responding to concerns brought up by a constituent. The budget assumed that attorney fees would be back to normal in 2016.

Chair Joyce Downing officially opened the budget hearing. There were no comments from the audience. The Chair then closed the budget hearing. There were no comments from Board members.

Lisa Morzel moved to approve the Fiscal Year 2016 budget. The motion was seconded by Bob Briggs. The motion passed 13-0.

Public Comment

Anne Fenerty brought up the use acronyms. She said she was concerned about the accuracy of descriptions of radioactive materials. She said plutonium emitted particles at high energy, and that ionizing radiation breaks up cells in the body. She also mentioned beryllium, a carcinogen

and one of most dangerous elements. She noted that a small particle can cause berylliosis. She said she hoped that the Board would look at the descriptions of acronyms.

LeRoy Moore thanked the Board for setting up audio system. He said it helped, but not enough. He said it was still very hard to hear the Board, and added that it they did not use a microphone, he could not understand what they were saying. He said he hoped this could be improved, and that this was a poor room for this kind of meeting.

Bonnie Grant Reed asked for a clarification on DOE's presentation regarding plutonium levels of .22-.72 pCi/g. She asked how that was prevented from going further in water and for more information about sampling. Scott Surovchak explained that samples were continuous. Bonnie asked if the water from the site flowed into Standley Lake. Scott said it did not. Bonnie asked if it went into other people's drinking water. Bruce Baker said it did. She said that the timing of these meetings seemed odd if they wanted to include the public. David Abelson explained that they were aware of this, but there were no other options because of local government meetings on weeknights.

Anne Fenerty said she had concerns about groundwater. She said that according to the USGS, contamination in Rocky Flats alluvium gets into water within short time. She said she was concerned about what happens to contaminated groundwater when it leaves the site.

Board Roundtable – Big Picture/Additional Questions/Issue Identification

David Abelson explained that the Executive Committee came up with this idea to flush out questions or issues that the Board thinks should be addressed. He said he added to the 'Issues to Watch' on Big Picture, and emailed the Board for suggestions.

David Allen said he wanted to re-iterate that the uranium exceedance is important because of past exceedances at GS10/WALPOC. Joe Cirelli brought up the topic of the effects of climate change on the remedy, and said he would like to keep up with this item. Bruce Baker said he would like to understand better how the Board moves issues up the ladder of decision-makers and brought up the 'trust' issue. Laura Weinberg asked about groundwater treatment systems. David noted that the Board gets updates regularly on these.

EXECUTIVE SESSION

At 10:55 a.m. Joyce Downing made a motion to move into Executive Session for the purpose of discussing Stewardship Council personnel contracts for 2016, authorized pursuant to Section 24-6-402(4)(e) & (b), C.R.S., to determine positions relative to matters that may be subject to negotiation, and conferencing with the attorney on such matters. Lisa Morzel seconded the motion. The motion passed 13-0.

The Board reconvened from Executive Session at 11:10 a.m. and affirmed that no actions had been taken during Executive Session.

Mark McGoff requested that Roman Kohler repeat a statement he had made during the Executive Session. Roman said that as a charter member of the Board, he believes David has done a strong job keeping the Stewardship Council on the right path and with the right focus. He added that Rik was invaluable as a technical assistant, and that the rest of the staff was exemplary.

New Member Interviews and Selection

David Abelson began the discussion by noting that seven non-governmental groups/individuals applied for membership to the Rocky Flats Stewardship Council. The next step was for the government members to complete interviews and then vote to approve four individuals/organizations as Board members for 2016-2017.

David noted that Nancy Newell was not in attendance. He said each applicant would be asked to explain their background and interest in serving on the Board. He said one individual would speak as representative of a group applying for membership.

Sue Vaughan (League of Women Voters): Sue noted that the League had been sitting on the Board for several years. She said they were a non-partisan group, focusing on education and advocacy. She said their participation on the Board enabled them to provide their members with information about Rocky Flats. Some of the League's interests include nuclear and hazardous waste, open meetings, and coordination among city and counties. Bruce Baker asked Sue what the League's goals were for being on the Board. Sue said they wanted to listen to issues with their positions in mind, to advocate and support the local community and to keep their members informed. Deb Gardner asked whether the League's education piece was formal or informal. Sue said they did a study on Rocky Flats few years ago. She also taught a class through DU for senior citizens. Additionally, there is sustainability committee related to the Northwest Parkway that she is able to provide information to.

Murph Widdowfield (Rocky Flats Cold War Museum): Murph said that the Museum did a lot of education through speaking to groups regarding the history of Rocky Flats. Members have spoken to several groups of over 100, including school children. He said financing was tough, and they were currently being financed by individual Board members. He said they received no DOE money, and very little from local governments. He said they recently gave DOE a selection from their archives to support the new visitor's center, and that the remainder of the archives was moved to the Federal Center, where no rent was being charged. He said the Museum was trying to figure out how to get back on track, now that their five-year grant was done. Murph said that the Stewardship Council gave the Museum the information they needed when talking to people in the community. Bruce Baker asked Murph what the goals and expectations the Museum had about serving on this Board. Murph said that their participation on the Board gives them good information for their educational role. Bruce asked if the Museum was lobbying DOE for funding, and whether that was a conflict. Murph said DOE did not financially support the Museum, and they were not being lobbied for funding. He said they only thing they get from DOE is use of a conference room for board meetings, and storage of artifacts. Bruce asked who provided the five-year grant. Murph said that came from Congress, and the grant was used up four years ago.

Roman Kohler (Rocky Flats Homesteaders): Roman explained that the Homesteaders is a social organization made up of former workers from Rocky Flats. He said he had 27 years of experience at Rocky Flats, including hands-on work in production areas machining plutonium, uranium and beryllium. He was also involved in supervision and management, and retired in 1995. He noted that the Homesteaders is a charter member of the Stewardship Council. He noted that their goal was to inform their members about what was transpiring at Rocky Flats through a newsletter that is distributed to 1,400 dues-paying members. He said there is a newsletter section dedicated to Stewardship Council information. He said he offered the Board his experience in answering questions about past operations, and is focused on what remains. Deb Gardner asked if members ever get together, and whether discussions with them could be two-way. Roman said they do breakfasts and other social events, usually attracting about 80-90 people. He added that many members were scattered throughout the U.S., and that the newsletter was the only contact with Rocky Flats for some of them. Lisa Morzel asked if other nuclear sites had similar organizations. Roman said they did, and all have same issues with insurance/worker benefits.

Nancy Newell (individual): Nancy was not present. David said he spoke with her and she expressed a desire to continue. She worked for CDPHE in Hazardous Waste. David noted that there was additional information about Nancy in the Board packet.

Steven Franks (individual): Steven said he was not representing any group and that his interest in Rocky Flats came after reading a few books about it. He said his background was in chemical engineering. He said he was volunteering with the US Bureau of Land Management on wastewater treatment at Gold King Mine, and had read many regulations. He said his goal was to give back to the community by serving and being able to provide some technical thoughts on sampling and such matters. Mark McGoff noted that some books are more advocacy-based, while others are more neutral, and was curious which books Steven has read. He said one was 'Full Body Burden' by Kristen Iversen, which he interpreted as more of a personal story. He also read 'Making a Real Killing' by Len Ackland, which he said seemed more factual. Steven said he had also had discussions with a former DOE employee about sampling and monitoring. Joe Cirelli asked if Steven had had any contact with the Stewardship Council before. He said he had not been aware of the group until he saw the ad for new members. Emily Hunt said she would be interested in new members with expertise, and who might offer a different background. She asked if Steven saw himself as contributing that way. He said he did, gave an example related to technical questions he would ask DOE about TCE sampling and how this showed his value to the Board.

Nick Hansen (Rocky Flats Downwinders Coalition): Nick passed out a flyer about his organization. He said he grew up in Evergreen, and was a lawyer in the Denver area for 25 years. He thanked the Board for the opportunity to apply. He said that the Downwinders was a group that was concerned about negative potential health effects from Rocky Flats. He said that in 2014, the government recognized workers health effects, and assumed radiation exposures for a cohort group. He said the next logical step was to determine whether residents were also affected, and that this was a moral imperative. He said no medical monitoring was done in the community. Nick said that at Hanford things were being done to recognize the residents as

victims. He said that the Downwinders was a new organization, and they launched a website last month. They were working to create awareness within the medical community. They obtained a permit to have a rally on 'Downwinders Day' in January, at which Kristen Iverson will speak. He said he saw their mission as consistent with this group. Barb Vander Wall asked if the Downwinders was a corporation or LLC. He said they were not. David Abelson asked where Nick's interest in Rocky Flats stemmed from. He said he had heard stories about people getting sick his whole life, and just wanted to put this issue to rest once and for all. David asked how many people were in the group. Nick said there were about 100, and that 30 had signed up on the website as 'adverse health affected'. Deb Gardner asked if these people lived within the area, and asked what Nick thought he would get out of being on the Stewardship Council. He said the 30 people reporting health effects lived in the area and that new people were signing up every day. He said he would be looking for the Stewardship Council to help with awareness of the Downwinders and to create relationships with local governments. He also wanted to gain more information about how Rocky Flats had historically affected people in the area. Ann Lockhart noted that there was a state central cancer registry. Nick said no surveys were done among residents. He said many had dispersed, and that they needed to reach out and figure out who they were. Ann also brought up the Historical Public Exposure Studies, which included a dose reconstruction study. He said that was from 25 years ago. He also asked again for the name of that study so he could look at it. Tim Plass noted that the Stewardship Council had a larger scope including looking at the remedy, and asked if Nick had an interest in being a part of that. He said he absolutely did, and that he grew up in the area. He said he would not limit his focus, and would brush up on issues as best he could.

Harrison Levine (individual): Harrison said he was a psychiatrist, and became interested in Rocky Flats through trying to treat a patient. He said he ended up getting to know Kristen Iversen. He said he also knew someone who worked at Rocky Flats during cleanup. He said he wondered if people disappeared if they became radioactive. He said cancer was 'sexy' to talk about, but wondered about other effects. He mentioned neurological damage, and said he did not know what it was, just that it happened. He said he needed additional Rocky Flats information in order to go about his job. He talked about burying materials six feet deep and creating earthquakes. He said everyone wanted to know what happened at Rocky Flats, but no one knows. He said he was frustrated with same things everyone else was.

The Board moved on to the voting process. Each government had four votes to distribute. They were voting for two year appointments, which would start at the February 2016 meeting. David noted that in 2013, the Board picked top four applicants after voting. In 2011, there were only four applicants. In 2009, there was a tie, but someone dropped out so there was no conflict. David said that if there was a tie, there would be another round of voting.

The government votes were recorded as follows:

Arvada – League of Women Voters, Cold War Museum, Homesteaders, Steven Franks
Boulder – League of Women Voters, Cold War Museum, Homesteaders, Nancy Newell
Boulder County – League of Women Voters, Cold War Museum, Homesteaders, Nancy Newell
Broomfield – League of Women Voters, Homesteaders, Nancy Newell, Steven Franks

Golden – League of Women Voters, Cold War Museum, Homesteaders, Steven Franks
Jefferson County – Nancy Newell, Steven Franks, Cold War Museum, Nick Hansen
Northglenn – League of Women Voters, Cold War Museum, Homesteaders, Steven Franks
Superior - League of Women Voters, Cold War Museum, Homesteaders, Steven Franks
Thornton – League of Women Voters, Cold War Museum, Homesteaders, Nancy Newell
Westminster – Cold War Museum, Homesteaders, Steven Franks, Nancy Newell

Final Vote Tallies (top 4 in bold were elected)

Rocky Flats Cold War Museum - 9
Rocky Flats Homesteaders - 9
League of Women Voters - 8
Steven Franks - 7
Nancy Newell - 6
Nick Hansen - 1
Harrison Levine - 0

Barb Vander Wall noted that her law firm would be sending memos to the local governments asking them to formally designate their Directors and Alternates. She said she would appreciate any help working these nominations through the systems.

Big Picture Review

February 1, 2016

Potential Business Items

- Elect 2016 Officers
- Adopt Resolution re: 2016 meeting dates

Potential Briefing Items

- DOE Quarterly Update
- Original Landfill

April 4, 2016

Potential Briefing Items

- USFWS Refuge Plans (non-LSO meeting)

Issues to watch:

- Original landfill
- Uranium exceedances
- Plutonium levels at SW027
- Groundwater treatment systems

- Refuge – CCP and Trails (non-LSO issue)
- Air quality monitoring
- Plutonium movement in soil column

The meeting was adjourned at 12:08 p.m.

Respectfully submitted by Erin Rogers.

Rocky Flats Stewardship Council
Check Detail-2016
October 9, 2015 through January 20, 2016

Type	Num	Date	Name	Account	Paid Amount	Original Amount
Check		**10/28/2015**		**CASH-Wells Fargo-Operating**		**-3.50**
				Admin Services-Misc Services	-3.50	3.50
TOTAL					-3.50	3.50
Check		**11/30/2015**		**CASH-Wells Fargo-Operating**		**-3.50**
				Admin Services-Misc Services	-3.50	3.50
TOTAL					-3.50	3.50
Bill P...	**1761**	**10/22/2015**	**Blue Sky Bistro**	**CASH-Wells Fargo-Operating**		**-290.00**
Bill	2106	10/01/2015		Misc Expense-Local Government	-290.00	290.00
TOTAL					-290.00	290.00
Check	**1762**	**11/05/2015**	**Century Link**	**CASH-Wells Fargo-Operating**		**-27.10**
				Telecommunications	-27.10	27.10
TOTAL					-27.10	27.10
Bill P...	**1763**	**11/05/2015**	**Jennifer A. Bohn**	**CASH-Wells Fargo-Operating**		**-342.00**
Bill	15-74	10/31/2015		Accounting Fees	-342.00	342.00
TOTAL					-342.00	342.00
Bill P...	**1764**	**11/05/2015**	**Seter & Vander Wall, P.C.**	**CASH-Wells Fargo-Operating**		**-2,258.58**
Bill	72239	10/31/2015		Attorney Fees	-2,258.58	2,258.58
TOTAL					-2,258.58	2,258.58
Bill P...	**1765**	**11/05/2015**	**The Denver Post**	**CASH-Wells Fargo-Operating**		**-944.92**
Bill	1019...	09/01/2015		Admin Services-Misc Services	-944.92	944.92
TOTAL					-944.92	944.92
Bill P...	**1766**	**11/05/2015**	**The Rogers Group, LLC**	**CASH-Wells Fargo-Operating**		**-650.00**
Bill	10/1...	09/30/2015		Personnel - Contract	-650.00	650.00
TOTAL					-650.00	650.00
Bill P...	**1767**	**11/08/2015**	**Blue Sky Bistro**	**CASH-Wells Fargo-Operating**		**-280.00**
Bill	2141	10/26/2015		Misc Expense-Local Government	-280.00	280.00
TOTAL					-280.00	280.00
Bill P...	**1768**	**11/08/2015**	**Crescent Strategies, LLC**	**CASH-Wells Fargo-Operating**		**-9,126.57**
Bill	10/3...	10/31/2015		Personnel - Contract	-7,150.00	7,150.00
				Telecommunications	-133.90	133.90
				TRAVEL-Local	-142.03	142.03
				Postage	-15.99	15.99
				Printing	-375.20	375.20
				TRAVEL-Out of State	-1,309.45	1,309.45
TOTAL					-9,126.57	9,126.57
Check	**1769**	**12/07/2015**	**Century Link**	**CASH-Wells Fargo-Operating**		**-26.01**
				Telecommunications	-26.01	26.01
TOTAL					-26.01	26.01
Check	**1770**	**12/07/2015**	**VOID**	**CASH-Wells Fargo-Operating**		
TOTAL					0.00	0.00

Rocky Flats Stewardship Council
Check Detail-2016
October 9, 2015 through January 20, 2016

Type	Num	Date	Name	Account	Paid Amount	Original Amount
Check	**1771**	**12/07/2015**	**VOID**	**CASH-Wells Fargo-Operating**		
TOTAL					0.00	0.00
Check	**1772**	**12/07/2015**	**VOID**	**CASH-Wells Fargo-Operating**		
TOTAL					0.00	0.00
Bill P...	**1773**	**12/07/2015**	**Crescent Strategies, LLC**	**CASH-Wells Fargo-Operating**		**-8,044.51**
Bill	11/3...	11/30/2015		Personnel - Contract	-7,150.00	7,150.00
				Telecommunications	-129.59	129.59
				TRAVEL-Local	-83.38	83.38
				Postage	-15.99	15.99
				TRAVEL-Out of State	-665.55	665.55
TOTAL					-8,044.51	8,044.51
Bill P...	**1774**	**12/07/2015**	**Jennifer A. Bohn**	**CASH-Wells Fargo-Operating**		**-418.00**
Bill	15-88	11/30/2015		Accounting Fees	-418.00	418.00
TOTAL					-418.00	418.00
Bill P...	**1775**	**12/07/2015**	**Seter & Vander Wall, P.C.**	**CASH-Wells Fargo-Operating**		**-789.50**
Bill	72366	11/30/2015		Attorney Fees	-789.50	789.50
TOTAL					-789.50	789.50
Bill P...	**1776**	**01/08/2016**	**Crescent Strategies, LLC**	**CASH-Wells Fargo-Operating**		**-7,671.94**
Bill	12/3...	12/31/2015		Personnel - Contract	-7,150.00	7,150.00
				Telecommunications	-132.70	132.70
				TRAVEL-Local	-63.25	63.25
				Postage	-325.99	325.99
TOTAL					-7,671.94	7,671.94
Bill P...	**1777**	**01/08/2016**	**Jennifer A. Bohn**	**CASH-Wells Fargo-Operating**		**-285.00**
Bill	15-90	12/31/2015		Accounting Fees	-285.00	285.00
TOTAL					-285.00	285.00
Check	**1778**	**01/08/2016**	**Century Link**	**CASH-Wells Fargo-Operating**		**-25.92**
				Telecommunications	-25.92	25.92
TOTAL					-25.92	25.92
Bill P...	**1779**	**01/08/2016**	**Seter & Vander Wall, P.C.**	**CASH-Wells Fargo-Operating**		**-383.71**
Bill	72582	12/31/2015		Attorney Fees	-383.71	383.71
TOTAL					-383.71	383.71
Bill P...	**1780**	**01/08/2016**	**The Rogers Group, LLC**	**CASH-Wells Fargo-Operating**		**-700.00**
Bill	12/1...	11/17/2015		Personnel - Contract	-700.00	700.00
TOTAL					-700.00	700.00

RESOLUTION
OF THE
BOARD OF DIRECTORS
OF
ROCKY FLATS STEWARDSHIP COUNCIL

regarding

2016 MEETING SCHEDULE AND NOTICE PROVISIONS

WHEREAS, pursuant to an Intergovernmental Agreement dated as of February 13, 2006, and as amended thereafter, (the "IGA"), the Rocky Flats Stewardship Council ("Stewardship Council") was established; and

WHEREAS, the Stewardship Council was created to allow local governments to work together on the continuing local oversight of the activities occurring on the Rocky Flats site to ensure that government and community interests are met with regards to long term stewardship of residual contamination and refuge management; and

WHEREAS, the Board of Directors of the Stewardship Council has a duty to perform certain obligations in order to assure the efficient operation of the Stewardship Council; and

WHEREAS, on March 6, 2006, the Board of Directors of the Stewardship Council adopted Bylaws regarding the operations of the Stewardship Council, governing, *inter alia*, meeting and notice requirements; and

WHEREAS, § 24-6-402, C.R.S., of the Colorado Sunshine Law, specifies the duty of the Board of Directors at its first regular meeting of the calendar year to designate a public posting place within the boundaries of the Stewardship Council for notices of meetings, in addition to any other means of notice; and

WHEREAS, pursuant to its Bylaws and Colorado laws, the Stewardship Council desires to establish its regular meeting schedule and location, and to designate its public posting place(s) for 2016.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE ROCKY FLATS STEWARDSHIP COUNCIL THAT:

1. Meeting Schedule/Location. The Board of Directors determines to hold regular meetings the **first Monday of February, April and June, the second Monday of September, and the fourth Monday of October at 8:30 AM** at the Rocky Mountain Metropolitan Airport Terminal Building, 11755 Airport Way, Broomfield, Colorado; and to hold special meetings as may be necessary, in accordance with the Bylaws of the Stewardship Council.

2. Regular Meeting Notice. The Board of Directors determines to annually post its regular meeting schedule at the Clerk and Recorder's office of the following counties: Jefferson, Boulder, Broomfield, Adams and Weld; and at the City or Town Clerk's Office of the following cities and/or towns: Arvada, Boulder, Broomfield, Westminster, Golden, Superior, Thornton, and Northglenn, for posting in a public place. In addition, the Board shall post its regular meeting schedule on the website established for the Stewardship Council. These notices shall remain posted throughout the year. At least seven (7) days advance notice of the regular meeting time, place and date shall be provided to the

directors and alternate directors, and to those members of the public who so request. The general nature of the business proposed to be transacted or the purpose of any meeting of the Board of Directors shall be specified in the notices of such meeting where possible.

3. Special Meeting Notice. In the event of a special meeting, a notice of such special meeting shall be posted at least seventy-two (72) hours in advance at the clerks' offices of the counties, cities and towns indicated above, for posting in a public place. At least seventy-two (72) hours advance notice of the special meeting time, place and date shall be provided to the directors and alternate directors, and to those members of the public who so request. The general nature of the business proposed to be transacted at or the purpose of any meeting of the Board of Directors shall be specified in the notices of such meeting where possible. The Board of Directors' ability to act on matters brought before it at a special meeting is restricted to those items specified in the notice.

4. Emergency Meeting Notice. Should the Board of Directors determine an emergency special meeting is necessary, a notice of such emergency meeting shall be posted at least twenty-four (24) hours in advance at the clerks' offices of the counties, cities and towns indicated above in accordance with the Colorado Open Meetings Act. The general nature of the business proposed to be transacted at, or the purpose of, any meeting of the Board of Directors shall be specified in the notices of such meeting where possible. The Board of Directors' ability to act on matters brought before it at a special meeting is restricted to those items specified in the notice.

5. Additional Notification. The Stewardship Council shall maintain a list of persons who, within the previous two years, have requested notification of all meetings, or of meetings with discussions of certain specified policies, and shall provide reasonable advance notification of such meetings to the individuals.

APPROVED AND ADOPTED THIS 1ST DAY OF FEBRUARY, 2016.

(SEAL)

ROCKY FLATS STEWARDSHIP COUNCIL

By: _____
Chair

ATTEST:

By: _____

DOE Quarterly Report Briefing

- Cover memo
- Section of quarterly report

Original Landfill Briefing

- Cover memo

ROCKY FLATS STEWARDSHIP COUNCIL

P.O. Box 17670
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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
Steven Franks

MEMORANDUM

TO: Stewardship Council Board
FROM: Rik Getty
SUBJECT: Quarterly Report Briefing
DATE: January 20, 2016

We have scheduled 50 minutes for DOE to present its quarterly update for the third quarter of 2015 (July - September). The report, minus the figures, tables and appendices, is attached. The full report can be found by clicking this link: Quarterly Report of Site Surveillance and Maintenance Activities Third Quarter Calendar Year 2015

Executive Summary – The following are highlights from the quarter:

- 14 flow-paced composite samples, 10 surface-water grab samples, 14 treatment-system samples, and 10 groundwater samples were collected in accordance with RFLMA protocols and submitted for analysis.
- Surface water leaving the DOE-retained lands at Point of Compliance (POC) monitoring locations WALPOC (Walnut Creek) and WOMPOC (Woman Creek) met all regulatory standards. The primary contaminants of concern are plutonium, americium, uranium and nitrates.
- All analyte concentrations at RFLMA Point of Evaluation (POE) locations GS10 (South Walnut Creek) and SW093 (North Walnut Creek) remained below the applicable water-quality standards.
- Reportable conditions for plutonium-239 and -240 were observed at POE SW027 where the South Interceptor Ditch (SID) empties into pond C2. In response, existing erosion controls were enhanced (see Section 3.1.3.2 of the report).
- Original Landfill (OLF): Routine OLF inspections were performed on July 22nd, August 17th and September 17th. An additional weather-related inspection was conducted on July 9th due to more than one inch of rain in a 24-hour period. Additionally,
  - As was discussed at the September and October meetings, additional cracking was observed around the eastern ends of Berms 5 and 6, and the western ends of Berms 1 and 2. The scarp at the top of the East Perimeter Channel subsided an additional six inches (approximately), and a puddle, approximately seven feet in diameter, formed between Berms 5 and 6.

- Some of the cracks that were manually repaired during the second quarter reopened during the third quarter.
- Contact Record (CR) 2015-06—to make interim repairs to the OLF, in accordance with the recommendations of a geotechnical engineer—was approved on July 28th. Interim grading and crack repairs began on August 17th. The project included filling in cracks and smoothing the surface to address areas of recent movement near the East and West Perimeter Channels, and to achieve a uniform grade and promote water drainage off the cover. Coconut matting was placed over areas that were disturbed during the grading process. These repairs were completed on September 22nd.
- One new seep, above Berm 7, was uncovered during construction.
- A small rock basin was constructed at the Berm 5 and Berm 6 seep locations to assist in channeling water to the nearest berm channel. The third seep is close to the Berm 7 channel and is allowed to drain to the East Perimeter Channel naturally.
- The three seeps were each flowing at an estimated rate of two-to-five gallons per minute on September 17th, the day of inspection.

- Present Landfill (PLF): The routine inspection was performed on August 19th. An additional inspection was also required on July 9th due to more than one inch in a 24-hour period. No significant problems were observed during either inspection.
- Mound Site Plume Treatment System (MSPTS): Flows remained elevated due to heavy spring precipitation. Routine maintenance included checking and adjusting flows, inspecting and flushing piping, monitoring water levels in the two treatment cells, and servicing the air stripper.
- East Trenches Plume Treatment System (ETPTS): Operation and maintenance activities primarily focused on accommodating the continued high flow rates.
- Solar Ponds Plume Treatment System (SPPTS): Routine maintenance activities included weekly inspections of the solar/battery systems that power the pumps, the operation of the pumps, and influent and effluent flow conditions. Due to high precipitation levels, the open-bottomed vaults continued to be inspected frequently for rising groundwater, which was pumped out as necessary.
- Revegetation activities were conducted at several small locations. Approximately 145 acres were treated with herbicides to help control noxious weeds.

Please let me know if you have any questions.

LMS/RFS/S13687

Rocky Flats Site, Colorado, Quarterly Report of Site Surveillance and Maintenance Activities Third Quarter Calendar Year 2015

January 2016

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Abbreviations

Am	americium
AOC	Area of Concern
CAD/ROD	Corrective Action Decision/Record of Decision
CDPHE	Colorado Department of Public Health and Environment
COU	Central Operable Unit
CR	Contact Record
CY	calendar year
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EPC	East Perimeter Channel
ETPTS	East Trenches Plume Treatment System
LM	Office of Legacy Management
M&M	monitoring and maintenance
µg/L	micrograms per liter (sometimes expressed as ug/L)
mg/L	milligrams per liter
MSPTS	Mound Site Plume Treatment System
N	nitrogen
OLF	Original Landfill
pCi/L	picocuries per liter
PLF	Present Landfill
PLFTS	Present Landfill Treatment System
PMJM	Preble's meadow jumping mouse
POC	point of compliance
POE	point of evaluation
Pu	plutonium
RCRA	Resource Conservation and Recovery Act
RFLMA	*Rocky Flats Legacy Management Agreement*
RFSOG	*Rocky Flats Site Operations Guide*
SID	South Interceptor Ditch
Site	Rocky Flats Site
SPPTS	Solar Ponds Plume Treatment System
VOC	volatile organic compound
ZVI	zero-valent iron

1.0 Introduction

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) is responsible for implementing the final response action selected in the *Corrective Action Decision/Record of Decision for Rocky Flats Plant (USDOE) Peripheral Operable Unit and Central Operable Unit* (CAD/ROD) (DOE, EPA, and CDPHE 2006), issued on September 29, 2006, and amended on September 21, 2011 (DOE, EPA, and CDPHE 2011), for the Rocky Flats Site, Colorado (the Site). DOE, the U.S. Environmental Protection Agency (EPA), and the Colorado Department of Public Health and Environment (CDPHE) are implementing the monitoring and maintenance requirements of the CAD/ROD as described in the *Rocky Flats Legacy Management Agreement* (RFLMA). Attachment 2 of the RFLMA (DOE 2012a) defines the Central Operable Unit (COU) remedy surveillance and maintenance requirements, the frequency for each required activity, and the monitoring and maintenance locations. The requirements include environmental monitoring; maintenance of the erosion controls, access controls (signs), landfill covers, and groundwater treatment systems; and operation of the groundwater treatment systems. The RFLMA also requires that the institutional controls, in the form of use restrictions as established in the CAD/ROD, be maintained.

This report is required in accordance with Section 7.0 of RFLMA Attachment 2, "Periodic Reporting Requirements." The purpose of this report is to inform the regulatory agencies and stakeholders of the remedy-related surveillance, monitoring, and maintenance activities being conducted at the Site during this quarter. LM provides periodic communications through several means, such as this report, web-based tools, and public meetings.

LM prepared the *Rocky Flats Site Operations Guide* (RFSOG) (DOE 2013) to serve as the primary internal document to guide work to satisfy the requirements of the RFLMA and to implement best management practices at the Site.

Several other site-specific documents provide additional detail regarding the requirements described in RFLMA Attachment 2, including all aspects of surveillance, monitoring, and maintenance activities, as well as data evaluation protocols.

Monitoring data and summaries of surveillance and maintenance activities for past quarters are available in the quarterly reports. Extensive discussion and evaluation of surveillance, monitoring, and maintenance activities are presented each calendar year in the annual report of Site surveillance and maintenance activities.

This report addresses remedy-related surveillance, monitoring, and operations and maintenance activities conducted at the Site during the third quarter (July 1 through September 30) of calendar year (CY) 2015. This report summarizes the following activities:

- Maintenance and inspection of the Original Landfill (OLF) and Present Landfill (PLF)
- Maintenance and inspection of the four groundwater treatment systems
- Inspection of signs posted at the perimeter of the COU as physical controls
- Erosion control and revegetation activities
- Routine (in accordance with the RFLMA and the RFSOG) water monitoring

2.0 Site Operations and Maintenance

2.1 Landfills

2.1.1 Present Landfill

The PLF is inspected quarterly in accordance with the requirements of the *Present Landfill Monitoring and Maintenance Plan and Post-Closure Plan* (PLF M&M Plan) (DOE 2014) and Attachment 2 of the RFLMA (DOE 2012a).

2.1.1.1 Inspection Results

The routine PLF inspection for the third quarter of CY 2015 was performed on August 19, 2015. An additional inspection was also required on July 9, 2015, due to precipitation greater than 1 inch in a 24-hour period. No significant problems were observed during either inspection. Copies of the landfill inspection forms are presented in Appendix A.

2.1.1.2 Settlement Monuments

The 2014 annual survey of the PLF settlement monuments was performed on December 9, 2014. Survey data indicate that vertical settling at each monument is within the limits specified in the PLF M&M Plan (DOE 2014). The 2015 annual survey was scheduled to be completed in the fourth quarter of CY 2015.

2.1.2 Original Landfill

The OLF is inspected monthly in accordance with the requirements in the *Rocky Flats Site Original Landfill Monitoring and Maintenance Plan* (OLF M&M Plan) (DOE 2009a) and the RFLMA. It was expected that after the first year, the inspection frequency might be reduced to quarterly for an additional 4 years. However, because of observed localized slumping and seep areas, and because of the investigation and repairs to the OLF cover completed in 2009, no change to the monthly inspection frequency was recommended in the *Third Five-Year Review Report for the Rocky Flats Site, Jefferson and Boulder Counties, Colorado* (DOE 2012b).

2.1.2.1 Inspection Results

Routine OLF inspections during the third quarter of CY 2015 were performed on July 22, August 17, and September 17, 2015. An additional weather-related inspection was required on July 9, 2015, due to precipitation events producing more than 1 inch of rain in a 24-hour period. The Site received 5.95 inches of precipitation in the third quarter of CY 2015. The completed inspection forms are presented in Appendix A.

Localized surface cracking and differential settlement in the northeastern portion of the cover were noted following the high-precipitation event in September 2013. (As described below, the affected area is near an area where small cracks were observed in 2010 and 2011.) In accordance with RFLMA Attachment 2, Section 6.0, "Action Determinations," DOE determined that this was a reportable condition affecting the effectiveness of the OLF cover.

DOE performed interim repairs in late 2013 and developed a design for regrading of the East Perimeter Channel (EPC) to enhance slope stability on the sides of the channel. The design was revised in the summer of 2014 to accommodate new movement seen in the EPC area in 2014, and construction was completed in January 2015. During the first quarter of 2015, some movement of the area on the east end of Berm 4 was observed, as reported in the first quarter report. During the second quarter, due to the effects of several significant rain events, significant cracking, slumping, and slope movement was observed on the east side of the landfill. Cracking in the Berm 1 area on the west side of the landfill was also observed. Figure 1 shows the locations of the movement observed during 2015. The red lines on the east side of the landfill depict the outline of the area of movement. The red lines on the west side depict large cracks. Photos are included in the inspection reports in Appendix A.

During the third quarter, additional cracking was observed around the eastern ends of Berms 5 and 6 and the western ends of Berms 1 and 2. The scarp at the top of the EPC subsided approximately 6 inches more, and a puddle, approximately 7 feet in diameter, formed between Berms 5 and 6. Some of the cracks that were manually repaired during the second quarter reopened during the third quarter.

Contact Record (CR) 2015-06, "Original Landfill (OLF) Implementation of Interim Action to Reestablish Surface Water Management on Portions of the OLF, with Soil Disturbance Review Plan," documents the rationale and type of interim repairs that were implemented during the quarter on the distressed areas of the OLF in accordance with the recommendations of a geotechnical engineer. The contact record was approved on July 28, 2015. Mobilization of equipment for the OLF interim grading and crack repairs (Figure 2) was initiated on August 17, 2015. The project included filling in cracks and smoothing the surface to address areas of recent movement near the East & West Perimeter Channel, and to achieve a uniform grade and promote water drainage off the cover. Coconut matting was placed over areas that were disturbed during the grading process. These repairs were completed on September 22, 2015. One new seep, above Berm 7, was uncovered during construction. The two existing seeps (near Berms 5 and 6) and the new seep were inspected to determine the best way to promote surface flow to the EPC. A small rock basin was constructed at each of the Berm 5 and Berm 6 seep locations to assist in channeling water to the nearest berm channel. The third seep is close to the Berm 7 channel and is allowed to drain to the EPC naturally. The three seeps were each flowing at a visually estimated rate of between 2 and 5 gallons per minute on September 17, 2015, the day of inspection.

Investigative potholing of the East Subsurface Drain was performed in an attempt to diagnose the lower than expected flows observed at the outfall. The potholing results were inconclusive. The gravel encountered 6–7 feet below ground surface appeared to be perched and no flow was observed.

2.1.2.2 Settlement Monuments

The OLF settlement monuments were surveyed on September 9, 2015. Survey data indicate that vertical settling at each monument is within the limits specified in the OLF M&M Plan (DOE 2009a). The survey results are presented in Appendix A.

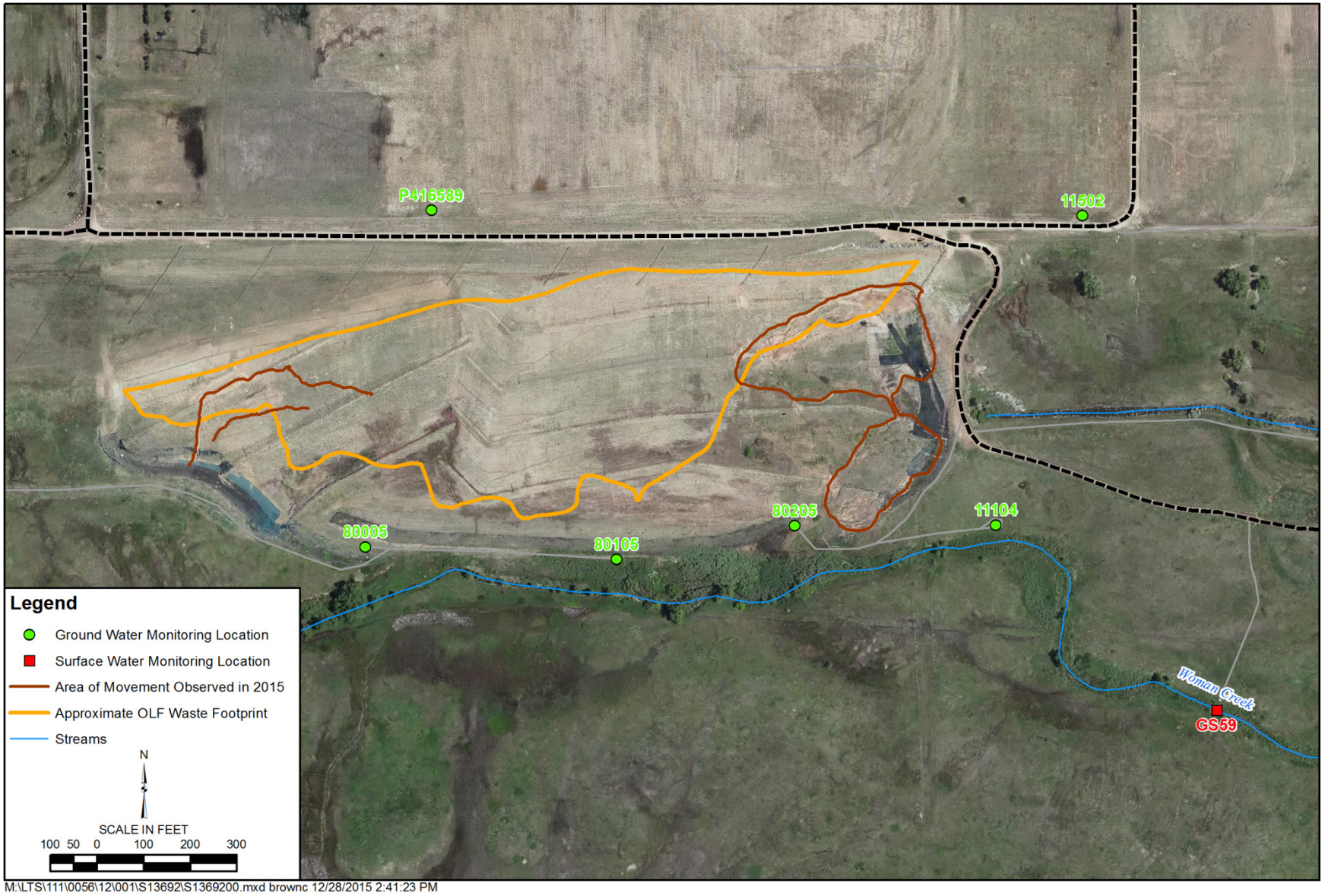


Figure 1. Original Landfill Movement—Third Quarter 2015

Figure 2. Original Landfill Interim Repairs Sketch Layout—September 2015

2.1.2.3 Inclinometers

As discussed in the quarterly report for the second quarter of CY 2009 (DOE 2009b), seven inclinometers were installed in boreholes at the OLF in 2008 as part of the geotechnical investigation of localized areas of instability. Movement of the inclinometers has been monitored approximately monthly since installation. Inclinometers are deflected by lateral movement of the ground in which they are located, and the deflection can be enough to break the inclinometer tubes. Once an inclinometer tube breaks, the portion of the inclinometer below the break can no longer be monitored. As stated in Section 3.3.1, "Monitoring Locations and Procedures," in the OLF M&M Plan, "Once an inclinometer tube breaks, it will no longer be monitored." Inclinometer monitoring at OLF has been discontinued.

2.1.2.4 Slumps

As noted in Section 2.1.2.1, new slumping was noted earlier in the year on the east and west sides of the landfill. This slumping was repaired by the end of September.

2.1.2.5 Seeps

Seeps at the OLF were evaluated during the monthly inspections. Individual seep location flow rates can be found in the monthly inspection reports.

2.2 Subsidence Observed Near Former Buildings

Former building areas, including former Buildings 371, 771, 881, and 991, are routinely inspected (i.e., quarterly and during weather-related inspections) for evidence of subsidence. Minor subsidence was observed in the area of former Buildings 771 and 881 during the third quarter of CY 2015. These areas were filled with Rocky Flats Alluvium and graded smooth during the quarter.

2.3 Groundwater Treatment Systems

Four groundwater treatment systems are operated and maintained in accordance with requirements defined in the RFLMA and the RFSOG. Three of these systems (the Mound Site Plume Treatment System [MSPTS], the East Trenches Plume Treatment System [ETPTS], and the Solar Ponds Plume Treatment System [SPPTS]) include a groundwater intercept trench (collection trench), which is similar to a French drain with an impermeable membrane on the downgradient side. The fourth system, the PLF Treatment System (PLFTS), passively treats water from the northern and southern components of the Groundwater Intercept System and water that flows from the PLF seep.

2.3.1 Mound Site Plume Treatment System

The MSPTS was installed in 1998 to treat groundwater contaminated with low concentrations of volatile organic compounds (VOCs). Groundwater that is intercepted by the collection trench is routed to treatment cells that are filled with zero-valent iron (ZVI). Dissolved VOCs are treated by the ZVI in these cells, and the water then flows to an effluent manhole and subsequently is discharged to the subsurface. In 2011 a small air stripper, designed and build by Site staff, was installed within this effluent manhole. This solar/battery-powered air stripper has been revised

and optimized in the years since then to more effectively polish the effluent from the ZVI-filled treatment cells, further reducing residual concentrations of VOCs. Refer to recent annual reports for additional information on this treatment system, including the air stripper.

Routine maintenance activities continued at the MSPTS through the third quarter of CY 2015. These activities included checking and adjusting flows, inspecting and flushing piping, monitoring water levels in the two treatment cells, and servicing the air stripper.

The air stripper operated throughout the quarter. Air-stripper maintenance mainly consisted of monitoring the water pressures and nozzle spray patterns, maintaining the fan assembly that provides powered ventilation, and cleaning the pump, lines, and nozzles as warranted.

Flows through the MSPTS remained elevated throughout this quarter due to heavy spring precipitation. While this is a normal response to spring conditions, spring 2015 was unusually wet. The annual report for 2015 will provide a more detailed discussion of the MSPTS operations and maintenance.

Refer to Section 3.1.9.1 for information on water-quality sampling.

2.3.2 East Trenches Plume Treatment System

The ETPTS was installed in 1999 to treat groundwater contaminated with low concentrations of VOCs, and was based on the design of the MSPTS. In its original configuration, groundwater that was intercepted by the ETPTS collection trench was routed to treatment cells filled with ZVI. Dissolved VOCs were treated by the ZVI in these cells, and the treated effluent then flowed to an effluent manhole and was subsequently is discharged to the subsurface. Following tests at the MSPTS that started in 2011, a small air stripper that was designed and built by Site staff was installed in the influent manhole in 2013. This component pre-treated (i.e., removed a portion of the VOCs from) water that was then routed to the ZVI-filled treatment cells. The ETPTS was reconfigured in 2014–2015. Although no changes were made to the groundwater intercept trench or the effluent manhole or discharge gallery, the ETPTS no longer relies on ZVI for treatment. Instead, a full-scale, commercial air stripper using only solar/battery power treats the VOCs in collected groundwater. Reconfiguration of the ETPTS was completed in January 2015. Refer to the Annual Report for 2014 (DOE 2015a) and the first-quarter 2015 report (DOE 2015b) for more information on the reconfiguration project. The annual report for 2015 will provide a summary of this project.

Operation and maintenance activities at the ETPTS in the third quarter of 2015 were primarily focused on accommodating the continued high flow rates. The timer settings, which control the maximum duration of daily air stripper operation, were adjusted as necessary and a generator was used on several occasions to help recharge the batteries, as provided for in the design modifications to the solar/battery power facility. The unusually high flow rates required the air stripper to operate for long periods each day—during the first quarter it only needed to operate for 4 to 5 hours per day to keep up with influent flows, but by early June it was running for over 12 hours per day, and for most of the third quarter it operated for 11 to 12 hours per day. During periods of cloudy conditions, the photovoltaic panels were not adequately recharging the batteries, and the generator helped address this condition. Also, as in the second quarter, a sump

pump augmented the effluent pump to discharge the higher daily volumes of treated effluent from the effluent tank.

Routine maintenance at the ETPTS also included checking the batteries and other power components and checking air stripper components for scale buildup associated with the very hard groundwater being treated. Unlike the previous air stripper that had been installed in the influent manhole, scale development in the new air stripper has been minimal and, as of the end of the third quarter, was still minor. Acid was used to clean scale from the inner surfaces of part of the air stripper housing as the quarter ended, but the trays did not yet require cleaning.

Other maintenance activities included greasing the blower motor at the start of the quarter, and replacing the pump installed in the effluent tank when it malfunctioned.

Refer to Section 3.1.9.2 for information on water-quality sampling.

2.3.3 Solar Ponds Plume Treatment System

The SPPTS was installed in 1999 to treat groundwater contaminated with nitrate and uranium, and it is based on the design of the MSPTS and ETPTS. In its original configuration, groundwater that was intercepted by the SPPTS collection trench was routed to a larger treatment cell filled with sawdust and a small percentage of ZVI, and thence to a smaller treatment cell filled with gravel and ZVI. Nitrate was treated in the first cell and uranium in the second. Effluent from the treatment cells is routed to an effluent manhole, from which it is piped to a subsurface discharge gallery. Several upgrades to the SPPTS have been installed and modified over the years, and numerous treatability studies have been conducted to improve its effectiveness. The SPPTS now incorporates additional treatment cells as well as pilot-scale nitrate treatment using a lagoon approach. Refer to recent annual reports for additional information on this treatment system and the upgrades and studies conducted here.

Routine maintenance activities at the SPPTS through the third quarter of CY 2015 included weekly inspections of the solar/battery systems that power the pumps, the operation of the pumps, and influent and effluent flow conditions. The risers in the original treatment cell structure were also flushed periodically by surging the water within them to improve flow through the piping and original media.

In addition, due to the moist spring conditions, the open-bottomed vaults continued to be inspected frequently for rising groundwater, which was pumped out as necessary. The SPPTS was shut down July 22–24 due to electrical malfunction; additional inspections identified damaged wiring that was replaced and operation was restored. The pump deployed in the Interceptor Trench System collection sump (referred to as the ITSS) began to malfunction in late August and was replaced.

Tests continued through the quarter on (1) treating uranium with smaller-scale “microcell” treatment components incorporating ZVI as a treatment media and (2) treating nitrate using pilot-scale lagoons. The microcell tests were revised and relocated to test treatment of water with lower concentrations of nitrate, as opposed to raw influent. Both tests are expected to continue until the interim reconfiguration project begins in 2016. These tests and associated results will be discussed in greater detail in the annual report for 2015.

Refer to Section 3.1.9.3 for information on water-quality sampling.

2.3.4 Present Landfill Treatment System

Routine maintenance activities continued at the PLFTS through the third quarter of CY 2015. These activities generally consisted of inspecting the system for potential problems. The biogrowth that had accumulated in the passive aeration system was cleaned out. During the quarter no problems were noted.

Refer to Section 3.1.9.4 for information on water-quality sampling.

2.4 Sign Inspection

"U.S. Department of Energy – No Trespassing" signs are required to be posted at defined intervals around the perimeter of the COU to notify persons that they are at the boundary of the COU. Signs listing the institutional controls and providing contact information are also required to be posted at access points to the COU. The signs are required by the remedy as physical controls, are inspected quarterly, and are maintained by repairing or replacing them as needed. Physical controls protect the engineered components of the remedy, including landfill covers, groundwater treatment systems, and monitoring equipment, which are also inspected routinely during monitoring and maintenance activities.

The signs were inspected on July 8, 2015, and they met the requirements.

2.5 Erosion Control and Revegetation

Maintenance of the Site erosion-control features required continued effort throughout the third quarter of CY 2015, 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 third quarter of CY 2015. In particular, existing erosion controls were enhanced in the former 903 Pad/Lip area and South Interceptor Ditch in response to the reportable water-quality condition at Point of Evaluation SW027 (see Section 3.1.3.2).

3.0 Environmental Monitoring

This section summarizes the environmental monitoring conducted in accordance with RFLMA Attachment 2. RFLMA Attachment 2, Table 1, "Surface Water Standards," establishes the concentrations that determine reportable conditions in accordance with RFLMA Attachment 2, Section 6.0, "Action Determinations." Reportable conditions require DOE to consult with CDHPE and EPA to determine the appropriate actions.

3.1 Water Monitoring

This section includes:

- A discussion of analytical results for the Point of Compliance (POC), Point of Evaluation (POE), PLF, and OLF surface-water monitoring objectives.
- Summaries of Area of Concern (AOC) well, Sentinel well, Evaluation well, and Resource Conservation and Recovery Act (RCRA) well groundwater monitoring; treatment-system monitoring; and Surface Water Support monitoring at the Site.

RFLMA Attachment 2 and the RFSOG offer details about the monitoring locations, sampling criteria, and evaluation protocols for the water monitoring objectives mentioned in the following sections. Appendix B provides analytical water-quality data for the third quarter of CY 2015. The annual report for CY 2015 will provide a more detailed interpretation and discussion.

3.1.1 Water Monitoring Highlights

During the third quarter of CY 2015, water monitoring successfully met the targeted monitoring objectives as required by the RFLMA and was in conformance with RFSOG implementation guidance. The routine RFLMA network consists of 8 automated gaging stations, 11 surface-water grab-sampling locations, 8 treatment-system locations, and 88 wells (DOE 2015a). Additional locations are occasionally sampled in support of investigations in response to reportable conditions. During the quarter, 14 flow-paced composite samples, 10 surface-water grab samples, 14 treatment-system samples, and 10 groundwater samples were collected (in accordance with RFLMA protocols) and submitted for analysis.[1]

Groundwater monitoring results will be evaluated as part of the annual report for CY 2015.

All RFLMA POC analyte concentrations remained below the applicable water-quality standards throughout the third quarter of CY 2015.

Reportable conditions for plutonium-239 and -240 were observed at RFLMA POE SW027 during the second quarter (April 30, 2015, and May 31, 2015). The current composite sample started on June 12, 2015, is still in progress. Therefore, 12-month rolling averages after that date cannot be calculated. These data are presented and discussed further in Section 3.1.3.2. All other analytes were not reportable through May 31, 2015.

[1] Composite samples consist of multiple aliquots ("grabs") of identical volume. Each grab is delivered by the automatic sampler to the composite container at each predetermined flow volume or time interval. During the third quarter of CY 2015, the 14 flow-paced composites comprised 672 individual grabs.

All analyte concentrations at RFLMA POE locations GS10 and SW093 remained below the applicable water-quality standards throughout the third quarter of CY 2015.

3.1.2 POC Monitoring

The following sections include summary tables and plots showing the applicable 30-day and 12-month rolling averages for the POC analytes.

3.1.2.1 Monitoring Location WALPOC

Monitoring location WALPOC is on Walnut Creek at the eastern COU boundary. Figure 3 through Figure 8 show no occurrences of reportable 12-month rolling or 30-day averages during the quarter for plutonium (Pu) and americium (Am) (in picocuries per liter [pCi/L]), uranium (in micrograms per liter [µg/L]), or nitrate + nitrite as nitrogen (N) (in milligrams per liter [mg/L]). Although the 12-month rolling average for uranium remained reportable as of December 31, 2014, due to the residual effects of the 2013 flooding (see CR 2015-01), uranium has not been reportable since January 31, 2015.[2] The methods for calculating the 30-day and 12-month rolling averages are detailed in the annual report.

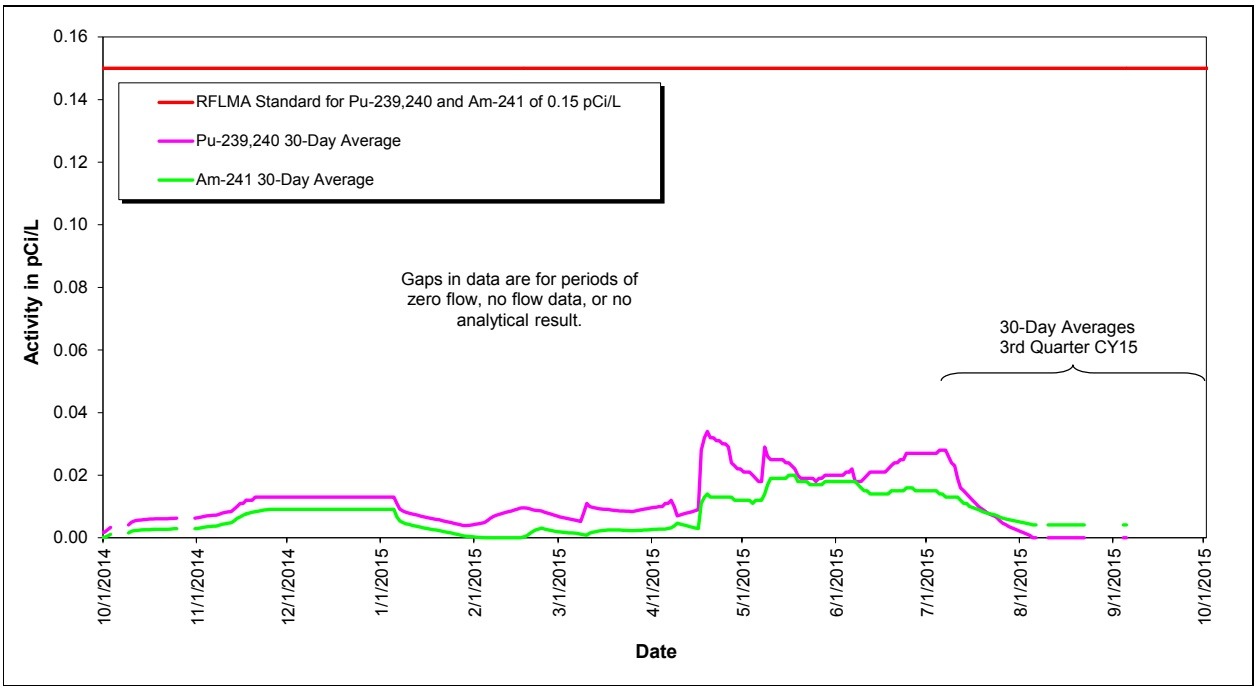


Figure 3. Volume-Weighted 30-Day Average Plutonium and Americium Activities at WALPOC: Year Ending Third Quarter CY 2015

[2] The 12-month rolling average is calculated 12 times per year, on the last calendar day of each month.

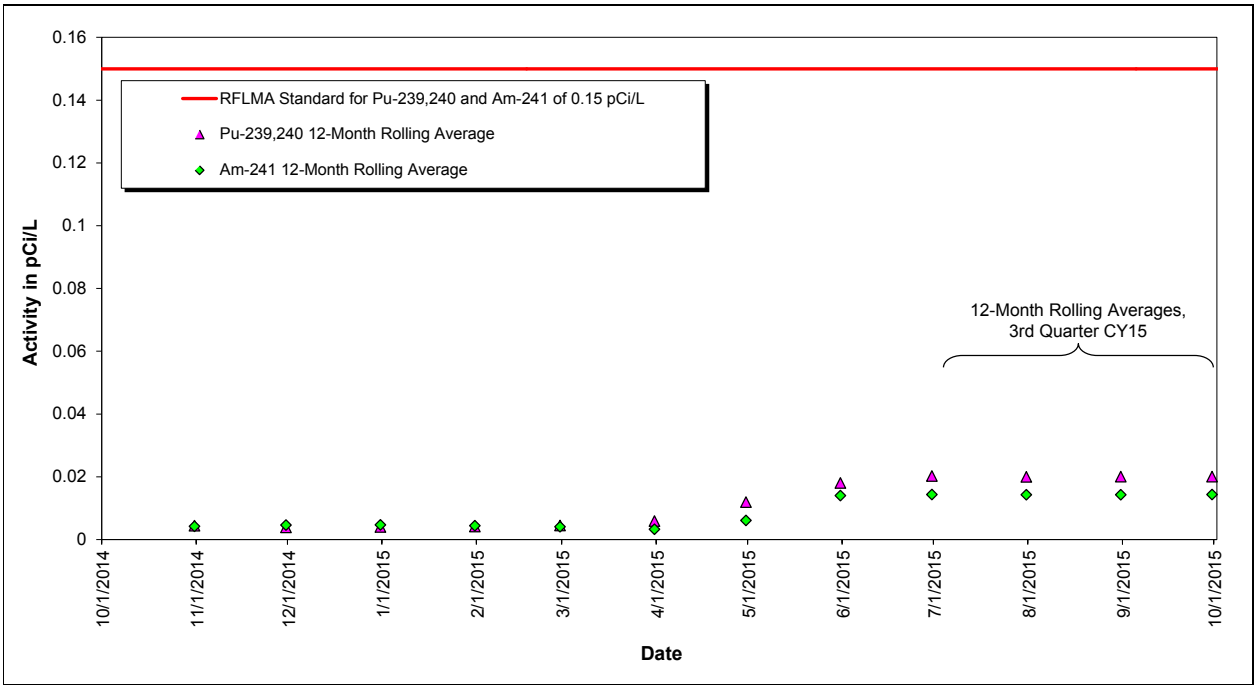


Figure 4. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at WALPOC: Year Ending Third Quarter CY 2015

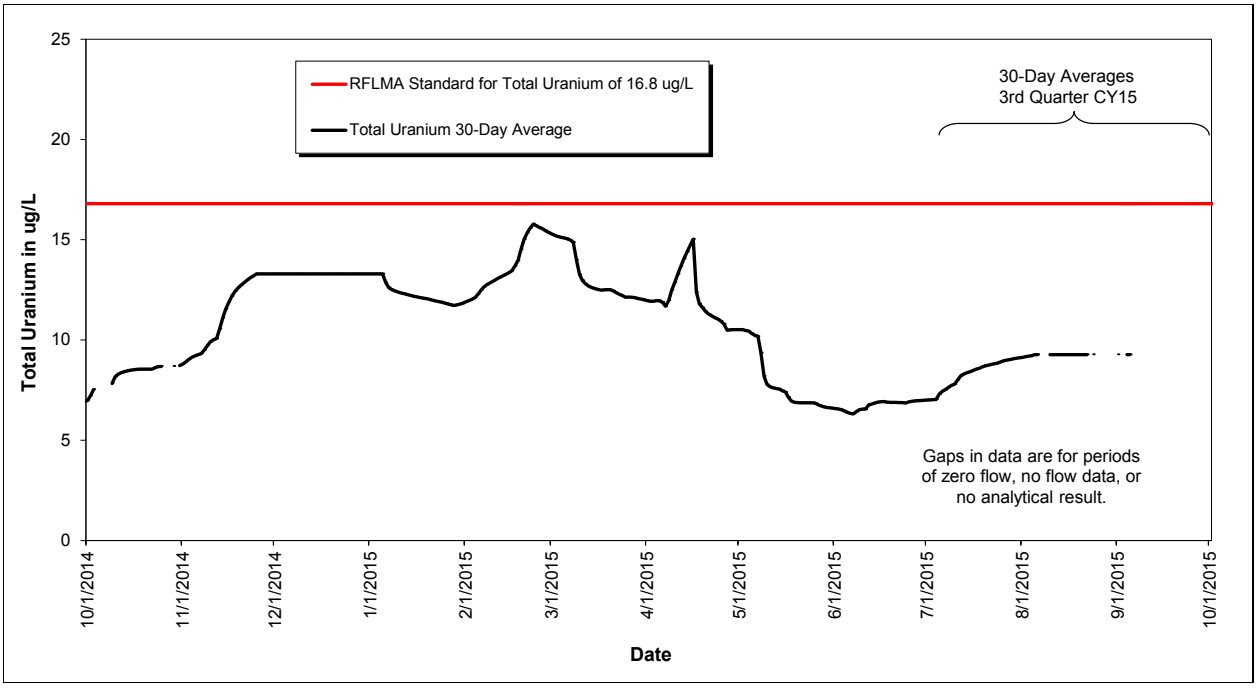


Figure 5. Volume-Weighted 30-Day Average Total Uranium Concentrations at WALPOC: Year Ending Third Quarter CY 2015

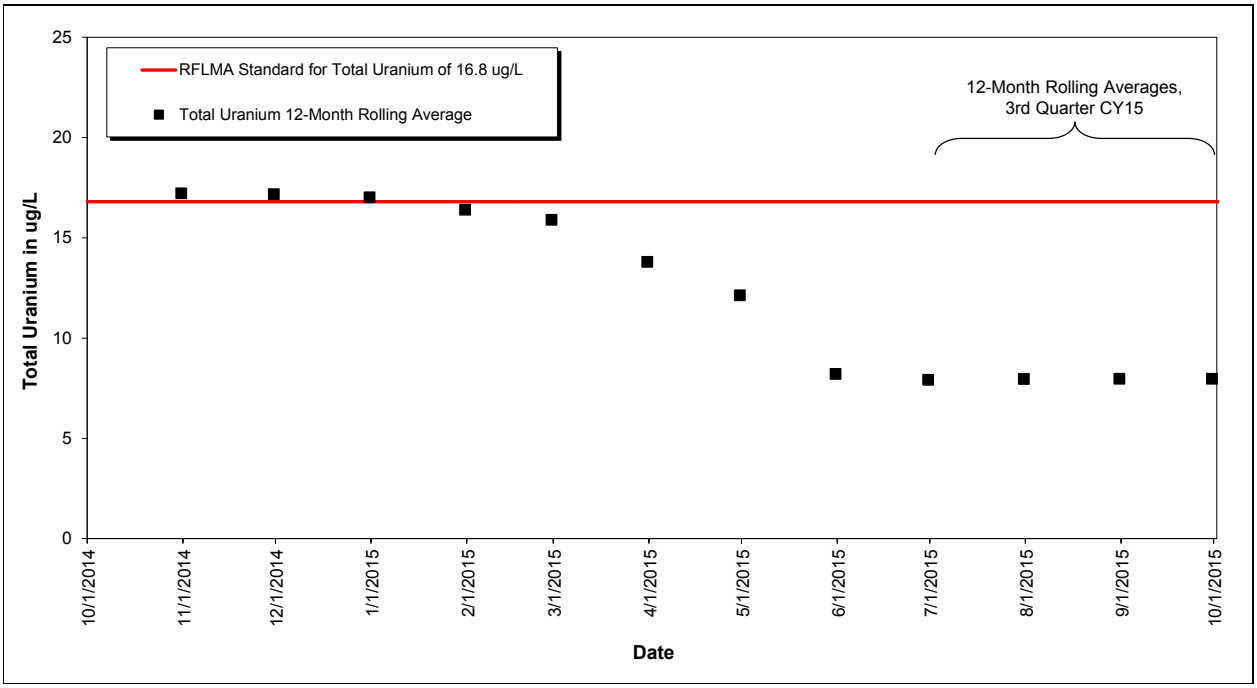


Figure 6. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at WALPOC: Year Ending Third Quarter CY 2015

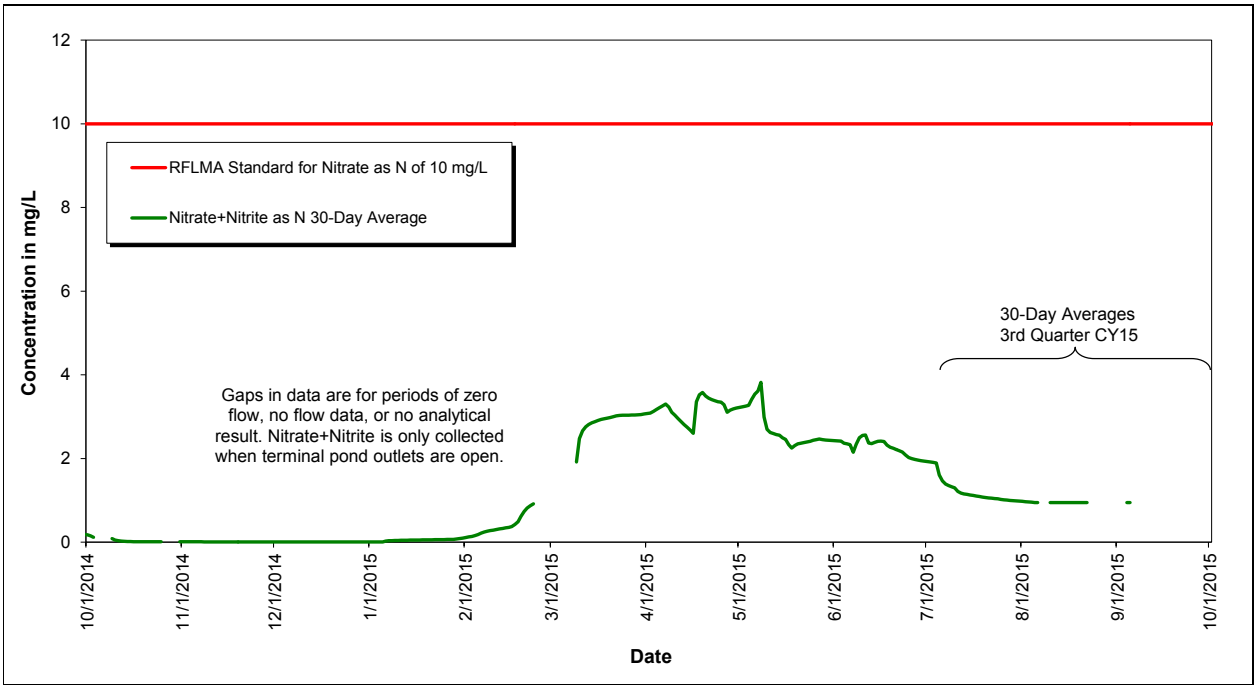
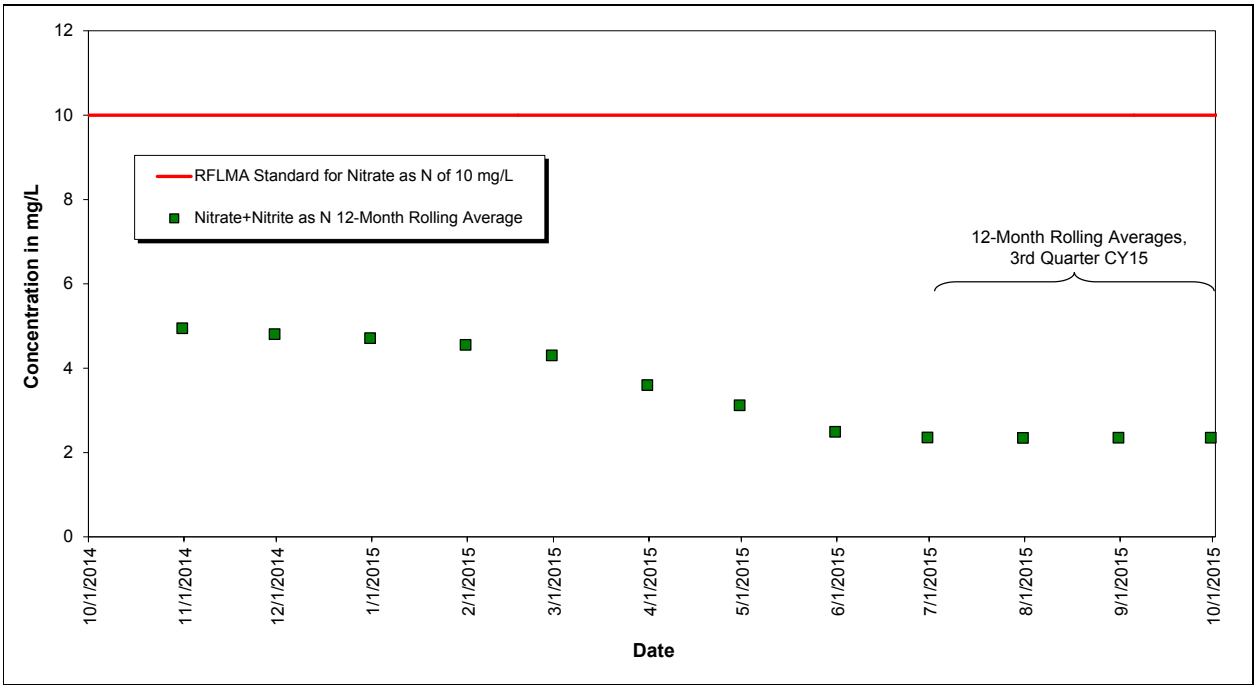


Figure 7. Volume-Weighted 30-Day Average Nitrate + Nitrite as Nitrogen Concentrations at WALPOC: Year Ending Third Quarter CY 2015



Note: Nitrate + nitrite as nitrogen 12-month averages are conservatively compared to the nitrate standard only.

Figure 8. Volume-Weighted 12-Month Rolling Average Nitrate + Nitrite as Nitrogen Concentrations at WALPOC: Year Ending Third Quarter CY 2015

3.1.2.2 Monitoring Location WOMPOC

Monitoring location WOMPOC is on Woman Creek at the eastern COU boundary. Figure 9 through Figure 12 show no occurrences of reportable 12-month rolling or 30-day averages for the quarter. The methods for calculating the 30-day and 12-month rolling averages are detailed in the annual report.

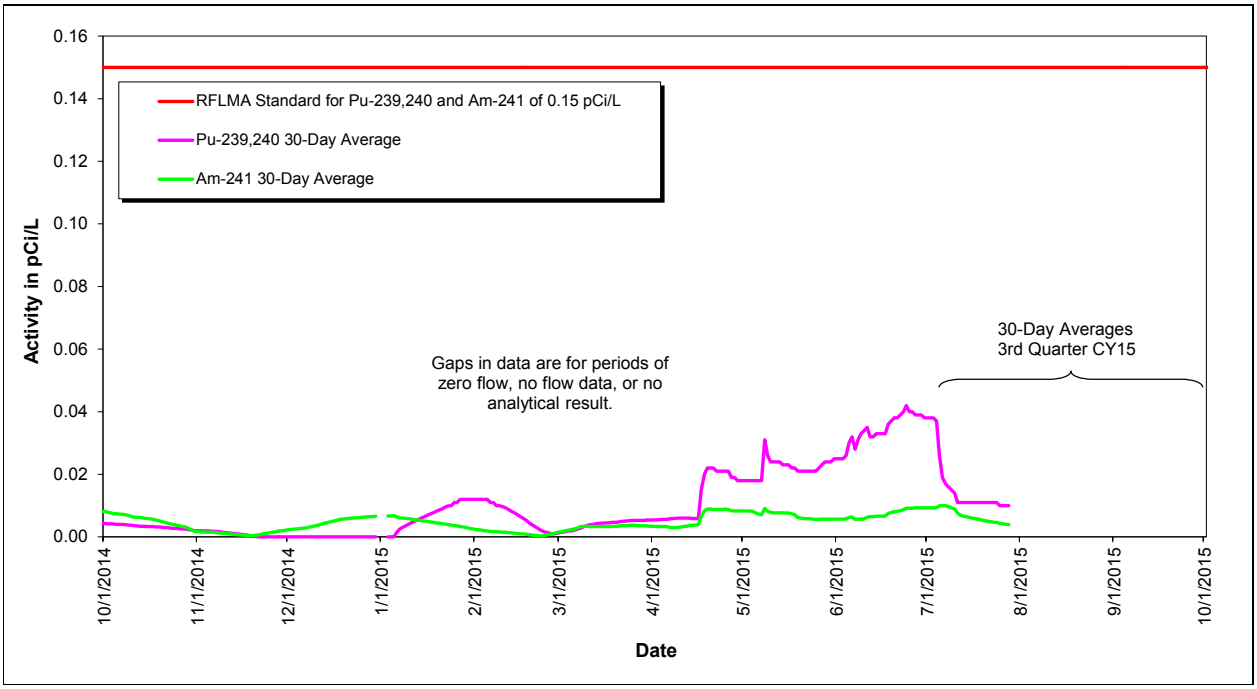


Figure 9. Volume-Weighted 30-Day Average Plutonium and Americium Activities at WOMPOC: Year Ending Third Quarter CY 2015

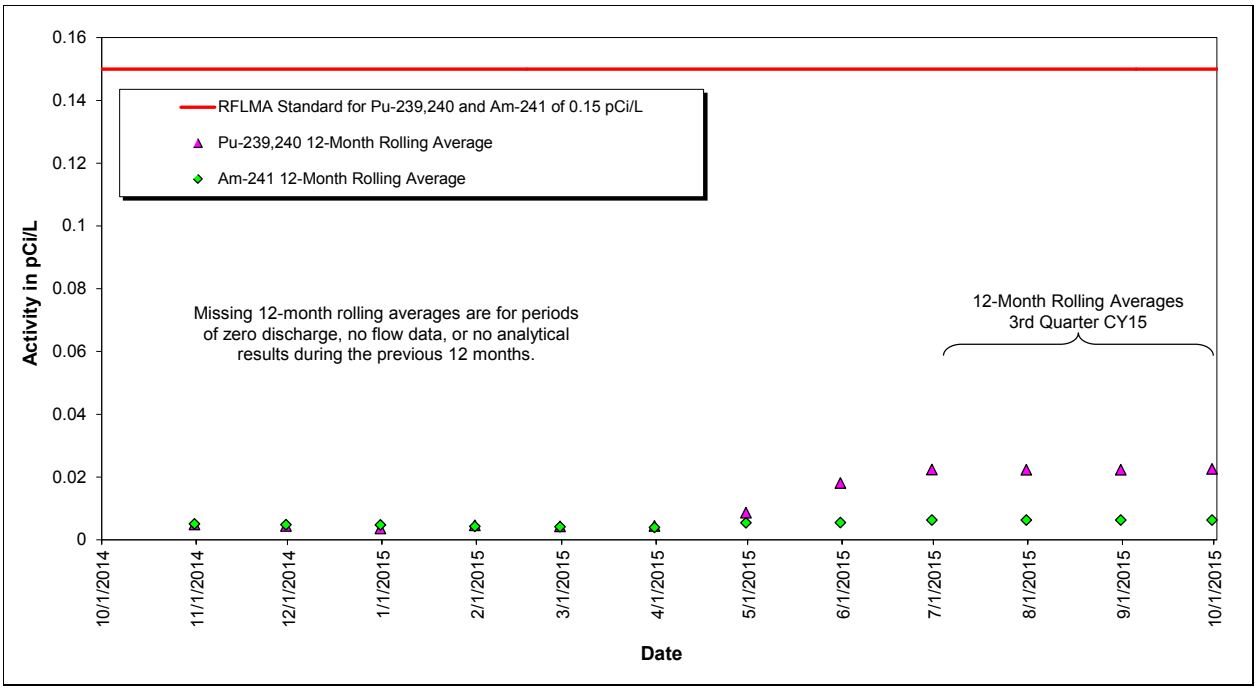


Figure 10. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at WOMPOC: Year Ending Third Quarter CY 2015

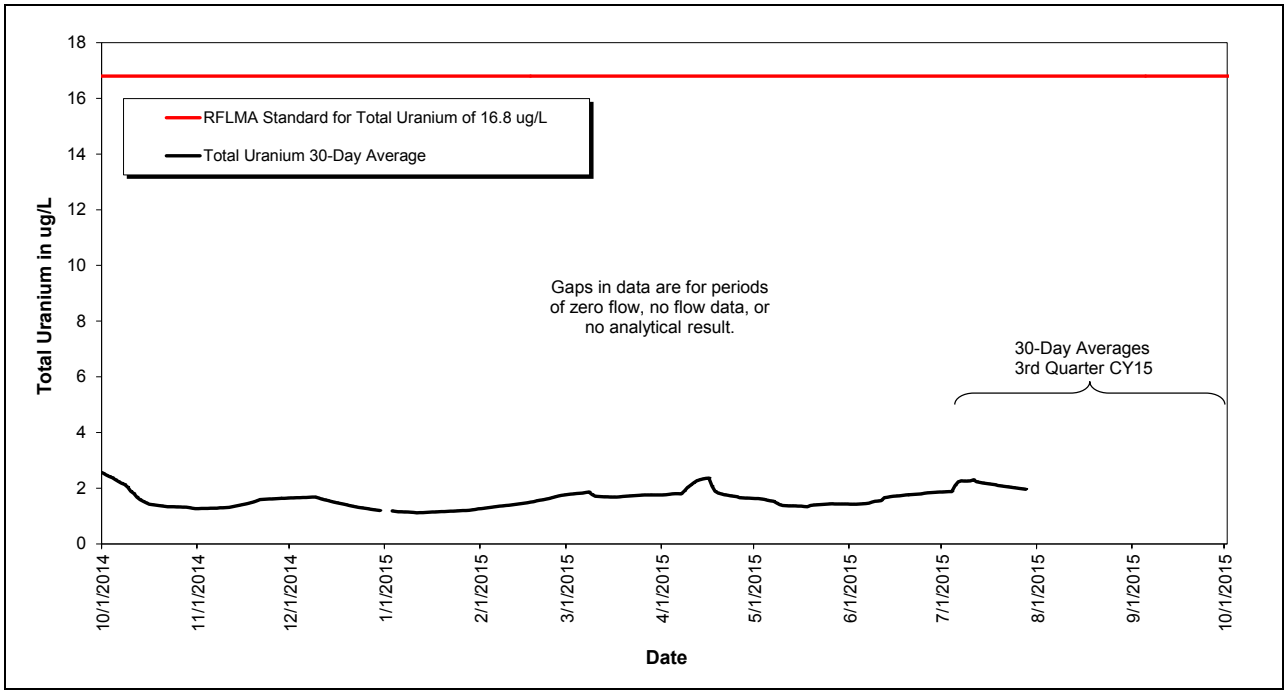


Figure 11. Volume-Weighted 30-Day Average Total Uranium Concentrations at WOMPOC: Year Ending Third Quarter CY 2015

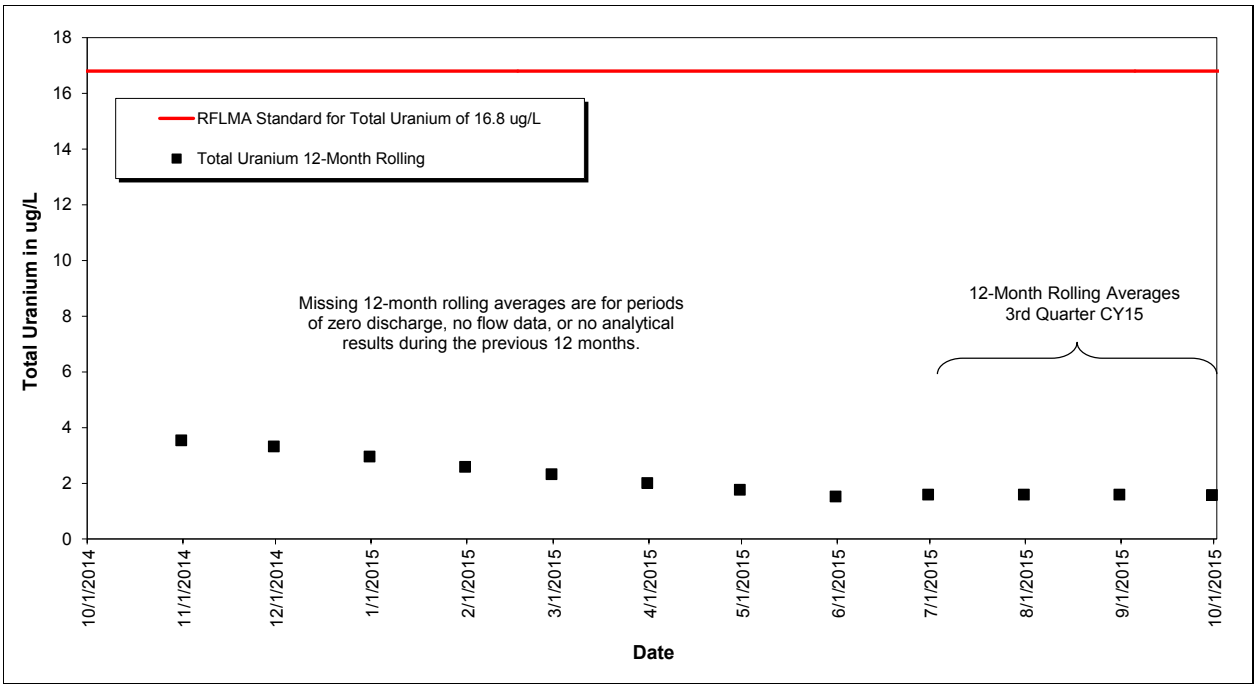


Figure 12. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at WOMPOC: Year Ending Third Quarter CY 2015

3.1.3 POE Monitoring

The following sections include summary plots showing the applicable 12-month rolling averages for the POE analytes.

3.1.3.1 Monitoring Location GS10

Monitoring location GS10 is on South Walnut Creek just upstream of the B-Series ponds. Figure 13 and Figure 15 show no occurrences of reportable 12-month rolling averages for plutonium, americium, or total uranium values during the quarter. Figure 14 and Figure 16 show sampling data from 2005 through the third quarter of CY 2015. The method for calculating the 12-month rolling averages is detailed in the annual report.

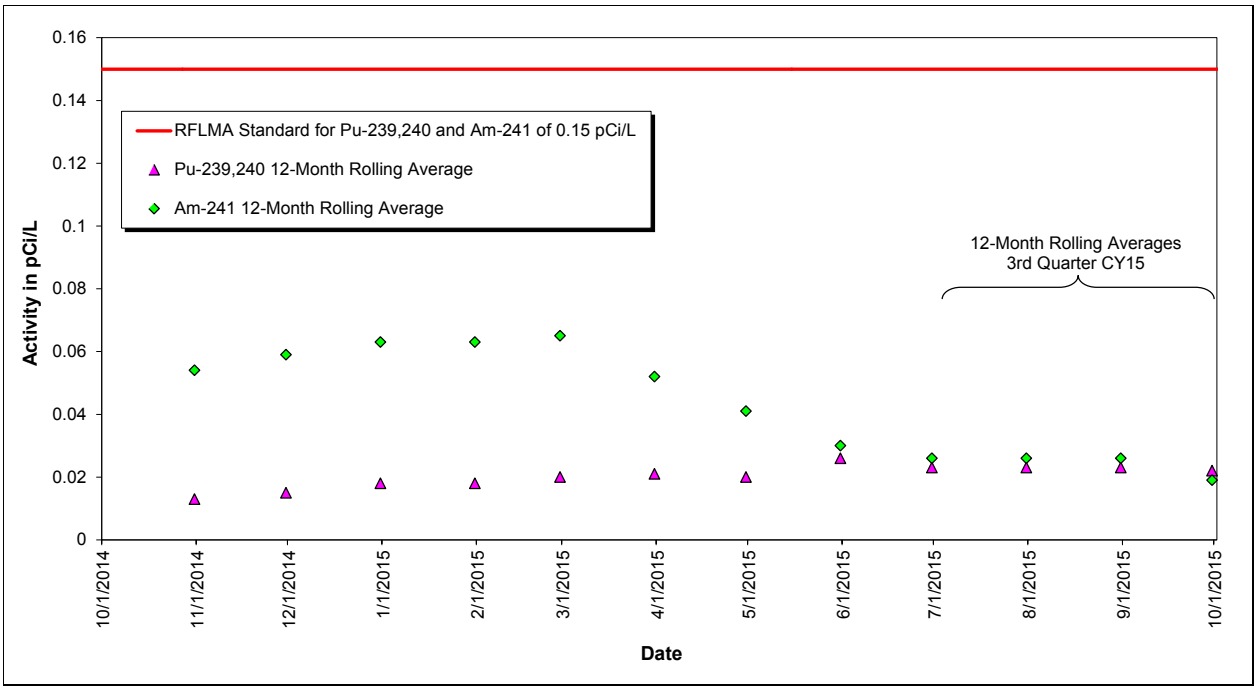


Figure 13. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at GS10: Year Ending Third Quarter CY 2015

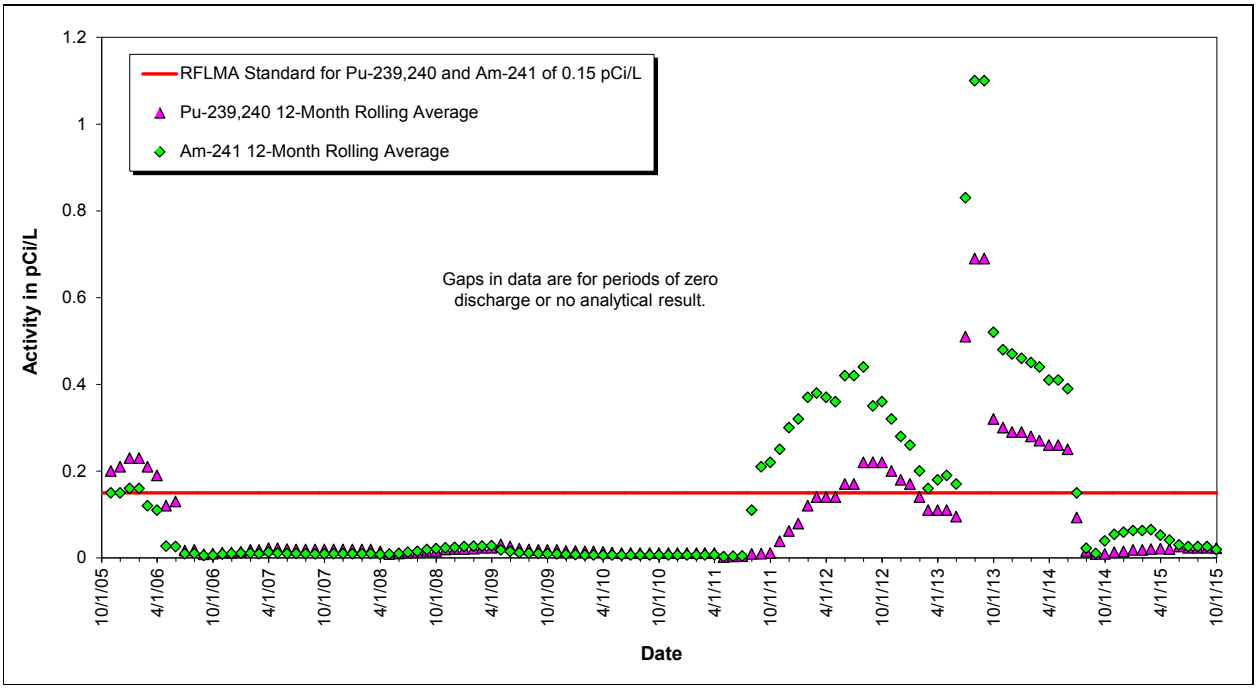


Figure 14. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at GS10: Postclosure Period Ending Third Quarter CY 2015

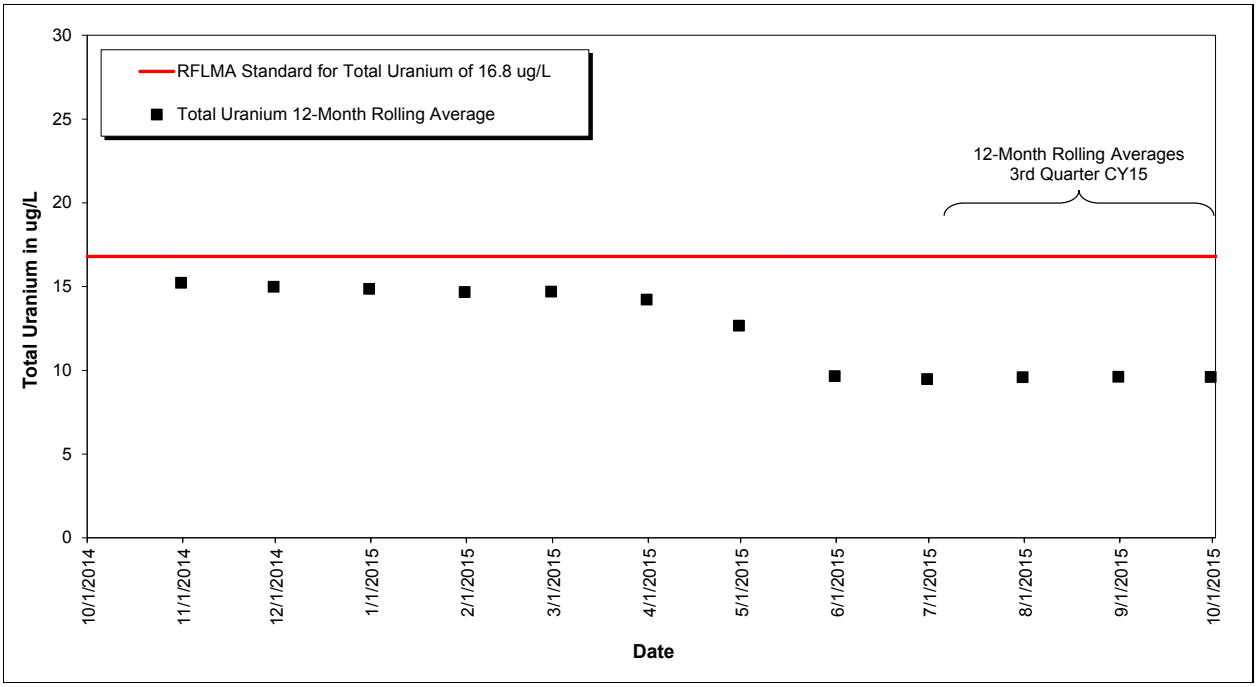


Figure 15. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at GS10: Year Ending Third Quarter CY 2015

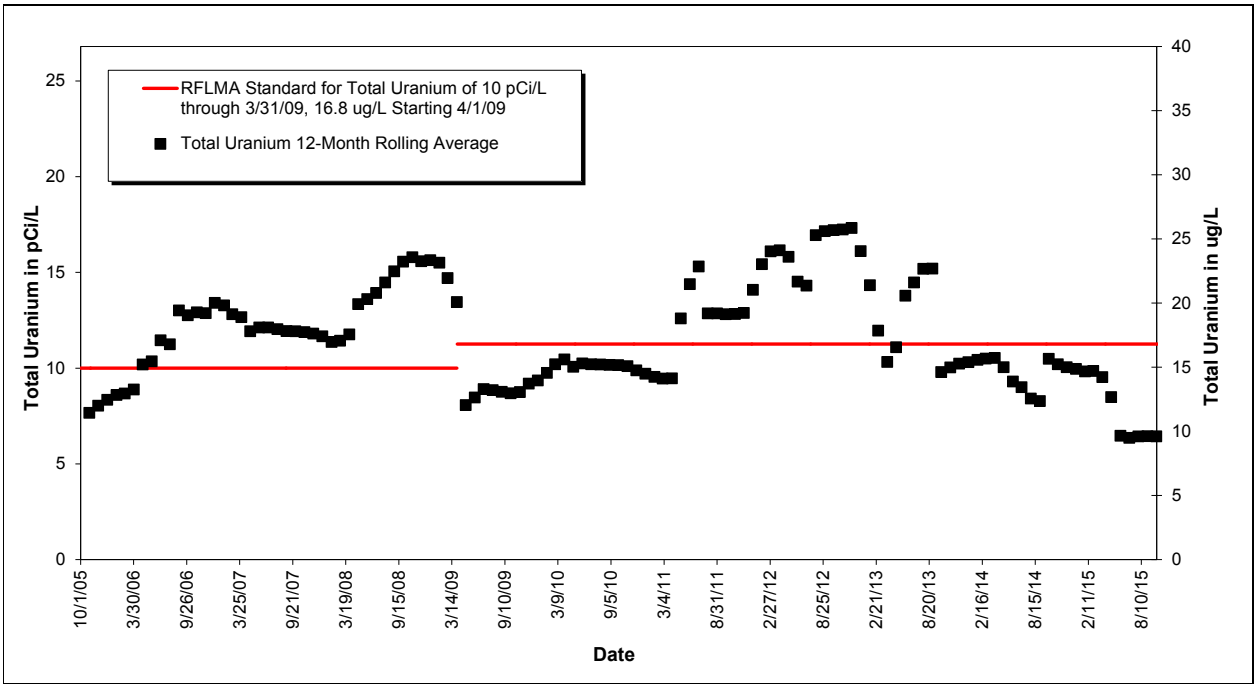


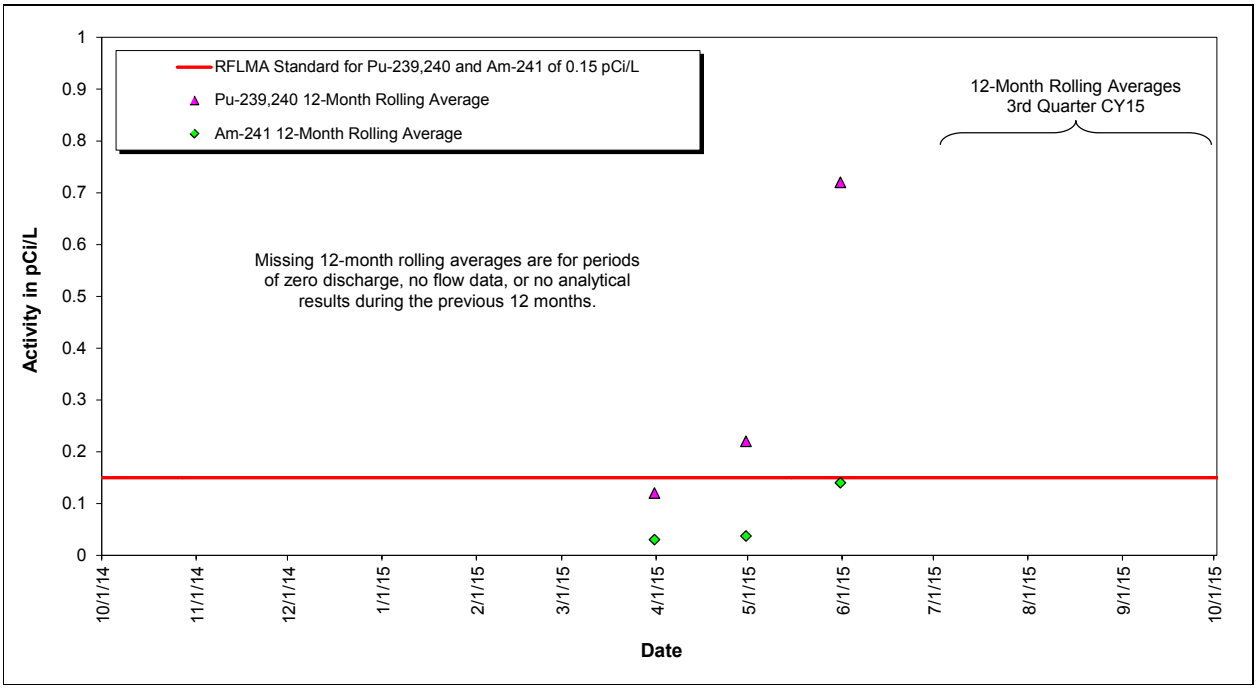
Figure 16. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at GS10: Postclosure Period Ending Third Quarter CY 2015

3.1.3.2 Monitoring Location SW027

Monitoring location SW027 is at the end of the South Interceptor Ditch at the inlet to Pond C-2. Figure 17 and Figure 19 show the 12-month rolling averages for plutonium, americium, and total uranium values during the quarter. Figure 18 and Figure 20 show water-quality data for plutonium, americium, and uranium from 2005 through the third quarter of CY 2015. The method for calculating the 12-month rolling averages is detailed in the annual report.

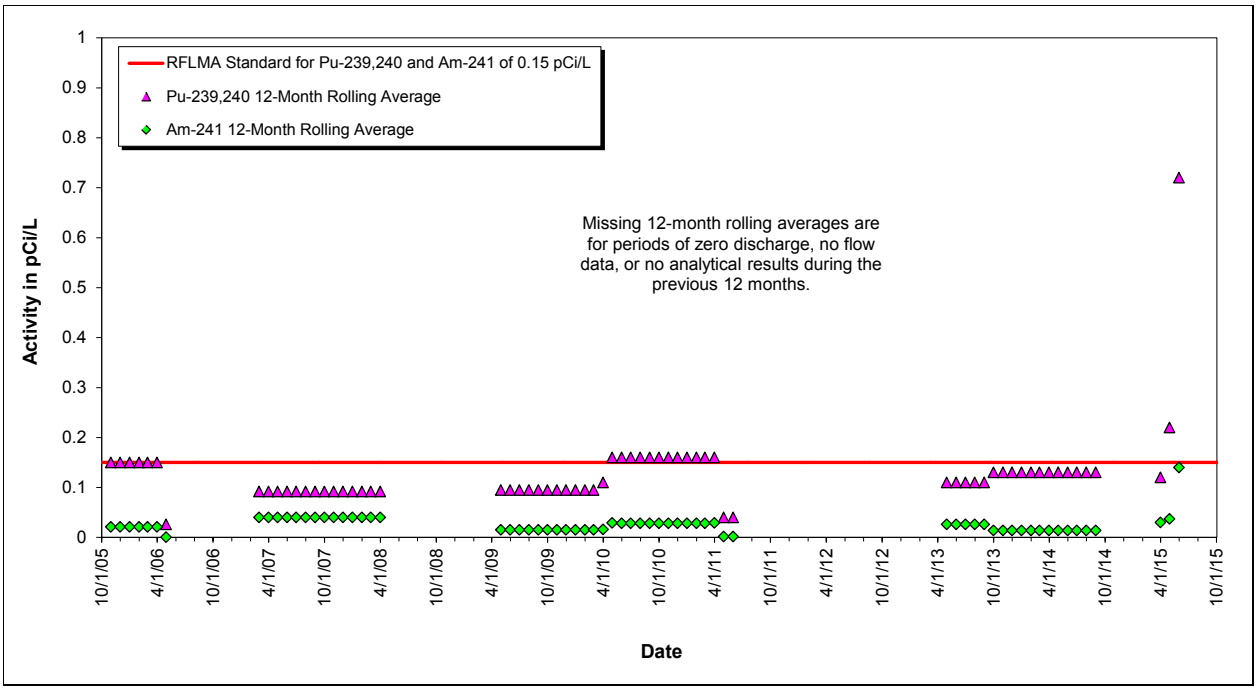
Figure 17 shows that the 12-month rolling average for plutonium exceeded the RFLMA standard of 0.15 pCi/L for the April 30, 2015, and the May 31, 2015, evaluation dates. The composite sample started on June 12, 2015, is still in progress. Therefore, 12-month rolling averages after that date cannot be calculated. All other analytes were not reportable through May 31, 2015.

Table 1 lists the americium, plutonium, and uranium results for composite samples collected during CY 2015.



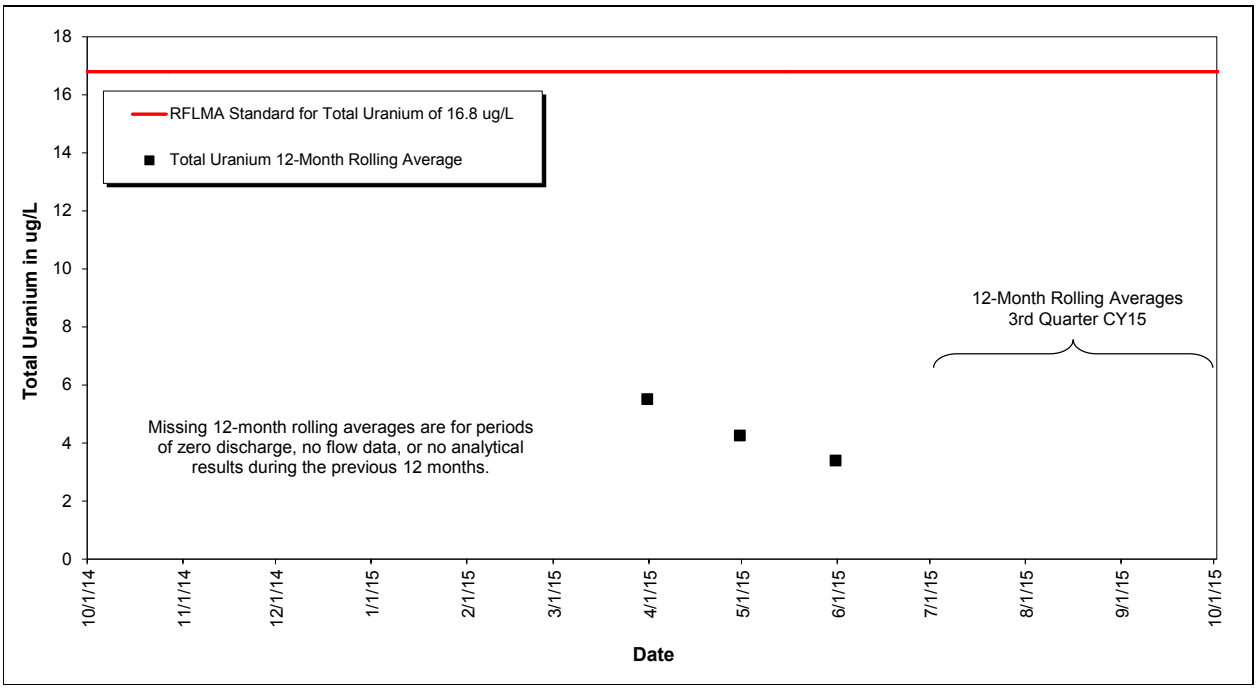
Note: The composite sample started on June 12, 2015, is still in progress. Therefore, the 12-month rolling averages after that date cannot be calculated.

Figure 17. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at SW027: Year Ending Third Quarter CY 2015



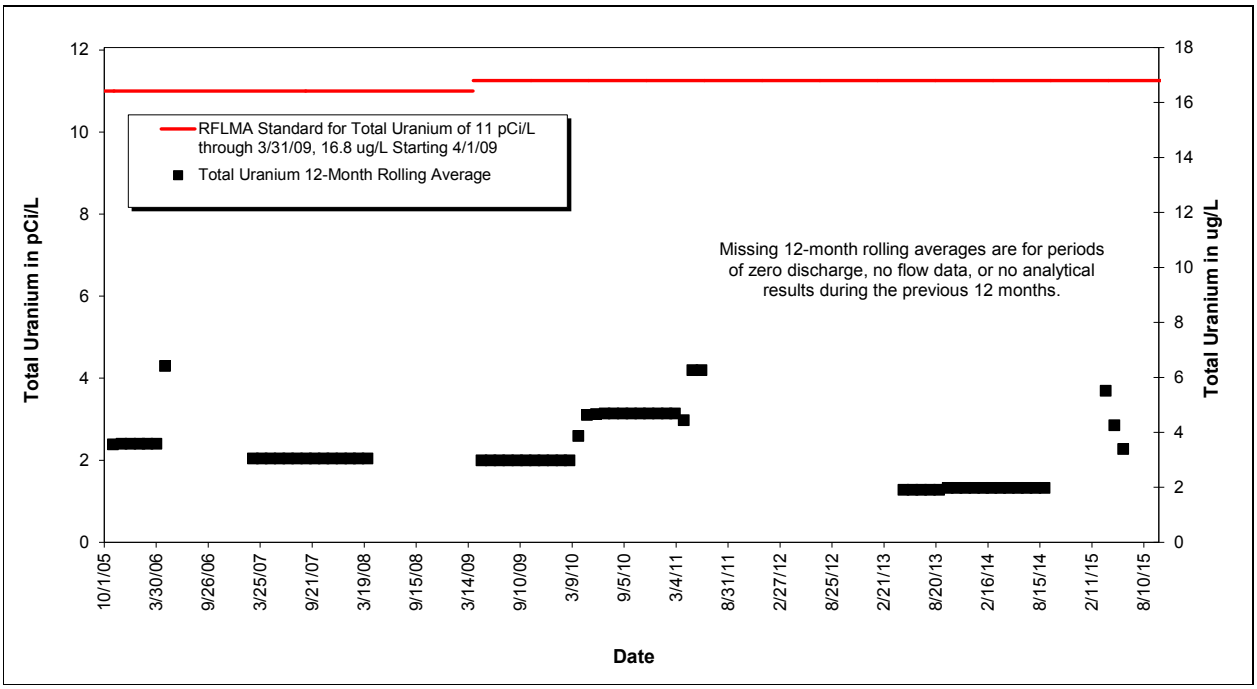
Note: The composite sample started on June 12, 2015, is still in progress. Therefore, the 12-month rolling averages after that date cannot be calculated.

Figure 18. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at SW027: Postclosure Period Ending Third Quarter CY 2015



Note: The composite sample started on June 12, 2015, is still in progress. Therefore, the 12-month rolling average after that date cannot be calculated.

Figure 19. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at SW027: Year Ending Third Quarter CY 2015



Note: The composite sample started on June 12, 2015, is still in progress. Therefore, the 12-month rolling average after that date cannot be calculated.

Figure 20. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at SW027: Postclosure Period Ending Third Quarter CY 2015

Table 1. CY 2015 Composite Sampling Results at SW027

Start Date and Time	End Date and Time	Am-241 Result (pCi/L)	Pu-239, 240 Result (pCi/L)	Uranium Result (µg/L)
3/6/2014 11:59	3/9/2015 13:00	NSQ[a]	NSQ[a]	NSQ[a]
3/9/2015 13:00	3/11/2015 12:57	0.030	0.116	5.92
3/11/2015 12:57	4/17/2015 17:50	0.030	0.139	4.04
4/17/2015 17:50	5/6/2015 12:42	0.040	0.251	3.78
5/6/2015 12:42	5/9/2015 12:43	0.169	0.887	3.45
5/9/2015 12:43	5/14/2015 9:56	0.034	0.306	3.07
5/14/2015 9:56	5/19/2015 14:13	0.068	0.432	3.17
5/19/2015 14:13	5/26/2015 16:32	0.109	0.501	3.55
5/26/2015 16:32	6/5/2015 10:37	1.260	5.590	2.19
6/5/2015 10:37	6/12/2015 14:51	0.321	1.520	3.05
6/12/2015 14:51	In progress	[b]	[b]	[b]

Notes:
[a] NSQ = non-sufficient quantity for analysis
[b] Sample in progress

The SW027 plutonium evaluation was performed in accordance with RFLMA Attachment 2, Figure 6, "Points of Evaluation," which resulted in a calculated 12-month rolling average concentration for plutonium on April 30, 2015, of 0.22 pCi/L. More recent 12-month rolling averages through May 31, 2015, continue to exceed the applicable RFLMA Table 1 standard of 0.15 pCi/L. Initial notification to the regulatory agencies and the public was made by email on June 18, 2015. RFLMA Contact Record 2015-05 (approved July 8, 2015), "Reportable condition for plutonium 12-month rolling average at Point of Evaluation (POE) SW027," provides a discussion of the monitoring results and recaps the outcome of the RFLMA Parties' consultation regarding the evaluation steps to be taken. This contact record is available on the Rocky Flats website: http://www.lm.doe.gov/Rocky_Flats/ContactRecords.aspx.

Contact Record 2015-05 describes the plan and schedule to address the reportable condition. The plan and schedule for evaluation and the status of actions related to the plan are described below.

- Evaluation of the steps taken in 2010 when it was anticipated the 12-month rolling average for plutonium would exceed the standard at SW027 as reported in CR 2010-06, "Monitoring Results at Surface Water Point of Evaluation (POE) SW027." This includes a review of "Status Report of Steps Taken Regarding Monitoring Results at Surface Water Point of Evaluation (POE) SW027," August 31, 2010, and "Calendar Year (CY) 2011 Status Report of Actions Taken in Point of Evaluation SW027 Drainage," January 2012.
- On June 17, 2015, Rocky Flats personnel walked the South Interceptor Ditch (SID) drainage area and identified opportunities to enhance the revegetation and erosion controls previously implemented in 2010 and 2011 (Figure 1 of CR 2015-05). Also during the June 17 inspection, limited areas in the SID showed evidence of local erosion and sediment deposition. Based on these general observations, a geotechnical engineer was scheduled to inspect the areas and provide recommendations.
- During the June 17 inspection, locations were identified for immediate installation of new wattles (Figure 2 of CR 2015-05); installation was completed on June 22, 2015.

- On June 29, 2015, geotechnical engineers, CDPHE, and Rocky Flats personnel walked down the SID to evaluate potential use of water and sediment management devices or structures. The geotechnical engineers will provide recommendations for water and sediment management in the SID. These recommendations will be implemented in the longer term as appropriate.
- Additional erosion control methods have been implemented in the SW027 drainage, predominantly on the hillside above GS51. These measures include matting, wattles, GeoRidge berms, and organic mulch. Several areas in the SID have also received erosion matting. This work was completed on August 20, 2015.
- Sampling will continue as currently scheduled when surface-water runoff is available.
- Status of the above items will be reported in quarterly and annual reports or both, depending on when the activities occur.

Downstream monitoring at WOMPOC continues to show plutonium concentrations below 0.15 pCi/L. Recent analytical results from WOMPOC are given in Table 2. The latest available 12-month rolling and 30-day average plutonium concentrations calculated from flow-paced composite samples are shown in Figure 9 and Figure 10.

Table 2. CY 2015 Composite Sampling Results at WOMPOC

Start Date and Time	End Date and Time	Am-241 Result (pCi/L)	Pu-239, 240 Result (pCi/L)	Uranium Result (µg/L)
3/9/2015 15:47	3/11/2015 13:28	0.003	0.006	1.30
3/11/2015 13:28	3/18/2015 12:44	0.002	0.006	1.58
3/18/2015 12:44	4/1/2015 10:53	0.002	0.005	2.28
4/1/2015 10:53	4/13/2015 13:13	0.005	0.007	2.72
4/13/2015 13:13	4/17/2015 13:22	0.005	0.005	1.75
4/17/2015 13:22	4/20/2015 11:08	0.011	0.030	1.55
4/20/2015 11:08	4/27/2015 11:12	0.006	0.011	1.30
4/27/2015 11:12	5/5/2015 10:25	0.006	0.010	1.62
5/5/2015 10:25	5/8/2015 13:22	0.003	0.016	1.37
5/8/2015 13:22	5/9/2015 16:04	0.017	0.084	1.23
5/9/2015 16:04	5/18/2015 16:25	0.006	0.015	1.28
5/18/2015 16:25	5/26/2015 16:49	0.003	0.018	1.65
5/26/2015 16:49	6/8/2015 15:22	0.008	0.057	1.50
6/8/2015 15:22	6/12/2015 16:52	0.021	0.045	1.85
6/12/2015 16:52	7/7/2015 14:41	0.008	0.011	2.36
7/7/2015 14:41	8/20/2015 11:58	0.003	0.010	1.85
8/20/2015 11:58	11/16/2015 14:03	0.000	0.001	2.98
11/16/2015 14:03	In progress	[a]	[a]	[a]

Notes:
[a] Sample in progress

3.1.3.3 Monitoring Location SW093

Monitoring location SW093 is on North Walnut Creek, 1,300 feet upstream of former Pond A-1. Figure 21 and Figure 23 show no occurrences of reportable 12-month rolling averages for plutonium, americium, or total uranium values during the quarter. Figure 22 and Figure 24 show sampling data from 2005 through the third quarter of CY 2015. The method for calculating the 12-month rolling averages is detailed in the annual report.

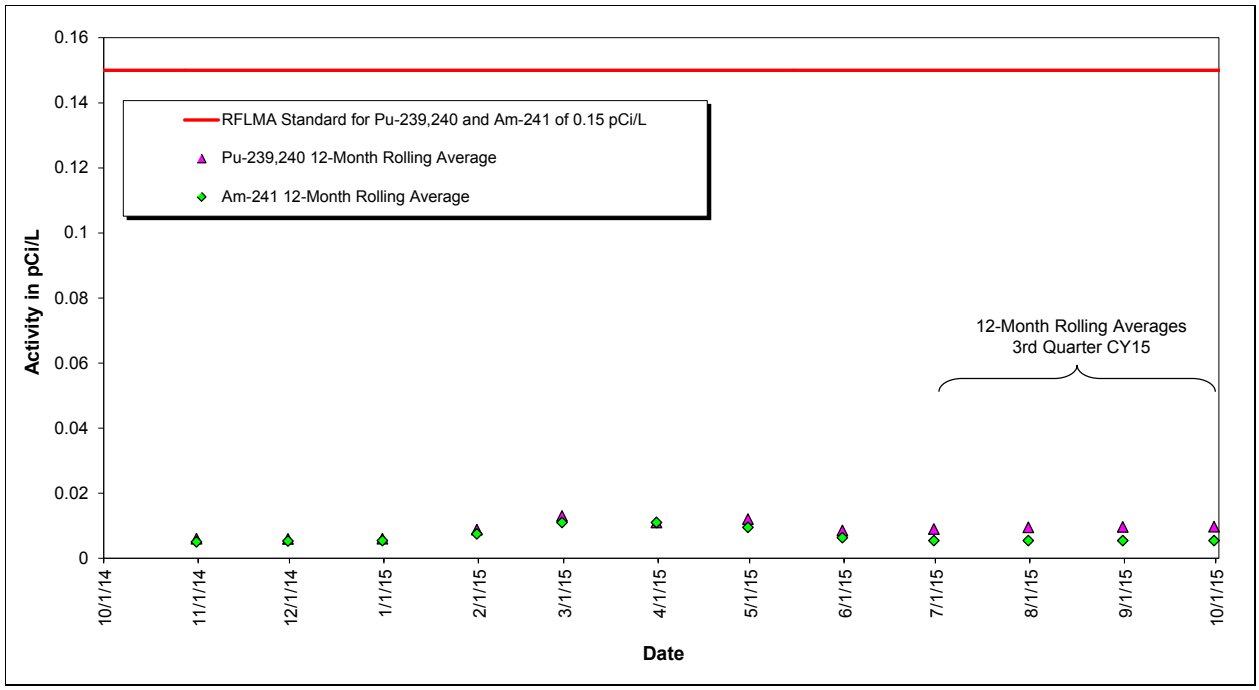


Figure 21. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at SW093: Year Ending Third Quarter CY 2015

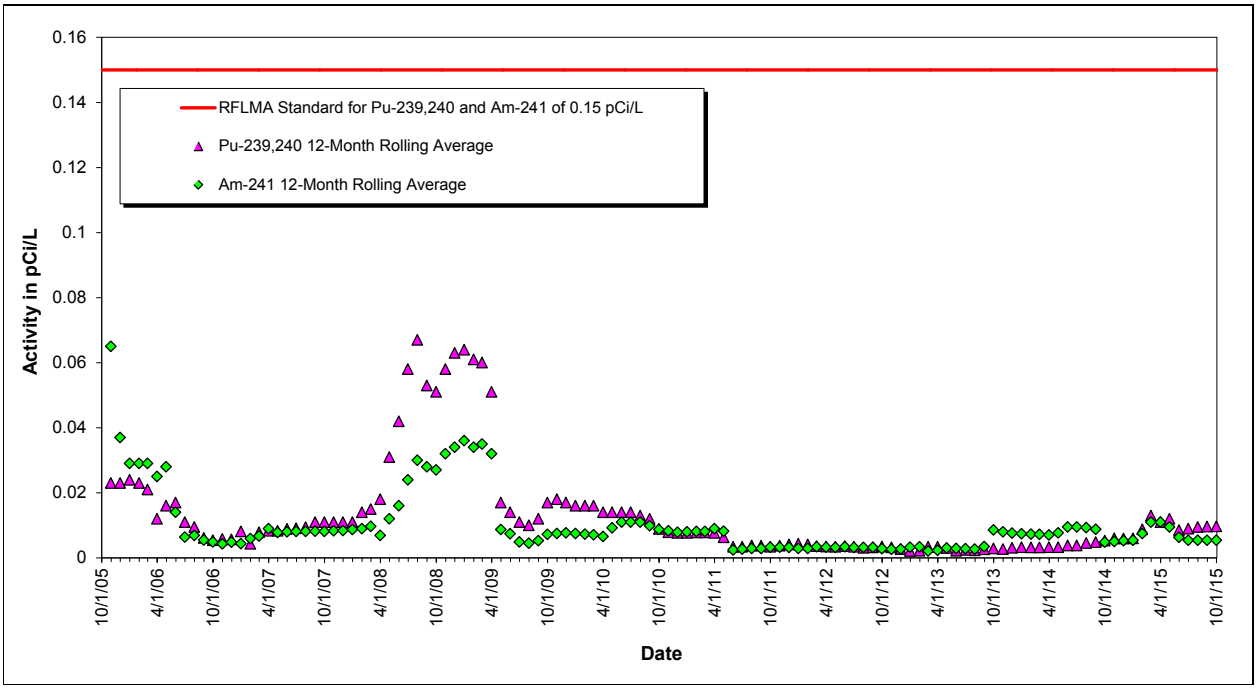


Figure 22. Volume-Weighted 12-Month Rolling Average Plutonium and Americium Activities at SW093: Postclosure Period Ending Third Quarter CY 2015

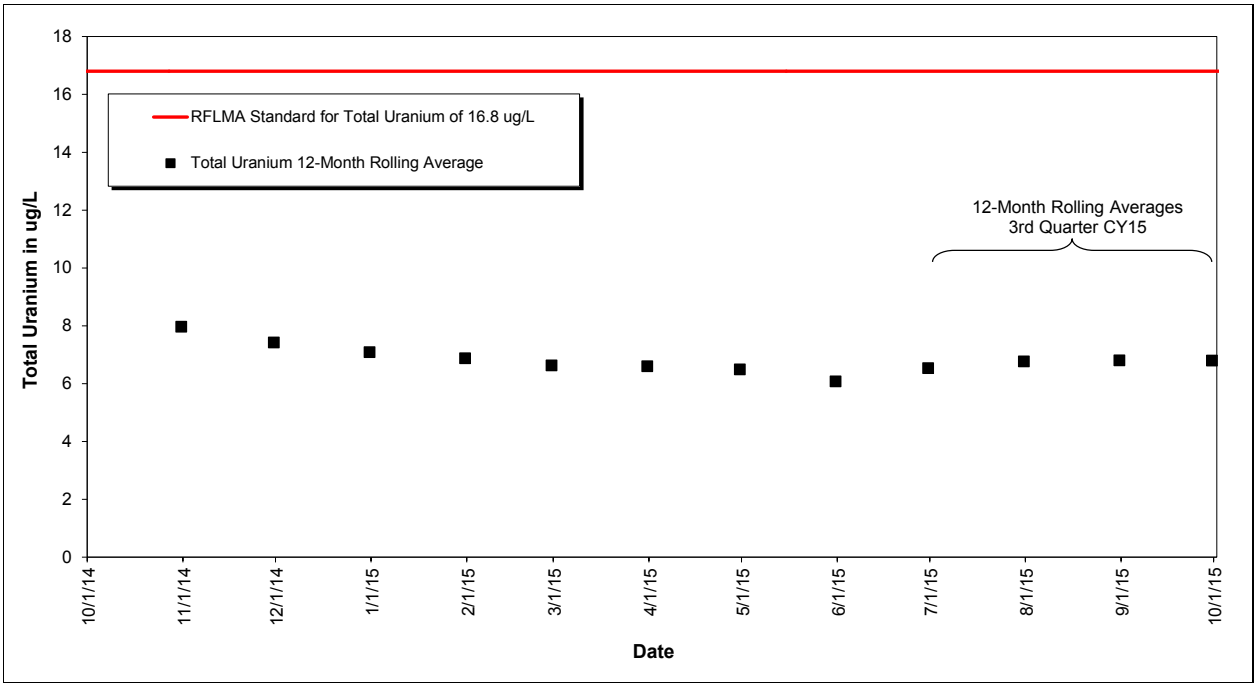


Figure 23. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at SW093: Year Ending Third Quarter CY 2015

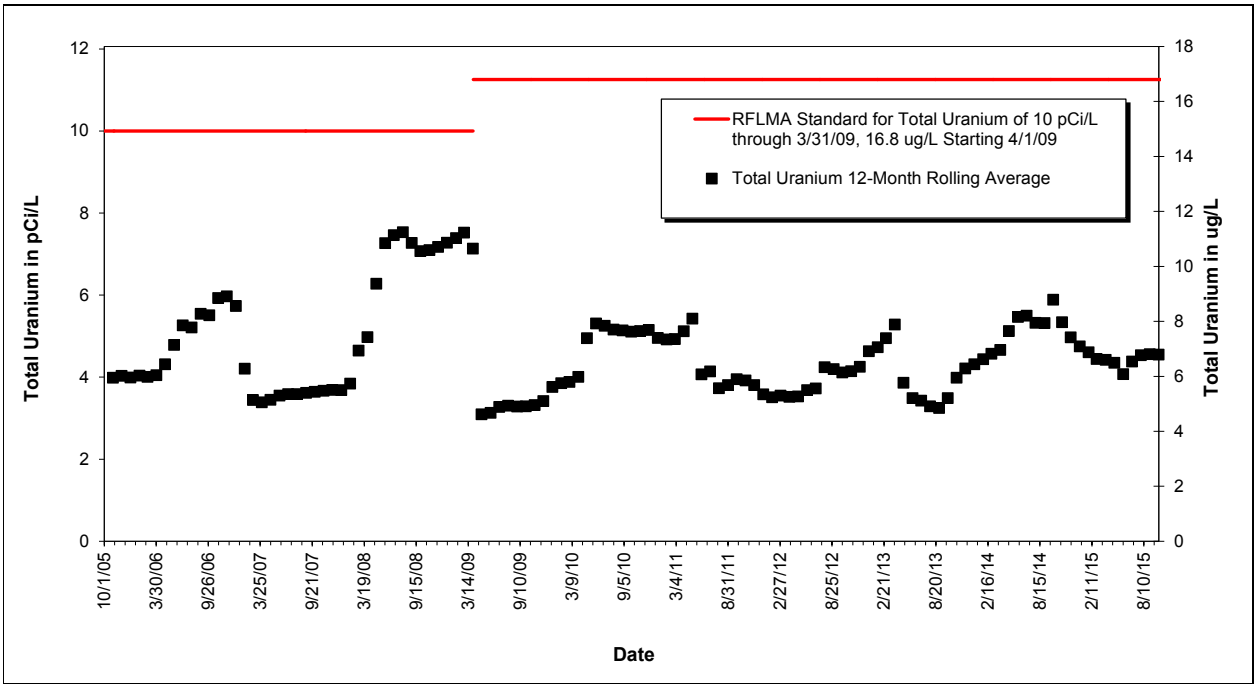


Figure 24. Volume-Weighted 12-Month Rolling Average Total Uranium Concentrations at SW093: Postclosure Period Ending Third Quarter CY 2015

3.1.4 AOC Wells and Surface Water Support Location SW018

Neither the AOC wells nor Surface Water Support location SW018 were scheduled for RFLMA monitoring in the third quarter of CY 2015.

3.1.5 Sentinel Wells

None of the Sentinel wells were scheduled for RFLMA monitoring in the third quarter of CY 2015.

3.1.6 Evaluation Wells

None of the Evaluation wells were scheduled for RFLMA monitoring in the third quarter of CY 2015.

3.1.7 PLF Monitoring

All RCRA groundwater monitoring wells at the PLF were sampled during the third quarter of CY 2015. Analytical results (Appendix B) were generally consistent with those of past samples and will be discussed and statistically evaluated as part of the annual report for CY 2015. Section 3.1.9.4 discusses monitoring the PLFTS.

3.1.8 OLF Monitoring

All RCRA groundwater monitoring wells at the OLF were sampled during the third quarter of CY 2015. Analytical results (Appendix B) were generally consistent with those of past samples and will be discussed and statistically evaluated as part of the annual report for CY 2015.

During the third quarter of CY 2015, when routine surface-water sampling was performed in Woman Creek downstream of the OLF (GS59), the mean concentrations for two analytes were above the applicable surface-water standards:

- The mean concentration of arsenic for the quarter was 10.6 µg/L (the RFLMA standard is 10 µg/L). In accordance with RFLMA protocols, sampling frequency was increased to monthly for the fourth quarter.
- The mean concentration of selenium for the quarter was 6.7 µg/L (the RFLMA standard is 4.6 µg/L). In accordance with RFLMA protocols, sampling frequency was increased to monthly for the fourth quarter.

3.1.9 Groundwater Treatment System Monitoring

As described in Section 2.3, contaminated groundwater is intercepted and treated in four areas of the Site. The MSPTS, ETPTS, and SPPTS include a groundwater intercept trench. Groundwater collecting in the trenches is routed through a pipe and then, at the MSPTS and SPPTS, into one or more treatment cells, where it is treated and then discharged to the subsurface; at the newly reconfigured ETPTS, the water is pumped through an air stripper for treatment, followed by discharge to the subsurface. The PLFTS treats water from the northern and southern components of the Groundwater Intercept System and water that flows from the PLF seep.

3.1.9.1 Mound Site Plume Treatment System

None of the MSPTS monitoring locations were scheduled for routine RFLMA sampling in the third quarter of CY 2015.

3.1.9.2 East Trenches Plume Treatment System

None of the ETPTS monitoring locations were scheduled for routine RFLMA sampling in the third quarter of CY 2015.

3.1.9.3 Solar Ponds Plume Treatment System

None of the SPPTS monitoring locations were scheduled for routine RFLMA sampling in the third quarter of CY 2015. However, nonroutine samples were collected, some to support the Adaptive Management Plan (DOE 2015c) and others to support continued testing of treatment components (microcells and pilot-scale lagoons). The associated results will be discussed in the annual report for 2015, together with additional information regarding these tests.

3.1.9.4 PLF Treatment System

Breaching of the PLF dam was completed in June 2012, and since then any PLFTS effluent flows through the remaining wetland area. This flow configuration is now essentially equivalent to the historical open valve configuration.

During collection of the July 9, 2015, sample at the system influent (monitoring location PLFSEEPINF), the flow rate was 1.74 gallons per minute. The routine quarterly effluent sample of the PLFTS (monitoring location PLFSYSEFF) collected on July 9, 2015, showed results for vinyl chloride, arsenic, and selenium that were above the applicable surface-water standards from RFLMA Attachment 2, Table 1, "Surface Water Standards." The individual results were as follows:

- The vinyl chloride concentration was 0.28 µg/L, exceeding the practical quantitation limit of 0.2 µg/L.
- The arsenic concentration was 18 µg/L, exceeding the standard of 10 µg/L.
- The selenium concentration was 14 µg/L, exceeding the standard of 4.6 µg/L.

According to RFLMA evaluation protocols, the metals results triggered an increase in sampling frequency from quarterly to monthly. Subsequent sampling at the increased frequency (August 5, 2015) showed arsenic and selenium as below the applicable standard and not detected respectively. Therefore, the metals sampling frequency returned to quarterly.

For the vinyl chloride, monthly sampling was initiated in the second quarter, continued into the third quarter, and culminated with the requirement to sample surface water leaving the former PLF pond area (location NNG01). Results from NNG01 were received on August 10, 2015, showing that vinyl chloride was not detected. Therefore, the VOC sampling frequency returned to quarterly.

All other analyte concentrations were below the RFLMA standards for the quarter.

3.1.10 Predischarge Monitoring

Predischarge samples are collected prior to opening the valves to initiate a discharge period at Ponds A-4, B-5, and C-2 on North Walnut Creek, South Walnut Creek, and Woman Creek, respectively.

No predischarge samples were collected at Ponds A-4, B-5, or C-2 during the third quarter of CY 2015. All three ponds have been operated in a flow-through configuration since September 2011.

4.0 Adverse Biological Conditions

No evidence of adverse biological conditions (e.g., unexpected mortality or morbidity) was observed during monitoring and maintenance activities in the third quarter of CY 2015.

5.0 Ecological Monitoring

During the third quarter of CY 2015, Preble's meadow jumping mouse (PMJM) mitigation monitoring, wetland mitigation monitoring, and revegetation monitoring were conducted. The PMJM monitoring data were summarized in the 2015 Preble's Meadow Jumping Mouse

Mitigation Monitoring Report for Biological Opinions at the Rocky Flats Site. That report was submitted to the U.S. Fish and Wildlife Service on November 19, 2015. The wetland mitigation monitoring was conducted to evaluate the status of selected mitigation wetlands. A portion of this data was summarized in a report that was submitted to the U.S. Army Corps of Engineers on December 17, 2015. The remainder of the data will be summarized in the annual report for CY 2015. Revegetation monitoring was conducted at several monitoring locations throughout the COU to evaluate the status of the revegetation parcels. These data will be summarized in the annual report for CY 2015. Other ecological monitoring conducted during the third quarter included weed mapping, vegetation mapping, wetland delineations, prairie dog surveys, forb nursery monitoring, and photopoint monitoring. The shrubs planted last spring as a habitat enhancement project will continue to be irrigated through the end of the growing season. Revegetation activities were conducted at several small locations. Approximately 145 acres were treated with herbicides during the third quarter to help control various noxious weed species.

6.0 References

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DOE (U.S. Department of Energy), 2012b. *Third Five-Year Review Report for the Rocky Flats Site, Jefferson and Boulder Counties, Colorado*, LMS/RFS/S07693, Office of Legacy Management, July.

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League of Women Voters -- Rocky Flats Cold War Museum -- Rocky Flats Homesteaders
Steven Franks

MEMORANDUM

TO: Stewardship Council Board
FROM: Rik Getty and David Abelson
SUBJECT: Original Landfill Briefing
DATE: January 19, 2016

We have scheduled one hour for DOE to brief the Board on the Original Landfill (OLF) history, monitoring data during cleanup, remedial actions taken to close the OLF, and post-closure monitoring and maintenance. DOE had planned to also brief on the engineer's report to help stabilize the OLF, but that report has been delayed and will now be discussed at the April meeting.

Executive Summary

- OLF operated from 1952-1968.
- It was a dump that was mostly used for construction debris, through some radioactive materials were disposed there.
- The remediation focused on hotspot removal, site grading, installation of a soil cover, and installation of a buttress near the bottom of the landfill. Berms were installed to move the water off of the landfill into channels.
- The OLF and surrounding areas are extensively monitored. Monitoring includes surface water and groundwater.
- After first calling for removal of the OLF to an off-site location, local governments, with the exception of Westminster, supported the remedial decision.
- Slumping at the landfill is a problem, and addressing the issues remains a priority action for DOE, the regulatory agencies, and others.

History of the Original Landfill

The following historical information is summarized from the March 2005 final regulatory decision document. The document, "Final Interim Measure/Interim Remedial Action for the Original Landfill" (IM/IRA), can be found at: http://www.lm.doe.gov/cercla/documents/rockyflats_docs/IA/IA-A-002617.pdf
Please note, this document is 300 pages, 20 Mb file size.

The IM/IRA final decision document is a requirement of federal CERCLA environmental cleanup regulations. It documents the final remedy selected for the cleanup of the OLF.

The OLF was basically a hillside dump that was used prior to the adoption of federal laws regulating the design, use and siting of landfills. The OLF is a 20-acre site located north of Woman Creek on a south-facing slope. Between 1952 and 1968, the year operations ceased at the OLF due to the opening of the Present Landfill, approximately 74,000 cubic yards (roughly 3,000 dump truck-equivalent loads) of solid waste consisting primarily of construction debris and general site waste was dumped there. The materials were contaminated or commingled with small amounts of hazardous constituents.

The waste was generally spread over the south-facing hillside and mixed with soil. The commingled waste and soil is estimated to be 160,000 cubic yards. Because of the slope angle and the geological mapping and characterization of the underlying surface, the OLF hillside was identified as being susceptible to sliding.

While called a "landfill," the OLF was not designed or operated as an engineered landfill. The OLF predates today's environmental laws, specifically the Resource Conservation and Recovery Act (RCRA), and thus does not have a number of key requirements that are required in today's landfills—e.g., there is no liner or other collection barrier, and the slope of the hillside exceeds slope angles found at regulated landfills.

What's in the Landfill?
The IM/IRA identifies the following:

- Asphalt from road construction (semi-volatile organic compounds; SVOC)
- Construction debris
- Street cleaning wastes
- Office and building debris
- Commonly used volatile organic solvents (VOC) used from 1952 to 1968 which may have been dumped are trichloroethene, carbon tetrachloride, 1,1,1-trichloroethane, dichloromethane, and benzene.
- Polychlorinated biphenyls (PCB) wastes such as carbonless copy paper, transformer and vacuum pump cleanup paper and small capacitors
- Metals such a beryllium, lead and chromium may also have been placed in the landfill

Additionally, a 1995 geotechnical investigation at the OLF reported the fill material included sheet metal, wood, broken glass, plastic, rubber, metal shavings, graphite sand, solid blocks of graphite, concrete, asphalt, and portions of 55-gallon steel drums. The waste fill ranged in thickness from 2 feet to over 11 feet.

In addition, in 1965 60 kilograms (kg) of depleted uranium (DU, U-238 isotope) were dumped in the OLF after the DU, which was left on a pallet, reportedly ignited on a truck flatbed. DU metal, especially small machine turnings, can pyrophorically ignite in air. When discussing the cleanup options, the community was told that the DU was probably covered with soil to

extinguish the fire. Efforts were later made to retrieve the DU; 40 kg of the original 60 kg were recovered.

Finally, as stated in the IM/IRA, there is no information indicating that the OLF was used for routine disposal of radioactive or other hazardous substance waste streams. The reason is that during the period of operation (1952-1968), several other areas at Rocky Flats were used for the management and disposal of hazardous wastes, including radioactive wastes. One site was the 903 Pad where 5,000 drums of liquid machining wastes contaminated with plutonium and uranium were stored outside, ultimately leaking and spreading radioactive contamination. The other large waste storage and disposal area was the East Trenches. There were 14 trenches; a wide variety of radioactive and hazardous wastes were buried in them. (For more detail see the Rocky Flats Coalition of Local Governments IHSS briefing summary on the East Trenches at: http://www.rockyflatssc.org/residual_contamination/IVV_East_Trenches_brief_summary_1_06_rev_0-1.pdf)

OLF Remediation Decision

The IM/IRA evaluated four cleanup alternatives to address direct contact with the waste material, control stormwater and erosion, and address the structural stability of the OLF. The alternatives evaluated were:

- Alternative 1: No action (required by law)
- Alternative 2: Removal of surface soil hotspots and site grading with a soil cover
- Alternative 3: Same as Alternative 2, plus a buttress at the base of the OLF
- Alternative 4: Removal and off-site disposal of wastes placed at the OLF

CERCLA requires that each alternative be evaluated for effectiveness, implementability, structural stability, and cost.

Alternative 3 was selected for the following reasons: (quoting from the IM/IRA)

- The surface soil areas with uranium concentrations that exceeded the regulatory action levels were removed in August 2004.
- A soil cover will eliminate the exposure and direct contact of the waste materials.
- Regrading will eliminate the ponding of stormwater at the surface and provide for positive runoff and control of stormwater.
- Regrading will also eliminate surface soil sloughing and erosion, and provide a structurally stable area to contain the waste materials.
- Construction of the buttress at the toe of the slope will increase stability and thus safety.
- The proposed action will not permanently negatively impact Preble's Meadows Jumping Mouse (federal endangered species) habitat or Woman Creek.
- The action is cost effective since the OLF is not a significant source of contamination to the environment.

Monitoring Before and During Closure

The IM/IRA reports the following pre-remediation soil and water sampling for the OLF and neighboring areas:

- Surface soil: 7,548 validated analyses from 70 surface locations
- Borehole samples to bedrock: 24,964 validated analyses from 175 soil samples
- Groundwater: 31,171 validated analyses from 213 samples from 50 wells
- Surface water: 25,384 validated analyses from 15 locations.

Pre-remediation investigations also included geotechnical evaluations, hydrogeologic testing, storm sewer sampling, and air monitoring. Other pre-remediation investigations conducted in the same time frame included the following:

- field instrument detection of low energy radiation and high purity germanium gamma radiation surveys to detect and identify near-surface areas of contamination from radioactive materials
- magnetometer survey to locate ferrous materials and anomalies
- electromagnetic survey to delineate dump boundaries, saturated materials, and anomalies
- cone penetrometer test to gather geotechnical information of the waste fill alluvium and bedrock
- soil gas survey for VOCs and combustible gases to locate possible sources of these constituents.

South Interceptor Ditch (SID)
Completed in 1980, the SID intercepted and transported surface runoff water from the southern portion of the industrial area into Pond C-2. The surface runoff drainage area associated with the SID is 192.6 acres.

The SID is approximately 1.45 miles in length (7700 ft.) with the west segment comprising 0.30 miles, the central segment 0.70 miles and the east segment 0.45 miles. The original channel width increases from 5 ft. to 15 ft. from the west segment to east segment respectively. The original channel depth including freeboard was approximately 4 ft. to 8 ft. from the west segment to east segment, respectively.

The western segment of the SID ran through the middle of the OLF near Woman Creek. The OLF remediation project covered up the SID segment that ran through the OLF.

As provided in the IM/IRA, pre-remediation characterization was performed on both SID surface water and sediments. There were three surface water monitoring locations along the SID as it passed through the OLF. The western-most and eastern-most locations were contaminated with U. Otherwise SID and Woman Creek surface water immediately downgradient of the OLF had very low frequencies of analyte concentrations above the surface water regulatory levels.

Local Governments' Views on the Closure
During the early discussions of what to do with the landfill, the local governments pressed for DOE digging up the landfill and shipping the material to off-site locations. That was not done for two primary reasons: (1) worker safety and (2) DOE did not want to set a precedent that would lead to increased costs at other facilities undergoing cleanup.

Knowing that our goal would not be achieved, the local governments took a different approach. The Stewardship Council's predecessor in interest, the Rocky Flats Coalition of Local Governments, was comprised of Boulder, Boulder County, Superior, Westminster, Broomfield, Arvada and Jefferson County. All of the governments with the exception of Westminster supported the remedial action, provided there was a comprehensive post-closure monitoring network and a mechanism to revisit the remedy and adopt additional remedial actions should the remedy not work. Westminster disagreed and pressed for DOE to install a RCRA hazardous waste cap.

Why No RCRA Cap?

As noted earlier, the Atomic Energy Commission, DOE's predecessor, ceased using the OLF in 1968. RCRA and CERLCA (Superfund) did not become law until 1986. Accordingly, DOE, EPA and CDPHE determined that a RCRA closure (and thus a RCRA cap) was not required under law.

A central reason why the majority of the Coalition governments supported DOE's plan and opposed installing a RCRA cap was that to meet the required slope angles, the cap would cover Woman Creek. The Coalition believed it was unwise to re-route Woman Creek or have a creek flow under a portion of the cap. The secondary concern was the negative impact of the additional weight of a RCRA cap due to the angle of the landfill and underlying slope instability issues.

Post-closure OLF monitoring and maintenance

Monthly OLF inspections commenced in 2005, but unlike the Present Landfill which had its inspection frequency dropped from monthly to quarterly, stability issues since 2007 have required the OLF monthly inspections, as well as after precipitation events exceeding one inch of water (rain) or water-equivalent (snowmelt) over a 24 hour period.

There have been numerous instances of slumping, subsidence and seep formation at the OLF since 2007. Numerous repairs have been made to the OLF in an attempt to promote water drainage off the surface and minimize slumping and subsidence.

In addition to the maintenance, several OLF geotechnical evaluations have been conducted. The most significant OLF damage has occurred in 2015, and as discussed at Stewardship Council meetings, DOE has contracted for an independent engineer's analysis to propose measures to protect the stability of the landfill.

The current post-closure water monitoring network for the OLF consists of the following:

- Surface water monitoring station GS5 located upstream from the OLF on Woman Creek
- RCRA groundwater well P416589 located upgradient from the OLF on the pediment above the OLF
- Surface water monitoring station GS59 located downstream from the OLF on Woman Creek

- RCRA wells 80005, 80105, 80205, located downgradient from the OLF near the buttress at the base of the landfill, and Area of Concern (AOC) well 11104 located slightly east of those downgradient RCRA wells

Based on extensive characterization data obtained prior to the OLF remediation, the surface water and groundwater is monitored for metals, VOCs, and U as required by the RFLMA.

We've been told that all of U in water samples is naturally occurring. The following are 2015 validated sampling results for U in the area of the OLF. The site-specific standard for water leaving the DOE-controlled lands is 16.8 ug/l. We thought it helpful to share this data so that you are reminded of the recent values.

Type of Sample/ Location	1st Quarter 2015	2nd Quarter 2015	3rd Quarter 2015
Surface water: GS05 (upstream of OLF)	4.08 ug/l	2.2 ug/l	0.71 ug/l
Groundwater: P416589 (upgradient of OLF)	1.8 ug/l	1.7 ug/l	1.7 ug/l
Surface water: GS59 (downstream)	0.79 ug/l	1.27 ug/l	1.9 ug/l
Groundwater: RCRA well 80005 (downgradient)	9.2 ug/l	8.1 ug/l	10 ug/l
Groundwater: RCRA well 80105 (downgradient)	14 ug/l	18 ug/l	12 ug/l
Groundwater: RCRA well 80205 (downgradient)	62 ug/l	66 ug/l	72 ug/l
Groundwater: RCRA well 11104 (downgradient)	Not sampled	28 ug/l	Not sampled

Please contact us if you have any questions.