ROCKY FLATS STEWARDSHIP COUNCIL
Monday, February 3, 2020, 8:30 – 11:15 AM
Rocky Mountain Metropolitan Airport, Terminal Building, Mount Evans Room
11755 Airport Way, Broomfield, Colorado

Board members in attendance: Nancy Ford (Arvada), Sandra McDonald (Alternate, Arvada), Matt Jones (Director, Boulder County), Deven Shaff (Director, Broomfield), Heidi Henkel (Alternate, Broomfield), David Allen (Alternate, Broomfield), Jim Dale (Director, Golden), Libby Szabo (Director, Jefferson County), Joyce Downing (Director, Northglenn), Shelley Stanley (Alternate, Northglenn), Mark Lacis (Director, Superior), Jan Kulmann (Director, Thornton), James Boswell (Alternate, Thornton), Kathryn Skulley (Director, Westminster), Rich Seymour (Alternate, Westminster), Jeannette Hillery (Director, League of Women Voters), Linda Porter (Alternate, League of Women Voters), Roman Kohler (Rocky Flats Homesteaders), Murph Widdowfield (Rocky Flats Cold War Museum), Kim Griffiths

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

Attendees: Scott Surovchak (DOE-LM), Andy Keim (DOE-LM), Gwen Hooten (DOE-LM), Karen Edson (DOE-LM), Kristen Holmes (DOE-LM), Linda Kaiser (Navarro), Hanna Bolton (Navarro), Nicole Lachance (Navarro), Chris Stewart (Navarro), Jody Nelson (Navarro), Ryan Wisniewski (Navarro), John Boylan (Navarro), George Squibb (Navarro), Jennifer Opila (CDPHE), Rob Beierle (CDPHE), Jim Grice (CDPHE), Lindsey Archibald (CDPHE), Laura Dixon (CDPHE), Jeremy Rodriguez (Rep. Perlmutter), Ryan Hanson (Sen. Gardner), Dan Miller (Colorado Department of Law), Ralph Sudowe (CSU), Carl Spreng, Max Dodson

Convene/Agenda Review: Vice Chair Jan Kulmann convened the meeting at 8:40 a.m. The first order of business was introductions of Board members and the audience.

Public Comment: None

Elect Stewardship Council Officers for 2020: Joyce Downing took over as Chair of the meeting. The current Board Officers—Joyce Downing as Chair, Jan Kulmann as Vice Chair, and Jeannette Hillery as Secretary Treasurer—all expressed interest in continuing in their positions. Joyce asked if anyone else was interested in serving in one of these positions. No one responded, so the Board moved to a vote.

Mark Lacis moved to approve Joyce, Jan and Jeannette as Officers. The motion was seconded by Kim Griffiths. The motion passed 11-0.

2020 Meeting Schedule and Notice Provisions: David noted that the proposed 2020 meeting schedule was the same as previous years, except for the June meeting, which will be the second Monday due to conflicts.

Jeannette Hillery moved to approve the 2020 Meeting Schedule and Notice Provisions. The motion was seconded by Jan Kulmann. The motion to accept the minutes and checks passed 11-0.

Consent Agenda: The consent agenda included approval of the minutes from the November 18, 2019, meeting and the checks written since then. David Allen offered one edit to the November meeting minutes. This change referred to the vote count for new member appointments.

Mark Lacis moved to approve the November Board minutes as amended and the checks. The motion was seconded by Jan Kulmann. The motion to accept the minutes and checks passed 11-0.

Executive Director's Report: David introduced the five new Board members for 2020. He noted that Matt Jones was the only elected official who was with the Stewardship Council during cleanup, though at that time he was staff for the City of Boulder. He highlighted how this turnover impacts the upcoming briefings regarding cleanup levels and the Board's understanding of these complex concepts.

David explained that the RFSC works off a five-year DOE Grant, with annual approval of its funding package. The annual amount is $139K. He said he was expecting funding approval from DOE within the week. He also noted that, although not required, the Stewardship Council undergoes an annual financial audit. This audit will be presented at the June meeting.

He went on to note three ongoing sampling efforts related to Rocky Flats: 1) Fish and Wildlife Service related to new trails, 2) Jefferson County Parkway Authority related to road construction, and 3) local governments related to Federal Lands Access Program (FLAP) grant. He said Broomfield was also doing its own independent sampling. He said all these efforts combined for 450 samples, using the same protocols and the same company doing the analysis. Out of all the samples, just one sample (part of Parkway Authority sampling) was above historic norms, and many are below. David said he would be surprised if any of this changed the risk profiles for Rocky Flats. He noted that many constituents are deeply afraid of Rocky Flats, and the fact that the data does not support this fear does not diminish their fear. Data, he noted based on risk communication studies, cannot be used to argue emotion. He advised that this fear needs to be acknowledged but does not necessarily lead to a change in agency decisions.

Kathryn Skulley asked if there was any way to help her constituents feel better or safer. David said there was no good answer, but that the most important thing for local government officials to do was to listen. He said fortunately citizens have a choice about whether they ever want to go onsite. Joyce Downing said she also encourages people who are concerned to come to the meetings and to learn more. Mark Lacis pointed out that the data can never be 100%, and therefore we can never identify every single hotspot. He highlighted the need to balance decisions and risk tolerance. Kim Griffiths said it appeared to her that opposing opinions are given equal weight in terms within the Stewardship Council. Libby Szabo pointed out the need to be careful to convey to constituents not to be afraid of every television sound bite, but to do research and learn more about the full picture.

Host DOE Quarterly Meeting: DOE was on hand to brief the Board regarding site activities for the third quarter of 2019 (July-September). The full report was posted on the DOE Legacy Management website. Activities included surface water monitoring, groundwater monitoring, ecological monitoring, and site operations (inspections, maintenance, etc.).

Surface Water Monitoring – George Squibb
George began with a quick review of the monitoring requirements, a map of locations and monitoring sites, what constituents they monitor.

At the Original Landfill (OLF), routine surface water sampling in Woman Creek downstream of the OLF (GS59) showed mean concentrations for all analytes below applicable RFLMA water-quality standards. At the Present Landfill (PLF), routine sampling showed concentrations for all analytes below applicable RFLMA water-quality standards.

At location SW027, the 12-month rolling average plutonium concentrations were reportable through April 2019. The average was calculated from a single sample collected in 2018 with 0.16 picocurie per liter (pCi/L) plutonium (the standard is 0.15 pCi/L). See RFLMA Contact Record 2019-01 for more information. There was no flow in 2019 until May 28. The composite sample started on May 28 was still in progress through the end of the quarter. Concentrations at the downstream Woman Creek Point of Compliance (WOMPOC) were not reportable.

No other Point of Evaluation (POE) analyte concentrations were reportable during the quarter, and no Point of Compliance (POC) concentrations were reportable during the quarter.

Kim Griffiths said it appeared that the remedy was working based on sampling results and asked if that was correct. George responded the remedy was working, and that DOE occasionally sees results above the regulatory standards, but that there was a process in place to mitigate when necessary. Kim then asked what would be observed if the remedy was not successful. George said he does not presume to know what we expect to see, but let the monitoring show DOE how to respond. Heidi Henkel asked what was involved with maintaining compliance, and whether this included the financial feasibility of any potential action. George said that agency consultation about possible actions could involve financial decisions, such as a cost-benefit analysis, and that the standards take this into account as well. He noted that many site-specific standards are lower than state standards. David Abelson added that the site water quality standard for plutonium is 100 times stronger (i.e., more protective) than the federal drinking water standard. George noted that Rocky Flats also has water quality standards comparisons at the Points of Evaluation that are not necessarily an indication that the remedy is not protective, but instead trigger consultation among the agencies.

Mark Lacis asked if the site had drawn any conclusions about the affect of weather on sampling results. George said that it depends on the constituent. For example, plutonium attaches to soil so that would affect what they see based on weather conditions. He said uranium mobility was based on groundwater seepage. In that case, lots of runoff brings the groundwater concentrations down as there is reduced seepage into the ground. Kim Griffiths asked if proposed changes to NEPA would affect Rocky Flats. David Abelson said this could apply to trails and a visitor center in the Refuge. Shelley Stanley asked if there was water at SW027 after May. George said there was just a small amount in June. David Allen asked George to explain the difference between grab samples and flow-paced sampling. George said a grab sample is just a manual sample where someone goes to the area and collects water into a sample container. A flow-paced sample involves an automated system that is set by personnel to pull samples based on the flow rate and sampling progress is delivered via telemetry. Scott Surovchak asked George to review the site monitoring system a bit more, focusing on SW027. George explained how different locations have different conditions (slope, wetlands, directions they face, etc.) and these serve to inform the interpretation of the sampling results.

Public Comment: None

Groundwater Monitoring – John Boylan
John first reviewed the RFLMA monitoring network, which includes:

- 10 Resource Conservation and Recovery Act (RCRA) wells (sampled quarterly to evaluate potential impacts from OLF and PLF)
- 9 Area of Concern (AOC) wells and one Surface Water Support location (sampled semiannually). These are in drainages downstream of contaminant plumes and are evaluated for plumes discharging to surface water
- 27 Sentinel wells (sampled semiannually). These are downgradient of treatment systems, edges of plumes, and in drainages, and are used to look for plumes migrating to surface water and treatment system problems
- 42 evaluation wells (sampled biennially – will occur second quarter 2020). These are located within plumes, near source areas, and interior of Central Operable Unit (COU) and are used to evaluate whether monitoring of an area or plume can cease
- 9 treatment system locations (seven are sampled semiannually, and two are quarterly)

During the quarter, only the 10 RCRA wells (at OLF and PLF) were sampled. Results were generally consistent with previous data. Data will be evaluated as part of the 2019 annual report.

Routine maintenance was performed at all three treatments systems: East Trenches Plume Treatment System (ETPTS), Solar Ponds Plume Treatment System (SPPTS), and Present Landfill Treatment System (PLFTS). An external outlet was added at SPPTS, so now they can use a generator to charge the batteries if solar is insufficient. They also finished installation of bird netting over the SPPTS "Big Box". At the Mound Site Plume Collection System (MSPCS), a transfer line from MSPCS to ETPTS was repaired. A valve was found to have been crushed by elk traffic.

Shelley asked whether there was a floating system to keep bacteria warm enough to work at the SPPTS. John said there were floating tiles to reduce heat loss since the water cannot be heated due to lack of utilities onsite. John was asked what the surface water support location was. He said they do grab sampling there, and it has never been reportable. Deven Shaff asked what potential impacts were being looked for with RCRA wells at the landfills. John said they look at a suite of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polynuclear aromatic hydrocarbons (PAHs), and uranium/metals. Deven asked what is done with any uranium that is found. John said that it is in groundwater and is dissolved. Nothing needs to be done with it, since the levels are not above RFLMA levels. Deven asked about the contaminant plumes. John pointed him to a map in RFLMA. Most are chlorinated solvents, then nitrates and small area of uranium contamination. At times when it would be helpful, the site does a type of analysis that differentiates natural vs manmade uranium.

Public Comment: None

Site Operations – Linda Kaiser
Quarterly Sign Inspections are a physical control under RFLMA. Signs were inspected on August 12, 2019 and all were in good condition and legible.

At the OLF, monthly and weather-related inspections were conducted on July 18, August 20, and September 17, 2019. They observed a tension crack and two small holes above Berm 4. These will be addressed by the stabilization subcontractor. During a weather-related inspection on July 3, minor sediment buildup behind erosion controls was removed.

Settlement monuments were surveyed on September 3, 2019. Vertical settling was within design limits. The slope stabilization design was completed on May 6, and the construction notice to proceed was issued August 26. Mobilization and site preparation took place for the slope stabilization project in September. As part of the slope stabilization project, they are inserting large concrete anchor blocks. As of the date of the briefing, about 100 of 263 of these were complete.

Also, at the OLF, the East Subsurface Drain continues to function as designed. The Seep 10 siphon operated during quarter. Approximately 1,410,000 gallons was diverted since seasonal startup in March 2019. This water would historically surface, flow downgradient, and then saturate and potentially destabilize the slump area as it flowed to the East Perimeter Channel. The temporary groundwater intercept system operated during most of the quarter and was shut down on September 25 due to construction activity in the area. Since seasonal startup on May 17, approximately 222,000 gallons were diverted.

At the PLF, the quarterly inspection took place on August 14 and a weather-related inspection was performed on July 3.

Site road maintenance was conducted from July 15 to August 1, 2019. 4.2 miles of primary gravel roads were regraded, and dust suppressant was applied. Three curves near the OLF were widened to allow passage of trucks. Several two tracks were also maintained, and water bars were added to the ETPTS road to minimize future rutting.

At the North Walnut Creek Slump, data collection from piezometers was continued where possible. Slump monitoring points were surveyed on July 3, August 8, and September 3. Maximum movement since baseline (September 5, 2017) was approximately 2 feet vertically. Scarp crack largely remained closed due to elk traffic in the area but were open 1/4 to 1/2 inch in places. Small cracking continued in the Interceptor Trench System Sump access road. Quarterly activities also included construction of a surface water diversion channel upgradient of the SPPTS road, with improvement/ realignment of rock crossings.

Site Ecology – Jody Nelson
Jody reported that ecology activities during the quarter included:

- Preble's mouse mitigation monitoring
- Wetland mitigation monitoring
- Revegetation monitoring
- Forb nursery monitoring
- Weed mapping
- Prairie dog surveys (no active towns in COU)
- Shrub/tree survival counts
- Photopoint monitoring
- Project support

Matt Jones asked if there were any concerns about overpopulation of elk. Jody said there are about 250 in the herd and that USFWS is looking at this. Scott Surovchak said that USFWS has tagged two elk so far (looking to do more) and are looking at how they use the area.

DOE Briefing on the Cleanup Levels and Protectiveness of the Remedy: Scott Surovchak briefed on the basis for the cleanup, the decision to delist the lands that now comprise the Refuge and transportation corridor from CERCLA, risk, and related issues. This conversation is foundational to CDPHE's April 2020 briefing on soil sampling by the Jefferson Parkway highway authority.

Scott began by explaining Rocky Flats' history as a key site in the U.S. nuclear weapons complex from 1951 through 1989. The site was comprised of a 385 acre "Industrial Area", surrounded by a 6,200 acre "Buffer Zone". During production years, most of the contamination was inside the buildings; however, some contamination was also released outside of the buildings. Scott also described the type of metal/machining work that was conducted including the use of protective gloveboxes.

In 1989, plutonium operations at Rocky Flats were suspended. Cleanup and closure took place between 1994 and 2005, and included environmental remediation, building decommissioning and decontamination (D&D) and building demolition. Scott's presentation included photos taken during cleanup. Scott noted that significant DOE complex integration was required to support Rocky Flats closure, as waste from cleanup and demolition were shipped to various sites across the U.S. for disposal and/or re-use.

Scott highlighted the environmental configuration of the site once all cleanup had concluded, including two primary surface water drainage pathways (Woman Creek and Walnut Creek). He also noted that the Rocky Flats does not impact any groundwater drinking water sources, although its shallow groundwater layer is a potential transport pathway.

Historic contamination at Rocky Flats includes:

Radionuclides
- Plutonium (Pu)
- Americium (Am)
- Uranium (U)

Other contaminants
- Metals
- Nitrate
- Organic compounds (solvents)

During cleanup, efforts were made to understand potential offsite plutonium contamination. Numerous studies collected offsite samples. Some sample results immediately east of the site are above background levels (highest = 6.5 pCi/g; most are near background). Concentrations west, north, and south of the site are within range of background.

The final regulatory decision for Operable Unit 3 (offsite areas) determined that no cleanup action was necessary to protect human health or the environment because contaminant levels were so low. Scott noted that this decision was based on a 3-volume RCRA Facility Investigation/Remedial Investigation report that provided data on surface water, groundwater, surface soil, subsurface soil, sediments, and air. See Volume I:
http://www.lm.doe.gov/cercla/documents/rockyflats_docs/OU03/OU03-A-000465.pdf

In terms of onsite plutonium contamination, more than 7,200 locations have been sampled since June 1991. More than 220,000 results were used to evaluate the nature and extent of surface-soil contamination. Air monitoring at the site was done to monitor for potential releases. That included effluent monitoring (monitoring emissions in exhaust from building stacks and vents), and ambient monitoring (concentration of contaminants measured in the "outside" air—onsite, at the perimeter, and in the communities). Monitoring equipment was upgraded periodically as regulations changed and science and technology advanced. Scott displayed maps of the monitoring locations, both onsite and offsite.

Air samplers collected not only site-derived radionuclides, but also naturally occurring and background radionuclides (particularly uranium isotopes). As a result, naturally occurring uranium made up most of the reported annual measured dose. All historical data were shown to be significantly under the relevant standard and support the exclusion of air monitoring from the current monitoring program.

The Actinide Migration Evaluation (AME) Panel was formed in 1996 to develop a scientific understanding of actinide transport at the site and help guide cleanup decisions based on science. These independent experts were asked to:

- Carefully examine site data
- Direct collection of new data
- Recommend and perform experiments and analyses with computer models (numerous studies conducted)
- Help to quantify actinide migration pathways (air, biological, surface water, groundwater)

The AME Pathway Analysis Summary Report can be found at:
http://www.lm.doe.gov/cercla/documents/rockyflats_docs/SW/SW-A-004544.PDF

Scott next spoke about the concept of risk, and reviewed radiation risks. He explained the CERCLA risk model, which looks at the additional risk of developing cancer, based on certain exposure scenarios. The target risk range is to keep additional cancer risk to an individual to 1 in 10,000 to 1 in 1,000,000. people. In Colorado, currently 50% of men and 1/3 of women get cancer during their lifetime.

In 2003, the Rocky Flats Cleanup Agreement (RFCA) modifications included the establishment of Radionuclide Soil Action Levels (RSALs) and the procedures for applying them. Action levels are numeric levels that, when exceeded, trigger an evaluation, remedial action, and/or management action. These levels were set by the agencies, based on input from:

- AME advisory group
- Stakeholder Focus Group
- RSALs Oversight Panel
- RSALs Working Group
    - Regulatory analysis
    - Computer modeling
    - RSAL calculations
    - New scientific information
    - Determining cleanup levels at other sites

Scott reviewed some key points about the RSALs. They were based on risk-based approach:

- Lifetime excess cancer risk: 0.00001 (or 1 x 10^{-5})
- Calculations include exposure time, exposure scenarios

The levels were based on input from multiple working groups, Citizen organizations and computer models. The RFCA parties agreed to require actions for soils with plutonium activity levels greater than 50 pCi/g (although the actual risk-based calculated value was much higher, 116 pCi/g).

An accelerated action process was created under RFCA. Individual Hazardous Substance Sites (IHSS) were investigated and characterized using EPA-approved methods in accordance with RFCA. Contaminated soil was excavated, packaged, and removed. Remedial actions were completed and documented, then reviewed by regulatory agencies. Approved actions were compiled in the HRR (The HRR is Appendix B of the RCRA Facility Investigation – Remedial Investigation/Corrective Measures Study – Feasibility Study Report for the Rocky Flats Environmental Technology Site).

Scott reviewed several of the cleanup projects, including 903 Pad, which was the primary source of plutonium and americium in surface soil. During the 903 Pad soil remediation project, tents were used to enclose excavation areas. 32,000 tons of soil was removed, including 900 grams of plutonium. Clean fill dirt was then added on top. Air and water quality were continually compliant throughout the work. This project was completed in December 2003. Cleanup of the 903 Lip Area (east of 903 Pad) was done to remove soil in concentrations greater than 50 pCi/g. The area was approximately 34 acres. Stringent dust and erosion controls were used. This project was completed in September 2004.

The overall site remedy included two distinct groupings:

1. Central Operable Unit (COU). This area includes the former production area, the ponds and the two landfills. Response actions include: Institutional controls, physical controls, and continued monitoring (because of residual contamination and to protect the remedy from human intrusion).
2. Peripheral Operable Unit (POU). This area, now the Rocky Flats National Wildlife Refuge, largely includes much of the former Buffer Zone. The area is suitable for unlimited use and unrestricted exposure (based on conservative exposure assumptions).

The Corrective Action Decision/Record of Decision for Rocky Flats Plant (USDOE) Peripheral Operable Unit and Central Operable Unit (CAD/ROD) can be found at:
http://www.lm.doe.gov/Rocky_Flats/Regulations.aspx

Scott ended his presentation with this brief summary:

- Characterization of site contaminants = Extensively sampled
- Regulatory process to guide cleanup = Rigorous CERCLA process with public participation
- Cleanup standards = Conservative
- Resulting risk = Low
- Environmental monitoring = Long-term, ongoing monitoring

Heidi Henkel asked about effects of the different kinds of radiation. Scott noted that Rocky Flats was mostly alpha radiation and the most important pathway is inhalation and the potential cancer risk was a long-term timeframe. He referenced a Manhattan Project monitoring study on workers that inhaled a higher number of radioactive particles only to find one potential cancer potentially associated with their direct and significant plutonium exposure. Nancy Ford asked Scott to confirm that there were still a lot of unknowns related to risks. Scott said this was not really the case, and that there is a lot known about what radiation does inside the body. David Abelson also pointed to the very conservative assumptions that were built into the risk scenarios as one way to address the uncertainty Nancy noted. He added that there is more known about high doses, and less about low dose. In the absence of some of this data, they used assumption that there was a linear relationship from high dose effect to corresponding low dose effects. He said that current studies are indicating that this was probably extremely conservative (i.e. Hiroshima survivor study, hormesis/adaptation to low dose).

Board Roundtable: Jeannette Hillery noted that Census 2020 was coming soon and that she hoped local governments were getting everything into place. Barb Vander Wall noted that she had distributed Oaths of Office for Board members to sign and asked that everyone return them to her.

Big Picture/Additional Questions/Issue Identification

April 6, 2020

Potential Business Items

- TBD

Potential Briefing Items

- Understanding Risk – Continued
- CDPHE Soil Sampling Results

June 8, 2020

Potential Business Items

- TBD

Potential Briefing Items

- TBD

Issues to watch:

- Soil sampling results
- Dam Breach
- Uranium exceedances in surface water
- Trichloroethylene (TCE) exceedances in groundwater

The meeting was adjourned at 11:58 a.m.

Respectfully submitted by Erin Rogers.