

## June 1, 2015 Stewardship Council Meeting Comments

**TO:** Members Rocky Flats Stewardship Council

Scott Surovchak, DOE/LM Rocky Flats Site Manager

**FROM:** Mary (Mickey Harlow) Retired Rocky Flats Coordinator, City of Westminster, Citizen Arvada.

**SUBJECT:** Evaluation of Water Quality Variability for Uranium and Other Selected Parameters in Walnut Creek at the Rocky Flats Site, Institutional Controls and the CAD/ROD; Engineered Treatment Units; Cleanup at Rocky Flats

Re-examine all that you have been told, dismiss that which insults your soul. Walt Whitman

Evaluation of Water Quality Variability for Uranium and Other Selected Parameters in Walnut Creek at the Rocky Flats Site prepared by Wright Water Engineers, April 2015.

The evaluation document states that “ **the largest recorded rainfall event in site history of the site occurred from September 9 through September 15, 2013.** The total rainfall depth ranging from 5.21 to 8.30 inches were measured at the site, the average of 6.5 inches. **The Actinide Migration studies state that Approximately 13.5 inches, or twice the average amount of precipitation fell during the period January through May 1995.** The 2013 storm event did not result in the largest amount of precipitation ever experienced at the site. The public would like to see the field data compiled by DOE referenced in this evaluation. Specifically, Dissolved Oxygen, Suspended Solids, Dissolved Solids and PH.

**ACTINIDE MIGRATION STUDIES FINAL REPORT:** The Actinide Migration Evaluation Pathway Analysis Summary report..” **Discussion of Uranium in Surface water.”** Page 19, states “the Concentration of uranium in surface water across the site are relatively uniform. Uranium loads in each basin are largely a function of each basins water yield. Total uranium concentrations at RFETS Points of Evaluation and Compliance monitoring stations from water years 1997 through 1999 averaged roughly one-tenth of the 30 microgram per liter maximum Concentration level for drinking water” ( pg 21 of the study) shallow groundwater flux was estimated using precipitation data for January through May of 1995. The Actinide Migration Study Page 33, states that ***“remediation of manmade uranium sources that impact surface water should provide long-term protection of surface water quality. If post closure monitoring identified residual actinide activity that impacts surface water quality, the best available technology should be used to appropriately characterize and mitigate the actinide source.”***

**WRIGHT WATER ENGINEERING RECOMMENDATIONS TO ADDRESS URANIUM OVEMENT DURING MAJOR STORM EVENTS:** It is interesting to note that this large, two year study does not contain any recommendations to address the uranium problem. The closest statement to a recommendation is on ***Page 56 last paragraph Wright Water Engineering study states “ Data suggest as long as the solar ponds plume and sediment sources remain, it can be expected that future storm of a magnitude***

***comparable to the September 2013 event will have a similar affect of initiating prolonged periods of relatively large uranium concentrations. “***

**MY RECOMMENDATION:** The solar ponds are a source of anthropogenic uranium. They were not remediated during cleanup and closure. The plastic liners in the cells failed and the man made uranium leaked into the groundwater.....**Remediate the Solar Ponds, remove the source.** Sediments in the onsite stream beds have been listed as a source of natural occurring and manmade uranium.....**cleanup the sediments.**

**WHY DOES THE AMOUNT OF URANIUM LEAVING THE SITE IN SURFACE WATER MATTER?** The headwaters for the Big Dry Creek watershed rise in Jefferson County at the mouth of Coal Creek Canyon. Activities and water quality protection at Rocky Flats directly influences water in Walnut Creek which is a tributary to Big Dry Creek which flows through Jefferson, Adams and Weld Counties. The majority of the discharge from Rocky Flats (drainage from the industrial area) is made to Walnut Creek, which is diverted around Great Western Reservoir and flows through the City of Westminster where children play in the creek and animals drink from it. Further down, the water flows into the south Platte where there are agricultural uses. EPA states that uranium and depleted uranium is both a chemical and radiological hazard. **The EPA states that phosphates and sulfides usually precipitate uranium and hence stop migration. This is a behavior that can be exploited in remedial operations.**

*State Engineers Office under Colorado Water Law-Water Commission pg 84 States that “Big Dry Creek watershed is one of eleven designated watersheds recognized by the clean water plan prepared by the DRCOG under the Federal Clean Water Act. “*

**MY RECOMMENDATION:** The DOE study the impacts of climate change and large storm events on all the treatment and engineering facilities at the site and provide a plan to ensure that the treatment facilities, monitoring devices and sampling devices are secured in a manner that they can withstand major storm events and climate change in general. The CDPHE and DOE sampling plan does not include yearly sediment sampling, it should be included.

**COLOARDO WATER QUALITY CONTROL COMISSION:** Page 5, DOE Document 20089 states that “DOE successfully petitioned the Colorado Water Quality Control Commission to revise the site specific uranium standard to the statewide basic standard for uranium 30ug/l. **The fact is that during the revision proceedings the WQCC requested that if a higher ambient standard was warranted the site should collect additional data justifying the need.** Code of Colorado Regulations, Water Quality Control Commission Reg No. 38 Classification and numeric standards South Platte River Basin, Laramie River Basin, Smokey Hill River Basic 5CCR 1002-38 (3)**Uranium (b) uranium levels in surface water shall be maintained the lowest practicable level.**

**My Letter to the Water Quality Control Commission, May 6, 2015, contained the following question:** Did the evaluation of the uranium levels at Walnut Creek point of Compliance trigger a reportable condition? Even though the parties decided to take no action, did the twelve month rolling uranium levels cause an exceedance of the site specific applicable standard of 16.8 ug/L?

**Reply: Decision has not yet been made regarding whether or not there is an exceedance of the water quality standard. The Water Quality Control Division makes recommendations about those sorts of decisions in context of the Section 303(d) list, the impaired waters list, Regulation 93 that occurs every two years. Uranium does not have a twelve month rolling average. (I intend to be a party to any hearing on changes to the uranium standard at Rocky Flats.**

#### **ENGINEERED TREATMENT UNITS – FAILURE OF THE REMEDY**

The Third Five Year Review Report by the EPA completed in 2012 concluded that the Rocky Flats site continues to be protective of human and health and the environment (EPA Region 8, Rocky Flats Plant (USDOE) some residual contamination remained in the core production areas, settling ponds and two landfills'. The reviews are used to determine how the remedy is working and if the remedy remains protective of human health and the environment. EPA says the remedy is working and is protective. **The facts do not support this statement.**

**GS10** - Reportable 12 month rolling average for Plutonium and Americium observed first half of CY 2014 at Point of Evaluation. GS 10 is located upstream of former pond B-1. As of June 30, 2014, the twelve month rolling average is no longer reportable. The sampling point was moved because DOE could not find the source of the plutonium and americium contamination. The baseline contamination data was lost for GS 10.

**All systems have required modification since closure.** Failure of the remedy. Ten years after installation all remedies should be working correctly. **DOE has moved from passive gravity driven engineered treatment to active, solar powered air stripping.** This is a change to the remedy in the CAD/ROD. DOE maintains that the CERCLA 5 year process (review and implement technological improvements as feasible warranted) drives the continuing efforts to improve systems. CERCLA speaks to new technologies not using old methods to fix a remedy that does not work correctly.

- **Plume Sources:** **Plume maps are no longer updated**, well network does not support detailed mapping. (pg 13) Adaptive Management Plan. The sampling wells have been removed at Indiana. How will DOE CDPHE and EPA determine if the plumes are moving offsite and contaminating the drinking wells of households downstream . **Sampling data are not available for the 15 private groundwater wells located east of RFETS. After major storm events, these wells should be monitored. Monitoring should be continued at Indiana until which time the roadway is installed.** Ongoing sampling is needed because in the past chlorinated organic compounds have been periodically detected at trace levels in groundwater wells along the Eastern RFETS property line. Dose reconstruction studies (chemrisk 1994b) indicated that it would take 30 to 300 years if not longer for site related contaminants to migrate from the center of Industrial area to the nearest down gradient private wells. Source: Agency for Toxic Substance and Disease Register (ASTDR), Rocky Flats Environmental Technology Site, May 13, 2005. U.S. Department of Health and Human Services Public Health Service.
- **903Pad/Ryan's Pit Plume** carbon tetrachloride, methylene chloride, tetrachlorethlenet (PCE) (TCE) and **uranium isotopes**. Located in the southeastern corner of the Industrial Area

- **Property Utilization and Disposal Yard Plume:** Located north of the Industrial area. COC are TCE nitrates and nitrites.
- **EAST TRENCHES:** contains an area that was previously used for disposing of sanitary sewage sludge, solvent and other wastes. Contaminated soils removed in 1996, contaminated groundwater remains. Carbon Tetrachloride, PCE and uranium isotopes. Treatment was revised with air stripper added in 2013 and approach that relies solely on air stripping for treatment. Current air stripper is being taken offline and new commercial air stripper is operational. An enclosure is being built to house air stripper, which is a more complex system.
- **Mound Plume:** adjacent to the Solar Ponds Plume contains contaminants from original leaking drums in a waste storage area. Many VOC's, PCS, TCS and vinyl chloride.
- **881 Hillside Plume:** located on the southern edge of the Industrial Area but North of Woman Creek. Past disposal practices caused contaminants to move to groundwater. Carbon Tetrachloride; methylene chloride, PCE, TCF; selenium and uranium isotopes.
- **Carbon Tetrachloride Plume and Industrial Area VOC plume** extend from portion of the Industrial area where waste solvents leaked into the soil and have since migrated to groundwater. Each plume measured contaminants 1,1-dichloroethylene, cis-1,3dichloroproplene, TCE, carbon tetrachloride and uranium isotopes.
- **Solar Evaporation Ponds Plume** located in Northeastern part of the Industrial Area. Selected liquid wastes that the plant previously discharged to temporary holding ponds. **Contaminants of Concern:** nitrates and uranium isotopes. Several treatment stems to keep plume from contaminating Walnut Creek. **Solar Ponds Treatment: Over years accumulation of biomass from biological denitrification process has led to clogging of the plumbing within each treatment cells as well as media and overburden. Result was** (ponds lined with plastic that leaked into the ground water). Vaults continued to accumulate groundwater as lingering effect of heavy precipitation in Sept 2013. Pump within Intercept trench system sump installed in 2008 as part of the Phase I upgrade malfunction late July, restarted to service July 31. 2014.

#### Flows - each system treats very low flow of water

MSPTS 0.75 GPM

ETPTS 1.5 GPM

SPPTS 1 GP

PLFTS 1 gallon per minute

Garden hose will be about 10 GPM

#### INSTITUTIONAL CONTROLS AT ROCKY FLATS

Institutional controls are used to prevent uncontrolled access to contaminated subsurface features was included in the remedy for the Central Operating Unit. The remedy also included other IC's to prevent uncontrolled soil erosion and prevent disturbance of engineered components that were designed to

limit contaminant migration and to monitor remedy performance. The Community supported leaving contamination below three feet to a higher level than the 35 pCi/G as recommended by the Rocky Flats Soil Action Level Review Panel which I co-chaired. We were guaranteed there would be no digging.

**WASTE MANAGEMENT CONFERENCE PRESENTATION ON INSTITUTIONAL CONTROLS: The following information was taken from a paper prepared by Rick DiSalvo, Scott Surovchek,(DOE), Carl Spreng (CDPHE)and Vera Moritz (EPA), “ Clarification of Institutional Controls at the Rock Flats site Central Operable Unit and Implementation of the Soil Disturbance Review Plan – 13053, WM 2013 Conference February 24-28 2013, Phoenix Arizona, USA. The paper points to the fact that digging began shortly after the ink was dry on the CAD/ROD, and the Rocky Flats Long Term Management Agreement.**

Shortly after the RFLMA incorporated the IC’s several soil disturbance and excavations occurred to implement the remedy and to maintain the land in the OU. The paper states:

1. **2006** – Slump began to develop on the hillside south of the location of former Building 991. In 2007 the slump was regarded and seeded to stabilize the hillside. Slump occurred because of water saturation of the soils caused by disruption of the French drain underlying the hill and the removal of the outfall associated with the drainage during closure. The regrading approximated the topography of the area that existed prior to the hillside construction. Sentinel well 45605 located with the slumping area was replaced after the grading work was completed....The work also included removal of several monitoring wells and replacement with new wells if determined necessary by CDPHE and EPA.
2. **2007** – Functional Channel -1 during grading for closure was excavated from 3 to 5 feet deep to provide additional fill material to fill some low spots around groundwater wells south of the former 371 building area. Excavated area was contoured to promote wetlands.
3. **2007** – Gravel road repairs and maintenance included four areas where roadside drainage ditches and water bars were constructed to channel runoff. The centers of the ditches are 1 foot below the pre-existing grade and the water depressions are 9 inches below existing grade
4. **2008 – 2009** dams breached by constructing notches in them. The excavations to accomplish the dam breach were more than 20 feet below the surface. Dams B-1, B-3, and B-4, located in South Walnut Creek. Contaminants consistently measured in on-site surface waters (primarily the holding ponds) at levels greater than background levels include gross alpha radiation, gross beta radiation, tritium and isotopes of americium, plutonium and uranium ,

**The work in the four examples did not restore soil to preexisting grade;** the work itself was designed to change the surface elevation. **Some of the examples included excavation deeper than 3 feet for non-remedy related purposes. The regulators evaluated each of these actions and determined they were consistent with the objectives and rationale of the IC.**

**In 2010** DOE decided to breach the five remaining retention pond dams in the Central OU. DOE prepared a draft Surface Water Configuration Environmental Assessment pursuant to the requirements of NEPA for the proposed action CR 2010-02 record of the consultation with RFLMA parties. Final EA was issued in 2011. Draft put out to public on April 30, 2010. CDPHE withdrew approval of Contact record 2010-02

on October 15, 2010 to allow RFLMA parties to consult that the IC in the 2006 CAD/ROD could be misinterpreted and that clarification was appropriate to document that **ICs are not intended to preclude DOE from appropriately managing the land compromising the COU.** CAD/ROD was amended in 2011., incorporating a protocol for a Soil Disturbance Review Plan for work subject to ICs that requires approval from the State and public notification by DOE prior to conducting approval of soil disturbing work.

**DOE must submit a description of the project, location, lateral and vertical extent of excavation, information about any remaining subsurface structures in the vicinity of project and information on any for Individual Hazard Sources or other known or potential soil or groundwater contamination in the vicinity of the proposed project.**

- 1. EPA , CDPHE will review and approve the proposed activity only if it determines that the proposed activity will not result in an unacceptable release or exposure to residual subsurface contamination and will not damage the remedy. CDPHE will ensure that the proposed project meets the rational and objective of the Institutional Controls.**

**Question:** Where is the written documentation that DOE has provided this information to CDPHE and EPA? Where is the written documentation that CDPHE has reviewed the proposal to ensure that contamination is not moving, that workers will be protected and that air monitoring will be available if necessary? Does the public have to file a FOIA in order to get a copy of the decision documents?

**The public is given 10 days to respond to digging proposal. Who is the public? It certainly is not the downwind residents of the site. The Contact Records do not have enough information in them for the public to respond.**

**WHY DOES THE PUBLIC INCLUDING MYSELF CONTINUALLY QUESTION THE CLEANUP OF ROCKY FLATS? STATE HEALTH SAYS IT'S CLEAN, EPA SAYS ITS CLEAN.....** *A weakness of the regulatory system is that regulators can decide that a harmful material is safe enough. The cleanup meets regulatory requirements but the site is not clean.*

Kaiser Hill performed the soil sampling at Rocky Flats. They performed the cleanup and then sampled the decontamination work to ensure the job was done correctly. The Inspector General's Review of the cleanup at several sites in a lessons learned document, chided DOE at Rocky Flats for not checking the sampling analysis data provided to them by Kaiser Hill, the cleanup contractor. EPA and CDPHE supported DOE and indicated in their reply to the comment that they thought the numbers were fine. An Independent Validation and Verification plant review by MACTE commissioned by the Rocky Flats Coalition of Local Governments did not bless the cleanup and here are some reasons:

It is unclear why MARSSIM, the accepted standard is not used by KH since it is directly applicable to the RF remediation. On February 19, 2005 John Rampe, of DOE stated that "Kaiser Hill will use the appropriate principles and techniques from MARISSIM as a guide to performing active iites.The Nuclear Regulatory Commission states that MARSSIM provides information on planning, conducting, evaluating and documenting building surface and surface soil final status radiological surveys for demonstrating compliance with dose or risk-based regulations or standards.

KH refers to soil samples of 6 inches in depth; the RFCA standard is 3 feet. Some data even use surface area measurements to express soil contaminant concentration. Both ORISE and MACTEC criticized the averaging of areas for RSAL's which are not defined. There needs to be a scientifically defined area for results to be significant.

Shawn McGrath, now head of the Region 8 EPA office, former member of the Rocky Flats Coalition of Local Governments, questioned DOE at a Coalition meeting about the use of 7 pCi/g in buffer zone being used as a standard. John Rampe, DOE responded that 7 pCi/g has no regulatory basis it is used in the context of the Institutional Controls.

On August 1, 2004 the Rocky Flats Coalition of Local Governments sent a letter to Mr. Frazier Lockhart, Manager, and Department of Energy. The Coalitions soil consultant, MACTEC strongly recommended that ORISE expand its mini-MARISSIM soils review to include soils adjacent to 1 or 2 production buildings' in the Industrial Area. MACTEC believed expanding this part of ORISE's review would add important information and would serve to strengthen the argument that ORISE is conducting a thorough independent review. The Coalition endorsed MACTEC's recommendation. **DOE's response to this letter, which was signed by Shawn McGrath, then chair of the Coalition, was that this request will not be granted.** The Coalition letter notes that "DOE's response appears to suggest that Kaiser-Hills schedule is driving its decision. The Coalition always supported a timely closure, but it now worries that the schedule appears to be unwisely undermining what we believe is a reasonable and necessary request.

**I include the above examples to illustrate the concerns that have lead the community to question the soil cleanup at Rocky Flats.**