Department of Energy
Office of Legacy Management

November 3, 2008

Mr. Paul Frohardt, Administrator
Colorado Water Quality Control Commission
OED-OEP-A5
4300 Cherry Creek Drive South
Denver, CO 80246-1530

Subject: U.S. Department of Energy's (DOE's) Proponent's Pre-Hearing Statement for Proposed Revisions to Segments 4a, 4b, and 5 Of Big Dry Creek (Walnut and Woman Creeks)

Dear Mr. Frohardt:

This is to transmit the enclosed original and 13 copies of the subject Proponent's Pre-Hearing Statement.

If you have any questions or require additional information, please call me at (720) 377-9682 or Rick DiSalvo, Assistant Project Manager for DOE's Rocky Flats Legacy Management Contractor. Rick may be reached at (303) 819-7150.

Sincerely,

Scott R. Surovchak
LM Site Manager

cc:
C. Spreng, CDPHE
Post Closure AR (Thru H. Young)
rc-rocky.flats RFS 425.02

CERTIFICATE OF SERVICE

I do hereby certify that a true and exact copy of the Proponent's Pre-Hearing Statement in the matter of the rulemaking hearing for consideration of revisions to segments 4a, 4b, and 5 of Big Dry Creek (Walnut and Woman Creeks) in the Classifications and Numeric Standards for South Platte River Basin, Laramie River Basin, Republican River Basin, Smoky Hill River Basin, Regulation #38 (5 CCR 1002-38), was e-mailed to the following on the 3rd day of November 2008:

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COLORADO WATER QUALITY CONTROL COMMISSION
STATE OF COLORADO

PROPONENT'S PRE-HEARING STATEMENT OF THE U.S. DEPARTMENT OF ENERGY

REVISIONS TO SEGMENTS 4A, 4B, AND 5 OF BIG DRY CREEK (WALNUT AND WOMAN CREEKS) IN THE CLASSIFICATIONS AND NUMERIC STANDARDS FOR SOUTH PLATTE RIVER BASIN, LARAMIE RIVER BASIN, REPUBLICAN RIVER BASIN, SMOKY HILL RIVER BASIN, REGULATION #38 (5CCR 1002-38)

Introduction

Revisions are proposed by the U.S. Department of Energy (DOE) Office of Legacy Management (LM) to Regulation #38, section 38.6, Table 2, for Big Dry Creek segments 4a, 4b, and 5, as shown in the Water Quality Control Commission's (Commission's) Notice of Public Rulemaking. These segments are portions of Woman and Walnut Creeks located on the Rocky Flats Site, which is owned by the United States and is under LM's jurisdiction and control. Portions of segments 4a and 4b are also located on the Rocky Flats National Wildlife Refuge, on land that DOE transferred to the U.S. Department of the Interior in 2007.

The Commission adopted the subject site-specific water-quality standards for uranium, gross alpha and gross beta for Big Dry Creek segments 4a, 4b, and 5 in 1989 and 1995, based on ambient conditions that existed when Rocky Flats (which was first known as the Rocky Flats Plant and subsequently the Rocky Flats Environmental Technology Site) was actively producing components for nuclear weapons. At that time the Commission had not adopted a state-wide surface water standard for uranium.

At its June 2005 rulemaking hearing, the Commission subsequently adopted, in the *Basic Standards and Methodologies for Surface Water Regulation #31*, Section 31.6, Table III, Metal Parameters, a drinking water supply table value for uranium that is the maximum contaminant level (MCL) promulgated by the U.S. Environmental Protection Agency (EPA).

Rocky Flats was listed on the Comprehensive Environmental Response, Compensation, and Liability Act National Priorities List (NPL) in 1989. The final remedy was selected in the September 29, 2006, Corrective Action Decision/Record of Decision (CAD/ROD) (EPA et al., 2006) after DOE's completion of cleanup and closure in late 2005. The CAD/ROD consolidated the portions of Rocky Flats that required additional response actions into the Central Operable Unit (OU). Generally speaking, the Central OU consists of the former industrialized area of Rocky Flats, the Original and Present Landfills, and land east of the former 903 Pad that contains relatively higher levels of residual contamination. The final remedy for the Central OU is being implemented in accordance with the *Rocky Flats Legacy Management Agreement* (RFLMA) (DOE et al., 2007).

The revisions are proposed because of changed hydrologic and surface-water volume conditions at Rocky Flats after cleanup and closure, resulting in a greater proportion of groundwater containing predominantly natural uranium as baseflow. While changes to these parameters were anticipated, post-closure surface-water monitoring has provided confirming information.

The proposed revisions would remove the site-specific standards for uranium, gross alpha, and gross beta. If the current site-specific uranium standard taken from Regulation #38, Section 38.6, Table 2, is removed, the uranium standard for the drinking water supply classification in the *Basic Standards and Methodologies for Surface Water Regulation #31*, Section 31.6, Table III, is proposed to apply. If Regulation #38's site-specific gross alpha and gross beta standards are removed, the radionuclide standards for surface water in the *Basic Standards and Methodologies for Surface Water Regulation #31*, Section 31.11 (2), or the site-specific standard in Regulation #38, Section 38.6, Table 2, for a particular radionuclide would continue to apply.

Background

The Rocky Flats Site area surrounding the Central OU was designated the Peripheral OU in the CAD/ROD. The Peripheral OU was deemed acceptable for unrestricted use and unlimited exposure, and was deleted from the NPL in 2007. That same year, portions of the Peripheral OU were transferred to the U.S. Department of the Interior to establish the Rocky Flats National Wildlife Refuge.

Downstream of Rocky Flats is Big Dry Creek, segment 3 (Great Western Reservoir), segment 2 (Standley Lake) and the remainder of the Big Dry Creek mainstem and tributaries. Since the completion of "Option B" in 1997, Woman Creek surface water from Rocky Flats has been collected in the Standley Lake Protection Project Woman Creek Reservoir and pumped to Walnut Creek, downstream of the Great Western Reservoir. Also, since the completion of the Great Western Reservoir Replacement Project, Walnut Creek surface water from Rocky Flats has bypassed the Great Western Reservoir.

In its April 10, 1995, Statement of Basis, Regulation #38, Section 38.45 (C), the Commission noted:

> The Commission is also mindful that the Option B water diversion project protecting water supplies downstream of the Rocky Flats Plant is scheduled for completion within the next two years. This project will consist of a 100-year flood detention reservoir on Woman Creek to protect Standley Lake (the drinking water supply of the local cities of Westminster, Northglenn, and Thornton), and the elimination of Great Western Reservoir as a water supply for the City of Broomfield, with the procurement of an equivalent replacement water supply. Because of Option B, water flowing off plant site is not anticipated to affect any drinking water supplies downstream; thus, the local communities, DOE, the

Division, and the Commission concur that the classifications and standards for the Big Dry Creek watershed should be reconsidered once Option B is in place.

Although segments 2 and 3 have site-specific standards for uranium, gross alpha, and gross beta, segment 1 does not. Furthermore, although segments 2, 3, 4a, 4b, and 5 have water supply classification, segment 1 does not. We are not aware of any actual water supply use of Big Dry Creek.

Changes in Surface-Water Volumes

Prior to the closure of Rocky Flats, surface water included precipitation runoff from impervious surfaces (parking lots, roads, and buildings) and sewer treatment plant effluent (an average of approximately 140,000 gallons per day for fiscal years 1993 through 2005, with maximum flows of up to 500,000 gallons per day during active production prior to 1993). In addition, imported water leaked out of water-distribution lines and into the groundwater, which ultimately contributed to surface-water flows prior to closure.

By the end of 2005, all Rocky Flats buildings (except for two former vehicle-inspection sheds) and impervious surfaces had been removed, and water was no longer imported for site use and discharged from sewage treatment. Under these post-closure conditions, Rocky Flats is returning to a natural surface-water and groundwater-baseflow condition. Table 1 provides data on surface-water volume.

Uranium

The uranium in groundwater at Rocky Flats is predominantly natural, as determined prior to closure, through hundreds of samples analyzed by Los Alamos National Laboratory (LANL), using high-resolution analytical methods. The results are in the LANL Report, *Quantitative Evaluation of Mixture Components in RFETS Uranium Isotopic Analysis*, LA-UR-05-7223. This report is available on the Rocky Flats website, http://www.lm.doe.gov/land/sites/co/rocky_flats/rocky.htm, in the Stakeholder Relations tab.

Post-closure high-resolution analysis of targeted groundwater and surface-water locations has been conducted, and results to date show that the uranium content continues to be predominantly natural. The results are in the LANL Reports, *Thermal Ionization Mass Spectrometry Uranium Results for October 2007 RFETS Waters*, LA-UR-07-7737 and, *Thermal Ionization Mass Spectrometry Uranium Results for September 2008 RFETS Waters*, LA-UR-07-7737. These reports are also posted to the aforementioned Rocky Flats website address.

Attached Figure 1, Sampling Locations for Pre-and Post-Closure LANL Uranium Quantitative Analysis and Figure 2, Comparison of Pre-and Post-Closure LANL Uranium Quantitative Analysis, show the locations of the LANL samples. Table 2 provides the status of the post-closure LANL sampling and analysis. Several of the sampling locations

were suggested by downstream municipality staff during a meeting in August 2008, and these results, along with results of samples collected earlier in the spring and summer are pending. We anticipate receiving all LANL results prior to the January 12, 2009, hearing for inclusion; the results will be submitted as evidence, and will also be posted to the aforementioned Rocky Flats website address.

During the operation of Rocky Flats, groundwater—in some places—also became contaminated with anthropogenic uranium (and other contaminants not relevant to this rulemaking). While there were several individual wells indicating anthropogenic uranium, one identifiable groundwater uranium plume area known as the Solar Ponds Plume exists. The Solar Ponds Plume Treatment System (SPPTS) (see Figures 1 and 2), consisting of a barrier to intercept and collect contaminated groundwater and treat the collected groundwater to remove uranium (and nitrates), was installed in 1999, and continuing operation of the SPPTS is required by RFLMA. An upgrade to the SPPTS to collect more groundwater that may be contributing to uranium levels in North Walnut Creek was completed in October 2008. Monitoring to evaluate the performance of the upgrade has begun.

Uranium that has been confirmed to be 100 percent natural has been measured in Rocky Flats groundwater at concentrations of more than 30 times the current site-specific standard and more than 14 times the MCL. As a result, with the quantity of surface water runoff reduced through the removal of impervious surfaces and the elimination of imported water, the relative contribution of groundwater to surface-water flows has increased, and consequently, uranium concentrations are also increasing.

The groundwater uranium contribution to surface-water baseflow indicates that the post-closure ambient uranium concentration may approach or exceed the previously established ambient standards developed when Rocky Flats was operating.

Gross Alpha and Gross Beta

The gross alpha and gross beta site-specific standards are also ambient-based standards adopted when Rocky Flats was operating. Gross alpha and gross beta results for post-closure LANL samples are presented in Table 2. Manmade plutonium, americium, and uranium are the radionuclides of interest in evaluating remedy performance; monitoring for gross alpha and gross beta is not required under RFLMA.

EPA-promulgated MCLs (dose based 4 millirem per year) for gross beta in the *Code of Federal Regulations*, Title 49, Section 141.66 (d) (49 CFR 141.66 [d]) apply to manmade beta-emitting radionuclides (besides tritium and strontium-90), and these are not analytes of interest at Rocky Flats.

The EPA-promulgated MCL for gross alpha in 49 CFR 141.66 (c) that applies to alpha-emitting radionuclides (excluding radium-226 and uranium) is 15 picocuries per liter (pCi/L). The basic and site-specific standard for plutonium and americium is 0.15 pCi/L,

which is well below the gross alpha MCL. The gross alpha results in Table 2 appear well correlated to the uranium results, so a site-specific standard seems redundant.

Operational and Economic Considerations

Currently, surface-water points of compliance established in RFLMA are immediately downstream of Terminal Ponds A-4 (North Walnut Creek), B-5 (South Walnut Creek), and C-2 (South Interceptor Ditch for discharge to Woman Creek) in the Central OU and in Walnut Creek and Woman Creek at the west side of Indiana Street in the Peripheral OU. Water-quality data from these locations demonstrate that water flowing from Rocky Flats meets all applicable standards.

Currently, surface water is released from the terminal ponds after the results of pre-discharge pond sample analyses are reviewed, unless an emergency discharge is required based on the operational requirements for the terminal pond dams. DOE will evaluate removing the terminal ponds in the future to reduce long-term surveillance and management costs associated with maintaining these dams, which are regulated under requirements promulgated by the State Engineer. The dams' removal would also enhance ecological resources by returning the streams to approximate pre–Rocky Flats Plant operations conditions.

The terminal pond pre-discharge samples for one discharge evolution from Pond B-4 in early 2007 indicated uranium concentrations close to the current site-specific standard for segment 5. The standard was not exceeded at the POC for this discharge evolution. However, in the eventuality that water held in a terminal pond needs to be discharged and is above the standard, management alternatives could include possible treatment or pumping to an up-stream pond to temporarily avoid discharge, if such a pond is available. An ambient-based standard that is unrealistically low, and below the MCL, combined with predominantly naturally occurring uranium, may result in expenditures of resources that are not cost-effective in relation to the protection of human health and the environment.

In evaluating upgrades for uranium treatment options for the SPPTS, design, testing, and construction costs for an installed small scale treatment system could be in the range of $100,000 depending on flow rates and location. Treatability studies would also need to be conducted to select an appropriate treatment media for pond water. A larger scale system, for example to treat pond water as it is discharged, would cost considerably more. Annual operation and maintenance costs would add to the life-cycle costs for the system.

Portable treatment systems may be feasible, but their availability and operability in variable weather conditions may be an issue. Assuming several weeks of operation to effectively treat several million gallons of water, mobilization charges, system rental fees, and field operator rates, one-time rental costs would also be substantial. If the system

was anticipated to be required several times, an installed system would likely be more cost-effective.

Witnesses

The following persons may provide testimony in support of this proposal. Other witnesses may be identified based on consideration responses to this Prehearing Statement.

Scott Surovchak, U.S. DOE
Richard DiSalvo, S.M. Stoller Corp.
George Squibb, S.M. Stoller Corp.
John Boylan, S.M. Stoller Corp.

References

DOE (U.S. Department of Energy), EPA (U.S. Environmental Protection Agency), and CDPHE (Colorado Department of Public Health and Environment), 2006. *Corrective Action Decision/Record of Decision for Rocky Flats Plant (USDOE) Peripheral Operable Unit and Central Operable Unit, Jefferson and Boulder Counties, Colorado*, U.S. Department of Energy, U.S. Environmental Protection Agency, and Colorado Department of Public Health and Environment, September.

DOE (U.S. Department of Energy), EPA (U.S. Environmental Protection Agency), and CDPHE (Colorado Department of Public Health and Environment), 2007. *Rocky Flats Legacy Management Agreement*, U.S. Department of Energy, U.S. Environmental Protection Agency, and Colorado Department of Public Health and Environment, March 14.

Respectfully submitted this 27th day of October 2008.

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Table 1. Annual Discharge Volume in Acre-Feet

Calendar Year	North Walnut Creek	South Walnut Creek		South Interceptor Ditch	Precipitation*
	SW093	GS10	WWTP	SW027	(inches)
1997	184.5	127.3	222.2	27.7	15.02
1998	184.0	121.5	204.6	32.4	12.83
1999	191.3	127.1	179.1	29.8	14.30
2000	126.0	96.1	180.8	11.1	12.29
2001	167.8	101.6	166.6	24.5	12.74
2002	86.0	56.1	153.2	6.6	7.94
2003	144.5	105.3	121.1	32.3	10.80
2004	127.0	96.0	69.2	20.8	16.91
2005	78.4	59.6	NA	6.9	11.58
2006	17.1	10.4	NA	0.0	9.18
2007	90.3	40.7	NA	10.4	11.55
2008 (through Sep.)	10.6	7.9	NA	0.0	8.49

* Arithmetic average of gauges in operation. Gauges are not heated and may underestimate water equivalent from snow.

Table 2. Post-Closure High-Resolution Uranium Isotopic Analysis and Gross Alpha, Gross Beta

Location (See Figure 2)	Description [1]	Sample Date	Total U (ug/L)	% Natural	Gross Alpha (Pci/L)	Gross Beta (Pci/L)
GS03	Surface Water POC	7/9/2007	3.7	77	7.76	14.7
GS10	Surface Water POE	7/23/2007	10.1	71	6.64	13.3
GS10	Surface Water POE	8/25/2008		pending	8.51	17.4
GS13 (Low Flow)	Surface Water POE	12/6/2007	47.3	71	20.5	18.1
GS13 (High Flow)	Surface Water POE	5/15/2008	21.5	75	8.51	17.4
SW093 (Low Flow)	Surface Water POE	12/6/2007	9.93	91	6.26	17.5
SW093 (High Flow)	Surface Water POE	5/15/2008	7.11	93	4.65	13.2
POM2	Surface Water POE	8/28/2008		pending	18.5	28.7
SPIN (Low Flow)	SPPTS Influent	6/6/2008		pending	12.1	19.6
SPIN (High Flow)	SPPTS Influent	8/20/2008		pending	22.6	10.7
SPPDG	SPPTS Discharge Gallery	9/12/2007	62	43	27.8	36.3
SPPDG (Low Flow)	SPPTS Discharge Gallery	12/6/2007	60.7	42	25.4	48.3
SPPDG (High Flow)	SPPTS Discharge Gallery	5/14/2008	58.7	41	21.6	34.9
B206989	AOC Well	9/2/2008		pending	insufficient volume	
00193	AOC Well	8/25/2008		pending	57.93	17.7
10594	AOC Well	9/11/2007	103	97	42.2	18.6
15699	Sentinel Well	8/24/2008		pending	15.4	11.2
80205	OLF Well	9/7/2007	79.2	100	59.1	22.8
99405	Sentinel Well	9/12/2007	439	100	231	91.3
PLF Pond Eff	Surface water	9/16/2008		pending	1.81	7.51
A3 Pond	Surface water	9/16/2008		pending	3.93	12.1
A4 Pond	Surface water	9/16/2008		pending	2.86	12.6
B5 Pond	Surface water	9/16/2008		pending	1.76	13.2
C2 Pond	Surface water	9/16/2008		pending	2.7	9.5

[1] POC: Point of Compliance
POE: Point of Evaluation
SPPTS: Solar Ponds Plume Treatment System
AOC: Area of Concern
OLF: Original Landfill (also termed "RCRA" well)