

October 11, 2006

Mr. Jack Craig  
U.S. Department of Energy  
Grand Junction Office  
2597 B 3/4 Road  
Grand Junction, CO 81503

SUBJECT: REVIEW OF REVISED LONG-TERM SURVEILLANCE PLAN FOR THE U.S.  
DEPARTMENT OF ENERGY CANONSBURG URANIUM MILL TAILINGS  
DISPOSAL SITE, CANONSBURG, PENNSYLVANIA

Dear Mr. Craig:

The Nuclear Regulatory Commission (NRC) has completed its review of the Department of Energy's (DOE's) revised *Long-Term Surveillance Plan (LTSP) for the U.S. Department of Energy Uranium Mill Tailings Disposal Site at Canonsburg, Pennsylvania* (September 2005) and *Evaluation of Water Quality and Regulatory Compliance at the Canonsburg, Pennsylvania, Disposal Site* (September 2005) submitted in support of the monitoring program proposed in the revised LTSP. NRC staff has determined that the changes in the revised LTSP, including modification to the environmental monitoring program are appropriate; however, two issues have been identified:

- 1) Manganese levels in monitor well MW-0412, located directly down gradient of the disposal cell, are higher than the background levels detected in other parts of the monitoring network; consequently, staff requests that manganese analysis at locations MW-0412 and SW-0602 continue through the next evaluation period.
- 2) An inconsistency has been identified with respect to the responsible party for maintaining the stream bank along Chartiers Creek in Area C. The discussion of Institutional Controls in LTSP, Section 2.3.4, page 2-10 is not consistent with stream bank related language in Appendix B (Real Estate Documentation) of the LTSP. As a result, it is not clear who has responsibility for maintaining the Area C stream bank in the event of damage resulting from a flood (i.e., an act of God). In a related matter, if DOE is retaining responsibility for maintaining the Area C stream bank, the current Deed Restrictions in Appendix B of the LTSP do not appear to grant site access for stream maintenance related activities.

If you have any questions regarding this letter, please contact me at (301) 415-7612 or by e-mail at [PXM2@nrc.gov](mailto:PXM2@nrc.gov).

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at: <http://www.nrc.gov/reading-rm/adams.html>.

Sincerely,

***/RA/***

Paul Michalak, Hydrogeologist  
Uranium Recovery Branch  
Decommissioning and Uranium Recovery  
Licensing Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: WM-42

Licensee: U.S. Department of Energy

Enclosure: Technical Evaluation Report

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**/RA/**

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**TECHNICAL EVALUATION REPORT  
CANONSBURG URANIUM MILL TAILINGS DISPOSAL SITE**

**DATE:** September 28, 2006

**DOCKET NO.:** WM-42

**LICENSEE:** U.S. Department of Energy

**SITE:** Canonsburg, Pennsylvania

**PROJECT MANAGER and  
TECHNICAL REVIEWER:** Paul Michalak

**ISSUE:** Revised Long-Term Surveillance Plan

**SUMMARY AND CONCLUSIONS:**

The U.S. Department of Energy (DOE) submitted a revised *Long-Term Surveillance Plan (LTSP) for the U.S. Department of Energy Uranium Mill Tailings Disposal Site at Canonsburg, Pennsylvania*, on October 31, 2005 (DOE 2005a). The revised LTSP contained a number of changes including altering the ground and surface water (i.e., environmental) monitoring program. Specifically, the revised environmental monitoring program included monitor wells MW-0406, 0412, 0413, and 0414 and surface water location SW-0602. Monitoring locations deleted from the original program include monitor well MW-0410 and surface water locations SW-0601 and SW-0603. DOE also reduced the target analytes list in the revised LTSP, retaining uranium and eliminating manganese and molybdenum. Finally, the revised LTSP recommends continued annual monitoring for the next 5 years (through 2010), followed by a re-evaluation.

Staff has determined that the environmental monitoring program changes outlined in the revised LTSP are appropriate; however, staff requests that manganese analysis from monitoring locations MW-0412 and SW-0602 continue through the next evaluation period.

An inconsistency has been identified with respect to the responsible party for maintaining the stream bank along Chartiers Creek in Area C. Discussion of Institutional Controls in Section 2.3.4, page 2-10, is not consistent with stream bank related language in Appendix B (Real Estate Documentation) of the LTSP. As a result, it is not clear who has responsibility for maintaining the Area C stream bank in the event of damage resulting from a flood (i.e., an act of God). In a related matter, if DOE is retaining responsibility for maintaining the Area C stream bank, the current Deed Restrictions in Appendix B of the LTSP do not appear to grant site access for stream maintenance related activities.

**BACKGROUND:**

The DOE Canonsburg facility is located in the Borough of Canonsburg, in northern Washington County, Pennsylvania, approximately 20 miles (mi) southwest of Pittsburgh, Pennsylvania

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(Figure 1). The site covers approximately 18.5 acres and is adjacent to Chartiers Creek (Figure 2). The facility has been used to process or contain radioactive materials since 1911. Between 1984 and 1986, DOE conducted surface remediation by removing the structures, contaminated soils, and materials from the site and stabilizing them in a permanent disposal cell. The disposal cell covers about 6 acres and contains approximately 172,000 cubic yards of contaminated materials. Area C, a 3.1 acre parcel located southeast of the disposal cell, contains some residual contamination (two subsurface thorium anomalies) and has several contamination related perpetual deed restrictions. In October 1995, DOE established a LTSP for the Canonsburg, Pennsylvania, Disposal Site (DOE 1995).

In September 1998, DOE submitted a Ground Water Compliance Action Plan (GCAP) and Application for Alternate Concentration Limits for the Canonsburg, Pennsylvania, UMTRA Project Site (DOE 1998) to the U.S. Nuclear Regulatory Commission (NRC) for concurrence. The GCAP identified manganese, molybdenum, and uranium as the constituents of concern (COCs). DOE (1998) proposed a uranium alternate concentration limit (ACL) of 1.0 mg/L at point of compliance (POC) wells MW-0412, 0413, and 0414 and a uranium limit of 0.01 mg/L at point of exposure (POE) surface water location SW-0602. The NRC approved the alternate concentration limits; however, it requested that DOE monitor manganese and molybdenum, along with uranium, as part of the environmental monitoring program to ensure concentrations remain protective. In February 2000, DOE submitted a revised GCAP and Application for Alternate Concentration Limits for the Canonsburg, Pennsylvania, UMTRA Project Site (DOE 2000) addressing staff's comments and manganese, molybdenum, and uranium were retained as target analytes in the GCAP (NRC 2000).

On October 31, 2005, DOE submitted its revised *LTSP for the U.S. Department of Energy Uranium Mill Tailings Disposal Site at Canonsburg, Pennsylvania* (DOE 2005a). DOE also submitted its *Evaluation of Water Quality and Regulatory Compliance at the Canonsburg, Pennsylvania, Disposal Site* (DOE 2005b) in support of the monitoring program proposed in the revised LTSP.

#### **TECHNICAL EVALUATION:**

DOE identified nine changes in the revised LTSP (DOE 2005a):

- 1) DOE revised the ground and surface water monitoring program specification to incorporate monitoring requirements specified in DOE (2000). Specifically, DOE deleted upgradient well MW-0410 and surface water monitoring locations SW-0601 and SW-0603 from the monitoring program. DOE retained monitoring locations on Area C, as requested by the NRC (NRC 2003). With respect to target analytes, DOE eliminated manganese and molybdenum.
- 2) DOE revised text describing ground water conditions to incorporate the monitoring results since the initial LTSP was approved in 1995.
- 3) The revised LTSP describes how the NRC concurred in the DOE request to delete institutional controls on ground water use in Area C and appended the concurrence letter and Technical Evaluation Report to the LTSP.

- 4) DOE appended Area C deed restrictions. These will be imposed and recorded when the Commonwealth of Pennsylvania finalizes the sale of Area C to a private entity. Inspection procedures were revised to include deed restriction (institutional controls) monitoring.
- 5) DOE appended the NRC concurrences in compliance with 40 CFR 192, Subparts A and B, and the associated Technical Evaluation Reports.
- 6) DOE addressed changes in site conditions since the previous LTSP was approved in 1995, including loss of erosion control marker ECM-4A in 1994 and stream bank erosion and repair in 2001 and 2005.
- 7) DOE updated the list of monitor wells to reflect decommissioning of unneeded wells in 2002.
- 8) DOE removed the material describing interagency coordination with the U.S. Army Corps of Engineers (USACE) to stabilize the Chartiers Creek bank. The USACE flood control project was not constructed upstream of the railroad bridge near Area C.
- 9) DOE revised other portions of the LTSP so it is consistent with 10 CFR 40.27 and other LTSPs. For example, the revised LTSP addresses annual and follow-up inspections, instead of Phase I and Phase II inspections as defined in the 1995 plan.

Of the nine changes listed above, changes 2, 3, and 7 updated the LTSP with respect to site conditions, while changes 3, 5, 8, and 9 updated regulatory/interagency status. As such, NRC staff concurs that these changes were necessary and appropriate. The remainder of this Technical Evaluation Report (TER) addresses changes 1 and 4.

#### Ground and Surface Water Monitoring Program

Ground water and surface water monitoring is the only environmental monitoring required at the Canonsburg site. The monitoring program in the revised LTSP is a combination of components taken from the original LTSP (DOE 1995) and the GCAP (DOE 2000). Specifically, the revised monitoring program includes all the ground and surface water locations specified in DOE (2000): monitor wells MW-0406, 0412, 0413, and 0414 and surface water location SW-0602. Of these locations, monitor wells MW-0412, 0413, and 0414 are designated POC wells, while surface location SW-0602, a downstream location adjacent to Area C, is designated as a POE. In addition, monitor well MW-0424, a downgradient well (located on Area C) that was part of the original LTSP monitoring program, has been included in the revised program as a "best management practice" location. Monitoring locations deleted from the original program include monitor well MW-0410 and surface water locations SW-0601 (upstream) and SW-0603 (downstream). With respect to target analytes, the revised LTSP has retained uranium and eliminated manganese and molybdenum from the list. Finally, the revised LTSP recommends continued annual monitoring for the next 5 years (through 2010), followed by a re-evaluation.

Monitor well MW-0410 is an upgradient well where 10 years of molybdenum analytical results (November 1995 through November 2004) and 7 years of uranium analytical data have established that both analytes are consistently below their respective 40 CFR 192, Subpart A, Table 1, maximum concentration. Manganese concentrations from November 1995 and November 2004 ranged between 1.3 mg/L to 3.16 mg/l, which were all above the U.S.

Environmental Protection Agency's (EPA's) Secondary Drinking Water Standard of 0.05 mg/L (EPA 2004). However, the location of MW-0410 indicates that elevated manganese levels are an upgradient condition not related to the Canonsburg site. As a result, staff believes that upgradient ground water quality conditions have been established and concurs that eliminating monitor well MW-0410 from the environmental monitoring program is appropriate.

Surface water location SW-0601, upstream of the Canonsburg site, has been sampled nine times between December 1996 and November 2004; while surface water location SW-0603, located downstream of the Canonsburg site, has been sampled 10 times between November 1995 and November 2004. Neither location has shown a water quality impact related to either manganese or uranium. Molybdenum surface water results have shown some results over the 40 CFR 192 Subpart A, Table 1, maximum concentration; however, these results include upstream location SW-0601 (i.e., not related to impact from the Canonsburg site). Moreover, surface water location SW-0602, located immediately downstream of the Canonsburg site (adjacent to Area C), has been retained in the environmental monitoring program and is sufficient to monitor changes in surface water quality related to the Canonsburg site. Consequently, staff concurs that eliminating surface water locations SW-0601 and SW-0603 from the environmental monitoring program is appropriate.

As discussed in NRC (2000), "compliance monitoring will be used to verify the decrease in contaminant concentrations ... for a minimum of 5 years and up to 30 years with re-evaluation after 5 years." For the 5 year period from 2000 through 2004, manganese concentrations within the environmental monitoring network have remained relatively constant. As discussed above, upgradient manganese levels (MW-0410) are at least 20 times higher than EPA's Secondary Drinking Water Standard of 0.05 mg/L (EPA 2004). Similar manganese levels are also found in MW-0406, located about 100 feet east of the Canonsburg site, north of Chartiers Creek. Since Chartiers Creek acts as a gaining stream in the vicinity of the Canonsburg site, monitor well MW-0404 is not hydraulically connected to the Canonsburg site. As such, manganese concentrations in the well (0.9 to 7.9 mg/L) are further evidence of the naturally occurring elevated levels of manganese in the area around the Canonsburg site. Monitor wells MW-0412, 0413, 0414, and 0424 also exhibit manganese levels significantly above the Secondary Drinking Water Standard, although levels in MW-0412 are considerably higher than the rest of the group. Furthermore, samples from upstream surface water location SW-601 have contained manganese above the Secondary Standard in all nine samples collected between December 1996 and November 2004. Samples from downstream locations SW-0602 and SW-0603 have shown similar manganese concentrations. Given the elevated ambient manganese concentrations in both ground and surface water around the Canonsburg site, staff concurs that eliminating manganese as a target analyte in the environmental monitoring program is appropriate; however, because manganese levels in MW-0412 are clearly higher than the background levels detected in other parts of the monitoring network, staff requests that manganese analysis at locations MW-0412 and SW-0602 continue through the next evaluation period.

With respect to molybdenum, for the 5 year period 2000 through 2004, the entire ground water monitoring network has exhibited concentrations at least 10 times less than the 0.1 mg/L maximum concentration specified in 40 CFR 192 Subpart A, Table 1. Surface water results have indicated slightly higher concentrations; however, this includes upstream location SW-0601. As a result, staff concurs that eliminating molybdenum as a target analyte in environmental monitoring program is appropriate.

Finally, the revised LTSP recommends continued annual monitoring for the next 5 years (through 2010), followed by a re-evaluation. Staff concurs that a re-evaluation of the environmental monitoring program following five additional years of monitoring is appropriate.

#### Area C Deed Restrictions/Institutional Controls

An inconsistency has been identified with respect to the responsible party for maintaining the stream bank along Chartiers Creek in Area C. Section 3.3.2, page 3-2 of the LTSP (DOE 2005a) indicates that annual inspections are to include Area C to "...evaluate the owner's compliance with deed restrictions (Section 2.3.4)." Correspondingly, Section 2.3.4, page 2-10 of the LTSP states, "The owner (of Area C) shall maintain the integrity [prevent erosion] of the stream bank along Chartiers Creek."

In contrast, the Area C stream bank related language in Appendix B (Real Estate Documentation) of the LTSP does not appear to put the onus on the owner of Area C to maintain the stream bank. The Area C Deed Restriction in Appendix B states, "The owner shall not compromise the integrity of the stream bank along Chartiers Creek." Staff believes that this language does not hold the owner responsible for stream bank damage other than damage directly caused by the owner. As such, stream bank repairs resulting from damage caused by flood waters (i.e., an act of God), does not appear to be the owner's responsibility. Based on this inconsistency in the LTSP, it is not clear who is responsible for maintaining the stream bank at Area C.

In a related matter, if DOE is retaining responsibility for maintaining the Area C stream bank, the current Deed Restrictions in Appendix B do not appear to grant site access for stream maintenance related activities. Although the Appendix B deed restriction grants access to DOE for "sampling, maintaining, decommissioning or other activity related to one well and one surface water sampling location within Area C," there are no other items in the deed restriction that grant DOE access to Area C (i.e., access to repair/maintain integrity the stream bank).

#### **REFERENCES:**

U.S. Department of Energy (1995) Long-Term Surveillance Plan (LTSP) for the U.S. Department of Energy Uranium Mill Tailings Disposal Site at Canonsburg, Pennsylvania. Revision 0. October [Legacy Accession No. 9511070334]

U.S. Department of Energy (1998) Ground Water Compliance Action Plan (GCAP) and Application for Alternate Concentration Limits for the Canonsburg, Pennsylvania, UMTRA Project Site. September [Legacy Accession No. 9809230313]

U.S. Department of Energy (2000) Ground Water Compliance Action Plan (GCAP) and Application for Alternate Concentration Limits for the Canonsburg, Pennsylvania, UMTRA Project Site. February [Adams Accession No. ML003692140]

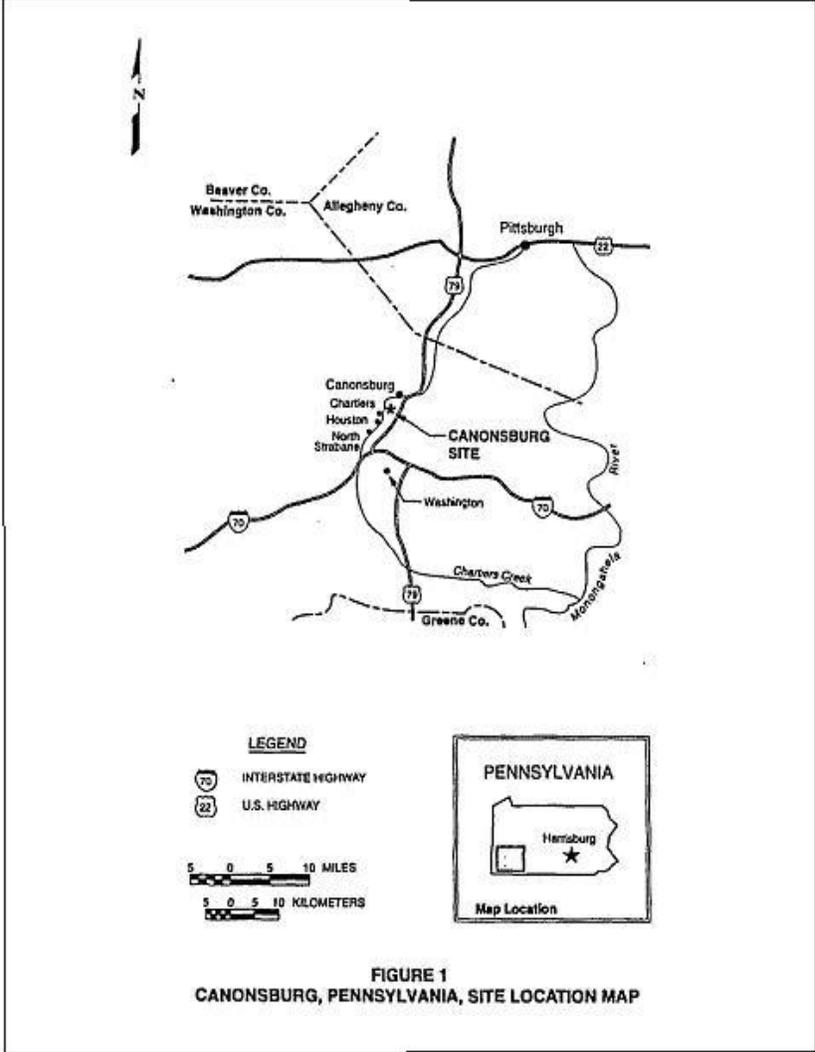
U.S. Department of Energy (2005a) Long-Term Surveillance Plan (LTSP) for the U.S. Department of Energy Uranium Mill Tailings Disposal Site at Canonsburg, Pennsylvania. September [Adams Accession No. ML053200441]

U.S. Department of Energy (2005b) Evaluation of Water Quality and Regulatory Compliance at the Canonsburg, Pennsylvania. September [Adams Accession No. ML053200441]

U.S. Environmental Protection Agency (2004) 2004 Drinking Water Standards and Health Advisory Tables. <http://www.epa.gov/waterscience/criteria/drinking/dwstandards.pdf>

U.S. Nuclear Regulatory Agency (2000) Nuclear Regulatory Commission Concurrence with Ground Water Compliance Action Plan (GCAP) and Application for Alternate Concentration Limits for the Canonsburg, Pennsylvania, UMTRA Project Site. January 24 [Adams Accession No. ML003679724]

U.S. Nuclear Regulatory Agency (2003) Correspondence from Susan Frant to Art Kleinrath, DOE concerning Review of Request for NRC Approval to Authorize Deletion of Institutional Controls (Area C) at Canonsburg, Pennsylvania. April [Adams Accession No. ML031200553]



**FIGURE 1**  
**CANONSBURG, PENNSYLVANIA, SITE LOCATION MAP**

