

# **Radiological Monitoring Results for Groundwater Samples Associated with the Industrial Wastewater Reuse Permit for the Materials and Fuels Complex Industrial Waste Ditch and Pond: May 1, 2010 – October 31, 2010**

February 2011



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**Prepared for the  
U.S. Department of Energy  
Assistant Secretary for Environment, Safety, and Health  
Under DOE Idaho Operations Office  
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## **ABSTRACT**

This report summarizes radiological monitoring performed on samples from specific groundwater monitoring wells associated with the Industrial Wastewater Reuse Permit for the Materials and Fuels Complex Industrial Waste Ditch and Industrial Waste Pond (#LA-000160-01). The radiological monitoring was performed to fulfill Department of Energy requirements under the Atomic Energy Act.



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# **Radiological Monitoring Results Associated with the Materials and Fuels Complex Industrial Waste Pond**

## **1 BACKGROUND**

The radiological information presented in this report is provided based upon an agreement between the Idaho Department of Environmental Quality and the U.S. Department of Energy Idaho Operations Office. The agreement is documented in the Industrial Wastewater Reuse Permit (IWRP) #LA-000160-01 for the Idaho National Laboratory Site's Materials and Fuels Complex (MFC) Industrial Waste Ditch (IWD) and Industrial Waste Pond (IWP). The IWRP was issued on April 14, 2010 and became effective on May 1, 2010 (Neher 2010). Items 7 and 8 of Section H ("Standard Reporting Requirements") of the IWRP state:

- The permittee agrees to provide to the Department the results of ground water radiological monitoring with respect to the MFC Industrial Waste Pond and Ditch (the HMU) that is performed to fulfill Department of Energy requirements under the Atomic Energy Act. The permittee agrees to provide the results with the Annual Report.
- The permittee agrees to provide to the Department the results of radiological monitoring of the MFC effluent, prior to discharge into the HMU, with respect to the MFC Industrial Waste Pond and Ditch (HMU) that is performed to fulfill Department of Energy requirements under the Atomic Energy Act.

## **2 RADIOLOGICAL SAMPLE RESULTS**

### **2.1 Reporting Period**

For the MFC Industrial Waste Pond and Ditch, the 2010 partial reporting year runs from May 1, 2010 through October 31, 2010. As stated in the “Facility Monitoring Table” of Section G of the IWRP, groundwater sampling shall be conducted in April/May and September/October.

### **2.2 Effluent Sample Results**

Monthly composite samples were collected from the Industrial Waste Pipeline (WW-016001) using a flow proportional composite sampler. Grab samples were collected quarterly from the wastewater discharged to Ditch C from the Industrial Waste Water Underground Pipe (WW-016002). No radiological analyses are performed on samples collected at these locations.

### **2.3 Groundwater**

Groundwater samples for radiological parameters were collected from aquifer wells ANL-MON-A-012, ANL-MON-A-013, ANL-MON-A-014 in May and September 2010. The samples were shipped under full chain of custody to GEL Laboratories in Charleston, South Carolina, and analyzed for gamma spectrometry, gross alpha, gross beta, tritium, and alpha spectroscopy. Samples were collected to satisfy the surveillance objectives of DOE Order 450.1A and requirements for the Comprehensive Environmental Response, Compensation, and Liability Act.

Table 1 shows the positive detections in ground water samples. Positive detections are considered measurements exceeding the instrument’s minimum detection level and greater than two times the uncertainty. Beta activity, uranium-234, and uranium-238 all occur naturally and are not indicative of anthropogenic impacts.

Table 1. Positive detections in ground water samples collected in May and September 2010 from the monitoring wells sampled for the MFC Industrial Waste Ditch and Pond IWRP.

<b>Monitoring Well</b>	<b>Sample Date</b>	<b>Parameter</b>	<b>Sample Result (pCi/L)</b>
<b>ANL-MON-A-012</b>	05/19/10	Uranium-233/234	1.34 ( $\pm$ 0.25) <sup>a</sup>
		Uranium-238	0.346 ( $\pm$ 0.113)
	9/28/10	Uranium-233/234	1.07 ( $\pm$ 0.173)
		Uranium-238	0.555 ( $\pm$ 0.116)
<b>ANL-MON-A-013</b>	05/19/10	Gross beta	4.49 ( $\pm$ 1.16)
		Uranium-233/234	1.41 ( $\pm$ 0.218)
		Uranium-238	0.794 ( $\pm$ 0.151)
	9/28/10	Gross beta	3.49 ( $\pm$ 1.08)
		Uranium-233/234	1.60 ( $\pm$ 0.241)
		Uranium-238	0.839 ( $\pm$ 0.158)
<b>ANL-MON-A-014</b>	05/19/10	Uranium-233/234	1.07 ( $\pm$ 0.175)
		Uranium-238	0.594 ( $\pm$ 0.122)
	9/28/10	Gross beta	3.59 ( $\pm$ 1.12)
		Uranium-233/234	1.26 ( $\pm$ 0.197)
		Uranium-238	0.697 ( $\pm$ 0.136)

a. One sigma uncertainty shown in parenthesis.

### 3 REFERENCES

- 42 USC § 2011–2259, 1954, “Atomic Energy Act of 1954,” *United States Code*.
- DOE Order 450.1A, June 4, 2008, “Environmental Protection Program,” U.S. Department of Energy.
- Neher, E., DEQ, to W. F. Hamel, DOE-ID, April 14, 2010, “Materials and Fuels Complex (MFC) Industrial Waste Ditch (IWD) and Industrial Waste Pond (IWP), Industrial Wastewater Reuse Permit No. LA-000160-01,” CCN 220726.