INL/EXT-17-40908-Revision-0

2016 Groundwater Radiological Monitoring Results Associated with the Advanced Test Reactor Complex Cold Waste Ponds

Mike Lewis

January 2017

The INL is a U.S. Department of Energy National Laboratory
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ABSTRACT

This report summarizes radiological monitoring results from groundwater wells associated with the Idaho National Laboratory Site's Advanced Test Reactor Complex Cold Waste Ponds Reuse Permit (I-161-02). All radiological monitoring is performed to fulfill Department of Energy requirements under the Atomic Energy Act.

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2016 Groundwater Radiological Monitoring Results Associated with the Advanced Test Reactor Complex Cold Waste Ponds

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. This report fulfills the terms of agreement documented in the current Reuse Permit (I-161-02) for the Idaho National Laboratory Site's Advanced Test Reactor Complex Cold Waste Ponds (CWPs). The Reuse Permit was issued on November 20, 2014 (Neher 2014).

Section 2, Additional Facility Information, of the Reuse Permit states "The Permittee agrees to provide to DEQ the results of ground water radiological monitoring with respect to the INL ATR Complex Cold Waste Ponds that is performed to fulfill Department of Energy requirements under the Atomic Energy Act." The Permittee agrees to provide the results at the same time as the annual report.

2 REPORTING PERIOD

For the ATR Complex CWPs, the Reuse Permit reporting year runs from November 1, 2015–October 31, 2016. Section 5.2.2 of the Reuse Permit requires groundwater samples to be collected twice annually in April or May and September or October.

3 GROUNDWATER SAMPLE RESULTS

Samples were collected to satisfy the release objectives of DOE Order 458.1, "Radiation Protection of the Public and the Environment" and addressed within the Environmental Management System required by DOE Order 436.1, "Departmental Sustainability".

Groundwater samples for radiological parameters were collected from aquifer wells USGS-098, USGS-065, TRA-08, USGS-076, Middle-1823, and USGS-058 in May and September 2016. A field duplicate sample was collected from USGS-098 on May 10, 2016. Samples were analyzed by gamma spectrometry, and for gross alpha, gross beta, tritium, and strontium-90.

Only gross alpha, gross beta, and tritium were positively detected in the May and/or September samples (Table 2). Positive detections are considered measurements exceeding the instrument's minimum detection level and greater than two times the uncertainty.

Table 1. Gross alpha, gross beta, and tritium results from samples collected in May and September 2016 from the Advanced Test Reactor Complex Cold Waste Ponds Reuse Permit monitoring wells.

Monitoring Well	Sample Date	Parameter	Sample Result (pCi/L)
USGS-098	05/10/16	Gross Alpha	ND[a] ND[b]
		Gross Beta	ND 2.77 (± 0.798)[c]
		Tritium	ND ND
	09/19/16	Gross Alpha	ND
		Gross Beta	ND
		Tritium	ND
USGS-065	05/11/16	Gross Alpha	ND
		Gross Beta	4.47 (± 1.03)
		Tritium	2,580 (± 299)
	09/21/16	Gross Alpha	2.83 (± 0.791)
		Gross Beta	5.33 (± 0.87)
		Tritium	2,270 (± 260)
TRA-08	05/10/16	Gross Alpha	3.68 (± 1.29)
		Gross Beta	4.62 (± 1.12)
		Tritium	1,020 (± 157)
	09/20/16	Gross Alpha	ND
		Gross Beta	2.29 (± 0.697)
		Tritium	885 (± 136)
USGS-076	05/11/16	Gross Alpha	ND
		Gross Beta	ND
		Tritium	532 (± 116)
	09/20/16	Gross Alpha	ND
		Gross Beta	2.04 (± 0.494)
		Tritium	361 (± 102)
Middle-1823	05/10/16	Gross Alpha	ND
		Gross Beta	ND
		Tritium	638 (± 125)
	09/19/16	Gross Alpha	ND
		Gross Beta	2.32 (± 0.56)
		Tritium	681 (± 125)
USGS-058	05/11/16	Gross Alpha	ND
		Gross Beta	ND
		Tritium	848 (± 140)

Monitoring Well	Sample Date	Parameter	Sample Result (pCi/L)
	09/21/16	Gross Alpha	2.13 (± 0.665)
		Gross Beta	2.42 (± 0.697)
		Tritium	482 (± 108)

a. ND – Not detected.
b. Analytical result from field duplicate sample collected on May 10, 2016, from well USGS-098.
c. One sigma uncertainty shown in parentheses.

4 REFERENCES

42 USC § 2011–2259, 1954, "Atomic Energy Act of 1954," *United States Code*.

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