

Appendix B: Chapter 5 Addendum



Table B-1. Advanced Test Reactor Complex cold waste pond effluent permit-required monitoring results (2021).^{a,b}

PARAMETER	MINIMUM	MAXIMUM	MEDIAN
pH (standard units)	6.70	7.74	7.21
Conductivity (µS/cm)	381	1475	393
Chromium, filtered (mg/L)	0.00313	0.01410	0.00369
Chromium, total (mg/L)	0.00319	0.01450	0.00354
Iron, filtered (mg/L)	0.033U ^c	0.0783	0.033U
Iron, total (mg/L)	0.033U	0.0817	0.033U
Nitrate + nitrite as nitrogen (mg/L)	0.920	4.35	0.970
Solids, total dissolved (mg/L)	203	1180	227
Sulfate (mg/L)	20.1	634	23.0

- a. Reuse Permit I-161-03 does not specify maximum effluent constituent loading or concentration limits.
- b. Duplicate samples collected in July 2021 are included in the statistical summary.
- c. U qualifier indicates the result was below the detection limit.

Table B-2. Hydraulic loading rates for the Advanced Test Reactor Complex cold waste pond (2021).

	YEARLY TOTAL FLOW
2021 flow ^a	235.32 MG ^b
Annual permit limit ^c	375 MG
5-yr moving annual average permit limit	300 MG

- a. Annual flow is reported for the 2021 permit reporting year.
- b. MG = million gallons.
- c. The reuse permit specifies an annual limit based on a twelve-month reuse year from November 1st – October 31st.



Table B-3a. Advanced Test Reactor Complex cold waste pond industrial wastewater reuse permit monitoring well results (2021).^a

WELL NAME	USGS-098 (GW-0161-01)		USGS-065 (GW-161-02)		USGS-076 (GW-161-04)		TRA-08 (GW-161-05)		MIDDLE-1823 (GW-161-06)		USGS-136 (GW-161-08)		STANDARD ^b PCS/SCS
SAMPLE DATE:	04/27/2021	10/04/2021	05/03/2021	10/06/2021	04/29/2021	10/04/2021	05/03/2021	10/06/2021	04/29/2021	10/05/2021	05/04/2021	10/05/2021	
Water table depth (ft) bls ^c	427.81	429.40	475.62	477.09	483.67	485.16	489.40	490.92	493.79	494.83	488.94	490.47	NA ^d
Water table elevation (ft) ^e	4,461.40	4,459.81	4,452.95	4,451.48	4,449.54	4,448.05	4,449.66	4,448.14	4,449.08	4,448.04	4,449.79	4,448.26	NA
Borehole correction factor (ft) ^f	2.53	2.53	NA	NA	NA	NA	0.63	0.63	NA	NA	0.22	0.22	NA
Nitrite + nitrate as nitrogen (mg/L)	1.13	1.15	1.53	1.53	1.09 (1.09) ^g	1.10	1.06	1.09	1.05	1.08	1.18	1.26	10 (PCS)
pH (s.u.)	7.29	6.98	8.20	7.32	7.70	7.37	7.82	7.34	7.84	7.44	7.28	7.30	6.5 to 8.5 (SCS)
Conductivity (µS/cm)	384	394	581	599	417	427	409	422	414	422	431	430	NA
Temperature (°F)	55.6	53.6	57.7	55.8	58.1	54.5	56.8	55.9	59.7	56.3	55.0	55.2	NA
Sulfate (mg/L)	23.0J ^h	22.9J	140J	140	33.8J (33.8J)	32.8J	43.2	43.2	32.3J	32.3J	31.9J	32.4J	250 (SCS)
Total dissolved solids (mg/L)	249	219	407	403	251 (223)	253	244	320	236	241	239	254	500 (SCS)
Chromium, total (mg/L)	0.00636	0.00666	0.0813	0.0821	0.0106 (0.0102)	0.0107	0.0184	0.0213	0.00941	0.0106	0.0150	0.0167	0.1 (PCS)
Chromium, filtered (mg/L)	0.00636	0.00653	0.0789	0.0808	0.0107 (0.0106)	0.0103	0.0183	0.0192	0.00974	0.0104	0.0143	0.0156	0.1 (PCS)
Iron, filtered (mg/L)	0.03U ⁱ	0.03U	0.03U	0.03U	0.03U (0.0347)	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.03U	0.3 (SCS)

- a. Reuse Permit I-161-03 was issued October 30, 2019.
- b. Primary constituent standards (PCS) and secondary constituent standards (SCS) in groundwater referenced in the Ground Water Quality Rule, IDAPA 58.01.11.200.01 a and b.
- c. bls = below land surface.
- d. NA = not applicable.
- e. Water table elevation above mean sea level (ft). Elevation data provided using the North American Vertical Datum of 1988 (NAVD 88).
- f. The borehole correction factors were determined from gyroscopic surveys conducted by U. S. Geological Survey to reconcile discrepancies in water level measurements from well deviations.
- g. Results shown in parenthesis are from the field duplicate samples.
- h. J flag indicates the associated value is an estimate and may be inaccurate or imprecise.
- i. U qualification indicates the analyte was not detected above the instrument detection limit or the analyte was detected at or above the applicable detection limit but the value is not more than 5 times the highest positive amount in any laboratory blank and is U qualified as a result of data validation.



Table B-3b. Advanced Test Reactor Complex cold waste pond industrial wastewater reuse permit monitoring well results (2021).

WELL NAME	USGS-058 ^a (GW-161-07)		STANDARD (PCS/SCS) ^b
	SAMPLE DATE:	05/04/2021	
Water table depth (ft) bgs ^c	471.52	473.01	NA ^d
Water table elevation (ft) ^e	4,450.37	4,448.88	NA
Borehole correction factor (ft) ^f	NA	NA	NA
pH (s.u.)	7.35	7.34	6.5 to 8.5 (SCS)
Conductivity (μS/cm)	418	430	NA
Temperature (°F)	59.5	57.6	NA
Total dissolved solids (mg/L)	226	377	500 (SCS)
Sulfate (mg/L)	34.2J ^g	32.3J	250 (SCS)

- a. Reuse permit I-161-03 only requires water table elevation, water table depth, pH, conductivity, temperature, total dissolved solids and sulfate reported for USGS-058.
- b. Primary constituent standards (PCS) and secondary constituent standards (SCS) in groundwater referenced in the Ground Water Quality Rule, Idaho Administrative Procedure Act 58.01.11.200.01.a and b.
- c. bgs = below ground surface.
- d. NA = not applicable.
- e. Water table elevation above mean sea level (ft). Elevation data provided using the North American Vertical Datum of 1988 (NAVD 88).
- f. The borehole correction factors were determined from gyroscopic surveys conducted by U. S. Geological Survey to reconcile discrepancies in water level measurements from well deviations.
- g. J flag indicates the associated value is an estimate and may be inaccurate or imprecise.

Table B-4. Idaho Nuclear Technology and Engineering Center sewage treatment plant influent monitoring results at CPP-769 (2021).

PARAMETER	MINIMUM	MAXIMUM	MEAN
Biochemical oxygen demand (5-day) (mg/L)	74.5	265	145
Nitrate + nitrite, as nitrogen (mg/L)	0.02440 U ^a	1.89	0.160
Total kjeldahl nitrogen (mg/L)	29.4	140	80.3
Total phosphorus (mg/L)	0.54	11.4	6.40
Total suspended solids (mg/L)	56.0	254	108.5

- a. U flag indicates the analyte was analyzed for but not detected above the method detection limit.



Table B-5. Idaho Nuclear Technology and Engineering Center sewage treatment plant effluent monitoring results at CPP-773 (2021).

PARAMETER	MINIMUM	MAXIMUM	MEAN
Biochemical oxygen demand (5-day) (mg/L)	4.06 U ^a	19.3	11.9
Nitrate + nitrite, as nitrogen (mg/L)	0.02080U	6.36	2.52
pH (standard units) ^b	6.93	9.01	8.20
Total coliform (MPN ^c /100 mL) ^b	33.6	2,827	1,542.1
Total kjeldahl nitrogen (mg/L)	6.36	27	13.5
Total phosphorus (mg/L)	2.43	5.0	3.87
Total suspended solids (mg/L)	1.7	39	19

a. U flag indicates the analyte was analyzed for but not detected above the method detection limit.

b. As required by the permit, the results for this parameter were obtained from a grab sample.

c. MPN = most probable number.

Table B-6. Idaho Nuclear Technology and Engineering Center new percolation ponds effluent monitoring results at CPP-797 (2021).

PARAMETER	MINIMUM	MAXIMUM	MEAN
Chloride (mg/L)	15.6	143.0	59.2
Chromium (mg/L)	0.00555	0.00788	0.00625
Coliform, fecal (MPN/100 mL) ^a	1	5	1
Coliform, total (MPN/100 mL) ^a	65.0	2419.2	1173.4
Fluoride (mg/L)	0.185	0.269	0.223
Manganese, total (mg/L)	0.002U ^b	0.00200U	0.002U
Nitrate + nitrite, as nitrogen (mg/L)	0.815	1.69	1.14
pH (standard units) ^a	7.65	9.22	8.40
Selenium (mg/L)	0.00150U	0.002U	0.002U
Total dissolved solids (mg/L)	191	417	280
Total phosphorus (mg/L)	0.343	1.220	0.651

a. As required by the permit, the results for this parameter were obtained from a grab sample.

b. U flag indicates the analyte was analyzed for but not detected above the method detection limit.

Table B-7. Hydraulic loading rates for the Idaho Nuclear Technology and Engineering Center new percolation ponds (2021).

	MAXIMUM DAILY FLOW	YEARLY TOTAL FLOW
2021 flow	1,314,000 gallons	203 MG ^a
Permit limit	3,000,000 gallons	1,095 MG

a. MG = million gallons.



Table B-8. Idaho Nuclear Technology and Engineering Center new percolation ponds aquifer monitoring well groundwater results (2021).

PARAMETER	ICPP-MON-A-165 (GW-13006)		ICPP-MON-A-166 (GW-13007)		ICPP-MON-A-164B (GW-13011)		STANDARD PCS/SCS ^a
	SAMPLE DATE:	05/18/2021	09/21/2021	05/18/2021	09/21/2021	05/17/2021	
Water table depth (ft below brass cap)	503.80	505.47	510.98	512.66	502.89	504.53	NA ^b
Water table elevation (at brass cap in ft) ^c	4,449.11	4,447.44	4,448.56	4,446.88	4,449.28	4,447.64	NA
Chloride (mg/L)	37.5J ^d	35.7J	16.4J	16.6J	9.09J	9.90J	250
Chromium (mg/L)	0.0076	0.0193	0.00511	0.00484	0.0102	0.0124	0.1
Coliform, fecal (MPN ^e /100 mL)	<1	<1	<1	<1	<1	<1	<1 CFU ^f /100 mL
Coliform, total (MPN/100 mL)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1 CFU/100 mL ^g
Dissolved oxygen (mg/L)	7.94	8.05	5.37	4.57	4.51	5.31	NA
Electrical conductivity (µmhos/cm)	477	466	332	329	377	412	NA
Fluoride (mg/L)	0.215	0.174	0.298	0.234	0.212	0.151	4
Manganese, dissolved (mg/L) ^h	NR ⁱ	NR	NR	NR	NR	NR	0.05
Manganese, total (mg/L)	ND (<0.001) ^j	0.00165J	0.00942	0.0818	ND (<0.001)	ND (<0.001)	0.05
Nitrate / nitrite, as nitrogen (mg/L)	1.25	1.03	0.379	0.333	0.860	0.938	10
pH (standard units)	7.97	7.77	7.97	7.69	8.18	7.88	6.5–8.5
Selenium (mg/L)	ND (<0.0015)	ND (<0.0015)	ND (<0.0015)	ND (<0.0015)	ND (<0.0015)	ND (<0.0015)	0.05
Temperature (°F)	54.81	53.87	54.25	53.58	55.60	54.63	NA
Total dissolved solids (mg/L)	279	287	207	203	209	231	500
Total phosphorus (mg/L)	0.0253J	ND (<0.020)	0.0663	ND (<0.020)	0.0782	ND (<0.020)	NA

a. Primary constituent standards (PCS) and secondary constituent standards (SCS) in groundwater referenced in IDAPA 58.01.11.200.01.a and b.

b. NA = not applicable.

c. Water table elevations referenced to North American Vertical Datum of 1988 (NAVD 88).

d. J flag indicates the parameter was positively identified, but the reported value is an estimate. This is because the matrix spike recovery was outside U.S. Environmental Protection Agency Method Recovery Criteria.

e. MPN = most probable number.

f. CFU = colony forming unit.

g. An exceedance of the PCS for total coliform is not a violation. If the PCS for total coliform is exceeded, analysis for fecal coliform is conducted. An exceedance of the PCS for fecal coliform is a violation.

h. The result of the dissolved concentrations of this parameter are used for SCS compliance determinations.

i. NR = parameter was not a monitoring requirement since the analytical result for total manganese did not exceed the standard in IDAPA 58.01.11.200.01.b manganese standard of 0.05 mg/L.

j. ND = Parameter not detected in sample. Value in parentheses is the detection limit.



Table B-9. Idaho Nuclear Technology and Engineering Center new percolation ponds perched water monitoring well groundwater results (2021).

PARAMETER	ICPP-MON-V-191 (GW-13008)		ICPP-MON-V-200 (GW-13009)		ICPP-MON-V-212 (GW-13010)		STANDARD PCS/SCS ^a
	SAMPLE DATE:	05/17/2021	09/20/2021	05/17/2021	09/20/2021	05/17/2021	
Depth to water (ft below brass cap)	Dry ^b	Dry	108.17	117.84	235.11	236.5	NA ^c
Water table elevation (at brass cap in ft) ^d	NA	NA	4,844.93	4,835.26	4,723.39	4,722.00	NA
Chloride (mg/L)	NA	NA	75.8J ^e	79.9 J	68.5J	72.3J	250
Chromium (mg/L)	NA	NA	0.00631	0.00843	0.0235	0.0344	0.1
Coliform, fecal (MPN ^f /100 mL)	NA	NA	<1	<1	<1	<1	<1 CFU ^g /100 mL
Coliform, total (MPN/100 mL)	NA	NA	<1.0	<1.0	<1.0	<1.0	1 CFU/100 mL ^h
Dissolved oxygen (mg/L)	NA	NA	7.02	4.88	4.27	5.95	NA
Electrical conductivity (µmhos/cm)	NA	NA	619	623	543	542	NA
Fluoride (mg/L)	NA	NA	0.264	0.193	0.212	0.173	4
Manganese, dissolved (mg/L) ⁱ	NA	NA	NR ^j	NR	NR	NR	0.05
Manganese, total (mg/L)	NA	NA	ND (<0.001) ^k	0.00226J ^l	0.0166	0.0152	0.05
Nitrate/nitrite, as nitrogen (mg/L)	NA	NA	0.900	1.21	1.48	1.35	10
pH (standard units)	NA	NA	7.97	8.00	10.16	9.82	6.5–8.5
Selenium (mg/L)	NA	NA	ND (<0.0015)	ND (<0.0015)	ND (<0.0015)	ND (<0.0015)	0.05
Temperature (°F)	NA	NA	59.58	58.82	62.24	62.08	NA
Total dissolved solids (mg/L)	NA	NA	324	357	301	296	500
Total phosphorus (mg/L)	NA	NA	0.423	0.291	0.0607	0.0720	NA

a. Primary constituent standards (PCS) and secondary constituent standards (SCS) in groundwater referenced in IDAPA 58.01.11.200.01.a and b.

b. ICPP-MON-V-191 was dry in May and September 2021.

c. NA = not applicable.

d. Water table elevations referenced to North American Vertical Datum of 1988 (NAVD 88).

e. J flag indicates the parameter was positively identified, but the reported value is an estimate. This is because the matrix spike recovery was outside United States Environmental Protection Agency Method Recovery Criteria.

f. MPN = most probable number.

g. CFU = colony forming units.

h. An exceedance of the PCS for total coliform is not a violation. If the PCS for total coliform is exceeded, analysis for fecal coliform is conducted. An exceedance of the PCS for fecal coliform is a violation.

i. The results of dissolved concentrations of this parameter are used for SCS compliance determinations.

j. NR = not required since the analytical result for total manganese did not exceed the standard in Idaho Administration Procedures Act 58.01.11.200.01.d for manganese of 0.05 mg/L.

k. ND = Parameter not detected in sample. Value in parentheses is the detection limit.

l. J flag indicates that the parameter was positively identified, but the reported value is an estimate. This is because the value is less than the laboratory reporting limit.



Table B-10. Materials and Fuels Complex industrial waste pond effluent monitoring results for the reuse permit (2021).^{a,b,c}

PARAMETER	MINIMUM	MAXIMUM	MEDIAN
pH (standard units)	7.15	8.59	7.30
Conductivity ^d ((μS/cm)	384	1157	479
Chloride ^d (mg/L)	12.0J ^e	224J	34.7
Nitrate + nitrite as nitrogen (mg/L)	2.73	4.06	3.07
Iron (mg/L)	0.03U ^f	0.0867	0.0394
Iron, filtered(mg/L)	0.03U	0.03U	0.03U
Manganese (mg/L)	0.002U	0.00426J	0.00208
Manganese, filtered (mg/L)	0.002U	0.00393J	0.002U
Sodium ^d (mg/L)	18.6	150	32.6
Sodium ^d , filtered (mg/L)	18.5	153	32.8
Total dissolved solids (mg/L)	213	610	289

- a. Liquid effluent results for permit-required constituents collected at the sampling station located on the Industrial Wastewater Collection System (IWCS) primary line prior to discharge into the pond. The results represent effluent contributions from both the IWCS Primary Line (PL) and Southwestern Branch Line (SBL), which are combined upstream of the sampling station.
- b. Duplicate samples were collected in July 2021. The duplicate results are included in the data summary.
- c. Reuse permit I-160-02 does not specify maximum constituent loading or concentration limits.
- d. Conductivity, chloride and sodium are not required effluent monitoring parameters in the reuse permit.
- e. J flag indicates the associated value is an estimate and may be inaccurate or imprecise.
- f. U qualifier indicates the result was below the detection limit.

Table B-11. Materials and Fuels Complex effluent hydraulic loading to the industrial waste pond (2021).

YEARLY TOTAL FLOW	
2021 flow ^a	7.366 MG ^b
Annual permit limit ^c	17 MG

- a. Annual flow is reported for the 2021 permit reporting year.
- b. MG = million gallons.
- c. The reuse permit specifies an annual limit based on a twelve-month reuse year from November 1st – October 31st.



Table B-12. Materials and Fuels Complex industrial waste pond summary of groundwater quality data collected for the reuse permit (2021).

WELL NAME	ANL-MON-A-012 (GW-16001)		ANL-MON-A-013 (GW-16002)		ANL-MON-A-014 (GW-16003)		PCS/SCS ^a
	SAMPLE DATE:	04/20/2021	10/07/2021	04/21/2021	09/29/2021	04/21/2021	
Water table depth (ft bls) ^b	658.46	661.28 ^c	646.89	649.78	646.02	648.95	NA ^d
Water table elevation (ft above mean sea level) ^e	4,474.24	4,471.42	4,473.48	4,470.59	4,472.06	4,469.13	NA
Temperature (°F)	50.9	55.6	55.2	55.6	57.6	53.6	NA
pH (s.u)	7.23	6.99	7.12	6.97	7.36	6.99	6.5 to 8.5 (SCS)
Conductivity (µmhos/cm)	411	399	431	472	422 (421) ^f	437	NA
Nitrite + nitrate as N (mg/L)	2.62	2.58	2.65	2.52	2.66 (2.68)	2.93	10 (PCS)
Nitrate nitrogen (mg/L) ^g	2.32 ^h	2.34	2.39	2.28	2.43 (2.43)	2.49	10 (PCS)
Total dissolved solids (mg/L)	233	246	240	226	266 (221J) ⁱ	220	500 (SCS)
Iron, total (mg/L)	0.03U ^j	0.03U	0.03U	0.0484	0.03U (0.03U)	0.03U	0.3 (SCS)
Iron, filtered (mg/L)	0.03U	0.03U	0.03U	0.03U	0.03U (0.03U)	0.03U	0.3 (SCS)
Manganese, total (mg/L)	0.001U	0.001U	0.00124	0.001U	0.001U (0.001U)	0.001U	0.05 (SCS)
Manganese, filtered (mg/L)	0.001U	0.001U	0.001U	0.001U	0.001U (0.001U)	0.001U	0.05 (SCS)

a. Primary Constituent Standard (PCS) or Secondary Constituent Standard (SCS) specified in the Ground Water Quality Rule, IDAPA 58.01.11.200.01.a and b.

b. bls = below land surface.

c. ANL-MON-A-012 was initially gauged for water level and sampled on 9/28/21, but due to an enroute shipping delay the well was re-sampled on 10/7/21. The water table depth and water table elevation for 9/28/21 were measured at 661.35 ft bls and 4,471.35 ft respectively.

d. NA = not applicable.

e. Elevations are given in the National Geodetic Vertical Datum of 1929.

f. Duplicate sample results are shown in parentheses.

g. Nitrate nitrogen is not required by the reuse permit. It was analyzed for surveillance and historical trending purposes.



Table B-12. continued.

WELL NAME	ANL-MON-A-012 (GW-16001)		ANL-MON-A-013 (GW-16002)		ANL-MON-A-014 (GW-16003)		PCS/SCS ^a
SAMPLE DATE:	04/20/2021	10/07/2021	04/21/2021	09/29/2021	04/21/2021	09/29/2021	

- h. J qualification indicates the associated value is an estimate and may be inaccurate or imprecise.
- i. Reanalysis of the original TDS result is reported. The reanalysis was requested to address quality control issues during data review. The reanalysis occurred beyond the allowable hold-time and the result was qualified J during the data validation process.
- j. U qualification indicates the analyte was not detected above the instrument detection limit or the analyte was detected at or above the applicable detection limit, but the value is not more than 5 times the highest positive amount in any laboratory blank.

Table B-13. Advanced Test Reactor Complex cold waste ponds effluent surveillance monitoring results (2021).^a

PARAMETER	MINIMUM	MAXIMUM	DCS ^b (pCi/L)
Gross beta (pCi/L \pm 1s) ^{c,d}	ND ^{d,e}	11.5 (\pm 0.948)	NA ^f
Potassium-40 ^g (pCi/L \pm 1s)	ND	30.6 (\pm 7.62)	16,000
pH (standard units) ^h	6.70	7.74	NA

- a. Monthly samples were analyzed for gross alpha, gross beta, tritium, and gamma-emitting radionuclides including americium-241, antimony-125, cerium-144, cesium-134, cesium-137, cobalt-58, cobalt-60, europium-152, europium-154, europium-155, manganese-54, niobium-95, potassium-40, radium-226, ruthenium-103, ruthenium-106, silver-108m, silver-110m, uranium-235, zinc-65, and zirconium-95.
- b. DOE Derived Concentration Standards for ingested water.
- c. Result \pm 1s. Results are shown only for statistically positive detections $>$ 3s.
- d. Gross beta was positively detected in March, April, and June 2021. Results were non-detect for the other nine months of 2021.
- e. ND = not detected.
- f. NA = not applicable. DCS values are not established.
- g. Potassium-40 was detected in February 2021. All other monthly results in 2021 were non-detect.
- h. Median pH was 7.21. For perspective, the Idaho Ground Water Quality Rule Secondary Constituent Standard (SCS) for pH is 6.5 – 8.5.



Table B-14. Radioactivity detected in surveillance groundwater samples collected at the Advanced Test Reactor Complex (2021).^a

MONITORING WELL	SAMPLE DATE	GAMMA EMITTERS ^a (PCI/L)	GROSS ALPHA (PCI/L)	GROSS BETA (PCI/L)	STRONTIUM-90 (PCI/L)	TRITIUM (PCI/L)
PCS/SCS ^b		NA	15	4 mrem/yr ^c	8	20,000
USGS-098	04/27/2021	ND ^d	ND	2.05 (±0.248) ^e	ND	ND
	10/04/2021	ND	ND	2.55 (±0.364)	ND	ND
USGS-058	05/04/2021	ND	ND	1.37 (±0.181)	ND	ND
	10/06/2021	ND	ND	1.65 (±0.251)	ND	ND
USGS-065	05/03/2021	ND	ND	2.20 (±0.251)	ND	1,130 (±169)
	10/06/2021	ND	2.04 (±0.447)	2.75 (±0.325)	ND	1,190 (±190)
TRA-08	05/03/2021	ND	1.28 (±0.420)	2.77 (±0.343)	ND	396 (±115)
	10/06/2021	ND	ND	1.30 (±0.159)	0.477 (±0.158)	566 (±138)
USGS-076	04/29/2021	ND	ND	1.29 (±0.205)	ND	424 (±101)
	10/4/2021	(ND) ^f ND	(ND) ND	(1.82 [±0.240]) 1.58 (±0.444)	(ND) ND	(361 [±96.5]) ND
MIDDLE-1823	04/29/2021	ND	ND	1.86 (±0.246)	ND	545 (±109)
	10/05/2021	ND	ND	2.86 (±0.380)	ND	ND
USGS-136	05/04/2021	ND	0.981 (±0.234)	2.43 (±0.281)	ND	871 (±152)
	10/05/2021	ND	1.70 (±0.366)	2.11 (±0.297)	ND	888 (±150)

- a. Gamma-emitting radionuclides including americium-241, antimony-125, cerium-144, cesium-134, cesium-137, cobalt-58, cobalt-60, europium-152, europium-154, europium-155, manganese-54, niobium-95, potassium-40, radium-226, ruthenium-103, ruthenium-106, silver-108m, silver-110m, uranium-235, zinc-65, and zirconium 95.
- b. Primary Constituent Standards (PCS) in the Ground Water Quality Rule, IDAPA 58.01.11.200.01.a, are provided for perspective.
- c. Gross Beta PCS = 4 mrem/yr effective dose, IDAPA 58.01.11.200.01.a. For perspective, the EPA public drinking water system regulations also specify a Maximum Contaminant Limit (MCL) of 4 mrem/yr for Gross Beta and use a screening level of 50 pCi/L to determine when speciation of individual beta/photon emitters is necessary.
- d. ND = not detected.
- e. Results shown are for statistically positive detections >3s, along with the reported 1s uncertainty.
- f. Results from field duplicate samples shown in brackets.



Table B-15. Liquid effluent radiological monitoring results for the Idaho Nuclear Technology and Engineering Center (2021).

SAMPLE DATE	GAMMA EMITTERS ^a (PCI/L)	GROSS ALPHA ^b (PCI/L)	GROSS BETA ^b (PCI/L)	TOTAL STRONTIUM (PCI/L)
EFFLUENT TO IDAHO NUCLEAR TECHNOLOGY AND ENGINEERING CENTER NEW PERCOLATION PONDS (CPP-797)				
January 2021	ND ^c	ND	6.42 (±1.08)	ND
February 2021	ND	ND	2.37 (±0.746)	ND
March 2021	84.6 (±39.0)J ^{d,e}	ND	5.38 (±1.06)	ND
April 2021	ND	ND	3.56 (±0.828)	ND
May 2021	ND	ND	ND	ND
June 2021	ND	ND	3.41 (±0.622)	ND
July 2021	ND	ND	4.47 (±0.921)	ND
August 2021	ND	ND	8.35 (±1.01)	ND
September 2021	ND	ND	4.55 (±0.712)	ND
October 2021	ND	ND	6.42 (±0.976)	ND
November 2021	ND	ND	5.08 (±9.98)	ND
December 2021	ND	ND	5.77 (±4.77)	ND

- a. Gamma-emitting radionuclides include americium-241, antimony-125, cerium-144, cesium-134, cesium-137, cobalt-58, cobalt-60, europium-152, europium-154, europium-155, manganese-54, niobium-95, potassium-40, radium-226, ruthenium-103, ruthenium-106, silver-108m, silver-110m, uranium-235, zinc-65, and zirconium-95.
- b. Detected results are shown along with the reported 1-sigma uncertainty.
- c. ND = no radioactivity was detected. The result was not statistically positive at the 95% confidence interval and was below its minimum detectable activity.
- d. J flag indicates the associated value is an estimate.
- e. Potassium-40 was the only gamma-emitting radionuclide detected.



Table B-16. Groundwater radiological monitoring results for the Idaho Nuclear Technology and Engineering Center (2021).

MONITORING WELL	SAMPLE DATE	GROSS ALPHA ^a (pCi/L)	GROSS BETA ^a (pCi/L)
ICPP-MON-A-165	05/18/2021	ND ^b	3.99 (±0.677)
	09/21/2021	4.23 (±1.26)	4.35 (±0.745)
ICPP-MON-A-166	05/18/2021	ND	ND
	09/21/2021	3.98 (±1.17)	3.51(±0.788)
ICPP-MON-V-200	05/17/2021	ND	3.82 (±0.753)
	09/20/2021	9.23 (±1.87)	6.68 (±0.994)
ICPP-MON-V-212	05/17/2021	ND	16.6 (±1.06)
	09/20/2021	ND	55.0 (±2.40)

- a. Detected results are shown along with the reported 1-sigma uncertainty.
 b. ND = no radioactivity was detected. The result was not statistically positive at the 95% confidence interval and was below its minimum detectable activity.

Table B-17. Radiological Monitoring Results for Materials and Fuels Complex industrial waste pond (2021).^a

PARAMETER ^b (pCi/L)	MINIMUM	MAXIMUM	DCS ^c (pCi/L)
Gross alpha	ND ^d	3.36 (±1.05)	NA ^e
Gross beta	ND	6.02 (± 0.780)	NA
Uranium-238 ^f	0.581 (± 0.133)	0.581 (± 0.133)	750
Uranium-233/234 ^f	1.83 (± 0.259)	1.83 (± 0.259)	660

- a. Samples were analyzed for gross alpha; gross beta; plutonium-241; strontium-90; tritium; gamma-emitting radionuclides including americium-241, antimony-125, cerium-144, cesium-134, cesium-137, cobalt-58, cobalt-60, europium-152, europium-154, europium-155, manganese-54, niobium-95, potassium-40, radium-226, ruthenium-103, ruthenium-106, silver-108m, silver-110m, uranium-235, zinc-65, zirconium-95; alpha-emitting radionuclides including americium-241, uranium-233/234, uranium-235, uranium-238, plutonium-236, plutonium-238, plutonium-239/240, and plutonium-242.
 b. Results shown are for statistically positive detections >3s, along with the reported 1s uncertainty. Only parameters with at least one positively detected result are shown.
 c. DCS = DOE Derived Concentration Standard for ingested water (DOE-STD-1196-2011).
 d. ND indicates the result was below the detection limit.
 e. NA = not applicable.
 f. Parameter was analyzed in August only; therefore, the minimum and maximum are the same.