

2010 Idaho National Laboratory Water Use Report and Comprehensive Well Inventory (Revision 19)

June 2011



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June 2011

**Idaho National Laboratory
Idaho Falls, Idaho 83415**

<http://www.inl.gov>

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Office of Nuclear Energy
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ABSTRACT

This *2010 Idaho National Laboratory Water Use Report and Comprehensive Well Inventory (Revision 19)* provides water use information (monthly annual average and total annual volume) for production and potable water wells at the Idaho National Laboratory for Calendar Year 2010. It also provides detailed information for new, modified, and abandoned (decommissioned) wells and holes. Five new wells were drilled and completed in the latter part of Calendar Years 2009 and 2010. Two wells were modified in Calendar Year 2010 and 66 wells and boreholes reported as abandoned (decommissioned). Detailed construction information for the new and modified wells, along with abandonment information for older wells, is provided. Location maps are provided if survey information was available.

This report is being submitted in accordance with the Water Rights Agreement between the State of Idaho and the United States, for the United States Department of Energy (dated 1990) and the subsequent Partial Decree for Water Right 34-10901 issued June 20, 2003.

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ACRONYMS

ATR Complex	Advanced Test Reactor Complex
bls	below land surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CITRC	Critical Infrastructure Test Range Complex
CWI	Comprehensive Well Inventory
CY	calendar year
IDWR	Idaho Department of Water Resources
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
LOFT	Loss of Fluid Test Facility
MFC	Materials and Fuels Complex
NRF	Naval Reactors Facility
RWMC	Radioactive Waste Management Complex
TAN	Test Area North
USGS	United States Geological Survey

2010 Idaho National Laboratory Water Use Report and Comprehensive Well Inventory (Revision 19)

1. INTRODUCTION

This *2010 Idaho National Laboratory Water Use Report and Comprehensive Well Inventory, (Revision 19)* is being submitted in accordance with the *Water Rights Agreement between the State of Idaho and the United States, for the United States Department of Energy* (Department of Justice 1990) and the subsequent Partial Decree for Water Right 34-10901 (District Court 2003) issued June 20, 2003. As previously agreed (Street 2001), the annual Water Use Report and Comprehensive Well Inventory (CWI) are being combined and submitted as one report.

Section 2 provides water use information required by the Water Rights Agreement for production and potable water wells at the Idaho National Laboratory (INL) Site. The INL Site water use reported here is for Calendar Year (CY) 2010. Section 2.1 provides monthly annual average and total annual volume for each production or potable water well. Section 2.2 provides the monthly diversion rates and the total annual volume for all production or potable water wells.

Section 3 discusses Revision 19 to the CWI for the INL Site. Section 3.1 provides information for new and modified wells, and Section 3.2 provides information for abandoned (decommissioned) wells and boreholes. Five new wells were drilled and completed in the latter part of CY 2009 and CY 2010 and are included in this report. Two wells were modified in CY 2010. Section 3.2 identifies 66 wells and boreholes reported as abandoned (decommissioned). Appendix A provides detailed construction information for the new and modified wells. Appendix B contains maps showing the locations of abandoned wells and boreholes and diagrams, if available, that provide detailed construction and abandonment information.

2. 2010 WATER USE INFORMATION FOR THE IDAHO NATIONAL LABORATORY

2.1 Water Volume for Individual Idaho National Laboratory Production or Potable Water Wells

Eight major facilities are located at the INL Site:

- Advanced Test Reactor Complex (ATR Complex)
- Central Facilities Area (CFA)
- Critical Infrastructure Test Range Complex (CITRC)
- Idaho Nuclear Technology and Engineering Center (INTEC)
- Materials and Fuels Complex (MFC)
- Naval Reactors Facility (NRF)
- Radioactive Waste Management Complex (RWMC)
- Test Area North (TAN).

Each major facility is serviced by one or more production and/or potable water wells. Tables 1 through 8 show water information for production or potable wells at these facilities.

Seven wells are grouped under the CFA facility. Wells CFA-1 and CFA-2 serve the actual CFA. The other five wells (Badging Facility Well, EBR-1, Fire Station Well, Rifle Range Well, and Site-04 [Dairy Farm]) serve smaller facilities or processes. The Fire Station Well occasionally has been used for filling water trucks for construction purposes. However, for 2010, the Fire Station Well was not used because the pump was inoperable. The Dairy Farm Well is used for irrigating various research projects. The wells identified at other INL Site facilities provide water primarily for that specific facility.

Each table provides the monthly annual average and total annual volume of water diverted from each production or potable well during CY 2010. Each well is identified by its official well name, the most common alias name, and the well identification number. Footnotes are provided where applicable.

Table 4. Idaho Nuclear Technology and Engineering Center water volume for 2010.

Volume in Gallons																
Well	Alias	Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
CPP-01 ^a	F-UTI-670	98	641,000	12,404,000	418,000	23,063,000	2,930,000	19,196,000	14,162,000	10,614,000	376,000	14,841,000	163,000	12,576,000	111,384,000	9,282,000
CPP-02 ^{a, b}	F-UTI-671	99	18,103,000	4,000	28,537,000	676,000	18,841,000	0	2,219,000	0	11,111,000	585,000	12,238,000	0	92,314,000	7,692,833
CPP-04 ^c		101	649,668	522,708	413,602	290,500	286,801	304,739	317,266	408,943	314,936	271,029	203,577	154,401	4,138,167	344,847
ICPP-POT-A-012 ^c	F-UTI-699 or CPP-05	1186	649,668	522,708	413,602	290,500	286,801	304,739	317,266	408,943	314,936	271,029	203,577	154,401	4,138,167	344,847
Monthly total			20,043,335	13,453,416	29,782,203	24,320,000	22,344,601	19,805,478	17,015,531	11,431,885	12,116,871	15,968,058	12,808,154	12,884,801		
Total annual volume for INTEC: 211,974,333																
a. The flow meters for CPP-01 and CPP-02 were replaced during the last week of July 2010.																
b. April—Datalogger in CPP-02 was inoperative April 5 through April 30, 2010, but well was offline during this period. May 1–6 and May 17–25, datalogger in CPP-02 was inoperative. Volumes were estimated based on same volume pumped the previous month. May 26 through July 27, datalogger in CPP-02 was offline. The flow meter was replaced and back online July 28, 2010.																
c. One flow meter was used for potable wells CPP-04 and ICPP-POT-A-012. Operations switched between the wells weekly, so the totals are estimated to be 50% for each well.																

Table 5. Materials and Fuels Complex water volume for 2010.

Volume in Gallons																
Well	Alias	Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
EBR-II #1 ^{a, b}	EBR-1	150	0	0	0	0	0	779,000	1,178,500	1,094,500	543,500	641,000	621,000	648,000	5,505,500	458,792
EBR-II #2 ^b	EBR-II	151	2,196,000	1,576,000	1,655,000	1,822,000	1,891,000	779,000	1,178,500	1,094,500	543,500	641,000	621,000	648,000	14,645,500	1,220,458
Monthly total			2,196,000	1,576,000	1,655,000	1,822,000	1,891,000	1,558,000	2,357,000	2,189,000	1,087,000	1,282,000	1,242,000	1,296,000		
Total annual volume for MFC: 20,151,000																
a. Well EBR-II #1 was removed from service beginning in August 2009 for upgrade of the electrical system, and was placed back in service in June 2010.																
b. The two wells share one flow meter. Operations switch between the wells, so the totals are estimated to be 50% for each well from June through December.																
Depth to water, static water level:																
<u>Date</u>	<u>EBR-II #1</u>	<u>EBR-II #2</u>														
May 2010	Not measured	658.5 feet bls														
November 2010	659.5 feet bls	660.0 feet bls														

Table 6. Naval Reactors Facility water volume for 2010.

Volume in Gallons																
Well	Alias	Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
NRF-1	1	240	898,000	136,000	20,000	28,000	180,000	152,000	361,000	97,000	38,000	45,000	114,000	185,000	2,254,000	187,833
NRF-2 ^a	2	241	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRF-3 ^b	3	242	300,453	299,124	309,559	367,748	355,500	101,152	186,799	245,027	213,203	159,717	113,325	108,497	2,760,104	230,009
NRF-4	4	869	946,000	786,000	912,000	929,000	1,051,000	1,961,000	2,479,000	2,066,000	1,228,000	1,799,000	1,482,000	1,857,000	17,496,000	1,458,000
NRF-14 ^b		2204	309,496	310,522	349,934	263,413	229,268	461,244	384,130	442,026	373,114	431,182	476,597	406,257	4,437,183	369,765
Monthly total			2,453,949	1,531,646	1,591,493	1,588,161	1,815,768	2,675,396	3,410,929	2,850,053	1,852,317	2,434,899	2,185,922	2,556,754		
Total annual volume for NRF: 26,947,287																
a. NRF-2 was removed from service in 2006. Future use will be determined.																
b. Wells NRF-3 and NRF-14 are used as potable water wells. Well NRF-14 is a new well that became fully operational in March 2009.																

Table 7. Radioactive Waste Management Complex water volume for 2010.

Volume in Gallons																
Well	Alias	Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
RWMC Production		268	774,200	654,500	882,200	744,900	650,100	1,023,900	1,373,500	1,492,300	1,203,300	858,700	444,400	435,600	10,537,600	878,133
PIT 9 Production Well		2155	0	0	0	0	0	0	0	0	158,700	361,100	53,200	0	573,000	47,750
Monthly total			774,200	654,500	882,200	744,900	650,100	1,023,900	1,373,500	1,492,300	1,362,000	1,219,800	497,600	435,600		
Total annual volume for RWMC: 11,110,600																

Table 8. Test Area North water volume for 2010.

Volume in Gallons																
Well	Alias	Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
ANP-01 ^a	TAN-612	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANP-02	TAN-613	70	181,600	172,700	169,800	161,000	101,900	137,300	116,200	139,800	68,900	156,200	62,700	70,300	1,538,400	128,200
FET-1	TAN-632	154	145,400	150,600	153,900	106,300	93,700	49,500	54,000	493,200	328,500	482,900	160,300	107,600	2,325,900	193,825
FET-2	TAN-639	155	207,700	160,000	222,100	274,800	535,300	799,200	1,219,700	565,800	407,100	281,000	173,700	167,400	5,013,800	417,817
Monthly total			534,700	483,300	545,800	542,100	730,900	986,000	1,389,900	1,198,800	804,500	920,100	396,700	345,300		
Total annual volume for TAN: 8,878,100																
a. Well is maintained as a backup well for ANP-02.																

2.2 Combined Total Volume Diverted from All Production and Potable Water Wells

Table 9 provides the combined total volume from all production and potable water wells at the INL Site during CY 2010. Table 9 includes:

- Total monthly volume of water diverted for each major INL Site facility
- The combined total monthly volume from all the major INL Site facilities
- Monthly average for all wells combined
- Total annual volume diverted at the INL Site.

Table 9. Idaho National Laboratory water volume totals for 2010.

Volume in Gallons												
Facility	January	February	March	April	May	June	July	August	September	October	November	December
Advanced Test Reactor Complex	33,204,200	30,289,200	37,669,100	29,829,500	41,978,500	34,529,400	42,827,100	51,765,900	48,084,500	46,654,800	42,280,700	36,777,700
Central Facilities Area	1,613,394	1,840,386	1,853,675	2,089,529	4,683,384	6,144,050	11,117,211	11,740,853	4,107,257	1,762,237	1,431,402	1,450,169
Critical Infrastructure Test Range Complex	447,400	480,100	453,100	335,700	191,400	169,200	221,000	130,100	228,200	153,800	95,900	138,000
Idaho Nuclear Technology and Engineering Center	20,043,335	13,453,416	29,782,203	24,320,000	22,344,601	19,805,478	17,015,531	11,431,885	12,116,871	15,968,058	12,808,154	12,884,801
Materials and Fuels Complex	2,196,000	1,576,000	1,655,000	1,822,000	1,891,000	1,558,000	2,357,000	2,189,000	1,087,000	1,282,000	1,242,000	1,296,000
Naval Reactors Facility	2,453,949	1,531,646	1,591,493	1,588,161	1,815,768	2,675,396	3,410,929	2,850,053	1,852,317	2,434,899	2,185,922	2,556,754
Radioactive Waste Management Complex	774,200	654,500	882,200	744,900	650,100	1,023,900	1,373,500	1,492,300	1,362,000	1,219,800	497,600	435,600
Test Area North	534,700	483,300	545,800	542,100	730,900	986,000	1,389,900	1,198,800	804,500	920,100	396,700	345,300
Monthly total	61,267,178	50,308,548	74,432,571	61,271,890	74,285,653	66,891,424	79,712,171	82,798,891	69,642,645	70,395,694	60,938,378	55,884,324
Maximum monthly diversion total		82,798,891 for August 10										
Total average monthly volume		67,319,114										
Total for 2010		807,829,367										

2.3 Water Use Summary

The INL Site's Federal Reserved Water Right is 35,000 acre-ft per year (1.14×10^{10} gal/ yr) and will not exceed a maximum diversion rate of 80 ft³/s (35,904 gpm). The total volume of water diverted at the INL Site for CY 2010 was approximately 8.08×10^8 gal (see Table 9) or approximately 7.1% of the annual water right. The maximum diversion rate occurred during August at a rate of 4.1 ft³/s (1,855 gpm). The average monthly volume of water diverted for all INL Site production and potable wells was approximately 6.73×10^7 gal. The INL's water use remained well within the established water right.

3. COMPREHENSIVE WELL INVENTORY, REVISION 19

3.1 Idaho National Laboratory New and Modified Wells in Calendar Year 2010

Five new wells were constructed at the INL Site in CY 2010: NRF-15, NRF-16, ICPP-2195, ICPP-2196, and ICPP-2205. Two wells, TRA-08 and USGS-108, were deepened and modified. These additions and modifications are listed in Table 10.

Drilling for NRF-15 began in October 2008 by the United States Geological Survey (USGS) and was completed in May 2009. Total depth for this well was reached at 759 feet below land surface (bls). This well was intended to be a replacement monitoring well for NRF-13. Well NRF-15 was intended to be used as an upgradient monitoring well. However, initial sample results from NRF-15, collected in November and December of 2008, showed higher than expected concentrations of chloride and sulfate, indicating that the groundwater quality was being influenced by NRF operations. Therefore, NRF-15 was completed as a piezometer well, with one shallow (screened at 380 feet bls to 390 feet bls) and one deep (screened at 612 feet bls to 622 feet bls) completion (see Figure A-1).

A decision was made to move to a new location and drill the NRF-13 replacement monitoring well (NRF-16). Well NRF-16 is located approximately 1 mile north of NRF 15. Construction of NRF-16 began in August 2009, and was completed in November 2009, to a depth of 425 feet bls (see Figure A-2). Water sample results indicated NRF-16 would meet NRF needs for an upgradient monitoring well (DOE-ID 2010). Coordinates for NRF-15 and NRF-16 have not been verified; therefore, a map is not included.

Three new perched water monitoring wells, ICPP-2195, ICPP-2196, and ICPP-2205 (see Figure A-3), were installed as part of the Phase 1 post-closure period of the CPP-601/627/640 landfill closure in accordance with *HWMA/RCRA Post-Closure Plan for the CPP-601/627/640 Landfill* (DOE-ID 2009). The new perched monitoring wells are intended to measure the groundwater elevations and monitor the groundwater quality below the waste management area. Drilling for ICPP-2195 began on February 16, 2010, and was completed on February 25, 2010. The well was drilled to 121 feet bls and was completed to a depth of 107 feet bls (see Figure A-4). Drilling for ICPP-2196 began on March 1, 2010, and was completed on March 22, 2010. The well was drilled to 143 feet bls and completed to a depth of 142 feet bls (see Figure A-5). Drilling for ICPP-2205 began on March 23, 2010, and was completed on March 29, 2010. The well was drilled to 150 feet bls and was completed to a depth of 141 feet bls (see Figure A-6).

Well TRA-08 (see Figures A-7 and A-8) is used for both Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and State of Idaho Wastewater Reuse Permit monitoring. The water volume in the well was not sufficient to allow purging of the well, which is required when sampling. The borehole diameter was increased at 405 feet bls from 4 inches to 6 inches, and the well was deepened to 531.5 feet bls. Slough material filled the borehole to 529.24 feet bls. The water level was at 488.8 feet bls on April 14, 2010. A 4-inch, stainless steel casing was set from -2.5 to 488.24 feet bls, and a stainless steel slotted screen was installed from 488.24 to 528.24 feet bls. A 5-hp pump was set at 519 feet bls, with the inlet at 522 feet bls (see Figure A-8). A new 12-inch-diameter, carbon steel protective casing was welded on at the surface.

Well USGS-108 (see Figures A-9 and A-10) was originally drilled to 760 feet bls. In 2008, USGS-108 was cored from 760 feet bls to 1,218 feet bls to examine the lithology and establish zones of interest. In September 2010, the corehole was widened to a 4.75-inch borehole, and a Westbay multi-level monitoring system was installed (see Figure A-10).

Table 10. Idaho National Laboratory new wells and modified wells in Calendar Year 2010.

INL NEW WELLS AND MODIFICATIONS IN CY 2010								
Well Name	Type	Borehole Depth (ft bls)	Casing Diameter (in.)	Construction Material	Status	Location	Driller/ License #	Comments
NRF-15	Observation/ piezometer	759	10 from 0 ft–16 ft 4 from –1.5 ft–128 ft 1 from –2.13 ft–622 ft (screen from 612 ft–622 ft) 1 from –2.03 ft–390 ft (screen from 380 ft–390 ft)	Carbon steel Stainless steel	Active	T04N, R30E, Sec. 20, NW ¼, SW ¼, NW ¼	USGS	Completed as a piezometer well with a shallow and deep monitoring interval.
NRF-16	Observation	425	10 from 0 ft–15 ft 7 from –2 ft–339 ft 5 from 302 ft–422 ft (screen from 362 ft–422 ft)	Carbon steel Stainless steel	Active	T04N, R30E, Sec. 17, SW ¼, NW ¼, SW ¼	USGS	CERCLA well. Upgradient monitoring well.
ICPP-2195	Monitoring	121	6 from –3.7 ft–56 ft 2 from –3 ft–107 ft (screen from 87 ft–107 ft)	Carbon steel Stainless Steel	Active	T03N, R30E, Sec. 19, NW ¼, NW ¼, SW ¼	Major Drilling Co./ #397	RCRA/CERCLA monitoring well.
ICPP-2196	Monitoring	143	6 from –2.7 ft–58 ft 2 from –2.08 ft–142 ft (screen from 117 ft–142 ft)	Carbon steel PVC	Active	T03N, R30E, Sec. 19, NW ¼, NW ¼, SW ¼	Major Drilling Co./ #397	RCRA/CERCLA monitoring well.
ICPP-2205	Monitoring	150	6 from –3.7 ft–56.5 ft 2 from –3.4 ft–141 ft (screen from 121 ft–141 ft)	Stainless steel	Active	T03N, R30E, Sec. 19, NW ¼, NW ¼, SW ¼	Major Drilling Co./ #397	RCRA/CERCLA monitoring well.
TRA-08	Monitoring	531.5	8 from 0 ft–70 ft 6 from –1.78 ft–405 ft 4 from –2.52 ft–528.24 ft (screen from 488.24 ft–528.24 ft)	Carbon steel stainless steel	Active	T03N, R29E, Sec. 23 NE ¼, SE ¼, NW ¼	Major Drilling Co./ #397	CERCLA/Wastewater Reuse well.
USGS-108	Monitoring	1,218	8 from 0 ft–400 ft 5 from –1 ft–760 ft 3 from –2.42 ft–1,194 ft	Carbon steel PVC	Active	T02N, R29E, Sec. 35, SW ¼, SW ¼, SW ¼	USGS	Widened to 4.75 in. from 760 ft–1,218 ft. Installed Westbay multi-level monitoring system.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act							
PVC	polyvinyl chloride							
RCRA	Resource Conservation and Recovery Act							
USGS	U.S. Geological Survey							

3.2 Idaho National Laboratory Wells Decommissioned in CY 2010

Table 11 identifies 66 wells and boreholes that were abandoned (decommissioned). Several abandonment applications were submitted to the Idaho Department of Water Resources (IDWR) for review (Hutchison 2009; Hutchison 2010; Angle 2010) prior to abandoning the wells or boreholes. Well abandonments were overseen by an Idaho Cleanup Project professional engineer, as agreed to by the IDWR, to certify that all substantive requirements of State of Idaho well construction standards (IDAPA 37.03.09.025.16; IC 42-238) were met.

An evaluation of an INTEC CERCLA monitoring well, USGS-050, revealed that the original well installation may not have adequately isolated INTEC perched water zones to prevent subsurface leakage and downward movement of contaminated water. Extensive attempts to repair the well were unsuccessful; therefore, it was recommended that USGS-050 be abandoned. The Idaho Department of Environmental Quality and the Environmental Protection Agency were requested to approve abandoning this well (Butler 2007). Upon approval from the Department of Environmental Quality (Livieratos 2007) and the Environmental Protection Agency (Wilkening 2009), abandonment activity began on December 8, 2009, and was completed on February 17, 2010. Details and date of abandonment are shown in Table 11.

ICPP-MON-P-017 (MW-16), a perched CERCLA monitoring well at INTEC, was abandoned May 7, 2008. An abandonment application was submitted to IDWR in May, 2007 (McNeel 2007). This abandonment information had not been previously included in a Comprehensive Well Inventory update report. Details and date of the abandonment are shown in Table 11.

One well, SB-06, was not included in the previous abandonment applications because its status had previously been listed as “Abandoned.” However, during a field check, it was discovered that the casing had not been sealed to the surface. This was remedied by adding casing seal (bentonite with water added) to the surface. This work was conducted in September 2009, but was not previously reported; therefore, it is included in this report as the record of its abandonment.

Twenty observation wells (TRA-A series) were drilled during the construction of the Material Test Reactor/Experimental Test Reactor Warm Waste Ponds between 1962 and 1968. During the 2010 activity to abandon INL Site wells and boreholes, several of these observation wells could not be found during a field investigation. After researching historical documents, it was discovered that some had been destroyed during construction events, and some were abandoned as part of the remedial action for the Warm Waste Ponds in 1993 (MK-Ferguson of Idaho 1994). Details are listed in Table 11.

Ten boreholes and wells (Pit-9 series, TESTHOLE 0, W-02, and W-03) at RWMC also were discovered from field investigations to have been previously abandoned during the construction of the foundation for the Pit 9 building in 1994. Also, two other wells, W-01 and W-10, were discovered from field investigations to have been previously abandoned. Information concerning all of these wells and boreholes is included in this report to provide verification of their abandonment. The method and date of abandonment are shown in Table 11. Borehole PIT-9-P03 was abandoned in 2008 by filling the 3-inch casing with bentonite.

One instrumented borehole, TEM1-A, used to monitor CERCLA activities, that was not previously included in an abandonment application, is included in this report as a record of its abandonment. The borehole was used to monitor soil gas in the Subsurface Disposal Area. This borehole did not meet the definition of a well (IDAPA 37.03.09.010.66). However, it was included in a previous Comprehensive Well Inventory update. The status was inactive, and no future use was intended. Construction activities at Accelerated Retrieval Project VII required the immediate decommissioning of this borehole. The standard method of abandonment was followed. Details and date of abandonment are shown in Table 11.

Appendix B contains maps showing the location of each well and borehole that was abandoned or determined to be abandoned in CY 2010 with the exception of TESTHOLE 0. Coordinates for the TESTHOLE 0 were not available. Also included in Appendix B, are diagrams, if available, that provide detailed construction and abandonment information on the abandoned wells and holes.

The CWI database maintains detailed well information that can be provided electronically to the state upon request.

Table 11. Idaho National Laboratory boreholes and wells abandoned in Calendar Year 2010.

INL WELLS ABANDONED IN CY 2010				
Well Name	Well ID	Type	Status	Method and Date of Abandonment
ICPP-MON-P-017	1072	Monitoring	Abandoned	Filled 2-in. casing with bentonite on 5/7/2008.
USGS-050	499	Monitoring	Abandoned	Pulled pump, filled 4-in. casing and 6-in. open borehole with bentonite. Activity began 12/8/09 and completed 2/17/10.
LOFT-A01	209	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A02	210	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A03	211	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A04	212	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A05	213	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A06	214	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A07	215	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A08	216	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A09	217	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A10	218	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A11	219	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A12	220	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A13	221	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A14	222	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A15	223	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A16	224	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A17	225	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A18	226	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A19	227	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
LOFT-A20	228	Observation	Abandoned	Filled 2-in. casing with bentonite on 6/7/2010.
SB-01	733	Observation	Abandoned	Instruments removed, and 2-in. casing filled with bentonite on 7/13/10.
SB-02	738	Observation	Abandoned	Instrument line cut, and 2-in. casing filled with bentonite on 7/13/10.
SB-03	739	Observation	Abandoned	Filled 2-in. casing with bentonite on 7/13/10.
SB-04	740	Observation	Abandoned	Instrument line cut, and 2-in. casing filled with bentonite on 7/13/10.
SB-05	741	Observation	Abandoned	Filled 2-in. casing with bentonite on 7/14/10.

Table 11. (continued.)

INL WELLS ABANDONED IN CY 2010				
Well Name	Well ID	Type	Status	Method and Date of Abandonment
SB-06	742	Observation	Abandoned	Filled 6-in. casing with bentonite on 9/3/2009.
SB-07	743	Observation	Abandoned	Instrument removed and 2-in. casing filled with bentonite on 7/13/10.
SB-08	744	Observation	Abandoned	Filled 2-in. casing with bentonite on 7/14/10.
TRA-06	808	Monitoring	Abandoned	Well was intended to be a monitoring well. Problems occurred during drilling and replaced with TRA-06A. Was partially abandoned at that time, but not to surface. Filled 6-in. casing with bentonite in August 2009. Not previously reported.
TRA-A16	376	Observation	Abandoned	Abandoned as part of the remedial action for the Warm Waste Ponds. Verified 5/20/2010 (Jorgensen 2010a).
TRA-A17	377	Observation	Abandoned	Abandoned as part of the remedial action for the Warm Waste Ponds. Verified 5/20/2010 (Jorgensen 2010a).
TRA-A21	381	Observation	Abandoned	Abandoned as part of the remedial action for the Warm Waste Ponds. Verified 5/20/2010 (Jorgensen 2010a).
TRA-A25	385	Observation	Abandoned	Abandoned as part of the remedial action for the Warm Waste Ponds. Verified 5/20/2010 (Jorgensen 2010a).
TRA-A27	387	Observation	Abandoned	Destroyed by construction in 1965. Verified 6/20/2010 (Jorgensen 2010b).
TRA-A28	388	Observation	Abandoned	Filled 1.5-in. casing with bentonite on 7/13/10.
TRA-A29	389	Observation	Abandoned	Destroyed by construction in 1988. Verified 6/20/2010 (Jorgensen 2010b).
TRA-A30	390	Observation	Abandoned	Destroyed by construction after 1992. Verified 6/20/2010 (Jorgensen 2010b).
TRA-A31	391	Observation	Abandoned	Filled 1.6-in. casing with bentonite on 7/13/10.
TRA-A33	393	Observation	Abandoned	Destroyed by construction in 1990. Verified 6/20/2010 (Jorgensen 2010b).
TRA-A34	394	Observation	Abandoned	Destroyed by construction in 1975. Verified 6/20/2010 (Jorgensen 2010b).
TRA-A35	395	Observation	Abandoned	Destroyed by construction in 1975. Verified 6/20/2010 (Jorgensen 2010b).
TRA-A37	397	Observation	Abandoned	Abandoned as part of the remedial action for the Warm Waste Ponds. Verified 6/20/2010 (Jorgensen 2010b).
TRA-A38	398	Observation	Abandoned	Abandoned as part of the remedial action for the Warm Waste Ponds. Verified 5/20/2010 (Jorgensen 2010a).
TRA-A39	399	Observation	Abandoned	Abandoned as part of the remedial action for the Warm Waste Ponds. Verified 5/20/2010 (Jorgensen 2010a).
TRA-A49	407	Observation	Abandoned	Destroyed by construction in 1988. Verified 5/20/2010 (Jorgensen 2010a).
TRA-A51	409	Observation	Abandoned	Destroyed by construction in 1977. Verified 6/20/2010 (Jorgensen 2010b).

Table 11. (continued.)

INL WELLS ABANDONED IN CY 2010				
Well Name	Well ID	Type	Status	Method and Date of Abandonment
TRA-A58	416	Observation	Abandoned	Abandoned as part of the remedial action for the Warm Waste Ponds. Verified 6/20/2010 (Jorgensen 2010b).
TRA-A76	428	Observation	Abandoned	Destroyed by construction after 1992. Verified 6/20/2010 (Jorgensen 2010b).
TRA-A77	429	Observation	Abandoned	Filled 2-in. casing with bentonite on 7/13/10.
PIT-9-P01	841	Borehole	Abandoned	Field observation on 7/12/10, revealed that well had been destroyed during the construction of Pit 9 building in 1994.
PIT-9-P02	842	Borehole	Abandoned	Field observation on 7/12/10, revealed that well had been destroyed during the construction of Pit 9 building in 1994.
PIT-9-P03	843	Borehole	Abandoned	Filled 3-inch casing with bentonite 8/13/2008.
PIT-9-P04	844	Borehole	Abandoned	Field observation on 7/12/10, revealed that well had been destroyed during the construction of Pit 9 building in 1994.
PIT-9-P05	845	Borehole	Abandoned	Field observation on 7/12/10, revealed that well had been destroyed during the construction of Pit 9 building in 1994.
PIT-9-P06	846	Borehole	Abandoned	Field observation on 7/12/10, revealed that well had been destroyed during the construction of Pit 9 building in 1994.
PIT-9-P07	847	Borehole	Abandoned	Field observation on 7/12/10, revealed that well had been destroyed during the construction of Pit 9 building in 1994.
PIT-9-P08	848	Borehole	Abandoned	Field observation on 7/12/10, revealed that well had been destroyed during the construction of Pit 9 building in 1994.
TESTHOLE 0	350	None	Abandoned	Field observation on 7/12/10, could not locate well. Believed to be previously abandoned by filling borehole with native soil.
W-01	874	Scientific instrumentation	Abandoned	Field observation on 7/12/10, revealed that well had been previously abandoned.
W-02	875	Scientific instrumentation	Abandoned	Field observation on 7/12/10, revealed that well had been covered over with the foundation of the PIT 9 building in 1994.
W-03	576	Scientific instrumentation	Abandoned	Field observation on 7/12/10, revealed that well had been covered over with the foundation of the PIT 9 building in 1994.
W-10	582	Scientific instrumentation	Abandoned	Field observation on 7/12/10, revealed that well had been previously abandoned.
TEM1-A	863	Vapor port	Abandoned	Instruments lines were capped and 4.5-in. casing filled with bentonite on 10/20/10.
BORAX	868	Storm water injection well	Abandoned	Casing cut off 10 in. bls then filled with 1.2 yd ³ of bentonite on 11/04/10.

4. REFERENCES

- Angle, Bruce M., Acting Director, Environmental Support and Services, INL, to M. Anders, IDWR, September 9, 2010, "Submittal of the Authorization to Abandon a Well form for the Decommissioning of BORAX Well and the Technical Requirements for Decommissioning BORAX Well ID 868," CCN 221981.
- Butler, J. Lane, Area Project Manager, Environmental Restoration, ICP, to N. Ceto, EPA and D. Koch, Idaho DEQ, May, 7, 2007, "Request to Plug Abandon INTEC Monitoring Wells," CCN 304830.
- Department of Justice, Environment and Natural Resources Division, 1990, *Water Rights Agreement between the State of Idaho and the United States, for the United States Department of Energy*.
- District Court-SRBA, Twin Falls Co., Idaho, 2003, Order of Partial Decree for Water Right 34-10901 (United States Department of Energy, Idaho National Engineering and Environmental Laboratory), Case No. 39576, June 20, 2003.
- DOE-ID, 2009, *HWMA/RCRA Landfill Closure Plan for the CPP-601/627/640 Landfill*, DOE/ID-11408, Rev 1, U. S. Department of Energy, Idaho Operations Office, December 2009.
- DOE-ID, 2010, *Completion Summary for Well NRF-16 near the Naval Reactors Facility, Idaho National Laboratory, Idaho*, DOE/ID-22210, U. S. Department of Energy.
- Hutchison, D. P., Director, Environmental and Regulatory Services, ICP, to D. Dunn, IDWR, July 21, 2009, "Wells for Potential Decommissioning (Abandonment) at the Idaho National Laboratory Site," CCN 308819.
- Hutchison, D. P., Director, Environmental and Regulatory Services, ICP, to D. Dunn, IDWR, August 18, 2010, "Decommissioning Notification for Fifty-Two Wells at the Idaho National Laboratory Site," CCN 310639.
- IC 42-238, 2010, "Well Drillers' Licenses and Operator Permits," Idaho Code.
- IDAPA 37.03.09.025.16, 2009, "Decommissioning (Abandoning) of Wells," Idaho Administrative Procedures Act.
- IDAPA 37.03.09.010.66, 2009, "Well," Idaho Administrative Procedures Act.
- Jorgensen, M. D., ER CERCLA Field Activities, ICP, to W. Jolley and R. Bowser, May 20, 2010a, "Well Abandonment Walkdown," CCN 310366.
- Jorgensen, M. D., ER CERCLA Field Activities, ICP, to R. Bowser and W. Jolley, June 10, 2010b, "TRA Wells", CCN 310367.
- Livieratos, T., WAG 3 Project Manager, DEQ, to J. L. Butler, ER, ICP, May, 16, 2007, "Request to Plug Abandon INTEC Monitoring Wells", CCN 304922.
- McNeel, K., Director, Environmental and Regulatory Services, ICP, to D. Dunn, IDWR, May 2, 2007, "Application for Authorization to Abandon Wells at the Idaho National Laboratory Site," CCN 304727 and CCN 306009.
- MK-Ferguson of Idaho, 1994, *Remedial Action Report, Test Reactor Area Warm Waste Pond Interim Action, Operable Unit 2-10*, Document Number: 02.010.2.1.209.01, INEL Environmental Restoration, MK-Ferguson of Idaho, June 1994.
- Street, L. V., INEEL, to D. Dunn, IDWR, September 4, 2001, "INEEL Comprehensive Well Surveys and Annual Water Use Reports," CCN 25370.
- Wilkening, M, EPA, to N. Hernandez, DOE-ID, October 14, 2009, "USGS 50 Well Abandonment Plan," CCN 311104.

Appendix A

Maps and Construction Diagrams for New and Modified Wells

