

## FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (FFA/CO) NEW SITE IDENTIFICATION (NSI)

<b>Site Title:</b> Monitoring Well MIDDLE-2051	<b>Site Code:</b> MISC-50
	<b>Document Number:</b> NSI-26030

**PART A**

1. **Site Status:**     **Potential New Site**     **Existing Site**

If a potential new site, record the date entered into the Long-Term Stewardship Tracking System: 07/06/2016.

2. **Description of Site and Location:**

Multi-port aquifer monitoring well MIDDLE-2051 is located in the southwest portion of the Idaho National Laboratory (INL) Site (Figure 1) and is currently used for groundwater sampling by both the Idaho Cleanup Project (ICP) and the U.S. Geological Survey (USGS). The well is located close to the channel of the Big Lost River (normally dry) in a relatively isolated portion of the INL Site. Well MIDDLE-2051 enables groundwater samples to be collected from five depths within the Snake River Plain Aquifer. Sampling port depths range from approximately 600 ft to 1140 ft below land surface. The well serves as an upgradient (background) monitoring well for WAG 7 that helps to define the quality of the groundwater flowing southwest toward the RWMC. Groundwater samples are collected biennially by ICP from the uppermost two sampling ports in the well (Ports 9 and 12), as required by the Waste Area Group (WAG) 7 Field Sampling Plan (DOE-ID 2014). ICP samples the well for the following constituents: carbon tetrachloride, methylene chloride, tetrachloroethylene, trichloroethylene, gross alpha/beta, C-14, Cl-36, Tc-99, tritium, U-234, U-235, U-238, bicarbonate, chloride, nitrate/nitrite, sulfate, calcium, potassium, magnesium, and sodium. USGS also samples the well annually for analysis of selected radionuclides and inorganics but generally not for volatile organic compounds (VOCs).

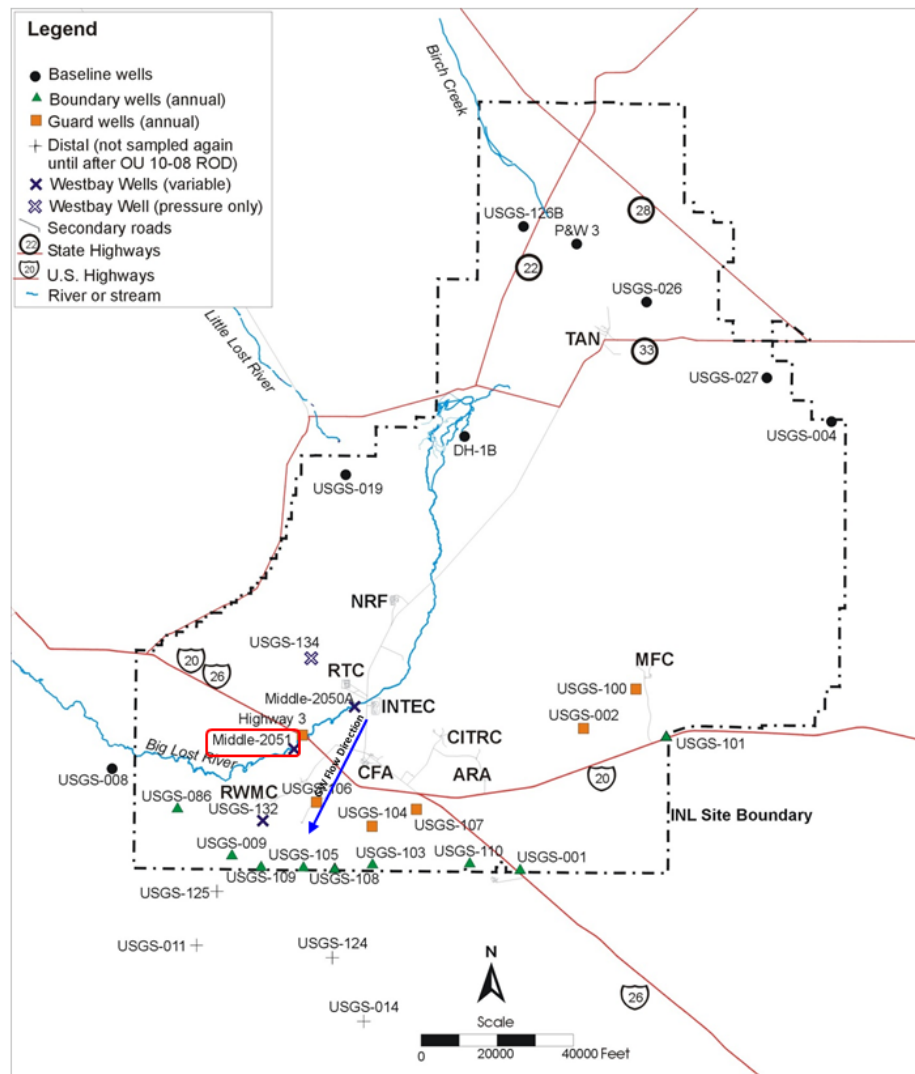


Figure 1. INL well location map showing monitoring well MIDDLE-2051 and groundwater flow direction.

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Following installation of the well in 2005, all five depth zones were sampled in 2005 and 2006, and no VOCs were detected. During routine ICP groundwater sampling in November 2015, the chlorinated solvent tetrachloroethene (PCE or perchloroethylene) was detected in the groundwater samples collected from the well (upper two ports). Table 1 summarizes the laboratory results. PCE had not been detected previously in the well. ICP performed confirmation sampling of the upper two ports March 2016, and the results confirmed the presence of PCE in the groundwater at concentrations as high as 6 µg/L. The drinking water standard (maximum contaminant level) for PCE is 5 µg/L.

Table 1. PCE concentrations reported for groundwater samples from well MIDDLE-2051.

Result Type	Lab	Location	Sample Depth (feet)	Date Collected	Constituent	Concentration	Units	Lab Qualifier	Validation Qualifier
Sample	GEL	MIDDLE-2051:Port 12	604	9/27/05	Tetrachloroethene	1	µg/L	U	
Sample	GEL	MIDDLE-2051:Port 12	604	6/2/06	Tetrachloroethene	1	µg/L	U	
Sample	GEL	MIDDLE-2051:Port 12	604	11/12/13	Tetrachloroethene	1	µg/L	U	
Sample	GEL	MIDDLE-2051:Port 12	604	11/10/15	Tetrachloroethene	5.84	µg/L		
Sample	GEL	MIDDLE-2051:Port 12	604	3/28/16	Tetrachloroethene	0.46	µg/L	J	J
Field Duplicate	GEL	MIDDLE-2051:Port 12	604	3/28/16	Tetrachloroethene	0.46	µg/L	J	J
Sample	GEL	MIDDLE-2051:Port 12	604	6/8/16	Tetrachloroethene	1	µg/L	U	
Field Duplicate	GEL	MIDDLE-2051:Port 12	604	6/8/16	Tetrachloroethene	1	µg/L	U	
Sample	GEL	MIDDLE-2051:Port 9	750	9/28/05	Tetrachloroethene	1	µg/L	U	
Sample	GEL	MIDDLE-2051:Port 9	750	6/1/06	Tetrachloroethene	1	µg/L	U	
Sample	GEL	MIDDLE-2051:Port 9	750	11/12/13	Tetrachloroethene	1	µg/L	U	
Sample	GEL	MIDDLE-2051:Port 9	750	11/10/15	Tetrachloroethene	2.78	µg/L		
Sample	GEL	MIDDLE-2051:Port 9	750	3/28/16	Tetrachloroethene	0.85	µg/L	J	J
Sample	GEL	MIDDLE-2051:Port 9	750	6/8/16	Tetrachloroethene	1	µg/L	U	
Sample	GEL	MIDDLE-2051:Port 6	827	9/28/05	Tetrachloroethene	1	µg/L	U	
Sample	GEL	MIDDLE-2051:Port 6	827	5/31/06	Tetrachloroethene	1	µg/L	U	
Field Duplicate	GEL	MIDDLE-2051:Port 6	827	5/31/06	Tetrachloroethene	1	µg/L	U	
Sample	GEL	MIDDLE-2051:Port 6	827	6/8/16	Tetrachloroethene	1	µg/L	U	
Sample	GEL	MIDDLE-2051:Port 3	1091	9/29/05	Tetrachloroethene	1	µg/L	U	
Sample	GEL	MIDDLE-2051:Port 3	1091	5/30/06	Tetrachloroethene	1	µg/L	U	
Sample	GEL	MIDDLE-2051:Port 3	1091	6/8/16	Tetrachloroethene	0.7	µg/L	J	J
Sample	GEL	MIDDLE-2051:Port 1	1141	9/29/05	Tetrachloroethene	1	µg/L	U	
Sample	GEL	MIDDLE-2051:Port 1	1141	5/26/06	Tetrachloroethene	1	µg/L	U	
Sample	GEL	MIDDLE-2051:Port 1	1141	6/8/16	Tetrachloroethene	824	µg/L	E	D
Sample	USGS	MIDDLE-2051:Port 1	1141	6/8/16	Tetrachloroethene	744	µg/L		
Sample	USGS	MIDDLE-2051:Port 1	1141	6/30/16	Tetrachloroethene	0.7737	µg/L		
Sample	USGS	MIDDLE-2051:Port 1	1141	6/30/16	Tetrachloroethene	0.6822	µg/L		
Sample	USGS	Westbay tubing fluid	1141	7/19/16	Tetrachloroethene	662.4	µg/L		

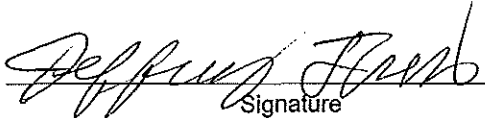

yellow = PCE detected  
 magenta = preliminary (unvalidated) data  
 D = PCE reported from re-analysis at 10x dilution  
 E = initial result exceeded calibration range; re-analysis performed  
 J = estimated value  
 U = undetected  
 GEL = General Engineering Laboratories  
 USGS = U.S. Geological Survey

Another groundwater sampling event was conducted on June 8, 2016, in collaboration with USGS. On that date, groundwater samples were collected by both USGS and ICP from all five sampling depths in Well MIDDLE-2051. The Idaho Department of Environmental Quality also co-sampled selected depth zones. The June 8, 2016, results from both USGS and ICP indicated the presence of PCE at higher concentrations than observed previously, with the highest concentration reported in the groundwater sample collected from the deepest sampling depth (824 µg/L at 1,141-ft depth, Port 1).\* PCE was not detected in the groundwater samples from the upper two sampling ports during the June 8 sampling event (Table 1). At the time this Part A form was completed, the Idaho Department of Environmental Quality results were not yet available.

The USGS re-sampled the well again on June 30, 2016, collecting duplicate samples from the deepest port only; and the preliminary laboratory results for that date indicated much lower concentrations of PCE (0.7737 µg/L and 0.6822 µg/L) than had been observed on June 8 (Table 1).

USGS performed downhole videologging in the well on July 18, 2016. The videolog revealed dark discoloration at many of the

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<p>polyvinyl chloride (PVC) pipe joints, and a substantial quantity of loose, light-colored sediment near the bottom of the well from 1,160 to 1,180 ft.</p> <p>On July 19, 2016, USGS collected a sample of the tubing fluid (water isolated inside the Westbay well plastic casing) from the same depth as the deepest sampling port (1,141 ft). The tubing fluid was placed in the well when it was constructed in 2005 and does not come in contact with the groundwater outside the well. Preliminary results indicated that the tubing fluid sample also contained an elevated PCE concentration (662.4 µg/L), suggesting that the tubing fluid had somehow become contaminated with PCE.</p> <p>PCE is the only organic compound that has been detected to date in the water samples from this well. There are no known sources of chlorinated solvents near this well, and the source of the PCE detected in Well MIDDLE-2051 remains unknown. At present, it has not yet been determined if a dissolved PCE groundwater plume exists in this area or if the detection of PCE in the samples from MIDDLE-2051 are instead the result of inadvertent contamination of Well MIDDLE-2051, although the tubing fluid sample result suggests the latter explanation. To resolve these questions, it is recommended that a new Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site be created and that a field sampling plan be developed to further investigate the source of the PCE in this well.</p> <p>* At the time this Part A was written some of the sampling results had not yet been validated.</p> <p>References:          DOE-ID, 2014, Field Sampling Plan for Operable Unit 7-13/14 Aquifer Monitoring, DOE/ID-11492, Rev. 1, U.S. Department of Energy Idaho Operations Office, August 2014.</p>	
<b>3. Solid Waste Management Unit</b> <span style="float:right"><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</span>	
<b>4. Potential New Site Recommendation</b> 4a. <input type="checkbox"/> Do not include as a new FFA/CO site. Provide NSI to Agencies for information only. 4b. <input checked="" type="checkbox"/> Include as a new FFA/CO site. Additional sampling recommended? <input checked="" type="checkbox"/> Yes – Submit Part A <input type="checkbox"/> No	
<b>5. Existing Site Recommendation</b> 5a. <input type="checkbox"/> No evidence of an additional CERCLA release or other changed conditions. Provide NSI to Agencies for information only. 5b. <input type="checkbox"/> Include as an existing FFA/CO site. Additional sampling recommended? <input type="checkbox"/> Yes – Submit Part A <input type="checkbox"/> No	
<b>6. Prepared By:</b> <div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="width: 30%;">           _____            Jeffrey Forbes            Name (printed)         </div> <div style="width: 30%; text-align: center;">             _____            Signature         </div> <div style="width: 30%; text-align: right;">           8/4/16            _____            Date         </div> </div>	
<b>7. Idaho Cleanup Project Environmental Restoration Director Concurrences:</b> <div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="width: 30%;">           _____            Marc Jewett            Name (printed)         </div> <div style="width: 30%; text-align: center;">             _____            Signature         </div> <div style="width: 30%; text-align: right;">           8/4/16            _____            Date         </div> </div>	

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**PART A**

8. FFA/CO Remedial Project Manager (RPM) Concurrence:

DOE-ID FFA/CO RPM:  Concur with recommendation.  Do not concur with recommendation.

EPA and DEQ concurrence required?  Yes  No

\_\_\_\_\_  
Nicole Badrov  
Name (printed) Signature Date  
8/3/16

Explanation:

EPA FFA/CO RPM:  Concur with recommendation.  Do not concur with recommendation.

\_\_\_\_\_  
Dennis Faulk  
Name (printed) Signature Date  
8/15/16

Explanation:

DEQ FFA/CO RPM:  Concur with recommendation.  Do not concur with recommendation.

\_\_\_\_\_  
Daryl F. Koch  
Name (printed) Signature Date  
8/11/2016

Explanation:



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**PART B**

**6. FFA/CO Remedial Project Manager (RPM) Concurrence:**

DOE-ID FFA/CO RPM:  Concur with recommendation.  Do not concur with recommendation.

\_\_\_\_\_  
Nicole Badrov  
Name (printed)

\_\_\_\_\_  
*Nicole Badrov*  
Signature

\_\_\_\_\_  
7-19-18  
Date

Explanation:

EPA FFA/CO RPM:  Concur with recommendation.  Do not concur with recommendation.

\_\_\_\_\_  
Rod Lobos  
Name (printed)

\_\_\_\_\_  
*Rod Lobos*  
Signature

\_\_\_\_\_  
7-31-2018  
Date

Explanation:

DEQ FFA/CO RPM:  Concur with recommendation.  Do not concur with recommendation.

\_\_\_\_\_  
Daryl Koch  
Name (printed)

\_\_\_\_\_  
*Daryl Koch*  
Signature

\_\_\_\_\_  
7-31-2018  
Date

Explanation: