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TRI-PARTY AGREEMENT

Change Notice Number TPA-CN- 400	TPA CHANGE NOTICE FORM	Date: November 9, 2010
Document Number, Title, and Revision: *Sampling and Analysis Plan for the 100-FR-1, 100-FR-2, 100-FR-3, 100-IU-2, and 100-IU-6 Operable Units Remedial Investigation/Feasibility Study*, DOE/RL-2009-43, Rev.0		Date Document Last Issued: April 2010
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Description of Change:

This change adds new Appendix C, *Groundwater Sampling at the 600-127 Excavation*, to sampling and analysis plan (SAP) DOE/RL-2009-43, Rev.0. Appendix C provides for collection of one groundwater sample from each of five temporary aquifer tubes installed at the bottom of the 600-127 waste site excavation. This includes revision of section 1.0 of the SAP to introduce new Appendix C and to introduce Appendix B added under TPA-CN-391. This site was excavated to the vadose zone/aquifer interface to remove soil contamination above action levels. The temporary tubes will be removed upon completion of sampling and before backfilling the excavation. These samples will be analyzed for selected volatile organic compounds and diesel range total petroleum hydrocarbons (TPH-diesel range). The samples will be unfiltered and collected as described in Appendix C and will be managed in accordance with DOE/RL-2009-43, Rev. 0, 3.7 Sample Handling and 3.8 Management of Waste.

_____ and _____ agree that the proposed change
DOE **Lead Regulatory Agency**
modifies an approved workplan/document and will be processed in accordance with the Tri-Party Agreement Action Plan, Section 9.0, *Documentation and Records,* and not Chapter 12.0, *Changes to the Agreement.*

Note: Include affected page number(s)

Justification and Impacts of Change:

This change adds Appendix C, *Groundwater Sampling at the 600-127 Excavation*, to this SAP as an additional task for the combined 100-FR-3 OU and 10-IU-6 OU RI/FS processes. General agreement was reached after completion of the 600-127 excavation that opportunistic groundwater sampling would be performed prior to backfilling the excavation. These groundwater data are not required to fill a defined RI/FS data gap but will be beneficial in helping to refine the site conceptual model.

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Approvals:

DOE Project Manager	11-23-10 Date	[X] Approved [ ] Disapproved
EPA Project Manager	11/23/10 Date	[X] Approved [ ] Disapproved

DECISIONAL DRAFT

APPENDIX C

GROUNDWATER SAMPLING AT THE 600-127 EXCAVATION

This appendix identifies the location, frequency, and sampling and analysis requirements and methods for collection of groundwater samples from beneath the 600-127 waste site excavation. 600-127 is a waste site of the source 100-IU-6 *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) Operable Unit (OU) that operated as a loading dock and fuels storage area. Samples will be collected of groundwater of the 100-FR-3 CERCLA OU that underlies this site. As part of the ongoing CERCLA 100-IU-6 OU remediation activities west of the 100-F Area, 600-127 vadose zone soil was excavated to the groundwater table to address contamination from unplanned releases of petroleum products stored at the site during operations. The excavation is uniformly approximately 8.75 m (29 ft) bgs deep and the excavation floor represents the groundwater level at the time that the excavation was completed. The periodically rewetted zone beneath is within 0.5 m (1.6 ft) of the excavation bottom, based on water levels in nearby wells and on available site photographs.

SAMPLE LOCATION AND FREQUENCY

Five samples will be collected from groundwater directly beneath the southeast end of the 600-127 excavation floor at the area shown in Figure C-1. This area was selected for sampling because it is where the soil contamination plume intersected groundwater as indicated by site monitoring during the excavation. Individual samples will be collected from this area at the locations shown on Figure C-2. The floor of the excavation is currently free of standing water and to avoid sampling through standing water, sample collection is planned to occur while the water table is near its seasonal low (i.e., groundwater levels below the excavation floor).

Focused sampling will be used to obtain unfiltered groundwater samples for analysis of TPH and the VOAs. Sample analytes are a subset of 100-IU-6 Groundwater OU COPCs from SAP table 1-4 selected for analysis based on:

- site process knowledge (i.e., site was a fuel storage area)
- indications of petroleum surface contamination that lead to remedial action
- soil sampling during the remedial action that tracked contamination to the groundwater table
- a strong smell of diesel in this area of the excavation.

Table C-1 summarizes the groundwater sample location, analytes, intervals, and number of samples. The groundwater sample analytical method and analytical performance requirements, including remedial action levels, are listed on Table C-2. The required analyte detection limits are sufficient for comparison of sample results to remedial action levels.

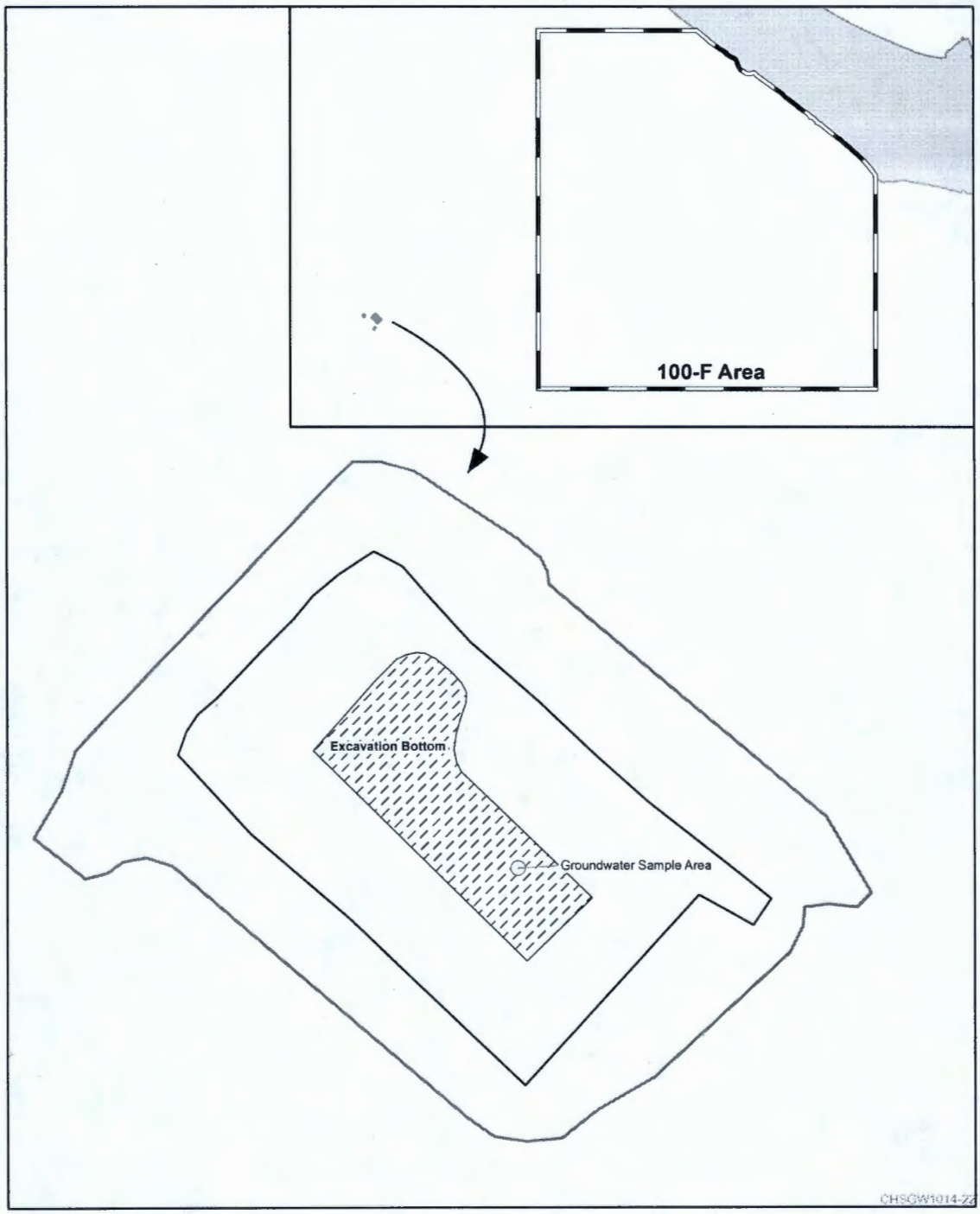

Figure C-1. 600-127 Location and Groundwater Sample Area

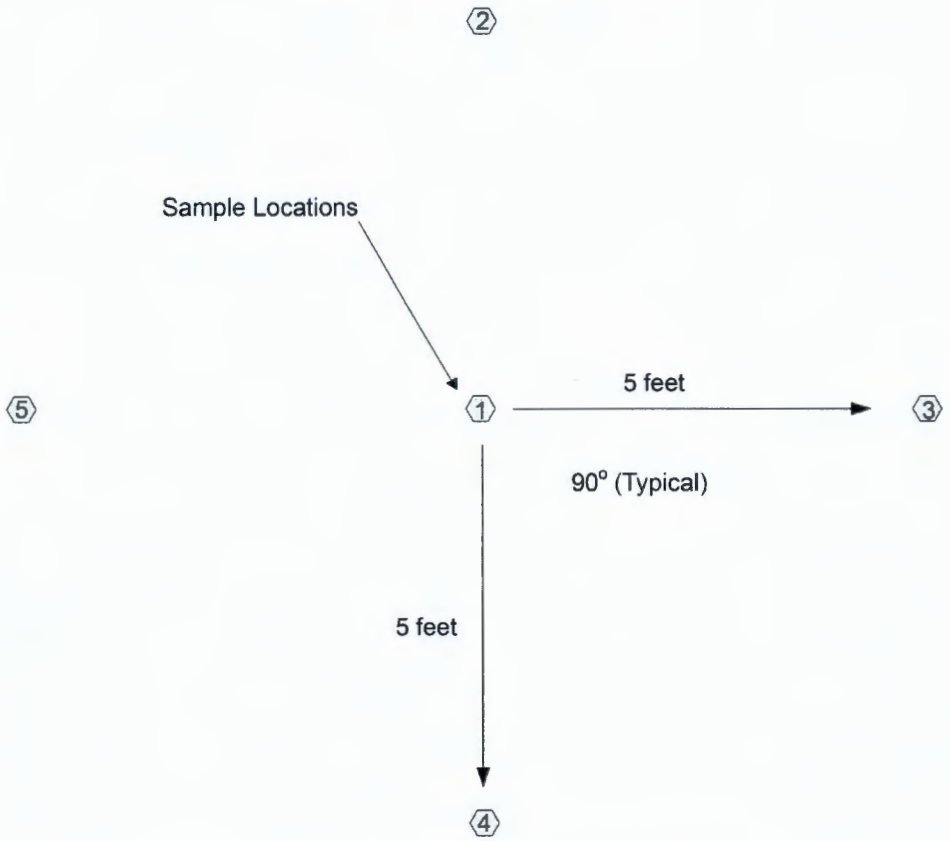

Figure C-2. 600-127 Aquifer Tube and Groundwater Sample Locations

Table C-1. Groundwater Sample Summary

Aquifer Tube No.	Sample Location Number (Figure 3)	Sample Collection Method	Analytes	Sample Location Information			
				Sample Location	Sample Depth (ft bgs)	No. of Samples	Field QC Samples
C-8218	1	Peristaltic Pump	TPH-Diesel range and VOAs (Table C-2)	Figure C-3	As close to the water table as practicable	1	3[a]
C-8219	2					1	
C-8220	3					1	
C-8221	4					1	
C-8222	5					1	
Total number of field samples 5							
Minimum number of field quality control samples 3							
Total site samples 8							

[a] QC samples include, at a minimum, one duplicate, one field transfer blank per day for VOA analyses, and one field equipment blank if disposable, one-time use equipment is not used (i.e., if pre-cleaned, multi-use sampling equipment is used).
bgs = below ground surface.

SAMPLING METHODS

Groundwater samples will be collected using temporary aquifer tube assemblies. Such tubes are a type of drive-point sampler that allows penetration through the soils and cobble to the groundwater. Five temporary aquifer tubes, numbered as identified in Table C-1, will be installed to a depth of approximately 4 ft below the excavation bottom to ensure sufficient depth for collection of groundwater samples. Water table depth will be determined at the time of sampling but is expected to be within 2 ft of the surface of the excavation bottom based on nearby well data and excavation test pit photographs showing groundwater approximately 2 ft below the excavation floor. Aquifer tubes will be placed generally as identified on figure C-2. The tube location will be determined at the time of installation and the final location will be identified using GPS coordinates. Screens will be provided for the samplers and will be placed near the top of the water column but below the water level. Samplers will be constructed and installed as described in job-specific work instructions and in accordance with internal site procedures. Field conditions may necessitate minor changes in locations or depths so that the aquifer tubes will produce sufficient water for sampling.

One groundwater sample will be collected from each temporary aquifer tube. Samples will be analyzed for total petroleum hydrocarbons (TPH-diesel range) and for volatile organic compounds (VOA) shown on Table C-2. Samples will be collected from near the top of the groundwater column to capture TPH and VOAs not in solution and that, due to lower specific gravity, will rise to the top of the water column. The tubes will be purged prior to sample collection in accordance with internal site procedures and as described in job-specific work instructions. Purgewater will be contained and managed in accordance with site procedures. After purging and before sample collection, field parameters identified in Table C-2 will be monitored, recorded, and when stabilized the sample may be collected. The groundwater samples will be collected using a pump and in accordance with internal site procedures. Field quality control samples will be collected as identified in Table C-1. After sample collection field parameters will again be measured and recorded.

Field and QC samples will be submitted to a standard fixed laboratory for TPH and VOA analyses shown on Table C-2. Groundwater sample and data quality requirements will be consistent with the data quality requirements identified in the SAP quality assurance project plan (DOE/RL-2009-43, Chapter 2.0). Modifications to sampling and sample management and will be in accordance with SAP sections 3.6, Sample Methods, 3.7, Sample Handling, and 3.8, Management of Waste.

Additional groundwater samples could be collected before excavation backfill where initial sampling has identified groundwater contaminant concentrations requiring further evaluation as determined by RL and EPA. The location of such samples would be determined at the time of resampling and these samples would be collected and analyzed in the same manner as described for the initial groundwater sampling.

Table C-2. Analytical Performance Requirements for 600-I27 Groundwater Samples

CAS Number	Analyte	Analytical Method[a]	EQL[b]	Precision (%)	Accuracy (%)	Action Level	Action Level Basis
79-01-6	Trichloroethene	EPA 8260 (volatile organics)	1 µg/L	≤20[c]	80-120[c]	0.49 µg/L	WAC 173-340-720(4)(b)(iii)(A) and (B)
75-01-4	Vinyl Chloride	EPA 8260 (volatile organics)	5 µg/L	≤20[c]	80-120[c]	0.025 µg/L	Human Health for the Consumption of Water + Organism
68334-30-5	TPH-diesel range	WTPH-D	500 µg/L	≤20[c]	80-120[c]	500 µg/L	WAC 173-340-720(3)
Performance Requirements for Field Measurements							
—	Oxidation reduction potential	REDOX PROBE	N/A	[d]	[d]	N/A	N/A
—	pH measurement	PROBE	0.5 pH unit	[d]	[d]	N/A	N/A
—	Specific conductance	PROBE	1 µS/cm	[d]	[d]	N/A	N/A
—	Temperature	PROBE	—	[d]	[d]	N/A	N/A
—	Dissolved oxygen	PROBE	—	[d]	[d]	N/A	N/A
—	Turbidity	PROBE	0.1 NTU	[d]	[d]	N/A	N/A

Notes:

Table C-2 information derived from SAP Table 2-1, Analytical Performance Requirements for 100-IU-2/IU-6 Area Water Samples.

WAC 173-340-720(3), "Model Toxics Control Act—Cleanup," "Ground Water Cleanup Standards," "Method A Cleanup Levels for Potable Ground Water."

a. For the four-digit EPA methods (e.g., EPA 8260), see SW-846, Test *Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update IV-B*. Tentatively identified compounds will be reported for SW-846, Method 8260.

b. EQL typically equal to 5 to 10 times the MDL (SW-846). MDLs are listed in DOE/RL-2008-66, *Hanford Site Groundwater Monitoring for Fiscal Year 2008,* Table C-30. When the action level is less than the MDL, the action level defaults to the MDL.

c. Accuracy criteria shown are the minimum for associated batch laboratory control sample percent recoveries. Laboratories must meet statistically based control limits, if more stringent. Additional accuracy criteria include analyte-specific evaluations performed for matrix spike and surrogate recoveries, as appropriate to the method. The precision criteria shown are for batch laboratory replicate matrix spike analysis relative percent differences. Tentatively identified compounds will be reported for SW-846 Method 8260.

d. Field measurements have no specific QC requirements except to perform checks to verify manufacturer's expected performance.

CAS = Chemical Abstracts Service MDL = method detection limit

1

References

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 9601, et seq. Available at: http://www.epa.gov/oecaagct/lcla.html#Hazardous%20Substance%20Responses.

EPA-600/4-79-020, 1983, *Methods for Chemical Analysis of Water and Wastes*, Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio. Available at: http://www5.hanford.gov/arpir/?content=findpage&AKey=D196019611.

SW-846, 2007, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update IV-B*, as amended, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C. Available at: www.epa.gov/SW-846/main.htm.