

VARIANCE / FIELD CHANGE NOTICE

V/FCN No. **5721**
52424-PSP-0004-03

PROJECT NO: 52424-PSP-0004, Revision 1, Final

Page 1 of 3

DOCUMENT NO: 52424-PSP-0004, Revision 1, Final

Date: 8/23/04

DOCUMENT TITLE: PSP for Direct Push Sampling in Former Soil Excavation Areas

VARIANCE / FIELD CHANGE NOTICE (Include justification)

Requirement:

Section 1, Page 2; Direct-push groundwater samples collected in Area 3A/4A will be tested for uranium and technetium-99.
Section 3, Page 7; Direct-push sampling in Area 3A/4A will proceed down to a depth of 20 feet below the water table.
Section 3.3, Page 9; All samples will be filtered through a 5-micron in-line filter attached to the discharge end of a peristaltic pump.
Section 3.3, Page 10, A duplicate sample will be collected at each location at a depth of 1 foot below the water table.

Variance:

Direct-push groundwater samples collected in the Waste Storage Area will be tested for uranium, technetium-99, nitrate/nitrite, manganese, and molybdenum. An analytical requirements table is attached. Two locations (Location 13322 and Location 12617B) will also be tested for carbon disulfide and trichloroethene. VOC sampling will be conducted using a WaTerra Inertial pump and HDPE tubing.

Sampling at Locations 12614B, 12615B, 12616B, 12618B, 12684B, 13320, and 13321 will proceed down to a depth of 40 feet below the water table. Sampling at Locations 13322, 13323, and 12617B will proceed down to a depth of 60 feet below the water table. A location map is attached.

VOC samples will not be filtered.

A duplicate sample will be collected at a depth of 20 feet below the water table at each location. A trip blank (VOCs only) and field blank (all parameters) for will be prepared for each day of sampling when samples are being collected for VOC testing. Rinsates will be collected at a rate of one per location and analyzed for all the analytical parameters specified for the location.

Justification:

Sampling depths are based on previous work completed for the Waste Storage Area Phase-I Design, and the depth of the blue clay layer. Probing will not proceed past the top of the blue clay layer that separates the upper and lower aquifer. A hole through the clay layer would provide a possible pathway for cross-contamination into the lower aquifer.

Locations 12614B, 12615B, 12616B, 12617B, 12618B, and 12684B were previously sampled in 1999-2000 in support of the Waste Storage Area Phase-I Design. Re-sampling at these locations will provide an update on any changed water quality conditions.

Requested By: Ken Broberg *KAB* Date: 8/23/04

X IF REQD	V/FCN APPROVAL	DATE	X IF REQD	V/FCN APPROVAL	DATE
	QUALITY ASSURANCE		X	<i>W. G. Zittel</i> Manager, Aquifer Restoration/Water Management	8/25/04
	Health and Safety		X	<i>[Signature]</i> Manager, Water Monitoring	8/25/04
	ANALYTICAL CUSTOMER SUPPORT			<i>[Signature]</i> Manager, Soil Sampling	

REVISION REQUIRED (Document No. & Title):
 YES NO

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Justification (continued)

Location 13322 is located east of Monitoring Well 2649, which is southeast of the Clearwell. As reported in the 2003 ISER uranium FRL exceedances occurred at this location for the first time in 2003. Preliminary data from 2004 indicates that uranium concentrations continue to increase at this location. Molybdenum, nitrate/nitrite, technetium-99, carbon disulfide, and trichloroethene FRL exceedances have also occurred at this location. Figure 3-19 from the OU5 RI indicates that the clay interbed layer is thin or absent under Monitoring Well 2649. If present it is projected that the top is situated at an elevation of approximately 449 feet above mean sea level (amsl), (approximately 70 feet below the July water table elevation of 520.2 feet amsl). Sampling will stop at an elevation of 459 feet amsl (depth of approximately 60 feet below the water table), approximately 10 feet above the top of the projected top of the clay layer. Should sample results indicate that the base of a plume has not been determined at a depth of 60 feet below the water table, other plans will need to be developed to complete the characterization.

Location 13323 is located east of Monitoring Well 3027, which was plugged and abandoned on October 27, 2000 due to casing integrity problems that resulted in cross contamination of the aquifer. A small scale pumping action was conducted in October of 2000 to remediate the cross contamination. At the start of pumping the total uranium concentration was 259 ug/L. After pumping 20,000 gallons of water from the well, the total uranium concentration decreased to approximately 13 ug/L.

Location 13320 is located east of Pit 1 and Location 13321 is located east of the burn pit area that is east of Pit 3.

Sampling for VOCs

As reported in Table 3-5 of the IEMP, Rev. 3, two VOCs have had FRL exceedances in the Waste Storage Area, 1) carbon disulfide and 2) trichloroethene. The carbon disulfide exceedances were sporadic and limited to three Monitoring Well locations (2649, 3821, and 2027) as indicated in Table A-2, IEMP, Rev. 3. No FRL exceedances for carbon disulfide have been detected at these three wells during the last four years of annual sampling, as indicated in the 2003 ISER, Table A.4-2. Based on these observations, direct push sampling for VOCs near Monitoring Wells 3821 and 2027 is not justified given that only sporadic detections were ever made, and not even sporadic exceedances have been detected in the last four years of annual sampling.

The FRL exceedances for trichloroethene at Monitoring Well 2649 are not sporadic and the extent of the plume needs to be determined, see Table A.4-2 of the 2003 ISER. Therefore, VOC sampling will be conducted at direct-push location 13322, next to Monitoring Well 2649 and at a further down gradient location (Location 12617B). VOC sampling will not take place at any of the other nine initial sampling locations. Semi-annual VOC sampling in monitoring wells in the Waste Storage Area will continue as part of the IEMP.

VOC sampling will be conducted at direct-push location 13322 using a WaTerra Inertial pump. Other pumps would require a larger diameter probe rod, which would be harder to push. HDPE tubing will be used to collect the VOC sample. A study shows that with relatively short duration's of exposure for organic sampling, the performance differences between Teflon, polypropylene and polyethylene are insignificant (Barcelona M.J., et. al., 1985, "Sampling Tubing Effect on Groundwater Samples", Anal., Chem., V. 57., No. 2, pp. 460-464). VOC samples will not be filtered in order to minimize possibility of volatilization during sampling.

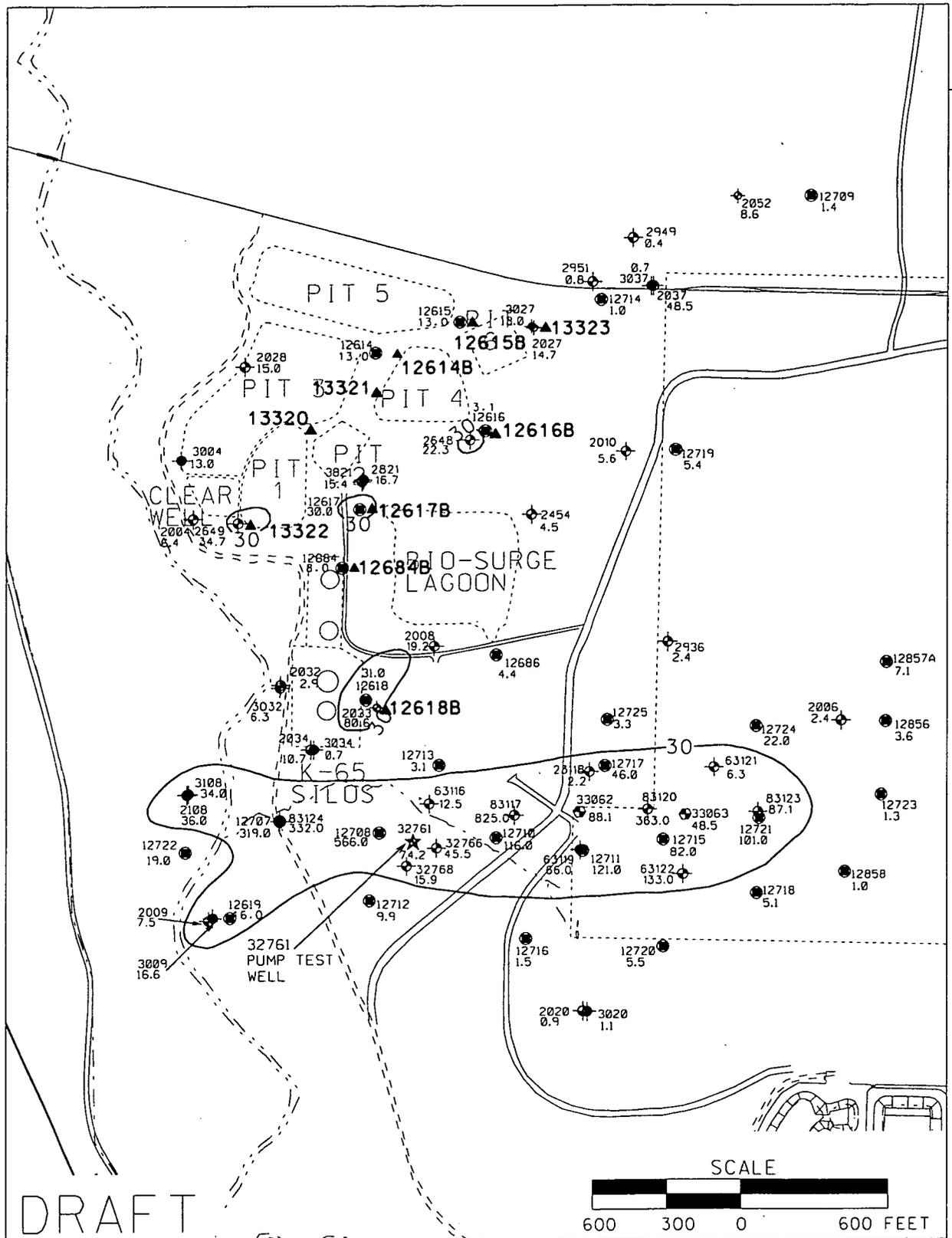
Duplicate samples will be collected at a depth of 20 feet below the water table to be consistent with Phase-1 characterization work. A trip blank and field blank are required per the IEMP, Revision 3.

TABLE 1
GEOPROBE™ SAMPLING ANALYTICAL REQUIREMENTS
(ASL B)

Constituent	Laboratory ^a	Chemical Preservative ^b	Holding Time	Optimum Volume	Minimum Volume	Container Required	Approximate Detection Levels
Carbon disulfide	Off-Site	Cool to 4°C	14 days	5 - 40 ml	1 - 40 ml	40 ml glass vial with teflon lined septum cap	5.0 µg/L
Trichloroethene		H ₂ SO ₄ , HCl, or solid NaHSO ₄ to pH < 2					3.0 µg/L
Nitrate/Nitrite	Off-Site	Cool to 4°C, H ₂ SO ₄ to pH < 2	28 days	500 ml	100 ml	500 ml plastic	1100 µg/L
Manganese	Off-Site	HNO ₃ to pH < 2	6 months	500 ml	300 ml	500 ml plastic	90 µg/L
Molybdenum							20 µg/L
Technetium-99	On-Site	HNO ₃ , pH < 2 2.25 ml/0.75 ml	6 months	1500 ml	500 ml	2 Liter plastic	30 pCi/L
Total Uranium							0.5 µg/L

^a All samples to be analyzed at ASL B as per SCQ specifications and audit requirements.

^b Estimated preservative volumes listed are the maximum for optimum and minimum sample volumes in order to remain within DOT limits. HNO₃ is 70 percent, 16N. Refer to Table 1 in procedure SMPL-02 for other volume information on the HNO₃ preservatives. Each drop of acid contains approximately 0.05 ml. Not adding more than 2.25 ml of HNO₃ into an optimum volume of 1500 ml, not adding more than 0.75 ml of HNO₃ into a minimum volume of 500 ml, or not adding more than 0.45 ml of HNO₃ into a minimum volume of 300 ml will insure that DOT limits are not exceeded. H₂SO₄ is 95 percent, 36N. Refer to Table 1 in procedure SMPL-02 for other volume information on the H₂SO₄ preservatives. Each drop of acid contains approximately 0.05 ml. Not adding more than 1.0 ml of H₂SO₄ into an optimum volume of 500 ml, not adding more than 0.2 ml of H₂SO₄ into a minimum volume of 100 ml, or not adding more than 0.08 ml of H₂SO₄ into a minimum volume of 40 ml will insure that DOT limits are not exceeded.



DRAFT

LEGEND:

- 30 µg/L TOTAL URANIUM CONTOUR SECOND HALF, 2003
- COMPLETED GEOPROBE LOCATION
- ▲ 12684B PROPOSED GEOPROBE LOCATION

- ◆◆ IEMP DATA SECOND HALF, 2003
- ⊕ RECOVERY WELL

FIGURE 1. PROPOSED GEOPROBE LOCATIONS FOR WASTE STORAGE AREA, PHASE-2 DESIGN