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LETTER REGARDING THE TRANSMITTAL OF FINAL SAMPLING AND ANALYSIS PLAN FOR OPERABLE UNIT 2 (OU 2) PRE DESIGN INVESTIGATION AND U S NAVY RESPONSE TO COMMENTS ON DRAFT VERSION NSY PORTSMOUTH ME
11/15/2010
TETRA TECH NUS

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PITT-11-10-043

November 15, 2010

Project Number 112G02229

Mr. Matthew Audet
USEPA, Region 1
5 Post Office Square
Suite 100
Mail Code OSRR07-3
Boston, Massachusetts 02109-3912

Mr. Iver McLeod
Maine Department of Environmental Protection
State House Station 17
Augusta, Maine 04333-0017

Reference: Contract No. N62470-08-D-1001 (CLEAN)
Contract Task Order No.WE43

Subject: Final Sampling and Analysis Plan for Operable Unit 2 (OU2) Pre-Design Investigation
Portsmouth Naval Shipyard (PNS), Kittery, Maine

Dear Mr. Audet/Mr. McLeod:

On behalf of the U.S. Navy, Tetra Tech NUS, Inc. is pleased to provide to the U.S. Environmental Protection Agency Region I (USEPA) and to the Maine Department of Environmental Protection (MEDEP) 2 and 3 copies, respectively, of the subject document and 1 CD each.

The USEPA indicated in an electronic mail message sent to the Navy on October 13, 2010 that the Draft Sampling and Analysis Plan for OU2 Pre-Design Investigation was accepted that there were no further comments. The MEDEP provided comments on the draft plan and the Navy provided informal responses to those comments. The MEDEP concurred with the informal responses to comments on the draft plan, however, the MEDEP clarified that a geology discussion should be added to the report. A geology discussion has been added to the report and the text of that discussion has also been added to the responses to comments. The responses to MEDEP comments are attached. The Health and Safety Plan (HASP) for this project is undergoing naval review and will be submitted under a separate cover at a later date.

If you have any comments or questions, or if additional information is required, please contact Ms. Linda Cole at 757.341.2011.

For the Community Restoration Advisory Board (RAB) members; if you have any comments or questions on these issues, they can be provided to the Navy at a RAB meeting, by calling the Public Affairs office at 207.438.1140 or by writing to:

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Sincerely,

Daniel C. Witt, P.E.
Project Manager

DCW/clm

Enclosure

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Electronic Copy on CD

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RESPONSES TO MEDEP COMMENTS DATED AUGUST 19, 2010
DRAFT SAMPLING AND ANALYSIS PLAN FOR OPERABLE UNIT 2 PRE-DESIGN INVESTIGATION
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

1. **Comment:** SAP Worksheet #5. Please correct my phone number (287-8010, not 787-8010).

   Response: The phone number will be corrected.

2. **Comment:** SAP Worksheet #9, fourth bullet. This paragraph mentions data will be collected on 30 foot centers. P. 5 of the Executive Summary indicates soil samples will be spaced "approximately 25 feet apart". These should be consistent.

   Response: Worksheet #9 documents the decisions that were made during various scoping sessions. During the first scoping session it was decided that samples would be spaced at 30 feet apart, however, this was later refined through the development of the SAP to be "approximately 25 feet apart." Therefore the citations in the plan are correct, however, the text in Worksheet #9 will be modified to clarify this point. The sentence will be modified to read as follows: "The decision was made that data will be collected on 30-foot centers across the study boundary and at 2-foot depth intervals until encountering refusal (note: through later development of this plan, the spacing of soil borings was refined to be approximately 25 feet apart)."

3. **Comment:** SAP Worksheet #9, Project Scoping Session December 8, 2009. Please correct the spelling of MEDEP geologist Gail Lipfert (also misspelled in Appendix D).

   Response: This misspelling will be corrected.

4. **Comment:** SAP Worksheet #9, Project Scoping Session December 8, 2009, Comments/Decisions, last bullet. Please explain what is meant by the terms vertical and horizontal phasing.

   Response: Additional text will be added to explain the terms vertical and horizontal phasing. The last bullet will be revised to read as follows:

   - Two general methods of analyzing samples were discussed: vertical phasing and horizontal phasing of the soil analyses. In vertical phasing, the need to analyze soil samples from the deeper intervals at a particular soil boring is based on the sample results from the upper intervals (i.e., a step down approach). In horizontal phasing, the need to analyze soil samples further from areas of known contamination at a particular soil boring is based on the sample results from the soil borings closer to areas of known contamination (i.e., a step out approach). It was agreed that vertical phasing of soil analysis would be more appropriate than horizontal phasing based on the CSM. Based on vertical phasing, it was decided that all samples from 0 to 2 feet bgs would be analyzed first, followed by deeper soil analysis if the upper sample showed contamination.

5. **Comment**: SAP Worksheet #10, 10.4, Conceptual Site Model. Please include a geologic section to the CSM that includes a description of soils/overburden, depth to bedrock, or depth to groundwater within the proposed extension of the OU2 area to the CSM.

Response: A geology section will be added to the CSM. The following text will be added to the CSM:

10.4.1 Geology

Limited geologic and hydrogeologic information is available for the pre-design study area. The hydrogeology of this area is based on information from the OU2 Supplemental RI Report (Tetra Tech, March 2010) and boring data.

The islands composing PNS are formed on bedrock highs with thin veneers of glacial till, recent alluvium, and fill materials. Based on the historical shoreline, most of OU2 was created by filling; however, the pre-design study area lies with the limits of the original island. The majority of the shoreline of the pre-design study area was created when Henderson Point was blasted away in 1905 and is bedrock outcrop of a dark gray or greenish-gray quartzite. Subsurface materials in the area of study are anticipated to include the following (from lowest to highest elevation): bedrock, weathered bedrock, and fill. A generalized cross section of the subsurface is illustrated in Figure 4A.

A limited number of geotechnical borings related to the construction of Building 348 and environmental borings related to the OU2 Supplemental RI Report have been installed within the pre-design study boundary. The borings around Building 348 encountered refusal on bedrock or boulders at approximately 10 to 13 feet below ground surface. The overburden was reported to be sand and gravel fill with lesser amounts of loam, peat, silt, and clay. Environmental borings along the shoreline (OU2-174 and OU2-124) in the westernmost portion of OU2 encountered sandy fill overlying weathered bedrock to depths of 2 to 3 feet and bedrock at approximately 4 feet. A topographic map from 1901 (prior to the removal of Henderson Point) shows the vicinity of Building 348 being in a low area between Henderson Point and the Seavey Island. This area was likely filled (presumably with rock fill from Henderson Point) to current grade. Therefore, it is anticipated that the bedrock surface is deeper near Building 348 than at the shoreline. Back channel-type deposits (e.g., peat and slit or clay) may be encountered below the surface fill in this historically topographic low area.

No monitoring wells have been installed within the pre-design study boundary; therefore, the hydrogeology of this area is interpreted based on the known hydrogeology of PNS and OU2. Groundwater at PNS generally flows from the original island interiors toward the current coastline. The overall conceptual model of groundwater flow at the facility is that fresh groundwater originating from precipitation in the island interior flows downward and outward through both the overburden and bedrock. Tidal effects are present near the shorelines with a net groundwater flow outward into the Piscataqua River.

The depth to groundwater is estimated to be approximately 10 feet below ground surface in the pre-design study area at high tide with the tidal range of approximately 8 feet. Based on these depths, the groundwater is expected to occur in the bedrock along the shoreline and in the filled area near Building 348. Groundwater is expected to occur in the bedrock North of Building 348, based on topography.

6. **Comment:** SAP Worksheet #10, 10.4, Conceptual Site Model, Site History. What is the history of uses for Building 233?

   Response: A brief listing of the uses in Building 233 will be added to the conceptual model discussion. This history will be based on the titles of the building from historical maps of the facility. The building is noted as a radiological decontamination training facility in the 1957 map of the shipyard and then the building is listed as production storage on 1979, 1982 and 1998 maps.

7. **Comment:** SAP Worksheet #10, 10.4, Conceptual Site Model, Potential Sources of Contamination, Soil Sample SS-24. The Navy defends the exclusion of sample SS-24 from the OU2 investigation as the contamination at SS-24 cannot have resulted from DRMO activities due to the location of former Building 233. What steps does the Navy plan to take to investigate this unrelated contamination outside the DRMO boundary?

   Response: The contamination associated with soil sample SS-24 is most likely a result of past ubiquitous industrial shipyard activities and not associated with OU2. Therefore contamination in this area would not be a CERCLA release and would not fall under the IR program. The Navy does not plan to investigate this location. The shipyard has policies in place for any soil excavation at the shipyard. The shipyard would have to manage any excavated soil in accordance with these policies after obtaining an excavation permit.

8. **Comment:** SAP #11, 11.4, Decision Rule #1, Lateral extent of surface contamination, first paragraph. The last sentence is incomplete.

   Response: The sentence will be corrected. The sentence will read as follows:

   "Based on this review, the project team will agree on the area(s) within which concentrations exceed the residential project action levels and area(s) within which the lower of construction worker or occupational worker PALs are exceeded."

9. **Comment:** SAP #11, 11.4, Decision Rule #1, Lateral extent of surface contamination.

   Response: It is assumed that Comment #9 and #10 are concerning the same issue. Please see the response to comment 10.

10. **Comment:** The Navy states, "The project team assumes that for any area that has surface soil contamination in excess of the residential PALs, the likely remedy will be land use controls. These controls will extend vertically from the surface to include all the unsaturated soil, therefore, delineation of subsurface soil above the residential PAL is not required." This doesn't make sense. If the Navy wants to continue to use the area commercially/industrially then contamination greater than the occupational and construction worker PALs must be remediated. Perhaps after "contamination in excess of the residential PALs" the Navy meant to add "but less than the lower of the construction worker or occupational worker PALs".

    Furthermore, terminating sampling after low levels of contamination are detected may result in omission of knowledge of greater contamination at depth. We recognize that the part of the CSM stating that contaminant concentrations are expected to decrease with depth makes sense conceptually. However, our acceptance of vertical phasing of samples was conditionally based on the Navy demonstrating this decreased concentration with depth using existing data. This is

reflected in Appendix D which states, "Data for borings nearby the sampling area should be reviewed to see if the data show a vertical pattern in the data." However, the current draft SAP does not contain any evaluation of contamination concentrations with depth and our assessment of previous OU2 data shows that surface samples with lead concentrations less than 400 mg/kg can have lead concentrations greater than 400 mg/kg at depth.

Response: The sentence discussed in the first paragraph of the comment will be clarified as indicated.

The concept that the concentration will decrease with depth in OU2 Pre-Design investigation area was evaluated by looking at the lead data in soil borings located near the OU2 Pre-design investigation area. The information was taken from Table 3-1 in the Supplemental OU2 RI Report (March 2010). Lead was chosen because it is the contaminant that the most information was available for and has the largest extent of contamination. Eleven locations were included in the evaluation. The lead results are shown on Table 1 (attached). Note some locations were not included because the location only contained one sample interval. If the lead concentrations decrease with depth a "yes" is included in the right hand column. If the concentrations do not decrease with depth the column says "No". The following observations can be made about the data:

- Of the eleven locations, seven decrease with depth.
- The other four locations generally also decrease with depth but show one sample interval which does not follow the pattern.
- Of the four locations which do not decrease with depth, the detected concentrations are all below 1,000 mg/kg and most of the results are below 400 mg/kg. The lower concentrations are closer to the ambient lead concentrations of the shipyard which may make it more difficult to distinguish lead contamination caused by OU2 activities and those concentrations due to general shipyard activities. The facility background levels for lead vary between 9.5 mg/kg to 1,100 mg/kg.
- For sample locations that have higher levels of contamination (above the occupational worker lead PAL of 1600 mg/kg) in the surface soil, the data shows a consistent decrease in concentration levels with depth (Five samples out of five).

The following conclusions can be made about the lead data. The lead contamination generally decreases with depth with only a few sample intervals not following the pattern at lower concentrations (below 1,000 mg/kg). The decreasing trend is much more consistent with the higher concentrations which may be related to a release of contamination rather than ambient conditions. The vertical phasing of sample analysis should be acceptable for delineating areas above the occupational worker PAL because in this concentration range the concentrations consistently decrease with depth.

The lead contamination fluctuations at lower concentration levels is likely indicative of background concentrations associated with fill materials. Concentrations in this range are likely no different than concentrations that could be found throughout the shipyard and would not be included as part of OU2. Based on the conceptual model of how contamination was released in the study area, higher surface concentrations are indicative of a release associated with OU2 and low concentration levels at the surface would be indicative of an area where contaminants were not released as part of OU2, therefore the decision rules presented in the sampling and analysis plan are still applicable.

11. **Comment:** Figure 4b, Human health conceptual site model. Under the heading, Secondary Release Mechanism, mechanisms such as snowplowing and previous construction/destruction activities should be listed

Response: The snowplowing and past construction activities will be shown on Figure 4b as secondary release mechanisms.

TABLE 1

LEAD RESULTS FOR SOIL SAMPLES NEAR THE PRE-DESIGN INVESTIGATION AREA
OPERABLE UNIT 2
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION ID	GROUND SURFACE[1] (feet 2002 PNS Datum)	SAMPLE DATE	Sample Depth Range (feet bgs)	SAMPLE ID	LEAD[2] MG/KG			
					XRF	CALCULATED	LABORATORY	Conc. Decrease w/depth
DSB-6C	110	1989 to 1991	0 - 2	DSB-06C(0-2)			2680	
		1989 to 1991	0 - 2	DSB-06C(0-2)-D			5330	
		1989 to 1991	15 - 15.5	DSB-06C(15-15.5)			61.1	yes
OU2-124	110	11/14/2007	0 - 2	OU2-SS-124-0002	3173.3		3830 J	yes
		11/14/2007	2 - 4	OU2-SB-124-0204	117	172		
OU2-125	110	11/14/2007	0 - 2	OU2-SS-125-0002	50957.3		37300 J	yes
		11/14/2007	2 - 4	OU2-SB-125-0204	54522.7	29600		
OU2-126	110	11/14/2007	0 - 2	OU2-SS-126-0002	11834.3	14800		
			2 - 4	OU2-SB-126-0204	6682	7110		
		11/14/2007	4 - 6	OU2-SB-126-0406	4019	3940		yes
OU2-158	110	11/16/2007	0 - 2	OU2-SS-158-0002	285	291		yes
		11/16/2007	2 - 3	OU2-SB-158-0204	58.7	130		
OU2-160	110	11/16/2007	0 - 2	OU2-SS-160-0002	217	243		no, however all conc.s are in the range of background[3]
		11/16/2007	2 - 4	OU2-SB-160-0204	587.7	508		
		11/16/2007	4 - 6	OU2-SB-160-0406	59	130		
OU2-161	111	11/16/2007	0 - 2	OU2-SS-161-0002	166	206		no, however all conc.s are in the range of background[3]
		11/16/2007	2 - 4	OU2-SB-161-0204	47		59.2 J	
		11/16/2007	4 - 6	OU2-SB-161-0406	165.7	206		
OU2-174	110	11/27/2007	0 - 2	OU2-SS-174-0002	1003.3	802		yes
		11/27/2007	2 - 4	OU2-SB-174-0204	19.3	102		
OU2-176	110	11/27/2007	0 - 2	OU2-SS-176-0002	1232.3	966		no, however all conc.s are in the range of background[3]
		11/27/2007	2 - 4	OU2-SB-176-0204	579.3	501		
		11/27/2007	4 - 5	OU2-SB-176-0405	213	240		
		11/27/2007	5 - 7	OU2-SB-176-0507	1072	852		
		11/27/2007	7 - 9	OU2-SB-176-0709	147	193		
OU2-177	110	11/27/2007	0 - 2	OU2-SS-177-0002	485	434		no, however all conc.s are in the range of background[3]
		11/27/2007	2 - 4	OU2-SB-177-0204	885.7	720		
		11/27/2007	4 - 5	OU2-SB-177-0405	87	150		
		11/27/2007	5 - 7	OU2-SB-177-0507	36.3	114		
OU2-178	110	11/27/2007	0 - 2	OU2-SS-178-0002	31145	21500		yes
		11/27/2007	2 - 4	OU2-SB-178-0204	8339.3	9090		
		11/27/2007	4 - 5	OU2-SB-178-0405	668.3	565		

1 - The 2002 PNS Vertical Datum equates Mean High Water (MWH) (which is 3.58 feet in the North American Vertical Datum of 1988 or NAVD 88) to 100.36 feet. Horizontal locations are based on the North American Datum (NAD) of 1983, Maine State Place Coordinate System, West Zone.

2 - Soil samples for field analysis (XRF) were collected as part of the 2007 and 2008 investigation for lead, and a percentage of the samples were sent to a fixed-base laboratory for confirmation and to determine the correlations between field and laboratory data. The correlations between field and laboratory data are discussed in greater detail in the OU2 Additional Investigation Package (TtNUS, August 2008). Based on the correlations, anticipated laboratory concentrations (calculated) were estimated for XRF results, and the estimated (calculated) and laboratory data are used for understanding the nature and extent of contamination and evaluation of the removal action area.

3 -The background levels of for lead vary between 9.5 mg/kg and 1,100 mg/kg at PNS. Although one sample at this location does not follow the pattern of decreasing concentration with depth, these concentrations are within the range of facility background and may be more indicative of fill soils at PNS than of contamination released as part of OU2.