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Date: September 9, 1996

Mr. Richard N. Stryker
 Atlantic Division, Naval Facilities Engineering Command
 Environmental Quality Division
 Code: 1822
 Building N 26, Room 54
 1510 Gilbert Street
 Norfolk, Va 23511-2699

Re: Naval Weapons Station, Yorktown, Va.
 Sites 4, 21, and 22
 Review of the Navy's draft *RI Work Plan*

Dear Mr. Stryker:

The U.S. Environmental Protection Agency (EPA) has reviewed the Navy's draft Round Two *Remedial Investigation Work Plan* for Sites 4, 21 and 22, located at the Naval Weapons Station-Yorktown, and we offer the following comments and concerns:

GENERAL COMMENTS

1. The number of samples and type of analyses described in the draft *RI Work Plan* are found to be insufficient for an adequate delineation of the extent of contamination at these sites. Site 4 is about 10 acres and Site 22 is probably larger; yet the number of subsurface sample locations proposed is only three at Site 4 and 5 at Site 22 (Tables ES-1 and ES-5). If the subsurface soils are to be adequately delineated for likely source of contamination, 15 to 20 dual-depth subsurface soil sample locations would be required at Site 4 and 20 to 25 locations would be required at Site 22. At Site 21, which is about one acre, a minimum of 3 borings should be drilled to collect subsurface soil samples.
2. In addition, the type of analyses proposed for Site 4 is inadequate. Analyses for nitroaromatics were proposed only for sediment samples at the site even though these contaminants have been detected at elevated concentrations in surface water samples (Figure 2-9). It is possible that these detected nitroaromatic compounds in surface water and sediments during the past are largely attributable to either ash that has since been removed from Site 4 or from Site 22; however, given the operation history of Site 4, it will prove prudent that selected soil samples and all

surface water and groundwater samples are also collected for nitroaromatic analyses.

3. A Wattera sampler may be inappropriate for volatile organics since it places a vacuum above the water sample. The action of the Wattera may increase sediment build-up in the well during purging and sampling in some cases.
4. The contaminants of potential concern (COPC) for sites 4, 21, and 22 (pages 3-1 to 3-2) are listed as, "...may include..." The rationale used to determine which contaminants may be of concern should be detailed in this document. In particular, the ecological risk assessment should be used to generate the list of contaminants of concern (COCs) based on ecologically sensitive guidelines. Since the aquatic ecological risk assessment has not been conducted (page 4-2), management decisions about the COCs should not be applied before the ecological risk assessment is completed.
5. The draft Round 2 RI Work Plan did not describe details regarding sediment sampling, so it is not known how the locations were chosen. Sediment samples should be collected from depositional areas.
6. Figure 4-3 indicates limited additional sediment sampling in Felgates Creek in the vicinity of these sites. There also was no data collected from the explosive burning facility (site 22) in round 1 RI sampling. The extensive wetlands located between Site 22 and Felgates Creek were not sampled in round 1 and there is no sampling proposed in this wetland in round 2. In order to determine if this wetland may be impacted by contaminants from sites 4, 21, and 22, sampling stations must be located in this wetland.
7. Details regarding the fish sampling were not provided in the subject document, except to state that representative samples will be collected from each station. Preferably, the species of fish collected should be those which would be most susceptible to bioaccumulation of contaminants of concern present in the drainage ditch and Felgates Creek. If contaminants that biomagnify through the food chain are found to be of concern (based on the proposed sediment sampling), then fish that are higher on the food chain should be sampled. Since it is not yet clear which contaminants are of concern, we request that two types of organisms be collected: those directly exposed to contaminants from contact with the sediment (e.g., oysters or clams), and carnivorous fish. Whole body fish analysis should be conducted and not just filets.
8. The proposed wells south of the explosive burning facility need to be relocated to better observe the radial flow around the site. Wells 22/GW03 & GW04 should be move approximately 150 feet north. Soil boring 22SB05 should be completed as a monitoring well.

9. Analysis of the data should include ground water flow maps and cross-sections, and contaminate isopleth maps and cross-sections.
10. The potential for natural attenuation should be analyzed. This should include such things as Eh and dissolved oxygen. Dissolved oxygen measurements need to be included in the analysis of purge water. The analysis of battery related contamination should also be looked at in association ph. This may not be a problem due to the buffering capacity of the Cornwallis Cave Formation.

SPECIFIC COMMENTS

1. Table ES-1:

Hardness analyses will not be necessary if TAL metals are analyzed in the surface water samples. It can be calculated with the sum of Ca and Mg.

2. Table 2-3

According to Table 2-3 of the subject report, detection limits for cadmium in sediment were as high as 4 mg/kg, which exceeds the ERL for cadmium of 1.2 mg/kg. Likewise, detection limits for cadmium in surface water (4 µg/L) exceeded the freshwater chronic AWQC (1.1 µg/L). The targeted detection limits for cadmium should be below these screening guidelines for the Round Two RI.

3. Page 2-3

A reference is made on page 2-3 to Leclanche type batteries. Please describe these types of batteries in the text, if they are not already described somewhere else in the document.

4. Figure 4-1:

Two additional surface soil samples should be collected on the north and west side of the access road to site 4 to be consistent with the surface soil sampling coverage conducted in the Round One RI. The surface soil samples collected within Site 4 should not be taken within the areas where excavation and backfill took place.

5. Figure 4-1:

Samples 21SS19 and 21SS20 would be more appropriately considered as surface soil samples for Site 4. In addition, two surface soil samples should be placed between Sites 4 and Site 21 north (or west) of the unnamed tributary to Felgates Creek. This will help to more thoroughly assess the impact of runoff from Site 4.

6. Sections 3.1, 3.2, and 3.3:

Other important potential ecological receptors include wading and probing shorebirds and raptors which eat fish and terrestrial receptors.

7. Sections 3.1 and 4.1:

Nitroaromatics should also be COPCs at Site 4.

8. Page 4-2, Section 4.1:

Please note that the USEPA Region III RBC Table has been updated.

9. Page 4-6, Section 4.1.2.2 Well Development:

Please explain purge water "discharged on site to the well."

10. Page 4-10, Section 4.1.4, 3rd paragraph:

All fish samples should have a tissue analysis for COPCs, even though sediment/water samples in the location may be clean. The areal extent of the surface water near the sites is quite small and it is reasonable to expect fish to be quite mobile among various sampling locations.

We suggest fish samples collected for ecological assessment be whole body samples, and filleted samples should be used if human health risk assessment is to be performed. For a bioaccumulation study, the gut should be taken out of the fish since it may contain sediments that would skew the evaluation of bioaccumulation in the fish tissue. In addition, nitroaromatics are also COPCs in the tissue samples and should be analyzed.

11. Page 4-10, Section 4.1.4:

Describe the targeted species of fish and the size class for the study.

12. Page 4-11, Section 4.2.1:

If leaching of contaminants into groundwater is a concern, samples for physical parameters (grain size, (sieve and hydrometer), bulk density, cation exchange capacity and permeability) should also be collected from the undisturbed zone. However, collection of these samples can be deferred until after the analytical results for soil samples indicate such a need.

13. Page 4-3, Section 4.1.1.2:

See general comments for the number of subsurface sample locations.

14. Page 4-12, Section 4.2.1.2:

Please spell out the location where subsurface soil samples will be collected. Two additional locations should be drilled to collect subsurface soil samples. See general comments.

15. Page 4-17, Section 4.3.1.2:

See general comments for the number of subsurface soil sample locations.

This concludes EPA's review of the Navy's draft Round Two *Remedial Investigation Work Plan* for Sites 4, 21 and 22, located at the Naval Weapons Station-Yorktown. If you have any questions regarding the above, please feel free to call me at (215) 566-3357,

Sincerely,



Robert Thomson, PE
Superfund Federal Facilities (3HW50)

cc: Steve Mihalko (VDEQ, Richmond)
Jeff Harlow (WPNSTA, 09E)
Barbara Okorn (USEPA, 3HW41)
Bruce Rundell (USEPA, 3HW41)