

**RESPONSE TO U.S. ENVIRONMENTAL PROTECTION AGENCY
COMMENTS ON THE DRAFT FINAL ENGINEERING EVALUATION/
COST ANALYSIS FOR SITES 4, 16, AND 21 REMOVAL ACTIONS,
NAVAL WEAPONS STATION, YORKTOWN VIRGINIA**

These responses have been prepared to address comments received from the U.S. Environmental Protection Agency (US EPA), Region III, regarding the "Draft Final Engineering Evaluation/Cost Analysis (EE/CA) for Sites 4, 16, and 21 Removal Actions, Naval Weapons Station, Yorktown, Virginia" (Baker/WESTON, May 1993). The comments were transmitted to Mr. Thomas Black, Public Affairs Officer at the Naval Weapons Station (WPNSTA), in a letter dated 16 June 1993.

GENERAL COMMENTS

1. For areas where explosive compounds have been burned which include TNT (and possibly RDX), media sampling analysis should be expanded to include cyanide compounds. An important aspect of TNT reactivity involves redox reactions between the reactive methyl group and the nitro groups, a type of reaction which can be initiated by various energetic stimuli including thermal, photochemical and chemical. Thus, all types of nitro compounds react easily with bases forming diverse types of products. In the case of TNT, the 2,4,6-trinitrobenzyl anion is formed initially and rapidly, and is a highly reactive species thought to be intermediate in the many reactions of TNT conducted under basic conditions. The cyanide ion can form from a complex of this anion.

Cyanide has been detected around the burning grounds at the former West Virginia Ordnance Works facility, where off-spec TNT was open-burned. Therefore, for Site 4 please include cyanide analyses in future sampling events.

The concern for the presence of cyanide is unclear. In "Military Explosives" (Technical Manual TM-9-1300-214, Department of the Army, 1984), the cyanide (CN) ion can form a complex with the 2,4,6-trinitrobenzyl ion. The cyanide ion must be present from another source, since open burning degradation does not generate the CN ion. Electron impact degradation can generate HCN after several steps, but these conditions are different than those generated under simple open burning.

As part of the sampling activities performed during the Round One RI activities at WPNSTA Yorktown, cyanide analyses were performed on surface soil samples at several TNT sites. No cyanide was detected above the method detection limit in any of the samples analyzed. In addition, cyanide was not present in any of the compounds historically burned at Site 4. However, cyanide analysis has been added to the analytical parameter list for the confirmatory sampling.

2. Please beware that, since the removal action areas have not been grid-sampled in their entirety, the possibility of encountering unanticipated contaminant concentrations in the soil is a real

possibility. Additionally, some of the solvents disposed of in the landfills may be listed RCRA wastes, and are therefore hazardous regardless of whether they fail TCLP or not. Please proceed with caution.

If the excavated materials indicate the possible presence of solvents or other hazardous constituents, additional analyses may be added to those specified. Otherwise, the samples will be tested for TCLP as specified.

3. Please note that the TCLP results for the removal action areas detected 2,4,5-trichlorophenol, while the sampling results from the draft RI did not detect this compound. Were the TCLP samples taken from the "worst" visually-contaminated areas at the removal sites?

As stated in the IT Testing Report for Sites 4, 16, and 21, the soil samples at Sites 4 and 16 were collected "from selected trench locations considered representative of the waste materials". The soil samples collected during the Round One Remedial Investigation (RI) program at these 2 sites were collected from the top 2 ft of the soil to evaluate immediate threats to human health and the environment. Since most of the wastes at these sites are not surficial, the absence of these compounds in the surface soil is understandable.

SPECIFIC COMMENTS

1. **Page 3-11, Table 3-2**

It is recommended that the title of this table be changed to: Risk-Based Cleanup Contaminant Removal Levels for Explosives at WPNSTA Yorktown.

This table has been deleted from the EE/CA. The EPA guidance manual has been added as an appendix, since compounds other than explosives will now be used for comparison of the soil samples collected from the ash pile excavation.

2. **Page 3-11, Table 3-2**

Please note that the referenced table has a mixed usage of the Hazard Quotient, H. Those explosive concentration removal levels calculated for H = 1 or 10^{-6} cancer risk include:

2,4-DNT
HMX
RDX
2,4,6-TNT
1,3,5-TNB

Those concentration removal levels calculated for H = 0.1 include:

2,6-DNT

It may be more appropriate to use H = 1 for all the removal action level concentrations. Therefore, the contaminant removal level for 2,6-DNT should be 42 mg/kg based upon H = 1.

See response to comment 1, above.

3. **Page 4-5, First Bullet**

Composite sampling is not recommended by EPA. Compositing tends to dilute the sample, especially in the case of volatiles. Discrete samples, taken at specified intervals, are recommended instead. Discrete samples not only give a more accurate picture of actual field conditions, they also enable one to compare the sample results with the field location. This would enable early detection of "hot spots" within the removal action areas which may contain contaminant levels which fail TCLP analyses.

Discrete samples will be collected instead of compositing. The EE/CA will be modified to reflect this correction.

4. **Page 5-8, Section 5.2.1.3**

As described above, composite sampling is not recommended.

See response No. 3.

5. **Page 5-22, Section 5.3.1.3**

As described above, composite sampling is not recommended.

See response No. 3.

6. **Page 7-2, First Bullet**

The manner in which the excavation boundaries are determined needs to be discussed in greater detail. Will there be a grid-sampling event performed at specified intervals for the entire removal action areas? With the numerous contaminants detected so far at each of the three removal action sites, the probability of discovering "hot spots" with significantly greater concentrations of contaminants, or possibly additional contaminants is real.

The ash pile will initially be excavated to remove all of the ash, plus an additional 6" of underlying soil. The excavated area will be sampled, and the results compared to the risk-based concentrations provided in the guidance document provided as Appendix C to the EE/CA. The exact sampling protocols will be outlined in the sampling plan.

The batteries and wastes will be excavated initially to the limits established through the work performed in the Testing Report. Additional excavation of the batteries will be conducted based on visual inspection and the use of metal detectors. Analytical testing will be performed in the excavated areas. The results of these analyses will be used in future RI/FS activities.

7. **Page 7-2, Second Bullet**

Beware of the TCLP analytical results listed in the Testing Report. These TCLP samples were

composited and, therefore, may not be illustrative of the variation in actual field conditions that may be present at the removal action areas. Proceed with caution.

Comment acknowledged. The analytical results for TCLP samples have been used to illustrate, in addition to the results of the Round One RI, the types of contaminants and general concentrations that may be encountered.

8. Page A-3, Table A-1

What are the units for Table A-1? EPA is assuming $\mu\text{g/L}$?

As stated on page A-1, the groundwater data are presented in units of micrograms per liter ($\mu\text{g/L}$).