



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

N60087.AR.001307  
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December 8, 2003

Mr. Orlando Monaco  
Department of Navy  
Engineering Field Activity-Northeast  
Code 1823/OM  
10 Industrial Highway, Mailstop 82  
Lester, PA 19113-2090

Re: Site 9-Direct Push Groundwater & Ash Landfill Investigation Report  
Naval Air Station, Brunswick, Maine

Dear Mr. Monaco:

The Maine Department of Environmental Protection (MEDEP) has reviewed the draft report entitled "Direct-Push Groundwater and Ash Landfill/Dump Area Delineation Investigation Summary Report for Site 9", dated October 2003, prepared by EA Engineering, Science and Technology. Based on that review MEDEP has the following comments and issues.

**General Comments:**

1. Regarding the Site 9 groundwater investigation, the conclusions should address the following:
  - what, if any, follow-up field work should be undertaken,
  - whether the contamination has been adequately delineated,
  - whether the monitored natural attenuation remedy specified in the ROD remains protective based on the new information,
  - and that three locations (S9-B6, S9-B8, and MW-NASB-069) exceed the MCL and MEGs for vinyl chloride or TCE. . (ED)
2. Map analysis of the new information in this report, together with older data, points to the ash landfill/dump area as a likely source of chlorinated VOCs. One daughter breakdown product of chlorinated solvents, vinyl chloride, appears to move down the hydraulic gradient to near the junction of the upper and lower retention ponds. TCE has also followed this course in past years, but some deep penetrating TCE appears to have flowed along the clay surface under the landfill, which slopes southwestward to TCE-contaminated borings S9-B6, MW-NASB-227 (monitoring well), and S9-B7.

The above source-area hypothesis draws support from the finding of cis-1,2 dichloroethene and vinyl chloride in soils at borings 2 and 5, and from the trace-level presence of TCE at the bottom of the well screen in MW-NASB-021, a deep screen monitoring well along the southwest side of the landfill and 60 feet downgradient of borings 2 and 5. (NR)

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3. The Navy's interpretation that the top-of-clay geometry indicates a lack of a preferential pathway along the western edge of the investigation area is not obvious from Figures 3 and 4, referenced in the third bullet of the conclusions. A top-of-clay contour map developed by MEDEP, based on the data in this report, shows an interesting geologic structure leading from the landfill towards the key contaminated locations. The southwesterly alignment away from the landfill of groundwater sampling points MW-NASB-069 to S9-B6 to MW-NASB-227 to S9-B7 shows a progressive decrease in total VOCs as follows: 95  $\mu\text{g/L}$ , 15.8  $\mu\text{g/L}$ , 5.7  $\mu\text{g/L}$ , to 4.9  $\mu\text{g/L}$ . The top-of-clay elevation also generally decreases: 20 ft msl, 6 ft msl, 14 ft msl, and 5 ft msl.

Also VOCs in soil borings occur at several locations within the ash landfill/dump area. MEDEP believes that the former ash landfill/dump maybe a source of the VOC groundwater contamination. MEDEP would like to discuss these items in more detail at the upcoming January 2004 Technical Meeting. (MTG)

**Specific Comments:**

4. Section 2.2, Field Activities and Sampling Procedures for Barrack..., p. 6, para 4:

"Soil samples collected for VOC analysis were split for preservation with both de-ionized water (using EPA Method 5035) and sodium bisulfate (using EPA Method 8260B) in order to distinguish between analytical variances associated with the laboratory preservation methods."

The report should include conclusions or recommendations based on a comparison between de-ionized water and sodium bisulfate as preservatives. (ED)

5. Section 3.1.1, Site Geology, p. 10, Cross-Section B-B':

An important deep well, MW-NASB-021, located next to MW-NASB-080 is missing from this cross section. The bottom of the screen of MW-NASB-021 (and top of clay) is at an elevation of 9 feet above msl. The clay at this location is deeper than at any other boring in this section, and defines the bottom of a possible trough structural feature. MW-NASB-021 became a part of the long-term monitoring program in the spring of 2001. Trace level of TCE (0.8J  $\mu\text{g/L}$ ) was reported in the deepest diffusion bag for the October 2001 sampling event. The spring 2002 result of this well was non-detect, which was defined as less than 2  $\mu\text{g/L}$ . MW-NASB-021 needs to be added to Figure 4 and pertinent information on MW-NASB-021 should be added to this section. (ED)

6. Section 3.2, Ash Landfill/ Dump Area at Barracks Buildings 218 and 219, para 4:

"As shown in Appendix B, the waste material varies from 1 to 8 ft in thickness."

This statement differs from the legend on Figure 7, which labels three locations (7, 25 and 26) with waste at less than one inch, however the soil boring logs indicate that waste material ranged from 2 to 14 inches thick at these locations. This needs to be rectified. (ED)

7. Section 3.3.1, Groundwater Results, p. 12, 1<sup>st</sup> bullet:

"These results are similar to those noted at MW-NASB-076, which is located upgradient of S9-B8."

Figure 3-5 cross section does not show that the results are similar. MW-NASB-076 has a total VOC concentration of 1.1  $\mu\text{g/L}$  (undifferentiated), whereas Table 2 shows that S9-B8 has 7.1  $\mu\text{g/L}$  of vinyl chloride, 2.6  $\mu\text{g/L}$  of cis-1,2-dichloroethene, and 0.97J  $\mu\text{g/L}$  of 1,1-dichloroethane. This is one order of magnitude higher in total VOCs. Please delete the above statement, or modify its content. (ED)

8. Section 3.3.1, Groundwater Results, p. 12, 2<sup>nd</sup> bullet:

a.) "This result [trichloroethene at S9-B8] represents the only detection of a chlorinated VOC that could potentially degrade into vinyl chloride via dechlorination processes."

Low concentrations of cis-1,2-dichloroethene were found at S9-B6, S9-B7, S9-B8, and S9-B9. Cis-1,2-dichloroethene dechlorinates directly to vinyl chloride under strongly reducing anaerobic conditions. Please make the appropriate change. (ED)

b.) "Trichloroethene was reported at a concentration of 7.3  $\mu\text{g/L}$  at direct-push boring S9-B8 ...."

This statement is incorrect, according to Table 2, page 3 of 4 which indicates that the 7.3  $\mu\text{g/L}$  concentration was at direct push boring S9-B6. Please clarify and correct. (ED)

9. Section 3.3.2 Soil Results – Ash Landfill/Dump Area, p. 13, 1<sup>st</sup> bullet:

Please correct the spelling of cis-1,2-dichloroethene. (ED)

10. Section 3.3.2 Soil Results – Ash Landfill/Dump Area, p. 13, 2<sup>nd</sup> bullet:

"Vinyl chloride was not detected in the samples collected at other soil borings in the area of boring S9-ASH-SB-2, ..."

This statement is incorrect, according to Appendix B. The Katahdin laboratory reported a concentration of vinyl chloride of 26  $\mu\text{g/Kg}$  in the 10 to 11 foot bgs sample at S9-ASH-SB-5-10-11. Please correct Table 3, the above statement, and any other related part of the report, as appropriate. (ED)

11. Section 3.3.2 Soil Results – Ash Landfill/Dump Area, p. 13, 4<sup>th</sup> bullet:

"Several inorganic analytes were detected, including arsenic, barium, beryllium, cadmium, chromium, mercury, nickel, and silver. Additionally, several other common metal analytes were reported, including calcium, iron, lead, magnesium, and manganese."

Those inorganic analytes that are distinctly elevated above BNAS soil background levels should be identified as such. At a minimum, this list should include copper, iron, lead, silver, and zinc. Relatively high concentrations of these metals basically occurred only at S9-ASH-SB-2 and S9-ASH-SB-5. This finding further suggests that the focal area of subsurface contamination due to dumping is the S9-ASH-SB-2/S9-ASH-SB-5 vicinity. MEDEP notes that

no soil laboratory samplings were collected close to the above named sampling locations, although borings 1, 3 and 4 are within 30 feet so while the objective of the delineation was achieved, the extend of the contamination is unknown. This will not be an issue if the landfill/dump is removed once the barracks are demolished. (ED)

12. Figure 6, Interpreted Potentiometric Surface Elevations:

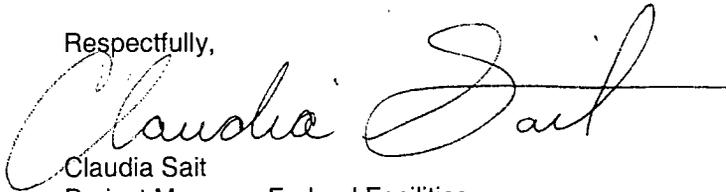
The prominent flow pattern depicted on Figure 6 was contoured to represent available groundwater gauging data from Monitoring Event 20 (April 2002). A more current groundwater flow pattern should be provided in this report since the Soil Vapor Extraction/Aquifer Air Sparging Remedial Systems at the Naval Exchange which is upgradient of Site 9 has been deactivated but might have played a role in the groundwater flow pattern. (ED)

13. Figure 7, Ash Landfill/Dump Area Delineation:

It is difficult to distinguish between the lines for the approximate locations of the Ash Landfill/Dump Area (per the Record of Decision) and the approximate extent of waste material based on the recent investigation. Different colors line size should be used. Please correct. (ED)

Thank you for the opportunity to review this report. If you have any questions or comments please call me at (207) 287-7713.

Respectfully,



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