



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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January 4, 2002

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, Neptune Drive Disposal Area, 2000 Annual Report, Monitoring Events 16 & 17
Naval Air Station, Brunswick"

Dear Mr. Monaco:

The Maine Department of Environmental Protection (MEDEP or Department) has reviewed the draft report entitled 2000 Annual Report, Monitoring Events 16 & 17, Site 9: Neptune Drive Disposal Site, dated October 2001, prepared by EA Engineering, Science and Technology. Based on that review the Department has the following comments and issues.

General Comments:

1. Based on the following comments there appear to be enough technical issues regarding Site 9 to warrant a 4 hour discussion on trends and modification to the monitoring network at the next technical meeting. (MTG)
2. MEDEP notes that the concentration of vinyl chloride has continued its gradual rise to a high of 60 µg/L in September 2000, whereas 1,2 dichloroethene (DCE) has remained nearly steady around 50 µg/L for the last three monitoring events. While it is encouraging to see the natural chemical degradation process working at Site 9 (as the selected remedy anticipated), MEDEP is anxious to see vinyl chloride levels in groundwater begin to decrease. A permanent decrease would signify that the mass of parent compound is appreciably shrinking.

The higher the vinyl concentrations become at the deep-screened monitoring well near the center of the site, the more concern MEDEP has that the downgradient wells may not be intercepting the core of the plume and may not be truly representing concentrations that are entering the northern surface-water impoundment. Only downgradient monitoring well MW-NASB-072 is screened just above the clay, and only one surface-water station is now being sampled. If one or both of these monitoring sites is not located within the plume migration path, chemical impacts at the discharge area will not be correctly measured. This multi-year issue has not gone away, and MEDEP requests that it be discussed at the next technical meeting. (MTG)

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Specific Comments:

3. Long Term Monitoring Program, Section 1.2, p. 1 &2, bullets:

The five goals of the Long Term Monitoring Program are outlined on page 1-2 of the Long Term Monitoring Plan (August 1999); this section should be revised to incorporate those goals verbatim. (ED)

4. Long-Term Monitoring Program, Section 1.2, p. 1, 1st paragraph:

The ROD, not the LTMP, established the requirement for monitoring, sampling, and institutional controls. Please restate. (ED)

5. Long-Term Monitoring Program, Section 1.2, p. 2, 1st paragraph after bullets:

"Ground-water elevation data were gathered to assess whether ground water from the Navy Exchange Service Station air sparging may be flowing toward Site 9."

As written, the intent and meaning of this statement is confusing. MEDEP believes that it has been evident for several years that groundwater flows from the NEX area into Site 9, and that the assessment is now one of delineating how this flow path responds to changes in remedial activities at the NEX, and to wet versus dry periods. Our recommended revision of the above statement is: "*Ground-water elevation data were gathered to assess changes in the pathway of ground-water flow from the Navy Exchange Service Station air sparging remedial area into Site 9.*" (ED)

6. Long-Term Monitoring Program, Section 1.2, p. 2, 1st paragraph after bullets:

"A complete description of site geologic conditions is not presented in this Annual Report, but can be found in previous Annual Reports for Site 9."

The Navy needs to reference a specific annual report, preferably the latest that applies. (ED)

7. Figure 1-3, Geologic Cross-Section of Site 9:

The Department is pleased to see a geologic section added to the Annual Report. MEDEP recommends the following to enhance the readers understanding.

First, the section follows nearly parallel with the interpreted movement of groundwater in Figures 2-1 and 2-2 except for wells MW-NASB-074 and MW-NASB-077. The section line may be improved by dropping these two wells, and adding MW-NASB-072 (and possibly MW-NASB-078 to cross the lower end of the Upper Pond) follow the plume center to its surface water discharge. MEDEP believes that very little plume water discharges to the Upper Pond, as suggested by the potentiometric contour maps. (ED)

Secondly, another geologic cross section is recommended to portray the subsurface perpendicular to groundwater flow. It is recommended to run this line through the "hot spot" (MW-NASB-069), and include wells MW-NASB-227, MW-NASB-079, and MW-NASB-70 for this annual report. (ED)

8. Volatile Organic Compounds, Section 2.2.1, p. 2-1, 3rd sentence:

"...(the highest reported vinyl chloride concentration detected in 2000)."

Please delete "reported", as the connotation is that other non-reported data exist. (ED)

9. Vinyl Chloride Trend Data, Section 2.2.2, p.2-2:

a.) The referenced Figure 2-1 should be Figure 2-3, in both cases. Please correct. (ED)

b.) Also, in the trend table summary, please review the characterizations of "steady" for 1995-2000 and of "increasing" for 1999-2000 for MW-NASB-080. These seem to be reversed. (ED)

10. Vinyl Chloride/Total Dichloroethene Ratio, Section 2.2.3., p. 2-2 and 2-3:

a.) Please review all of the figure reference numbers in this section.. Does the Navy intend to reference Figures 2-4 and 2-5? Please correct as necessary. (ED)

b.) "A decreasing concentration of total DCE (parent compound) and an increasing concentration of vinyl chloride (daughter product) indicated the rate of dechlorination process is increasing."

The sloped straight-lines in Figure 2-4 do not represent increasing rates of dechlorination; straight lines on arithmetic graphs imply that the rate for any specific line (or well) is constant over time. MEDEP suggests that this statement be removed or revised as written in the note on Figure 2-4. "*Higher vinyl chloride/total 1,2 DCE ratio indicates increasing dechlorination.*"

c.) DCE may not be the true parent compound, as it also is a daughter product of TCE. TCE has been detected historically between the MEG/MCL (5 µg/L) and 1 µg/L at MW-NASB-227 and MW-NASB-074, and at trace levels at MW-MASB-072, MW-NASB-075, and MW-NASB-076. Therefore any reference to DCE as a parent compound needs to include the fact that DCE likely is a daughter product of TCE.

11. Figure 2-3, Total volatile organic compounds and vinyl chloride trends, 1995-2000:

In the graph for MW-NASB-080, the black trend line for the 1998 – 2000 does not appear correctly drawn. Also, refer to Comment 9. Please review and make the appropriate change. (ED)

12. Figure 2-5, Sum of vinyl chloride and 1,2-dichloroethene, total concentration, 1995 – 2000:

a.) Because vinyl chloride is very likely derived from the degradation of total 1,2-dichloroethene, it would be better to show the DCE graph physically above the VC graph. (ED)

b.) Please add a clarifying footnote that says that the sum represents all monitoring wells sampled at Site 9 for each monitoring event. (ED)

13. Ground-Water Monitoring and Sampling Program, Section 3.1.2, p. 3-3, 1st bullet:

"The source of the 1,2-DCE at Site 9 is not apparent, but may be related to changing geochemical conditions at the Navy Exchange Service Station, which have affected ground-water chemistry at Site 9."

Please rewrite to indicate the following: "*The source of contamination at Site 9 has not been determined. The changing geochemical conditions related to the NEX do appear important and likely have aided degradation of 1,2 DCE at Site 9.*" (ED)

14. Ground-Water Monitoring and Sampling Program, Section 3.1.2, p. 3-3, 2nd bullet:

"Ground water moving onto Site 9 from the west (i.e., the area near MW-NASB-227) does not appear to be contributing significant concentrations of VOCs to Site 9."

MEDEP suggests that after the surface water drainage was dammed in early 1998 and after the air sparging began at the NEX, the groundwater flow pattern changed subtly but significantly. It seems likely that the flow into Site 9 had a stronger west to east component prior to 1998. If the 42-inch drain pipe was actually removed as the Navy contends, this could have also lessened the draw of groundwater from west of Site 9. Although potential solvent sources once existed in the current upgradient direction (e.g., the vehicle maintenance building and the waste oil storage tank at the NEX), past migration from the Flight Line to Site 9 is another possibility, as EPA has suggested. (NR)

15. Ground-Water Monitoring and Sampling Program, Section 3.1.2, p. 3-3, 4th bullet:

"Therefore, if elevated concentrations of vinyl chloride were to occur in areas downgradient of MW-NASB-069, the existing monitoring well network is likely to effectively track changes in ground-water concentrations of VOCs."

It is very possible that the existing monitoring network is not adequate. Only MW-NASB-072 has a well screen placed just above the clay and is also located between MW-NASB-069 and surface water. The mass of the vinyl chloride appears to be moving along the top of the clay. The graph of VOC concentrations at MW-NASB-072 (Appendix A, Figure 18) shows a gradual decline from a range of 5 to 10 $\mu\text{g/L}$ in the mid-1990s to non-detect after March 1999. This suggests to MEDEP that the flow path containing vinyl chloride has shifted. It may now be north of MW-NASB-072, as can be interpreted from the potentiometric surface elevation maps in this report. The Department requests that the need for another monitoring well be discussed at the next technical meeting. (RR/MTG)

16. Surface Water Sampling Program, Section 3.1.3, p. 3-4:

Both 1,2-DCE and vinyl chloride were detected at surface water station SW-10 in 2000. Given the substantial potential for volatilization and dilution of these compounds once they reach the stream, this finding is noteworthy. It may also be an indication that the flow path has shifted north of MW-NASB-072 (see Comment 15). It may be necessary to discuss an additional monitoring well. (RR/MTG)

17. Recommendations, Section 3.2, p. 3-5:

- a.) MEDEP agrees with the recommendations in bullets 1, 2, 4, and 6. (NR)
- b.) Bullet 3: While MEDEP agrees in theory with expanding the use of aqueous diffusion samplers for Site 9, the number of rounds using multiple samplers and low flow sampling should be discussed and consensus reached among the Restoration Advisory Board members. Any change in sampling methods would then need to be incorporated into the Long Term Monitoring Plan for Site 9. (MTG)
- c.) Bullet 5. Please clarify what is meant by "further evaluation is recommended". Is the Navy recommending investigating the possibility of a source of 1,2-DCE in the western part of Site 9? If so, the search should look for former releases of TCE and PCE, since both compounds have been consistently documented in groundwater samples from MW-NASB-227. Two and a half years of laboratory analytical data for this well indicate a flat trend in concentration. Groundwater samples from just above the clay upgradient of this well should be collected. (RR/MTG)
- d.) Bullet 6: The elimination of SVOC analysis should be discussed and consensus reached at a RAB meeting prior to documenting the change in the Long Term Monitoring Plan for Site 9.

18. Appendix A, Figure 33, MW-NASB-227:

For MW-NASB-227, both TCE and PCE should be graphed, regardless if they are not designated as "chemicals of concern" site-wide. After all, it is very likely that 1,2-DCE, and subsequently vinyl chloride, are daughter degradation products of TCE and/or PCE. (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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