

STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



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December 16, 2004

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

Re: Sites 1,3 & Eastern Plume, Monitoring Event 23-October 2003  
Naval Air Station, Brunswick, Maine

Dear Mr. Monaco:

The Maine Department of Environmental Protection (MEDEP) has reviewed the Navy's Response to Comments (RTC), dated November 17, 2004 for draft "Monitoring Event 23 Report for Sites 1 and 3 and Eastern Plume, prepared by EA Engineering, Science and Technology. Based on that review MEDEP has the remaining comments and issues.

The follow up responses follow the original number system.

19. Section 2.4.2.2 Sites 1 and 3 – Inorganics, p. 25, 4<sup>th</sup> bullet, Leachate Seep SEEP-05:

"Manganese concentrations have increased to a new high at 58,100  $\mu\text{g/L}$  from samples collected in October 2003. Arsenic concentrations have increased to a new high at 15,700  $\mu\text{g/L}$  from samples collected in October 2003."

**MEDEP Initial Comment:** Appendix C.4 graphs in Figures 126 and 127 show that both arsenic and manganese had much higher concentrations in October 2003 than any previous results since monitoring began in 1995. It is noted that pH was measured at 6.15 units and dissolved oxygen at 0.28 mg/L. Under such in-situ chemical environments, arsenic and manganese are commonly dissolved into groundwater from desorption of mineral coatings on soil grains. The reason for the low pH and very low dissolved oxygen apparently is unknown or else not reported. MEDEP believes the likely cause is changes in subsurface conditions emanating from Sites 1 and 3 immediately upgradient. MEDEP is concerned about this escalating arsenic and manganese leachate adjacent to Mere Brook above their Ambient Water Quality Criteria of 0.018  $\mu\text{g/L}$  and 50  $\mu\text{g/L}$  respectively. If this situation continues the Navy will need to consider the effectiveness of the remedy. (MTG)

**Navy's Response**—This topic was discussed during the October 2004 Technical Meeting. The seep sampling locations will be replaced with shallow sampling points which can be more effectively developed to remove suspended materials, and which should provide more representative samples of shallow groundwater.

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**MEDEP Follow-up Response:** MEDEP maintains that while it is important to minimize turbidity in the seep aqueous samples, and even though manganese and arsenic concentrations may return to those values corresponding to very low turbidity, other parameter values indicate that the groundwater is being affected by the landfills. The composition of these seeps over time suggests continuing landfill leachate contamination, and not just desorption of inorganics from soil grains coated from a pre-slurry wall/cap plume.

20. Section 2.4.2.2 Sites 1 and 3 – Inorganics, p. 26, 1<sup>st</sup> bullet, Leachate Seep SEEP-09:

“Inorganic concentrations, with the exception of manganese, are generally within the historical range ... (excluding two spikes in arsenic at approximately 12,500 µg/L and 5,190 µg/L during 2002 and October 2003 sampling events, respectively). Manganese concentrations have increased to a new high at 10,400 µg/L from samples collected in October 2003.”

**MEDEP Initial Comment:** SEEP-09 is close to and downgradient of SEEP-05, as discussed in comment 19. The pH at SEEP-09 was low (5.64 units) and the dissolved oxygen was very low (0.20 mg/L). The coincidence of record highs of manganese and arsenic at both locations and depressed pH and DO levels are further evidence that these seeps are within a migration path that passes through the gap in the slurry wall on the south in the direction of Mere Brook. MEDEP is concerned about this escalating arsenic and manganese leachate adjacent to Mere Brook above their Ambient Water Quality Criteria. If this situation continues the Navy will need to consider the effectiveness of the remedy. (MTG )

**Navy's Response**—Please see the response to Comment No. 19.

**MEDEP Follow-up Response:** Please see the above MEDEP response to Comment 19.

31. Section 2.5.3, Natural Attenuation Screening Process, p. 33, 2<sup>nd</sup> paragraph:

“In addition, weighted scores indicated that there is limited evidence of chlorinated VOC biodegradation for 6 remaining monitoring locations that were assessed. These locations included MW-205, MW-230A, MW-332, MW-NASB-212, P-111 and P-106.”

**MEDEP Initial Comment:** Some of the above listed wells will change categories when the well data are correctly evaluated using Table 17. Table 18, which is the basis of the above statement, has the following problems that affect the application of the EPA scoring methodology:

- A negative 3 points should only be awarded when dissolved oxygen exceeds 5.0 mg/L, not 0.5 mg/L. MW-105A, MW-1104, MW-230A, MW-319, MW-NASB-212, MW-330, and P-111 will all receive 3 additional points each.
- No points should be awarded for the presence of 1,1,1-trichloroethane, as it is not a daughter product. MW-205A, MW-229A, MW-306, MW-332, and P-106 will all lose 2 points each.

The overall MNA assessment for the Eastern Plume may change once these corrections are made. Isocontour maps based on natural attenuation scores for the selected wells sampled likely will require modification. (ED, RR)

**Response**—The Navy agrees with this comment. The scoring values have been changed as noted in this comment. The contours on Figure 14 have been edited to reflect these changes. Note that these changes were relatively minor and the conclusions provided in the draft report were not affected by these corrections.

**MEDEP Follow-up Response:** MEDEP looks forward to receiving the MNA revised isocontouring of Figure 14.

32. Section 3.1, General Conclusions and Recommendations, p. 35, 1<sup>st</sup> bullet:

“However, continued increases in concentrations at MW-331 in 2003 have been noted and this well is currently the monitoring point with the highest total VOC concentrations. These increases suggest an area of increased VOC contamination is moving south; and, during 2003, the center of mass of the Eastern Plume moved from P-106 to MW-331.”

**MEDEP Initial Comment:** Movement of the center of mass between P-106 and MW-331, a distance of 1200 feet, requires that the northern and southern regions of the Eastern Plume connect. The statement at the bottom of page 33 says that the chemical data does not exist to support a connection. At this time, MEDEP cannot endorse the concept that significant mass has migrated from P-106 to MW-331. The increase in concentration at MW-331 could be due to a long-decline in pumping rate at EW-02A and EW-01, resulting in contamination no longer being “pulled” from the MW-331 area. MW-331 is 600 feet from EW-02A, which at one time had a contoured radius of hydraulic influence over a 200 feet. The contaminant graph in Figure 133 (Appendix C-4) shows a general decline in VOC concentrations at P-106 over the last four years, with a leveling trend after the fall of 2002. At MW-331, the fall 2003 VOC concentrations are not as high as in the fall of 2001 and the fall of 2002, therefore, contaminant mass has not been accumulating here.

MEDEP has agreed with the recommendation to investigate the placement of new replacement extraction wells in the P-106 and MW-331 areas. (RR)

**Navy's Response**—Groundwater data show the center of mass (i.e., highest concentrations) had been located at P-106 and is now located at MW-331. Whether there is a direct hydraulic connection cannot be determined at this time, although it appears clear these areas are connected and contamination is moving from north to south. The additional boring data and groundwater sampling in the northern portion of the Eastern Plume will provide information that can be used to more fully assess this issue in the future.

**MEDEP Follow-up Response:** There is yet a general disagreement concerning whether the plume has physically migrated between these monitoring wells, as the Navy's response does not present any new information to support a long migration. MEDEP is looking forward to receiving the boring data and groundwater data but until that time our original comment stands.

34. Section 3.1, General Conclusions and Recommendations, p. 36, 1<sup>st</sup> bullet:

**MEDEP Initial Comment:** MEDEP agrees with much of the conclusion, but cautions that the VOC plume may travel beneath Mere Brook for some distance rather than discharge to the stream at MW-313. The recommended one-time expansion of surface-water sampling should be delayed until the geologic and chemical data from the 2004 field investigation in this area are available and integrated into the site conceptual model. (RR)

**Navy's Response**—The Navy agrees with this comment. Note that the groundwater monitoring network south of Mere Brook is well suited to identify the Eastern Plume if VOCs travel beneath the Brook.

**MEDEP Follow-up Response:** The Navy apparently misinterpreted the reach of Mere Brook that the original comment was referring to. The comment was referring to that part of Mere Brook one hundred or so yards upstream and downstream of the MW-313 location. It appears that the Navy thought the underflow being addressed was along a much longer reach farther down the valley. The direct-push data collection initiated in 2003 near MW-313 may indicate a need for another monitoring well in this area.

40. Figure 12, PCE, TCE, 1,1,1-TCA Concentration Isocontours:

**MEDEP Initial Comment:** The method used to construct the isocontours for the three maps needs to be named. Please explain the rationale behind the unusual numerical ranges assigned to the four categories for each map (e.g., 60-137, 138-206, 207-240, 241-310). These maps vividly illustrate the lack of interior sampling points between the P-106 and MW-331 hot spots. Another interesting new feature is the tongue of clean water that has penetrated to former interior well MW-207AR. (RR)

**Navy's Response**—These maps were contoured to illustrate the distribution of VOCs in support of the monitored natural attenuation assessment. The numerical contours were chosen to illustrate local trends based on data from Monitoring Event 23. The Navy agrees that little groundwater data are present between P-106 and MW-331. Additional monitoring wells are anticipated in this region of the plume during the installation of the replacement extraction wells scheduled near P-106 and MW-331.

**MEDEP Follow-up Comment:** The Navy did not adequately explain the selecting the unusual numerical groupings of MNA scores, as the original comment requested. What configurations of total MNA score would result if other groupings were used?

41. Figure 13, 1,1-DCA, 1-2, DCE, and Methane Concentration Isocontours:

**MEDEP Initial Comment:** The method used to construct the isocontours for the three maps needs to be named. Please explain the rationale behind the unusual numerical ranges assigned to the four categories for each map (e.g., 35-106, 107-177, 178-248, 249-320). (RR)

**Navy's Response**—These maps were contoured to illustrate the distribution of VOCs in support of the monitored natural attenuation assessment. The numerical contours were chosen to illustrate local trends based on data from Monitoring Event 23.

**MEDEP Follow-up Comment:** Please see the above MEDEP response to Comment 40.

42. Figure 14, Isocontours of Monitored Natural Attenuation Scoring:

**MEDEP Initial Comment:** MEDEP does not agree with how the isocontours are depicted in the southern area of the Eastern Plume for the following reasons and therefore it needs to be revised.

- The MW-105A/B wells, which are not contaminated, have been shown to be too shallow to represent the Eastern Plume therefore MW-105A/B should be eliminated from this figure.

- The area surrounding MW-205 belongs in the green dotted unit (>5-14).
- Table 18 contains errors (See Specific Comment 47 below).

Once these changes have been made most of the southern plume region will then be above 5 MNA points. (ED)

**Navy's Response**—Figure 14 has been revised and corrected based on the above comments. Note that MW-105A/B was maintained as this figure illustrates the results of the monitored natural attenuation scoring and, therefore, including results from this well is necessary.

**MEDEP Follow-up Response:** MEDEP stands by its original comment.

45. Table 8, Summary of Water Quality Indicator Parameters Measured in Aqueous :

**MEDEP Initial Comment:** An unexpected number of the reported field measurements made October 2-15 are significantly different from the same measurements made October 21-22 (Table 10) during field data collection for the natural attenuation assessment. It seems unlikely that specific conductance would change 2 to 4 fold, dissolved oxygen would increase or decline 7 to 8 mg/L, or pH change as much as 1 unit. It is an accepted fact that field instruments occasionally lose their calibration, and some variation between instruments should be expected. Another factor is that the earlier set of samples was collected via diffusion bags and the later set using low-flow pumping. Of most concern for assessing natural attenuation is having confidence that the dissolved oxygen readings are reliable. The Navy needs to state which collection method they believe provide the most representative data, and their rationale. (RR)

**Navy's Response**—This issue was discussed during the October 2004 Technical Meeting. The differences noted in this comment are likely attributed to the differences in the origin of the groundwater water being measured—diffusion sampler versus low-flow sampling. It appears that low-flow values are more reasonable, although diffusion samplers have been shown to have representative results at other sites.

**MEDEP Follow-up Response:** The Navy's explanation is unlikely to be correct for most of the cases. MEDEP continues to believe that these large differences are due to instrument problems or other field conditions that inadvertently vary.

If you have any questions or comments please call me at (207) 287-7713 or email me at [claudia.b.sait@maine.gov](mailto:claudia.b.sait@maine.gov).

Respectfully,



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