

**RESPONSE TO COMMENTS FROM THE  
MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION ON THE  
DRAFT FINAL LONG-TERM MONITORING PLAN FOR SITES 1 AND 3  
AND EASTERN PLUME, NAVAL AIR STATION, BRUNSWICK, MAINE**

**COMMENTOR: Claudia Sait**

**DATED: 13 August 1999**

The Maine Department of Environmental Protection (DEP or Department) has reviewed the report entitled *Draft Final, Long-Term Monitoring Plan, Sites 1 and 3 and Eastern Plume*, dated June 1999, prepared by EA Engineering, Science, and Technology. Based on that review, the Department has the following comments and issues.

**GENERAL COMMENTS**

1. The new Figure 1-2 is nicely done. However, Figure 1-2 shows the "approximate limits of the Eastern Plume in 1999" while Figure 3-1 shows the "inferred extent of Eastern Plume above MEG/MCL based on Monitoring Event 13 data (November 1998). A significant difference exists between the plume expanse shown on these maps. Figure 1-2 indicates one continuous plume from north to south, while Figure 3-1 shows distinctly disconnected northern and southern lobes. While the Navy may be able to support both versions based on differences in dates of data and VOC detections versus MEG/MCL exceedances, the reader will likely be confused. The separate lobe interpretation historically has been displayed in reports. DEP is open-minded as to whether this interpretation is a result of data gaps, or whether the bedrock ridge at MW-308 actually does not allow contamination from a wide and composite source area to merge together downgradient.

To correct this situation, either the mapping criteria should be changed to produce a single version, or the legends of both maps be made more explicit and new text added to explain the different interpretative approaches taken. The Department recognizes that added value might be achieved by showing both the limits of VOC detections and the area where MEGs/MCLs are exceeded.

*Response*—The approximate 1999 limit of the Eastern Plume on Figure 3-1 has been re-drawn closer to the vicinity of MW-333, as stated in the response to EPA Comment No. 1. The following text has been added as the second sentence of the second paragraph of Section 1.2.1.2:

*The approximate limits of the plume in 1991 and 1999, as shown on Figure 1-2, are based on where VOCs have been detected during the Long-Term Monitoring Program.*

This change has been made on Figures 1-1, 1-2, 3-1, and 3-2.

2. Figures 3-1 through 3-3 document well the new revised Long-Term Monitoring Program. However, the Department is disappointed that the Navy rejected our suggestion (Comment No. 42) to include a map figure showing the original monitoring locations. We still feel that it would be beneficial to make available a visual comparison between programs. The reader

could then better appreciate an improved coverage due to the addition of new wells. We recognize that Table 1-2 lists the deletions from the original program, but their locations are not shown on any figure in this report. Please reconsider our request.

**Response**—The monitoring wells listed in Tables 1-2 and 1-3 as being deleted from the original program are shown on Figure 3-1 (Long-Term Monitoring Network) and Figure 3-3 (Long-Term Monitoring Gauging Locations). Therefore, it was not considered necessary to include a map figure showing the original monitoring locations, as the additional information on the figure would likely be confusing to the reader.

3. The water level gauging and criteria for the reactivation of extraction wells 6 and 7 in landfills 1 and 3 need to be added to the Long-Term Monitoring Plan (LTMP). These also need to be added to the list of goals in Section 1.1.

**Response**—The following text has been added as the fourth paragraph of Section 1.1:

*Based on changes to the original LTMP, the following goal has been added to the Long-Term Monitoring Program:*

- *Monitor monitoring wells within the landfill to ensure that the water elevation does not rise above the level of the waste.*

The following text has been added as the third sentence of Section 3.1.2.4:

*Extraction wells EW-6 and EW-7 will be reactivated if water elevations within the landfill rise above the level of the waste, and would be reinstated into the Long-Term Monitoring Program if necessary. If extraction wells are returned to service, a sample will be collected from Sites 1 and 3 influent and analyzed for VOCs and TAL metals, and the ground-water extraction and treatment system effluent sample will be analyzed additionally for TAL metals.*

The following text has been added as note (c) on Table 3-1:

*Extraction wells EW-6 and EW-7 will be sampled and analyzed for VOCs and TAL elements if they are returned to service.*

4. For sediment sampling, perhaps we should be considering methanol preservation of VOC sediment samples. In researching the subject, it appears that most VOCs are lost in the sampling procedure and even though the given detection limit of methanol preserved samples is higher than unpreserved samples, more of the contaminant(s) is retained in the preserved samples.

**Response**—We do not feel using methanol preservation of VOC sediment samples is necessary for the following reasons:

- Based on discussions with the analytical laboratory, methanol preservation has an elevated detection limit of approximately 200  $\mu\text{g}/\text{kg}$ , compared to the currently achieved detection limit of approximately 2-30  $\mu\text{g}/\text{kg}$ .
- EPA Method 5035 using an Encore sampler is a newer method that can reach detection limits ranging from 5 to 200  $\mu\text{g}/\text{kg}$ . However, there is a potential to lose VOCs by sampling with this method, but possibly not as many VOCs are lost as in sampling with EPA Method 8260.
- In order to achieve a low detection limit (approximately 5  $\mu\text{g}/\text{kg}$ ), sodium bisulfate must be used, rather than methanol. During the 8 December 1999 Technical Meeting teleconference, the Navy requested MEDEP look into which (if any) preservation method is preferred based on these issues.
- Unpreserved soil or sediment samples have been collected throughout the Long-Term Monitoring Program from Monitoring Event 1 to Monitoring Event 15. Use of different sampling methods may prevent meaningful comparisons between past and future data.
- At several other sites at NAS Brunswick (Old Navy Fuel Farm, NEX, and Site 9), unpreserved soil or sediment samples have been collected without objection from MEDEP.

Based on discussions held during the 27 January 2000 meeting, unpreserved samples will be sufficient for this LTMP, but may be revised if warranted by future discussions.

## SPECIFIC COMMENTS

5. *Introduction, Chapter 1, Page 1-1, Fourth Sentence*—Changes to the LTMP have been made based on a geostatistical evaluation (EA 1998a) and observed trends in chemical concentrations over time.

The Department suggests the above be modified as follows to be more accurate:

*Changes to the existing LTMP are based on a number of factors, including:*

- *A geostatistical assessment that assessed the adequacy of the well network*
- *Graphs of chemical concentrations measured over time*
- *New information regarding plume extent and migration*
- *Reclassification of monitoring wells into interior, perimeter or sentinel wells*
- *Changes to remedial pumping locations.*

**Response**—The following sentence replaces the fifth sentence of Chapter 1:

*Changes to the existing LTMP have been made based on a geostatistical assessment that assessed the adequacy of the monitoring well network; changes in chemical concentrations over time; new information regarding plume extent and migration; reclassification of monitoring wells into interior plume, perimeter, or sentinel wells; and changes to remedial pumping locations.*

6. **Purpose and Scope, Section 1.1, Page 1-1, First Sentence**—The purpose of this LTMP document is to identify monitoring points where samples will be collected and laboratory analysis that will be conducted to verify the effectiveness of the selected remedial actions.

Please modify as follows:

*The purpose of this LTMP document is to:*

- *Develop a monitoring program that identifies monitoring points and the media that will be sampled*
- *Identifies type of sampling, and sampling frequency*
- *Specifies the laboratory analyses to be implemented.*

**Response**—The first sentence of Section 1.1 has been revised as follows:

*The purpose of this LTMP document is to develop a monitoring program that identifies monitoring points and the media to be sampled, identifies the type of sampling and sampling frequency, and specifies the laboratory analyses to be implemented to verify the effectiveness of the selected remedial actions.*

7. **Purpose and Scope, Section 1.1, Page 1-2, Top Paragraph**—Sampling at Sites 1 and 3 is planned for up to 30 years....

As stated in our previous comment letter, the Record of Decision for Remedial Action at Sites 1 and 3 (June 1992) Environmental Monitoring (Page 52) reads, “At a minimum, the environmental monitoring program would continue for 30 years.” This is consistent with 40 CFR 264.117 (RCRA) which is an action-specific ARAR for Sites 1 and 3. RCRA mandates 30 years of monitoring but can be extended, if deemed necessary. Therefore, the Navy must change this statement to be consistent with the language in the ROD and meet the RCRA requirement.

**Response**—The sentence in question has been revised as follows:

*At a minimum, environmental monitoring ~~Sampling at Sites 1 and 3 is planned for up to~~ will continue for 30 years and be extended if necessary, and at the Eastern Plume...*

8. **Purpose and Scope, Section 1.1, Page 1-2, First Paragraph**—The Navy needs to mention here that the annual reports and their reviews by regulators and the Restoration Advisory Board also provide a means to discuss and potentially initiate changes to the LTMP. This aspect is discussed in Section 3.1, but should also be said in Section 1.1.

**Response**—We agree with the goal of this comment, but felt language should be added to Section 1.5 rather than Section 1.1. Mention of the annual reports and their reviews by regulators and the Restoration Advisory Board has been removed from Section 3.1, and the following sentence has been added as the third sentence of the second paragraph of Section 1.5:

*The annual report will provide a basis for discussing findings of the Long-Term Monitoring Program sampling (i.e., at Restoration Advisory Board meetings) and to propose refinements to the monitoring program.*

9. **Purpose and Scope, Section 1.1, Page 1-2, Fourth Bullet**—Assess the dispersion and degradation of contamination that has already emanated from the landfill.

While this is correct, the goal must be expanded to include monitoring changes in plume expanse and intensity, similar to the second bullet under Eastern Plume. The reason this change is needed is that landfill contamination is not hydraulically contained, and new contamination could emanate from beneath the landfill in the future regardless if the waste is saturated or not. Both shallow and deep potentiometric contour maps do not show any closed contours in the landfill area, and the slurry wall has a 400-ft opening on the downgradient side.

**Response**—A plume has not been defined at Sites 1 and 3, therefore, it would be difficult to monitor any changes in the plume's nature and extent. Currently, one well within the landfill that is being sampled as part of the current Long-Term Monitoring Program. One well cannot adequately provide results for monitoring a plume. Therefore, no changes have been made.

10. **Purpose and Scope, Section 1.1, Page 1-2, Seventh Bullet**—Monitor the treatment plant effluent.

The theme of this goal must be expanded to include treatment plant influent and well extraction rates (as historically done), and these data used to calculate mass removal of contaminants on an annual basis.

**Response**—As noted in the fourth paragraph of Section 1.1 of the LTMP, the goals for long-term monitoring were simply a restatement of the goals listed in the Record of Decision for No Further Action at Sites 4, 11, and 13 (Section X, Subsection B, Page 34), and a Remedial Action for the Eastern Plume ground-water monitoring (ABB-ES 1998). Therefore, no changes have been made to this section as the requested change is not in the Record of Decision.

To address this comment, the following text was added to Section 1.5, Page 1-11:

*Treatment plant influent and extraction well removal rates for VOCs will be calculated for monthly and annual periods.*

11. **Purpose and Scope, Section 1.1, Pages 1-2 & 1-3**—If analytical results indicated that contaminant levels have not exceeded regulatory standards (State Maximum Exposure Guidelines, [MEG], Federal Maximum Contaminant Levels [MCL], or State Water Quality Criteria) or concentrations pose unacceptable risk over the last four or more consecutive rounds, a reduction of sampling or possible termination of the Long-Term Monitoring Program may be considered.

The Department is unsure what the Navy means by this statement. If concentrations pose an unacceptable risk reduction of sampling or termination would not be considered. But as stated in other versions of long term monitoring plans, the Navy must also consider increasing sampling and expanding the program as necessary. Since the following sentence deals with refining the plan this sentence seem unnecessary. If the Navy feels strongly about keeping it (with corrections) then an equally specific statement is needed dealing with increasing and/or expanding the program is necessary.

**Response**—The second sentence of the seventh paragraph of Section 1.1 has been revised as follows:

*Depending on the long-term trends of the compound concentrations, monitoring frequency may be increased or decreased, as determined to be necessary, with approval by EPA and MEDEP.*

12. **Purpose and Scope, Section 1.1, Page 1-3, Top Paragraph**

- (a) Refinements to the LTMP may include additions or reductions of sampling points in the long-term monitoring network, changing areas of sampling emphasis, or alterations of laboratory analytical method or field sampling methods.

This statement needs to include that the frequency of sampling may also be changed.

**Response**—The third sentence of the first paragraph on Page 1-3 has been revised as follows:

*Refinements to the LTMP may include additions or reductions of sampling points in the long-term monitoring network, increase or decrease of the frequency of sampling, changing areas of sampling emphasis, or alterations of laboratory analytical method or field sampling methods.*

- (b) Refinements to the LTMP will be based on a comparison of sample results to regulatory standards (MEG, MCL, or Surface Water Quality Criteria), and will be considered based on consultation with the Restoration Advisory Board members.

Another criteria that should be given is *nature of trends of recent contaminant concentrations as compared to their respective historical trends.*

**Response**—The next sentence has been revised as follows:

*Refinements to the LTMP will be based on a comparison of sample results to regulatory standards (Maximum Exposure Guidelines, Maximum Contaminant Levels, or Surface Water Quality Criteria), and the nature of trends of recent contaminant concentrations as compared to their respective historical trends. Refinements to the LTMP will be considered based on consultation with the Restoration Advisory Board members.*

- (c) Please check the grammar in the last sentence of the paragraph. The word “of” appears to have been left out and the word “sampling” should be omitted.

**Response**—The last sentence of the paragraph has been revised as follows:

*..., and based on the results of long-term monitoring ~~sampling~~.*”

13. **Geology, Section 1.2.2, Page 1-4, Second Sentence**—Three major units have been identified in the overburden: sand, transition, and clay (E.C. Jordan 1991).

DEP recommends that this old verbiage is abandoned, and that the geologic setting is portrayed as it is known today. The aquifer that is the focus of remediation is a second deeper sand unit that lies between the transition and underlying clay. It must be named, although it is also important to point out that this unit joins with the upper sand unit that underlies the Eastern Plume source area.

Also, this section should be expanded to briefly mention the bedrock and clay topography as it relates to the plume, and discuss the high variability in clay thickness within the Eastern Plume area. Please make the appropriate changes.

**Response**—We feel a limited discussion of site geology is sufficient for this section, as an in-depth summary of site geology, and is not the focus of the LTMP. The second sentence of Section 1.2.2 has been revised as follows:

*Three major units ~~have been~~ were identified in the overburden: sand, transition, and clay (E.C. Jordan 1991).*

The following text has been added at the end of Section 1.2.2:

*The deep sand which lies between the transition and the clay is the focus of the remediation efforts at the Eastern Plume. The deep sand joins with the upper sand under the Eastern Plume source areas (i.e., Sites 4, 11, and 13). Clay thickness is variable across the Eastern Plume ranging from 0 to 60 ft thick. The top surface of the clay and bedrock have variable elevations which are inferred to influence VOC concentrations as noted with higher concentrations being observed in the clay troughs.*

14. **Hydrogeology, Section 1.2.3, Page 1-5, Second Sentence**—In the overburden, variations in shallow and deep potentiometric flow have been observed.

It is unclear what the Navy means by this statement, as the term “potentiometric flow” is not standard technical language. Potentiometric head or contours indicate ground-water flow directions. The contours do have a degree of variability when contrasting the shallow and deep sand units, or as a result of remedial pumping. Movement of ground water (flow) in the southern-to-eastern general direction certainly must have varied some due to the strength and distribution of ground-water extractions. Please clarify and be more specific.

**Response**—The second sentence has been revised as follows:

*~~In the overburden,~~ Variations in ground-water flow directions have been observed when comparing the shallow and deep flow systems.*

Hydrogeology also includes ground-water discharge and its relation to surface water runoff. These appear important to understanding the Eastern Plume behavior, and deserve mention, even though the real nature of the relationship is yet unclear.

**Response**—The following text was added to Section 1.2.3:

*...south-southeast and may discharge to surface water, although this relationship is not fully understood.*

15. **Hydrogeology, Section 1.2.3, Page 1-5**

- (a) “Shallow ground water generally flows toward Mere Brook and Merriconeag Stream.”

As stated in our comments on the annual report: *Within the report area this is universally true, the only exceptions being very close-in to the operating extraction wells where minor areas of backflow locally occur. Therefore, the word “generally” should be deleted.*

**Response**—The text has been revised as suggested; the word “generally” has been deleted.

- (b) The clay name “Presumpscot” is misspelled several times. Please correct.

**Response**—The misspelling of “Presumpscot” has been corrected.

- (c) The Navy needs to mention that the deep contaminated sand is confined by Transition Unit silts and clays in areas such as in the general area of the confluence of Mere Brook and Merriconeag Stream.

**Response**—The following text has been added to Section 1.2.3:

*of Mere Brook and Merriconeag Stream, and is under confined aquifer conditions in these areas.*

16. **Previous Investigations, Section 1.3.1, Page 1-6, Top Bullet**—After “identified,” please insert “and initiated.”

**Response**—The words “and initiated” have been inserted after “identified” as suggested.

17. **Monitoring Locations Relative to the Eastern Plume, Section 1.4.1, Page 1-6, Second Item**—Upon reconsideration, the Department believes that the definition should be modified slightly to read: “Wells located within the area of known contamination at the edge of the plume. Ground-water data from these wells would be used to document any change in contaminant concentrations occurring at the plume boundary.” This will also need to be corrected in Table 1-4.

**Response**—This definition was determined during a technical meeting with input from all interested parties (MEDEP, EPA, Navy, the Brunswick Citizens Group, and the entire Restoration Advisory Board). We feel this definition should remain as previously discussed with all parties for the purposes of this LTMP. Therefore, no change has been made.

18. **Monitoring Locations Relative to the Eastern Plume, Section 1.4.1, Table 1-4**—According to Figure 3-1 and other recent maps of the Eastern Plume, both MW-1104 and MW-306 should not be designated as “perimeter wells” as they are located on essentially the same flow line. Clearly MW-306 is more within the plume (higher concentrations) than is MW-1104. Our recommendation is to move MW-306 to the “interior well” category.

**Response**—Monitoring well MW-306 has been moved to the interior plume category on Table 1-4 and other report tables.

19. **Sampling Frequency, Section 1.4.3; Third Sentence**—Following a review of the ground-water concentrations reported in monitoring Events 1 through 13, sampling frequency was reduced to bi-annual sampling at Sites 1 and 3 and Eastern Plume.

Please note the year that the sampling frequency was reduced to bi-annual.

**Response**—The third sentence of Section 1.4.3 has been revised as follows:

*Following a review of the ground-water concentrations reported in Monitoring Events 1 through 13, sampling frequency was reduced to bi-annual sampling in 1999 at Sites 1 and 3 and Eastern Plume.*

20. **Reports and Data Presentation, Section 1.5, Page 1-10, First Paragraph**—These monitoring event reports will summarize the....

Please clarify that these are individual monitoring events as opposed to the annual report.

**Response**—We feel the sentence is accurate as written, and no changes are necessary.

There appears to be a contradiction regarding the response to comments. The text states: *The annual report will include the response letters to comments received on the previous year's annual report and monitoring event reports.* However, the table indicates that the final annual report will be provided to the regulators one month (proposed) after receiving comments. Why wouldn't the Navy just include all responses to comments in the annual report and monitoring event reports in the final annual report? Please consider the following language: *The final annual report will include the response letters to comments received on the draft annual report and monitoring event reports."*

**Response**—The last sentence of the second paragraph of Section 1.5 has been revised as follows:

*The final annual report will include the response to comments letters received on that year's ~~the previous year's annual report and monitoring event reports and draft annual report.~~"*

The State would like a review period of 45 days rather than 1 month.

**Response**—The review period for the annual report has been increased to 45 days. The table at the end of Section 1.5 has been revised to show that comments are due from the regulators by mid-March and the Final Annual Report will be due mid-April.

## 21. **Monitoring Plan, Section 3, Page 3-1**

- (a) A bullet should be added to discuss the monitoring of the water level with the landfills to ensure that the current water levels do not rise and saturate the waste.

**Response**—The following bullet has been added as the fifth bullet of Section 3.:

*Monitor the water level within the landfill to ensure that the current level does not rise above the level of the waste.*

- (b) Bullet 1: Delete "...and assess effectiveness of remedial actions." This is better said in Bullets 2 and 3 below and is not needed twice.

**Response**—The text has been removed as suggested.

- (c) Bullet 3: The language "is being maintained" assumes that full hydraulic control has been realized in the past. The Department has not received adequate evidence that this was achieved. Please reword.

**Response**—The third bullet of Section 3 has been revised as follows:

*Analyze the effective capture zone of the ground-water extraction system at Sites 1 and 3 and the Eastern Plume to assess the status of hydraulic control of the plume.*

- (d) **Bullet 4:** Modify by saying “Evaluate the effectiveness of the landfill cap, slurry wall, and local aquifer dewatering by...”

**Response**—The fourth bullet of Section 3 has been revised as follows:

*Evaluate the effectiveness of the landfill cap, slurry wall, and local aquifer dewatering by evaluating...*

22. **Surface Water and Sediment Sampling Program, Section 3.1.1.2, Page 3-2, First Paragraph**—It is more important that Figure 3-2 show the Eastern Plume boundaries than Figure 3-1. Please add the pale yellow areas to Figure 3-2, as done for Figure 3-1.

**Response**—The inferred extent of the Eastern Plume above MEG/MCL and the approximate limits of the Eastern Plume in 1999 based on VOC detections have been added to Figure 3-2.

23. **Surface Water and Sediment Sampling Program, Section 3.1.1.2, Page 3-2, Third Paragraph**—Sediment stations SED-17, SED-18, and SED-19 are not shown on Figure 3-2, as stated. These will need to be determined prior finalizing the LTMP

**Response**—Note 3 on Figure 3-2 states that *The locations of sediment samples SED-17 through SED-19 will be determined based on seep locations.* On 1 September 1999, the three sediment sample locations were determined in the field. Based on this information, the approximate locations for sediment samples SED-17, SED-18, and SED-19 have been added to Figure 3-2. (These locations have not yet been surveyed, but will be after the April 2000 sampling event.)

24. **Ground-Water Sampling Program, Section 3.1.2.1, Page 3-3, Last Sentence**—Optional field parameters, including Eh and dissolved oxygen, may also be included.

Per our comment for the 1998 Annual Report review, DEP would like to see the Navy convert these parameters from optional to mandatory. In particular, DO will be necessary to collect to assess natural attenuation potentials. This should also be corrected in Section 3.1.1.3.

**Response**—Although these parameters will continue to be collected, we feel they should remain as optional until the issue of how best to monitor for natural attenuation has been discussed and finalized.

25. **Stream Sediment Sampling Program, Section 3.1.2.3, Page 3-4**—One stream sediment sampling location (SED-11) within the Eastern Plume on Mere Brook is included in the Long-Term Monitoring Program and identified on Figure 3-2.

One sampling location will not be adequate to monitor for plume seepage into the streams (if that is occurring), but might be adequate to monitor TAL elements that may be migrating within the stream channel from upstream sources. The Department may want to add additional locations to the Eastern Plume sediment program; the vapor concentration results

from the currently deployed diffusion samplers along Mere Brook and Merriconeag Stream may influence our stance on this issue. Depending on these results, VOC analysis may be required for sediment samples.

**Response**—We feel that this issue has been addressed by the results of the wetlands diffusion sampling and Monitoring Event 15 sediment sampling along Mere Brook. The Eastern Plume does not appear to be discharging to Merriconeag Stream. Therefore, the Navy does not feel that it is necessary to monitor Merriconeag Stream sediments for VOC at this time. No change has been made to the sampling program.

26. **Ground-Water Extraction and Treatment System Sampling Program, Section 3.1.2.4, First Paragraph**—Six samples will be collected from the active extraction well (EW-1 through EW-5 and EW-2A) (Table 3-2).

Currently, EW-3 is down and the Navy has said it will not be repaired. In that other currently used extraction wells have experienced problems, the above statement should be rewritten. We suggest:

*Ground-water samples will be collected at the well head from all active extraction wells (see Table 3-2 for currently active wells).*

**Response**—By rewording the sentence as suggested, the Navy would be required to revise Table 3-2 any time an extraction well was activated or deactivated. Instead, the second sentence of the first paragraph of Section 3.1.2.4 has been revised to address MEDEP's concern as follows:

*Ground-water samples will be collected from the active extraction wells (Table 3-2).*

27. **Ground-Water Extraction and Treatment System Sampling Program, Section 3.1.2.4, Second Paragraph**—As previously suggested, it would be prudent to test for iron and manganese to track if these elements may accumulate and pose operational problems to well screens and pumps. Target Analyte List elements are not included in the analyses for the Eastern Plume monitoring wells, and therefore, testing the extraction wells for iron and manganese may also provide useful data to help assess natural attenuation. A field Hach kit would be appropriate for the intended purpose, and would require only several minutes more per well sampled.

**Response**—As discussed at previous technical meetings, it was determined that previous problems with extraction wells were related to iron flocculation causing turbidity increase, rather than dissolved iron concentrations. Iron testing at each extraction well would provide the amount of dissolved iron in the water. Therefore, analyzing samples from extraction wells for TAL metals is not believed to be necessary. Note that only one extraction well (EW-5) recorded a one time problem with fouling (Spring 1998). Since that time, there have been no other occurrences of this problem.

28. **Surface Water and Sediment Sampling Program, Section 3.3.2, Page 3-5**—Procedures provided in Appendix A do not specify what depth in the water column surface water samples should be collected. Based on observing sample collection at Merriconeag Stream, the Department is concerned that past sampling is biased toward non-detects because water in the upper interval of the water column was sampled. This scenario is possible due to the non-turbulent, quiet flow in the channels, where the distribution of volatile compounds in the water column likely is not uniform. If the Eastern Plume is discharging to the streams (or streambeds), the highest concentrations in surface water would be expected close to the streambed, while volatilization at the surface likely would lower concentrations in water near the stream surface.

The Department highly recommends that future stream samples be collected within several tenths of a foot of the streambed. The results of the currently deployed diffusion samplers may provide support for changing the sampling procedure. Appendix A needs to specify the depth-of-sample.

**Response**—It should be noted that surface water samples have consistently been sampled from near the bottom of the water column as recommended in the comment, and not from the upper interval of the water column. The second paragraph of Section A.3.4 has been revised as follows:

*Collect the sample from the surface water, within several tenths of a foot of the streambed, by immersing....*

29. **Engineering Inspection, Section 3.4, Page 3-7, Second Paragraph**—What are the reasons for conducting engineering site inspections in both August and October? It would seem to DEP that these could be combined as one inspection in September, to coincide with the LTMP schedule for the Eastern Plume and Sites 1 and 3, which is April and September.

**Response**—We agree that engineering inspections can be done to coincide with the sampling events in April and September. The last paragraph of Section 3.4 has been revised to indicate the inspection will be done concurrent with the sampling events.

30. **Landfill Gas Monitoring, Section 3.4.1, Page 3-7, Second Paragraph**—The objective of landfill gas monitoring at the Sites 1 and 3 landfills is to monitor and identify subsurface gas migration.

Many rounds of gas monitoring have occurred at Sites 1 and 3, and the data are presented in reports. In the 1998 Annual Report, the conclusions were that (1) there is limited methane production within the landfill, and (2) oxygen levels under the landfill cover are consistent at 21 percent, which is the atmospheric concentration. However, the report does not address the monitoring objective and interpret where and how subsurface gas is migrating. It appears that the microbial activity is low and not perceptibly changing, perhaps due to the relatively old age of the landfill. Based on the above observations, the Department questions if gas monitoring is worthwhile and an effective expenditure of funds.

**Response**—We agree that microbial activity is low within the landfill and, therefore, past data have indicated that limited subsurface gas is present. We believe that gas monitoring should still be conducted at least once during the year to determine that no change has occurred. Therefore, we recommend gas monitoring be conducted during the September sampling event. If it is determined that levels have risen, the frequency of monitoring will be re-evaluated. The last paragraph of Section 3.4.1 has been revised to show that gas monitoring will occur on an annual basis (September).

31. **Laboratory Quality Assurance and Quality Control, Section 3.5.2, Page 3-8, last sentence**—“...and recommend how the data should be utilized”.

The Department staff understands that this means that data that does not conform to the quality standards will be qualified as not suitable for certain types of interpretations, but the public may not understand this. We suggest the following revision:

*...and recommend which data are not of sufficient quality for use in quantitative interpretations (for example, risk assessments).*

**Response**—The goal of this section is not to assure data can be used in risk assessments, but rather to assure management decisions can be made with confidence. Therefore, the sentence has been revised as follows:

*... and recommend which data are not of sufficient quality for use in quantitative interpretations (i.e., management decisions).*

32. **Settlement and Subsidence Control Maintenance, Section 4.1.3, Page 4-2, Second Paragraph**—Just for clarification, the Department suggests the following language: Following restoration of the hydraulic barrier grade, *the GCL and geomembrane will be repaired and tested per the construction specification and*, the overlying layers will be reconstructed.

**Response**—The last sentence of the second paragraph has been revised as follows:

*Following restoration of the hydraulic barrier grade, the geosynthetic clay liner and geomembrane will be repaired and tested per the construction specification, and the overlying layers will be reconstructed.*

33. **Data Uses, Appendix B, Quality Assurance Project Plan, Section 2.3, Page 2-1**—Data uses in the QAPP should reflect goals listed in Section 1.1 of the LTMP.

**Response**—Section 2.3 of the QAPP has been revised to read as follows:

*Long-term monitoring data collected at Sites 1 and 3 will be used to monitor the effectiveness of the remedial action for the protection of human health and the environment, monitor the effectiveness of the installed low permeability cap and a slurry wall to limit ground-water contact with waste, and assess the dispersion and degradation of contamination that has already emanated from the landfill. In addition,*

*field activities conducted as part of long-term monitoring will be used to assess the condition of the site monitoring wells and physical features, such as landfill cap and other appurtenances. Data will also be used to ensure that water elevations within the landfill do not rise above the level of the waste.*

*Long-term monitoring data collected at the Eastern Plume will be used to provide a tiered approach to attain the requirements of MEDEP water quality standards, monitor changes in the plume nature and extent and potential migration pathways, and monitor the treatment plant effluent. In addition, field activities conducted as part of long-term monitoring will be used to assess the condition of the site monitoring wells.*

34. **Project Reporting Limits, Appendix B, Quality Assurance Project Plan, Section 5.5, Page 5-4, Table**—Although the laboratory MDLs for Vinyl Chloride and Thallium are higher than state MEGs, the method is adequate for long term monitoring, at this time. This may become an issue when (if) a determination about the “cleanness” of the site is made.

**Response**—We agree no change is needed, and anticipate that at the time a determination about the “cleanness” of the site is needed to be made at that time.

35. **Table 3-1, Appendix B, Quality Assurance Project Plan**—Table 3-1 in the QAPP only includes aqueous samples. Sediment samples should also be listed since they are being collected. There is an error in the formula for nitric acid. The formula should be HNO<sub>3</sub>.

**Response**—Table 3-1 in the QAPP has been revised to include sediment samples. The formula for nitric acid has also been corrected.

36. **Tables 5-1 and 5-2, Appendix B, Quality Assurance Project Plan**—Tables 5-1 and 5-2 also only include aqueous samples. Sediment samples should be included as well.

**Response**—Tables 5-1 and 5-3 (rather than Table 5-2 as noted in the comment) have been revised to include sediment samples.

37. **Table 8-1, Appendix B, Quality Assurance Project Plan**—In the instrument maintenance section (Table 8-1), the GC maintenance portion is missing. Please provide.

**Response**—The maintenance section has been revised to include gas chromatograph/mass spectrometer maintenance.

38. **Attachment A-1**—Holding time corrective action (Attachment A-1: Holding Time Laboratory Corrective Action) does not include flagging the report. Either reports should be flagged, or some other mechanism should be worked out to assure samples have been analyzed within the holding time.

**Response**—If samples were to be run outside of holding times, the QAPP does not indicate these samples should be “flagged.” Any significant problems with sample analysis such as sample holding time exceedance would instead be noted in the PARCC assessment (this is stated in the third bullet of Section 9.3.1 of the QAPP).

39. ***Attachment A-1***—Laboratory control samples and matrix spikes for method 8260B (Attachment A-1 SW846 5030A/8260B) should be fortified with analytes of concern. Control limits should also be set for these analytes in the QC samples.

***Response***—The analytical laboratory uses the full list of analytes for EPA Method 8260B for laboratory control samples and matrix spikes. Attachment A-1 has been updated to include the full list of analytes and their control limits.

40. ***Attachment A-2***—Are the acceptance criteria in Attachment A-2 the same for sediment samples as it is for aqueous samples? If there is a difference for sediment samples these criteria should be included.

***Response***—Attachment A-2 has been updated to include sediment sample acceptance criteria for sediment specific analysis (i.e., total organic carbon and organochlorine pesticides).

41. ***Response of Comments Received on the Draft LTMP, Appendix C, MEDEP Comment 9***—It would be helpful to know concentration relative to flow. Therefore, it should be noted at the time of sampling whether the flow is high or low and this can be quantified by taking water depth.

***Response***—Reliable flow estimates may be highly subjective due to the wide flood plain, numerous side channels, and generally swampy nature of the streams. Therefore, this parameter has not been added to the plan.