



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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January 4, 2000

Mr. Emil Klawitter  
Code 1823 EK  
Department of the Navy, Northern Division  
Naval Facilities Engineering Command  
10 Industrial Highway, Mail Stop 82  
Lester, PA 19113-2090

Re: Bi-Annual Progress Report on Soil Vapor Extraction/Aquifer Air Sparging Remedial System Operations for January-June 1999, Old Navy Fuel Farm, Naval Air Station, Brunswick, Maine”

Dear Mr. Klawitter:

The Maine Department of Environmental Protection (MEDEP or Department) has reviewed the report entitled Bi-Annual Progress Report on Soil Vapor Extraction/Aquifer Air Sparging Remedial System Operations for January-June 1999, dated October 1999, prepared by EA Engineering, Science and Technology. Based on that review the Department has the following comments and issues.

**General Comments:**

1. The submitted document is mislabeled as final instead of draft. This report includes interpretive statements not just analytical data, therefore the Department cannot accept it as a final and will consider it a draft. Any changes of this nature to deliverables must be discussed and agreed upon prior to implementing the changes.
2. The cover letter (dated November 1, 1999) accompanying the report stated that “response to MEDEP comments for previous reports have been prepared and will be forwarded under separate cover.” As of the date of this letter the Navy’s responses have not been received. Nor, has the Navy been diligent in keeping the Department involved in discussions and planning for the site.
3. This report documents that substantial groundwater (and likely shallow soil) contamination is still present at the Old Fuel Farm. System modification that was tested during this report period did not show much promise for timely remediation of the site due to saturation of the treatment medium (carbon) to prevent air emission exceedence. The very shallow water table has been a major problem, and apparently

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the implemented groundwater extraction system (vacuum) did not help much. Figure 10 of the subject report shows that increased TVH removal rates were not sustainable with the modified system design.

The minutes to the July 21, 1999 RAB meeting indicated that EA recently reevaluated the SVE remedial system, and "questioned if this is the technology to use". The minutes also implied that areas of significant petroleum contamination yet exist that are not being addressed. MEDEP understands that this summer's implemented field exploratory program was intended to delineate a larger source area. MEDEP awaits those results.

Given this backdrop of relatively ineffective remediation through June 1999, the Department concurs that a different approach is needed if the Navy still has intentions to use the site for recreational purposes within several years. MEDEP supports the concept that additional soil removal likely will be needed over a wider area, as speculated under "Conclusions and Recommendations".

MEDEP reviewed the hydrogeological information of the area of the 200 Series Tanks with respect to surface drainage existing prior to construction of the tank farm, top of clay/bedrock topography underlying the site, and present-day water table contours. The February 25, 1999 water-table elevation data were contoured, as this was immediately before the dewatering project and might best reflect natural groundwater flow directions. The following is surmised:

- Before the tank farm, a wetland immediately north of Tanks 202 and 204 drained approximately eastward to a larger wetland that is part of the upper reaches of Mere Brook.
- This drainage follows a general elongated low in the surface of the clay/bedrock immediately underlying the contaminated surficial sand unit. An eastern fork of the general low is suggested, and passes close to former Tank 204.
- The February water-table map contours suggest that groundwater preferentially moves into the elongated low and exits the site, even after all the construction and regrading work that has occurred at the site.
- The elongated shape of the south "lobes" of the 100 µg/L and 1000 µg/L of the BTEX and GRO contours (Figures 6 and 7, respectively) and the general elongation of the eastern 1000 µg/L contour of DRO (Figure 8) nearly mimics the position and orientation of the underlying structural channel(s).

From these relationships, MEDEP believes that the pattern of contamination is predominately controlled by geology and has not been substantially changed by air sparging.

### Specific Comments

4. Well Gauging and Water Quality Monitoring Program, Section 2.1, p. 3, 3<sup>rd</sup> para:

“To improve water quality parameter representativeness and usability, the 21 well points will be removed from service and replaced by 6 additional monitoring wells.”

MEDEP agrees that the installation of carefully designed monitoring wells should improve the validity of dissolved oxygen and redox readings by being able to sustain low-flow purging. However, MEDEP recommends that all well points not being replaced by a new monitoring well remain a part of the monitoring network to provide adequate coverage for plume mapping purposes.

The location of new monitoring wells should be selected after detailed consideration of geological variation and favor critical gaps in the downgradient (leading edge) area. The Department would be glad to assist the Navy in determining these locations.

5. Ground-Water Sampling Program, Section 2.3, p.5, 4<sup>th</sup> para:

“The overall ground-water flow direction observed during the 26 June 1999 gauging event, when the AAS/SVE system was inactive, was similar to that observed during the August 1996 gauging event (prior to system activation) and during subsequent periods of active sparging”.

The chronology of system operation given in Section 3 (pages 6 & 7) indicates that the system was operating during the June 26 gauging event, contrary to what is quoted above. It appears that the Navy is saying that general groundwater flow direction has not changed significantly regardless of whether the system is operating or shut down. MEDEP concurs with this generalization, based on the comparison given below, and suggests that this is further evidence of geologic control, mentioned in Comment 3.

The February 25, 1999 water-table contour map that MEDEP prepared for in house use is more like the March 1, 1990 contour map (see the Hydrogeological Report by O'Brien & Gere, April 1990) than it is like the Figure 4 map of June 26, 1999.

A copy of MEDEP's contour map will be provided, upon request.

6. Ground-Water Elevation Contour Map, June 28, 1999, Figure 4:

The Department notes that currently there are no monitoring locations at the south end of the west lobe (former 100 Tank area). Two new wells should be installed to adequately fill this gap.

7. Soil Vapor Extraction System Process Water Sampling, Section 2.4:

Appendix Table A-9 shows that the concentrations of total BTEX and GRO were much higher (two and one orders of magnitude, respectively) in the April 1 sample than the other five samples (March 10 – July 1 period). Neither this report nor the April 1999 Monthly Ground-Water Extraction and Treatment System Report (referenced) addresses this inconsistency, or provides data to indicate why this should have occurred. What is the Navy's explanation?

It would be helpful if this report had the same level of detail and provided the information in the monthly system reports. Please consider implementing this request for future Old Fuel Farm reports.

8. Assessment of System Performance, Section 3, p. 6:

The Department calculates that, assuming a soil porosity of 0.25, the area containing the SVE piping (approximately 300,000 square feet) was dewatered roughly 0.4 feet after 222,200 gallons were removed. This small amount of drawdown (neglecting any rain that may have fallen during the period and reduced the 0.4 foot figure) could not be expected to aid the system operation, as the Navy came to realize. However, the experiment was an appropriate venture. No response required.

9. Assessment of System Performance, Section 3, p. 7, last sentence:

"Further, the analytical data also demonstrate that dissolved-phase hydrocarbons have not migrated from the Old Navy Fuel Farm."

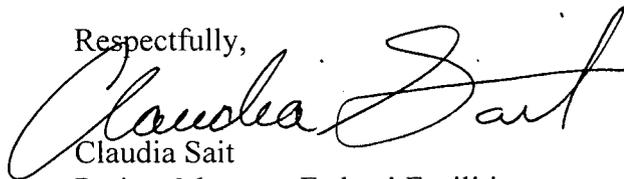
Historical and current BTEX and DRO data would indicate the opposite. Downgradient of the center of mass of the western lobe, sampling points WP-14 and WP-15 show consistent hits, and WP-18R and MW-56R have not been sampled since 1996, when both BTEX and DRO were detected (very low concentrations). Apparently, no other wells further downgradient of the western lobe have been installed/sampled. On MEDEP water table map, MW-58 is downgradient of the eastern lobe.

Concerning the eastern lobe, the three wells that are downgradient all have had repetitive detections of DRO. Whereas a decreasing trend has occurred at MW-58, a trend line for MW-49 is not evident.

The above Navy statement is not supported by the data, however, it could be ventured that the database suggests that significant hydrocarbon contamination has not migrated off site since sampling was begun in 1990 (O'Brien & Gere report VOC delineation). The O'Brien & Gere report gave a groundwater velocity estimate of 2.2 feet/day for sand penetrated by their test wells. At this rate of travel, contamination could have traveled to Mere Brook before 1990, if natural biodegradation was not effective. This statement must be deleted.

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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