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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
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BOSTON, MASSACHUSETTS 02114-2023

December 21, 2004

Mark Evans, Remedial Project Manager
U.S. Department of the Navy
Naval Facilities Engineering Command
Northern Division
10 Industrial Highway
Code 1823, Mail Stop 82
Lester, PA 19113-2090

Re: Round 14 Groundwater Monitoring Report for the Area A Landfill

Dear Mr. Evans:

EPA reviewed the *Round 14 Groundwater Monitoring Report for Area A Landfill*, dated November 2004 in light of its conformance to the Groundwater Monitoring Plan [1] and completeness of the execution and presentation. The report provides a brief review of the site history and documents results from groundwater and surface water sampling and analyses performed in June 2004. The report does not offer any interpretation of the data; this is deferred until the next annual report. Detailed comments are provided in Attachment A.

The field and analytical activities summarized in the Groundwater Monitoring Report (GMR) generally follow the Groundwater Monitoring Plan [1]. The sampling in Round 14 followed the original scheme, and does not reflect adjustments discussed with regulators in 2003 (*e.g.*, reduction in the number of dredge-material wells off the toe of the landfill, addition of deep alluvium well 2LOW1D). If the scope of the monitoring has not yet been resolved, further discussion should be held between Navy and regulators. The data continue to support the conclusion reached previously that the deep ("DS") wells off the toe of the landfill cover are redundant, and appear to sample a domain whose chemistry is strongly dominated by the characteristics of the dredge material, rather than by any interaction with buried waste in the landfill.

A qualitative review of the data raises no significant concerns with respect to contaminants from the site that may have impacted groundwater.

- Few SVOCs were detected. Benzo(a)anthracene was detected (0.35 J micrograms per liter) above the primary monitoring criterion (0.3 micrograms per liter) at one surface water sample location, 3MSP01. There is no suggestion that this signals a persistent problem; recent previous rounds have been ND (<0.2 micrograms per liter).

- Total and dissolved arsenic were detected at concentrations at or above the primary monitoring criterion at several wells and surface water locations. The detections were all within historical ranges. Groundwater detections were associated reducing conditions at the dredge-material wells, as noted previously. Turbidity clearly plays a role in some of the elevated results (*e.g.*, total As at SG-24 was 44.9 micrograms per liter; dissolved (filtered) was 4.7 micrograms per liter; turbidity 195 NTU).

I look forward to working with you and the Connecticut Department of Environmental Protection to protect the environs of the Naval Submarine Base. Please do not hesitate to contact me at (617) 918-1385 should you have any questions.

Sincerely,

Kymberlee Keckler, Remedial Project Manager
Federal Facilities Superfund Section

Attachment

cc: Mark Lewis, CTDEP, Hartford, CT
Melissa Cokas, NSBNL, Groton, CT
Jennifer Stump, Gannett Fleming, Harrisburg, PA

ATTACHMENT A

Page	Comment
p. 2-1, §2.2	The text refers to Figure 2-2 for an interpretation of the potentiometric surface. The distinctive "mound" centered on 4MW1S appears to be an artifact of the available data coverage in the upgradient area. There are no constraints on the water levels to the west, south, or east of this single well to define the roughly circular feature shown. It seems equally plausible that the contours (*e.g.*, for 90, 100, and 110 ft) may remain more "open" to the southeast, more parallel to the surface topographic contours. This has no significant implications for the Area A Landfill monitoring; it is still clear that the rocky upland slope is a recharge area, and that groundwater generally flows to the northeast to discharge to the wetland. However, the contours might be sketched more tentatively where data are lacking.
p. 2-3, §2.4	The text is clear that the surface water samples are first collected in a container *without* preservative, and then filtered into the final sample container. It is not stated whether the latter is acidified. The field sample sheets (App. D) imply that the surface water samples for inorganics analyses are acidified. The text should make it clear that the samples are preserved. As it reads now, only "upreserved" appears in the description.
p. 3-1, §3.0	EPA reviewed the iron analyses from this round because of the importance of iron in geochemical controls on the mobility of trace metals. It is interesting that there are numerous samples for which there is a significant difference in the results for total and dissolved iron, but for which the difference is not readily explained by differences in measured turbidity. It is often the case that total (unfiltered) and dissolved (filtered) iron results are quite comparable regardless of turbidity, provided that conditions are strongly reducing. In such cases, it appears that the iron in the sample is mobilized from particulate surfaces, and the unfiltered sample yields a reasonably good estimate for dissolved iron. However, the data from Round 14 show several wells in which the ratio of dissolved to total iron does not appear to correlate with turbidity. It seems possible that the relatively low "dissolved" iron results for these wells may be influenced by the sampling procedure. For example, it is possible that the groundwater at these wells, under highly reducing conditions, is high in dissolved iron, as reflected in the *total* iron analyses. For the dissolved iron samples, is it possible that the filtration procedure results in oxygenation of the flowing water, oxidation of dissolved (reduced) iron, and loss of that iron at the filter? This could cause the "dissolved" analyses for iron to be biased low. The field procedures for collecting filtered samples should be reviewed to ensure that oxygenation of the water upstream of the filter is minimized. Collection of both filtered and unfiltered samples for

inorganics analyses, as is currently done, remains valuable, in part to provide data to decipher these issues.

well	total Fe (ppb)	diss Fe (ppb)	turbidity (NTU)	ORP (mV)
21S	8400	750	6.4	-349.6
38DS	3600	720	7	-44.6
41DS	2000	530	10	-351.9
42DS	5900	48	37	-363.9
44DS	2000	27	7	-416

p. 3-2, §3.0 *typo:* The first bullet on this page refers to well 2MW38S. Please change to 2MW38DS.

Figure 3-2 *typo:* The tag for sample SG-22 shows "Copper, Dissolved" at 25.9 micrograms per liter. It appears from Table 3-2 that this entry should be for the *total* copper. Please check for consistency.

REFERENCE

[1] Tetra Tech NUS, Inc., "Groundwater Monitoring Plan for Area A Landfill, Naval Submarine Base, New London, Groton, Connecticut," January 1999.