



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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April 12, 2001

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 5 - Groundwater Monitoring Report for the Area A Landfill

Dear Mr. Evans:

EPA reviewed the *Round 5 Groundwater Monitoring Report for Area A Landfill*, dated March 2001. The report provides a brief review of the site history and documents groundwater analyses based on sampling performed in December 2000. Since this is an interim report, EPA limited its evaluation of the monitoring results to a comparison of these results to the criteria identified in the GMP for Area A Landfill (TtNUS, January 1999). EPA reviewed the report with particular attention to conformance to the Groundwater Monitoring Plan [1], completeness of the execution and presentation, any preliminary indications of contaminant trends. Detailed comments are provided in Attachment A.

1. The field and analytical activities summarized in the Groundwater Monitoring Report (GMR) generally follow the Groundwater Monitoring Plan [1]. Exceptions include the omission of three surface water samples owing to lack of water at the planned sample locations and omission of two monitoring wells (3MW12S and 3MS12D) that have been buried or destroyed and could not be located. In addition, the validity of the water levels obtained from staff gauges is questionable because some gauges have been moved since installation. Apparently, the staff gauges have not been re-surveyed since installation of the landfill cap. Also, the dissolved oxygen data should be reviewed for indications of instrument errors, recording errors, *etc.* Additional discussion is provided in Attachment A.
2. Review comments for the Annual Groundwater Monitoring Report for Year 1 (Tetra Tech NUS, February 2001) recommended the addition of reduced iron to the field parameters and nitrate/nitrite and dissolved manganese to the laboratory analyses in order to assess interpretations of redox-dependent transport process. While I recognize that the Round 5 sampling effort occurred before these recommendations were made, the recommendations still apply and should be considered for future events.

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3. In follow-up to a comment made on the Annual Report (Tetra Tech NUS, February 2001), quarterly monitoring data are compared to the annual mean for upgradient and downgradient wells. The following table shows mean values for the field parameters for upgradient wells 4MW1S and 2LMW20S (four rounds of data for each of the two wells, "lumped"), downgradient wells 2WMW40DS and 2WMW46DS (four rounds of data for each of the two wells, "lumped"), and well 2WMW21S (four rounds, "lumped"). Wells 2WMW40DS and 2WMW46DS are directly downgradient of wells 4MW1S and 2LMW20S, respectively. All mean values are shaded. Round 5 quarterly data are provided below each mean value.

wells	pH	DO (mg/L)	ORP (mV)	salinity (%)	Spec. Cond. (mS/cm)	turbidity (NTU)
4MW1S/ 2LMW20S (mean)	5.84	1.66	96.5	0.14	0.40	0.74
4MW1S (Rnd 5)	5.8	6.54	66.7	NA	0.270	2.8
2LMW20S (Rnd 5)	6.23	3.87	-98.5	NA	0.552	1.59
2WMW40DS/ 2WMW46DS (mean)	7.01	2.24	-335	21.7	34.4	64.8
2WMW40DS (Rnd 5)	7.11	40.31	-320	NA	2.52	8.35
2WMW46DS (Rnd 5)	7.00	2.24	-376	NA	4.05	45
2WMW21S (mean)	6.76	3.50	-366	20.4	32.8	68.6
2WMW21S (Rnd 5)	6.95	4.85	-310	NA	3.38	19.3

The initial comment questioned the choice and use of proposed "upgradient" well locations.

4. Previous quarterly reviews have raised concerns regarding concentration of metals in filtered samples being higher than concentrations of that metal in the corresponding unfiltered sample. EPA therefore reiterates its request that the report discuss this data uncertainty for any metals where filtered concentrations exceed unfiltered concentrations.
5. Qualitative review of the data raises no significant concerns with respect to contaminants from the site that may have impacted groundwater. There are no detections of VOCs, pesticides, or PCB analyses above the method reporting limit.

Phenanthrene was detected in monitoring well 3MW37S (0.11 J ug/L) and in surface water samples SG-19 (0.39 J ug/L), SG-24 (0.19 J ug/L) and SG-24D (0.14 J ug/L).

These concentrations are all above the primary monitoring criteria of 0.077 ug/L, which is the Connecticut SWPC for substances in groundwater.

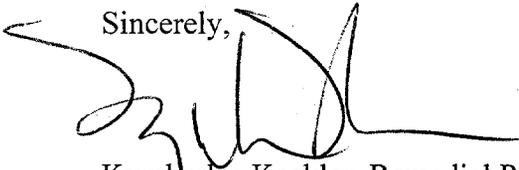
Arsenic exceeded primary monitoring criteria in several wells in both the filtered and unfiltered samples. No arsenic exceedances occurred in surface water.

Copper was detected in the unfiltered sample from surface water location SG-24 (5.0 ug/L) in excess of the secondary monitoring criteria of 4.8 ug/L. No copper exceedances occurred in surface water.

Zinc exceeded primary monitoring criteria of 123 ug/L in the unfiltered sample from monitoring well 2WMW40DS (210 ug/l). Zinc was detected in seven of the eight surface water locations in excess of the secondary monitoring criteria of 58.2 ug/L. Exceedances of the secondary criteria were noted in both filtered and unfiltered samples. Zinc exceeded the primary monitoring criteria of 123 ug/L in both the filtered and unfiltered samples for surface water locations SG-22 and SG-23.

I look forward to working with you and the Connecticut Department of Environmental Protection to complete the Area A Landfill remediation. Please do not hesitate to contact me at (617) 918-1385 should you have any questions.

Sincerely,



Kymerlee Keckler, Remedial Project Manager
Federal Facilities Superfund Section

Attachment

cc: Mark Lewis, CTDEP, Hartford, CT
Dick Conant, NSBNL, Groton, CT
Ken Finkelstein, NOAA, Boston, MA
Jennifer Stump, Gannett Fleming, Harrisburg, PA

ATTACHMENT A

<u>Page</u>	<u>Comment</u>
p. 2-1, §2.1	The text notes that the water levels measured on the staff gauges are suspect because the gauges were moved after installation. The staff gauges should be re-surveyed in order to bring these data into the water-level data base and make them available to constrain contour maps of water levels.
p. 3-1, §3.0	The first bullet indicates that no volatile organic compounds were detected. However, total xylenes were detected in SG-19 at a concentration of 0.21 J ug/L. This bullet should be corrected to state that total xylenes were detected at a concentration below the method reporting limit and that there are no monitoring criteria established for total xylenes.
pp. 3-1 & 3-2, §3.0	Several of the values listed in these bulleted items should include the J qualifier. Please review the data results presented in this text with those presented in Tables 3-1 and 3-2 and include the J qualifier where appropriate.
p. 3-2, §3.0	The last bullet indicates that zinc was detected in four surface water samples at concentrations exceeding the primary monitoring criteria. This is somewhat misleading because the exceedances occurred only at two locations. Zinc was detected at concentrations exceeding the primary criteria at surface water locations SG-22 and SG-23 in both the filtered and unfiltered samples for these locations. Please clarify the zinc exceedances in this bullet.
Appendix D	Review of the Groundwater Sample Log Sheets reveal questionable DO values. In particular, 2WGW40DS (sampled on 12/14), 2WGW41DS (sampled on 12/14), and 2WGW45DS (sampled on 12/15). These wells all exhibit extremely high DO (>40 mg/L), at levels virtually impossible to reach in groundwater. I also note that the DO reading tended to drift upward over the purge period in most of these cases, <i>i.e.</i> the readings did not stabilize. Furthermore, the ORP measured at the same time as these extremely high DO values was negative, a somewhat contradictory result. While this combination is not impossible (<i>e.g.</i> , redox couples may not be in equilibrium), it is unusual. There is a strong suggestion in these data that one of the two flow-through cells used suffered from electrode fouling, poor calibration, electronics instability, or some other problem. The flow-through cell should be inspected and calibrated carefully in future sampling rounds, and the data should be reviewed for indications of instrument errors, recording errors, <i>etc.</i> Field personnel should be instructed to be alert to results that appear to be spurious. These data are critical to understanding the transport of inorganics at the site.

REFERENCES

- [1] Tetra Tech NUS, Inc., "Groundwater Monitoring Plan for Area A Landfill, Naval Submarine Base, New London, Groton, Connecticut," January 1999.
- [2] Tetra Tech NUS, Inc., "*Year 1, Annual Groundwater Monitoring Report for Area A Landfill, Naval Submarine Base, New London, Groton, Connecticut,*" February 2001.