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LETTER REGARDING THE TECHNICAL MEMORANDUM NUMBER ONE REPORT NSB
KINGS BAY GA
7/19/1993
U S DEPARTMENT OF THE INTERIOR



United States Department of the Interior

GEOLOGICAL SURVEY
Water Resources Division
Peachtree Business Center, Suite 130
3039 Amwiler Road
Atlanta, Georgia 30360-2824



July 19, 1993

Mr. Ed Lohr
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive, P.O. Box 190010
North Charleston, SC 29419-9010

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Dear Ed:

Review of the Technical Memorandum Number One report by ABB Environmental Services has been completed by the U.S. Geological Survey. Review comments regarding the slug-test and elevation data were transmitted to you on April 16 and June 21, 1993. Review comments on the rest of the report are enclosed.

The enclosed review comments/questions are in two sections. The section "General Comments and Questions" pertains to the overall report, or to general statements about a site or problem. The section "Comments and Questions on Specific Pages" is in regard to particular statements made in the report.

We hope that this review is helpful to you. If you have any questions, please feel free to call.

Sincerely,

Bud Zehner
Hydrologist

Enclosure

USGS REVIEW COMMENTS AND QUESTIONS ON
REPORT "TECHNICAL MEMORANDUM NUMBER 1",
WRITTEN BY ABB ENVIRONMENTAL CONSULTING FIRM

Acronyms used here are the same as in the Technical Memorandum Number 1 report (TMI), and are: CRQL - Contract required quantitation limit, MCL - maximum contaminant limit, NEESA - Naval Energy and Environmental Support Activity. Also, para means paragraph and ug/L is micrograms per liter.

General Comments and Questions

The dates of operation of the burial areas are apparently not given in TMI, and would have been helpful for considering time involved in contaminant transport. Even the year of closure of the Camden County landfill is not known?

The times of water-level measurements for potentiometric-surface maps are not given. At least a total time for all measurements at each site should be given. Contour intervals are only 0.5 foot at two sites, and, even considering the apparently small range of water-level fluctuations shown on hydrographs in Appendix D, small water-level changes due to elapse of time between measurements might affect how contours are drawn and interpreted.

Water-level and water-quality information would probably have been useful at the south end of site 16. Was no well constructed there because, as noted on the potentiometric-surface map (fig. 4-16, page 4-51), most of that area is "construction area C"? If limited access were the reason no well was installed at the south end, a comment to that effect in the text would have been helpful.

Why were surface-soil samples taken only from site 5, and not from sites 11 and 16? This is not explained in TMI.

Only ranges of specific conductance and pH are given. All values should be included in the report. No statement is specifically made in the "Recommendations" section that specific conductance and pH will continue to be measured in the field, (although it is assumed that they probably will continue). The simple measurement of specific conductance might prove useful for interpreting directions of flow of contaminated water.

The statement is made in the site 11 summary section (page 4-42, 2nd para) that terrain conductivity data indicated elevated values on the downgradient, western side of the landfill. Although correct, the statement is a bit misleading because no point is made that, based on concentrations of trace elements in ground water, the terrain conductivity data are inconclusive for indicating a plume of contaminated water flowing from the landfill. Except for selenium and sulfide concentrations, the inorganics concentrations in water from upgradient wells 11-6, 11-7, 11-8, and 11-9 were greater, or approximately equal to, the concentrations of inorganics in water from most downgradient wells. Moreover, well 5 evidently contains the highest concentrations of most inorganics, relative to other wells, and terrain-conductivity values are not greater at well 5 (north of landfill).

Wells 5-3, 5-4, 5-5, 11-4, 11-5, and 16-3 are called downgradient (which is assumed to mean hydraulically downgradient of the burial sites), but can be interpreted from the potentiometric-surface maps as hydraulically upgradient if potentiometric-surface lines and burial-site boundary lines are considered to be accurate, and if flow is assumed to be at right angles to potentiometric lines. Also, only wells 11-1, 11-7, 11-8, and 11-9 are referred to as upgradient wells at site 11, but it is obvious from the potentiometric-surface map (fig. 4-12) that well 11-6 is also upgradient.

The concentrations of inorganics in ground water are expected to be greater in areas downgradient of the burial sites, as noted in TMI. This relation is not apparent at the western (larger) section of site 5, and at site 11. Wells 5-1 and 5-2 are obviously upgradient, as interpreted from the potentiometric-surface contours shown on figure 4-3. Wells 5-3, 5-4 and 5-5 are called hydraulically downgradient in TMI, but may not be downgradient, as explained in a previous paragraph. Concentrations of all inorganics in water from well 5-4 are less than concentrations of all inorganics in water from well 5-1. Concentrations of most inorganics in water from wells 5-3 and 5-5 are less than, or approximately equal to, concentrations in water from upgradient wells 5-1 and 5-2. Well 11-7 is called an upgradient well in TMI, but, except for well 11-5, well 11-7 exceeds all other wells at site 11 for mercury, chromium, barium, arsenic, copper, zinc, cyanide, and sulfide - these are more than one-half the inorganics analyzed for.

A comment - wells 5-6 and 5-7 are obviously downgradient, as interpreted from figure 4-3. These seem to be the only downgradient wells at site 5 that have water with greater concentrations of inorganics than upgradient wells, and this relation might be the result of transport only from the small eastern burial area.

Why was cadmium data for site 16 not discussed, as was done for sites 5 and 11? Is this because all concentrations at site 16 were below the CRQL of 5.0 ug/L (all concentrations are shown as 2.9 U ug/L in Appendix C)? If so, a comment to that effect in the text would have been helpful.

A comment - the cobalt data in Appendix C are different than other trace-element data in that cobalt concentrations in water samples from site 11 are several times less than the cobalt concentrations in water samples from sites 5 and 16. Most dissolved trace elements at site 11 have concentrations greater than, or about equal to, concentrations at the other two sites.

A summary table would have been helpful in section 4 or 5 which listed the samples, and organic and inorganic concentrations that show influence from waste burial.

Recommendations are made in TMI regarding future monitoring of pesticides, herbicides, PCBs, dioxins, and furans in ground water at sites 5 and 16, but no recommendations are made regarding these compounds at site 11. Since none of these constituents were detected in ground water at site 11, are they to be omitted from analysis during future ground-water sampling as will be done at site 16?

The discussion on "NEESA level C quality-control guidelines" in the analytical conformance section (section 3) is not clear in regards to the "U" qualifier for the data. On page 3-12, statements at the second and third "bullets" mean that the basis for using the "U" qualifier is related to both the concentration of the CRQL and the concentration of the "associated" blank (call this case 1). The "associated" blank is assumed to be the laboratory method blank rather than the field blank. The statement at the fourth "bullet" means that the basis for using the "U" qualifier is the CRQL concentration only (call this case 2). A sample can have a concentration such that conditions for both case 1 and case 2 are satisfied. Which case then has precedence? These questions particularly apply to methylene chloride data for site 5 soil samples SS-07 and SB-07, as described in the next two paragraphs.

The surface and subsurface soil analyses from site 5, as shown in table 4-1 (pages 4-5 and 4-6) - is the CRQL of 10 ug/kg shown for methylene chloride a typo error? Table 3-3 on pages 3-9 and 3-10 (the list of CRQL values used for analyses) shows that the methylene chloride CRQL is 5 ug/kg for both surface and subsurface soil samples from site 5. Appendix C (list of analyses) also shows the methylene chloride CRQL is 5 ug/kg for the site 5 soil samples.

Why is the "U" qualifier applied in table 4-1 to the methylene chloride concentration of 72 U ug/kg for sample SS-07? If the 10 ug/kg CRQL in table 4-1 is supposed to be 5 ug/kg, and concentrations greater than 10 times the CRQL for methylene chloride are supposed to be reported as unqualified, as described for case 2 above, the 72 U ug/kg concentration for soil sample SS-07 perhaps should be shown as unqualified because 10×5 ug/kg is less than 72 ug/kg. Or is the "U" qualification used because case 1, as described above, has precedence over case 2? Table 3-3 (page 3-10) shows the "method blank" concentration for this sample as 8 ug/kg, and 10×8 exceeds 72, so if case 2 applies the "U" qualifier would be used.

Comments and Questions on Specific Pages

Page 4-3, 4th para, line 6 -- is the 5-SS-01 sample described here a typo error? Only the 5-SS-02 sample was shown in table 4-1 as having a methylene chloride concentration of 110 J ug/kg.

Page 4-3, 1st sentence of last para - states that three surface-soil samples contained carbon disulfide, but the remainder of the sentence, and the data in table 4-1, shows four surface-soil samples containing this compound. The error is repeated in the discussion of subsurface soil samples, on page 4-11, third line of third para.

Page 4-7, table 4-1 - the note at the bottom of the table defines the "U" qualifier as "not detected above or below the CRQL". Why do most of the organics concentrations in this table have a "U" qualifier even though the concentrations are greater than the CRQL? For example, the "380" in the "380 U" concentration of naphthalene in sample SS-01 is greater than the CRQL of 330, so why would a "U" qualifier be applied? If the "U" qualifier is applied because of the concentrations in the method blank, the footnote wording should be changed because 380 is certainly above 330.

Page 4-8, first para - why is the concentration of 3 J ug/kg for sample 5-SS-02 the only one cited as a positive indication of trichlorofluormethane? Values of this compound in other surface-soil samples are greater than 3, but are given a "U" qualifier. Is the "U" used because of concentrations in the method blanks? Concentrations of trichlorofluormethane in method blanks are apparently not given in TM1.

Page 4-11, 4th para, 3rd line -- shows a toluene concentration of 7 ug/L in sample SB-06, but table 4-1 (page 4-5) and Appendix C show a toluene concentration of 4 J ug/L for this sample. The statement on the following line of this same para states that xylene was found in seven samples (as also shown in table 4-1), but only five are cited. This latter sentence should probably have also included samples 05-SB-04 and 05-SB-05.

Page 4-13, second para -- statement is made that the pond on the east side of site 5 is recharging the aquifer in the vicinity of well 5-5. How was this determined? The water-level elevation of the pond is not given and no ground-water mounding is apparent on the potentiometric-surface map. The pond surface could be just part of a continuous north-to-south slope of the water table in the area, and the pond water could be essentially ground-water discharge from the north.

Page 4-21, last sentence - states that cyanide was detected in two soil samples and two ground-water samples from identical locations, but does not give the locations. This was not previously discussed. Is it in the appendices? Why not give the locations?

Page 4-22, first para, first sentence - states that chromium and arsenic are in ground water upgradient of site 5 at concentrations above MCL. The only arsenic sample exceeding MCL is from well 5-7, and this well was described on page 4-20 as downgradient.

Page 4-22, first para, second sentence - states that chromium, lead, and cadmium are in ground water downgradient of the site at concentrations above that in upgradient water. However, concentrations of chromium and lead in water from upgradient well 5-1 exceed concentrations in water from wells 5-3, 5-4, and 5-5 which were previously described as downgradient. Is this a typo error? This statement directly contradicts the statement made about lead concentrations on page 4-20, second sentence.

Page 4-39, 2nd from last para, 2nd sentence - states that, except for well 11-5, chromium in water samples from downgradient wells were below chromium concentrations in samples from upgradient wells. However, wells 11-2 and 11-4 were described as downgradient, and the chromium concentrations in water from these wells exceed concentrations in water from upgradient wells 11-8 and 11-9.

Page 4-41, 3rd para, last sentence - states that the 7.3 ug/L upper part of the range of arsenic concentrations for downgradient wells is below concentrations in samples from upgradient locations. However, water from upgradient wells 11-1 and 11-9 contain lower concentrations of 1.9 and 3.5 ug/L, respectively. Moreover, the 7.3 ug/L concentration is in water from well 11-6 and, from figure 4-12, well 11-6 is obviously upgradient.

Page 4-41, 5th para, last sentence - states that water from well 11-5 consistently contains concentrations of inorganics that are greater than in water from other wells. This is true for most inorganics, but is not really "consistent" in that exceptions are selenium, antimony, cyanide, and sulfide.

Page 4-50, 2nd from last para, 2nd sentence -- states that the compound 4-methyl-2-pentanone was found only in water from well 16-3, but table 4-7 (page 4-52) and a table in Appendix D show this compound as only in the sample from well 16-2. Is this a typo error in the text or in the tables?

Page 4-52, table 4-7, analysis of ground water from site 16 -- why is the "J" qualifier applied to all values for lead, and to the 17.3 ug/L concentration of thallium from site 16-1, when all concentrations exceed the CRQL? Is the footnote 3 designation missing from the row of values for lead? There is no footnote 3 in the body of the table. Or does the latter part of the explanation of the J qualifier in Appendix C apply here (does not meet quality-control criteria)?

Page 4-52, table 4-7, analysis of ground water from site 16 -- concentrations in the associated blanks for some samples shown in this table evidently cannot be checked. No values are given in table 3-5 (pages 3-13 and 3-14) for thallium for any sample, and for lead in "associated samples" of ground water for sites 16-2, 16-3, and 16-4.

Page 4-53 - seems as if two different authors wrote the last two paragraphs. Next-to-last para says MCL for lead is 5 ug/l. Actually, the old MCL is 50 ug/l and new "Action Level" is 15 ug/l. The 5 ug/l shown in the text is evidently not a typo error because the author says the 12.0 ug/l at well 16-4 exceeds the MCL of 5 ug/l. Statement in the next para is that the new MCL for lead is 15 ug/l. Also, in the last para, three well-number prefixes are given as "11-", and probably should be "16-". The last three sentences of the last para are redundant and probably could have been omitted.

Page 5-1, last para - the recommendation in the first part of the para is correct, but an incorrect statement is made in the third sentence that arsenic was detected at site 5 in -upgradient- ground water at a concentration greater than MCL. Only well 5-7 had a concentration exceeding MCL at site 5, and it is a -downgradient- well, as was stated in the ninth line of page 4-20.

Page 5-3, second para - incorrect statement is made that chromium was at a concentration greater than MCL in the upgradient well. Well 16-4 was cited as the only upgradient well, and concentrations of chromium were less than MCL in well 16-4.