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February 24, 1995

Commander
Atlantic Division
Naval Facilities Engineering Command
1510 Gilbert Street (Building N-26)
Norfolk, VA 23511-2699

Attn: Mr. David Forsythe
Code 18224

Re: Contract N62470-89-D-4814
Navy CLEAN, District III
Contract Task Order (CTO) 0084
Camp Allen Landfill, Naval Base, Norfolk, Virginia
Revised Final Baseline Risk Assessment Report

Dear Mr. Forsythe:

Baker Environmental, Inc. (Baker) is pleased to submit two copies of the Revised Final Baseline Risk Assessment for the above-referenced CTO. In addition, four copies have been forwarded to Ms. Dianne Bailey (NAVBASE) as have one copy each to Mr. Robert Thomson (USEPA) and Ms. Patricia McMurray (VDEQ).

Attachment A to this letter itemizes the modifications that were made to the Final RA (Baker, November 1994) in response to VADEQ's comments dated December 27, 1994. Please note that the comments have not been re-typed, but are included as Attachment B.

Should you have any questions concerning the enclosures, please call me at (412) 269-2032 or Mr. Patrick Moroney at (412) 269-4691.

Sincerely,

BAKER ENVIRONMENTAL, INC.

Jeri L. Trageser, P.G.
Project Manager

JLT/PMB/lq

Enclosures

- cc: Ms. Lee Anne Rapp, LANTDIV Code 183 (letter only)
- Mr. Rollie Burford, LANTDIV Code 02112 (letter only)
- Ms. Dianne Bailey, NAVBASE Code N42B (4 copies)
- Mr. Robert Thomson, USEPA (1 copy)
- Ms. Patricia McMurray, VDEQ (1 copy)



A Total Quality Corporation

Attachment A
Changes Made in Revised Final Risk Assessment

**ATTACHMENT A
RESPONSE TO VDEQ COMMENTS
CAMP ALLEN LANDFILL
NAVAL BASE, NORFOLK, VIRGINIA**

- 1) Table A-3 was modified to show that Aroclor-1260 was not retained as a COPC for surface soils at Area B - Elementary School.
- 2) All COPC selection tables in Appendix A have been checked and modified to include the correct COPC screening levels as necessary. These modifications also included new RBCs for aluminum and dibenzofuran which were introduced by USEPA Region III into the Quarterly RBC tables for the fourth quarter of 1994, and were received by Baker following the submittal of the Final RA. The addition of RBCs for these noncarcinogenic constituents was made possible by the availability of new oral reference doses that are used in the derivation of RBCs. COPC screening levels for noncarcinogenic constituents are derived by dividing the RBCs by a factor of 10. Comparisons of detected site concentrations of aluminum and dibenzofuran with the new COPC screening levels resulted in the elimination of dibenzofuran as a COPC and the inclusion of aluminum as a site COPC in site soils and groundwater.

In the Final RA, aluminum was qualitatively evaluated since no reference dose was available at the time the Final RA was being developed. However, with the new reference dose, noncarcinogenic risks associated with aluminum were quantitatively estimated in the Revised Final RA for potential exposures to Area A surface soil, Area B soil borings, the shallow aquifer in areas A and B, the deep aquifer in Areas A and B, Area A and Area B-pond surface waters, and Area B-Pond shallow sediments. This resulted in increases in noncarcinogenic risks to potential human receptors.

- 3) In response to this comment, Baker deleted the second sentence on page 2-21 of the Final RA and stated the following in the Revised Final RA: "Maximum detected surface water concentrations were compared with Federal AWQCs that are protective of human health (recalculated from IRIS). Freshwater and marine acute and chronic AWQCs were used in the absence of human health values. Maximum detected surface water concentrations were not compared with Virginia Water Quality Standards (WQs) since these are, for the most part, similar or less conservative than the Federal AWQCs. Federal AWQCs for known or suspected carcinogens were derived from IRIS based on a target risk level of 1×10^{-6} ; whereas Virginia WQs for known or suspected carcinogens were derived based on a target risk level of 1×10^{-5} ; thereby, being less health conservative than the corresponding AWQCs. Only for noncarcinogens (e.g., copper and lead) are there cases of some WQs being more health conservative than the AWQCs. However, application of WQs, carcinogenic or noncarcinogenic, would not have affected the selection of surface water COPCs, and consequently the results of this risk assessment. Therefore, Federal AWQCs were primarily used in the selection of surface water COPCs at the Camp Allen Landfill site."
- 4) The Federal MCL for PCBs (0.5 ug/L) was added to Table 2-2.
- 5) The reference McDonald, 1992 was changed to USEPA, 1992b. The complete citing provided in the Reference Section (Section 9.0) is as follows:

United States Environmental Protection Agency. 1992b. Sediment
Classification Methods Compendium. Office of Water. EPA 8213-R-92-006.
- 6) The next-to-last sentence on page 3-3 was modified for clarification as follows: "Volatilization is not a significant removal mechanism when evaluating groundwater in an aquifer and subsurface soils."

- 7) A few of the most contaminated wells were selected as shallow and deep groundwater exposure point locations in Areas A and B. Text was added to Sections 3.0 and 7.0 of the Revised Final RA discussing the well locations selected for groundwater risk evaluations and the uncertainties associated with this methodology.
- 8) Per Baker's request, the following references, cited in VADEQ's comment, have been received via fax from VADEQ:

Ryan, E.A., Hawkins, E.T., et al. (1987) Assessing Risk from Dermal Exposure at Hazardous Waste Sites. Bennet, G. and J. Bennet editors. Superfund '87: Proceedings of the 8th National Conference. November 16-18, 1987, Washington, D.C. Hazardous Materials Control Research Institute.

Wester, R.C., Maibach, H.I., et al. (1993) *In Vivo and in Vitro* Percutaneous Absorption and Skin Decontamination of Arsenic from Water and Soil. Fundamental and Applied Toxicology 20, 336-340.

The above references contained the following dermal absorbance values, which VADEQ and USEPA Region III prefer for use in the evaluation of chronic daily intakes (CDIs) that may result from dermal exposures to soils and sediments:

VOCs - 25% (Ryan, et al., 1987)
SVOCs - 10% (Ryan, et al., 1987)
Pesticides - 10% (Ryan, et al., 1987)
Arsenic - 3% (Wester, et al., 1993)
Inorganics - 1% (Ryan, et al., 1987)

Each of these values represent the upper absorbance limits as presented in the cited literature. These values are more conservative than those used in the Final RA (organics - 1%, inorganics - 0.1%), and were incorporated into the dermal risk calculations for soils and sediments. These values resulted in an increase of carcinogenic and noncarcinogenic risks associated with dermal exposures to soils and sediments. The dermal absorbance values used in the Final RA for cadmium (1%) and PCBs (6%), were not affected by VADEQ's comment and were not changed in the Revised Final RA. The dermal absorbance values for cadmium and PCBs were obtained from the following guidance:

United States Environmental Protection Agency. 1992. Dermal Exposure Assessment: Principles and Applications. Interim Report. Office of Health and Environmental Assessment. Washington, D.C. January 1992. EPA/600/8-91/011B.

All of the dermal absorbance values presented above are discussed and presented in Section 3.4.3 and Tables 3-6 through 3-12 in the Revised Final RA.

- 9) Risk levels estimated for young child (ages 1-6 years) and adult residents represent minimum and maximum potential risks under the shallow groundwater non-potable use exposure scenario. If risk levels were estimated for an older child (ages 7-15 years), they would be expected to fall within the range defined by those estimated for the adult and young child. This was discussed in Section 7.0 of the Revised Final RA.

- 10) No modification of the soil ingestion rate of 50 mg/day was made in the evaluation of risks to Brig prisoners who could potentially ingest surface soils while outdoors. This reduced value, which is lower than the residential value of 100 mg/day, was used because prisoners spend less time outdoors than what is assumed for the typical adult resident.
- 11) The EF value of 0.2 hours/day presented for groundwater in Table 3-11 of the Final RA was corrected to 350 day/year in the Revised Final RA. The former value presented in the Final RA table was a typographical error and was not used in any risk calculations.
- 12) The description of the USEPA B2 carcinogenic classification presented in the toxicological profile for lead was corrected to reflect that a B2 carcinogen is a "probable", rather than a "possible" carcinogen. This change had no effect on the outcome of the risk assessment results.
- 13) A footnote was added to each of the referenced tables to indicate that the zinc value in the "State of Virginia MCLs" column is a Virginia groundwater standard. The cadmium value presented in the "State of Virginia MCLs" column was corrected to show the State MCL.

Attachment B
VADEQ Comments on Final Risk Assessment

Post-It™ brand fax transmittal memo 7671 # of pages >	
To <i>Jeri Traqser</i>	From <i>David Forsythe</i>
Co.	Co.
Dept.	Phone #
Fax # <i>412 269 2002</i>	Fax #



COMMONWEALTH of VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY

Peter W. Schmidt
Director

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December 27, 1994

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command
1510 Gilbert Street
Attn: Code 1822, Mr. David Forsythe
Norfolk, VA 23511-2699

RE: **Final Baseline Risk Assessment
Camp Allen Landfill
Norfolk Naval Base**

Dear Mr. Forsythe:

Attached for your review are my comments on the "Final Baseline Risk Assessment, Camp Allen Landfill, Norfolk Naval Base, Norfolk, Virginia" dated November, 1994.

If you have any questions about the comments, please contact me at (804)-762-4186.

Sincerely,

Patricia McMurray
Toxicologist, Office of
Federal Facilities
Restoration and Superfund

Attachments

cc: Rob Thomson, EPA Region III
Sharon Waligora, Norfolk Naval Base
Frank Daniel, Tidewater Regional Office
Erica Dameron

Comments
Norfolk Naval Base
Camp Allen Landfill
Final Baseline Risk Assessment

1. Table A-3: It is not clear why Aroclor-1260 has been retained as a COPC (contaminant of potential concern) since it was detected below the screening level in this area. In addition, page 2-9 Section 2.2.1.2 indicates that it has not been retained.
2. Page 2-4, Section 2.1 indicates that screening levels for non-carcinogens would be obtained by dividing the RBC by a factor of 10. It appears that this has been done inconsistently. For example, on Table A-2, it appears that the RBCs for naphthalene, phenanthrene, fluoranthene, pyrene, butylbenzylphthalate, barium, cobalt, nickel, and zinc have not been divided by 10. Table A-3 appears to be effected as well. All tables should be checked and corrected as necessary. If additional contaminants need to be retained after the tables are corrected they should be added.
3. Page 2-21, Section 2.2.5 states that Virginia Water Quality Standards have not been presented since they are equal to or less conservative than federal criteria. It should be noted that the Virginia standards are not always equal to or less conservative than federal criteria. (See copper and lead for example.)
4. Table 2-2: The proposed MCL for PCBs (polychlorinated biphenyls) should also be included on this table.
5. Table 2-5: A complete citing for the MacDonald, 1992 reference on this table could not be located in the reference section. This should be added to the list of references.
6. Page 3-3, Section 3.3.1 states that volatilization is not as important for evaluating groundwater as it is for surface soil and surface water. It seems that volatilization would be likely when groundwater is used for domestic purposes. In particular, this statement appears to be inconsistent with the evaluation of shower air under a future residential scenario.
7. Page 3-13, Section 3.4.1: It should be noted that the method of determining exposure point concentrations for groundwater in effect eliminates some of the contaminants that had previously been selected as contaminants of potential concern. While it appears that the most highly contaminated wells have been selected for evaluation, there are additional wells that could also contribute significant risks. This issue should be discussed in the risk assessment.

Mr. Forsythe

Camp Allen Landfill Baseline Risk Assessment Comments

Page 2

8. Tables 3-6 through 3-12: Region IV Interim Guidance has been cited for the absorbance factor (ABS) for organics and inorganics for contaminants not listed in Dermal Exposure Assessment: Principles and Applications. It should be noted that Region III has not approved the Region IV default values for ABS. For other contaminants appropriate literature values should be used and the reference included. Suggested sources include:

Wester, R. C., Maibach, H. I., et al. (1993) *In Vivo and in Vitro Percutaneous Absorption and Skin Decontamination of Arsenic from Water and Soil*. *Fundamental and Applied Toxicology* 20, 336-340.

If appropriate literature values cannot be located, ranges for metals, volatile organic compounds and semivolatile organic compounds may be found in:

Ryan, E. A., Hawkins, E. T., et al. (1987) *Assessing Risk from Dermal Exposure at Hazardous Waste Sites in Bennet G. and J. Bennet editors Superfund '87: Proceedings of the 8th National Conference*. November 16-18, 1987, Washington, D. C. Hazardous Materials Control Research Institute.

9. Table 3-6: It is not clear why exposure to shallow groundwater has not been included for a 6-15 year old child. It would seem that some of the uses of the non-potable aquifer (watering lawns, washing cars) would more likely be performed by an older child.
10. Page 3-23 and Table 3-7: It is not clear why a commercial/industrial ingestion rate was used for Brig prisoners when they would presumably be in the Brig area at all times. A residential rate of 100 mg/day may be more appropriate.
11. Table 3-11: It appears that the exposure time (ET) for dermal exposure to groundwater has inadvertently been listed under exposure frequency (EF).
12. Appendix C, Lead Page 4: The EPA carcinogen classification for lead has been stated as B2-possible human carcinogen. It should be noted that a B2 classification indicates a probable human carcinogen.
13. Tables A-6, A-7, A-8, A-9: It should be noted that the values listed as Virginia MCLs for zinc and cadmium are actually groundwater standards.