



State of Ohio Environmental Protection Agency

Northwest District Office

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Bob Taft
Governor

RE: U.S. NASA PLUM BROOK
ERIE COUNTY
OHIO ID#: 322-0552
TNT AREA B REMEDIAL
INVESTIGATION COMMENTS

April 14, 2000

Department of the Army
Nashville District, Corps of Engineers
Ms. Linda S. Ingram
P.O. Box 1070
Nashville, Tennessee 37202-1070

Dear Ms. Ingram:

The Ohio Environmental Protection Agency (EPA), Division of Emergency and Remedial Response (DERR), has reviewed the draft "TNT Area B Remedial Investigation, Volume I - Report of Findings, Volume II - Human Health Risk Assessment, and Volume III - Ecological Risk Assessment" for the former Plum Brook Ordnance Works, Sandusky, Ohio. This document was submitted to the Ohio EPA by the International Technology Corporation (ITC) on behalf of the Corps of Engineers, July 2, 1999, for review and comments.

I wish to apologize for the delay in the completion of the review of this document. The Ohio EPA, DERR finds Volume I, the Report of Findings, acceptable and does not require any corrections. However, revisions may be necessary to address the risk assessment comments. Ohio EPA, DERR is providing the attached comments concerning the human health and ecological risk assessment sections.

Please review these comments and incorporate them in the revised version of this document. I believe there may be a need for a meeting or conference call to discuss these risk assessment comments. Should you desire a meeting, or have questions and comments regarding these comments, feel free to contact me at (419) 373-3147 or Laurie Moore at (937) 285-6457.

Sincerely,

Ron Nabors
Site Coordinator
Division of Emergency and Remedial Response
Northwest District Office

/sw

Attachment

cc: Richard L. Meadows, USACE
Laurie Moore, OFFO, SWDO
DERR File

The following comments are for the human health (Volume II) and ecological risk assessment (Volume III) sections found in the Draft TNT Area B Remedial Investigation, Former Plum Brook Ordnance Works, Sandusky, Ohio, dated June 1999. In an effort to clarify the context of the comment, text from the concept paper is identified by *italics*.

Comments for Volume II Human Health Risk Assessment:

1. **Executive Summary, page ES-2:** *"Certain metals and polycyclic aromatic hydrocarbon chemicals were identified as natural or anthropogenic background constituents at the site. Background chemicals were not eliminated, but were included in an evaluation of background risk"*

In general, comparison with naturally occurring levels is applicable only to inorganic chemicals because the majority of organic chemicals are not naturally occurring, even though they may be ubiquitous. Do not eliminate anthropogenic chemicals from the site risk evaluation because it is extremely difficult to conclusively show that such chemicals are present at a site due to operations not related to the site or surrounding area. The presence of anthropogenic background chemicals can be discussed in the uncertainties section, however, these constituents should be retained and evaluated in the site-related risk. Compounds evaluated in background risk should include only those constituents detected in the samples collected from background locations. Background locations are classified as unimpacted areas that are not influenced by site activity.

2. **Executive Summary, page ES-2:** *"The groundskeeper represents a site worker exposure to surface soil in the current and future (industrial) land-use scenario."*

There are no restrictions on this property to prevent future residential land use. Clarify this sentence to indicate that current land-use is industrial and future land use is residential, for example: "The groundskeeper represents a site worker exposure to surface soil in the current (industrial) and the future (residential) land-use scenario."

3. **Executive Summary, page ES-3:** *"The construction worker.....Relevant pathways evaluated were incidental ingestion and dermal contact with soil and inhalation of volatile organic compound (VOC) vapor and dust."*

There is potential for the construction worker to have exposure to contaminated groundwater during excavation activities, utility repair, etc. Include this pathway or justification for excluding it.

4. **Executive Summary, page ES-3:** *"Inhalation of VOC emissions from surface water and sediment is possible, but the large volume of ambient air is assumed to dilute airborne concentrations to toxicologically insignificant levels, and this inhalation pathway was not quantified."*

Documentation is needed to support this statement. If justification for this statement cannot be provided, this pathway will be evaluated in a quantitative risk assessment.

5. **Executive Summary, page ES-3:** *"It is assumed, however, that the large volume of outdoor air would effectively dilute airborne concentrations to toxicologically insignificant levels, and this inhalation pathway was not quantified."*

See comment #4.

Remove this statement and reference from this section of the report. Discussion of this source (i.e., ATSDR, 1995) with respect to site conditions is more appropriately placed in the uncertainties section. Evaluate PAHs in the quantitative risk assessment for site-related risk. See comment #10. Remove background values for PAHs from ATSDR (1995) in Table 2-6.

12. **Section 2.1.3, Identifying Site-Related Chemicals, page 2-4:** *"Therefore, the MDC of the background data set is conservatively selected as the BSC for nonparametric background data sets."*

This methodology should be used when the calculated UTL value for a constituent exceeds the maximum detected concentration for that constituent, independent of the statistical distribution. Therefore, when the calculated UTL value for a constituent exceeds the maximum detected concentration for that constituent, default to the maximum detected concentration. For example, in Table 2-6, For Aluminum the 95% UTL = 26,900 ppm and the maximum detected concentration = 15,500 ppm, therefore the Background Screening Criterion (BSC) should be conservatively selected as 15,500 ppm. Make the necessary corrections to Table 2-6 and sections of the text with respect to defaulting to the maximum detected value.

13. **Section 2.1.3, Identifying Site-Related Chemicals, page 2-5:** *"Metals and organic chemicals identified as anthropogenic background were not eliminated from the RA; instead they were included and evaluated in total site risk and background risk, but not in site-related risk.....Anthropogenic background concentrations of PAH compounds are shown in Table 2-7."*

See comment #10 & #11.

Remove Table 2-7 from this section. The information in this table and the ATSDR reference is more appropriately discussed in the uncertainties section. Remove background values for PAHs from ATSDR (1995) in Table 2-6.

14. **Section 2.14 Risk Based Screening, page 2-5 to 2-6:** *"The mechanisms by which receptors are exposed to sediment are similar to those for soil.....The residential soil PRGs are not adjusted downward when applied to sediment.....In other words, the unadjusted residential soil PRGs are considered to reflect an ILCR of 1E-7 and HI of 0.1 when used for screening chemical concentrations in sediment. Similarly the EPA tap water PRGs are adopted for surface water....."*

Revise text for agreement between adjusting PRGs and the ILCR risk level that the adjustment reflects. For instance, USEPA Region IX PRGs reflect an ILCR of 1E-6 when they are not adjusted. The text, as written, is confusing because the text states that the PRGs were not adjusted for surface water and sediment screens, but reflect an ILCR of 1E-7.

15. **Section 2.1.5 Evaluating Essential Nutrients, page 2-6:** *"Essential nutrients such as calcium, chloride, iodine, magnesium, phosphorus, potassium and sodium were eliminated as COPC....."*

Using the essential nutrient status as the basis for the COPC screen should be limited to calcium, iron, magnesium, potassium, and sodium. Without consideration of the levels that may be associated with toxicity for these other inorganics, it is not appropriate to screen them out.

20. **Figure 3-1, footnote 3:** *"Although theoretically complete, large dilution of ambient air is assumed to render exposure point concentrations toxicologically insignificant."*

See comment #4. Remove this footnote and assess this pathway, unless documentation for excluding it can be provided and justified.

21. **Figure 3-1, footnote 4:** *"Contact with this medium, although plausible, is not part of this receptors normal or expected activities; therefore contact would be sporadic and is not quantified."*

Exposure to both surface water and sediment could, at times, be significant to construction worker and/or groundskeeper, if the receptors activities involve the installation or repair of utility lines that cross Ransom Brook or any bank stabilization/erosion control projects.

22. **Table 3-1: Receptor Exposure Scenarios, footnote d:** *"Although theoretically complete, this pathway was not quantified because the large volume of ambient air would effectively dilute concentrations to toxicologically insignificant levels."*

See comment #4 and #20.

23. **Table 3-1: Receptor Exposure Scenarios, footnote b:** *"Although contact with this medium is possible, exposure would be sporadic, rather than continuous....."*

See comment #21.

24. **Section 3.1.3.1 Groundskeeper, page 3-3:** *"The groundskeeper scenario was designed to evaluate the upper bound for site worker exposure to surface soil in the current and future (industrial) land use scenario."*

See comment #2.

25. **Section 3.1.3.1 Groundskeeper, page 3-3:** *"It was assumed that relatively high dust concentrations would be produced within the groundskeeper's breathing zone, with little opportunity for dilution by the large volume of ambient air."*

Remove *"with little opportunity for dilution by the large volume of ambient air."*

26. **Section 3.1.3.1 Groundskeeper, page 3-3:** *"Generally, surface soil that has been in place for extended periods is not a significant source of airborne VOCs because dissipation over time would have reduced the residues at the surface to toxicologically insignificant levels. VOCs were detected in surface soils.....probably because surface soil samples may have included soil from a depth as great as 1 ft bgs."*

See comment #4.

Remove *"Generally, surface soil that has been in place for extended periods is not a significant source of airborne VOCs because dissipation over time would have reduced the residues at the surface to toxicologically insignificant levels."*

Revise the statement *"probably because surface soil samples may have included soil from a depth as great as 1 ft bgs."* This statement gives the reader the impression that you are not sure what depth defines surface soil. As stated in the work plan, surface soil is defined

Segregation of hazard indices by effect and mechanism of action can be complex and time-consuming because it is necessary to identify all of the major effects and target organs for each chemical and then to classify the chemicals according to target organ or mechanism of action. This analysis is not simple and should be performed by a toxicologist. If segregation is not carefully done, an underestimate of the true hazard could result. A strong case is required to indicate that two compounds which produce adverse effects on the same organ system, although by different mechanisms, should not be treated as dose additive (RAGS Volume 1, USEPA, 1989).

33. **Section 5.3.1 Groundskeeper, page 5-4; Section 5.3.2 Construction Worker, page 5-5; Section 5.3.3 On-Site Resident, page 5-5:** *"The total ILCR from all exposure pathways falls within the 1E-6 to 1E-4 range considered acceptable by EPA (1990)."*

Ohio EPA currently operates within the risk range of 10^{-6} to 10^{-4} , with the point of departure at 10^{-6} . Risks in the range of 10^{-6} to 10^{-4} must be acknowledged and discussed in the report. Risk less than 10^{-6} is considered to be protective and risk greater than 10^{-4} are considered not protective; however, risk falling within the range will need to be evaluated. The point at which to take remedial action and the final clean-up level will be a risk management decision. The use of the 10^{-6} point of departure, does not reflect a presumption that the final remedial action should attain such goals.

34. **Section 5.3.4, Alternate On-Site Residential and Construction Site Locations, page 5-6:**

With respect to future land use, deed restrictions or other restrictions are not in place to designate which areas a resident could or could not develop. Therefore, the assumption that a future resident would randomly select a building site within the TNT Area B boundary is appropriate and the "alternate on-site residential and construction site locations" sections and associated risk assessment on the modified data sets is not necessary and should be removed. However, if the contractor feels that the concentrations in the northeast quadrant are indicative of a hotspot, then a separate quantitative hotspot analysis should be performed on this portion of the site.

35. Please provide the contents of Appendix A: Analytical Results for review.
36. Include the contents of Appendix C in the draft final.
37. Include a Summary/Conclusions section at the end of Volume II Human Health Risk Assessment.
38. **Table 2-1 through Table 2-5, Table 5-10,**

Remove footnote b - background screening criteria for soil (Table 2-6) and references to background soil values. It is not appropriate to compare sediment concentrations to soil background concentrations as a "background screen." Sediment and soil are separate media. For a background comparison, sediment samples should be collected from a background sediment location. Also remove PAH background values shown in Table 2-7.

39. **Tables 5-5 and 5-6 and 5-9:**

Include a footnote defining NA.

5. **Section 5.1 Terrestrial Plant Impact Assessment, page 5-1:** *"Although one bare soil area was noted during the site reconnaissance....."*

Were discrete samples taken from the bare spot and analyzed?

6. **Section 5.3 Predictive Risk Estimation for Terrestrial and Aquatic Wildlife, page 5-3:** *"It should be noted that the maximum 2,4,6-TNT concentration in surface so (6,900 mg/kg) was used as the source-term concentration (due to the unmodified data distribution), while the arithmetic mean concentration was 261 mg/kg. This estimate of central tendency is 26 times lower than the maximum concentration and the suggests that using the maximum concentration is overly conservative. It should also be noted that the maximum aluminum and iron concentrations measured in surface water were used as the source-term concentrations due to the limited number of samples and additional sampling effort could potentially reduce the hazard estimate."* **Page 5-4:** *It should be noted that the maximum concentrations of many of the COPECs measured in surface water and sediment were used as the source-term concentrations due to limited number of samples, and additional sampling effort could potentially reduce the hazard estimate. It should also be noted that there are significant uncertainties....."*

Statements regarding the uncertainties associated with calculating hazard indices and HQs should be removed from this section of the text and discussed in the "Uncertainties" section of the report.

7. **Section 5.5 Risk Description, page 5-6:** *"Based on uncertainties of toxicity, and on the fact that no RTE species have been confirmed at the site, remedial actions may not be warranted at this time for soil" "Based on uncertainties of toxicity, estimating concentrations in aquatic insects, and limited sample size, no remedial actions are warranted at this time for surface water or sediment."*

This is a risk management decision. CERCLA and the NCP state *"protection of human health and the environment"* this is not limited only to the protection of threatened and endangered species.

Statements should be limited to recommendations for more investigations or justification supporting that a thorough ecological risk assessment has been completed. Considering that there are HI>1 at this site for several of the ecological receptors, recommending that no remedial actions are warranted is inappropriate.

8. **Table 5-1 Terrestrial Plant Impact Assessment:**

It is not appropriate to assume that the benchmark was not exceeded, when a benchmark concentration is not available. In this situation (i.e., when a benchmark concentration is not available for a specific constituent), the constituent should be retained and carried through the ecological risk assessment. In this table, please remove the "No" from the last column titled "Benchmark Exceeded" when a benchmark concentration for a constituent is not applicable. A footnote could be added in place of the "No" which states something to the effect "Constituent Retained Due to Lack of Benchmark Information."