



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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September 27, 2007

Engineering Field Activity, Midwest
Attn: Mr. Howard Hickey
Building 1A, Code 931
201 Decatur Avenue
Great Lakes, Illinois 60088-5600

Re: Draft Remedial Investigation and Risk
Assessment Report for Site 1 - Golf Course
Landfill, Naval Station Great Lakes
Great Lakes, Illinois

0971255048 - Lake
Great Lakes Naval Station
Superfund/Technical

Dear Mr. Hickey:

The Illinois Environmental Protection Agency (Illinois EPA or Agency) is in receipt of the submitted Draft Remedial Investigation and Risk Assessment Report for Site 1 - Golf Course Landfill, Naval Station Great Lakes. It was drafted by Tetra Tech NUS, Inc. on behalf of the Naval Facilities Engineering Command (Navy). It was dated July 2007 and was received at the Agency on August 6, 2007. The Agency has conducted a review of the submittal and has generated the following comments.

- 1) **Sections 2.1.2, 4.1, and 4.2** - While reviewing the *Draft Final Preliminary Assessment Naval Station Great Lakes, Illinois NTC Lakefront and TSA Ranges*, which pertains to munitions response sites, it was noticed that a figure from an historical document identified a trap shooting range very near the Fire Fighter Training Unit and on the site of the golf course. It appeared to be located on the western portion of the current golf course. This information should be researched and potentially added here for informational purposes. Obviously, if the trap shooting range existed, lead contamination from the lead shot would be expected.
- 2) **Section 2.3.2** - In the last paragraph on page 2-6 it states that for the 10 subsurface soil samples collected in March 2004, there were no VOC, SVOC, or RCRA Metals detections that exceeded the screening objectives and then references Table 2-3. In Table 2-3, there are a couple of compounds which have been highlighted to identify exceedances that appear to be identified by sample IDs attributed to the 2004 sampling

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effort. Please review the table and revise the text and/or table as necessary. The figures also identify exceedances and list those same sample IDs.

- 3) **Table 2-3 (4 of 4)** – The criteria listed in the fourth column of this table are identified as being TACO migration to groundwater soil remediation objectives. It should be specified in this table that comparisons to these values must be made using environmental results based on extraction analysis and that the units are mg/L. Milligram/kilogram migration to groundwater soil remediation objectives for some of the listed parameters are available in 742.Appendix B/Table D; however, Table D objectives are dependent upon soil pH and can thus vary between soil borings.
- 4) **Section 3.1** – The third bullet states an extra sediment sample was collected because the lithology was unique compared to other sediment sampling locations. Which sediment sample was that? The Quality Assurance Project Plan (QAPP) listed 5 sediment sampling locations. They were identified as the origination point of Skokie Ditch, the bend in Skokie Ditch, the sediment trap located near the split in Skokie Ditch, equidistant between the origination point and the split, and the point where Skokie Ditch flows off-site. Section 4.5 of this Remedial Investigation lists those same 5 locations as having been sampled and the results tables list 5 sediment sample results, both surface and subsurface. Please explain this apparent discrepancy.
- 5) **Section 3.2.6** – On page 3-6 it lists 5 water quality parameters that were measured and recorded at each well during purging. These all had stabilization parameters (listed) that were to be met prior to sample collection. There were actually 6 parameters, in accordance with the QAPP. Oxidation-Reduction Potential (ORP) was also measured as is verified in Appendix A.7. Please revise this section to be consistent with what actually occurred during the investigation.
- 6) **Section 3.2.8** – The water level in the ditch at the time of sample collection is not reported here or in Appendix A.8 (Surface Water Sample Log Sheets). Was the creek at flood stage? Was it at base flow? Was it at a seasonal low (drought)? This type of information should be provided. The resultant data could be interpreted differently depending on the answer to these questions. There is also no mention of flow velocity of the creek. That information might be useful as well. Please include such information, if it exists.
- 7) **Section 3.2.8** – The QAPP and Table 3-2 of this document both indicate that the “Secondary Parameters” were to be evaluated for surface water. The text in this section does not mention those analyses. Please determine if samples for those parameters were or were not collected and analyzed. If they were, please include that information. If not, an explanation of why the QAPP was not followed will be required.

- 8) **Tables 3-3** – The last four numeric water level values reported for the 3/8/07 column are inaccurate. Please review and revise as necessary.
- 9) **Table 3-4** – Units of measure should be added to this table of sieve analysis results.
- 10) **Figure 3-3** – The sample IDs are confusing when compared to Table 3-1 and it appears there may be a couple of sediment samples missing from the figure. Please review the figure for clarity, determine if all samples have been properly identified, and revise as necessary.
- 11) **Figure 3-4** – The labels for the cross sections are missing the prime (‘) character on one end. The subsequent figures show cross sections, for example, from A – A’, but on this figure the label is shown as A – A. Please add the prime character where appropriate.
- 12) **Figure 3-9** – The groundwater contour lines are shown using a 5 foot contour interval. However, there appear to be several lines missing. The lines on the eastern half of the figure are labeled 690, 695, 700, and then 715. Lines for 705 and 710 need to be added. Please review and revise as necessary.
- 13) **Section 4.2** – Unless there is some reason the data from the previous Fire Fighter Training Unit (FFTU) investigation, specifically, is considered questionable, the known contamination remaining there should be worked into this section also. There were detections/exceedances for several contaminants including benzene, toluene, ethyl benzene, xylene, and naphthalene, were there not? Additionally, that data should be worked into the Chemical Fate and Transport Analysis Section and the Human Health Risk Assessment Section as well. It is understood that data was not part of this RI, but the contamination was identified, remains on-site, and will add to the residual risk at this site. If, as noted in the Quality Assurance Project Plan for this site, “because of uncertainties associated with data quality”, that data cannot be used to quantitatively assess potential risks at Site 1, then it should at least be used in a qualitative fashion to support the conclusions of the risk analysis. In that case, the FFTU information would tend to make the risk assessment less conservative.
- 14) **Section 4.3.1** – Following the first bullet, a concentration range of 0.27 to 0.27 micrograms per liter is listed. Suggest merely listing the concentration and stating that it applies to both samples, which were duplicates anyway.
- 15) **Section 4.5.3, Figure 4-4, Section 4.6.3** – Since there are PAH exceedances reported and shown for the surface and subsurface sediment samples collected at the southern-most location within the creek just prior to leaving the site, an additional sample or two should be collected from across the road to the south at the outfall of the creek and/or in the first

depositional area to determine whether the extent of contamination has been bounded or if it continues off-site and downstream.

- 16) **Table 4-1** – In the Polynuclear Aromatic Hydrocarbons portion of this table, the entry “BAP EQUIVALENT ZEROND” is included. This entry needs to be explained.
- 17) **Table 4-2** – Some of the parameters identified in this table as having no TACO soil remediation objective (NA) do have analogous values. These values can be obtained from the Agency web site at the following address: <http://www.epa.state.il.us/land/taco/chemicals-not-in-taco-tier-1-tables.html>.
- 18) **Tables 4-6 and 4-8** – The source for the surface water “Ecological Screening Level” values should be identified.
- 19) **Section 6.2.3** – The use of exposure units for a site of this size is essential for development of an acceptable risk assessment. The Agency was unable to verify the appropriateness of the environmental samples included in each of the receptor-specific exposure units. Please define the exposure units used for the exposure point concentrations (EPC) and provide the sample identification numbers or plots of sample locations along with contaminant concentration information that were grouped for each exposure unit EPC calculation.
- 20) **Section 6.2.3** – The fifth bullet on the subject page identifies the statistical software used to calculate the exposure point concentrations for the risk assessment. The ProUCL software package was significantly upgraded in April 2007 to version 4.0. Version 4.0 accepts up to 70% censored dataset where earlier versions could accept no more than 15% nondetects. Because significant numbers of nondetects are present in the Site 1 data, exposure point concentrations should be recalculated using the current version of ProUCL.
- 21) **Section 6.4.4.5** – In the fourth paragraph, average environmental lead concentrations are discussed. As in the comment for Section 6.2.3, to verify the reported findings, the exposure units need to be identified and which samples were included in the lead groundwater and lead soil exposure units.
- 22) **Section 6.5** – The Uncertainty Analysis Section should also discuss the potential for contamination to have been overlooked. As the site was once a trench and burn type landfill, the contamination would not be expected to be homogeneous across the site. It is very possible that the locations chosen for sampling, along the proposed sewer routes, were not in the most highly contaminated areas. This should be discussed as the risks posed at this site are likely under estimated for both the subsurface soil and groundwater within the bounds of the landfill.

- 23) **Section 6.6.4** – The last sentence states the surface soil at Site 1 consists of clean fill to a depth of 2 feet. Suggest revising it to read to a *minimum* depth of two feet since in many areas of the golf course the depth of fill is significantly more than two feet.
- 24) **Table 6-4** – The use of an attenuation factor of 0.001 in the vapor intrusion evaluation should be explained and justified. Also, please add the explanation for footnote #8 and add or explain the absence of footnote #7.
- 25) **Table 6-10** – The “Inhalation of Volatile Emissions While Showering” section of this table provides a breathing rate of 0.6 m³/hour. The associated footnote credits Illinois EPA as the source. Please refresh our memory as to the basis of this value.
- 26) **Table 6-12** – The Agency has several comments for this table of non-cancer toxicity values. They are as follows:
- For Barium, we ascertained an oral RfD of 2.0E-1 mg/kg-day from the IRIS data source.
 - For Manganese, we determined a combined oral RfD of 2.0E-02 mg/kg-day for all non-food sources (soil and water). We read the IRIS record to suggest two separate uncertainty factors; the first being 3 for concerns regarding absorption and the special circumstances relating to neonates and infants, and the second being 2 to focus on the non-dietary fraction of intakes.
 - For Thallium, we determined an oral RfD of 8.0E-05 which is the lowest of the Thallium salt RfDs from IRIS.
 - For Vanadium, we would select the HEAST RfD value of 7.0E-03 over the NCEA value. This decision is based on OSWER Directive 9285.7-53 regarding a hierarchy of data sources for selection of toxicological values.
 - Subchronic toxicity values for the construction worker receptor should be listed when available.
- 27) **Table 6-13** – Provide subchronic inhalation values when available.
- 28) **Table 6-14** – Illinois EPA understands that the slope factor presented in this table for “Vinyl Chloride (child)” should be used for any exposures that include receptors in stages of early-life. For this risk assessment, this would include the recreational/trespasser, future military resident, and future civilian resident receptors. Receptors that include no early-life-stage periods would use the “Vinyl Chloride (adult)” cancer slope value. Please confirm this and revise as necessary.
- 29) **Table 6-15** – We determined a unit risk of 3.3E+04 for TCDD TEQ from the HEAST data source.

- 30) **Section 7.1.4.1** – Following the first paragraph, a fourth bullet should be added to include reptiles and amphibians in the ecological risk assessment. This is in agreement with the site conceptual model (Figure 7-2).
- 31) **Section 7.6** – The second bullet describes a COPC screening process that uses the frequency of detection of contaminants. Obviously, this process would be meaningless to receptors having small home ranges such as soil or benthic invertebrates. Any frequency of detection screening process must be appropriate for each receptor's home range and the extent of the applicable ecological exposure units.
- 32) **Section 7.6.1.1** – In the third paragraph on page 7-19, add the units for the Cubbage et al. probable effects threshold value.
- 33) **Section 7.6.1.1** – In the last paragraph on page 7-19, the comparisons to Illinois background values were apparently performed using the wrong set of values. Comparisons should be completed using Table 1 of the Evaluation of Illinois Sieved Stream Sediment Data – 1982-1995.
- 34) **Tables 7-3 through 7-9** – All of the subject tables include average contaminant concentrations or average exposure factors. Screening level ecological risk assessments typically use maximum detection concentrations and reasonable maximum exposure factors. Please explain and justify the use of averages.
- 35) **Figure 7-2** – There is a footnote next to the soil exposure medium that has not been defined. Please add the definition to the figure.
- 36) **Section 8.1** – The first sentence following the second bullet on page 8-2 is incomplete. Please review and revise as necessary.
- 37) **Section 8.2** – The first bulleted item states that no additional investigation at the site is warranted. As noted previously, Illinois EPA believes a couple of additional sediment samples across Buckley Road to the south should be collected and analyzed to determine if contamination has spread off site.
- 38) **Section 8.2** – The last bulleted item suggests incorporating the FFTU into the feasibility study and decision documents. Illinois EPA is in agreement with that statement. However, as a former remediation site itself, closure for the FFTU site will need to be handled carefully and will require substantially more information, both historical and current, be included in those documents than would otherwise be necessary. See previous comment regarding contamination at that site.

- 39) **General** - All questions regarding the disposition of environmental quantities of dioxins and furans must be referred to the Toxic Substances Control Act division of the United States Environmental Protection Agency, Region 5, for approval.
- 40) **General** - No contaminant results or evaluation of surface soils risks and hazards are addressed in this report. All surface soils are reported to be imported from uncontaminated sources but no hard proof or documentation is provided. Surface soil can be a major contributor to risk for ecological and human receptors. Both the human health and ecological risk assessments are normally incomplete without an evaluation of current surface soil conditions and assurances that subsurface soils will not be moved to the surface through construction or repair activities on the site. In this case, Illinois EPA will agree that the imported surface soils on the golf course are clean and were imported from uncontaminated sources. However, as part of the final remedy, there must be worker caution notifications and restrictions placed upon the property to ensure subsurface soils will not be moved to the surface through construction or maintenance/repair activities. If, as planned, the presumptive remedy for landfills of capping is selected and implemented, such restrictions will be required for the cap anyway.

If you have any questions regarding anything in this letter or require any additional information, please contact me at (217) 557-8155 or by electronic mail at Brian.Conrath@illinois.gov.

Sincerely,

Brian A. Conrath

Brian A. Conrath
Remedial Project Manager
Federal Facilities Unit
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cc: Bob Davis, Tetra Tech NUS, Inc.
Owen Thompson, USEPA (SR-6J)