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LETTER REGARDING U S NAVY RESPONSE TO FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION COMMENTS ON FINAL RISK ASSESSMENT RE-EVALUATION OF SOILS AT SITES 9-18 NAS WHITING FIELD FL

4/18/2008

TETRA TECH NUS

TETRA TECH NUS, INC.
3360 Capital Circle N.E., Suite B • Tallahassee, FL 32308
Tel 850.385.9899 • Fax 850.385.9860 • www.tetratech.com

April 18, 2008

Florida Department of Environmental Protection
Attn: Mr. John Winters
Twin Towers Office Bldg.
2600 Blair Stone Road
Tallahassee, FL 32399

Subject: **Response to FDEP Comments on the Final Risk Assessment Re-evaluation of Soils for Sites 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18 Naval Air Station (NAS) Whiting Field, Milton, Florida**

Dear Mr. Winters:

Attached please find a copy of Tetra Tech's response to comments (RTCs) for FDEP comments (received December 2007) issued on the above referenced report (submitted September 2006).

Please call me at 850-385-9899 if you have any questions regarding this letter or the attached RTCs.

Sincerely,

Michael O. Jaynes

Michael O. Jaynes, P.E.
Senior Engineer/Project Manager

Enclosures

Cc: Larry Smith, TtNUS
Rich May, TtNUS
Sarah Reed, NAVFAC SE
Craig Benedikt, USEPA

RESPONSES TO FDEP COMMENTS ON THE FINAL RISK ASSESSMENT RE-EVALUATION OF SOILS AT SITES 9 THROUGH 18 (TtNUS, 2006)

General Comments:

1. It is unclear why the risk assessment for soil did not address leachability. Applying a two-foot clean soil cover and restricting excavation may eliminate direct contact risk for current and future receptors, but it does not prevent chemicals from leaching. Deeper soil may still need to be removed or treated to protect groundwater and surface water.

TtNUS Response to No. 1: As stated in the introduction of your comment letter, leachability will be addressed in a separate report (Site 40 – Base-wide Groundwater at NAS Whiting Field) and, therefore, was not dealt with in this risk assessment re-evaluation.

As part of the Site 40 RI (in production), a groundwater pathway evaluation using SESOIL modeling was conducted for all sites at NAS Whiting Field including the 10 sites covered in this risk assessment re-evaluation. The full text (approx. 40 pages) is available upon request. For immediate reference, excerpts from the introduction and conclusion sections of the evaluation are provided below.

Introduction

"The groundwater pathway evaluation was performed using SESOIL (SEasonal SOIL compartment model). This modeling software was developed for the U.S. Environmental Protection Agency (USEPA) and is highly recommended by the USEPA, the State of Florida, and the American Society for Testing and Materials (ASTM) to perform soil-to-groundwater screening-level evaluations (Bonazountas et al., 1997). SESOIL is capable of simultaneously simulating water transport, sediment transport, and contaminant fate. SESOIL is widely used by consultants and state regulatory agencies in assessing vertical migration of contaminants in soil as well as determining alternative SCTLs protective of groundwater. The model's ability to account for contaminant wash load, volatilization and air diffusion of the volatile organic compounds (VOCs), sorption/desorption onto the soil matrix, degradation, cation exchange, hydrolysis, and metal complexation makes it a powerful and robust assessment tool.

The model calculates the amount of rainfall infiltrating the ground and passing through contaminated soil to the water table. In the model, the unsaturated zone (i.e., vadose zone) can be divided in up to 4 layers and each layer may be divided into 10 sub layers. As water passes down through the soil "compartments", the model simulates contaminant mass desorbing from the soil and moving primarily downward. However, the model also supports volatile organic compounds (VOCs) possibly volatilizing and move upward by diffusion through air-filled pore spaces. In the model, the downward velocity of contaminant migration is primarily dependent on the soil water velocity, the soil-water partition coefficient (K_d) of the contaminant, and the rate of biodegradation (for organic compounds only)."

"The approach for estimating initial contaminant concentrations in vertical soil profiles also resulted in conservative model results. The highest concentration for each contaminant detected at a given site and given depth interval was used to represent the entire area for the given interval. Thus, maximum concentrations were obtained from various parts of a site and extrapolated to create an exaggerated vertical concentration profile for the whole site. This approach created overestimated concentration profiles and resulted in a higher contaminant mass in the soils than likely to be present at each site."

The remainder of this appendix discusses:

- ***The general site geology and hydrogeology features (Section E.2).***
- ***The general soil types and soil characteristics found at NAS Whiting Field (Section E.3).***
- ***The climatic data and calculated groundwater recharge rates (Section E.4).***
- ***The physical and chemical characteristics of each contaminant that affect mobility, fate, and persistence (Section E.5).***
- ***Each of the 22 sites on a site by site basis (Sections E.6 through E.27), including: the geology, hydrology, and physical characteristics of each individual site; the nature, extent, and transport characteristics of principal contaminants; and the modeling results for each contaminant."***

<u>Conclusions</u>

"Overall, the concentrations of contaminants in shallow (e.g., 0 – 15 ft bgs) and mid-depth soils (e.g., 15 – 40 ft bgs) do not seem to pose risks to groundwater quality....

The modeling performed for these evaluations used maximum concentrations detected in order to build a profile of current contamination in the vadose zone at each site. Using conservatively high concentrations over conservatively large areas results in over predicted starting contaminant mass in each model and over predicted impacts. Therefore, the minimal GCTL exceedences predicted by the modeling runs are not likely to occur in reality."

In summary, the 10 sites covered in this risk assessment re-evaluation present very low to no risk for impacts on groundwater pathways.

2. Antimony, chromium, and silver were eliminated as COCs because they were below site-specific background. Although this is a possibility, we have not seen any site-specific background data on these metals. Therefore, we cannot comment on the validity of their exclusion.

TtNUS Response to No. 2: Please refer to the RI/FS General Information Report (ABB-ES, 1998) for further information on the site-specific background data study.

3. Chapter 62-777, FAC was updated in February 2005. The re-evaluation would be more sound if current FDEP cleanup target levels (CTLs) were used instead of values from 1999.

TtNUS Response to No. 3: Agreed. However, the risk assessments were performed before Chapter 62-780, F.A.C. was finalized. If the final version had been available, the April 2005 guidance would have been used to prepare the risk assessments presented in the RIs for the subject sites. Along the same lines, the re-evaluation was conducted prior to the new numbers being finalized. In order to incorporate the new numbers the entire analysis would need to be re-done. There is currently not funding for this task. In summary, the conclusions of the human health risk assessments would not change significantly.

4. The derivation of TRPH cleanup target levels differs from methods used for other chemicals. Therefore, TRPH criteria should not be apportioned.

TtNUS Response to No. 4: Comment noted. Also, see response to Comment No.10 (Site 10).

5. Adult and adolescent recreational users and trespassers were assumed to be exposed to on-site soil for 45 d/y based on professional judgment. Although 45 d/y may be an appropriate exposure frequency for a trespasser, it is low for recreational users. We recommend using an exposure frequency of 200 d/y for the recreational scenario. This value has been used by the FDEP for recreational scenarios and other sites.

TtNUS Response to No. 5:

Given the current and expected future use of Sites 9 – 18 (an active military facility that will remain active for the foreseeable future – see Section 2.1.2.1), the most likely potentially exposed population is the trespasser. The possibility of future use as recreation space for these sites is minimal. Given this, an exposure frequency for trespassers of 200 days per year is excessive; a more realistic exposure frequency for trespassers is the 45 day/year value used in the risk assessment for these sites.

There is scant evidence in the literature for an appropriate exposure frequency for trespassers. The USEPA's Human Health Evaluation Manual (USEPA 1991) notes that at most active military sites, like NAS Whiting Field, security patrols and normal maintenance of barriers such as fences tend to limit, if not entirely prevent, trespassing. At NAS Whiting Field, guards do in fact continually patrol these sites and most of the perimeter of these sites is fenced, substantially limiting access.

Nonetheless, to account for the remote possibility that the sites might be accessed by trespassers, USEPA Region 4's suggested exposure frequency of 45 days/year (USEPA 1995) was used in the risk assessment for these sites.

6. Acute-effects based on SCTLs that exist for a number of chemicals (e.g., copper, fluoride, vanadium) were not used in evaluating the recreational land use scenario. If children are permitted to use the park, then the acute toxicity-based SCTLs would be applicable.

TtNUS Response to No. 6:

Acute effects-based SCTLs were developed by FDEP for 8 chemicals – barium, cadmium, copper, cyanide, fluoride, nickel, phenol, and vanadium. An examination of the specific non-cancer hazards at each site, where applicable, was conducted to determine the changes to the risk assessment (if any) of using acute SCTLs.

At Site 9, the only notable change to the risk assessment is a decrease in the risk ratio for vanadium in surface soil (from 5.1 to 1.1) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (see Table 3-3).

At Site 10, one notable change to the risk assessment is a decrease in the risk ratio for vanadium in surface soil (from 4.2 to 0.6, or below 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (see Table 4-4). Also at Site 10, another notable change is a decrease in the risk ratio for vanadium in subsurface soil (from 6.9 to 1.6) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (see Table 4-9).

At Site 11, one notable change to the risk assessment is a decrease in the risk ratio for vanadium in surface soil (from 1.4 to 0.3, or below 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (see Table 5-4). Also at Site 11, another notable change is a decrease in the risk ratio for vanadium in subsurface soil (from 2.5 to 0.6, or below 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (see Table 5-7).

At Site 12, one notable change to the risk assessment is a decrease in the risk ratio for vanadium in surface soil (from 1.8 to 0.4, or below 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (Table 6-4). Also at Site 12, another notable change is a decrease in the risk ratio for vanadium in subsurface soil (from 2.8 to 0.4, or below 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (Table 6-6).

At Site 13, one notable change to the risk assessment is a decrease in the risk ratio for vanadium in surface soil (from 4.2 to 0.6, or below 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (Table 7-4). Also at Site 13, another notable change is a decrease in the risk ratio for vanadium in subsurface soil (from 3.0 to 0.7, or below 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (Table 7-6).

At Site 14, one notable change to the risk assessment is a decrease in the risk ratio for vanadium (from 2.8 to 0.6, or below 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (Table 8-3). Also at Site 14, another notable change is a decrease in the risk ratio for vanadium in subsurface soil (from 3.2 to 0.7, or below 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (Table 8-5).

At Site 15, one notable change to the risk assessment is a decrease in the risk ratio for vanadium (from 2.4 to 0.5, or below 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (Table 9-4). Also at Site 15, another notable change is a decrease in the risk ratio for vanadium in subsurface soil (from 1.7 to 0.4, or below 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (Table 9-6).

At Site 16, notable changes to the risk assessment are a decrease in the risk ratio for barium in surface soil (from 2.3 to 2.1) because the SCTL used in the risk assessment was 110 mg/kg and the acute SCTL is 120 mg/kg; a decrease in the risk ratio for copper in surface soil (from 1.8 to 1.3) because the SCTL used in the risk assessment was 110 mg/kg and the acute SCTL is 150 mg/kg; and a decrease in the risk ratio for vanadium in surface soil (from 1.9 to 0.4, or below 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (Table 10-4). Also at Site 16, notable changes to the risk assessment are a decrease in the risk ratio for barium in subsurface soil (from 1.6 to 1.5) because the SCTL used in the risk assessment was 110 mg/kg and the acute SCTL is 120 mg/kg; a decrease in the risk ratio for copper in subsurface soil (from 33 to 24) because the SCTL used in the risk assessment was 110 mg/kg and the acute SCTL is 150 mg/kg; and a decrease in the risk ratio for vanadium in subsurface soil (from 4.5 to 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (Table 10-7)

At Site 17, notable changes to the risk assessment are a decrease in the risk ratio for barium in surface soil (from 1.5 to 1.4) because the SCTL used in the risk assessment was 110 mg/kg and the acute SCTL is 120 mg/kg; a decrease in the risk ratio for copper in surface soil (from 2.1 to 1.6) because the SCTL used in the risk assessment was 110 mg/kg and the acute SCTL is 150 mg/kg; and a decrease in the risk ratio for vanadium in surface soil (from 4.8 to 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (Table 11-4). Also at Site 17, another notable change is a decrease in the risk ratio for vanadium in subsurface soil (from 7.0 to 1.6) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (Table 11-8). Also at Site 17, another notable change is a decrease in the risk ratio for vanadium in subsurface soil > 15 feet bgs (from 2.4 to 0.5, or below 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (Table 11-11).

At Site 18, notable changes to the risk assessment are a decrease in the risk ratio for barium in surface soil (from 2.6 to 2.4) because the SCTL used in the risk assessment was 110 mg/kg and the acute SCTL is 120 mg/kg; and a decrease in the risk ratio for copper in surface soil (from 7.9 to 5.8) because the SCTL used in the risk assessment was 110 mg/kg and the acute SCTL is 150 mg/kg (Table 12-4). Also at Site 18, another notable change is a decrease in the risk ratio for vanadium in subsurface soil (from 1.6 to 0.4, or below 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (Table 12-8). Also at Site 18, another notable change is a decrease in the risk ratio for vanadium in subsurface soil > 15 feet bgs (from 2.7 to 0.6, or below 1.0) because the SCTL used in the risk assessment was 15 mg/kg and the acute SCTL is 67 mg/kg (Table 12-13).

In summary, the effect of using the acute SCTLs is a decrease in risk ratios in every case, and a decrease to below 1.0 in many cases.

Appendix A:

7. The comparison between site and background samples used the null hypothesis that there was no significant difference between site and background data (Test Form 1). This form of the test will lead to the conclusion that the site is not contaminated unless there is compelling data to the contrary. As such, this form of the test is inherently un-conservative. Test Form 2 has as its null hypothesis that the site is contaminated, and its use offers more assurance that a false negative conclusion will not be reached (i.e. concluding that the site is not contaminated when in fact it is). We recommend including Test Form 2 in the analysis.

TtNUS Response to No. 7: Comment noted.

8. The USEPA recommends at least 24 data points in each group to conduct a parametric test. In some cases parametric ANOVA tests were conducted in the risk assessment re-evaluation with as few as six data points. Parametric tests perform poorly when the data set is small.

TtNUS Response to No. 8: Comment noted.

Site 9:

9. Samples were taken from 0 to 1 foot below ground surface (bgs). A two-foot clean soil cover was then placed over the surface of the site. The soil cover eliminates risk from direct contact, but subsurface soul conditions (below 3 feet bgs) are unknown. In view of limited information on subsurface contaminant concentrations, institutional controls regarding excavation and/or construction may be warranted at this site.

TtNUS Response to No. 9: Comment noted. A ROD documenting No Further Action for surface and subsurface soil at Site 9 was approved in 2005.

Site 10:

10. We disagree with the recreational criteria develop for Site 10 COCs (TRPH = 31,000 milligrams per kilogram (mg/kg), barium = 250,000 mg/kg, and cPAHs = 0.8 mg/kg). Site-specific recreational criteria should be developed based on a 200 d/y exposure frequency. The SCTL for barium should remain 120 mg/kg if small children may be present. Use of an alternative CTL necessitates apportionment, per Chapter 62-780, FAC.

TtNUS Response to No. 10:

As described in the response to General Comment No. 5, the most appropriate exposure scenario for Site 10 is the trespasser. The trespasser is generally considered to be an adolescent, not a child who may exhibit pica behavior (i.e., the ingestion of large amounts of soil). As a consequence, the barium acute effects-based SCTL is not an appropriate comparison SCTL for Site 10. In addition, the appropriate exposure duration for this scenario at Site 10 is 45 days/year; not 200 days/year. Thus, non-apportioned SCTLs for TRPH and cPAHs would remain 31,000 mg/kg and 0.8 mg/kg, respectively. Apportioned SCTLs for TRPH and cPAHs would be as follows:

For TRPH:

31,000 mg/kg ⁄ 28 = 1,107 mg/kg

The number 28 represents the total number of noncarcinogenic chemicals detected in Site 10 surface soil. This is a conservative estimate of the apportioned SCTL for TRPH because the actual number of noncarcinogenic chemicals detected in Site 10 soil that affect the same target organ is less than 28 (FDEP rules stipulate that an apportioned SCTL for a noncarcinogenic chemical is determined by dividing the non-apportioned SCTL by only the number of chemicals that affect the same target organ).

For cPAHs:

0.8 ⁄ 14 = 0.06 mg/kg

The number 14 represents the total number of carcinogenic chemicals detected in Site 10 surface soil. FDEP rules stipulate that an apportioned SCTL for a carcinogenic chemical is determined by dividing a non-apportioned SCTL by the total number of carcinogenic chemicals, even though different carcinogens may cause different tumors types and/or cause cancer by different mechanisms.

The apportioned SCTL for TRPH – 1,107 mg/kg – is almost two times greater than the maximum surface soil TRPH concentration (666 mg/kg; see Table 4-7). This results in a risk ratio of 0.6. The risk ratio for cPAHs, using the apportioned SCTL, is greater than 1.0, but the risk ratio was greater than 1.0 using the non-apportioned risk ratio.

11. Samples taken from 0 to 1-foot bgs exceed residential, industrial and recreational SCTLs. Limited subsurface (below 1 foot bgs) sampling found no significant contamination. A two-foot clean soil cover was then placed over the surface of the site. The soil cover eliminated exposure to contamination by direct contact under current site conditions, but excavation to uncover contaminated soils in the future should be prevented through institutional controls.

TtNUS Response to No. 11: Agreed. A ROD documenting Non-residential/Recreational LUCs (including a digging/excavation prohibition) for surface and subsurface soil at Site 10 was approved in 2007.

<u>**Site 11:**</u>

12. The exposure point concentration at Site 11 for dieldrin is 0.1 mg/kg. We recommend developing a site-specific recreational criterion using an exposure frequency of 200 d/y. Apportionment was not attempted for the recreational scenario. It is therefore unclear if dieldrin exceeds the apportioned recreational SCTL for this site.

TtNUS Response to No. 12:

A site-specific recreational SCTL was not developed for dieldrin at Site 11 because the surface soil exposure point concentration – 0.1 mg/kg – was less than the Level 2 (industrial) SCTL for dieldrin – 0.3 mg/kg (see Table 5-6). Therefore, a Level 3 (recreational) evaluation was not required for surface soil.

Likewise, a site-specific recreational SCTL was not developed for dieldrin at Site 11 because the subsurface soil exposure point concentration – 0.033 mg/kg – was less than the Level 1 (residential) SCTL for dieldrin – 0.07 mg/kg (see Table 5-7). Therefore, Level 2 (industrial) and Level 3 (recreational) evaluations were not required for subsurface soil.

13. The recreational SCTL was not created for lead. Lead is a COC at this Site and, if recreational use is a possibility, an SCTL should be derived for this scenario. Additionally, the maximum lead concentration of 2,230 mg/kg may exceed the recreational SCTL.

TtNUS Response to No. 13:

Page 5-4 of the risk assessment provides an evaluation of surface soil lead concentrations. Although the maximum detected concentration of 2,230 mg/kg in surface soil (location 11-SL-02) exceeded the USEPA and screening level of 400 mg/kg for residential exposures (400 mg/kg is also the Florida residential SCTL), extensive surface soil sampling for lead in the immediate vicinity of location 11-SL-02 suggests very limited lead contamination in this area. The arithmetic mean lead concentration for 30 locations established by a 25-foot sampling grid in the vicinity of location 11-SL-02 does not exceed 150 mg/kg. Currently, there is no acceptable model for evaluating lead exposures in an adolescent trespasser population and consequently, no means to derive an alternate SCTL for lead based on this population. However, a health-protective approach (if one accepts that children are the most sensitive population with respect to lead health effects and with respect to the degree of lead absorption from the environment) is to evaluate hypothetical future residential exposures in children ages 0 to 7 years to lead in surface soil using the IEUBK lead model, as was done in the risk assessment for Site 11.

As recommended by the IEUBK model, the average concentration of lead in surface soil (93.1 mg/kg, all available surface soil data considered) was used as the model input for soil. Default parameters were used for the rest of the model input parameters. IEUBK model outputs are included in Appendix B of the risk assessment. The lead concentration of 93.1 mg/kg in surface soil results in less than 1 percent of future on-site child residents having a blood lead level greater than 10 µg/dL. This result does not exceed the USEPA goal of no more than 5 percent of children exceeding a 10 µg/dL blood lead level. Therefore, soil lead concentrations at Site 12 are safe for adolescent trespassers.

14. Chemical concentrations in the soil are acceptable for commercial/industrial use. This would require an institutional control.

TtNUS Response to No. 14: Based on the responses to No. 12 and No. 13 above addressing risk re-evaluation calculations, the Navy believes the previously selected Non-residential/Recreational LUCs documented in the approved ROD should be adequate for Site 11.

Site 11 Ecological Risk:

15. As previously mentioned in our letter dated April 27, 2005, there is an avian toxicity value listed for heptachlor in the Region 6 Screening Level Ecological Risk Assessment Protocol, Appendix E, Toxicity Reference Values (TRVs). Heptachlor has an acute LOAEL for quail of 6,500 ug/kg. The recommended TRV is 65 ug/kg. In the absence of other avian toxicity data for heptachlor, the TRV based on an acute LOAEL can be used to estimate a lower bound (less conservative) risk estimate.

TtNUS Response to No. 15: Comment noted. The recommended TRV is not likely to change the results of the evaluation.

Site 12:

16. No chemicals were present above FDEP default residential SCTLs in surface or subsurface soil.

TtNUS Response to No. 16: Agreed. A ROD documenting No Action for surface and subsurface soil at Site 12 was approved in 2005.

Site 13:

17. There are no chemicals that exceed residential SCTLs from zero to one-foot bgs. Mercury concentrations in subsurface soil below a depth of five-feet bgs exceeded the residential SCTL. No soil samples were taken from one to five feet bgs. The vertical extent of Mercury contamination is therefore unclear and needs to be delineated. The current mercury concentrations do not exceed the industrial/commercial SCTL and the site could be restricted to industrial use with an institutional control.

TtNUS Response to No. 17: Comment noted. A ROD documenting Non-residential/Recreational LUCs (including a digging/excavation prohibition) for surface and subsurface soil at Site 13 was approved in 2006.

Site 14:

18. Site 14 had no chemical concentrations above FDEP default residential SCTLs for zero to one-foot bgs and below five feet bgs. Although there is no indication that the site is contaminated, the absence of samples from one to five feet bgs limits the ability to conclude with confidence that the site is clean.

TtNUS Response to No. 18: Comment noted. Please note that the risk re-evaluation did note that the subsurface soil dataset was limited. A ROD documenting No Further Action for surface and subsurface soil at Site 14 was approved in 2006.

Site 15:

19. We disagree with the recreational SCTL of 6.2 mg/kg developed for Aroclor-1242. We recommend developing site-specific recreational criterion using an exposure frequency of 200 d/y. The exposure point concentration of 2.2 mg/kg may exceed this recreational criterion.

TtNUS Response to No. 19:

As described in the response to General Comment No. 5, the most appropriate exposure scenario for Site 15 is the trespasser. As such, the appropriate exposure duration for this scenario at Site 15 is 45 days/year; not 200 days/year. Thus, the recreational SCTL for Aroclor-1242 would remain 6.2 mg/kg.

20. There are no chemicals that exceed residential SCTLs from zero to one-foot bgs. Aroclor-1242 concentrations in subsurface soil below a depth of five feet bgs exceed residential and recreational SCTLs. No soil samples were taken from one to five feet bgs. The extent of Aroclor-1242 contamination is therefore unclear and needs to be delineated.

TtNUS Response to No. 20: Comment noted. Please note that the risk re-evaluation did note that the subsurface soil dataset was limited. A ROD documenting Non-residential/Recreational LUCs (including a digging/excavation prohibition) for surface and subsurface soil at Site 15 was approved in 2006.

21. The current Aroclor-1242 concentrations do not exceed the industrial/commercial SCTL and the site could be restricted to industrial use by an institutional control.

TtNUS Response to No. 21: Comment noted. A ROD documenting Non-residential/Recreational LUCs (including a digging/excavation prohibition) for surface and subsurface soil at Site 15 was approved in 2006.

Site 16:

22. We disagree with the recreational criterion developed for cPAHs (0.8 mg/kg). The unapportioned recreational SCTL should be based on an exposure frequency of 200 d/y. However, use of an alternative CTL necessitates apportionment. Apportionment could decrease the recreational SCTL for cPAHs and cause an exceedence of the criterion for the recreational scenario.

TtNUS Response to No. 22:

On pages 10-8 and 10-9 of the risk assessment for Site 16 surface soil and subsurface soil, it says "No COCs were identified in the Level 2 evaluation; consequently, a Level 3 [recreational] evaluation was not required." As such, no alternate recreational SCTLs were developed for either surface soil or subsurface soil at Site 16. References to the development of recreational SCTLs at Site 16 (e.g., page 10-11, 3rd paragraph, 2nd line) were made in error.

23. Site 16 surface and subsurface soils meet industrial/commercial SCTLs. If contamination is left in place, the site could be managed under an industrial land use scenario, which would require an institutional control.

TtNUS Response to No. 23: Agreed. Soils exceeding industrial SCTLs were removed during the IRA in 2002. A ROD documenting Non-residential/Recreational LUCs as the selected remedy for surface and subsurface soil at Site 16 is currently being proposed.

<u>Site 16 Ecological Risk:</u>

24. As previously mentioned in our later dated April 27, 2005, there is an avian toxicity value listed for silver in the Region 6 Screening Level Ecological Risk Assessment Protocol, Appendix E, Toxicity Reference Values. Silver has a subchronic (14 day) NOAEL for the mallard of 1780 mg/kg. The recommended TRV is 178 mg/kg.

TtNUS Response to No. 24: Silver was eliminated as a COC based on the site-specific background data. Please see the RI/FS General Information Report (ABB-ES, 1998) for further information on the site-specific background study.

25. Total chromium is usually 90% trivalent and 10% hexavalent, but under oxidizing conditions the percentage of hexavalent chromium can be much greater. In the absence of speciation data or data presenting soil conditions favorable to the formation of trivalent chromium, the conservative method is to assume chromium concentrations consist of hexavalent chromium. Therefore, the proper screening level is 0.4 mg/kg and chromium should remain a COPEC.

TtNUS Response to No. 25: Comment noted. While the described assumptions are possible, based on site-specific data and conditions it is not likely that hexavalent chromium is prevalent at Site 16. The use of the recommended screening level would not likely change the results of the evaluation.

<u>Site 17:</u>

26. We disagree with the recreational criterion developed for TRPH (31,000 mg/kg). Based on an exposure scenario of 200 d/y, the recreational criterion would probably decrease. The exposure point concentration for Site 17 (4957 mg/kg) may exceed the recreational criterion.

TtNUS Response to No. 26:

As described in the response to General Comment No. 5, the most appropriate exposure scenario for Site 18 is the trespasser. As such, the appropriate exposure duration for this scenario at Site 15 is 45 days/year; not 200 days/year. Thus, the recreational SCTL for TRPH would remain 31,000 mg/kg.

27. Samples taken from zero to eight inches bgs exceed residential, industrial, and recreational SCTLs. Subsurface soils below five feet bgs are clean. A two-foot clean soil cover was then placed over the surface of the Site. The soil cover eliminates exposure to contamination by direct contact. However, excavation or construction could bring contaminated soil to the surface. This possibility should be eliminated with an institutional control.

TtNUS Response to No. 27: Agreed. A ROD documenting Non-residential/Recreational LUCs (including a digging/excavation prohibition) for surface and subsurface soil at Site 17 was approved in 2006.

<u>Site 18:</u>

28. TRPH also exceeds the recreational SCTL in surface soil and should be added to the COC list for the recreational scenario.

TtNUS Response to No. 28:

According to Table 12-7 of the risk assessment, the maximum TRPH concentration in surface soil at Site 18 is 23,500 mg/kg. This is less than the recreational SCTL of 31,000 mg/kg. Therefore, TRPH is not a COC for the recreational scenario.

29. Surface and subsurface soils exceed residential, industrial, recreational, and construction worker SCTLs. Two feet or clean soil was placed as a cover over the surface of the site. The soil cover eliminates exposure to contamination by direct contact. However, excavation or construction could bring contaminated soil to the surface. This possibility should be eliminated with an institutional control

TtNUS Response to No. 29: Agreed. A ROD documenting Non-residential/Recreational LUCs (including a digging/excavation prohibition) for surface and subsurface soil at Site 18 was approved in 2006.

30. Pages 12-8 states "The HI for industrial workers was approximately equal to 1 indicating adverse, non-carcinogenic effects are not anticipated for industrial workers". The HI for industrial workers is equal to 1.4. Therefore, TRPH remains a concern for the industrial scenario.

TtNUS Response to No. 30:

An HI value should not be reported to more significant figures than the least number of significant figures associated with the exposure and toxicity factors used to determine the HI value. In other words, there can be no more mathematical precision in an HI value than that associated with the input to that value. Since EPA's IRIS (Integrated Risk Information System) data base reports toxicity values (reference doses) to only one significant figure, HI values are to be reported with no more precision than one significant figure. An HI value of 1.4 mathematically cannot be distinguished from a value of 1.0 if input to both values is reported to one significant figure. Therefore, the statement "The HI for industrial workers was approximately equal to 1 indicating adverse, non-carcinogenic effects are not anticipated for industrial workers" is true and TRPH is not a concern for the industrial scenario.