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EMAIL AND ATTACHED U S NAVY RESPONSE TO U S EPA REGION V COMMENTS  
REGARDING THE DRAFT FINAL RESOURCE CONSERVATION AND RECOVERY ACT  
FACILITY INVESTIGATION ADDENDUM FOR SOLID WASTE MANAGEMENT UNIT 16  
(SWMU 16) CAST HIGH EXPLOSIVES FILL/BUILDING 146 INCINERATOR NSA CRANE IN  
09/04/2015  
NAVFAC MID ATLANTIC

## Cohen, Deborah

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**From:** Brent, Thomas CIV NAVFAC MIDLANT, PWD Crane <thomas.brent@navy.mil>  
**Sent:** Friday, September 04, 2015 3:34 PM  
**To:** Ramanauskas, Peter  
**Cc:** Cole, Linda L CIV NAVFAC MIDLANT, IPTNE; Cohen, Deborah; Basinski, Ralph  
**Subject:** SWMU 16 RFI RTCs (March 2012)  
**Attachments:** 2\_Responses to EPA 2012 Comments on 2011 RFI\_May 26 2015.pdf  
**Signed By:** thomas.brent@navy.mil

Pete,

Attached are the responses to comments from March 2012 on the SWMU 16 RFI. Specifically, the comments addressed eco issues. No changes are proposed for the RFI since the eco risks were mitigated during the IM. An RFI Addendum will be submitted to provide an update RFI conclusions based on completion of IM (2013/2014) at SWMU 16. Please let me know if you have any questions or concerns.

Thanks,  
Tom

**Responses to USEPA March 6, 2012 Comments**  
**ERA - March 2011 RFI Report**  
**SWMU 16 - Cast High Explosives Fill/B146 Incinerator,**  
**Naval Support Activity Crane**  
**Crane, Indiana.**

On January 26, 2015, the Navy and United States Environmental Protection Agency Region 5 (USEPA) discussed how to finalize the March 2011 Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for SWMU 16 given the completion of the 2013/2014 interim measures (IM) and finalization of the IM Report in September 2014. It was agreed that change pages for the March 2011 RFI Report (cover and title) would be provided to indicate that the current document is the final version. The Navy also agreed to prepare an RFI Addendum that updates the Executive Summary from the March 2011 RFI Report to address ecological risks for exposure to soil remaining after the IM was completed. Also on January 26, 2015, USEPA provided comments dated March 6, 2012 on the Ecological Risk Assessment (ERA) in the SWMU 16 RFI Report and requested that the Navy review these comments to confirm that they have been resolved during execution of the IM. No changes to the Ecological Risk Assessment (ERA) are required. The March 2012 comments provided have been adequately addressed by the completion of the 2013/2014 IM. There are no potentially unacceptable ecological risks remaining to soil at SWMU16.

The following provides background and responses to general topics (Step 3a Refinement Step, Use of Older Screening Levels, Background Comparison, and Sediment and Surface Water) presented in the March 6, 2012 USEPA comments to support that USEPA ecological concerns have been addressed as part of the ERA and the planning for and completion of the IM at SWMU 16. Specific comment numbers are referenced below for clarification purposes, when necessary. With the exception of adding text to the RESPONSE: Information about comments related to the ERA has been added. RFI Addendum to indicate that the IM has been completed and that ecological risks as have been addressed, no additional risk evaluation or update to the March 2011 RFI is necessary.

**Background**

The ERA was conducted in accordance with the approach presented in the approved Quality Assurance Project Plan (QAPP) (Tetra Tech, February 2003). The ERA was reviewed by USEPA prior to 2012 as part of the USEPA review of the RFI Report. Comments received February 8, 2007 on the RFI Report included comments on the ERA. The one comment relating to a screening level was addressed. The remaining comments either concurred with the identification of lead, antimony, copper, and zinc as ecological chemicals of concern (COC)s or did not require any modifications to the ERA. . The ERA concluded that terrestrial plants and invertebrates at SWMU 16 could be impacted from exposure to antimony, copper,

lead, and zinc in soil and birds could be impacted from lead and zinc in soil. Risks were acceptable for ecological receptors exposed to chemicals in the sediment and surface water.

The conclusions of the ERA were reiterated in the May 2010 Sampling and Analysis Plan (SAP) (Field Sampling Plan and Quality Assurance Project Plan) SWMU 16 Cast High Explosives Fill/Building 146 Incinerator Toxicity Testing, which stated the following in Section 10.4, Conceptual Site Model:

*“Results from the RFI Ecological Risk Assessment indicate unacceptable risks from exposure to surface soil. Ecological receptors that could be impacted from exposure to metals in surface soil consist of terrestrial plants, terrestrial invertebrates, and birds. Based on data collected during the RFI, terrestrial plants and invertebrates at SWMU 16 could be impacted from exposure to antimony, copper, lead, and zinc in soil, while birds could be impacted from lead and zinc in soil.”* Furthermore, as indicated in Section 11.1, Problem Definition, of the SAP: *“In order to evaluate remedial alternatives in the CMS, the volume of contaminated soil that must be addressed must be estimated. Utilization of only the generic risk-based screening criteria for the soil volume estimates could result in an over-estimation of the soil volume requiring remediation. Therefore, toxicity testing using impacted surface soil from SWMU 16 and standard test organisms will be conducted to establish site-specific media cleanup standards for antimony, copper, lead, and zinc.”*

Based on these conclusions, the Navy decided to perform an IM to excavate the metal-contaminated soils. Toxicity testing using SWMU16 soil was conducted to establish site-specific media cleanup standards (MCS) for protection of ecological receptors. The toxicity testing methodology was established in the USEPA-approved May 2010 SAP. In accordance with the SAP, plant and earthworm toxicity tests and earthworm bioaccumulation tests were conducted to establish site-specific soil MCSs for antimony, copper, lead, and zinc. The development of these site-specific soil MCSs are presented in the October 2013 Final Technical Memorandum Ecological Media Cleanup Goals, SWMU 16 Surface Soil (Technical Memorandum). USEPA had provided comments, December 21, 2012 on the Technical Memorandum. . The Navy provided responses to the comments on April 21, 2013. The exposure parameters and toxicity reference values for the food chain model that are in the final Technical Memorandum were used to determine the MCS for the four metals. These MCS were used in the SWMU 16 Interim Measures Work Plan (IMWP) to establish excavation boundaries for remediation of ecological risks. The final parameters/values that were used to develop the MCSs are presented in the Technical Memorandum. . The September 2014 Final Interim Measures Report (IMR) for SWMU 16 Cast High Explosives Fill/Building 146 Incinerator documents completion of the IM and attainment of the MCS. Therefore, no further action is necessary to address ecological risks for SWMU 16.

### **Step 3a Refinement Step**

Consistent with Navy Policy for Conducting Ecological Risk Assessments (Ser N453E/9U595355, dtd 1999Apr05), the RFI ERA consisted of Tier 1 (Steps 1 and 2 – the Screening Risk Assessment) and the first part of Tier 2 (the Step 3a refinement portion of the Baseline Ecological Risk Assessment). The initial COPCs identified at the end of Step 2 based on maximum chemical concentrations and conservative exposure assumptions, were refined in Step 3a using average chemical concentrations, more realistic exposure assumptions, and other factors to determine whether the chemicals and receptors needed to proceed further in the ERA process. The Step 3a refinement step was conducted in accordance with the Appendix D of the QAPP, which presents the exposure factors, toxicity reference values, and approach for conducting the conservative (screening) and average (Step 3a) food chain models. The following table was excerpted from Appendix D.

<b>Conservative Scenario</b>	<b>Average Scenario</b>
95% UCL soil, surface water, or sediment concentration. [ <b>Note: The maximum concentrations were actually used in the screening steps of the ERA</b> ]	Average soil, surface water, or sediment concentration.
90% BAF/BSAF value from the literature (when available).	Median BAF/BSAF value from the literature (when available).
Highest receptor body weight for NOAEL calculation.	Average receptor body weight for LOAEL calculation.
Lowest receptor body weight for CDI equation.	Average receptor body weight for CDI equation.
Conservative receptor ingestion rate.	Average receptor ingestion rate.
Use NOAELS.	Use LOAELS.
Receptors spend 100% of their time at the site.	Receptor's home range taken into account.

In response to General Comment #1, the approach used in conservative food chain model (in Step 2) maximized the exposure dose in accordance with USEPA ERA Guidance (USEPA, 1997). This was done by using maximum body weights to calculate the ingestion rates (in kg/day), but minimum body weights were used in the denominator of the food chain model to calculate the dose (in mg chemical/kg body weight-day). This assumes that the smallest organisms are consuming the greatest amount of food, which greatly overestimates the exposure dose. In the Step 3a food chain models, however, average body weights were used to calculate ingestion rates, and average body weights were used in the denominator of the food chain model to calculate the dose. This assumes that average size organisms are consuming an average amount of food which results in a more realistic exposure dose.

In response to General Comment #2, the data in Tables J.4 and J.5 in Appendix J of the RFI report are found in Volume 2 of the Wildlife Factors Handbook (USEPA, 1993). These values have been used by the Navy at most, if not all, NSA Crane environmental site and had been approved by USEPA in the QAPP. An attempt was made to use data in the Wildlife Factors Handbook from studies conducted in Indiana or similar areas to Crane, and/or field studies in lieu of laboratory studies, which may be the reason for the differences

in ingestion rates. All equations are presented in the text of the ERA as well as the text portion of Appendix J.4.

In response to General Comment #2, the ingestion rates in the USEPA Ecological Soil Screening Levels (Eco SSL) document (USEPA 2007) are in units of g dw/g bw-d, while the ingestion rates used in the ERA are in kg/day, which is one reason for the difference in the values between in the ERA and the Eco SSL document. This difference is accounted for in the dose equation in the ERA where the ingestion rate in kg/day is divided by the body weight resulting in the same units for ingestion rate referenced in the USEPA Eco SSL document (g dw/g bw-d) (USEPA, 2007). In response to Specific Comment #28, there is a difference between the food ingestion rates on Table 8-9 and the ones on Table J.4-1 (and J.5-1) because the ingestion rates in Table J.4-1 (and J.5-1) are on a wet-weight basis while the ones in Table 8-9 are on a dry-weight basis. This is explained in Section 8.4.2.1 of the RFI and in the text portion of Appendix J.4.

In response to Specific Comment #2, body weight scaling was used in the ERA as requested by USEPA and their contractor (TechLaw) in comments and e-mail correspondence in 2002 for other sites at Crane. Therefore, this approach was presented in the 2003 QAPP and subsequently used in the ERA. Since that time, USEPA Region 5 has determined that body weight scaling is no longer appropriate so it is has not been used in more recent ERAs. ~~in prior to completing the QAPP.~~

### **Use of Older Screening Levels**

The RFI for SWMU 16 was initially submitted in 2005, revised in December 2008, and revised in March 2011. While the ERA was modified between 2005 and 2011 based on regulator comments, it was not updated during each iteration to reflect changes to screening levels/toxicity data. Therefore, the screening levels presented in the March 2011 ERA were screening levels available in 2005. Table 8-6 of the RFI report presents the Eco-SSLs that were available in 2005 (USEPA, 2005). Table 8-7 does not include the Region 3 BTAG screening levels compiled in 2006 (USEPA, 2006 a, b) because they were not available when the ERA was first prepared. However, based on a review of the current Eco SSLs and Region 3 BTAG values, no additional chemicals would have unacceptable risks in the risk assessment.

### **Background Comparison**

NSA Crane conducted an extensive background study which was summarized in the approved Background Basewide Soil Investigation Report (Tetra Tech, 2001). As part of the background study, the data were reviewed for outliers. No outliers were identified in the 5% significance level in any in any data set. The comparison of the maximum site concentration to the maximum background concentration was done in Step 3a to determine whether the chemicals are likely to be site-related and therefore needed to be carried forward in the ERA process. Because no significant outliers were identified, the maximum-to-maximum comparison is appropriate for Step 3a of the ERA.

### **Sediment and Surface Water**

Although the Navy recognizes that some aquatic organisms could be present in the ditch during wet periods, neither barium nor manganese should be retained as COPCs for risks to sediment invertebrates because: 1) concentrations in downstream samples were lower than or similar to concentrations in upgradient samples; 2) poor habitat would preclude the presence of benthic invertebrates; and, 3) concentrations in soil were less than background so chemicals are not likely attributable to SWMU activities. USEPA concurred with these conclusions and it was determined that it was not necessary to develop site-specific MCSs for chemicals detected in sediment or surface water.

### **Conclusion**

The ERA, which was initially submitted in 2005, utilized screening levels and risk assessment methodology that was available and accepted at that time. Since 2005, several screening levels have been updated, and some of the exposure parameters and risk assessment methodology have changed. However, none of these changes are significant enough to change the overall conclusions in the ERA that terrestrial plants and invertebrates at SWMU 16 could have been impacted from exposure to antimony, copper, lead, and zinc in soil and birds could be impacted from lead and zinc in soil. The 2013/2014 IM addressed these risks and no further action is required. For these reasons, no changes to the ERA are necessary.

### **References**

USEPA, 1993. Wildlife Exposure Factors Handbook. Office of Research and Development. Washington, D.C. EPA/600/R-93/187a. December.

USEPA, 1997. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments. Interim Final. Environmental Response Team. June 5.

USEPA, 2005. Guidance for Developing Ecological Soil Screening Levels. Office of Solid Waste and Emergency and Response. OSWER Directive 92857-55. February. <http://www.epa.gov/ecotox/ecoss/> and chemical-specific documents.

USEPA, 2006a. Region 3 Freshwater Surface Water Screening Benchmarks. July. <http://www.epa.gov/reg3hwmd/risk/eco/btag/sbv/fw/screenbench.htm>

USEPA, 2006b. Region 3 Freshwater Sediment Screening Benchmarks. August. <http://www.epa.gov/reg3hwmd/risk/eco/btag/sbv/fwsed/screenbench.htm>

Revised

USEPA, 2007. Guidance for Developing Ecological Soil Screening Level, Attachment 4-1, Exposure Factors and Bioaccumulation Models for Derivation of Wildlife Eco-SSLs. Office of Solid Waste and Emergency and Response. OSWER Directive 9285.7-55. April.