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EMAIL AND ATTACHED U S EPA REGION V 6 MARCH 2012 COMMENTS ON THE ECOLOGICAL RISK ASSESSMENT PORTION OF MARCH 2011 RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION REPORT FOR SOLID WASTE MANAGMENT UNIT 16 (SWMU 16) NSA CRANE IN
01/27/2015
U S EPA REGION V

Peter Ramanauskas, USEPA Region V,
March 6, 2012 Comments on Ecological Risk Assessment Portion of March 2011 RFI Report for SWMU 16
Naval Support Activity Crane, Crane, Indiana
27 January 2015

From: Brent, Thomas CIV NAVFAC MIDLANT, PWD Crane <thomas.brent@navy.mil>
Sent: Tuesday, January 27, 2015 8:10 AM
To: Cole, Linda L CIV NAVFAC MIDLANT, IPTNE
Cc: Cohen, Deborah; Basinski, Ralph; Bernhardt, Aaron
Subject: FW: SWMU 16 RFI Eco
Attachments: JD Review of ERA portion of March 2011 RFI 3-6-12.docx
Signed By: thomas.brent@navy.mil

Linda,

See Pete's comments below and the attached from Jennifer Dodds. The comments are on the March 2011 RFI. I can't find where we received this previously. Tetra Tech will likely need to weigh in on any impact and significance of Jennifer's comments post-IM.

Thanks,
Tom

-----Original Message-----
From: Ramanauskas, Peter [mailto:ramanauskas.peter@epa.gov]
Sent: Monday, January 26, 2015 4:45 PM
To: Brent, Thomas CIV NAVFAC MIDLANT, PWD Crane
Subject: SWMU 16 RFI Eco

Tom,

As part of the RFI Addendum submittal preparation, could you/TetraTech please look over the attached eco-risk comments from Jennifer Dodds? Perhaps given the IM work that has taken place since 2011 at the site, some of these comments are no longer an issue. If you could address them as part of the Addendum, that would be welcome. It might be easier to discuss things like Step 3A with Jennifer on a call. I spoke to Dan Mazur as I recall we had a lot of back & forth on Step 3A with him in the past, and he thought a call with Jennifer would be good.

Let me know what you think.

Thanks,

Pete

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

Technical Review

SUBJECT: Review of the Ecological Risk Assessment (ERA) Section of the March 2011 Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the Cast High Explosives Fill/B146 Incinerator (SWMU 16) portion of the Naval Surface Warfare Center Crane, located in Crane, Indiana.

DATE: 3-6-2012

FROM: Jennifer Dodds
Ecologist

TO: Peter Ramanauskas
Project Manager

General Comments:

1. As this is a screening ERA, risk is estimated by comparing maximum detected exposure concentrations with ecotoxicity screening values, i.e. NOAELs. In addition, conservative exposure parameters should be used in a screening ERA, ex. 100 percent area use factor, 100 percent bioavailability, etc. EPA Guidance is clear on these points and this is the preferred method for assessing risk to ecological receptors at this level of the ERA process. However, as part of the Navy's Step 3a of their ERA process, both conservative (i.e. maximum) and average contaminant concentrations and exposure parameters were applied for each input of the food chain calculation (i.e. area use factors, food ingestion rate, etc). Aspects of this approach are typically acceptable as part of a Baseline Ecological Risk Assessment (BERA), where more site specific assumptions can be made. For example, the use of maximum and average contaminant concentrations for use in food chain modeling or looking at the home range of a receptor and adjusting the area use factor accordingly are appropriate approaches and are typically considered by EPA as part of a BERA. However, although it is considered part of Step 3a of the Navy's ERA process, some aspects of this "conservative" and "average" approach are not acceptable as part of any ERA. For example, the use of a maximum body weight is proposed for the calculation of the "conservative ingestion rate", when only 1 ingestion rate is available. However, the use of a maximum body weight in a conservative exposure scenario would most likely serve to underestimate exposure as typically smaller receptors with a lower body weight are more ecologically sensitive to contaminants given a typically higher metabolism etc. Overall, this approach, as presented, needs to be revised in order to be considered by EPA as part of the Step 3a process. To assist in this effort, it is recommended that this topic be discussed more fully in a conference call or meeting.

2. EPA has numerous questions and concerns with the information presented in Appendix J. One example is the Tables in Appendix J.4 and J.5 site U.S. EPA 1993, the Wildlife Exposure Factors Handbook, as the primary source for the information provided in the Tables. However, EPA was not able to locate all of the values provided in the Appendix in the sources listed, i.e. Table J.5-1. The text in the Appendix J.4 indicates that conversions were made, however equations and example calculations are not provided on the Tables themselves, i.e. Table J.4-1. In addition, the logic for using or not using data for any given parameter is not clear. As one example, the ingestion rates appear to be low as compared to those used in the development of EPA's Ecological Soil Screening values (EcoSSLs) and are in many cases different from the values provided in U.S EPA 1993. The uncertainties in the information provided in this Appendix need to be resolved in order for the ERA to be approved by EPA.

Specific Comments:

3. Page 8-14, Section 8.3.2, Selection of COPCs at SWMU 16

   According to Figure 8-7, which shows the surface soil locations at SWMU 16, there appear to be data gaps in terms of sampling on both the west and east sides of Building 146. Please explain why more soil samples were not taken in these areas.

4. Page 8-14, Section 8.3.2.1, Surface Soil

   Table 8-1 does not appear to use EPA's EcoSSLs as the preferred ecological soil screening value as is indicated on Page 8-12, in Section 8.3.1. Please clarify.

5. Page 8-17, Section 8.4, Surface Soil

   The decision criteria for the results of the food chain modeling make reference to average contaminant concentration. Average concentrations cannot be used in a screening ERA. Please revise to include only maximum contaminant concentrations.

6. Page 8-20, Section 8.4, Surface Water

   Please see Specific Comment #5 above.

7. Page 8-21, Section 8.4, Terrestrial Plants and Invertebrates

   It is unclear if the EcoSSLs were included as one of the screening benchmarks used to evaluate risks to plants and invertebrates. Please clarify.

8. Page 8-23, Section 8.4.1.1, Dioxins

   The maximum concentration is referred to in this section, but is never detailed. Please include this value in the text.

9. Page 8-29, Section 8.4.1.1, Arsenic

   The maximum arsenic concentration should be compared to the EcoSSL value of 18 mg/kg for plants. Please revise.

10. Page 8-28, Section 8.4.1.1, Cobalt

    The comparison of the maximum detected cobalt concentration to the maximum background concentration may not be appropriate. A more appropriate comparison would be to the average background concentration. A maximum background value may be more indicative of a "hot spot" rather than a true estimate of background. Please explain why the average background concentration was not used.

11. Page 8-32, Section 8.4.1.1, Manganese

    The range of "background" values given, 268 mg/kg to 3,040 mg/kg, is quite large. This does not appear to represent "background", but rather a potential mix of background concentrations and contaminated samples. Please explain.

12. Page 8-36, Section 8.4.1.1, Zinc

    The maximum zinc concentration should be compared to the EcoSSL values. Please revise.

13. Page 8-36, Section 8.4.1.1, Summary of Surface Soil Risk

    In addition to those COPCs listed, EPA recommends that manganese be retained until the uncertainty surrounding the wide range of background values is more fully explained.

14. Page 8-37, Section 8.4.1.2, Benthic Invertebrates – Sediment Risk

    More information is needed on the hydroperiods and dates of sampling in the intermittent drainage ditches/gullys. Based on the photographs provided in Appendix A, some of these areas may be vernal pools or ephemeral wetlands. In addition, based on the sample log sheets provided in Appendix C, most of the sampling in this area appears to have taken place in September and October. Given that vernal pools experience cyclic periods of water inundation and drying, with water present in early spring and subsequent drying throughout the summer months, it would not be surprising that these areas were dry when sampled in the fall. Though relatively small and sometimes overlooked, vernal pools provide critical habitat for many plants and animals, including rare species and species with specialized adaptations for coping with temporary and variable hydroperiods. Given the uncertainty in the presence or absence vernal pools in this area, it is not appropriate at this time to screen out all the COPCs in the drainage ditch/gully.

15. Page 8-38, Section 8.4.1.2, Barium

Barium needs to be retained given its exceedance of the Apparent Effects Threshold (AET). The AET is based upon empirical relationships between sediment concentrations and observed toxicity bioassay results or observed benthic community impacts. For a given analyte, paired observations are ranked in increasing concentrations. The highest concentration associated with a nontoxic sample then sets the AET value, such that only toxic samples are observed at higher concentrations. Note, however, that toxic samples may also have been observed at values below the AET. AETs are applied as a set, such that a single analyte exceeding its AET would be predictive of adverse impacts. The other Step 3a factors are not robust enough to justify the elimination of barium as a COPC. Therefore, since all four sediment samples exceed the AET, we can conclude adverse effects are occurring in those locations and barium needs to be retained.

16. Page 8-39, Section 8.4.1.2, Manganese

The text erroneously states that "the LEL indicates the level of sediment contamination which has no effect on and can be tolerated by the majority of sediment-dwelling organisms…" In fact the LEL indicates the level of sediment contamination below which no effects are observed. By definition, effects may be seen if the sample is above the LEL, as is the case with the samples collected from SWMU 16. In addition, please refer to Specific Comment # 14 regarding the discussion of "poor habitat" and dry areas in some of the sample areas. Given that several samples exceeded both the LEL and SEL, manganese should be retained.

17. Page 8-40, Section 8.4.1.2, Selenium

The statement that no alternate sediment benchmark is available for selenium is not accurate. EPA Region 3 uses a benchmark of 2 mg/kg based on a 2002 US Forest Service Study. The detected concentrations of selenium are all below the EPA Region 3 benchmark. Selenium does not need to be retained as a COPC.

18. Page 8-42, Section 8.4.1.2, Summary of Sediment Risk

Based on its review, EPA recommends that barium and manganese be retained as COPCs in sediment. In addition, based on the information that will be provided on the hydroperiods and sampling dates in the drainage ditch/gullys, more study may be warranted in these areas.

19. Page 8-45, Section 8.4.1.3, Manganese

The level of manganese found in the maximum background surface water sample is very high, as are the levels detected in the SMWU 16 samples. High levels of manganese were also found in on-site and background soil and sediment samples. EPA is concerned about the adverse ecological effects manganese is having throughout SWMU 16 and recommends the source of the manganese contamination be explored more fully.

20. Page 8-47, Section 8.4.1.3, Summary of Surface Water Risk

Based on the uncertainties surrounding manganese, EPA recommends that manganese be retained.

21. Page 8-48, Section 8.4.2.1, Food Chain Modeling Methodology

It appears as though body weight scaling was performed even though Region 5 had previously indicated that the use of a metabolic scaling factor is no longer appropriate. Please explain and revise as necessary.

22. Page 8-51, Section 8.4.2.2, Results and Discussion

It is not clearly stated in the text what is meant by the "conservative" exposure scenario, although after further review it was assumed to refer to a maximum exposure concentration scenario. Please refer to General Comment #1 regarding the use of this approach.

23. Page 8-56, Section 8.6, ECOLOGICAL RISK SUMMARY AND CONCLUSIONS

This Section will need to be revised based on the discussions surrounding General Comment #1.

24. Tables

Several of the Tables will need to be revised based on the discussions surrounding General Comment #1.

25. Appendix J.1

This Appendix appears to contain the "Checklist for Ecological Risk Assessment/Sampling" that should be included as part of Appendix J.2. Please revise if necessary.

26. Appendix J.2

The Appendix is titled "Checklist for Ecological Risk Assessment/Sampling"; however a checklist is not included. It appears the checklist was erroneously placed in Appendix J.1. Please revise if necessary.

27. Appendix J.3, Table J.3-1

Please see General Comment #1 regarding the use of "conservative" and "average" values in a screening level ERA. The use of both a "conservative" and "average" BAF is not appropriate at this stage of the ERA. A screening ERA assumes maximum exposures so as not to underestimate risk in the early stages of the risk assessment process.

28. Appendix J.4, Table J.4-1

The food ingestion rates as listed are different from those listed in Table 8-9. A reason for the discrepancy should be noted and any conversion equations used should be listed with an example calculation.

29. Appendix J.5

Table J.5-1: EPA has many questions surrounding this Table. Many of the data were not listed in the source given, EPA 1993, and it is unclear where these data came from. The equations used to convert the food ingestion rates from g/g-day to kg/day and the water ingestion rates from g/g-day to L/day should be listed on the Table and example calculations given. In addition, it is confusing to the reviewer to have the home range exposure parameters listed in both hectares (ha) and acres. A separate row should be added and the conversion information included on the Table.

Tables J.5-2, 5-3, and 5-4: Although it is appropriate to calculate a no observed adverse effect level (NOAEL) from a lowest observed adverse effect level (LOAEL), assuming a ten-fold lower effect, it is not appropriate to apply this logic in reverse; that is to calculate a LOAEL from a NOAEL. Without knowing the details of the study design, i.e. the dosing intervals, the actual lowest level of effects can be missed by assuming a ten-fold increase in effect. Often times the LOAEL is only a fraction higher than the NOAEL, therefore the 10.0 uncertainty factor as applied to the NOAEL is not conservative enough, and the LOAEL as calculated is not acceptable for use in this ERA. Please revise.

Table J.5-4: Footnote 1 states that "The sources of these NOAELs and LOAELs are presented in the Table J.4-5." However, that Table does not exist. It appears that the text should refer to Table J.5-5. Please revise.

Table J.5-5: EPA's preferred source for NOAEL and LOAEL TRVs is the EcoSSL documents. The NOAEL and LOAEL values were derived based on an extensive literature search and subsequent review that was done to develop the EcoSSLs, which are concentrations of contaminants in soil that are protective of ecological receptors that commonly come into contact with soil or ingest biota that live in or on soil. These values are not designed to be used as clean up numbers, but rather are used to identify those contaminants requiring further evaluation in a BERA. That said, the EcoSSLs uses a very conservative and scientifically sound method to derive TRVs. In particular, the literature search, review, and evaluation process identifies toxicity data used to develop the TRVs and should be used as a resource.

30. Appendix J.6

Please see General Comment #1 regarding the use of conservative and average inputs and the resulting appropriateness of these Tables. Please revise.

References:

EPA. 1997. *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments.* Interim Final. Office of Solid Waste and Emergency Response. EPA 540-R-97-006. June 5, 1997.
http://www.epa.gov/oswer/riskassessment/ecorisk/ecorisk.htm

EPA. 1993. *Wildlife Exposure Factors Handbook. Volumes I and II.* USEPA/600/R-93/187a,b. U.S. Environmental Protection Agency, Office of Research and Development, Washington D.C.

Guidance for Developing Ecological Soil Screening Levels
http://www.epa.gov/ecotox/ecossl/SOPs.htm

Lemley, A.D. 2002. *Selenium assessment in aquatic ecosystems*. US Forest Service, Blacksburg, VA.