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EMAIL AND US EPA REGION V APPROVAL TO FINALIZE THE NOVEMBER 2010 INTERIM MEASURES REPORT FOR SOLID WASTE MANAGEMENT UNIT 12 (SWMU 12) BATTERY DUMP SITE NSA CRANE IN
04/21/2016
U S EPA REGION V CHICAGO IL

Peter Ramanauskas, USEPA Region V
USEPA Approval to Finalize the November 2010 Interim Measures Report for SWMU 12 Battery Site, Naval Support Activity Crane, Crane, Indiana
21 April 2016

Subject: RE: SWMU 12 IMR Battery Site - Eco Risk Comments

-----Original Message-----
From: Ramanauskas, Peter [mailto:ramanauskas.peter@epa.gov]
Sent: Thursday, April 21, 2016 11:46 AM
To: Brent, Thomas CIV NAVFAC MIDLANT, PWD Crane; Cole, Linda L CIV NAVFAC MIDLANT, IPTNORTH
Subject: [Non-DoD Source] FW: SWMU 12 IMR Battery Site - Eco Risk Comments

Tom/Linda,

Please note Dan's comments and feel free to finalize the IMR.

Let me know if you have questions.

Thanks,
Pete

-----Original Message-----
From: Mazur, Dan
Sent: Thursday, April 21, 2016 9:48 AM
To: Ramanauskas, Peter <ramanauskas.peter@epa.gov>
Cc: Beedle, Michael <beedle.michael@epa.gov>
Subject: RE: SWMU 12 IMR Battery Site - Eco Risk Comments

Pete,

I've made some edits for clarity and my final review comments are attached.

Dan

April 21, 2016

MEMORANDUM

TO: Peter Ramanauskas, Project Manager

FROM: Daniel Mazur, Ecologist

SUBJECT: Draft Interim Measures Report, November 2010 – Crane SWMU 12
Risk Appendix G: Ecological Evaluation and Attachment A (8/17/2015 revision)
Review of Navy Response to EPA Comments (8/17/2015)

Review of Response to Comment 1: Data tables were provided to Attachment A as requested in the original comment and random checks of average metal concentrations (Tables 2-1, 2-2 and 2-3) now confirms the correct values were used for ecological risk scenarios.

Review of Response to Comment 2: The EPA Ecological Soil Screening Level (Eco-SSL) report provides a method for selecting a lowest adverse effect level (LOAEL) toxicity reference value (TRV). Most of the Eco-SSL reports supply LOAEL TRVs for both avian and mammal receptors and these LOAEL TVRs were presented for Chromium^{+3}, Copper and Zinc in the March 23, 2015 EPA comments. Please note in selecting LOAEL TRVs, the Eco-SSL report only uses bounded studies (both NOAEL and LOAEL values). Likewise, the Eco-SSL report does not advocate using a geometric mean of all LOAEL values (i.e., unbounded studies, acute or sub-chronic values and/or high adverse effects) to develop a LOAEL TRV.

The intent is for NOAEL and LOAEL values to bracket the threshold of adverse effects. About half (mammal 43% and avian 52%) of the bounded studies in the Eco-SSL report (Attachment 4-5, Section 4.5 and Fig 4.2) show the LOAEL is often within a factor of two of the respective NOAEL value. Since a LOAEL to NOAEL ratio greater than 10 was only observed in about 4% of the studies, the mammal LOAEL TRVs for Chromium and Copper merit additional review.

A dose–response relationship (e.g., EC_{20}) is recommended (see Allard et al. 2010, includes Dept. of Defense) whenever possible for determining toxicity thresholds (Chapman et al. 1996 Environ Toxicol Chem 15:77-79; Crane and Newman 2000 Environ Toxicol Chem 19:516-519; Allard et al. 2010 Integr Environ Assess Manag 6:28-37; Landis and Chapman 2011 Integr Environ Assess Manag 7:vi-viii). EPA presented a method to the Navy to develop a LOAEL TRVs for lead for the UXO-7 site using Eco-SSL LOAEL values with 12 - 29% adverse effects. The LOAEL TRV used by the Navy does not indicate if it represents an EC_{20} or studies used limit adverse effects to < 30%.

Previously, an avian LOAEL TRV of 128 mg/kg-day for zinc was recommended using the EPA Region 5 method. Using this same method, a mammalian LOAEL TRV of 823 mg/kg-day for zinc was developed only requiring review of four papers (not hundreds of studies as stated by the Navy) from the Eco-SSL report. EPA Region 5 can provide the studies and data used. These zinc LOAEL TRVs will be applied to develop a soil LOAEL PRG in the following Review of Responses to Comment 3.

Review of Response to Comment 3: The data provided in response to original Comment 1 along with exposure factors and equations now provide a clear explanation of how the ecological effects quotient (EEQ) was generated for Tables 3-1, 3-2 and 3-3.

EPA accepts the use of empirical studies within Indiana or from similar areas within Crane. Although the Navy uses a different approach to estimate exposure, EPA will use the equations and values from the Eco-SSL report when reviewing ecological risk assessments for soil contaminants.

Since zinc was the only contaminant of concern in scenarios 2 and 3, a revised soil LOAEL PRG was estimated using the following equations. Please note the zinc LOAEL TRV will use the values in previous Review of Response to Comment 2.

HQ = Fir x (soil x Ps + B)/ TRV

Set HQ = 1 and solve for soil Use the following Fir, Ps & TRV

	Woodcock	Shrew
Food ingestion rate (Fir)	0.142 g/g-day	0.167 g/g-day
Soil ingestion, proportion of diet (Ps)	0.064 (6.4%)	0.009 (0.9%)

	LOAEL TRV (mg/kg-day)		Concentration in Soil Invertebrates
	Avian	Mammal	
Zinc	128	823	$\ln(B) = 0.328 \times \ln(soil) + 4.449$

Solving for soil in the above equation provides the following soil LOAEL PRGs for the American woodcock and short-tailed shrew (sensitive bird and mammal receptors)

	Soil LOAEL PRG (mg/kg)	
	Woodcock	Shrew
Zinc	1039	114,203

The recalculated zinc LOAEL PRGs shows zinc is no longer a concern in scenarios 2 and 3.

This concludes EPA's ecological risk assessment review and any residual contaminant concentrations are below the lowest adverse effect levels.