



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

REPLY TO THE ATTENTION OF:

MEMORANDUM

DATE: January 22, 2016

SUBJECT: Review of Responses to Agency Comments: Ecological Risk Assessment
 Off-Property Focused CMS, August 2014, Appendix A
 Former Koppers Inc. Facility
 Superior, Wisconsin

FROM: Daniel J. Mazur, Ecologist
 U.S. EPA, Region 5
 Land and Chemicals Division
 Remediation and Reuse Branch

TO: Chris Saari, Hydrogeologist
 Wisconsin Department of Natural Resources
 Remediation & Redevelopment Program

As requested by WDNR on January 15, 2016, EPA reviewed the response to comments on the ecological risk assessment contained within Appendix A of the Off-Property Focused CMS report (August, 2014) for the facility noted above. This review covered specific ecological comments 3 through 6 and Table 2-5. Although the responses were clear and reasonable, EPA recommends developing the exposure and effect values using the equations provided in the USEPA Ecological Soil Screening Levels (<http://www.epa.gov/ecotox/ecossil/>) especially for Table 4. (LOAEL HQ Summary). Also, acceptable ecological risk will be less than the lowest adverse effect level (LOAEL) benchmarks.

A LOAEL benchmark for HMW PAH in soil is calculated below for a shrew using the equation, food ingestion rate and soil intake from the Eco-SSL guidance.

$$HQ = [F_{ir} \times (\text{soil} \times P + B) / TRV \quad \text{set } HQ = 1 \text{ and solve for Soil}$$

$TRV/F_{ir} = \text{Soil} \times P + B$	Where: LOAEL TRV (mammal)	= 3.07 mg/ kg-day
	Food Ingestion Rate (F_{ir})	= 0.167 g/ g-day
	Soil – Invert Uptake (B)	= 2.6 soil
	Soil Ingestion Proportion of Diet (P)	= 0.009

$$(3.07 / 0.167) = 0.009 \text{ soil} + 2.6 \text{ soil}$$

Shrew LOAEL = 7.05 mg (HMW PAH)/ Kg soil

An evaluation of the shrew LOAEL to soil Area 1 using the two soil sampling sites in Area 1 are presented below for HMW PAHs.

HMW PAHs	T 23	T 24
Benzo(a)anthracene	0.66	0.64
Chrysene	3.2	3.6
Fluoranthene	0.47	0.15
Pyrene	0.44	0.55
Benzo(b)fluoranthene	1.4	2.2
Benzo(k)fluoranthene	0.49	0.84
Benzo(a)pyrene	1.2	2.1
Dibenzo(a,h)anthracene	0.45	0.48
Indeno(1,2,3-c,d)pyrene	2.3	2.4
Benzo(g,h,i)perylene	2.8	2.8
Σ HMW PAHs = 7.05ppm	13.4	15.7

Both of these samples in Area 1 exceeds the shrew LOAEL.