

DEPARTMENT OF THE NAVY

NORTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
LESTER, PA 19113-2090

IN REPLY REFER TO
5090
Code 1823/JS

21 JUL 1998



Ms. Kymberlee Keckler
U.S. EPA Region I
Federal Facilities Superfund Section
John F. Kennedy Federal Building
Boston, MA 02203-0001

Mr. Paul Kulpa
Rhode Island Department of Environmental Management
Division of Site Remediation
291 Promenade Street
Providence, RI 02908-5767

SUBJ: SITE 09, OLD FIRE FIGHTING TRAINING AREA, NAVAL EDUCATION AND TRAINING
CENTER, NEWPORT, RHODE ISLAND

Dear Ms. Keckler and Mr. Kulpa:

The enclosed NETC Newport Draft Lead Evaluation for Site 09 Old Fire Fighting Training Area is provided for your review and comment. The evaluation, based on the Integrated Exposure Uptake Biokinetic (IEUBK) Model for lead in children, was prepared using USEPA guidance dated January 1994. The model concludes that Site 09 does not pose a potential risk to residential children at the site. Please note that the IEUBK Model assumes a more conservative residential risk scenario, while the site is actually used for recreational purposes.

If you have any questions regarding the enclosure please contact me at (610) 595-0567, extension 241.

Sincerely,

A handwritten signature in cursive script that reads "James Shafer".

James Shafer
Remedial Project Manager
By direction of the
Commanding Officer

Enclosures: 1. Site 09 Draft Lead Evaluation

Copy to:
NETC/M. Griffin

NETC Newport – Site 09 Old Fire Fighting Training Area Lead Evaluation Draft

IEUBK Model

The Integrated Exposure Uptake Biokinetic (IEUBK) Model is designed to predict the probable Blood Lead Level (BLL) concentrations for children between 0 and 84 months (7 years) of age who have been exposed to lead through environmental media (air, water, soil, dust, and diet). The IEUBK standardizes exposure by assuming age-weighted parameters for intake of food, water, soil, and dust. The model simulates continual growth under constant exposure levels (on a year-to-year basis). In addition, the model also simulates lead uptake, distribution within the body, and elimination from the body.

EPA and the Centers for Disease Control and Prevention (CDC) have determined that childhood BLL concentrations at or above 10 micrograms of lead per deciliter of blood ($\mu\text{g}/\text{dL}$) present risks to children's health. In accordance with EPA policy, 5 percent of the population can have BLLs above 10 $\mu\text{g}/\text{dL}$. The IEUBK calculates the probability that children's BLL will exceed 10 $\mu\text{g}/\text{dL}$ (or other user-entered value). By varying the data entered into the model, the user can evaluate how changes in environmental conditions may affect blood lead levels in exposed children.

Source: *Guidance Manual for the IEUBK Model for Lead in Children*, USEPA, January 1994.

Site 09 Old Fire Fighting Training Area

The Old Fire Fighting Training Area is located at the northern end of Coasters Harbor Island. The site occupies approximately 5.5 acres. Presently, Site 09 contains a picnic area, playground, and baseball field. There are two hills located on the site. One is located in the center of the site and is approximately 20 feet high and another is located in the western corner of the site and is approximately 6 feet high. The site is mostly vegetated. The playground area is used by a nearby daycare facility. In accordance with EPA policy this does qualify as a residential area.

The IEUBK may be run using default values, however, it is preferable to obtain site-specific values for soil and dust concentrations. The data used in this evaluation was based on the 40 soil samples taken for the Phase II RI. The data ranged from 7.5 mg/kg to 2970 mg/kg with 39 of the 40 samples less than 375 mg/kg (see Table 1). The data was determined to be log-normally distributed and the 95 percent Upper Confidence Level of was calculated.

USEPA's (1994c) Integrated Exposure Uptake Biokinetic (IEUBK) Model (Version 0.99d) was used to determine total lead uptake in children resulting from inhalation, diet,

other background contributions, soil/dust ingestion, and maternal transfer; and to predict a BLL based on total lead uptake. In this evaluation, default values for air, diet, drinking water, maternal lead contribution, and other sources were used. The surface soil concentration used was the 95 UCLM of 137.13 mg/kg.

The results of this analysis indicate that for children up to 7 years of age, the geometric mean blood lead level considering site soil concentrations is 3.0 µg/dL and 0.52 percent of potential future child residents may have BLLs greater than 10 µg/dL (see IEUBK Output Package).

According to the results of the IEUBK model, only 0.52 percent of the child residents exposed to site-specific lead concentrations might have BLLs in the range where there is some potential for adverse health effects. This is well within the EPA acceptable level of 5 percent in a residential setting. Therefore, the model concludes that Site 09 does not pose a potential risk to residential children at the site.

TABLE 1 - Site 09 lead concentrations in surface soil (ppm).

Sample ID	Lead Concentration in Surface Soil (ppm)
SS12	22.1
SS13	25.1
SS14	69.4
SS15	27
SS16	7.5
SS17	28.9
SS18	36.2
SS19	29.9
SS20	100
SS21	39.5
SS22	16.1
SS23	22.1
SS24	16.5
SS25	15.1
SS26	16.1
SS27	14.9
SS35	14.3
SS28	21.8
SS29	33.6
SS30	349
SS31	133
B81	35.1
B91	68.7
B101	60.4
B111	108
B121	108
B131	125
B141	22.5
B151	77.4
B161	126
B164	83.2
B171	23.6
B181	43.7
M61	41.1
M71	43.8
M81	22.5
M91	97.3
M93	82
M101	372
M111	2970

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m³ DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.

Other AIR Parameters:

Age	Time Outdoors (hr)	Vent. Rate (m ³ /day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

DIET: DEFAULT

DRINKING WATER Conc: 4.00 ug Pb/L DEFAULT
WATER Consumption: DEFAULT

SOIL & DUST:

Soil: constant conc.

Dust: constant conc.

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
0-1	137.1	137.1
1-2	137.1	137.1
2-3	137.1	137.1
3-4	137.1	137.1
4-5	137.1	137.1
5-6	137.1	137.1
6-7	137.1	137.1

Additional Dust Sources: None DEFAULT

PAINT Intake: 0.00 ug Pb/day DEFAULT

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

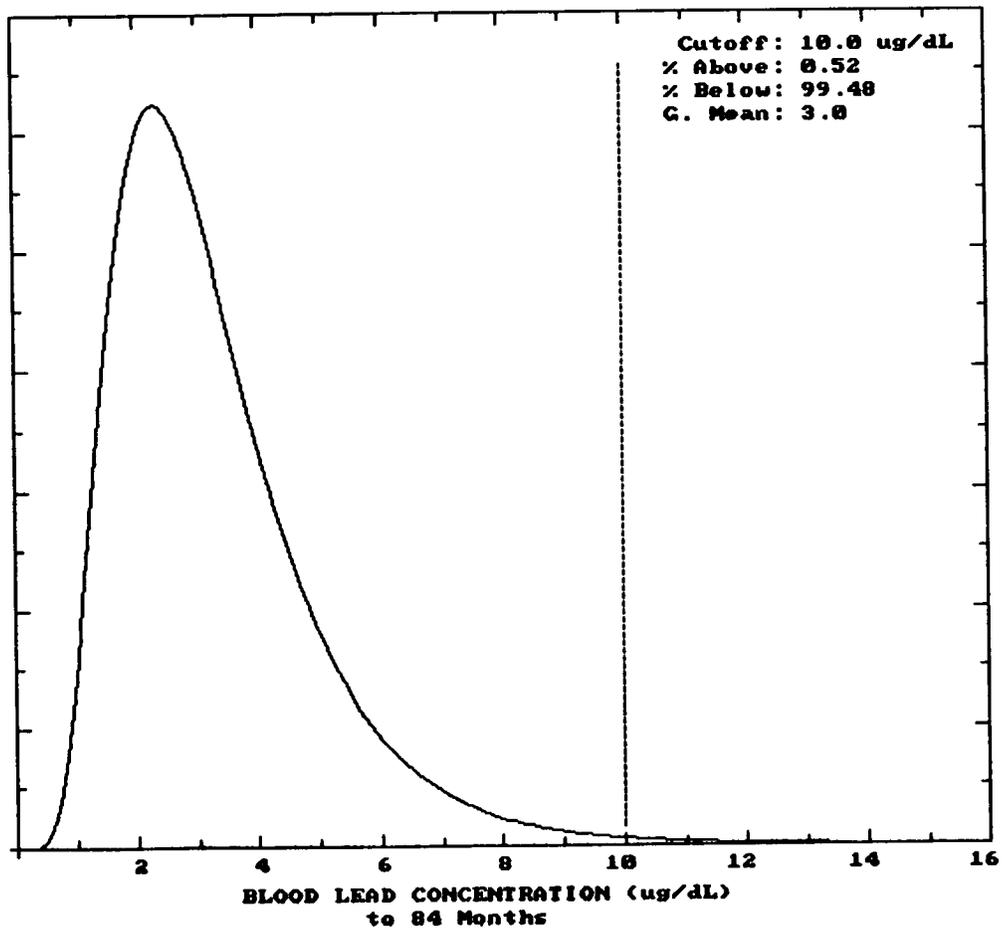
CALCULATED BLOOD Pb and Pb UPTAKES:

YEAR	Blood Level (ug/dL)	Total Uptake (ug/day)	Soil+Dust Uptake (ug/day)
0.5-1:	3.4	6.23	3.26
1-2:	3.7	8.78	5.14
2-3:	3.4	9.25	5.18
3-4:	3.3	9.25	5.24
4-5:	2.8	7.94	3.94
5-6:	2.5	7.83	3.57
6-7:	2.3	7.99	3.38

YEAR	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
0.5-1:	2.58	0.37	0.00	0.02
1-2:	2.68	0.93	0.00	0.03
2-3:	3.03	0.97	0.00	0.06

3-4:	2.94	1.00	0.00	0.07
4-5:	2.88	1.05	0.00	0.07
5-6:	3.05	1.12	0.00	0.09
6-7:	3.38	1.14	0.00	0.09

Probability Density
Function f(blood Pb)



LEAD .99d