CITY OF ALBUQUERQUE

Environmental Health Department

Sandra K. Begay, Director

December 5, 2019

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Subject: Status Report Addendum
Voluntary Remediation Program
City of Albuquerque Rail Yards
VRP Site No. 53161007

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Ms. Savannah Richards:

Please find the enclosed addendum to the Status Report for the Rail Yards Voluntary Remediation Program (VRP). The addendum provides the additional information requested by the Ground Water Quality Bureau (GWQB) of the New Mexico Environment Department during the meeting held with City of Albuquerque on October 28, 2019. The addendum provides the following:

- The input and output data of the IEUBK Modeling files to determine the bioavailibility of the soils;
- The rationale used to determine that 550 ppm of lead would result in a site-specific blood lead (Pb) value of 9.9 µg /dL in children between the ages of 1 and 2 years; and
- A correction to the Pb value of sample 96 in the IEUBK Table of the Rail Yards Status Report.

If you have any further questions, please do not hesitate to contact me by phone at (505) 768-2658 or via e-mail at cmunoz-dyer@cabq.gov.

Sincerely,

Carina G. Munoz-Dyer

Carina G. Munoz-Dyer
Acting Environmental Health Manager
Environmental Health Department
City of Albuquerque

Voluntary Remediation Program
Status Report Addendum
City of Albuquerque Rail Yards
VRP Site No. 5316107

Prepared for: Ground Water Quality Bureau
New Mexico Environment Department

Prepared By: Environmental Services Division
City of Albuquerque Environmental Health Department

December 5, 2019

Summary

The City of Albuquerque (City) submitted a status report for the Rail Yards Voluntary Remediation Program on July 2019 to the Ground Water Quality Bureau (GWQB) of the New Mexico Environment Department (NMED).

The Rail Yards Status Report provided a description of: (1) the abatement of asbestos containing materials (ACM) and lead-based paint (LBP) prior to the demolition of the Sheet Metal House and North Washroom; and (2) soil remediation of two known areas, the Battery Storage Area and the Sand Blasting Area.

However, the GWQB requested additional information regarding the information provided in the Rail Yard Status Report. This addendum provides the following information to address GWQB comments:

- The input and output data of the IEUBK Modeling files to determine the bioavailability of the soils;
- Changes to the input data of the IEUBK Modeling files to determine the bioavailability of the soils;
- The rationale used to determine that 550 ppm of lead (Pb) would result in a site-specific blood Pb value of 9.9 µg /dL in children between the ages of 1 and 2 years; and
- A correction to the Pb value of sample 96 in the IEUBK Table of the Rail Yards Status Report.

IEUBK Modeling Input and Output Data

The City made a few changes to the input data of the IEUBK models. These changes are the following:

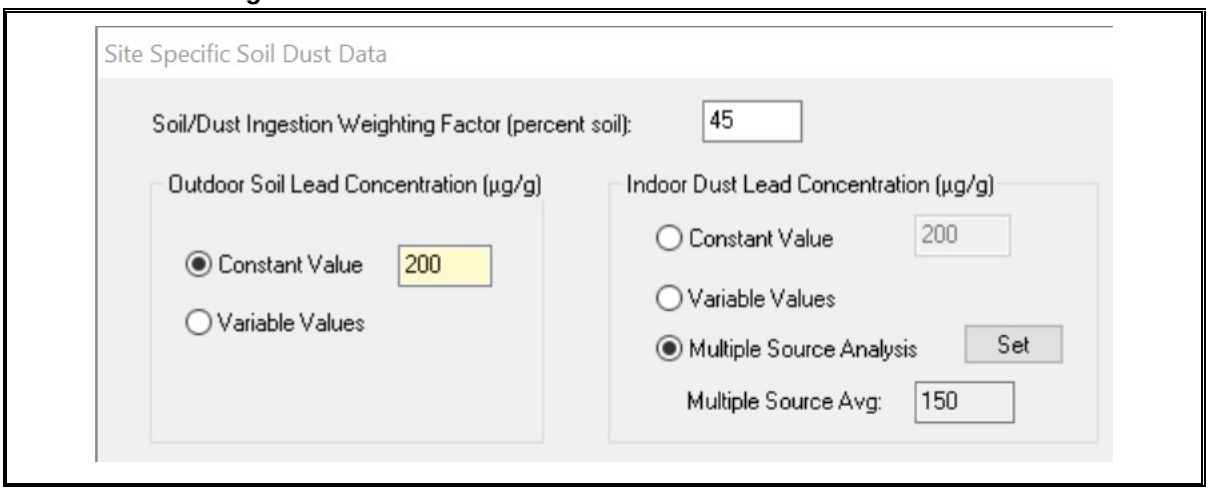
1. Indoor Dust Lead Concentration (µg/g) was changed from the Constant Value to the Multiple Source Analysis, which has a "Set" default value;
2. The Outdoor Air Lead Concentration was changed from the default value of 0.1 µg /m^3 to 0.003 µg /m^3; and
3. The Constant Value for the Outdoor Soil Lead Concentration was changed from 650 ppm to 550 ppm.

The next few paragraphs provide an explanation for these changes and how the City determined that a Pb concentration of 550 ppm would result in a site-specific blood Pb value of less than 10 µg /dL.

First, the City selected the Constant Value of 200 ppm in the input modeling files for the Railyard Status Report, which was consistent to the Outdoor Soil Lead Concentration of 200 ppm. However, the Indoor Dust Lead Concentration Constant Value should be used when site-specific dust analysis is conducted. Therefore, the City changed to the Indoor Dust Lead Concentration (µg /g) Multiple Source Analysis default value.

The Multiple Source Analysis default value is a more conservative approach, as stated in the IEUBK User's Guide: *"By default, the IEUBK model defaults to Multiple Source Analysis because it assumes that site-specific dust concentrations are not measured and therefore, Multiple Source Analysis should be used to determine the appropriate dust concentration…. Multiple Source Analysis allow the use of information about the contribution of soil lead (PbS), air Pb, and other sources to derive a value for indoor dust lead (PbD)."* Figure 2.1 shows the Indoor Dust Lead Concentration default value used for this addendum. The Indoor Dust Lead Concentration – Multiple Source Analysis was used to obtain the site-specific blood value and determine if it will exceed the 10 µg/dL.

Figure 2.1 – Indoor Dust Lead Concentration Constant Value



Additionally, the Outdoor Air Pb Concentration (µg /m^3) was changed from the default value of 0.1 µg /m^3 to 0.003 µg /m^3, which is the highest daily concentration from the most current outdoor air quality inventory data (year 2017) collected at the City of Albuquerque Del Norte monitoring station (Station No. 350010023) and available at https://www.epa.gov/outdoor-air-quality-data/download-daily-data).

Figure 2.2 shows the Site Specific Soil Dust Data entered in the model with a Constant Value of 550 µg/g for the Outdoor Soil Lead Concentration; and Figure 2.3 provide also the GI Values/Bioavailability Information. Table 2.1 provides a summary of the seven soil samples collected through the site and submitted for the IVBA analysis, and it includes: the sample name, sample location, sample Pb soil concentration, the XRF Pb result, the IVBA RBA percent, and IEUBK modeled blood level for each sample. IEUBK modeling results for these soil samples are provided in Attachment 1 of this Addendum.

Figure 2.2 – Outdoor Dust Lead Concentration Constant Value

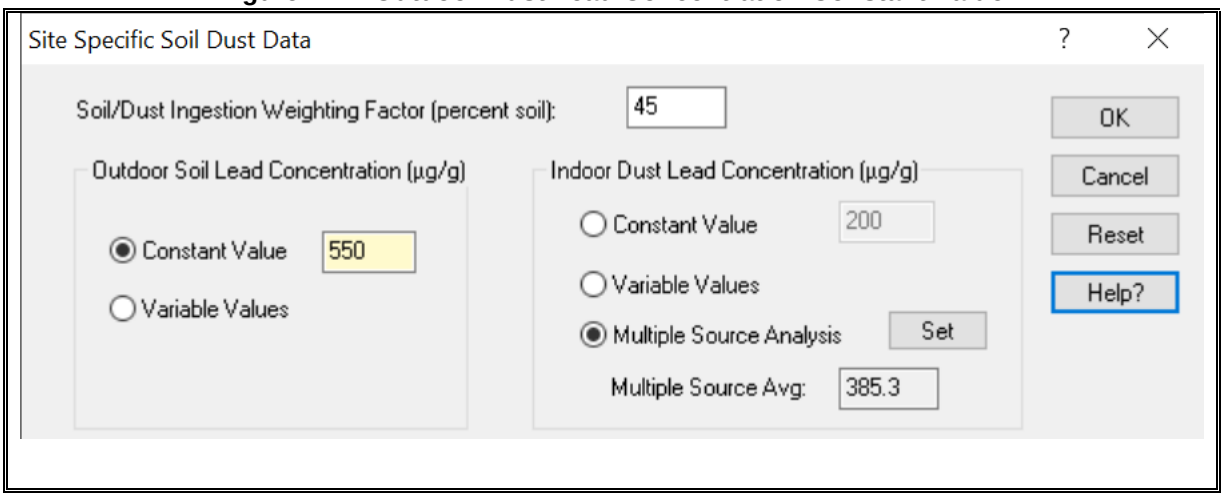


Figure 2.3 – Site Specific Soil Dust Data and GI Values/ Bioavailability Information

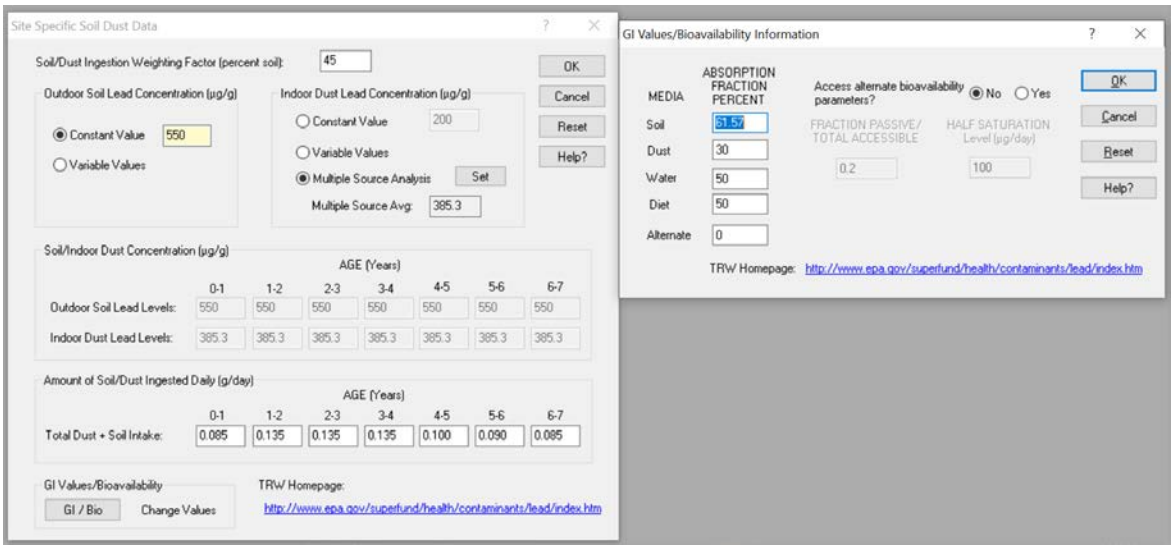


Table 2.1 – Summary Results of Soil Samples Collected

Sample Name	Sample Location	Pb Soil concentration (ppm)	Pb XRF Result (ppm)	Pb RBA (%)	IEUBK Max Blood Lead (ug/dL)	Age Range (years)
SS50	Sidewall S and E of ADD parking lot	4,400	1,292	72.0	40.5	1 – 2
SS 58	E sidewall, ~4ft from NEC of Flue Shop	745	558	62.0	12.5	1 – 2
SS 78	Test pit S and E of SB Excavation	979	1,387	61.0	15.1	1 – 2
SS 82	Test pit central area of parking lot	422	410	57.0	7.7	1 – 2
SS 92	Test pit E of SB Excavation	500	571	61.0	9.2	1 – 2
SS 96	Sidewall western excavation battery storage area	1660	913	57.0	20.7	1 – 2
SS 104	Test Pit SW of Battery Storage Area	721	605	61.0	10.4	1 – 2

Footnotes

SB- Sand Blasting Excavation
ADD- Handicapped
N- North
S- South
E- East
W- West
NEC- Northeast Corner

Figure 2.4 through 2.6 provides the input files for the different Pb RBA (in vivo) percentages for the different samples, as shown in Table 2.1. The Pb RBA % value is used in the IEUBK model to estimate the blood Pb level in children.

Figure 2.4 – GI Value/Bioavailability Information – 57% Soil Absorption

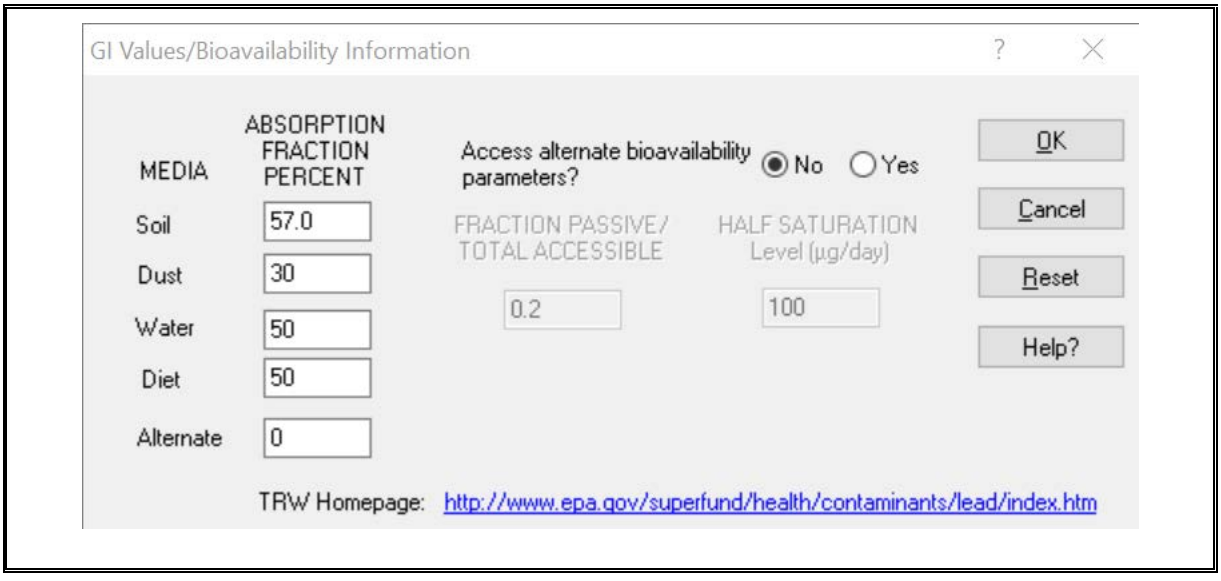


Figure 2.5 – GI Value/Bioavailability Information – 61% Soil Absorption

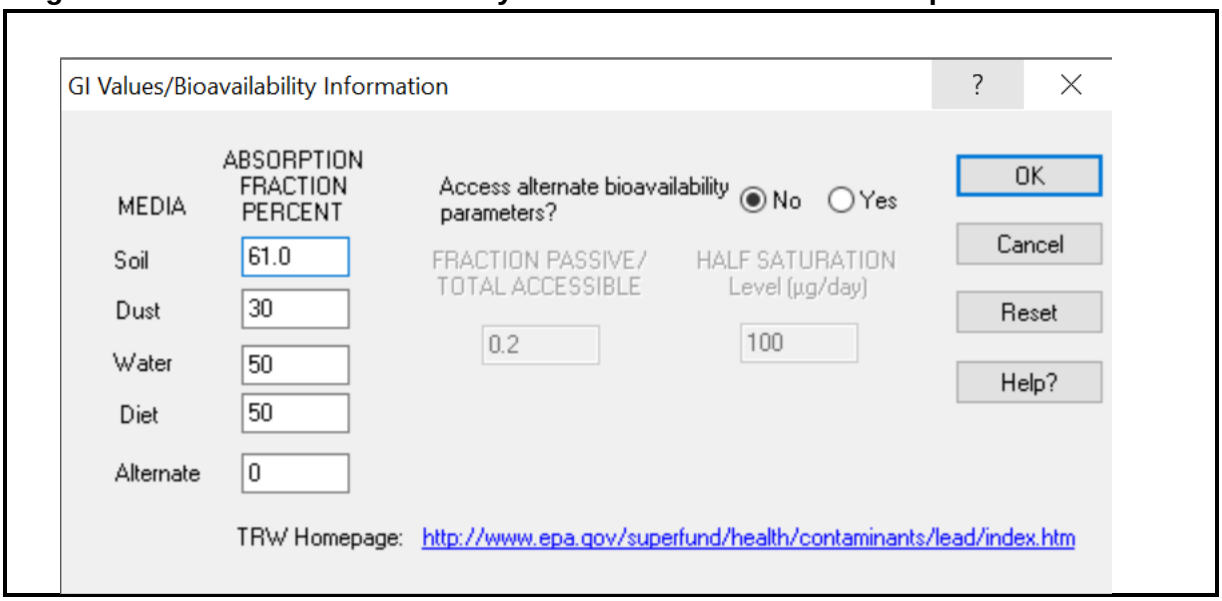
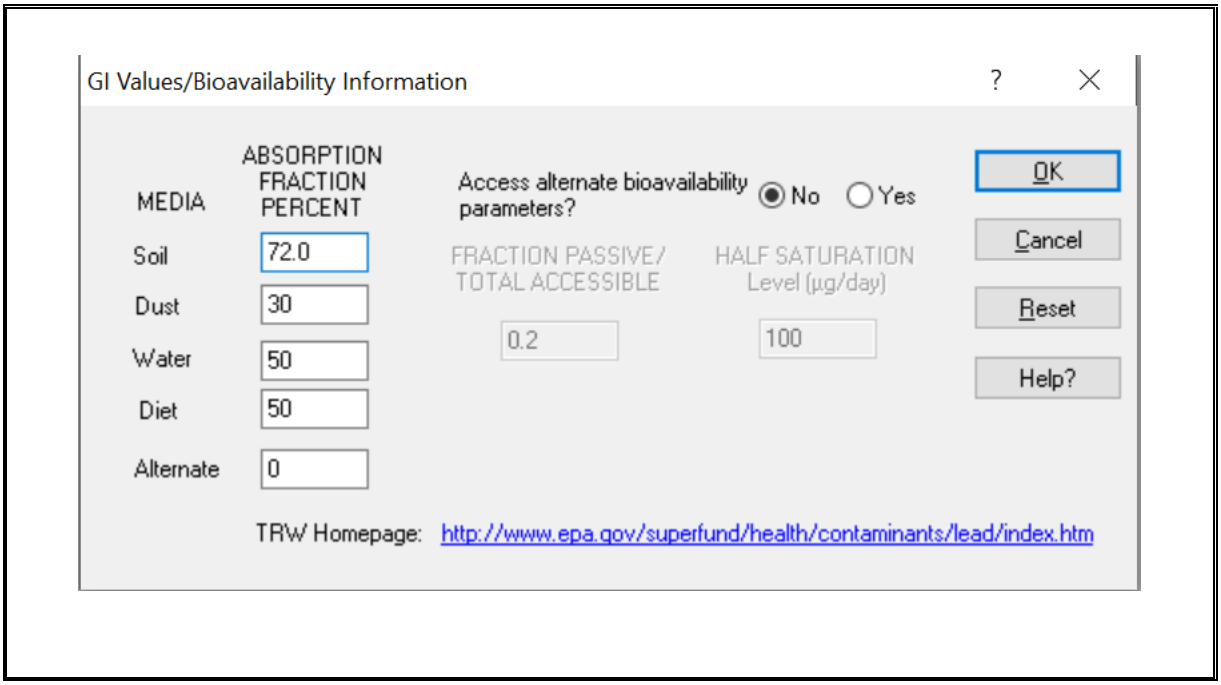


Figure 2.6 – GI Value/Bioavailability Information – 72% Soil Absorption



As describe in the Rail Yards Status Report, the City tweaked the modeled site-specific screening levels for Pb to find the resulting blood Pb level of less than 10 µg /dL, as described in Section 2.3.3 of the New Mexico Environment Department Soil Screening Guidance for Human Health Risk Assessments.

The City used the following parameters to demonstrate that the site-specific blood Pb value of 9.9 µg /dL are the following:

- An IVBA Pb RBA (in vivo) absorption of 61.57% from bioavailability site-specific samples
- Water concentration of 1 ppm Pb;
- Outdoor Air Pb Concentration 0.003 µg /m3;
- The Multiple Source Analysis default value for the Indoor Dust Lead Concentration; and
- An Outdoor Soil Lead Concentration of 550 µg /g.

Recommendation

Based on the results from the bioavailability sampling and modeling, the City recommends VRP approval of the site-specific soil lead residential level of 550 ppm for the Rail Yards Site.

LEAD MODEL FOR WINDOWS Version 1.1

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Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research

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****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m³/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m³)
.5-1	1.000	2.000	32.000	0.003
1-2	2.000	3.000	32.000	0.003
2-3	3.000	5.000	32.000	0.003
3-4	4.000	5.000	32.000	0.003
4-5	4.000	5.000	32.000	0.003
5-6	4.000	7.000	32.000	0.003
6-7	4.000	7.000	32.000	0.003

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200

1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 1.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 3080.300 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	4400.000	3080.300
1-2	4400.000	3080.300
2-3	4400.000	3080.300
3-4	4400.000	3080.300
4-5	4400.000	3080.300
5-6	4400.000	3080.300
6-7	4400.000	3080.300

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

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CALCULATED BLOOD LEAD AND LEAD UPTAKES:
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Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.001	0.499	0.000	0.044
1-2	0.001	0.401	0.000	0.102
2-3	0.002	0.463	0.000	0.113
3-4	0.002	0.471	0.000	0.122
4-5	0.002	0.532	0.000	0.150
5-6	0.003	0.604	0.000	0.171
6-7	0.003	0.686	0.000	0.182

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	72.638	73.182	35.4
1-2	106.810	107.314	40.5
2-3	113.560	114.138	38.8
3-4	120.583	121.178	38.5
4-5	105.449	106.133	34.2
5-6	102.615	103.393	30.5
6-7	101.575	102.446	27.8

Environmental exposures associated with blood lead levels above 30 µg/dl are above the range of values that have been used in the calibration and empirical validation of this model. (Zaragoza, L. and Hogan, K. 1998. The Integrated Exposure Uptake Biokinetic Model for Lead In Children: Independent Validation and Verification. Environmental Health Perspectives 106 (supplement 6). p. 1555)

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Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research

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****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m^3)
.5-1	1.000	2.000	32.000	0.003
1-2	2.000	3.000	32.000	0.003
2-3	3.000	5.000	32.000	0.003
3-4	4.000	5.000	32.000	0.003
4-5	4.000	5.000	32.000	0.003
5-6	4.000	7.000	32.000	0.003
6-7	4.000	7.000	32.000	0.003

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200

1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 1.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 521.800 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	745.000	521.800
1-2	745.000	521.800
2-3	745.000	521.800
3-4	745.000	521.800
4-5	745.000	521.800
5-6	745.000	521.800
6-7	745.000	521.800

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

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CALCULATED BLOOD LEAD AND LEAD UPTAKES:
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Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.001	0.887	0.000	0.079
1-2	0.001	0.740	0.000	0.189
2-3	0.002	0.832	0.000	0.203
3-4	0.002	0.822	0.000	0.213
4-5	0.002	0.841	0.000	0.237
5-6	0.003	0.908	0.000	0.257
6-7	0.003	0.997	0.000	0.265

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	19.620	20.586	10.8
1-2	29.964	30.894	12.5
2-3	31.006	32.044	11.7
3-4	31.966	33.003	11.3
4-5	25.354	26.435	9.4
5-6	23.429	24.596	7.8
6-7	22.446	23.711	6.8

LEAD MODEL FOR WINDOWS Version 1.1

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Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research

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****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m³/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m³)
.5-1	1.000	2.000	32.000	0.003
1-2	2.000	3.000	32.000	0.003
2-3	3.000	5.000	32.000	0.003
3-4	4.000	5.000	32.000	0.003
4-5	4.000	5.000	32.000	0.003
5-6	4.000	7.000	32.000	0.003
6-7	4.000	7.000	32.000	0.003

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200

1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 1.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 685.600 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	979.000	685.600
1-2	979.000	685.600
2-3	979.000	685.600
3-4	979.000	685.600
4-5	979.000	685.600
5-6	979.000	685.600
6-7	979.000	685.600

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

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CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

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Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.001	0.840	0.000	0.074
1-2	0.001	0.696	0.000	0.177
2-3	0.002	0.787	0.000	0.192
3-4	0.002	0.781	0.000	0.203
4-5	0.002	0.811	0.000	0.229
5-6	0.003	0.880	0.000	0.249
6-7	0.003	0.970	0.000	0.258

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	24.140	25.056	13.0
1-2	36.592	37.466	15.1
2-3	38.083	39.064	14.2
3-4	39.473	40.459	13.8
4-5	31.749	32.790	11.5
5-6	29.513	30.645	9.7
6-7	28.372	29.603	8.5

LEAD MODEL FOR WINDOWS Version 1.1

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Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research

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****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m³/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m³)
.5-1	1.000	2.000	32.000	0.003
1-2	2.000	3.000	32.000	0.003
2-3	3.000	5.000	32.000	0.003
3-4	4.000	5.000	32.000	0.003
4-5	4.000	5.000	32.000	0.003
5-6	4.000	7.000	32.000	0.003
6-7	4.000	7.000	32.000	0.003

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200

1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 1.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 295.700 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	422.000	295.700
1-2	422.000	295.700
2-3	422.000	295.700
3-4	422.000	295.700
4-5	422.000	295.700
5-6	422.000	295.700
6-7	422.000	295.700

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

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CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

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Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.001	0.977	0.000	0.086
1-2	0.001	0.827	0.000	0.211
2-3	0.002	0.919	0.000	0.224
3-4	0.002	0.898	0.000	0.233
4-5	0.002	0.895	0.000	0.252
5-6	0.003	0.955	0.000	0.270
6-7	0.003	1.043	0.000	0.277

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	11.536	12.600	6.7
1-2	17.895	18.934	7.7
2-3	18.295	19.441	7.2
3-4	18.658	19.791	6.9
4-5	14.410	15.559	5.6
5-6	13.173	14.401	4.6
6-7	12.544	13.868	4.0

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Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research

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****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m³/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m³)
.5-1	1.000	2.000	32.000	0.003
1-2	2.000	3.000	32.000	0.003
2-3	3.000	5.000	32.000	0.003
3-4	4.000	5.000	32.000	0.003
4-5	4.000	5.000	32.000	0.003
5-6	4.000	7.000	32.000	0.003
6-7	4.000	7.000	32.000	0.003

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200

1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 1.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 350.300 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	500.000	350.300
1-2	500.000	350.300
2-3	500.000	350.300
3-4	500.000	350.300
4-5	500.000	350.300
5-6	500.000	350.300
6-7	500.000	350.300

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

SS 92

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.001	0.949	0.000	0.084
1-2	0.001	0.800	0.000	0.204
2-3	0.002	0.893	0.000	0.218
3-4	0.002	0.875	0.000	0.227
4-5	0.002	0.879	0.000	0.248
5-6	0.003	0.941	0.000	0.266
6-7	0.003	1.030	0.000	0.274

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	13.931	14.965	7.9
1-2	21.504	22.509	9.2
2-3	22.069	23.181	8.6
3-4	22.582	23.687	8.2
4-5	17.582	18.711	6.7
5-6	16.124	17.335	5.5
6-7	15.382	16.689	4.8

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Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research

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****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m³/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m³)
.5-1	1.000	2.000	32.000	0.003
1-2	2.000	3.000	32.000	0.003
2-3	3.000	5.000	32.000	0.003
3-4	4.000	5.000	32.000	0.003
4-5	4.000	5.000	32.000	0.003
5-6	4.000	7.000	32.000	0.003
6-7	4.000	7.000	32.000	0.003

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200

1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 1.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 1162.300 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	1660.000	1162.300
1-2	1660.000	1162.300
2-3	1660.000	1162.300
3-4	1660.000	1162.300
4-5	1660.000	1162.300
5-6	1660.000	1162.300
6-7	1660.000	1162.300

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

SS 96

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.001	0.742	0.000	0.066
1-2	0.001	0.606	0.000	0.155
2-3	0.002	0.693	0.000	0.169
3-4	0.002	0.695	0.000	0.180
4-5	0.002	0.742	0.000	0.209
5-6	0.003	0.816	0.000	0.231
6-7	0.003	0.907	0.000	0.241

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	34.486	35.295	18.0
1-2	51.558	52.320	20.7
2-3	54.217	55.081	19.7
3-4	56.771	57.648	19.3
4-5	46.986	47.939	16.5
5-6	44.253	45.302	14.1
6-7	42.871	44.021	12.5

LEAD MODEL FOR WINDOWS Version 1.1

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Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research

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****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m^3)
.5-1	1.000	2.000	32.000	0.003
1-2	2.000	3.000	32.000	0.003
2-3	3.000	5.000	32.000	0.003
3-4	4.000	5.000	32.000	0.003
4-5	4.000	5.000	32.000	0.003
5-6	4.000	7.000	32.000	0.003
6-7	4.000	7.000	32.000	0.003

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200

1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 1.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 505.000 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	721.000	505.000
1-2	721.000	505.000
2-3	721.000	505.000
3-4	721.000	505.000
4-5	721.000	505.000
5-6	721.000	505.000
6-7	721.000	505.000

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

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CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

SS 104

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.001	0.895	0.000	0.079
1-2	0.001	0.747	0.000	0.191
2-3	0.002	0.839	0.000	0.205
3-4	0.002	0.828	0.000	0.215
4-5	0.002	0.846	0.000	0.239
5-6	0.003	0.912	0.000	0.258
6-7	0.003	1.001	0.000	0.266

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	18.928	19.902	10.4
1-2	28.942	29.881	12.1
2-3	29.921	30.967	11.3
3-4	30.820	31.865	10.9
4-5	24.392	25.478	9.0
5-6	22.518	23.691	7.5
6-7	21.563	22.833	6.6

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Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research

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****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m³/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m³)
.5-1	1.000	2.000	32.000	0.003
1-2	2.000	3.000	32.000	0.003
2-3	3.000	5.000	32.000	0.003
3-4	4.000	5.000	32.000	0.003
4-5	4.000	5.000	32.000	0.003
5-6	4.000	7.000	32.000	0.003
6-7	4.000	7.000	32.000	0.003

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200

1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 1.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 385.300 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	550.000	385.300
1-2	550.000	385.300
2-3	550.000	385.300
3-4	550.000	385.300
4-5	550.000	385.300
5-6	550.000	385.300
6-7	550.000	385.300

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.001	0.935	0.000	0.083
1-2	0.001	0.786	0.000	0.201
2-3	0.002	0.879	0.000	0.215
3-4	0.002	0.863	0.000	0.224
4-5	0.002	0.871	0.000	0.246
5-6	0.003	0.934	0.000	0.264
6-7	0.003	1.023	0.000	0.272

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	15.195	16.214	8.6
1-2	23.397	24.385	9.9
2-3	24.058	25.154	9.3
3-4	24.661	25.750	8.9
4-5	19.282	20.400	7.3
5-6	17.712	18.913	6.0
6-7	16.913	18.211	5.3