# APPENDIX A

# RISK ANALYSIS WORKSHEETS AND TABLES

The heavy metal concentrations exhibited in Minnie Moore Gulch may present an unacceptable health risk for receptors visiting and/or working at the site. To evaluate risks to human health from exposure to soils in Minnie Moore gulch, DEQ used the DEQ 2004 Risk Evaluation Manual (REM). This analysis is based on exposure to surface soils, and it utilized the following sample data from the jig tailings and Minnie Moore shaft waste dump.

It is assumed that recreational visitors have the potential to contact contaminants at the site while hiking, hunting, and riding mountain bikes or ATVs. However, due to current quarrying activities, it is also assumed that most visitors may access the site specifically for mineral exploration and development. Therefore, the exposure routes, in decreasing order of significance, are incidental soil ingestion, inhalation of particulates, and dermal contact.

Although the following is a very brief synopsis of the risk evaluation, the detailed analysis and tables containing the results of the calculations may be found in Appendix A.

**Exposure Duration and Frequency**

Both cancer risk and non-cancer risk (hazard index) are shown in Table 3. The age-adjusted receptor represents an individual who visits the site over 30 years, six times as a child, nine times as an adolescent, and fifteen times as an adult. For non-residential receptor the exposure duration is 6.6 years. The exposure duration of a construction worker is 30 days; this is assumed to be a conservative estimate owing to the duration of most construction projects.

For exposure routes involving direct contact with soil, including soil ingestion and dermal exposure, it is assumed that receptors have contact with soil primarily in warmer months, when the ground is not frozen or snow covered. For this reason, an exposure frequency of 270 days per year is used for these exposure routes for both residential and nonresidential scenarios. The direct contact exposure frequency for construction workers is 30 days per year (REM, Appendix E, p. E-2).

Discussion

IDEQ ran the Risk Evaluation Model (REM) for each of the areas where soils sample analysis demonstrated metals concentrations higher than Idaho's Initial Default Threshold Limits (IDTL's). Potential for cancer risk and non-cancer hazards analysis were driven by arsenic, cadmium and mercury concentration levels. The tables of *Summary(s) of Cumulative Risk and hazard Index(s), Representative Concentrations for Residential Receptors, Representative Concentrations for Non-Residential Receptors, Representative Concentrations for Construction Workers, Risk/Hazard Quotient for Residential Receptors, Risk/Hazard Quotient for Residential Receptors, Risk/Hazard Quotient for Non-Residential Receptors, and Risk/Hazard Quotient for Construction Workers, a*re contained in Appendix A. No REM analysis has been completed for ecological receptors.

Under the current uses for the site the most realistic receptor for the site is the construction worker. Although there are no residences in Minnie Moore Gulch, and public access is well restricted, there is a fairly good potential that Minnie Moore Gulch may be considered for residential development. Therefore residential (child and age-adjusted) and non-residential scenarios have been included for consideration and recommendations regarding risk management needs for that future use. Most of the receptors are expected to be construction workers actively working the mineral claims or adjacent ground. Considering the climate, the elevation and slope aspect of the workings, May through October might represent the typical mining season. The frequency and duration of the construction worker seems to be appropriate to the type of mining activities which were observed within Minnie Moore Gulch. These risk factor assumptions would significantly change if residences are developed in proximity to the mine waste and jig tailings piles.

*Minnie Moore Shaft Wastes:*

Cancer risk for residential, non-residential and construction worker receptors is greater than the acceptable level of 1E-05. The non-cancer hazard is greater than the acceptable level (Hazard Index = 1) for all receptors.

*Minnie Moore Jig Mill Tailings:*

Cancer risk for residential, non-residential and construction worker receptors is greater than the acceptable level of 1E-05. The non-cancer hazard is greater than the acceptable level (Hazard Index = 1) for all receptors.

*Minnie Moore Shaft Background Soils*:

Cancer risk for residential receptors is greater than the acceptable level of 1E-5. The non-cancer hazard is less than the acceptable level (Hazard Index = 1) for the age-adjusted residential, the non-residential and the construction worker receptors.

*Michigan Shaft Wastes:*

Cancer risk for residential, non-residential and construction worker receptors is greater than the acceptable level of 1E-05. The non-cancer hazard is greater than the acceptable level (Hazard Index = 1) for all receptors.

*Michigan Shaft Background Soils*:

Cancer risk for residential, non-residential and construction worker receptors is greater than the acceptable level. The non-cancer hazard is greater than the acceptable level (Hazard Index = 1) for the age-adjusted residential, the non-residential and the construction worker receptors.

*Relief Shaft Wastes:*

Cancer risk for residential, non-residential and construction worker receptors is greater than the acceptable level. The non-cancer hazard is greater than the acceptable level (Hazard Index = 1) for the age-adjusted residential, the non-residential and the construction worker receptors.

*Relief Shaft Background Soils*:

Cancer risk for residential is greater than the acceptable level of 1E-05.Cancer risks for non-residential and construction workers is less than the acceptable level of 1E-05. The non-cancer hazard is less than the acceptable level (Hazard Index = 1) for all receptors.

*Allen Shaft Wastes:*

Cancer risk for residential and non-residential receptors is greater than the acceptable level. Cancer risk for construction worker receptors is less than the acceptable level. The non-cancer hazard is less than the acceptable level (Hazard Index = 1) for the age-adjusted residential receptors. The non-cancer hazard is greater than the acceptable level (Hazard Index = 1) for, the non-residential and the construction worker receptors.

*Allen Shaft Background Soils*:

Cancer risk for Age-Adjusted residential receptors is greater than the acceptable level of 1E-05.Cancer risks for residential (child), non-residential and construction workers is less than the acceptable level of 1E-05. The non-cancer hazard is less than the acceptable level (Hazard Index = 1) for all receptors.

*Unnamed Shaft (Alta Claim) Wastes:*

Cancer risk for residential receptors is greater than the acceptable level. Cancer risk for non-residential and construction worker receptors is less than the acceptable level. The non-cancer hazard is greater than the acceptable level (Hazard Index = 1) for the residential receptors. The non-cancer hazard is less than the acceptable level (Hazard Index = 1) for, the non-residential and the construction worker receptors.

*Unnamed Shaft (Alta Claim) Background Soils:*

Cancer risk for residential receptors is greater than the acceptable level. Cancer risk for non-residential and construction worker receptors is less than the acceptable level. The non-cancer hazard is greater than the acceptable level (Hazard Index = 1) for the residential receptors. The non-cancer hazard is less than the acceptable level (Hazard Index = 1) for, the non-residential and the construction worker receptors.

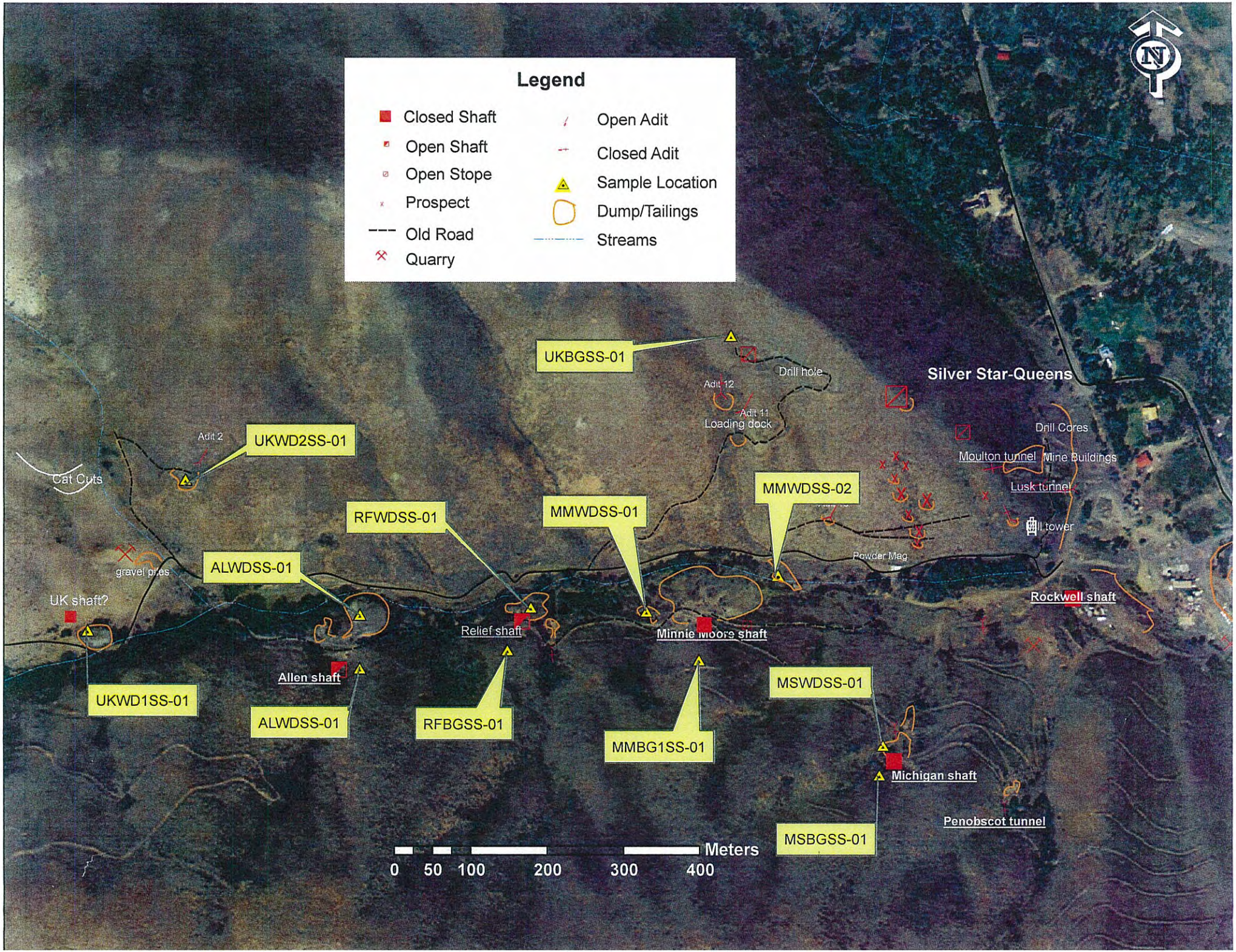
*Unnamed Adit (Con Virginia) Wastes:*

Cancer risk for all receptors is greater than the acceptable level. The non-cancer hazard is greater than the acceptable level (Hazard Index = 1) for the residential receptors. The non-cancer hazard is less than the acceptable level (Hazard Index = 1) for, the non-residential and the construction worker receptors.

**Uncertainty**

The risk estimates presented here are based on specific locations and may not be representative of the huge surface areas described by claims or large volumes of materials contained in waste dumps. Furthermore, it is unlikely that under the current uses for the site receptors would realize the assumed exposure time. However, if any of the claims are developed without incorporation of significant risk management for mine wastes and jig tailings, then risk factor assumptions, particularly for residents, would radically change.

The analysis presented here assumed that all of the arsenic is 100% bioavailable. It is likely that bioavailability varies in soils throughout this site; 60% arsenic bioavailability has often been assumed for arsenic in soils contaminated with mine waste.


Legend
Closed Shaft
Open Shaft
Open Stope
Prospect
Old Road
Quarry
Open Adit
Closed Adit
Sample Location
Dump/Tailings
Streams
UKBGSS-01
Drill hole
Adit 12
Adit 11
Loading dock
Silver Star-Queens
Drill Cores
Moulton tunnel
Mine Buildings
Lusk tunnel
Adit 2
UKWD2SS-01
Cat Cuts
MMWDSS-02
RFWDSS-01
MMWDSS-01
Powder Mag
gravel pits
ALWDSS-01
UK shaft?
Rockwell shaft
Relief shaft
Minnie Moore shaft
Allen shaft
MSWDSS-01
UKWD1SS-01
ALWDSS-01
RFBGSS-01
MMBG1SS-01
Michigan shaft
Penobscot tunnel
MSBGSS-01
Meters
0 50 100 200 300 400

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IDEQ
1410 N. Hilton
Boise, ID 83706

Work Order: **W701633**
Reported 16-Oct-07 15:25

**ANALYTICAL REPORT FOR SAMPLES**

| Sample ID | Laboratory ID | Matrix | Date Sampled | Sampled By | Date Received |
|---|---|---|---|---|---|
| MMWDSS-01 | W701633-01 | Solid | 19-Sep-07 | BAS | 01-Oct-07 |
| MMWDSS-02 | W701633-02 | Solid | 19-Sep-07 | BAS | 01-Oct-07 |
| RFWDSS-01 | W701633-03 | Solid | 19-Sep-07 | BAS | 01-Oct-07 |
| RFBGSS-01 | W701633-04 | Solid | 19-Sep-07 | BAS | 01-Oct-07 |
| ALBGSS-01 | W701633-05 | Solid | 19-Sep-07 | BAS | 01-Oct-07 |
| MMBGSS-01 | W701633-06 | Solid | 19-Sep-07 | BAS | 01-Oct-07 |
| ALWDSS-01 | W701633-07 | Solid | 19-Sep-07 | BAS | 01-Oct-07 |
| UKWD1SS-01 | W701633-08 | Solid | 20-Sep-07 | BAS | 01-Oct-07 |
| MSBGSS-01 | W701633-09 | Solid | 21-Sep-07 | BAS | 01-Oct-07 |
| UKWD2SS-01 | W701633-10 | Solid | 20-Sep-07 | BAS | 01-Oct-07 |
| MSWDSS-01 | W701633-11 | Solid | 21-Sep-07 | BAS | 01-Oct-07 |
| UKBGSS-1 | W701633-12 | Solid | 20-Sep-07 | BAS | 01-Oct-07 |

The complete report includes pages for each sample; a full QC report, and a notes page.

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Work Order: **W701633**
Reported 16-Oct-07 15:25

Client Sample ID: **MMWDSS-01**
SVL Sample ID: **W701633-01 (Solid)**



Sampled: 19-Sep-07
Received: 01-Oct-07
Sampled By: BAS

| Method | Analyte | Result | Units | RL | MDL | Dilution | Notes | Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | | |
| EPA 6010B | **Antimony** | 79.2 | mg/kg | 2.0 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Arsenic** | 6150 | mg/kg | 25.0 | 7.4 | 10 | | 15-Oct-07 | DT |
| EPA 6010B | **Cadmium** | 230 | mg/kg | 0.20 | 0.05 | | | 15-Oct-07 | DT |
| EPA 6010B | **Copper** | 76.1 | mg/kg | 1.00 | 0.27 | | | 15-Oct-07 | DT |
| EPA 6010B | **Iron** | 191000 | mg/kg | 60.0 | 9.5 | 10 | D2 | 15-Oct-07 | DT |
| EPA 6010B | **Lead** | 4200 | mg/kg | 0.75 | 0.50 | | | 15-Oct-07 | DT |
| EPA 6010B | Selenium | < 4.0 | mg/kg | 4.0 | 1.1 | | | 15-Oct-07 | DT |
| EPA 6010B | **Silver** | 19.4 | mg/kg | 0.50 | 0.06 | | | 15-Oct-07 | DT |
| EPA 6010B | **Zinc** | 23500 | mg/kg | 10.0 | 1.30 | 10 | D2 | 15-Oct-07 | DT |
| **Mercury by SW846 Methods** | | | | | | | | | |
| EPA 7471A | **Mercury** | 2.38 | mg/kg | 0.330 | 0.066 | 10 | D2 | 12-Oct-07 | JAA |
| **Percent Solids** | | | | | | | | | |
| Percent Solids | **% Solids** | 96 | % | | | | | 08-Oct-07 | HB |

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**Larry Drew**
Technical Director

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Work Order: **W701633**
Reported 16-Oct-07 15:25

Client Sample ID: **MMWDSS-02**
SVL Sample ID: **W701633-02 (Solid)**



Sampled: 19-Sep-07
Received: 01-Oct-07
Sampled By: BAS

| Method | Analyte | Result | Units | RL | MDL | Dilution | Notes | Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | | |
| EPA 6010B | **Antimony** | 388 | mg/kg | 2.0 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Arsenic** | 3600 | mg/kg | 2.5 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Cadmium** | 116 | mg/kg | 0.20 | 0.05 | | | 15-Oct-07 | DT |
| EPA 6010B | **Copper** | 643 | mg/kg | 1.00 | 0.27 | | | 15-Oct-07 | DT |
| EPA 6010B | **Iron** | 113000 | mg/kg | 60.0 | 9.5 | 10 | D2 | 15-Oct-07 | DT |
| EPA 6010B | **Lead** | 22100 | mg/kg | 7.50 | 5.00 | 10 | D2 | 15-Oct-07 | DT |
| EPA 6010B | Selenium | < 4.0 | mg/kg | 4.0 | 1.1 | | | 15-Oct-07 | DT |
| EPA 6010B | **Silver** | 256 | mg/kg | 0.50 | 0.06 | | | 15-Oct-07 | DT |
| EPA 6010B | **Zinc** | 13700 | mg/kg | 10.0 | 1.30 | 10 | D2 | 15-Oct-07 | DT |
| **Mercury by SW846 Methods** | | | | | | | | | |
| EPA 7471A | **Mercury** | 4.57 | mg/kg | 0.330 | 0.066 | 10 | D2 | 12-Oct-07 | JAA |
| **Percent Solids** | | | | | | | | | |
| Percent Solids | **% Solids** | 99 | % | | | | | 08-Oct-07 | HB |

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Work Order: **W701633**
Reported 16-Oct-07 15:25

Client Sample ID: **RFWDSS-01**
SVL Sample ID: **W701633-03 (Solid)**



Sampled: 19-Sep-07
Received: 01-Oct-07
Sampled By: BAS

| Method | Analyte | Result | Units | RL | MDL | Dilution | Notes | Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | | |
| EPA 6010B | **Antimony** | 16.8 | mg/kg | 2.0 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Arsenic** | 2490 | mg/kg | 2.5 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Cadmium** | 13.3 | mg/kg | 0.20 | 0.05 | | | 15-Oct-07 | DT |
| EPA 6010B | **Copper** | 578 | mg/kg | 1.00 | 0.27 | | | 15-Oct-07 | DT |
| EPA 6010B | **Iron** | 78400 | mg/kg | 6.0 | 1.0 | | | 15-Oct-07 | DT |
| EPA 6010B | **Lead** | 8350 | mg/kg | 0.75 | 0.50 | | | 15-Oct-07 | DT |
| EPA 6010B | **Selenium** | 7.1 | mg/kg | 4.0 | 1.1 | | | 15-Oct-07 | DT |
| EPA 6010B | **Silver** | 38.3 | mg/kg | 0.50 | 0.06 | | | 15-Oct-07 | DT |
| EPA 6010B | **Zinc** | 1400 | mg/kg | 1.00 | 0.13 | | | 15-Oct-07 | DT |
| **Mercury by SW846 Methods** | | | | | | | | | |
| EPA 7471A | **Mercury** | 2.00 | mg/kg | 0.330 | 0.066 | 10 | D2 | 12-Oct-07 | JAA |
| **Percent Solids** | | | | | | | | | |
| Percent Solids | **% Solids** | 95 | % | | | | | 08-Oct-07 | HB |

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**Larry Drew**
Technical Director

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Work Order: **W701633**
Reported 16-Oct-07 15:25

Client Sample ID: **RFBGSS-01**
SVL Sample ID: **W701633-04 (Solid)**

**Sample Report Page 1 of 1**

Sampled: 19-Sep-07
Received: 01-Oct-07
Sampled By: BAS

| Method | Analyte | Result | Units | RL | MDL | Dilution | Notes | Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | | |
| EPA 6010B | Antimony | < 2.0 | mg/kg | 2.0 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Arsenic** | 11.8 | mg/kg | 2.5 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Cadmium** | 1.79 | mg/kg | 0.20 | 0.05 | | | 15-Oct-07 | DT |
| EPA 6010B | **Copper** | 16.6 | mg/kg | 1.00 | 0.27 | | | 15-Oct-07 | DT |
| EPA 6010B | **Iron** | 26900 | mg/kg | 6.0 | 1.0 | | | 15-Oct-07 | DT |
| EPA 6010B | **Lead** | 42.4 | mg/kg | 0.75 | 0.50 | | | 15-Oct-07 | DT |
| EPA 6010B | Selenium | < 4.0 | mg/kg | 4.0 | 1.1 | | | 15-Oct-07 | DT |
| EPA 6010B | Silver | < 0.50 | mg/kg | 0.50 | 0.06 | | | 15-Oct-07 | DT |
| EPA 6010B | **Zinc** | 101 | mg/kg | 1.00 | 0.13 | | | 15-Oct-07 | DT |
| **Mercury by SW846 Methods** | | | | | | | | | |
| EPA 7471A | **Mercury** | 0.035 | mg/kg | 0.033 | 0.007 | | | 12-Oct-07 | JAA |
| **Percent Solids** | | | | | | | | | |
| Percent Solids | **% Solids** | 99 | % | | | | | 08-Oct-07 | HB |

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Work Order: **W701633**
Reported 16-Oct-07 15:25

Client Sample ID: **ALBGSS-01**
SVL Sample ID: **W701633-05 (Solid)**



Sampled: 19-Sep-07
Received: 01-Oct-07
Sampled By: BAS

| Method | Analyte | Result | Units | RL | MDL | Dilution | Notes | Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | | |
| EPA 6010B | Antimony | < 2.0 | mg/kg | 2.0 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Arsenic** | 5.8 | mg/kg | 2.5 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Cadmium** | 1.42 | mg/kg | 0.20 | 0.05 | | | 15-Oct-07 | DT |
| EPA 6010B | **Copper** | 14.2 | mg/kg | 1.00 | 0.27 | | | 15-Oct-07 | DT |
| EPA 6010B | **Iron** | 25200 | mg/kg | 6.0 | 1.0 | | | 15-Oct-07 | DT |
| EPA 6010B | **Lead** | 19.9 | mg/kg | 0.75 | 0.50 | | | 15-Oct-07 | DT |
| EPA 6010B | Selenium | < 4.0 | mg/kg | 4.0 | 1.1 | | | 15-Oct-07 | DT |
| EPA 6010B | Silver | < 0.50 | mg/kg | 0.50 | 0.06 | | | 15-Oct-07 | DT |
| EPA 6010B | **Zinc** | 82.9 | mg/kg | 1.00 | 0.13 | | | 15-Oct-07 | DT |
| **Mercury by SW846 Methods** | | | | | | | | | |
| EPA 7471A | Mercury | < 0.033 | mg/kg | 0.033 | 0.007 | | | 12-Oct-07 | JAA |
| **Percent Solids** | | | | | | | | | |
| Percent Solids | **% Solids** | 100 | % | | | | | 08-Oct-07 | HB |

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Boise, ID 83706

Work Order: **W701633**
Reported 16-Oct-07 15:25

Client Sample ID: **MMBGSS-01**
SVL Sample ID: **W701633-06 (Solid)**



Sampled: 19-Sep-07
Received: 01-Oct-07
Sampled By: BAS

| Method | Analyte | Result | Units | RL | MDL | Dilution | Notes | Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | | |
| EPA 6010B | Antimony | < 2.0 | mg/kg | 2.0 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Arsenic** | 27.6 | mg/kg | 2.5 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Cadmium** | 3.03 | mg/kg | 0.20 | 0.05 | | | 15-Oct-07 | DT |
| EPA 6010B | **Copper** | 36.5 | mg/kg | 1.00 | 0.27 | | | 15-Oct-07 | DT |
| EPA 6010B | **Iron** | 21500 | mg/kg | 6.0 | 1.0 | | | 15-Oct-07 | DT |
| EPA 6010B | **Lead** | 62.6 | mg/kg | 0.75 | 0.50 | | | 15-Oct-07 | DT |
| EPA 6010B | Selenium | < 4.0 | mg/kg | 4.0 | 1.1 | | | 15-Oct-07 | DT |
| EPA 6010B | Silver | < 0.50 | mg/kg | 0.50 | 0.06 | | | 15-Oct-07 | DT |
| EPA 6010B | **Zinc** | 266 | mg/kg | 1.00 | 0.13 | | | 15-Oct-07 | DT |
| **Mercury by SW846 Methods** | | | | | | | | | |
| EPA 7471A | **Mercury** | 0.037 | mg/kg | 0.033 | 0.007 | | | 12-Oct-07 | JAA |
| **Percent Solids** | | | | | | | | | |
| Percent Solids | **% Solids** | 100 | % | | | | | 08-Oct-07 | HB |

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Work Order: **W701633**
Reported 16-Oct-07 15:25

Client Sample ID: **ALWDSS-01**
SVL Sample ID: **W701633-07 (Solid)**

**Sample Report Page 1 of 1**

Sampled: 19-Sep-07
Received: 01-Oct-07
Sampled By: BAS

| Method | Analyte | Result | Units | RL | MDL | Dilution | Notes | Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | | |
| EPA 6010B | Antimony | < 2.0 | mg/kg | 2.0 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Arsenic** | 104 | mg/kg | 2.5 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Cadmium** | 8.37 | mg/kg | 0.20 | 0.05 | | | 15-Oct-07 | DT |
| EPA 6010B | **Copper** | 49.0 | mg/kg | 1.00 | 0.27 | | | 15-Oct-07 | DT |
| EPA 6010B | **Iron** | 25600 | mg/kg | 6.0 | 1.0 | | | 15-Oct-07 | DT |
| EPA 6010B | **Lead** | 103 | mg/kg | 0.75 | 0.50 | | | 15-Oct-07 | DT |
| EPA 6010B | Selenium | < 4.0 | mg/kg | 4.0 | 1.1 | | | 15-Oct-07 | DT |
| EPA 6010B | **Silver** | 0.76 | mg/kg | 0.50 | 0.06 | | | 15-Oct-07 | DT |
| EPA 6010B | **Zinc** | 573 | mg/kg | 1.00 | 0.13 | | | 15-Oct-07 | DT |
| **Mercury by SW846 Methods** | | | | | | | | | |
| EPA 7471A | **Mercury** | 0.593 | mg/kg | 0.033 | 0.007 | | | 12-Oct-07 | JAA |
| **Percent Solids** | | | | | | | | | |
| Percent Solids | **% Solids** | 100 | % | | | | | 08-Oct-07 | HB |

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Work Order: **W701633**
Reported 16-Oct-07 15:25

Client Sample ID: **UKWD1SS-01**
SVL Sample ID: **W701633-08 (Solid)**

**Sample Report Page 1 of 1**

Sampled: 20-Sep-07
Received: 01-Oct-07
Sampled By: BAS

| Method | Analyte | Result | Units | RL | MDL | Dilution | Notes | Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | | |
| EPA 6010B | Antimony | < 2.0 | mg/kg | 2.0 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Arsenic** | 28.5 | mg/kg | 2.5 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Cadmium** | 10.7 | mg/kg | 0.20 | 0.05 | | | 15-Oct-07 | DT |
| EPA 6010B | **Copper** | 69.6 | mg/kg | 1.00 | 0.27 | | | 15-Oct-07 | DT |
| EPA 6010B | **Iron** | 18500 | mg/kg | 6.0 | 1.0 | | | 15-Oct-07 | DT |
| EPA 6010B | **Lead** | 31.1 | mg/kg | 0.75 | 0.50 | | | 15-Oct-07 | DT |
| EPA 6010B | **Selenium** | 6.1 | mg/kg | 4.0 | 1.1 | | | 15-Oct-07 | DT |
| EPA 6010B | **Silver** | 0.59 | mg/kg | 0.50 | 0.06 | | | 15-Oct-07 | DT |
| EPA 6010B | **Zinc** | 842 | mg/kg | 1.00 | 0.13 | | | 15-Oct-07 | DT |
| **Mercury by SW846 Methods** | | | | | | | | | |
| EPA 7471A | **Mercury** | 0.088 | mg/kg | 0.033 | 0.007 | | | 12-Oct-07 | JAA |
| **Percent Solids** | | | | | | | | | |
| Percent Solids | **% Solids** | 100 | % | | | | | 08-Oct-07 | HB |

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

**Larry Drew**
Technical Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

IDEQ
1410 N. Hilton
Boise, ID 83706

Work Order: **W701633**
Reported 16-Oct-07 15:25

Client Sample ID: **MSBGSS-01**
SVL Sample ID: **W701633-09 (Solid)**



Sampled: 21-Sep-07
Received: 01-Oct-07
Sampled By: BAS

| Method | Analyte | Result | Units | RL | MDL | Dilution | Notes | Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | | |
| EPA 6010B | Antimony | < 2.0 | mg/kg | 2.0 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Arsenic** | 21.9 | mg/kg | 2.5 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Cadmium** | 4.52 | mg/kg | 0.20 | 0.05 | | | 15-Oct-07 | DT |
| EPA 6010B | **Copper** | 42.3 | mg/kg | 1.00 | 0.27 | | | 15-Oct-07 | DT |
| EPA 6010B | **Iron** | 22700 | mg/kg | 6.0 | 1.0 | | | 15-Oct-07 | DT |
| EPA 6010B | **Lead** | 25.1 | mg/kg | 0.75 | 0.50 | | | 15-Oct-07 | DT |
| EPA 6010B | Selenium | < 4.0 | mg/kg | 4.0 | 1.1 | | | 15-Oct-07 | DT |
| EPA 6010B | Silver | < 0.50 | mg/kg | 0.50 | 0.06 | | | 15-Oct-07 | DT |
| EPA 6010B | **Zinc** | 368 | mg/kg | 1.00 | 0.13 | | | 15-Oct-07 | DT |
| **Mercury by SW846 Methods** | | | | | | | | | |
| EPA 7471A | Mercury | < 0.033 | mg/kg | 0.033 | 0.007 | | | 12-Oct-07 | JAA |
| **Percent Solids** | | | | | | | | | |
| Percent Solids | **% Solids** | 97 | % | | | | | 08-Oct-07 | HB |

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

**Larry Drew**
Technical Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

IDEQ
1410 N. Hilton
Boise, ID 83706

Work Order: **W701633**
Reported 16-Oct-07 15:25

Client Sample ID: **UKWD2SS-01**
SVL Sample ID: **W701633-10 (Solid)**



Sampled: 20-Sep-07
Received: 01-Oct-07
Sampled By: BAS

| Method | Analyte | Result | Units | RL | MDL | Dilution | Notes | Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | | |
| EPA 6010B | **Antimony** | 3.8 | mg/kg | 2.0 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Arsenic** | 96.3 | mg/kg | 2.5 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Cadmium** | 3.87 | mg/kg | 0.20 | 0.05 | | | 15-Oct-07 | DT |
| EPA 6010B | **Copper** | 82.8 | mg/kg | 1.00 | 0.27 | | | 15-Oct-07 | DT |
| EPA 6010B | **Iron** | 36600 | mg/kg | 6.0 | 1.0 | | | 15-Oct-07 | DT |
| EPA 6010B | **Lead** | 77.7 | mg/kg | 0.75 | 0.50 | | | 15-Oct-07 | DT |
| EPA 6010B | **Selenium** | 8.3 | mg/kg | 4.0 | 1.1 | | | 15-Oct-07 | DT |
| EPA 6010B | **Silver** | 0.80 | mg/kg | 0.50 | 0.06 | | | 15-Oct-07 | DT |
| EPA 6010B | **Zinc** | 183 | mg/kg | 1.00 | 0.13 | | | 15-Oct-07 | DT |
| **Mercury by SW846 Methods** | | | | | | | | | |
| EPA 7471A | **Mercury** | 0.345 | mg/kg | 0.033 | 0.007 | | | 12-Oct-07 | JAA |
| **Percent Solids** | | | | | | | | | |
| Percent Solids | **% Solids** | 99 | % | | | | | 08-Oct-07 | HB |

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

**Larry Drew**
Technical Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

IDEQ
1410 N. Hilton
Boise, ID 83706

Work Order: **W701633**
Reported 16-Oct-07 15:25

Client Sample ID: **MSWDSS-01**
SVL Sample ID: **W701633-11 (Solid)**



Sampled: 21-Sep-07
Received: 01-Oct-07
Sampled By: BAS

| Method | Analyte | Result | Units | RL | MDL | Dilution | Notes | Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | | |
| EPA 6010B | **Antimony** | 9.9 | mg/kg | 2.0 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Arsenic** | 773 | mg/kg | 2.5 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Cadmium** | 11.9 | mg/kg | 0.20 | 0.05 | | | 15-Oct-07 | DT |
| EPA 6010B | **Copper** | 33.8 | mg/kg | 1.00 | 0.27 | | | 15-Oct-07 | DT |
| EPA 6010B | **Iron** | 54800 | mg/kg | 6.0 | 1.0 | | | 15-Oct-07 | DT |
| EPA 6010B | **Lead** | 575 | mg/kg | 0.75 | 0.50 | | | 15-Oct-07 | DT |
| EPA 6010B | Selenium | < 4.0 | mg/kg | 4.0 | 1.1 | | | 15-Oct-07 | DT |
| EPA 6010B | **Silver** | 2.52 | mg/kg | 0.50 | 0.06 | | | 15-Oct-07 | DT |
| EPA 6010B | **Zinc** | 951 | mg/kg | 1.00 | 0.13 | | | 15-Oct-07 | DT |
| **Mercury by SW846 Methods** | | | | | | | | | |
| EPA 7471A | **Mercury** | 0.607 | mg/kg | 0.033 | 0.007 | | | 12-Oct-07 | JAA |
| **Percent Solids** | | | | | | | | | |
| Percent Solids | **% Solids** | 99 | % | | | | | 08-Oct-07 | HB |

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

**Larry Drew**
Technical Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

IDEQ
1410 N. Hilton
Boise, ID 83706

Work Order: **W701633**
Reported 16-Oct-07 15:25

Client Sample ID: **UKBGSS-1**
SVL Sample ID: **W701633-12 (Solid)**



Sampled: 20-Sep-07
Received: 01-Oct-07
Sampled By: BAS

| Method | Analyte | Result | Units | RL | MDL | Dilution | Notes | Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | | |
| EPA 6010B | Antimony | < 2.0 | mg/kg | 2.0 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Arsenic** | 23.8 | mg/kg | 2.5 | 0.7 | | | 15-Oct-07 | DT |
| EPA 6010B | **Cadmium** | 2.13 | mg/kg | 0.20 | 0.05 | | | 15-Oct-07 | DT |
| EPA 6010B | **Copper** | 21.7 | mg/kg | 1.00 | 0.27 | | | 15-Oct-07 | DT |
| EPA 6010B | **Iron** | 29400 | mg/kg | 6.0 | 1.0 | | | 15-Oct-07 | DT |
| EPA 6010B | **Lead** | 20.6 | mg/kg | 0.75 | 0.50 | | | 15-Oct-07 | DT |
| EPA 6010B | Selenium | < 4.0 | mg/kg | 4.0 | 1.1 | | | 15-Oct-07 | DT |
| EPA 6010B | Silver | < 0.50 | mg/kg | 0.50 | 0.06 | | | 15-Oct-07 | DT |
| EPA 6010B | **Zinc** | 91.0 | mg/kg | 1.00 | 0.13 | | | 15-Oct-07 | DT |
| **Mercury by SW846 Methods** | | | | | | | | | |
| EPA 7471A | Mercury | < 0.033 | mg/kg | 0.033 | 0.007 | | | 12-Oct-07 | JAA |
| **Percent Solids** | | | | | | | | | |
| Percent Solids | **% Solids** | 95 | % | | | | | 08-Oct-07 | HB |

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

**Larry Drew**
Technical Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

IDEQ
1410 N. Hilton
Boise, ID 83706

Work Order: **W701633**
Reported 16-Oct-07 15:25

## Quality Control - BLANK Data

| Method | Analyte | Units | Result | MDL | MRL | Batch ID | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | |
| EPA 6010B | Antimony | mg/kg | <2.0 | 0.7 | 2.0 | W710052 | 15-Oct-07 | |
| EPA 6010B | Arsenic | mg/kg | <2.5 | 0.7 | 2.5 | W710052 | 15-Oct-07 | |
| EPA 6010B | Cadmium | mg/kg | <0.20 | 0.05 | 0.20 | W710052 | 15-Oct-07 | |
| EPA 6010B | Copper | mg/kg | <1.00 | 0.27 | 1.00 | W710052 | 15-Oct-07 | |
| EPA 6010B | Iron | mg/kg | <6.0 | 1.0 | 6.0 | W710052 | 15-Oct-07 | |
| EPA 6010B | Lead | mg/kg | <0.75 | 0.50 | 0.75 | W710052 | 15-Oct-07 | |
| EPA 6010B | Selenium | mg/kg | <4.0 | 1.1 | 4.0 | W710052 | 15-Oct-07 | |
| EPA 6010B | Silver | mg/kg | <0.50 | 0.06 | 0.50 | W710052 | 15-Oct-07 | |
| EPA 6010B | Zinc | mg/kg | <1.00 | 0.13 | 1.00 | W710052 | 15-Oct-07 | |
| **Mercury by SW846 Methods** | | | | | | | | |
| EPA 7471A | Mercury | mg/kg | <0.033 | 0.007 | 0.033 | W710389 | 12-Oct-07 | |

## Quality Control - LABORATORY CONTROL SAMPLE Data

| Method | Analyte | Units | LCS Result | LCS True | % Rec. | Acceptance Limits | Batch ID | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | | |
| EPA 6010B | Antimony | mg/kg | 103 | 100 | 103 | 84 - 110 | W710052 | 15-Oct-07 | |
| EPA 6010B | Arsenic | mg/kg | 99.8 | 100 | 99.8 | 84 - 110 | W710052 | 15-Oct-07 | |
| EPA 6010B | Cadmium | mg/kg | 103 | 100 | 103 | 86 - 110 | W710052 | 15-Oct-07 | |
| EPA 6010B | Copper | mg/kg | 108 | 100 | 108 | 89 - 112 | W710052 | 15-Oct-07 | |
| EPA 6010B | Iron | mg/kg | 1050 | 1000 | 105 | 86 - 117 | W710052 | 15-Oct-07 | |
| EPA 6010B | Lead | mg/kg | 104 | 100 | 104 | 82 - 117 | W710052 | 15-Oct-07 | |
| EPA 6010B | Selenium | mg/kg | 91.3 | 100 | 91.3 | 80 - 108 | W710052 | 15-Oct-07 | |
| EPA 6010B | Silver | mg/kg | 5.30 | 5.00 | 106 | 90 - 118 | W710052 | 15-Oct-07 | |
| EPA 6010B | Zinc | mg/kg | 100 | 100 | 100 | 85 - 112 | W710052 | 15-Oct-07 | |
| **Mercury by SW846 Methods** | | | | | | | | | |
| EPA 7471A | Mercury | mg/kg | 0.795 | 0.833 | 95.4 | 85 - 115 | W710389 | 12-Oct-07 | |

## Quality Control - MATRIX SPIKE Data

| Method | Analyte | Units | Spike Result | Sample Result (R) | Spike Level (S) | % Rec. | Acceptance Limits | Batch ID | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | | | |
| EPA 6010B | Antimony | mg/kg | 62.9 | 3.7 | 100 | 59.2 | 75 - 125 | W710052 | 15-Oct-07 | M2 |
| EPA 6010B | Arsenic | mg/kg | 135 | 30.6 | 100 | 104 | 75 - 125 | W710052 | 15-Oct-07 | |
| EPA 6010B | Cadmium | mg/kg | 117 | 13.5 | 100 | 103 | 75 - 125 | W710052 | 15-Oct-07 | |
| EPA 6010B | Copper | mg/kg | 199 | 77.0 | 100 | 122 | 75 - 125 | W710052 | 15-Oct-07 | |
| EPA 6010B | Iron | mg/kg | 21300 | 19300 | 1000 | R > 4S | 75 - 125 | W710052 | 15-Oct-07 | M3 |
| EPA 6010B | Lead | mg/kg | 252 | 144 | 100 | 108 | 75 - 125 | W710052 | 15-Oct-07 | |
| EPA 6010B | Selenium | mg/kg | 110 | 13.1 | 100 | 97.1 | 75 - 125 | W710052 | 15-Oct-07 | |
| EPA 6010B | Silver | mg/kg | 7.61 | 1.56 | 5.00 | 121 | 75 - 125 | W710052 | 15-Oct-07 | |
| EPA 6010B | Zinc | mg/kg | 1230 | 1080 | 100 | R > 4S | 75 - 125 | W710052 | 15-Oct-07 | M3 |
| **Mercury by SW846 Methods** | | | | | | | | | | |
| EPA 7471A | Mercury | mg/kg | 2.48 | 2.38 | 0.167 | R > 4S | 75 - 125 | W710389 | 12-Oct-07 | M3 |

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

IDEQ
1410 N. Hilton
Boise, ID 83706

Work Order: **W701633**
Reported 16-Oct-07 15:25

## Quality Control - MATRIX SPIKE DUPLICATE Data

| Method | Analyte | Units | Spike Result | Sample Result | Spike Level | % Rec. | Rec. Limits | RPD | RPD Limit | Batch ID | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | | | | | |
| EPA 6010B | Antimony | mg/kg | 62.0 | 3.7 | 100 | 58.4 | 75-125 | 1.43 | 20 | W710052 | 15-Oct-07 | |
| EPA 6010B | Arsenic | mg/kg | 131 | 30.6 | 100 | 101 | 75-125 | 2.31 | 20 | W710052 | 15-Oct-07 | |
| EPA 6010B | Cadmium | mg/kg | 112 | 13.5 | 100 | 98.9 | 75-125 | 3.61 | 20 | W710052 | 15-Oct-07 | |
| EPA 6010B | Copper | mg/kg | 192 | 77.0 | 100 | 115 | 75-125 | 3.51 | 20 | W710052 | 15-Oct-07 | |
| EPA 6010B | Iron | mg/kg | 19900 | 19300 | 1000 | 53.1 | 75-125 | 7.20 | 20 | W710052 | 15-Oct-07 | |
| EPA 6010B | Lead | mg/kg | 257 | 144 | 100 | 113 | 75-125 | 1.77 | 20 | W710052 | 15-Oct-07 | |
| EPA 6010B | Selenium | mg/kg | 108 | 13.1 | 100 | 95.2 | 75-125 | 1.75 | 20 | W710052 | 15-Oct-07 | |
| EPA 6010B | Silver | mg/kg | 7.19 | 1.56 | 5.00 | 113 | 75-125 | 5.58 | 20 | W710052 | 15-Oct-07 | |
| EPA 6010B | Zinc | mg/kg | 1160 | 1080 | 100 | 75.4 | 75-125 | 6.36 | 20 | W710052 | 15-Oct-07 | |
| **Mercury by SW846 Methods** | | | | | | | | | | | | |
| EPA 7471A | Mercury | mg/kg | 3.77 | 2.38 | 0.167 | 830 | 75-125 | 41.1 | 20 | W710389 | 12-Oct-07 | M3, R2 |

## Quality Control - POST DIGESTION SPIKE Data

| Method | Analyte | Units | Spike Result | Sample Result (R) | Spike Level (S) | % Rec. | Acceptance Limits | Batch ID | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Recoverable Metals by EPA 6000/7000 Series Methods** | | | | | | | | | | |
| EPA 6010B | Antimony | mg/kg | 96.1 | 3.7 | 100 | 92.4 | 75 - 125 | W710052 | 15-Oct-07 | D2 |

### Notes and Definitions

| | |
|---|---|
| R2 | RPD exceeded the laboratory control limit. |
| M3 | The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable. |
| M2 | Matrix spike was low, but the LCS was acceptable. |
| D2 | Sample required dilution due to high concentration of target analyte. |

# CHAIN OF CUSTODY RECORD



SVL Analytical, Inc. • One Government Gulch • Kellogg, ID 83837 • (208) 784-1258 • FAX: (208) 783-0891

FOR SVL USE ONLY
SVL JOB #

TEMP on Receipt: W701633

**Report to Company:** IDEQ
Contact: Bruce Schuld
Address: 1410 N Orchard
Boise, ID 83706
Phone Number: 208-373-0554
FAX Number: 208-373-0154
E-mail: bruce.schuld@deq.idaho.gov

**Invoice Sent To:** Same
Contact:
Address:
Phone Number:
FAX Number:
PO#:

**Table 1. -- Matrix Type**
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other

**Project Name:** Minnie Moore Gulch
**Sampler's Signature:** Bruce A Schuld

**Indicate State of sample origination:** ID **USACE?** ☐ Yes ☐ No

| | Sample ID (Please take care to distinguish between: 1 and I, 2 and Z, 5 and S, ø and o. Thanks!) | Collection Date | Collection Time | Collected by: (Init.) | Misc. Matrix Type (From Table 1) | Misc. No. of Containers | Preservative(s) Unpreserved | $HNO_3$ Filtered | $HNO_3$ Unfiltered | HCl | $H_2SO_4$ | NaOH | Other (Specify) | Analyses Required: T. Antimony | T. Arsenic | T. Cadmium | T. Copper | T. Iron | T. Lead | T. Mercury | T. Selenium | T. Silver | T. Zinc | Rush Instructions (Days) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MMWDSS-01 | 9/19/07 | 12:00 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | no time on sample labels. |
| 2 | MMWDSS-02 | 9/19/07 | 13:00 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | |
| 3 | RFWDSS-01 | 9/19/07 | 14:00 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | |
| 4 | RFBGSS-01 | 9/19/07 | 13:30 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | |
| 5 | ALBGSS-01 | 9/19/07 | 14:00 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | |
| 6 | MMBGSS-01 | 9/19/07 | 11:30 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | |
| 7 | ALWDSS-01 | 9/19/07 | 14:30 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | |
| 8 | UKWD1SS-01 | 9/20/07 | 10:20 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | |
| 9 | MSBGSS-01 | 9/21/07 | 10:00 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | |
| 10 | UKWD2SS-01 | 9/20/07 | 11:00 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | |

Relinquished by: Bruce A Schuld Date: 9/27 Time: Received by: R. Stribling Date: 10/01/07 Time: 12:45
Relinquished by: Date: Time: Received by: Date: Time:

* Sample Reject: ☐ Return ☐ Dispose ☐ Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

# CHAIN OF CUSTODY RECORD



SVL Analytical, Inc. • One Government Gulch • Kellogg, ID 83837 • (208) 784-1258 • FAX: (208) 783-0891

FOR SVL USE ONLY
SVL JOB #

TEMP on Receipt: W701633

**Report to Company:** IDEQ
Contact: Bruce Schuld
Address: 1410 N Hilton
Boise, ID 83706
Phone Number: 208-373-0554
FAX Number: 208-373-0154
E-mail: bruce.schuld@deq.idaho.gov

**Invoice Sent To:** BM IDEQ
Contact: Bruce Schuld
Address: 1410 N Hilton
Boise ID USA 83706
Phone Number: Same
FAX Number:
PO#:

**Table 1. -- Matrix Type**
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other

**Project Name:** Triumph/Minnie Moore
**Sampler's Signature:** Bruce A Schuld

**Indicate State of sample origination:** ID **USACE?** ☐ Yes ☐ No

| | Sample ID (Please take care to distinguish between: 1 and I, 2 and Z, 5 and S, Ø and O. Thanks!) | Collection Date | Collection Time | Collected by: (Init.) | Misc. Matrix Type (From Table 1) | Misc. No. of Containers | Preservative(s) Unpreserved | $HNO_3$ Filtered | $HNO_3$ Unfiltered | HCl | $H_2SO_4$ | NaOH | Other (Specify) | Analyses Required: T. Antimony | T. Arsenic | T. Cadmium | T. Copper | T. Iron | T. Lead | T. Selenium | T. Silver | T. Zinc | T. Mercury | Rush Instructions (Days) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BS1SS-01 | 9/26 | 1330 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | | * Rush |
| 2 | BS1SS-02 | 9/26 | 1345 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | | * Rush |
| 3 | BS1SS-03 | 9/26 | 2400 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | | * Rush |
| 4 | BS2SS-01 | 9/26 | 2412 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | | * Rush |
| 5 | BS2SS-02 | 9/26 | 2430 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | | * Rush |
| 6 | BS2SS-03 | 9/26 | 2445 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | | * Rush |
| 7 | TTSPSS-01 | 9/26 | 3000 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | | * Rush |
| 8 | MSWDSS-01 | 9/21 | 0900 | BAS | 3 | 1 | X | | | | | | | | | | | | | | | | | | Normal Process |
| 9 | UKBGSS-1 | | | | | | | | | | | | | | | | | | | | | | | | Normal Process |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | | Normal Process |

Comments: * Rush process. Please report ASAP via email bruce.schuld@deq.idaho. ⊙ no time on sample label. ⊙ Date on sample label read 9/20/07 RS 10/6/07

Triumph project

| | | | | | | |
|---|---|---|---|---|---|---|
| Relinquished by: Bruce A Schuld | Date: 9/27 | Time: 0900 | Received by: R. Stebbins | Date: 10/01/07 | Time: 12:45 |
| Relinquished by: | Date: | Time: | Received by: | Date: | Time: |

* Sample Reject: ☐ Return ☒ Dispose ☐ Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

SVL-COC 9/(

✓ Date on sample label Reads 9/24/07

11 Lines Two Different Project Names

⊙ no times on sample labels

# RE-1 SUMMARY OF CUMULATIVE RISK AND HAZARD INDEX

| Routes of Exposure | RECEPTOR | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RESIDENTIAL | | | | NON-RESIDENTIAL | | CONSTRUCTION WORKER | |
| | CHILD | | AGE-ADJUSTED | | | | | |
| | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index |
| **Surface Soil:** Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | 4.78E-05 | 1.30E+00 | 7.07E-05 | 3.85E-01 | 3.04E-06 | 7.59E-02 | 3.70E-07 | 6.10E-02 |
| **Subsurface Soil:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Groundwater:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Soil-Vapor:** Indoor Inhalation of Vapor Emissions from Soil and/or Groundwater | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Site Risk** | **4.78E-05** | | **7.07E-05** | | **3.04E-06** | | **3.70E-07** | |
| **Site Hazard Index** | | **1.30E+00** | | **3.85E-01** | | **7.59E-02** | | **6.10E-02** |
| RATL-1/RATL-2 Required? | YES | YES | YES | NO | NO | NO | NO | NO |

**Notes:**
**NA: Not applicable because the chemical is not a COC for the pathway (no representative concentration entered) or its properties (toxicity and/or physical-chemical) are not available.**

## RE-1 RISK/HAZARD QUOTIENT FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | CHILD | | | | | | | | AGE-ADJUSTED | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Antimony | | | | | | | | | | | | | | | | |
| Arsenic | 4.78E-05 | 1.24E+00 | | | | | | | 7.07E-05 | 3.66E-01 | | | | | | |
| Cadmium | 2.75E-11 | 6.05E-02 | | | | | | | NTOX | 1.78E-02 | | | | | | |
| Lead | NTOX | NTOX | | | | | | | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 1.36E-03 | | | | | | | NTOX | 4.03E-04 | | | | | | |
| Silver | | | | | | | | | | | | | | | | |
| Zinc | | | | | | | | | | | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
|---|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Antimony | | | | | | | | |
| Arsenic | 3.04E-06 | 7.16E-02 | | | | | | |
| Cadmium | 1.89E-11 | 4.28E-03 | | | | | | |
| Lead | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 8.99E-05 | | | | | | |
| Silver | | | | | | | | |
| Zinc | | | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
|---|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Antimony | | | | | | | | |
| Arsenic | 3.04E-06 | 7.16E-02 | | | | | | |
| Cadmium | 1.89E-11 | 4.28E-03 | | | | | | |
| Lead | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 8.99E-05 | | | | | | |
| Silver | | | | | | | | |
| Zinc | | | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 SUMMARY OF CUMULATIVE RISK AND HAZARD INDEX

| Routes of Exposure | RECEPTOR | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RESIDENTIAL | | | | NON-RESIDENTIAL | | CONSTRUCTION WORKER | |
| | CHILD | | AGE-ADJUSTED | | | | | |
| | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index |
| **Surface Soil:** Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | 6.23E-03 | 1.76E+02 | 9.22E-03 | 5.20E+01 | 3.96E-04 | 1.03E+01 | 4.82E-05 | 8.26E+00 |
| **Subsurface Soil:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Groundwater:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Soil-Vapor:** Indoor Inhalation of Vapor Emissions from Soil and/or Groundwater | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Site Risk** | **6.23E-03** | | **9.22E-03** | | **3.96E-04** | | **4.82E-05** | |
| **Site Hazard Index** | | **1.76E+02** | | **5.20E+01** | | **1.03E+01** | | **8.26E+00** |
| RATL-1/RATL-2 Required? | YES | YES | YES | YES | YES | YES | YES | YES |

**Notes:**
**NA: Not applicable because the chemical is not a COC for the pathway (no representative concentration entered) or its properties (toxicity and/or physical-chemical) are not available.**

## RE-1 RISK/HAZARD QUOTIENT FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | CHILD | | | | | | | | AGE-ADJUSTED | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Antimony | NTOX | 1.07E+01 | | | | | | | NTOX | 3.17E+00 | | | | | | |
| Arsenic | 6.23E-03 | 1.62E+02 | | | | | | | 9.22E-03 | 4.78E+01 | | | | | | |
| Cadmium | 1.05E-09 | 2.32E+00 | | | | | | | NTOX | 6.82E-01 | | | | | | |
| Lead | NTOX | NTOX | | | | | | | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 1.69E-01 | | | | | | | NTOX | 4.97E-02 | | | | | | |
| Silver | NTOX | 5.66E-01 | | | | | | | NTOX | 1.67E-01 | | | | | | |
| Zinc | NTOX | 5.05E-01 | | | | | | | NTOX | 1.49E-01 | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
|---|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Antimony | NTOX | 7.07E-01 | | | | | | |
| Arsenic | 3.96E-04 | 9.34E+00 | | | | | | |
| Cadmium | 7.22E-10 | 1.64E-01 | | | | | | |
| Lead | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 1.11E-02 | | | | | | |
| Silver | NTOX | 3.73E-02 | | | | | | |
| Zinc | NTOX | 3.33E-02 | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR CONSTRUCTION WORKERS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | |
|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | |
| | Risk | HQ |
| Antimony | NTOX | 5.66E-01 |
| Arsenic | 4.82E-05 | 7.50E+00 |
| Cadmium | 4.56E-11 | 1.31E-01 |
| Lead | NTOX | NTOX |
| Mercury | NTOX | 8.90E-03 |
| Silver | NTOX | 2.99E-02 |
| Zinc | NTOX | 2.67E-02 |

**Notes:**
**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**
**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 SUMMARY OF CUMULATIVE RISK AND HAZARD INDEX

| Routes of Exposure | RECEPTOR | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RESIDENTIAL | | | | NON-RESIDENTIAL | | CONSTRUCTION WORKER | |
| | CHILD | | AGE-ADJUSTED | | | | | |
| | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index |
| **Surface Soil:** Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | 1.06E-02 | 2.84E+02 | 1.57E-02 | 8.39E+01 | 6.77E-04 | 1.65E+01 | 8.24E-05 | 1.32E+01 |
| **Subsurface Soil:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Groundwater:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Soil-Vapor:** Indoor Inhalation of Vapor Emissions from Soil and/or Groundwater | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Site Risk** | **1.06E-02** | | **1.57E-02** | | **6.77E-04** | | **8.24E-05** | |
| **Site Hazard Index** | | **2.84E+02** | | **8.39E+01** | | **1.65E+01** | | **1.32E+01** |
| RATL-1/RATL-2 Required? | YES | YES | YES | YES | YES | YES | YES | YES |

**Notes:**
**NA: Not applicable because the chemical is not a COC for the pathway (no representative concentration entered) or its properties (toxicity and/or physical-chemical) are not available.**

## RE-1 RISK/HAZARD QUOTIENT FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | CHILD | | | | | | | | AGE-ADJUSTED | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Antimony | NTOX | 2.19E+00 | | | | | | | NTOX | 6.46E-01 | | | | | | |
| Arsenic | 1.06E-02 | 2.76E+02 | | | | | | | 1.57E-02 | 8.16E+01 | | | | | | |
| Cadmium | 2.09E-09 | 4.59E+00 | | | | | | | NTOX | 1.35E+00 | | | | | | |
| Lead | NTOX | NTOX | | | | | | | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 8.78E-02 | | | | | | | NTOX | 2.59E-02 | | | | | | |
| Silver | NTOX | 4.29E-02 | | | | | | | NTOX | 1.27E-02 | | | | | | |
| Zinc | NTOX | 8.67E-01 | | | | | | | NTOX | 2.56E-01 | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
|---|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Antimony | NTOX | 1.44E-01 | | | | | | |
| Arsenic | 6.77E-04 | 1.59E+01 | | | | | | |
| Cadmium | 1.43E-09 | 3.25E-01 | | | | | | |
| Lead | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 5.78E-03 | | | | | | |
| Silver | NTOX | 2.83E-03 | | | | | | |
| Zinc | NTOX | 5.71E-02 | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR CONSTRUCTION WORKERS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | |
|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | |
| | Risk | HQ |
| Antimony | NTOX | 1.16E-01 |
| Arsenic | 8.24E-05 | 1.28E+01 |
| Cadmium | 9.04E-11 | 2.60E-01 |
| Lead | NTOX | NTOX |
| Mercury | NTOX | 4.63E-03 |
| Silver | NTOX | 2.27E-03 |
| Zinc | NTOX | 4.57E-02 |

**Notes:**
**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**
**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 SUMMARY OF CUMULATIVE RISK AND HAZARD INDEX

| Routes of Exposure | RECEPTOR | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RESIDENTIAL | | | | NON-RESIDENTIAL | | CONSTRUCTION WORKER | |
| | CHILD | | AGE-ADJUSTED | | | | | |
| | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index |
| **Surface Soil:** Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | 3.79E-05 | 1.07E+00 | 5.61E-05 | 3.17E-01 | 2.41E-06 | 6.32E-02 | 2.93E-07 | 5.07E-02 |
| **Subsurface Soil:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Groundwater:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Soil-Vapor:** Indoor Inhalation of Vapor Emissions from Soil and/or Groundwater | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Site Risk** | **3.79E-05** | | **5.61E-05** | | **2.41E-06** | | **2.93E-07** | |
| **Site Hazard Index** | | **1.07E+00** | | **3.17E-01** | | **6.32E-02** | | **5.07E-02** |
| RATL-1/RATL-2 Required? | YES | YES | YES | NO | NO | NO | NO | NO |

**Notes:**
**NA: Not applicable because the chemical is not a COC for the pathway (no representative concentration entered) or its properties (toxicity and/or physical-chemical) are not available.**

## RE-1 REPRESENTATIVE CONCENTRATIONS FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | SUB-SURFACE SOIL | GROUNDWATER | SOIL-VAPOR | GROUNDWATER AND/OR SURFACE WATER PROTECTION | | |
|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Representative Groundwater Concentration at the Source [mg/L] | Representative Soil Concentration at the Source [mg/kg] | Representative Groundwater Concentration at the POC [mg/L] |
| | Representative Concentration [mg/kg] | Representative Concentration [mg/kg] | Representative Concentration [mg/L] | USE OF SOIL-VAPOR DATA IS NOT ALLOWED UNDER RE-1 | | NOT USED IN CALCULATIONS | |
| Arsenic | 2.19E+01 | | | | | | |
| Cadmium | 4.52E+00 | | | | | | |
| Lead | 2.51E+01 | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Notes:**

background sample

Hg, Se, Ag below MDL

# RE-1 REPRESENTATIVE CONCENTRATIONS FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | SUB-SURFACE SOIL | GROUNDWATER | SOIL-VAPOR |
|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions |
| | Representative Concentration [mg/kg] | Representative Concentration [mg/kg] | Representative Concentration [mg/L] | USE OF SOIL-VAPOR DATA IS NOT ALLOWED UNDER RE-1 |
| Arsenic | 2.19E+01 | | | |
| Cadmium | 4.52E+00 | | | |
| Lead | 2.51E+01 | | | |
| | | | | |
| | | | | |

**Note:**

# RE-1 REPRESENTATIVE CONCENTRATIONS FOR CONSTRUCTION WORKER

| CHEMICALS OF CONCERN | SOIL TO TYPICAL DEPTH OF CONSTRUCTION |
|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion |
| | Representative Concentration [mg/kg] |
| Arsenic | 2.19E+01 |
| Cadmium | 4.52E+00 |
| Lead | 2.51E+01 |
| | |
| | |

**Note:**

## RE-1 RISK/HAZARD QUOTIENT FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | CHILD | | | | | | | | AGE-ADJUSTED | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Arsenic | 3.79E-05 | 9.83E-01 | | | | | | | 5.61E-05 | 2.91E-01 | | | | | | |
| Cadmium | 4.10E-11 | 9.02E-02 | | | | | | | NTOX | 2.66E-02 | | | | | | |
| Lead | NTOX | NTOX | | | | | | | NTOX | NTOX | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
|---|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Arsenic | 2.41E-06 | 5.68E-02 | | | | | | |
| Cadmium | 2.81E-11 | 6.39E-03 | | | | | | |
| Lead | NTOX | NTOX | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR CONSTRUCTION WORKERS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | |
|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | |
| | Risk | HQ |
| Arsenic | 2.93E-07 | 4.56E-02 |
| Cadmium | 1.78E-12 | 5.11E-03 |
| Lead | NTOX | NTOX |
| | | |
| | | |

**Notes:**
**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**
**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 SUMMARY OF CUMULATIVE RISK AND HAZARD INDEX

| Routes of Exposure | RECEPTOR | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RESIDENTIAL | | | | NON-RESIDENTIAL | | CONSTRUCTION WORKER | |
| | CHILD | | AGE-ADJUSTED | | | | | |
| | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index |
| **Surface Soil:** Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | 1.34E-03 | 3.50E+01 | 1.98E-03 | 1.03E+01 | 8.51E-05 | 2.02E+00 | 1.04E-05 | 1.62E+00 |
| **Subsurface Soil:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Groundwater:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Soil-Vapor:** Indoor Inhalation of Vapor Emissions from Soil and/or Groundwater | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Site Risk** | **1.34E-03** | | **1.98E-03** | | **8.51E-05** | | **1.04E-05** | |
| **Site Hazard Index** | | **3.50E+01** | | **1.03E+01** | | **2.02E+00** | | **1.62E+00** |
| RATL-1/RATL-2 Required? | YES | YES | YES | YES | YES | YES | YES | YES |

**Notes:**
**NA: Not applicable because the chemical is not a COC for the pathway (no representative concentration entered) or its properties (toxicity and/or physical-chemical) are not available.**

## RE-1 REPRESENTATIVE CONCENTRATIONS FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | SUB-SURFACE SOIL | GROUNDWATER | SOIL-VAPOR | GROUNDWATER AND/OR SURFACE WATER PROTECTION | | |
|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Representative Groundwater Concentration at the Source [mg/L] | Representative Soil Concentration at the Source [mg/kg] | Representative Groundwater Concentration at the POC [mg/L] |
| | Representative Concentration [mg/kg] | Representative Concentration [mg/kg] | Representative Concentration [mg/L] | USE OF SOIL-VAPOR DATA IS NOT ALLOWED UNDER RE-1 | | NOT USED IN CALCULATIONS | |
| Arsenic | 7.73E+02 | | | | | | |
| Cadmium | 1.19E+01 | | | | | | |
| Lead | 5.75E+02 | | | | | | |
| Mercury | 6.07E-01 | | | | | | |
| Silver | 2.52E+00 | | | | | | |

**Notes:** waste dump sample

# RE-1 REPRESENTATIVE CONCENTRATIONS FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | SUB-SURFACE SOIL | GROUNDWATER | SOIL-VAPOR |
|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions |
| | Representative Concentration [mg/kg] | Representative Concentration [mg/kg] | Representative Concentration [mg/L] | USE OF SOIL-VAPOR DATA IS NOT ALLOWED UNDER RE-1 |
| Arsenic | 7.73E+02 | | | |
| Cadmium | 1.19E+01 | | | |
| Lead | 5.75E+02 | | | |
| Mercury | 6.07E-01 | | | |
| Silver | 2.52E+00 | | | |

**Note:**

# RE-1 REPRESENTATIVE CONCENTRATIONS FOR CONSTRUCTION WORKER

| CHEMICALS OF CONCERN | SOIL TO TYPICAL DEPTH OF CONSTRUCTION |
|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion |
| | Representative Concentration [mg/kg] |
| Arsenic | 7.73E+02 |
| Cadmium | 1.19E+01 |
| Lead | 5.75E+02 |
| Mercury | 6.07E-01 |
| Silver | 2.52E+00 |

**Note:**

## RE-1 RISK/HAZARD QUOTIENT FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | CHILD | | | | | | | | AGE-ADJUSTED | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Arsenic | 1.34E-03 | 3.47E+01 | | | | | | | 1.98E-03 | 1.03E+01 | | | | | | |
| Cadmium | 1.08E-10 | 2.38E-01 | | | | | | | NTOX | 7.00E-02 | | | | | | |
| Lead | NTOX | NTOX | | | | | | | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 2.24E-02 | | | | | | | NTOX | 6.60E-03 | | | | | | |
| Silver | NTOX | 5.58E-03 | | | | | | | NTOX | 1.64E-03 | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
|---|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Arsenic | 8.51E-05 | 2.00E+00 | | | | | | |
| Cadmium | 7.41E-11 | 1.68E-02 | | | | | | |
| Lead | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 1.48E-03 | | | | | | |
| Silver | NTOX | 3.67E-04 | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR CONSTRUCTION WORKERS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | |
|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | |
| | Risk | HQ |
| Arsenic | 1.04E-05 | 1.61E+00 |
| Cadmium | 4.68E-12 | 1.35E-02 |
| Lead | NTOX | NTOX |
| Mercury | NTOX | 1.18E-03 |
| Silver | NTOX | 2.94E-04 |

**Notes:**
**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**
**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 SUMMARY OF CUMULATIVE RISK AND HAZARD INDEX

| Routes of Exposure | RECEPTOR | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RESIDENTIAL | | | | NON-RESIDENTIAL | | CONSTRUCTION WORKER | |
| | CHILD | | AGE-ADJUSTED | | | | | |
| | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index |
| **Surface Soil:** Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | 4.31E-03 | 1.12E+02 | 6.37E-03 | 3.32E+01 | 2.74E-04 | 6.49E+00 | 3.33E-05 | 5.21E+00 |
| **Subsurface Soil:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Groundwater:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Soil-Vapor:** Indoor Inhalation of Vapor Emissions from Soil and/or Groundwater | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Site Risk** | **4.31E-03** | | **6.37E-03** | | **2.74E-04** | | **3.33E-05** | |
| **Site Hazard Index** | | **1.12E+02** | | **3.32E+01** | | **6.49E+00** | | **5.21E+00** |
| RATL-1/RATL-2 Required? | YES | YES | YES | YES | YES | YES | YES | YES |

**Notes:**
**NA: Not applicable because the chemical is not a COC for the pathway (no representative concentration entered) or its properties (toxicity and/or physical-chemical) are not available.**

## RE-1 REPRESENTATIVE CONCENTRATIONS FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | SUB-SURFACE SOIL | GROUNDWATER | SOIL-VAPOR | GROUNDWATER AND/OR SURFACE WATER PROTECTION | | |
|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Representative Groundwater Concentration at the Source [mg/L] | Representative Soil Concentration at the Source [mg/kg] | Representative Groundwater Concentration at the POC [mg/L] |
| | Representative Concentration [mg/kg] | Representative Concentration [mg/kg] | Representative Concentration [mg/L] | USE OF SOIL-VAPOR DATA IS NOT ALLOWED UNDER RE-1 | | NOT USED IN CALCULATIONS | |
| Arsenic | 2.49E+03 | | | | | | |
| Cadmium | 1.33E+01 | | | | | | |
| Lead | 8.35E+04 | | | | | | |
| Mercury | 2.00E+00 | | | | | | |
| Selenium | 7.10E+00 | | | | | | |
| Silver | 3.83E+01 | | | | | | |

**Notes:** waste dump sample

# RE-1 REPRESENTATIVE CONCENTRATIONS FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | SUB-SURFACE SOIL | GROUNDWATER | SOIL-VAPOR |
|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions |
| | Representative Concentration [mg/kg] | Representative Concentration [mg/kg] | Representative Concentration [mg/L] | USE OF SOIL-VAPOR DATA IS NOT ALLOWED UNDER RE-1 |
| Arsenic | 2.49E+03 | | | |
| Cadmium | 1.33E+01 | | | |
| Lead | 8.35E+03 | | | |
| Mercury | 2.00E+00 | | | |
| Selenium | 7.10E+00 | | | |
| Silver | 3.83E+01 | | | |

**Note:** waste dump sample

# RE-1 REPRESENTATIVE CONCENTRATIONS FOR CONSTRUCTION WORKER

| CHEMICALS OF CONCERN | SOIL TO TYPICAL DEPTH OF CONSTRUCTION |
|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion |
| | Representative Concentration [mg/kg] |
| Arsenic | 2.49E+03 |
| Cadmium | 1.33E+01 |
| Lead | 8.35E+03 |
| Mercury | 2.00E+00 |
| Selenium | 7.10E+00 |
| Silver | 3.83E+01 |

**Note:**

## RE-1 RISK/HAZARD QUOTIENT FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | CHILD | | | | | | | | AGE-ADJUSTED | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Arsenic | 4.31E-03 | 1.12E+02 | | | | | | | 6.37E-03 | 3.31E+01 | | | | | | |
| Cadmium | 1.21E-10 | 2.66E-01 | | | | | | | NTOX | 7.82E-02 | | | | | | |
| Lead | NTOX | NTOX | | | | | | | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 7.38E-02 | | | | | | | NTOX | 2.18E-02 | | | | | | |
| Selenium | NTOX | 1.57E-02 | | | | | | | NTOX | 4.63E-03 | | | | | | |
| Silver | NTOX | 8.47E-02 | | | | | | | NTOX | 2.50E-02 | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
|---|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Arsenic | 2.74E-04 | 6.46E+00 | | | | | | |
| Cadmium | 8.28E-11 | 1.88E-02 | | | | | | |
| Lead | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 4.86E-03 | | | | | | |
| Selenium | NTOX | 1.04E-03 | | | | | | |
| Silver | NTOX | 5.58E-03 | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR CONSTRUCTION WORKERS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | |
|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | |
| | Risk | HQ |
| Arsenic | 3.33E-05 | 5.19E+00 |
| Cadmium | 5.23E-12 | 1.50E-02 |
| Lead | NTOX | NTOX |
| Mercury | NTOX | 3.89E-03 |
| Selenium | NTOX | 8.29E-04 |
| Silver | NTOX | 4.47E-03 |

**Notes:**
**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**
**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 SUMMARY OF CUMULATIVE RISK AND HAZARD INDEX

| Routes of Exposure | RECEPTOR | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RESIDENTIAL | | | | NON-RESIDENTIAL | | CONSTRUCTION WORKER | |
| | CHILD | | AGE-ADJUSTED | | | | | |
| | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index |
| **Surface Soil:** Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | 2.04E-05 | 5.67E-01 | 3.02E-05 | 1.68E-01 | 1.30E-06 | 3.32E-02 | 1.58E-07 | 2.67E-02 |
| **Subsurface Soil:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Groundwater:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Soil-Vapor:** Indoor Inhalation of Vapor Emissions from Soil and/or Groundwater | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Site Risk** | **2.04E-05** | | **3.02E-05** | | **1.30E-06** | | **1.58E-07** | |
| **Site Hazard Index** | | **5.67E-01** | | **1.68E-01** | | **3.32E-02** | | **2.67E-02** |
| RATL-1/RATL-2 Required? | YES | NO | YES | NO | NO | NO | NO | NO |

**Notes:**
**NA: Not applicable because the chemical is not a COC for the pathway (no representative concentration entered) or its properties (toxicity and/or physical-chemical) are not available.**

## RE-1 REPRESENTATIVE CONCENTRATIONS FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | SUB-SURFACE SOIL | GROUNDWATER | SOIL-VAPOR | GROUNDWATER AND/OR SURFACE WATER PROTECTION | | |
|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Representative Groundwater Concentration at the Source [mg/L] | Representative Soil Concentration at the Source [mg/kg] | Representative Groundwater Concentration at the POC [mg/L] |
| | Representative Concentration [mg/kg] | Representative Concentration [mg/kg] | Representative Concentration [mg/L] | USE OF SOIL-VAPOR DATA IS NOT ALLOWED UNDER RE-1 | | NOT USED IN CALCULATIONS | |
| Arsenic | 1.18E+01 | | | | | | |
| Cadmium | 1.79E+00 | | | | | | |
| Lead | 4.24E+01 | | | | | | |
| Mercury | 3.50E-02 | | | | | | |

**Notes:** background sample

# RE-1 REPRESENTATIVE CONCENTRATIONS FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | SUB-SURFACE SOIL | GROUNDWATER | SOIL-VAPOR |
|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions |
| | Representative Concentration [mg/kg] | Representative Concentration [mg/kg] | Representative Concentration [mg/L] | USE OF SOIL-VAPOR DATA IS NOT ALLOWED UNDER RE-1 |
| Arsenic | 1.18E+01 | | | |
| Cadmium | 1.79E+00 | | | |
| Lead | 4.24E+01 | | | |
| Mercury | 3.50E-02 | | | |

**Note:**

# RE-1 REPRESENTATIVE CONCENTRATIONS FOR CONSTRUCTION WORKER

| CHEMICALS OF CONCERN | SOIL TO TYPICAL DEPTH OF CONSTRUCTION |
|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion |
| | Representative Concentration [mg/kg] |
| Arsenic | 1.18E+01 |
| Cadmium | 1.79E+00 |
| Lead | 4.24E+01 |
| Mercury | 3.50E-02 |

**Note:**

## RE-1 RISK/HAZARD QUOTIENT FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | CHILD | | | | | | | | AGE-ADJUSTED | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Arsenic | 2.04E-05 | 5.30E-01 | | | | | | | 3.02E-05 | 1.57E-01 | | | | | | |
| Cadmium | 1.63E-11 | 3.57E-02 | | | | | | | NTOX | 1.05E-02 | | | | | | |
| Lead | NTOX | NTOX | | | | | | | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 1.29E-03 | | | | | | | NTOX | 3.81E-04 | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
|---|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Arsenic | 1.30E-06 | 3.06E-02 | | | | | | |
| Cadmium | 1.11E-11 | 2.53E-03 | | | | | | |
| Lead | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 8.51E-05 | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR CONSTRUCTION WORKERS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | |
|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | |
| | Risk | HQ |
| Arsenic | 1.58E-07 | 2.46E-02 |
| Cadmium | 7.04E-13 | 2.02E-03 |
| Lead | NTOX | NTOX |
| Mercury | NTOX | 6.81E-05 |

**Notes:**
**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**
**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 SUMMARY OF CUMULATIVE RISK AND HAZARD INDEX

| Routes of Exposure | RECEPTOR | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RESIDENTIAL | | | | NON-RESIDENTIAL | | CONSTRUCTION WORKER | |
| | CHILD | | AGE-ADJUSTED | | | | | |
| | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index |
| **Surface Soil:** Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | 1.80E-04 | 4.86E+00 | 2.66E-04 | 1.44E+00 | 1.14E-05 | 2.83E-01 | 1.39E-06 | 2.27E-01 |
| **Subsurface Soil:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Groundwater:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Soil-Vapor:** Indoor Inhalation of Vapor Emissions from Soil and/or Groundwater | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Site Risk** | **1.80E-04** | | **2.66E-04** | | **1.14E-05** | | **1.39E-06** | |
| **Site Hazard Index** | | **4.86E+00** | | **1.44E+00** | | **2.83E-01** | | **2.27E-01** |
| RATL-1/RATL-2 Required? | YES | YES | YES | YES | YES | NO | NO | NO |

**Notes:**
**NA: Not applicable because the chemical is not a COC for the pathway (no representative concentration entered) or its properties (toxicity and/or physical-chemical) are not available.**

# RE-1 REPRESENTATIVE CONCENTRATIONS FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | SUB-SURFACE SOIL | GROUNDWATER | SOIL-VAPOR |
|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions |
| | Representative Concentration [mg/kg] | Representative Concentration [mg/kg] | Representative Concentration [mg/L] | USE OF SOIL-VAPOR DATA IS NOT ALLOWED UNDER RE-1 |
| Arsenic | 1.04E+02 | | | |
| Cadmium | 8.37E+00 | | | |
| Lead | 1.03E+02 | | | |
| Mercury | 5.93E-01 | | | |
| Silver | 7.60E-01 | | | |

**waste dump**

## RE-1 REPRESENTATIVE CONCENTRATIONS FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | SUB-SURFACE SOIL | GROUNDWATER | SOIL-VAPOR | GROUNDWATER AND/OR SURFACE WATER PROTECTION | | |
|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Representative Groundwater Concentration at the Source [mg/L] | Representative Soil Concentration at the Source [mg/kg] | Representative Groundwater Concentration at the POC [mg/L] |
| | Representative Concentration [mg/kg] | Representative Concentration [mg/kg] | Representative Concentration [mg/L] | USE OF SOIL-VAPOR DATA IS NOT ALLOWED UNDER RE-1 | | NOT USED IN CALCULATIONS | |
| Arsenic | 1.04E+02 | | | | | | |
| Cadmium | 8.37E+00 | | | | | | |
| Lead | 1.03E+02 | | | | | | |
| Mercury | 5.93E-01 | | | | | | |
| Silver | 7.60E-01 | | | | | | |

**Notes:**

# RE-1 REPRESENTATIVE CONCENTRATIONS FOR CONSTRUCTION WORKER

| CHEMICALS OF CONCERN | SOIL TO TYPICAL DEPTH OF CONSTRUCTION |
|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion |
| | Representative Concentration [mg/kg] |
| Arsenic | 1.04E+02 |
| Cadmium | 8.37E+00 |
| Lead | 1.03E+02 |
| Mercury | 5.93E-01 |
| Silver | 7.60E-01 |

**Note:**

## RE-1 RISK/HAZARD QUOTIENT FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | CHILD | | | | | | | | AGE-ADJUSTED | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Arsenic | 1.80E-04 | 4.67E+00 | | | | | | | 2.66E-04 | 1.38E+00 | | | | | | |
| Cadmium | 7.60E-11 | 1.67E-01 | | | | | | | NTOX | 4.92E-02 | | | | | | |
| Lead | NTOX | NTOX | | | | | | | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 2.19E-02 | | | | | | | NTOX | 6.45E-03 | | | | | | |
| Silver | NTOX | 1.68E-03 | | | | | | | NTOX | 4.96E-04 | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
|---|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Arsenic | 1.14E-05 | 2.70E-01 | | | | | | |
| Cadmium | 5.21E-11 | 1.18E-02 | | | | | | |
| Lead | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 1.44E-03 | | | | | | |
| Silver | NTOX | 1.11E-04 | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR CONSTRUCTION WORKERS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | |
|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | |
| | Risk | HQ |
| Arsenic | 1.39E-06 | 2.17E-01 |
| Cadmium | 3.29E-12 | 9.47E-03 |
| Lead | NTOX | NTOX |
| Mercury | NTOX | 1.15E-03 |
| Silver | NTOX | 8.88E-05 |

**Notes:**
**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**
**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 SUMMARY OF CUMULATIVE RISK AND HAZARD INDEX

| Routes of Exposure | RECEPTOR | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RESIDENTIAL | | | | NON-RESIDENTIAL | | CONSTRUCTION WORKER | |
| | CHILD | | AGE-ADJUSTED | | | | | |
| | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index |
| **Surface Soil:** Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | 1.00E-05 | 2.91E-01 | 1.48E-05 | 8.60E-02 | 6.38E-07 | 1.72E-02 | 7.77E-08 | 1.38E-02 |
| **Subsurface Soil:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Groundwater:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Soil-Vapor:** Indoor Inhalation of Vapor Emissions from Soil and/or Groundwater | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Site Risk** | **1.00E-05** | | **1.48E-05** | | **6.38E-07** | | **7.77E-08** | |
| **Site Hazard Index** | | **2.91E-01** | | **8.60E-02** | | **1.72E-02** | | **1.38E-02** |
| RATL-1/RATL-2 Required? | YES | NO | YES | NO | NO | NO | NO | NO |

**Notes:**
**NA: Not applicable because the chemical is not a COC for the pathway (no representative concentration entered) or its properties (toxicity and/or physical-chemical) are not available.**

## RE-1 REPRESENTATIVE CONCENTRATIONS FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | SUB-SURFACE SOIL | GROUNDWATER | SOIL-VAPOR | GROUNDWATER AND/OR SURFACE WATER PROTECTION | | |
|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Representative Groundwater Concentration at the Source [mg/L] | Representative Soil Concentration at the Source [mg/kg] | Representative Groundwater Concentration at the POC [mg/L] |
| | Representative Concentration [mg/kg] | Representative Concentration [mg/kg] | Representative Concentration [mg/L] | USE OF SOIL-VAPOR DATA IS NOT ALLOWED UNDER RE-1 | | NOT USED IN CALCULATIONS | |
| Arsenic | 5.80E+00 | | | | | | |
| Cadmium | 1.42E+00 | | | | | | |
| Lead | 1.99E+01 | | | | | | |
| Mercury | 3.30E-02 | | | | | | |
| Silver | 5.00E-01 | | | | | | |

**Notes:** Hg <0.033 Ag <0.50

# RE-1 REPRESENTATIVE CONCENTRATIONS FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | SUB-SURFACE SOIL | GROUNDWATER | SOIL-VAPOR |
|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions |
| | Representative Concentration [mg/kg] | Representative Concentration [mg/kg] | Representative Concentration [mg/L] | USE OF SOIL-VAPOR DATA IS NOT ALLOWED UNDER RE-1 |
| Arsenic | 5.80E+00 | | | |
| Cadmium | 1.42E+00 | | | |
| Lead | 1.99E+01 | | | |
| Mercury | 3.30E-02 | | | |
| Silver | 5.00E-01 | | | |

**background sample** Hg <0.033 Ag <0.50

# RE-1 REPRESENTATIVE CONCENTRATIONS FOR CONSTRUCTION WORKER

| CHEMICALS OF CONCERN | SOIL TO TYPICAL DEPTH OF CONSTRUCTION |
|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion |
| | Representative Concentration [mg/kg] |
| Arsenic | 5.80E+00 |
| Cadmium | 1.42E+00 |
| Lead | 1.99E+01 |
| Mercury | 3.30E-02 |
| Silver | 5.00E-01 |

**Note:**

## RE-1 RISK/HAZARD QUOTIENT FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | CHILD | | | | | | | | AGE-ADJUSTED | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Arsenic | 1.00E-05 | 2.60E-01 | | | | | | | 1.48E-05 | 7.70E-02 | | | | | | |
| Cadmium | 1.29E-11 | 2.84E-02 | | | | | | | NTOX | 8.35E-03 | | | | | | |
| Lead | NTOX | NTOX | | | | | | | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 1.22E-03 | | | | | | | NTOX | 3.59E-04 | | | | | | |
| Silver | NTOX | 1.11E-03 | | | | | | | NTOX | 3.26E-04 | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
|---|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Arsenic | 6.38E-07 | 1.50E-02 | | | | | | |
| Cadmium | 8.84E-12 | 2.01E-03 | | | | | | |
| Lead | NTOX | NTOX | | | | | | |
| Mercury | NTOX | 8.02E-05 | | | | | | |
| Silver | NTOX | 7.29E-05 | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR CONSTRUCTION WORKERS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | |
|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | |
| | Risk | HQ |
| Arsenic | 7.77E-08 | 1.21E-02 |
| Cadmium | 5.58E-13 | 1.61E-03 |
| Lead | NTOX | NTOX |
| Mercury | NTOX | 6.42E-05 |
| Silver | NTOX | 5.84E-05 |

**Notes:**
**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**
**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 SUMMARY OF CUMULATIVE RISK AND HAZARD INDEX

| Routes of Exposure | RECEPTOR | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RESIDENTIAL | | | | NON-RESIDENTIAL | | CONSTRUCTION WORKER | |
| | CHILD | | AGE-ADJUSTED | | | | | |
| | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index |
| **Surface Soil:** Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | 4.12E-05 | 1.11E+00 | 6.09E-05 | 3.28E-01 | 2.62E-06 | 6.47E-02 | 3.19E-07 | 5.20E-02 |
| **Subsurface Soil:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Groundwater:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Soil-Vapor:** Indoor Inhalation of Vapor Emissions from Soil and/or Groundwater | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Site Risk** | **4.12E-05** | | **6.09E-05** | | **2.62E-06** | | **3.19E-07** | |
| **Site Hazard Index** | | **1.11E+00** | | **3.28E-01** | | **6.47E-02** | | **5.20E-02** |
| RATL-1/RATL-2 Required? | YES | YES | YES | NO | NO | NO | NO | NO |

**Notes:**
**NA: Not applicable because the chemical is not a COC for the pathway (no representative concentration entered) or its properties (toxicity and/or physical-chemical) are not available.**

## RE-1 REPRESENTATIVE CONCENTRATIONS FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | SUB-SURFACE SOIL | GROUNDWATER | SOIL-VAPOR | GROUNDWATER AND/OR SURFACE WATER PROTECTION | | |
|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Representative Groundwater Concentration at the Source [mg/L] | Representative Soil Concentration at the Source [mg/kg] | Representative Groundwater Concentration at the POC [mg/L] |
| | Representative Concentration [mg/kg] | Representative Concentration [mg/kg] | NOT REQUIRED-USING SOIL VAPOR | USE OF SOIL-VAPOR DATA IS NOT ALLOWED UNDER RE-1 | | NOT USED IN CALCULATIONS | |
| Arsenic | 2.38E+01 | | | | | | |
| Cadmium | 2.13E+00 | | | | | | |
| Lead | 2.06E+01 | | | | | | |

**Notes:** background sample near ridge above Grey Copper/Queen of the Hills

# RE-1 REPRESENTATIVE CONCENTRATIONS FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | SUB-SURFACE SOIL | GROUNDWATER | SOIL-VAPOR |
|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions |
| | Representative Concentration [mg/kg] | Representative Concentration [mg/kg] | NOT REQUIRED-USING SOIL VAPOR | USE OF SOIL-VAPOR DATA IS NOT ALLOWED UNDER RE-1 |
| Arsenic | 2.38E+01 | | | |
| Cadmium | 2.13E+00 | | | |
| Lead | 2.06E+01 | | | |

**Note:**

# RE-1 REPRESENTATIVE CONCENTRATIONS FOR CONSTRUCTION WORKER

| CHEMICALS OF CONCERN | SOIL TO TYPICAL DEPTH OF CONSTRUCTION |
|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion |
| | Representative Concentration [mg/kg] |
| Arsenic | 2.38E+01 |
| Cadmium | 2.13E+00 |
| Lead | 2.06E+01 |

**Note:**

## RE-1 RISK/HAZARD QUOTIENT FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | CHILD | | | | | | | | AGE-ADJUSTED | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Arsenic | 4.12E-05 | 1.07E+00 | | | | | | | 6.09E-05 | 3.16E-01 | | | | | | |
| Cadmium | 1.93E-11 | 4.25E-02 | | | | | | | NTOX | 1.25E-02 | | | | | | |
| Lead | NTOX | NTOX | | | | | | | NTOX | NTOX | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
|---|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Arsenic | 2.62E-06 | 6.17E-02 | | | | | | |
| Cadmium | 1.33E-11 | 3.01E-03 | | | | | | |
| Lead | NTOX | NTOX | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR CONSTRUCTION WORKERS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | |
|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | |
| | Risk | HQ |
| Arsenic | 3.19E-07 | 4.96E-02 |
| Cadmium | 8.37E-13 | 2.41E-03 |
| Lead | NTOX | NTOX |

**Notes:**
**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**
**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 SUMMARY OF CUMULATIVE RISK AND HAZARD INDEX

| Routes of Exposure | RECEPTOR | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RESIDENTIAL | | | | NON-RESIDENTIAL | | CONSTRUCTION WORKER | |
| | CHILD | | AGE-ADJUSTED | | | | | |
| | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index | Risk | Hazard Index |
| **Surface Soil:** Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | 4.93E-05 | 1.51E+00 | 7.30E-05 | 4.47E-01 | 3.14E-06 | 9.02E-02 | 3.82E-07 | 7.24E-02 |
| **Subsurface Soil:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Groundwater:** Indoor Inhalation of Vapor Emissions | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Soil-Vapor:** Indoor Inhalation of Vapor Emissions from Soil and/or Groundwater | NA | NA | NA | NA | NA | NA | Not Applicable | Not Applicable |
| **Site Risk** | **4.93E-05** | | **7.30E-05** | | **3.14E-06** | | **3.82E-07** | |
| **Site Hazard Index** | | **1.51E+00** | | **4.47E-01** | | **9.02E-02** | | **7.24E-02** |
| RATL-1/RATL-2 Required? | YES | YES | YES | NO | NO | NO | NO | NO |

**Notes:**
**NA: Not applicable because the chemical is not a COC for the pathway (no representative concentration entered) or its properties (toxicity and/or physical-chemical) are not available.**

## RE-1 REPRESENTATIVE CONCENTRATIONS FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | SUB-SURFACE SOIL | GROUNDWATER | SOIL-VAPOR | GROUNDWATER AND/OR SURFACE WATER PROTECTION | | |
|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Representative Groundwater Concentration at the Source [mg/L] | Representative Soil Concentration at the Source [mg/kg] | Representative Groundwater Concentration at the POC [mg/L] |
| | Representative Concentration [mg/kg] | Representative Concentration [mg/kg] | Representative Concentration [mg/L] | USE OF SOIL-VAPOR DATA IS NOT ALLOWED UNDER RE-1 | | NOT USED IN CALCULATIONS | |
| Arsenic | 2.85E+01 | | | | | | |
| Cadmium | 1.07E+01 | | | | | | |
| Mercury | 8.80E-02 | | | | | | |
| Selenium | 6.10E+00 | | | | | | |
| Silver | 5.90E-01 | | | | | | |

**Notes:** waste dump isolated from any workings (shaft?)

# RE-1 REPRESENTATIVE CONCENTRATIONS FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | SUB-SURFACE SOIL | GROUNDWATER | SOIL-VAPOR |
|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions | Indoor Inhalation of Vapor Emissions |
| | Representative Concentration [mg/kg] | Representative Concentration [mg/kg] | Representative Concentration [mg/L] | USE OF SOIL-VAPOR DATA IS NOT ALLOWED UNDER RE-1 |
| Arsenic | 2.85E+01 | | | |
| Cadmium | 1.07E+01 | | | |
| Mercury | 8.80E-02 | | | |
| Selenium | 6.10E+00 | | | |
| Silver | 5.90E-01 | | | |

**Note:**

# RE-1 REPRESENTATIVE CONCENTRATIONS FOR CONSTRUCTION WORKER

| CHEMICALS OF CONCERN | SOIL TO TYPICAL DEPTH OF CONSTRUCTION |
|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion |
| | Representative Concentration [mg/kg] |
| Arsenic | 2.85E+01 |
| Cadmium | 1.07E+01 |
| Mercury | 8.80E-02 |
| Selenium | 6.10E+00 |
| Silver | 5.90E-01 |

**Note:**

## RE-1 RISK/HAZARD QUOTIENT FOR RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | CHILD | | | | | | | | AGE-ADJUSTED | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Arsenic | 4.93E-05 | 1.28E+00 | | | | | | | 7.30E-05 | 3.78E-01 | | | | | | |
| Cadmium | 9.72E-11 | 2.14E-01 | | | | | | | NTOX | 6.29E-02 | | | | | | |
| Mercury | NTOX | 3.25E-03 | | | | | | | NTOX | 9.57E-04 | | | | | | |
| Selenium | NTOX | 1.35E-02 | | | | | | | NTOX | 3.98E-03 | | | | | | |
| Silver | NTOX | 1.31E-03 | | | | | | | NTOX | 3.85E-04 | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR NON-RESIDENTIAL RECEPTORS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | | SUB-SURFACE SOIL | | GROUNDWATER | | SOIL-VAPOR | |
|---|---|---|---|---|---|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | | Indoor Inhalation of Vapor Emissions | |
| | Risk | HQ | Risk | HQ | Risk | HQ | Risk | HQ |
| Arsenic | 3.14E-06 | 7.39E-02 | | | | | | |
| Cadmium | 6.66E-11 | 1.51E-02 | | | | | | |
| Mercury | NTOX | 2.14E-04 | | | | | | |
| Selenium | NTOX | 8.89E-04 | | | | | | |
| Silver | NTOX | 8.60E-05 | | | | | | |

**Notes:**

**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**

**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**

# RE-1 RISK/HAZARD QUOTIENT FOR CONSTRUCTION WORKERS

| CHEMICALS OF CONCERN | SURFICIAL SOIL | |
|---|---|---|
| | Inhalation of Vapors and Particulates, Dermal Contact, and Accidental Ingestion | |
| | Risk | HQ |
| Arsenic | 3.82E-07 | 5.94E-02 |
| Cadmium | 4.21E-12 | 1.21E-02 |
| Mercury | NTOX | 1.71E-04 |
| Selenium | NTOX | 7.12E-04 |
| Silver | NTOX | 6.89E-05 |

**Notes:**
**NPCP: A physical-chemical parameter, required in the calculation of the value, is not available.**

**NTOX: The toxicity parameter(s) required in the calculation of the value, is not available.**
**NCOC: The chemical is not a COC for the pathway because it was selected, but no representative concentration was entered.**