

**Table 1-2
Category I Material at the Cell 4 Landfill**

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| Area | Description of Materials | Approximate Volume (cubic yards) |
|-----------------------------------|---|---|
| Mounded Cell 3 | Waste, Soils, Debris | 23,600 |
| Demolition Material | Building debris, concrete, waste water concentrate | 45,600 |
| Diesel #2 Spill Material | Diesel impacted soils | 2,750 |
| East Property Landfill Material | Waste, Soils, Debris | 75,400 |
| El Paso Water Utilities Materials | Construction debris, materials | 2,250 |

**Table 2-1
COCs and AOIs for Site Media**

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| Media | COCs | AOIs |
|--|--|--|
| Soil | <i>Metals (8 analytes):</i> Arsenic, cadmium, chromium, copper, iron, lead, selenium, zinc | <i>Metals (7 analytes)¹:</i> Antimony, barium, cobalt, mercury, molybdenum, nickel, silver <i>VOCs (20 analytes):</i> Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, 1,1,2-trichloroethane, carbon tetrachloride, chlorobenzene, ortho-dichlorobenzene, trichlorofluoromethane, 1,1,2-trichloro-1,2,2-trifluoroethane, dichlorodifluoromethane, xylenes, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol <i>SVOCs (1 analyte):</i> Hexachlorocyclopentadiene <i>TPH</i> <i>PCBs</i> <i>Pesticides (3 analytes):</i> chlordane, endrin, methyl parathion |
| Groundwater and Surface Water ² | <i>Metals (8 analytes):</i> Arsenic, cadmium, chromium, copper, iron, lead, selenium, zinc <i>Water Quality Parameters (1 analyte):</i> TDS <i>Field Parameters: (2 analytes):</i> Specific conductivity, pH | <i>Metals (7 analytes):</i> Aluminum, barium, cobalt, mercury, molybdenum, nickel, thallium <i>Water Quality Parameters (14 analytes):</i> Alkalinity, aluminum, calcium, chloride, fluoride, magnesium, manganese, nitrate/nitrite, potassium, sodium, sulfate, sulfide, TOC, TSS <i>Field Parameters (5 analytes):</i> Temperatures, DO, ORP, turbidity, ferrous iron |

Notes:

¹ Hexavalent chromium was also included in this suite for the Parker Brothers Arroyo and Acid Plant Assessment Area

² Both total and dissolved fractions, where appropriate, were analyzed for surface water and groundwater samples

AOI = Analyte of Interest

COC = Constituent of Concern

DO = Dissolved Oxygen

ORP = Oxidation-Reduction Potential

PCBs = Polychlorinated Bipheynls

SVOC = Semivolatile Organic Compound

TDS = Total Dissolved Solids

TOC = Total Organic Carbon

TPH = Total Petroleum Hydrocarbons

TSS = Total Suspended Solids

VOCs = Volatile Organic Compounds

**Table 2-2
Soils Screening Standards**

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| Program/Agency | RRR | | TRRP | | | |
|---------------------------------------|---------|---------|--|-------------------------------|--|-----------------------------|
| | SAI-Res | SAI-Ind | TotSoil _{Comb} (Residential) | TotSoil _{Comb} (C/I) | GWSoil _{Ing} (Residential) | GWSoil _{Ing} (C/I) |
| Metals (mg/kg) | | | | | | |
| Antimony | 72 | 490 | 15 | 310 | 2.7 | 2.7 |
| Arsenic ¹ | 20 | 200 | 46 | 320 | 2.5 | 2.5 |
| Barium | 26,000 | 170,000 | 8,100 | 120,000 | 220 | 220 |
| Cadmium | 240 | 1,500 | 52 | 850 | 0.75 | 0.75 |
| Chromium | 59,000 | 350,000 | 27,000 | 75,000 | 1200 | 1200 |
| Cobalt | 15,000 | 110,000 | 21 | 270 | 3.3 | 9.9 |
| Copper | 10,000 | 74,000 | 550 | 39,000 | 520 | 520 |
| Iron | -- | --- | -- | -- | -- | -- |
| Lead | 500 | 1,000 | 500 | 1,600 | 1.5 | 1.5 |
| Mercury | 0.11 | 0.15 | 2.1 | 3.3 | 0.0039 | 0.0039 |
| Molybdenum | 1,100 | 8,100 | 160 | 4,500 | 25 | 73 |
| Nickel | 1,900 | 12,000 | 840 | 8,600 | 79 | 230 |
| Selenium | 1,300 | 9,300 | 310 | 4,900 | 1.1 | 1.1 |
| Silver | 470 | 2,900 | 97 | 2,300 | 0.24 | 0.71 |
| Zinc | 59,000 | 410,000 | 9,900 | 250,000 | 1200 | 3500 |
| VOCs (mg/kg) | | | | | | |
| 1,1,1-trichloroethane | 2300 | 3400 | 32000 | 55000 | 0.81 | 0.81 |
| 1,1,2-trichloro-1,2,2-trifluoroethane | 43000 | 60000 | 220000 | 330000 | 40000 | 120000 |
| 1,1,2-trichloroethane | 9.7 | 17 | 10 | 19 | 0.01 | 0.01 |
| 1,2-dichlorobenzene | 560 | 800 | 390 | 570 | 8.9 | 8.9 |
| 4-methyl-2-pentanone | 13000 | 35000 | 5400 | 28000 | 2.5 | 7.4 |
| acetone | 1700 | 2500 | 59000 | 290000 | 21 | 64 |
| carbon tetrachloride | 0.35 | 0.63 | 23 | 46 | 0.031 | 0.031 |
| chlorobenzene | 400 | 590 | 320 | 540 | 0.55 | 0.55 |
| cyclohexane | 12000 | 17000 | 42000 | 65000 | 2900 | 8800 |
| dichlorodifluoromethane | 2200 | 3100 | 750 | 1100 | 120 | 360 |
| ethyl acetate | 8900 | 13000 | 74000 | 920000 | 24 | 70 |
| ethyl ether | 3800 | 5700 | 16000 | 200000 | 5.6 | 17 |
| ethylbenzene | 4300 | 6900 | 5300 | 17000 | 3.8 | 3.8 |
| methylene chloride | 8.7 | 16 | 470 | 4300 | 0.0065 | 0.0065 |
| tetrachloroethene | 6 | 17 | 420 | 770 | 0.025 | 0.025 |
| trichloroethene | 3.7 | 6.6 | 11 | 21 | 0.017 | 0.017 |
| trichlorofluoromethane | 2600 | 3800 | 25000 | 310000 | 64 | 190 |
| xylenes | 580 | 830 | 3700 | 6500 | 61 | 61 |
| methanol | 140000 | 1000000 | 41000 | 510000 | 12 | 35 |
| n-butyl alcohol | 27000 | 200000 | 8200 | 100000 | 52 | 7.9 |
| SVOCs (mg/kg) | | | | | | |
| hexachlorocyclopentadiene | 10 | 14 | 7.2 | 10 | 9.6 | 9.6 |
| chlordane | 1.6 | 11 | 5.9 | 64 | 4.8 | 4.8 |
| endrin | 46 | 310 | 9 | 200 | 0.38 | 0.38 |
| methyl parathion | 39 | 260 | 17 | 170 | 0.085 | 0.25 |

**Table 2-2
Soils Screening Standards**

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| Program/Agency | RRR | | TRRP | | | |
|---|---------|---------|--|---|--|---|
| | SAI-Res | SAI-Ind | ^{Tot} Soil _{Comb} (Residential) | ^{Tot} Soil _{Comb} (C/I) | ^{GW} Soil _{Ing} (Residential) | ^{GW} Soil _{Ing} (C/I) |
| Additional Analyses (mg/kg) | | | | | | |
| PCBs | 10 | 10 | 1.1 | 7.1 | 5.3 | 5.3 |
| 6 C aliphatics (TPH) | 150 | 200 | 2500 | 6600 | 86 | 260 |
| >6-8 C aliphatics (TPH) | 300 | 420 | 2500 | 6600 | 210 | 630 |
| >8-10 C aliphatics (TPH) | 3100 | 4800 | 2700 | 5200 | 1800 | 5400 |
| >10-12 C aliphatics (TPH) | 5300 | 10000 | 2500 | 5100 | 13000 | 38000 |
| >12-16 C aliphatics (TPH) | 8200 | 2000 | 3200 | 7700 | 250000 | 740000 |
| >16-21 C aliphatics (TPH) | 310000 | 2000000 | 130000 | 1000000 | 1000000 | 1000000 |
| >16-21 C, >21-35 C aliphatics (TPH) (for transformer mineral oil releases only) | 250000 | 1600000 | 110000 | 1000000 | 1000000 | 1000000 |
| >7-8 C aromatics (TPH) | 3700 | 5800 | 5300 | 17000 | 10 | 30 |
| >8-10 C aromatics (TPH) | 1700 | 2800 | 1100 | 2100 | 33 | 97 |
| >10-12 C aromatics (TPH) | 2700 | 5800 | 1500 | 4000 | 50 | 150 |
| >12-16 C aromatics (TPH) | 4000 | 11000 | 2000 | 7800 | 99 | 300 |
| >16-21 C aromatics (TPH) | 4100 | 27000 | 1900 | 19000 | 230 | 700 |
| >21-35 C aromatics (TPH) | 4100 | 27000 | 1900 | 19000 | 1800 | 5500 |

Notes:

^{Tot}Soil_{Comb} (Residential)= Tier 1 Residential Standard for Soil, combined pathway of inhalation, ingestion, dermal contact, and vegetable consumption

^{Tot}Soil_{Comb} (C/I)= Tier 1 Commercial/Industrial Standard for Soil, combined pathway of inhalation, ingestion, dermal contact, and vegetable consumption

^{GW}Soil_{Ing} (Residential)= Residential Standard for Soil, protective of groundwater ingestion

^{GW}Soil_{Ing} (C/I) = Commercial/Industrial Standard for Soil, protective of groundwater ingestion

1 - Arsenic ^{Tot}Soil_{Comb} Residential and C/I PCLs based on Tier 2 values assuming 40 % relative bioavailability Factor based on USEPA site-specific study
mg/kg = milligrams per kilogram

SVOC = Semi-volatile Organic Compound

NE = Not Established

TPH = Total Petroleum Hydrocarbons

PCBs = Polychlorinated Bipheynls

TRRP = Texas Risk Reduction Program

RRR = Texas Risk Reduction Rules

VOC = Volatile Organic Compound

SAI-Res = Soil Medium Specific Concentration for Residential Use Based on Inhalation, Ingestion, and Dermal Contact

SAI-Ind = Soil Medium Specific Concentration for Industrial Use Based on Inhalation, Ingestion, and Dermal Contact

**Table 2-3
Groundwater Screening Standards**

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| Program/Agency | | USEPA | | TAC | RRR | | TRRP | |
|--|-----------------|-------|---------------|--------|-------------------|-------------------|---|---|
| | Screening Level | MCL | Secondary MCL | SWQS | GW _{Res} | GW _{Ind} | ^{GW} GW _{Ing} ² (Residential) | ^{GW} GW _{Ing} ² (Commercial/ Industrial) |
| Total Metals (mg/L) | | | | | | | | |
| Antimony | 0.006 | 0.006 | | | | | 0.006 | 0.006 |
| Arsenic | 0.01 | 0.01 | | | | | 0.01 | 0.01 |
| Barium | 2 | 2 | | | | | 2 | 2 |
| Cadmium | 0.005 | 0.005 | | | | | 0.005 | 0.005 |
| Chromium | 0.1 | 0.1 | | | | | 0.1 | 0.1 |
| Cobalt | 6.1 | | | 1.5 | 2.2 | 6.1 | 0.0073 | 0.022 |
| Copper | 1.3 | 1.3 | 1.0 | 0.09 | | | 1.3 | 1.3 |
| Iron | NE | | 0.3 | | | | | |
| Lead | 0.015 | 0.015 | | | | | 0.015 | 0.015 |
| Mercury | 0.002 | 0.002 | | 0.0013 | | | 0.002 | 0.002 |
| Molybdenum | 0.51 | | | | 0.18 | 0.51 | 0.12 | 0.37 |
| Nickel | 2 | | | | 0.73 | 2 | 0.49 | 1.5 |
| Selenium | 0.05 | 0.05 | | 0.005 | | | 0.05 | 0.05 |
| Thallium | 0.002 | 0.002 | | | | | 0.002 | 0.002 |
| Zinc | 31 | | 5 | 0.8 | 11 | 31 | 7.3 | 22 |
| Water Quality Parameters (mg/L) | | | | | | | | |
| Aluminum | 100 | | | 0.991 | 37 | 100 | 24 | 73 |
| Calcium | NE | | | | | | | |
| Magnesium | NE | | | | | | | |
| Manganese | 14 | | | | 1.7 | 14 | 1.1 | 10 |
| Potassium | NE | | | | | | | |
| Sodium | NE | | | | | | | |
| Chloride | 250 | | 250 | | NE | NE | NE | NE |
| Fluoride | 4 | 4 | 2 | | 4 | 4 | 4 | 4 |
| Nitrate | 10 | 10 | | | 10 | 10 | 10 | 10 |
| Nitrite | 1 | 1 | | | 1 | 1 | 1 | 1 |
| Sulfate | 250 | | 250 | | NE | NE | NE | NE |
| Sulfide | NE | NE | | | NE | NE | NE | NE |
| TDS | 500 | | 500 | | NE | NE | NE | NE |
| TOC | NE | NE | | | NE | NE | NE | NE |
| TSS | NE | NE | | | NE | NE | NE | NE |
| Alkalinity | NE | NE | | | NE | NE | NE | NE |

Notes:

GW_{Res} = Residential Standard for Groundwater

GW_{Ind} = Commercial/Industrial Standard for Groundwater

^{GW}GW_{Ing}² (Residential) = Residential Standard for Groundwater, Ingestion

^{GW}GW_{Ing}² (Commercial/Industrial) = Commercial/Industrial Standard for Groundwater, Ingestion

MCL = Maximum Contaminant Level, USEPA National Primary Drinking Water Standard

mg/L = milligrams per liter

NE = Not Established

RRR = Texas Risk Reduction Rules

SWQS = Surface Water Quality Standards (30 TAC 307)

TAC = Texas Administrative Code

TDS = Total Dissolved Solids

TOC = Total Organic Carbon

TSS = Total Suspended Solids

USEPA = United States Environmental Protection Agency

Background concentrations based on the average concentration detected in location SEP-9

**Table 2-4
Surface Water Screening Standards**

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| Program/Agency | | | | USEPA | | values | |
|--|---|---|-------|---------------|-----------------------------|------------|--|
| | Surface Water Screening Standard - American Canal | Surface Water Screening Standard - Rio Grande | MCL | Secondary MCL | Freshwater Chronic Criteria | Background | |
| Total Metals (mg/L) | | | | | | | |
| Antimony | 0.006 | 0.006 | 0.006 | NE | 0.16 | NC | |
| Arsenic | 0.01 | 0.01 | 0.01 | NE | 0.32 ^a | NC | |
| Barium | 2 | 2 | 2 | NE | 16 | NC | |
| Cadmium | 0.005 | 0.0017 | 0.005 | NE | 0.0017 ^a | NC | |
| Chromium | 0.1 | 0.1 | 0.1 | NE | 0.81 ^a | NC | |
| Cobalt | NE | 1.5 | NE | NE | 1.5 | NC | |
| Copper | 1.3 | 0.07 | 1.3 | 1.0 | 0.07 ^a | NC | |
| Iron | NE | 1 | NE | 0.3 | 1 | 7.2 | |
| Lead | 0.015 | 0.015 | 0.015 | NE | 0.042 ^a | NC | |
| Mercury | 0.002 | 0.0013 | 0.002 | NE | 0.0013 | NC | |
| Molybdenum | NE | 2 | NE | NE | 2 | NC | |
| Nickel | NE | 0.33 | NE | NE | 0.33 ^a | NC | |
| Selenium | 0.05 | 0.005 | 0.05 | NE | 0.005 | NC | |
| Thallium | 0.002 | 0.002 | 0.002 | NE | 0.004 | NC | |
| Zinc | NE | 0.94 | NE | 5 | 0.94 ^a | NC | |
| Water Quality Parameters (mg/L) | | | | | | | |
| Aluminum | 16.4 | 16.4 | NE | NE | 0.087 | 16.4 | |
| Calcium | NE | NE | NE | NE | NE | 115 | |
| Magnesium | 25.7 | 25.7 | NE | NE | 3.235 | 25.7 | |
| Manganese | 0.39 | 0.39 | NE | NE | 0.12 | 0.39 | |
| Potassium | NE | NE | NE | NE | NE | 15.5 | |
| Sodium | NE | NE | NE | NE | NE | 612 | |
| Chloride | NE | 230 | NE | 250 | 230 | 541 | |
| Fluoride | 4 | 4 | 4 | 2 | NE | NC | |
| Nitrate | 10 | 10 | 10 | NE | NE | NC | |
| Nitrite | 1 | 1 | 1 | NE | NE | NC | |
| Sulfate | NE | NE | NE | 250 | NE | 600 | |
| Sulfide | NE | NE | NE | NE | NE | NC | |
| TDS | NE | NE | NE | 500 | NE | 1990 | |
| TOC | NE | NE | NE | NE | NE | NC | |
| TSS | NE | NE | NE | NE | NE | 536 | |
| Alkalinity | NE | NE | NE | NE | NE | NC | |

Notes:

MCL = Maximum Contaminant Level, USEPA National Primary Drinking Water Standard

mg/L = milligrams per liter

NE = Not Established

SWQS = Surface Water Quality Standards

TAC = Texas Administrative Code

TDS = Total Dissolved Solids

TOC = Total Organic Carbon

TRRP = Texas Risk Reduction Program

TSS = Total Suspended Solids

USEPA = United States Environmental Protection Agency

Background concentrations based on the 95% UPL calculated using the student's t-test method;

analytical data from locations SEP-9 and SEP-1 from 1999 through 2012 were used for statistical evaluation

^a = Total Freshwater Chronic Criteria numbers converted from calculated dissolved standards.

Dissolved standards were calculated based on a hardness value of 250 and water-effect ratio of 1.

Background concentrations based on the average concentration detected in location SEP-9

Table 3-1
Summary of Soil Investigations Completed as part of Supplemental RI Activities

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| AA/IA | Analytical Suite ¹ | Sample Locations (No. Locations/ No. Samples) | Other Investigations |
|--------------------------------------|---|--|--|
| East Mountain | COCs: Metals AOIs: Metals | Surface Soil: 19/19 | |
| East Property | COCs: Metals AOIs: Metals | Soil Boring and Surface Soil: 22/44 Test Pits: 15/15 | Geophysical Survey |
| Parker Brothers Arroyo | | Surface Soil: 9/9 Soil Borings and Test Pits ³ : 17/28 | Geophysical Survey Seismic Survey Sequential Extraction Analysis |
| Boneyard Area | COCs: Metals AOIs: Metals ² ; VOCs (BTEX only); TPH | Soil Borings and Test Pits ⁴ : 12/35 | |
| Fines Pile/Ephemeral Pond Areas | | Soil Borings: 6/21 | |
| Acid Plant Area | AOIs: pH ^{2,5} | Soil Borings: 2/8 | |
| Plant Entrance Area | COCs: Metals AOIs: Metals | Soil Borings: 7/14 | |
| Transformer Storage Area | AOIs: PCBs | Soil Borings: 2/8 | |
| Wastewater Treatment Plant Area | COCs: Metals AOIs: Metals | Soil Borings: 1/2 | |
| Former Lead Smelter Area | COCs: Metals AOIs: Metals | Soil Borings: 3/5 | |
| Contop-Reverb-Converter Area | COCs: Metals AOIs: Metals | Surface Soil: 6/6 | |
| Former Zinc and Cadmium Plant Area | COCs: Metals AOIs: Metals ² | Soil Borings: 6/19 | |
| Anode Pour Area | COCs: Metals AOIs: Metals; VOCs, SVOCs | Soil Borings: 2/8 | |
| Drum Holding Area | AOIs: PCBs; TPH | Soil Borings: 3/12 | |
| Liquid Mercury Collection Area | AOIs: Mercury | Soil Borings: 2/0 ⁶ | |
| Unloading and Bedding Building Areas | COCs: Metals AOIs: Metals; VOCs, SVOCs | Surface Soil: 3/3 Soil Borings: 7/12 | |

Notes:

¹ The analytical suite for each COC and AOI set is provided in Table 2-1

² Hexavalent chromium and thallium were included as additional metal AOIs for this IA

³ 9 soil borings and 8 test pits were completed as described in Appendices J and K.

⁴ 7 soil borings and 5 test pits were completed as described in Appendices J and K.

⁵ Soil pH was included as an additional AOI for this IA, and was the only species analyzed during supplemental Remedial Investigation activities

⁶ No visual evidence of mercury was present and thus no analytical samples were collected.

AOI = Analyte of Interest (as defined in Table 2-1)

BTEX = Benzene, Toluene, Ethyl Benzene, Total Xylenes

COC = Constituent of Concern (as defined in Table 2-1)

AA/IA = Assessment Area Investigation Area

PCBs = Polychlorinated Bipheynls

SVOC = Semivolatile Organic Compound

TPH = Total Petroleum Hydrocarbons

VOCs = Volatile Organic Compounds

**Table 4-1
Available Soil Data by Assessment Area**

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| Analytical Suite ¹ | Number of Samples Collected for Each Analytical Suite | | | | | | | Additional Analysis ² |
|-------------------------------|---|--------|-------|-------|-----|------|----|--|
| | COCs | AOIs | | | | | | |
| | Metals | Metals | VOCs | SVOCs | TPH | PCBs | | |
| Assessment Area | | | | | | | | |
| East Mountain | 42 | 35 | | | | | | 1 sample was analyzed for thallium |
| East Property | 354 | 73 | 17 | 9 | | | 9 | 1 sample was analyzed for thallium |
| Parker Brothers Arroyo | 457 | 185 | 4 | | 4 | | | 11 samples were analyzed for thallium and manganese; 5 samples were analyzed for hexavalent chromium |
| Plant Entrance Arroyo | 76 | | | | | | | |
| South Terrace Arroyo | 177 | 8 | 8 | 8 | | | 8 | |
| Pond 1 Arroyo | 220-238 | 16-28 | 14-16 | 16 | | | 16 | 2 samples were analyzed for VOC cyclohexanone |
| Ponds 5 and 6 Arroyo | 269-284 | 21-22 | 13 | 13 | | 8 | 13 | 3 samples were analyzed for thallium |
| Acid Plant Arroyo | 171 | 19 | | | 13 | 11 | | 8 samples were analyzed for pH; 15 samples were analyzed for hexavalent chromium |
| La Calvera | 33 | 1 | 3 | 1 | | | 1 | |
| Floodplain | 102-144 | | | | | | | |

Notes:

¹ The analytical suite for each COC and AOI set is provided in Table 2-1

² Additional analysis was completed for select samples, based on information obtained after development of the 2010 Remedial Action Work Plan

AOI = Analyte of Interest (as defined in Table 2-1)

COC = Constituent of Concern (as defined in Table 2-1)

PCBs = Polychlorinated Bipheynls

SVOC = Semivolatile Organic Compound

TPH = Total Petroleum Hydrocarbons

VOCs = Volatile Organic Compounds

Table 4-2
Soils Analytical Data Summary - East Mountain Area
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| Parameter | Screening Standard | COC? | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation | No. Values above SAI-Ind | % Above SAI-Ind |
|-----------------------------|--------------------|------|---------|---------|--------|-------|-------------|---------|--------------------|--------------------------|-----------------|
| Total Metals (mg/kg) | | | | | | | | | | | |
| Antimony | 72 | Yes | 0.42 | 137 | 13.9 | 20 | 28 | 7 | 25.7 | 1/35 | 3 |
| Arsenic | 46 | Yes | 4.25 | 615 | 99.5 | 0 | 42 | 0 | 110 | 22/42 | 52 |
| Barium | 26,103 | No | 52.3 | 342 | 158 | 0 | 35 | 0 | 57.6 | 0/35 | 0 |
| Cadmium | 240 | No | 0.04 | 132 | 25.8 | 7 | 39 | 3 | 30.2 | 0/42 | 0 |
| Chromium | 59,334 | No | 1.05 | 130 | 16.9 | 5 | 40 | 2 | 30.8 | 0/42 | 0 |
| Cobalt | 15,286 | No | 2.43 | 14.6 | 5.96 | 3 | 34 | 1 | 2.37 | 0/35 | 0 |
| Copper | 10,191 | No | 2.83 | 5,460 | 814 | 0 | 42 | 0 | 1120 | 0/42 | 0 |
| Iron | NE | No | 3,910 | 38,000 | 15,100 | 0 | 42 | 0 | 6,090 | 0/42 | 0 |
| Lead | 500 | Yes | 2.51 | 5570 | 745 | 0 | 42 | 0 | 991 | 20/42 | 48 |
| Mercury | 0.11 | Yes | 0.02 | 1.82 | 0.403 | 6 | 33 | 2 | 0.45 | 23/35 | 66 |
| Molybdenum | 1,140 | No | 0.30 | 34.1 | 6.09 | 6 | 33 | 2 | 8.26 | 0/35 | 0 |
| Nickel | 1,873 | No | 1.98 | 62.1 | 8.65 | 0 | 35 | 0 | 10.1 | 0/35 | 0 |
| Selenium | 1,274 | No | 0.33 | 16.3 | 2.49 | 26 | 31 | 11 | 2.99 | 0/42 | 0 |
| Silver | 468 | No | 0.14 | 44.5 | 5.08 | 11 | 31 | 4 | 8.33 | 0/35 | 0 |
| Thallium | 20 | No | 0.49 | 0.49 | 0.49 | 0 | 1 | 0 | - | 0/1 | 0 |
| Zinc | 59,403 | No | 18 | 3,270 | 558 | 2 | 41 | 1 | 701 | 0/42 | 0 |

Notes:

1. Minimum value is lowest detected concentration.

COC = Constituent of Concern

mg/kg = milligrams per kilogram

ND = Non-Detect

NE = Not Established

No. = number

SAI-Ind = Soil Medium Specific Concentration for Industrial Use Based on Inhalation, Ingestion, and Dermal Contact

SAI-Res = Soil Medium Specific Concentration for Industrial Use Based on Inhalation, Ingestion, and Dermal Contact

Screening Standard = SAI-Res

**Table 4-3
Soils Analytical Data Summary - East Property**

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| Parameter | Screening Standard | COC? | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation | No. Values above SAI-Ind | % Above SAI-Ind |
|---------------------------------------|--------------------|------|---------|---------|--------|-------|-------------|---------|--------------------|--------------------------|-----------------|
| Total Metals (mg/kg) | | | | | | | | | | | |
| Antimony | 72 | Yes | 0.31 | 1,680 | 57.3 | 12 | 64 | 9 | 237 | 7/73 | 10 |
| Arsenic | 46 | Yes | 1.19 | 15,600 | 675 | 21 | 281 | 73 | 1,970 | 107/354 | 30 |
| Barium | 26,103 | No | 37.7 | 591 | 142 | 3 | 71 | 2 | 108 | 0/73 | 0 |
| Cadmium | 240 | Yes | 0.28 | 3,500 | 128 | 35 | 229 | 125 | 328 | 30/354 | 8 |
| Chromium | 59,334 | No | 1.99 | 290 | 34.7 | 42 | 205 | 149 | 47.8 | 0/354 | 0 |
| Cobalt | 15,286 | No | 1.72 | 76.9 | 9.8 | 1 | 72 | 1 | 16.7 | 0/73 | 0 |
| Copper | 10,191 | Yes | 1.96 | 150,000 | 2,640 | 9 | 322 | 32 | 10,000 | 15/354 | 4 |
| Iron | NE | No | 2,400 | 273,000 | 20,500 | 1 | 352 | 2 | 25,100 | 0/354 | 0 |
| Lead | 500 | Yes | 3.4 | 106,000 | 2,580 | 11 | 317 | 37 | 9,950 | 72/354 | 20 |
| Mercury | 0.11 | Yes | 0.00 | 458 | 17.2 | 32 | 50 | 23 | 77.9 | 31/73 | 43 |
| Molybdenum | 1,140 | No | 0.12 | 277 | 21.7 | 6 | 69 | 4 | 52.5 | 0/73 | 0 |
| Nickel | 1,873 | No | 2.57 | 87.4 | 11 | 8 | 67 | 6 | 15.5 | 0/73 | 0 |
| Selenium | 1,274 | Yes | 0.19 | 1,880 | 48 | 68 | 114 | 240 | 214 | 2/354 | 1 |
| Silver | 468 | No | 0.12 | 122 | 10.2 | 44 | 41 | 32 | 24.5 | 0/73 | 0 |
| Thallium | 20 | No | ND | ND | ND | 100 | 0 | 1 | - | 0/1 | 0 |
| Zinc | 59,403 | No | 9.57 | 19,800 | 1540 | 7 | 328 | 26 | 3,370 | 0/354 | 0 |
| VOCs (mg/kg) | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 2,324 | No | ND | ND | ND | 100 | 0 | 17 | - | 0/17 | 0 |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 42,658 | No | ND | ND | ND | 100 | 0 | 17 | - | 0/17 | 0 |
| 1,1,2-Trichloroethane | 9.69 | No | ND | ND | ND | 100 | 0 | 17 | - | 0/17 | 0 |
| 1,2-Dichlorobenzene | 561 | No | 0.0003 | 0.0003 | 0.0003 | 88 | 2 | 15 | 0.0001 | 0/17 | 0 |
| 4-Methyl-2-pentanone (MIBK) | 12,914 | No | ND | ND | ND | 100 | 0 | 17 | - | 0/17 | 0 |
| Acetone | 1,743 | No | 0.00746 | 0.0239 | 0.0131 | 47 | 9 | 8 | 0.00524 | 0/17 | 0 |
| Carbon tetrachloride | 0.35 | No | ND | ND | ND | 100 | 0 | 17 | - | 0/17 | 0 |
| Chlorobenzene | 398 | No | ND | ND | ND | 100 | 0 | 17 | - | 0/17 | 0 |
| Cyclohexane | 12,057 | No | ND | ND | ND | 100 | 0 | 17 | - | 0/17 | 0 |
| Dichlorodifluoromethane | 2,161 | No | ND | ND | ND | 100 | 0 | 17 | - | 0/17 | 0 |
| Ethyl acetate | 8,864 | No | ND | ND | ND | 100 | 0 | 17 | - | 0/17 | 0 |
| Ethyl ether | 3,848 | No | ND | ND | ND | 100 | 0 | 17 | - | 0/17 | 0 |

**Table 4-3
Soils Analytical Data Summary - East Property**

**Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site**

| Parameter | Screening Standard | COC? | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation | No. Values above SAI-Ind | % Above SAI-Ind |
|---------------------------|--------------------|------|---------|---------|--------|-------|-------------|---------|--------------------|--------------------------|-----------------|
| VOCs, continued | | | | | | | | | | | |
| Ethylbenzene | NE | No | 0.0002 | 0.0003 | 0.0003 | 82 | 3 | 14 | 0.0000 | 0/17 | 0 |
| Methylene chloride | 8.68 | No | ND | ND | ND | 100 | 0 | 17 | - | 0/17 | 0 |
| Tetrachloroethene | 6.02 | No | ND | ND | ND | 100 | 0 | 17 | - | 0/17 | 0 |
| Total Xylenes | 585 | No | 0.0004 | 0.0011 | 0.0007 | 35 | 11 | 6 | 0.0002 | 0/17 | 0 |
| Trichloroethene | 3.73 | No | ND | ND | ND | 100 | 0 | 17 | - | 0/17 | 0 |
| Trichlorofluoromethane | 2,634 | No | 0.0005 | 0.0031 | 0.0013 | 12 | 15 | 2 | 0.0007 | 0/17 | 0 |
| SVOCs (mg/kg) | | | | | | | | | | | |
| Hexachlorocyclopentadiene | 10.18 | No | ND | ND | ND | 100 | 0 | 9 | - | 0/9 | 0 |
| Pesticides (mg/kg) | | | | | | | | | | | |
| Chlordane | 1.60 | No | ND | ND | ND | 100 | 0 | 9 | - | 0/9 | 0 |
| Endrin | 46.46 | No | 0.0004 | 0.0004 | 0.0004 | 89 | 1 | 8 | - | 0/9 | 0 |
| Methyl parathion | 38.72 | No | ND | ND | ND | 100 | 0 | 9 | - | 0/9 | 0 |

Notes:

1. Minimum value is lowest detected concentration.

COC = Constituent of Concern

mg/kg = milligrams per kilogram

ND = Non-Detect

NE = Not Established

No. = number

PCB = Polychlorinated Biphenyl

SAI-Ind = Soil Medium Specific Concentration for Industrial Use Based on Inhalation, Ingestion, and Dermal Contact

SAI-Res = Soil Medium Specific Concentration for Industrial Use Based on Inhalation, Ingestion, and Dermal Contact

Screening Standard = SAI-Res

SVOC = Semivolatile Organic Compound

TPH = Total Petroleum Hydrocarbon

Table 4-4
Soils Analytical Data Summary - Parker Brothers Arroyo, Fines Pile, Boneyard Areas

Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site

| Parameter | Screening Standard | COC? | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation | No. Values above SAI-Ind | % Above SAI-Ind |
|------------------------------|--------------------|------|---------|---------|--------|-------|-------------|---------|--------------------|--------------------------|-----------------|
| Total Metals (mg/kg) | | | | | | | | | | | |
| Antimony | 491 | Yes | 0.32 | 1,990 | 82.6 | 17 | 153 | 32 | 244 | 6/185 | 3 |
| Arsenic | 320 | Yes | 1.56 | 4,830 | 286 | 15 | 390 | 68 | 652 | 73/458 | 16 |
| Barium | 168,329 | No | 13.7 | 2,170 | 300 | 0 | 185 | 0 | 372 | 0/185 | 0 |
| Cadmium | 1,460 | Yes | 0.15 | 2,100 | 87.3 | 38 | 286 | 172 | 279 | 4/458 | 1 |
| Chromium | 352,726 | No | 0.41 | 730 | 53.1 | 40 | 273 | 185 | 78.2 | 0/458 | 0 |
| Chromium, hexavalent | 1,226 | No | ND | ND | ND | 100 | 0 | 5 | - | 0/5 | 0 |
| Cobalt | 111,491 | No | 1.32 | 512 | 34.1 | 0 | 185 | 0 | 66.4 | 0/185 | 0 |
| Copper | 74,327 | Yes | 1.57 | 279,000 | 2,323 | 12 | 402 | 56 | 14,610 | 1/458 | 0 |
| Iron | NE | No | 374 | 310,000 | 39,826 | 0 | 458 | 0 | 58,916 | 0/458 | 0 |
| Lead | 1,000 | Yes | 2.32 | 24,400 | 1,084 | 9 | 415 | 43 | 2,683 | 83/458 | 18 |
| Manganese | 107,310 | No | 110 | 1,760 | 685 | 0 | 11 | 0 | 653 | 0/11 | 0 |
| Mercury | 0.15 | Yes | 0.01 | 13.9 | 0.41 | 25 | 139 | 46 | 1.43 | 46/185 | 25 |
| Molybdenum | 8,091 | No | 0.2 | 2,260 | 143 | 1 | 184 | 1 | 348 | 0/185 | 0 |
| Nickel | 11,680 | No | 0.75 | 658 | 18.4 | 0 | 185 | 0 | 54.3 | 0/185 | 0 |
| Selenium | 9,291 | No | 0.17 | 109 | 15.8 | 66 | 156 | 302 | 22.8 | 0/458 | 0 |
| Silver | 2,920 | No | 0.11 | 116 | 12.4 | 46 | 100 | 85 | 19 | 0/185 | 0 |
| Thallium | 149 | No | 0.26 | 1.19 | 0.62 | 27 | 8 | 3 | 0.29 | 0/11 | 0 |
| Zinc | 408,800 | No | 10.8 | 158,000 | 6,564 | 10 | 413 | 45 | 20,275 | 0/458 | 0 |
| VOCs (mg/kg) | | | | | | | | | | | |
| Benzene | 1.58 | No | ND | ND | ND | 100 | 0 | 4 | - | 0/4 | 0 |
| Ethylbenzene | NE | No | ND | ND | ND | 100 | 0 | 4 | - | 0/4 | 0 |
| Toluene | 25,281 | No | ND | ND | ND | 100 | 0 | 4 | - | 0/4 | 0 |
| Total Xylenes | 826 | No | ND | ND | ND | 100 | 0 | 4 | - | 0/4 | 0 |
| TPH (mg/kg) | | | | | | | | | | | |
| Total Petroleum Hydrocarbons | NE | No | 115 | 5,325 | 2,720 | 50 | 2 | 2 | 3,680 | 0/4 | 0 |

Notes:

1. Minimum value is lowest detected concentration.

COC = Constituent of Concern
mg/kg = milligrams per kilogram
ND = Non-Detect
NE = Not Established
No. = number

Screening Standard = SAI-Ind
SAI-Ind = Soil Medium Specific Concentration for Industrial Use Based on Inhalation, Ingestion, and Dermal Contact
SAI-Res = Soil Medium Specific Concentration for Industrial Use Based on Inhalation, Ingestion, and Dermal Contact
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table 4-5
Soils Analytical Data Summary - Plant Entrance Arroyo
Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site

| Parameter | Screening Standard | COC? | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation | No. Values above SAI-Ind | % Above SAI-Ind |
|-----------------------------|--------------------|------|---------|---------|--------|-------|-------------|---------|--------------------|--------------------------|-----------------|
| Total Metals (mg/kg) | | | | | | | | | | | |
| Arsenic | 320 | Yes | 8.08 | 1,300 | 116 | 53 | 36 | 40 | 214 | 10/76 | 13 |
| Cadmium | 1,460 | No | 0.11 | 160 | 28.6 | 47 | 40 | 36 | 35.3 | 0/76 | 0 |
| Chromium | 352,726 | No | 2.75 | 200 | 50.8 | 79 | 57 | 15 | 47.3 | 0/72 | 0 |
| Copper | 74,327 | No | 2.71 | 31,000 | 1,837 | 87 | 66 | 10 | 4,423 | 0/76 | 0 |
| Iron | NE | No | 4,340 | 56,000 | 18,269 | 100 | 72 | 0 | 9,746 | 0/72 | 0 |
| Lead | 1,000 | Yes | 2.59 | 9,600 | 941 | 92 | 70 | 6 | 1,800 | 15/76 | 20 |
| Selenium | 9,291 | No | 0.696 | 33 | 8.4 | 26 | 19 | 53 | 5.5 | 0/72 | 0 |
| Zinc | 408,800 | No | 11.6 | 5,700 | 720 | 100 | 72 | 0 | 1,200 | 0/72 | 0 |

Notes:

1. Minimum value is lowest detected concentration.

COC = Constituent of Concern

mg/kg = milligrams per kilogram

ND = Non-Detect

NE = Not Established

No. = number

SAI-Ind = Soil Medium Specific Concentration for Industrial Use Based on Inhalation, Ingestion, and Dermal Contact

Screening Standard = SAI-Ind

Table 4-6
Soils Analytical Data Summary- South Terrace Arroyo

Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site

| Parameter | Screening Standard | COC? | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation | No. Values above SAI-Ind | % Above SAI-Ind |
|---------------------------------------|--------------------|------|---------|---------|--------|-------|-------------|---------|--------------------|--------------------------|-----------------|
| Total Metals (mg/kg) | | | | | | | | | | | |
| Antimony | 491 | No | 3.83 | 267 | 107 | 50 | 4 | 4 | 127 | 0/8 | 0 |
| Arsenic | 320 | Yes | 2.58 | 15,000 | 738 | 36 | 114 | 63 | 1,840 | 28/177 | 16 |
| Barium | 168,329 | No | 33.5 | 120 | 77.7 | 0 | 8 | 0 | 30.5 | 0/8 | 0 |
| Cadmium | 1,460 | Yes | 0.212 | 2,200 | 253 | 46 | 96 | 81 | 432 | 4/177 | 2 |
| Chromium | 352,726 | No | 2.14 | 520 | 92.5 | 51 | 87 | 90 | 97.3 | 0/177 | 0 |
| Cobalt | 111,491 | No | 1.93 | 36.4 | 9.81 | 0 | 8 | 0 | 13.4 | 0/8 | 0 |
| Copper | 74,327 | Yes | 3.08 | 190,000 | 7,950 | 20 | 141 | 36 | 23,300 | 4/177 | 2 |
| Iron | NE | No | 3,000 | 260,000 | 28,600 | 0 | 177 | 0 | 37,600 | 0/177 | 0 |
| Lead | 1,000 | Yes | 4.25 | 51,000 | 3,330 | 20 | 142 | 35 | 8,400 | 31/177 | 18 |
| Mercury | 0.15 | Yes | 0.01 | 10.8 | 3.69 | 38 | 5 | 3 | 4.96 | 4/8 | 50 |
| Molybdenum | 8,091 | No | 0.35 | 201 | 28.3 | 0 | 8 | 0 | 70 | 0/8 | 0 |
| Nickel | 11,680 | No | 3.09 | 52 | 12.6 | 0 | 8 | 0 | 17 | 0/8 | 0 |
| Selenium | 9,291 | No | 0.355 | 240 | 70.8 | 83 | 31 | 146 | 62.7 | 0/177 | 0 |
| Silver | 2,920 | No | 2.57 | 108 | 34.1 | 50 | 4 | 4 | 50.1 | 0/8 | 0 |
| Zinc | 408,800 | No | 11 | 33,000 | 2,260 | 4 | 170 | 7 | 5,200 | 0/177 | 0 |
| VOCs (mg/kg) | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 3,370 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 59,973 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| 1,1,2-Trichloroethane | 17.50 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| 1,2-Dichlorobenzene | 800 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| 4-Methyl-2-pentanone (MIBK) | 34,612 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| Acetone | 2,454 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| Carbon tetrachloride | 0.63 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| Chlorobenzene | 591 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| Cyclohexane | 17,001 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| Dichlorodifluoromethane | 3,126 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| Ethyl acetate | 12,782 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| Ethyl ether | 5,712 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| Ethylbenzene | NE | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| Methanol | 1,022,000 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| Methylene Chloride | 15.89 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |

Table 4-6
Soils Analytical Data Summary- South Terrace Arroyo

Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site

| Parameter | Screening Standard | COC? | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation | No. Values above SAI-Ind | % Above SAI-Ind |
|---------------------------|--------------------|------|---------|---------|------|-------|-------------|---------|--------------------|--------------------------|-----------------|
| VOCs, continued | | | | | | | | | | | |
| n-Butyl alcohol | 204,400 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| Tetrachloroethene | 16.76 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| Total Xylenes | 826 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| Trichloroethene | 6.61 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| Trichlorofluoromethane | 3,786 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| SVOCs (mg/kg) | | | | | | | | | | | |
| Hexachlorocyclopentadiene | 14.37 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| Pesticides (mg/kg) | | | | | | | | | | | |
| Chlordane | 10.87 | No | 0.01 | 0.01 | 0.01 | 88 | 1 | 7 | - | 0/8 | 0 |
| Endrin | 307 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |
| Methyl parathion | 256 | No | ND | ND | ND | 100 | 0 | 8 | - | 0/8 | 0 |

Notes:

1. Minimum value is lowest detected concentration.

COC = Constituent of Concern

mg/kg = milligrams per kilogram

ND = Non-Detect

NE = Not Established

No. = number

SAI-Ind = Soil Medium Specific Concentration for Industrial Use Based on Inhalation, Ingestion, and Dermal Contact

Screening Standard = SAI-Ind

SVOC = Semivolatile Organic Compound

VOCs = Volatile Organic Compounds

Table 4-7
Soils Analytical Data Summary - Pond 1 Arroyo

Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site

| Parameter | Screening Standard | COC? | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation | No. Values above SAI-Ind | % Above SAI-Ind |
|---------------------------------------|--------------------|------|---------|---------|--------|-------|-------------|---------|--------------------|--------------------------|-----------------|
| Metals (mg/kg) | | | | | | | | | | | |
| Antimony | 491 | No | 0.292 | 79.9 | 21.3 | 31 | 11 | 5 | 25.9 | 0/16 | 0 |
| Arsenic | 320 | Yes | 0.70 | 6,600 | 321 | 40 | 144 | 94 | 846 | 27/238 | 11 |
| Barium | 168,329 | No | 36.9 | 561 | 183 | 43 | 16 | 12 | 173 | 0/28 | 0 |
| Cadmium | 1,460 | Yes | 0.22 | 2,600 | 122 | 53 | 108 | 124 | 298 | 1/232 | 0 |
| Chromium | 352,726 | No | 2.18 | 1,800 | 104 | 61 | 90 | 142 | 196 | 0/232 | 0 |
| Cobalt | 111,491 | No | 1.79 | 46.4 | 9.03 | 0 | 16 | 0 | 12.6 | 0/16 | 0 |
| Copper | 74,327 | No | 5.49 | 55,000 | 3,340 | 20 | 177 | 43 | 7,570 | 0/220 | 0 |
| Iron | NE | No | 3400 | 180,000 | 24,500 | 0 | 220 | 0 | 24,700 | 0/220 | 0 |
| Lead | 1,000 | Yes | 6.02 | 29,000 | 1,410 | 13 | 207 | 31 | 3,230 | 50/238 | 21 |
| Mercury | 0.15 | Yes | 0.01 | 5.35 | 1.05 | 54 | 13 | 15 | 1.46 | 9/28 | 32 |
| Molybdenum | 8,091 | No | 0.17 | 163 | 20.5 | 0 | 16 | 0 | 44.2 | 0/16 | 0 |
| Nickel | 11,680 | No | 2.71 | 51.6 | 12.4 | 0 | 16 | 0 | 12.9 | 0/16 | 0 |
| Selenium | 9,291 | No | 0.33 | 270 | 31.4 | 82 | 42 | 190 | 44.7 | 0/232 | 0 |
| Silver | 2,920 | No | 0.13 | 103 | 28.8 | 61 | 11 | 17 | 34.3 | 0/28 | 0 |
| Zinc | 408,800 | No | 10 | 28,000 | 1,500 | 3 | 214 | 6 | 4,030 | 0/220 | 0 |
| VOCs (mg/kg) | | | | | | | | | | | |
| Ethylbenzene | NE | No | 0.000 | 0.001 | 0.001 | 81 | 3 | 13 | 0.000 | 0/16 | 0 |
| Total Xylenes | 826 | No | 0.000 | 0.003 | 0.001 | 56 | 7 | 9 | 0.001 | 0/16 | 0 |
| 1,1,1-Trichloroethane | 3,370 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 59,973 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| 1,1,2-Trichloroethane | 17 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| 1,2-Dichlorobenzene | 800 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| 4-Methyl-2-pentanone (MIBK) | 34,612 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| Acetone | 2,454 | No | 0.02 | 0.02 | 0.02 | 94 | 1 | 15 | - | 0/16 | 0 |
| Carbon tetrachloride | 0.63 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| Chlorobenzene | 591 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| Cyclohexane | 17,001 | No | ND | ND | ND | 100 | 0 | 14 | - | 0/14 | 0 |
| Cyclohexanone | 2,981 | No | ND | ND | ND | 100 | 0 | 2 | - | 0/2 | 0 |
| Dichlorodifluoromethane | 3,126 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |

**Table 4-7
Soils Analytical Data Summary - Pond 1 Arroyo**

**Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site**

| Parameter | Screening Standard | COC? | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation | No. Values above SAI-Ind | % Above SAI-Ind |
|---------------------------|--------------------|------|---------|---------|------|-------|-------------|---------|--------------------|--------------------------|-----------------|
| VOCs, continued | | | | | | | | | | | |
| Ethyl acetate | 12,782 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| Ethyl ether | 5,712 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| Methanol | 1,022,000 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| Methylene chloride | 15.89 | No | 0.01 | 0.01 | 0.01 | 94 | 1 | 15 | - | 0/16 | 0 |
| n-Butyl alcohol | 204,400 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| Tetrachloroethene | 16.763577 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| Trichloroethene | 6.61 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| Trichlorofluoromethane | 3,786 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| SVOCs (mg/kg) | | | | | | | | | | | |
| Hexachlorocyclopentadiene | 14.37 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| Pesticides (mg/kg) | | | | | | | | | | | |
| Chlordane | 10.87 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| Endrin | 307 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |
| Methyl parathion | 256 | No | ND | ND | ND | 100 | 0 | 16 | - | 0/16 | 0 |

Notes:

1. Minimum value is lowest detected concentration.

COC = Constituent of Concern

mg/kg = milligrams per kilogram

ND = Non-Detect

NE = Not Established

No. = number

PCBs = Polychlorinated Bipheynls

SAI-Ind = Soil Medium Specific Concentration for Industrial Use Based on Inhalation, Ingestion, and Dermal Contact

Screening Standard = SAI-Ind

SVOC = Semivolatile Organic Compound

TPH = Total Petroleum Hydrocarbons

VOCs = Volatile Organic Compounds

Table 4-8
Soils Analytical Data Summary - Ponds 5 and 6 Arroyo

Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site

| Parameter | Screening Standard | COC? | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation | No. Values above SAI-Ind | % Above SAI-Ind |
|---------------------------------------|--------------------|------|---------|---------|--------|-------|-------------|---------|--------------------|--------------------------|-----------------|
| Total Metals (mg/kg) | | | | | | | | | | | |
| Antimony | 491 | Yes | 0.367 | 738 | 137 | 5 | 20 | 1 | 231 | 3/21 | 14 |
| Arsenic | 320 | Yes | 3.01 | 20,000 | 686 | 12 | 250 | 34 | 2,150 | 45/284 | 16 |
| Barium | 168,329 | No | 58.6 | 1,760 | 314 | 5 | 21 | 1 | 390 | 0/22 | 0 |
| Cadmium | 1,460 | Yes | 0.306 | 11,000 | 591 | 46 | 146 | 124 | 1,550 | 13/270 | 5 |
| Chromium | 352,726 | No | 1.89 | 440 | 95.3 | 70 | 81 | 189 | 82.2 | 0/270 | 0 |
| Cobalt | 111,491 | No | 2.25 | 81.1 | 22.2 | 0 | 21 | 0 | 24 | 0/21 | 0 |
| Copper | 74,327 | No | 9.15 | 69,000 | 3,310 | 16 | 226 | 43 | 9,720 | 0/269 | 0 |
| Iron | NE | No | 3,300 | 176,000 | 23,600 | 0 | 269 | 0 | 20,200 | 0/269 | 0 |
| Lead | 1,000 | Yes | 1.56 | 71,000 | 2,540 | 4 | 274 | 10 | 7,980 | 58/284 | 20 |
| Mercury | 0.15 | Yes | 0.05 | 9.37 | 2.62 | 18 | 18 | 4 | 2.43 | 15/22 | 68 |
| Molybdenum | 8,091 | No | 0.35 | 801 | 127 | 0 | 21 | 0 | 233 | 0/21 | 0 |
| Nickel | 11,680 | No | 4.09 | 152 | 31.6 | 0 | 21 | 0 | 35.9 | 0/21 | 0 |
| Selenium | 9,291 | No | 0.452 | 390 | 75.7 | 80 | 55 | 215 | 104 | 0/270 | 0 |
| Silver | 2,920 | No | 0.256 | 122 | 21.8 | 14 | 19 | 3 | 28.8 | 0/22 | 0 |
| Thallium | 149 | No | 1.24 | 11.5 | 6.37 | 33 | 2 | 1 | 7.25 | 0/3 | 0 |
| Zinc | 408,800 | No | 12 | 38,000 | 2,080 | 6 | 254 | 15 | 5,690 | 0/269 | 0 |
| VOCs (mg/kg) | | | | | | | | | | | |
| Ethylbenzene | NE | No | 0.0004 | 0.0005 | 0.0004 | 85 | 2 | 11 | 0.0001 | 0/13 | 0 |
| Total Xylenes | 826 | No | 0.001 | 0.002 | 0.001 | 69 | 4 | 9 | 0.001 | 0/13 | 0 |
| 1,1,1-Trichloroethane | 3,370 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 59,973 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |
| 1,1,2-Trichloroethane | 17.50 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |
| 1,2-Dichlorobenzene | 800 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |
| 4-Methyl-2-pentanone | 34,612 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |
| Acetone | 2,454 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |
| Carbon tetrachloride | 0.63 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |
| Chlorobenzene | 591 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |
| Cyclohexane | 17,001 | No | ND | ND | ND | 100 | 0 | 4 | - | 0/4 | 0 |
| Cyclohexanone | 2,981 | No | ND | ND | ND | 100 | 0 | 9 | - | 0/9 | 0 |
| Dichlorodifluoromethane | 3,126 | No | 0.001 | 0.001 | 0.001 | 85 | 2 | 11 | 0.0001 | 0/13 | 0 |
| Ethyl acetate | 12,782 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |

Table 4-8
Soils Analytical Data Summary - Ponds 5 and 6 Arroyo

Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site

| Parameter | Screening Standard | COC? | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation | No. Values above SAI-Ind | % Above SAI-Ind |
|---------------------------|--------------------|------|---------|---------|-------|-------|-------------|---------|--------------------|--------------------------|-----------------|
| VOCs, continued | | | | | | | | | | | |
| Ethyl ether | 5,712 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |
| Xylene, m/p- | 3,300 | No | ND | ND | ND | 100 | 0 | 2 | - | 0/2 | 0 |
| Methanol | 1,022,000 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |
| Methylene chloride | 15.89 | No | 0.006 | 0.062 | 0.021 | 54 | 6 | 7 | 0.022 | 0/13 | 0 |
| n-Butyl alcohol | 204,400 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |
| Xylene, o- | 48,125 | No | ND | ND | ND | 100 | 0 | 2 | - | 0/2 | 0 |
| Tetrachloroethene | 16.76 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |
| Trichloroethene | 6.61 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |
| Trichlorofluoromethane | 3,786 | No | 0.001 | 0.001 | 0.001 | 85 | 2 | 11 | 0.0003 | 0/13 | 0 |
| SVOCs (mg/kg) | | | | | | | | | | | |
| Hexachlorocyclopentadiene | 14 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |
| PCBs (mg/kg) | | | | | | | | | | | |
| PCBs, Total | 10 | No | 0.03 | 0.03 | 0.03 | 88 | 1 | 7 | - | 0/11 | 0 |
| Pesticides (mg/kg) | | | | | | | | | | | |
| Chlordane | 10.87 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |
| Endrin | 307 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |
| Methyl parathion | 256 | No | ND | ND | ND | 100 | 0 | 13 | - | 0/13 | 0 |

Notes:

1. Minimum value is lowest detected concentration.

COC = Constituent of Concern

mg/kg = milligrams per kilogram

ND = Non-Detect

NE = Not Established

No. = number

PCBs = Polychlorinated Bipheynls

SAI-Ind = Soil Medium Specific Concentration for Industrial Use Based on Inhalation, Ingestion, and Dermal Contact

Screening Standard = SAI-Ind

SVOC = Semivolatile Organic Compound

TPH = Total Petroleum Hydrocarbons

VOCs = Volatile Organic Compounds

Table 4-9
Soils Analytical Data Summary - Acid Plant Arroyo

Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site

| Parameter | Screening Standard | COC? | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation | No. Values above SAI-Ind | % Above SAI-Ind |
|------------------------------|--------------------|------|---------|---------|--------|-------|-------------|---------|--------------------|--------------------------|-----------------|
| Metals (mg/kg) | | | | | | | | | | | |
| Antimony | 491 | Yes | 4.59 | 1,760 | 257 | 0 | 19 | 0 | 428 | 3/19 | 16 |
| Arsenic | 320 | Yes | 10 | 25,300 | 1,590 | 12 | 153 | 20 | 4,070 | 60/171 | 35 |
| Barium | 168,329 | No | 89.6 | 1,270 | 400 | 0 | 19 | 0 | 325 | 0/19 | 0 |
| Cadmium | 1,460 | Yes | 10 | 3,460 | 316 | 34 | 114 | 59 | 528 | 6/171 | 3 |
| Chromium | 352,726 | No | 3.93 | 1,500 | 161 | 64 | 62 | 111 | 302 | 0/171 | 0 |
| Chromium, hexavalent | 1,226 | No | ND | ND | ND | 100 | 0 | 15 | ND | 0/15 | 0 |
| Cobalt | 111,491 | No | 2.55 | 205 | 34.5 | 0 | 19 | 0 | 52.4 | 0/19 | 0 |
| Copper | 74,327 | No | 10 | 51,300 | 4,330 | 18 | 142 | 31 | 8,460 | 0/171 | 0 |
| Iron | NE | No | 4860 | 223,000 | 32,200 | 0 | 173 | 0 | 35,700 | 0/171 | 0 |
| Lead | 1,000 | Yes | 11 | 43,700 | 2,690 | 12 | 153 | 20 | 5,630 | 52/171 | 30 |
| Mercury | 0.15 | Yes | 0.0103 | 43.2 | 5.31 | 0 | 19 | 0 | 10.8 | 16/19 | 84 |
| Molybdenum | 8,091 | No | 1.14 | 2,070 | 254 | 0 | 19 | 0 | 514 | 0/19 | 0 |
| Nickel | 11,680 | No | 4.03 | 412 | 52.9 | 0 | 19 | 0 | 98.6 | 0/19 | 0 |
| Selenium | 9,291 | No | 1.85 | 1,300 | 80.8 | 64 | 62 | 111 | 182 | 0/171 | 0 |
| Silver | 2,920 | No | 0.375 | 285 | 37.6 | 5 | 18 | 1 | 68 | 0/19 | 0 |
| Zinc | 408,800 | No | 12 | 44,000 | 4,020 | 1 | 172 | 1 | 7,420 | 0/171 | 0 |
| PCBs (mg/kg) | | | | | | | | | | | |
| PCBs, Total | 10 | No | 0.0133 | 0.0614 | 0.0388 | 64 | 4 | 7 | 0.0198 | 0/11 | 0 |
| TPH (mg/kg) | | | | | | | | | | | |
| Total Petroleum Hydrocarbons | NE | No | 71.1 | 518 | 262 | 54 | 6 | 7 | 151 | 0/13 | 0 |

Notes:

1. Minimum value is lowest detected concentration.

COC = Constituent of Concern

mg/kg = milligrams per kilogram

ND = Non-Detect

NE = Not Established

No. = number

PCBs = Polychlorinated Bipheynls

SAI-Ind = Soil Medium Specific Concentration for Industrial Use Based on Inhalation, Ingestion, and Dermal Contact

Screening Standard = SAI-Ind

TPH = Total Petroleum Hydrocarbons

Table 4-10
Soils Analytical Data Summary - La Calavera

Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site

| Parameter | Screening Standard | COC? | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation | No. Values above SAI-Res | % Above SAI-Res |
|---------------------------------------|--------------------|------|---------|---------|--------|-------|-------------|---------|--------------------|--------------------------|-----------------|
| Total Metals (mg/kg) | | | | | | | | | | | |
| Antimony | 72 | No | 30 | 30 | 30 | 0 | 1 | 0 | - | 0/1 | 0 |
| Arsenic | 46 | Yes | 18 | 655 | 88.1 | 39 | 20 | 13 | 142 | 9/33 | 27 |
| Barium | 26,103 | No | 417 | 417 | 417 | 0 | 1 | 0 | - | 0/1 | 0 |
| Cadmium | 240 | No | 10 | 42 | 19.7 | 64 | 12 | 21 | 10.4 | 0/33 | 0 |
| Chromium | 59,334 | No | 12.3 | 100 | 50.9 | 79 | 7 | 26 | 31.4 | 0/33 | 0 |
| Cobalt | 15,286 | No | 64 | 64 | 64 | 0 | 1 | 0 | - | 0/1 | 0 |
| Copper | 10,191 | No | 22 | 2,280 | 308 | 18 | 27 | 6 | 549 | 0/33 | 0 |
| Iron | NE | No | 7000 | 45,300 | 14,700 | 0 | 33 | 0 | 7,270 | 0/33 | 0 |
| Lead | 500 | Yes | 14 | 1,820 | 217 | 6 | 31 | 2 | 433 | 3/33 | 9 |
| Mercury | 0.11 | Yes | 3.79 | 4 | 4 | 0 | 1 | 0 | - | 1/1 | 100 |
| Molybdenum | 1,140 | No | 72.7 | 72.7 | 72.7 | 0 | 1 | 0 | - | 0/1 | 0 |
| Nickel | 1,873 | No | 44.5 | 44.5 | 44.5 | 0 | 1 | 0 | - | 0/1 | 0 |
| Selenium | 1,274 | No | 9.4 | 9.4 | 9.4 | 97 | 1 | 32 | 2010 | 0/33 | 0 |
| Silver | 468 | No | 4.42 | 4.42 | 4.42 | 0 | 1 | 0 | - | 0/1 | 0 |
| Zinc | 59,403 | No | 19 | 7,100 | 435 | 12 | 29 | 4 | 1320 | 0/33 | 0 |
| VOCs (mg/kg) | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 2,324 | No | ND | ND | ND | 100 | 0 | 3 | - | 0/3 | 0 |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 42,658 | No | ND | ND | ND | 100 | 0 | 3 | - | 0/3 | 0 |
| 1,1,2-Trichloroethane | 9.69 | No | ND | ND | ND | 100 | 0 | 3 | - | 0/3 | 0 |
| 1,2-Dichlorobenzene | 561 | No | ND | ND | ND | 100 | 0 | 3 | - | 0/3 | 0 |
| 4-Methyl-2-pentanone (MIBK) | 12,914 | No | ND | ND | ND | 100 | 0 | 3 | - | 0/3 | 0 |
| Acetone | 1,743 | No | 0.01 | 0.01 | 0.01 | 67 | 1 | 2 | - | 0/3 | 0 |
| Carbon tetrachloride | 0.35 | No | ND | ND | ND | 100 | 0 | 3 | - | 0/3 | 0 |
| Chlorobenzene | 398 | No | ND | ND | ND | 100 | 0 | 3 | - | 0/3 | 0 |
| Cyclohexane | 12,057 | No | ND | ND | ND | 100 | 0 | 3 | - | 0/3 | 0 |
| Dichlorodifluoromethane | 2,161 | No | ND | ND | ND | 100 | 0 | 3 | - | 0/3 | 0 |
| Ethyl acetate | 8,864 | No | ND | ND | ND | 100 | 0 | 3 | - | 0/3 | 0 |
| Ethyl ether | 3,848 | No | ND | ND | ND | 100 | 0 | 3 | - | 0/3 | 0 |

Table 4-10
Soils Analytical Data Summary - La Calavera

Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site

| Parameter | Screening Standard | COC? | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation | No. Values above SAI-Res | % Above SAI-Res |
|---------------------------|--------------------|------|---------|---------|--------|-------|-------------|---------|--------------------|--------------------------|-----------------|
| VOCs, continued | | | | | | | | | | | |
| Ethylbenzene | NE | No | ND | ND | ND | 100 | 0 | 3 | - | 0/3 | 0 |
| Methylene chloride | 8.68 | No | ND | ND | ND | 100 | 0 | 3 | - | 0/3 | 0 |
| Tetrachloroethene | 6.02 | No | ND | ND | ND | 100 | 0 | 3 | - | 0/3 | 0 |
| Total Xylenes | 585 | No | 0.0007 | 0.0007 | 0.0007 | 67 | 1 | 2 | - | 0/3 | 0 |
| Trichloroethene | 3.73 | No | ND | ND | ND | 100 | 0 | 3 | - | 0/3 | 0 |
| Trichlorofluoromethane | 2,634 | No | 0.0005 | 0.0015 | 0.0012 | 0 | 3 | 0 | - | 0/3 | 0 |
| SVOCs (mg/kg) | | | | | | | | | | | |
| Hexachlorocyclopentadiene | 10.18 | No | ND | ND | ND | 100 | 0 | 1 | - | 0/1 | 0 |
| Pesticides (mg/kg) | | | | | | | | | | | |
| Chlordane | 1.60 | No | ND | ND | ND | 100 | 0 | 1 | - | 0/1 | 0 |
| Endrin | 46.46 | No | ND | ND | ND | 100 | 0 | 1 | - | 0/1 | 0 |
| Methyl parathion | 38.72 | No | ND | ND | ND | 100 | 0 | 1 | - | 0/1 | 0 |

Notes:

1. Minimum value is lowest detected concentration.

COC = Constituent of Concern

mg/kg = milligrams per kilogram

ND = Non-Detect

NE = Not Established

No. = number

VOCs = Volatile Organic Compounds

SAI-Res = Soil Medium Specific Concentration for Industrial Use Based on Inhalation, Ingestion, and Dermal Contact

Screening Standard = SAI-Res

SVOC = Semivolatile Organic Compound

**Table 4-11
Soils Analytical Data Summary - Floodplain**

**Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site**

| Parameter | Screening Standard | COC? | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation | No. Values above SAI-Ind | % Above SAI-Ind |
|-----------------------------|--------------------|------------|---------|---------|--------|-------|-------------|---------|--------------------|--------------------------|-----------------|
| Total Metals (mg/kg) | | | | | | | | | | | |
| Arsenic | 320 | No | 2.9 | 240 | 57.8 | 47 | 77 | 69 | 51.8 | 0/146 | 0 |
| Cadmium | 1,460 | No | 10 | 150 | 37.6 | 60 | 53 | 81 | 33.4 | 0/134 | 0 |
| Chromium | 352,726 | No | 11 | 190 | 61.8 | 36 | 86 | 48 | 42.2 | 0/134 | 0 |
| Copper | 74,327 | No | 10 | 7,200 | 770 | 15 | 114 | 20 | 1,230 | 0/134 | 0 |
| Iron | NE | No | 8900 | 32,000 | 18,200 | 0 | 144 | 0 | 4,670 | 0/144 | 0 |
| Lead | 1000 | Yes | 6.05 | 4,200 | 447 | 3 | 132 | 4 | 697 | 16/136 | 12 |
| Selenium | 9,291 | No | 11 | 30 | 16.1 | 93 | 9 | 125 | 6.05 | 0/134 | 0 |
| Zinc | 408,800 | No | 10 | 3,300 | 401 | 3 | 130 | 4 | 613 | 0/134 | 0 |

Notes:

1. Minimum value is lowest detected concentration.

COC = Constituent of Concern

mg/kg = milligrams per kilogram

ND = Non-Detect

NE = Not Established

No. = number

SAI-Ind = Soil Medium Specific Concentration for Industrial Use Based on Inhalation, Ingestion, and Dermal Contact

Screening Standard = SAI-Ind

**Table 4-12
Groundwater Analytical Data Summary**

**Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site**

| Parameter | Screening Standard | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation |
|--|--------------------|----------|---------|----------|-------|-------------|---------|--------------------|
| Total Metals (mg/L) | | | | | | | | |
| Antimony | 0.006 | 0.00176 | 2.91 | 0.113 | 42.3 | 101 | 74 | 0.418 |
| Arsenic | 0.01 | 0.00607 | 84.1 | 6.61 | 8.6 | 160 | 15 | 14.4 |
| Barium | 2 | 0.00382 | 0.581 | 0.0396 | 5.4 | 140 | 8 | 0.0516 |
| Cadmium | 0.005 | 0.00086 | 2.27 | 0.18 | 60.6 | 69 | 106 | 0.363 |
| Chromium | 0.1 | 0.00163 | 4.46 | 0.143 | 64.6 | 62 | 113 | 0.602 |
| Cobalt | 6.1 | 0.00136 | 0.097 | 0.0174 | 66.2 | 50 | 98 | 0.0239 |
| Copper | 1.3 | 0.00207 | 27.5 | 0.478 | 42.9 | 100 | 75 | 2.81 |
| Iron | 0.3 ¹ | 0.025 | 57.2 | 3.23 | 40 | 105 | 70 | 6.99 |
| Lead | 0.015 | 0.000743 | 1.04 | 0.0648 | 46.9 | 93 | 82 | 0.183 |
| Mercury | 0.002 | 0.000132 | 0.00714 | 0.000888 | 75.7 | 36 | 112 | 0.0016 |
| Molybdenum ¹ | 0.51 | 0.00841 | 11.9 | 0.648 | 2.7 | 144 | 4 | 1.62 |
| Nickel | 2 | 0.00223 | 5.07 | 0.231 | 25 | 111 | 37 | 0.873 |
| Selenium | 0.05 | 0.00114 | 6.72 | 0.577 | 9.1 | 159 | 16 | 1.46 |
| Thallium | 0.002 | 0.000752 | 1.24 | 0.129 | 56.1 | 65 | 83 | 0.311 |
| Zinc | 31 ¹ | 0.00373 | 13.3 | 1.29 | 39.2 | 90 | 58 | 3.02 |
| Water Quality Parameters (mg/L) | | | | | | | | |
| Aluminum | 100 | 0.0182 | 33.2 | 1.06 | 45.1 | 96 | 79 | 3.75 |
| Calcium | NE | 34 | 921 | 251 | 0.6 | 166 | 1 | 185 |
| Magnesium | NE | 15.2 | 747 | 111 | 0.6 | 166 | 1 | 121 |
| Manganese | 14 | 0.00301 | 12.2 | 1.45 | 20 | 140 | 35 | 2.64 |
| Potassium | NE | 1.72 | 1,100 | 83.9 | 1.2 | 165 | 2 | 165 |
| Sodium | NE | 140 | 7,720 | 973 | 0.6 | 166 | 1 | 825 |
| Chloride | 250 ¹ | 53.1 | 5,660 | 494 | 0 | 175 | 0 | 651 |
| Fluoride | 4 | 0.154 | 54 | 4.57 | 3.4 | 169 | 6 | 5.78 |
| Nitrate | 10 | 0.516 | 248 | 41 | 20.7 | 73 | 19 | 59.5 |
| Nitrite | 1 | 7.09 | 7.09 | 7.09 | 98.91 | 1 | 91 | 2,010 |
| Sulfate | 250 ¹ | 80.1 | 9,620 | 1,790 | 0 | 173 | 0 | 1,480 |
| Sulfide | NE | 0.014 | 20.7 | 0.711 | 61.4 | 66 | 105 | 3.43 |
| Alkalinity | NE | 149 | 1,450 | 411 | 0 | 148 | 0 | 199 |
| TDS | 500 ¹ | 1,020 | 16,500 | 4,290 | 0 | 175 | 0 | 3,030 |
| TOC | NE | 1.17 | 213 | 17.7 | 9.1 | 159 | 16 | 30.1 |
| TSS | NE | 2 | 543 | 35.4 | 28.3 | 124 | 49 | 77 |

Notes:

¹ Concentration shown is the Secondary United States Environmental Protection Agency (USEPA) Maximum Contaminant Level (MCL). The Secondary MCL has not been used to defined Constituents of Concern (COCs).

mg/L = milligrams per liter

ND = Non-Detect

NE = Not Established

No. = number

Screening Standard = Unless otherwise noted is the USEPA MCL or the Texas Commission on Environmental Quality (TCEQ) Minimum Specific Concentration (MSC) for Industrial Groundwater

TDS = Total Dissolved Solids

TOC = Total Organic Carbon

TSS = Total Suspended Solids

**Table 4-13
Groundwater COC Summary**

**Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site**

| Parameter | Screening Standard | COC? | Maximum | % NDs | No. of Locations with Exceedances |
|--|---------------------------|-------------|----------------|--------------|--|
| Total Metals (mg/L) | | | | | |
| Antimony | 0.006 | Yes | 2.91 | 42.3 | 18 |
| Arsenic | 0.01 | Yes | 84.1 | 8.6 | 42 |
| Cadmium | 0.005 | Yes | 2.27 | 60.6 | 10 |
| Chromium | 0.1 | Yes | 4.46 | 64.6 | 4 |
| Copper | 1.3 | Yes | 27.5 | 42.9 | 1 |
| Lead | 0.015 | Yes | 1.04 | 46.9 | 9 |
| Mercury | 0.002 | Yes | 0.00714 | 75.7 | 2 |
| Molybdenum | 0.51 | Yes | 11.9 | 2.7 | 11 |
| Nickel | 2 | Yes | 5.07 | 25 | 2 |
| Selenium | 0.05 | Yes | 6.72 | 9.1 | 26 |
| Thallium | 0.002 | Yes | 1.24 | 56.1 | 18 |
| Water Quality Parameters (mg/L) | | | | | |
| Fluoride | 4 | Yes | 54 | 3.4 | 17 |
| Nitrate | 10 | Yes | 248 | 20.7 | 14 |
| Nitrite | 1 | Yes | 7.09 | 98.91 | 1 |

Notes:

COC = Constituent of Concern

mg/L = milligrams per liter

ND = Non-Detect

No. = number

Screening Standard = United States Environmental Protection Agency (USEPA) Maximum Contaminant Level (MCL) or the Texas Commission on Environmental Quality (TCEQ)

Minimum Specific Concentration (MSC) for Industrial Groundwater

Table 4-14
Surface Water Analytical Data Summary: Rio Grande

Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site

| Parameter | Screening Standard | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation |
|--|--------------------|----------|----------|----------|-------|-------------|---------|--------------------|
| Total Metals (mg/L) | | | | | | | | |
| Antimony | 0.006 | ND | ND | ND | 100 | 0 | 40 | - |
| Arsenic | 0.01 | 0.00626 | 0.239 | 0.0856 | 42.5 | 23 | 17 | 0.081 |
| Barium | 2 | 0.0321 | 0.233 | 0.13 | 0 | 32 | 0 | 0.073 |
| Cadmium | 0.0017 | ND | ND | ND | 100 | 0 | 40 | - |
| Chromium | 0.1 | 0.00175 | 0.0113 | 0.00735 | 57.5 | 17 | 23 | 0.00282 |
| Cobalt | 1.5 | 0.00191 | 0.00506 | 0.0035 | 50 | 16 | 16 | 0.00107 |
| Copper | 0.07 | 0.00198 | 0.0157 | 0.00803 | 25 | 30 | 10 | 0.00329 |
| Iron | 1 | 0.15 | 9.51 | 3.49 | 0 | 40 | 0 | 3.15 |
| Lead | 0.015 | 0.000788 | 0.0112 | 0.00574 | 22.5 | 31 | 9 | 0.00267 |
| Mercury | 0.0013 | ND | ND | ND | 100 | 0 | 32 | - |
| Molybdenum ¹ | 2 | 0.00596 | 0.272 | 0.0854 | 9.4 | 29 | 3 | 0.0938 |
| Nickel | 0.33 | 0.00273 | 0.0134 | 0.00684 | 12.5 | 28 | 4 | 0.00363 |
| Selenium | 0.005 | 0.00117 | 0.0428 | 0.011 | 47.5 | 21 | 19 | 0.0117 |
| Thallium | 0.002 | 0.000719 | 0.000719 | 0.000719 | 96.87 | 1 | 31 | - |
| Zinc | 0.94 | 0.00481 | 0.0513 | 0.0207 | 0 | 32 | 0 | 0.0121 |
| Water Quality Parameters (mg/L) | | | | | | | | |
| Aluminum | 16.4 | 0.136 | 14.9 | 5.27 | 0 | 40 | 0 | 5.07 |
| Calcium | NE | 68.9 | 136 | 98.4 | 0 | 40 | 0 | 20 |
| Magnesium | 25.7 | 15.7 | 80.1 | 34.8 | 0 | 40 | 0 | 22.9 |
| Manganese | 0.39 | 0.064 | 0.74 | 0.314 | 0 | 40 | 0 | 0.168 |
| Potassium | NE | 8.81 | 41.2 | 16.5 | 0 | 40 | 0 | 8.53 |
| Sodium | NE | 88.9 | 1,040 | 381 | 0 | 40 | 0 | 325 |
| Chloride | 230 | 88.1 | 749 | 302 | 0 | 40 | 0 | 236 |
| Fluoride | 4 | 0.6 | 2.22 | 1.03 | 20 | 32 | 8 | 0.509 |
| Nitrate | 10 | 0.53 | 131 | 15.6 | 44 | 9 | 7 | 43.3 |
| Nitrite | 1 | ND | ND | ND | 100 | 0 | 16 | - |
| Sulfate | NE | 140 | 1,300 | 509 | 0 | 40 | 0 | 412 |
| Sulfide | NE | 0.015 | 0.037 | 0.024 | 93 | 3 | 37 | 0.0115 |
| Alkalinity | NE | 141 | 309 | 201 | 0 | 32 | 0 | 54.8 |
| TDS | NE | 534 | 3,370 | 1,500 | 0 | 40 | 0 | 1,030 |
| TOC | NE | 3.05 | 41.5 | 10.2 | 3 | 39 | 1 | 11.1 |
| TSS | NE | 12 | 554 | 183 | 0 | 40 | 0 | 186 |

Notes:

¹ While still below the Screening Standard, this species has a maximum concentration above the Texas Risk Reduction Program Standard
mg/L = milligrams per liter

ND = Non-Detect

NE = Not Established

No. = number

Screening Standard = As stated in Table 2-4

TDS = Total Dissolved Solids

TOC = Total Organic Carbon

TSS = Total Suspended Solids

Table 4-15
Surface Water COC Summary: Rio Grande

Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site

| Parameter | Screening Standard | COC | Maximum | % NDs | No. of Locations with Exceedances (Total 8 monitoring locatios) |
|--|---------------------------|------------|----------------|--------------|--|
| Total Metals (mg/L) | | | | | |
| Arsenic | 0.01 | Yes | 0.239 | 43.64% | 7 |
| Iron | 1 | Yes | 9.51 | 0.00% | 8 |
| Selenium | 0.005 | Yes | 0.0428 | 47.50% | 6 |
| Water Quality Parameters (mg/L) | | | | | |
| Chloride | 230 | Yes | 749 | 0.00% | 8 |
| Magnesium | 25.7 | Yes | 80.1 | 0.00% | 6 |
| Manganese | 0.39 | Yes | 0.74 | 0.00% | 11 |
| Nitrate | 10 | Yes | 131 | 45.45% | 1 |

Notes:

COC = Constituent of Concern
mg/L = milligrams per liter
ND = Non-Detect
NE = Not Established
No. = number
Screening Standard = As stated in Table 204
TDS = Total Dissolved Solids

Table 4-16
Surface Water Analytical Data Summary: American Canal

Revised Supplemental Remedial Investigation Report
Former ASARCO Smelter Site

| Parameter | Screening Standard | Minimum | Maximum | Mean | % NDs | No. Detects | No. NDs | Standard Deviation |
|--|--------------------|----------|----------|----------|-------|-------------|---------|--------------------|
| Total Metals (mg/L) | | | | | | | | |
| Antimony | 0.006 | ND | ND | ND | 100 | 0 | 15 | - |
| Arsenic | 0.01 | 0.00826 | 0.0168 | 0.0123 | 46.7 | 8 | 7 | 0.00355 |
| Barium | 2 | 0.0316 | 0.228 | 0.121 | 0 | 12 | 0 | 0.0848 |
| Cadmium | 0.005 | ND | ND | ND | 100 | 0 | 15 | - |
| Chromium | 0.1 | 0.00603 | 0.0103 | 0.00805 | 60 | 6 | 9 | 0.00207 |
| Cobalt | NE | 0.00259 | 0.00486 | 0.0037 | 50 | 6 | 6 | 0.000977 |
| Copper | 1.3 | 0.00177 | 0.019 | 0.00927 | 26.7 | 11 | 4 | 0.00529 |
| Iron | NE | 0.168 | 8.93 | 3.58 | 0 | 15 | 0 | 3.4 |
| Lead | 0.015 | 0.00102 | 0.0138 | 0.00621 | 26.7 | 11 | 4 | 0.00363 |
| Mercury | 0.002 | 0.000152 | 0.000152 | 0.000152 | 91.67 | 1 | 11 | - |
| Molybdenum | NE | 0.00659 | 0.0187 | 0.0116 | 25 | 9 | 3 | 0.0049 |
| Nickel | NE | 0.00686 | 0.0125 | 0.00961 | 50 | 6 | 6 | 0.00264 |
| Selenium | 0.05 | 0.00108 | 0.00338 | 0.0021 | 60 | 6 | 9 | 0.00103 |
| Thallium | 0.002 | ND | ND | ND | 100 | 0 | 12 | - |
| Zinc | NE | 0.0202 | 0.0396 | 0.0283 | 0 | 12 | 0 | 0.00564 |
| Water Quality Parameters (mg/L) | | | | | | | | |
| Aluminum | 16.4 | 0.154 | 13.8 | 5.47 | 0 | 15 | 0 | 5.31 |
| Calcium | NE | 70.1 | 107 | 88 | 0 | 15 | 0 | 13.1 |
| Magnesium | 25.7 | 15.7 | 26.4 | 20 | 0 | 15 | 0 | 3.15 |
| Manganese | 0.39 | 0.091 | 0.361 | 0.236 | 0 | 15 | 0 | 0.0819 |
| Potassium | NE | 8.79 | 14.4 | 11.5 | 0 | 15 | 0 | 1.89 |
| Sodium | NE | 88.4 | 560 | 258 | 0 | 15 | 0 | 194 |
| Chloride | NE | 82.4 | 502 | 246 | 0 | 15 | 0 | 189 |
| Fluoride | 4 | 0.58 | 1.23 | 0.857 | 20 | 12 | 3 | 0.277 |
| Nitrate | 10 | 0.72 | 1.12 | 0.98 | 50 | 3 | 3 | 0.225 |
| Nitrite | 1 | ND | ND | ND | 100 | 0 | 6 | - |
| Sulfate | NE | 129 | 566 | 310 | 0 | 15 | 0 | 192 |
| Sulfide | NE | ND | ND | ND | 100 | 0 | 15 | - |
| Alkalinity | NE | 141 | 222 | 174 | 0 | 12 | 0 | 24.5 |
| TDS | NE | 539 | 1,920 | 1,120 | 0 | 15 | 0 | 636 |
| TOC | NE | 3.19 | 27.8 | 8.47 | 7 | 14 | 1 | 8.27 |
| TSS | NE | 9.6 | 562 | 185 | 0 | 15 | 0 | 193 |

Notes:

mg/L = milligrams per liter

ND = Non-Detect

NE = Not Established

No. = number

Screening Standard = As stated in Table 2-4

TDS = Total Dissolved Solids

TOC = Total Organic Carbon

TSS = Total Suspended Solids

Table 4-17
Surface Water COC Summary: American Canal

Revised Supplemental Remedial Investigation Report
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| Parameter | Screening Standard | COC | Maximum | % NDs | No. of Locations with Exceedances (Total of 3 locations) |
|--|---------------------------|------------|----------------|--------------|---|
| Total Metals (mg/L) | | | | | |
| Arsenic | 0.01 | Yes | 0.0168 | 46.70% | 3 |
| Water Quality Parameters (mg/L) | | | | | |
| Magnesium | 25.7 | Yes | 26.4 | 0.00% | 1 |

Notes:

COC = Constituent of Concern
mg/L = milligrams per liter
ND = Non-Detect
NE = Not Established
No. = number
Screening Standard = As stated in Table 204
TDS = Total Dissolved Solids