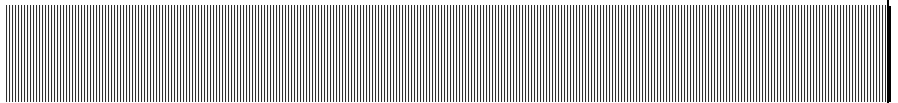


Texas Custodial Trust

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Tables



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

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

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 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**

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

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 Biphenyls

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**

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

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	20	200	24	200	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**

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

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)= Residential Standard for Soil, combined pathway of inhalation, ingestion, dermal contact, and vegetable consumption

^{Tot}Soil_{Comb} (C/I)= 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

mg/kg = milligrams per kilogram

NE = Not Established

PCBs = Polychlorinated Bipheynls

RRR = Texas Risk Reduction Rules

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

SVOC = Semi-volatile Organic Compound

TPH = Total Petroleum Hydrocarbons

TRRP = Texas Risk Reduction Program

VOC = Volatile Organic Compound

**Table 2-3
Groundwater Screening Standards**

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

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**

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

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**

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

AA/IA	Analytical Suite¹	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	
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**

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

Analytical Suite ¹	Number of Samples							Additional Analysis ²
	COCs	AOIs						
	Metals	Metals	VOCs	SVOCs	TPH	PBCs	Pesticides	
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	62							
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

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	72	Yes	0.42	137	13.9	20	28	7	25.7	1/35	3
Arsenic	20	Yes	4.25	615	99.5	0	42	0	110	38/42	91
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**

**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	72	Yes	0.31	1,680	57.3	12	64	9	237	7/73	10
Arsenic	20	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**

**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

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	200	Yes	1.56	4,830	284	15	389	68	652	89/457	20
Barium	168,329	No	13.7	2,170	300	0	185	0	372	0/185	0
Cadmium	1,460	Yes	0.15	2,100	80.8	37	286	171	258	4/457	1
Chromium	352,726	No	0.41	730	52.3	41	272	185	77.8	0/457	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	2,320	12	401	56	14,600	1/457	0
Iron	NE	No	374	310,000	39,700	0	457	0	58,900	0/457	0
Lead	1,000	Yes	2.32	24,400	1,080	9	414	43	2,690	83/457	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	155	302	22.9	0/457	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	6,550	10	412	45	20,300	0/457	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

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	200	Yes	8.08	1,300	243	65	22	40	324	8/62	13
Cadmium	1,460	No	0.21	160	50.9	58	26	36	46.4	0/62	0
Chromium	352,726	No	2.75	200	59.9	24	47	15	52.9	0/62	0
Copper	74,327	No	2.71	31,000	2,130	16	52	10	5,220	0/62	0
Iron	NE	No	4,340	56,000	19,300	0	62	0	10,100	0/62	0
Lead	1,000	Yes	2.59	9,600	941	10	56	6	1,990	11/62	18
Selenium	9,291	No	2.86	33	16.8	86	9	53	7.77	0/62	0
Zinc	408,800	No	11.6	5,700	750	0	62	0	1,290	0/62	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

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	200	Yes	2.58	15,000	738	36	114	63	1,840	38/177	22
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

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

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	200	Yes	0.70	6,600	321	40	144	94	846	39/238	16
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

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

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	200	Yes	3.01	20,000	686	12	250	34	2,150	53/284	19
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

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

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	200	Yes	10	25,300	1,590	12	153	20	4,070	70/171	41
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

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	20	Yes	18	655	88.1	39	20	13	142	18/33	55
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

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

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	200	Yes	2.9	240	57.8	47	77	69	51.8	2/146	1
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**

**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	1100	83.9	1.2	165	2	165
Sodium	NE	140	7720	973	0.6	166	1	825
Chloride	250 ¹	53.1	5660	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	2010
Sulfate	250 ¹	80.1	9620	1790	0	173	0	1480
Sulfide	NE	0.014	20.7	0.711	61.4	66	105	3.43
Alkalinity	NE	149	1450	411	0	148	0	199
TDS	500 ¹	1020	16500	4290	0	175	0	3030
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**

**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

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	1040	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	1300	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	3370	1500	0	40	0	1030
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

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

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	1920	1120	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

Supplemental Remedial Investigation Report
Former ASARCO Smelter Site

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