Texas Custodial Trust

2301 West Paisano Drive • El Paso, Texas 79922

Appendix K
Parker Brothers Arroyo
Interim Channel Removals

6835001

MALCOLM PIRNIE

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November 29, 2011

Mr. James S.H. Sher, P.E.
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg. C
Austin, Texas 78753

Re: Texas Custodial Trust
Former ASARCO Smelter Site, El Paso, Texas

Subject: Interim Channel Project Including Impacted Soil Removal and Soil Amendment in Parker Brothers Arroyo (revised)

Dear Mr. Sher:

This letter describes proposed impacted soil removal and amendment activities to be completed in Parker Brothers Arroyo (PBA) as part of the planned Interim Channel Project (Project). The Interim Channel plans were submitted to the Texas Commission on Environmental Quality (TCEQ) on November 17, 2011. The Project was presented and discussed with you and Mr. Bill Shafford at the Former ASARCO Smelter site in El Paso, Texas (Site) on November 3, 2011. We request your written approval to proceed with these proposed activities.

Background, Data Collection and Evaluation

Impacted groundwater exists at the Site as described in several documents (e.g., Remedial Investigation Reports [Hydrometrics, 1998, 2000, 2001 and 2003] and Final Remediation Work Plan [Malcolm Pirnie, 2011]). The groundwater monitoring data show that elevated arsenic is present at the Site with the highest concentrations located in PBA. Soil samples taken in PBA show that arsenic and lead are present at elevated levels in some of the borings. Soil samples were collected from twelve boreholes completed to depths ranging from 15 to 45 feet below ground surface (bgs) (see PBA locations on Sheet 1) and from six test pits dug to depths of less than 15 feet bgs (see TP locations on Sheet 1). Soil analytical data for Site constituents of concern (COCs) from the boreholes are included in Table 1; analytical data from test pits are included in Table 2. The data show elevated levels of arsenic and lead at boring PBA-02 from 23 to 25 feet bgs (Sample PBA-SB02-23-25) and PBA-05 from 17 to 19 feet bgs (Sample PBA-SB05-17-19). Elevated arsenic and lead were also found at TP-5 at 3 feet bgs (Sample TP-5-015-3), TP-13 at 3 feet bgs (Sample TP-13-015-3), TP-16 at 5 feet bgs (Sample TP-16-025-5), TP-20 at 11 feet bgs (Sample TP20-025-11) and TP-28 at 6 feet bgs (Sample TP-28-015-6). Measured concentrations of COCs in the materials are consistent with Category 2 materials at the Site. Corresponding Synthetic Precipitation Leaching Procedure (SPLP) data taken on the referenced test pit samples indicate the arsenic is leachable (see Table 2). It is also important to note that deeper samples taken at each location have lower levels of arsenic indicating the impacted material is confined to the upper layer.

In light of the elevated arsenic values and their leaching potential, it has been determined that removal of the upper layer of impacted sediment/slag/alluvium (Upper Impacted Material) in PBA is the most immediate and cost-effective first step to improve groundwater conditions within PBA. The objective is to remove the Upper Impacted Material to significantly reduce the source of arsenic that has the potential to be leached by surface water infiltration or groundwater flow through this material.

The location of the proposed excavation is shown on Sheet 1. The limits of the excavation were estimated from the borehole and test pit samples. The lateral extent of the excavation is intended to remove the Upper Impacted Material from the existing 100-year floodplain therefore eliminating future loading of COCs from this layer to the groundwater in PBA. The amount of Upper Impacted Material to be removed is calculated to be approximately 110,000 cubic yards. The excavated material will be removed and stockpiled on the plant site for subsequent management as a Category 2 material. The bottom of the excavation will be determined by visual identification of the sediment/slag - alluvium interface, plus up to three feet of impacted alluvium (based on existing data, this depth will result in a substantial reduction of the arsenic source material and is considered a practical depth to maintain a safe operation). The impacted alluvium to be removed will be identified from measured soil concentration data using x-ray fluorescence [XRF] measurements. When the excavation is complete, soil samples will be collected from the bottom of the excavation to document concentrations of COCs in soils left in-place (using XRF and laboratory methods) for later use in designing the final groundwater remedy. Procedures that will be used for XRF measurements and laboratory soil sampling will be submitted under separate cover. TCEQ approval of the proposed soil excavation will allow Malcolm Pirnie to proceed with preparing and submitting a grading permit application to the City of El Paso to complete this work.

Soil Amendment Area

Once the excavation of the Upper Impacted Material is completed, an area in the former PBA flow path will be amended with zero valent iron (ZVI) to further reduce arsenic concentrations in groundwater. The approximate location of the soil amendment area is shown on Sheet 2; the location may be adjusted based on field conditions as the excavation proceeds and is completed. It is anticipated that the soil amendment area will be approximately 80 feet long, 25 feet wide, and up to 25 feet deep, below the Upper Impacted Material excavation, yielding about 3,000 cubic yards of in-place material to be amended. To determine the optimum amendment mixture and to better define the target treatment area, up to three deep soil borings will be completed prior to implementation of the soil amendment. This will allow sufficient time, prior to the excavation, to complete column testing to determine the optimum ratio of ZVI for soil amendment. Amendments can then be procured and be ready to mix when the excavation in this area is completed. Mixing in the field is anticipated to be completed with a large excavator and a water truck for dust control.

Up to three new groundwater monitoring wells will be installed in the PBA alluvium downgradient of the soil amendment area (see Sheet 2) to evaluate performance of the soil amendment at reducing arsenic

concentrations in groundwater and overall groundwater quality. A specific monitoring plan of the soil amendment area will be presented under a separate cover.

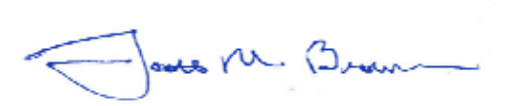
Backfill

The excavated area will be backfilled with native soils taken from the Category 1 Landfill, Cell 4 excavation. Soil samples and XRF readings of the excavated soils will be taken to assure the backfill is not impacted. The backfill will be placed and compacted to 90 percent of maximum density and within 2 percent of optimum moisture content as determined by ASTM D1557. The backfill will form the subgrade for the proposed Interim Channel.

We hope the information presented in this letter is sufficient to facilitate your review and approval of these activities. Please let us know if you need additional information or have any questions.

Sincerely,

Scott M. Brown, P.E.



Vice President

cc: Roberto Puga (Project Navigator)
Lorinda Gardner (TCEQ Region 6)
Chuck Barnes (EPA)
Seth Matters
Alicia Fogg
Gaston Leone

Attachments:
Sheet 1 – PBA Soil Monitoring Locations and Proposed Excavation Area
Sheet 2 – Soil Amendment Area
Table 1 – Soil Analytical Data – Borehole Locations
Table 2 – Soil Analytical Data – Test Pits

HISTORIC ARROYO FLOW LINE

1:1 CUT SLOPE

PBA-03

LIMITS OF PROPOSED LANDFILL

PROPERTY LINE

UNION PACIFIC RAILROAD

TP-5

10+00

11+00

PBA-07

9.0'

12+00

PBA-04

FEMA 100 YEAR FLOOD LINE

TP-19

STORM/SANITARY SEWER PIPE TO REMAIN DURING SLAG EXCAVATION

0.5:1 CUT SLOPE

TP-16

TP-20

PBA-09

PBA-08

TP-13

13+00

9.0'

0.25:1 CUT SLOPE

14+00

PBA-05/05B

MONITORING WELL TO REMAIN. PROTECT IN PLACE.

EP-85

13.0'

1.5:1 CUT SLOPE

HISTORIC ARROYO FLOW LINE

7.0'

15+00

PBA-06

6.0'

16+00

0.25:1 CUT SLOPE

17+00

9.0'

PBA-12

EXISTING STRUCTURES TO BE REMOVED

PBA-02

18+00

12.5'

PBA-10

19+00

12.5'

EXISTING STRUCTURE TO BE REMOVED

20+00

21+00

25.0'

PBA-13

TP-28

0.25:1 CUT SLOPE

PROPERTY LINE

HISTORIC ARROYO FLOW LINE

0.5:1 CUT SLOPE

EXISTING 100 YEAR FLOOD LINE

SMELTER SITE

HISTORIC ARROYO FLOW LINE

N

0 40' 80'

SCALE: 1"= 40'

(12.5') SLAG DEPTH FROM EXISTING GROUND

G:\ENV\PROJ\1200\1209 - MP - El Paso Smelter\180 - CAD\01-Category 1 Landfill\WORKING FILES\for Adam Griffin-Impacted Excav\1209 PBA Impacted Excav Fig 01.dwg Plotted by: RKosciolek Nov 22, 2011 2:04pm

REVISIONS:	DATE:	BY:

211 N Florence St
Suite 202
El Paso, TX 79901
FIRM REGISTRATION F-979

MALCOLM PIRNIE

CALL TWO WORKING DAYS BEFORE YOU DIG
Texas 811
1-800-344-8377

DESIGNER: CMZ
DRAWN BY: RJK
CHECKED BY:
DATE: 11-22-11

IMPACTED EXCAVATION AREAS

PROJECT:
EL PASO SMELTER
EL PASO, TEXAS

JOB NO.
06835001

Impacted Excav

SHEET NO.
1
OF
2

PBA-09

STORM/SANITARY SEWER PIPE TO REMAIN DURING SLAG EXCAVATION

LIMITS OF PROPOSED LANDFILL

FEMA 100 YEAR FLOOD LINE

PROPERTY LINE

HISTORIC ARROYO FLOW LINE

13.0'

9.0'

12.5'

12.5'

25.0'

ALIGNMENT 01

ALIGNMENT 02

0+00

1+00

2+00

2+94

14+00

18+00

19+00

20+00

21+00

22+00

1.5:1 CUT SLOPE

GROUND WATER AMENDMENT TARGET AREA

PBA-12

PBA-02

PBA-10

PBA-13

TP-28

EXISTING STRUCTURES TO BE REMOVED

0.25:1 CUT SLOPE

0.5:1 CUT SLOPE

EXISTING 100 YEAR FLOOD LINE

PROPERTY LINE

HISTORIC ARROYO FLOW LINE

PRE-IMPLEMENTATION BORING LOCATION

PRE-IMPLEMENTATION BORING LOCATION (CONTINGENCY)

PERFORMANCE MONITORING WELL LOCATION

12.5 SLAG DEPTH FROM EXISTING GROUND

N

0 20' 40'

SCALE: 1"= 20'

G:\ENV\PROJ\1200\1209 - WP - El Paso Smelter\180 - CAD\01-Category I Landfill\WORKING FILES\for Adam Griffin-Impacted Excav\1209 PBA Impacted Excav Fig 02.dwg Plotted by: RKosciolek Nov 22, 2011 2:05pm

REVISIONS:	DATE:	BY:

211 N Florence St
Suite 202
El Paso, TX 79901
FIRM REGISTRATION F-979

MALCOLM PIRNIE

CALL TWO WORKING DAYS BEFORE YOU DIG
Texas811.org
1-800-344-8377

DESIGNER: CMZ
DRAWN BY: RJK
CHECKED BY:
DATE: 11-22-11

IMPACTED MATERIAL EXCAVATION AREAS

PROJECT:
EL PASO SMELTER
EL PASO, TEXAS

JOB NO.
06835001

Impacted Excav

SHEET NO.
2
OF
2

Table 1
Soil Analytical Data – Borehole Locations
Parker Brothers Arroyo
Former ASARCO Smelter, El Paso, TX

Parameter	Total Metals Limits		PBA-SB02-23-25	PBA-SB02-43-45	PBA-SB03-2-4	PBA-SB04-3-5	PBA-SB05-17-19	PBA-SB06-15-17	PBA-SB06-28-30	PBA-SB06-33-35	PBA-SB07-15-16	PBA-SB08-19-20	PBA-SB08-24-25	PBA-SB08-34-35	PBA-SB09-20-22	PBA-SB09-33-35	PBA-SB10-15-17	PBA-SB10-32-34	PBA-SB12-28-30	PBA-SB12-32-34	PBA-SB13-30-32	PBA-SB13-42-44
	Risk Reduction (mg/kg)	TRRP (mg/kg)	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM
			Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)	Total (mg/kg)
Arsenic	110	200	**1,080**	9.78	42.1	36.2	**188**	37.5	16.4	7.97	12.5	18.2	12.1	9.17	4.99	4.78	18.9	9.08	11.7	23.1	20.5	19
Cadmium	1,500	850	24.5	0.919	2.88	1.5	5.52	5.6	4.42	0.451 J	0.216 J	3.05	3.32	0.937	0.452 J	0.334 J	25.3	2.02	0.474 J	1.03	3.02	0.321 J
Chromium	35,000	75,000	12.5	15.2	17.9	9.67	27.6	6.77	5.22	5.94	6.12	5.5	4.98	4.21	7.76	4.81	4.68	6.24	9.24	53	6.79	4.07
Copper	74,000	37,000	918	33.3	401	158	196	36.6	6.4	2.51	8,330	29.8	8.01	7.7	14.2	12.4	10.2	13.2	13.3	126	18.2	9.56
Iron	--	--	72,300	20,400	22,900	13,800	31,200	11,500	9,030	8,750	4.25	10.8	3.66	3.32	12,000	10,400	4.45	5.97	6,840	20,300	9,470	4.84
Lead	10,000	1,600	**5,160**	25.4	163	63.7	918	42.1	12.4	3.76	4.25	10.8	3.66	3.32	7.44	7.53	4.45	5.97	21.3	75.8	7.81	4.84
Selenium	9,300	4,700	1.92	0.339 J	0.985	0.19 J	2.14	0.846 J	0.291 J	<0.226	<0.22	<0.207	<0.205	0.188 J	0.575 J	0.786 J	<0.212	<0.235	0.674 J	0.321 J	<0.217	<0.204
Zinc	410,000	250,000	5,240	77.7	1,710	538	3,610	166	72.5	18.6	19.6	82.8	68.5	29.8	45	45	164	43.1	34.6	173	45.6	20.3

Notes:
Risk Reduction = Industrial standards,
TRRP = $^{Tot}Soil_{comb}$
Bold = Result exceeds Risk Reduction or TRRP Limits

Table 2
Soil Analytical Data – Test Pits
Parker Brothers Arroyo
Former ASARCO Smelter, El Paso, TX

Parameter	Total Metals Limits		TP5-01S-3		TP5-02S-9		TP13-01S-3		TP13-02S-9		TP16-02S-5		TP19-02S-5		TP20-02S-11		TP28-01S-6	
			SEDIMENT/SLAG		ALLUVIUM		SEDIMENT/SLAG		ALLUVIUM		ALLUVIUM		ALLUVIUM		ALLUVIUM		SLAG	
	Risk Reduction (mg/kg)	TRRP (mg/kg)	Total (mg/kg)	SPLP (mg/L)	Total (mg/kg)	SPLP (mg/L)	Total (mg/kg)	SPLP (mg/L)	Total (mg/kg)	SPLP (mg/L)	Total (mg/kg)	SPLP (mg/L)	Total (mg/kg)	SPLP (mg/L)	Total (mg/kg)	SPLP (mg/L)	Total (mg/kg)	SPLP (mg/L)
Arsenic	110	200	**384**	0.169	26.4	0.0417	**349**	0.146	75.2	0.132	**185**	0.479	11.6	0.0136	**486**	0.391	**199**	0.0261
Cadmium	1,500	850	99.6	0.00435 J	6.54	0.00370 J	27.5	0.0239	4.69	0.00323 J	13.2	0.00261 J	0.855	0.000340 U	40.6	0.0154	7.71	0.00511
Chromium	35,000	75,000	29.5 J	<0.00883 UJ	7.69	0.0105	38.9	<0.00948 UJ	5.77	0.00758 J	8.6	0.00664 J	5.85	0.00765 J	11.9	0.00621 J	28.2 J	<0.00667 UJ
Copper	74,000	37,000	5,010	<0.0818 UJ	164	0.0402	3,330	0.227	215	0.0407	457	0.0045	65.2	0.00700 J	853	0.0259	4,170	0.222
Iron	--	--	127,000	0.196 J	NA	NA	114,000	0.305	NA	NA	NA	NA	NA	NA	NA	NA	147,000	0.21
Lead	10,000	1,600	1,440	<0.031 UJ	258	0.00830 J	**2,190**	0.0783	887	0.0297	290	0.0503	32.5	0.00330 U	1,240	0.0212	**3,480**	0.0514
Selenium	9,300	4,700	21.5 J	0.0238	0.668	0.00445 J	16 J	0.0194	1.13	0.0042	3.74	0.0042	0.792 J	0.00420 U	6.19	0.00929 J	3.27	<0.0042
Zinc	410,000	250,000	19,500	0.0909	713	0.0955	25,500	0.82	3,770	0.115	1,620	0.0057	199	0.0602	3,270	0.114	15,400	<0.25 UJ

Notes:
Risk Reduction = Industrial standards,
TRRP = $^{Tot}Soil_{Comb}$
NA = not anlayzed
Bold = Result exceeds Risk Reduction or TRRP Limits

Bryan W. Shaw, Ph.D., *Chairman*
Buddy Garcia, *Commissioner*
Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.C., *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

December 5, 2011

Mr. Scott M. Brown, P.E.
Malcolm Pirnie, Inc.
4646 E. Van Buren St., Suite 400
Phoenix, AZ 85008

Re: Approval on Interim Channel Soil Removal in Parker Brothers Arroyo
Former ASARCO Smelter site, El Paso, Texas

Dear Mr. Brown:

The Texas Commission on Environmental Quality (TCEQ), with concurrence from the US Environmental Protection Agency (USEPA), approves your proposal impacted soil removal and soil amendment in Parker Brothers Arroyo dated November 29, 2011.

Pleaj let me know should you have any questions or need additional information.

Sincerely,

James Sher, P.E.
Texas Commission on Environmental Quality

Cc: Charles Barnes, Enforcement Officer, US EPA Region 6
Carlos Sanchez, Chief AR/TX Section, US EPA Region 6