1069127 - R8 SDMS

ASARCO, INCORPORATED
EAST HELENA PLANT

RESPONSES TO QUESTIONS POSED DURING THE MAY 6-7, 1997 RCRA INSPECTION

1. **Provide the average assay of all the materials identified on the April 1997 inventory check list.**

   The assays obtained by Asarco upon receipt of the materials identified on the April 1997 inventory sheet are provided in Attachment 1. Certain materials (identified in the footnotes within Attachment 1) have only recently been received into the East Helena Plant. Since these materials are pending analyses, no assays for these materials are presently available in the East Helena metals tracking system. Instead, the historical average assays are being used.

   In some cases, materials having relatively standard assays (such as the glass and fire assay materials) are not routinely sampled upon receipt. In these cases, we are submitting assays from shipping contracts or Asarco's pre-acceptance review information.

2. **Provide a copy of the March inventory check list.**

   A copy of the March 1997 inventory check list was provided to you on May 6, 1997 during the inspection.

3. **Provide a listing of the materials on the April 1997 inventory check list in which Asarco is paid to process.**

   As customary in the smelting inductry, the East Helena Plant imposes a treatment charge on every material that appears on the April 1997 inventory check list. This treatment charge is applied individually and is based on each material's characteristics and its difficulty in processing through the smelter.

4. **Provide shipment dates, quantity of material received, and quantity of the material processed for the Encycle materials identified in Piles 213, 320, and 697.**

Asarco does not maintain the dates materials are shipped. However, the dates of receipt are recorded and are provided, along with the additional information requested, in the following table.

Encycle Material Identification	Date Received	Tons Received (Wet Weight)	Tons Processed (Wet Weight)
Pile 213	3/21/97	492	0
Pile 320	7/8/96 7/16/96 7/19/96	257 83 89	 0
Pile 697	5/15/96 5/20/96 2/14/97 3/21/97 4/7/97 4/14/97	938 79 91 99 305 100	 737

5. **Provide shipment dates, quantity of the material received, and quantity of the material processed for the Missouri material identified in Pile 265.**

Asarco does not maintain the dates materials are shipped. However, the dates of receipt are recorded and are provided, along with the additional information requested, in the following table.

Missouri Material Identification	Date Received	Tons Received (Wet Weight)	Tons Processed (Wet Weight)
Pile 265	5/16/96	91	0

6. **Provide shipment dates, quantity of material received, and quantity of the material processed for the Omaha materials identified in Piles 347, 409, and 487.**

Asarco does not maintain the dates materials are shipped. However, the dates of receipt are recorded and are provided, along with the additional information requested, in the following table.

Omaha Material Identification	Date Received	Tons Received (Wet Weight)	Tons Shipped for Disposal (Wet Weight)
Pile 347	7/31/96	145	70
Pile 409	3/19/96 9/10/96 9/30/96	93 44 18	 125
Pile 487	4/4/94	60	0

7. **Provide information on the Idaho material identified as being shipped by Neway Transportation.**

Neway Transportation makes deliveries into the Asarco East Helena Plant. Neway Transportation confirms that a contract exists to make deliveries into the East Helena Plant from the Hecla Mining Company. The Hecla Mining Company owns the Lucky Friday Mine. The lead concentrate that Neway Transportation transports is currently being shipped at a rate of approximately 2,100 tons/month, with all shipment originating from their Mullan, Idaho facility.

8. **Provide a copy of the Amarillo precious metal brick manifest.**

A copy of the Amarillo precious metal brick manifest for the brick that was received on April 9, 1997 was provided to you on May 6, 1997 during the inspection.

9. **Provide a copy of the hazardous waste manifest for Omaha brick that was being shipped off-site.**

Copies of two hazardous waste manifests for the Omaha brick that was shipped off-site (Manifests Nos. 00070 and 00071) were provided to you on May 6, 1997 during the inspection.

10. **Provide a copy of the hazardous waste manifests for East Helena brick that was shipped off-site?**

A copy of a hazardous waste manifest for the East Helena brick that was shipped off-site (Manifest No. 00047) was provided to you on May 6, 1997 during the inspection.

11. **Provide a copy of the waste profile sheet for the all brick shipments off-site for disposal.**

A copy of the waste profile sheet for flue brick and debris was provided to you on May 6, 1997 during the inspection. A copy of the waste profile sheet for the parting plant brick and debris is included in Attachment 2.

12. **Provide a copy of the waste manifest for the spent solvents shipments.**

A copy of the waste manifest for a spent solvent shipment is included in Attachment 3.

13. **Identify the material in Pile 436.**

The identity of the material in Pile 436 is Amarillo precious metal brick.

14. **Provide the quantity of Trafiguria Beheer material smelted in 1996 that are highlighted on the previous 3007 response table.**

The quantity of Trafiguria Beheer material smelted in 1996 was 2,131 tons.

15. **Provide the quantity of Golden Reward Mining cupels smelted in 1996 that are highlighted on the previous 3007 response table.**

The quantity of Golden Reward Mining cupels smelted in 1996 was 0 tons. The quantity of Golden Reward Mining cupels smelted in 1995 was 12 tons.

16. **Provide the quantity of the two Encycle materials smelted in 1996 that are highlighted on the previous 3007 response table.**

The quantity of Encycle/Texas material (first entry on the previous 3007 response table) smelted in 1996 was 474 tons.

Upon further review of the second entry on the previous 3007 response table, it has been determined that this material was, in fact, a Homestake Carbon and not an Encycle product. This Homestake carbon was smelted in 1995.

17. **Provide the fire assaying procedures used at the East Helena Plant.**

A copy of the fire assaying procedures for the Asarco East Helena plant was provided to you on May 7, 1997 during the inspection.

18. **Provide the material sampling procedures used in the East Helena Plant.**

The "Asarco Standards - Uniformity of Sampling Procedures For Plant Diversions" procedure is included as Attachment 4.

19. **Provide a description of how the Sauget material (Pile 612) is generated.**

The zinc leaching residue received from the Sauget, Illinois primary zinc smelter is the residue that remains after leaching the zinc calcines with sulfuric acid. This material typically contains valuable amounts of silver (38 oz/ton), copper (2.9%), and lead (6.6%).

In 1988, Asarco was notified that Big River Minerals Corporations had acquired the Amax Zinc Company in Sauget, Illinois. Consequently, material names such as Big River, Amax, and Sauget all refer to the same owner. Asarco uses the three names interchangeably.

20. **Provide a description of how the Amax material (Piles 773 and 776) are generated.**

See response to question number 19.

21. **Provide the dates or date of generation for the East Helena brick piles.**

Consistent with the newly adopted Asarco policy, the East Helena Plant is tracking the date of generation of used brick. However, the facility has not historically recorded this information and cannot respond to Question 21 with regard to existing East Helena brick piles

22. **Provide data of generation of foul speiss. Provide the volume and assay.**

The following table represents the volume (tonnage) and assay of the foul speiss that was on-hand at the end of April 1997.

Location	Tons On Hand (Wet Weight)	Gold (oz/ton)	Silver (oz/ton)	Lead (Percent)	Copper (Percent)
Pad	238	1.83	289.08	31.6	33.9
Bin 14	318	2.016	232.12	34.4	26.5
Bin 15	241	2.016	232.12	34.4	26.5

23. **Provide the cost of transportation of the Amarillo brick.**

The cost for transporting the April 8, 1997 Amarillo precious metal brick to the East Helena Plant was $2,452.45.

24. Provide a copy of the May 22, 1996 summary of a meeting between Mr. Novotny and the union posted in the hallway outside Mr. Shaw's office.

A copy of the May 22, 1996 summary of a meeting between Mr. Novotny and the union is included in Attachment 5.

Average Assays of All the Materials Identified on the April 1997 Inventory Sheet

Attachment 1

ASARCO INC., EAST HELENA PLANT
APRIL 1997 INVENTORY LIST
AVERAGE ASSAYS

				Chemical Composition													
		OZ/TON		PERCENT													
PILE NUMBER	MATERIAL NAME	Au	Ag	Pb	Cu	Zn	As	Sb	Bi	Ni	Cd	S	Sn	SiO2	Fe	CaO	MgO
111	SIPI 66/3095	0.77	50.31	2.00	0.30	7.20		0.35		0.03	0.43	0.10	0.02				
116	COLT ROUTER DUST	7.71	0.45	0.07	0.92					0.08	N/D	0.03	N/D				
118	JUST CARBON 8 (1)	16.93	64.64	0.01	0.03		0.02			0.05	0.02	0.30					
121	SIPI ROUTER	19.57	16.67	0.80	0.90	0.10		0.23	0.20	0.21	0.25						
122	SIPI ROUTER	5.34	1.52	0.30	3.10		0.20			0.10	0.02	0.20					
135	JUST CARBON	11.97	5.22				0.10			0.40	0.01						
139	TRAFIGURA Ag	0.04	308.01	9.22	0.75	10.90	1.17	3.16	0.14	0.01	0.04	18.90	0.98				
141	TRAFIGURA Ag	0.03	343.76	9.50	0.81	11.00	1.17	3.16	0.14	0.02	0.04	20.40	0.98				
142	TRAFIGURA Ag	0.03	340.71	9.56	0.86	11.30	1.17	3.16	0.14	0.02	0.04	20.00	0.98				
143	TRAFIGURA Ag	0.04	341.03	9.46	0.77	10.60	1.17	3.16	0.14	0.02	0.04	19.90	0.98				
145	ENVIROCHEM	5.22	47.76	0.49	0.52	0.12	N/D	0.05		0.06	0.06	8.41	0.01				
146	ENVIROCHEM	5.94	5.56	0.32	1.34			1.34		0.10	N/D	0.08	0.01				
147	ESKAY CREEK	2.01	93.11	3.89	0.98	5.97	0.01	1.92	0.01	0.02	0.03	11.23		42.27	3.37	1.67	8.63
150	SAVAGE DROSS		60.00	80.00													
151	SIPI L/G SWEEPS	0.62	73.65	1.58	0.55	13.39	0.02	0.34		0.01	0.81	0.10	0.09				
152	BOLIVIAN/ BARE		503.25	25.90	2.45	8.50	0.88	3.44	0.12	0.10	0.04	24.90					
153	BOLIVIAN/ BARE		152.48	5.92	2.41	8.50	1.75	6.64	0.05	0.02	0.08	21.70					
154	BOLIVIAN/ BARE		78.62	12.20	0.82	8.00	0.69	7.06	0.04	0.02	0.07	27.30					
155	BOLIVIAN/ BARE		837.12	8.98	1.72	8.00	0.85	12.69	0.05	0.01	0.04	25.00					
156	BAREX/MINTRAD		782.98	12.64	1.77	9.85	0.95	6.94	0.07	0.02	0.06	25.71					
158	HOMESTAKE SLA	10.26	239.05	0.78	0.61	0.13	1.82	0.14	0.05	0.08	0.02	0.44					
159	GROUSE CREEK (2)	N/D	N/D	7.40	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	N/D						
173	OSRAM SYLVANI	0.01	373.85	0.60	21.60		0.10	0.08	0.70	10.27		4.20					
176	COLT R. DUST	9.75	0.47	0.08	0.06		N/D	N/D	N/D	0.07		0.04	N/D				
177	COLT R. DUST	9.75	0.47	0.08	1.06		N/D	N/D	N/D	0.07		0.04	N/D				
181	ECS SWEEPS 34	1.18	980.07	0.13	N/D					N/D	0.02	7.07					
184	ACADAMY SLAG	1.07	237.38	0.22	0.08		0.03	0.03	N/D	0.02	0.01	1.83					
185	BOLIV BAREX		770.48	15.47	1.19	10.17	0.83	7.64	0.05	0.02	0.07	24.62					
186	BOLIV BAREX		770.48	15.55	1.19	10.17	0.83	7.64	0.05	0.02	0.07	24.62					
187	PRECIOUS META	0.05	309.21	0.56	0.09	0.18		0.04		0.03	0.01	3.10					
190	ECS ROUTER DS	4.92	6.57	0.37	1.17	1.27	0.03	0.08		0.37	0.03	N/D	0.03				
191	ACADAMY SLAG	1.07	237.38	0.22	0.08		0.03	0.03	N/D	0.02	0.01	1.83					
192	PYROPURE SLAG	0.05	389.07	0.52	0.24		0.04	0.06	0.02	0.01	N/D	6.79					
194	SIPI L/G SWEEPS	1.17	89.85	1.94	0.60	14.51	0.02	0.35		0.02	0.83	0.03	0.05				
198	ECS CRT GLASS (2)	N/D	N/D	4.50			N/D	0.24	0.40					70.00			

ASARCO INC., EAST HELENA PLANT
APRIL 1997 INVENTORY LIST
AVERAGE ASSAYS

				Chemical Composition													
		OZ/TON		PERCENT													
PILE NUMBER	MATERIAL NAME	Au	Ag	Pb	Cu	Zn	As	Sb	Bi	Ni	Cd	S	Sn	SiO2	Fe	CaO	MgO
200	JUST CARBON	12.86	3.08	0.04			0.02	0.01		0.06	0.01						
201	JUST CARBON	12.86	3.08	0.04			0.02	0.01		0.06	0.01						
202	BAREX / BOLIVIA		770.38	15.55	1.19	10.17	0.87	7.64	0.05	0.02	0.07	24.62					
203	CASCADE SLAG	3.00	70.00	5.00													
204	ENCYLCE GLASS (2)	N/D	9.00	0.46	<0.02	0.44	<0.02	0.19	<0.02	0.04	N/D			55.40			
206	ENV CHEM CART	5.22	47.76	0.49	0.52	0.12	N/D	0.05		0.06	0.06	8.41	0.01				
207	ENV CHEM ROUT	5.94	5.56	0.32	1.34			0.08		0.10	N/D	0.08	0.01				
208	PREC METALS	0.05	309.21	0.56	0.09	0.18		0.04		0.03	0.01	3.10					
209	JUST CARBON	12.87	3.08	0.04			0.02	0.01		0.06	0.01						
210	JUST CARBON (1)	12.87	3.08	0.04			0.02	0.01		0.06	0.01	0.02					
211	ECS ROUTER DS	4.92	6.57	0.37	1.17	1.27	0.03	0.08		0.37	0.03	N/D	0.03				
213	ENCYCLE PB/CU	0.01	3.11	29.19	17.11	0.03	0.32	0.17	0.03	1.22	0.45	8.44	0.17				
217	X-CEL OPTICA (2)		16.16	6.60	0.12	0.82				0.01				53.58			
218	BAREX LOT 478		770.38	15.55	1.19	10.17	0.87	7.64	0.05	0.02	0.07	24.62					
220	ECS ROUTER DS	4.92	6.57	0.37	1.17	1.27	0.03	0.08		0.37	0.03	N/D	0.03				
221	SIPI LOT 652	0.52	51.93	1.70	0.30	7.00		0.30		0.01	0.48						
224	GEMARK SLAG	0.04	406.76	0.18	0.03			N/D	0.01	0.03	N/D	0.24	0.06				
225	COLT ROUTER	6.79	1.41	0.10	1.25		N/D	N/D	N/D	0.05							
226	COLT ROUTER	6.79	1.41	0.10	1.25		N/D	N/D	N/D	0.05							
228	ECS CRT GLASS (2)	N/D	N/D	4.50			N/D	0.24	0.40					70.00			
229	ECS SLAG	1.12	126.11	0.28	0.24	2.76		0.01	N/D	0.07	0.31	0.37	0.38	21.90	1.30	3.10	
230	ESC SWEEPS	1.01	874.57	0.17	0.01					N/D	0.02	6.31					
232	ECS ROUTER DS	45.81	5.26	0.40	0.90					0.11	0.03						
235	BOLIVIAN/BARE		1036.60	14.17	1.78	8.68	1.02	7.79	0.06	0.02	0.07	24.60	2.12				
239	ENV CHEM FILM	2.50	332.26	0.16	0.90	0.03	N/D	0.05	N/D	0.04	0.03	9.58	0.01				
240	ENV CHEM STL	2.50	332.26	0.16	0.90	0.03	N/D	0.05	N/D	0.04	0.03	9.58	0.01				
241	ENV CHEM ROUT	4.29	3.14	0.31	1.53			0.05		0.10	N/D	0.03	0.01				
242	UMPIRE&CONTRO (2)			39.75										7.70		11.85	
243	KENNECOT RIDG (1)	0.02	0.72	26.40	0.10	0.70	0.04	0.10	0.02		N/D	0.05	0.04	5.70	0.30	4.20	2.80
244	ESC PRECIP	0.02	108.79	0.23						0.01	N/D	5.71	0.02				
245	ECS PRECIP	0.02	108.79	0.23						0.01	N/D	5.71	0.02				
246	RND MTN CARBO	13.81	15.57	0.03			0.02			0.03	N/D	0.12					
247	RND MTN CARBO	13.81	15.57	0.03			0.02			0.03	N/D	0.12					
248	SIPI ROUTER	0.73	48.97	2.00	0.80	10.10		0.39		0.01	0.73						
250	ESKAY CREEK	1.16	170.74	3.12	0.64	5.14	0.25	1.69	N/D	0.06	0.07	11.61		42.18	2.40	1.73	7.59

ASARCO INC., EAST HELENA PLANT
APRIL 1997 INVENTORY LIST
AVERAGE ASSAYS

				Chemical Composition													
		OZ/TON		PERCENT													
PILE NUMBER	MATERIAL NAME	Au	Ag	Pb	Cu	Zn	As	Sb	Bi	Ni	Cd	S	Sn	SiO2	Fe	CaO	MgO
251	HOMESTAKE SLA	12.28	243.38	0.78	0.61	0.13	1.82	0.14	0.05	0.08	0.02	0.44					
252	SAVAGE DROSS	0.01	90.94	76.88	0.24	0.97	0.02	0.04	0.02			1.09					
253	ESC PHOTO PRE	13.81	15.57	0.03			0.02			0.03	N/D	5.71	0.02				
254	ECS SWEEPS	0.99	829.68	0.17	0.01					N/D	0.02	6.31					
255	ECS ROUTER D.	5.41	6.57	0.37	1.17	1.27	0.03	0.08		0.37	0.03	N/D	0.03				
256	CRE POWDER	9.99	156.03	0.35	0.12	0.01		0.11	N/D	0.02	0.05	6.29					
257	SIPI 773/2784	0.68	34.00	2.10	0.70	8.00		0.28		0.01	0.36						
258	CRE POWDER	9.99	156.03	0.35	0.12	0.01		0.11	N/D	0.02	0.05	6.29					
259	CRE POWDER	9.99	156.03	0.35	0.12	0.01		0.11	N/D	0.02	0.05	6.29					
260	CRE POWDER	9.99	156.03	0.35	0.12	0.01		0.11	N/D	0.02	0.05	6.29					
261	CRE POWDER	9.99	156.03	0.35	0.12	0.01		0.11	N/D	0.02	0.05	6.29					
262	CRE POWDER	9.99	156.03	0.35	0.12	0.01		0.11	N/D	0.02	0.05	6.29					
263	CRE POWDER	9.99	156.03	0.35	0.12	0.01		0.11	N/D	0.02	0.05	6.29					
264	CRE POWDER	9.99	156.03	0.35	0.12	0.01		0.11	N/D	0.02	0.05	6.29					
265	MISSOURI CU		1.30	31.70	11.30		3.00	0.30	1.00								
266	CRE POWDER	9.99	156.03	0.35	0.12	0.01		0.11	N/D	0.02	0.05	6.29					
267	CRE POWDER	9.99	156.03	0.35	0.12	0.01		0.11	N/D	0.02	0.05	6.29					
268	ENCYCLE GLASS (2)	N/D	9.00	0.46	<0.02	0.44	<0.02	0.19	<0.02	0.04	<0.01			55.40			
274	SIPI 904/2799	0.62	34.26	2.20	0.40	6.60		0.26		0.01	0.49	0.39	0.20				
286	GOLDEN PHOTON (1)										0.50			72.00	0.50	9.00	3.00
294	SIPI	0.72	35.08	2.10	0.70	5.00		0.50		0.02	0.56	0.01					
302	SAVAGE DROSS		66.06	77.90	0.11	0.87	0.02	0.09	0.01			0.96					
309	SIPI SWEEPS	0.77	177.17	0.90	0.30	13.00		0.12		0.01	2.07	0.23					
317	ECS ROUTER DS	8.79	0.11	0.20	0.80					0.07							
320	ENCYCLE PBYCU	0.02	1.69	23.19	14.90		0.26	0.17	0.03	2.65	0.57	8.70	0.18	3.28	8.54	3.45	0.10
321	SONY GLASS (2)	N/D	9.00	0.46	<0.02	0.44	<0.02	0.19	<0.02	0.04	N/D			55.40			
326	COLT ROUTER	11.75	0.05	0.10	0.80					0.07		0.10	0.01				
327	COLT ROUTER	4.82	0.12		2.10					0.09							
347	OMAHA B BRCO	0.78	159.25	11.49		1.88	0.08	1.83	0.87	0.07		0.07					
349	SIPI SWEEPS	0.51	61.21	1.00	0.50	23.14		0.23		0.01	0.80		0.18				
390	SAVAGE DROSS	0.01	104.82	83.47	0.34	1.05	0.02		0.03			1.20					
407	SIPI L/G SWEE	0.46	87.97	1.50	0.70	19.32		0.64		0.01	0.53	0.01	0.11				
409	OMAHA B BRCO	0.40	54.00	6.00		4.00	0.10	0.60	0.60	0.60		0.07					
410	COLT ROUTER	1.41	0.21		1.40			0.10	0.03	0.15							
411	SONY GLASS (2)	N/D	9.00	0.46	<0.02	0.44	<0.02	0.19	<0.02	0.04	N/D			55.40			

ASARCO INC., EAST HELENA PLANT
APRIL 1997 INVENTORY LIST
AVERAGE ASSAYS

				Chemical Composition													
		OZ/TON		PERCENT													
PILE NUMBER	MATERIAL NAME	Au	Ag	Pb	Cu	Zn	As	Sb	Bi	Ni	Cd	S	Sn	SiO2	Fe	CaO	MgO
426	SONY GLASS (2)	N/D	9.00	0.46	<0.02	0.44	<0.02	0.19	<0.02	0.04	N/D			55.40			
436	AMARILL MIS	10.10	416.33		4.40		0.44	1.81	0.67	0.74		0.81	0.35				
444	INDUSTRIAL RE	9.69	36.36	1.00	13.80			0.60	0.04	0.27	0.01	0.70	0.05				
450	ECS ROUTER D.	1.93	0.35	0.10	4.20					0.21	0.01						
452	SONY CRT GLAS (2)	N/D	9.00	0.46	<0.02	0.44	<0.02	0.19	<0.02	0.04	N/D			55.40			
453	FAIRFIELD L/G	1.78	3.22	0.46	0.12		0.10	0.06	0.02	0.02	0.02	10.53		61.46	7.38	0.19	0.39
454	FAIRFIELD H/G	4.36	17.67	0.40	0.15		0.10	0.05	0.04	0.04	0.01	10.00	0.04	71.90	8.50	0.15	0.40
462	PREC. METALS	0.07	336.84	0.18	0.03			0.04		0.02	0.01	3.61					
475	SIPI 1935/320	0.90	84.36	2.00	0.80	12.60		0.39		0.40	0.62		0.02				
487	OMAHA B BRCO	0.04	80.00	20.00	3.00												
489	SIPI SW 1988	3.38	91.52	3.10	0.50	9.70		0.32		0.02	0.64		0.02				
494	BRAZ. SOGEM	0.50	593.63	9.70	0.10	13.00	0.08	0.14	0.04		0.07	48.60	0.10				
499	ECS ROUTER DS	2.78	0.30		1.00					0.66							
500	ECS ROUTER DS	7.78	0.15	0.10	0.30					0.06							
501	ECS ROUTER DS	11.45	0.17	0.10	1.50					0.13							
502	SIPI SWEEPS	0.76	59.91	2.60	0.68	11.30		0.35			0.63						
505	ESKAY CREEK C	1.80	119.00	3.50	0.80	5.50	N/D	1.60	0.01	0.04	0.08	11.00		41.00	2.20	1.60	7.50
512	PRECIOUS META	0.07	339.84	0.18	0.03			0.04		0.02	0.01	3.61					
195	SIPI (1)	7.32	7.50	0.32	2.13	0.10		0.12	0.20	0.13	0.02	0.20					
196	SIPI (1)	7.32	7.50	0.32	2.13	0.10		0.12	0.20	0.13	0.02	0.20					
215	SIPI (1)	7.32	7.50	0.32	2.13	0.10		0.12	0.20	0.13	0.02	0.20					
216	SIPI (1)	0.80	69.04	1.84	0.53	12.17	0.01	0.30		0.01	0.71	0.13	0.25				
233	JUST CARBON (1)	28.78	33.22	0.11	0.90	0.25	0.04	0.04	0.03	0.11	0.02	0.33					
234	JUST CARBON (1)	28.78	33.22	0.11	0.90	0.25	0.04	0.04	0.03	0.11	0.02	0.33					
237	SIPI (1)	0.80	69.04	1.84	0.53	12.17	0.01	0.30		0.01	0.71	0.13	0.25				
238	SIPI (1)	7.32	7.50	0.32	2.13	0.10		0.12	0.20	0.13	0.02	0.20					
600	MEXICAN/PERUO	0.10	67.00	60.00	3.40	5.80	0.60	0.39	0.35		0.03	18.10					
601	RGT. ARSENIO	0.64	1.40	1.23	0.41	1.24	8.00	0.12	0.02	0.02		39.00	0.02	4.90	40.40		
602	MCCOY COVE	1.00	75.00	28.00	0.80	11.50	0.40	0.30	0.01	0.02	0.12	28.00	0.15				
603	UCHUCCHACUA	0.02	270.00	20.50	0.50	6.00	1.49	1.13	0.02	0.01	0.03	29.00		6.50	18.50	1.20	0.06
604	EP. CONV.CONTP	0.01	12.70	5.37	18.40	5.48	2.07	0.28	1.45	0.04	0.47	12.26	0.25	3.50			
605	JULCANI	0.70	233.00	37.00	2.86	10.00	0.64	1.61	0.19	0.02	0.07	25.60		4.90	11.30	0.35	
606	LEADVILLE PB	0.85	20.40	62.00	0.60	1.60	0.10	0.10	N/D	0.01	0.05	17.70					
607	ORCOPAMPA	2.30	278.00	3.70	3.30	4.00	0.24	1.12	0.01	0.02	0.04	30.00					
609	CAROLINA	0.24	185.68	35.34	2.18	5.00	0.81	2.29	0.60	0.01	0.05	26.34		6.90	17.60	0.51	

ASARCO INC., EAST HELENA PLANT
APRIL 1997 INVENTORY LIST
AVERAGE ASSAYS

				Chemical Composition													
		OZ/TON		PERCENT													
PILE NUMBER	MATERIAL NAME	Au	Ag	Pb	Cu	Zn	As	Sb	Bi	Ni	Cd	S	Sn	SiO2	Fe	CaO	MgO
610	NOR PERU	0.31	748.82	8.65	17.19	11.00	4.90	5.52	0.25	0.01	0.10	31.26		5.80	14.40	0.08	
611	SUNSHINE SILV	0.27	998.20	24.97	16.98	2.12	0.46	1.13	0.09	0.04	0.03	22.30					
612	SAUGET (1)		27.00	5.80	2.90	19.10		0.26	0.01	0.08	0.63	11.20					
613	ELPASO CNVCT	0.01	9.51	5.99	11.60	11.97	2.12	0.12	2.00	0.03	0.70	14.20	0.28	2.70			
615	BOLIVIAN 42	0.02	227.06	31.09	1.54	7.68	0.79	2.30	0.12	0.02	0.07						
616	OMAHA SKIMS	1.29	38.67	61.08		4.56	0.32	10.64	0.43	0.02	0.01	0.31	0.38		0.30		
617	RGT. ARSENO	2.34	1.68	1.17	0.36	1.14	8.01	0.14	0.02	0.02	0.01	39.78	0.02	5.10	40.31	1.52	0.64
618	CAROLINA	0.03	90.45	65.85	1.01	1.50	0.63	0.40	0.04	0.01	0.03	16.41	0.20				
619	LUCKY FRIDAY	0.02	68.11	64.40	0.42	5.76	0.20	0.55	N/D	0.02	0.05	13.00					
640	OMAHA A SKIM	0.01	6.00	65.00		4.00	0.10	2.40	0.25			0.10	0.50	1.40		0.50	
669	OMAHA S SKIM	0.01	6.00	65.00		4.00	0.10	2.40	0.25			0.10	0.50	1.40		0.50	
681	YAULI - 23	0.49	228.00	21.90	16.50	10.70	2.51	2.11	0.42	0.02	0.05	27.00					
686	MT TUNNELS	2.10	40.00	48.00	0.50	9.50	0.10	0.10	0.01	0.01	0.05	24.00	0.01				
693	SUNSHINE AG	0.03	900.00	25.00	12.00	1.50	0.60	1.40	0.10	0.05	0.01	22.00					
697	ENCYCLE PB/CU		2.33	28.87	16.59	16.73	0.32	0.23	0.03	2.19	0.44	8.03	0.28	5.76	7.35	1.96	0.30
718	HAYDEN SAND	0.52	50.00		26.00	0.10	1.50	1.10	0.05	1.50	0.01	5.00	0.10	42.50	9.50	1.05	
726	SOGUM O4	0.71	137.00	37.60	1.00	10.00	0.27	0.45	0.03	0.02	0.04	22.30		9.30	12.10	0.40	
733	CAROLINA	0.26	149.00	29.00	1.20	5.00	0.58	1.87	0.47	0.01	0.04						
734	QUIR PB	0.09	93.50	61.00	2.64	3.00	1.45	2.40	0.19		0.03	18.00		4.50	5.80	0.13	
745	LUCKY FIRDAY	0.02	50.00	63.00	0.35	6.50	0.10	0.40	0.02	0.02	0.05	14.00					
759	NOR PERU	0.11	192.50	8.60	17.10	11.00	4.90	5.52	0.25	0.01	0.10	30.10		5.80	14.40	0.08	
760	CAROLINA	0.24	164.61	28.13	1.64	5.00	0.72	1.91	0.52	0.01	0.05	29.80		6.90	17.60	0.51	
768	JULCANI	0.65	248.00	37.00	2.91	9.00	0.78	1.52	0.16	0.02	0.07	25.80		3.14	10.40	0.51	
773	AMAX	0.26	150.55	29.22	1.20	5.00	0.58	1.87	0.47	0.01	0.04	30.90		5.40	18.70	0.45	
776	AMAX		50.00	9.00	1.00	11.00	0.15	0.10	0.03	0.09	0.45						

Footnote 1 - Historical average assays used for this material.
Footnote 2 - Shipping contract or Asarco pre-acceptance review information used for this material.
N/D - Non-Detectable (< 0.01%).

Waste Profile Sheet for the Parting Plant Brick and Debris

Attachment 2

USPCI
A CAIDEAN COMPANY

NOTIFICATION OF WASTE ACCEPTANCE

10/01/96

Grassy Mountain FIMS

CUSTOMER INFORMATION
EPA ID#: MTD006230346
ASARCO INC
100 SMELTER RD
HELENA, MT 59635
CONTACT: DON ROBBINS
PHONE: (801) 263-5220

INVOICE INFORMATION
REF #: BILLASARCOIN
ASARCO INCORPORATED
PO BOX 1230
E HELENA, MT 56935
CONTACT: JON C. NICKEL
PHONE: (406) 227-7191

PROFILE SHEET #: 300481 SAMPLE #: WP96-05602 WASTE STREAM #: GM96-0192
RECEIVED: 09/25/96 RECEIVED: 05/06/96 PARTING PLANT BRICK & DEBRIS
Last Change Date: 10/01/96

Thank you for selecting USPCI for your waste management requirements. Your waste stream has been reviewed and is acceptable for management at our facility based on the information provided on the profile sheet number listed above and conditions listed below. Our facility has the necessary permits to allow the storage, treatment, or disposal of this waste. The above referenced acceptance number should be listed on all shipping documents and correspondence. Please retain these documents for your records and future reference.

Please contact Customer Service at 1-800-243-0783 should you have any questions. To schedule a shipment, contact USPCI customer service at 1-800-243-0783.

USPCI Sales Representative: TERRY TRAYNOR (303) 288-5558

ACCEPTANCE INFORMATION

The waste stream identified by the reference number above is
Acceptable for disposal.

This waste is acceptable for delivery beginning on 05/16/96 thru 12/01/96, at which time an update review may be required for continued acceptability.

Comments:
RCRA CELL/ NEWLY IDENTIFIED WASTE, NOTIFICATION AND TREATMENT ARE NOT REQUIRED

Shipping Requirements:

Type of Container: SOLID (BULK)

USPCI Grassy Mountain Facility
P.O. Box 22750 Salt Lake City, Utah 84122
Phone 801.323.8900 Fax 801.323.8990

USPCI
A LADDCAR COMPANY

10/01/96

PROFILE SHEET #: 300481 SAMPLE #: WP96-05602 WASTE NUMBER #: GM96-0192

WASTE STREAM ANALYSIS INFORMATION

Waste Name.....: PARTING PLANT BRICK & DEBRIS
Physical State.....: SOLID
Process Producing Waste..: FROM PRIMARY COPPER SMELTER PARTING PLANT

EPA Waste Codes:
D006 D008

Color.....:	MULTI	pH.....:	6.7
Water RX..:	NEG	Layering..:	SINGLE
Normality.:	NR	Sp. Grav..:	2.8
Absorbants:	NEG	TLV.....:	60
Flash Pt..:	NR	T. Solids.:	92
Free Liq..:	NEG	RX CN Scr.:	NEG
RX S Scr..:	NEG	PFLT.....:	PASS
Ox. Scr...:	POS	Red. Scr..:	NEG
HOC Scr...:	13.2PPM	Radio Scr.:	NEG

This analysis is solely for use by USPCI employees for the purpose of determining waste acceptability. No other claims are made or implied.

AUTHORIZATION

Approval: Troy S. Belka Date: 10/1/96

Approval: Sharon Jacobs Date: 10/01/96

Waste Stream #: GM96-0192

USPCI Grassy Mountain Facility
P.O. Box 22750 Salt Lake City, Utah 84122
Phone 801.323.8900 Fax 801.323.8990

1-Sample GM-96-092 A9641543 300481

USPCI/Laidlaw

☐ Standard Approval ☒ RUSH Approval (extra charge)

Waste Profile Sheet

FOR USPCI/LAIDLAW USE ONLY Exhibit A to _____	Contract date	Sample reference #	PO #	Sales Representative

IMPORTANT INFORMATION NEEDED BEFORE COMPLETING THIS FORM:

1. All boxes MUST be completed unless otherwise indicated.
2. Incomplete Profiles will result in unnecessary delays. Please supply all required information. If you have questions, please call your facility customer service representative or USPCI/LAIDLAW sales representative.
3. When a check-off box is used on this form, please check the box if the item describes the waste or is found in the waste. Leaving the box blank indicates that the item does not apply to the waste stream.

I. Generator Information

Generator Company Name: ASARCO INCORPORATED

Generator Facility Address:
100 Smelter Road
East Helena, MT 59635

Generator Mailing Address:
P.O. Box 1230
East Helena, MT 59635

Invoice Directions:
Jon C. Nickel

US EPA ID: M T D 0 0 6 2 3 0 3 4 6

State Generator ID:

Facility Contact/Title (generator): Jon C. Nickel/ Environmental Manager
Phone: (406) 227-7191 Fax: (406) 227-8897

Technical Contact/Title (generator): Jon C. Nickel/ Environmental Manager
Phone: (406) 227-7191 Fax: (406) 227-8897

Broker, Contractor, Invoice Contact/Title: Jon C. Nickel/ Environmental Manager
Phone: (406) 227-7191 Fax: (406) 227-8897

If specific treatment is desired, please specify:

Standard Industry Code (SIC): 3339

II. Waste Generation Information

Waste name: Parting plant brick and debris

Describe process producing waste (attach additional sheet if necessary): Brick and debris from primary copper smelter parting plant

Estimated rate of waste generation: 1300

Units: ☐ Drums ☐ Gallons ☐ Pounds ☒ Tons ☐ Yards

Frequency: ☐ Monthly ☐ Quarterly ☐ Yearly ☒ One time only

Is the waste generated from a... ☐ RCRA corrective action ☐ CERCLA site ☐ foreign source ☒ none of the preceding

Is the waste generated by a chemical manufacturing plant, coke by-product recovery plant or a petroleum refinery? ☐ Yes ☒ No

Does this waste contain benzene subject to the control requirements of 40 CFR Part 61 Subpart FF (NESHAP)? ☐ Yes ☒ No
If "Yes" please specify the benzene concentration in section III.

III. Waste Constituents, Characteristics and Properties

Physical state: ☒ Solid ☐ Liquid ☐ Powder

Contains free liquids? ☐ yes ☐ no If yes, enter volume _____%

Waste Composition	Range in %
Brick + Debris TJB 5/16/96	100% 10-40%
TJB 6/17/96 Crushed Brick	60-90%
See Attached:	
Wet Chemical Results	
Total must equal at least 100%	

Waste contains: (check only if applicable)
☐ biodegradable sorbents ☐ non-biodegradable sorbents ☒ asbestos
☐ cyanides-level____ ☐ contaminated soil ☒ contaminated debris (per EPA) ☐ dioxins
☐ fuming acids ☐ oxidizers ☐ PCBs-level____ ☐ strong odor ☐ sulfides-level____

Waste properties: (check only if applicable)
☐ autopolymerizable ☐ explosive ☐ hydrophoric
☐ infectious ☐ pyrophoric ☐ radioactive
☐ reactive ☐ shock sensitive ☐ thermally sensitive

Physical properties
Bulk density: 2300 lbs/ton Color: Brown
Specific gravity: 2.2-3.3 Flash Point: 200 F
Normality: TJB 5/16/96

pH range: ☐ ≤ 2 ☐ 2.1-5 ☒ 5.1-8 ☐ 8.1-12.4 ☐ ≥ 12.5 _____ Range

Complete for Thermal Destruction (if applicable)
☐ Heat Value (BTU/lb) _____ to _____
☐ Water Content (%) _____ to _____
☐ Ash (%) _____ to _____
☐ Vapor Pressure (mmHG)____ @ STP
☐ Viscosity _____ @ _____°F
☐ Total Bromine _____ to _____%
☐ Total Chlorine _____ to _____%
☐ Total Fluoride _____ to _____%
☐ Total Iodine _____ to _____%
☐ Total Sulfur _____ to _____%

IV. Special Handling, Safety or Other Additional Information

See Attached: Special handling, safety, or other information.

ORIGINAL

300481

V. Waste Codes

Applicable EPA listed waste codes (F,K,U or P)	State waste codes

D-Code Characteristic Waste (a blank box indicates N/A)		Actual Range				Actual Range
☐ D001 Ignitable (f.p.<140° F)			☐ D015	Toxaphene	≥0.5 mg/l	
☐ Ignitable liquids ☐ High TOC (>10%) NWW			☐ D016	2,4-D	≥10.0 mg/l	
☐ Oxidizers			☐ D017	2,4,5-TP Silvex	≥1.0 mg/l	
☐ Reactives			☐ D018	Benzene	≥0.5 mg/l	
☐ Compressed Gases			☐ D019	Carbon tetrachloride	≥0.5 mg/l	
☐ D002 Corrosive (pH≤2 or ≥12.5)			☐ D020	Chlordane	≥0.03 mg/l	
☐ Acid liquids ☐ Alkaline liquids			☐ D021	Chlorobenzene	≥100.0 mg/l	
☐ Other corrosive liquids			☐ D022	Chloroform	≥6.0 mg/l	
☐ D003 Reactive			☐ D023	0-Cresol	≥200.0 mg/l	
☐ Reactive sulfides ☐ Explosives			☐ D024	m-Cresol	≥200.0 mg/l	
☐ Water reactives ☐ Reactive cyanides			☐ D025	p-Cresol	≥200.0 mg/l	
☐ Other reactives			☐ D026	Cresol	≥200.0 mg/l	
☐ D004 Arsenic	≥5.0 mg/l		☐ D027	1,4-Dichlorobenzene	≥7.5 mg/l	
☐ D005 Barium	≥100.0 mg/l		☐ D028	1,2-Dichloroethane	≥0.5 mg/l	
☒ D006 Cadmium	≥1.0 mg/l	13 mg/l	☐ D029	1,1-Dichloroethylene	≥0.7 mg/l	
☐ Cadmium batteries			☐ D030	2,4-Dinitrotoluene	≥0.13 mg/l	
☐ D007 Chromium	≥5.0 mg/l		☐ D031	Heptachlor (and its epoxide)	≥0.008 mg/l	
☒ D008 Lead	≥5.0 mg/l	629 mg/l	☐ D032	Hexachlorobenzene	≥0.13 mg/l	
☐ Lead acid batteries			☐ D033	Hexachlorobutadiene	≥0.5 mg/l	
☐ D009 Mercury	≥0.2 mg/l		☐ D034	Hexachloroethane	≥3.0 mg/l	
☐ High mercury-organics (>260 mg/kg)			☐ D035	Methyl ethyl ketone	≥200.0 mg/l	
☐ High mercury-inorganics (>260 mg/kg)			☐ D036	Nitrobenzene	≥2.0 mg/l	
☐ Incin. residues			☐ D037	Pentachlorophenol	≥100.0 mg/l	
☐ Low mercury (<260 mg/kg)			☐ D038	Pyridine	≥5.0 mg/l	
☐ D010 Selenium	≥1.0 mg/l		☐ D039	Tetrachloroethylene	≥0.7 mg/l	
☐ D011 Silver	≥5.0 mg/l		☐ D040	Trichloroethylene	≥0.5 mg/l	
☐ D012 Endrin	≥0.02 mg/l		☐ D041	2,4,5-Trichlorophenol	≥400.0 mg/l	
☐ D013 Lindane	≥0.4 mg/l		☐ D042	2,4,6-Trichlorophenol	≥2.0 mg/l	
☐ D014 Methoxychlor	≥10.0 mg/l		☐ D043	Vinyl chloride	≥0.2 mg/l	

*Newly Identified Per Joint letter 3/9/92

VI. Land Disposal Restriction Standards

Federal Land Disposal Restriction standards: (check one)
- ☐ does not meet any applicable standards
- ☐ treated to meet all applicable standards
- ☐ meets all applicable standards without treatment
- ☐ needs to be treated to meet certain treatment standards
- ☒ no federally-mandated treatment standards apply

- ☐ HOC > 1000 mg/l
- ☐ thallium > 130 mg/l
- ☐ nickel > 134 mg/l

State Land Disposal Restriction standards: (check if applicable)
- ☐ does not meet any applicable standards
- ☐ treated to meet all applicable standards
- ☐ meets all applicable standards without treatment
- ☐ needs to be treated to meet certain treatment standards
- ☒ no state-mandated treatment standards apply

D001-D002 Wastes Potentially Regulated Under 40 CFR § 268.37

Contains any constituents for which a treatment standard has been established in relation to F039 (multi-source leachate): ☐ yes ☒ no ☐ not sure

If yes, identify each constituent _____

This information is based on (attach additional sheets if necessary):

☐ analysis–describe _____

☐ knowledge-describe _____

Non-Regulated Waste:
☒ Non-RCRA Regulated ☐ Conditionally Exempt Small Quantity Generator ☐ Household Hazardous ☐ 100–1000 kg/mo generator

LDR Treatability Group
☐ Wastewater ☐ Non Wastewater

VII. State of California Regulated Metals (use this section only if applicable–indicate actual range in PPM)

	Actual Range		Actual Range		Actual Range
☐ Antimony (Sb)		☐ Copper (Cu)		☐ Thallium (Tl)	
☐ Beryllium (Be)		☐ Molybdenum (Mo)		☐ Vanadium (V)	
☐ Cobalt (Co)		☐ Nickel (Ni)		☐ Zinc (Zn)	

VIII. Shipping Information

Proper DOT Shipping Name: RQ, Hazardous Waste Solid, nos, (D006, D008)

DOT Hazard Class	UN/NA number	Packing Group	Reportable Quantity
9	UN 3077	III	10 lbs

Container Type: ☐ Drum ☒ Bulk Solid ☐ Bulk Liquid ☐ Other:

Grassy Mountain Customers only — Is this waste a combustion residue? ☐ Yes ☒ No

IX. Certification Statement

I certify that the information presented on this form and all attached forms is accurate and that all known or suspected hazards have been disclosed. The Waste Stream has been correctly characterized according to 40 CFR 262.11 and all applicable state regulations. A Representative Sample or lab pack inventory (if required) of this Waste Stream has been provided to USPCI/LAIDLAW. I am authorized by the above listed company or agency to make this certification. This waste does not contain any biological pathogenic and/or etiological agents.

Signature	Printed name	Date
Jon Nickel	Jon C. Nickel	5/1/96

REV AUG 1993

ORIGINAL

Waste Manifest for Spent Solvent

Attachment 3

MAY 26

Emergency Contact Telephone Number
31-3294-10

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. MTD006230346 | Manifest Document No. 95002
2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address: ASARCO
P.O. BOX 1230
EAST HELENA, MT 59635
4. Generator's Phone: (406) 227-7157 MR. BRAD BROUGH

A. State Manifest Document Number
B. State Generator's ID

5. Transporter 1 Company Name: SPECIAL RESOURCE MNGT., TRANSPORT
6. US EPA ID Number: MTD981547678
C. State Transporter's ID
D. Transporter's Phone: (406) 782-4201

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address:
CHEMICAL WASTE MANAGEMENT
9131 EAST 96th AVENUE
HENDERSON, CO 80640
10. US EPA ID Number: COD980591184
G. State Facility's ID
H. Facility's Phone: (303) 289-4827

	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.	XX WASTE NAPTHA, SOLVENT, 3, UN1256, III, RQ (D009)	1	DM	EST. 500	P	D001, D004, D006, D008, D009, F003
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
11.a. PROFILE # BN7633.

K. Handling Codes for Wastes Listed Above
EMERGENCY CONTACT:
1-800-765-8713

15. Special Handling Instructions and Additional Information
24521
1993 EMERGENCY RESPONSE GUIDEBOOK - 11.a. GUIDE # 27.
CERTIFICATE OF DESTRUCTION REQUIRED.

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name, and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Month	Day	Year
Bradley W. Brough	Bradley W. Brough	05	01	95

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
DAN Emmett		05	01	95

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

TRANSPORTER

19. Discrepancy Indication Space

FACILITY

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Ken Dizon		05	09	95

TRANSPORTER #2

Asarco Standards Uniformity of Sampling Procedures

Attachment 4

INDEX

SUBJECT PAGE

List of diverted materials.....1
Weighing- Preliminary handling.....3
Moisture determination.....4
Control sampling-X's criteria, patterns.....5
Composites.....8
Number of pulps.....8
Fine grinding.....9
Single X.....9
Double X.....10
Four X.....10
Special cases:
Residues.....11
Sunshine Copper Residue.....11
Crude ores.....14
El Indio.....15
Mt. Isa Dross.....16
Glover Dross.....17

ASARCO STANDARDS

UNIFORMITY OF SAMPLING PROCEDURES FOR

PLANTS DIVERSIONS

ASARCO

Copy to MAS

El Paso Plant

November 22, 1983

RECEIVED
NOV 28 1983
LEE C. TRAVIS

Mr. Lee C. Travis, General Manager
Western Department
New York, N. Y.

SAMPLING PROCEDURES

With reference to your letter of November 18th, Mr. Lindstrom will be El Paso's representative to work on the development of uniform sampling procedures.

I suggest that Mr. Herrera work with Mr. Lindstrom on this project.

For your information, this will now be easy to accomplish because for the past year El Paso has been modifying their sampling department and the procedures with little exception are similar in both plants.

PA DeSantis

P. A. DeSANTIS

RECEIVED
DEC 1 1983

PAD:gp
cc: J. Shaw
E. Lindstrom
L. Cahill
W. Latimer

12/5/83 Copy sent per LCTravis to:
MASHARP

Peruvian Lead Crude	Chimbote Peru	Samincorp	X
Pacococha Cts.	Callao Peru	Cia.Minero Pacococha	2X
Picasso Cts.	Pisco Peru	Cia.Minera Picasso	2X
Quiruvilca Cts.	Callao Peru	Northern Peru	X
Read Rosebery Cts.	Tasmania	EZCO	2X
RioPallanga Cts.	Callao Peru	Cia.Minera RioPallanga	2X
Raura Cts.	Callao Peru	Philipp	2X
San Ignacio Cts.	Chimbote Peru	Samincorp	X
Sucuitambo Cts.	Matarani Peru	Hoschild	4X
Santander Cts.	Callao Pe ru	Cia.Minera Santander	X
Sayapullo Cts.	Salavery Peru	Cia.Minera Sayapullo	2X
Sunshine Pyrite Cts.	Kellogg Idaho	Sunshine	2X
Sunshine Cu.Cts.	Kellogg Idaho	Sunshine	4X
Uchuchaqua Cts.	Callao Peru	Minera Bueneventura	2X

The preliminary list of the materials diverted between the present smelters and some extinct ones (in past, present and possibly future):

NAME OF MINE OR ORE	SHIPPING POINT	SHIPPER	
Atacocha Cts.	Callao Peru	Grace	X
Alianza Cts.	Callao Peru	Cia.Minera Alianza	2X
Arcata Cts.	Matarani Peru	Cia.Minera Arcata	4X
Amax Residue	St.Louis IL	Amax	special
Baming Crude	Arica Or Antofagasta Chile	BancoMinerodeBolivia	X
Bolivian Lead Crude	"	"	X
Buchans Cts.	Newfoundland	Buchans	X
Buick	Buick MO	Buick	X
Buick Homestead Cts.	Buick MO	Homestead	X
Castrovirreyna Cts.	Pisco Peru	Philipp - Grab 2X or 4X	
Condoroma	Matarani Peru	Samincorp	2X
Condoroma	Matarani Peru	Hoschild	2X
China Mail	Hong Kong	Otis Bland	2X
Caylloma Cts.	Matarani Peru	Metal Traders	4X
Candlasa Cts.	Pisco Peru	Grace	2X
Cia.Africana Cts.	SanAntonio Chile	Santiago	2X
Crescent Cts.	Kellogg Idaho	Asarco	4X
Esquilache Cts.	Matarani Peru	Philipp	2X
Elura Cts.	Australia	EZCO	X
Farrell Cts.	Tasmania	Burnie Co.	2X
Frontino Crude	Buenaventura Colombia	Frontino	2X
Gubbings Cts.	Callao Peru	Philipp	2X
Galjuf Cts.	Santiago Chile	Metal Traders	2X
Galena Cts.	Kellogg Idaho	Asarco	4X
Glover Dross	Glover MO	Asarco	X
Huanco Cts.	Pisco Peru	Philipp	2X
El Indio Crude	Coquimbo Chile	Indio Mining	4X
Julcani Cts.	Callao Peru	Cia.Buenaventura	2X
Korean Lead Crude	Inchon Korea	Otis Bland	2X
Kidd Creek Cts.	Timmons Ont.	Texas Gulf	X
Kidd Creek Res.	"	"	special
Los Cordes Cts.	Valparaiso Child	Los Condes S.A.	2X
Leadville Cts.	Leadville CO	Asarco	2X
Lucky Friday Cts.	Wallace Idaho	Hecla	2X
Los Andes Cts.	Callao Peru	Minero Peru	2X
Milpo Cts.	Pacasmayo Peru	Grace & Philipp	X
Miranda Cts.	Pacasmayo Peru	Philipp	X
Miranda Cts.	Callao Peru	Philipp	X
Mt. Isa Dross	Australia	MIM Ltd.	X
Millacocha Cts.	Callao Peru	Metal Traders	4X
Morococha Cts.	Callao Peru	Cia.Minero Morococha	2X
Midvale Cts.	Midvale Utah	UV Industries	
Peruvian Lead Cts.	Callao Peru	Samincorp Grab from	X,2X or 4X
" " "	"	M. Hoschild	"
" " "	"	Philipp	"
" " "	"	Samincorp	X

GENERAL

Diverted Material Weigh In/Out:
All diverted material is received in railroad cars, some in bulk, some in barrels or bags.

Railroad cars: Weighed in on BN's East Helena depot scale.

Present for weigh in are: [redacted]
Asarco Weighmaster
Shipper's Representative

Scale tickets are left in scale house until cars are tared out after unloading. Cars are uncoupled and weighed individually.

Prior to the arrival of the cars, the shipper mails the bill of lading to the smelter with information as to car number, shipper's lot number and weight. The depot agent receives similar information from the BN called a weighbill. The Asarco weighmaster compares this data and prepares the necessary paper work for the process through the plant.

After weigh in the cars are brought inside plant to appropriate spots for handling. Concentrates, residues, dust, etc., to Hopto unloading.

If there is free standing water in the car, the water is removed before any sampling is done. This condition is most prominent during winter when thawhouse has to be used. Handled as follows:

(1) Pumped into 55 gal. drum or drums if amount isn't very much. Thereby obtaining the number of gallons which, by calculated weight, is deducted from net weight.

(2) Dipped or ladled out with backhoe if significant amount of water. Done by digging a hole in one end of car, water runs into hole and is bailed out with Hopto bucket. Car is then reweighed.

Barrels, Drums, Cartons, or Sacks:

Rail car received and weighed in over BN scale, unloaded and tared out. After dumping material out of original containers, 10 containers are weighed on truck scale or, if sacks, 20 sacks weighed on high grade scale to obtain an average weight per container. Number of containers is known. Tare calculated then deducted from original weight for settlement.

Present for car weigh in/out same as other rail cars.
Present for tare of containers: Mill foreman or moistureman,
Shipper's Representative

Moisture:

Sampled for moisture content by use of sample pipe. The pattern is six equally spaced rows along the car length and three equally spaced sampling positions in each row along the car width, making a total of 18 pipe holes per car. The sample is placed in a tightly sealed 5 quart plastic bucket and taken to the moisture room. Shook to obtain a good mix in the bucket, the lid is opened and 2000g are weighed on the Toledo scale. The sample is placed in the drying oven for 48 hours at 220°F and weighed out, with a direct reading on moisture content. Butcher waxed paper is used on the Toledo scale tray before the 200 are weighed in and transferred along with the material which moisture we are about to determine, into the dryer pan. This is done to prevent corrosion of the dryer pans. An equal piece of paper is put on the other Toledo scale tray where the 1500g weights are to protect the Plant against a 0.1% possible moisture loss.

The moistureman records the percent moisture read and also fills out the appropriate cards which the weighmaster will bring to the settlement office.

The foregoing generalities on moisture sampling apply to all diversions coming in except for Sunshine copper residue, drosses, residues, crudes and El Indio crude. These exceptions are explained under separate descriptions for these materials.

Control Sample:

Pipe sampled according to gold and silver content and homogeneity. Generally classed:

	oz/Ton Au	oz/Ton Ag	Pattern
Low Grade	<0.5	<100	1X
Medium	>0.5 <2.0	>100 <200	2X
High Grade	>2.0	>200	4X

SAMPLE PATTERNS :

PATTERN	HOLE PATTERN	TOTAL HOLES
1X	5 x 14	70

x	x	x	x	x	x	x	x	x	x	x	x	x	x
x	x	x	x	x	x	x	x	x	x	x	x	x	x
x	x	x	x	x	x	x	x	x	x	x	x	x	x
x	x	x	x	x	x	x	x	x	x	x	x	x	x
x	x	x	x	x	x	x	x	x	x	x	x	x	x

PATTERN	HOLE PATTERN	TOTAL HOLES
2X	2 (5 x 14)	140

```
X   X   X   X   X   X   X   X   X   X   X   X   X   X
  O   O   O   O   O   O   O   O   O   O   O   O   O   O
X   X   X   X   X   X   X   X   X   X   X   X   X   X
  O   O   O   O   O   O   O   O   O   O   O   O   O   O
X   X   X   X   X   X   X   X   X   X   X   X   X   X
  O   O   O   O   O   O   O   O   O   O   O   O   O   O
X   X   X   X   X   X   X   X   X   X   X   X   X   X
  O   O   O   O   O   O   O   O   O   O   O   O   O   O
X   X   X   X   X   X   X   X   X   X   X   X   X   X
  O   O   O   O   O   O   O   O   O   O   O   O   O   O
```

PATTERN	HOLE PATTERN	TOTAL HOLES
4X	4 (5 x 14)	280

```
X + X + X + X + X + X + X + X + X + X + X + X + X + X +
* O * O * O * O * O * O * O * O * O * O * O * O * O * O
X + X + X + X + X + X + X + X + X + X + X + X + X + X +
* O * O * O * O * O * O * O * O * O * O * O * O * O * O
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X + X + X + X + X + X + X + X + X + X + X + X + X + X +
* O * O * O * O * O * O * O * O * O * O * O * O * O * O
```

1X Sample	X
2X Sample	O
3X Sample	+
4X Sample	*

MOISTURE PATTERN	3 x 6	18

```
X   X   X   X   X   X

X   X   X   X   X   X

X   X   X   X   X   X
```

RESIDUE, CONTROL & MOISTURE PATTERN 5 x 7 35
One & the same sample

X	X	X	X	X	X	X
X	X	X	X	X	X	X
X	X	X	X	X	X	X
X	X	X	X	X	X	X
X	X	X	X	X	X	X

SAMPLE CUTTING BOX 3 x 9 27

X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X

SAMPLE SIZE CUT DOWN & COMPOSITES FOR MORE THAN ONE CAR PER LOT. BUCKING.

Each X pattern yields approximately 120 pounds of sample piped into two 2.5 gallon sample buckets. Therefore:

1X Sample	2 bkts
2X Sample	4 bkts
4X Sample	8 bkts

Each bucket of sample is identified with a manila card which has car number, material name and what X written on it.
Buckets are taken to Sample Cutter for further sample size cut down (Plateman).

Sample Cutting: 1 x 2X samples -- Each bucket from each X, one at a time, is forced through a 1/4" screen into a 27" long x 9-3/4" wide x 12" deep steel box, small hand shovel hand mixed, leveled and piped a 3 x 9 pattern with a 1" x 12" pipe sampling spoon -- see Sample Cutting Box pattern for detail. Piped once for the control sample and once again for the reserve sample. The other bucket of respective X is piped likewise into the same common control and reserve pans. Should there be more than one car per lot, all 1X's are piped to their common pans and all 2X's to their common pans. This process reduces sample to a 12-15 pound sample per X. (See Composites.)

Pans are placed in Bucking Room to await final sample preparation. Reserve portion sacked (see detail below on how this is done).

4X samples -- all buckets of each X are worked through a 1/4" screen onto a circular table. Sample is then ring and coned 3 times, flattened, quartered, 2 opposite quarters discarded. Remaining sample ring and coned once, quartered and half discarded again. Remainder ring and coned once, quartered, 2 opposite quarters taken for control sample, other 2 quarters reserve sample.

A 15 pound sample is desired even if lot is larger than normal. Therefore, additional ring and cone, quarter and discards may be necessary to obtain proper sample size.

Control sample put in red fiberglass pans and set in Bucking Room dryer. All empty buckets are washed with soap and water before reusing.

No 4X car can have more than one car per lot but 2X can, especially if they are South merican standard boatloads.

Rejects -- are kept in plastic bags at one bucket to one bag and the two bags per X (from 2 buckets) go in one paper bag. The paper bag is marked on the outside with lot number, car number, date and if it is X or XX. If there are more than one car per lot, each car will have a paper bagged reject with two plastic bags in it per X. For example: A 2 car lot 2X's will have 8 buckets and therefore 8 plastic bags in 4 paper bags properly marked as X or XX, 2 for car A and the same for car B.

The foregoing ritual has a good reason for being: Should the X's not check within 1% of their mean, the rejects are rerun. If the reason for the discrepancy was a mixup in the buckets and the buckets rejects were not kept

separate, the error could never be properly corrected. It is of capital importance to find out the reason for each discrepancy. in all cases, to run a tight ship and thus prevent losses, accidental or deliberate salting, etc. Inside each plastic bag he puts a manila card with all descriptions for I.D.

Composites of more than one car per lot:

At East Helena, they are done on a wet basis because dry material won't pipe in the box and because of dusty and unhealthy conditions. Other plants do it dry and we have no objection if they can lick both effects. Mathematical analysis of maximum standard deviation show that the possible error is negligible with our receipts. A bonus benefit of compositing by wet weight is storage space reduction for the buckets and in the dryers.

For each X, two cars lot, the weight per car going to the pan is 1 oz per ton. Example: A two ±100 tons each , two car lot two X material will have 2 pans (one pan per each X). For car A weighing 98 tons the Plateman will pipe 1/2 of 98 oz per each bucket of the X sample and same for the 2X sample. For car B, weighing 100 tons, he will take 1/2 of 100 oz. He will therefore have two pans weighing 12.375 pounds wet each and marked X and XX with the proper tickets in.

The materials in the pans are not mixed yet. Car B is on top of car A. That is why on the single X concentrates report, under "Fine Grinding" the materials are processed as described there.

For a three car lot, the composite is made at 3/4 of an oz per wet ton, the rest being the same as described above.

For the purpose of composites we use a NLC scale Model 3210-30, digital, zero button, oz display with a 500 oz range at 0.2 oz retailing for about $700 each. After the clean pan is put on it, the zero button is pressed to erase that weight and start from zero oz until the proper weight is reached. The zeroing is repeated after the first bucket of car A X is in, again after the 2nd, again after the first bucket of car B X is in, etc., for three car lots.

For accidental salting control we use color coded pans, red for 4X's, green for X or 2X's. The pans are fiberglass and withstand 220°F without problems on a 6 year life expectancy.

Bucking: Number of pulps needed are determined by shipper, lab, and umpire requirements. Usually, two pulp sacks for our assayers and one for our lab's chemist, two sealed pulps for umpire: one pulp for reserve and two for shipper. That is a minimum of seven pulp sacks or 5-1/4 pounds sample to the rod mill per X. Bucker needs to know number of pulp sacks to determine how much sample to weigh out for control sample. About 3/4 pounds per sack for heavy concentrates and less for lighter ones.

Sample is removed from dryer, whole sample dumped into rod mill or cube mixer, mixed for 15 minutes, dumped into a pan and determined amount of sample weighed out on a balance scale. Remaining material is reserve sample from which composites are made; if not required, discarded.

Weighed portion of sample is put in rod mill and ground from one to four hours, depending on material, until all passes through 100 mesh. Should there be scales they are recovered off the screen, placed in a separate pulp sack and sent to lab appropriately labeled along with the pulp.

After screening, sample is put back in rod mill with mixing bars or cube mixer, mixed for 15 minutes, dumped into a pan and then hand scooped into pulp sacks. Sometimes it is just cloth mixed before scooping.

For composites on boatloads, an amount proportional to the dry weights of each of the lots is weighed out, combined together, ground, screened, mixed and pulped. Pulps taken to lab for distribution. Boatload composites are made dry, by the Buckers and not by the Plateman.

SINGLE X CONCENTRATE SAMPLING

Moisture: Sampled for moisture content by use of sample pipe. The pattern is six equally spaced rows along the car length and three equally spaced sampling positions in each row along the car width, making a total of 18 pipe holes per car. The sample is placed in a tightly sealed 5 quart plastic bucket and taken to the moisture room. Shook to obtain a good mix in the bucket, the lid is opened and 2000g are weighed on the Toledo scale. The sample is placed in the drying oven for 48 hours at 220°F and weighed out, with a direct reading on moisture content.

Control Sample: Made by use of sample pipe. The pattern is 14 equally spaced rows along the car length and 5 equally spaced sampling positions in each row along the car width, making a total of 70 pipe holes per car. The samples, in two buckets, weighing about 50 pounds per bucket, are cut down in the Sample Mill building by the 1/4" screen box and pipe method to approximately 12 to 15 pounds and placed in a sample pan. After a minimum of two days drying, the sample is ground.

Fine Grinding: The entire sample pan is placed in a clean rod mill and tumbled for 5 to 10 minutes. The rod mill is emptied back into the pan and 3/4 of a pound per sack of pulp needed is put back into the rod mill for final grinding. This sample size cut down is done by random increments from pan to scale to obtain the average of 5 or 6 pounds which will be ground to -100 mesh. After the grinding is done, the material is screened and the pulp sacks are filled by random increments. After screening, sample is put back in rod mill with mixing bars or cube mixer, mixed for 15 minutes, dumped into a pan and then hand scooped into pulp sacks. Sometimes it is cloth mixed.

Other Miscellaneous: If the railroad cars are too deep for the pipe to reach the bottom of the car, then the car is unloaded and the concentrates flattened down on the pad before pipe sampling. Any material caught on the 1/4" screen during the original cut down is sent to the lab along with the weight of the original two buckets of sample for the so called metallic correction.

Any scales caught on the 100 mesh are sent to the lab along with the weight of the final load to the rod mill for correction. If any scales appear on the 100 mesh screen, they are bucked and put back on the screen. Only what won't go through is sent to lab as scales. If scales appear and are bucked through, the sample is cloth mixed before loading the pulp sacks.

If the boatload has several cars, they are lotted up to 3 cars per lot. The sample in such a case is composited by net wet weight at the time of the original screen box cut down so the sample going to the Buckers is already composited. The moisture is not composited. Each car yields a dry weight.

DOUBLE AND FOUR X SAMPLES:

Moisture: Except for Sunshine copper residues, described in a separate report, all double and four X's moisture samples are the same as the single X; one pipe sample, 18 holes pattern, 5 quart sealed lid plastic bucket, 2000g weighed in, 48 hrs drying time at 220°F and direct reading on special Toledo scale. The waxed paper put on the Toledo scale tray before the 2000g are weighed in is in all cases balanced by an equal piece of paper put on the other tray where the 1,500g of weights are. If this correction was not done, the average error would be about -0.05% against the Company, which affects the next tenth and amounts to more than $3,000 per month now on a 20,000 unit.

Control Sample: Different patterns as described on separate Patterns Report with 140 holes for double X and 280 holes for four X.

Fine Grinding: As described on the August 3, 1983 report for single X, the difference being that we start with two single X's (a 2X) or 4 single X's (a 4X) for that same car, depending on the grade.

Other Miscellaneous: Same as on the above mentioned report. In addition, if the material is traditionally spotty in nature, such as Lucky Friday, Galena, etc., the cars are mixed by backhoe in the car and leveled before pipe sampling in the car. An alternative often used is to unload the car first (after moisture sampling) to a clean concrete pad, mix and level there and pipe sample on the pad.

AMAX ZINC PLANT RESIDUE SAMPLING PROCEDURE:

Arriving in railroad cars, the Amax residues are settled on 3 cars per lot for metal content, the sample being composited by dry weight. The dry weight of each car is determined individually. The moisture and control samples are both taken at the same time because they are one and the same. It is done by pipe and using a 35 hole pattern with 5 rows of 7 holes each:

1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5

Prior to the arrival of the cars, the shipper mails the bill of lading to the smelter with information as to car number, shipper's lot number and weight. The depot agent receives similar information from the Burlington Northern called a weighbill. The Asarco weighmaster compares this data and prepares the necessary paper work for the process through the plant.

After the cars go over the BN scales, they are sampled in the car and unloaded by Hopto backhoe to stock or use. About half go to stock because several residues are premixed on the ground before being moved to smelting. In the winter time, the cars must sometimes be thawed before weigh-in for settlement.

The sample is taken in a 2-1/2 gallon rubber bucket to the moisture room where it is mixed and cut down to 2,000 gms which is put in the dryer at 220°F for 48 hours. After the moisture content is determined, the sample pan is covered and saved in a warm cabinet until all three cars constituting the lot have been sampled.

The weighmaster prepares a compositing list showing the dry weight of each car in pounds. The bucker will then take each of the three pans and coarse grind them in the Englebach. He will then take 1/200 of that weight, measured in grams, out of each pan and screen it through 100 mesh. The coarse he will put back in the grinder and screen again. After this operation, everything will go through the mesh. He will then cube mix the sample for 10 minutes and sack pulps. The leftover is paper sacked and saved as a lot reject.

SUNSHINE COPPER RESIDUE:

We found that this material, due to its chemical constitution, while losing moisture in the drying ovens, also gains weight. The curve of weight loss against time reaches a minimum and from then on it increases. For this reason, the sample preparation procedure differs from our standard way where we take a moisture sample to determine the percent water in the subject material and a control sample to determine the metal value. With Sunshine copper residue, the same sample used to determine the moisture content is subsequently ground and used for control determination of the metal value. A description of the entire procedure follows:

The samplers must wear rubber boots and gloves as the strong basic material attacks leather. The cars are weighed over the BN scale and brought into the smelter yards by the switch engine in the morning. If there is any free water in the car, it is siphoned out and the car is reweighed. The cars are unloaded by crane or Hopto backhoe over concrete pads which have been swept clean, into one car piles, as there is one car to each smelter lot.

The piles are mixed on the ground once again by crane or Hopto and flattened down to no more than 20 inch depth in order to insure that the pipe will penetrate the entire pre body.

Usually two samplers will take the 4X sample patterns which contain 70 pipe holes each and yield two sample buckets of 30-40 pounds each. This is a total of 8 buckets, 280 pipe holes and 240 to 320 pounds of sample from four identical and independent samples.

Care is taken that each set of two buckets representing one sample, which is one pattern of 70 holes covering the entire pile surface area, are properly marked. This is done by putting a tag in the bucket in the field after it is full, or by making holes in it with the pipe cleaning stick.

The sample buckets are taken to the cutting room and processed in pairs. They are pushed through a 1/4" mesh screen which sits atop a steel box 9" x 27" x 12", one bucket at a time. After the first bucket goes through the screen, the screen is removed and the material is mixed by means of a small hand shovel and tamped down inside the box. It is then pipe sampled with a special pipe using a 27 hole pattern of 9 rows by 3 holes each in the steel box.

Two patterns are made from each bucket, the samples going to two separate containers. One of them is the control and the other is the reserve. The procedure is repeated for the second bucket which joins the same containers. This finishes one X's sample.

Each pair of buckets follows the same procedure, the total yield being 4 control samples (4 X's) and four reserve samples.

The reserve samples are kept in plastic buckets with sealed lids, which are standard ice cream 5/4 containers. The control samples, in special teflon lined moisture pans and weighing 2000 to 2500 gms each, are precisely weighed in on a OHAUS scale and put in the high grade drying oven for 48 hours at 220°F.

After the pans are weighed out dry and the moisture content calculated, recorded and reported to the weighmaster by the moisture man, the high grade bucker puts the entire pan contents in the rod mill and grinds and mixes it for 5 to 10 minutes. The rod mill is emptied back into the pan (this procedure is done with each X of the 4 X's in 4 different rod mills).

The idea is to get a thorough mix. He then weighs out 1500 grams from each pan. The 4 samples are put in four rod mill drums and the timer set for 4 hours grinding time. This is usually done at the end of the shift so the samples are ready to be cut down the next morning.

Each sample is subsequently passed through a 100 mesh Tyler screen, cloth mixed, split and bottled. The number of bottles is as follows:

1 set 4 X's..... Shipper
1 set 4 X's..... Asarco Lab
1 set 4 X's..... Reserve
1 composite for Umpire.
1 composite for Reserve.
1 composite for Asarco Chemists.

Note: No metallics or scales are produced from this material so there are no corrections for the pulp assays.

General: Because of the high value nature of the Sunshine copper residue and its corrosiveness, all the equipment used for sampling this material is used exclusively for that purpose or washed thoroughly afterwards. This includes neoprene rubber sample buckets, stainless steel sampling pipes, cutting box, screen, pipe and shovel, polyethlene reserve buckets with tight lids, teflon lined moisture pans, rod mills, Tyler screens and bottles. A high grade drying oven, a high grade bucking room, a high grade scale, along with a high grade bucker.

CRUDE ORES SAMPLING PROCEDURE AND EL INDIO:

Moisture Sample: Depends on what weight is used for settlement as to when and how the sample is taken. In both cases, it is right after the settlement weigh.

If settlement is on receiving weight before crushing, as is the case on all diversions of crudes except El Indio, while still in the rail car, 4 or 5 holes are dug around piles and representative shovel sample taken, i.e., judgement of Moistureman as to percent coarse, fines, etc. Moisture sample is also the grab sample.

If settlement is on after crushed weight, as is the case with El Indio, the material is piped in car with a long 40" pipe sampling spoon. If only a small amount, 3 holes are dug in pile in car and moisture sample taken along side of holes. On this type of settlement, a separate grab sample is taken on as received before crushing.

Lotting of El Indio cars is done by the Weighmaster after crushing. The original weight of the incoming cars is used only for freight costs. To use incoming weights for settlement, with after crushing moistures, can be a very costly mistake.

Moisture samples are mixed on moisture table, 2000g weighed out on moisture scale, set in dryer for 48 hours, weighed out and sent to Buckers if grab is desired. With El Indio, 4 moisture samples are taken, each weighing about 6 pounds, weighed individually down to the gram. The moisture is calculated after 48 hours drying and thereafter weighing. Average of all 4 samples is used for the car dry weight.

Control Sample: Cut from main stream via 3 Vezin Samplers. Bulk of material is crushed -3/8". Sample -3/16". Each Vezin sampler cuts out 1/5 of stream, if passed through all three, 1/125 of material crushed ends up as sample. 100 tons yields 1600 pounds of sample which fills two sample carts. Depending on lot size or value only one or two Vezins may be used.

Sample carts are wheeled to Head Bucker's room for cut down.

Grade of crude ore is determined from grab sample results. Crudes are classed like concentrates but gold and silver content for any given class is half again as low. This is because there is a tendency for free gold and spottiness in crude ores.

Sample Cutting and Bucking: Regardless of grade, for each given lot, before X's are cut out, Bucker starts with only one cart of sample. Therefore, if there are 4 carts representing one lot, each cart is twirl mixed 3 times and quartered by passing sample through 33-1/2" Jones Riffle twice. Others quartered likewise into same cart to make one cart that is representative of the lot. Rest of sample is discarded.

Twirl mixing is done by raising a full sample cart over an empty one and controlling the flow of material from upper to lower via slot gate in bottom of cart while rotating twirling upper cart. Jones 33-1/2" Riffle fits on bottom of sample carts. Riffling is done by raising full cart with riffle attached over 2 empty carts or a cart and wheelbarrow dropping material through slot gate into riffle, which splits sample in half.

Low Grade Crude, 1X - lot sample twirl mixed 3 times, riffled and half is discarded. Riffled again, reject half saved in wheelbarrow. Control sample continues to be split with reject added to reject wheelbarrow until sample is about 30 pounds in cart. Then sample is riffled into 2 long pans. One, the control sample, is placed in a regular sample pan and put in bucking room dryer. The other, reserve sample, is sacked with about 40 pounds shoveled from reject wheelbarrow.

If any crude classed as single X is known to have metallics, the "sample size reduction" by riffling stops at 150 to 200 pounds and the material is rolled and 10 meshed before the X is cut out, just like any medium grade crude 2X.
Medium Grade Crude, 2X - lot sample twirl mixed 5 times, riffled, and halves discarded until roughly a 150 pound sample is obtained which is then passed through the smooth rolls and 10 meshed. If any metallics are present they are sent to the lab with the weight of the sample they originated from. The first X is subsequently cut by riffling down to 15 pounds. The rejects from the 10 meshed sample go to a clean sample cart.

To get the second X sample, reject is worked in same manner. From what is left, 90 to 100 pounds is shoveled out for a lot reserve sample. Remainder discarded. The sample pans are set on the dryer for at least 24 hours.

Low and medium grade crude ore control samples are Englebach crushed and pulp sacked. About 5 pounds are scooped up at random from the sample pan and screened through 100 mesh.

High grade crude, 4X - from all crude diversions, only El Indio falls into this class - lot sample twirl mixed 6 times, riffled, reject half saved in 55 gallon barrel as reserve sample. Control half riffled down to approximately 150 pounds discarding riffle reject. Sample then weighed on floor balance beam scale. Next, whole sample is smooth rolls crushed (known as "rolled") and Vibra screened -10 mesh. Scales recovered are weighed on OHAUS scale, sacked and sent to lab with control sample along with the weight of the sample they originated from, -10 mesh part of sample is ring and coned 3 times, quartered, 2 opposite quarters set aside; 2 quarters left ring and coned once, quartered, and half again set aside with other; continues until one quarter is about 15 pounds for control sample and opposite for reserve. This is the 1st X.

All material that had been set aside is ring and coned 3 times and processed same for 2nd X. Redone in same manner for 3rd and 4th X s. Whatever is left is discarded. X s are put in high grade bucking room dryer.

1000 g are randomly scooped from each X and placed in Rod mills. Remaining material saved as high grade reserve sample. X s are ground -100 mesh, pulp sacked and sent to lab.

SAMPLING OF MT. ISA DROSS:

As explained under Generalities, for drummed diversion drosses such as Mt. Isa, the received railroad car is weighed in when it comes in the summer or after thawing in winter. After dumping the material out of the original containers, about 10 empty drums are weighed on the truck scale. The number of containers (drums) is known. The car is tared out empty and the calculated total drums tare is deducted from the original gross weight to arrive at the net wet weight for settlement.

Moisture Sampling: Done by shovel out of the pipe after the drums of each car are dumped. Standard procedure as described under Generalities from here on.

Control Sampling: As the barrels are dumped with the forklift special drum dumper attachment, one out of every 5 drums is emptied into a separate "sample" pile while the next 4 go to the regular pile. In this manner, out of an average + 75 ton car, the random sample contains about 15 tons. This sample is later, when the Crushing Mill is ready to make a Mt. Isa dross run, passed through it with all 3 Vezin cutters in use to obtain about 240 pounds of sample.

Bucking: The Head Bucker handles the cut down of the sample size as he does with all crudes by twirl mixing it twice and splitting it also twice through the Ad-hoc Jones Riffle, thereby reducing the sample size to 50/70 pounds. The last split giving the control sample also yields the opposite half saved for rejects.

The sample is screened through 1/4 mesh, the plus fraction rolled once and screened again. Plus 1/4 metallics are weighed and sent to the lab with notation of the sample's original weight for metallics correction of the final settlement assay. The minus fraction is coned and ringed on the steel floor by shovel and cone quartered to 12-15 pounds which go to fine grinding. All rejects from this operation are discarded. The sample pan is set on the dryer.

Fine Grinding: About 5 pounds are scooped up at random by the regular Bucker and Englebach ground and screened through 100 mesh. The +100 mesh scales are sent to the lab with notation of the weight of sample they originated from for scales correction of the final settlement assay.

GLOVER DROSS SAMPLING:

This differs from Mt. Isa dross in that it arrives in bulk and has a lot more size spectrum from + 10" to powder.

Moisture Sampling: Handled like a standard crude ore.
Control Sampling: By shovel, after the car has been unloaded and in a grab fashion where coarse and fines ratio is estimated by the sampler and he takes about 70 pounds of sample per car.

Bucking: It is settled on a monthly composite sample described as follows:

GLOVER DROSS COMPOSITE For month of _____

Car Number	E.H. Lot	Glover Lot	Weighmaster Car Dry Wt.	Head Bucker +10 Mesh	Grams for Coarse Comp.	Head Bucker -10 Mesh	Grams for Fines Comp.

PROCEDURE:
The Head Bucker weighs the total sample he receives from each car for the month in question and screens it through 10 mesh. He rolls the plus and screens it again. When no more, size reduction is possible, he weighs the coarse and by difference arrives at the weight of the fines. He writes both figures in the columns provided in this form. These figures are the key to the subsequent settlement calculations made by the lab. The Head Bucker saves enough of both coarse and fines until the end of the month to make the composite with the figures the Metallurgist gives him and he discards the rest of the sample. This procedure is done throughout the month as the samples arrive to him. He does not wait until all the samples are in for the month to start his screening and weighing or he would run out of storage room. The only thing he has to provide are: Enough sample saved to make his composite at the end of the month, and the ratio split of coarse and fines in each car.

At the proper time, when this list is made with all the cars involved in that month composite and the Weighmaster can provide the Metallurgist with all the dry weights, the Head Bucker will make the composites for fines and coarse using the number of grams for each car. They will be written on this form by the Metallurgist.

For the coarse fraction, the Head Bucker will make a 50 pound composite which he will mix well and split into two equal bags of 25 pounds each. For the Fines, he will make one 5 pound pan composite which he will take to the Buckers for fine grinding.

The Buckers will split a Reserve part out of the 5 pound pan and fine grind the rest after weighing it. They will sack up the pulp and record the screen scales obtained and send them to the lab along with the weights recorded. Here, too, this information is vital: The weight of the scales and that of the portion they were obtained from.

The lab keeps one 25 pound coarse bag in reserve (we don't run that here) and sends the other one to the Umpire Lab in El Paso. Our lab runs the scales to extinction (no set for El Paso) and assays the pulp. Sends some pulp packages to the Umpire Lab as their assay settles.

With El Paso returns at hand, our lab calculates the value of the scales into the pulp assay and also calculates (by weighted average) the assay of the coarse fraction assay received from El Paso, using the Head Bucker's original "split" as they appear on this form.

May 22, 1996 Summary of a Meeting
Between Mr. Novotny and the Union

Attachment 5

Union Company Meeting with Bob Novotny - May 22, 1996

On May 21, 1996 Local 72 asked for a meeting with Bob Novotny, the Company and Union JLG group. On May 22 a meeting was held and in attendance were R. Novotny, J. Shaw, T. Tenneson, T. McIntyre, O. Johnson, L. Doney, G. Murdock, G. Hughes, B. Waddington, B. Cox, J. Jones and J. Verbanac.

Tenneson opened the meeting by stating that about a month before negotiations everything was going well and suddenly everything came to a screaming halt. He said the Union was not happy and felt the Company was not cooperating after both sides had made a commitment. He stated that he heard Bob Litle told upper management that the Union "took and took and took".

Shaw corrected him by saying Litle said the Company "gave and gave and gave."

Tenneson asked Novotny to expound on the Partnership from the corporate viewpoint.

Novotny asked the Union what they wanted out of the partnership. He said he was kept in the dark by the consultant. He said he saw the presentation from the JLG group in November and was both happy and disappointed and reflected what he knew about the problems Great Lake Steel had ... and also that they had an end result of a reduction but they survived, while other companies failed. He added we are in the same situation as Great Lakes Steel.

Novotny told the Union members that both the local Union and the Company wanted to have negotiations here in East Helena, however the staff representative for the Union thought they would lose direction and not be able to carry out business as needed.

He went on so say that Otto Johnson was renowned for his participation in the computer balancing system and that, to him, was the perfect example of employee initiative and what a cooperative partnership was all about.

Novotny told the group that he was not saying that East Helena was going to shut down but the lawsuit from the EPA says we willfully broke the law and 6 Hydrometrics employees will be testifying before the Grand Jury in this matter. He also said that we must be in total compliance with the Lead SIP by 1-1-97 and one disgruntled employee could screw the whole thing up. He pointed out that regulatory agencies make it hard for a lead company to operate and that we need change, commitment and support to continue to be around.

He spoke of selling Ingitech to the Board of Directors, and stated it would cost appx. $150 million to put the process in East Helena (which he feels is the logical place)... but he wasn't going to go before the Chairman and ask for the money when we have a group here that is out of control. He specified by talking about belt buckles with holes burned

into them, derogatory letters from employees to New York, and phone calls from employees to agencies such as OSHA and the EPA (without first trying to solve the issue). He wanted the group to ask themselves if with those kinds of things going on, do we really expect consideration. He added that this was not a threat but that things have got to change.

Tenneson said he thought bringing in John Shaw was a good move for the plant and asked why management was always saying labor costs were killing us. To this Novotny told the group what workers compensation and medical removals cost for 1995. This amounted to appx. $1.3 million for 1995.

Tenneson said the Union wanted input into all aspects of the plant and Novotny told him that the dross reverb problem was a great start in soliciting everyone's help to secure the collective future. Novotny added that projects like this were the way for the partnership to go.... instead of dealing with issues from ten years ago. He stated the reality of the situation is that we all need to act as soon as possible. Tom Tenneson added that he personally didn't vote for returning Bob Stump (the CORE ROI consultant) because of personal reasons, but felt we need to move forward with the partnership and deal with real issues.

Bob Novotny expressed extreme displeasure in the frequent phone calls to OSHA and the EPA, including a phone call to OSHA made a few days prior to the meeting. This type of handling problems solves very little and affects everyone's future. He stated that we have spent 12 million in improving exposures and will continue to work on them. The fact that 5% or fewer of the guys in the plant who hate ASARCO call OSHA and can ruin it for everyone. . He also stated that the Region 8 office of the EPA is doing whatever it can to put ASARCO out of the lead business.

Tom Tenneson said that an area manager told him to call OSHA about the pressurizers in mobile equipment and that was what the recent call had been.

Bob Novotny stated that the partnership had better things to do than keep "everyone happy". He reiterated that there were critical issues for the plant, and collectively they needed attention. This was started in the Under the Roof Committee and because it was translated to the people in the plant by a "few" people as a way to eliminate jobs, it has been a problem. He said that reality is we have to look at areas such as job productivity, that there is plenty of work for our workforce and that the partnership should look at some of the tough 20 year old issues. He also felt that it wasn't the partnership job to get into contract interpretation or changes as its primary focus.

Tom Tenneson said he didn't want to play games and asked about gainsharing. John Shaw talked about gainsharing that was in place at other ASARCO facilities and said information and background work was available. Bob Novotny feels gainsharing is a possibility at East Helena and could be based on items such as cutting Workman's Comp

costs, improving safety and other real type issues. He also stated that he's not talking cutting jobs, but rather working through inefficiencies, cutting costs and deviations and trying to enhance the future of the smelter and all employee's jobs. He feels this can be done.

J. Jones told the group that the majority of the people in this plant worked hard and did what they could to help out. However, he stated there were a few employees who even get to the point of going and attacking the company at public meetings on issues such as yard cleanups. He felt that there is a limit to "company hating" and if it's that bad for the few guys who do all they can to impact all employee's futures, then they should find another place to work. He then cited two examples of inaccurate information given to citizens regarding East Helena's financial position and future production forecast.

R. Novotny stated that the company does still have a negative cash flow and is nearly 900 million dollars in debt. To date, appx. 50 million dollars have been spent on environmental and CERCLA costs in East Helena. The fact is that ASARCO supports East Helena's tax base, schools, etc... and he has a problem with those folks trying to milk the company for every dollar it has.The Superfund model changes and is not consistent and it is having a negative affect on the financial health of the whole company.

Scott St. Clair felt that lawns in the end would cost more because of the attitude of Mr. Novotny. Mr. Novotny then informed Scott that without ASARCO there would not be an East Helena and until 1988 this was not an issue. Scott talked about money not being lent by banks for houses with elevated lead levels, etc... and Mr. Novotny stated that wasn't the company's fault. John Shaw also added the majority 70% of the city's tax base was paid by ASARCO and there is quite a bit at stake. Scott then said that people were "tearing out side walks and stuff" to prepare for new lawns and they had a right to be mad for not getting them. ASARCO contaminated them and should be responsible for cleaning them.

Mr. St. Clair then added that he was the one who called OSHA about loader pressurization, because of an incident of elevated cadmium. He said management was well aware of the problems and hadn't acted on them. Lloyd said Adam and others were working on the pressurizers and everyone was helping out. Scott stated it was just an informative call and not a complaint. John Shaw said some calls can start investigations that can cost the company millions of dollars and that proper channels should be followed.

Mr. Novotny felt that if there is a problem, it should be fixed, but walking around with 1-800-OSHA stickers won't do much for anyone. He said that we need to continue to improve and dedicated time to issues such as pressurizer maintenance. By working together and focusing, then these types of problems can be overcome.

In closing, Mr. Novotny felt that he'd add to or decrease the work force based on justification. He felt John Shaw was the right choice for the plant and that he could objectively assess situations such as employee numbers. He added again that the company has just invested another $40 million in East Helena and that we have a future if we re-focus our intentions on real problems and controlling our business. He again added his comments about being frustrated with the OSHA, EPA threats and felt that it was everyone's futures being affected by those actions.

A tale of alchemy, complete with moral

By GEORGE OCHENSKI

alchemy: *a medieval chemical science and speculative philosophy aiming to achieve the transmutation of the base metals into gold, the discovery of a universal cure for disease, and the means of indefinitely prolonging life. 2: a power or process of transforming something common into something precious.*

GEORGE OCHENSKI

Once upon a time, in a beautiful land called Montana, there lived a governor named Markie Mouse. Late one night, in the darkened rotunda of the Capitol, a giant cauldron hung suspended from an iron tripod over a fire built on the Great Seal. The flames, from burning volumes of environmental laws, cast eerie illumination as Markie and his top advisors stand in a circle wearing pointy hats and long robes adorned with mystical runes and stars. They chant, waving their magic wands back and forth over the cauldron.

"Boil, boil,
fire and turmoil...
Bubble, bubble,
W's in trouble"

From a side door labeled "Mis-Communications Director" stumbles the governor's Press Gnome. He has just returned from working on the faltering presidential campaign of George W. Bush. "Rats" he says, tripping over his too-long robe as he fades into the shadows at the Governor's side.

"We have been called upon to make powerful magic," says Markie. "If Bush goes down, we're all out of a job. Clearly, to be honest, we need to change me into The Environmental Governor and blame Clinton for everything, which will weaken Gore by association, so W can prevail. After considerable consideration I have determined..."

"Can it," says the white-haired Gnome, cutting the governor off in mid-babble, "We got work to do." Pulling a list of vital ingredients from his robe, he begins to read the archaic script from the state's new computer system.

"Ayes of Newt."

"Right here," says the chief of staff, pulling out a long list of Gingrich votes to deny aid to the poor, trash the environment and give inordinate tax breaks to the wealthy.

"Straight from DC."

"Tale of Woe"

"Got it," says the ex-campaign director, tossing in the latest polls on Bush's plummeting numbers. "We got Woe."

"Essence of ARCO."

The Un-natural resource advisor slops a bucket of Milltown Dam sludge into the mix. "We got tons more where this came from," she says.

"Whirling fish and fallen elk."

The director of Fish Hatcheries, Wildlife Farms and Parking Lots, fumbles with his too-short robe. "I got it, I got it," he says, tossing a handful of whirling disease infected trout into the pot. "Fresh from the Madison." Opening an envelope, he dumps powdery white ash into the mix. "This is all that's left of the diseased game farm elk we incinerated," he says, "but it should do...prions are hard to kill."

The liquid thickens as Markie stirs the pot. "Only a few more items," he says, "and then I'll be The Environmental Governor.

"We need more heat," says the gnome, pulling the framed copy of the Montana Constitution from the wall, "The peasants will never know — hell, they don't even need to know."

The mixture finally comes to a boil, Markie leans forward, tosses back a big scoop and falls to the floor. Everyone crowds in as Markie regains his senses. "Did it work, did it work?" he splutters, "Am I The Environmental Governor now??"

"Let's test it out," says the Gnome. "What's your single biggest concern?"

"Forest Health" says Markie. "Excellent, excellent" says the Gnome. "Just one more test. Here's a bill fresh from the legislature exempting Open Pit Mines from reclamation. And here's a pen. What are you gonna do?"

Quick as a flash, Markie's hand snatches the pen and he signs the bill into law. "NO!" cries the Gnome, but it is too late. "The magic didn't work," he says, desperation showing in his beady eyes. "We need something else. Call in the Fish Witch!"

"Not the Fish Witch" moan the fledgling socerers, pinching their noses, "she reeks."

"Live with it," says the Gnome, "only she can bring us what we need." Pulling a cellphone out of his robe, he hits an auto-dial number. Minutes later, the Fish Witch appears, riding a four-wheeler with a "Chenoweth for Congress" sticker on the tank. A trail of blue smoke leads back toward Idaho...

"Hate to call you in on such short notice," says the Gnome, "but we're having a helluva time turning Markie into The Environmental Governor. Can you help us out?"

"I can," says the Fish Witch, leaning close and peeling back her robe to reveal a dried, very smelly fish. "This is the last salmon from Redfish Lake...there will never be another."

"Excellent," says the Gnome as the Fish Witch tosses the salmon in the pot. "If this doesn't do it, nothing will." But then, he notices one last ingredient on the list, something so unusual that he had overlooked it first time around. "Whooa" he says, "we might be in trouble."

"Clearly, to be honest with you, after much deliberation and considerable consideration I have to say it is time to make these decisions based on science and to move forward working together..."

"Can it!" says the Gnome, cutting off Markie in mid-babble. "It says here we need one dram of pure water."

Everyone looks around at each other with worry in their eyes. Since Markie took office, clean water has been very hard to come by in Montana. But the director of the Department of Environmental Destruction, his shifty eyes going round the circle of alchemists pulls a tiny vial from his robe. "The last in Montana" he whispers, reaching out to dump it in the pot. The vial, however, slips from his hands, shattering on the new tiles of the Capitol floor.

And that, kiddies, is why Markie Mouse never did become The Environmental Governor. The moral of the story? Keep your water clean — you can never tell when you're gonna need it.

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