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James Doyle Sell Mining Collection

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K. R.
JAN 18 1957

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

January 16, 1957

Mr. K. E. Richard, Chief Geologist
Tucson Office

Special sampling of diamond drill sludges at the East Pima project was started in October, 1956 and terminated in December.

Objectives of this test work were:

1. To determine performance characteristics of the "Ray" type sludge splitter as to volume, weight and assay of samples cut.

2. To check sludge loss to sample overflow.

The more important findings of these tests were:

a. The "Ray" type sludge sampler averages a 8.11:1 cut by total volume within a range of 9.3:1 to 7.19:1; and a sample by moss (dried precipitate) of 7.37:1 in a range of 8.25:1 to 6.58:1.

b. The 1/8th split shows a loss of sample to overflow of 3.5% in a range of 2% to 22%, whereas, the 7/8th split loss to overflow averages 36% over a range of 17.7% to 56.3%.

Assay loss to overflow varies from no change to - .18 Cu with a head sample of .32% Cu. Insufficient assays were available to set an exact loss but it will average for these tests about .03 Cu, with the 1/8th and 7/8th splits being very similar in this respect.

Copper values in the mineralized zones drilled are too low to be of much value in direct comparison on the attached graph. As a result of scanning reports on various other holes the "standard" sludge sample results herein used for comparison are believed to be better than average.

A. H. Haworth
A. H. HAWORTH

AHH/ds

SPECIAL SAMPLES

EAST PIMA - NOV-DEC 56

actual sludge % / Theoretical sludge + total sample

DD HOLE		SIZE	INTERVAL FROM-TO	RUN FT	CORE % Rec	CORE Sp. Gr	CORE WT	CORE ASSAY	REG SLUDGE Rec	REG SLUDGE WT	REG SLUDGE ASSAY	1/8 SLUDGE gal	1/8 SLUDGE WT	1/8 SLUDGE ASSAY	1/8 DECANT gal.	1/8 DECANT WT	1/8 DECANT ASSAY	TOTAL 1/8 WT	TOTAL 1/8 Theor	7/8 SLUDGE Gal	7/8 SLUDGE WT	7/8 SLUDGE ASSAY	7/8 DECANT gal	7/8 DECANT WT	7/8 DECANT ASSAY	TOTAL 7/8 WT	TOTAL 7/8 Theor	RATIOS Vol	RATIOS MASS	Sludge/Theor. 1/8	Sludge/Total Theor
(1)	114	NX	643.8 - 650.0	6.2	89	2.51	21.8	.15	06	4.1	.12																				
(A)		"	650.0 - 652.9	2.9	97	2.71	12.1	.14				4	1.8	.12	47	To Small to Assay	Tr ?	1.85	1.44	5	8.7	.12	406	3.9	.13	12.6	10.08	9.06:1	.78:1	1:25:1	1.25:1
		"	665.5 - 676.7	10.2	98	2.66	42.1	.23																							
(B)		"	676.7 - 683.9	7.2	81	2.62	24.2	.15				2	3.8	.18	78	1.1	.17	4.9	4.05	5	15.4	.18	597	6.2	.18	21.6	20.39	8.52:1	5.43:1	1.21:1	.82:1
		"	699.2 - 707.3	8.1	88	2.62	29.6	.23																							
(C)		"	707.3 - 713.5	6.2	98	2.56	24.5	.25				5	4.9	.21	34	.1	X .14	5.0	2.87	7	8.0	.25	247	1.6	.21	9.6	20.11	7.5:1	2.92:1	1.74:1	.64:1
		"	713.5 - 721.2	7.7	86	2.63	27.5	.19																							
(D)		BX	721.2 - 730.8	9.6	100	2.62	24.1	.28				5	4.0	.24	84	.1	.21	4.1	2.94	5	12.2	.25	569	7.0	.24	24.2	20.59	7.45:1	6.9:1	1.39:1	1.2:1
		"	740.9 - 750.9	10.0	94	2.62	23.2	.19																							
(E)		"	750.9 - 760.8	9.9	100	2.61	24.6	.10				4	3.3	.13	78	5.1 ? obvious error	.11	8.4	3.02	5	14.5	.12	522	6.7	.125	21.2	21.15	7.42:1	3.53:1	2.78:1	1.22:1
		"	771.0 - 780.5	9.5	5	2.63	1.1	.96	56	6.3	1.20																				
(F)		"	798.5 - 804.3	5.8	100	2.60	15.4	.90				2.5	2.9	.77	81	.1	.20	3.0	1.76	5	7.4	.87	577	3.6	.74	11.0	12.34	2.97:1	4.7:1	1.7:1	1.01:1
		"	804.3 - 814.7	10.4	100	2.74	27.3	.86	46		.89																				
		"	814.7 - 818.3	3.6	99	2.63	9.0	.62				2	1.6	.59	63		NOT	Saved		5	6.2	.63	466	4.9	.56			8.24:1	—	—	—
		"	835.5 - 846.0	10.5	100	3.22	32.1	.37	41		.48																				
		"	846.0 - 856.2	10.2	100	2.76		.85	58		.75																				
		"	856.2 - 866.3	10.1	96	2.57	23.3	.26	36		.40																				
(G)		"	866.3 - 875.5	9.2	97	2.73	22.6	.29				2	2.7	.38	81	.2	.31	2.9	3.02	5	8.7	.39	580	9.6	.36	18.3	21.17	8.05:1	7.3:1	.96:1	1.0:1
		"	895.8 - 905.8	10.1	88	3.33		.91	25	2.2	.58																				
(H)		"	905.8 - 913.5	7.6	82	2.78	16.2	.31				2	2.2	.36	67	.2	.31	2.4	2.914	5	7.6	.36	568	9.8	.34	17.4	20.399	9.3:1	8.25:1	.82:1	.85:1
		"	913.5 - 923.5	10.0	92	3.0	26.0	.46	41	3.1	.44																				

SAMPLE NOT VERY GOOD SHOULD BE Thrown OUT

SPECIAL SAMPLES

EAST PIMA NOV DEC [illegible] 56

* Theor = Theoretical WT

(2)

DD HOLE		SIZE	INTERVAL FROM-TO	RUN FT	CORE % Rec	CORE Sp.Gr	CORE WT	CORE ASSAY	REG. SLUDGE Rec.	REG. SLUDGE WT	REG. SLUDGE ASSAY	% SLUDGE gal	% SLUDGE WT	% SLUDGE ASSAY	% DECANT gal	% DECANT WT	% DECANT ASSAY	TOTAL % WT	TOTAL % *Theor	% SLUDGE Gal	% SLUDGE WT	% SLUDGE Assay	% DECANT gal	% DECANT WT	% DECANT Assay	TOTAL % WT	TOTAL % Theor	Vol	MASS	Sludge/Theor %	Sludge/Total Theor
	121	NX	250.9 - 257.0	6.1	94	2.65		.13																							
(I)		"	257.0 - 259.2	2.2	79	2.64	7.3	.33	?			2	1.4	.23	86	.2	.21	1.6	1.27	5	7.2	?	568	3.3	.20	10.5	8.89	7.57:1	7.56:1	1.25:1	1.18:1
		"	259.2 - 266.1	6.9	99	2.75		.58	27.8		.44																				
		"	291.2 - 301.4	10.2	94	2.64		.54	33.3		.50																				
(K)			301.4 - 310.7	9.3	100	2.60		.32				3	4.1	.32	85	.4	.14	4.5	4.28	5	19.1		613	6.0	.21	25.1	29.96	8.02:1	6.58:1	1.05:1	.86:1
			310.7 - 318.1	7.4	99	2.63	30.4	.30	28.1		.25																				
(J)		"	349.8 - 355.7	5.9	90	2.62		.05				2.5	3.2	.08	75	.6	.04	3.8	3.04	5	14.4		559	7.3	.04	21.7	21.295	8.3:1	6.7:1	1.25:1	1.05
	120	BX	622.7 - 632.9	10.2	99	2.64		.14	57		.15																				
(L)			632.9 - 643.1	10.2	98	2.68		.17				2.0	3.6	.16	86	.3	.16	3.6	3.26	5	18.6	.16	560	5.5	.14	24.1	22.82	7.19:1	7.18:1	1.20:1	1.09:1
		"	681.4 - 691.4	10.0	99	2.65		.18	46		.14																				
(M)			691.4 - 699.4	8.0	100	2.56		.15				2.	2.1	.17	75	.6	.17	2.7	2.395	5	12.8	.17	592	6.1	.14	18.9	16.76	8.05:1	8.0:1	1.13:1	1.13:1
			763.6 - 771.9	8.3	93	2.66		.07			.05																				
(N)			771.9 - 775.2	3.3	100	2.66		.11				1	.5	.11	78	.1	.09	.6	1.026	2.5	5.8	.11	585	4.2	.10		7.185	7.8:1			
																												Ave. 0.19			
																												8.1:1	7.3:1		

STANDARD SLUDGE
DEC 1956

SAMPLE	CORE FT Run	CORE Rec %	Sludge Rec. %	Sludge Assay / Core Assay %
1	6.2	89	66	.12 / .15 — 80
2	9.5	5	55	1.2 / .96 — 125
3	10.4	100	46	.89 / .86 — 103
4	10.5	100	41	.48 / .37 — 130
5	10.2	100	58	.75 / .85 — 88
6	10.1	96	36	.40 / .26 — 154
7	10.1	88	25	.58 / .91 — 64
8	10.0	92	41	.44 / .46 — 96
9	6.9	99	27.3	.44 / .58 — 76
10	10.2	94	33	.50 / .54 — 93
11	9.4	99	28	.25 / .30 — 83
12	10.2	99	57	.14 / .14 — 100
13	10.0	99	46	.14 / .18 — 78
14	8.3	93	45	.05 / .07 — 71
15				

RAY SPLITTER - 1/8 Cut
DEC 1956

Sample	Core FT	Core Rec %	Sludge Rec %	Sludge Assay / Core Assay %
A	2.9'	97	125	.12 / .14 — 86
B	9.2	81	121	.18 / .15 — 120
C	6.2	98	174	.21 / .25 — 84
D	9.6	100	139	.24 / .28 — 86
E	9.9'	100	272	.13 / .10 — 130
F	5.8'	100	170	.77 / .90 — 86
G	9.2'	97	96	.38 / .29 — 131
H	7.6	82	82	.36 / .31 — 116
I	2.2	79	125	.23 / .33 — 70
J	5.9	90	125	.08 / .05 — 160
K	9.3	100	105	.32 / .32 — 100
L	10.2	98	120	.16 / .17 — 94
M	8.0	100	113	.17 / .15 — 113
N	3.3	100		.11 / .11 — 100

Known very Bad field work

Dec. 2, 1957

Summary 16-76; 77-109; 110-201
Core Rec. Range 86-90, Holes 16-201

Range of Sludge Rec.	No. of Samples	Average of Sl. Rec. in Range	Average Core Assay	Average Sludge Assay	Ratio of Sl. Assay to C.A.	% of Difference
100-120	7	107	1.21	1.19	98%	-2%
90-99	1	94	1.19	.73	61%	-39%
80-89	10	86	1.79	1.74	97%	-3%
70-79	11	74	1.05	.97	92%	-8%
60-69	12	63	.73	.69	95%	-5%
50-59	16	54	.63	.60	95%	-5%
40-49	22	45	1.14	1.01	89%	-11%
30-39	20	34	.92	.84	91%	-9%
20-29	13	25	1.58	1.77	112%	+12%
10-19	3	13	.85	1.00	118%	+18%
1-9	2	8	.51	.22	43%	-57%
	117	53	1.07	1.03	96%	-4%

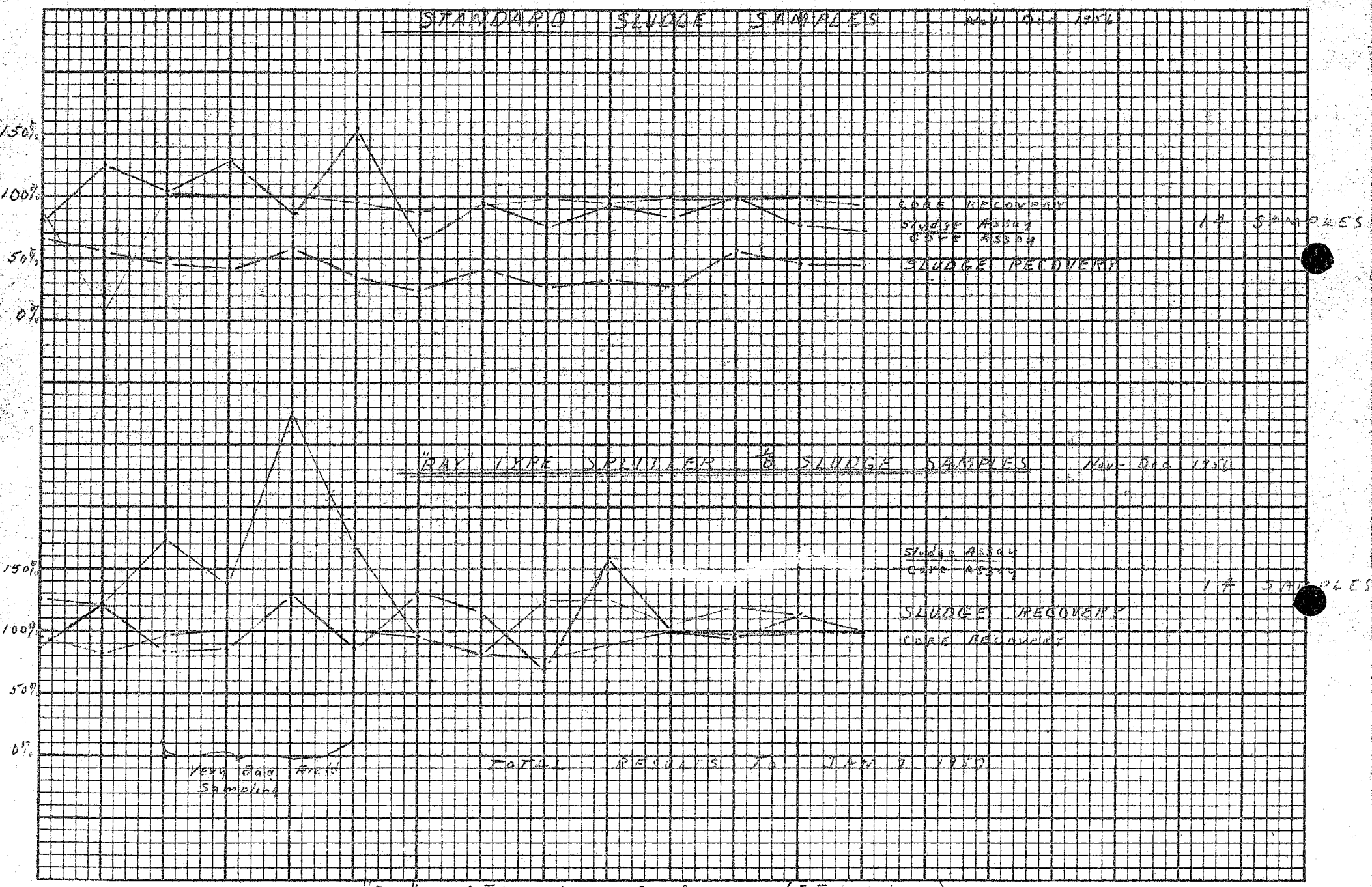
Summary, 16-76, 77-109, 110-201
Core Rec Range 81-85, Holes 16-201

100-120	5	109	1.07	.75	70%	-30%
90-99	3	94	.41	.33	80%	-20%
80-89	2	82	.61	.43	70%	-30%
70-79	4	75	.96	.53	55%	-45%
60-69	14	66	.72	.73	101%	+1%
50-59	10	55	1.01	.88	87%	-13%
40-49	4	45	.60	.57	95%	-5%
30-39	5	36	.77	.57	74%	-26%
20-29	3	24	.53	.56	106%	+6%
10-19	4	16	1.03	.77	75%	-25%
1-9	—	—	—	—	—	—
	54	60	.81	.68	84%	-16%

No. 91[illegible]12, 10 x 10 to 1"
Each [illegible] heavy
The A. [illegible]tz Co., San Francisco
Made in U. S. A.

EAST PIMA PROJECT

Comparison of "standard sludges & "Ray splitter" sludges



"Ray" splitter AV CUT 8.11 : 1 (Total volume)
7.37 : 1 (Total mass

Dec. 3, 1957

Summary [illegible]6-76, 77-109, 110-[illegible]01
Core Rec. Range 76-80 Holes 16-201

Range of Sludge Rec.	No. of Samples	Average Sl. Rec. in Range	Average Core Assay	Average Sludge Assay	Ratio of S.A. to C.A.	% of Difference
100-120	4	111	.56	.55	98%	-2%
90-99	4	94	.64	.62	97%	-3%
80-89	2	85	.48	.56	117%	+17%
70-79	2	73	.48	.42	88%	-12%
60-69	8	65	1.27	1.04	82%	-18%
50-59	6	55	.50	.60	120%	+20%
40-49	6	44	1.06	1.16	109%	+9%
30-39	5	34	.71	.66	93%	-7%
20-29	5	25	.75	.61	81%	-19%
10-19	1	16	.34	.08	24%	-76%
1-9	—	—	—	—	—	—
	43	60	.79	.74	94%	-6%

Bottom of Pt
FM 11/28/56

II

CORE SLUDGE DATA

Holes 16-76 and 77-109

Core Rec. Range	No. Samples	Sum Core Assays	Average Core Assay	Sum Sludge Assays	Average Sludge Assay	% average SLUDGE Recovery	C.A. / S.A.
96-100	339	335.07	.99	298.69	.88	55	89
91-95	169	161.93	.96	129.45	.77	56	80
86-90	86	72.06	.84	66.49	.77	51	92
81-85	57	41.10	.72	36.59	.64	62	89
76-80	35	28.66	.82	25.70	.73	59	89
71-75	31	17.51	.56	15.08	.49	58	88
66-70	25	24.44	.98	18.47	.74	83	76
61-65	11	12.41	1.13	10.06	.91	79	81
56-60	13	6.67	.51	7.21	.55	69	108
51-55	12	12.01	1.00	9.26	.77	63	77
46-50	9	5.49	.61	5.17	.57	63	103
41-45	3	2.68	.89	2.26	.75	40	84

Holes 110 – 201, inclusive

Core Rec Range	No. of Samples	Core Assay Sum	Average Core Assay	Sludge Assay Sum	Average Sludge Assay	Average Sludge Rec.	Ratio of Sl. Assay to Core Assay
96 – 100	186	337.34	1.81	275.58	1.48	69	82%
91 – 95	76	149.44	1.97	129.75	1.71	69	87%
86 – 90	35	61.77	1.76	59.87	1.71	66	97%
81 – 85	7	8.64	1.23	5.87	.84	92	68%
76 – 80	10	7.37	.74	8.80	.88	100	119%
71 – 75	8	5.58	.70	4.11	.51	117	73%
66 – 70	6	6.70	1.12	7.79	1.30	80	116%
61 – 65	6	3.04	.51	3.39	.57	90	112%
56 – 60	4	1.83	.46	1.64	.41	95	89%
51 – 55	3	5.45	1.82	2.91	.97	40	53%
46 – 50	1	.42	.42	.27	.27	121	64%
41 – 45	1	1.42	1.42	1.17	1.17	86	82%
36 – 40	2	.82	.41	.63	.32	72	78%
31 – 35	2	1.02	.51	.51	.255	112	50%
26 – 30	2	.55	.28	1.23	.62	72	221%
21 – 25	0	—	—	—	—	—	
16 – 20	1	.71	.71	.29	.29	83	41%
11 – 15	1	.23	.23	.59	.59	124	257%
6 – 10	0	—	—	—	—	—	—
1 – 5	1	.96	.96	1.20	1.20	55	125%
31521 ÷ 352 Av 90%	352	593.29	1.69	505.60	1.44	25481 ÷ 352 Av. 72	85%

Nov. 22, 1957

Core Rec. Range 96-100 Holes 110-201

Range of Sludge Rec	No. of Samples	Average Sl. Rec in Range	Average Core Assay	Average Sludge Assay	Ratio of Sludge Assay to Core Assay	% of Diff.
100-120	27	108	1.66	1.42	86%	-14%
90-99	11	95	1.62	1.27	78%	-22%
80-89	14	84	1.37	1.14	83%	-17%
70-79	13	75	2.24	2.02	90%	-10%
60-69	16	64	2.24	1.87	83%	-17%
50-59	17	54	1.17	1.31	112%	+12%
40-49	27	44	1.44	1.33	92%	-8%
30-39	15	35	1.46	1.55	106%	+6%
20-29	14	24	1.99	1.21	61%	-39%
10-19	9	15	5.33	2.72	51%	-49%
1-9	4	6	2.80	1.68	60%	-40%

10M FORM HB-1321HO

AVOID ORAL ORDERS

EAST PIMA PROJECT
SLUDGE TESTING

Oral Orders are often forgotten or misunderstood. Use this blank for all important instructions or requests.

K. R

To Mr. R.E. RICHARD

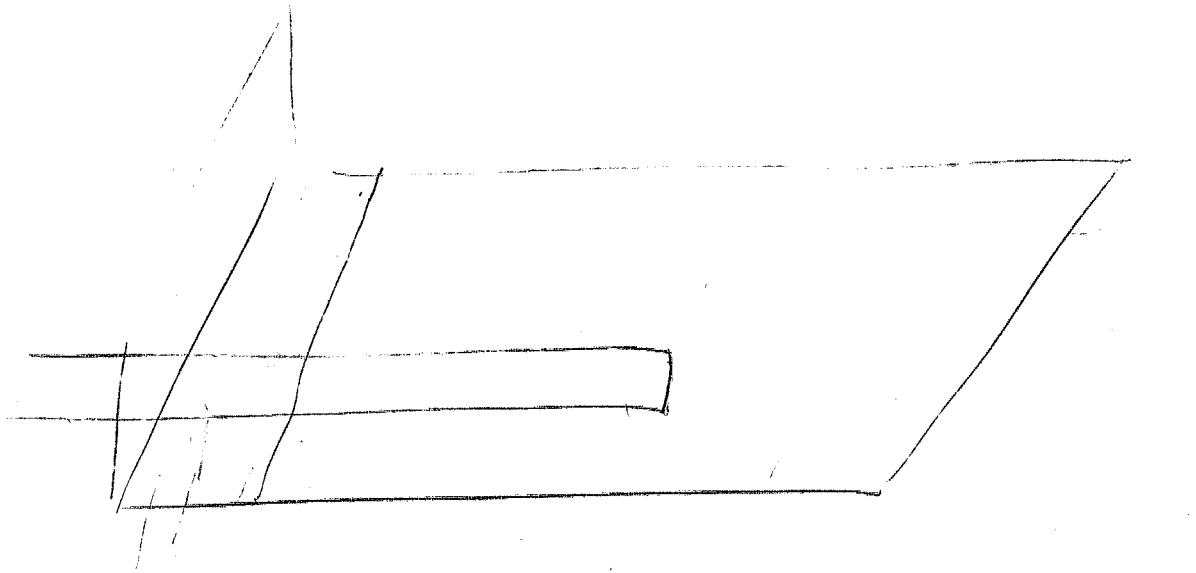
NOV 26 1956

Tabulated are some preliminary figures on measurements of overflow from sludge tank on D.D.H. 111. The samples listed are of material that would ordinarily be recirculated with drill water.

Sample No.	Volume	Time	Footage Interval	Solid Weight	Assay % Cu	
2510	192 Gal.	15 min.	609.5'-610.4' (0.9')	6.9 lb.	0.52	(No Separan added)
2511	150 Gal.	10 min.	662'-663' (1.0')	3.8 lb.	0.28	(0.0005% Solid Separan by wt.)
2512	150 Gal.	10 min.	663'-664' (1.0')	2.3 lb.	0.25	(no Separan added)

Date 11/13/56

Signed B. S.H.



November 28, 1956

FILE MEMORANDUM

EAST PIMA
CORE/SLUDGE RECOVERY
and Assay Comparisons

The following tabulations have been prepared on core/sludge recovery and core/sludge assays. For these comparisons, cases where there was no sludge information were necessarily excluded. Cases where the core grade was less than 0.3 were also excluded, unless the sludge grade was substantially higher.

Core Rec. Range	No. Samples	Core Assay Sum	Average Core Assay	Sludge Assay Sum	Average Sludge Assay	Average Sludge Recovery	Core Assay / Sludge Assay
Holes 16 - 76							
96 - 100	217	222.50	1.03	195.22	.90	59	87
91 - 95	109	106.05	.97	79.67	.73	61	75
86 - 90	51	42.13	.83	37.37	.73	50	88
81 - 85	40	28.76	.72	24.22	.61	60	85
76 - 80	21	19.84	.94	18.39	.88	58	94
71 - 75	19	11.10	.58	9.13	.48	61	83
66 - 70	18	20.47	1.14	15.04	.84	58	74
61 - 65	8	11.09	1.39	8.80	1.10	88	79
56 - 60	5	2.04	.41	2.78	.56	91	137
51 - 55	7	9.76	1.39	6.52	1.06	61	76
46 - 50	8	4.64	.58	4.15	.52	62	90
41 - 45	0	-	-	-	-	-	-
36 - 40	4	4.71	1.18	4.57	1.14	74	97
31 - 35	7	3.16	.45	3.26	.47	37	104
26 - 30	1	.32	.32	.25	.25	75	78
21 - 25	1	.45	.45	.38	.38	1	84
16 - 20	3	3.78	1.26	2.90	.97	64	77
11 - 15	4	1.86	.46	1.92	.48	48	104
6 - 10	3	.77	.26	1.46	.49	100	188
1 - 5	1	.87	.87	.23	.23	44	26
AV. 55%		424.30	.94	416.25	.73	2.69	94
Holes 16-76 and 77-109							
96 - 100	339	335.07	.99	298.69	.88	55	89
91 - 95	169	161.93	.96	129.45	.77	56	80
86 - 90	86	72.06	.84	66.49	.77	51	92
81 - 85	57	41.10	.72	36.59	.64	62	89
76 - 80	35	28.66	.82	25.70	.73	59	89
71 - 75	31	17.51	.56	15.08	.49	58	88
66 - 70	25	24.44	.98	18.47	.74	83	76
61 - 65	11	12.41	1.13	10.06	.91	79	81
56 - 60	13	6.67	.51	7.21	.55	69	108
51 - 55	12	12.01	1.00	9.26	.77	63	77
46 - 50	9	5.49	.61	5.17	.57	63	103
41 - 45	3	2.68	.89	2.26	.75	40	84

Core Recovery Range 96-100%

Holes 16-76 and 76-109

No. of Samples	Sludge Recovery	Average Sludge Rec. in Range	Average Core Assay	Average Sludge Assay	% Diff.	Core Assay / Sludge Assay
8	101-120	108	2.01	1.60	-20	80
10	90-100	96	1.00	.90	-10	90
22	80- 89	84	.92	.80	-13	87
28	70- 79	74	.81	.83	+ 2	102
37	60- 69	64	.91	.86	- 5	95
43	50- 59	54	.89	.85	- 4	96
35	40- 49	44	.86	.80	- 7	93
44	30- 39	35	1.29	1.52	+18	118
24	20- 29	26	.86	.81	- 6	94
12	10- 19	12	.94	.79	-16	84
5	0- 9	7	.78	.64	-18	82