PR-SUKUNKA 93P 3e - 70 (1) c.

CONFIDENTIAL

OPEN FILE

PROPOSED MINING PROJECT

SUKUNKA COAL FIELD

BRITISH COLUMBIA

PR-SUKUNKA 70 (1) c.

Paul Weir Company
Chicago, Illinois

November 25, 1970
Job No. 1693

TABLE OF CONTENTS

Tables

Tables
(continued)

Figures

Exhibits

PROPOSED MINING PROJECT
SUKUNKA COAL FIELD
BRITISH COLUMBIA

I INTRODUCTION & SUMMARY CONCLUSIONS

Introduction

Brameda Resources Limited has been carrying out an exploration program on their coal land leases in the vicinity of the Sukunka River about 35 miles from Chetwynd, British Columbia. Please refer to Exhibit B for location.

This report is a preliminary feasibility study, based upon results of exploration furnished by Brameda, including information on geology, diamond core drilling results, analyses of drill core samples, washability tests and maps of the area. Weirco engineers have visited the site, and supervised the collection and testing of bulk adit samples.

While one and sometimes two other coal seams occur above the principal Chamberlain seam in the area under present consideration, it is assumed that only the Chamberlain seam will be mined, and this study is therefore predicated on only the Chamberlain seam.

This report presents preliminary concepts for the development of a proposed mine and mining program, with preliminary estimates of capital and operating costs, for initial development work and for subsequent production at an annual rate of 1,000,000 long tons of clean, marketable coal. Cost projections are also included for operations at a production rate of 2,000,000 long tons of clean coal annually if, through experience gained at the lower rate, it should prove possible to increase the capacity to the 2,000,000 ton level. For reasons cited in the body of the report, we have reservations about this possibility -- at least within the area explored to date, and on which the current study is based.

Summary Conclusions

The estimates presented in this report are preliminary and are based upon generally good mining conditions. However, the exploration has proven that there are faults in the projected mine area. In order to make a fully reliable estimate of the mining costs, and to establish the production rate that can be expected, it is our opinion that it is necessary to locate and determine what interruptions in the mining of the coal will be expected in the faulted areas.

We have proposed a small initial mining operation to mine across the faulted areas that are presently known and to locate other possible faults. Unless there are large areas undisturbed by faults, the mine production and costs predicted herein cannot be realized.

We project subsequent production at a rate of 1.0 million tons annually. The original investment for such an operation would be $25.6 million including mine facilities, preparation plant and railroad, Assuming a 20 year life of mine, expenditures of $14.0 million would be required for replacements of equipment and extension of facilities over the life of the mine. The coal reserves are capable of supporting production of an extremely high quality metallurgical coal. We estimate total recoverable reserves of 26,000,000 long tons clean coal. Assuming a realization at the port of $20.00 per long ton, which may or may not be conservative, and a rail rate of $5.00 per long ton including port charges, realization at the mine might approximate $15.00. Reflecting our best interpretation of likely mining conditions, we estimate a total cash cost of production of $7.38 per long ton f.o.b. rail at the mine at the 1.0 million ton level of production. After allowing for income tax and replacement of equipment, generation of cash should approximate $5.00 per ton or $5.0 million annually. On an original investment of $25.6 million, the potential rate of return is thus very attractive.

We recommend that Brameda proceed with the preliminary development of the mine.

II EXPLORATION AND RESERVES

Prospecting

Fifty diamond drill holes (cored) have been drilled to date in the area under study, generally on approximately 2,000 foot centers. Forty of the holes are within the area currently being considered for mining in this report.

Normal seam thickness (Chamberlain seam) averages approximately 8.5 to 9.0 feet, excepting abnormal thicknesses at or near faults as mentioned in the following text.

In addition to the diamond drilling, the outcrop has been exposed on the North and West boundaries of the area. Two adits have been driven in the Chamberlain seam. A bulk sample was taken from the No. 2 adit for washability and coking tests.

Interpretation of Results of Prospecting

The surface geology, as developed for the general area, shows that the area being considered for the mine lies between two major thrust faults. The area between the major faults is essentially flat lying or slightly pitching. The large proportion of the drill holes shows the normal coal seam indicating that there are probably substantial areas where the coal bed is undisturbed. The general line of faulting is in a northwest-southeast direction. As is common to mountain areas when there has been sharp folding and thrust faulting, there are a number of minor faults associated with the main faults. This results in areas where the coal seam is repeated or the coal is abnormally thickened due to lateral forces. Of the 50 holes drilled in the area, 13 were in fault zones where the coal bed was disturbed. In several cases the coal bed was thickened to 1.5 to 2.5 times the normal thickness. While the alignment of the smaller faults is irregular and their frequency not clearly defined, their general direction will be the same as the major faults.

Several holes indicated major vertical displacement of the seam. The amount of disturbance, the location of the faults and the difficulty of mining the coal seam through the fault areas cannot be precisely determined by drilling without drilling on a pattern so close as to be impractical in our opinion.

Two of the drill holes show that the seam is split and a shale band is present in the seam. There is no indication in adjacent drill holes to indicate the extent of this split.

A band of bone or carbonaceous shale is present immediately above the coal seam. In places this band is 8 to 10 inches thick. It is anticipated that this bone or shale will be mined with the coal.

The initial mine development work (limited scale) as projected herein will serve to define the geologic and coal seam conditions (that affect actual mining operations) to a much better degree than is possible through drilling only.

Estimate of Reserves

The area outlined in Exhibit A contains approximately 6,100 acres. Considering an average mining height of 8.5 feet, this represents

83,000,000 long tons of coal in place without discounting for faulted areas. We believe that this should be discounted for coal either non-existing or unmineable at and in the vicinity of such faults. Pending development of further information, we are discounting the in place reserves by 25 percent for this reason, resulting in a total of, say 63,000,000 long tons in place. The in place reserves must be further discounted for mining recovery percentages and losses through the preparation plant, which we estimate as follows:

Total tonnage in place	63,000,000 long tons
Estimated mining recovery	50 percent
Total recoverable raw coal	31,500,000 long tons
Recovery through preparation plant	84 percent
Total recoverable clean coal, say	26,000,000 long tons

There are additional coal reserves east and southeast of the area of the proposed mine, but the extent has not yet been determined.

III COAL QUALITY

The projected quality of the Sukunka area coal is based upon analysis of the Chamberlain seam. Insufficient data at this date are available on the Skeeter (upper Chamberlain) seam.

Analyses have been studied of drill cores S-1 through S-41 and the bulk samples taken from No. 2 adit. Analytical methods have been in accordance with ASTM procedures. Cores and some of the miscellaneous analytical work were analyzed by either Coast Eldridge, Vancouver; Commercial Testing & Engineering Co., Vancouver; or by Eastern Associated Coal Corp. at their Everett, Massachusetts Research Center. The latter was especially involved with the bulk sample analysis and movable wall coke oven tests.

As of this writing not all of the analyses are, as yet, available. Petrographic analyses, for example, being conducted by Dr. Spackman at the Pennsylvania State University, are in the process of being carried out. Enough data are available, however, to give reasonably accurate guidelines as to the quality of the Sukunka Chamberlain seam.

Table III-1 summarizes the core analyses on the "raw coal basis". Average moisture, ash and sulfur contents are shown on an air dried basis, while volatile matter, fixed carbon, calorific value (Btu/lb.) are shown on a moisture and ash free basis (MAF).

Table III-1

BRAMEDA RESOURCES LIMITED

SUKUNKA RIVER PROJECT

CHAMBERLAIN SEAM CORE ANALYSES - RAW COAL BASIS

Hole No.	Sample No.	Depth, Feet TC	Depth, Feet BC	Thickness, Ft.	Recovered, Ft.	Air Dried Basis Moist.,%	Air Dried Basis Ash,%	Air Dried Basis Sul.,%	MAF Basis V.M.,%	MAF Basis Fixed Carbon,%	MAF Basis Btu/lb.
S- 1	S-012	432.0	437.1	5.1	4.5	0.70	3.45	0.38	26.13	73.87	15879
S- 2	(a) ex.	100.7	129.5	28.8	14.0	0.90	7.40	0.34	28.24	71.76	15594
	(b) ex.	100.7	129.5	28.8	14.0	1.12	7.90	0.57	26.40	73.60	16267
S- 4	S-041	54.0	63.2	9.2	6.5	0.55	8.65	0.48	25.09	74.91	16020
S- 5	S-052	512.7	521.8	9.1	8.0	0.47	6.90	0.64	21.22	78.78	16161
S- 8	S-081	141.5	146.1	4.6	4.6	0.77	3.50	0.52	25.36	74.66	15768
S-11	S-11-2	275.0	283.0	8.0	6.0	0.37	6.85	0.47	26.01	73.99	16027
S-12	S-12-1	444.5	453.0	8.5	8.5	0.40	4.95	0.46	24.78	75.22	16132
S-13	S-13-1	369.5	381.0	11.5	11.5	0.52	5.65	0.47	25.82	74.18	16168
S-14	S-14-1	246.0	257.0	11.0	6.0	0.45	8.0	0.52	27.09	72.91	16052
S-15	S-15-1	229.0	237.5	8.5	8.0	0.43	6.55	0.45	23.92	76.08	16093
	Coast-Eldridge Averages					(0.50)	(6.15)	(0.49)	(24.92)	(75.08)	(16064)

8

Table III-1

(Continued)

Hole No.	Sample No.	Depth, Feet TC	Depth, Feet BC	Thickness, Ft.	Recovered, Ft.	Air Dried Basis Moist.,%	Air Dried Basis Ash,%	Air Dried Basis Sul.,%	MAF Basis V.M.,%	MAF Basis Fixed Carbon,%	MAF Basis Btu/lb.
S- 6	CH-6 ex.	912.7	917.4	4.7	2.0	0.66	4.63	0.31	23.50	76.50	15564
S-16	B-16-1 ex.	1,258.0	1,273.0	10+	-4.0	0.78	10.33	0.33	24.07	75.93	15453
S-17	A-17-1	276.0	283.0	7.0	7.0	0.89	4.68	0.34	26.74	73.26	15528
S-18	A-18-1	282.5	292.0	9.5	9.5	0.75	4.73	0.46	25.10	74.90	15518
S-19	A-19-2	157.0	162.5	5.0+	5.0	0.74	3.68	0.52	26.97	73.03	15585
S-20	A-20-1	1,238.0	1,246.0	8.0	4.5	0.58	6.85	0.50	26.68	73.32	15484
S-21	A-21-1	625.5	634.0	8.5	7.5	0.86	5.54	0.45	24.21	75.79	15491
S-22	A-22-1	708.5	716.2	7.7	7.7	0.82	6.14	0.58	24.70	75.30	15589
S-24	A-24-1	909.5	918.0	8.5	8.5	0.99	4.47	0.37	24.39	75.61	15611
S-25	A-25-1	1,474.0	1,482.5	8.5	8.5	0.74	4.11	0.35	25.27	74.73	15602
	CH-25	1,474.0	1,482.3	8.3	7.7	0.68	5.14	0.44	24.63	75.37	15627
S-26	CH-26	1,369.5	1,377.5	8.0	6.5	0.81	6.74	0.47	24.28	75.72	15674
S-27A	CH-27	1,234.0	1,243.0	9.0	9.0	0.81	5.54	0.48	23.40	76.60	15684
S-28	CH-28	1,086.0	1,095.5	9.5	9.5	0.76	5.91	0.43	23.31	76.69	15667
S-29	CH-29	1,515.2	1,525.0	9.8	9.5	0.78	4.46	0.41	23.88	76.12	15712
S-30	CH-30	1,353.0	1,375.2	22.2	21.0	0.90	5.21	0.43	23.47	76.53	15665
S-31	CH-31 ex.	1,530	1,545	15	2	1.02	7.04	0.39	24.83	75.17	15523
S-32	CH-32-1	1,140.4	1,145.4	5.0	5.0	0.93	7.55	0.30	22.96	77.04	15607
	CH-32-2	1,145.4	1,155.0	9.6	8.7	0.96	7.36	0.21	23.57	76.43	15539

Table III-1

(Continued)

Hole No.	Sample No.	Depth, Feet: TC	Depth, Feet: BC	Thickness, Ft.	Recovered, Ft.	Air Dried Basis: Moist.,%	Air Dried Basis: Ash,%	Air Dried Basis: Sul.,%	MAF Basis: V.M.,%	MAF Basis: Fixed Carbon,%	MAF Basis: Btu/lb.
S-34	CH-34 ex.	913	951	38	32	1.10	4.88	0.33	26.70	73.30	15593
S-35	CH-35	1,725.5	1,733.5	8.0	7.0	0.98	8.28	0.49	23.77	76.23	15620
S-36	CH-36	1,203.5	1,213.5	10.0	8.5	1.04	7.60	0.39	24.27	75.73	15582
S-37	CH-37	1,182.0	1,192.5	10.5	10.0	0.74	4.58	0.49	25.54	74.46	15708
S-38	CH-38	1,028.5	1,038.0	9.5	9.0	0.91	5.07	0.38	24.73	75.27	15728
S-39	CH-39 ex.	1,569.1	1,580.0	10.9							
S-40	CH-40	1,218	1,227	9.0	9.0	1.05	5.25	0.47	22.90	77.10	15603
S-41	CH-41	529	538	9.0	9.0	0.94	6.02	0.47	23.01	76.99	15658
	Commercial Testing & Engineering-Vancouver Averages					(0.86)	(5.58)	(0.43)	(24.29)	(75.71)	(15622)

Note:

ex. = Excluded from calculation of averages.

Examination of the MAF Btu values reported by Coast Eldridge and Commercial Testing & Engineering (Vancouver) shows that Coast Eldridge values are too high and the C.T.&E. values are the correct ones.

Table III-2 tabulates the analytical values of drill hole cores floated at 1.60 specific gravity. This more nearly represents the theoretical quality of coal to be expected by washing. One notes an average yield @ 1.60 of 97.1 percent, with an inherent moisture (air dry moisture) of 0.88 percent; ash content of 4.62 percent; sulfur at 0.42 percent; volatile matter of 22.52 percent; Btu value of 14792 and an FSI of 9. The average Gieseler fluidity in D.D.P.M. was 149.

Ash ranges from 4.06 to 5.96 percent; sulfur 0.22 to 0.49 percent and Gieseler fluidities from 67 to 417 D.D.P.M. The FSI remained consistently high, between 8 and 9.

All these cores indicate exceptionally high quality coal of the medium volatile rank and give the indices of being a strongly coking coal.

It is generally true that coal core analyses are of somewhat higher grade than that obtained from proper bulk samples. The cores did not contain the boney coal and/or carbonaceous shale band which lies directly above the Chamberlain seam. Also, in actual mining practice some of the roof and/or bottom gets into the product. All these impurities raise the ash and lower the yield from that shown

Table III-2

BRAMEDA RESOURCES LIMITED

CHAMBERLAIN SEAM

(Core Analyses @ 1.60 Specific Gravity)

Table III-2

Hole No.	Sample No.	Depth, Feet TC	Depth, Feet BC	Thickness, Ft.	Recovered, Ft.	Yield,%	Air Dried Basis Moist.,%	Ash,%	Sul.,%	V.M.,%	Fixed Carbon,%	Btu/lb.	F.S.I.	Automatic Gieseler Fluidities Temp.,°C @ Initial	Temp.,°C @ Maximum	Maximum D.D.P.M.	Temp.,°C @ Final	Temp. Range, °C
					SUMMARY OF FLOAT 1.60 ANALYSES OF CORES													
S-25	CH-25	1,474.0	1,482.3	8.3	7.7	97.1	0.68	4.06	0.44	23.46	71.80	14886	9	411	456	161	485	74
S-26	CH-26	1,369.5	1,377.5	8.0	6.5	96.2	0.81	5.13	0.46	22.84	71.22	14743	8	414	456	128	481	67
S-27A	CH-27	1,234.0	1,243.0	9.0	9.0	96.5	0.82	4.11	0.48	22.25	72.82	14911	9	420	462	113	484	64
S-28	CH-28	1,086.0	1,095.5	9.5	9.5	97.1	0.78	4.80	0.43	22.01	72.41	14793	8-1/2	413	459	89	482	69
S-29	CH-29	1,515.2	1,525.0	9.8	9.5	99.0	0.78	4.18	0.41	22.70	72.34	14933	9	409	456	178	485	76
S-30	CH-30	1,353.0	1,375.2	22.2	21.0	98.3	0.90	4.54	0.43	22.19	72.37	14813	8	422	456	44.5	481	59
S-32	CH-32-1 ex.	1,140.4	1,145.4	5.0	5.0	95.5	0.94	5.12	0.31	21.57	72.37	14661	4-1/2	432	456	3.8	470	38
	CH-32-2	1,145.4	1,155.0	9.6	8.7	95.3	0.97	5.09	0.22	22.14	71.80	14597	8-1/2	417	456	52.0	481	64
S-35	CH-35	1,725.5	1,733.5	8.0	7.0	93.1	1.00	5.10	0.48	22.32	71.58	14667	9+	416	459	103	485	69
S-36	CH-36	1,203.5	1,213.5	10.0	8.5	97.0	1.05	5.96	0.40	22.57	70.42	14490	9	413	456	161.5	485	72
S-37	CH-37	1,182.0	1,192.5	10.5	10.0	98.4	0.74	4.05	0.49	24.32	70.89	14956	9	406	456	417	485	79
S-38	CH-38	1,028.5	1,038.0	9.5	9.0	97.7	0.92	4.26	0.38	23.45	71.37	14913	9	411	456	326	485	74
S-40	CH-40	1,218.0	1,227.0	9.0	9.0	97.5	1.06	4.06	0.46	21.73	73.15	14804	9+	410	459	179	488	78
S-41	CH-41	529.0	538.0	9.0	9.0	97.0	0.95	4.89	0.47	21.67	72.49	14744	9	421	465	67	488	67
AVERAGE FLOAT 1.60						97.1	(0.88)	(4.62)	(0.42)	(22.52)	(71.98)	14792	(9)	415	458	149	483	68
					SUMMARY OF SINK 1.60 ANALYSES OF CORES													
						Rejects,%												
S-25	CH-25				7.7	2.9	0.54	41.35	0.56									
S-26	CH-26				6.5	3.8	0.94	47.60	0.72									
S-27A	CH-27				9.0	3.5	0.64	44.96	0.49									
S-28	CH-28				9.5	2.9	0.19	43.17	0.40									
S-29	CH-29				9.5	1.0	0.65	32.58	0.25									
S-30	CH-30				21.0	1.7	1.01	43.86	0.34									
S-32	CH-32-1				5.0	4.5	0.72	59.05	0.17									
	CH-32-2				8.7	4.7	0.81	53.47	0.10									
S-35	CH-35				7.0	6.9	0.76	51.14	0.61									
S-36	CH-36				8.5	3.0	0.80	60.56	0.21									
S-37	CH-37				10.0	1.6	0.50	37.02	0.35									
S-38	CH-38				9.0	2.3	0.47	39.68	0.22									
S-40	CH-40				9.0	2.5	0.56	51.67	0.67									
S-41	CH-41				9.0	3.0	0.46	42.42	0.37									
AVERAGE SINK 1.60						2.9	0.67	47.59	0.40									

Note:
ex.: Excluded from the average of the F.S.I. and Gieseler test results.

in the analyses of the coal cores. This is why special attention is attached to analyses of the bulk samples and allowance made in yields of coal in comparison to theoretical recoveries.

Float and sink analyses of the No. 2 adit bulk samples are shown in Table III-3. The raw coal analysis of the coal crushed to minus 2 inches show 12.10 percent ash in the 2" x 28 mesh sizes and 0.47 percent sulfur. The minus 28 mesh, which amounted to 16.0 percent by weight of the sample, ran 7.4 percent ash and 0.56 percent sulfur. Sample procedures for the bulk sample are shown in Exhibit A.

The yield of coal at 1.60 for the 2" x 28 mesh is 85.26 percent at a 4.52 percent ash, but when combined with the raw 28 mesh x 0, the product ash is increased to 5.4 percent.

The washability characteristics as shown in Table III-3 and in the curves shown in Figures III-2, III-3 and III-4 indicate that at all size ranges the coal is an "easy" coal to clean, with little or no "near gravity" material at the normal separating gravities; i.e., 1.45 to 1.60.

The froth flotation test made on the 28 mesh x 0 fines indicates an exceptionally easy coal to float with a high yield and a very low ash. For example, a yield of 93 percent is obtained at 4.0 percent ash level. This is shown in Figure III-5.

Figure III-1 shows the size distribution of the bulk sample crushed to minus 2 inches.

Table III-3

BRAMEDA RESOURCES LIMITED

SUKUNKA RIVER - CHAMBERLAIN SEAM

FLOAT & SINK ANALYSES - BULK SAMPLE ADIT NO. 2

Size	Specific Gravity	Direct			Cumulative Float			Cumulative Sink		
		Wt.,%	Ash,%	Sul.,%	Wt.,%	Ash,%	Sul.,%	Wt.,%	Ash,%	Sul.,%
2" x 3/4" (20.5% by Wt. of Total Sample)	-1.35	59.6	3.4	0.36	59.6	3.40	0.36	100.0	17.58	0.37
	1.40	8.9	10.9	0.24	68.5	4.37	0.34	40.4	38.49	0.40
	1.50	4.4	16.8	0.27	72.9	5.12	0.34	31.5	46.29	0.44
	1.60	2.2	26.7	0.60	75.1	5.76	0.35	27.1	51.08	0.47
	1.70	7.9	41.9	0.40	83.0	9.20	0.35	24.9	53.23	0.46
	1.80	10.8	46.9	0.53	93.8	13.54	0.37	17.0	58.50	0.48
	+1.80	6.2	78.7	0.40	100.0	17.58	0.37	6.2	78.70	0.40
		100.0	17.58	0.37						
3/4" x 1/4" (25.6% by Wt.)	-1.35	65.5	3.3	0.38	65.5	3.30	0.38	100.0	15.28	0.55
	1.40	7.6	9.9	0.38	73.1	3.99	0.38	34.5	38.04	0.87
	1.50	5.0	16.1	0.43	78.1	4.76	0.38	26.9	45.99	1.01
	1.60	2.5	24.7	0.63	80.6	5.38	0.39	21.9	52.81	1.15
	1.70	5.6	39.8	1.51	86.2	7.62	0.46	19.4	56.44	1.21
	1.80	5.4	47.3	1.86	91.6	9.96	0.55	13.8	63.19	1.09
	+1.80	8.4	73.4	0.60	100.0	15.28	0.55	8.4	73.40	0.60
		100.0	15.28	0.55						
2" x 1/4" (Composite) (46.1% by Wt.)	-1.35	62.88	3.34	0.37	62.88	3.34	0.37	100.00	16.30	0.47
	1.40	8.18	10.38	0.31	71.06	4.15	0.36	37.12	38.25	0.64
	1.50	4.73	16.39	0.36	75.79	4.91	0.36	28.94	46.13	0.74
	1.60	2.37	25.53	0.62	78.16	5.54	0.37	24.21	51.94	0.81
	1.70	6.62	40.91	0.92	84.78	8.30	0.41	21.84	54.81	0.83
	1.80	7.80	47.05	1.04	92.58	11.57	0.47	15.22	60.86	0.79
	+1.80	7.42	75.37	0.53	100.00	16.30	0.47	7.42	75.37	0.53
		100.00	16.30	0.47						

Table III-3

(Continued)

Size	Specific Gravity	Direct			Cumulative Float			Cumulative Sink		
		Wt.,%	Ash,%	Sul.,%	Wt.,%	Ash,%	Sul.,%	Wt.,%	Ash,%	Sul.,%
1/4" x 28 Mesh (37.9% by Wt.)	-1.35	85.1	2.50	0.43	85.1	2.50	0.43	100.0	7.00	0.48
	1.40	4.6	8.30	0.47	89.7	2.80	0.43	14.9	32.67	0.75
	1.50	2.8	15.30	0.70	92.5	3.18	0.44	10.3	43.55	0.83
	1.60	1.4	23.90	0.90	93.9	3.48	0.45	7.5	54.10	0.94
	1.70	2.8	44.70	1.32	96.7	4.68	0.47	6.1	61.03	0.95
	1.80	0.6	56.40	1.36	97.3	5.00	0.48	3.3	74.89	0.64
	+1.80	2.7	79.00	0.48	100.0	7.00	0.48	2.7	79.00	0.48
		100.0	7.00	0.48						
2" x 28 Mesh (84.0% by Wt. of Total Sample)	-1.35	72.91	2.90	0.40	72.91	2.90	0.40	100.00	12.10	0.47
	1.40	6.56	9.72	0.36	79.47	3.46	0.40	27.09	36.87	0.67
	1.50	3.86	16.03	0.47	83.33	4.04	0.40	20.53	45.55	0.77
	1.60	1.93	25.00	0.71	85.26	4.52	0.41	16.67	52.39	0.84
	1.70	4.90	41.89	1.02	90.16	6.55	0.44	14.74	55.97	0.85
	1.80	4.55	47.61	1.06	94.71	8.52	0.47	9.84	62.99	0.77
	+1.80	5.29	76.21	0.52	100.00	12.10	0.47	5.29	76.21	0.52
		100.00	12.10	0.47						

28 Mesh x 0 = 16.0% by Wt. of Sample @ 7.4% Ash.

PAUL WEIR COMPANY
INCORPORATED
CHICAGO ILLINOIS

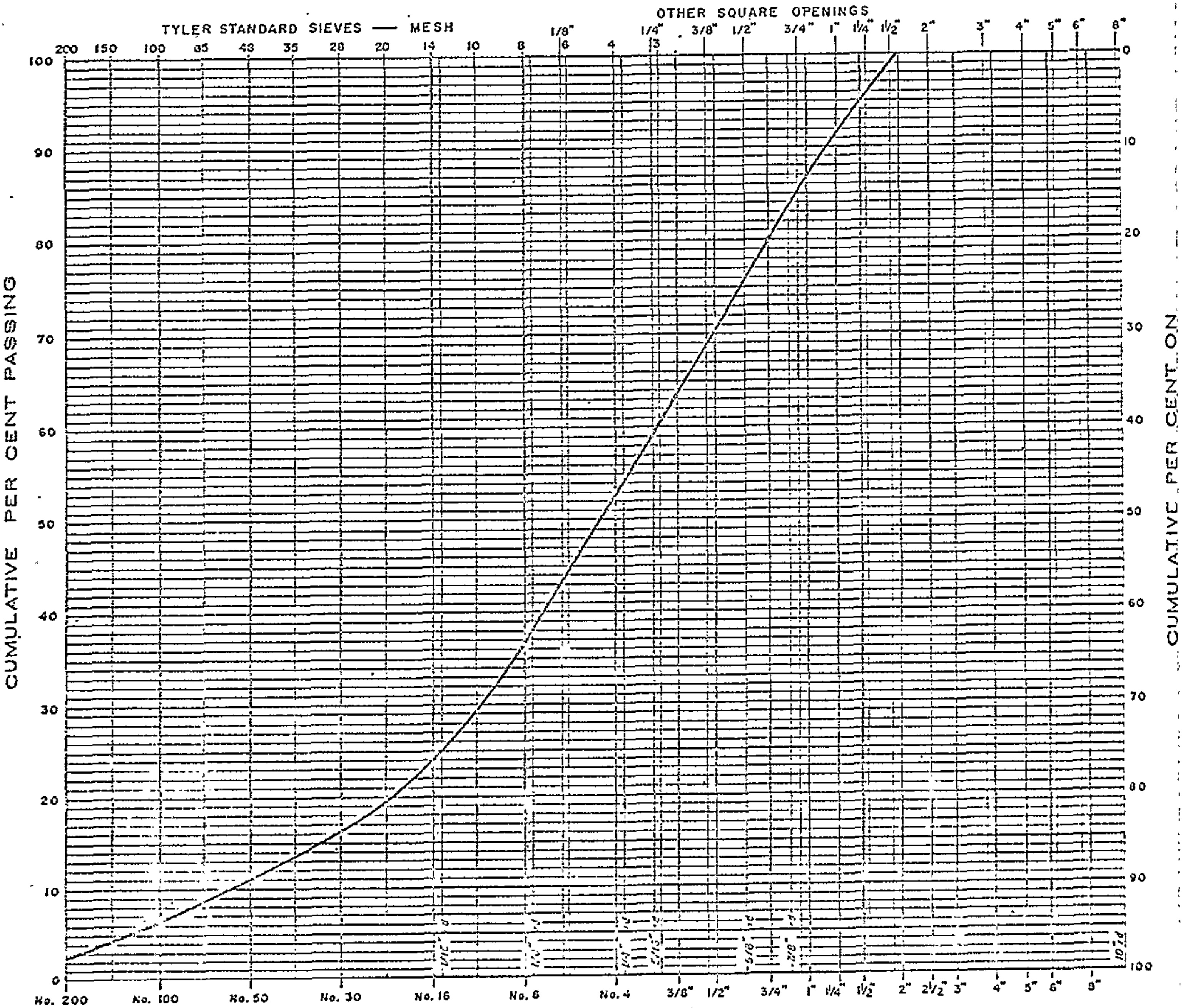
DESCRIPTION BRAMEDA RESOURCES LIMITED

CHAMBERLAIN SEAM SAMPLE FROM ADIT NO. 2

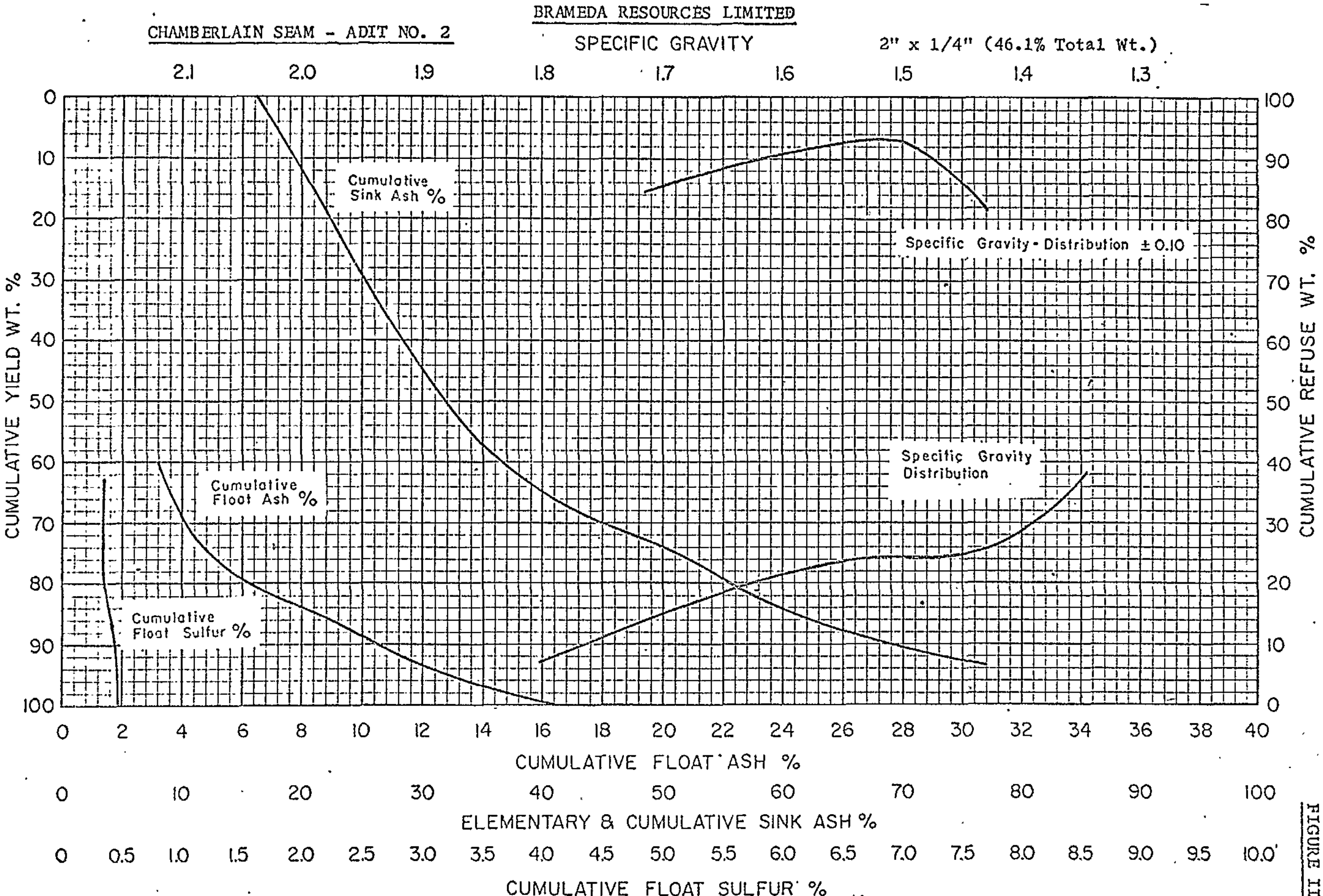
Total Weight of Sample - -

Date November 12, 1970

SCREEN ANALYSIS CURVE



NOTE: SCREEN OPENINGS ON LOGARITHMIC SCALE WITH $\frac{\text{in. rd.}}{\text{in. sq.}} = 1.25$



PAUL WEIR COMPANY
CHICAGO Job No. 1693 ILLINOIS

BRAMEDA RESOURCES LIMITED

CHAMBERLAIN SEAM - ADIT NO. 2

1/4" x 28 Mesh (37.9% Total Wt.)

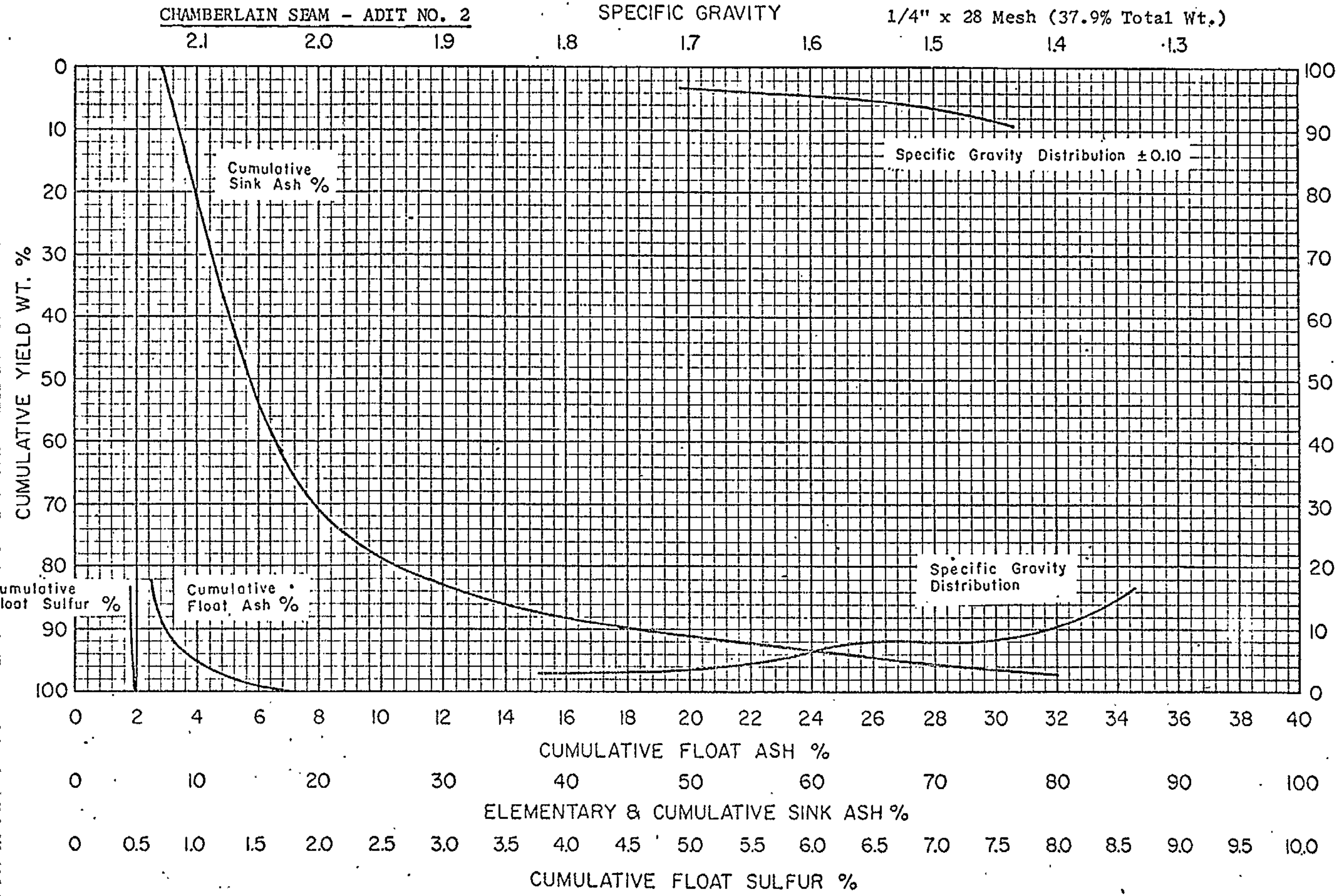


FIGURE III-3

PAUL WEIR COMPANY
CHICAGO Job No. 1693 ILLINOIS

BRAMEDA RESOURCES LIMITED

CHAMBERLAIN SEAM - ADIT NO. 2

2" x 28 Mesh (84.0% Total Wt.)

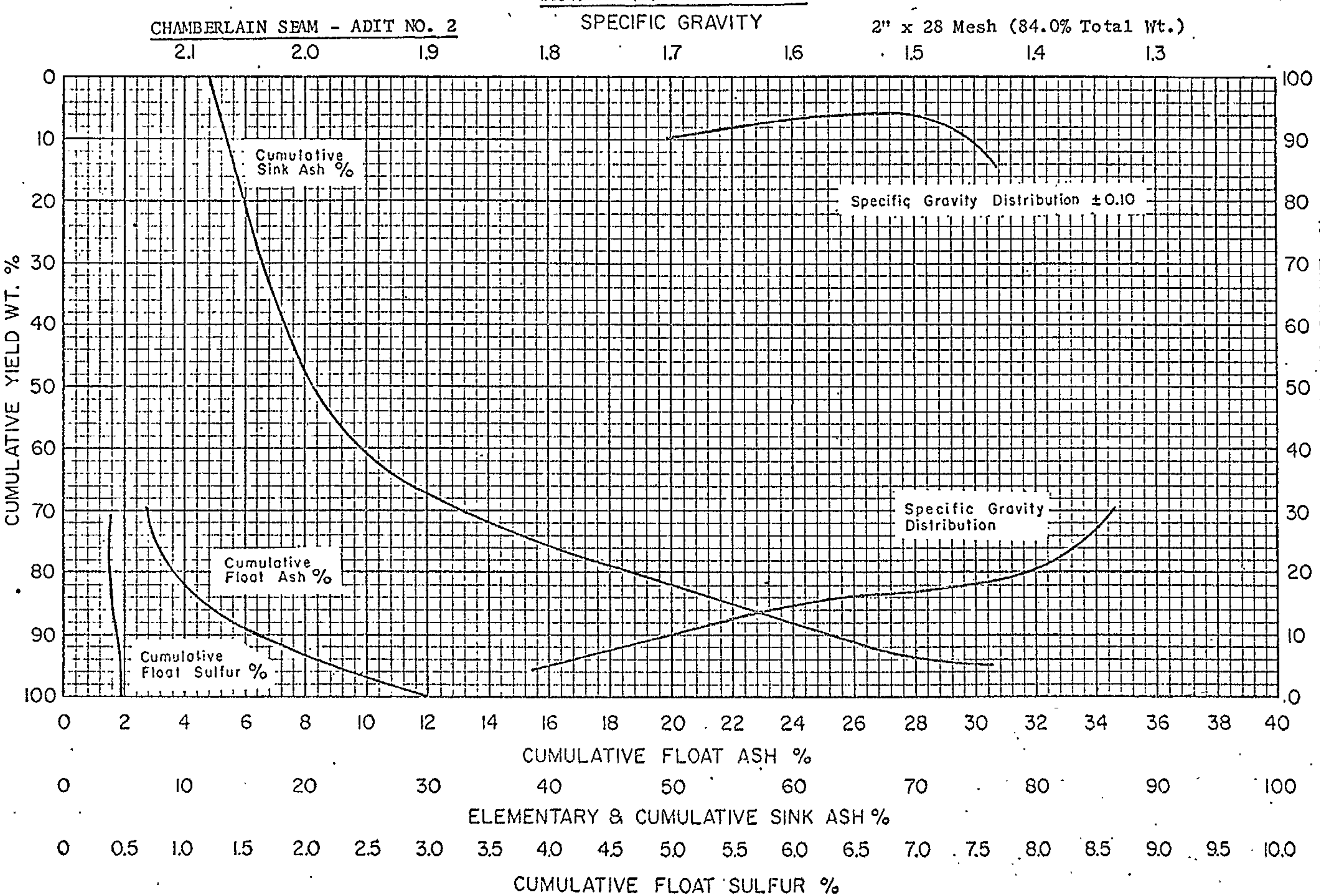


FIGURE III-4

PAUL WEIR COMPANY
CHICAGO Job No. 1693 ILLINOIS

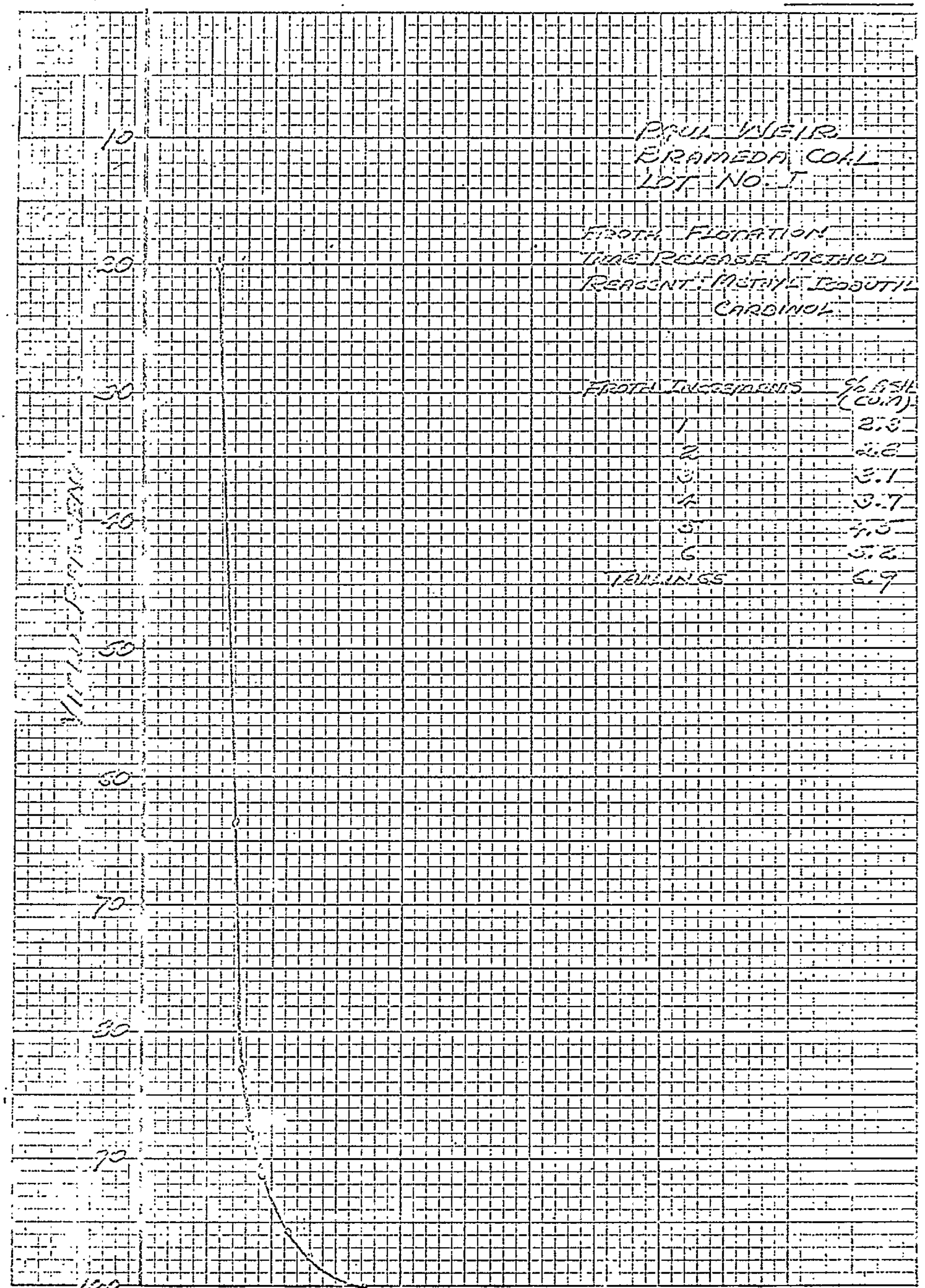

PAUL WEIR
LOT NO. I
FROTH FLOTATION
TIME RELEASE METHOD
REAGENT: METHYL ISOBUTYL
CARBINOL
FROTH INCREMENTS % ASH (CUM)
1 2.3
3 3.1
4 3.7
5 4.5
6 5.2
TAILINGS 6.9
10
20
30
40
50
60
70
80
90
100
2
4
6
8
10
12
14
16
18
20

Table III-4 contains the tabulated data on sizing, proximates, flotation, etc. made by Eastern Associates on the No. 2 adit bulk sample. The proximate analyses are on a raw coal basis. Note that the coarser sizes (on a raw coal basis) are low in FSI. This is normal for coal in this area, due to its higher durain content. The sample of all sizes combined shows FSI of 9.

The grindability (Hardgrove) indicates this is a soft, friable coal, but not quite as soft as coal of low volatile rank.

Table III-5 gives the analyses of the bulk sample prepared for the coke oven tests. This produced a yield of 85.2 percent at a 5.4 percent ash content at a separating density of 1.60 on the 2" x 28 mesh which, when combined with raw 28 mesh x 0, gives a yield of 87.5 percent overall.

Table III-6 shows the expansion properties of the coal, Gieseler fluidity and Audibert-Arnu dilatometer results.

This is an expanding coal as shown by the sole heated oven test and later proven in the movable wall oven tests. This means that the coal would require blending with high volatile coals to bring the expansion down to practical limits. The Gieseler fluidity was 200 D.D.P.M. with a temperature range of 75 degrees. The dilatometer test showed a maximum contraction of -29 and a maximum dilation of +40. All these conditions are normal for coal of this rank.

Table III-4

Screen Size and Analytical Data
Paul Weir Co. Sample
BRAMEDA, Lot #1 (6935)

Preliminary Screen @ 2-inch Round Hole, wt %

Plus 2-inch	23.4
Minus 2-inch	76.6

Secondary Screen (includes +2-inch Rd. Crushed to Minus 2-inch)

	%	% cum
2-inch Rd x 3/4-inch sq	20.5	20.5
3/4-inch sq x 1/4-inch sq	25.6	46.1
1/4-inch sq x 28 mesh	37.9	84.0
28-mesh x 0	16.0	100.0

28-mesh x 0 Size Consist, Tyler Mesh, wt %

	%	% cum
28M x 48M	28.0	28.0
48M x 100M	34.4	62.4
100M x 200M	18.0	80.4
Minus 200M	19.6	100.0

Sample	2" x 3/4" Heads	3/4" x 1/4" Heads	1/4" x 28M Heads	28M x 0 Head
Proximate Analysis, % dry basis				
Volatile Matter	19.7	19.7	22.7	23.9
Fixed Carbon	63.0	64.0	69.7	68.7
Ash	17.3	16.3	7.6	7.4
Sulfur, %	0.42	0.60	0.50	0.56
Free Swelling Index	2	3-1/2	9	9
Grindability	78.8	81.1	91.4	----

28M x 0 Fractions

Ash Content of Sieve Test Fractions, % dry basis

28M x 48M	6.6
48M x 100M	6.6
100M x 200M	7.7
Minus 200M	9.3

Froth Flotation

Froth Increments	Yield (Cum %, dry basis)	Ash (Cum %, dry basis)	Sulfur (Cum %, dry basis)
1	20.6	2.3	0.50
2	63.2	2.8	0.52
3	83.0	3.1	0.52
4	91.4	3.7	0.53
5	95.9	4.5	0.54
6	97.7	5.2	0.55
Tailings	2.3	6.9	0.56

Reagent:

MIB

Table III-5

Head Clean Coal Analyses

Proximate Analysis, % dry basis		
Volatile Matter	22.7	
Fixed Carbon	71.9	
Ash	5.4	
Sulfur, %	0.48	
Free Swelling Index	9	
BTU		
Grindability		
Ash Fusion		
Yield of Clean Coal (2" rd x 28 M) washed @ 1.60 sp. gr.		85.2%
Total Yield of Coal, 2" rd x 28 M washed @ 1.60 sp gr. plus unwashed (28m-x0) fraction		87.5%

Table III-6

ANALYSES AND BENCH-SCALE TESTS

BRAMEDA Lot #1 (6935)

Sole-Heated Oven (ASTM D2014-64)	
Expansion (+) or Contraction (-)	
@ 55 lb/cu ft and 1.0% Moisture	+9
@ 52 lb/cu ft and 2.0% Moisture	+2
Proximate Analysis, % dry basis	
Volatile Matter	22.7
Fixed Carbon	71.9
Ash	5.4
Free Swelling Index	9
Gieseler Fluidity (ASTM D2639-67T)	
Start, 1 ddpm, °C	417
Final, 1 ddpm, °C	492
Range, C°	75
Max. Fluidity Temp, °C	462-465
Max. Fluidity, ddpm	200
Audibert-Arnu Dilatometer (ISO Recommendation No. 228)	
Max. Contraction, %	-29
Max. Dilatation, %	+40
Temperature, °C	
Of Softening	388
Of Max. Contraction	430
Of Max. Dilatation	460

LAR:amc
11/10/70

Eastern Associated Coal Corp.
Research Center
138 Robin Street
Everett, Massachusetts 02149

Coke oven test data are shown in Table III-7, using the 100 percent Chamberlain washed coal. The information includes coke size analyses, shatter test, ASTM tumbler test and JIS drum tests as well as coke yield, porosity and apparent specific gravity.

The results are excellent. Of particular interest is the ASTM (Tumbler) stability of 59.7 percent at plus one inch and the JIS drum test at 15 mm. giving 94.2 percent. This is an exceptionally hard, dense coke.

Table III-8 gives the coke oven log data, while Figure III-6 gives a graph of the oven test as well as pertinent data.

Table III-9 gives the coke test data of a blend of 70 percent high volatile and 30 percent Chamberlain seam coal. This reduces the coke oven pressure to acceptable limits, but at a slight reduction in coke strength. However, its coke stability of 55.2 percent and the JIS drum strength of 93.4 percent at 15 mm. is still quite high.

Table III-10 and Figure III-7 give the test log data of the oven test using the 70 percent high volatile blend.

In summary, the Chamberlain seam is a low ash, high quality strong coking coal of excellent properties. Its ASTM rank is Mvb. Its ISO number is 434, with a Gray-King of G-6 to G-8.

Its Roga Index is over 45 and its free-swelling index is 8 to 9. Its volatile matter content of 22 to 25 percent (MAF) and Gieseler fluidity places it in the lower range of the medium volatile

Table III-7

SUMMARY OF TEST RESULTS

COKE OVEN TESTS

Test No. Date:	PW-CA-13 11-2-70
Blend Composition, wt.%	
Brameda Lot #1 (6935) 100%	
Equiv. Coking Time in 17-inch Wide Oven, hr	15.8
Moisture, %	2.8
Pulverization, % minus 1/8 inch	86.1
Bulk Density in Oven, lb/cu ft.	48.8
Coke Screen Test, cum %	
On 5-inch	----
On 4-inch	2.5
On 3-inch	30.1
On 2-inch	72.6
On 1-1/2-inch	90.8
On 1-inch	96.4
Minus 1/2-inch	2.6
Shatter Test, cum % (ASTM D-144-66)	
On 2-inch	60.8
On 1-1/2-inch	86.8
Tumbler Test, cum % (ASTM D294-64)	
On 1-inch	59.7
On 1/4-inch	68.4
JIS Drum Test (From JIS-K2151-1960	
On 50 mm	29.8
On 25 mm	90.0
On 15 mm	94.2
On 6 mm	95.7
Apparent Specific Gravity	0.89
Coke Porosity	48.3
Yield of Coke, % dry basis	79.3
Coking Pressure, psi	3.6

LAR:amc
11/10/70

Eastern Associated Coal Corp.
Research Center
138 Robin Street
Everett, Massachusetts 02149

Table III-8

OVEN LOG SHEET

100% CHAMBERLAIN SEAM

pre-peak none psi

peak 3.58 psi

Full Range on Pressure Vacum

EASTERN ASSOCIATED COAL CORP.

Research Center

Coke Quality Oven Test Specifications

Sheet No. 1

Project No. 2001-J Test No. PW-CA-13 Date 11-2-70

Mix, Wt. % BERMEDA LOT I 6935 100%

Operators PRH - TG

Charge Wt., Lb. Gross 510.0

Excess 9.6 + 8.0 = 17.6

Time of Charge 7:07 A.M.

Net Lb. 492.4

Charge Complete 37 Sec.

Heating Program 1650 - 1900 °F.

Rate 36 °F/Hr.

Signal Center Temp. 982 °C

Signal Coking Time 10:30 Hr:Min.

Time of Push 10:34 Hr:Min.

Time of Quench 10:37 Hr:Min.

Moisture 2.8 %

Bulk Density 48.8 Lb./Cu.Ft.

Watt Meter, Final 8365 KWH

Watt Meter, Initial 8100 KWH

Gross Consumption 265 KWH

9 Hr. Flues, 7) 1851 8) 1640 9) 1830

Holding Flue Temp. 1600 °F

Heating Data

Globars	Amps.	Volts
1	29	107
2	25	03
3	26	97
4	26	01
5	27	101
6	27	50
7	29	11
8	27	70
9	26	55
10	26	101
11	27	67
12	27	57

P.S. Max.Gas Pressure — Lb/Sq.In.

P.S. Time of Peak — Hr:Min.

C.S. Max.Gas Pressure ______ Lb/Sq.In.

C.S. Time of Peak ______ Hr:Min.

Phase Voltage 117 115 119

Remarks: Top coke level 0" to 0" — small amount of shrinkage — [illegible]

3/31/65

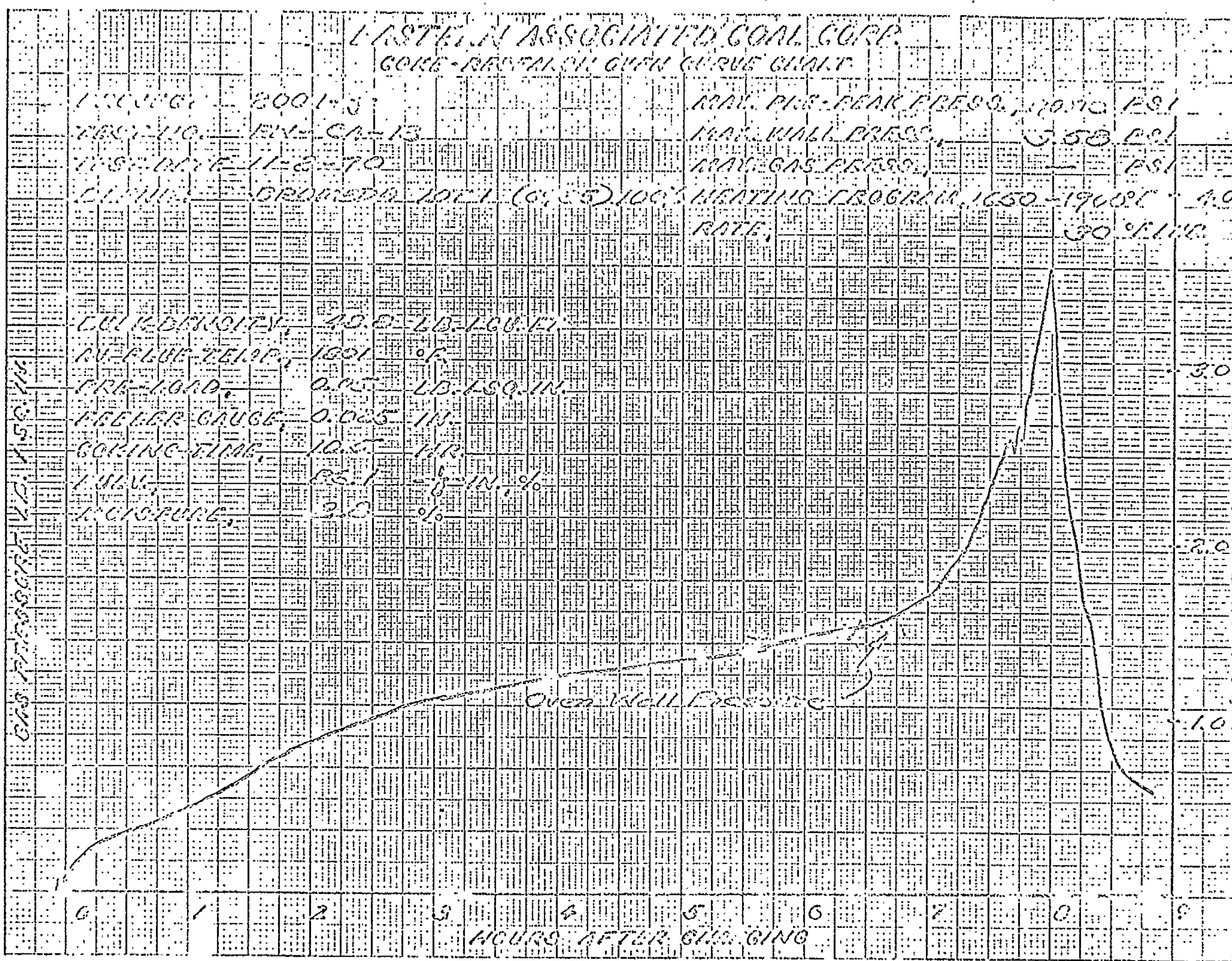

EASTERN ASSOCIATED COAL CORP.
MAX. WALL PRESS.,
MAX. GAS PRESS.,
HEATING PROGRAM
RATE,
BULK DENSITY,
AV. FLUE TEMP.,
PRE-LOAD,
FEELER GAUGE,
COKING TIME,
MOISTURE,
3.0
2.0
1.0
Oven Wall Pressure
0
1
2
3
4
5
6
7
8
9
HOURS AFTER CHARGING

FIGURE III-6

Table III-9

SUMMARY OF TEST RESULTS

COKE OVEN TESTS

Test No.				PW-CA-14
Date:				11-6-70
Blend Composition, wt.%				
	Brameda Lot #1	(6935)	30%	Chamberlain
	High Volatile	(6921)	70%	Wharton No. 2
Equiv. Coking Time in 17-inch Wide Oven, hr				15.1
Moisture, %				1.0
Pulverization, % minus 1/8 inch				84.4
Bulk Density in Oven, lb/cu ft				52.3
Coke Screen Test, cum %				
On 5-inch				----
On 4-inch				----
On 3-inch				15.6
On 2-inch				63.0
On 1-1/2-inch				87.6
On 1-inch				96.5
Minus 1/2-inch				1.9
Shatter Test, cum % (ASTM D-144-66)				
On 2-inch				54.4
On 1-1/2-inch				83.4
Tumbler Test, cum % (ASTM D294-64)				
On 1-inch				55.2
On 1/4-inch				68.0
JIS Drum Test (From JIS-K2151-1960				
On 50 mm				17,5
On 25 mm				85.5
On 15 mm				93.4
On 6 mm				95.1
Apparent Specific Gravity				0.86
Coke Porosity				49.9
Yield of Coke, % dry basis				72.8
Coking Pressure, psi				0.8

Eastern Associated Coal Corp.
Research Center
138 Robin Street
Everett, Massachusetts 02149

Table III-10

COKE OVEN LOG SHEET

70% HV 30% CHAMBERLAIN

pre-peak ______ psi
peak 0.8 psi
Normal range on p. recorder

EASTERN ASSOCIATED COAL CORP.

Research Center

Coke Quality Oven Test Specifications

Sheet No. 1

Project No. 2001-5 Test No. PW-CA-14 Date 11-6-70

Mix, Wt. % Bermuda Lot 1 (6935) 30% — Winifrede 2 (6931) 70%

Operators PRH — TG

Charge Wt., Lb. Gross 550.0

Excess 13.2 + 8.8 = 22.0

Net Lb. 528.0

Time of Charge 6:39 A.M.

Charge Complete 30 Sec.

Heating Program 1650 - 1900 °F.

Rate 30 °F/Hr.

Signal Center Temp. 982 °C

Signal Coking Time 10:00 Hr:Min.

Time of Push 10:06 Hr:Min.

Time of Quench 10:09 Hr:Min.

Moisture 1.0 %

Bulk Density 52.3 Lb./Cu.Ft.

Watt Meter, Final 9923 KWH

Watt Meter, Initial 9674 KWH

Gross Consumption 249 KWH

9 Hr. Flues, 7) 1045 8) 1040 9) 1034

Holding Flue Temp. 1765 °F

Heating Data

Globars	Amps.	Volts
1	29	107
2	29	91
3	26	97
4	26	90
5	27	102
6	27	58
7	29	66
8	29	70
9	26	58
10	26	105
11	27	61
12	27	57

P.S. Max.Gas Pressure ______ Lb/Sq.In.

P.S. Time of Peak ______ Hr:Min.

C.S. Max.Gas Pressure ______ Lb/Sq.In.

C.S. Time of Peak ______ Hr:Min.

Phase Voltage 120 118 120

Remarks:
Top [illegible] of [illegible] — small amount of [illegible] from the sides

3/31/65

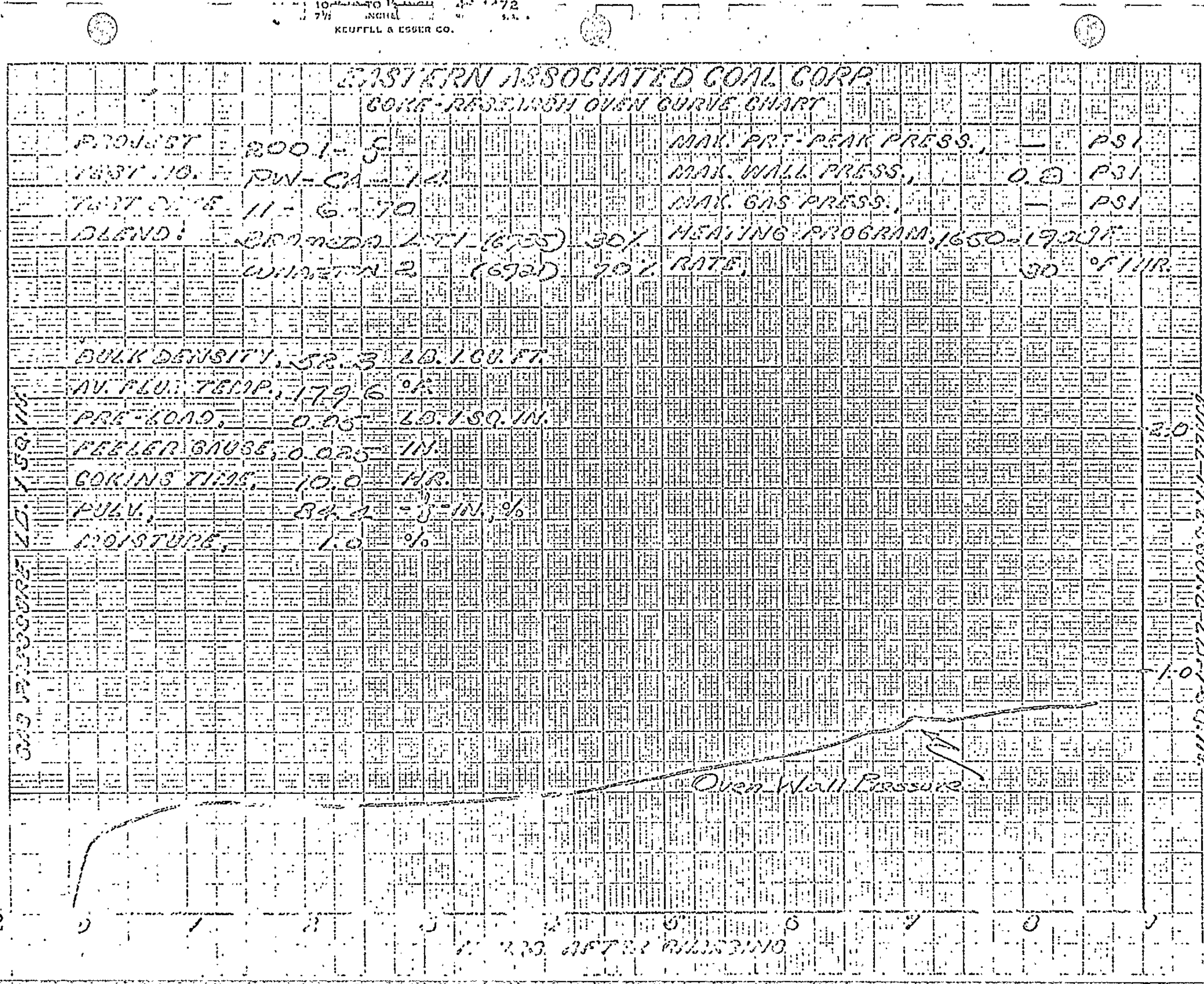

KEUFFEL & ESSER CO.
EASTERN ASSOCIATED COAL CORP.
COKE-RESEARCH OVEN CURVE CHART
PROJECT 2001-5
TEST NO. RW-CA-14
TEST DATE 11-6-70
BLEND:
(6720) 70%
MAX. PRT-PEAK PRESS., — PSI
MAX. WALL PRESS., 0.8 PSI
MAX. GAS PRESS., — PSI
HEATING PROGRAM, 1650-1950°F
RATE, 30 °F/HR.
BULK DENSITY, 52.3 LB./CU.FT.
AV. FLUE TEMP., 1796 °F
PRE-LOAD, 0.05 LB./SQ.IN.
FEELER GAUGE, 0.025 IN.
COKING TIME, 10.0 HR.
PULV., 84.4 %
MOISTURE, 1.0 %
2.0
1.0
LB./SQ.IN.
Oven Wall Pressure
AFTER CHARGING

FIGURE III-7

rank of coal. In fact, it is probable that a considerable proportion of the coal could be substituted for the low volatile coal in many coal blends. Its low ash and low volatile content give it an exceptionally high effective carbon content for blast furnaces.

IV MINING

Mining Conditions

The Skeeter seam is present about 20 to 30 feet above the Chamberlain seam. The seam is split with several shale bands of varying thickness. Because of the small interval between the seams it is not considered practical to mine both of the seams in the same area.

The immediate roof above the Chamberlain seam is a band of bone or carbonaceous shale. This material easily breaks free from the shale above. It may be difficult to hold, and the assumption is that it would be extracted with the coal. Where observed in the No. 2 adit, the bone band was 6 to 8 inches thick. The shale above the bone is a firm, gray silty shale and should make an excellent roof.

In the development stage, the possibility of holding the bone band may be worth considering. This would require leaving top coal of 12 to 18 inches. If feasible to hold the top coal, a much cleaner raw product can be produced.

The floor is a sandy shale to sandstone and should be satisfactory for hauling with rubber-tired equipment.

There are several sandstone layers from 10 to 60 feet thick within 100 feet of the top of the coal seam. In some of the drill holes a 30 foot sandstone is only a few feet above the Skeeter seam.

We would assume that the mine will be wet and that pumping a fairly large quantity of water will be required. This should not present a serious problem.

The roof as observed in the No. 2 adit can be supported over the normal entry width with roof bolts. Through faulted areas a considerable amount of timbering will be required.

Mining Operations

Preliminary development during the first two years will be limited to a small scale mining operation, producing run-of-mine coal.

This development will consist of driving three entries on 80 foot centers with crosscuts on 100 foot centers. One continuous miner unit (one continuous miner, two shuttle cars, one roof bolter and one 36-inch belt conveyor) will constitute the face unit. Materials and supplies will be transported by battery tractor units. A rock loader and rock drilling equipment will be required for driving through and grading through fault zones.

This mining unit will operate for about two years during which time a decision is made as to the ultimate practicable size of the proposed mine, and the most suitable plan for extraction at full production rates. It is felt that these decisions will be possible after perhaps about 10 to 12 months of this initial development period, at which time steps would commence for the design and erection of the preparation plant, construction of railroad and other surface facilities and procurement of equipment for full production.

The proposed operation would employ a room and pillar system of mining. Initially we propose the system without pillar extraction and based on that we have used 50 percent mining recovery in estimating recoverable reserves. With experience in the mining operation, and in the behavior of the roof, pillar recovery may prove to be practical, in which case overall "mining recovery" would increase to possibly 65 percent.

The room and pillar system as compared to longwall operation is much more flexible. Undoubtedly, there will not be sufficient information to locate in advance and in detail all the abnormalities such as faults, rolls or variations in seam height. Longwall systems require a uniform block of coal with consistent conditions to be highly productive. Room and pillar systems with continuous miners and shuttle car operation can be developed to mine in odd shaped blocks, such as the variations in the seam and geologic conditions may require.

Also, the loss or disruption to the operation of one continuous miner or conventional unit due to seam abnormality does not have the same detrimental effect on overall mine production as would the loss of production from one longwall face. The estimates of the cost of production are based upon what we believe can be expected from experience in similar conditions. We believe it is unreasonable to project production for these units comparable to the best performance in the U.S.A. because mines in the U.S.A. with the high production records have men available with many years of experience in the supervision, operation and maintenance required for this type of equipment.

Most of the men required for this operation will have no such experience and no doubt will have to be specifically trained and gain experience on this project.

Practically all of the area considered in this report for mining has less than 1,500 feet of cover above the Chamberlain seam. In an additional area southeast of the proposed mining the cover is apparently 1,500 feet plus. If and when mining is projected into that area it may be necessary to change to the longwall system of mining.

Basically the proposed mining plan as outlined on Exhibit B consists of driving a series of main and sub-main entries. The position as outlined presumes a pattern of faulting. The location of the thrust faults which will interrupt the normal mining plan can only be determined by the proposed initial development entries, which information will form the basis of the possible interference pattern expected from faulting.

A series of panel entries and room panels are to be driven for distances of about 2,000 feet from the main and sub-main entries. The extent of the coal between fault zones will determine whether the panels may be on one side or both sides of the main entries.

Coal would be mined with rotating head type continuous miners. The coal would be loaded into rubber-tired shuttle cars and trammed for distances up to 400 feet for transfer to belt conveyors which would convey the coal from the mine.

Several units of equipment are included for rock loading as it is anticipated that considerable grading will be required to cross the faulted areas.

Mine supplies and men would be transported by rail from the mine portal to the panel entries. Rubber-tired equipment would be used to transport the supplies to the face areas.

Rock would be loaded into rail cars and transported out of the mine for disposal.

Main and sub-main entries are projected in groups of seven. This provides for two intake airways, three return airways, one belt haulage entry for coal and one track haulage entry for supplies, men and rock. Entries are to be driven 18 feet wide on 80 foot centers.

Panel entries 2,000 feet long are driven on 80 foot centers. Three entries (one intake airway, one return airway and a center entry for coal haulage on a belt conveyor) would be required. Rooms would be 22 to 26 feet wide on 60 foot centers and 300 to 310 feet deep. Panels would be spaced 750 to 810 feet apart.

The main entries would be projected so that the three initial development entries will serve as three of the seven mains ultimately required.

Coal from the mine will be delivered to a hillside storage pile, reclaimed from storage and conveyed by belt conveyor to a raw coal storage bin for delivery to the preparation plant in the valley below the mine portals. This requires a downhill conveying system about 17,000 feet long.

Size of Mining Operation

We believe that at this stage the projected mining operation should be based on production not exceeding 1,000,000 long tons of clean coal per year. There are a number of reasons for not planning the mine larger than this at the present time. Certain adverse mining conditions will be encountered, such as faults, rolls, water, steep grades, and poor roof in areas of faults. There is presently a shortage of qualified supervisors and men. Training the number of men required for supervision and the operation and maintenance of the equipment is difficult for even a one million ton per year operation.

Therefore, our current plans call for operating the mine at the one million ton per year level, with the possibility, but not firm assurance, that if at the end of a 5 year period mining conditions and available personnel warrant expansion, the mine might then be increased to two million tons per year at that time.

Proposed Schedule of Operations

Stage	Year	Production Long Tons Clean Coal
I Development R.O.M. Coal	1	200,000
	2	300,000
II One Million Tons/Year	3	650,000
	4	850,000
	5	1,000,000
	6	1,000,000
	7	1,000,000
Then (Conditions Permitting):		
III Two Million Tons/Year	8	1,500,000
	9	1,750,000
	10	1,750,000
8 Years @ 2,000,000 Tons/Year	11-18	16,000,000
TOTAL 18 YEARS		26,000,000

V COAL PREPARATION

As a study of the washability data on the bulk sample shows (see Section III - Coal Quality), the Chamberlain seam is a relatively easy coal to clean. Usually the difficulty of separation is based upon the percent of near gravity material at the specific gravity of separation required to meet the market ash and/or sulfur requirements. The quantity of near gravity material affects yield, efficiency of separation and, of course, the choice of processes used to clean the coal.

A study of the washability curves (see Figures III-2, III-3 and III-4) shows that a specific gravity cut point at 1.60 would, theoretically, give a 4.52 ash and a yield of 85.26 percent for the 2" x 28 mesh size. This represents 80 percent of the raw coal.

If no cleaning (froth flotation) is done on the 28 mesh x 0, the balance of the raw coal (28 mesh x 0) runs 7.4 percent ash. A combination of the washed 2" x 28 mesh with the raw 28 mesh x 0 would give approximately a 5.5 percent ash product.

If it is felt necessary to produce a lower ash, it would probably be desirable to install froth flotation for cleaning 28 mesh x 0.

Table V-1 gives the basis for coal preparation plant calculations at 1,000,000 long tons per year of product. Depending on the processes used this means a plant of 400 to 420 tph of raw feed.

BASIS FOR COAL PREPARATION PLANT CALCULATIONS

BRAMEDA - PINE PASS, SUKUNKA RIVER

(Preliminary Study - November 1, 1970)

Capacity Metallurgical Coal Required = 1,000,000 Long Tons/Year

@ 240 day year = 4,200 long tons clean coal per day
4,700 short tons clean coal per day

Plant "A" @ 80.5% Yield = 1,240,000 Long Tons ROM/Yr.
Plant "B" @ 84.0% Yield = 1,190,000 Long Tons ROM/Yr.

Plant "A" @ 4,700 Short Tons/Day Clean Coal
= 5,850 short tons/day raw feed
= 300 tph @ 20 net hours/day/3 shifts
= 420 tph @ 14 net hours/day/2 shifts

Plant "B" @ 4,700 Short Tons/Day Clean Coal
= 5,600 short tons/day raw feed
= 280 tph @ 20 hours/day
= 400 tph @ 14 hours/day

Calculated Yields

Plant "A" - Baum jig on 2" x 28 Mesh + Raw 28 Mesh x 0

Jig Efficiency = 92% of theoretical recovery @ 1.60 Specific Gravity

2" x 28M = 85.0 x 92.0 = 78.0% Yield
28M x 0 = 90% Yield (i.e. 10% loss in system)

2" x 28M = 80% x 78.0 = 62.5%
28M x 0 = 20% x 90.0 = 18.0%
80.5% Calculated Total Yield

Baum Jig Ash = 5.0%
Raw 28M x 0 = 7.5%
Weighted Ash = 5.49% Clean Coal

Plant "B" - Heavy Media on 2" x 1/4"
Compound Water Cyclones or Deister Tables on 1/4" x 28M
28M x 0 Raw

@ 1.60 Specific Gravity

2" x 1/4" = 78.16 x 98.0 efficiency = 76.0%
1/4" x 28M = 95.0 x 96.0 efficiency = 91.0%
76.0 x 46.0% (Wt. %) = 35.0
91.0 x 34.0% (Wt. %) = 31.0
90.0 x 20.0% (Wt. %) = 18.0
84.0% Yield

HMS Ash = 5.5
CWC Ash = 4.0
28M x 0 = 7.5
Weighted Ash = 5.41 % Clean Coal

The preliminary flow sheet and estimates of cost for the preparation plant are based upon a capacity of 400 short tons per hour feed to the plant. This is based upon 2 shift operation or 14 hours per day.

In order to increase the production from 1,000,000 to 2,000,000 long tons of clean coal per year, the capacity of the preparation plant would be 800 short tons per hour operating on the same 2 shift basis.

By operating the plant 3 shifts, or 18 hours per day, 6 days per week, 300 days per year, a plant of 500 short tons per hour raw coal feed can process the 2,000,000 long tons of clean coal per year.

The flow sheet shown in Exhibit C and the calculations in Table V-1 are made to show two systems of washing.

Plant "A" is using a Baum type jig to wash the coal. Plant "B" shows the use of a heavy media process for the coarse coal and either Deister tables or compound water cyclones for the 3/8" x 28 mesh. In both cases the 28 mesh x 0 is recovered without froth flotation.

Either scheme should give about a 5.5 percent ash in the product. However, there is a substantial difference in the expected yield between the two schemes, due to the relative efficiency of separation. Plant "B" would increase the yield 3.5 percent. We are not too confident about the efficiency to be obtained from the compound water cyclones, but feel more assured that the Deister tables would give the required ash and recovery. This is subject to further investigations. At this stage, we would be inclined to favor the Deister tables and Plant "B" over Plant "A".

It should be emphasized that the flow sheet as herein presented is "Preliminary". Full discussion of requirements and a more detailed study will be necessary before a final flow sheet is prepared.

Plant "A". It is envisioned that the run-of-mine coal will be coming from the mine mouth by belt conveyor in tonnages up to 600 tph. This coal will pass into a feed belt conveyor and on to a grizzly screen where the plus 2-inch or plus 3-inch is screened out. The plus sizes will discharge into a rotary breaker where large oversize rock will be extracted. The breaker through product will combine with the natural minus 2-inch or minus 3-inch and be fed to a raw coal storage bin of possibly 2,000 ton capacity.

Variable speed feeders will discharge the 2" or 3" x 0 raw coal to the plant feed belt containing a belt scale and a tramp iron magnet. At the plant the belt will discharge the coal (400 tph) to a Baum jig, along with plant recirculating water.

The Baum jig will be a five cell, two compartment jig with two reject elevators. The one elevator will discharge primary refuse. The second elevator will discharge secondary reject which may contain some coal. This material will either go direct to plant refuse along with the product from the No. 1 elevator or will be crushed and recirculated back into the Baum jig feed.

The refuse will be dewatered and pass to a refuse bin where it will be trucked to a refuse disposal area.

The clean coal plus water will pass over dewatering screens. Here a possible 3/4-inch size separation will be made with the plus 3/4-inch dewatered in a centrifuge. The minus 3/4-inch and water will go to a sump and be pumped over sieve bends and slurry screens where the minus 28 mesh and most of the water is taken out and sent to a static thickener.

The 3/4" x 28 mesh is dewatered in centrifuges. The 28 mesh x 0 is settled out in the static thickener and pumped to a vacuum filter. The filter cake is then combined with the centrifuged 3/4" x 28 mesh and sent to a thermal dryer. The heat dryer product is combined with the plus 3/4-inch on a collecting conveyor, weighed and automatically sampled.

The finished product is then sent to two 5,000 ton capacity bins and from there sent out to a unit train loading station.

Plant "B". The raw coal is handled the same as in Plant "A" except that upon feeding the plant raw coal screens are used to separate the coal at 3/8 inch. The plus 3/8-inch sizes are cleaned in a heavy media vessel, and the 3/8" x 0 and water pass over sieve bends where the minus 28 mesh and water go to the static thickener. The 3/8" x 28 mesh is then cleaned in either compound water cyclone systems or on Deister tables.

The 3/8" x 28 mesh is centrifuged and combined with the raw 28 mesh x 0 filter cake and thermally dried. The dried product and the plus 3/8-inch clean coal are combined and the product passes to the clean coal handling system as shown under Plant "A".

Estimated costs for both Plant "A" and "B" are given in Section VI of this report.

VI ESTIMATED CAPITAL AND OPERATING COSTS

A. PRELIMINARY DEVELOPMENT

The estimated capital cost for the preliminary development operation, producing unwashed coal, is shown in Table VI-1.

The proposed labor force is given in Table VI-2.

Estimated operating costs are shown in Table VI-3.

The proposed operation is based upon the following:

Development to consist of three entries, on 80-foot centers with crosscuts spaced at 100-foot centers. Mining height is considered to be 8.5 feet.

Tons Per Foot of Single Entry	5.46
Tons Per Foot of Advance of Three Entries, Including Crosscuts	23.32
Average Number of Men - First Year (Men Per Day)	78
Average Number of Men - Second Year (Men Per Day)	90
Production - Three Shifts Per Day (Days Per Year)	350
Average Production - First Year (Tons Per Day)	600
Average Production - Second Year (Tons Per Day)	900
Average - Two Years (Tons Per Day)	750

	Tons
Production - First Year	210,000
Production - Second Year	315,000
Total Production	525,000

	Feet
Estimated Entry Advance - First Year	9,000
Estimated Fntry Advance - Second Year	13,500
Total Estimated Entry Advance	22,500

The productivity as estimated for this unit is based entirely upon our judgement, predicated on information from a similar type of operation under similar conditions.

The proposed initial development operation is based upon operating two years at this limited scale -- as explained in Section IV (Mining).

Table VI-1

Estimated Capital Costs

PRELIMINARY MINE DEVELOPMENT

	Canadian Dollars Estimated Cost	Total
1. Roads & Site Preparation		
a. Improvement Road to Chetwynd, 40 Miles (Add to cost of hauling coal @ $0.50 Per Ton)	$ -	
b. Road to Portals, 4 Miles	50,000	
c. Additional Services, Camp Site	5,000	
d. Portal Excavation - Storage, Loading & Fan Area	50,000	
		$ 105,000
2. Surface Buildings		
a. Shop & Warehouse	$ 15,000	
b. Shop Equipment	40,000	
c. Bathhouse -- 100 Men, 30' x 40' = 1,200 Sq.Ft. @ $20.00	24,000	
		$ 79,000
3. Power Supply		
a. Diesel Power Plant, 2-600 KW Generators	$125,000	
b. Power Lines Surface, Transformers & Switchgear	30,000	
c. Fuel Storage and Piping	5,000	
		$ 160,000
4. Surface Vehicles		
a. Bus for Men	$ 8,000	
b. Trucks	27,000	
		$ 35,000
5. Portals		
a. Portal Construction	$ 30,000	
b. Fan and Drive (150,000 c.f.m.)	50,000	
c. 100-Ton Coal Bin	40,000	
d. Coal Bar Screen & Crusher	50,000	
		$ 170,000

Table VI-1

(Continued)

	Canadian Dollars	
	Estimated Cost	Total
6. Underground Equipment, Face Unit		
a. Continuous Miner	$190,000	
b. Shuttle Cars (2)	132,000	
c. Roof Bolter	28,000	
d. Belt Conveyor	85,000	
e. Conveyor Extensions (3)	255,000	
f. Fans and Tubing	6,000	
g. Pumps and Piping	15,000	
h. Rock Duster	3,000	
		$ 714,000
7. Electrical		
a. Substation and Switchgear	$ 50,000	
b. Cables and Couplers - 8,000' @ $5.00	40,000	
		$ 90,000
8. Rock Loading		
a. Loading Machine	$ 65,000	
b. Drills, Bits, etc.	4,000	
c. Compressor and Piping	24,000	
		$ 93,000
9. Supply Delivery		
a. Battery Tractor	$ 18,000	
b. Batteries	13,000	
c. Supply Trailers, 4 @ $1,500	6,000	
d. Battery Charging Equipment	2,000	
		$ 39,000
10. General Mine		
a. Water Supply to Mine	$ 5,000	
b. Lighting & Mine Communications	6,000	
c. Cap Lamps & Charging Equipment	7,000	
		$ 18,000
Subtotal		$1,503,000
Contingencies		150,000
Extra Continuous Miner		190,000
Total		$1,843,000

Table VI-1

(Continued)

	Canadian Dollars	
	Estimated Cost	Total
11. Coal Storage & Loading		
Storage at Mine		
a. Clearing & Grading Site	$ 15,000	
b. *Front-End or Overshot Loader	130,000	
Storage & Loading at Chetwynd		
a. Site Preparation	15,000	
b. 3,500' Railroad Siding	125,000	
c. Car Hauls (2)	50,000	
Subtotal		$ 335,000
Contingencies		34,000
Total		$ 369,000
GRAND TOTAL		$2,212,000

Note:

* Front-End Loader to work 1 day loading railroad cars at Chetwynd. Front-End Loader to work 2 days loading trucks at mine stockpile.

Approximately 50% of equipment or facilities may be used for mine production in the permanent mine.

Table VI-2

Proposed Labor Force

PRELIMINARY MINE DEVELOPMENT

	First Shift	Second Shift	Third Shift	Total
UNDERGROUND				
Face Labor				
Continuous Miner Operators	1	1	1	3
Continuous Miner Helpers	1	1	1	3
Shuttle Car Operators	2	2	2	6
Roof Bolters	1	1	1	3
Timbermen	2	2	2	6
Utility & Ventilation	2	2	2	6
Mechanics	1	1	1	3
Supplies	2	2	2	6
Beltmen	1	1	1	3
Total Face Labor	13	13	13	39
Supervision				
Mine Foreman & Fire Boss	1	1	1	3
Mechanic & Electrical Foreman	1	1	1	3
Total Supervision	2	2	2	6
SURFACE LABOR				
Superintendent	1	-	-	1
Engineers and Surveyors	5	-	-	5
Office and Warehouse	6	1	1	8
Truck Loading at Portal	1	1	1	3
Mobile Equipment Operators	4	1	1	6
Shop	5	2	2	9
Loading Ramp, Chetwynd and Miscellaneous Laborers	7	3	3	13
Total Surface Labor	29	8	8	45
GRAND TOTAL, LABOR FORCE	44	23	23	90

Table VI-3

Estimated Operating Costs

PRELIMINARY MINE DEVELOPMENT

We have used a wage rate for labor of $49.80 per day, including fringe benefits. The estimated operating costs for this part of the development are:

	Canadian Dollars Per Long Ton, Raw Coal
Labor	$ 5.980
Materials & Supplies	2.500
Power	0.350
Royalty	0.280
Subsistence and Travel	1.200
Heat Buildings, Camp & Mine Air	0.080
Equipment Rental	0.160
Taxes and Insurance (exclusive of income or corporate taxes)	0.100
Administration	0.500
Total Mine Cost, at Mine Mouth	$11.150
Transportation & Loading	
Mine Portal to Stockpile (4 Miles at 8 cents ton/mile)	$ 0.320
Mine Storage to Chetwynd (40 Miles at 5 cents ton/mile)	2.000
Road Maintenance and Repair	0.500
Loading Trucks and Railroad Cars	0.200
Total Transportation & Loading	$ 3.020
Estimated Cost on Cars at Chetwynd (before depreciation and interest)	$14.170

B. PROPOSED MINE AT 1,000,000 TONS CLEAN COAL ANNUALLY

A summary of the estimated capital costs for the proposed mine at a capacity of 1,000,000 long tons of clean coal annually is shown in Table VI-4. Details of capital cost estimates are shown in Tables VI-5; VI-6; VI-7 and VI-8.

Proposed labor force is shown in Table VI-9.

Estimated operating costs are shown in Table VI-10.

The estimates are based upon:

Life of Mine (Years)	20
Annual Production (Long Tons Clean Coal)	1,000,000
Number of Production Days Per Year	240
Daily Production (Long Tons Clean Coal)	4,200
Number of Production Units	7
Number of Production Unit Shifts Per Day	14
Production Per Unit Shift (Long Tons Clean Coal)	300
Number of Men Per Day	370
Production (Tons Per Man-Shift)	11.35

The estimated operating costs are based upon an average production of 400 short tons run-of-mine coal equivalent to 300 long tons of clean coal per unit shift. This would be considered fairly good performance for fair mining conditions. It is not possible to determine the difficulties that will be encountered in mining through and close to the faulted areas.

Table VI-4

SUMMARY OF ESTIMATED CAPITAL COSTS

PROPOSED MINE AT 1,000,000 TONS CLEAN COAL ANNUALLY

(in Canadian Dollars)

	Bring Mine Up To Capacity	Extend Facilities To Maintain Production	Replacements	Total
SURFACE				
Railroad, 40 Miles	$ 6,800,000	$	$	$ 6,800,000
Power Line, 40 Miles	1,000,000			1,000,000
Housing in Chetwynd	500,000			500,000
Coal Processing & Railroad Loading	6,580,000			6,580,000
Surface Facilities, Buildings & Equipment	3,757,000		543,000	4,300,000
Total Surface	$18,637,000	$	$ 543,000	$19,180,000
UNDERGROUND				
Face Units	$ 4,800,000	$	$ 8,784,000	$13,584,000
General Mine	2,184,000	1,700,000	3,029,000	6,913,000
Total Underground	$ 6,984,000	$1,700,000	$11,813,000	$20,497,000
GRAND TOTAL	$25,621,000	$1,700,000	$12,356,000	$39,677,000

Table VI-5

PRELIMINARY COST ESTIMATE DETAIL

COAL PROCESSING & RAILROAD LOADING FACILITIES

PROPOSED MINE AT 1,000,000 TONS CLEAN COAL ANNUALLY

	Canadian Dollars
I. Raw Coal Handling System	
Conveyors, Miscellaneous	$ 100,000
Grizzley & Rotary Breaker	175,000
Concrete Storage Bin, 2,000 Ton	200,000
Feeders, Belt Scales, Plant Feed Conveyor	150,000
	$ 625,000
II. Preparation Plant	
Using Plant "A" Flow Sheet, Baum Jig System	$ 350,000
Dewatering Screens, Sieve Bends & Centrifuges	175,000
Static Thickener, 100' Diam., Concrete	200,000
Vacuum Filter & Auxiliaries	175,000
Thermal Dryer	350,000
Pumps & Piping	150,000
Plant Heating System	125,000
Misc. Auxiliary Equipment including Elevator, Control Center, etc.	200,000
Electrical Equipment, Wiring	475,000
Automatic Sampler	75,000
Structure, Siding, etc.	750,000
	$3,025,000
III. Clean Coal Storage & Unit Train Loading System	
Two 5,000 Ton Concrete Bins	$ 500,000
Emergency Stockpile System	75,000
Feeders, Conveyors, 3,500 tph	250,000
300 Ton Unit Train Surge Bin	150,000
	$ 975,000
IV. Miscellaneous	
Site Preparation & Piling	$ 150,000
Water Supply	150,000
Laboratory, including Equipment	75,000
Refuse Truck	125,000
Bulldozer	125,000
	$ 625,000
Total I, II, III & IV	$5,250,000
Engineering @ 7%	368,000
	$5,618,000
Contingencies @ 10%	562,000
	$6,180,000
Note: For Plant "B" substituting heavy media and CWC cyclones or Deister tables, add $400,000 to the above over using Baum jig system.	400,000
	$6,580,000

Table VI-6

PRELIMINARY COST ESTIMATE DETAIL

OTHER SURFACE BUILDINGS, EQUIPMENT AND FACILITIES

PROPOSED MINE AT 1,000,000 TONS CLEAN COAL ANNUALLY

(in Canadian Dollars)

	Bring Mine Up To Capacity	Extend Facilities To Maintain Production	Replacements	Total
1. Site Preparation				
(Grading, Roads, etc.)	$ 75,000	$	$	$ 75,000
2. Surface Buildings				
Office & Bathhouse				
12,500 Sq.Ft. @ $23.00	288,000			288,000
Shop & Warehouse,				
16,000 Sq.Ft. @ $33.00	528,000			528,000
3. Road to Portal				
4 Miles @ $30,000 Per Mile	120,000			120,000
4. Vehicles				
Buses (2) (5 Year Life)	20,000		60,000	80,000
High Lift (1) (5 Year Life)	30,000		90,000	120,000
Trucks (5 Year Life)	25,000		75,000	100,000
Pick Ups (5 Year Life)	16,000		48,000	64,000
Dozers (5 Year Life)	90,000		270,000	360,000
5. Conveyor System				
36" Belt Conveyor, 600 t.p.h.,				
18,000 Ft., Structure & Terminals	900,000			900,000
Belting	900,000			900,000
Construction	450,000			450,000
6. Portals				
Excavation & Grading (Storage)	135,000			135,000
Concrete & Steel Portal	40,000			40,000
Fan Portal	40,000			40,000
7. Fan Drive, Housing & Installation	100,000			100,000
TOTAL	$3,757,000	$ -	$ 543,000	$4,300,000

Table VI-7

PRELIMINARY COST ESTIMATE DETAIL

FACE UNITS

PROPOSED MINE AT 1,000,000 TONS CLEAN COAL ANNUALLY

(in Canadian Dollars)

Face Units	Number Required	Cost Each	Total Cost Per Face Unit	Replacement 7 Years	Replacement 10 Years
1. Continuous Miner	1	$190,000	$190,000	$190,000	$
2. Shuttle Cars	2	66,000	132,000	132,000	
3. Roof Bolter	1	28,000	28,000	28,000	
4. Belt Feeder-Breaker	1	33,000	33,000	33,000	
5. 36" Belt Conveyor, 2,000 Ft.	1	86,000	86,000	40,000	46,000
6. Electrical Substation Transformer & Switchgear		50,000	50,000		50,000
7. Electric Cables		20,000	20,000	10,000	10,000
8. Battery Tractor Supply	1	18,000	18,000	18,000	
9. Batteries & Charger		10,000	10,000	10,000	
10. Supply Trailers	4	2,000	8,000	8,000	
11. Rock Duster Trickle Unit		3,000	3,000	3,000	
12. Fans (2) and 1,000 Ft. Vent. Tube		17,000	17,000	17,000	
13. Pumps and Pipe		5,000	5,000	5,000	
			$600,000	$496,000	$106,000

Initial Investment		
8 Face Units (7 Production + 1 Spare)	$600,000 x 8	$ 4,800,000
Replacements		
7 Year Life Items Replace Twice	$496,000 x 2 x 8	7,936,000
10 Year Life Items Replace Once	$106,000 x 1 x 8	848,000
Total Replacements		8,784,000
Total Initial Investment and Replacements		$13,584,000

Table VI-8

PRELIMINARY COST ESTIMATE DETAIL

GENERAL MINE-UNDERGROUND

PROPOSED MINE AT 1,000,000 TONS CLEAN COAL ANNUALLY

(in Canadian Dollars)

	Bring Mine Up To Capacity	Extend Facilities To Maintain Production	Replacements	Total
1. Transportation - Men, Materials & Rock				
Track, 20,000 Ft. @ $15.00	$ 300,000	$ 375,000	$	$ 675,000
Diesel Locomotives (4)	120,000			120,000
Man-Riding Cars (12)	48,000			48,000
Jeeps (8)	96,000		96,000	192,000
Rock Loaders (2)	130,000		65,000	195,000
Rock Cars (10)	30,000		30,000	60,000
Material Cars	10,000			10,000
Diesel Shuttle Cars (2)	160,000		160,000	320,000
Elevating Conveyors (2)	20,000		20,000	40,000
Fans & Tubing	8,000		16,000	24,000
Drills, Bits, etc.	10,000		20,000	30,000
Rock Dusters (2)	24,000		24,000	48,000
Air Compressors (2)	48,000		48,000	86,000
2. Underground Power Lines				
High Voltage Power Lines	100,000	80,000		180,000
Switchgear and Transformers	75,000			75,000
3. Underground Water				
Pumps and Pipe	45,000	25,000		70,000
Water Supply	30,000	20,000		50,000
4. Transportation - Coal				
48" Belt Conveyors, 5,000 Ft.	900,000	1,200,000	2,550,000	4,650,000
5. Safety Equipment and Supplies	30,000			30,000
TOTAL	$2,184,000	$1,700,000	$3,029,000	$6,913,000

Table VI-9

PROPOSED LABOR FORCE

PROPOSED MINE AT 1,000,000 TONS CLEAN COAL ANNUALLY

	No. Per Unit	First Shift	Second Shift	Third Shift	Total
1. Face Units					
Continuous Miner Operators	1	7	7	-	14
Continuous Miner Helpers	1	7	7	-	14
Shuttle Car Operators	2	14	14	-	28
Roof Bolters	2	14	14	-	28
Mechanics	1	7	7	8	22
Utility	1	7	7	-	14
Rock Dust and Supplies	-	-	-	8	8
Face Bosses	1	7	7	-	14
Total		63	63	16	142
2. Underground General					
Supply		2	2	2	6
Drainage and Water Supply		4	-	-	4
Ventilation, Stopings		6	-	-	6
Trackmen		6	-	-	6
Conveyor Extensions & Patrol		2	2	8	12
Mechanics-Electricians		4	4	2	10
Timbermen		6	-	-	6
General Pool		10	6	4	20
Rock Dust		-	-	4	4
Fire Bosses		1	1	1	3
Total		41	15	21	77
3. Rock Loading					
Section Bosses		2	2	-	4
Loader Operators		2	2	-	4
Loader Helpers		2	2	-	4
Shuttle Car Operators		4	4	-	8
Motormen		2	2	-	4
Timbermen		4	4	-	8
Total		16	16	-	32
4. Supervision-Underground					
Mine Foremen		1	1	1	3
Section Foremen		3	3	-	6
Maintenance Foremen		-	-	2	2
Total		4	4	3	11

Table VI-9

(Continued)

	No. Per Unit	First Shift	Second Shift	Third Shift	Total
5. Surface					
Shop		4	3	3	10
Lamps and Dry.		2	2	2	6
Drivers, Mobile Equipment		4	2	2	8
Warehouse & Purchasing		3	1	1	5
Office and Clerical		11	-	-	11
Surveyors and Draftsmen		4	-	-	4
Laboratory		4	-	-	4
Laborers and Miscellaneous		10	4	4	18
Foreman (Surface)		1	-	-	1
Total		43	12	12	67
6. Preparation and Loading					
Plant Operation		4	4	-	8
Loading		4	4	-	8
Maintenance		3	3	8	14
Clean Up		2	2	2	6
Total		13	13	10	36
7. Supervision					
General Superintendent		1	-	-	1
Chief Mining Engineer		1	-	-	1
Maintenance Superintendent		1	-	-	1
Preparation Superintendent		1	-	-	1
Assistant General Superintendent		1	-	-	1
Total		5	-	-	5
GRAND TOTAL, LABOR FORCE		185	123	62	370

Table VI-10

ESTIMATED OPERATING COSTS

PROPOSED MINE AT 1,000,000 TONS CLEAN COAL ANNUALLY

We have used a wage rate for labor of $49.80 per day, including fringe benefits. At a production of 4,200 tons per day (clean coal) and a labor force of 370 per day, productivity is 11.35 long tons clean coal per man-day.

	Canadian Dollars Per Long Ton, Clean Coal F.O.B. Railroad at Mine
Labor Cost	$4.390
Materials and Supplies	2.255
Power	0.150
Royalty, 25 Cents per Short Ton	0.280
Administration and Sales	0.250
Taxes and Insurance (Exclusive of income or corporate taxes)	0.050
Total Operating Cost, F.O.B. Rail At Mine before depreciation, interest and provision for extension of facilities	$7.375

C. POSSIBLE EXPANSION OF MINE TO 2,000,000 TONS ANNUALLY

We doubt that the proposed mine can be expanded to produce more than 1 million tons per year. However, if after a period of some 5 years conditions indicate that the production rate may be increased, we estimate a rough approximation of costs as follows:

To Expand From 1.0 to 2.0 Million Tons Annually

Additional Initial Capital to Reach 2.0 Million Tons from 1.0 Million Tons	$11,000,000

Estimated Operating Costs at 2.0 Million Ton Level
(8,000 Tons Per Day - 615 Men - Labor @ $49.80 Per Day)

	Canadian Dollars Per Long Ton, Clean Coal F.O.B Railroad at Mine
Labor	$3.83
Supplies	2.26
Power	0.15
Royalty	0.28
Taxes and Insurance (Exclusive of income or corporate taxes)	0.05
Administration	0.15
Total (before depreciation, interest and provision for extension of facilities and replacements)	$6.72

Respectfully submitted,

PAUL WEIR COMPANY