ESSO RESOURCES CANADA LTD.

SUMMARY REPORT ON FIELD INVESTIGATIONS OF COAL MINE WASTE DUMPS IN THE NANAIMO AREA VANCOUVER ISLAND

PREPARED FOR :
ESSO RESOURCES CANADA LTD.

PREPARED BY :
STEPHEN L. GARDNER, P. GEOL.

DATE: October, 1983

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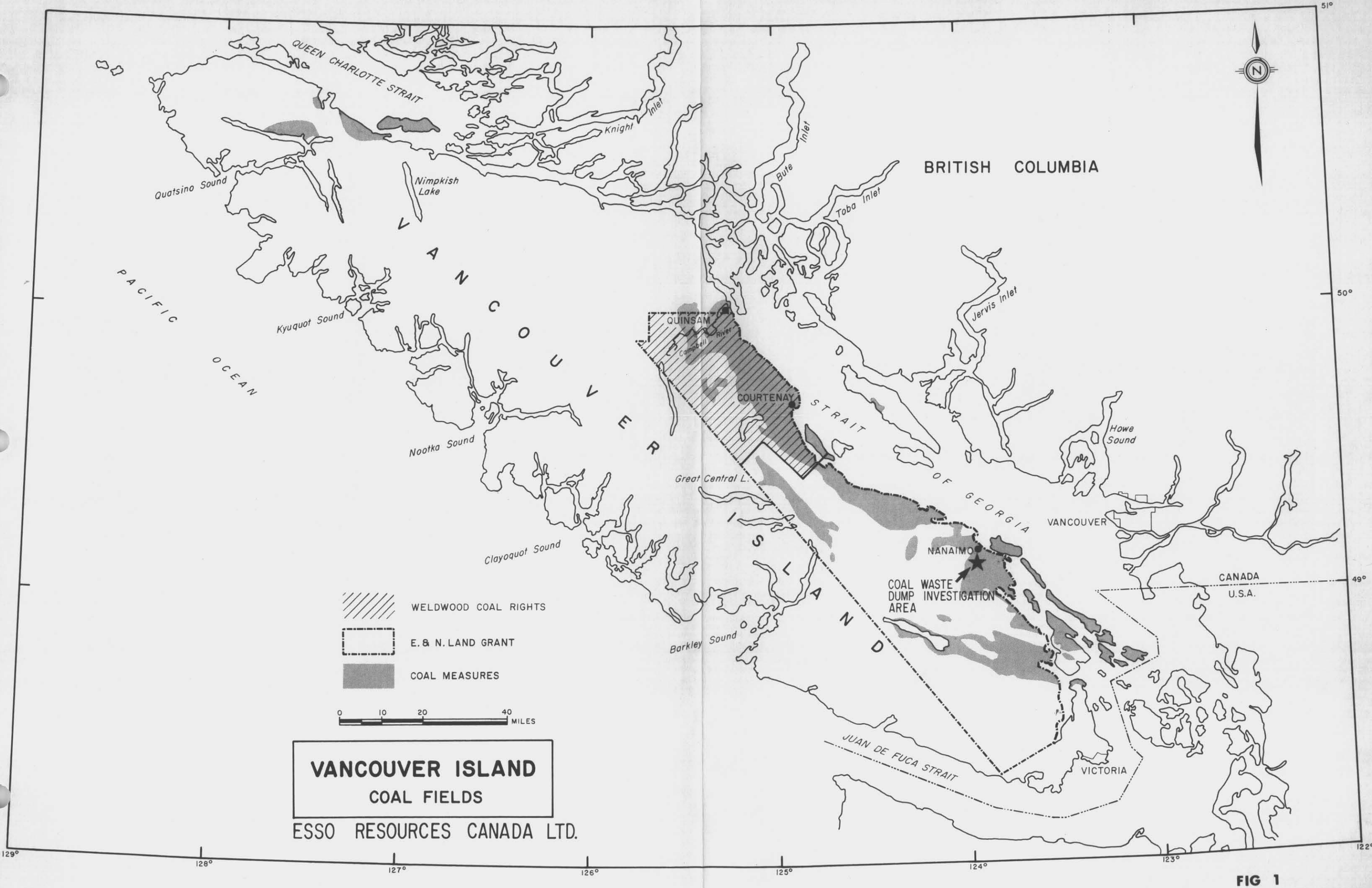

QUEEN CHARLOTTE STRAIT
Knight Inlet
Bute Inlet
Toba Inlet
BRITISH COLUMBIA
Quatsino Sound
Nimpkish Lake
VANCOUVER ISLAND
PACIFIC OCEAN
Kyuquot Sound
Nootka Sound
Clayoquot Sound
Barkley Sound
QUINSAM
Campbell River
COURTENAY
Great Central L.
Jervis Inlet
Howe Sound
STRAIT OF GEORGIA
VANCOUVER
NANAIMO
COAL WASTE DUMP INVESTIGATION AREA
CANADA
U.S.A.
JUAN DE FUCA STRAIT
VICTORIA
WELDWOOD COAL RIGHTS
E. & N. LAND GRANT
COAL MEASURES
0 10 20 40 MILES
VANCOUVER ISLAND
COAL FIELDS
ESSO RESOURCES CANADA LTD.
51°
50°
49°
129°
128°
127°
126°
125°
124°
123°
122°

FIG 1

SECTION 1.

1.0 INTRODUCTION

Between 5 and 10 million tonnes of coal mine tailings occurs in the Nanaimo area of southeastern Vancouver Island. This tailings material is contained in a number of waste dumps varying in size from a few thousand to as much as 500,000 cubic meters. These dumps are located near the abandoned mine headings that are scattered around the suburban Nanaimo area.

Preliminary analytical work, consisting mainly of grab samples taken from random locations, indicated that the dumps contain between 50 to 60% ash on an as-received basis, with 8 - 10% moisture, and 3,500 to 5,000 BTU/lb. This preliminary testing prompted Countryside Coal Processing Ltd. to secure options on the piles from the various land owners.

In September, 1983 Esso Resources Ltd. entered into an agreement with Countryside to investigate the waste dumps in greater detail and evaluate the economics of processing the dumps in order to recover clean coal product. Three of the larger and more accessible dumps were chosen for the initial investigation.

This report describes the field methods chosen for the sampling of each of the dump sites and outlines the field program undertaken by the author on behalf of Esso Resources Ltd.

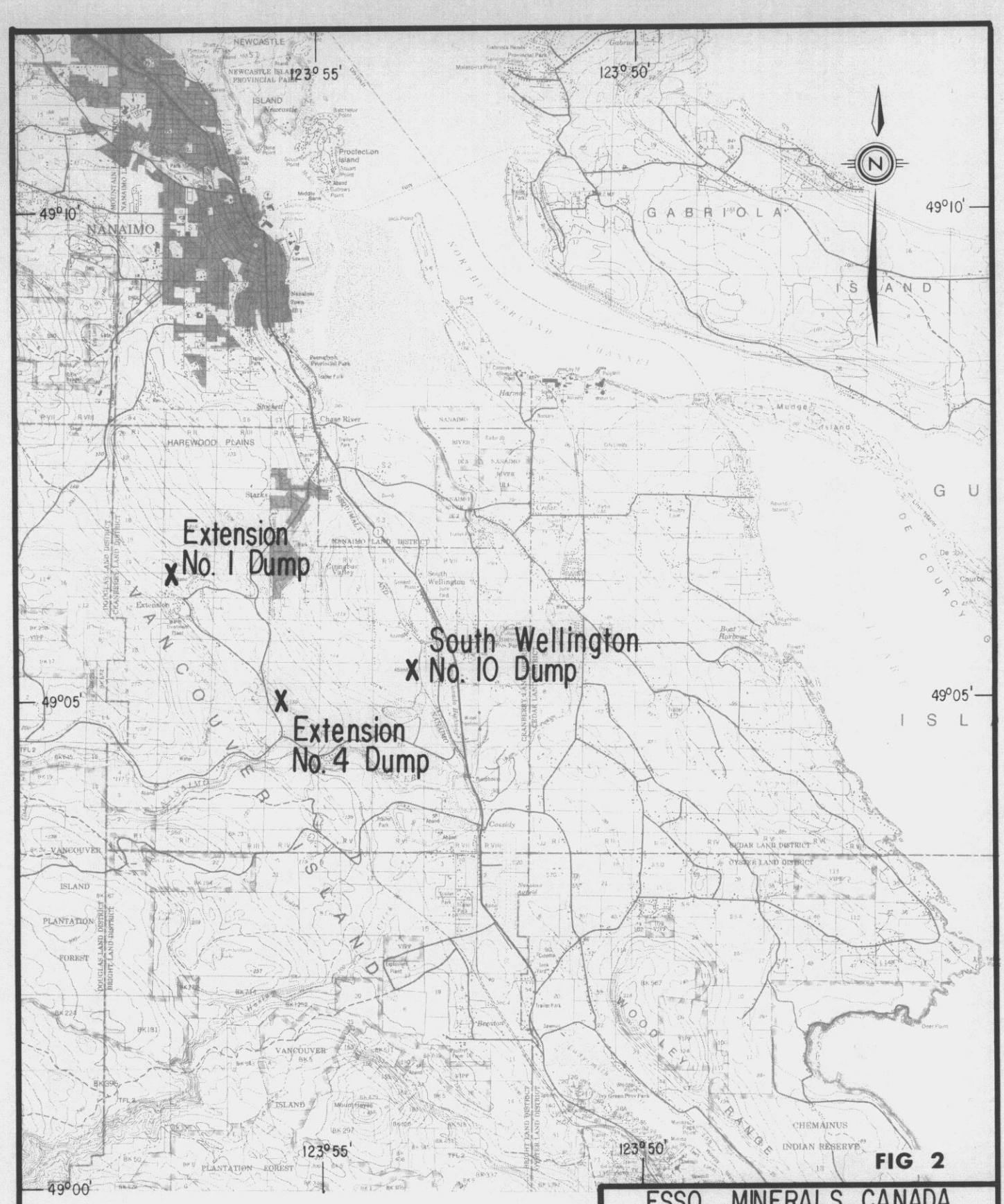


FIG 2

ESSO MINERALS CANADA

COAL WASTE DUMP INVESTIGATION

LOCATION MAP
1983 SAMPLING PROGRAM

SCALE : 1 : 100 000			
DRAWN BY: S.L. GARDNER	CHECKED BY:	DRAFTED BY: E.J. DUNN	DATE: OCT 1983

1.1 Location of Coal Waste Dumps Selected for Initial Investigations

Figure 2 shows the location of the three waste dumps selected for initial sampling work. These are the South Wellington No. 10 Mine Dump, the Extension No. 1 Mine Dump, and the Extension No. 4 Mine Dump. They are located within an 11 km. road distance of each other and are 12 km. road distance of tidewater.

The South Wellington No. 10 Dump is located on a 22.7 hectare parcel of land owned by Mr. Mac Smith, a local equipment contractor. The Extension No. 1 and No. 4 Mine Dumps are both located on MacMillan Bloedel Ltd. surface rights. All three dumps are situated outside of the city limits of Nanaimo and as such fall within the jurisdiction of the Regional District of Nanaimo.

SECTION 2.

2.0 BRIEF HISTORY OF COAL MINING - NANAIMO AREA

During the period 1852 to 1964, approximately 55 million short tons of coal was produced from the Nanaimo coalfield. Of this 55 million tons, 18 million tons was produced from the Wellington Seam horizon (the lowermost seam). Of the remaining 37 million tons, approximately 20 million tons was produced from the No. 1 Mine near Nanaimo harbour and other mines within the vicinity of downtown Nanaimo (the Douglas Seam Horizon). The other 17 million tons were produced from scattered locations in the Nanaimo coalfield.

Most of the mines washed their raw coal with a simple Vissac Jig wash plant. Jig plant efficiency for the various mines ranged from 71 to 80 %. In general, the Douglas Seam mines on the south end of the field had the lowest plant yields (71 to 73 %). This was because the Douglas Seam in this area was subjected to a great amount of stress resulting in areas of pinch and swell, which yielded a great amount of fines. The Jig plants had difficulty recovering the fines fraction, and these fines were difficult to market in the domestic and bunkering trades.

Most of the coal waste in the harbour and downtown Nanaimo areas had been disposed of due to urban developments. On the outskirts of the city, however, numerous waste dumps ranging from a few thousands of tons to hundreds of thousands of tons still remain.

Using the approximate total output figures for the Nanaimo coalfield of 55 million tons minus the 20 million tons from the harbour area, a figure of 35 million tons for the outlying mines is estimated. By employing an average jig plant yield of 75 %, and assuming that all of the coal was washed, an estimate of 8.75 million tons of coal waste may be present in the Nanaimo district.

Table 1. illustrates some washery data for the typical coal sizes produced from Nanaimo mines.

TABLE 1. COAL WASHERY DATA, NANAIMO COALFIELD

WASHED COAL SIZES			% RECOVERY	% RECOVERY
Classification	inches	millimeters	Wellington Seam	Douglas Seam
No. 1 Nut	-2½+1½	-64+38	13.85	4.96
No. 2 Nut	-1½+7/8	-38+22	10.45	7.12
Pea	-7/8+3/16	-22+05	20.00	21.91
Washed Smalls	-3/16	-05	25.61	32.26
Boiler Smalls	-3/16	-05	6.64	6.04
Refuse	-3/16	-05	23.45	27.71
			55.70	66.70

3.0 PREVIOUS SAMPLING WORK

Previous analytical work on the waste dumps consists of work conducted by the author in 1979 on two of the most extensive dumps: the South Wellington No. 10 Mine Dump and the Extension No. 4 Mine Dump. This work is tabulated in the following tables. Sample No. 1 is a composite sample of the No. 1 Extension Dump located approximately 11 km. southwest of the Nanaimo city centre. The sample labelled Sample No. 2 is a composite sample of the South Wellington No. 10 Mine Dump, located approximately 8 km. south of the city centre.

The 1979 sampling involved the use of a tractor-mounted backhoe. The backhoe was able to ascend the sides of the piles in both cases, utilizing the tipple ramps. Holes were spaced randomly up the ramps and around the base of the piles. In most cases, the backhoe penetrated 2 to 3 meters into the material before a sample was collected. Approximately 350 kg. of dump material was composited from the various trench sites for each sample. The composite was then coned and quartered several times to reduce the shipped sample weight to approximately 50 kg. for each sample.

Dry screening and float-sink testing was conducted on each sample. The results are documented in the following tables.

Results of the dry screening are tabulated in Table 2. It should be noted that between 11 and 14 % of the total sample is greater than the 1 in. (25 mm.) size. Also, approximately 1/3 of the total samples are smaller than 10 mesh. (1.7)

The dry screen analysis was performed in order to determine whether a particular size range would have a greater or lesser coal content. The data shows that the ash percent of all size fractions is quite similar, except a slight decrease in ash in the finer sizes. Screening does little to enhance

TABLE 2. - SIZE DISTRIBUTION ANALYSIS

SIZE RANGE INCHES	MM	DIRECT WT. %	ASH %	% WT. ASH OF TOTAL	CUM. WT. % ASH	CUMULATIVE OVERSIZE WT. %	ASH %
SAMPLE#1 (Extension)							
+2	+50	4.43	80.69	3.16	3.16	4.43	71.33
+1	+25	9.43	75.44	7.11	10.27	13.86	74.10
+½	+13	9.30	67.19	6.25	16.52	23.16	71.34
+¼	+6	14.21	62.49	8.88	25.40	37.37	67.97
+ 1/8	+3	14.71	63.99	9.41	34.81	52.08	66.84
+ 1/16	+1.5	16.71	66.08	11.04	45.85	68.79	66.65
- 1/16	-1.5	31.22	66.16	20.66	66.51	100.01	66.51
SAMPLE#2 (South Wellington)							
+2	+50	4.71	67.08	3.16	3.16	4.71	67.09
+1	+25	6.85	72.08	4.94	8.10	11.56	70.06
+½	+13	10.20	57.21	5.84	13.94	21.76	64.06
+¼	+6	14.80	55.89	8.27	22.21	36.56	60.75
+ 1/8	+3	14.92	55.98	8.35	30.56	51.48	59.36
+ 1/16	+1.5	15.22	57.26	8.71	39.27	66.70	58.88
- 1/16	-1.5	33.32	58.11	19.36	58.63	100.02	58.63

GENERAL TESTING LABORATORIES

DIVISION: SUPERINTENDENCE COMPANY (CANADA) LTD.
1001 EAST PENDER STREET, VANCOUVER, B.C., CANADA
V6A 1W2
PHONE (604) 254-1647 TELEX 04-507514 CABLE SUPERVISE

CERTIFICATE OF ANALYSIS

TO:
Mr. Steven L. Gardner
273 Westwood Road,
R.R. # 3 - Site S.
Nanaimo, B.C. V9R 5K3

No.: 7907-1014
DATE: August 10, 1979
FILE:

TABLE 3.

WE HEREBY CERTIFY that we have analyzed the submitted samples herein described and report as follows:

AS RECEIVED BASIS: Samples marked # 1 and # 2

	Total Moisture	Ash	Volatile Matter	Fixed Carbon
Sample # 1	9.29%	61.27%	17.79%	11.65%
Sample # 2	8.15%	54.86%	19.95%	17.04%

AIR DRY BASIS:	Fraction %	Residual Moisture %	Ash %	Volatile Matter %	Fixed Carbon %	Sulphur %
# 1 Original	--	1.66	66.43	19.36	12.55	0.19
+ 2"	4.43	1.78	80.69	14.08	3.45	0.10
+ 1"	9.43	1.46	75.44	15.83	7.27	0.13
+ 1/2"	9.30	1.44	67.19	18.58	12.79	0.17
+ 1/4"	14.21	1.53	62.49	20.06	15.92	0.20
+ 1/8"	14.71	1.62	63.99	19.83	14.56	0.20
+ 1/16"	16.71	1.68	66.08	18.53	13.71	0.18
- 1/16"	31.22	1.84	66.16	18.54	13.46	0.19
#2 Original	--	1.57	58.79	21.45	18.19	0.48
+ 2"	4.71	1.51	67.08	18.31	13.10	0.49
+ 1"	6.85	1.31	72.08	17.05	9.56	0.27
+ 1/2"	10.20	1.42	57.21	22.05	19.32	0.35
+ 1/4"	14.80	1.57	55.89	22.50	20.04	0.48
+ 1/8"	14.92	1.59	55.98	21.96	20.47	0.45
+ 1/16"	15.22	1.60	57.26	21.74	19.40	0.45
- 1/16"	33.32	1.67	58.11	21.17	19.05	0.53

Calorific Value on Original Sample # 1 (air dry basis) ..... 3582 BTU/lb.
Calorific Value on Original Sample # 2 (air dry basis) ..... 5033 BTU/lb.

Calorific Value and Specific Gravity on Fractions with lowest Ash (air dry basis)
Sample # 1 - 1/4" ..... 4111 BTU/lb. ..... Specific Gravity 1.99 g/cm^3
Sample # 2 - 1/4" ..... 5485 BTU/lb. ..... Specific Gravity 1.87 g/cm^3

NOTE:
Specific Gravity was determined on air dry basis pulps -60 mesh.

LL:at

L. Lakosil

L. Lakosil - Chief Coal Chemist.
SIGNATURE AND TITLE

GENERAL TESTING LABORATORIES

DIVISION: SUPERINTENDENCE COMPANY (CANADA) LTD.
1001 EAST PENDER STREET, VANCOUVER, B.C., CANADA
V6A 1W2
PHONE (604) 254-1647 TELEX 04-507514 CABLE SUPERVISE

TO:
MR. STEVEN L. GARDNER
274 Westwood Road,
R.R. # 3 - Site S.
Nanaimo, B.C. V9R 5K3

CERTIFICATE OF ANALYSIS

No.: 7908-0905	DATE: August 27, 1979
FILE:	

TABLE 4.

WE HEREBY CERTIFY that we have analyzed the herein described samples and report as follows:

DESCRIPTION: Two (2) submitted Coal Samples

1 FEED: Air Dry Ash 66.43% - Dry Ash 67.55%

SPECIFIC GRAVITY	F L O A T		S I N K	
	Yield %	Dry Ash %	Yield %	Dry Ash %
1.3	4.53	15.15	95.47	69.16
1.4	12.39	19.26	87.61	74.46
1.5	16.83	19.43	83.17	76.91
1.6	20.20	23.12	79.80	77.65
1.7	23.01	24.14	76.99	79.59
1.8	28.33	28.85	71.67	81.82
1.9	31.19	32.03	68.81	83.10

2 FEED: Air Dry Ash 58.79% - Dry Ash 59.73%

1.3	4.86	7.92	95.14	61.96
1.4	18.36	11.04	81.64	70.31
1.5	26.94	16.94	73.06	74.37
1.6	30.25	18.27	69.75	76.65
1.7	34.16	19.87	65.84	79.10
1.8	40.23	25.30	59.77	81.01
1.9	43.42	27.06	56.58	82.92

LL:at

for L. Lakosil - Chief Coal Chemist

SIGNATURE AND TITLE

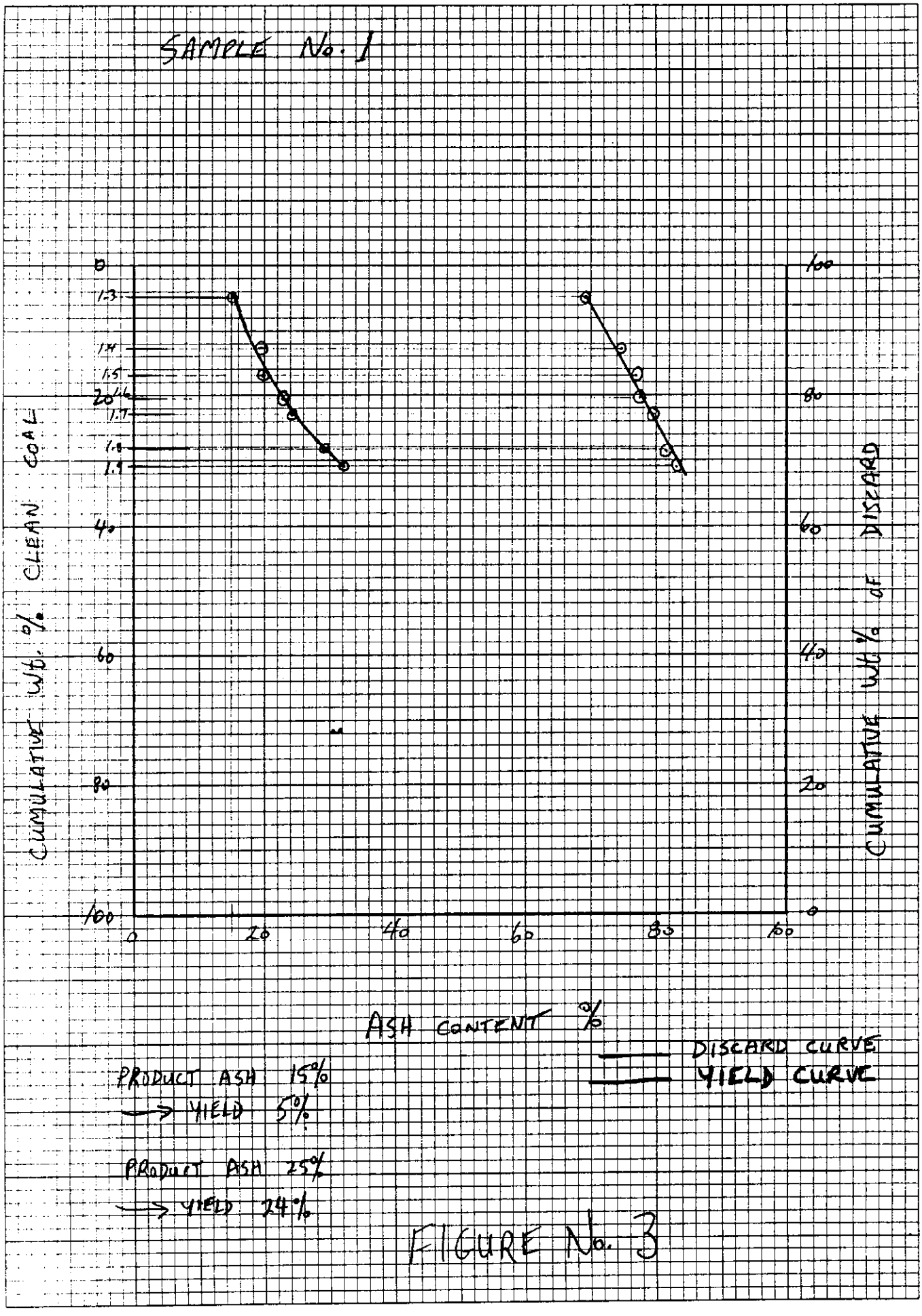

SAMPLE No. 1
CUMULATIVE WT. % CLEAN COAL
CUMULATIVE WT. % OF DISCARD
ASH CONTENT %
DISCARD CURVE
YIELD CURVE
PRODUCT ASH 15%
→ YIELD 51%
PRODUCT ASH 25%
→ YIELD 74%

FIGURE No. 3

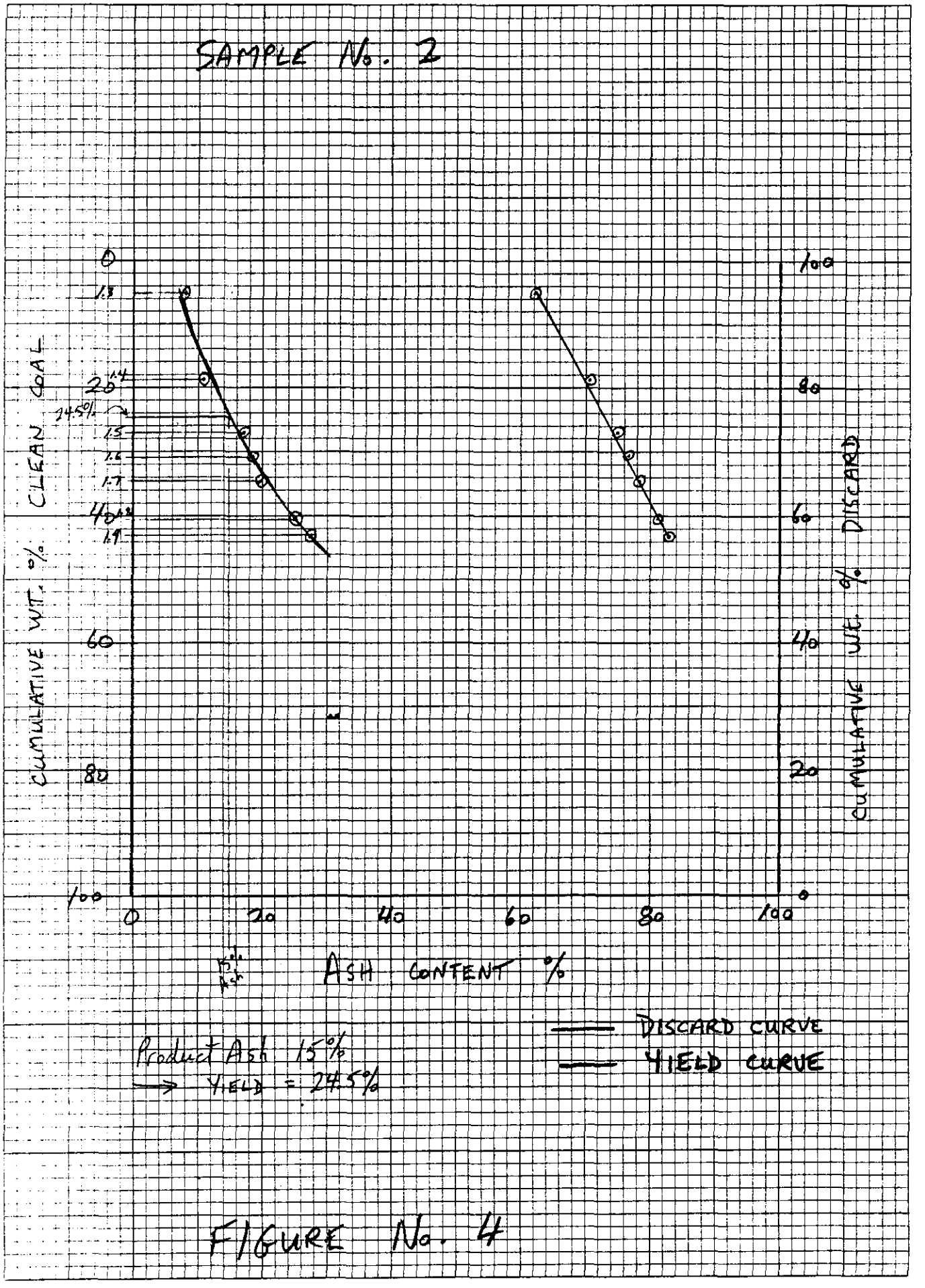

SAMPLE No. 2
CUMULATIVE WT. % CLEAN COAL
CUMULATIVE WT. % DISCARD
ASH CONTENT %
0
20
40
60
80
100
1.3
1.4
1.5
1.6
1.7
1.8
1.9
24.5%
15% Ash
DISCARD CURVE
YIELD CURVE
Product Ash 15%
→ YIELD = 24.5%

FIGURE No. 4

Section 3.0 (continued)

the quality of the sample, no matter what sieve size is employed.

Float-sink testing was performed on each sample at Relative Density separations of 1.3 to 1.9, on.1 increments. The results are tabulated in Table 4. Figures 3 and 4 are graphs showing predicted yields using the float-sink data. Figure 4 (sample No. 2), which is the No. 10 South Wellington Dump, shows a good performance: if product ash is specified at 15%, then the yield can be expected to be 24.5%. The difference in yields between Sample No. 2 and Sample No. 1 is quite apparent when Figures 3 and 4 are compared. Sample No. 1 will hardly produce a 15% ash product and this is cause for concern. One important limiting factor when assessing the validity of the 1979 data is that the material in the composite samples was not separated into size fractions prior to float-sink testing. However, the dry screening data indicates that this should not impact the results to a great extent.

Additional analytical work has been performed by Countryside Coal Processing in 1982 and 1983, however, sampling methods and analyitical procedures are not in the author's possession. Presumably these results will be made available to Esso Resources Ltd.

SECTION 4.

4.0 DESCRIPTION OF THE RECENT SAMPLING PROGRAM

4.1 Scope of Work

Because of time constraints, Esso Resources Ltd. decided to limit their investigation to the three aforementioned dumps, while at the same time realizing that additional tailings dumps are controlled by Countryside Coal Processing and available for testing.

The two important factors that the initial sampling program was designed to confirm are:

a) The volumes of coal dump material in place in each of the three initial dumps.

b) The relative uniformity, or conversely, the relative variance of the quality of the material within each dump.

In addition to these factors, samples would be used to provide more information on the actual make-up of the dump material and its cleaning characteristics.

4.2 Methods of Sampling

Two major sampling methods were employed in the course of the program - drillhole sampling and trenching. Each method is described below:

1. Drillhole sampling: Because of the height of the piles (up to 45 meters) and the diverse nature of the material within the piles, which ranged from the normal coal tailings to a collection of mine timbers, peices of scrap metal and other articles, an augur system, which would have been more preferable in terms of size range of material collected, was ruled out. The alternative was drilling. An air-rotary rig equipped with a casing hammer was selected. The casing hammer equipment was necessary for three reasons:

Section 4.2 (continued)

a) it prevented up-hole caving by setting casing immediately behind the drill bit, thus assuring the catchment of representative samples through the entire depth of the pile,
b) it allowed the casing to be driven through obstructions such as timbers, which were common occurrences in the course of the drilling, and
c) it allowed for the complete catchment of drill samples by discharging the entire amount of sample material through a 6 meter long flexible spout.

Samples were collected in 3 meter intervals in all of drillholes. The tailings material was discharged from the spout assembly into metal pails, then transferred directly to properly-labelled large fibre shipping bags. As instructed by Esso Resources Ltd., no coning and quartering was done prior to shipment. No water or other circulation additives were added to the air-flushing system, so that as-received moistures reflect the total moisture contents of each sample.

The biggest drawback of the drilling technique is that it alters the size consist of the material by the action of the drill bit. This alteration of the size consist and its ramifications on coal quality and ash content of the individual reporting size fractions was not forecast to be great, considering the relatively uniform distribution of ash through all size ranges (see Table 2).

2. Trench Sampling: In order to provide a comparison of unaltered sample material with the crushed drill cuttings samples, a number of trenches were dug and sampled. A tractor-mounted backhoe was employed for this work. Selected trench locations included the collars of the drillholes so that the trench samples could be directly compared to the upper sample intervals of the drillholes. Other trench sample locations included random trenches

Section 4.2 (continued)

around the toe of the dump piles. The backhoe trenched in to maximum digging depth before the sample was collected. These samples were transferred directly into large, properly labelled fibre shipping bags of the type used for the drillhole samples. Again, no coning and quartering of the sample was done proir to shipment, as instructed by Esso Resources Ltd.

4.3 Surveying

As part of the sampling program, initial survey work on both the Extension No. 1 Mine Dump and the South Wellington No. 10 Mine Dump was conducted. This consisted of stadia traverses that tied in the drillhole and trench sample locations, and provided elevations and survey control on the dumps. Contour drawings of the dump sites on a scale of 1:500 were then produced.

This type of detailed survey work was not undertaken on the Extension No. 4 dump site, however in order to effect some measurements on the volume of material in this dump, chainages and elevations were measured around the toe and the top of the slope with the aid of a rod, level and chain. A 1:500 scale plan was also produced for this dump (see Appendix III).

4.4 The South Wellington No. 10 Mine Dump

Investigations of the South Wellington No. 10 Mine Dump near Beck Lake consisted of four drillholes and five trench locations. The four drillholes, labelled SW-83-01 to SW-83-04 inclusively, were completed in 26 operating hours. A total of 101 drilled meters were completed. The deepest hole was SW-83-02, which ended in brown peat at 29.5 meters.

A surface trench to a maximum depth of 5 meters was

4.4 (continued)

completed by the backhoe beside the collar of each drillhole. In addition, one surface trench at the toe of the dump on the west side was dug.

Appendix I consists of plans and sections of the South Wellington No. 10 Mine Dump, with drillhole locations and section lines shown.

Table 5. details volume calculations for the South Wellington Mine Dump. These volumes were calculated by section according to the sections drawn up in Appendix I. Total volume of material for this dump is estimated at 220,000 cubic meters (288,000 Cu. Yds.). Assuming an average Relative Density of 1.87 g/cc. as documented in Table 3., the total tonnage works out to 412,000 tonnes.

Table 6. lists the sample inventory for the South Wellington Dump as shipped to General Testing Laboratories in Vancouver for analysis.

In general, the tailings material in the South Wellington No. 10 Dump was quite uniform in all the holes. However, holes SW-83-01 and SW-83-04 intersected a lot of timber. A strong smell of gas occurred right at the base of the dump directly above the water table in holes 01, 02 and 03.

TABLE 5. — SOUTH WELLINGTON No. 10 DUMP

SECTION No.	AREA (m^2)	ΔD	VOLUME (m^3)
		0	
510 N	0		
		20	2,100
490 N	210		
		20	8,420
470 N	632		
		20	19,210
450 N	1289		
		20	30,140
430 N	1725		
		20	37,550
410 N	2030		
		20	36,530
390 N	1623		
		20	34,810
370 N	1858		
		20	32,070
350 N	1349		
		20	16,390
330 N	290		
		20	2,900
310 N	0		

220,120 m^3
(288,357 cu.yd.)

=411,600 tonnes
(453,583 short tons)

TABLE 6. — SAMPLE INVENTORY — SOUTH WELLINGTON No. 10 DUMP

HOLE No./TRENCH No.	SAMPLE No.	SAMPLE INTERVAL (meters)	No. of BAGS
SW-83-01	1	0 — 3.0	2
"	2	3.0 — 6.0	1
"	3	6.0 — 9.0	2
"	4	9.0 — 12.0	2
"	5	12.0 — 15.0	2
"	6	15.0 — 18.0	2
"	7	18.0 — 21.0	2
"	8	21.0 — 24.0	2
"	9	24.0 — 25.5	1
"	10	25.0 — 27.0	1
"	11	27.0 — 28.0	1
SW-83-02	1	0 — 3.0	2
"	2	3.0 — 6.0	2
"	3	6.0 — 9.0	3
"	4	9.0 — 12.0	3
"	5	12.0 — 15.0	3
"	6	15.0 — 18.0	3
"	7	18.0 — 21.0	3
"	8	21.0 — 24.0	3
"	9	24.0 — 27.0	3
"	10	27.0 — 29.5	3
SW-83-03	1	0 — 3.0	2
"	2	3.0 — 6.0	2
"	3	6.0 — 9.0	3
"	4	9.0 — 12.0	3
"	5	12.0 — 15.0	3
"	6	15.0 — 18.0	3
"	7	18.0 — 21.0	3
"	8	21.0 — 24.0	3
"	9	24.0 — 25.5	1
SW-83-04	1	0 — 3.0	2
"	2	3.0 — 6.0	1
"	3	6.0 — 9.0	2
"	4	9.0 — 12.0	3
"	5	12.0 — 15.0	3
"	6	15.0 — 17.0	3
SW-83-01(TRENCH)	1	—	4
SW-83-02(TRENCH)	1	—	4
SW-83-03(TRENCH)	1	—	4
SW-83-04(TRENCH)	1	—	4
SW-83-05(TRENCH)	1	—	4

Total No. of Samples: 41

4.5 The Extension No. 1 Mine Dump

Investigations of the Extension No. 1 Mine Dump consisted of three drillholes and four trench locations. The three drillholes, labelled EX-83-01 to EX-83-03 inclusively, for a total of 113.5 meters, were completed in 31 operating hours. The deepest of these holes was EX-83-01, which ended in brown peat and gravel at 51 m.

A trench, labelled EX-83-04 TRENCH, was located in the road cut beside drillhole EX-83-02 but above the collar. A second trench was completed beside the collar of drillhole EX-83-03 (labelled EX-83-05 TRENCH). Trenches labelled EX-83-06 TRENCH and EX-83-07 TRENCH were completed at the toe of the dump on the west side.

Appendix II consists of plans and sections of the Extension No. 1 Mine Dump, with drillhole locations and section lines shown.

Table 7. details volume calculations for the Extension No. 1 Mine Dump. These volumes were calculated by section according to the sections drawn up in Appendix II. Total volume of material for this dump is estimated at 369,000 cubic meters (483,000 cu. yds.). Assuming an average Relative Density of 1.99 g/cc. as documented in Table 3., the total tonnage works out to 734,000 tonnes. Some additional tonnage occurs under the approach road to the dump area, which is an old railway grade built of tailings.

In general, the tailings material sampled in the drillholes and trenches on the Extension No. 1 Mine Dump appeared dirty with abundant shale material throughout. Some lenses of red clinker and burned shale were encountered in both the backhoe trenches and in the drillholes, especially near the base of the pile in holes EX-83-01 and EX-83 -02. It is not known whether this burned material was dumped on the site or whether it burned in place.

Table 8. lists the sampleinventory for this dump as shipped to General Testing Labs for analysis.

TABLE 7. — EXTENSION No. 1 DUMP VOLUME CALCULATIONS

SECTION No.	AREA (m^2)	ΔD	VOLUME (m^3)
1140 N	0		
		20	8270
1120 N	827		
		20	35270
1100 N	2700		
		20	62140
1080 N	3514		
		20	71340
1060 N	3620		
		20	67140
1040 N	3094		
		20	52810
1020 N	2187		
		20	37830
1000 N	1596		
		20	23010
980 N	705		
		20	9070
960 N	202		
		20	2020
940 N	0		

TOTAL: 368,900 m^3
(483,259 cu. yd.)

Assume an S.G. of 1.99 gm/cm^3 (see Table 3)

734,111 tonnes
(808,990 short tons)

TABLE 8. — SAMPLE INVENTORY — EXTENSION No. 1 DUMP

HOLE No./TRENCH No.	SAMPLE No.	SAMPLE INTERVAL (meters)	No. of BAGS
EX-83-01	1	0 — 3.0	2
"	2	3.0 — 6.0	2
"	3	6.0 — 9.0	3
"	4	9.0 — 12.0	3
"	5	12.0 — 15.0	3
"	6	15.0 — 18.0	3
"	7	18.0 — 21.0	3
"	8	21.0 — 24.0	3
"	9	24.0 — 27.0	3
"	10	27.0 — 30.0	3
"	11	30.0 — 33.0	3
"	12	33.0 — 36.0	3
"	13	36.0 — 39.0	3
"	14	39.0 — 42.0	3
"	15	42.0 — 45.0	3
"	16	45.0 — 48.0	3
"	17	48.0 — 51.0	3
EX-83-02	1	0 — 3.0	3
"	2	3.0 — 6.0	3
"	3	6.0 — 9.0	3
"	4	9.0 — 12.0	3
"	5	12.0 — 15.0	3
"	6	15.0 — 18.0	3
"	7	18.0 — 21.0	3
"	8	21.0 — 24.0	3
"	9	24.0 — 27.0	3
"	10	27.0 — 30.0	3
"	11	30.0 — 33.0	3
"	12	33.0 — 35.0	3
"	13	35.0 — 37.5	1
EX-83-03	1	0 — 3.0	2
"	2	3.0 — 6.0	3
"	3	6.0 — 9.0	3
"	4	9.0 — 12.0	3
"	5	12.0 — 15.0	3
"	6	15.0 — 18.0	3
"	7	18.0 — 21.0	3
"	8	21.0 — 24.0	3
"	9	24.0 — 27.0	1
EX-83-04 TRENCH	1	—	4
EX-83-05 TRENCH	1	—	4
EX-83-06 TRENCH	1	—	3
EX-83-07 TRENCH	1	—	3

TABLE 9. — EXTENSION No. 4 DUMP VOLUME CALCULATIONS

SECTION No.	AREA (m^2)	ΔD	VOLUME (m^3)
0+260	0		
		45	11,228
0+215	499		
		106	57,770
0+109	591		
		61	30,897
0+048	422		
		56	11,816
0-008	0		

TOTAL: 111,711 m^3
(146,341 cu. yd.)

Assume an S.G. of 1.87 gm./cc.*

208,900 tonnes total material
(230,208 short tons)

* Equivalent to S.G. of No. 10 South Wellington Dump, which appears to be of similar coal content.

4.6 The Extension No. 4 Mine Dump

No drilling was performed on the Extension No. 4 Mine Dump, however a total of six backhoe trenches on the dump were completed, with approximately 150 kg. of material shipped from each trench. Only thesouth end of the dump was investigated, as there was some question as to surface rights ownership (the owner of a house located near the northwest end of the dump came over during the sampling program and claimed that the north end of the dump was on his property).

Appendix III consists of plan and sections of the Extension No. 4 Mine Dump, with trench locations and section lines shown.

Table 9. details volume calculations for this dump. These volumes were calculated by section according to the drawings in Appendix III. Total volume of material for this dump is estimated at 112,000 cubic meters, or 147,000 cu. yds.. Assuming a Relative Density of 1.87 g/cc. (equivalent to the South Wellington Dump, which appears of similar quality), the total tonnage works out to about 209,000 tonnes.

Table 10 lists the sample inventory for the Extension No. 4 Mine Dump, as shipped to General Testing Labs-

TABLE 10. : SAMPLE INVENTORY, EXTENSION No. 4 DUMP

Label	No. of Bags
No. 4 Dump Trench No. 1	4
No. 4 Dump Trench No. 2	4
No. 4 Dump Trench No. 3	4
No. 4 Dump Trench No. 4	4
No. 4 Dump Trench No. 5	4
No. 4 Dump Trench No. 6	4

SECTION 5.

5.0 SUMMARY AND CONCLUSIONS

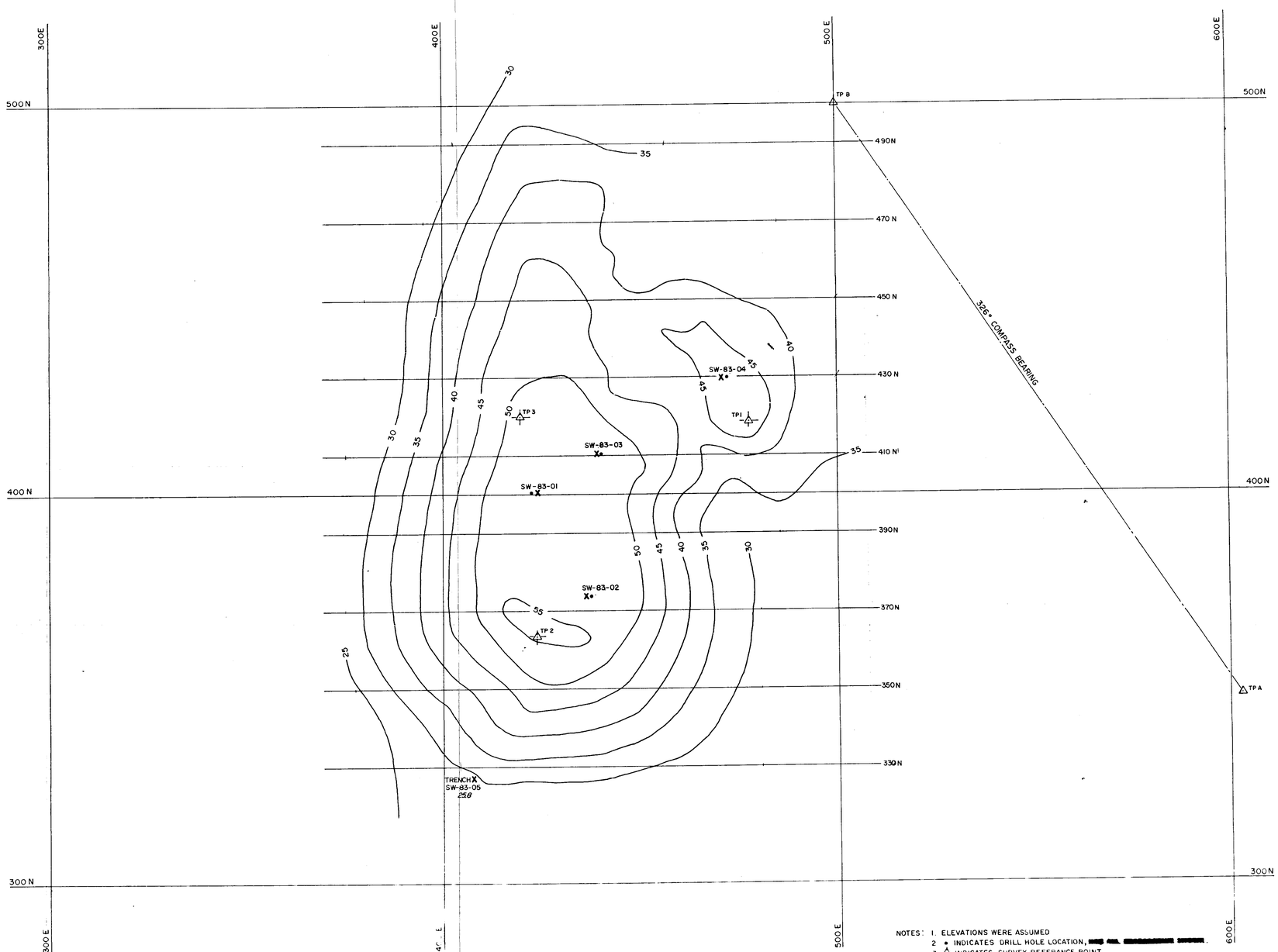
On-site investigations of three major coal tailings dumps in the Nanaimo area of Vancouver Island were conducted by Esso Resources Ltd. in September of 1983. These on-site investigations were designed to estimate volumes of dump material in place and to determine the relative uniformity of tailings throughout each tailings pile. Samples of the tailings from each site would be used to evaluate the cleaning characteristics of the coal tailings, with a view to determining the economic viability of recovering clean coal product from the dumps.

Two sampling techniques were employed in the course of the program - drillhole sampling and trench sampling. The drillhole sampling would provide information on the coal content of the tailings through the entire thickness of dump material by sampling on 3 meter intervals. Because the drilling method crushed the top sizes of material, a number of backhoe trenches located in various spots on and around the piles would provide an undisturbed sample for comparisons with the drillhole data.

Volume calculations as a result of the survey work identified a total of 701,000 cubic meters of tailings material, of which 220,000 cubic meters is contained in the South Wellington No. 10 Mine Dump, 369,000 cubic meters in the Extension No. 1 Mine Dump, and 112,000 cubic meters in the Extension No. 4 Mine Dump. Additional volumes of material can be found in numerous other dump sites in the Nanaimo area, which were not part of this study.

A total of seven drillholes and seventeen backhoe trenches were completed on the dump sites for an approximate total cost of $ 20,000.00. This work resulted in the collection of 90 samples for shipment to the laboratory for analytical work.

APPENDIX I.



NOTES: 1. ELEVATIONS WERE ASSUMED
2 • INDICATES DRILL HOLE LOCATION, [redacted].
3 △ INDICATES SURVEY REFERANCE POINT.
4 X INDICATES TRENCH LOCATION

DRAWING REFERENCE

NO	DATE	BY	ENG	SUBJECT

REVISIONS

JOB NUMBER	
SCALE	1 : 500
DRAWN	A.M
DESIGNED	
CHECKED	
APPROVED	
APPROVED	
DATE	OCT. '83

ESSO RESOURCES CANADA LTD.

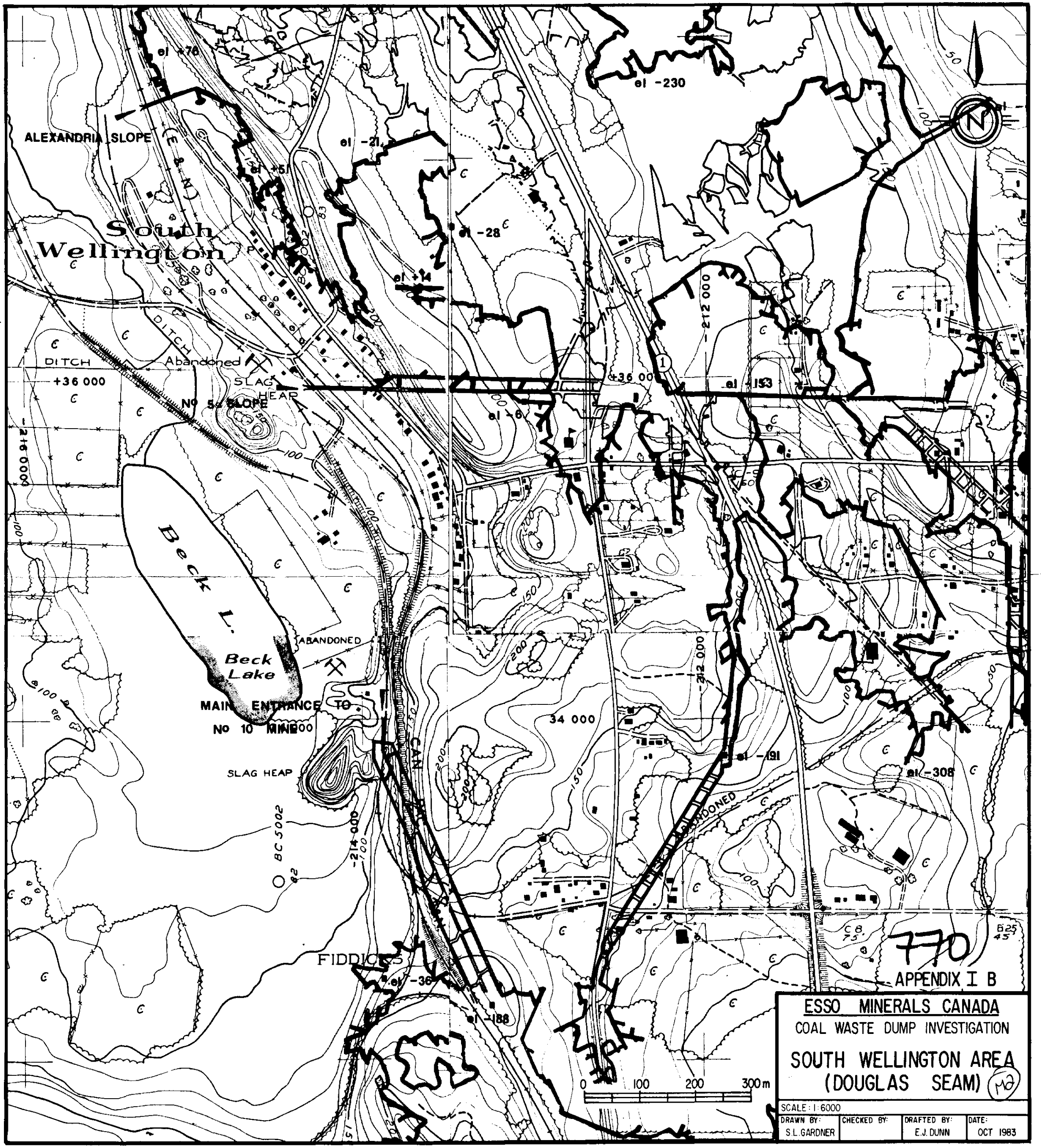
APPENDIX I

SOUTH WELLINGTON
No. 10 DUMP
CONTOUR PLAN

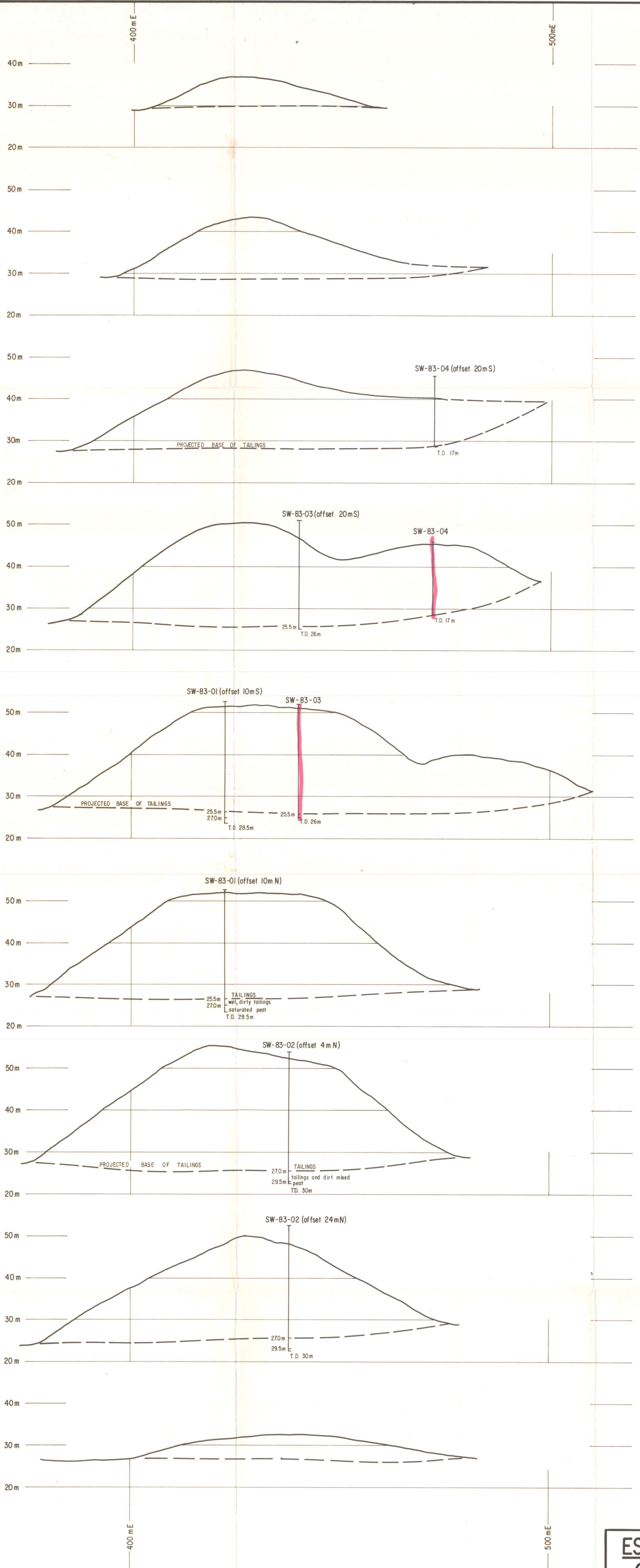
(M)

770

DRAWING NUMBER	REV	SHEET


el +76
ALEXANDRIA SLOPE
el +5
el -21
el -230
South Wellington
el -28
el +14
DITCH
Abandoned
SLAG HEAP
+36 000
NO 5 SLOPE
-216 000
Beck L.
Beck Lake
MAIN ENTRANCE TO
NO 10 MINE
SLAG HEAP
BC 5002
-214 000
el -6
el -193
-212 000
34 000
el -191
el -308
ABANDONED
FIDDICKS
el -36
el -188
0 100 200 300 m
770
APPENDIX I B
ESSO MINERALS CANADA
COAL WASTE DUMP INVESTIGATION
SOUTH WELLINGTON AREA
(DOUGLAS SEAM)
SCALE : 1:6000
DRAWN BY: S.L.GARDNER
CHECKED BY:
DRAFTED BY: E.J. DUNN
DATE: OCT 1983

CROSS-SECTIONAL AREA (sq. metres)	LINE (mN)
210	490
632	470
1289	450
1725	430
2030	410
1623	390
1858	370
1349	350
290	330



770

APPENDIX I A

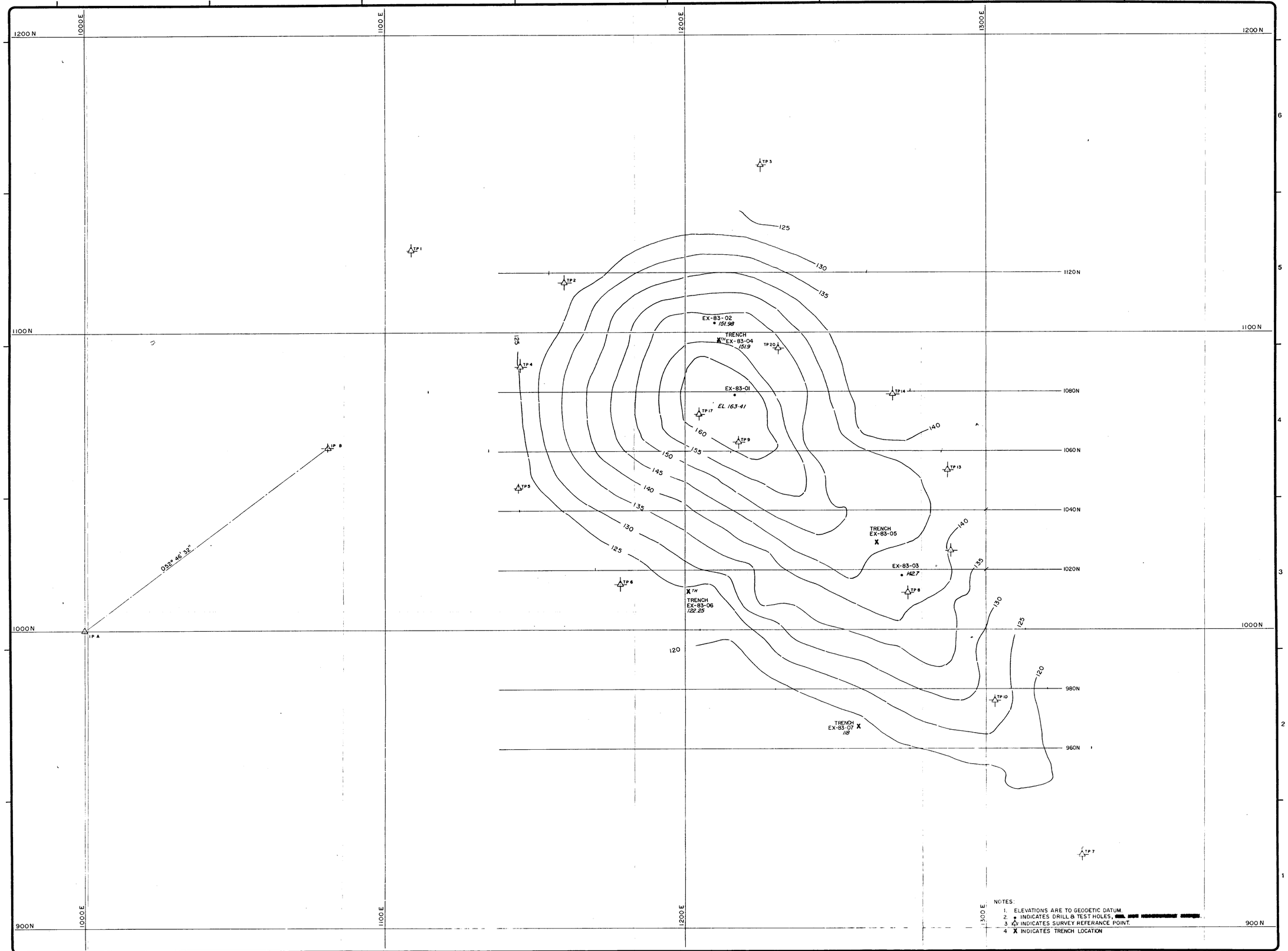
ESSO RESOURCES CANADA LTD.

CROSS-SECTIONS SOUTH WELLINGTON No.10 DUMP SHOWING LOCATION OF TEST HOLES

M3

SCALE: 1:500			
DRAWN BY: S.L.GARDNER	CHECKED BY:	DRAFTED BY: E.J.DUNN	DATE: OCT 1983

APPENDIX II.



DRAWING REFERENCE

NO	DATE	BY	ENG.	SUBJECT

REVISIONS

JOB NUMBER	
SCALE	1 : 500
DRAWN	A.M
DESIGNED	
CHECKED	
APPROVED	
APPROVED	
DATE	OCT. 83

ESSO RESOURCES CANADA LTD.

APPENDIX II

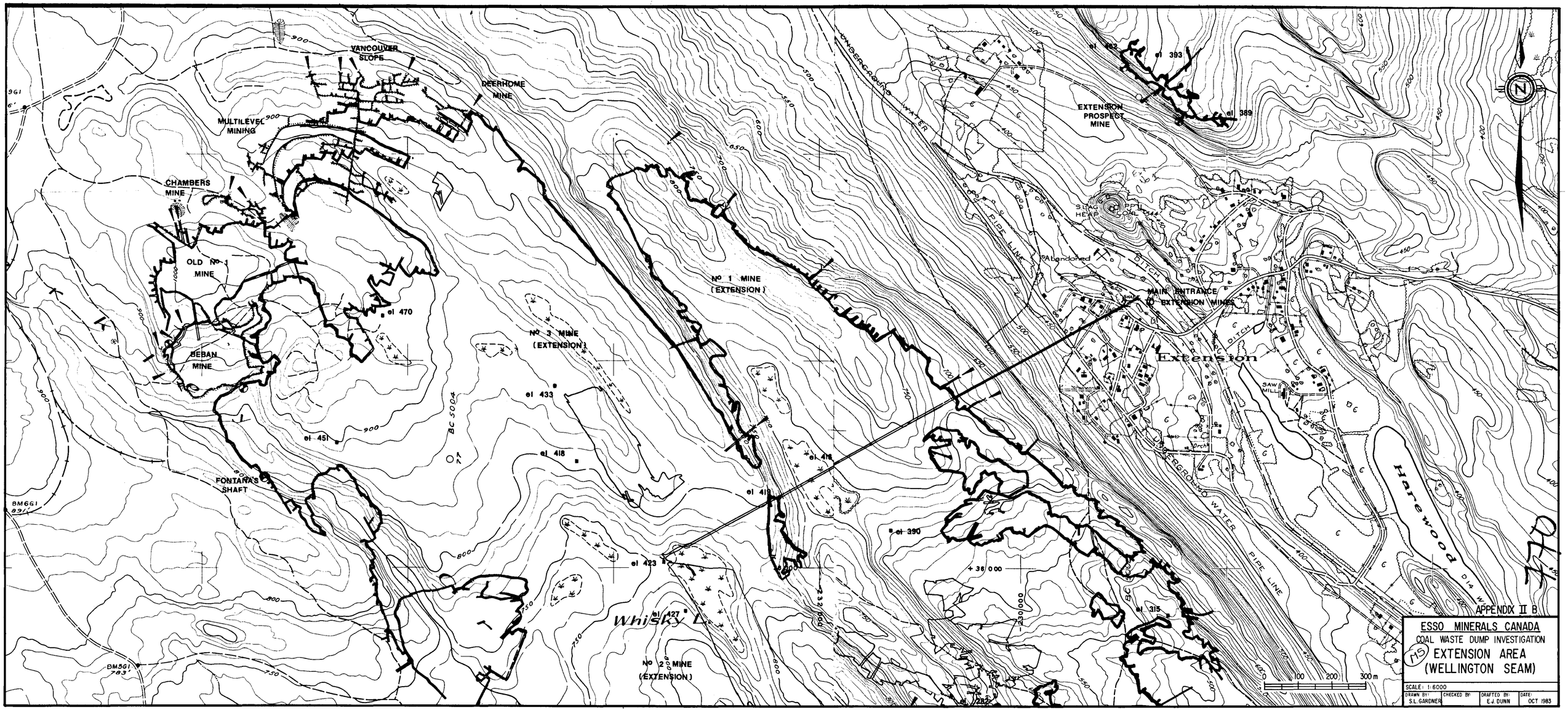
EXTENSION No. 1 - DUMP

CONTOUR PLAN

(14)

770

DRAWING NUMBER	REV.	SHEET



APPENDIX II B

ESSO MINERALS CANADA
COAL WASTE DUMP INVESTIGATION
MS EXTENSION AREA
(WELLINGTON SEAM)

SCALE: 1:6000			
DRAWN BY: S.L. GARDNER	CHECKED BY:	DRAFTED BY: E.J. DUNN	DATE: OCT 1983

House

0+250

ROCK BLUFF

H.P.

SECTION 0+215

C — C'

0+200

Top of Slope

Toe of Slope

ROCK BLUFF

0+150

Top of Slope

H.P.

Trench No. 4

ROAD

B — B'

SECTION 0+109

Trench No. 6

0+100

Trench No. 3

H.P.

Trench No. 2

ROCK BLUFF

0+050

SECTION 0+048

A — A'

H.P.

ROAD

Trench No. 1

Trench No. 5

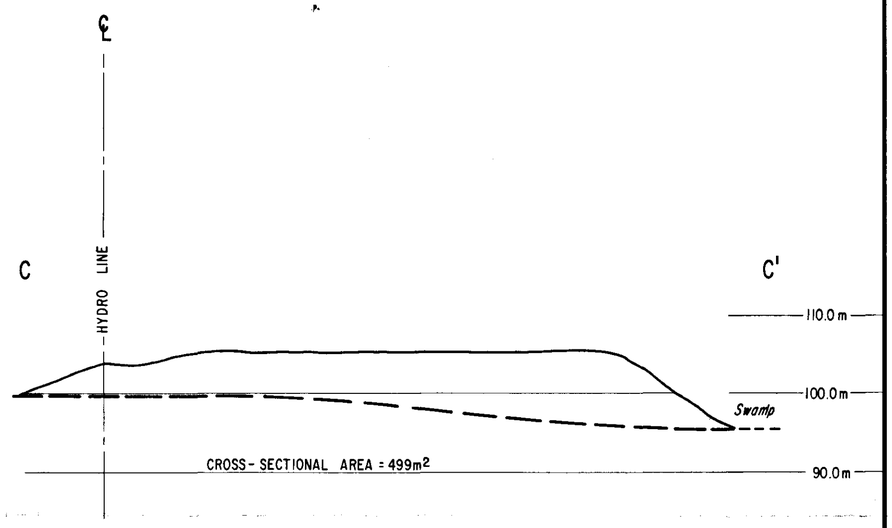
ROCK BLUFF

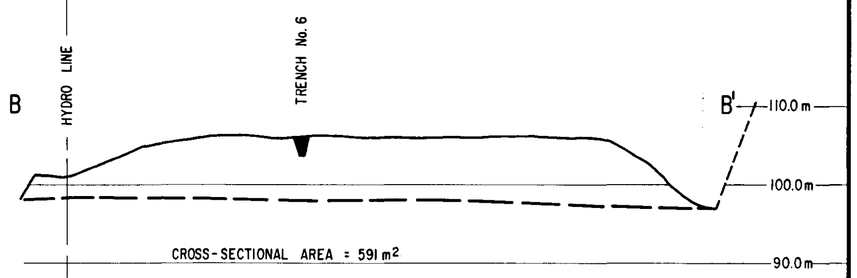
0+00

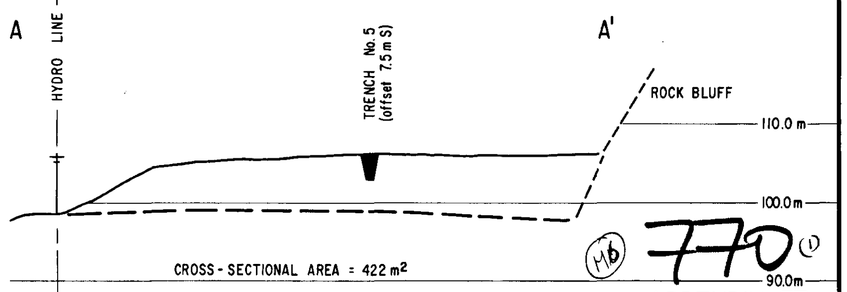
RAMP

0 10 20 30 40 50

METRES







770

APPENDIX III

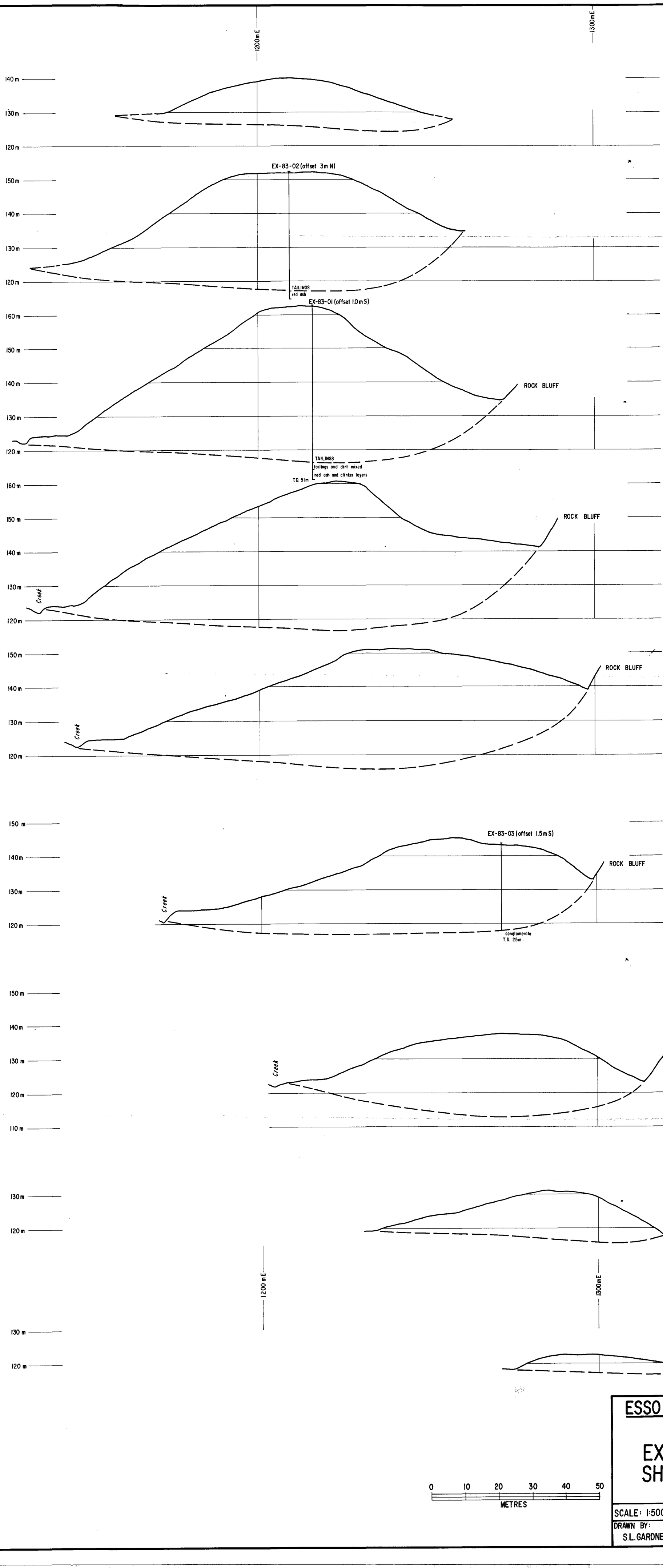
ESSO RESOURCES CANADA LTD.

PLAN AND SECTIONS OF EXTENSION No.4 DUMP SHOWING LOCATION OF SAMPLE TRENCHS

SCALE : 1:500

DRAWN BY:	CHECKED BY:	DRAFTED BY:	DATE:
S.L.GARDNER		E.J. DUNN	OCT 1983

CROSS-SECTIONAL AREA (sq. metres)	LINE (mN)
827	1120
2700	1100
3514	1080
3620	1060
3094	1040
2187	1020
1596	1000
705	980
202	960



APPENDIX II A

ESSO RESOURCES CANADA LTD.

CROSS-SECTIONS EXTENSION No. 1 DUMP SHOWING LOCATION OF TEST HOLES

SCALE: 1:500

DRAWN BY:	CHECKED BY:	DRAFTED BY:	DATE:
S.L. GARDNER		E.J. DUNN	OCT 1983

NANAIMO STOCKPILE - OCTOBER 1983

DRILL HOLE SAMPLES

LABORATORY REPORTS

ESSO MINERALS CANADA ERCL
A DIVISION OF ESSO RESOURCES CANADA LTD.
237-4TH AVENUE S.W. - CALGARY - ALBERTA T2P 0H6
EXPLORATION MANAGER : MR. HUGH JONES

ANALYTICAL WORK ACCORDING TO ASTM PERFORMED BY :
GENERAL TESTING LABORATORIES
A DIVISION OF SGS SUPERVISION SERVICES INC.
1707 FRANKLIN ST - VANCOUVER B.C. - CANADA - V5L 1P6
TELEX : 04-507514 - PHONE : (604) 254-2148
CHIEF CHEMIST : L.M. LAKOSIL

TO L. Lakosil
GENERAL TESTING LABS
VANCOUVER, B.C.

FROM Stephen L. Gardner
per/ Esso Resources
Nanaimo B.C.

SUBJECT SAMPLE INVENTORY - EXTENSION DUMP - HOLE EX-83-01

DATE Sept. 25 1983

SAMPLE No.	INTERVAL (m)	No. of Bags
1	0 - 3.0 m.	2
2	3.0 - 6.0 m.	2
3	6.0 - 9.0 m.	3
4	9.0 - 12.0 m	3
5	12.0 - 15.0 m.	3
6	15.0 - 18.0 m.	3
7	18.0 - 21.0	3
8	21.0 - 24.0	3
9	24.0 - 27.0	3
10	27.0 - 30.0	3
11	30.0 - 33.0	3
12	33.0 - 36.0 m.	3
13	36.0 - 39.0 m.	3
14	39.0 - 42.0 m.	3
15	42.0 - 45.0 m.	3
16	45.0 - 48.0 m.	3
17	48.0 - 51.0 m.	3
	TOTAL BAGS	49

SIGNED Stephen Gardner

REDIFORM 43065E MOORE BUSINESS FORMS 3

FOLD AT MARKS FOR USE IN #9 OR # 10 WINDOW ENVELOPE

REDI-LETTER

TO L. LAKOSIL
GENERAL TESTING LABS
VANCOUVER B.C.

FROM Stephen L. Gardner
per ESSO RESOURCES LTD.
NANAIMO B.C.

SUBJECT SAMPLE INVENTORY - EXTENSION HOLE EX-83-02

DATE Sept. 27 19 83

SAMPLE NO.	INTERVAL (M.)	NO. of BAGS
1	0 — 3.0	3
2	3.0 — 6.0	3
3	6.0 - 9.0	3
4	9.0 - 12.0	3
5	12.0 - 15.0	3
6	15.0 - 18.0	3
7	18.0 - 21.0	3
8	21.0 - 24.0	3
9	24.0 - 27.0	3
10	27.0 - 30.0	3
11	30.0 - 33.0	3
12	33.0 - 35.0	3
13		

SIGNED Stephen Gardner

REDIFORM 4S085E MOORE BUSINESS FORMS 3

FOLD AT MARKS FOR USE IN #9 OR # 10 WINDOW ENVELOPE

REDI-LETTER

TO L. LAKOSIL
GENERAL TESTING LABS
VANCOUVER BC.

FROM STEPHEN L GARDNER
PER ESSO RESOURCES LTD.
NANAIMO B.C.

SUBJECT SAMPLE INVENTORY - EXTENSION HOLE EX-83-03

DATE Sept. 28 19 83

SAMPLE NO.	INTERVAL (M.)	NO. of BAGS
1	0 — 3.0	2
2	3.0 — 6.0	3
3	6.0 — 9.0	3
4	9.0 — 12.0	3
5	12.0 — 15.0	3
6	15.0 — 18.0	3
7	18.0 — 21.0	3
8	21.0 — 24.0	3
9	24.0 — 27.0	1/2

SIGNED Stephen Gardner

REDIFORM 4S065E MOORE BUSINESS FORMS 3

FOLD AT MARKS FOR USE IN #9 OR # 10 WINDOW ENVELOPE

REDI-LETTER

TO L. Lakosil
GENERAL TESTING LABS
VANCOUVER, B.C.

FROM Stephen L. Gardner
c/o ESSO RESOURCES
NANAIMO, B.C.

SUBJECT SAMPLE INVENTORY: South Wellington Dump: Hole SW-83-01

DATE Sept. 23 1983

SAMPLE No.	INTERVAL (m.)	Number of Bags
1	0 - 3.0	2
2	3.0 - 6.0	1
3	6.0 - 9.0	2
4	9.0 - 12.0	2
5	12.0 - 15.0	2
6	15.0 - 18.0	2
7	18.0 - 21.0	2
8	21.0 - 24.0	2
9	24.0 - 25.5	1
10	25.5 - 27.0	1
11	27.0 - 28.0	1 (Total 18 bags)

SIGNED Stephen Gardner

TO L. Lakosil
GENERAL TESTING LABS
VANCOUVER, B.C.

FROM Stephen L. Gardner
per/ ESSO RESOURCES LTD.
NANAIMO, B.C.

SUBJECT SAMPLE INVENTORY: South Wellington Dump: Hole SW-83-02

DATE Sept. 24 19 83

SAMPLE No.	INTERVAL (m.)	Number of Bags
1	0 - 3.0	2
2	3.0 - 6.0	2
3	6.0 - 9.0	3
4	9.0 - 12.0	3
5	12.0 - 15.0	3
6	15.0 - 18.0	3
7	18.0 - 21.0	3
8	21.0 - 24.0	3
9	24.0 - 27.0	3
10	27.0 - 29.5	3
	TOTAL	28

SIGNED Stephen Gardner

TO L. Lakosil
GENERAL TESTING LABS
VANCOUVER, B.C.

FROM Stephen L. Gardner
274 Westwood Rd.
Nanaimo, B.C.

SUBJECT ESSO RESOURCES WASTE DUMP, INVESTIGATION - SAMPLE INVENTORY

DATE Sept. 24 19 83

Hole SW-83-03

SAMPLE No.	INTERVAL (m.)	No. of Bags
1	0-3.0	2
2	3.0-6.0	2
3	6.0-9.0	3
4	9.0-12.0	3
5	12.0-15.0	3
6	15.0-18.0	3
7	18.0-21.0	3
8	21.0-24.0	3
9	24.0-25.5 m	1
	TOTAL	23

SIGNED Stephen Gardner

TO L. Lakosil
GENERAL TESTING LABS
VANCOUVER, B.C.

FROM Stephen L. Gardiner
for/ ESSO RESOURCES
NANAIMO, B.C.

SUBJECT SAMPLE INVENTORY - HOLE SW-83-04

DATE Sept. 25 1983

SAMPLE No.	INTERVAL (m)	No. of Bags
1	0 - 3.0	2
2	3.0 - 6.0	1
3	6.0 - 9.0	2
4	9.0 - 12.0	3
5	12.0 - 15.0	3
6	15.0 - 17.0	3
	TOTAL	14

SIGNED Stephen Gardiner

General Testing Laboratories
A Division of SGS Supervision Services Inc.
1001 East Pender Street,
Vancouver, B.C. Canada V6A 1W2
Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

TO: Attn: Mr. Hugh Jones
ESSO MINERALS CANADA
A Division of ESSO RESOURCES CANADA LTD.,
237-4th Avenue S.E.
Calgary, Alberta, T2P OH6

CERTIFICATE OF ANALYSIS

No.	DATE:
FILE: 8310-1858C	Nov. 3, 1983

WE HAVE ANALYZED the herein described submitted sample, and report as follows:

DESCRIPTION: NANAIMO COAL DUMPS

Marked as below

LAB I.D.	DRILL HOLE NUMBER	ASH % AIR DRY	CUBIC FOOT WEIGHT KG	SPECIFIC GRAVITY Grams/cm^3
EH 3	EX83-01- 3	65.07	38.15	1.92
EH 13	-13	72.43	38.80	2.04
EH 19	EX83-02- 2	62.92	36.10	1.92
EH 29	-12	75.77	40.80	2.18
EH 31	EX83-03- 1	69.42	36.10	2.06
EH 38	- 8	71.75	39.60	2.08
EH 41	SW83-01- 2	56.70	34.90	1.84
EH 47	- 8	70.40	40.60	2.08
EH 51	SW83-02- 1	59.61	37.00	1.89
EH 60	-10	64.60	34.90	1.93
EH 63	SW83-03- 3	62.12	36.85	1.94
EH 68	- 8	62.33	35.50	1.91
EH 70	SW83-04- 1	56.05	34.50	1.81
EH 75	- 6	59.91	36.30	1.79

NOTES: 1. All cubic foot weight tightly packed in the container, NOT free loaded.

2. Specific gravity determined by water displacement method.

L. Lakosil - Chief Coal Chemist

SIGNATURE AND TITLE

PRELIMINARY SIEVE ANALYSIS ON SELECTED DRILL HOLE SAMPLES

SAMPLE #	+1" %	1"x½" %	½"x¼" %	¼"x28M %	28Mx100M %	100Mx0 %
EX-83-03-1	none	none	12.43	49.80	22.16	15.61
EX-83-03-2	none	none	25.56	46.61	16.95	10.88
SW-83-03-1	none	none	6.07	49.68	27.04	17.21
SW-83-03-2	none	none	6.39	44.52	29.43	19.66

ESSO – EX-83-01

DRILL HOLES - Total Moisture, Proximate

SMPL NO	MOISTURE A.D. %	MOISTURE T.M. %	BASIS	R.M. %	ASH %	V.M. %	F.C. %
EX-83-01-1	2.90	3.40	A.D.	0.52	62.48	19.81	17.19
EH 1			DRY	-	62.81	19.92	17.27
EX-83-01-2	4.08	4.60	A.D.	0.54	66.11	18.78	14.57
EH 2			DRY	-	66.47	18.88	14.65
EX-83-01-3	3.61	4.19	A.D.	0.60	65.07	18.02	16.31
EH 3			DRY	-	65.47	18.13	16.40
EX-83-01-4	3.66	4.11	A.D.	0.47	68.68	17.60	13.25
EH 4			DRY	-	69.00	17.69	13.31
EX-83-01-5	3.90	4.39	A.D.	0.51	65.84	18.83	14.82
EH 5			DRY	-	66.17	18.93	14.90
EX-83-01-6	3.43	3.88	A.D.	0.47	67.42	18.62	13.49
EH 6			DRY	-	67.74	18.71	13.55
EX-83-01-7	3.82	4.29	A.D.	0.49	66.26	19.17	14.08
EH 7			DRY	-	66.58	19.26	14.16
EX-83-01-8	3.81	4.23	A.D.	0.44	67.54	18.38	13.64
EH 8			DRY	-	67.84	18.46	13.70
EX-83-01-9	3.81	4.32	A.D.	0.53	71.17	16.95	11.35
EH 9			DRY	-	71.55	17.04	11.41
EX-83-01-10	3.98	4.31	A.D.	0.34	73.07	17.21	9.38
EH 10			DRY	-	73.31	17.27	9.42
EX-83-01-11	4.05	4.35	A.D.	0.31	71.68	16.91	11.10
EH 11			DRY	-	71.90	16.96	11.14
EX-83-01-12	4.40	4.70	A.D.	0.31	73.40	15.69	10.60
EH 12			DRY	-	73.62	15.74	10.64

ESSO - EX-83-01

DRILL HOLES - Total Moisture, Proximate

SMPL NO	MOISTURE A.D. %	MOISTURE T.M. %	BASIS	R.M. %	ASH %	V.M. %	F.C. %
EX-83-01-13	4.15	4.49	A.D.	0.35	72.43	17.17	10.05
EH 13			DRY	-	72.69	17.23	10.08
EX-83-01-14	3.65	3.96	A.D.	0.32	72.66	18.83	8.19
EH 14			DRY	-	72.89	18.89	8.22
EX-83-01-15	7.65	8.00	A.D.	0.38	73.86	11.68	14.08
EH 15			DRY	-	74.14	11.72	14.14
EX-83-01-16	8.40	9.07	A.D.	0.73	79.12	10.53	9.62
EH 16			DRY	-	79.70	10.61	9.69
EX-83-01-17	14.50	16.93	A.D.	2.84	73.16	12.24	11.76
EH 17			DRY	-	75.30	12.60	12.10

ESSO - EX-83-02

DRILL HOLES - Total Moisture, Proximate

SMPL NO	MOISTURE A.D. %	MOISTURE T.M. %	BASIS	R.M. %	ASH %	V.M. %	F.C. %
EX-83-02-1	3.30	3.98	A.D.	0.70	69.70	16.69	12.91
EH 18			DRY	-	70.20	16.81	12.99
EX-83-02-2	2.51	2.98	A.D.	0.48	62.92	19.77	16.83
EH 19			DRY	-	63.23	19.87	16.90
EX-83-02-3	3.89	4.33	A.D.	0.46	67.71	18.73	13.10
EH 20			DRY	-	68.02	18.82	13.16
EX-83-02-4	4.03	4.45	A.D.	0.44	70.23	16.99	12.34
EH 21			DRY	-	70.54	17.07	12.39
EX-83-02-5	3.92	4.32	A.D.	0.42	70.27	17.04	12.27
EH 22			DRY	-	70.56	17.11	12.33
EX-83-02-6	3.80	4.25	A.D.	0.47	71.27	16.63	11.63
EH 23			DRY	-	71.61	16.70	11.69
EX-83-02-7	3.90	4.41	A.D.	0.53	71.17	16.34	11.96
EH 24			DRY	-	71.55	16.43	12.02
EX-83-02-8	3.97	4.45	A.D.	0.50	68.39	17.66	13.45
EH 25			DRY	-	68.74	17.74	13.52
EX-83-02-9	4.42	4.84	A.D.	0.44	71.59	16.65	11.32
EH 26			DRY	-	71.90	16.72	11.38
EX-83-02-10	3.72	4.03	A.D.	0.32	68.79	16.42	14.47
EH 27			DRY	-	69.01	16.47	14.52
EX-83-02-11	5.44	6.26	A.D.	0.87	80.60	8.70	9.83
EH 28			DRY	-	81.31	8.78	9.91
EX-83-02-12	4.79	5.58	A.D.	0.83	75.77	11.90	11.50
EH 29			DRY	-	76.40	12.00	11.60
EX-83-02-13	5.11	5.68	A.D.	0.60	96.19	3.03	0.18
EH 30			DRY	-	96.77	3.05	0.18

ESSO – EX-83-03

DRILL HOLES - Total Moisture, Proximate

SMPL NO	MOISTURE A.D. %	MOISTURE T.M. %	BASIS	R.M. %	ASH %	V.M. %	F.C. %
EX-83-03-1	4.36	5.74	A.D.	1.44	69.42	16.95	12.19
EH 31			DRY	-	70.43	17.19	12.38
EX-83-03-2	3.50	4.79	A.D.	1.34	73.57	16.85	8.24
EH 32			DRY	-	74.57	17.08	8.35
EX-83-03-3	2.91	3.99	A.D.	1.11	73.45	15.44	10.00
EH 33			DRY	-	74.28	15.61	10.11
EX-83-03-4	2.77	3.79	A.D.	1.05	74.41	15.51	9.03
EH 34			DRY	-	75.20	15.67	9.13
EX-83-03-5	2.71	3.75	A.D.	1.07	73.73	16.61	8.59
EH 35			DRY	-	74.52	16.79	8.69
EX-83-03-6	2.48	3.51	A.D.	1.06	69.77	17.12	12.05
EH 36			DRY	-	70.51	17.30	12.19
EX-83-03-7	3.92	4.34	A.D.	0.44	73.05	16.28	10.23
EH 37			DRY	-	73.38	16.35	10.27
EX-83-03-8	4.48	4.91	A.D.	0.45	71.75	16.49	11.31
EH 38			DRY	-	72.07	16.57	11.36
EX-83-03-9	3.23	4.64	A.D.	1.46	76.75	13.27	8.52
EH 39			DRY	-	77.89	13.46	8.65

ESSO - SW-83-01

DRILL HOLES - Total Moisture, Proximate

SMPL NO	MOISTURE A.D. %	MOISTURE T.M. %	BASIS	R.M. %	ASH %	V.M. %	F.C. %
SW-83-01-1	0.91	2.59	A.D.	1.70	58.03	21.42	18.85
EH 40			DRY	-	59.03	21.79	19.18
SW-83-01-2	2.36	3.81	A.D.	1.48	56.70	22.95	18.87
EH 41			DRY	-	57.55	23.30	19.15
SW-83-01-3	4.59	5.24	A.D.	0.68	55.53	23.70	20.09
EH 42			DRY	-	55.91	23.86	20.23
SW-83-01-4	3.34	3.94	A.D.	0.62	65.19	20.46	13.73
EH 43			DRY	-	65.60	20.59	13.81
SW-83-01-5	4.15	4.62	A.D.	0.49	59.89	21.21	18.41
EH 44			DRY	-	60.18	21.32	18.50
SW-83-01-6	4.14	4.61	A.D.	0.49	62.20	20.40	16.91
EH 45			DRY	-	62.51	20.51	16.98
SW-83-01-7	3.51	3.97	A.D.	0.48	58.63	22.11	18.78
EH 46			DRY	-	58.91	22.22	18.87
SW-83-01-8	3.39	3.90	A.D.	0.53	70.03	17.86	11.58
EH 47			DRY	-	70.40	17.96	11.64
SW-83-01-9	3.33	3.76	A.D.	0.44	63.01	19.96	16.59
EH 48			DRY	-	63.29	20.04	16.67
SW-83-01-10	4.33	4.80	A.D.	0.49	64.36	20.20	14.95
EH 49			DRY	-	64.67	20.30	15.03
SW-83-01-11	4.43	4.99	A.D.	0.59	65.56	20.04	13.81
EH 50			DRY	-	65.95	20.16	13.89

ESSO — SW-83-02

DRILL HOLES - Total Moisture, Proximate

SMPL NO	MOISTURE A.D. %	MOISTURE T.M. %	BASIS	R.M. %	ASH %	V.M. %	F.C. %
SW-83-02-1	4.52	4.90	A.D.	0.40	59.61	21.76	18.23
EH 51			DRY	-	59.85	21.85	18.30
SW-83-02-2	2.31	2.68	A.D.	0.38	60.83	21.50	17.29
EH 52			DRY	-	61.06	21.58	17.36
SW-83-02-3	3.79	4.17	A.D.	0.40	65.39	20.79	13.42
EH 53			DRY	-	65.66	20.87	13.47
SW-83-02-4	4.29	4.64	A.D.	0.37	64.33	19.91	15.39
EH 54			DRY	-	64.57	19.98	15.45
SW-83-02-5	3.97	4.33	A.D.	0.38	62.85	21.72	15.05
EH 55			DRY	-	63.09	21.80	15.11
SW-83-02-6	4.63	5.43	A.D.	0.84	59.82	21.13	18.21
EH 56			DRY	-	60.33	21.31	18.36
SW-83-02-7	4.86	5.29	A.D.	0.45	61.19	20.97	17.39
EH 57			DRY	-	61.47	21.07	17.46
SW-83-02-8	4.59	4.68	A.D.	0.75	67.05	18.46	13.74
EH 58			DRY	-	67.56	18.60	13.84
SW-83-02-9	5.12	5.62	A.D.	0.53	64.27	19.86	15.34
EH 59			DRY	-	64.61	19.96	15.43
SW-83-02-10	5.41	6.01	A.D.	0.63	64.60	19.45	15.32
EH 60			DRY	-	65.01	19.58	15.41

ESSO – SW-83-03

DRILL HOLES - Total Moisture, Proximate

SMPL NO	MOISTURE A.D. %	MOISTURE T.M. %	BASIS	R.M. %	ASH %	V.M. %	F.C. %
SW-83-03-1	4.28	6.08	A.D.	1.88	61.07	19.68	17.37
EH 61			DRY	-	62.24	20.05	17.71
SW-83-03-2	3.92	5.69	A.D.	1.84	60.14	20.22	17.80
EH 62			DRY	-	61.27	20.60	18.13
SW-83-03-3	3.97	4.60	A.D.	0.66	62.12	20.33	16.89
EH 63			DRY	-	62.53	20.47	17.00
SW-83-03-4	4.36	4.99	A.D.	0.66	61.03	21.26	17.05
EH 64			DRY	-	61.44	21.40	17.16
SW-83-03-5	4.32	4.83	A.D.	0.53	64.77	19.85	14.85
EH 65			DRY	-	65.12	19.96	14.92
SW-83-03-6	3.61	4.09	A.D.	0.50	71.77	16.97	10.76
EH 66			DRY	-	72.13	17.05	10.82
SW-83-03-7	3.40	4.11	A.D.	0.74	70.61	17.38	11.27
EH 67			DRY	-	71.14	17.51	11.35
SW-83-03-8	3.87	4.71	A.D.	0.87	62.33	20.44	16.36
EH 68			DRY	-	62.88	20.62	16.50
SW-83-03-9	4.62	5.76	A.D.	1.19	58.37	22.14	18.30
EH 69			DRY	-	59.07	22.41	18.52

ESSO – SW-83-04

DRILL HOLES - Total Moisture, Proximate

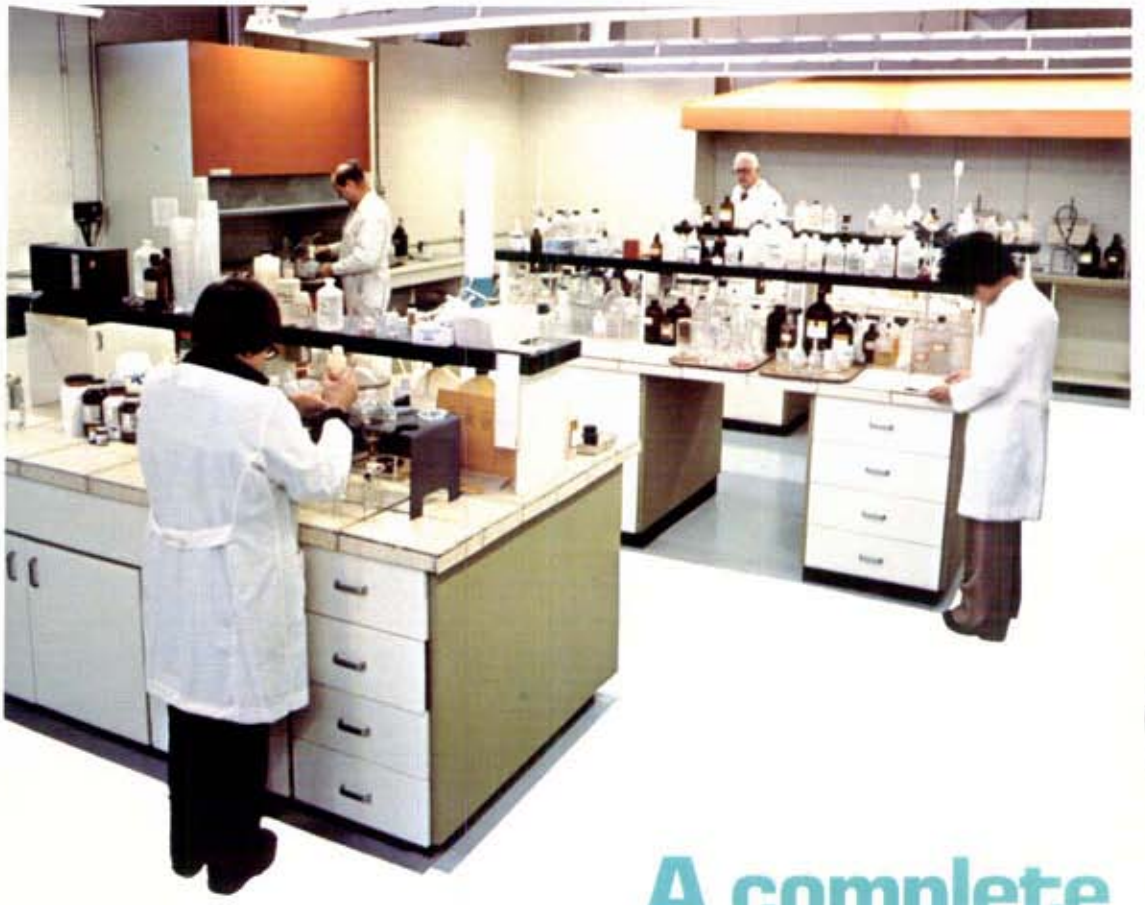
SMPL NO	MOISTURE A.D. %	MOISTURE T.M. %	BASIS	R.M. %	ASH %	V.M. %	F.C. %
SW-83-04-1	3.78	4.32	A.D.	0.56	56.05	21.95	21.44
EH 70			DRY	-	56.36	22.08	21.56
SW-83-04-2	3.64	4.15	A.D.	0.53	58.44	21.81	19.22
EH 71			DRY	-	58.75	21.93	19.32
SW-83-04-3	4.05	4.61	A.D.	0.58	59.96	22.09	17.37
EH 72			DRY	-	60.31	22.21	17.48
SW-83-04-4	3.91	4.45	A.D.	0.56	63.06	21.38	15.00
EH 73			DRY	-	63.42	21.50	15.08
SW-83-04-5	4.16	4.80	A.D.	0.67	64.78	19.28	15.14
EH 74			DRY	-	65.21	19.41	15.38
SW-83-04-6	3.77	4.52	A.D.	0.78	59.91	21.13	18.18
EH 75			DRY	-	60.38	21.30	18.32

COAL, COKE AND WATER TESTING

a specialized service of

GENERAL TESTING LABORATORIES

A DIVISION OF SGS SUPERVISION SERVICES INC.



A complete coal and coke testing service from exploration to final destination.

SGS has the facilities and personnel to serve the coal industry in many ways . . . from testing a foot of drill core to sampling a bulk carrier full of coking coal. In our laboratories, skilled technicians perform a full range of tests and analyses.

We offer consulting services on mechanical sampling systems and conduct seminars and workshops on coal sampling and testing. Our services include draft surveys and sampling of sea-going vessels. On completion of any assignment we provide detailed reports on quality and/or quantity.

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A full range of water purity tests can be carried out in our laboratories. The tests are basically designed to measure the level of trace metals in effluent and industrial waste. This service is of special value to industries such as mining and forestry.

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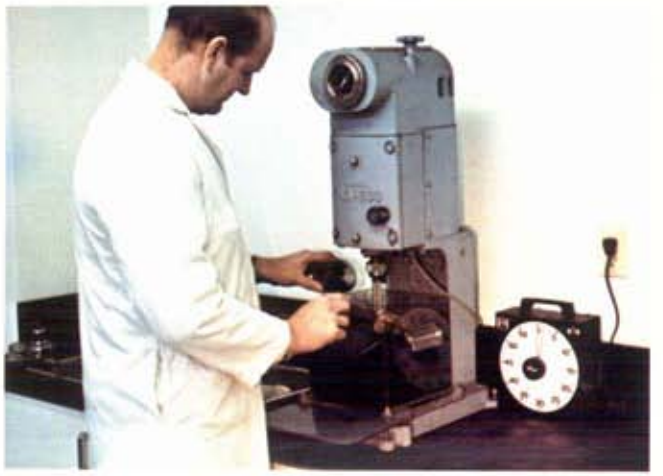
Laboratories for testing coal, coke and water are located in Vancouver, Toronto, Montreal and Sydney, Nova Scotia. The following range of tests and analyses can be performed at these laboratories:

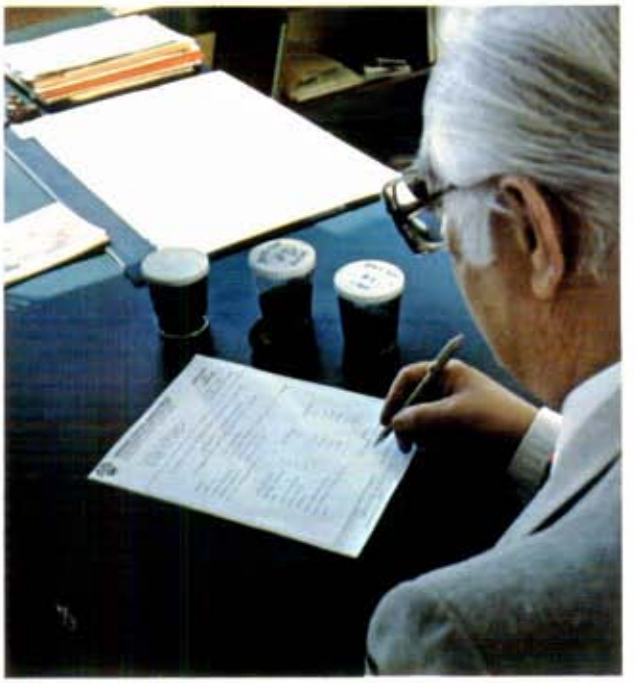


COAL AND COKE:

- Proximate analysis (moisture, ash, volatile, fixed carbon)
- Sulphur
- Equilibrium moisture
- Ultimate analysis (carbon, hydrogen, nitrogen, oxygen, sulphur, ash)
- Calorific value (BTU's or calories)
- Specific gravity
- Density
- Free swelling index
- Dilatometer tests
- Gieseler plasticity
- Hardgrove grindability
- Ash fusion temperatures (oxidizing and reducing atmospheres)
- Screen tests
- Froth flotation
- Chlorine
- Sulphur forms
- Water soluble alkalis
- Float-sink analysis (producing washability curves)
- Ash analysis (trace elements by spectrographic or neutron activation procedures)

WATER:

- Metal analysis of mining or industrial effluent
- Radioactive isotope measurements in water and effluents



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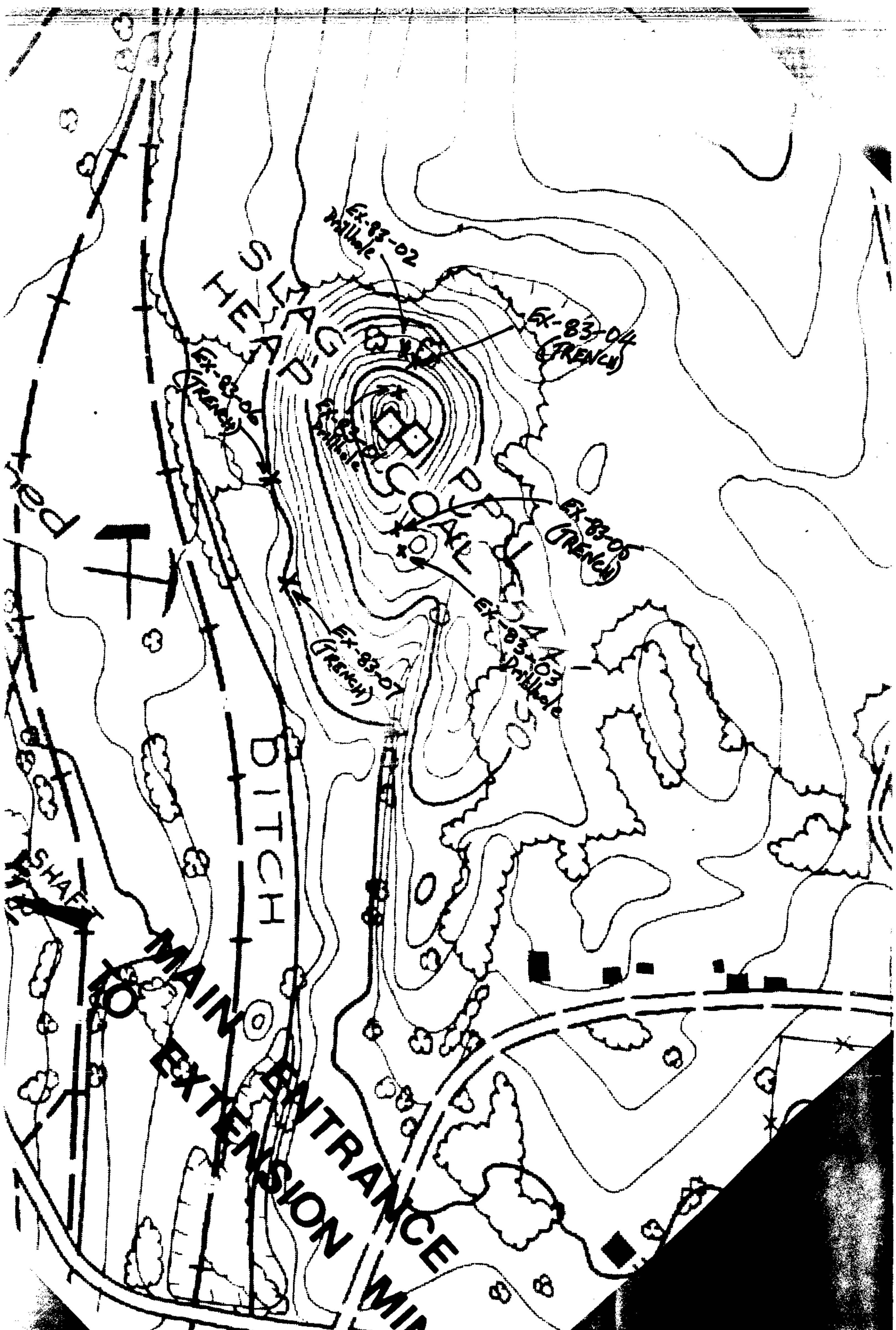
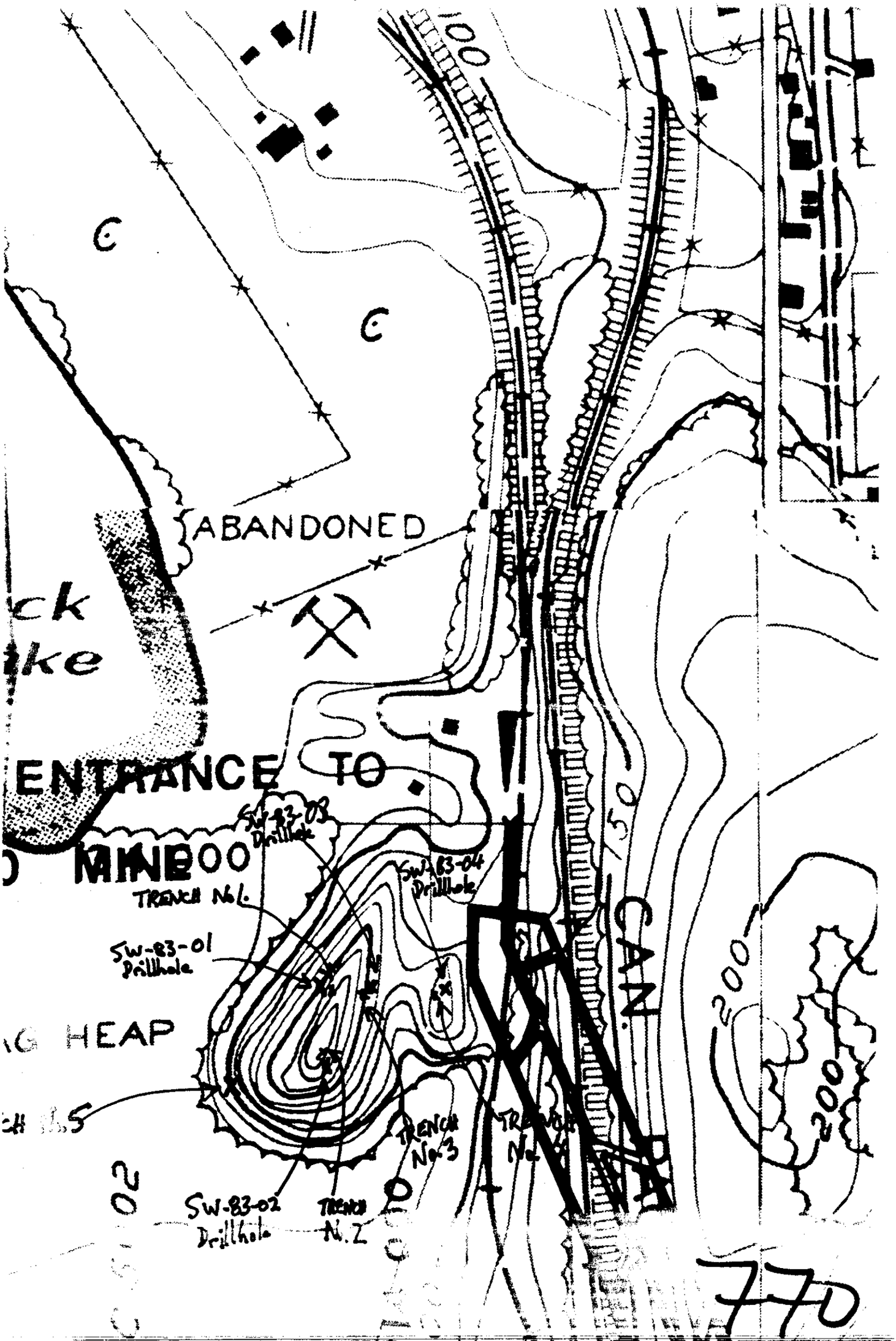
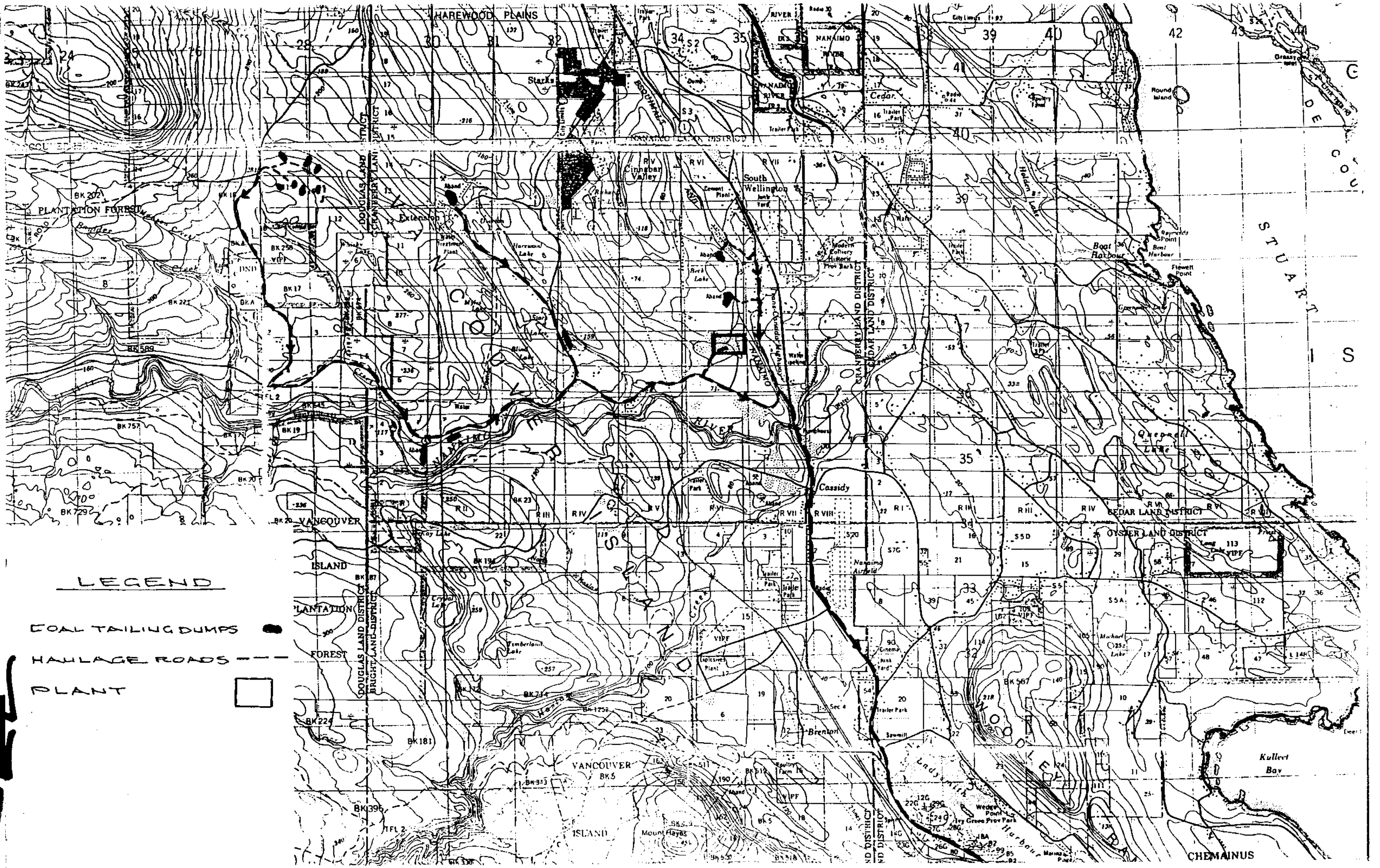

SLAG HEAP
COAL
DITCH
MAIN ENTRANCE TO EXTENSION
SHAFT
Ex-83-02 Drillhole
Ex-83-04 (TRENCH)
Ex-83-06 (TRENCH)
Ex-83-05 (TRENCH)
Ex-83-03 Drillhole
Ex-83-07 (TRENCH)


100
ABANDONED
ENTRANCE TO
MINE
TRENCH No.1
SW-83-03 Drillhole
SW-83-04 Drillhole
SW-83-01 Drillhole
HEAP
TRENCH No.3
TRENCH No.2
SW-83-02 Drillhole
TRENCH No.1
150
200
770



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Holden Lake
Nanaimo Airfield
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CHEMAINUS
Ladysmith Harbour
Mount Hayes
STUART

#70

NANAIMO STOCKPILE - OCTOBER 1983

TRENCH SAMPLES

LABORATORY REPORTS

ESSO MINERALS CANADA
A DIVISION OF ESSO RESOURCES CANADA LTD.
237-4TH AVENUE S.W. - CALGARY - ALBERTA T2P 0H6
EXPLORATION MANAGER : MR. HUGH JONES

ANALYTICAL WORK ACCORDING TO ASTM PERFORMED BY :

GENERAL TESTING LABORATORIES
A DIVISION OF SGS SUPERVISION SERVICES INC.
1707 FRANKLIN ST - VANCOUVER B.C. - CANADA - V5L 1P6
TELEX : 04-507514 - PHONE : (604) 254-2148
CHIEF CHEMIST : L.M. LAKOSIL

TO L. Lakosil
GENERAL TESTING LABS
VANCOUVER, B.C.

FROM Stephen. L. Gardner
per ESSO RESOURCES LTD.
NANAIMO B.C.

SUBJECT TRENCH SAMPLE INVENTORY, EXTENSION AND SOUTH WELLINGTON PROPS

DATE Sept. 27 1983

Dear Liba: Please find the following trench samples:

SW-83-01 (Trench) 4 bags
SW-83-02 (Trench) 4 bags
SW-83-03 (Trench) 4 bags
SW-83-04 (Trench) 4 bags
SW-83-05 (Trench) 4 bags
20

EX-83-06 (Trench) 3 BAGS
EX-83-07 (Trench) 3 BAGS
6

15 samples

SIGNED Stephen Gardner

REDIFORM 4S065E MOORE BUSINESS FORMS 3

FOLD AT MARKS FOR USE IN #9 OR # 10 WINDOW ENVELOPE

REDI-LETTER

TO L. Lakosil
GENERAL TESTING LABS
VANCOUVER, B.C.

FROM Stephen L. Gardner
per/ ESSO RESOURCES
NANAIMO, B.C.

SUBJECT RE: TRENCH SAMPLE INVENTORY

DATE SEPT 27 19 83

Dear Liba: Please find enclosed a number of samples marked (TRENCH) - These are not the same as drill hole samples and you will be supplied with a different set of instructions for these.

Ex - 83 - 04 (TRENCH) - 4 bags
Ex - 83 - 05 (TRENCH) - 4 bags
No. 4 DUMP (TRENCH #1) - 4 bags
No. 4 DUMP (TRENCH #2) - 4 bags
" " (" #3) - 4 bags
" " (" #4) - 4 bags
" " (" #5) - 4 bags
" " (" #6) - 4 bags

SIGNED Stephen Gardner

82

REDIFORM 4S085E MOORE BUSINESS FORMS 3

FOLD AT MARKS FOR USE IN #9 OR # 10 WINDOW ENVELOPE

REDI-LETTER

ESSO – TRENCH

RAW COAL (CALCULATED)

SAMPLE NO - ESSO : EX-83-05(T)
- GTL : ET 1

FRACTION	YIELD %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
+ 4 INCH	6.49	(KEPT ASIDE)				
+ 1 INCH	6.39	(CRUSHED TO -1 INCH)				
+28 MESH	77.01	65.23	18.38	16.39	0.26	2216
+100 MESH	14.06	68.27	18.78	12.95	0.29	1645
-100 MESH	8.93	73.86	16.58	9.56	0.23	1381
RAW COAL	-	66.43	18.28	15.29	0.26	2061

ESSO - TRENCH

RAW COAL (CALCULATED)

SAMPLE NO - ESSO : SW 83-03(T)
- GTL : ET 2

FRACTION	YIELD %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
+ 4 INCH	8.72	(KEPT ASIDE)				
+ 1 INCH	12.40	(CRUSHED TO -1 INCH)				
+28 MESH	71.58	57.11	21.89	21.00	0.46	2851
+100 MESH	18.07	57.61	22.55	19.84	0.47	2626
-100 MESH	10.35	60.75	20.35	18.90	0.56	2599
RAW COAL	-	57.58	21.85	20.57	0.47	2784

ESSO - TRENCH

RAW COAL (CALCULATED)

SAMPLE NO - ESSO : #4 DUMP T6
- GTL : ET 3

FRACTION	YIELD %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
+ 4 INCH	10.97	(KEPT ASIDE)				
+ 1 INCH	16.50	(CRUSHED TO -1 INCH)				
+28 MESH	84.87	53.84	23.18	22.98	0.28	3226
+100 MESH	9.40	48.51	26.23	25.26	0.30	3456
-100 MESH	5.73	53.74	23.71	22.55	0.30	3212
RAW COAL	-	53.33	23.49	23.18	0.28	3247

ESSO – TRENCH

RAW COAL (CALCULATED)

SAMPLE NO - ESSO : EX-83-06(T)
- GTL : ET 4

FRACTION	YIELD %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
+ 4 INCH	2.34	(KEPT ASIDE)				
+ 1 INCH	14.00	(CRUSHED TO -1 INCH)				
+28 MESH	69.24	69.76	16.08	14.16	0.16	1598
+100 MESH	20.90	66.83	18.16	15.01	0.19	1847
-100 MESH	9.86	69.72	16.99	13.29	0.23	1480
RAW COAL	-	69.14	16.60	14.26	0.17	1638

ESSO - TRENCH

RAW COAL (CALCULATED)

SAMPLE NO - ESSO : SW-83-02(T)
- GTL : ET 5

FRACTION	YIELD %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
+ 4 INCH	8.34	(KEPT ASIDE)				
+ 1 INCH	9.09	(CRUSHED TO -1 INCH)				
+28 MESH	68.67	57.48	21.74	20.78	0.52	2904
+100 MESH	19.26	56.89	23.13	19.99	0.54	2724
-100 MESH	12.07	62.79	21.09	16.12	0.63	2596
RAW COAL	-	58.01	21.93	20.06	0.54	2832

ESSO – TRENCH

RAW COAL (CALCULATED)

SAMPLE NO - ESSO : #4 DUMP T1
- GTL : ET 6

FRACTION	YIELD %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
+ 4 INCH	1.57	(KEPT ASIDE)				
+ 1 INCH	12.30	(CRUSHED TO -1 INCH)				
+28 MESH	75.21	60.91	20.76	18.33	0.23	2522
+100 MESH	17.90	59.08	21.40	19.51	0.22	2530
-100 MESH	6.89	56.92	24.97	18.11	0.26	2831
RAW COAL	-	60.30	21.17	18.53	0.23	2545

ESSO - TRENCH

SAMPLE NO - ESSO : EX-83-05(T)
GTL : ET 1

FRACTION : +28 MESH

FRACTIONAL

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
1.40	A.D.	-	1.20	7.88	36.94	53.98	0.57	7408
	DRY	17.04	-	7.98	37.39	54.63	0.57	7498
1.50	A.D.	-	1.08	22.39	33.17	43.36	0.56	6044
	DRY	3.54	-	22.63	33.54	43.83	0.56	6110
1.60	A.D.	-	1.14	32.84	30.11	35.91	0.53	5130
	DRY	2.53	-	33.22	30.46	36.32	0.54	5189
1.70	A.D.	-	1.06	41.92	26.68	30.34	0.43	4322
	DRY	2.92	-	42.37	26.97	30.66	0.44	4368
1.80	A.D.	-	1.17	50.50	23.72	24.61	0.35	3556
	DRY	3.44	-	51.10	24.00	24.90	0.35	3598
****	A.D.	-	1.60	82.65	11.78	3.97	0.14	474
	DRY	70.53	-	83.99	11.97	4.04	0.14	481

CUMULATIVE - BASIS : DRY

S.G.	YIELD %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
1.40	17.04	7.98	37.39	54.63	0.57	7498
1.50	20.58	10.50	36.72	52.78	0.57	7260
1.60	23.11	12.99	36.04	50.97	0.57	7033
1.70	26.03	16.28	35.02	48.70	0.55	6734
1.80	29.47	20.35	33.73	45.92	0.53	6368
****	100.00	65.23	18.38	16.39	0.26	2216

ESSO - TRENCH

SAMPLE NO - ESSO : SW 83-03(T)
GTL : ET 2

FRACTION : +28 MESH

FRACTIONAL

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
1.40	A.D.	-	1.41	8.63	37.96	52.00	0.62	7217
	DRY	21.94	-	8.75	38.51	52.74	0.63	7320
1.50	A.D.	-	1.07	20.35	33.99	44.59	0.62	6081
	DRY	4.59	-	20.57	34.36	45.07	0.62	6147
1.60	A.D.	-	0.94	29.90	31.36	37.80	0.62	5230
	DRY	4.27	-	30.18	31.65	38.17	0.62	5279
1.70	A.D.	-	0.91	39.04	28.33	31.72	0.63	4411
	DRY	3.55	-	39.40	28.59	32.01	0.63	4452
1.80	A.D.	-	0.95	47.78	25.34	25.93	0.62	3694
	DRY	3.54	-	48.23	25.59	26.18	0.63	3730
****	A.D.	-	1.44	79.11	13.63	5.82	0.35	710
	DRY	62.11	-	80.27	13.83	5.90	0.35	720

CUMULATIVE - BASIS : DRY

S.G.	YIELD %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
1.40	21.94	8.75	38.51	52.74	0.63	7320
1.50	26.53	10.80	37.79	51.41	0.63	7117
1.60	30.80	13.48	36.94	49.58	0.63	6863
1.70	34.35	16.16	36.08	47.76	0.63	6613
1.80	37.89	19.16	35.10	45.74	0.63	6344
****	100.00	57.11	21.89	21.00	0.46	2851

ESSO - TRENCH

SAMPLE NO - ESSO : #4 DUMP T6
GTL : ET 3

FRACTION : +28 MESH

FRACTIONAL

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
1.40	A.D.	-	2.07	8.18	37.21	52.54	0.51	7246
	DRY	18.61	-	8.35	38.00	53.65	0.52	7399
1.50	A.D.	-	1.43	22.33	33.39	42.85	0.46	5993
	DRY	4.37	-	22.65	33.87	43.48	0.47	6080
1.60	A.D.	-	1.37	32.14	30.40	36.09	0.41	5138
	DRY	5.73	-	32.59	30.82	36.59	0.42	5209
1.70	A.D.	-	1.83	41.62	27.50	29.05	0.37	4310
	DRY	7.50	-	42.39	28.02	29.59	0.37	4390
1.80	A.D.	-	1.98	49.58	23.89	24.55	0.30	3559
	DRY	8.05	-	50.58	24.38	25.04	0.31	3631
****	A.D.	-	2.11	74.08	15.45	8.36	0.14	1164
	DRY	55.74	-	75.67	15.78	8.55	0.15	1189

CUMULATIVE - BASIS : DRY

S.G.	YIELD %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
1.40	18.61	8.35	38.00	53.65	0.52	7399
1.50	22.98	11.07	37.21	51.72	0.51	7148
1.60	28.71	15.36	35.94	48.70	0.49	6761
1.70	36.21	20.96	34.30	44.74	0.47	6270
1.80	44.26	26.35	32.49	41.16	0.44	5790
****	100.00	53.84	23.18	22.98	0.28	3226

ESSO - TRENCH

SAMPLE NO - ESSO : EX-83-06(T)
GTL : ET 4

FRACTION : +28 MESH

FRACTIONAL

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
1.40	A.D.	-	2.49	6.99	32.72	57.80	0.50	6868
	DRY	5.82	-	7.17	33.55	59.28	0.51	7044
1.50	A.D.	-	4.48	12.42	31.23	51.87	0.48	6007
	DRY	5.22	-	13.00	32.70	54.30	0.50	6288
1.60	A.D.	-	4.23	22.68	26.33	46.76	0.40	5271
	DRY	3.51	-	23.68	27.49	48.83	0.42	5503
1.70	A.D.	-	2.38	35.56	24.59	37.47	0.35	4421
	DRY	2.74	-	36.42	25.19	38.39	0.36	4529
1.80	A.D.	-	2.80	46.27	21.61	29.32	0.11	3505
	DRY	2.46	-	47.60	22.23	30.17	0.12	3606
****	A.D.	-	1.99	80.20	12.48	5.33	0.09	554
	DRY	80.25	-	81.82	12.73	5.45	0.09	565

CUMULATIVE - BASIS : DRY

S.G.	YIELD %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
1.40	5.82	7.17	33.55	59.28	0.51	7044
1.50	11.04	9.93	33.15	56.92	0.51	6687
1.60	14.55	13.25	31.79	54.96	0.48	6401
1.70	17.29	16.92	30.74	52.34	0.47	6104
1.80	19.75	20.74	29.68	49.58	0.42	5793
****	100.00	69.76	16.08	14.16	0.16	1598

ESSO - TRENCH

SAMPLE NO - ESSO : SW-83-02(T)
GTL : ET 5

FRACTION : +28 MESH

FRACTIONAL

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
1.40	A.D.	-	3.76	8.92	36.55	50.77	0.56	7126
	DRY	25.82	-	9.27	37.97	52.76	0.59	7405
1.50	A.D.	-	1.23	21.40	33.96	43.41	0.74	6049
	DRY	4.66	-	21.66	34.38	43.96	0.75	6125
1.60	A.D.	-	1.34	29.90	31.53	37.23	0.74	5279
	DRY	4.05	-	30.30	31.96	37.74	0.75	5351
1.70	A.D.	-	1.17	38.74	29.07	31.02	0.86	4487
	DRY	3.09	-	39.20	29.42	31.38	0.87	4541
1.80	A.D.	-	1.23	46.80	26.49	25.48	0.95	3791
	DRY	2.92	-	47.38	26.82	25.80	0.97	3838
****	A.D.	-	1.55	83.21	12.17	3.07	0.41	393
	DRY	59.46	-	84.52	12.36	3.12	0.42	399

CUMULATIVE - BASIS : DRY

S.G.	YIELD %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
1.40	25.82	9.27	37.97	52.76	0.59	7405
1.50	30.48	11.16	37.42	51.42	0.61	7209
1.60	34.53	13.41	36.78	49.81	0.63	6991
1.70	37.62	15.53	36.18	48.29	0.65	6790
1.80	40.54	17.82	35.50	46.68	0.67	6577
****	100.00	57.48	21.74	20.78	0.52	2904

ESSO - TRENCH

SAMPLE NO - ESSO : #4 DUMP T1
GTL : ET 6

FRACTION : +28 MESH

FRACTIONAL

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
1.40	A.D.	-	1.25	8.21	38.13	52.41	0.51	7221
	DRY	14.63	-	8.31	38.62	53.07	0.52	7313
1.50	A.D.	-	1.31	19.68	32.29	46.72	0.48	6083
	DRY	2.88	-	19.94	32.72	47.34	0.48	6164
1.60	A.D.	-	1.50	28.70	30.73	39.07	0.43	5269
	DRY	4.28	-	29.14	31.19	39.67	0.44	5350
1.70	A.D.	-	1.50	38.53	29.29	30.68	0.39	4461
	DRY	5.10	-	39.12	29.73	31.15	0.39	4529
1.80	A.D.	-	1.49	47.50	24.82	26.19	0.32	3704
	DRY	5.05	-	48.22	25.20	26.58	0.32	3760
****	A.D.	-	2.11	76.86	14.45	6.58	0.13	898
	DRY	68.06	-	78.52	14.76	6.72	0.13	917

CUMULATIVE - BASIS : DRY

S.G.	YIELD %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
1.40	14.63	8.31	38.62	53.07	0.52	7313
1.50	17.51	10.22	37.65	52.13	0.51	7124
1.60	21.79	13.94	36.38	49.68	0.50	6775
1.70	26.89	18.71	35.12	46.17	0.48	6349
1.80	31.94	23.38	33.55	43.07	0.45	5940
****	100.00	60.91	20.76	18.33	0.23	2522

ESSO - TRENCH

SAMPLE NO - ESSO : EX-83-05(T)
- GTL : ET 1

FRACTION : +100 MESH

FRACTIONAL

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	S %	C.V. CAL/G
1.40	DRY	5.82	-	8.05	37.39	54.56	0.75	7313
1.50	DRY	5.43	-	16.91	35.27	47.82	0.74	6129
1.60	DRY	2.92	-	31.95	29.03	39.02	0.59	5114
1.70	DRY	5.74	-	44.13	28.36	27.51	0.42	3239
1.80	DRY	1.01	-	46.01	26.80	27.19	0.43	3096
****	A.D.	-	3.83	76.55	14.52	5.10	0.19	631
	DRY	79.08	-	79.60	15.10	5.30	0.20	656

CUMULATIVE

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	S %	C.V. CAL/G
1.40	A.D.	-	3.01	7.81	36.27	52.91	0.73	7093
	DRY	5.82	-	8.05	37.39	54.56	0.75	7313
1.50	A.D.	-	3.88	11.85	34.96	49.31	0.72	6480
	DRY	11.25	-	12.33	36.37	51.30	0.75	6742
1.60	A.D.	-	4.26	15.67	33.37	46.70	0.68	6133
	DRY	14.17	-	16.37	34.86	48.77	0.71	6406
1.70	A.D.	-	2.42	23.79	32.19	41.60	0.61	5360
	DRY	19.91	-	24.37	32.98	42.65	0.63	5493
1.80	A.D.	-	3.13	24.62	31.66	40.59	0.60	5209
	DRY	20.92	-	25.42	32.69	41.89	0.62	5377
****	DRY	100.00	-	68.27	18.78	12.95	0.29	1644

ESSO - TRENCH

SAMPLE NO - ESSO : SW 83-03(T)
- GTL : ET 2

FRACTION : +100 MESH

FRACTIONAL

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	S %	C.V. CAL/G
1.40	DRY	6.82	-	9.22	37.12	53.66	0.60	7209
1.50	DRY	8.03	-	17.98	36.31	45.71	0.57	6420
1.60	DRY	6.29	-	26.28	35.29	38.43	0.60	5380
1.70	DRY	6.83	-	32.39	30.40	37.21	0.58	4553
1.80	DRY	6.72	-	42.12	27.34	30.54	0.52	3239
****	A.D.	-	3.58	72.10	16.20	8.12	0.40	1110
	DRY	65.31	-	74.78	16.80	8.42	0.41	1152

CUMULATIVE

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	S %	C.V. CAL/G
1.40	A.D.	-	2.64	8.98	36.14	52.24	0.58	7018
	DRY	6.82	-	9.22	37.12	53.66	0.60	7209
1.50	A.D.	-	2.94	13.55	35.61	47.90	0.57	6583
	DRY	14.85	-	13.96	36.68	49.36	0.58	6782
1.60	A.D.	-	3.49	17.01	35.00	44.50	0.57	6143
	DRY	21.14	-	17.62	36.27	46.11	0.59	6365
1.70	A.D.	-	3.87	20.41	33.49	42.23	0.56	5693
	DRY	27.97	-	21.23	34.84	43.93	0.59	5923
1.80	A.D.	-	4.44	24.16	31.90	39.50	0.55	5163
	DRY	34.69	-	25.28	33.38	41.34	0.57	5403
****	DRY	100.00	-	57.61	22.55	19.84	0.47	2626

ESSO — TRENCH

SAMPLE NO - ESSO : #4 DUMP T6
- GTL : ET 3

FRACTION : +100 MESH

FRACTIONAL

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	S %	C.V. CAL/G
1.40	DRY	19.54	-	8.15	37.19	54.66	0.55	7285
1.50	DRY	7.36	-	19.85	34.26	45.89	0.49	6222
1.60	DRY	5.13	-	32.60	34.07	33.33	0.50	4883
1.70	DRY	8.32	-	35.17	32.74	32.09	0.48	4478
1.80	DRY	7.58	-	45.65	32.31	22.04	0.33	3312
****	A.D.	-	3.14	69.57	17.71	9.58	0.13	1302
	DRY	52.07	-	71.82	18.29	9.89	0.13	1344

CUMULATIVE

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	S %	C.V. CAL/G
1.40	A.D.	-	2.80	7.92	36.15	53.13	0.53	7081
	DRY	19.54	-	8.15	37.19	54.66	0.55	7285
1.50	A.D.	-	2.88	11.02	35.34	50.76	0.52	6793
	DRY	26.90	-	11.35	36.39	52.26	0.53	6994
1.60	A.D.	-	2.93	14.32	34.96	47.79	0.51	6461
	DRY	32.03	-	14.75	36.02	49.23	0.53	6656
1.70	A.D.	-	3.46	18.31	34.12	44.11	0.50	5992
	DRY	40.35	-	18.96	35.34	45.70	0.52	6207
1.80	A.D.	-	3.94	22.27	33.49	40.30	0.47	5523
	DRY	47.93	-	23.18	34.86	41.96	0.49	5749
****	DRY	100.00	-	48.51	26.23	25.26	0.30	3456

ESSO — TRENCH

SAMPLE NO - ESSO : EX-83-06(T)
- GTL : ET 4

FRACTION : +100 MESH

FRACTIONAL

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	S %	C.V. CAL/G
1.40	DRY	2.51	-	6.81	36.88	56.31	0.57	6981
1.50	DRY	5.79	-	12.46	33.57	53.97	0.52	5968
1.60	DRY	5.08	-	18.26	33.13	48.61	0.48	5411
1.70	DRY	4.04	-	29.43	32.20	38.37	0.41	4346
1.80	DRY	2.90	-	45.96	31.49	22.55	0.33	3336
****	A.D.	-	3.46	75.71	13.80	7.03	0.12	931
	DRY	79.68	-	78.42	14.30	7.28	0.12	965

CUMULATIVE

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	S %	C.V. CAL/G
1.40	A.D.	-	3.51	6.57	35.58	54.34	0.55	6736
	DRY	2.51	-	6.81	36.88	56.31	0.57	6981
1.50	A.D.	-	3.50	10.38	33.36	52.76	0.51	6055
	DRY	8.30	-	10.75	34.57	54.68	0.53	6275
1.60	A.D.	-	3.73	13.10	32.75	50.42	0.49	5725
	DRY	13.38	-	13.60	34.02	52.38	0.51	5947
1.70	A.D.	-	3.75	16.63	32.34	47.28	0.47	5367
	DRY	17.42	-	17.27	33.60	49.13	0.49	5576
1.80	A.D.	-	3.69	20.58	32.07	43.66	0.45	5062
	DRY	20.32	-	21.37	33.30	45.33	0.47	5256
****	DRY	100.00	-	66.83	18.16	15.01	0.19	1837

ESSO - TRENCH

SAMPLE NO - ESSO : SW-83-02(T)
- GTL : ET 5

FRACTION : +100 MESH

FRACTIONAL

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	S %	C.V. CAL/G
1.40	DRY	11.45	-	10.71	37.62	51.67	0.68	7205
1.50	DRY	7.97	-	21.58	32.84	45.58	0.66	6210
1.60	DRY	5.85	-	28.67	32.84	38.49	0.67	5286
1.70	DRY	6.43	-	38.68	33.22	28.10	0.67	4419
1.80	DRY	7.11	-	40.89	32.81	26.30	0.73	3787
****	A.D.	-	3.83	73.67	15.42	7.08	0.44	851
	DRY	61.19	-	76.60	16.03	7.37	0.46	884

CUMULATIVE

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	S %	C.V. CAL/G
1.40	A.D.	-	2.14	10.48	36.81	50.57	0.67	7051
	DRY	11.45	-	10.71	37.62	51.67	0.68	7205
1.50	A.D.	-	2.42	14.80	34.79	47.99	0.66	6632
	DRY	19.42	-	15.17	35.66	49.17	0.67	6797
1.60	A.D.	-	2.45	17.85	34.15	45.55	0.66	6289
	DRY	25.27	-	18.29	35.01	46.70	0.67	6447
1.70	A.D.	-	2.77	21.81	33.68	41.74	0.65	5868
	DRY	31.70	-	22.43	34.64	42.93	0.67	6035
1.80	A.D.	-	3.21	24.98	33.21	38.60	0.66	5443
	DRY	38.81	-	25.81	34.31	39.88	0.68	5624
****	DRY	100.00	-	56.89	23.13	19.99	0.54	2724

ESSO - TRENCH

SAMPLE NO - ESSO : #4 DUMP T1
- GTL : ET 6

FRACTION : +100 MESH

FRACTIONAL

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	S %	C.V. CAL/G
1.40	DRY	10.67	-	6.83	38.56	54.61	0.63	7348
1.50	DRY	4.54	-	19.20	33.71	47.09	0.48	5916
1.60	DRY	6.12	-	24.00	33.47	42.53	0.46	5479
1.70	DRY	6.59	-	33.65	29.13	37.22	0.37	4464
1.80	DRY	5.93	-	69.12	21.58	9.30	0.18	1734
****	A.D.	-	4.54	71.72	15.17	8.57	0.10	1076
	DRY	66.15	-	75.13	15.89	8.98	0.11	1127

CUMULATIVE

S.G.	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	S %	C.V. CAL/G
1.40	A.D.	-	2.97	6.63	37.41	52.99	0.61	7130
	DRY	10.67	-	6.83	38.56	54.61	0.63	7348
1.50	A.D.	-	2.53	10.26	36.17	51.04	0.57	6746
	DRY	15.21	-	10.52	37.11	52.37	0.59	6921
1.60	A.D.	-	3.03	13.95	34.97	48.05	0.53	6310
	DRY	21.33	-	14.39	36.07	49.54	0.55	6507
1.70	A.D.	-	4.38	18.10	32.92	44.60	0.48	5761
	DRY	27.92	-	18.93	34.43	46.64	0.51	6025
1.80	A.D.	-	4.37	26.51	30.77	38.35	0.43	5043
	DRY	33.85	-	27.73	32.18	40.09	0.45	5273
****	DRY	100.00	-	59.08	21.40	19.51	0.22	2530

ESSO - TRENCH

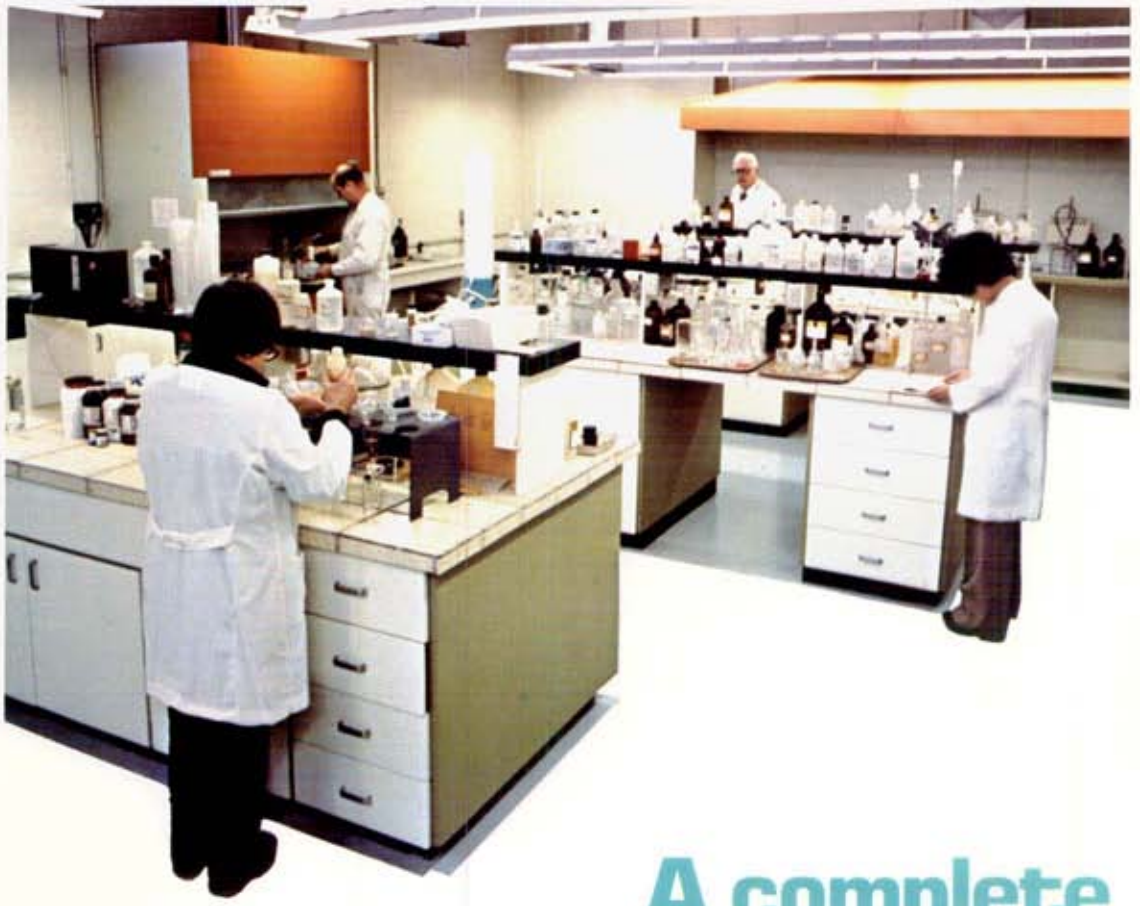
FRACTION : -100 MESH

SMPL NO	BASIS	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	T.S. %	C.V. CAL/G
ET 1	A.D.	8.93	4.51	70.53	15.83	9.13	0.22	1319
EX-83-05(T)	DRY	-	-	73.86	16.58	9.56	0.23	1381
ET 2	A.D.	10.35	3.90	58.38	19.56	18.16	0.54	2497
SW 83-03(T)	DRY	-	-	60.75	20.35	18.90	0.56	2599
ET 3	A.D.	5.73	3.57	51.82	22.87	21.74	0.29	3098
#4 DUMP T6	DRY	-	-	53.74	23.71	22.55	0.30	3212
ET 4	A.D.	9.86	4.11	66.85	16.29	12.75	0.22	1419
EX-83-06(T)	DRY	-	-	69.72	16.99	13.29	0.23	1480
ET 5	A.D.	12.07	2.56	61.19	20.55	15.70	0.62	2530
SW-83-02(T)	DRY	-	-	62.79	21.09	16.12	0.63	2596
ET 6	A.D.	6.89	2.12	55.71	24.44	17.73	0.25	2771
#4 DUMP T1	DRY	-	-	56.92	24.97	18.11	0.26	2831

COAL, COKE AND WATER TESTING

a specialized service of
GENERAL TESTING LABORATORIES

A DIVISION OF SGS SUPERVISION SERVICES INC.



A complete coal and coke testing service from exploration to final destination.

SGS has the facilities and personnel to serve the coal industry in many ways . . . from testing a foot of drill core to sampling a bulk carrier full of coking coal. In our laboratories, skilled technicians perform a full range of tests and analyses.

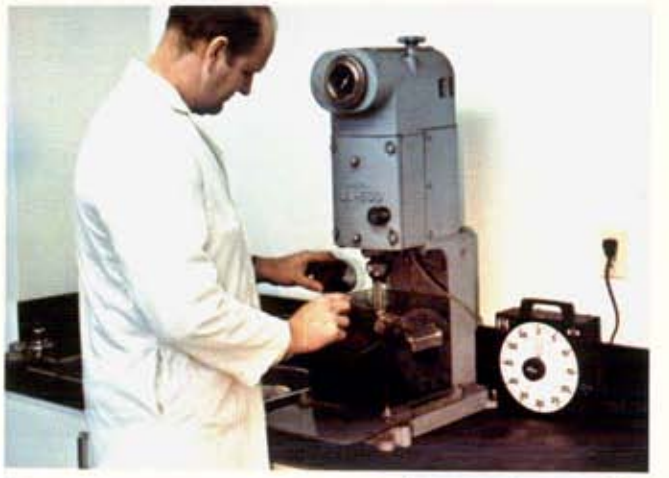
We offer consulting services on mechanical sampling systems and conduct seminars and workshops on coal sampling and testing. Our services include draft surveys and sampling of sea-going vessels. On completion of any assignment we provide detailed reports on quality and/or quantity.

Water testing and analysis

A full range of water purity tests can be carried out in our laboratories. The tests are basically designed to measure the level of trace metals in effluent and industrial waste. This service is of special value to industries such as mining and forestry.

MODERN LABORATORY FACILITIES FROM COAST TO COAST

Laboratories for testing coal, coke and water are located in Vancouver, Toronto, Montreal and Sydney, Nova Scotia. The following range of tests and analyses can be performed at these laboratories:

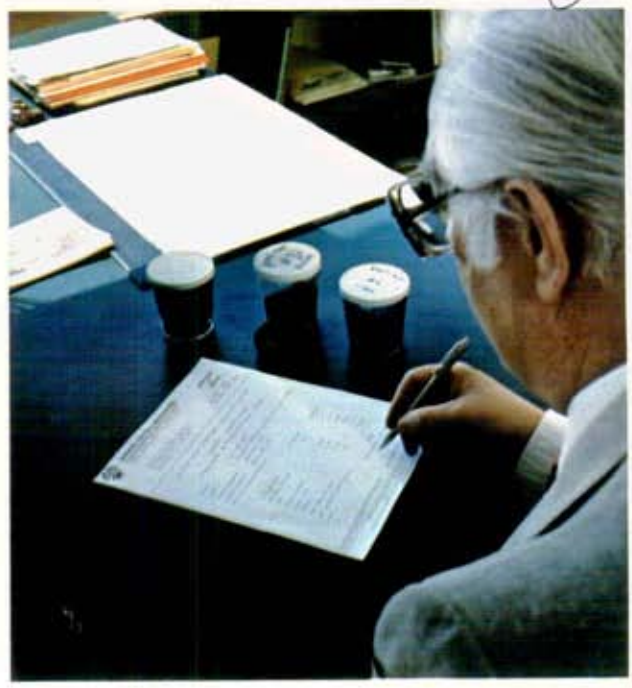


COAL AND COKE:

- Proximate analysis (moisture, ash, volatile, fixed carbon)
- Sulphur
- Equilibrium moisture
- Ultimate analysis (carbon, hydrogen, nitrogen, oxygen, sulphur, ash)
- Calorific value (BTU's or calories)
- Specific gravity
- Density
- Free swelling index
- Dilatometer tests
- Gieseler plasticity
- Hardgrove grindability
- Ash fusion temperatures (oxidizing and reducing atmospheres)
- Screen tests
- Froth flotation
- Chlorine
- Sulphur forms
- Water soluble alkalis
- Float-sink analysis (producing washability curves)
- Ash analysis (trace elements by spectrographic or neutron activation procedures)

WATER:

- Metal analysis of mining or industrial effluent
- Radioactive isotope measurements in water and effluents



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On the completion of any assignment, we provide comprehensive reports. A Certificate of Inspection and/or Analysis is dispatched or results telexed . . . allowing the client to complete a purchase or sale without delay. Verification of quality and/or quantity of materials shipped is often required in the sales contract. Our certificates are accepted by banking institutions and government agencies around the world.

SGS-THE WORLD'S LARGEST INDEPENDENT TESTING ORGANIZATION

SGS Supervision Services Inc. is an affiliate member of the world's largest independent testing organization. This is invaluable to clients involved in international trade, for we can quickly arrange on-site inspection of any product in any part of the world.

Look to General Testing Laboratories for prompt, professional service for all your coal, coke and water testing needs . . . and look to SGS for a wide range of inspection services, in Canada and throughout the world.

SGS

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Coal, coke and water testing facilities located at:

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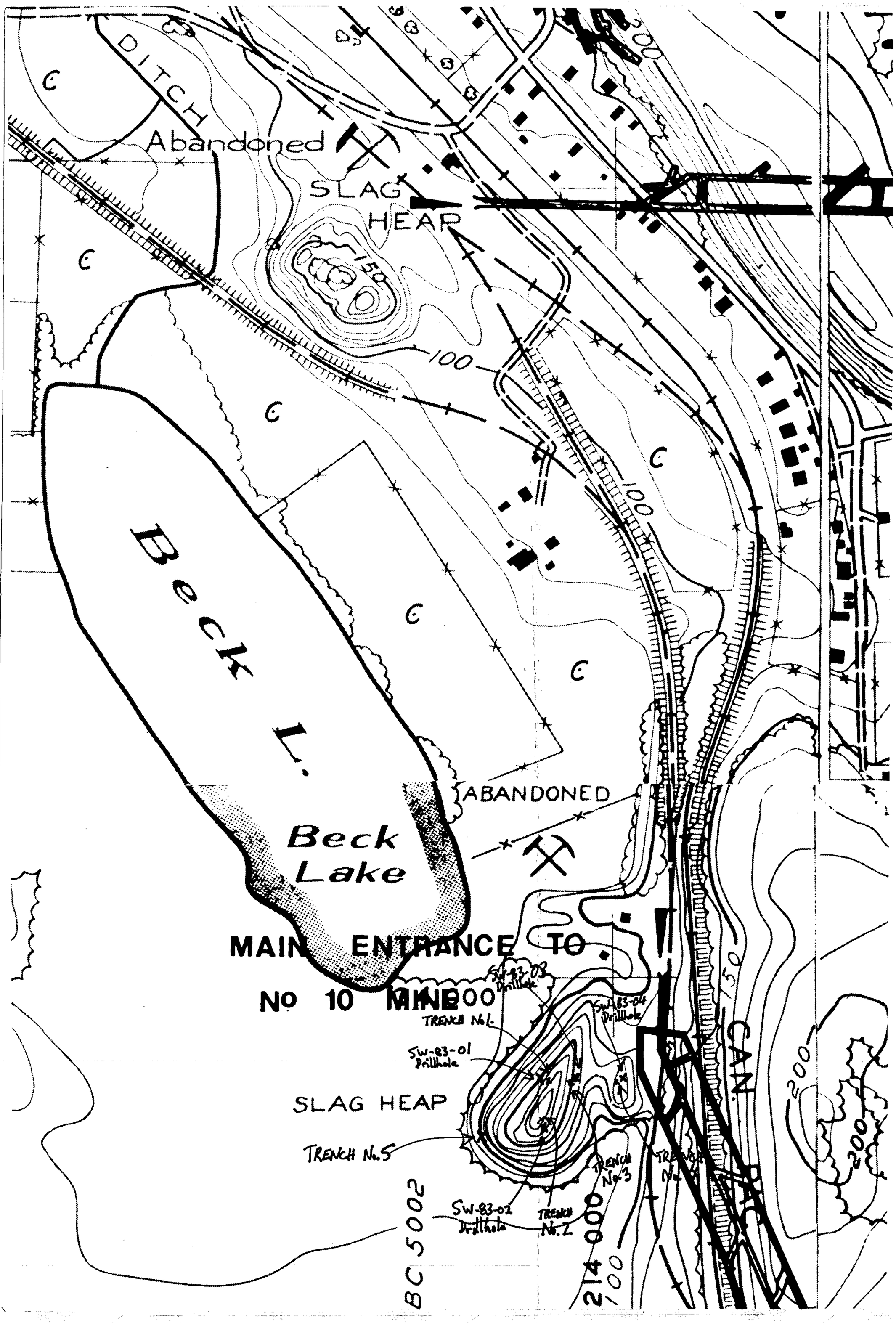
Vancouver, B.C. V5L 1P6
Tel: (604) 254-1647 254-2148
Telex: 04-507514

19 Le Royer Street
Chambre 401, Montreal, P.Q. H2Y 1W4
Tel: (514) 844-2803/5/6
Telex: 05-561238

259 Lakeshore Blvd. East
Toronto, Ont. M5A 3T7
Tel: (416) 461-6313
Telex: 06-23114

P.O. Box 39, Whitney Pier
Sydney, Nova Scotia B1N 3B1
Tel: (902) 562-2344
Telex: 019-35219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Beck L.
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No 10 MINE
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SW-83-04 Drillhole
TRENCH No.1.
SW-83-01 Drillhole
SLAG HEAP
TRENCH No.5
TRENCH No.3
TRENCH No.4
SW-83-02 Drillhole
TRENCH No.2
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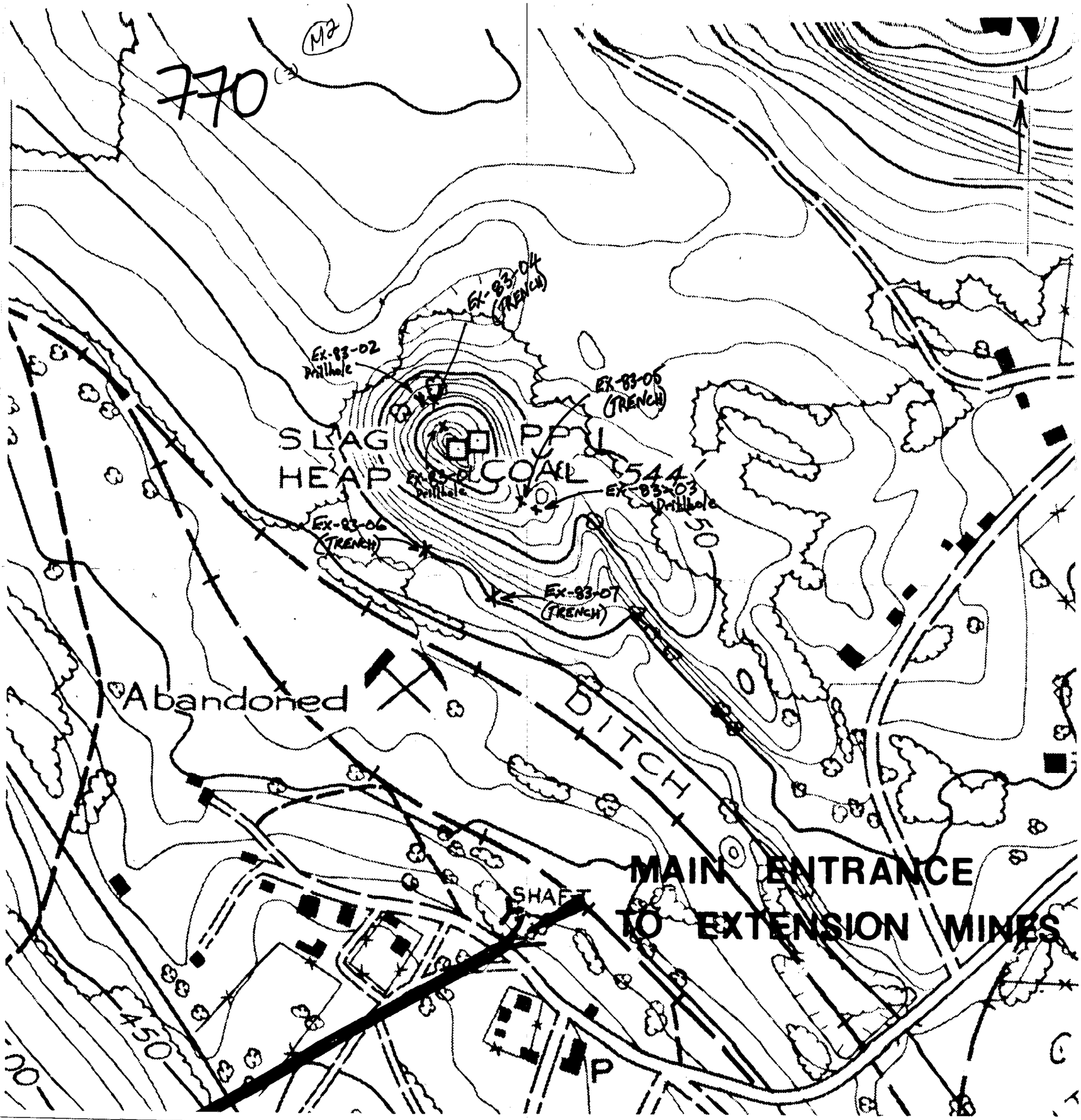
770
N
EX-83-04 (TRENCH)
EX-83-02 Drillhole
EX-83-05 (TRENCH)
SLAG HEAP
EX-83-01 Drillhole
EX-83-03 Drillhole
EX-83-06 (TRENCH)
EX-83-07 (TRENCH)
Abandoned
DITCH
MAIN ENTRANCE
TO EXTENSION MINES
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