

**ANNUAL RECLAMATION REPORT**

**B. C. Hydro and Power Authority**

**Annual Reclamation Report for Year 1977 and**

**Proposed Programme for Year 1978**

**Operation and Surface Work Permit No. 103**

**1 March 1978:**

## 1.0 Introduction

### 1.1 Objectives

- a) **Drill sites and access roads**
  - to recontour and revegetate disturbed areas.
- b) **Bulk sample excavation and waste disposal sites**
  - trenches to remain open for several years for slope stability testing.
  - to revegetate recontoured waste piles and to monitor effects of different seeding methods, materials and slope.

### 1.2 Future Land Use

Present land disturbances are restricted to drill sites, access trails and the areas associated with the Bulk Sample Program trenches and waste disposal sites. The drill sites and access trails are being reclaimed for return to original use. The Bulk Sample Program trenches are being left as is in order to examine the stability of slopes over several years. The waste embankments are being revegetated to provide data for use in the full scale operation. These areas are available for use by cattle.

### 1.3 History

Drilling, bulk sample extraction and reclamation activities are being carried out under permit #103 (revised). Reclamation of drill sites and access trails have been undertaken in past years. This is the first year that a large sample extraction program has been undertaken.

## 2.0 Mining Program

### 2.1 Surface Development to Date

A short history on the early development at Hat Creek coal is quoted from DCA 1977 geology report as follows:

"Coal in Upper Hat Creek Valley was reported by Dr. G.M. Dawson of the Geological Survey of Canada in 1877 and 1894. The only coal exposures were along the banks of Hat Creek where the overburden cover had been removed by creek erosion. By 1925, three shallow shafts and two short adits (DDH 25-7) had been driven into the coal along the creek and seven holes (DDH 25-1 to DDH 25-7) had been bored into it. No further work was done on the deposit until 1933.

From 1933 until 1942 a few hundred tons of coal a year were produced from the property and sold in the nearby towns and villages. No work was done from 1942 to 1957. In 1957 the property was optioned by Western Development and Power Ltd., a subsidiary of B. C. Electric Co. Ltd., at which time one Crown Grant claim was extensively explored by surface diamond drilling, (DDH 57-8 to DDH 57-15 and DDH 59-16 to DDH 59-22).

Following the acquisition of B. C. Electric by the Province of British Columbia, the ownership of the one explored Crown Grant claim and two coal licences comprising the Hat Creek property passed to British Columbia Hydro and Power Authority. No further exploration was done on the property until mid-1974 when B. C. Hydro began definitive drilling of the deposit. In 1974, B. C. Hydro acquired coal licences

covering most of Upper Hat Creek Valley. One additional licence was acquired in 1975.

Fieldwork under the current exploration program began in mid-1974 and continued in 1975 and 1976."

#### Coal Drilling

1974	DD Holes	#74-23 to 47	=	25 Holes
1975	DD Holes	#75-45 to 110	=	66 Holes
1976	DD Holes	#76-111 to 208	=	<u>98 Holes</u>
			<u>Total</u>	<u>189</u>

#### Geotechnical Drilling

1976	DDH	801-828	=	28
1974	Rotary	RH 74-1 - 2	=	2
1975	Rotary	RH 75-3 - 4	=	2
1976	Rotary	RH 76-5 - 76-21	=	17
1976	BAH	76-1 - 13	=	13 42" Dia.
1976	Percussive	P76-1 - 30	=	<u>30</u>
			<u>Total</u>	<u>92</u>

#### 2.2 Surface Development in Current Year

				<u>Drilled Length</u>
1977	DD Holes	77-209-250	= 40	9905 metres
1977	RH	77- 23- 42	= 20	2358 metres
1977	Percussive	P77- 31- 49	= <u>19</u>	<u>1717 metres</u>
			<u>Total</u>	<u>79</u> <u>13,980 metres</u>

#### 2.3 Surface Development Projected Over Next Five Years

Next five years not decided yet (until production permits are given).

- a) Apart from the reclamation research work noted in 3.1.8 below no attempt was made to locate specific materials on the surface of waste dumps. Rather the waste dumps themselves were used to examine the revegetation potential of the various materials.

A wide variety of materials were extracted during the Bulk Sample Program. Preliminary examination using pH, electrical conductivity, colour, reaction to carbonates and texture were used to identify the different materials in the field. Samples of these materials were analyzed in detail at the B. C. Department of Agriculture laboratories in Kelowna.

Apart from the coaly materials the pH's are generally alkaline. Salt content apart from the bentonitic clay is not excessive. Available nutrients are low and therefore substantial fertilizer additions were required; these are indicated on Table 1.

- b) See 3.1.2

- c) See 1.2

### 3.0 Reclamation Program

#### 3.1 Past Year's Program

##### 3.1.1 Site Preparation

###### a) Drill Sites

- Areas were recontoured, harrowed, seeded and fertilized.

###### b) Bulk Sample Waste Piles

- Waste piles built up from the bottom to obtain better compaction.
- Slopes originally at angle of repose of  $37^{\circ}$  -  $38^{\circ}$  claystones,  $33^{\circ}$  -  $34^{\circ}$  baked clay, carbonaceous shale, coaly waste.
- Some slopes were recontoured to provide a wide range of slope angles. See attached drawings for details.
- Topsoil was not added to surface.

##### 3.1.2 Seeding

###### a) Species

A single seed mix comprised of the following was used on all areas:

	<u>lbs/acre</u>	<u>Kg/ha</u>
Crested wheatgrass (Nordan)	20	22.4
Alfalfa (Drylander)	10	11.2
Fall Rye	20	22.4
Canada Bluegrass	<u>1</u>	<u>1.1</u>
	<u>51</u>	<u>57</u>

b) Fertilizer

- Drill Sites

Based on requirements of the surficial materials in the area of most intense drilling the following fertilizers were added:

11-48-0	250 lb/acre	280 Kg/ha
0-0-60	100 lb/acre	112 Kg/ha

- Bulk Sample Waste Piles

Several different mixes were used based on analysis of the material being revegetated. See Table 1.

c) Method

- Hydro Seeding - all waste dumps were hydro seeded.

Hydro seeding was carried out by Interior Reforestation Co., Cranbrook.

Fertilizer, seed and a mulch (Weyerhaeuser-Silva Fibre) were mixed prior to seeding.

Mulch application rate was 1200 lb/acre (1344 Kg/ha)

In one instance (coaly waste) a binder was also applied (Dowell J197) to assist with surface stabilization.

- Harrow Seeding

Harrow seeding was carried out at four locations to test seeding method.

Selected areas were flat dump surfaces and comprised the following materials:

Carbonaceous shale

Waste coal

Gritstone

Fluvial gravel

Areas were prepared with a chain harrow, seed and fertilizer added with a handbroadcaster and the area re-harrowed to bury the seed.

3.1.3 Planting

No shrubs or seedlings were planted.

3.1.4 Tending

Areas have not been irrigated or refertilized.

3.1.5 Seed Collection

No native seed collections have been attempted.

3.1.6 Propagation, Nursery, Tending

A nursery has not been established.

3.1.7 Summary of Areas Reclaimed

Table attached.

3.1.8 Reclamation Research

A program of revegetation testing was undertaken in the Hat Creek Valley during 1977. Two test programs were undertaken; one was designed to examine the potential for revegetation at different slopes, the second being to examine the various waste



materials as growth media. Details of these programs are contained in a separate report, (attached).

### 3.2 Future Work

Drill sites and access roads will continue to be reclaimed.

A program to monitor the revegetated areas is being developed.

Factors such as germination success, slope stability, biomass production will be considered.

3.1.7 SUMMARY OF AREAS DISTURBED AND RECLAIMED TO DECEMBER 13, 1977

PRODUCTION

Disturbance	Area Disturbed	Area Recontoured	Area Seeded/ Planted	Area Fertilized	Total Area Receiving Work	Area of Completed Reclamation
Roads 1977 - Total to date -	7.7 27	(Roads are still being used)	-	-	-	-
Administration 1977 - Total to date -		(Temporary trailer camp only)				
Plant Site 1977 - Total to date -	NIL	(No plant site yet)				
Dist Area DDH's & trenches 1977 - Total to date -	6.3 14	- 8	- 8	- 6	-	- 8
Waste Dumps 1977 - Total to date -	14 14	- -	10 10	- -	(Experimental)	
Fillings Ponds 1977 - Total to date -	NIL	-	-	-	-	-
Stockpiles 1977 - Total to date -	1 1	- -	- -	- -	- -	- -
Other 1977 - Total to date -	NIL	-	-	-	-	-
TOTAL 1977 -	29	-	10	6	-	-
TOTAL TO DATE -	56	8	18	6	-	8

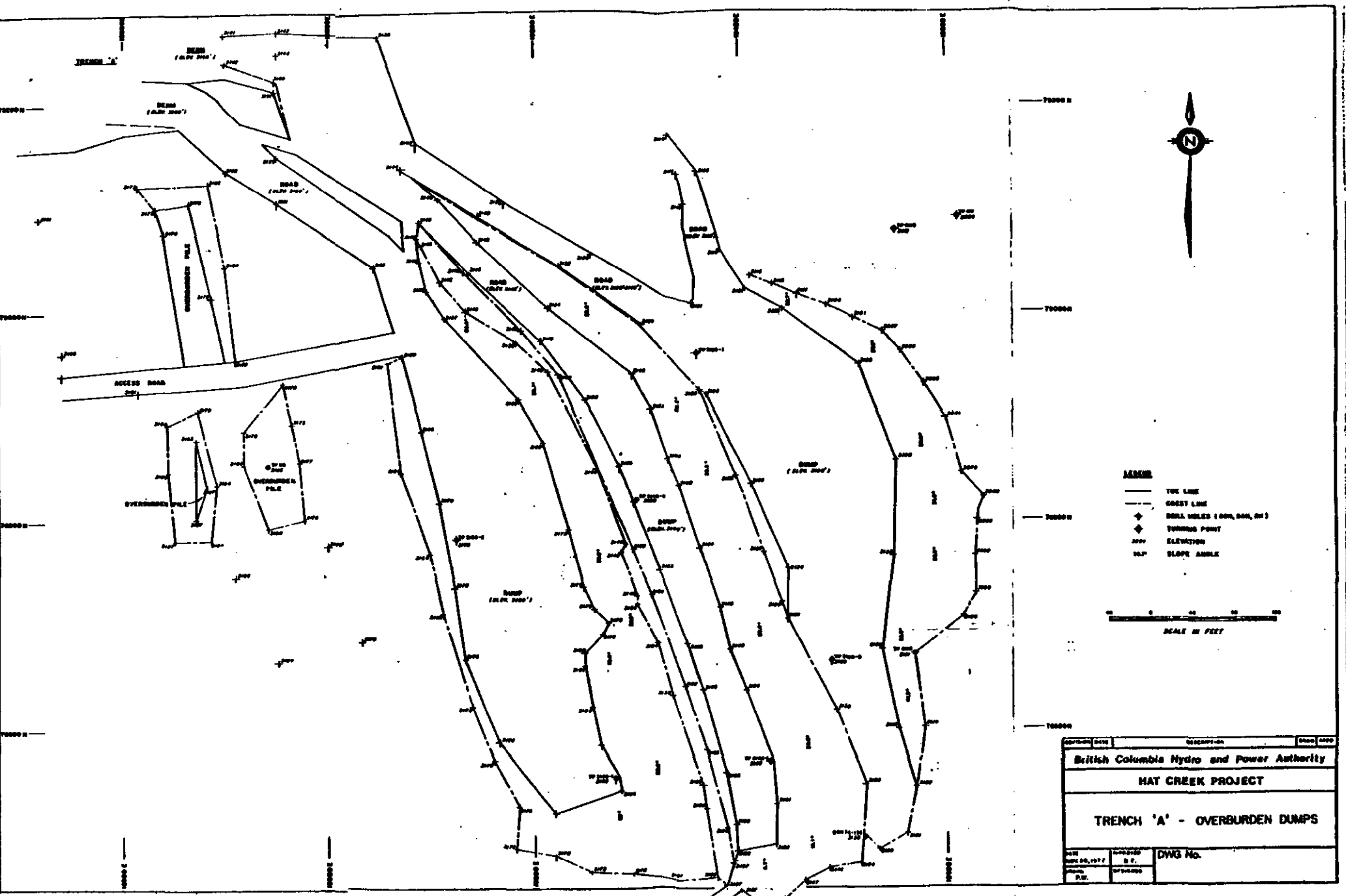
TABLE 1

NUTRIENT REQUIREMENTS AND FERTILIZER ADDED

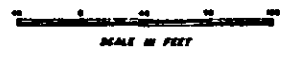
LOCATION	REQUIREMENTS			FERTILIZER ADDED	
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	HYDRO SEEDING	HARROW SEEDING
				LBS/ACRE	LBS/ACRE
<b>Waste Dump Trench B</b>					
- Major Dump-gravel	30	100	70	F 1 - 200	FA 16
- Subsoil Dump				F 11 - 50	FB 209
				F 111 - 100	FC 117
<b>Waste Dump Trench A</b>					
- 3160', carb shale	30	100	50	F 1 - 200	FA 16
				F 11 - 50	FB 209
				F 111 - 100	FC 85
- 3140', baked clay	30	60	0	F 1 - 150	
				F 11 - 50	
- 3120', gritstone	30	80	0	F 1 - 150	FA 27
				F 11 - 50	FB 167
					FC 108
<b>Coal Waste Trench A</b>					
- Faces	30	100	0	F 1 - 200	FA 16
				F 11 - 50	FB 209

F 1 : 11-55-0  
 F 11 : 16-20-0  
 F 111 : 0-0-60

FA: 45-0-0  
 FB: 11-48-0  
 FC: 0-0-60

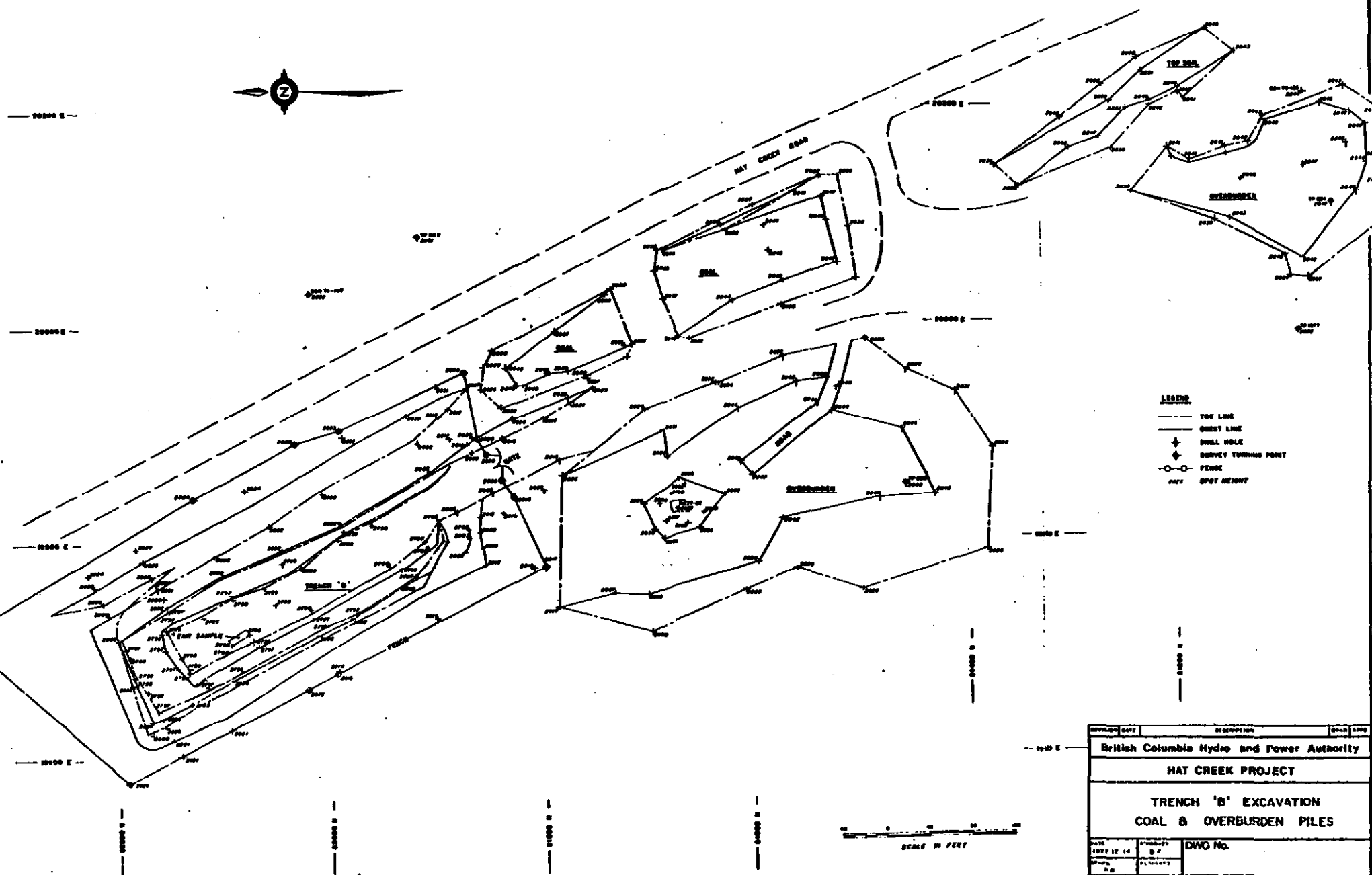


- LEGEND**
- TOE LINE
  - - - - CREST LINE
  - ◆ DRILL HOLES (100', 200', 300')
  - ◆ TURNING POINT
  - ▲ ELEVATION
  - 1:2 SLOPE ANGLE



DATE	APPROVED	DWG No.
MAY 24, 1977	D. F.	
BY	REVISED	

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY  
**HAT CREEK PROJECT**  
**TRENCH 'A' - OVERBURDEN DUMPS**



**LEGEND**

- TOP LINE
- - - - QUEST LINE
- ⊕ DRILL HOLE
- ⊕ SURVEY TURNING POINT
- FENCE
- SPOT HEIGHT

DATE	PROJECT	DWG No.
1977 12 14	B.C.	
British Columbia Hydro and Power Authority		
HAT CREEK PROJECT		
TRENCH 'B' EXCAVATION COAL & OVERBURDEN PILES		

