Tulameen Coal Project
Mining Cost Estimate Study
by

LORAM CONSTRUCTION LTD.

P81-5571 & 5573 810639

LORAM CONSTRUCTION LTD.

1100, 840 - 7th Avenue S. W.
CALGARY, ALBERTA
T2P 3J3

July 30, 1981

Cyprus Anvil Mining Corporation
300, 355 Burrard Street
Vancouver, B.C.
V6C 2G8

ATTENTION: Mr. T.J. Adamson
Sr. Geologist, Coal Projects

Dear Sirs:

RE: Tulameen Coal Project
Mining Cost Estimate Study

We have analyzed the cost of mining the Tulameen Coal Project and our report is transmitted herewith.

In accordance with the terms of reference, we have estimated the costs to mine using the equipment fleet and methods proposed by Wright Engineers.

We have also made our own assessment of the work. On that assessment, we have prepared a second estimate based on the methods and equipment which we would recommend.

We have treated the preparation of these estimates as we would a project up for competitive bid. In accordance with our normal practice, a highly qualified "senior estimator" (in this case, Mr. Gordon Glaholt, a professional Engineer with many years of related experience) was assigned as the estimate team "Captain". He in turn was assigned support staff to prepare quantity take-offs for each "work item". Specialists have provided current data on such items as labour rates and equipment costs. The work and work-sequence has been analyzed. Crew, equipment and production are attributed to each "work item". The costs are calculated and summarized by our computerized estimating program. During preparation, the estimate is reviewed several times:

. . . /2

- At an early stage by the Mining Division to approve criteria and methods.

- In early draft form by Division Management. A complete review.

- In semi-final form by Senior Company Management. A complete review and risk analysis.

- The final estimate proposal is reviewed by the Division Manager and the Chief Engineer.

Every effort has been made to make the two estimates directly comparable. In each case, wherever possible, we have used common criteria. In each case, we have referred to our corporate operating experience. We maintain current history on equipment operating costs, production rates, mechanical and operating availabilities and a broad range of other data. We calculate equipment haul cycles using a computerized haul cycle program which has been derived from our own actual operating experience. In the case of the "Wright" approach, we have accepted the production data as given.

The products in this report are detailed contractor's estimates for two distinctly different mining approaches.

Should the "Wright" approach be considered, we have included certain recommendations and comments which we felt were appropriate, based on our experience.

Similarly, we have commented on the "LORAM" approach.

We have also included certain general comments intended to be helpful.

Our assessment indicates that current economics favour the LORAM approach. Should project start-up be delayed, those conclusions should be reviewed at the time.

We very much appreciate the opportunity of preparing our report which, we hope, will be helpful to yourselves. We are available to review and discuss it further at your convenience.

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We would be pleased to demonstrate how quickly and easily our estimates can be revised or updated, either now or in the future.

We wish you the best of luck in the development of Tulameen and hope that we may be considered for further participation.

Yours very truly,

John W. Abernethy
Manager, Mining Division

JWA/mkk

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SECTION

Terms of Reference

1. TERMS OF REFERENCE

1. Prepare a cost estimate for the Tulameen open pit coal mine based on the mining method proposed by Wright Engineers Ltd., hereinafter referred to as Alternate A.

2. Prepare a second cost estimate (Alternate B) based on Alternate A design criteria and basic production parameters, using Loram Construction Ltd.'s proposed mining methods.

3. Submit a comparative analysis of the two methods, and recommendations.

Site Description

2. SITE DESCRIPTION

LOCATION:

The Tulameen Coal Basin is located at latitude 49° 30' North and longitude 120° 45' West in the South Western region of British Columbia, on the East flank of the Cascade Mountains. It is located South of the Tulameen River, between the settlements of Tulameen and Coalmont, about 170 kilometers East of Vancouver and 48 kilometers North of the U.S. border.

ACCESS:

The prospective Tulameen Coal Project Mine Site of Cyprus Anvil Mining Corporation is accessible from Coalmont by a good 11 kilometer gravel road, passing over a bridge on the Tulameen River. Coalmont is connected by paved roads to Princeton to the South and to Merritt on the North, both being larger population centres.

The elevation of the prospective mine site is around 1,300 meters, while the elevation of the town of Coalmont is at 750 meters above sea level.

A branch line of the Canadian Pacific Railway runs from Princeton through Coalmont and Tulameen to the main line at Spencer Bridge. The total rail distance from Coalmont to Vancouver is 420 kilometers.

CLIMATE:

The climate in the Tulameen Coal Basin area is continental type, that is relatively moderate. Temperatures average to daily highs of 30 degrees C and lows of 7 degrees C in mid summer, and to daily highs of -4 degrees C and lows of -12 degrees C in mid winter respectively. Temperatures of 40 degrees C and -40 degrees C are considered extreme.

The average annual precipitation is 500 mm of which 90% is in the form of snow. Rainfalls can be expected on about 60 days, and snowfalls on about 50 days.

Snowfalls can be expected from October through April. On the average, however, the snow pack is deepest in the months of March and April. The average snow depth for the month of April between 1960 and 1975 was 125 cm, the minimum being 74 cm and the maximum 193 cm. The snow usually stays on the ground through late May, the mid May snow depth averaging 41 cm. The worst case to date was observed in 1971, when 74 cm snow was measured on the ground on June 17th.

The growing season probably ranges from 125 to 150 days without any water deficit.

Alternate Mining Methods

3. ALTERNATE MINING METHODS

A. WRIGHT ENGINEERS LTD. METHOD

(Quoted from Wright Engineers Ltd. Report)

MINING EQUIPMENT

The selected method for both stripping and coal extraction in the initial open pit mine is the use of conventional scrapers, assisted by tractors for ripping and for push loading.

Among the various sizes of rippers, the D9H tractor is the most suitable on the basis of the manufacturers' specifications with a 9D single shank ripper.

Among the wheel tractor-scrapers, Model 631D is the most suitable in view of the following:

- It is compatible with the D9H tractor for push loading;
- It is versatile to carry coal waste or refuse, either from the pit or from stockpiles;
- It is large enough to handle the volume in a moderate size fleet, but it is small enough to move around in the pit.

Initially, the coal and the waste will be hauled downhill. As the pit will deepen, the 631D scrapers will be replaced by 637D models with identical load capacities, but with two engines to shorten round trip cycles.

Other major equipment include 12G graders as well as sander and water trucks for road maintenance.

Due to the relatively steep dip of the coal seam and to the configuration of the waste bands, it is expected that some sorting and removal of impurities could be done efficiently by the above rippers and scrapers.

On the basis of suitability to the given geological conditions and of economic performance, the ripping-scraping method compares favourably with dragline, bucket wheel, conveyor belt and other open pit mining methods.

ASSUMPTIONS AND DESIGN CRITERIA

Access ramp grade	10% maximum
Footwall slope	28 degrees to 45 degrees
Hanging wall slope	57 degrees maximum
Raw coal reserves	12,000,000 tonnes
Annual mining rate	816,330 tonnes
Annual plant feed rate	800,000 tonnes

Initial open pit life	14.7 years	
Working days per year:		
One year		365 days
Less 5-day week	104	
Less statutory holidays	12	
Less vacation	15	
Unscheduled allowance	3	
Total non-working days		134 days
Total working days		231 days

Shift utilization	81% - 6.5 operating hours
Shift efficiency	83% - 50 effective min/op.hour-daytime
	75% - 45 effective min/op.hour-nightime

Pit Volumes:	
Total pit volume	42,012,600m^3
Coal volume	7,317,100m^3
Waste volume	34,695,500m^3

LOAD FACTORS

Coal

The coal is expected to rip fairly fine and the scrapers should load easily. Using 90% of heaped capacity with a load factor of 0.74, each load of the 631D scraper is:

$$23.7 \times .9 \times .74 = 15.78 \text{ BCM}$$

Assume 15.5 BCM or 25.5 RMT per load.

Waste

The shale is foliated which may produce large pieces and the scraper may not be filled well. The swell factor of most rocks is about 60% resulting in a load factor of 62.5%. Each load of waste is then:

$$23.7 \times .85 \times .625 = 12.59 \text{ BCM}$$

Assume 13.0 BCM per load.

COARSE REFUSE HAULAGE

The annual tonnage of coarse refuse will consist of about 2% of the raw coal mined, that is 16,330 tonnes per year rejected at the braker station and of 32.3% of the wash plant feed, that is 258,400 tonnes rejected at the plant. The total annual coarse refuse to be hauled from the plant site by scrapers to the waste dump is:

Breaker reject:	16,330 tonnes
Plant reject:	258,400 tonnes
Total	274,730 tonnes

TOTAL SCRAPER REQUIREMENT

Year	Stripping	Coal	Refuse	Total	Fleet	Model
1	7.89	0.86	0.25	9.00	12	631D
2	7.96	0.79	0.25	9.00	12	631D
3	8.08	0.67	0.25	9.00	12	631D
4	7.86	0.89	0.25	9.00	12	631D
5	7.46	1.29	0.25	9.00	12	631D
6	10.55	1.21	0.24	12.00	16	637D
7	10.46	1.30	0.24	12.00	16	637D
8	10.39	1.37	0.24	12.00	16	637D
9	10.30	1.46	0.24	12.00	16	637D
10	10.19	1.57	0.24	12.00	16	637D
11	10.08	1.68	0.24	12.00	16	637D
12	9.98	1.78	0.24	12.00	16	637D
13	3.29	1.93	0.24	5.46	7	637D
14	1.52	2.00	0.24	3.76	5	637D
15	0.17	2.06	0.24	2.47	3	637D

RIPPER REQUIREMENTS

During the operation of the former Mullins pit in the area, the waste rock was ripped with a D-8 tractor. This suggests that the range of seismic wave velocities is between 5,000 and 6,000 feet per second and well within the ripping capacity of a D-9 tractor.

To establish the ripping requirements, the following assumptions are made:

Rip spacing:	1.00m	
Tip penetration:	0.50m	
Ripping distance:	100.00m	
Speed:	1.67 km/hr	= 26.7 m/minute
Cycle:	100/26.7	= 3.75 minutes
	Turning	0.25 minute
	Total	4.00 minutes
Cycle/hour:	60/4.0	= 15
Production/cycle:	100.0 x 1.0 x 0.5	= 50 BCM

Average daily production per ripper:

$$\frac{(2 \times 50)}{(4.0)} + \frac{(45)}{(4.0)} \times 6.5 \times 50 = 11{,}781 \text{ BCM}$$

Average annual waste haulage:	= 2,360,000 BCM
Average annual coal haulage:	497,760 BCM
Annual volume to be ripped:	2,857,760 BCM
Daily volume to be ripped:	12,370 BCM

Number of rippers required at 100% availability:

$$\frac{12{,}370}{11{,}781} = 1.05$$

Number of rippers required at 75% availability:

$1.05/0.75 = 1.4$

Required number in fleet: 2 rippers

PUSHER REQUIREMENTS

The capacity of the self-loading 631D scrapers can be increased by as much as 10% with the use of pushers, that is D9 dozers equipped with cushion blades. Usually a pusher can handle several scrapers and when not pushing, it can be used for cut maintenance as well as for other jobs.

A pusher's cycle time is assumed to be as follows:

Boost time	0.10 minute
Return time	0.98 minute
Maneuvre time	0.15 minute
Total	1.23 minute

Pushers required for coal scrapers in years 1 to 5:

Longest cycle time	8.76 minutes
Number of scrapers handled by one pusher	8.76/1.23 = 7.12
Actual number of scrapers to be pushed	two
Number of pushers required	one

Pushers required for stripping scrapers in years 1 to 5:

Longest cycle time	9.92 minutes
Number of scrapers handled by one pusher	9.92/1.23 = 8.06
Actual number of scrapers to be pushed	nine
Number of pushers required	two

In year 6 the 631D scrapers will be replaced by 637D scrapers which will push each other during loading, thus eliminating the need for extra pushers.

ADDITIONAL EQUIPMENT REQUIREMENTS

In view of the project economics, the haulage of clean coal from the plant site to the railroad in Coalmont should be contracted out, at least initially. For the maintenance of the haulage road, however, a grader is required. Another grader will be required for the roads around the pit, plant site and waste dump. It is expected that Caterpillar Model 12G will be sufficient in both areas.

The rest of the equipment should include water and sanding trucks, a service truck to serve the D9 equipment in the pit and at the dump, a small mobile crane to facilitate on site maintenance work and repair, a van to carry D9 operators to their place of work, ten pick-ups for supervisory personnel and an ambulance. Finally, a model 988B wheel loader is selected for train loading and to provide miscellaneous services in the plant area in between train shipments.

3.B ALTERNATE MINING METHODS OF LORAM CONSTRUCTION LTD.

B. LORAM CONSTRUCTION LTD.

1. MINING EQUIPMENT

A 14 m^3 clam bucket hydraulic shovel assisted by a D9L dozer and ripper has been selected for open pit stripping, with 85T end dumps hauling to waste.

Questions this match.

To facilitate excavation of the shale and sandstone waste rock, each bench has been drilled and shot, using 300 mm diameter rotary drilled holes and a 0.5 kg/m^3 powder factor.

Hole Diam. quite large. Powder factor high for this type rock.

Coal is excavated with a 992C loader with the assistance of a D9L "S" dozer and ripper.

70 T Belly dumps haul the coal to the plant. This operation is done on a single day shift basis to ensure that maximum efficiency will be achieved in sorting and removing impurities.

A 966C front end loader will tram coal from dead storage to the plant feed conveyor on the third shift. Sufficient live storage is available to feed the plant on the second shift. During the day it will be available for plant maintenance.

The 992C loader will also be used as back-up for the 14 m^3 shovel.

A D9L dozer and ripper will be used on the waste dump, and will provide back-up for the production dozers.

Reject coal will be hauled from the plant to the waste dump by a 12 cy. tandem end dump on a 3 shift/day basis. This unit is loaded directly from the plant 150 T surge bin.

Pit maintenance and access road maintenance will be handled by 14G graders, as well as water/sanding trucks and calcium spreaders.

Coal train loading will be done with a 988B front end loader. This unit will stay at the rail site to avoid the costs and traffic hazard to travel between the plant site and the rail siding.

2. ASSUMPTIONS AND DESIGN CRITERIA

Access ramp grade	10% maximum
Footwall slope	28 degrees to 45 degrees
Hanging wall slope	57 degrees maximum
Raw coal reserves	12,000,000 tonnes
Annual mining rate	816,330 tonnes
Annual plant feed rate	800,000 tonnes

Initial open pit life		14.7 years
Working days per year:		
One year		365 days
Less 5-day week	104	
Less statutory holidays	12	
Less vacation	15	
Unscheduled allowance	3	
Total non-working days		134 days
Total working days		231 days

3. SCHEDULING

1. Complete projected mining within 15 years. However, select equipment to allow for a completion within 12 years. (This will depend on the requirements of the coal purchases).

2. Work 231 days/year (per Wright Engineering Schedule), 5 day week, 3 shifts per day (Plant Operation).

4. UNION

1. Cyprus Anvil have not decided to go union or non-union, but have directed that the same rates and conditions in effect at the Similkameen mine be used.

2. The Similkameen Division of Newmont Mines Limited have an agreement with CAIMAW. (Canadian Association of Industrial Mechanical and Allied Workers Local 22).

5. OPERATING TIME

a) Shift time 8 hours

	Lost Time (Min.)	480 minutes
Switch over	10.0	
Lunch	35.0	
Switch over	10.0	
Misc. lost time	15.0	70 minutes
Net labour operating time		410 minutes

b) Allow a mechanical availability with back-up, on a 3 shift/day schedule, of 80% = 328 minutes.

(41.0 minutes operating hour)

6. EQUIPMENT LIFE/SALVAGE

a) Allow 25% salvage across the board.

b) Life expectancy major units:

Diesel Haul Units	25,000 hours
Hydraulic Shovel	20,000 hours
Rotary Drill	20,000 hours

7. HAUL CRITERIA

a) Slope: 10% maximum.

b) Haul Road Widths:

- 2-way Travel Surface - 16 M
- Total overall width - 19 M (allows for O/S berm)

c) Rolling Resistance/Speed

1) Rolling Resistance = Maintained Haul Road = 3%
Waste Dump Road = 4%
Pit Bench = 4%
Loading Area (100M) = 6%
Dumping Area (100M) = 6%

2) Maximum speed in curves = 20 kph or other speed restrictions

d) Minimum radius of curvature: 30 M

8. MATERIAL DATA

Material	LB/BCY	Load Factor	LB/LCY	Swell/Shrink Factor	LB/ECY
Topsoil	2600	0.80	2080	1.00	2600
Overburden	3200	0.85	2720	1.00	3200
Shale	3000	0.70	2100	1.05	2857
Sandstone	4200	0.60	2520	1.35	3111
Coal	2764	0.74	2045	1.32	2094
Washed Coal	1850	0.76	1406	1.00	1850

9. PRODUCTION RATES /CRITERIA

a) Excavating:

Excavator	Shift Hour Production	
	Waste	Coal
14 M^3 Hyd. Shovel	522.4 BM^3	
992C 12 cy. F.E.L.	516.4 BM^3	523.8 RMT
988B F.E.L. (Coal Bucket)		(washed coal) 550 RMT
966C F.E.L. (100 M Tram)		180.0 RMT

b) Haul Units:

Unit	CAPACITY BM^3		
	Waste		Coal
	Shovel LDG	F.E.L. LDG	F.E.L. LDG
70T B.D.			34.78
85T E.D.	33.2 30-1-ridal	32.7	

c) Drilling:

(Rotary Drill)

7.6 M x 7.6 M pattern

2.1 M sub drill

30 cm Dia. hole

18 M/shift hour

10 meter bench

d) Shooting:

PF = 0.5 kg/BM^3

double line 10% of the holes

use 90% ANFO

e) Rip all the coal, and 10% of the waste material.

TOTAL DISTANCE = 4206. METERS

DATE 07/27/81

TRAVELLING TIME = 7.94 MINUTES → ON NEXT PAGE

LOAD TIME = 3.00 MINUTES

SPOT TIME = 0.21 MINUTES

DUMP TIME = 0.50 MINUTES

WAIT TIME = 0.22 MINUTES

TOTAL CYCLE = 11.87 MINUTES

THE AVERAGE SPEED IS 31.8 KM PER HR

THE AVERAGE CYCLE SPEED IS 21.2 KM PER HR

MATERIAL DENSITY IS 2017.18 KG/CUBIC METER

MACHINE LOAD IS 30.1 BCM → WHY NOT 33.2 OR 32.7 BCM.

ONE CAT TRUCK 777 PRODUCES 103.9 BCM PER 41 MINUTE HOUR

LOADER

LOADING UNIT 13.25 HYDSH

BCM PER PASS 0.

PASS CYCLE 0.

PASSES PER LOAD 0.

PRODUCTION 384. BCM

THE NUMBER OF TRUCKS NEEDED ARE 3.70

$\frac{41}{11.87} \times 33.2 = 114.7$

$\frac{384}{114.7} = 3.35$

OR

$\frac{41}{11.87} \times 32.7 = 112.9$

$\frac{384}{112.9} = 3.40$

10. TYPICAL HAUL CYCLE

a) Waste Haul

HAULLING UNIT - CAT TRUCK 777 | KILOWATTS 649. | TARE WT(KGS) 56382. | PAYLOAD(KGS) 80694. | DATE 07/27/81

LOADED PORTION OF CYCLE - C3 TO D4 RTE 9 2967230 BCM

SEGMENT	DISTANCE	ROLLING RESIST	GRADE RESIST	TOTAL RESIST	EFF.	MAXIMUM VELOCITY	SPEED FACTOR	CALC AVG VEL	USED AVG VEL	LAST VEL	TIME
1	100.00	6	0.	6.0	2	26.33	0.45	11.85	11.85	18.37	0.51
2	50.00	4	2.0	6.0	2	26.33	0.48	20.28	20.28	22.19	0.15
3	300.00	3	10.0	13.0	2	12.97	1.01	13.08	13.08	12.97	1.38
4	1155.00	3	-2.5	0.5	2	53.10	0.98	32.63	32.63	52.29	2.12
5	398.00	4	-2.5	1.5	2	53.10	0.87	52.64	52.64	52.99	0.45
6	100.00	6	0.	6.0	2	26.33	1.08	28.44	14.22	0.	0.42
TOTALS	2103.										5.03

EMPTY PORTION OF CYCLE -

SEGMENT	DISTANCE	ROLLING RESIST	GRADE RESIST	TOTAL RESIST	EFF.	MAXIMUM VELOCITY	SPEED FACTOR	CALC AVG VEL	USED AVG VEL	LAST VEL	TIME
1	100.00	6	0.	6.0	2	50.65	0.45	22.79	22.79	35.33	0.26
2	398.00	4	2.5	6.5	2	49.42	0.87	41.46	41.46	47.59	0.58
3	1155.00	3	2.5	5.5	2	51.67	0.98	49.59	49.59	51.59	1.40
4	300.00	3	-10.0	-7.0	2	59.76	0.80	54.86	54.86	58.12	0.33
5	50.00	4	-2.0	2.0	2	53.10	0.47	25.14	25.14	55.74	0.12
6	100.00	6	0.	6.0	2	50.65	1.02	51.54	25.77	0.	0.23
TOTALS	2103.										2.92

TOTAL DISTANCE = 5085. METERS

DATE 07/27/81

TRAVELLING TIME = 15.80 MINUTES ON NEXT PAGE

LOAD TIME = 4.50 MINUTES

SPOT TIME = 0.21 MINUTES

DUMP TIME = 0.50 MINUTES

WAIT TIME = 0.22 MINUTES

TOTAL CYCLE = 21.23 MINUTES

THE AVERAGE SPEED IS 19.3 KM PER HR

THE AVERAGE CYCLE SPEED IS 14.4 KM PER HR

MATERIAL DENSITY IS 1639.85 KG/CUBIC METER

MACHINE LOAD IS 36.7 BCM

ONE CAT 768C 70T BD PRODUCES 70.9 BCM PER 41 MINUTE HOUR

$\frac{41}{21.23} \times 36.7 = 70.9$

$\frac{269}{70.9} = 3.8$

WHY NOT VS

34.78 BCM.

$\frac{41}{21.23} \times 34.8 = 67.2$

$\frac{269}{67.2} = 4.0$

LOADER

LOADING UNIT 992C

BCM PER PASS 0.

PASS CYCLE 0.

PASSES PER LOAD 0.

PRODUCTION 269.

THE NUMBER OF TRUCKS NEEDED ARE 3.80

10. TYPICAL HAUL CYCLE

b) Coal Haul

HAULLING UNIT - CAT 768C (UT BD KILOWATTS 336. TARE WT(KGS) 47066. PAYLOAD(KGS) 60700. DATE 07/27/81

LOADED PORTION OF CYCLE - COAL YRS 6 TO 10 2550371 BCM

SEGMENT	DISTANCE	ROLLING RESIST	GRADE RESIST	TOTAL RESIST	EFF.	MAXIMUM VELOCITY	SPEED FACTOR	CALC AVG VEL	USED AVG VEL	LAST VEL	TIME
1	100.00	6	0.	6.0	2	14.91	0.37	5.52	5.52	8.99	1.09
2	200.00	4	0.	4.0	2	23.33	0.70	14.01	14.01	19.03	0.86
3	600.00	3	10.0	13.0	2	6.79	1.01	6.85	6.85	6.79	5.26
4	1301.00	3	0.	3.0	2	28.64	0.92	16.84	16.84	26.90	4.63
5	100.00	3	0.	3.0	2	28.64	0.56	27.39	25.76	24.13	0.23
TOTALS	2301.										12.07

15.80

EMPTY PORTION OF CYCLE -

SEGMENT	DISTANCE	ROLLING RESIST	GRADE RESIST	TOTAL RESIST	EFF.	MAXIMUM VELOCITY	SPEED FACTOR	CALC AVG VEL	USED AVG VEL	LAST VEL	TIME
1	50.00	3	0.	3.0	2	66.49	0.45	29.92	24.13	24.13	0.12
2	1834.00	3	0.	3.0	2	66.49	0.97	44.68	44.68	64.36	2.46
3	600.00	3	-10.0	-7.0	2	64.36	0.92	64.36	64.36	64.36	0.56
4	200.00	4	0.	4.0	2	50.31	1.11	55.77	55.77	50.31	0.22
5	100.00	6	0.	6.0	2	34.83	1.19	41.38	16.09	0.	0.37
TOTALS	2784.										3.73

To J. F. Olk

Copy to

From A. H. von Kursell

Date 2 September 1981

Subject Tulameen Coal - Wright Engineers Ltd's Report

The following are my concerns listed in point form.

1. Number of scrapers - could we not reduce the number required if we do maintenance on weekends?

2. Loader - one 988B is not enough. One loader unit is required around the plant and as back-up.

3. Service vehicle - not enough money.

4. Tyre manipulator not included. - 100,000

5. Graders - 2 14G required.

6. Manpower:

   a. Operators listed are inconsistent with pieces of equipment scheduled.

   b. Shop - too many labourers.

      Shop mechanics - 5 scheduled. Does this include welders, pipefitters, machinists, carpenters, and tyreman? If so, 5 insufficient.

7. Operating costs:

   Scrapers - estimated life per tyre 1500 - 1800 hours.
   Cost $5000 for a 33.25 x 35 tyre.
   Cost per tyre hour $\frac{5000}{1500} = \$3.33$

   or $\frac{5000}{1800} = \$2.78$

   For a 631 scraper tyre costs will range from $11.12/ machine hour to $13.32/machine hour.

   Estimated tyre cost for a 637 scraper will be 20 per cent to 25 per cent higher.

   Above costs apply to standard size tyres only.

8. Estimated equipment life too short.

9. Grader operating costs are light.

10. Bulldozer costs appear to be light. I would anticipate that ripper-bits will have a relatively short life.

11. Overhead - G and A appears to be some $300,000/400,000 low.

12. I have some concern over estimated ripability of material at lower elevations, but above the point where we change equipment.

13. We should look at work scheduling which could reduce initial equipment purchase.

14. Blasting - should we allow for some drill and blast equipment to (a) break boulders too large to handle, and (b) enable us to loosen sections of ground too hard to rip?

15. Unions - I suggest we go non-union and have an incentive or profit sharing plan. This will give us greater flexibility and higher productivity.

16. Other concerns are not major dollar items and need not be mentioned now.

A. H. von Kursell

AHvK:MW

4. SUPPORT FACILITIES

A. WRIGHT ENGINEERS LTD.

A.1 ANCILLARY SERVICES BUILDING

The Ancillary Services Building will be located adjacent to the Wash Plant and will comprise a maintenance and repair shop, a warehouse, a dry and various administrative offices.

The shops will consist of:

- a drive through lubrication bay to handle the regular shift servicing and the scheduled service inspections of the scrapers and of other mobile equipment;

- one drive through repair bay for scrapers, with tire change and other miscellaneous repair equipment;

- a drive through tractor repair bay with rails cast in the floor, providing repair facilities for bulldozers, graders, wheel loaders and other ancillary equipment;

- a bay for welding and repair of both mining and plant equipment;

- a small machine shop and electrical shop;

- one smaller bay for servicing and repair of service trucks and pick-ups;

- separate areas allocated for lube storage, compressors, tool crib, electric distribution room, wash rooms and others.

The main bays will be serviced by an overhead crane.

An equipment wash pad will be located near the shops.

A component replacement maintenance system is recommended and the shops, as well as the warehouses should be furnished accordingly. Component overhaul work should be sent out to larger population centres equipped to handle that highly skilled type of work.

The dry facilities are designed to have separate clean and dirty clothes sections, complete with showers and washrooms. Within those sections, separate areas are provided for staff and for women.

The operations and administration offices are arranged to provide assembly areas for work assignments, as crews pass through from the dry to the shops, the plant and to the mine areas.

A.2 ELECTRIC POWER SUPPLY AND DISTRIBUTION

Power Supply

Two alternatives can be considered for the supply of electric power: on-site diesel generation and public utility.

The on-site diesel generation system would consist of four 400 kW, 600 volt, 3 phase, 60 Hz generators connected to a common bus and equipped for manual synchronizing. Each generator would be rated at 400 kW continuous and 550 kW standby power. Normally, three sets would be in operation, carrying an estimated load of 1,200 kW, while the fourth set would be available for maintenance and overhaul. In the event that one set would go down while another is being overhauled, the remaining two sets would operate at their standby rating of 1,100 kW total. Thus, security of power supply would be maintained.

As an alternative, West Kootenay Power and Light have the capacity at Princeton to supply the required load, although their present distribution line to Coalmont is inadequate, being 7,200 volt, single phase. In order to provide the required power, that line would have to be rebuilt to three phases at a higher voltage level. In addition, a suitable switchgear and transformation will have to be installed at Princeton. To date, the new transmission voltage has not yet been determined. For cost comparison purposes, it is assumed

that 60 kV would be selected. Accordingly, the substation at the mine site would consist of 60 kV incoming switchgear and a 1,500 KVA, 60-0.6 kV transformer.

Examining the costs of the two alternatives, it is found that the lower capital cost of a diesel installation is offset by its relatively high operating cost:

		Diesel	Utility
Depreciation	/RMT	$0.05	$0.18
Operating Cost	/RMT	$0.97	$0.21
Overall Cost	/RMT	$1.02	$0.39

The above diesel operating cost is based on the current diesel fuel cost at $0.38 per litre ($1.75 per Imperial gallon) which will escalate in line with the planned increases in the cost of crude oil.

It is recommended, therefore, that the public utility power supply should be developed.

A.3 POWER DESCRIPTION

The power distribution is designed to be the same, regardless which power supply will be developed. 600 volt power from either the diesel plant or from the substation will be fed to a 600 volt switchboard. Individual circuit breakers will feed

the Breaker Station, Wash Plant, Water Supply System, Ancillary Services Building and the Mine Dewatering System.

All feed circuits will be buried cables, with the exception of the Water supply System's circuit which will be a 4,160 volt overhead line, complete with a step-up transformer, as well as individual step-down transformers at the pumps.

A.4 PROCESS WATER SUPPLY

The process water from the tailings pond will be pumped through a 400 mm diameter pipe line to a 760 m^3 (200,000 U.S. gallons) storage tank. This tank capacity will be sufficient to provide an hour's supply of process water or fire fighting water.

Process water usage will be approximately 180 litre per second (2,850 U.S. gpm) at 400 to 500 kPa (60 to 80 psi) pressure.

Water lost in the process as moisture and by seepage or evaporation will be made up by water obtained from pit dewatering.

A.5 POTABLE WATER SUPPLY

The pit dewatering system will feed a 34 m^3 (9,000 U.S. gallons) potable water storage tank. This tank capacity will correspond to two days normal supply to the plant site.

The potable water will be disinfected with liquid hypochlorite and distributed through a 75 mm diameter mild steel pipe line.

A.6 SEWAGE DISPOSAL

Sewage from the plant and offices will be collected in a system of 100 mm diameter concrete lined ductile iron sewers and treated in a prefabricated package sewage treatment plant discharging to a small drainage field.

A.7 PIT DEWATERING

The pit will be dewatered by a system of ten 200 mm diameter boreholes. Each borehole will be furnished with a 14 kW submersible pump discharging into a 100 mm steel pipe line feeding the process water tank. At spring time, overpumping will be required to provide for the excessive evaporation losses of the summer months.

Should water from pit dewatering prove insufficient at any time, it may be necessary to drill additional wells in an adjacent aquifer.

A.8 ACCESS ROAD

Access to the site from Coalmont at present is via an existing road on the west side of Granite Creek. It can be improved to

a 6.1m (20 ft) wide gravel road with 1.5m (5 ft) wide shoulders and having a maximum gradient of 10%.

Consideration was given to an alternate access road route via Fraser Gulch. Although the route is slightly shorter and transportation costs would be less than on the Granite Creek road, it would require a substantially greater initial capital expenditure for its construction.

Immediately west of Coalmont the Tulameen River is crossed by a public bridge which was constructed in 1922 consisting of untreated timber on concrete abutments. It is currently subject to a road restriction of 11,000 kgm (90,000 lbs) which effectively bars trucks with 18 tonne (20 ton) payloads. It is proposed to install a new heavy-duty bridge across the Tulameen River and an allowance has been made for it in the capital costs. It is possible, however, that it would be paid for by the B.C. Department of Highways.

4.B SUPPORT FACILITIES OF LORAM CONSTRUCTION LTD.

B. LORAM CONSTRUCTION LTD.

The same shop/warehouse/office facilities outlined in Alternate A were used and costed, except for the following changes in the shop area:

1. Overhead service bay doors were increased in size to accommodate the larger equipment.

2. Service bays widths were increased by 1 meter.

3. Floor to ceiling clearance was increased by 1 meter.

B.1 FUEL STORAGE

Fuel storage and lube faciities were included in both estimates.

Cost Estimate Items

5. COST ESTIMATE ITEMS

ITEM	DESCRIPTION	REMARKS
1	Clearing	By Owner
2.	Grubbing	By Owner
3.	Access Road	By Owner
4.	Service Facilities	Note!
5.	Excavate, Stockpile Topsoil	
6.	Rip, Strip, Haul, Waste, Year 1 (R, S, H, Waste)	
7.	R, S, H, Waste, Year 2	
8.	R, S, H, Waste, Year 3	
9.	R, S, H, Waste, Year 4	
10.	R, S, H, Waste, Year 5	
11.	R, S, H, Waste, Year 6	
12.	R, S, H, Waste, Year 7	
13.	R, S, H, Waste, Year 8	
14.	R, S, H, Waste, Year 9	
15.	R, S, H, Waste, Year 10	
16.	R, S, H, Waste, Year 11	
17.	R, S, H, Waste, Year 12	
18.	R, S, H, Waste, Year 13	
19.	R, S, H, Waste, Year 14	
20.	R, S, H, Waste, Year 15	

21	Rip, Load, Haul, Coal, Year 1-5 (R, L, H, Coal)	
22	R, L, H, Coal, Year 6 - 12	
23	R, L, H, Coal, Year 13	
24	R, L, H, Coal, Year 14	
25	R, L, H, Coal, Year 15	
26	Load, Haul, Waste, Coal to Dump Site	Note
27	Coalmont Access Road Maintenance	Note
28	Pit Dewatering and Maintenance	
29	Pit Reclamation	Not in Terms of Reference for Costing
30	Tailings Pond Dyke	Not in Terms of Reference for Costing
31	Pit Lighting	Assumed Overhead Lighting & Pole Line By Others
32	Equipment Purchase and Salvage	
33	Mobilization	Included in Fixed General Expense
34	Train Loading and Plant Maintenance	
35	Fuel Facilities	Note
7001-7600	Fixed General Expense	Note
8001-9999	Variable General Expense	Note

Cost Estimate &
Back-Up

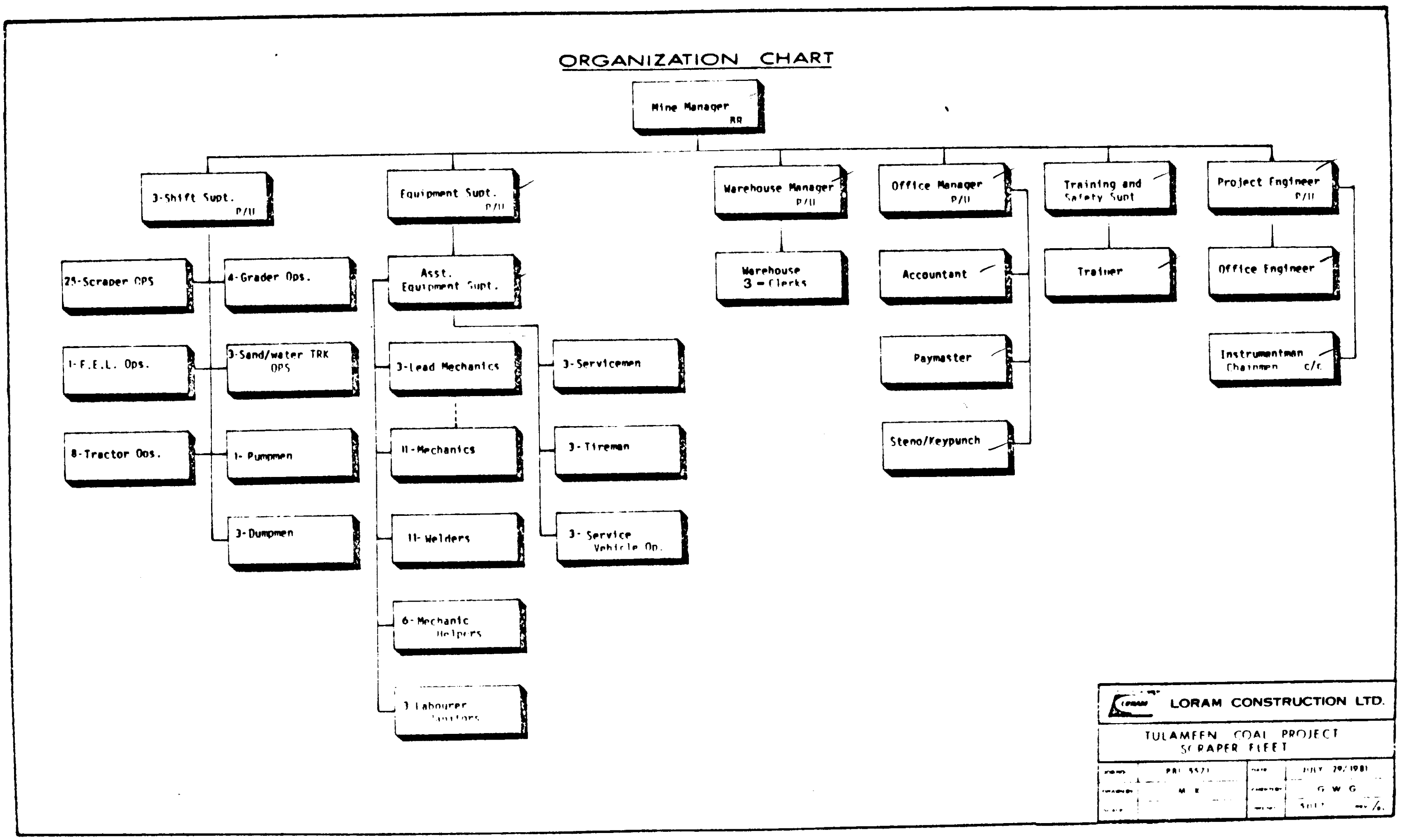
ESTIMATE COMPARISON SUMMARY

Note: Repair labor

Description	Wright Enginering Ltd. Scraper Alternate	Loram Construction Ltd. Truck-Shovel Alternate
1. Total Direct Cost	$ 81,738,085	$ 78,730,264
2. Equipment Purchase (Less Salvage)	~~39,422,964~~ 36,042,825	~~26,545,857~~ 23,681,100
3. Interest	~~19,703,411~~ 18,749,972	~~12,945,668~~ 12,286,200.
4. Mobilization	370,123	188,220
5. Project Overhead	41,646,331	36,771,366
SUB TOTAL	~~182,880,914~~ 178,244,336	~~155,181,375~~ 151,657,150.
Contractor's Fee Firm Price Contract (@ 20% of Cost, Not Including Interest)	~~32,635,501~~ 31,898,873	~~28,447,141~~ 27,874,190
TOTAL	~~215,516,415~~ 210,143,208	~~183,628,516~~ 179,531,340
DIFFERENCE	~~(31,887,899)~~ 30,611,868.	

* Contractor's fee may vary depending on form and term of contract - refer to Section 8.

6.A COST ESTIMATE AND BACK-UP OF WRIGHT ENGINEERS LTD. (SCRAPER ALTERNATIVE)


ORGANIZATION CHART
Mine Manager RR
3-Shift Supt. P/U
Equipment Supt. P/U
Warehouse Manager P/U
Office Manager P/U
Training and Safety Supt
Project Engineer P/U
25-Scraper OPS
4-Grader Ops.
1-F.E.L. Ops.
3-Sand/water TRK OPS
8-Tractor Ops.
1- Pumpmen
3-Dumpmen
Asst. Equipment Supt.
3-Lead Mechanics
11-Mechanics
11-Welders
6-Mechanic Helpers
3-Servicemen
3-Tireman
3-Service Vehicle Op.
Warehouse 3 - Clerks
Accountant
Paymaster
Steno/Keypunch
Trainer
Office Engineer
Instrumentman Chainmen c/c
LORAM CONSTRUCTION LTD.
TULAMEEN COAL PROJECT
SCRAPER FLEET
JULY 29/1981
M K
G W G

EE-3A(Rev 1/80)

ESTIMATE BASED ON:- TULAMEEN COAL PROJECT

JOB PLAN AND PROGRESS SCHEDULE

LORAM

DATE: JULY 29/1981

PROJECT: SCRAPER FLEET PROJECT NO: P81-5571 PREPARED BY: G.W.G CHECKED BY: REVISION: 0

CODE NO	ITEM	QUANTITY
	SUBMIT COST ESTIMATES	
	OWNER FINALIZES MARKET	
	SUBCONTRACTS (Not included in Estimates)	
	CLEARING & GRUBBING	BY OTHERS
	SITE WORK INCL TAILINGS POND	
	POWER LINE	
	RAILWAY SIDING	
	ACCESS ROAD/BRIDGE IMPROVEMENT	
	DEEP WELL DEWATERING	
	COAL PLANT	
	PLANT AREA UTILITIES	
	MINING MOBILIZATION	
	SHOP/OFFICE FACILITIES	
	EQUIPMENT MOBILIZATION	
	STOCKPILE TOPSOIL	200 000 Bm^3
	MINING	
	STRIPPING REMOVAL	34 700 000 Bm^3
	COAL EXCAVATION	12 000 000 RMT
	COAL TRAIN LOADING	8 120 000 RMT
	ACCESS ROAD MAINTENANCE	12 km
	DEMOBILIZATION (Not included in Estimates)	
	SITE RECLAMATION	
	DEMOB MINING EQUIPMT	

YR 1981 | 1982 | 1983 | YEAR | 1998

J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D 84 85 86 87 88 89 90 91 92 93 94 95 96 97 J F M A M J J A S O N D

Why only 2 months with Wrights. vs 9 months

EQUIPMENT PURCHASE PAYMENT SCHEDULE

TULAMEEN OPEN PIT MINE COST STUDY

SCRAPER ALTERNATE

NOTE: CALCULATIONS BASED ON 4 YEAR NOTES AT 18% INTEREST (29.375 COST/$1,000/MONTH)
(PURCHASE PRICE INCLUDES 6% P.S.T.)

Year of Purchase	Annual Purchase		Total Payment		Annual Payments				Total Annual Payments
	Purchase	Monthly Payment	Gross	(Interest)	1st Year	2nd Year	3rd Year	4th Year	
1st YEAR	9,684,700	284,488	13,655,427	3,970,727	3,413,857				3,413,857
2nd YEAR	-	-	-	-	-	3,413,857			3,413,857
3rd YEAR	4,723,400	138,750	6,659,994	1,936,594	1,664,999	-	3,413,857		5,078,856
4th YEAR	1,494,900	43,913	2,107,809	612,909	526,952	1,664,999	-	3,413,857	5,065,808
5th YEAR	536,900	15,771	757,029	220,129	189,257	526,952	1,664,999	-	2,381,208
6th YEAR	10,100,500	296,702	14,241,705	4,142,205	3,560,426	189,257	526,953	1,664,999	5,941,635
7th YEAR	573,300	16,841	808,353	235,053	202,089	3,560,426	189,257	526,953	4,478,725
8th YEAR	601,700	17,675	848,397	246,697	212,100	202,089	3,560,426	189,257	4,163,872
9th YEAR	9,902,300	290,880	13,962,243	4,059,943	3,490,561	212,099	202,089	3,560,427	7,465,176
10th YEAR	573,300	16,841	808,353	235,053	202,089	3,490,561	212,099	202,089	4,106,838
11th YEAR	716,100	21,035	1,009,701	293,601	252,426	202,089	3,490,561	212,099	4,157,175
12th YEAR	1,002,300	29,443	1,413,243	410,943	353,311	252,425	202,089	3,490,560	4,298,385
13th YEAR	7,182,900	210,948	10,127,889	2,944,989	2,531,972	353,311	252,425	202,089	3,339,797
14th YEAR	964,800	28,341	1,360,368	395,568	340,092	2,531,972	353,311	252,425	3,477,800
15th YEAR						340,092	2,531,972	353,310	3,225,374
16th YEAR							340,092	2,531,972	2,872,064
17th YEAR								340,092	340,092
18th YEAR									
				18,749,972					
TOTAL	48,057,100		67,760,511	19,703,411					67,760,511

5,605,808

3968
3363
5016
5535
2358
5866
4413
4102
7355
4046
4096
4235
3299
3422
3178
2890
335

66,807,000

67,760,511 - 0.25(48,057,100) = 55,746,236

May 1983

EQUIPMENT PURCHASE SCHEDULE - SCRAPER ALTERNATIVE

EQUIPMENT AT 1981 R.V. PLUS 6% P.S.T.

Why fewer costs

Note replacement.

Description	Life	Total Project Hours	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6		Year 7		Year 8		Year 9		Year 10		Year 11		Year 12		Year 13		Year 14		Year 15		TOTAL	
			No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value
631D Scraper	9,000	188,019	12	5658.5			9	4243.9																									23	9902.4
D9L C Dozer c/w Pusher	12,000	40,721	2	921.7					2	921.7																							4	1843.4
D9L C Dozer c/w Ripper	10,000	56,536	1	479.5			1	479.5					1	479.5					1	479.5					1	479.6			1	479.5			6	2877.0
D9L S Dozer c/w Ripper	10,000	56,536	1	485.4					1	485.4					1	485.4					1	485.4			1	485.3			1	485.3			6	2912.4
988B F.E.L.	12,000	26,789	1	375.5													1	375.5															2	751.0
12G Grader	13,500	83,178	2	369.6							2	369.6											2	396.6									6	1106.8
15 CY Sander	15,000	33,257	1	37.5									1	37.5											1	37.5							3	112.5
4000 Gal. Water Tank	15,000	33,257	1	13.9									1	14.0									1	14.0									3	41.9
12 CY E.D. Truck	15,000	33,257	1	64.0									1	63.9									1	64.0									3	191.9
Lube Station	7.5 yr	62,369	1	46.6													1	46.7															2	93.3
Serv./Lub Truck	15,000	62,369	1	167.3							1	167.3							1	167.3							1	167.2					4	669.1
Lunch Trailer	15 yr.	-	2	26.8																													2	26.8
1 1/4 CY Hyd. B.H.	10,000	9,384	1	212.9																													1	212.9
Steam Cleaner	7.5 yr	20,736	1	9.2													1	9.2															2	18.4
Shop Compressor	7.5 yr	-	1	14.8															1	14.8													2	29.6
22 T R.T. Crane	20,000	10,398	1	181.4																													1	181.4
D 400A Welder	7.5 yr	42,393	2	15.7													2	15.7															4	31.4
E 300A Welder	7.5 yr	42,393	2	3.3															1	3.4													4	6.7
3 T Mech. Truck	5.0 yr	21,197	1	104.5									1	104.5									1	104.5									3	313.5
Tire Truck	15,000	21,197	1	50.9													1	50.9															2	101.8
Mech's Pick Up	5.0 yr	21,197	1	24.1									1	24.1									1	24.1									3	72.3
Call Spreader	7.5 yr	-	1	4.8													1	4.7															2	8.5
6 kw Light Tower	5.0 yr	-	3	63.9									3	63.9									3	63.9									9	191.7
4" & 6" Pumps	5.0 yr	-	4	45.2									4	45.1									4	45.2									12	135.5
75 kw Gen. Set	7.5 yr	-	2	39.6													2	39.5															4	79.1
55 kw & 25 kw Gens.	7.5 yr	-	2	25.4													2	25.4															4	50.8
Radios	7.5 yr	-	-	11.4													-	11.5															-	22.9
24 Pass. Bus	5.0 yr	20,790	1	30.7									1	30.7									1	30.8									3	~~32.2~~ 92.2.
Ambulance	7.5 yr	20,790	1	22.5													1	22.6															2	45.1
Bronco/Pick Ups	3.0 yr	636,174	8	87.9					8	87.8					8	87.9					8	87.9					8	87.9					40	439.4
30 M Tanks	15.0 yr	-	4	76.4																													4	76.4
10 M Tanks	15.0 yr	-	1	10.6																													1	10.6
2 M Tank	15.0 yr	-	2	3.2																													1	1.6
637D Scrapers	9,000	403,372											16	9237.3					16	9237.3							12	6927.8					48	25402.4
				9684.7		-		4723.4		1494.9		536.9		10100.5		573.3		601.7		9902.3		573.3		716.1		1002.3		7182.9		964.8		-		48057.1

16 vs 9

BID ITEM	DESCRIPTION	BID QUANTITY		LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST
1	CLEARING	100	HA							
2	GRUBBING	100	HA							
3	ACCESS ROAD	11	KM							
4	SERVICE FACILITIES	1	LS	102257	4051	295058	10237	143562	1035173	1590338
5	EXCAV STKPLE TPSL	200000	BM3	20086 .100	59051 .295					79137 .396
6	RP STRP HL WSTE YR 1	2900540	BM3	1092039 .376	2590354 .893		232043 .080			3914436 1.350
7	RP STRP HL WSTE YR 2	2440210	BM3	1101749 .451	2613380 1.071		195217 .080			3910346 1.602
8	RP STRP HL WSTE YR 3	2569550	BM3	1118287 .435	2652607 1.032		205564 .080			3976458 1.548
9	RP STRP HL WSTE YR 4	2313980	BM3	1087907 .470	2580548 1.115		185119 .080			3853574 1.665
10	RP STRP HL WSTE YR 5	2129300	BM3	1032545 .485	2449217 1.150		170344 .080			3652106 1.715
11	RP STRP HL WSTE YR 6	3049590	BM3	1159763 .380	4462673 1.463		243967 .080			5866403 1.924
12	RP STRP HL WSTE YR 7	3129810	BM3	1149871 .367	4424587 1.414		250385 .080			5824843 1.861
13	RP STRP HL WSTE YR 8	3252100	BM3	1142064 .351	4394556 1.351		260168 .080			5796788 1.782
14	RP STRP HL WSTE YR 9	3378450	BM3	1132166 .335	4356470 1.289		270276 .080			5758912 1.705
15	RP STRP HL WSTE YR10	3134890	BM3	1120181 .357	4310325 1.375		250791 .080			5681297 1.812
16	RP STRP HL WSTE YR11	2837360	BM3	1107991 .391	4263450 1.503		226989 .080			5598430 1.973
17	RP STRP HL WSTE YR12	2475150	BM3	1096948 .443	4220972 1.705		198012 .080			5515932 2.229
18	RP STRP HL WSTE YR13	728910	BM3	529683 .727	1701226 2.334		58313 .080			2289222 3.141

Scraper Alternate

BID ITEM	DESCRIPTION	BID QUANTITY		LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST
19	RP STRP HL WSTE YR14	318760	BM3	266437 .836	743041 2.331		25501 .080			1034979 3.247
20	RP STRP HL WSTE YR15	36910	BM3	42675 1.156	106558 2.887		2953 .080			152186 4.123
21	RP LD HL COAL YR 1-5	4081650	TNE	622701 .153	1477038 .362		49775 .012			2149514 .527
22	RP LD HL COAL YR6-12	5855650	TNE	1139972 .195	4386503 .749		69685 .012			5596160 .956
23	RP LD HL COAL YR 13	816330	RMT	310756 .381	998088 1.223		9955 .012			1318799 1.616
24	RP LD HL COAL YR 14	816330	RMT	350497 .429	977463 1.197		9955 .012			1337915 1.639
25	RP LD HL COAL YR 15	816330	RMT	488428 .598	1219626 1.494		9955 .012			1718009 2.105
26	LD HL WSTE COAL DUMP	4120950	TNE	495737 .120	1259285 .306					1755022 .426
27	COALMNT AC RD MNTNCE	15	YR	504059 33603.933	348068 23204.533		191000 12733.333			1043127 69541.800
28	PIT DEWATERING/MTNCE	15	YR	167160 11144.000	63855 4257.000		171400 11426.667			402415 26827.667
29	PIT RECLAMATION	1	LS							
30	TAILINGS POND DYK	1	LS							
31	PIT LIGHTING	180	MO		183357 1018.650		330000 1833.333			513357 2851.983
32	EQUIP PURCH/SALVAGE	1	LS		36070650		23055725			59126375
33	MOBLILZATION	1	LS				1			1
34	TRAIN LDNG-PLNT MTCE	1	LS	366737	1029936					1396673
35	FUEL FACILITIES	1	LS	2587	719		1200	7200		11706
	TOTAL			18751283	93947654	295058	26684530	150762	1035173	140864460

55,749,236

Scraper Alternate

BID ITEM	DESCRIPTION	BID QUANTITY		LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST
7001	TEMP LOAD/UNLOAD FAC	1	LS							
7002	TEMP & ACCESS ROADS	1	LS							
7003	TEMP BRIDGES/XINGS	1	LS							
7004	TEMPORARY WHARVES	1	LS							
7005	PREPARE PLANT/CAMPST	1	LS							
7006	MISC TEMP FACILITIES	1	LS							
7007	TRLR PARK SITE PREP.	1	LS							
7010	DISMANTLE TEMP FACIL	1	LS							
7101	EQUIP MOB-FREIGHT IN	1	LS				280553			280553 - Capital
7102	EQUIP-UNLOAD/ASSMBLE	1	LS	87770						87770 - Capital
7111	EQUIP-DISMAN/MVE OUT	1	LS							
7112	EQUIP - FREIGHT OUT	1	LS							
7201	CONST COOKHSE/DINING	1	LS							
7202	CONST. BUNKHOUSES	1	LS							
7203	CONST COMM/REC BLDGS	1	LS							
7211	CONST. STAFF HOUSES	1	LS							
7212	CONST PERSON TRLRS.	1	LS							
7221	CONST MECH/TIRE SHOP	1	LS							
7222	CONST LUBE/FUEL FACL	1	LS							
7223	CONST CARPENTER SHOP	1	LS							
7231	CONST OFFICE BUILDNG	1	LS							
7232	CONST 1ST AID BLDG.	1	LS							
7233	CONSTR. WAREHOUSE	1	LS							
7234	CONST OWNER BLDGS.	1	LS							
7241	CONST. FIELD SHACKS	1	LS							
7250	CONST. MISC SHELTRS	1	LS							

Scraper Alternate

BID ITEM	DESCRIPTION	BID QUANTITY		LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST
7301	INST CAMP ELEC SYST.	1	LS							
7302	INST CAMP SEWAGE SYS	1	LS							
7303	INST CAMP WATER SYST	1	LS							
7304	CAMP FUEL LINE SYSTE	1	LS							
7308	TRLR PARK SERVICES	1	LS							
7310	JOB FUEL LINE SYSTEM	1	LS							
7311	INST JOB ELEC SYSTEM	1	LS							
7312	INST JOB SEWER SYSTM	1	LS							
7313	INST JOB WATER SYSTM	1	LS							
7314	INST PROJ RADIO SYST	1	LS						1800	1800
7315	SUP/INST PHONE/TELEX	1	LS							
7401	SETUP CRSH/SCRN PLT.	1	LS							
7402	SETUP WASHING PLANTS	1	LS							
7403	SETUP RECLAIM SYSTEM	1	LS							
7404	SETUP BATCH PLANT	1	LS							
7405	SETUP CEMENT SILOS	1	LS							
7406	SETUP AIR PLANT	1	LS							
7407	SETUP HEATING PLANT	1	LS							
7408	SETUP REGRIF. PLANT	1	LS							
7501	INSURANCE	1	LS							
7502	TAXES NOT P/R OR S/T	1	LS							
7503	SPEC. BONDS-PERFORM.	1	LS							
7600	EQUIPMENT WRITE OFF	1	LS							
	TOTAL			87770			280553		1800	370123

Scraper Alternate

BID ITEM	DESCRIPTION	BID QUANTITY		LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST	
8001	MAINT TEMP FACILITY	1	LS								
8002	MAINT. OF BLDGS.	1	LS	154031			36000			190031	G+A
8003	MAINT. OF UTILITIES	1	LS								
8004	MAINT OF TRAILR PRK	1	LS								
8101	OP/FAC-TRAILER RENT	1	LS								
8102	OP/FAC-LIGHT & POWER	1	LS								
8103	OP/FAC-WATER SUPPLY	1	LS								
8104	OP/FAC-FUEL FOR HEAT	1	LS				586440			586440	G+A
8105	OP/FAC-RADIO EXPENSE	1	LS				129600			129600	
8106	OP/FAC-STAT. AIR PLT	1	LS								
8201	TRANSPORT-DRIVER PAY	1	LS	1100208						1100208	Z
8202	TRANSPORT-AUTO/TRKS.	1	LS		907217					907217	
8203	TRANSPORT-SUPPRT EQP	1	LS		87031					87031	
8204	TRANSPORT-MISC EQUIP	1	LS						166320	166320	
8301	CATERING SUBCONTRACT	1	LS								
8302	CAMP OPERATING LABOR	1	LS								
8303	COST OF FOOD STUFFS	1	LS								
8304	KITC'N EQP/UTENL/SUP	1	LS								
8305	DORM LINEN/LNDRY/SUP	1	LS								
8310	SERVICES TO CATERER	1	LS								
8311	RM & BRD OUT OF CAMP	1	LS								
8312	EMPLOYEE R&B RECOVRY	1	LS								
8315	CAMP BUILDING RENTAL	1	LS								
8401	COMMISSARY WAGES	1	LS								
8402	RECREATION EQUIPMENT	1	LS								
8403	MISC. REC. EXPENSE	1	LS				9000			9000	

What is it.

Scraper Alternate

BID ITEM	DESCRIPTION	BID QUANTITY		LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST	
8501	CO. HOUSE/TRLR-FURN.	1	LS								
8502	CO. HSE/TRAIL-REVNUE	1	LS								
9001	MANAGEMENT SALARIES	1	LS	3939984						3,939,984	
9002	OFF. ENGR. SALARIES	1	LS	1635930						1,635,930	
9003	FIELD ENG. SALARIES	1	LS	1838796						1,838,796	
9004	OFFICE SALARY-WAGES	1	LS	2471782						2,471,782	G+A
9005	SFTY/1ST AID WAGES	1	LS	1488888						1,488,888	
9006	WAREHOUSE SALARIES	1	LS	619780						619780	
9007	MECH. SHOP SALARIES	1	LS	2404764						2,404,764	
9103	ENG. EQUIP SUPPLIES	1	LS			15000	87500			1,02500	G+A
9104	PROGRESS PHOTOS	1	LS						9300	9300	×
9105	CONSULTANT FEES	1	LS						25000	25,000	G+A
9202	OFF FURN. & EQUIP	1	LS				31500			31,500	G+A
9203	OFFICE RENT	1	LS								
9204	STATIONERY-MISC SUPP	1	LS				126000			126,000	G+A
9205	TELEPHONE & TELEX	1	LS				157500			157,500	G+A
9206	COMPUTER EXPENSES	1	LS				75000			75,000	G+A
9207	AUDIT EXPENSE	1	LS								
9301	EQUIP. INSURANCE	1	LS								
9302	LICENCES & PERMITS	1	LS				30000			30,000	G+A
9303	PROVINCIAL SALES TAX	1	LS								
9304	INTEREST/BANK CHARGE	1	LS				18600			18,600	G+A
9305	GROUP INSURANCE	1	LS								
9306	LEGAL EXPENSE	1	LS								
9307	DAMAGE CLAIMS	1	LS								
9308	ROYALTIES	1	LS								

Check these salaries.

Scraper Alternate

BID ITEM	DESCRIPTION	BID QUANTITY		LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST	
9309	EMPLOYEE MOVE IN/OUT	1	LS				18750			18750	
9310	FAMILY MOVE IN/OUT	1	LS				120000			120000	
9311	STAFF TRAVEL	1	LS				90000			90000	
9312	TRAVEL TIME ON PROJ.	1	LS								
9313	SUBSISTENCE ALLOWANC	1	LS								
9314	YARD & SITE RENTALS	1	LS								
9315	SCHOOL EXPENSE	1	LS								
9316	MOVES WITHIN PROJECT	1	LS								
9317	WINTER SHUTDOWN RENT	1	LS								
9402	1ST AID EQUIP/SUPPLS	1	LS								
9403	SAFETY EQUIPMENT	1	LS				140000			140000	
9404	FIRE PROTECT. EQUIP.	1	LS								
9405	BARRICADES & SIGNS	1	LS				15000			15000	
9406	SEC. GUARDS/WATCHMEN	1	LS								
9411	PERSONNEL MEDICALS	1	LS				60000			60000	
9501	WAREHSE WAGES-HOURLY	1	LS	1082850						1082850	
9502	MISC WAREHSE SUPPLYS	1	LS				94500			94500	
9503	WAREHOUSE RENT	1	LS								
9504	POWER TOOLS	1	LS				140000			140000	
9505	JOB SMALL TOOLS	1	LS				140000			140000	
9506	FREIGHT/EXPR CHARGES	1	LS				372000			372000	
9507	DEMURRAGE	1	LS								
9551	STAGING AREA-LABOR	1	LS								
9601	MECH SHOP LABOR-HRLY	1	LS	12537748						12537748	
9602	MECH. SHOP TOOLS	1	LS				300792			300792	
9603	MECH SHOP-EQ OP COST	1	LS		602474					602474	

Scraper Alternate

BID ITEM	DESCRIPTION	BID QUANTITY		LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST
9604	MISC. SHOP SUPPLIES	1	LS				3007922			3007922
9605	WELDING SUPPLIES	1	LS				902377			902377
9610	MECH. SHOP RENT	1	LS							
9621	LUBE & FUEL SERVICE	1	LS	3300621	570126					3870747
9630	CARP SHOP-OPER COSTS	1	LS							
9901	VACATION/HOLIDAY PAY	1	LS							
9902	UNEMPLOYMENT INSURAN	1	LS							
9903	PL & PD INSURANCE	1	LS							
9904	CANADA PENSION PLAN	1	LS							
9905	W.C.B. ASSESMENT	1	LS							
9906	HEALTH AND WELFARE	1	LS							
9907	UNION DEVELOP FUND	1	LS							
9908	TRAVEL ALLOWANCE	1	LS							
9909	UNION PENSION FUND	1	LS							
9910	SPARE ACCOUNT	1	LS							
9998	CREDIT-GE PRORATIONS	1	LS							
9999	CATERING COST	1	LS							
	TOTAL			32575382	2166848	15000	6688481		200620	41646331

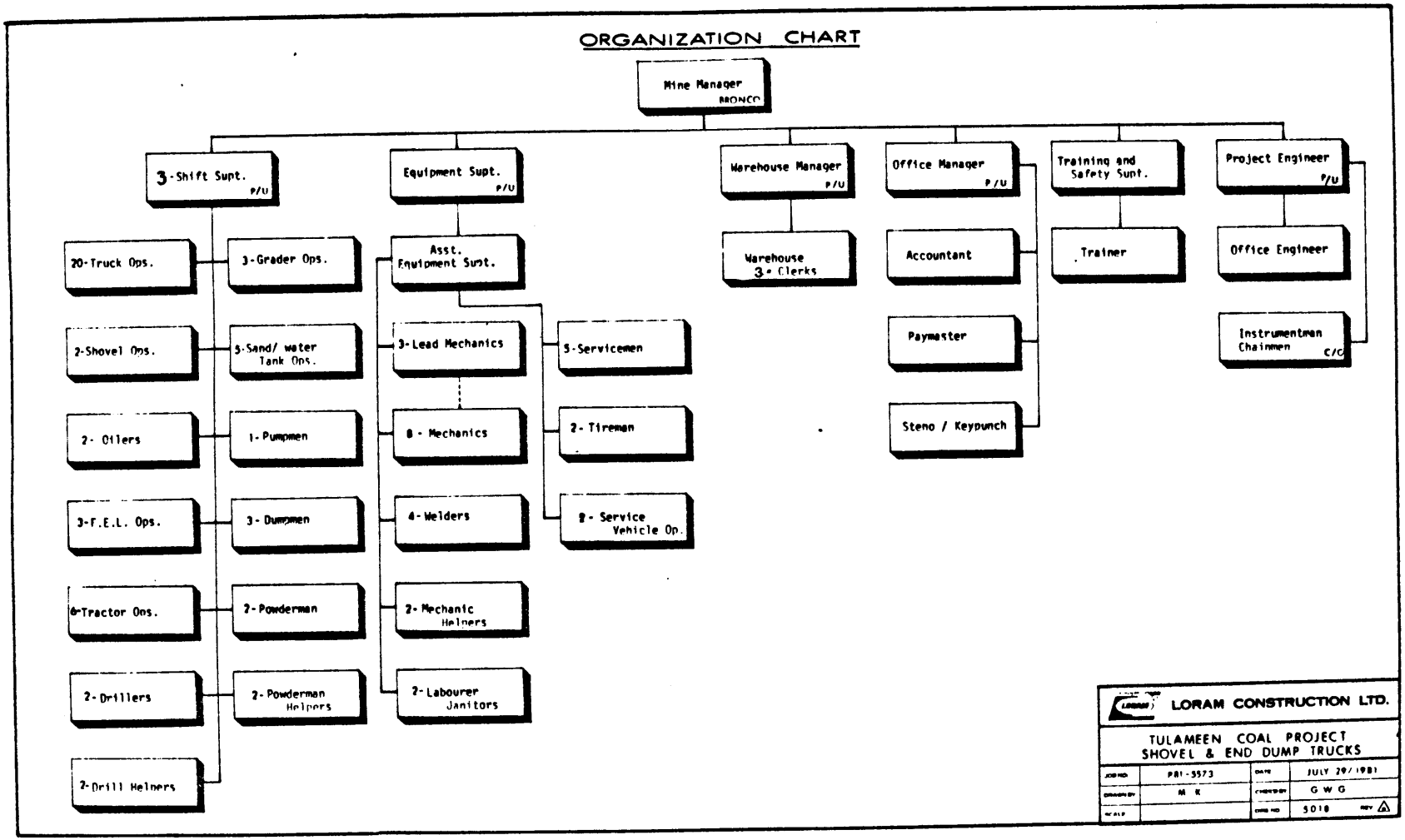
Scraper Alternate

BID ITEM	DESCRIPTION	BID QUANTITY	LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST
	ESTIMATE TOTAL		51414435	961145C2	310058	33653564	150762	1237593	182880914

Scraper Alternate

6.B COST ESTIMATE & BACK-UP OF LORAM CONSTRUCTION LTD. (TRUCK-SHOVEL ALTERNATE)

ORGANIZATION CHART



EE-3A(Rev 1/80)

ESTIMATE BASED ON: TULAMEEN COAL PROJECT

PROJECT: SHOVEL AND END DUMP TRUCKS

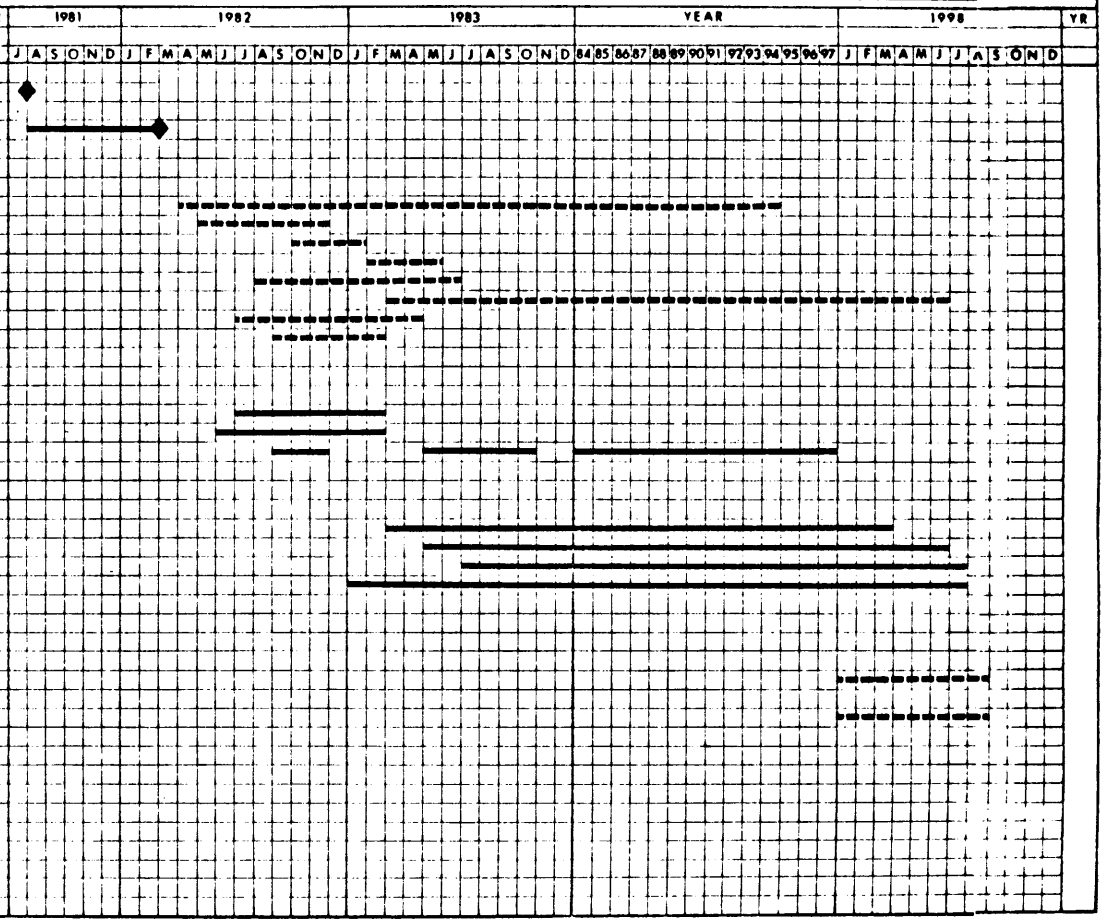
JOB PLAN AND PROGRESS SCHEDULE

LORAM

DATE: JULY 29/1981

PROJECT NO: P81-5573 PREPARED BY: G.W.G CHECKED BY: REVISION: 0

CODE No.	ITEM	QUANTITY
	SUBMIT COST ESTIMATES	
	OWNER FINALIZES MARKET	
	SUBCONTRACTS (Not included in Estimates)	
	CLEARING & GRUBBING	BY OTHERS
	SITE WORK INCL TAILINGS POND	
	POWER LINE	
	RAILWAY SIDING	
	ACCESS ROAD/BRIDGE IMPROVEMENT	
	DEEP WELL DEWATERING	
	COAL PLANT	
	PLANT AREA UTILITIES	
	MINING MOBILIZATION	
	SHOP/OFFICE FACILITIES	
	EQUIPMENT MOBILIZATION	
	STOCKPILE TOPSOIL	200 000 Bm^3
	MINING	
	STRIPPING REMOVAL	34 700 000 Bm^3
	COAL EXCAVATION	12 000 000 RMT
	COAL TRAIN LOADING	8 120 000 RMT
	ACCESS ROAD MAINTENANCE	12 km
	DEMOBILIZATION (Not included in Estimates)	
	SITE RECLAMATION	
	DEMOB MINING EQUIPMENT	



EQUIPMENT PURCHASE PAYMENT SCHEDULE

TULAMEEN OPEN PIT MINE COST STUDY

SHOVEL & TRUCKS

CALCULATION OF INTEREST ON EQUIPMENT NOTES

BASED ON 4 YEAR NOTES AT 18% INTEREST (29.375 COST/$1,000/MONTH)

Year of Purchase	Annual Purchase		Total Payment		Annual Payments				Total Annual Payments
	Purchase	Monthly Payment	Gross	(Interest)	1st Year	2nd Year	3rd Year	4th Year	
YEAR 1	13,847,800	400768 406,779	19,525,398	5,677,598	4,881,350	-	-	-	4,881,350
YEAR 2	-	-	-	-	-	4,881,350	-	-	4,881,350
YEAR 3	-	-	-	-	-	-	4,881,349	-	4,881,349
YEAR 4	87,900	2544 2,582	123,939	36,039	30,985	-	-	4,881,349	4,912,334
YEAR 5	1,623,600	46988 47,693	2,289,276	665,676	572,319	30,985	-	-	603,304
YEAR 6	3,073,800	88958 90,293	4,334,058	1,260,258	1,083,515	572,319	30,985	-	1,686,819
YEAR 7	1,779,300	51495 52,267	2,508,813	729,513	627,203	1,083,514	572,319	30,984	2,314,020
YEAR 8	3,788,000	109628 111,272	5,341,080	1,553,080	1,335,270	627,204	1,083,515	572,319	3,618,308
YEAR 9	1,521,100	44022 44,682	2,144,751	623,651	536,188	1,335,270	627,203	1,083,514	3,582,175
YEAR 10	1,231,400	35638 36,172	1,736,274	504,874	434,068	536,188	1,335,270	627,203	2,932,729
YEAR 11	2,570,600	74395 75,511	3,624,546	1,053,946	906,136	434,069	536,188	1,335,270	3,211,663
YEAR 12	825,200	29882 24,240	1,163,532	338,332	290,883	906,137	434,068	536,187	2,167,275
YEAR 13	1,226,100	35,484 36,016	1,728,801	502,701	432,201	290,883	906,136	434,069	2,063,289
YEAR 14	-	-	-	-	-	432,200	290,883	906,137	1,629,220
YEAR 15	-	-	-	-	-	-	432,200	290,883	723,083
YEAR 16	-	-	-	-	-	-	-	432,200	432,200
YEAR 17	-	-	-	-	-	-	-	-	-
TOTAL	31,574,800	-	44,520,468	12,945,668	11,130,118	11,130,119	11,130,116	11,130,115	44,520,468

4809
4809
4809
4840
594
1662
2280
3585
3529
2889
3164
2135
2033
1605
712
426
43,861.

12,286.

TULAMEEN OPEN PIE MINE COST STUDY

SHOVEL-TRUCK ALTERNATE

EQUIPMENT PURCHASE SCHEDULE

PLUS 6% PST IN EQUIPMENT AT 1981 RV

Description	Life	Total Project Hours	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6		Year 7		Year 8		Year 9		Year 10		Year 11		Year 12		Year 13		Year 14		Year 15		TOTAL	
			No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	Value	No	
H241 18 C.Y. SHVL	20,000	49,500	1	2347.4									1	2347.4									1	2347.4							3	7042.2
992C FEL	13,100	26,324	1	811.1											1	811.1															2	1622.2
988B FEL	14,322	14,322	1	375.5																											1	375.5
966C FEL	12,000	23,717	1	209.7											1	209.7															2	419.4
Bobcat	14,000	28,365	1	24.4													1	24.4													2	48.8
D9L S Dozer Ripper	12,000	125,308	3	1456.3							3	1456.3							3	1456.3							2	970.9			11	5339.8
R85 ED Trucks	25,000	350,880	7	3570.3													7	3570.3							1	510.0					15	7650.6
768C 707 B.D.	25,000	81,132	4	2012.9									1	503.2																	5	2516.1
12 CY ED Trucks	18,000	69,788	2	142.1											2	142.1															4	284.2
DH80 Rotary Drill	20,000	28,365	1	902.4																	1	902.4									2	1804.8
Cat 14 Grader	13,500	70,440	2	528.5											2	528.5									1	264.3					5	1321.3
1 1/4 CY Hyd. B.H.	10,000	4,509	1	212.9																											1	212.9
15 CY Sand Spreader	15,000		1	37.5															1	37.5											2	75.0
4000 Gal. Tank	15,000		1	13.9															1	13.9											2	27.8
Calcium Spreader	7.5 Yr		1	4.8													1	4.8													2	9.6
6KW Lite Tower	5.0 Yr		3	63.9									3	63.9									3	63.9							9	191.7
Lube Station	7.5 Yr		1	46.6													1	46.6													2	93.2
Hyd. Pump	7.5 Yr		1	28.6																	1	28.6									2	57.2
3/4 T Expl Truck	15,000	28,365	1	13.4															1	13.4											2	26.8
Serv/Lube Truck	15,000	62,370	1	167.3							1	167.3									1	167.3					1	167.3			4	669.2
30M Gal Tank	15 Yr		4	76.4																											4	76.4
10M Gal Tank	15 Yr		1	10.6																											1	10.6
2M Gal Tank	7.5 Yr		2	3.2																											2	3.2
75 & 50KW Gen.	7.5 Yr		4	65.0													4	65.0													8	130.0
22T Crane	20,000	10,318	1	181.4																											1	181.4
12.5 T Forklift	20,000	21,196	1	94.7																											1	94.7
3T Mech Truck	5.0 Yr		1	104.5									1	104.5									1	104.5							3	313.5
Tire Truck	15,000	21,196	1	50.9																					1	50.9					2	101.8
Mech Pickup	5.0 Yr		1	24.1									1	24.1									1	24.1							3	72.3
Steam Cleaner	7.5 Yr		1	9.2													1	9.2													2	18.4
150 CFM Compressor	7.5 Yr		1	14.8													1	14.8													2	29.6
400A D Welder	7.5 Yr		2	15.7													2	15.7													4	31.4
300A D Welder	7.5 Yr		2	3.3													2	3.3													4	6.6
Lunch Trailer	15 Yr		2	26.8																											2	26.8
24 Pass Bus	5.0 Yr		1	30.7									1	30.7									3	30.7							3	92.3
3/4 T Pickup	3.0 Yr		8	87.9					8	87.9					8	87.9					8	87.9					8	87.9			40	439.5
Ambulance	7.5 Yr		1	22.5													1	22.5													2	45.0
Dewater Pumps	7.5 Yr		4	45.2																	4	45.2									8	40.4
Radios	7.5 Yr		1	11.4													1	11.4													2	22.8
		Totals		13847.8						87.9		1623.6		3073.8		1779.3		3788.0		1521.10		1231.40		2570.6		825.20		1226.1		-		-		31,574.8

BID ITEM	DESCRIPTION	BID QUANTITY		LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST
1	CLEARING	100	HA							
2	GRUBBING	100	HA							
3	ACCESS RD	11	KM							
4	SERVICE FACILITIES	1	LS	105295	552	309212	10552	146632	1114818	1687061
5	STRIPPING/STCKPILING	200000	BM3	28441 .142	2750 .014	209435 1.047				240626 1.203
6	RP,STRP,HL WSTE YR 1	2900540	BM3	1217270 .420	2565582 .885		1424295 .491			5207147 1.795
7	RP,STRP,HL WSTE YR 2	2440210	BM3	961638 .394	2017180 .827		1224781 .502			4203599 1.723
8	RP,STRP,HL WSTE YR 3	2569550	BM3	998115 .388	2091642 .814		1238309 .482			4328066 1.684
9	RP,STRP,HL WSTE YR 4	2313980	BM3	898887 .388	1883708 .814		1136276 .491			3918871 1.694
10	RP,STRP,HL WSTE YR 5	2129300	BM3	1582755 .743	3295751 1.548		1007287 .473			5885793 2.764
11	RP,STRP,HL WSTE YR 6	3049590	BM3	1243893 .408	2649873 .869		1442595 .473			5336361 1.750
12	RP,STRP,HL WSTE YR 7	3129810	BM3	1245801 .398	2685735 .858		1480541 .473			5412077 1.729
13	RP,STRP,HL WSTE YR 8	3252100	BM3	1282017 .394	2777638 .854		1538389 .473			5598044 1.721
14	RP,STRP,HL WSTE YR 9	3378450	BM3	1387825 .411	3048022 .902		1598159 .473			6034006 1.786
15	RP,STRP,HL WSTE YR10	3134890	BM3	1320565 .421	2871642 .916		1482944 .473			5675151 1.810
16	RP,STRP,HL WSTE YR11	2837360	BM3	1229120 .433	2643859 .932		1342199 .473			5215178 1.838
17	RP,STRP,HL WSTE YR12	2475150	BM3	1072331 .433	2306597 .932		212971 .086			3591899 1.451
18	RP,STRP,HL WSTE YR13	728910	BM3	274578 .377	705661 .968		382618 .525			1362857 1.870

Truck & Shovel Alternate

BID ITEM	DESCRIPTION	BID QUANTITY		LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST
19	RP,STRP,HL WSTE YR14	318760	BM3	100107	258659		167326			526092
				.314	.811		.525			1.650
20	RP,STRP,HL WSTE YR15	36910	BM3	13043	33240		19378			65661
				.353	.901		.525			1.779
21	RP,LD,HL COAL YR 1-5	4081650	TNE	978530	1675543		199105			2853178
				.240	.411		.049			.699
22	RP,LD,HL COAL YR6-12	5855650	TNE	1579164	2689473		285641			4554278
				.270	.459		.049			.778
23	RP,LD,HL COAL YR 13	816330	TNE	266699	459917		39821			766437
				.327	.563		.049			.939
24	RP,LD,HL COAL YR 14	816330	TNE	266699	459917		39821			766437
				.327	.563		.049			.939
25	RP,LD,HL COAL YR 15	816330	TNE	266699	459917		39821			766437
				.327	.563		.049			.939
26	LD HL WSTE COAL-DUMP	4120950	TNE	757919	464444					1222363
				.184	.113					.297
27	HAUL RD MAINTENANCE	15	YR	504059	443909		191000			1138968
				33603.933	29593.933		12733.333			75931.200
28	PIT DEWATERING/MTNCE	15	YR	357975	235304		186400			779679
				23865.000	15686.933		12426.667			51978.600
29	PIT RECLAMATION	1	LS							
30	TAILINGS POND DYKE	1	LS							
31	PIT LIGHTING	180	MO		183357		330000			513357
					1018.650		1833.333			2851.983
32	EQUIP PURCH/SALVAGE	1	LS		23681790		15809733			39491523
33	MOBILIZATION	1	LS				1			1
34	TRAIN LDNG-PLNT MTCE	1	LS	323657	743904					1067561
35	FUEL FACILITIES	1	LS	2460	110	2109	8400			13079
	TOTAL			20265542	63335676	520756	32838363	146632	1114818	118221787

Truck & Shovel Alternate

BID ITEM	DESCRIPTION	BID QUANTITY		LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST
7001	TEMP LOAD/UNLOAD FAC	1	LS							
7002	TEMP & ACCESS ROADS	1	LS							
7003	TEMP BRIDGES/XINGS	1	LS							
7004	TEMPORARY WHARVES	1	LS							
7005	PREPARE PLANT/CAMPST	1	LS							
7006	MISC TEMP FACILITIES	1	LS							
7007	TRLR PARK SITE PREP.	1	LS							
7010	DISMANTLE TEMP FACIL	1	LS							
7101	EQUIP MOB-FREIGHT IN	1	LS				98650			98650
7102	EQUIP-UNLOAD/ASSMBLE	1	LS	87770						87770
7111	EQUIP-DISMAN/MVE OUT	1	LS							
7112	EQUIP - FREIGHT OUT	1	LS							
7201	CONST COOKHSE/DINING	1	LS							
7202	CONST. BUNKHOUSES	1	LS							
7203	CONST COMM/REC BLDGS	1	LS							
7211	CONST. STAFF HOUSES	1	LS							
7212	CONST PERSON TRLRS.	1	LS							
7221	CONST MECH/TIRE SHOP	1	LS							
7222	CONST LUBE/FUEL FACL	1	LS							
7223	CONST CARPENTER SHOP	1	LS							
7231	CONST OFFICE BUILDNG	1	LS							
7232	CONST 1ST AID BLDG.	1	LS							
7233	CONSTR. WAREHOUSE	1	LS							
7234	CONST OWNER BLDGS.	1	LS							
7241	CONST. FIELD SHACKS	1	LS							
7250	CONST. MISC SHELTRS	1	LS							

Truck & Shovel Alternate

DIRECT COST SUMMARY - FIXED G.E.

BID ITEM	DESCRIPTION	BID QUANTITY		LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST
7301	INST CAMP ELEC SYST.	1	LS							
7302	INST CAMP SEWAGE SYS	1	LS							
7303	INST CAMP WATER SYST	1	LS							
7304	CAMP FUEL LINE SYSTE	1	LS							
7309	TRLR PARK SERVICES	1	LS							
7310	JOB FUEL LINE SYSTEM	1	LS							
7311	INST JOB ELEC SYSTEM	1	LS							
7312	INST JOB SEWER SYSTM	1	LS							
7313	INST JOB WATER SYSTM	1	LS							
7314	INST PROJ RADIO SYST	1	LS						1800	1800
7315	SUP/INST PHONE/TELEX	1	LS							
7401	SETUP CRSH/SCRN PLT.	1	LS							
7402	SETUP WASHING PLANTS	1	LS							
7403	SETUP RECLAIM SYSTEM	1	LS							
7404	SETUP BATCH PLANT	1	LS							
7405	SETUP CEMENT SILOS	1	LS							
7406	SETUP AIR PLANT	1	LS							
7407	SETUP HEATING PLANT	1	LS							
7408	SETUP REGRIT. PLANT	1	LS							
7501	INSURANCE	1	LS							
7502	TAXES NOT P/R OR S/T	1	LS							
7503	SPEC. BONDS-PERFORM.	1	LS							
7600	EQUIPMENT WRITE OFF	1	LS							
	TOTAL			87770			98650		1800	188220

Truck & Shovel Alternate

BID ITEM	DESCRIPTION	BID QUANTITY		LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST
8001	MAINT TEMP FACILITY	1	LS							
8002	MAINT. OF BLDGS.	1	LS	821482			36000			857482
8003	MAINT. OF UTILITIES	1	LS							
8004	MAINT OF TRAILR PRK	1	LS							
8101	OP/FAC-TRAILER RENT	1	LS				1260000			1260000
8102	OP/FAC-LIGHT & POWER	1	LS							
8103	OP/FAC-WATER SUPPLY	1	LS							
8104	OP/FAC-FUEL FOR HEAT	1	LS				630000			630000
8105	OP/FAC-RADIO EXPENSE	1	LS				129600			129600
8106	OP/FAC-STAT. AIR PLT	1	LS							
8201	TRANSPORT-DRIVER PAY	1	LS	733472						733472
8202	TRANSPORT-AUTO/TRKS.	1	LS		906674					906674
8203	TRANSPORT-SUPPRT EQP	1	LS		87031					87031
8204	TRANSPORT-MISC EQUIP	1	LS						166320	166320
8301	CATERING SUBCONTRACT	1	LS							
8302	CAMP OPERATING LABOR	1	LS							
8303	COST OF FOOD STUFFS	1	LS							
8304	KITC'N EQP/UTENL/SUP	1	LS							
8305	DORM LINEN/LNDRY/SUP	1	LS							
8310	SERVICES TO CATERER	1	LS							
8311	RM & BRD OUT OF CAMP	1	LS							
8312	EMPLOYEE R&B RECOVRY	1	LS							
8315	CAMP BUILDING RENTAL	1	LS							
8401	COMMISSARY WAGES	1	LS							
8402	RECREATION EQUIPMENT	1	LS							
8403	MISC. REC. EXPENSE	1	LS				9000			9000

Truck & Shovel Alternate

BID ITEM	DESCRIPTION	BID QUANTITY		LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST
8501	CO. HOUSE/TRLR-FURN.	1	LS							
8502	CO. HSE/TRAIL-REVNUE	1	LS							
9001	MANAGEMENT SALARIES	1	LS	3939984						3939984
9002	OFF. ENGR. SALARIES	1	LS	1635930						1635930
9003	FIELD ENG. SALARIES	1	LS	1838796						1838796
9004	OFFICE SALARY-WAGES	1	LS	2471782						2471782
9005	SFTY/1ST AID WAGES	1	LS	1488888						1488888
9006	WAREHOUSE SALARIES	1	LS	619780						619780
9007	MECH. SHOP SALARIES	1	LS	2404764						2404764
9103	ENG. EQUIP SUPPLIES	1	LS			16000	79250			95250
9104	PROGRESS PHOTOS	1	LS						9300	9300
9105	CONSULTANT FEES	1	LS						25000	25000
9202	OFF FURN. & EQUIP	1	LS				53890			53890
9203	OFFICE RENT	1	LS							
9204	STATIONERY-MISC SUPP	1	LS				114120			114120
9205	TELEPHONE & TELEX	1	LS				142650			142650
9206	COMPUTER EXPENSES	1	LS				75000			75000
9207	AUDIT EXPENSE	1	LS							
9301	EQUIP. INSURANCE	1	LS							
9302	LICENCES & PERMITS	1	LS				30000			30000
9303	PROVINCIAL SALES TAX	1	LS							
9304	INTEREST/BANK CHARGE	1	LS				18600			18600
9305	GROUP INSURANCE	1	LS							
9306	LEGAL EXPENSE	1	LS							
9307	DAMAGE CLAIMS	1	LS				75000			75000
9308	ROYALTIES	1	LS							

Truck & Shovel Alternate

BID ITEM	DESCRIPTION	BID QUANTITY		LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST
9309	EMPLOYEE MOVE IN/OUT	1	LS				18750			18750
9310	FAMILY MOVE IN/OUT	1	LS				120000			120000
9311	STAFF TRAVEL	1	LS				90000			90000
9312	TRAVEL TIME ON PROJ.	1	LS							
9313	SUBSISTENCE ALLOWANC	1	LS							
9314	YARD & SITE RENTALS	1	LS							
9315	SCHOOL EXPENSE	1	LS							
9316	MOVES WITHIN PROJECT	1	LS							
9317	WINTER SHUTDOWN RENT	1	LS							
9402	1ST AID EQUIP/SUPPLS	1	LS				126800			126800
9403	SAFETY EQUIPMENT	1	LS				126800			126800
9404	FIRE PROTECT. EQUIP.	1	LS							
9405	BARRICADES & SIGNS	1	LS				15000			15000
9406	SEC. GUARDS/WATCHMEN	1	LS							
9411	PERSONNEL MEDICALS	1	LS				60000			60000
9501	WAREHSE WAGES-HOURLY	1	LS	1082850						1082850
9502	MISC WAREHSE SUPPLYS	1	LS				85590			85590
9503	WAREHOUSE RENT	1	LS							
9504	POWER TOOLS	1	LS				126800			126800
9505	JOB SMALL TOOLS	1	LS				126800			126800
9506	FREIGHT/EXPR. CHARGES	1	LS				372000			372000
9507	DEMURRAGE	1	LS							
9551	STAGING AREA-LABOR	1	LS							
9601	MECH SHOP LABOR-HRLY	1	LS	6879879						6879879
9602	MECH. SHOP TOOLS	1	LS				216098			216098
9603	MECH SHOP-EQ OP COST	1	LS		825667					825667

Truck & Shovel Alternate

BID ITEM	DESCRIPTION	BID QUANTITY		LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST
9604	MISC. SHOP SUPPLIES	1	LS				2160978			2160978
9605	WELDING SUPPLIES	1	LS				648294			648294
9610	MECH. SHOP RENT	1	LS							
9621	LUBE & FUEL SERVICE	1	LS	3300621	570126					3870747
9630	CARP SHOP-OPER COSTS	1	LS							
9901	VACATION/HOLIDAY PAY	1	LS							
9902	UNEMPLOYMENT INSURAN	1	LS							
9903	PL & PD INSURANCE	1	LS							
9904	CANADA PENSION PLAN	1	LS							
9905	W.C.B. ASSESMENT	1	LS							
9906	HEALTH AND WELFARE	1	LS							
9907	UNION DEVELOP FUND	1	LS							
9908	TRAVEL ALLOWANCE	1	LS							
9909	UNION PENSION FUND	1	LS							
9910	SPARE ACCOUNT	1	LS							
9998	CREDIT-GE PRORATIONS	1	LS							
9999	CATERING COST	1	LS							
	TOTAL			27218228	2389494	16000	6947020		200620	36771366

Truck & Shovel Alternate

DIRECT COST SUMMARY - JOB TOTAL

BID ITEM	DESCRIPTION	BID QUANTITY	LABOUR	EQUIP EXPENSE	OUTSIDE RENTALS	CONST MATRL	PERM MATRL	SUB CONTRACTS	TOT DIRECT COST
	ESTIMATE TOTAL		47571540	65725174	536756	39884033	146632	1317238	155181373

Truck & Shovel Alternate

DATE 07/13/81

LORAM CONSTR LTD
LIST OF LABOUR RATES FOR ESTIMATING SYSTEM

DIVISION- MINING

P81-5573 TULAMEEN OPEN PIT MINING--B.C.

TEAM CAPTAIN- G GLABOLT

STARTING DATE MAY 1 1982 FINISHING DATE YEAR 1997
AGREEMENT WITH CAN ASSC MECH WKRS LOC 22 WORKING 3 SHIFTS----8 HOURS---5 DAYS

RATE CODE	CRAFT CLASS	BASE RATE	ESCAL	OVTME PREM.	SHIFT DIFF.	STAND BY	DAILY SUB	VAC HOL	SUB RATE	UIC	PLPD	CPP	WCB	HEL NEF	UDF	TRAV	PENS	WAGE RATE
100	CARP FORE	1110H	0H	0H	17H	0D	0D	100H	1227H	22H	9H	22H	52H	69H	60H	15H	0H	1476H
101	CARP JMAN	1085H	0H	0H	17H	0D	0D	98H	1200H	22H	9H	22H	50H	69H	60H	15H	0H	1447H
201	C MAS JMAN	983H	0H	0H	17H	0D	0D	88H	1088H	22H	8H	20H	46H	69H	60H	10H	0H	1323H
300	WIRE FORE	1110H	0H	0H	17H	0D	0D	100H	1227H	22H	9H	22H	52H	69H	60H	15H	0H	1479H
301	WIRE JMAN	1085H	0H	0H	17H	0D	0D	98H	1200H	22H	9H	22H	50H	69H	60H	15H	0H	1450H
400	STRUC FORE	1110H	0H	0H	17H	0D	0D	100H	1227H	22H	9H	22H	52H	69H	60H	22H	0H	1483H
401	STRUC JMAN	1085H	0H	0H	17H	0D	0D	98H	1200H	22H	9H	22H	50H	69H	60H	22H	0H	1454H
500	LABOR FORE	1008H	0H	0H	17H	0D	0D	91H	1116H	22H	8H	20H	47H	69H	60H	10H	0H	1352H
501	COM LABOR	838H	0H	0H	17H	0D	0D	75H	930H	22H	7H	17H	39H	69H	60H	10H	0H	1154H
502	CONC LAB	838H	0H	0H	17H	0D	0D	75H	930H	22H	7H	17H	39H	69H	60H	10H	0H	1154H
503	CHN SAW OP	983H	0H	0H	17H	0D	0D	88H	1088H	22H	8H	20H	46H	69H	60H	10H	0H	1323H
504	PW TOOL OP	930H	0H	0H	17H	0D	0D	84H	1031H	22H	8H	19H	43H	69H	60H	10H	0H	1262H
505	D AIR TRAC	953H	0H	0H	17H	0D	0D	86H	1056H	22H	8H	19H	44H	69H	60H	10H	0H	1288H
510	D HISCALER	953H	0H	0H	17H	0D	0D	86H	1056H	22H	8H	19H	44H	69H	60H	10H	0H	1288H
511	D J HAMMER	930H	0H	0H	17H	0D	0D	84H	1031H	22H	8H	19H	43H	69H	60H	10H	0H	1262H
512	D HELPER	902H	0H	0H	17H	0D	0D	81H	1000H	22H	8H	18H	42H	69H	60H	10H	0H	1229H
513	DUMP FLAG	838H	0H	0H	17H	0D	0D	75H	930H	22H	7H	17H	39H	69H	60H	10H	0H	1154H
517	PIPELAYER	902H	0H	0H	17H	0D	0D	81H	1000H	22H	8H	18H	42H	69H	60H	10H	0H	1229H
518	POWDERMAN	983H	0H	0H	17H	0D	0D	88H	1088H	22H	8H	20H	46H	69H	60H	10H	0H	1323H
519	POWDR HELP	953H	0H	0H	17H	0D	0D	86H	1056H	22H	8H	19H	44H	69H	60H	10H	0H	1288H
600	OPENG FORE	1110H	0H	0H	17H	0D	0D	100H	1227H	22H	9H	22H	52H	69H	60H	15H	0H	1477H
602	CONVEYOR	983H	0H	0H	17H	0D	0D	88H	1088H	22H	8H	20H	46H	69H	60H	10H	0H	1323H
604	BHOE 1.5CY	1043H	0H	0H	17H	0D	0D	94H	1154H	22H	9H	21H	48H	69H	60H	10H	0H	1393H

P61-5573 TULAMEEN OPEN PIT MINING--B.C.

DIVISION- MINING

TEAM CAPTAIN- G GLADDY

STARTING DATE MAY 1 1982 FINISHING DATE YEAR 1997
AGREEMENT WITH CAN ASSC MECH WKRS LOC 22 WORKING 3 SHIFTS----8 HOURS---5 DAYS

RATE CODE	CRAFT CLASS	BASE RATE	ESCAL	OVTME PREM.	SHIFT DIFF.	STAND BY	DAILY SUB	VAC HOL	SUB RATE	UIC	PLPD	CPP	WCB	HEL NEF	UDF	TRAV	PENS	WAGE RATE
609	~~CRANE 25T~~	~~1043H~~	~~0H~~	~~0H~~	~~17H~~	~~0D~~	~~0D~~	~~94H~~	~~1154H~~	~~22H~~	~~9H~~	~~21H~~	~~48H~~	~~69H~~	~~60H~~	~~10H~~	~~0H~~	~~13931~~
611	DRIVER OIL	930H	0H	0H	17H	0D	0D	84H	1031H	22H	8H	19H	43H	69H	60H	10H	0H	1262H
617	FORKLIFT	953H	0H	0H	17H	0D	0D	86H	1056H	22H	8H	19H	44H	69H	60H	10H	0H	1288H
~~618~~	~~SERVICEMAN~~	~~983H~~	~~0H~~	~~0H~~	~~17H~~	~~0D~~	~~0D~~	~~88H~~	~~1088H~~	~~22H~~	~~8H~~	~~20H~~	~~46H~~	~~69H~~	~~60H~~	~~10H~~	~~0H~~	~~1323H~~
622	FEL 7CY	983H	0H	0H	17H	0D	0D	88H	1088H	22H	8H	20H	46H	69H	60H	10H	0H	1323H
623	FEL 10CY	1007H	0H	0H	17H	0D	0D	91H	1115H	22H	8H	20H	47H	69H	60H	10H	0H	1351H
~~625~~	~~MECH FORE~~	~~1110H~~	~~0H~~	~~0H~~	~~17H~~	~~0D~~	~~0D~~	~~100H~~	~~1227H~~	~~22H~~	~~9H~~	~~22H~~	~~52H~~	~~69H~~	~~60H~~	~~22H~~	~~0H~~	~~1483H~~
626	MECH WELD	1085H	0H	0H	17H	0D	0D	98H	1200H	22H	9H	22H	50H	69H	60H	22H	0H	1454H
627	WELDR ONLY	1007H	0H	0H	17H	0D	0D	91H	1115H	22H	8H	20H	47H	69H	60H	15H	0H	1356H
~~628~~	~~MECH HELPR~~	~~870H~~	~~0H~~	~~0H~~	~~17H~~	~~0D~~	~~0D~~	~~78H~~	~~965H~~	~~22H~~	~~7H~~	~~17H~~	~~41H~~	~~69H~~	~~60H~~	~~19H~~	~~0H~~	~~1191H~~
630	MOTOR GRAD	983H	0H	0H	17H	0D	0D	88H	1088H	22H	8H	20H	46H	69H	60H	10H	0H	1323H
631	OILER	930H	0H	0H	17H	0D	0D	84H	1031H	22H	8H	19H	43H	69H	60H	10H	0H	1262H
~~633~~	~~4" PUMP~~	~~930H~~	~~0H~~	~~0H~~	~~17H~~	~~0D~~	~~0D~~	~~84H~~	~~1031H~~	~~22H~~	~~8H~~	~~19H~~	~~43H~~	~~69H~~	~~60H~~	~~10H~~	~~0H~~	~~1262H~~
637	6" PUMP	930H	0H	0H	17H	0D	0D	84H	1031H	22H	8H	19H	43H	69H	60H	10H	0H	1262H
638	SP COMPACT	953H	0H	0H	17H	0D	0D	86H	1056H	22H	8H	19H	44H	69H	60H	10H	0H	1288H
~~639~~	~~SCRAPER 1~~	~~983H~~	~~0H~~	~~0H~~	~~17H~~	~~0D~~	~~0D~~	~~88H~~	~~1088H~~	~~22H~~	~~8H~~	~~20H~~	~~46H~~	~~69H~~	~~60H~~	~~10H~~	~~0H~~	~~1323H~~
640	SCRAPER 2	1007H	0H	0H	17H	0D	0D	91H	1115H	22H	8H	20H	47H	69H	60H	10H	0H	1351H
642	SHOVL 10CY	1067H	0H	0H	17H	0D	0D	96H	1180H	22H	9H	21H	50H	69H	60H	10H	0H	1421H
~~643~~	~~SHOVL 14CY~~	~~1067H~~	~~0H~~	~~0H~~	~~17H~~	~~0D~~	~~0D~~	~~96H~~	~~1180H~~	~~22H~~	~~9H~~	~~21H~~	~~50H~~	~~69H~~	~~60H~~	~~10H~~	~~0H~~	~~1421H~~
644	TRAC TO D4	953H	0H	0H	17H	0D	0D	86H	1056H	22H	8H	19H	44H	69H	60H	10H	0H	1288H
645	TRAC D6-D9	983H	0H	0H	17H	0D	0D	88H	1088H	22H	8H	20H	46H	69H	60H	10H	0H	1323H
~~646~~	~~TRAC FARM~~	~~953H~~	~~0H~~	~~0H~~	~~17H~~	~~0D~~	~~0D~~	~~86H~~	~~1056H~~	~~22H~~	~~8H~~	~~19H~~	~~44H~~	~~69H~~	~~60H~~	~~10H~~	~~0H~~	~~1288H~~
650	D10 DOZER	983H	0H	0H	17H	0D	0D	88H	1088H	22H	8H	20H	46H	69H	60H	10H	0H	1323H

LIST OF LABOUR RATES FOR ESTIMATING SYSTEM

P81-5573 TULAMEEN OPEN PIT MINING--B.C.

DIVISION- MINING

TEAM CAPTAIN- G GLAHOLT

STARTING DATE MAY 1 1982 FINISHING DATE YEAR 1997

AGREEMENT WITH CAN ASSC MECH WKRS LOC 22 WORKING 3 SHIFTS----8 HOURS---5 DAYS

RATE CODE	CRAFT CLASS	BASE RATE	ESCAL	OVTIME PREM.	SHIFT DIFF.	STAND BY	DAILY SUB	VAC HOL	SUB RATE	UIC	PLPD	CPP	WCB	HEL WEF	UDF	TRAV	PENS	WAGE RATE
701	PIPE JMAN	1085H	OH	OH	17H	OD	OD	98H	1200H	22H	9H	22H	50H	69H	60H	22H	OH	1454H
900	TEAMS FORE	1008H	OH	OH	17H	OD	OD	91H	1116H	22H	8H	20H	47H	69H	60H	10H	OH	1352H
903	BUS DRIVER	983H	OH	OH	17H	OD	OD	88H	1088H	22H	8H	20H	46H	69H	60H	10H	OH	1323H
904	EDUMP 50T	983H	OH	OH	17H	OD	OD	88H	1088H	22H	8H	20H	46H	69H	60H	10H	OH	1323H
905	EDUMP 85T	983H	OH	OH	17H	OD	OD	88H	1088H	22H	8H	20H	46H	69H	60H	10H	OH	1323H
906	EDUMP 100T	983H	OH	OH	17H	OD	OD	88H	1088H	22H	8H	20H	46H	69H	60H	10H	OH	1323H
907	FLAT DECK	902H	OH	OH	17H	OD	OD	81H	1000H	22H	8H	18H	42H	69H	60H	10H	OH	1229H
909	A FRAME	930H	OH	OH	17H	OD	OD	84H	1031H	22H	8H	19H	43H	69H	60H	10H	OH	1262H
911	SERVICE TR	983H	OH	OH	17H	OD	OD	88H	1088H	22H	8H	20H	46H	69H	60H	10H	OH	1323H
914	HIGHBED	983H	OH	OH	17H	OD	OD	88H	1088H	22H	8H	20H	46H	69H	60H	10H	OH	1323H
915	LOWBOY	983H	OH	OH	17H	OD	OD	88H	1088H	22H	8H	20H	46H	69H	60H	10H	OH	1323H
916	FUEL TRK	983H	OH	OH	17H	OD	OD	88H	1088H	22H	8H	20H	46H	69H	60H	10H	OH	1323H
918	WATER TRK	983H	OH	OH	17H	OD	OD	88H	1088H	22H	8H	20H	46H	69H	60H	10H	OH	1323H
921	WHOUSEMAN	953H	OH	OH	17H	OD	OD	86H	1056H	22H	8H	19H	44H	69H	60H	10H	OH	1288H
9100	PROJ MGR	5450M	OM	OM	OM	OD	OD	218M	5668M	38M	28M	24M	78M	57M	OM	OM	164M	6057M
9101	A PROJ MGR	4800M	OM	OM	OM	OD	OD	192M	4992M	38M	25M	24M	78M	57M	OM	OM	144M	5358M
9104	NIGHT SUPT	4500M	OM	OM	OM	OD	OD	180M	4680M	38M	23M	24M	78M	57M	OM	OM	135M	5035M
9200	PROJ ENGR	4150M	OM	OM	OM	OD	OD	166M	4316M	38M	22M	24M	78M	57M	OM	OM	125M	4660M
9204	OFFICE ENG	3700M	OM	OM	OM	OD	OD	148M	3848M	38M	19M	24M	78M	57M	OM	OM	111M	4175M
9303	INSTR MAN	3170M	OM	OM	OM	OD	OD	127M	3297M	38M	16M	24M	78M	57M	OM	OM	95M	3605M
9306	CHAINMAN	2725M	OM	OM	OM	OD	OD	109M	2834M	38M	14M	24M	78M	57M	OM	OM	82M	3127M
9307	RODMAN	2750M	OM	OM	OM	OD	OD	110M	2850M	38M	14M	24M	78M	57M	OM	OM	83M	3154M
9400	OFFICE MGR	3380M	OM	OM	OM	OD	OD	135M	3515M	38M	18M	24M	78M	57M	OM	OM	101M	3831M

LORAM CONSTR LTD
LIST OF LABOUR RATES FOR ESTIMATING SYSTEM

P81-5573 TULAMEEN OPEN PIT MINING--B.C.

DIVISION- MINING

TEAM CAPTAIN- G GLAHOLT

STARTING DATE MAY 1 1982 FINISHING DATE YEAR 1997
AGREEMENT WITH CAN ASSC MECH WKRS LOC 22 WORKING 3 SHIFTS----8 HOURS---5 DAYS

RATE CODE	CRAFT CLASS	BASE RATE	ESCAL	OVTME PREM.	SHIFT DIFF.	STAND BY	DAILY SUB	VAC HOL	SUB RATE	UIC	PLPD	CPP	WCB	MEI WEF	UDF	TRAV	PENS	WAGE RATE
9403	ACCOUNTANT	2725M	0M	0M	0M	0D	0D	10.9M	2834M	38M	14M	24M	78M	57M	0M	0M	82M	31274
9407	PAYMASTER	2450M	0M	0M	0M	0D	0D	98M	2548M	38M	13M	24M	78M	57M	0M	0M	74M	28324
9416	SECRETARY	1500M	0M	0M	0M	0D	0D	60M	1560M	38M	8M	24M	78M	57M	0M	0M	45M	18104
9420	GEN CLERK	1400M	0M	0M	0M	0D	0D	56M	1456M	38M	7M	24M	78M	57M	0M	0M	42M	17024
9500	SAFTY DIR	3600M	0M	0M	0M	0D	0D	144M	3744M	38M	19M	24M	78M	57M	0M	0M	108M	40684
9504	1ST AID AT	2800M	0M	0M	0M	0D	0D	112M	2912M	38M	15M	24M	78M	57M	0M	0M	84M	32084
9506	TRAINER	3600M	0M	0M	0M	0D	0D	144M	3744M	38M	19M	24M	78M	57M	0M	0M	108M	40684
9600	M.HSE MGR	2850M	0M	0M	0M	0D	0D	114M	2964M	38M	15M	24M	78M	57M	0M	0M	86M	32624
9700	EQPT SUPT	4800M	0M	0M	0M	0D	0D	192M	4992M	38M	25M	24M	78M	57M	0M	0M	144M	53584
9701	A MST MECH	3950M	0M	0M	0M	0D	0D	158M	4108M	38M	21M	24M	78M	57M	0M	0M	119M	44454
9702	SHOP CLERK	2750M	0M	0M	0M	0D	0D	110M	2860M	38M	14M	24M	78M	57M	0M	0M	83M	31544
9703	LUBE SUPT	3750M	0M	0M	0M	0D	0D	150M	3900M	38M	20M	24M	78M	57M	0M	0M	113M	42304

DATE 07/13/81

LORAM CONSTR LTD
LIST OF LABOUR RATES FOR ESTIMATING SYSTEM

P81-5573 TULAMEEN OPEN PIT MINING--B.C.

DIVISION- MINING

TEAM CAPTAIN- G GLAHOLT

STARTING DATE MAY 1 1982
AGREEMENT WITH CAN ASSC MECH WKRS LOC 22
WORKING DAYS PER MONTH 21.6
WORKING HOURS PER DAY 8.0
WORKING HOURS PER WEEK 40.0

FINISHING DATE YEAR 1997
WORKING 3 SHIFTS----8 HOURS---5 DAYS

VAC/HOL PAY IS 9.00 % OF G UIC $ 8.82 PER WEEK PLPD 0.75 % CPP 1.80 % WCB 4.20 % HOURLY

VAC/HOL PAY IS 0. % OF UIC $ 0. PER WEEK PLPD 0. % CPP 0. % WCB 0. % WEEKLY

VAC/HOL PAY IS 4.00 % OF G UIC $ 8.82 PER WEEK PLPD 0.50 % CPP $ 288.00 PER YR WCB $ 936.00 PER YR MONTHLY

RATE CODE	BASE RATES START	FINISH	IN %*100	SHIFT	HEL/WEF	UDF	PENSION	NO OF RATE INCREMENTS	% OF WORK DONE AT BASERATE	DOWNTIME IN DAYS*10
921	1/ 9/80	30/ 9/81	0	17	69	60	0	0	10000	0
9703	1/ 1/81	31/12/81	0	0	5700	0	300	0	10000	0

Comparison of
Mining Methods

7. COMPARISONS OF MINING METHODS

A. WRIGHT ENGINEERS LTD.

A.1 GENERAL COMMENTS

Where stripping does not consist of materials requiring ripping or blasting, scrapers can be used quite efficiently if the haul distance is not over 1000 M. For efficient production, all scrapers should be pushed and single engined scrapers should be double pushed. A twin engined scraper cannot self-load efficiently except in very light materials .

When scrapers are used to load ripped or blasted material, the operating costs increase dramatically and economic life is correspondingly reduced.

Although scrapers can build a waste dump without using a dozer, dumping and maneuvering time will be increased, particularly when hauling ripped material.

When it is planned to sort reject coal strata material in the pit, this operation will function more efficiently on the day shift, even though artificial lighting is available on other shifts.

Coal extraction is usually handled more efficiently as a separate operation from stripping.

In our experience, the 12G size of grader is too light for pit and access road maintenance.

A.2 RECOMMENDATIONS

To consider the use of scrapers, we would recommend the following changes and/or additions to the equipment selected.

1. Provide 2 push cats for each fleet of 631D or 637D scrapers.
2. Have a dozer on the waste dump. It can also be used as a back-up for the pushers or the dozer rippers.
3. Change the graders from Cat 12G to a Cat 14G or equivalent.
4. Haul reject plant material with a standard 12-14 cy. end dump truck instead of using a scraper.
5. Train loading - A 988B front end loader with a coal bucket should be left at the railway siding. To run the unit between the rail siding and the plant results in additional operating costs, reduction in available life, and creates unwarranted traffic hazards on the access road. This will mean, however, that a 966C should be added to the fleet for plant maintenance.
6. Provide an additional service bay for scrapers.

A.3 COST ESTIMATE

Although the scraper cost estimate followed the equipment selection and criteria outlined in the Wright report, we believe the foregoing changes should be made and the additional costs considered in making an equivalent comparison with Alternate B.

7.B COMPARISON OF MINING METHODS OF LORAM CONSTRUCTION LTD.

B. LORAM CONSTRUCTION LTD.

B.1 GENERAL

A shovel and truck operation was selected in view of economic results experienced on similar projects where rippable materials were encountered. Although the apparent direct costs may be similar, the following factors favour large hole drilling and shooting over ripping:

- assured production and availability of muck by scheduling drill and blast program ahead of loading requirements.
- assured rate of muck production regardless of extreme variations in geologic strata.
- controlled muck pile height for loading efficiency.
- control of muck size for loading efficiency and equipment maintenance economy.

To improve loading and hauling characteristics of the stripping, drilling and light blasting techniques were included.

Coal excavation was done with a 992C and a D9L dozer ripper on the day shift only. 70 ton belly dump haul units transported the coal from the pit to the plant.

The design life feed storage will handle feed for the 2nd shift. A 966C loader will tram from dead storage for the 3rd shift feed requirements.

This will result in the 966C front end loader being available during the day shift for plant maintenance instead of bringing the 988B loader in from the Coalmont rail siding.

Using a shovel in the stripping operation means that the coal seam will be clearly exposed, reducing potential for contamination or unnecessary waste of good coal.

During the latter stages of the pit operation, the 992C loader would undertake stripping excavation on the 2nd and 3rd shifts, replacing the shovel.

A D9L S dozer complete with ripper would be used on the waste dump. It will also provide back-up for either the shovel or loader pit operation.

A 12 cy. end dump is proposed to handle plant reject material on a 3 shift basis. The maintenance sanding truck would provide back-up.

B.2 COST ESTIMATE

The cost estimate for the shop has been increased to allow for larger overhead doors and additional head room which will be required for the proposed fleet.

B.3 SUMMARY

The proposed fleet has sufficient production capacity to complete pit operations in 12 years without adding additional units.

Form of Contract - Recommendations

8. FORM OF CONTRACT - RECOMMENDATIONS

The contract form must offer the owner the best job on the most cost efficient basis. The Owner must consider the amount of input required by his own personnel, the advancement of pre-engineering and the variables which might occur during both the life of the contract and life of the mine.

For the Tulameen Project, we recommend that the Owner consider and evaluate two contract formats; (a) Unit Price or Lump Sum and (b) Target Form Contract.

(a) Unit Price or Lump Sum

This form of contract is most familiar to both Owner and Contractor. Initially, the Owner or a selected Engineer Manager will request potential bidders to pre-qualify for the Work to be tendered. A "short list" is prepared of qualified contractors (with suitable mining experience and depth) and the engineering documents are prepared for the tender. Contractors will develop their bids and submit to Owner. The successful Contractor will commence work and proceed to conclusion. This contract form is particularly suitable when:

1. There is adequate time to prepare the tender package.
2. All the pre-engineering and assessment evaluations are completed.

3. All the variables may be assessed beforehand.
4. Climatic and geotechnical conditions are well known.
5. The Owner has the human resources to inspect and survey the project on a regular basis.

When the Owner is able to quantify the variables prior to the tendering procedure, a unit price/lump sum contract should be considered. Contractors tendering are able to assess the risks and build the cost of the risk into his estimate. Where little information is available, the risk increases and is reflected into the estimate.

At Tulameen, a minimum contract term of approximately 3 years will allow the Contractor to recover the cost of the short life equipment; i.e. tractors, pick-ups, graders. This will reduce overall unit costs to the Owner as the Contractor minimizes his risk. Long life mine equipment, end dumps, drills, shovels supplied by the Contractor should be subject to a "Buy-Out" by the Owner either with first right of refusal or by a negotiated formula at the outset of the Contract. Escalations protect the Contractor and reduce the risk money otherwise necessarily included in the firm price.

(b) Target Contract

This incentive contract form permits the Owner and Contractor to work on an amicable basis when time is of the greatest es-

sence and when job conditions and variables cannot be reasonably quantified at the outset of the project. The estimate of costs is developed with the cooperation of Contractor and Owner and is adjusted for changes in quantities and changes in job conditions as originally contemplated. The target estimate is developed without the contingencies for risk found in the "hard money" unit price/lump sum contract. The Contractor works for a guaranteed rate of return and either shares in underruns or suffers fee erosion due to overruns.

The Target Contract facilitates an early start to the mine development and continuity of the operations should the Owner desire to take over the works on a turn-key basis. Under the "Target" concept, a smooth transition may be achieved as the Owner assumes on a coordinated management of the day-to-day operations and at the same time acquiries the Contractor's secondary level of management as his own.

In a target contract the Owner may wish to purchase the long life mine equipment early and place it under the management of the Contractor. This will produce the following:

(i) Economies of scale during the initial development because of the utilization of larger mining equipment;

(ii) Continuity of operation during the Owner-Contractor transition.

A brief explanation of the target contract follows:

BASIS OF A TARGET ESTIMATE CONTRACT

Philosophy Behind A Target Contract:

To give the Owner what he wants or requires as economically as possible within the time limits realistically required by the Owner, and to do this within the budgeted costs of both the Owner and the Contractor.

What a Target Contract Is:

The Contractor, in close association with the Owner, makes his best estimate of the cost of performing the work. The Contractor's fee is agreed in advance. On completion of the work, if the actual cost of the work is less than the Target Estimate cost, then the Owner and the Contractor benefit by sharing the savings. If the actual costs exceed the Target Estimate, the Contractor's fee is reduced. When special achievements are necessary or desirable a system of Incentive Bonuses for the Contractor are incorporated into the Contract. The Owner ultimately pays only what the work has actually cost plus the Contractor's fees.

Reasons For Employing A Target Contract:

For most heavy construction projects carried out in recent years time has been a very inportant factor. This circumstance has come about for many reasons, but chief among these has been the pressing requirement to minimize the time between financing and profit generation. As a result, many Owners have not had the time to devote to exhaustive exploratory and design procedures or long tendering periods, not have they had the resources or been inclined to face extra expenditures. Yet without the necessary long lead time, and sometimes even with it, significant design changes often occur, or circumstances that could not have been anticipated by either the Owner or Contractor develop. Under a Unit Price or Fixed Price Contract if one or all of the aspects mentioned above happen, disagreement between the Contractor and Owner is bound to occur, unless the Owner is cognizant of the changes and prepared to accept the costs attached thereto. Generally speaking, the more stringent the specification is made in an attempt to anticipate unknown situations, the more contingent money all contractors are forced to incorporate into a firm price bid to cover added risk assumed. These funds may or may not be spent. The end conclusion being that there very rarely is an absolutely firm or fixed price contract unless there is a totally inflexible set of circumstances attached to such a price, or for what is commonly thought of as a Fixed Price Contract, the Owner often pays a premium which may or may not assure him of knowing his ultimate end price as he may still face a Claim for extra payment caused by inadequate or incorrect interpretation of information supplied at the time of tendering.

By utilizing a Target Type Contract the Owner gains the following advantages, not necessarily listed in the order of their importance nor all-inclusive.

1. It establishes a mutually acceptable estimate and cash flow schedule which provide the Owner with an accurate and reasonable budgetary control.

2. It retains the necessary degree of control required by the Owner's representative through a system of expenditure and operation approvals designed to allow the work to progress with the minimum of hinderance.

3. It creates an effective working relationship between the Owner, Engineer and the Contractor which, on completed projects, has resulted in completion of the work ahead of, or on schedule, to the satisfaction of all concerned. In Loram International Ltd. experience this has meant many repeat Target Contracts for the same Owner.

4. It reduces the cause for claims and other disputes.

5. Changes required in the work resulting in increases or decreases of cost are more easily incorporated during the course of the work under a Target Type of Contract. The Owner maintains the maximum economy and control over costs and performance of the work. The schedule can be accelerated of decelerated and costs kept to a minimum.

6. The Target Contract provides an ideal vehicle for resolving substantial claim situations and allows the Owner to mutally agree with the Contractor what steps and costs are involved in achieving the construction schedule, or an accelerated construction schedule for meeting original completion dates. Or it allows the Owner, with the full aid of the Contractor, to choose his most economical solution to any problem that might arise.

7. If the scope of work is known, yet the individual quantities are such that they cannot be determined accurately, a Target allows for an equitable and flexible contract thus allowing the Owner maximum advantage and control.

8. The best interests of the Owner are served by providing the Contractor with an incentive to keep costs to a minimum.

9. It provides the Owner with a known cost for a basic fleet of equipment to carry out the work as described in the schedule of quantities and within the time requirements of the Contract.

10. The contractor is not forced to include potential contingency and risk factors in his price as he would be forced to do on a firm price basis. In a Target Estimate Contract the Owner pays only for what does in fact happen, not for everything which the Contractor feels might happen when making a firm price bid. Thus the Target Type of Contract offers considerable economies to the Owner over a firm unit price or lump sum contract. If there are known contingent situations the Owner allows for these in his overall budget.

12. By mutually agreeing to a Target cost the Owner is reasonably assured of the end cost of the constuction contemplated. By offering to share in a Target Over-run the Contractor is demonstrating his belief in the Target Figure and his ability to meet it, thus the retention to the Owner's benefit of the project management's best efforts to meet the estimated costs and it possible effect a cost savings.

13. The Target Contract reduces the need for duplicated engineering, supervisory and administrative staff services and accordingly reduces the end cost of the work.

14. Design and tendering lead time can be greatly reduced as the final design need not be completed prior to commencement of construction.

The following is a typical formula for arriving at a participating Cost plus Fee Target Contract.

1. The Contractor develops an estimate of cost for completing the project. This estimate is based on the quantities of work encompassed by the Tender Schedule as for a Unit Price Contract.

2. The Contractor will specify a lump sum, or a rental schedule to cover the ownership costs for supplying the necessary equipment to complete the scope of work, as outlined in the Tender Schedule, by the completion date required. Ownership costs are defined as equipment depreciation, equipment financing, and return on equipment investment. Equipment is defined as all major mobile and fixed plant directly associated with production or supervision of production and ususally excludes buildings, small tools, shop, service office and warehouse tools.

3. The Contractor will receive % of the target cost for head office supervision of services. This is an operating charge representing costs incurred by the Contractor on behalf of the project by its head office personnel and its costs of doing business. This charge will be paid regardless of outcome of actual costs versus target costs.

4. The Contractor will receive % of the target costs for profit. This fee is to be subject to adjustment under participation formula.

5. The Contactor will participate in any cost savings to the Owner as represented by an under-run of actual cost versus target cost. Such participation will be % of the savings up to dollars under-run and % of any additinal under-run. This fee will be paid as Incentive to Achieve a Cost Savings.

   The contractor will participate in any over-run cost as represented by an over-run in cost as represented by an over-run in actual cost versus target cost. Such participation will be % of the over-run up to dollars over-run and % of any additional over-run with the limitation that the profit fee as set out in item 4 above can never be reduced to less than % of the target costs.

6. Various bonus clauses can be introduced to cover specific or desired achievements such as early completion.

7. The Contractor will be reimbursed for all actual costs of construction and project management. The Owner shall set up a revolving fund by advancing to the Contractor funds from which the Contractor will liquidate its costs which are reimbursable as part of the actual costs of the work. Actual costs are defined as all proper and reasonably necessary expenditures incurred in performing the work, whether direct, or indirect expenditures. Direct expenditures shall be all expenditures directly applicable to and necessary for the performance of the work, exclusive of the Contractor's general officers' salaries and expenses and other head office expenses as covered under operating charge; exclusive also of equipment ownership expenses as covered under equipment ownership charge; and exclusive of profit as covered by profit fee. Indirect expenditures shall be all expenditures indirectly applicable to and necessary for the performance of the work exclusive of the above mentioned coverages of operating charge, equipment ownership charge and profit fee.

8. The target cost will require adjustment in proportion to the work which shall have been performed compared to the quantities estimated in the aforementioned Tender Schedule; the Unit Prices remaining fixed. When circumstances warrant, new unit prices will be developed and mutually agreed to accommodate changed conditions. The original target cost will also be adjusted by the addition thereto of the cost of any additional items necessary to complete work which was not contemplated at the time of making the original estimate or which could be classified as "extra work" and not included in the specifications. This adjusted target cost will be the basis for calculating the operating charge, profit fee and participation. An upwards variation in this target cost of % or more will signify a change in the scope of the work and require and increase in the equipment charge.

The above is a very general approach to a Target Contract and can be expanded as desired. In any event, negotiations are required to reach a mutually satisfactory Contract as each project requires a Contract tailored specifically to satisfy the conditions unique to that project and Owner.