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CANADIAN MINE ENTERPRISES LTD.

MINING CONTRACTORS

745 CLARK DRIVE, VANCOUVER, B.C. V5L 3J3

August 19, 1975

REPORT ON GROUND FALL OF AUGUST 12, 1975 IN MAIN DECLINE

The following are correlated facts leading to the caving of main decline starting from August 3, 1975 up to and including August 12, 1975.

AUGUST 3, 1975: On this date the Rockbolt Jumbo was bolting at the face (beginning of afternoon shift) when the right wall, approximately 50 feet back from steel set #1 fell next to Jumbo, exposing an area approximately 6 feet high off footwall of decline and 4 feet deep X 10 feet long. 102 bolts were installed in the immediate area and ground movement seemed to have stopped. Advance in decline continued with close pattern on installation of bolts and straps being carried with each round.

AUGUST 6, 1975: At this time main decline was reduced in size to 12' x 12' with an arch beginning at the 6' mark from footwall. Prior to reducing size of decline the fault had been defined as to dip and thickness (August 5/75). Overbreak on prior three rounds (August 4 - 5/75, inclusive) was approximately 2' on left wall and 1' on back. After reducing size to 12' x 12', the tunnel size after each blast became approximately 14' x 14' with the arch maintaining itself.

AUGUST 8, 1975 : Left wall was noticed to be peeling behind face and crews were instructed to pop loose at the 5' mark above footwall (left wall) and install screen and bolts with straps. This work was carried out and any movement in the rock stopped.

AUGUST 9, 1975: Encountering stable ground within the 12'x 12' section and with no overbreak, slashing on right wall was commenced in co-ordination with advance to obtain a 14 x 14 finished section in decline. Right wall was exceptionally stable with no problems encountered in slashing.

AUGUST 10 - 12, 1975: Advance continued with bolts and straps installed and ground being competent. Graveyard shift (August 11/75) reported some sluffing off the back and left arch in previously screened area of fault. On dayshift (August 12/75) 8:00 A.M. writer inspected said area, and instructed crews to finish bolting at the face and move equipment out in preparation for application of Shotcrete in area of fault. Work was commenced on surface to prepare Shotcrete Plant for use underground and application of Shotcrete commenced at approximately 5:00 P.M. (August 12, 1975). Crews were instructed to apply same at area of first sluffing of right (August 3, 1975). Prior to installation of shotcrete, crews were instructed to pop loose off of left arch in area of fault on left wall above screened area approximately 150' back from face.

As Shotcreting progressed (up until 10:00 P.M. August 12) ground continued to peel in faulted area and at 10:30 P.M. approximately 80 tons of rock fell out of left back and arch in faulted area immediately in front of the crew at work. Area was inspected and crews were instructed to start installing steel arch sets from a safe area (170' from face) towards caved area. Two sets were installed and blocked, up until 8:00 A.M. August 13, 1975. At approximately 6:30 A.M. August 16/75 crews were installing steel set # 7 and in process of bringing materials down decline, when area immediately above # 7 set caved to approximately 15 - 20 feet above set. Sets # 1 - 6 inclusive remained intact with fallen rock piled up to the top of #6 set. Work was halted at this point.

Larry Seeland



PROJECT MANAGER
Canadian Mine Enterprises
Faro, Y.T.

LS/vr

Aug. 17/75

Summary of Alternatives (Proceeding through caved area).

1) Mining Alternative	\$ 165,000	(21 days)
2) Steel Arches & Plate Alternative	\$ 183,000	(32 ")
3) Multiplate Culvert Alternative	\$ 233,000	(46 ")
5) Concrete Plug - (i) Readimix	\$ 190,000	(23 ")
(ii) Batch Plant	\$ 182,000	(27 ")

Notes: The mining alternative saves 35' of vent raise access drift over the original plan. (i.e. ~\$7,000 savings, bringing the mining alternative down to \$158,000).

If delivery times on #2 + #3 can be speeded up savings of \$4200/day or \$29000/week could be realized.

1) Mining Alternative

Additional footage:	600' @ \$200/ft	\$120,000
Lump Sum charge:	\$1200/day x 21 days	25,200
Shotcrete rental:	\$70 x 21	1,500
Other Lost Plus Work:	40 mhrs/day x \$13/hr. x 21	10,900
	20 Cathrs./day x \$17.50 x 21	<u>7,300</u>
		164,900.

COST: \$165,000 (21 days)

2) Install Steel Arches on 4' Centres + Tight Line with 1/2" Plate Alternative

Required length: 40', ∴ 11 Arches. (13' high x 13' wide).

Plate required/ft. tunnel:

$$\text{Flat: } 6.5' + 6.5' = 13 \text{ ft}^2/\text{ft. advance.}$$

$$\text{Arch: } \frac{\pi D}{2} \times 1' = 20.4 \text{ ft}^2/\text{ft. advance.}$$

Delivery: Arches: (1+1) = 2 weeks to site

Plate: (3+1) = 4 weeks to site.

* quoted.

(used in analysis) or (2+1) = 3 weeks to site (assuming 1wk. faster delivery)

Installation: Muck, set 1 set: 8hrs.

Weld 8hrs.

Push & install 8hrs.

24hrs → 4' advance.

∴ $\frac{40'}{4} = 10 \text{ days} + 1 \text{ day clean up} = 11 \text{ days.}$

<u>Costs:</u>	Arches. 11 x \$620/arch. job site	\$6,800
	Plate: Flat: $13\frac{1}{2}\text{ft} \times 20.4\frac{\text{lb}}{\text{ft}^2} \times .25\frac{\text{ft}}{\text{lb}} = 66.30/\text{ft}$	
	Arch: $20.4\text{ft}^2 \times 20.4 \times 0.40 = 166.70/\text{ft}$	
		\$233.00/ft
	$40' \times 233.00/\text{ft}$	9,300
	Hydraulic Jack rental. (guesstimate)	2,500
	Plant Down Time (3 weeks ^{total} delivery)	
	14 days @ \$4200/day (assumes fast delivery)	58,800
	7 " @ \$5700/day	39,900.
	Demob. & remob. 12 crew, 12 x 210	2,500
	Installation: 11 days @ \$5700/day	62,700.
		<u>\$182,500</u>

<u>COST:</u>	<u>\$182,000</u>	(fast delivery) (32 days)
<u>COST:</u>	<u>\$212,000</u>	(quoted delivery (7 days x \$4200/day additional)) (39 days)

③ Install Multiplate Culvert Alternative

The proper material for u/g installation is liner plate (delivery (10+1) weeks) as it is easier to put together. It is very debatable whether multiplate (delivery (4+1) weeks) could be put together underground. For this comparison it is assumed that the multiplate can be put together u/g as the liner plate delivery is unrealistic. Installation is estimated @ 4' /day; 40' required.

<u>Costs</u> :	40' Multiplate (13'φ, 14") @ \$226/ft, job site.	\$ 9000
	Ram rental from Armco	1000
	Plant Down Time: (5wks. delivery time)	
	28 days @ \$4200/day	117,600
	Demob & remob 12 crew @ \$210/ea.	2,500
	7 days @ \$5700/day	39,900
	62,700	
	Installation : 11 days (10+1) @ \$5700/day	62,700
		<u>232,700</u>

COST: 232,000 (46 days)

④ Plant Down Time ^{Daily} Costs :

(i) With full complement

Labour : 175 mhrs x \$14/hr = \$2450

Contractor's fee: 24hrs x \$30/hr = 720

Lump Sum : \$1200/day 1200.

Shotcrete Plant: 2200/30 70.

Plant Rental \$50/hr. 1200

\$5640

∴ Full Plant Down Time Daily Cost: \$5700

(ii) With reduced complement (less 6 miners, 4 mechanics, 2 surveyors)

Labour : 67 mhrs x \$14/hr. = \$940

Remaining items as above. 3190

\$4130

∴ Reduced Plant Down Time Daily Cost: \$4200

5) Borehole - Concrete Alternative.

Muck out rock, drill hole from surface & fill with concrete. Leave "bulkhead" of muck to prevent filling of far end of drift. Method assumes someone to muck out under open back. Void to be filled approx. 20' x 30' x 27' or 600 yds³. Redimix (3000 PSI) from Whitehorse is \$44.75/yd³ plus \$80.50/yd³ freight (\$0.35/yd³/loaded mile). A batch plant would require 7-10 days to set-up & get running in an emergency (2-3 wks. normally). Estimated price for batch plant is \$85/yd³. (Concrete prices from General Enterprises, Whitehorse).

Costs (1) Readimix

600 yds ³ concrete @ \$125/yd	\$ 75,000
Drill hole: 350' @ 14"/ft.	4,900.
Access road, set-up, etc. (15 hrs. @ \$31.50/hr.) +\$125 misc.	600.
Down Time: Drill hole: 2 days.	
Haul Concrete: 4 days	
Set. 14 "	
Mine thru. 3	
23 days.	
of which, say, 7 @ \$5700	39,900
26 @ 4200	67,200
Demob & remob 12 crew (12 x 210)	2,500
	\$ 190,100

COST: 190,000 (23 days)

Notes: While drilling surface hole w/g crew mucks out heading. For concrete haul, assumed 9 trucks @ 2 trips/day = 18 loads or 144 yds³/day.

(ii) Batch Plant Concrete

Concrete: $600 \text{ yds}^3 @ \$85/\text{yd}^3 =$ \$51,000
Drill hole & access road. 5,000.

Downtime: Mobilize batch plant: 8 days.

Pour concrete. 2 "

Set 14 "

Mine. 3

27 days.

of which, say: 7 days @ \$5700/day \$39,900
20 " @ \$4200/ " 84,000.

Demob & Mobilize 12 new.

2,500
\$ 182,400

Cost: 182,000 (27 days)

Notes: Muck out mfg & drill surface hole while waiting to mobilize batch plant.

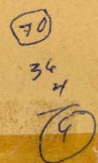
ATT A MCDUGALL

STEEL ESTI AMATES:

13' DIAMETER MULTI PLATE 226.00 DOLLATS PER FT
FOB JOB SITE

7 FT DIAMETER STEEL ARCH 40.00 DOLLARS PR FT FOB JOB SITE +
STEELL ARCH SETS 620.00 PER SET FOB JOB SITE ←

LINEAR PLATE
256.00
1000



550 + ACCESS

IS THIS ALL U NEED MR MCDUFGALL

CUNADIAN MINE SERVICES LTD
FARO

ATT: AJ MCDUGALL

MULTI-PLATE A 4 WEEKS

4x1

LINER PLATE 10 WEEKS

STEEL ARCH SETS (70) - 20/WEEK FIRST DELIVERY AUGUST 29.

STEEL ARCH 1/2'' PLATE - 3 WEEKS (SEE NOTE BELOW)

N B STEEL ARCH 1/2'' PLATE - ^{3x1} SONE LEG TO BE WELDED IN FIELD AS
DELIVERY ON PLAE LARGER THAN 30 FEET VERY POOR.

A RICKABY

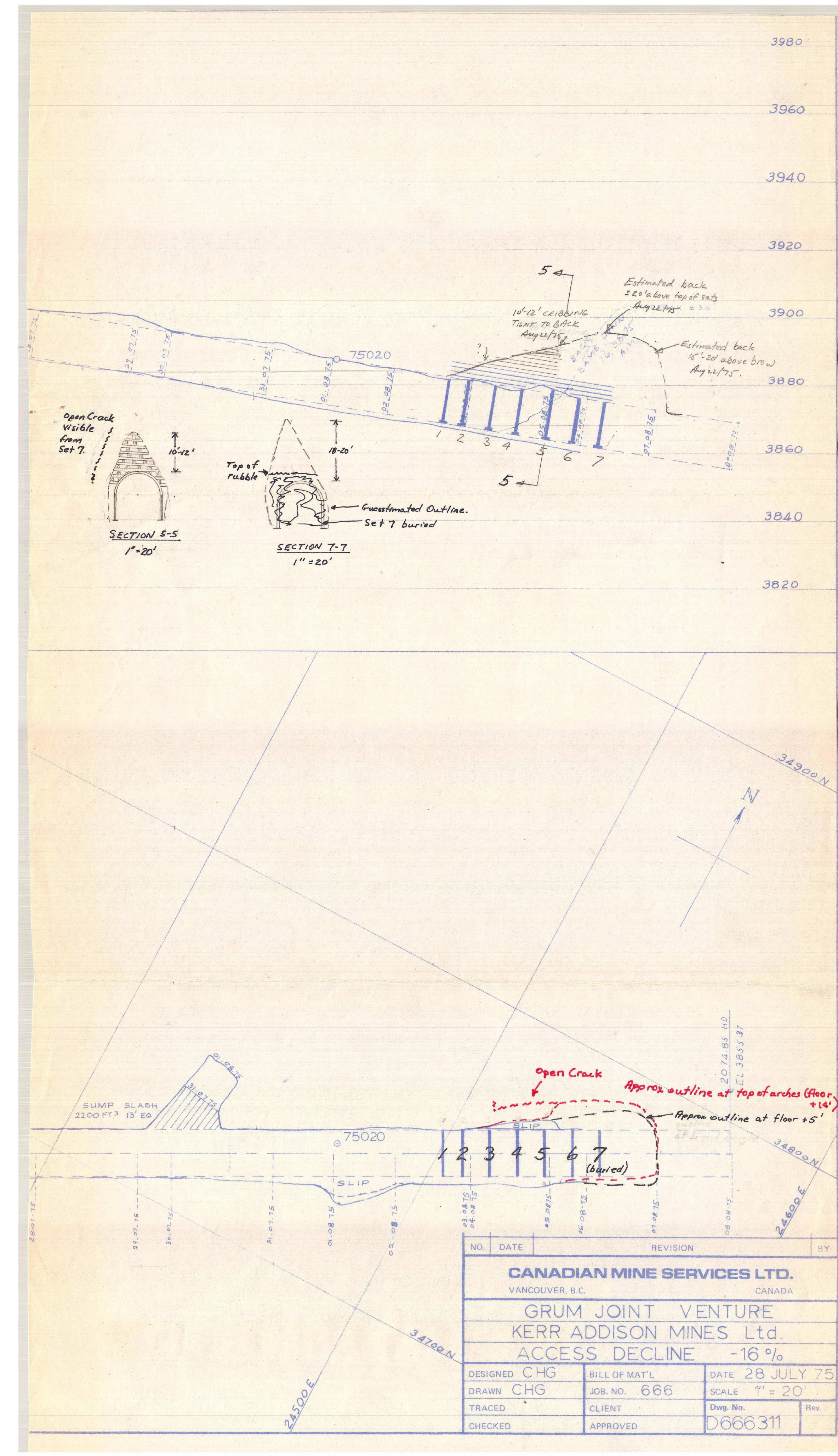
CORRECTION: SONE LEG... SHUD READ ONE LEG...

TKS

VCANMS VCR

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CANMS FARO



NO.	DATE	REVISION	BY
CANADIAN MINE SERVICES LTD.			
VANCOUVER, B.C.		CANADA	
GRUM JOINT VENTURE			
KERR ADDISON MINES Ltd.			
ACCESS DECLINE -16%			
DESIGNED	CHG	BILL OF MAT'L	DATE 28 JULY 75
DRAWN	CHG	JOB NO. 666	SCALE 1" = 20'
TRACED		CLIENT	Dep No.
CHECKED		APPROVED	D666311