

## ENGINEERING REVIEW MEETING

Attending: K. Forgaard      R. Visagie      R. Bourke      H. Upton ✓  
 M. Felley ✓      G. Grams      T. Cloutier      R. Grant  
 G. Jilson ✓      P. Clarke

An Engineering Review Meeting was held at the Faro minesite on August 13, 1986. Ten key concerns were addressed, and responsibilities assigned to various individuals and groups.

1. Port Sampling and Assaying

Discontinue port sampling, except for moisture and ship loading samples. May have to reinstate port sampling if a large inventory accumulates.

Ship loading samples are to be 50 ml taken every 50 tonnes (as per weightometer) on a per-hold basis. Samples are to be composited. R. Bourke will split composite samples on site (mine) and also send check samples to other labs. K. Forgaard will set up metallurgical reconciliation.

M. Felley will use a rolling average from the pots for financial purposes and ship invoices.

2. Zero Discharge At Pumphouse

G. Grams to supervise IWS on well installation and also to determine best means of measuring discharge from the pumphouse reservoir to the Rose Creek Diversion.

Water requirement for Mill is estimated to be 7,500 IGPM, of which 5,000 IGPM will come from the existing reservoir.

A public hearing will be required on the issue of Zero discharge. Required letters and applications will be written by R. Grant.

Curragh will also approach the YTWB to eliminate the 1,000 IGPM spill on an emergency basis.

3. Abandonment Plan

The current Abandonment Plan is not possible to implement. SRK is to edit their recent report to show major deficiencies in previous work. Report ready by 15 September, 1986.

M. Felley to write letter detailing proposed testing plan and works, plus request 12-month continuance. Scope of project must be redefined.

R. Bourke revising tailings deposition plan.

4. Crossing of North Fork, Rose Creek

G. Grams to supervise D. Campbell on detailed conceptual design. Report plus economics to be brought together by first week in September so meeting with Fisheries can be set up for mid to late week of 8 - 12 September.

5. Faro and Vangorda Mine Planning (Long Range)

First priority is short-term planning, ie. Faro Pit. G. Jilson will have new model of Phase 'A' by 4-5 September. T. Cloutier and K. Atherton to schedule Faro Pit, and sequence Plateau deposits.

Last schedule using latest model and information to be complete by October 1.

6. Computer Based Cost System

K. Forgaard coordinating evaluation and purchase of new system. Target date is 1 November for installation.

7. 1987 Budget

This will be based on schedules developed by Cloutier and Atherton as in point 5. Target date is also 1 October.

8. Coal and Lime Supply

G. Jilson has made an application for surface leases to cover limestone supply near Whitehorse.

Coal supply is sufficient for this year, but will require evaluation in early 1987. G. Jilson to examine alternate supplies as far as Dawson.

9. Faro Pit Dewatering

Seismic program indicates depth of overburden in Faro Valley too deep for successful well point interception.

Faro Creek Diversion appears to be leaking greatest amount along Zone of bedrock outcrop.

Grams and Cloutier to install new ditches (as required) on east wall. Old ditches will be rehabilitated if possible. Contractor on site mid-September. No work to be done on Faro Creek Diversion.

Wells in pits to be installed if and when possible - operating room is the main constraint.

10. Stability of Pit Walls

Greatest benefit will be realized by controlling surface water.

Most failures appear to be shallow, ie. not deep seated major failures. However, particular attention must be given to the east wall of AY Pit in the vicinity of the designed ramp.

A program is now being set up to monitor wall movements.

G. Grams  
Chief Engineer

To: Engineering planning meeting attendees  
From: Gregg Jilson  
Date: Aug. 12, 1986

Re: Engineering and geological activities undertaken by the  
Whitehorse office

Faro Long Range Planning

A new model is being constructed to cover the northeast portion of Zone III and eventually all of Zone III.

This model is based on a new geologic interpretation by R.S. Tolbert modified in places to reflect new information. All new drilling information will be taken into account.

Block size will be 35' X 25' <sup>x20'</sup> high. Geologic control will be by 70' spaced cross sections (locally 35' sections where needed). Model orientation has been rotated 45° to conform to geologic sections. This design will provide reasonably good geologic control for block geology and will allow the use of different bench heights if required to optimize mining effectiveness.

Interpolation parameters will be determined shortly in conjunction with Faro users.

At present sections 117 + 000 to 121 000 are simplified and 50% are digitized ready for entry to model. The remainder will be finished by August 20. Sections from 121 to 124 will be added after that. This will cover the entire part of the deposit where the old geologic interpretation was used in the current mine model (the FI Model). It also covers all of AY and the bulk of the BY phase.

The estimated completion date of the model for this portion of the deposit is September 1.

Because of the hurried nature of model construction I recommended not planning to use the derived reserves for at least one additional week to allow for verification of the model.

My confidence in the bench geology and hence the bench reserves will be increased significantly - a factor of 2 to 4 times more confident.

As with recent models this model will tend to sharpen the grade distinctions between ore types. This will result in a tendency to report higher grades but lower tonnes as the FI model did with respect to older models. This means that the historically accepted mine call factor of -5% to the grade will have to be revised just as it must in order to report FI model insitu reserves as mill feed. This factor can only be derived empirically by comparison to production statistics.

Another important factor that all users must be aware of (for all Anvil district models) is that the SG used is the measured SG of the assay pulps interpolated into relevant model blocks. This SG does not account for void space in the insitu rock. Comparative studies indicate that the degree of overstatement of SG is about 5% for quartzose ore types and 5 - 15% for massive ore types depending on the degree of porosity.

### Vangorda Plateau Planning

During June and July new block models were developed for the Grum (above 1100 m elevation) and Vangorda deposits. New preliminary pit designs for both deposits were also produced.

Geologic and Open Pit insitu (ie: unadjusted for dilution) reserves are summarized on attached tables.

The text for a report describing the geology of the district and the deposits, the modeling technique and the pit design parameters has been written. Due to priority having shifted to Faro modeling all work on the Vangorda Plateau has been suspended. It is estimated that with one additional weeks work an interim report describing the reserves developed to date could be completed.

Scheduled mine and plant production capital, infrastructure and manpower requirements <sup>for the Plateau</sup> have not been started. We estimate that 18 days work would be required to develop these schedules, to write documentation and to plot the necessary plans and sections to illustrate a report.

This does not include the work required to integrate the Vangorda and Grum deposits with the various possible pit and stockpile combinations to produce an optimum overall plan. We estimate that at least 16 days should be allotted to accomplish this and produce a document acceptable for presentation.

To summarize there are two options:

- 1.) document work to date in an interim report-7 days from start.
- 2.) complete a coordinated Faro and Vangorda Plateau long term plan and a descriptive document-34 days from start.

Development of the Grum and Vangorda deposits will require considerable preliminary work for regulatory approval. Surface leases will have to be acquired and a plan to divert Vangorda Creek formulated. Environmental baseline data gathering for the Plateau will presumably have to be resumed.

Development work required for the plateau deposits is not extensive but if production is to be advanced a plan for this work must be ready. The primary concerns here are fill in drilling for Vangorda (about 5000') to confirm reserves and

obtain samples for metallurgical testing to evaluate the reputed oxidation of Vangorda ores. At Grum no fill in drilling is needed to define reserves but oriented core holes could be useful to define S<sub>2</sub> orientation along the northeast wall to evaluate slope stability. Due to the extensive thick overburden at Grum action should be taken on various consultants recommendations for dewatering prior to stripping. At present there is no plan existing.

The alignment of the Vangorda Plateau haul road should be studied since a level road is possible as opposed to a more direct road with 70 meters of extra elevation gain from the planned Grum Pit exit.

#### Coal

Other than a preliminary evaluation of Yukon coal resources carried out in February, no work has been conducted on a long term coal supply.

The Ross River coal area appeared to offer the best potential coal at that time.

The Whitehorse Coal Company property was considered but does not offer a suitable product. This property will be visited and sampled however.

The ownership of the Carmacks Coal properties is not totally resolved but it appears that Curragh will inherit these. There is a small amount of coal remaining at the Carmacks pit and apparently potential for underground coal below the pit that has been severely compromised by fires in the existing underground workings. Reclamation of the existing Carmacks coal pit is estimated to require \$250,000. There is considerable potential for exploration for another Carmacks type deposit. An effective exploration programme could be mounted for \$250,000 but there is no assurance that a coal deposit will result and essentially no likelihood that a product superior to past Carmacks coal will be found. This area has been explored for open pit coal in the past.

Tertiary coals in the Pelly Crossing and Dawson areas may offer the best potential for a flat lying deposit of "Ross River" quality coal however there is little known of these occurrences and considerable reconnaissance exploration would be needed.

Short term recommendations for coal are:

- a.) visit and map structure at Ross River
- b.) clarify land position at Carmacks and visit area in late fall to familiarize for an evaluation of exploration potential this winter.
- c.) gather information on existing coal properties from

vendors such as Whitehorse Coal and Teslin Explorations.

d.) up date Northern Cordilleran Mineral Inventory to allow a through inventory of known coal localities and exploration in Yukon. Will cost \$1000 and is useful for all commodities, not just coal. Using that inventory evaluate feasibility and cost of an exploration program for new coal properties, and the potential to restake known occurrences further to property exploration.

e.) investigate feasibility of using detailed multispectral satellite imagery along existing transportation corridors to reconnoiter new coal (and limestone) areas.

### Limestone

The Eagles Nest Bluff area has been staked and a lease application submitted. The Government has acknowledged receipt and is processing application.

This material is considerably "marbleized" and is not likely to be a suitable kiln feed on the basis of grain size.

Other limestone localities in the Whitehorse trough should be investigated but as these are generally reefoid masses and slightly metamorphosed <sup>thus</sup> the potential may not be good.

The Devonian belt crossing the Campbell Highway between Little Salmon and Faro should be evaluated.

Aerial reconnaissance followed by ground visits would appear to be the best approach to look for limestone. Satellite imagery may be a useful adjunct because of the soil pH change over limestone outcrops and likely effect on vegetation.

The large carbonate outcrops between Faro and Ross River are not suitable since they are heavily recrystallized. No unmetamorphosed carbonate bodies of any extent exist in the Anvil Range near roads.



## VANGORDA DEPOSIT - GEOLOGICAL RESERVES - 86-07 MODEL

in-situ reserves - no adjustments

entire deposit, irrespective of pit outlines

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plus 6 %

rock type		% of ore type	tonnes (x1000)	density (tn/bcm)	Pb (%)	Zn (%)	Pb + Zn (%)	Ag (g/t)	Au (g/t)
4A	1	7.1	402.45	2.96	3.17	4.66	7.83	39.74	0.68
4C	2	0.0	1.49	3.69	6.40	1.01	7.41	57.51	1.77
4EC	3	0.4	22.54	3.84	2.97	3.79	6.75	46.65	0.80
4E	4	0.1	4.38	3.61	2.57	4.12	6.69	46.50	0.63
4EG	5	90.8	5,176.72	4.17	4.51	5.83	10.34	64.03	0.75
4EH	6	1.7	94.98	3.84	6.82	5.05	11.87	83.15	0.54
TOTAL		100.0	5,702.56	4.08	4.45	5.72	10.17	62.55	0.74

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4 % to 6 %

rock type		% of ore type	tonnes (x1000)	density (tn/bcm)	Pb (%)	Zn (%)	Pb + Zn (%)	Ag (g/t)	Au (g/t)
4A	1	58.6	1,257.26	2.98	1.86	3.02	4.88	26.48	0.46
4C	2	9.5	204.34	3.44	2.34	2.08	4.42	25.82	0.79
4EC	3	14.1	302.09	3.88	2.28	2.40	4.68	33.18	0.85
4E	4	10.2	218.51	3.95	1.90	2.87	4.77	37.94	0.14
4EG	5	6.7	144.51	3.94	2.47	2.76	5.23	36.96	0.76
4EH	6	0.9	20.14	3.98	2.43	2.95	5.38	34.31	0.41
TOTAL		100.0	2,146.85	3.33	2.01	2.81	4.83	29.30	0.53

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minus 4 %

rock type		% of ore type	tonnes (x1000)	density (tn/bcm)	Pb (%)	Zn (%)	Pb + Zn (%)	Ag (g/t)	Au (g/t)
4A	1	36.2	3,916.93	3.07	0.90	1.44	2.34	12.48	0.33
4C	2	42.8	4,624.43	3.45	0.79	1.00	1.79	14.50	0.65
4EC	3	17.9	1,939.48	3.86	1.33	1.34	2.67	21.57	0.94
4E	4	2.9	314.92	3.84	1.50	1.40	2.90	17.48	0.28
4EG	5	0.1	6.19	3.40	0.67	0.86	1.53	11.66	0.65
4EH	6	0.1	9.57	3.15	0.39	0.49	0.88	5.95	0.08
TOTAL		100.0	10,811.52	3.40	0.95	1.23	2.18	15.12	0.57

1 Aug 86

Grum Deposit  
Geological Reserves (62W - 86W above 1093.4m elev)

insitu reserves - no adjustments

	Tonnes x 1,000,000	Pb	Zn	Ag	Pb+Zn
+4% Pb+Zn New Model (8606 model) "G2"	21.7	3.29	5.55	55.2	8.84
Old Model "G1"	19.0	3.17	5.01	48.4	8.18

1 Aug 86

OPEN PIT RESERVES  
ALL UNADJUSTED FOR DILUTION OR ANYTHING ELSE.

VANGORDA PIT (3W - 29E area of deposit)

Total Waste (incl. overburden)

Tonnes	b. cu. m.
22,058,210	8,831,980

Sulphides

	Tonnes	SG	Pb	Zn	Ag(g/t)	Au(g/t)	Pb+Zn
+6%	4,978,820	4.04	4.51	5.79	63.9	0.72	10.30
4-6%	1,185,490	3.22	2.07	2.89	31.4	0.54	4.96
+4%	6,164,310	3.88	4.04	5.24	57.6	0.68	9.28

GRUM PIT (62W - 86W above 1088.5 m elev.)

Waste

	Tonnes	b.cu.m.
overburden	23,367,000	11,127,000
rock	129,322,000	47,944,000
total	152,689,000	59,071,000

Sulphides

	Tonnes	Pb	Zn	Ag	Au	Pb+Zn
+6%	13,309,000	3.82	6.56	63.8	0.96	10.38
4-6%	4,644,000	1.81	3.16	31.7	0.69	4.97
+4%	17,953,000	3.30	5.68	55.5	0.89	8.98