

Giant
YELLOWKNIFE MINES LIMITED

MEMO TO: S. E. El-Alfy
FROM: D. W. Cooper
DATE: June 2, 1988
SUBJECT: T.R.P. MONTH END REPORT - MAY 1988

1. Operations and Metallurgy

Commissioning of the plant continued on slurry during May. Instrumentation was gradually phased in and tested. Approximately 54,507 S.D.T. of tailings were passed through the CIL portion of the plant at an estimated average grade of 0.060 oz. Au per ton. Automatic sampling units are as yet not completely operational and hand cut samples are being taken. Due to the low density of the plant feed, carbon cannot be transferred up stream since it is not dispersed throughout the tank. A minimum of about 30% solids is required to suspend the carbon.

It was expected that higher densities would have been achieved much earlier so about 165.35 tons (300 bags) of carbon were added directly to the last (No. 6) CIL tank to allow fines to be flushed out most rapidly. The carbon was added on May 1. Cyanide addition was started on May 14 but, due to problems with the mix tank, it was actually added to the circuit on May 17 at a feed rate of about 1.0 lb./ton. On May 31, 50.20 tons of carbon (91 bags) were added to tanks No. 2 and No. 3. This was done to prevent excessive gold loss due to cyanide being consumed prior to tank No. 6 and short-circuiting of the feed material to tank No. 6 and not properly contacting the carbon. The total amount of carbon added including an additional 4.41 tons (8 bags) added to Tank No. 6 from commissioning the kiln results in an average of 15 grams of carbon per litre when divided evenly among 5 tanks. No. 1 Tank will not have carbon initially until the quantity of trash collected in this tank is determined.

Tonnage indicators are not yet correct since the density meters were incorrectly specified for steel pipe. Modifications are underway to correct this problem. The tonnage of tailings mined this month was taken from a survey.

A carbon sample taken from Tank No. 6 on a day that densities permitted assayed at 10.9 oz. Au per ton. This assay on the grab sample is expected to be high since calculations show that the carbon should be about 5.49 oz. Au per ton. The first calculation was made assuming the tons of tailings equalled the tonnage of the feed and the same for the solution portion (i.e. a material balance). The second calculation was made assuming the volume of material in the tailings equalled the volume of material in the feed. Since samples are hand cut, some discrepancies may occur and also since the CIL system had not reached any degree of steady state it is expected that there will be some errors in the first month.

Daily metallurgical calculations will be done using the feed and tailings data on an instantaneous basis rather than accounting for the circuit residence time which may amount to 30 to 40 hours.

For accounting purposes it should be assumed that the first method of calculation is most valid. This indicates a recovery of 20.47% of the gold in the feed loaded to the carbon and a carbon loading of 5.49 oz. Au per ton. The result is 908.38 oz. of gold loaded onto 165.35 tons of carbon. Most of this will be largely non recoverable since the stripping plant may only reduce the loading from 50 ounces per ton to about 5 ounces per ton. This has as yet to be tested in the new plant.

The strip circuit was successfully commissioned using water only. The system was brought up to 60 p.s.i. and 260°F and operated at this condition for 24 hours. The reactivation kiln was also commissioned during May using fresh carbon. This demonstrated the rapid cooling effect of carbon moisture content as well as the effect of breaking down the carbon into fines. It is expected that the greatest loss of carbon to fines will occur in the kiln. The only remaining systems to be operated are the acid/caustic wash and the electrowinning cells. Pumps and agitators have been operated but the pH control system for the acid wash area has not been tested.

It is planned to strip the carbon from the carbon columns to effectively test the strip circuit. This will be done early in June after making some modifications requested by the Mining Inspector and the Gas Inspector.

A clock will be connected to the CIL feed pump to determine operating hours and availability since only a crude estimate can be made for May.

2. Mechanical

The following items required repairs during May that entailed downtime on the plant:

- (a) Settling of the Surge Tank and No. 5 CIL Tank - expansion joints were not sufficiently able to allow for the degree of differential settling and were replaced with hoses;

- (b) Cyanide and Caustic Mix Tanks - were not constructed with baffles causing severe mixing problems. The caustic mix tank has yet to be done;
- (c) Tailings pump and pipeline - air build-up within the tailings line and pump prevented reaching full capacity. This has generally been solved when pumping the short route but the longer route has yet to be tested at elevated (3,000 g.p.m.) flowrates;
- (d) Trash screen underflow pump - pumpbox still overflows slightly but it is anticipated that a speed increase should solve this problem;
- (e) Trommel screen underflow pump - some spillage may always occur here but it should not cause severe problems;
- (f) Trommel screen - settling of the unit and weak bearing supports as well as no axial centering wheels caused premature wear on trunnion wheels and wheel guides. This has been solved and repaired;
- (g) Radial splitters - vortexing of the feed to these splitters and uneven distribution of the discharge was solved by venting the splitters;
- (h) Pump discharge pipe "goose-necks" or loops - caused problems with both the monitor water pumps and tailings pump. These were removed or reduced in size;
- (i) Vibration in Surge Tank - Hayward-Gordon and Kilborn Engineering will have people on site to examine this problem on June 1;
- (j) C.S.A. Approval - some equipment lacked C.S.A. approval: both Ingersoll-Rand compressors, electrowinning rectifiers, Derrick screen oil lubricator and the Toyo pumps. The compressors and associated electrical gear have now been approved and the remaining items will be examined in early June.

3. Electrical

- (a) Barge Pump or Decant Water Pump No. 1 - auto transformer needed replacing after a failure due to what is suspected to be too many starts too often. A new circuit design is underway with a sequencing technique using a P.C.;
- (b) Lightning arrestors were installed on the main power pole on the plant site. This required a power outage for 2 1/2 hours;
- (c) Heat tracing problems were traced to grounding with the metal cladding over the insulation;
- (d) Derrick screens - trash screen No. 2 upper motor was shorting, possibly due to water entering the motor. The unit will be returned to Derrick for repairs;

- (e) Motor No. 501 - monitor water pump bearings on the output end may need replacing. Two spare pumps were connected to supply water for the second monitor;
- (f) New Substation installed at the trommel screen area to replace the diesel generator;
- (g) Modifications were made to the lime mix control strategy to prevent spills on shutdown of the system.

4. Instrumentation

- (a) Lime addition and pH control system - tuning problems were solved and the control valve was replaced due to failure of valve seats;
- (b) Density meter problems were sourced and materials for repairs have been ordered;
- (c) Installation of the new tailings cyanide monitor is proceeding;
- (d) C.I.L. feed flow or variable speed controller and monitor water tank level controller - both failed and were replaced by unused controllers - failed units were sent out for repairs;
- (e) Process Water Tank level transmitter - failure of circuit board - sent out for repairs when new board received.

The failure of the Monitor Water Tank level controller caused a reclaim water spill. The spill penetrated the ground and ran down to Baker Creek. Modifications to the tank overflow and to the monitor water pump balancing flows to prevent a reoccurrence were made and discussed with Mr. Adrian MacDonald of Environment Canada. All flows or potential flows were routed to the thickener area which discharges to the mining or tailings pond area.

D. W. Cooper

/kid

DATE	S H I F T	F E E D			T A I L I N G S		
		SOLIDS		SOLUTION	SOLIDS		SOLUTION
		Au Oz./Ton	% Solids	Au Oz./Ton	Au Oz./Ton	% Solids	Au Oz./Ton
May 15	1	0.054	-	0.0021	0.040	-	0.0020
16	1	0.074	36.45?	0.0027	0.045	4.47	0.0027
	2	0.070	6.43	0.0039	0.045	6.04	0.0027
17	1	0.069	9.84	0.0030	0.041	5.36	0.0025
	2	0.059	7.56	0.0032	0.044	7.81	0.0027
18	1,2	0.061	13.02	0.0034	0.041	-	0.0023
19	1,2	0.062	10.78	0.0022	0.026	8.78	0.0017
20	1	0.048	12.41	0.0035	0.037	6.89	0.0032
	2	0.045	13.25	0.0036	0.040	9.34	0.0032
21	1	0.052	12.10	0.0032	0.040	10.96	0.0030
	2	0.045	17.13	0.0035	0.040	11.75	0.0034
22	1	0.046	15.75	0.0036	0.039	14.30	0.0033
	2	0.045	14.91	0.0033	0.040	12.97	0.0028
23	1	0.042	14.54	0.0032	0.037	15.24	0.0031
	2	0.055	16.09	0.0035	0.047	16.05	0.0027
24	1	0.059	14.44	0.0032	0.053	16.13	0.0028
	2	0.061	14.87	0.0032	0.044	15.60	0.0026
25	1	0.068	22.81	0.0035	0.051	14.80	0.0026
	2	0.063	13.76	0.0030	0.049	14.92	0.0026
26	1	0.062	15.63	0.0022	0.088	15.77	0.0031
	2	0.090	15.14	0.0034	0.056	14.56	0.0026
27	1	0.068	20.34	0.0047	0.058	15.86	0.0021
	2	0.067	19.56	0.0044	0.058	15.60	0.0015
28	1	0.064	25.12	0.0048	0.079	15.78	0.0014
	2	0.077	9.93	0.0033	-	-	-
29	1	0.088	16.76	0.0036	0.080	16.72	0.0014
	2	0.045	14.91	0.0033	0.054	14.14	0.0015
30	1	0.056	18.52	0.0034	0.065	18.52	0.0021
	2	0.044	20.62	0.0034	0.044	20.67	0.0011

1. RECOVERY TO CARBON - BASED ON TONS IN = TONS OUT

	SOLIDS		SOLUTION		SOLIDS Oz. Au	SOLUTION Oz. Au	TOTAL Oz. Au	RECOVERY %
	S.D.T.	Oz. Au/Ton	Tons	Oz. Au/Ton				
Feed	54,507	0.060	343,122	0.0034	3,270,420	1,166,610	4,437,030	100.00
Tails	54,507	0.049	343,122	0.0025	2,670,840	857,810	3,528,650	79.53
Recovered To Carbon					599,580	308,800	908,380	20.47
Initial Loading Locked in Carbon 2.4%							<i>21,801 incorrect - actually all 908,000 are locked in</i>	
In Process 97.60%								
Stripping Recovery 96%							851,116	

May 1988

REAGENT CONSUMPTION - MAY 1988

Reagent	MONTH		YEAR TO DATE	
	lbs	lbs/ton	lbs	lbs/ton
Propane ¹	-	-	-	-
Carbon ²	-	-	-	-
Lime	71,085	1,304	71,085	1,304
Muriatic Acid	-	-	-	-
Caustic Soda	2,480	0.045	2,480	0.045
Sodium Cyanide	28,863	0.530	28,863	0.530
Steel Wool	-	-	-	-

1. Charged to a capital account - used about 55,413 litres.

2. Added 386 bags to tanks for initial carbon charge

$$386 \times 500 \text{ kg} \times 2.2046 = 425,488 \text{ lbs.}$$

Don Cooper
T.R.P. Plant Superintendent

MONTHLY REPORT COMMENTS

$$\text{Adsorpt \%} = \left((E_{21} - E_{26}) + (H_{21} - H_{26}) \right) / \left((E_{21} - E_{26}) + H_{21} \right) \times 100$$

Feed in feed

$$E_{21} = B_{21} \times D_{21}$$

$$\begin{aligned} \text{O}_3 \text{ Au in Feed Solids} &= E_{21} = \text{Feed Tons} \times \text{Feed Assay} \\ E_{26} &= \text{Tail Tons} \times \text{Tails Total ounces} = B_{26} \times D_{26} \end{aligned}$$

$$H_{21} = \text{Reclaim Au ounces} = \text{Tons Reclaim Sol}^n \times \text{Sol}^n \text{ Assay}$$

$$H_{26} = \text{Tails Solution} = F_{26} \times G_{26}$$

$$D_{21} = \text{Feed Assay} = P_{60}$$

$$P_{60} = 0.53 + (1.53 \times (0.53 - 0.553)) / 1.53$$

$$= 1 - \frac{\text{Tails Sol}^n}{\left(\frac{\text{Feed Sol}^n + \text{Reclaim}^n}{\text{Feed ounces} - \text{Tail solution ounces}} \right)} = \frac{\left(\text{Feed Sol}^n + \text{Reclaim}^n \right) - \text{Tails Sol}^n}{\left(\text{Feed} - \text{Tail} \right) + \text{Reclaim}^n}$$