

Section 10

High Cyanide Addition Test

The plant high cyanide addition test was conducted during the week starting September 23, 1988. The set point for cyanide addition was increased from 1.0 to 2.0 lb NaCN/ton dry feed solids.

The enclosed graphs show that relative to the background trending of % gold extraction, this variable did not respond sharply to the increased cyanide. Tailings residual cyanide measurements were not accurate during the test due to an error (new Staff Member) in titrant solution preparation. Cumulative data indicates that there was at least 0.6 lb NaCN/ton solution (300 ppm) present in tailings compared to the norm for 1988 of 0.3 lb/ton.

Cyanide addition is the foremost operating variable from process and operating cost viewpoints. The execution of the plant testwork must be improved on the following points:

- o Maintenance of cyanide addition to target.
- o Take increased cyanide concentration profile data (interstage).
- o Ensure accuracy in solution titration procedures.

Cyanide optimization testwork will continue on a plant scale in 1989. Increased data analysis and depth of technical reporting will be undertaken.

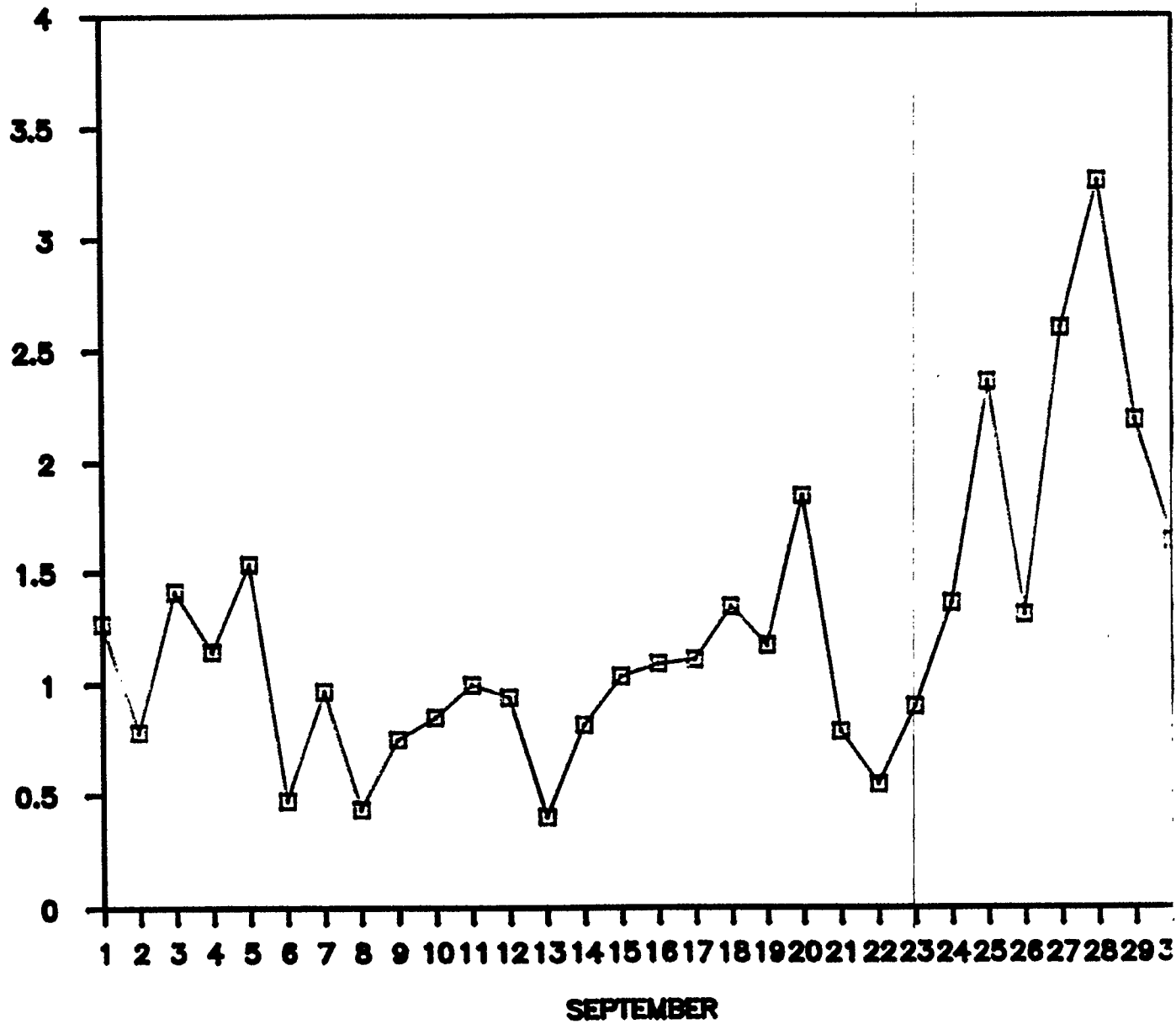
Laboratory Simulation

The data of Dan Kivari in Section 6 suggests that increased cyanide addition by itself may not result in significantly increased gold extraction. Following are the results of 24 hour bottle roll testwork using samples of fresh TRP tailings slurry:

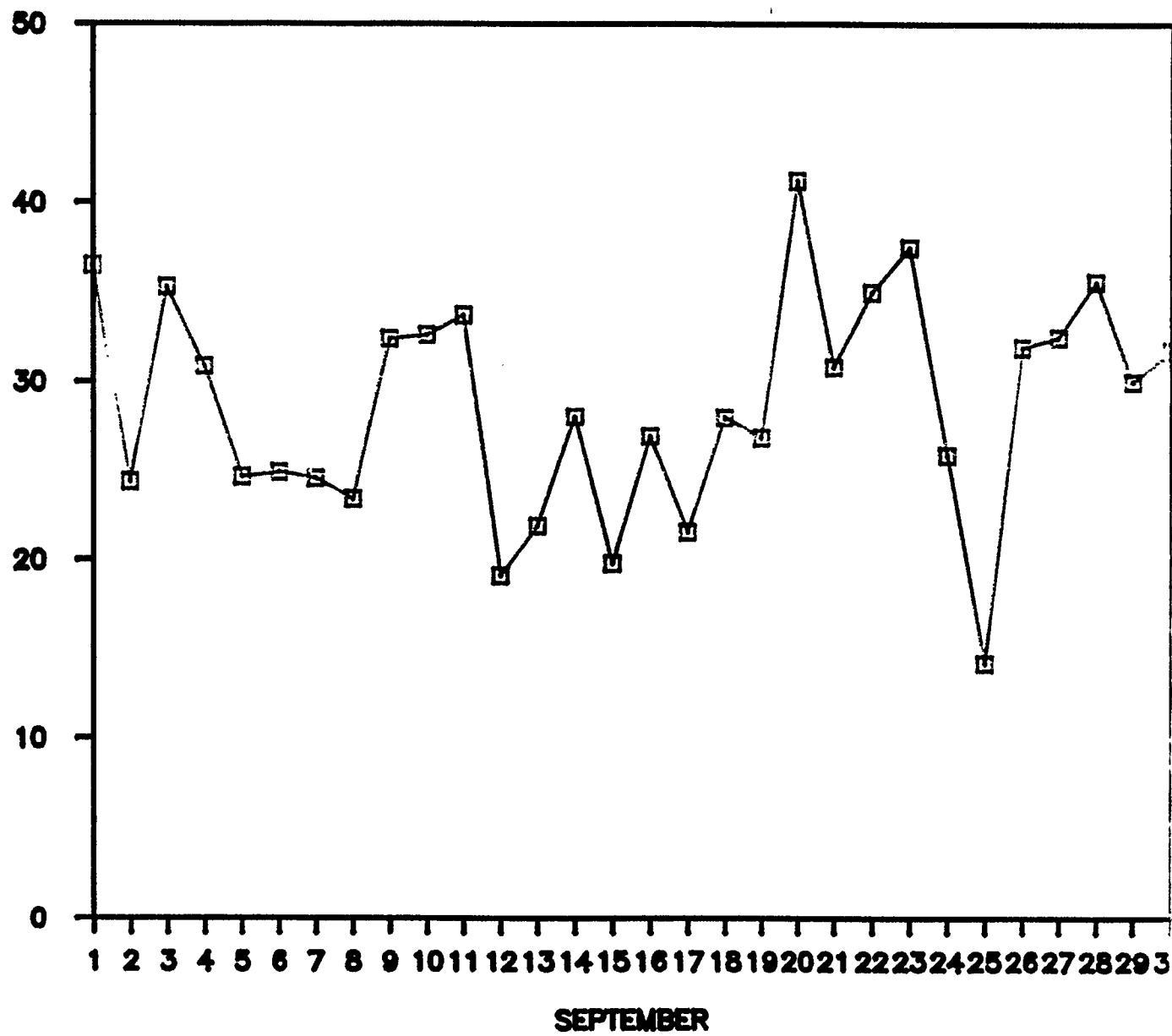
Day	Tailings Solids Assay After 24 hours	Incremental Cyanide lb/ton feed	Residual Free NaCN lb/ton Solution
Oct. 12	0.040	0	0.34
	0.040	0.5	0.60
Oct. 13	0.037	0	0.37
	0.036	0.5	0.42
Oct. 14	0.039	0	0.20
	0.040	0.5	0.31
Oct. 15	0.033	0	0.27
	0.033	0	0.38
Oct. 16	0.038	0	0.31
	0.038	0.5	0.53

D.R. Bartlett
November 7, 1988

SEPTEMBER CIL CYANIDE CONSUMED lb/ton



SEPTEMBER CIL RECOVERIES



CIL TANK PROFILE

SEPT. 24 to 28, 1988 AVERAGES

TANK FEED	ASSAY SOLIDS	oz Au/TON SOLUTION	pH	CN lb/ton	% SOLIDS
SURGE	0.0528	0.0037	10.30	0.022	
1	0.0584	0.0048	10.27	0.052	36.90
2	0.0514	0.0055	10.50	0.264	36.90
3	0.0492	0.0046	10.56	0.406	36.80
4	0.0490	0.0029	10.64	0.518	35.60
5	0.0500	0.0019	10.56	0.540	35.40
6	0.0490	0.0011	10.51	0.464	35.40
TAILS	0.0486	0.0010	10.47	0.376	

Bryan Cross
Nov 15/88

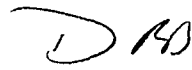
Giant
YELLOWKNIFE MINES LIMITED

MEMO TO: D. Cooper
CC: J.S. McAlpine, S.E. El-Alfy
FROM: D. Bartlett
DATE: October 27, 1988
SUBJECT: TRP Projected Cyanide Usage

TRP performance for the 1988 season was a NaCN addition of 1.0 lb/ton of feed and a residual free NaCN level of 0.3 lb/ton of solution (150 ppm). Assuming the average density to be 37.5% solids, the above data indicate that 50% of the NaCN added was consumed by cyanicides in the feed. The remaining 50% reported as free cyanide in TRP tailings solution.

The question is how low can the cyanide addition be reduced without sacrificing gold extraction or incur precipitation of dissolved gold on reactive sulphides? A critical tailings free cyanide level is required to ensure maximum gold recovery to carbon. The reactivity of sulphide minerals in GYML tailings is low (reducing power <100) and thus the possibility of gold precipitation may not be significant. My feeling is that the NaCN addition can be reduced to 0.6 - 0.75 lb/ton without ill effect. This question can be investigated over the winter using bottle roll lab tests on a one week composite slurry sample I have prepared.

There is the potential to significantly reduce TRP operating costs or improve cyanide inventory. The operating control strategy for cyanide addition will also deserve scrutiny to be compatible with a reduced margin for error.


Doug Bartlett

Giant
YELLOWKNIFE MINES LIMITED

MEMO TO: D. Cooper
CC: J.S. McAlpine, S.E. El-Alfy
FROM: D. Bartlett
DATE: October 27, 1988
SUBJECT: Free Cyanide Titration - TRP Tailings

During the week of Sept. 25 - Oct. 1, 1988, the measured free cyanide concentration of TRP tailings was in the 3.0 lb/ton range versus the usual 0.3 lb/ton. The cyanide addition had been doubled during this test period from 1.0 to 2.0 lb/ton of feed, but this gross effect on the tailings cyanide measurement was impossible unless some other ions were reacting with the AgNO_3 titrant.

It was subsequently determined that an inappropriate strength AgNO_3 solution was the reason for the discrepancy. However, in the meantime, investigative work by Dan Kivari (1) and others have resulted in some noteworthy technical points concerning the TRP titration.

Using AgNO_3 titrant and rhodamine indicator, viz:

1. Rhodamine indicator is subject to far less interferences compared to the alternative KI indicator.
2. Sulphide (S^{2-}) ion is a potential interference, however, its presence will be noted by a brown precipitate (Ag_2S) which will mask the normal indicator colour and change from yellow to salmon pink.


In this instance, a fresh solution sample should be obtained and the sulphide ion first removed by precipitation with PbNO_3 . The PbS precipitate should be filtered off, rhodamine indicator added and titration with AgNO_3 conducted in the usual manner.

.... /2

(1) Memo: Dan Kivari to Sadek El-Alfy, "TRP Review and Recommendations", October 3, 1988

With the low reactivity of GYML tailings sulphides (reducing powers <100), titration interference with sulphide is not expected. However, should solution discolouring occur, a simple test to identify S^{2-} is to use lead acetate paper. A positive result will be immediate appearance of a dark black colour.

3. The only other common interference is dissolved copper. Titration with $AgNO_3$ will reduce $Cu(CN)_4^{2-}$ to $Cu(CN)_2$. This is not anticipated to be a problem with GYML tailings (current levels <10 ppm Cu), however, correction factors can be readily developed should the need arise.


D.R. Bartlett
Sr. Project Metallurgist

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MEMO TO: T.R.P. Metallurgical Team
(D. Cooper; D. Bartlett; B. Cross; S. El-Alfy; J. Bartrum)

CC: K. Blower

FROM: J. S. McAlpine

DATE: November 8, 1988

SUBJECT: INCREASED REVENUE REQUIRED FOR INCREASED CYANIDE ADDITION

Question

Assuming that increasing the cyanide rate of addition by 1 kg/ton, what increase in recovery would be required to cover the cost of the increased cost of cyanide.

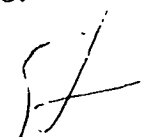
Calculation

The 1989 plan calls for treating 1,530,000 tons at a grade of .070 oz/ton. If the increase in cyanide addition is 1.0 kg per ton, the increased cost for cyanide priced at \$2.10 per kg would be \$3,213,000. It is expected that the gold price for the T.R.P. production will be \$583 in 1989. Therefore, an additional 5,511 recovered ounces of gold would be needed to cover the cost of increasing the cyanide addition rate.

Assuming a base recovery of 32% without the increased cyanide addition rate, the recovery would need to improve by 5.1% to 37.1% to cover the cost of cyanide alone.

Conclusion

Plant recovery must be maximized and then reagent consumption optimized. This memo is simply to point out that a large improvement in recovery is required to cover significant increases in the cyanide addition rate.


J. Steven McAlpine
Mine Manager

/kid

File note: DAS

Oct 21/88

TRP Plant CN Consumption

Feed to circuit, say 37.5% solids
56% solids 2.7

NACN Addition, 1 lb/ton solids.

Residual cyanide 0.3 lb/ton solution.
(150 ppm).

Calc 1. Feed pulp 1310 g slurry / liter

$$\begin{aligned}\text{Volume solution} &= 1310 \times (1 - .375) \\ &= 819 \text{ ml / l. slurry.}\end{aligned}$$

$$\text{Weight of Solids} = 1310 \times .375 = 491 \text{ g}$$

$$2. \text{CN Added} = \frac{1}{2000} \times 491 = 0.246 \text{ g} = 246 \text{ mg}$$

$$3. \text{CN Residual} = 819 \text{ ml} \times \frac{.15 \text{ mg}}{\text{ml}} = 123 \text{ mg}$$

123 mg.

∴ At 1 lb/ton addition levels, about 50% of the cyanide is consumed by cyanicides.

Recommend Testwork at level < 1 lb/ton
to investigate effect on residual CN^- , and

possible problems with re-precip on reactive
Cyanides - Low R.R. - reference Dite

GIANT YELLOWKNIFE MINES LIMITED
TIMMINS DIVISION

November 12, 1988

MEMO TO: S. McAlpine

FROM: J. Bartrum

SUBJECT: Your Memorandum Dated November 8, 1988, Titled "Increased Revenue Required for Increased Cyanide Addition"

1. In the light cast by my previous memorandum - please leave the metallurgy to me, for the sake of Pamour Inc. and in turn Giant Resources.
2. Your calculation and therefore conclusion is grossly incorrect:
 - ° Reference 1 - Section 2 of the "Report" - no page number but Item 19. "1.0 pounds of sodium cyanide per ton of dry tons of tailings treated is the budget number for 1989."
 - ° Reference 2 - Section 3 of the "Report" this of course has a page number - page 3 Item 2.3.3, second sentence "The average cyanide addition was 2.01 lbs/s.t."
3. Therefore, $2.01 \text{ lbs/s.t.} - 1.00 \text{ lbs/s.t.} = 1.01 \text{ lbs/t}$
 $1.01/2.2046 = 0.4581 \text{ kgs.}$ There is no need for an "if" statement, the increase required is 0.4581 kgs/s.t.
4. The increased cost, therefore, assuming the rest of your calculation is correct is $0.4581 \times \$3.213 \text{ M}$ which I believe is \$1.4719 M.
5. Reference 3 - Section 3 of the "Report" Page 2, Section 2.1 first sentence "The average gold recovery for the Pilot Plant test programme was 35%, which resulted from 38.9% gold dissolution, and 89.7% gold adsorption from solution onto carbon".
6. As the adsorption figure is abysmally low by world standards, the actual recovery achievable is 38.8%.
7. So in reality if \$1.4719 M were spent on bringing the cyanide up to where it should, the recovery increase would be 32% (your base) to 38.8% an additional 6.8 percentage points.
8. On the basis of your own calculations if $5\% = \$3.213 \text{ M}$ then $6.8\% = \$4.3697 \text{ M}$.

9. However, your base is not 32% is it? Reference 4, Section 2 last paragraph "In closing4774.265 ozs lost through poor adsorption efficiency lowered the overall gold recovery from 29.44% to the 23.18% for the year.
10. So I have to assume that your base is 29.44% equally assuming that the gold is being adsorped on carbon.
11. Therefore, the potential increase is 29.44% to 38.8% which is 9.36 percentage units. $(9.36/5) \times \$3.213 \text{ M} = \6.0147 M .
12. Therefore, the return on expenditure is $6.0147 - 1.4719/1.4719 = 312.23\%$.
13. On this basis it would seem sensible to set the 1989 budget at 2.01 lbs/s.t. However, some additional work has to be done to get the maximum effect of cyanide.
14. Reference 5 - Section 4, no page number, B Point 2: "Graph 7 shows that decreasing tonnage is associated with increasing gold extraction to solution".

Reference 6 - Section 3, Page 1, 1.1.2 second line "Recovery improved slightly for longer dissolution times".

Reference 7 - Section 3, no page number, Figure 2.4 - recovery is still climbing at 36 hours.

Summary - These 3 items are saying all the same thing that is retention time control is critical to achieving optimum metallurgy.

So this means both feed rate and feed density have to be tightly controlled.

15. Reference 8 - Section 2, no page number, Item 9(d) "Tank #1 at 26% solids at surface had an increase to 55% when bottom material from Tank #6 which had 23% solids surface slurry was transferred".

Summary - This means the agitation efficiency despite increased air is atrocious and has to be upgraded over winter.

16. Reference 9 - Section 2, no page number, Item 20 "Optimize retention time".

Summary - 8 out of 10 samples (or 80%) showed increased dissolution of T.R.P. tailings. This means more cyanide, more retention time or better agitation in the Plant.

Reference 10 - Section 8, no page number, second last sentence "TRP tailings Re - Cyanidation showed further extraction but that was only on a few tests".

Summary - This means more cyanide, more retention time or better agitation in the Plant.

17. Leaching efficiency is directly related oxygen saturation, agitation efficiency, retention time in the circuit, cyanide solution strengths, feed density and lime addition.
18. We know the following are deficient:
 - (a) Agitation is hopeless, adverse effects are short circuiting, poor distribution of solids and carbon, poor contact between solids and air and cyanide.
 - (b) Cyanide levels are far too low, adverse effect - poor extraction efficiencies.
 - (c) Retention times in the Plant were all over the place due to tonnage variation and erratic and low feed density control. Adverse effect - effects contact time in a poor environment of poor agitation efficiency and low cyanide additions.
 - (d) Erratic and low density control since start up. Adverse effect - doesn't help agitation, deflates retention time, dilutes cyanide.
 - (e) Oxygen - still not enough evidence.
 - (f) pH level - looks okay.
 - (g) We still know nothing about organics or inorganics in solution.
19. So far the "reader" has absorbed this information from your "Report" using clearly defined references throughout from this report and this achieved in less than one hour. There are also many other references!
20. Also, the "reader" has "participated" in "the spirit of this information sharing" by spending valuable time away from the E.R.G. Project.
21. Now the "reader" will "contribute" to a "sound" operating strategy for 1989, since no one listened in 1988.
 - (a) You need more cyanide (Stated August 22, 1988).
 - (b) You need to improve agitation efficiency (August 22, 1988).
 - (c) You need to do competent retention time studies in the laboratory to be able to set a figure for 1989. (Aug. 22/88)
 - (d) You need to address the problems of erratic and low feed densities (August 22, 1988 + 4 days).

- (e) You need to be able to control cyanide better than 1988 (August 22, 1988 \pm 2 days).
 - (f) You need to establish methods to maximize oxygen saturation in each tank including the surge tank. (August 22, 1988)
 - (g) You need to find out if there are soluble sulphide ions in the pulp (August 22, 1988).
 - (h) You need to understand the pulp chemistry and learn what you are dealing with (August 22, 1988).
23. Having now "participated" and "contributed" I now direct you and your "metallurgical team" to attend to what was clearly obvious in August 1988, \$9.0 Million dollars ago!

John Bartrum

JB*ag

c.c. A. Fleming
R. Needham
D. Emery
K. Blower
G. Greenhill
M. Driscoll

MEMORANDUM

To: S. McAlpine
From: K. Morton
CC: D. Cooper
Date: December 20, 1988
Subject: Average and Extreme Temperatures at Yellowknife

The attached graphs have been produced from data contained in the Canadian Climate Normals for the Yellowknife area. Averages shown are from the period 1951 to 1980. Temperature extremes are from the period 1951 to 1985.

I have included graphs showing degree days above and below zero for both the Yellowknife and Timmins areas. Degree days are defined as a measure each day of the departure of temperature from some reference temperature, in this case 0 degrees Celcius, and are often regarded as a good way to represent the cumulative effect of temperature.

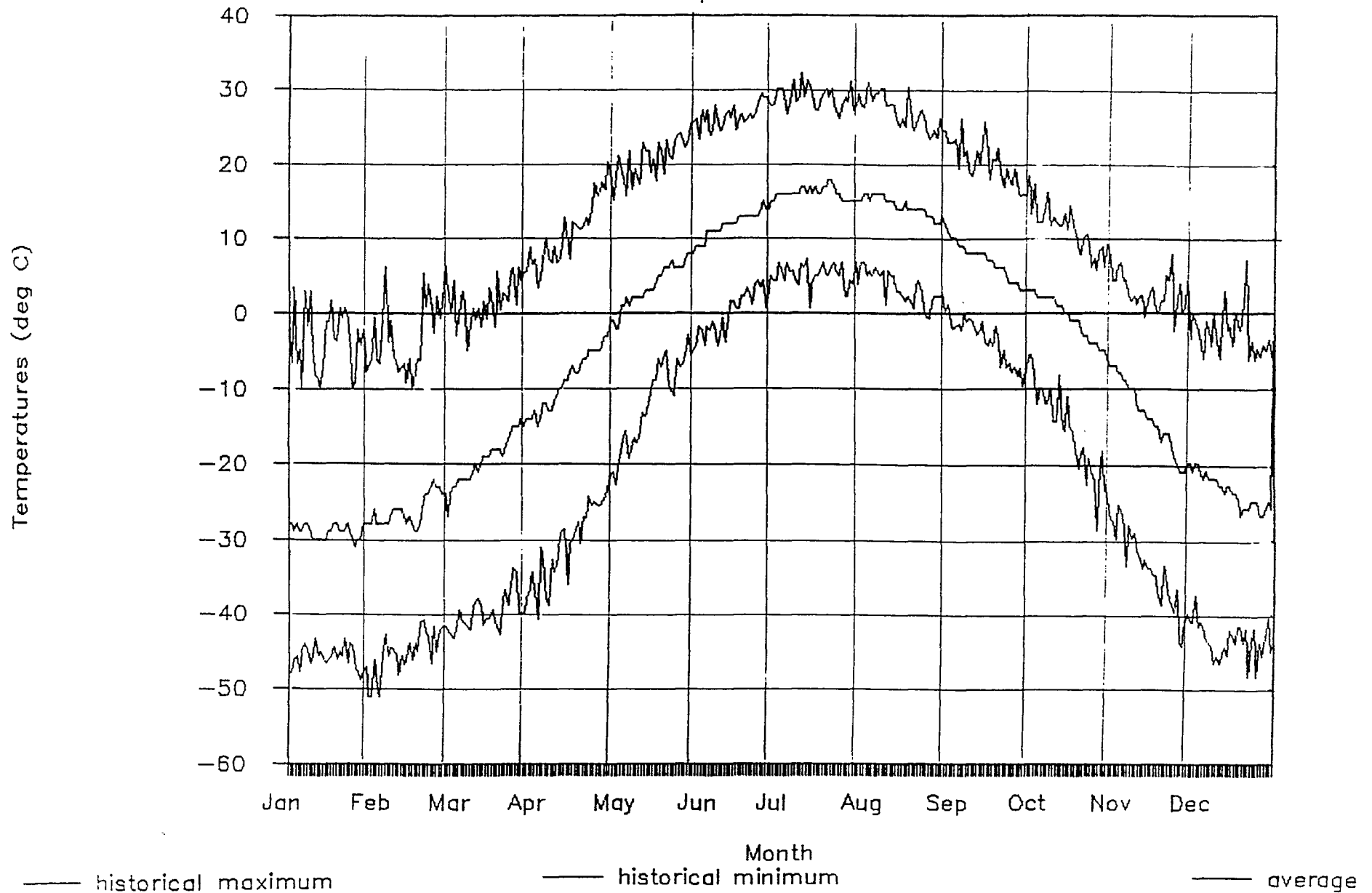
When considering the implications of an extended reclaim season, it is interesting to note that the number of degree days below zero for Yellowknife in April is just over half the number for November. It is also interesting that the number of degree days below zero for Yellowknife in November is very similar to that for Timmins in December.



K. Morton

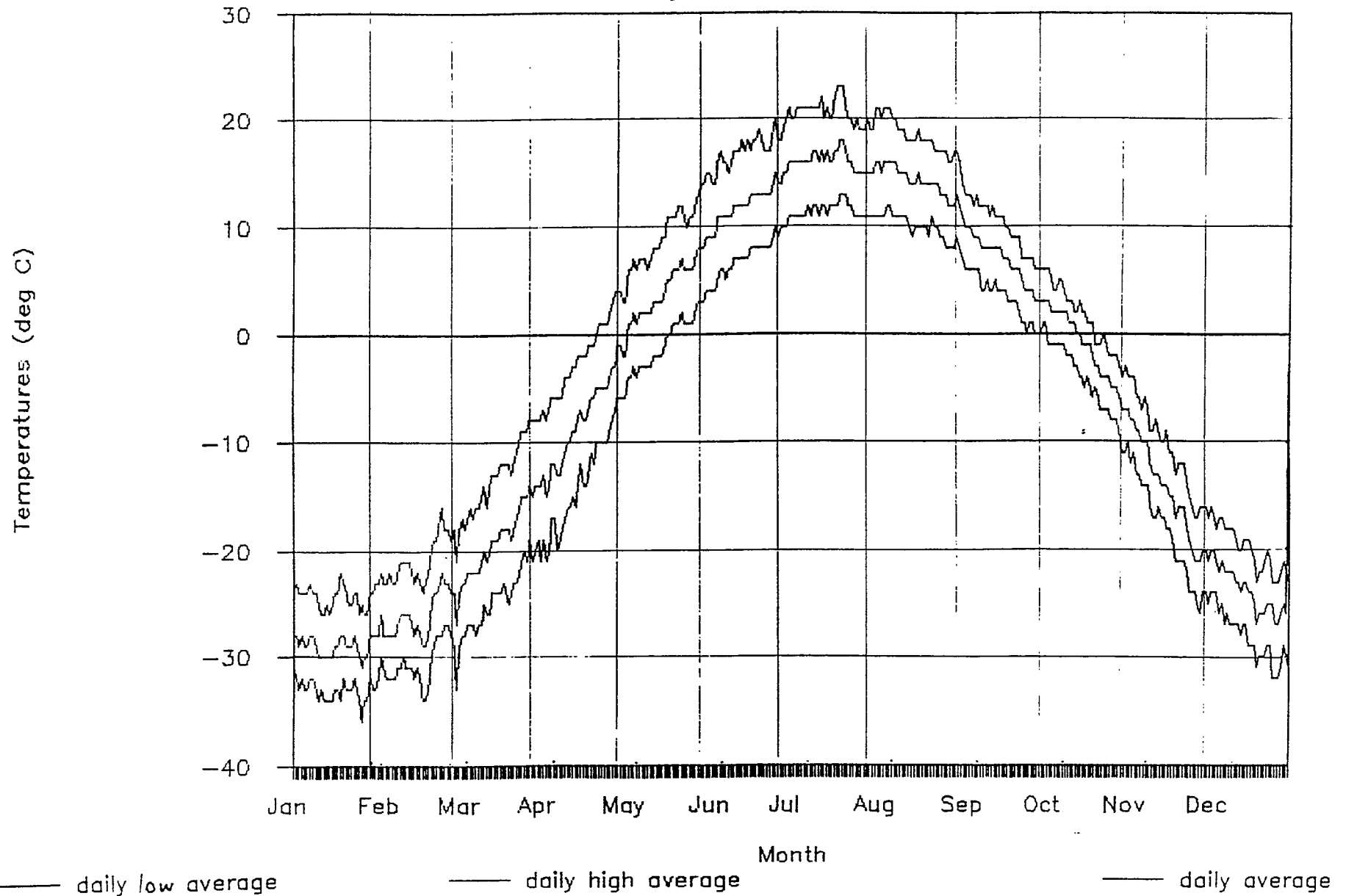
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Temperature Extremes



Giant Yellowknife Mines

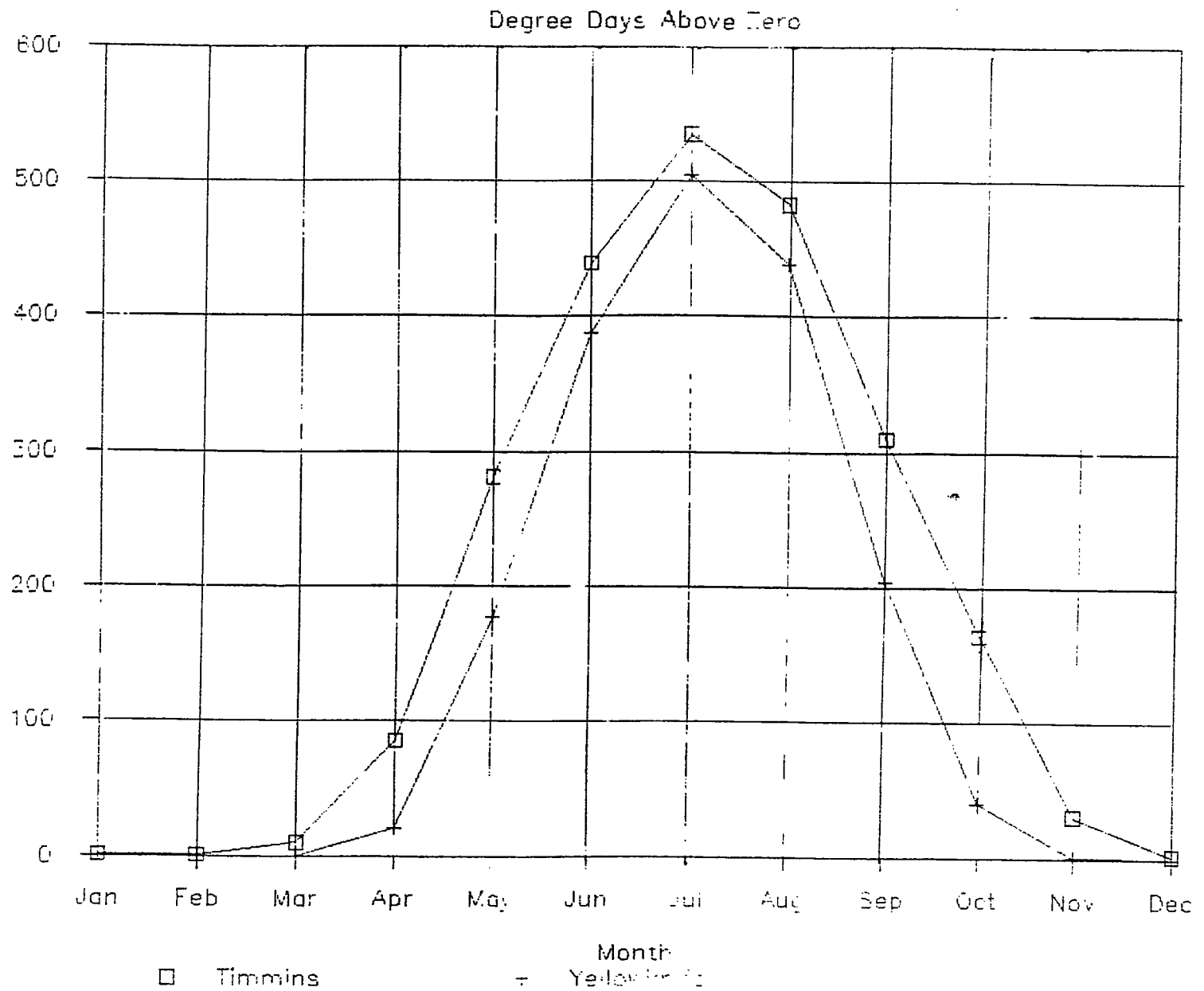
Daily Average Temperatures



Giant Yellowknife Mines Ltd

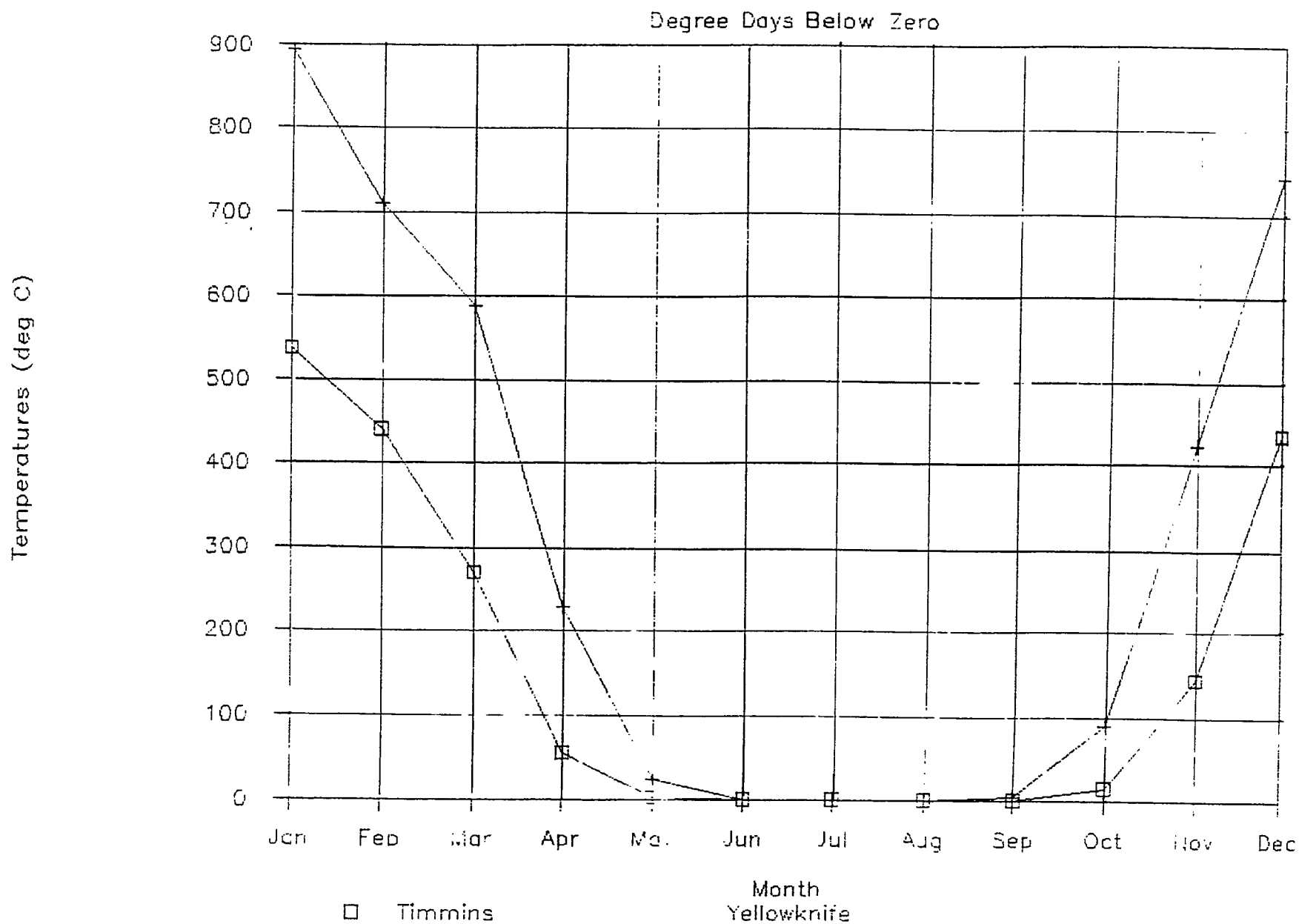
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Temperatures (deg C)



Giant Yellowknife Mines Ltd

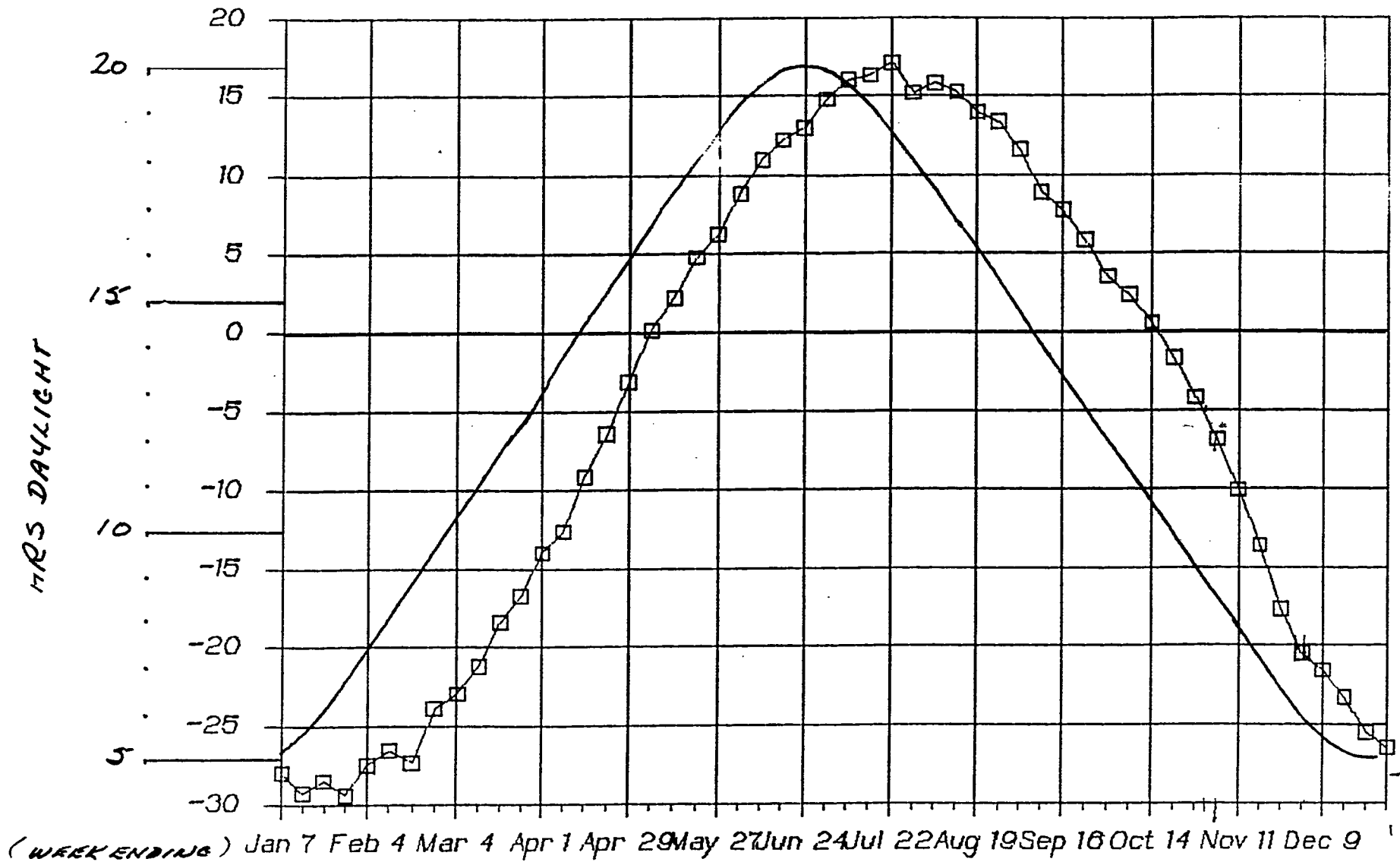
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GIANT YELLOWKNIFE MINES LTD

AVERAGE DAILY TEMPERATURE

6



□ AVG DAILY TEMP

G I A N T
YELLOWKNIFE MINES LIMITED

MEMO TO: J.S. McAlpine
CC: S.E. El-Alfy; G. Doerksen; D. Bartlett; B. Cross
FROM: D. Cooper
DATE: November 08, 1988
SUBJECT: TRP - PLANT MONTH END REPORT - OCTOBER 1988

GENERAL OPERATIONS

Temperatures on October 1 fell below freezing with lows of -2 to -5°C and daytime highs of about +7°C. These temperatures were characteristic of the first week. A warming trend during the second week of the month resulted in record daytime highs of about 15°C. On October 17 daytime highs were about -3°C and lows of -7°C were reached. On October 18 daytime highs were about -9 °C and lows were -16°C. Nighttime lows of -10 to -20°C were characteristic of the rest of the month. On October 23 the daytime high was -16°C.

At least one D8 Cat was used pushing unfrozen tailings to feed the monitors for most of this month with the objective of maximizing throughput to achieve maximum recovered gold ounces. All limitations on feed rate were removed with the exception of not allowing the trash and safety screens to flood over.

Once the temperature dropped below -5°C severe icing conditions occurred on the trash and safety screens. Problems in this area became progressively worse. Below -10°C exposed nozzles at hose stations and spray water nozzles froze as well as gland water lines to the CIL feed pump and the safety screen Oversize Return Pump. Exposed tank and pumpbox nozzles such as pumpbox dump nozzles and CIL tank dump nozzles froze. Launder screens in the CIL tanks began icing severely. Leach air lines carrying compressed air to the bottom of the CIL tanks froze due to the entrained moisture carried in the Air system. The potable water system froze for the third time on October 17.

Monthly Weather Summary
Yellowknife "A", N.W.T.
OCTOBER 1988

Date	Maximum	Minimum	Rain (mm)	Snow (cm)	Precipitation (mm)
1	5.4	-1.4		tr	tr
2	3.9	-3.9			
3	8.4	3.2			
4	11.7	5.0			
5	19.0*	6.2			
6	16.4*	5.2			
7	15.2*	7.1			
8	13.9	3.3			
9	8.0	2.9			
10	8.4	1.4			
11	10.0	2.3	tr		tr
12	7.1	2.9	0.2		0.2
13	5.6	3.9	1.0		1.0
14	5.1	-0.2	12.6		12.6*
15	0.0	-3.5		tr	tr
16	-0.5	-3.5		0.4	0.4
17	0.0	-2.6		0.2	tr
18	-2.4	-7.2		1.8	1.1
19	-5.6	-9.0		tr	tr
20	-6.6	-9.9		tr	tr
21	-8.4	-14.1		tr	tr
22	-7.3	-13.3		tr	tr
23	-6.5	-11.8			
24	-4.0	-8.7		tr	tr
25	-4.3	-9.3		tr	tr
26	-8.4	-12.8		tr	tr
27	-10.3	-15.6		0.8	tr
28	-8.9	-13.8		1.4	0.6
29	-11.5	-17.1			
30	-8.2	-14.1		2.4	2.4
31	-7.0	-10.4		3.2	3.4

* Indicates new record - Records have been retained since 1943

	<u>October 1988</u>	<u>Normal</u>
Mean Daily Maximum	1.2	1.2
Mean Daily Minimum	-4.5	-4.4
Mean Daily Temperature	-1.7	-1.6
Rainfall (mm)	13.8	12.8
Snowfall (cm)	10.2	23.1
Total Precipitation (mm)	21.7	34.5
Heating Degree Days	609.4	611.1
Bright Sunshine (hours)	111.1	58.0

On October 19 the loaded carbon screen froze preventing further transfer of carbon to the processing plant. The Polishing Pond was shutdown on this day. On October 19 the trommel screen cloth froze preventing passage of slurry. The trommel screen underflow pump froze during the time it was shutdown to remove screens from the trommel. This pump was replaced with a spare pump. From this point on the trommel screen was removed from service as a screening facility. The surface material being pushed into the mining area by the Cat was freezing quickly as was the water in the Toyo sumps. At noon on October 28 the tailings line froze somewhere in the section of pipe past the location of the "Y". At this time the tailings line was broken apart and drained. The process water system from the Northwest Pond was also shutdown and the pipeline drained. An attempt to pump out the surge tank was made but the CIL feed pump discharge line froze. After two days of steaming out the pipeline it was cleared and pumping from the surge tank resumed. The overflow pipeline from No. 6 CIL tank to the safety screens froze on October 29. A 5 X 4 pump was installed at the base of No. 6 CIL to drain this tank into No. 1. The surge tank was drained on October 29 to the mining area. On October 29 the potable water line froze solid and work was commenced to install the insulated, heat traced pipeline. In addition to the above 15 ft. X 30 ft. diameter process water tank became seriously frozen and a steam truck was called in to break up the bulk of the ice. No carbon could be transferred since October 18 and the stripping circuit has been shut down following Batch 88-40.

The barge at the South Pond was removed on October 29 and brought into the plant building to thaw. Preparations for removal of the barge at the Northwest Pond were underway by month end.

On October 31 No. 1 CIL tank agitator began tripping out. It was found that the leach air lines were frozen and a considerable amount of submerged ice was hitting the impellers causing the agitator to jump and finally trip out. The air lines were cleared and the agitator was again running normally. This unit however was drawing considerably more amperage than all remaining agitators. It was found that the tank density was in excess of 50% solids. This had to have resulted from pumping out from the bottom of No. 6 tank which is a further indication of inadequate mixing since at the time the feed was shut off all tanks showed densities of 25 to 30% solids.

The current plan to allow removal of loaded carbon and drain the CIL system is as follows:

1. Hoard in loaded carbon screen - complete October 31.
2. Install heat traced and insulated potable water line - complete November 05.
3. Install heat traced, insulated pipeline from South Pond for process water requirements - pre-insulated pipe ordered November 03.
4. Hoard in potable water tank.
5. Overflow potable water tank to process water tank to allow transfer of carbon from No. 6 CIL to Plant. This should allow No. 6 to be emptied and readied to accept stripped carbon while working on Item 3 above.
6. Order bags to allow removal of carbon from the CIL system if all else fails or if serious agitator problems occur.
7. Drain tanks in the following order No. 6, 1, 2, 3, 4, 5.
8. Each tank will be pumped from the bottom to the loaded carbon screen with the screen underflow returning to the same tank until the amount of carbon reporting to the screen decreases significantly. This will indicate that the bulk of the carbon has been removed. The screen underflow will then be routed to waste and the tank level allowed to drop. The tank will then be pumped out completely. This method should prevent large amounts of carbon from settling in the tanks when the agitators are shut off.

It was found this year that the best technique for shutting down would be to pump water into the system as soon as the feed is shut off. Flushing out the slurry would have some benefits in pumping the carbon out of the system. Another possibility would be to run only low grade material to the system for two days prior to shutdown allowing as much carbon as possible to be advanced forward to the CIL system.

9. With No. 6 tank empty, regenerated carbon could be returned to this tank. It would be preferable to screen the carbon being returned but may not be possible. If water is flushed through the system on start up next year most of the fines could be removed.
10. There is some risk of having all the carbon in tank No. 6 as in 1988 but as long as sufficient compressed air is available to ensure good mixing and good solids densities can be achieved early no major problems should occur.

METALLURGY

1. On October 5 the 0.85 mm opening urethane cloths on the east trash screen were replaced with the following:

Feed panel - 0.50 mm opening

Centre panel - 0.50 mm opening

Discharge panel - 40 mesh wire cloth with backing wire

The west screen remained with the 0.85 mm opening panels. Samples were taken on the screen underflow from both screens and screened through a 60 mesh laboratory sieve. It was only possible to do a visual inspection of the dried material due to the quantity of oversize sand entrained with the wood. Wood fibres passing the 0.85 mm screens were 1/4 to 1/2 inch in length and about 1/8 inch in width. There was a large proportion of these along with many smaller pieces.

The finer screen wood fibres were much like cotton batten and there was a much reduced quantity compared to the other screen. The open area of the 0.50 mm panels was about 32%. Since this test new panels have been made with about a 43% open area which is nearly identical with the 0.85 mm panels. These new panels were purchased for trial but the plant was shut down before they could be installed. One significant difference between the new panels and the old was the central ribbing. Two more ribs were fabricated which shortened the length of the slot and should prevent wood from forcing its way through. The combination of shorter slots and finer openings with greater open area should make this a very useful panel for this operation.

2. On October 8 the cyanide addition was put on a fixed flow rate. It was no longer controlled by feed tonnage or feed flow. This was done due to the wide variations in both and the reduced cyanide inventory. The cyanide flow rate was fixed to give about 14 USGPM. Cyanide concentration was equivalent to 0.4275 lbs of NaCN per US gallon of cyanide solution on 1 bin (3000 lbs) mixed per batch. The addition rate was about 8,000 to 9,000 lbs of cyanide per day.
3. During October the screen cloth on the CIL launder screens was wearing out almost as fast as they were changed. This made it difficult to maintain controllable carbon densities in the CIL tanks. The possibility of installing urethane panels will be investigated this winter and they may be tested on No. 6 tank first.
4. A six inch Krebs cyclone was installed on October 14 on the loaded carbon line feeding the acid wash tank. The cyclone was placed on its side to permit the underflow to access the acid wash tank without cutting holes in the ventilation hood. Only a couple of batches were actually tried but the cyclone worked well on wood removal. Entrained sand still passed to the cyclone underflow. About 70% of the wood in the feed reported to the cyclone overflow while no visible carbon was found. The cyclone was fed by the loaded carbon eductor located on the CIL tanks and enough pressure was provided to operate the cyclone effectively.
5. Bullion produced to October 1988:

<u>Bar No.</u>	<u>Gold</u>	<u>Assay Silver</u>	<u>Total</u>
TRP-001	745.01	187.49	932.50
002	745.23	185.48	930.71
003	664.13	161.63	825.76
004	669.04	166.32	835.36
005	676.40	262.22	938.62
006	684.30	243.38	927.68
007	688.72	247.91	936.63
008	688.93	245.98	934.91
009	645.86	299.29	945.15
010	645.63	295.81	941.44
011	643.19	297.47	940.66
012	591.43	357.57	949.00
013	591.80	354.71	946.51

The above shows a trend in the gold/silver ratio which as yet must be investigated. The total fineness has increased while the silver content of the bars has increased from less than 20% to over 35%. A general comment might be that gold/silver ratio is decreasing in the North Pond or that the Polishing Pond may have some effect on the ratio.

MAINTENANCE

A) Mechanical

1. Repairs to Toyo pumps.
2. Repairs to Toy pump discharge pipelines.
3. Repaired slurry recirculation line on pH control system.
4. Installation of framework for loaded carbon screen shelter.
5. Supports for monitors.
6. Repairs made to carbon fines removal screen on No. 6 CIL.
7. Moved second DSM screen from Pilot Plant to No. 6 CIL.
8. Building stairs for access to Monitor Water pumps.
9. New screen cloth installed on all spare launder screen frames.
10. New mechanical seal with water flush for Toyo.

B) Electrical

1. Lighting.
2. Toyo pumps.
3. Air dryer installation and instrument air lines.
4. Motors:
 - changed 10 h.p. acid wash area sump pump motor - October-
 - changed 200 h.p. trash screen U/F pump motor - October 8.
 - changed motor on carbon fines removal screen on CIL #6.
 - Cyanide mix tank - agitator motor showing ground fault - motor replaced.
5. North Pond memory unit cable.
6. Power supply for electrowinning cells.
7. Lime system PLC.
8. Installed new High/Low Fire switch on Volcano unit.
9. High cyanide gas alarms installed in Shift Office.
10. Vehicle plug-ins installed.

C) Instrumentation

1. Cyanide addition valves at CIL cleaned - installed new ball valves.
2. Calibrated electrowinning cell flowmeters.
3. Rebuilt caustic addition valve to acid wash surge tank.
4. Repairs ti No. 3 cyanide addition flowmeter.
5. Rewired strip vessel feed flowmeter.
6. Installed switch to change cyanide addition control from feed flow to feed tonnage basis.
7. Worked on Volcano modulating controller.

DOWNTIME RECORD

OCTOBER 1988

<u>DATE</u>	<u>HOURS</u>	<u>EXPLANATION</u>
Oct. 1	4.30	Low feed - North Pond Toyo down - electrical changed pump. Polishing Pond - repiping slurry line to trommel.
2	9.50	Low feed (as above).
	0.20	Cleaning safety screens.
3	2.50	Low feed - Polishing Pond still down for piping repairs.
4	0.50	Low feed.
5	3.00	Low feed - Polishing Pond - advancing monitor. - North Pond - Toyo tripped on overload, repairs to Flexhose.
8	4.90	Trash screen U/F pump motor changed, bearings shot.
10	2.40	Increased angle on safety screen, cleaning screens.
12	0.40	Low feed - moving crane, North Pond; broken pipeline Polishing Pond.
	0.90	Cleaning trash/safety screens.
13	0.30	Cleaning screens.
	0.60	Repairs to CIL feed pump gland.
14	0.10	Cleaning trash/safety screens.
	0.80	Changed 2 panels on No. 2 safety screen.
	0.60	Low feed - North Pond Toyo plugged.
15	0.50	Low feed - Repairs to slurry return line, pH control system.
19	19.60	Trommel screen, slurry lines, trommel U/F pump frozen.
20	10.50	Replaced trommel U/F pump.
22	8.50	Shut down plant at 3:40 p.m. for season.
23 to 31 to October 31.	24.00	24.00 hrs down per day - budgeted for operating
<hr/>		
	286.10	TOTAL
	457.90	Operating Hours
	61.55%	Availability

DOWNTIME ANALYSIS

1. Summary

June to October	- Operating Hours (Budget)	3672.00
	Operating Hours (Actual)	3152.17
	Availability (%)	85.84
	Downtime Hours	519.83
	Downtime (%)	14.16

2. Breakdown

	<u>Total Downtime Hours</u>	<u>% of Total Downtime Hours</u>	<u>% Contribution to Downtime</u>
Plant - Electrical	8.00	1.54	0.22
Mechanical	29.72	5.72	0.81
Instrumentation	---	---	---
Operating	28.13	5.41	0.76
Modifications(1)	22.68	4.36	0.62
Mining	135.80	26.12	3.70
Water Supply	9.08	1.75	0.25
Power Failure	31.82	6.12	0.87
Early Winter Shutdown	224.50	43.19	6.11
Frozen Equipment	<u>30.10</u>	<u>5.79</u>	<u>0.82</u>
TOTAL	519.83	100.00	14.16

Don Cooper
TRP Plant Superintendent

REAGENT CONSUMPTION

OCTOBER 1988

REAGENT	MONTH		YEAR TO DATE	
	LBS *(LITRES)	LBS/TON *(LITRES/TON)	LBS	LBS/TON
PROPANE*	100,290	0.643	272,359	0.273
CARBON	45,194	0.290	216,064	0.216
LIME	96,400	0.618	701,869	0.702
MURIATIC ACID	997	0.006	7,474	0.008
CAUSTIC SODA	17,861	0.114	135,426	0.136
SODIUM CYANIDE ¹	105,000	0.673	957,682	0.958
STEEL WOOL	30	0.0002	170	0.0002

¹ Sodium cyanide consumption for October was actually 162,000 lbs but it was reduced by 57,000 lbs to adjust for an error in the quantity reported as consumed in October.

TRP METALLURGICAL BALANCE
(C.I.L.)

DATE: OCT. 31, 1988

DAY

RECOVERIES (%)	COMBINED GRADES oz/Ton Au.	AVAILABILITY (HRS/%)
-----	-----	-----
SOLIDS		
DISSOLUTION 0.00	HEADS 0.000	OP.HRS.(BUDG) 24.0
ADSORPTION 0.00	TAILS 0.000	OP.HRS.(ACT) 0.0
TOTAL 0.00	CIL RECOVERY	AVAIL.(%) 0.0
	TO CARBON 0.000 oz.	DOWNTIME(HRS) 24.00
SHUT DOWN FOR SEASON AT 3:40 PM. OCT. 22, 1988.		
CIL FEED SOLUTION ASSAY: 0.0000		

MONTH TO DATE

RECOVERIES (%)	COMBINED GRADES oz/Ton Au..	AVAILABILITY (HRS/%)
-----	-----	-----
SOLIDS		
DISSOLUTION 26.71	HEADS 0.065	OP.HRS.(BUDG) 744
ADSORPTION 90.70	TAILS 0.048	OP.HRS.(ACT) 457.9
TOTAL 26.60	CIL RECOVERY	AVAIL.(%) 61.5
	TO CARBON 2694.14 oz.	DOWNTIME(HRS) 286.1

YEAR TO DATE

RECOVERIES (%)	COMBINED GRADES oz/Ton Au..	AVAILABILITY (HRS/%)
-----	-----	-----
SOLIDS		
DISSOLUTION 29.82	HEADS 0.076	OP.HRS.(BUDG) 4416
ADSORPTION 72.32	TAILS 0.059	OP.HRS.(ACT) 3772.17
TOTAL 23.18	CIL RECOVERY	AVAIL.(%) 85.4
	TO CARBON 17695.52 oz.	DOWNTIME(HRS) 643.83

TRP METALLURGICAL BALANCE
(C.I.L.)

DAY

DATE: OCT. 31, 1988

FEED :				RECLAIM SOLUTION			TOTAL
Tons	Percent Solids	Ounces Au/Ton	Ounces Au.	Tons	Ounces Au/Ton	Ounces Au.	Ounces Au.
0	0.00	0.000	0.00	0.0	0.0000	0.00	0.00
TAILS :				TAILS SOLUTION			TOTAL
0	0.00	0.000	0.00	0.0	0.0000	0.00	0.00

MONTH TO DATE

FEED :				RECLAIM SOLUTION			TOTAL
Tons	Percent Solids	Ounces Au/Ton	Ounces Au.	Tons	Ounces Au/Ton	Ounces Au.	Ounces Au.
156044.8	38.80	0.063	9766.35	246149.7	0.0015	361.89	10128.24
TAILS :				TAILS SOLUTION			TOTAL
156044.8	38.80	0.046	7157.79	246149.7	0.0011	276.31	7434.10

YEAR TO DATE

FEED :				RECLAIM SOLUTION			TOTAL
Tons	Percent Solids	Ounces Au/Ton	Ounces Au.	Tons	Ounces Au/Ton	Ounces Au.	Ounces Au.
999339.1	33.34	0.074	73903.58	1997644.9	0.0012	2430.13	76333.71
TAILS :				TAILS SOLUTION			TOTAL
999339.1	33.34	0.052	51866.28	1997644.9	0.003	6771.91	58638.19

TRP METALLURGICAL BALANCE
(STRIP CIRCUIT)

DAY BATCH No.88-41 IN PROCESS.

DATE: OCT 31, 1988.

TONS OF CARBON (EST.)	LOADED CARBON		STRIPPED CARBON		CATHODE RECOVERED
	oz Au/TON	oz Au	oz Au/TON	oz Au	oz Au
0.000	0.000	0.000	0.000	0.000	0.000

STRIP CIRCUIT RECOVERY: ERR
MONTH (BATCH Nos.88-31 TO 88-40)

TONS OF CARBON (EST.)	LOADED CARBON		STRIPPED CARBON		CATHODE RECOVERED
	oz Au/TON	oz Au	oz Au/TON	oz Au	oz Au
43.282	53.698	2324.148	1.345	58.235	2265.913

STRIP CIRCUIT RECOVERY: 97.49

YEAR (BATCH Nos.88-01 TO 88-40)

TONS OF CARBON (EST.)	LOADED CARBON		STRIPPED CARBON		CATHODE RECOVERED
	oz Au/TON	oz Au	oz Au/TON	oz Au	oz Au
176.587	50.428	8904.996	2.376	419.532	8488.212

STRIP CIRCUIT RECOVERY: 95.31
TRP BULLION PRODUCED

OCTOBER 1988 (BAR Nos. TRP-009 TO TRP-013)

TOTAL WEIGHT ozs.	ASSAY FINENESS		TROY OUNCES	
	GOLD	SILVER	GOLD	SILVER
3,642.680	628.517	319.119	2,289.485	1,162.450

YEAR TO DATE (BAR Nos. TRP-001 TO TRP-013)

TOTAL WEIGHT ozs.	ASSAY FINENESS		TROY OUNCES	
	GOLD	SILVER	GOLD	SILVER
9,468.938	659.320	253.195	6,243.059	2,397.489

CATHODES CURRENTLY CONTAIN (ozs Au): 2245.153

ESTIMATED CIL CARBON GOLD INVENTORY

DATE:
OCT. 31, 1988

DAY

FROM INVENTORY	TO INVENTORY		NET CHANGE
CARBON TO STRIP oz Au	CIL RECOVERY TO CARBON oz Au	STRIPPED CARBON oz Au	PLUS (MINUS) oz Au
0.000	0.000	0.000	0.000

MONTH

FROM INVENTORY	TO INVENTORY		NET CHANGE
CARBON TO STRIP oz Au	CIL RECOVERY TO CARBON oz Au	STRIPPED CARBON oz Au	PLUS (MINUS) oz Au
2324.148	2694.16	58.235	428.247

YEAR

FROM INVENTORY	TO INVENTORY		NET CHANGE
CARBON TO STRIP oz Au	CIL RECOVERY TO CARBON oz Au	STRIPPED CARBON oz Au	PLUS (MINUS) oz Au
8905	17695.55	419.532	9269.547

CURRENT CIL CARBON GOLD INVENTORY oz Au: 9269.547

ADJUSTMENTS WITH ROYAL CANADIAN MINT ON REFINED DORE

MONTH : OCTOBER 1988

BAR NUMBERS	GOLD ozs	SILVER ozs
-----	-----	-----
TRP001 to 002	(2.185)	2.62
TRP003 to 004	2.204	8.50
TRP005 to 008	(1.072)	2.14
-----	-----	-----
NET	(1.053)	13.26

The above numbers were applied to the October Production data.

G I A N T
YELLOWKNIFE MINES LIMITED

MEMO TO: S.E. El-Alfy
CC: J.S. McAlpine; G. Doerksen
FROM: Don Cooper
DATE: October 11, 1988
SUBJECT: TRP - PLANT MONTH END REPORT - SEPTEMBER 1988

METALLURGICAL AND OPERATIONS

Seventeen batches of carbon were processed during September in the stripping plant resulting in 4133 oz. Au recovered to cathodes and 2931 oz. Au to bullion produced. This was the first month that ounces stripped exceeded ounces loaded to carbon. The rate of loaded carbon transfer is now in the 4 to 6 hour range for a batch of carbon. Improvements in the washing of the carbon on the loaded carbon screen are now needed since entrained slurry is now causing considerable delays in the washing stage. Eductor sizing is not a problem in the strip plant as yet since the delays involved in transferring carbon from the acid wash vessel to the strip vessels is caused by plugging of the bottom strip vessel screens and hence slow drainage of water. An attempt to speed this up by installing an overflow drain on the top of the vessels met with little success due to plugging of the top screens. The lower screens and slow drainage problems may be caused by wood fibres alone. One solution to the above may be to remove the upper screen while educting to the strip vessel and run the overflow lines back to the acid wash vessel to trap any carbon carryover. The change from a 35 to 28 mesh polyurethane screen deck on the loaded carbon screen and the installation of the DSM screen ahead of the loaded carbon screen helped considerably in speeding up the rate of carbon transfer to the plant.

11 Oct 22
Comp. → 5 - 1881

The number of cathodes was increased to 5 per electrowinning cell as well as the steel wool content was increased to 2 1/2 pounds per cathode. This allows loading of one cathode per cell every second batch. The strip solution is changed every 3 to 3 batches resulting in reasonably constant rectifier voltages and also has provided a workable system while concentration has been on the CIL recoveries.

Carbon adsorption in the CIL system has improved considerably with the increased stripping rate, new carbon addition and more even carbon distribution in the CIL tanks. Adsorption MTD averaged 89.40% while it roughly averaged 93% for the latter half of the month. Fresh carbon initially purchased was 6 X 12 type while the extra 60 tonnes purchased was 6 X 16. By month end the carbon density in the CIL tanks was about 19.55 grams per litre.

Erratic solution sample assays were determined to be caused by contamination of the sample bottles. Currently only new or acid washed bottles are used. Potassium permanganate is being added to the sample buckets on the automatic samplers to stop the leaching action in the containers. In addition samples are filtered every six hours to assist in obtaining accurate results.

CIL feed tonnage was limited to 8000 tpd maximum for the month of September and on September 19 the feed flow rate was limited to 2500 USGPM. This was done to prevent variations in plant recoveries possibly caused by retention time. No major difference in recoveries was noticed that could be attributed to retention time alone.

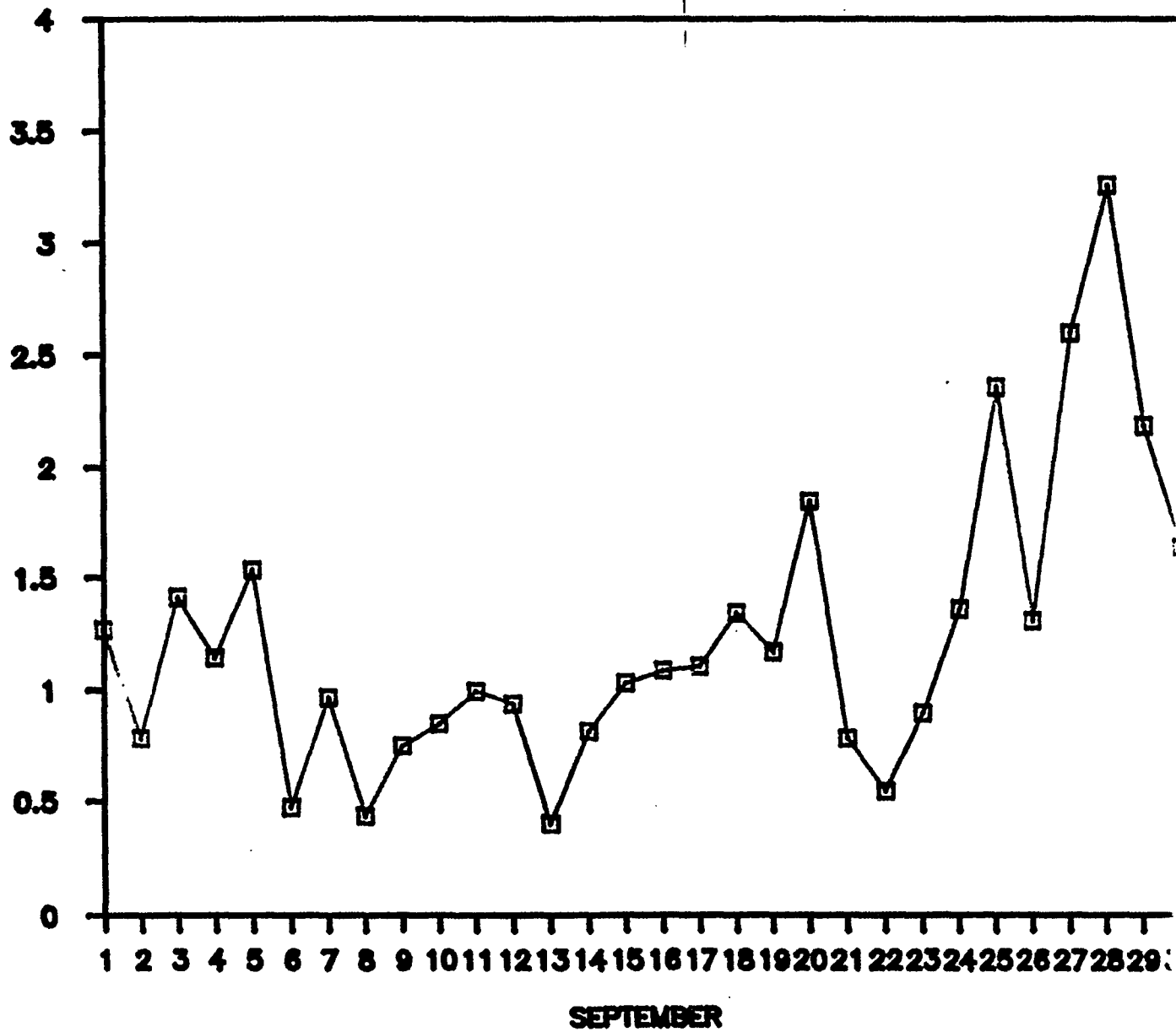
On September 20 cyanide addition was changed from control based on feed tonnage (mass flow) to volume of feed. This was done since on many occasions the cyanide concentration in the CIL system would drop due to high volumetric feed rates but low solids density. Due to the variation in both solids content and volumetric flow rate consideration is being given to adding cyanide at a fixed flow rate independent of either mass or volumetric CIL feed rate. On September 23 cyanide addition was increased to approximate 2 lbs/ton of feed ore. The results of this test are summarized in the following two graphs. Although the average gold recoveries during this period showed no significant increase over the preceding periods the general trend is towards higher recoveries. It is most likely that addition rates of between 1.0 and 1.5 lbs/ton will provide the optimum recoveries. X

Scaling problems in the cyanide circulation system and in the magnetic flow metering system were encountered this month. This problem will be examined and a suitable anti-scaling additive may be required. During August 11.30 hours of downtime resulted from plugged cyanide circulation lines due to scale breaking away inside pipe.

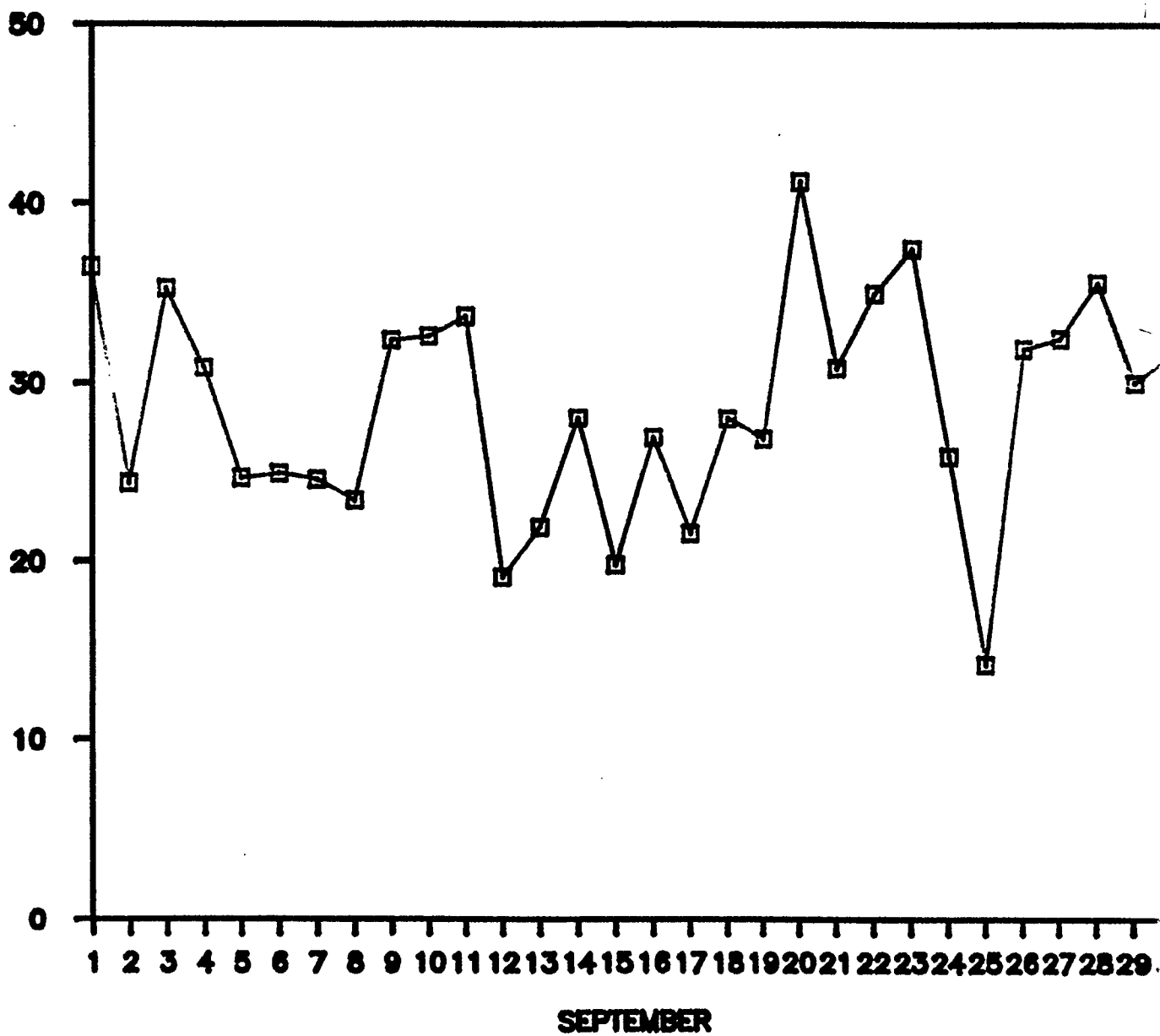
MECHANICAL

- Installed 28 mesh urethane panels on loaded carbon screen (replaced 35 mesh panels).
- Air sparges installed in surge tank (2 installed Sept. 3 plus 2 more Sept. 15).
- Removed metal piping on barren tank ventilation fan suction-installed HDPE fused pipe.
- "Y" in tailings line leaking, removed and installed straight spool piece.
- Installed DSM screen ahead of loaded carbon screen.
- Completed cement work under Trash/Safety screen deck.
- Cyanide addition points changed to tank feed boxes.
- Raised sides of kiln feed hopper to increase capacity.
- Fabrication of spool pieces on strip vessel discharge to allow valves to remain connected when removing screens.
- Installed mechanical seal in Toyo (100 h.p.).
- Installed expanded metal trash screen on end of load carbon screen.
- Acid pump discharge line changed to PVC.
- Repairs to pipelines in Polishing Pond area.
- Repairs to Toyo pumps.
- Shelving for cold storage warehouse.
- Patched hole in acid wash vessel.

SEPTEMBER CIL CYANIDE CONSUMED lb/ton



SEPTEMBER CIL RECOVERIES



ELECTRICAL

- Kiln motion failure setting changed - wouldn't start - motion failure setting too close to trip point.
- Installation of lights in cold storage shed, monitor areas and vapourizer shed.
- Cable connection to gen-sets.
- UPS system for North Pond.
- Lime system PLC program.
- Ground fault alarm system and meters for electrowinning cells.
- Toyo pumps - cables, timers (for starter), moisture sensor.
- Tie in 75 KVA transformer - North Pond.
- Repairs to heat tracing.
- Installed lighting at Derrick screen area.
- Siren for high CN gas alarm.
- Solenoid/valve installed on gland water lines to CN transfer and circulating pumps - when pumps shutdown, gland water shuts off automatically.
- Monitor memory controls.

INSTRUMENTATION

1. Checked calibration on CIL feed density on September 5th and 14th. Very accurate.
2. Calibrated HCN detectors on September 6th.
3. Calibrated trommel density on September 3rd and 14th.
4. Received Rosemount electronics modules from the Rosemount Service Centre. These modules were previously damaged from power oscillations. A total of 3 modules were received. I tested these modules and one is still faulty.

5. Calibrated the acid wash pH probe on September 10th. Calibrated the trash screen underflow pH probe on September 6th and 15th.
6. Replaced rupture disk on strip vessel #1 due to a pressure build-up.
7. Cleaned out the cyanide addition metering valve on the barren solution tank.
8. Matched level indications on the barren solution tank. Two level detecting devices are present on the vessel which are: 1) Milltronic's ultrasonic level transmitter and 2) level gauge mounted 1' from the bottom. Having trouble matching these devices since the temperature of the surroundings and the amount of vapours present in the vessel affect the accuracy of the ultrasonic transmitter. I matched the devices when the solution is being mixed since this is the time when the indication is most needed.
9. The solution heater has been shutting down quite frequently. The modulating controller lost all calibration values. Replaced controller and entered new values. The solution heater would complete it's purge cycle but would not ignite. Removed the ignition electrodes and discovered that the terminals were shorting out behind the electrodes instead of at the electrodes. Tightened the terminals and it works fine.

The solution heater would shutdown and alarm randomly. We think that the ultraviolet flame sensor is losing its ability to sense the flame. New sensor on its way, also a representative from Volland is arriving on September 20th.

10. Replaced electronics module in #3 cyanide addition flow transmitter, checked flow rates in all three additions. #1 and #2 are accurate but #3 is off by a significant amount. Currently checking the flow element in the pipe.
11. Checked calibration of CIL feed density on September 28th.
12. Checked calibration of trommel density on September 27th.
13. Calibrated the acid wash pH probe on September 23.
14. Calibrated CIL pH probe on September 28th.
15. Worked on the solution heater. Adjusted the fuel/air mixture for efficiency. Adjusted the control parameters for more stable control of temperature.

16. Replaced CIL surge tank level indicator. Operators claimed the other indicator was faulty.
17. Replaced the ultraviolet flame sensor on the solution heater.
18. Received 3 rupture disks from suppliers.
19. Installed ball valves on the blow-off lines of the rupture disks.
20. Changed the remote setpoint for cyanide addition from mass flow (tons/hr) to feed flow (GPM).
21. Cleaned #1, 2 and 3 cyanide addition flowmeters. Re-calibrated each device. #3 cyanide addition still isn't operating correctly. Suspect that the seal has been broken and cyanide has leaked into the electronics.
22. Replaced the temperature indicators on top of the strip vessels.
23. Installed the strip vessel feed flow meter. Having problems with the operation of the device.
24. Installed the electrowinning cells feed flowmeter.
25. Replaced membrane and electrolyte for each HCN gas detector. Calibrated each device.
26. Cleaned #1 cyanide addition valve.

DOWNTIME RECORD

SEPTEMBER 1988

<u>DATE</u>	<u>HOURS</u>	<u>EXPLANATION</u>
Sept. 1	1.50	Barge pumps - electrical.
2	1.00	Low feed on 50 hp Toyo - blown motor.
3	4.30	Air sparge installation in surge tank.
4	0.20	Low feed - using 50 hp Toyo in North Pond.
5	3.00	Repairs to CIL feed line (pH bleed), tailings line hole at pump.
10	1.40	Low feed - surge tank level low.
11	3.60	Low feed - surge tank level low.
12	1.00	Power failure
	3.90	Repairs to "Y" in tailings line - install spool piece.
15	0.60	Polishing Pond down to extend ramp.
16	3.20	Low feed - problems with Toyo at Polishing Pond.
17	3.70	Low feed - North Pond pumps down, changing pumps in Polishing Pond.
18	0.50	Changing screens - Derrick trash screens.
	0.40	Blasting ditch for CIL tank drainage.
19	3.90	Low feed - piping problems in North and Polishing Ponds.
20	3.50	Power failure.
	1.50	Tailings pump - blown fuse.
	5.30	Low feed - Toyo pump, Polishing Pond.
21	1.50	Change screen cloth on Derrick Trash screens.
	2.50	Low feed - moving crane, North Pond Toyo pump problems, Polishing Pond.
22	0.40	Safety screens plugged.
23	0.90	Safety screens plugged.
24	0.80	Low feed.
25	2.20	Low feed.
26	4.20	Low feed - North Pond, Toyo motor burned out.
27	3.30	Low feed - Changed from 50 to 100 hp Toyo, North Pond.
28	3.50	Low feed - Sanded line - North Pond, from Toyo.
29	1.70	Low feed - Moved monitor Polishing Pond, switched monitors, North Pond.
30	2.50	Low feed - Advance Polishing Pond ramp - Toyo not pumping.
TOTAL	66.00	

1 DOWNTIME ANALYSIS - JUNE TO SEPTEMBER 1988

1. Summary

June to September -	Operating Hours (Budget)	2928.00
	Operating Hours (Actual)	2694.27
	Availability (%)	92.02
	Downtime Hours	233.73
	Downtime (%)	7.98

2. Breakdown

	Total Downtime Hours	% of Total Downtime Hours	% Contribution to Downtime
Plant - Electrical	3.10	1.33	0.11
Mechanical	28.62	12.25	0.98
Instrumentation	---	---	---
Operating	23.43	10.02	0.80
Modifications(1)	22.68	9.70	0.77
Mining	115.00	49.20	3.93
Water Supply	9.08	3.89	0.31
Power Failure	<u>31.82</u>	<u>13.61</u>	<u>1.08</u>
TOTAL	233.73	100.00	7.98

- (1) Installation of diffuser pipe in surge tank (6.48 hours).
 Conversion of CIL feed pump to gland water (9.40 hours).
 Vibration tests by consultant on surge tank (0.60 hours).
 Air sparge installation on surge tank (4.30 hours).
 Blasting for CIL tank drainage trench (0.40 hours).
 Changing type of Trash screen cloths (1.50 hours).

From the above the actual downtime for the plant was 2.20% for the June to September period.

A considerable amount of the mining area downtime was due to problems with the Toyo pumps especially with the lower seal mechanism. In addition, since CIL feed densities dropped drastically when the agitator in the surge tank was shutdown the CIL feed was shutdown before the agitator was shut off. This method of operation provides at most 2 hours of surge capacity. Installation of proper size air spargers at the end of the season should solve this problem. Some of the mining problems encountered in September may have been due to the limitations of feed flow and tonnage placed on plant throughput.

Don Cooper
 TRP Plant Superintendent

REAGENT CONSUMPTION - SEPTEMBER 1988

REAGENT	MONTH		YEAR TO DATE	
	LBS *(LITRES)	LBS/TON *(LITRES/TON)	LBS	LBS/TON
PROPANE	101,206	0.546	172,069	0.204
¹ CARBON	70,560	0.380	170,870	0.203
LIME	58,600	0.316(.)	605,469	0.719
MURIATIC ACID	1,993	0.011	6,477	0.008
CAUSTIC SODA	29,271	0.158	117,565	0.140
SODIUM CYANIDE	278,333	1.501	852,682	1.013
STEEL WOOL	45	0.00024	140	0.0002

1. Carbon added to CIL.

(.) Purchased 60 tonnes of new carbon but has not yet all been received.

TRF METALLURGICAL BALANCE
(C.I.L.)

DATE: SEPT. 30, 1988

DAY

RECOVERIES (%)	COMBINED GRADES oz/Ton Au.	AVAILABILITY (HRS/%)	
SOLIDS			
DISSOLUTION 31.58	HEADS 0.078	OP.HRS.(BUDG)	24.0
ADSORPTION 94.66	TAILS 0.053	OP.HRS.(ACT)	21.5
TOTAL 31.79	CIL RECOVERY	AVAIL.(%)	89.6
	TO CARBON 179.988 oz.	DOWNTIME(HRS)	2.50
LOW FEED SUPPLY.			
CIL FEED SOLUTION ASSAY:	0.0048		

MONTH TO DATE

RECOVERIES (%)	COMBINED GRADES oz/Ton Au..	AVAILABILITY (HRS/%)	
SOLIDS			
DISSOLUTION 28.66	HEADS 0.073	OP.HRS.(BUDG)	720
ADSORPTION 89.40	TAILS 0.052	OP.HRS.(ACT)	654
TOTAL 28.14	CIL RECOVERY	AVAIL.(%)	90.8
	TO CARBON 3829.88 oz.	DOWNTIME(HRS)	66

YEAR TO DATE

RECOVERIES (%)	COMBINED GRADES oz/Ton Au..	AVAILABILITY (HRS/%)	
SOLIDS			
DISSOLUTION 30.29	HEADS 0.079	OP.HRS.(BUDG)	3672
ADSORPTION 69.78	TAILS 0.061	OP.HRS.(ACT)	3314.27
TOTAL 22.66	CIL RECOVERY	AVAIL.(%)	90.3
	TO CARBON 15001.38 oz.	DOWNTIME(HRS)	357.73

TRP METALLURGICAL BALANCE
(C.I.L.)

DAY

DATE: SEPT. 30, 1988

FEED :				RECLAIM SOLUTION			TOTAL
Tons	Percent Solids	Ounces Au/Ton	Ounces Au.	Tons	Ounces Au/Ton	Ounces Au.	Ounces Au.
7302.1	41.39	0.075	549.65	10341.4	0.0016	16.55	566.19
TAILS :				TAILS SOLUTION			TOTAL
7302.1	41.39	0.052	376.06	10341.4	0.0010	10.15	386.21

MONTH TO DATE

FEED :				RECLAIM SOLUTION			TOTAL
Tons	Percent Solids	Ounces Au/Ton	Ounces Au.	Tons	Ounces Au/Ton	Ounces Au.	Ounces Au.
186638.6	36.21	0.070	13069.41	328741.8	0.0016	538.38	13607.79
TAILS :				TAILS SOLUTION			TOTAL
186638.6	36.21	0.050	9323.70	328741.8	0.0014	454.21	9777.91

YEAR TO DATE

FEED :				RECLAIM SOLUTION			TOTAL
Tons	Percent Solids	Ounces Au/Ton	Ounces Au.	Tons	Ounces Au/Ton	Ounces Au.	Ounces Au.
843294.3	32.50	0.076	64137.24	1751495.2	0.0012	2068.23	66205.47
TAILS :				TAILS SOLUTION			TOTAL
843294.3	32.50	0.053	44708.49	1751495.2	0.004	6495.60	51204.09

**TRP METALLURGICAL BALANCE
(STRIP CIRCUIT)**

DAY BATCH No.88-30.

DATE: SEPT. 30, 1988

TONS OF CARBON (EST.)	LOADED CARBON		STRIPPED CARBON		CATHODE RECOVERED
	oz Au/TON	oz Au	oz Au/TON	oz Au	oz Au
4.288	59.380	254.621	1.100	4.717	249.905

STRIP CIRCUIT RECOVERY: 98.14

MONTH (BATCH Nos.88-014 TO 88-30)

TONS OF CARBON (EST.)	LOADED CARBON		STRIPPED CARBON		CATHODE RECOVERED
	oz Au/TON	oz Au	oz Au/TON	oz Au	oz Au
77.430	55.475	4295.444	2.135	165.297	4132.891

STRIP CIRCUIT RECOVERY: 96.21

YEAR (BATCH Nos.88-01 TO 88-30)

TONS OF CARBON (EST.)	LOADED CARBON		STRIPPED CARBON		CATHODE RECOVERED
	oz Au/TON	oz Au	oz Au/TON	oz Au	oz Au
133.305	49.367	6580.848	2.710	361.297	6222.299

STRIP CIRCUIT RECOVERY: 94.55

TRP BULLION PRODUCED

SEPTEMBER 1988 (BAR Nos. TRP-003 TO TRP-008)

TOTAL WEIGHT OZS.	ASSAY FINENESS		TROY OUNCES	
	GOLD	SILVER	GOLD	SILVER
4,324.787	677.805	220.744	2,931.361	954.669

YEAR TO DATE (BAR Nos. TRP-001 TO TRP-008)

TOTAL WEIGHT OZS.	ASSAY FINENESS		TROY OUNCES	
	GOLD	SILVER	GOLD	SILVER
5,826.258	678.579	211.978	3,953.574	1,235.039

CATHODES CURRENTLY CONTAIN (ozs Au): 2268.725

ESTIMATED CIL CARBON GOLD INVENTORY

DATE:
SEPT. 30, 1988

DAY

FROM INVENTORY	TO INVENTORY		NET CHANGE
CARBON TO STRIP oz Au	CIL RECOVERY TO CARBON oz Au	STRIPPED CARBON oz Au	PLUS (MINUS) oz Au
254.621	179.988	4.717	-69.916

MONTH

FROM INVENTORY	TO INVENTORY		NET CHANGE
CARBON TO STRIP oz Au	CIL RECOVERY TO CARBON oz Au	STRIPPED CARBON oz Au	PLUS (MINUS) oz Au
4295.444	3889.345	165.297	-240.802

YEAR

FROM INVENTORY	TO INVENTORY		NET CHANGE
CARBON TO STRIP oz Au	CIL RECOVERY TO CARBON oz Au	STRIPPED CARBON oz Au	PLUS (MINUS) oz Au
6580.852	15396.72	361.297	9177.17

CURRENT CIL CARBON GOLD INVENTORY oz Au: 9177.17

METALLURGICAL BALANCE VS TANK SAMPLE INVENTORY
SEPT. 30, 1988

CIL TANK NUMBER	WEIGHTS		ASSAY	TOTAL
	gms/L	TONS	ozs Au/ton	ozs Au
1	19.00	55.70	59.44	3310.676
2	10.10	29.61	45.22	1338.863
3	34.60	101.43	36.71	3723.443
4	27.00	79.15	20.00	1582.989
5	35.10	102.89	14.40	1481.678
6	35.60	104.36	12.50	1304.501
TOTAL		473.14		12742.15
AVERAGE	26.90		26.93	

CARBON ASSAYS FROM 28TH SAMPLES.

	CIL CARBON oz Au	INVENTORY TONS CARBON	INVENTORY oz Au/TON
FROM MET. BALANCE	9,177.170	311.90	29.42
FROM TANK SAMPLING	12,742.151	473.14	26.93
DIFFERENCE	(3,564.981)	-161.24	2.49

TONS OF FRESH CARBON ADDED TO DATE: 311.901

GIANT
Yellowknife Mines Limited

DATE: October 7, 1988
TO: D. Cooper
T.R.P. Superintendent
FROM: G. Doerksen
RE: T.R.P. Mining Report - September 1988

<u>Production</u>	<u>Actual</u>	<u>Forecast</u>
Tons Mined	186,640	240,000
Tons/Day	6,221	8,000
Density	36%	45%
Grade	0.073oz/Ton	0.067
Total Feed Ounces	13,608	16,080
Feed Rate	2325 USGPM 259	2,900 333

Tonnages for Semptember were well below forecast for the following reasons:

- restricted flowrate (2,500 USGPM)
- restricted tonnages (1,000 T.P.D. for Three Days, and 8,000 for rest of month)
- Toyo pump breakdowns
- Operator apathy

In order to improve production in October all flow and tonnage restrictions have been removed.

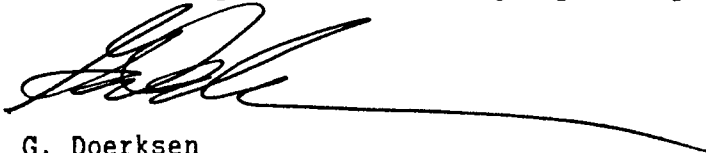
Richard Juckes from Toyo Pumps will be arriving in Yellowknife on October 11th to work on improving the reliability of the Toyo pumps. Richard or another Engineer will be on site for the remainder of the mining season.

.../2

Memo to Don Cooper
October 7, 1988
Page 2

Doug Chapman and Charlie Hawkins will be assigned to supervise the monitor operators for the month of October. This extra supervision will hopefully eliminate problems encountered through the summer with operator motivation. Beacause operators get paid the same amount whether they mine 6,000 tons a day or 10,000 tons a day there is no incentive for them to try that little bit harder to mine more tons.

A D8 will be kept on the North Pond pushing tailings for at least 16 hrs/day in order to keep densities/tonnage up during freezing temperatures



G. Doerksen
T.R.P General Foreman

GD/lh

c.c J.S. McAlpine
S.E. El-Alfy
D. Chapman

**G I A N T
YELLOWKNIFE MINES LIMITED**

MEMO TO: S.E. El-Alfy

CC:

FROM: Don Cooper

DATE: August 09, 1988

SUBJECT: TRP - PLANT MONTH END REPORT - AUGUST 1988

METALLURGICAL

The major problem facing improvements in recovery was determined to be a lack of fresh or minimally loaded carbon in the CIL tanks. Other problems may arise as this one is cured but due to the length of time the carbon has been in contact with the slurry many contaminants have adsorbed onto the carbon. It seems likely that the activity of the carbon is much less than when new. Other problems facing recovery improvements were the inability to maintain even carbon distribution within each tank due to what appeared to be insufficient agitation. Contamination of sample bottles compounded the problems by yielding erroneous and erratic assay results. During the latter part of August cyanide supplies dwindled and deliveries were not assured. This problem was rectified through contacts with Dupont but deliveries of sufficient quantities to allow increasing cyanide addition rates is still a problem.

During August Batch 88-04 to 88-14 were actually stripped but since assay data was not available on 88-14 at month-end calculations include up to 88-13 only. Ideally 30 batches of carbon should have been processed. The loaded carbon screen was identified as the hold-up in the circuit. To rectify this an order was placed to change the polyurethane deck from 35 mesh to 28 mesh. This should increase the throughput. A pipe was installed on the No. 1 carbon advance pump feeding the screen to replace the flexible hose which had collapsed in places.

The pump surging combined with insufficient volume throughput by the screen was still a problem. Arrangements were made to install a DSM screen ahead of the loaded carbon screen to remove the bulk of the solution. This will also allow the pump speed to be increased if necessary. The above work will be completed by mid-September.

To compensate for the low stripping/regeneration rate fresh carbon was added to the CIL tanks commencing on August 21. The object was to add 5 tons of carbon, either regenerated or fresh, per day. By increasing the load of low grade carbon it was hoped to increase the rate of gold adsorption and hence increase recoveries from solution. Carbon was also advanced to No. 1 tank on August 29. This was to increase the contact time of the solution with carbon and to allow movement of lower grade carbon further forward in the system.

The first gold brick was poured on August 26. The gold resulted from 12 batches of carbon processed. The large number of cathodes and the large initial quantity of steel wool used accounted for the lag time in obtaining sufficient loading on the wool for the pour. Initially 3 1/2 to 4 pounds of steel wool was used per cathode with 7 cathodes per cell. Currently 5 cathodes per cell are in use with 2 1/2 pounds of wool each. Approximately 1/4 inch of sludge was removed from the bottom of the cells after Batch 88-09. Plans for next month include adjusting cell voltages to reduce ammonia gas production and reduce sludge formation. Reliable samples must be obtained first before making these changes.

The attached pages illustrate the technique required to obtain a plant throughput of 5 tons of carbon per day. The inefficiencies in the system are apparent due to the various extended waiting periods. It appears that by increasing the kiln feed hopper size from 3 ton capacity to 5 ton capacity it could speed up the process. This chart will allow identification of bottlenecks in the system and provide targets to speed up processing.

The following also illustrate the highlights of the metallurgical work done in August.

To get 1 BATCH of carbon per day the following must be done:

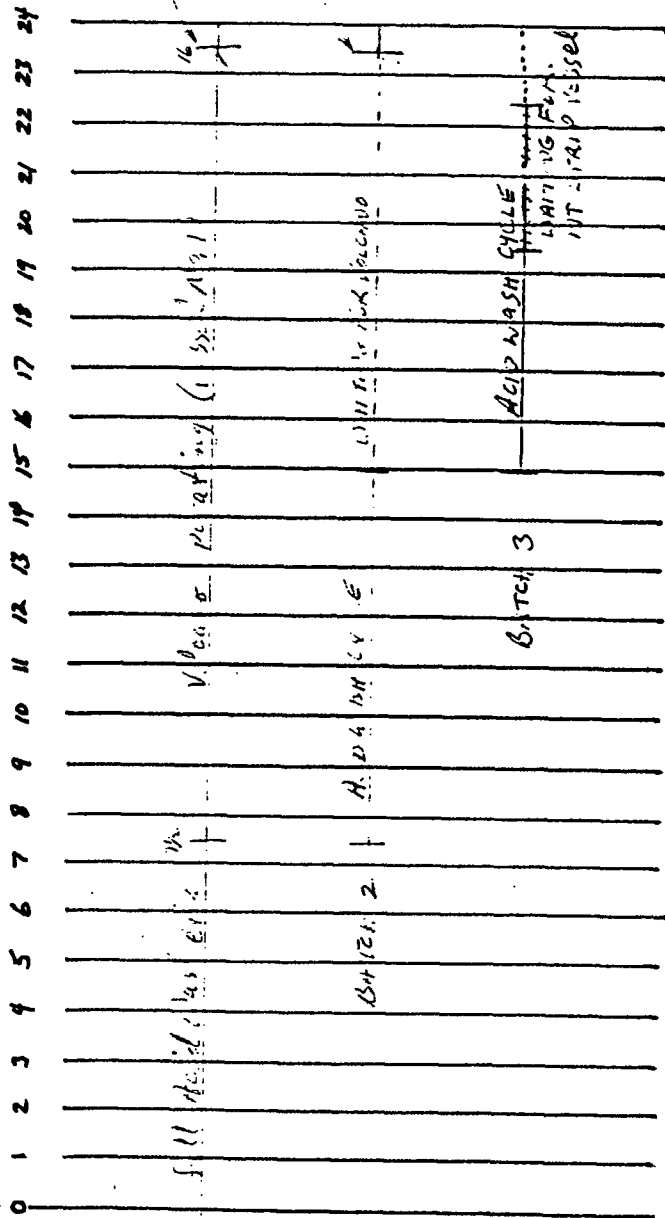
A)	ACID WASH CYCLE	<u>HRS</u>
	1. Fill Acid Wash Vessel from CIL tanks.	3
	2. Acid/Caustic/Water Wash.	1 1/2
	3. Educting from Acid Wash Vessel to Strip Vessel	<u>3</u>
	TOTAL ACID WASH CYCLE	7 1/2

B)	STRIP CYCLE	
	1. Heat up time for Volcano.	2
	2. Strip.	12
	3. Cool down time for solution.	2
	4. Educt 3 tons carbon to kiln hopper (5 tons = 3 hrs).	1.8
	5. DRAIN Time.	0.5
	6. Draw hopper down by 2 tons (500 lbs/hr = 4 hrs/ton)	8
	7. Educt 2 tons carbon to kiln hopper.	1.2
	8. Clean screens etc., Avg. per batch since may not need to be done every batch.	<u>0.5</u>
	TOTAL STRIP CYCLE	28.0

C)	REGENERATION CYCLE	
	1. 2 tons included in above - time to regenerate remaining 3 tons	12

TOTAL 48 hrs or 2 days to complete but with 2 strip vessels can complete 1 BATCH per day.

Sh. f. ¹/₂ inch long to 1 inch
high

- Volume on. to
stripped no. 2

strip vessel - 8 1/2 hrs waiting for previous strip to be completed.

Acid Wash Vessel - 3 hrs waiting for available strip vessel

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
BATCH 1								51	Key	1	1	1	1	1											
BATCH 2																									
BATCH 3																									

(*) BATCH 1 complete. *

educt to Kiln hopper etc.

strip vessel 8hrs - Kiln hopper full
 strip vessel 1hr - waiting for volcano.
 Acid wash 5hrs - waiting for MT strip vessel

[illegible]

Factor 2 completes:

product to Kila Hopper.

Strip Vessel
Acid Wash - 11 1/2 hrs waiting for RT strip vessel.
Strip vessel - 16 hrs - waiting for Kiln Hopper to empty out.
Acid Wash - 5 hrs - waiting for RT strip vessel.

DAY 4

BATCH 3 completed

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24	

VE, EL, MI

BATCH 3

August 31/88

GIANT YELLOWKNIFE MINES LIMITED

TRP PLANT

Actions that have taken during the period of August 10-31, 1988:

- 1) Slurry feed densities have been increased and are generally maintained in the 38-42% solids range.
- 2) The metallurgical accounting has been revised to account for gold dissolution prior to the CIL circuit and to account directly for gold present in reclaim solution. August 11.
- 3) Wire square mesh screens were installed on the trash screens to remove more woodchips from the slurry feed. August 20.
- 4) Carbon has been distributed through the CIL circuit so that carbon concentrations are between 10-30 gram/litre in each tank. Carbon was advanced to tank No. 1 August 29.
- 5) New carbon is being added to the CIL circuit to raise the average carbon concentration to 20 grams/litre in each tank. August 21.
- 6) A second compressor has been installed to supply additional air to the bottom of the CIL tanks. August 22 (1200 cfm).
- 7) Slurry agitation and carbon suspension in each tank has been greatly improved.
- 8) Slurry flow through the downcomers on CIL tanks #1 and #6 has been obtained as a result of improved mixing with the addition of the extra compressor.
- 9) Sanding in the overflow launders of CIL tank #5 has been eliminated.
- 10) The pH of the slurry in the CIL circuit has been dropped from pH 11 to pH 10.3. This has possibly contributed to lower viscosity and better agitation in the tanks.
- 11) Five foot long pipe extensions have been added to the suction of the carbon advance pipes so that the draw-point is now approximately 8 feet below the slurry surface. August 23-25.

- 12) The feed to the CIL circuit has been limited to 8000 tons of solids per day to optimize recovery.
- 13) Cyanide addition was increased to 1.25 lbs/ton at pH 11.0 on August 9 and subsequently reduced to 0.75 lbs/ton (in the feed) on August 16 due to dwindling supplies.
- 14) The loaded carbon dewatering screen has been levelled and has compressed air entering the bottom of the feed launder. This has improved the operation of the screen. Screen rotation was reversed August 29.
- 15) Feed, tails and reclaim solution samples have been sent out for comprehensive analysis.
- 16) A carbon sampling program has been started.
- 17) A daily maintenance program for the CIL tanks has been started.

OPERATIONS

1. Batch 88-06 carbon was mostly wood chips. This resulted partly from holes in the trommel screen allowing too much wood to the trash screens which passed some of this to the CIL tanks and partly from wood being forced through the Derrick trash screens.
2. Lower temperature limit for kiln was determined to be in the 400 to 500oF range. This is the lower control limit.
3. Insufficient transfer of carbon from CIL tanks was determined to be caused by:
 - a) loaded carbon screen not levelled after surge tank settled;
 - b) sanding or air locking of carbon advance pump discharge line; and
 - c) openings of loaded carbon screen not passing sufficient slurry volume.
4. Cyanide supplies running low during latter half of month. Dupont/Van Waters and Rogers indicated no further shipments would be made. This problem was rectified by month end but delivery schedules still causing problems.
5. Gland water addition to CIL feed pump has solved the problem of rapidly wearing shaft sleeves.
6. Specialized metal clad, teflon lined hoses on strip vessels have started to leak either as a result of carbon wearing holes in the lining or mechanical damage to the liner. Replacements were ordered and studies are underway to find a more appropriate type of hose for the application.
7. Work was commenced to install a cement wall across Trash/Safety screen area to prevent spills going to CIL tank base area. A trench was dug and drilling and blasting will be done to install a culvert to direct spills to the pond.
8. Contractors were engaged to install supports for tarps to close in loaded carbon screen area for winter operation.
9. Reclaim barge may have leaks between ballast tanks. Pumped ballast to redistribute and level unit. Discharge hose was placed on floating walkway. Second walkway was connected to allow access.

10. Cracks have begun appearing in Derrick screen feed boxes. This is possibly due to the weight of the large feed pipes. These pipes will need better support structures.
11. Scale buildup in the cyanide loop feed line broke loose and plugged the pipe. Two days were required to clean pipe properly. The return line was used to supply cyanide to the CIL tanks.
12. Trommel screen alignment is still causing excessive wear on support roller guides.
13. Ventilation system needs considerable work, especially at barren solution tank and cyanide mix and holding tank. Vent fan for electrowinning cells may need upgrading. Some operational changes may help in these areas.

MAINTENANCE

1. Mechanical

- a) Rebuilt Mather-Platt 1A pumps.
- b) Patched holes in trommel screen.
- c) Fixed cracks in Derrick screen feed boxes.
- d) installed wire mesh screens on Derrick screen decks.
- e) Pump and small barge built and installed at TRP catchment pond to control run-off or spills and direct to tailings pump box.
- f) Installed piping for polishing and booster pump.
- g) Rebuilt 100 HP and 50 HP Toyo pumps.
- h) Changed coolant and filters (oil and air) on XF400 and U25H-SP-SS compressors.
- i) Changed air filter on LP blower.
- j) Started work on barren tank ventilation.
- k) Built table for working on cathodes.

2. Electrical

- a) Connected spare generator set - emergency power back-up 500 KVA.
- b) Improved lighting in Polishing and North Ponds and plant yard.
- c) Hooked up Polishing Pond to permanent power from Pilot Plant line.
- d) wired in transmitters and meters to provide density indication in Shifter's office from both mining areas.
- e) Installed PLC for barge pump controls.
- f) Work progressing on PLC for lime slaker.

- g) Heat tracing checked out for operation.
- h) Terminal protection on electrowinning cells completed.
- i) Completion of process plant lighting.
- j) Installed heated enclosures for CIL feed controls and cyanide addition instruments.
- k) Work on UPS system nearing completion; waiting for unit.
- l) Wired in extra wall fan at electrowinning cell area.
- m) Wired in spare fan for barren solution tank.

3. INSTRUMENTATION

- 1) Took the Brooks metering valve off the cyanide addition line to the barren solution tank. Since a replacement was needed in a hurry, the metering valve for caustic addition to the cyanide mixing tank was removed and installed on top of the barren solution tank. Took apart the valve and found the wraps inside along with some carbon.
- 2) Re-installed metering valve on top of cyanide mix tank.
- 3) Metering valve on barren tank malfunctioned three weeks later. Took apart and found a build-up of scale inside. Cleaned up and re-installed.
- 4) Replaced rupture disk on the pressure safety valve on top of strip vessel #2. Ordered more rupture disks for spare parts.
- 5) Hooked up low density alarm to OP2 and partially to the Shifter's office. Electricians moved density and flow transmitters into the Operator's shack.
- 6) Calibrated versatile level indicating controller at the barren solution tank.
- 7) Checked calibration on pressure gauges in the strip circuit area.
- 8) Installed resistance temperature detector for the temperature transmitter in the strip area.
- 9) Installed level gauges on the barren solution tank and the cyanide mix tank.
- 10) Installed Fisher controller on cyanide #3 flow. Configured as required.

- 11) Troubleshooted fired solution heater alarm. Found out what it alarms to inside the Volcano's electronics module. It alarms to low solution flow, low water level and also if the remote emergency shutdown button located in OP2 is shoved in.
- 12) Calibrated Sensidyne HCN gas detectors on August 17 - 31.
- 13) Cleaned and calibrated pH probe at trash screen underflow pumpbox on August 9, 23 and 30.
- 14) Calibrated CIL feed density on August 18 and 29. Accurate maximum % error is .8%.
- 15) Adjusted trommel feed density to read 31% when the Marcy scale indicated 36%.

VISITORS TO PLANT

1. Tom Stiles of Hayward-Gordon, August 2 - examine tank agitation.
2. Sean Waller, Kilborn, August 10 to present. Extra metallurgist to help sort out recovery problems and sampling.
3. John Bartrum, Manager Metallurgy with Giant Resources, August 19 to 25, sorting out plant operational and metallurgical problems.
4. Kelvin Fiedler, Gold Copper Exploration Ltd. (joint venture partner with Giant Resources), August 30 to September 12, metallurgist here to offer suggestions to improve recoveries.

OTHER HIGHLIGHTS

1. Gord Doerksen promoted to General Foreman August 10th.



D. Cooper
T.R.P. Plant Superintendent

REAGENT CONSUMPTION - AUGUST 1988

REAGENT	MONTH		YEAR TO DATE	
	LBS *(LITRES)	LBS/TON *(LITRES/TON)	LBS	LBS/TON
1 PROPANE	48,754	0.227	70,863	0.108
2 CARBON	83,775	0.390	100,310	0.153
3 LIME	333,305	1.550	546,869	0.833
MURIATIC ACID	2,491	0.012	4,484	0.007
CAUSTIC SODA	39,187	0.182	88,294	0.134
SODIUM CYANIDE	135,000	0.628	574,349	0.875
STEEL WOOL	35	---	95	---

- Quantity of propane used but paid for on capital - 23,243 litres
Quantity of propane used - charged to operations - 25,511

TOTAL USED IN AUGUST 48,754

- This represents carbon added to CIL tanks during August and YTD excluding the initial loading of 212.744 tons (425,488 lbs).
- Lime consumption for past 2 months was low due to reading incorrectly.

DOWNTIME RECORD

AUGUST 1988

DATE	HOURS DOWN	DESCRIPTION
Aug. 3	0.9	CIL feed pump ground fault alarm.
Aug. 4	3.8	Low feed.
Aug. 5	1.3	Power failure.
Aug. 7	2.7	Cleaning launder screens.
Aug. 8	0.4	Cleaning launder screens.
Aug. 9	0.6	Vibration tests on surge tanks.
Aug. 12	0.7	Power failure.
Aug. 14	0.2	Low feed.
Aug. 15	1.9	Moving Toyo pumps.
Aug. 18	2.0	1.0 hrs power failure, 1.0 hrs low feed supply.
Aug. 19	4.67	Low feed supply.
Aug. 20	1.00	Low feed.
Aug. 21	1.00	No leach air.
Aug. 24	0.6	Cyanide line plugged.
Aug. 25	10.70	1.5 hrs power failure; cyanide line plugged, plugged launder screens from power outage.
Aug. 26	<u>11.80</u>	power outage.
TOTAL	44.27	

TRP METALLURGICAL BALANCE
(C.I.L.)

DATE: AUG. 31, 1988

DAY

RECOVERIES (%)	COMBINED GRADES oz/Ton Au.	AVAILABILITY (HRS/%)
SOLIDS		
DISSOLUTION 29.16	HEADS 0.071	OP.HRS.(BUDG) 24.0
ADSORPTION 78.10	TAILS 0.054	OP.HRS.(ACT) 24.0
TOTAL 24.89	CIL RECOVERY	AVAIL.(%) 100.0
	TO CARBON 142.40 oz.	DOWNTIME(HRS) 0.00
NO DOWNTIME.		
CIL FEED SOLUTION ASSAY:	0.0072	

MONTH TO DATE

RECOVERIES (%)	COMBINED GRADES oz/Ton Au..	AVAILABILITY (HRS/%)
SOLIDS 29.02	HEADS 0.075	OP.HRS.(BUDG) 744
SOLUTION 61.10	TAILS 0.061	OP.HRS.(ACT) 699.73
TOTAL 19.04	CIL RECOVERY	AVAIL.(%) 94.0
	TO CARBON 3070.86 oz.	DOWNTIME(HRS) 44.27

RECOVERIES (%)	COMBINED GRADES oz/Ton Au..	AVAILABILITY (HRS/%)
SOLIDS 31.11	HEADS 0.081	OP.HRS.(BUDG) 2952
SOLUTION 65.72	TAILS 0.063	OP.HRS.(ACT) 2660.3
TOTAL 21.76	CIL RECOVERY	AVAIL.(%) 90.1
	TO CARBON 11507.40 oz.	DOWNTIME(HRS) 291.7

**TRP METALLURGICAL BALANCE
(C.I.L.)**

**DAY

DATE: AUG. 31, 1988

FEED :				RECLAIM SOLUTION			TOTAL
Tons	Percent Solids	Ounces Au/Ton	Ounces Au.	Tons	Ounces Au/Ton	Ounces Au.	Ounces Au.
8030	41.09	0.069	550.22	11513.5	0.0019	21.88	572.10
TAILS :				TAILS SOLUTION			TOTAL
8030	41.09	0.049	389.77	11513.5	0.0035	39.92	429.69

**MONTH TO DATE

FEED :				RECLAIM SOLUTION			TOTAL
Tons	Percent Solids	Ounces Au/Ton	Ounces Au.	Tons	Ounces Au/Ton	Ounces Au.	Ounces Au.
215025	36.16	0.073	15639.58	379573.3	0.0013	486.67	16126.26
TAILS :				TAILS SOLUTION			TOTAL
215025	36.16	0.052	11100.33	379573.3	0.0052	1955.07	13055.40

**YEAR TO DATE

FEED :				SOLIDS			RECLAIM SOLUTION			TOTAL
Tons	Percent Solids	Ounces Au/Ton	Ounces Au.	Tons	Ounces Au/Ton	Ounces Au.	Ounces Au.	Ounces Au.	Ounces Au.	
656655.7	31.58	0.078	51364.61	1422753.4	0.0011	1529.85			52894.47	
TAILS :				SOLIDS			TAILS SOLUTION			TOTAL
656655.7	31.58	0.054	35384.79	1422753.4	0.004	6002.28			41387.07	

**TRP METALLURGICAL BALANCE
(STRIP CIRCUIT)**

DAY (BATCH No.88-13)

DATE: AUG. 31, 1988

TONS OF CARBON (EST.)	LOADED CARBON		STRIPPED CARBON		CATHODE RECOVERED
	oz Au/TON	oz Au	oz Au/TON	oz Au	oz Au
0.000	0.000	0.000	0.000	0.000	0.000

STRIP CIRCUIT RECOVERY: ERR
MONTH (BATCH Nos.88-01 TO 88-13)

TONS OF CARBON (EST.)	LOADED CARBON		STRIPPED CARBON		CATHODE RECOVERED
	oz Au/TON	oz Au	oz Au/TON	oz Au	oz Au
55.875	40.902	2285.408	3.508	196.000	2089.408

STRIP CIRCUIT RECOVERY: 91.42

YEAR (BATCH Nos.88-01 TO 88-13)

TONS OF CARBON (EST.)	LOADED CARBON		STRIPPED CARBON		CATHODE RECOVERED
	oz Au/TON	oz Au	oz Au/TON	oz Au	oz Au
55.875	40.902	2285.408	3.508	196.000	2089.408

STRIP CIRCUIT RECOVERY: 91.42

TRP BULLION PRODUCED

AUGUST 1988 (BAR Nos. TRP-001 TO TRP-002)

TOTAL WEIGHT	ASSAY FINENESS		TROY OUNCES	
	GOLD	SILVER	GOLD	SILVER
1,501.471	680.808	186.730	1,022.213	280.370

YEAR TO DATE (BAR Nos. TRP-001 TO TRP-002)

TOTAL WEIGHT	ASSAY FINENESS		TROY OUNCES	
	GOLD	SILVER	GOLD	SILVER
1,501.471	680.808	186.730	1,022.213	280.370

CATHODES CURRENTLY CONTAIN (ozs Au): 1067.195

ESTIMATED CIL CARBON GOLD INVENTORY

DATE:
AUG. 31, 1988

DAY

FROM INVENTORY	TO INVENTORY		NET CHANGE
CARBON TO STRIP oz Au	CIL RECOVERY TO CARBON oz Au	STRIPPED CARBON oz Au	PLUS (MINUS) oz Au
0.00	142.40	0.00	142.4

MONTH

FROM INVENTORY	TO INVENTORY		NET CHANGE
CARBON TO STRIP oz Au	CIL RECOVERY TO CARBON oz Au	STRIPPED CARBON oz Au	PLUS (MINUS) oz Au
2285.408	3070.84	196	981.432

YEAR

FROM INVENTORY	TO INVENTORY		NET CHANGE
CARBON TO STRIP oz Au	CIL RECOVERY TO CARBON oz Au	STRIPPED CARBON oz Au	PLUS (MINUS) oz Au
2285.408	11507.38	196	9417.972

CURRENT CIL CARBON GOLD INVENTORY oz Au: 9417.972

METALLURGICAL BALANCE VS TANK SAMPLE INVENTORY
AUG. 31, 1988

CIL TANK NUMBER	WEIGHTS		ASSAY ozs Au/ton	TOTAL ozs Au
	gms/L	TONS		
1	21.10	61.85	58.90	3643.192
2	8.60	25.21	48.10	1212.629
3	16.90	49.54	35.30	1748.822
4	8.60	25.21	25.40	640.349
5	21.10	61.85	20.40	1261.819
6	13.80	40.45	16.60	671.539
TOTAL		264.12		9178.35
AVERAGE	15.02		34.75	

	CIL CARBON oz Au	INVENTORY TONS CARBON	INVENTORY oz Au/TON
FROM MET. BALANCE	9,417.972	263.14	35.79
FROM TANK SAMPLING	9,178.349	264.12	34.75
DIFFERENCE	239.623	-0.99	1.04

TONS OF FRESH CARBON ADDED TO DATE: 263.137

CIL TANK PROFILE

TANK FEED	ASSAY SOLIDS	oz Au/TON SOLUTION	pH	CN lb/ton	% SOLIDS	D.O. mg/l
SURGE			10.12		42.00	8.40
1	0.063	0.008	9.75	0.05	42.00	6.80
2	0.051	0.008	10.09	0.20	39.00	10.20
3	0.050	0.008	10.17	0.30	39.00	10.40
4	0.050	0.008	10.34	0.50	39.00	10.30
5	0.048	0.007	10.20	0.50	38.50	10.50
6	0.047	0.007	10.15	0.40	41.00	10.20

{ 262.

G I A N T
Yellowknife Mines Limited

MEMO TO: Gord Doerksen
CC: J.S. McAlpine; S.E. El-Alfy; D. Cooper
FROM: D. Chapman
DATE: September 01, 1988
SUBJECT: T.R.P. MINING REPORT - AUGUST 1988

PRODUCTION

	<u>Actual</u>	<u>Forecast</u>
Tons Mined	215,025	248,000
Average Tons/Day	6,936	8,000
Average Density	36%	45%
Grade	0.076 oz/ton*	0.067 oz/ton
Total Feed Ounces	15,180	16,616
Feed Rate	2481 USGPM 289 tons/hr	2900 USGPM 333 tons/hr

* Based on August 1 to August 30 Assays.

The tonnage for August was relatively low compared to that of the previous month however it is encouraging to see that the grades are still coming in higher than forecasted.

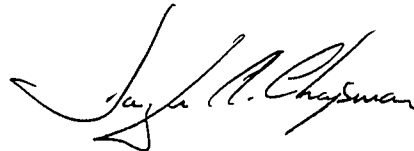
During the month, there were a few major obstacles encountered which caused us to run at half the daily tonnage for a few days. These could not be avoided but were remedied as quickly as possible. The most noticeable obstacle was obviously the cyanide shortage but that was restored within four days.

There were also numerous power outages encountered during the month, some for as long as 8 hours. The back-up generators on the property do not enable us to run the monitor feed pump so this again slowed us down.

The ramps in the Polishing Pond were advanced three times during the month and in the North Pond they were advanced twice. The Polishing Pond Mather-Platt pumps needed rebuilding due to a build-up of rocks in the impellers which had been caught in the line. These were repaired and re-installed in two days.

The mobile crane which was purchased a few weeks ago to run in the Polishing Pond has still not been repaired. The amount of headway made in the pond can be directly related to the lack of this piece of equipment.

In general the month was not as productive as we had hoped for, but we are slowly making headway and overcoming some major obstacles. With the advice from John Bartrum from Giant Resources and Sean Waller from Kilborn this next month should prove to be our best so far.



Douglas A. Chapman
Hydraulic Mining Technician

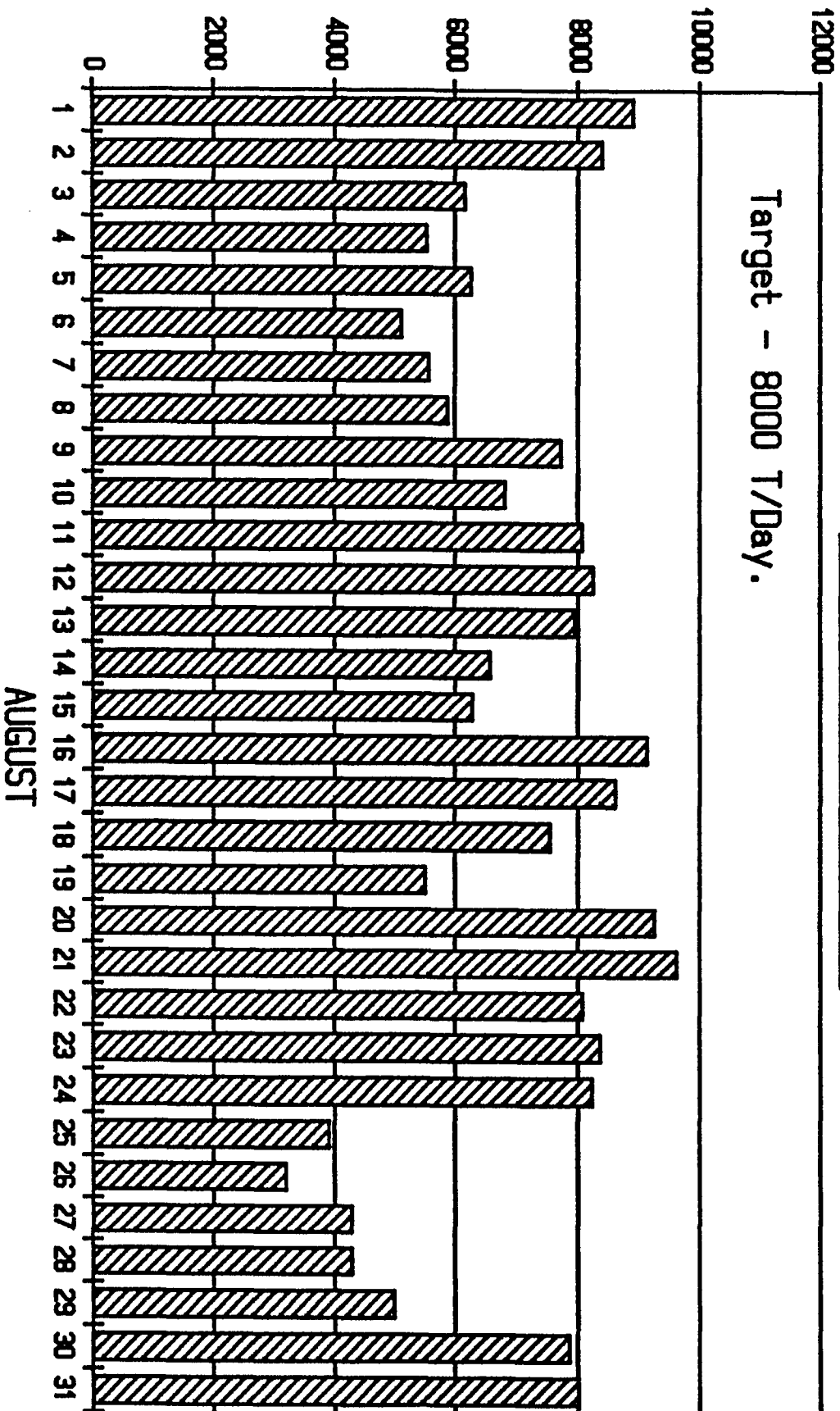
TRP MONTHLY MINING SCHEDULE

This outlines our progress so far:

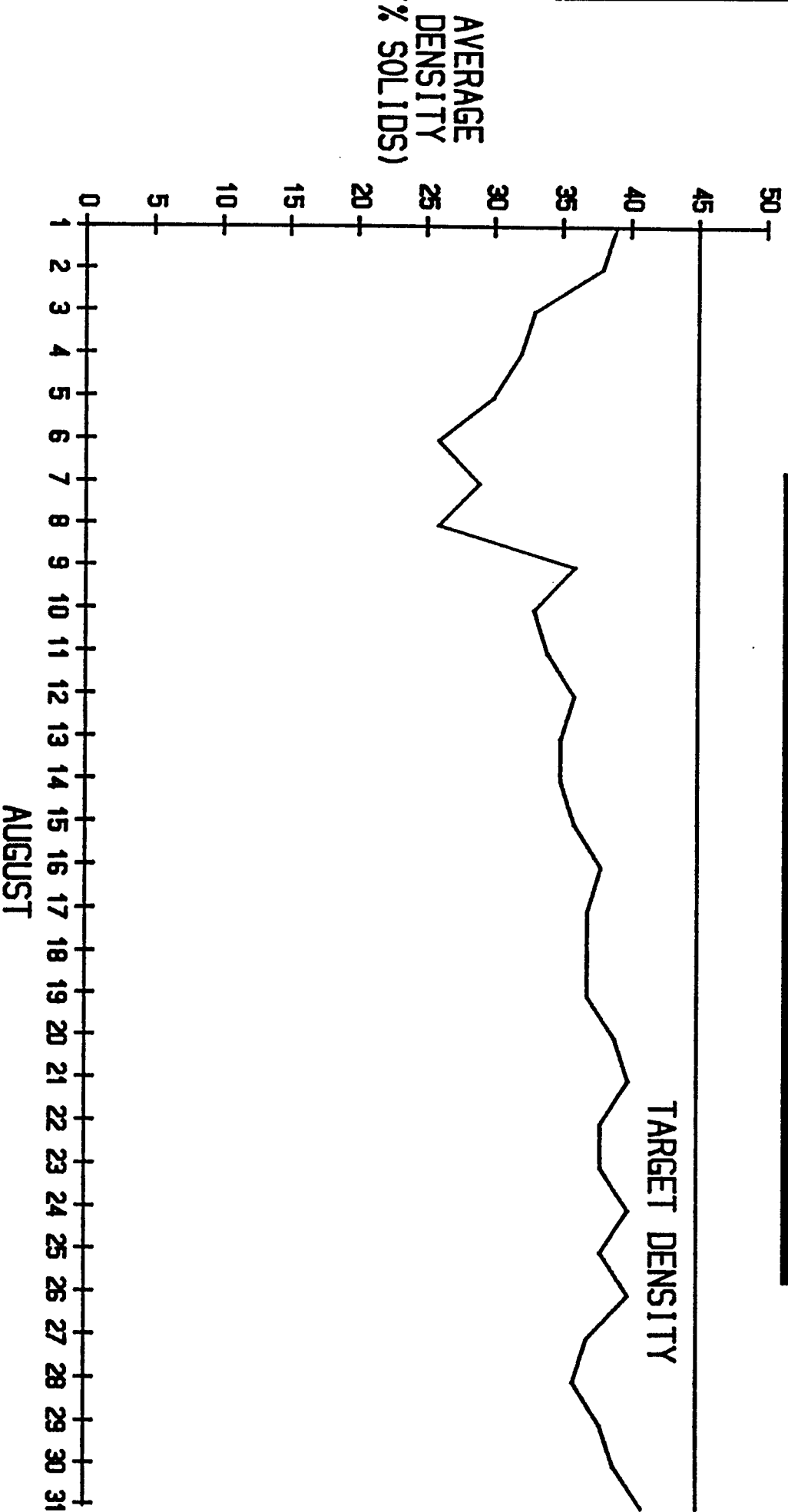
	<u>August Production</u>	<u>Monthly Forecast</u>	<u>Year To Date</u>	<u>Year to Date Forecast</u>
Tons Mined	215,025	248,000	602,508	744,000
Average Tons/Day	6,936	8,000	6,479	8,000
Average Density	36%	45%	34.96	45
Grade	0.076	0.067	0.080	0.067
Total Feed Ounces	15,180	16,616	41,371	49,848
Feed Rate (USGPM)	2,481	2,900	2,353	2,900
(TONS/HR)	289	333	272	333

	<u>MAY</u>	<u>JUNE</u>	<u>JULY</u>	<u>AUGUST</u>	<u>SEPT. 86</u>
Tons Mined	54,507	157,833 158,333	227,802	215,025	186,640
Average Tons/Day		5,261	7,593	6,936	6,221
Average Density		32.07	37.35	36	36
Grade		0.10	0.07	0.076	
Total Feed Ounces		9,170	17,022	15,180	
Feed Rate (USGPM)		2,156	2,477	2,481	2325
(TONS/HR)		222	308	289	259

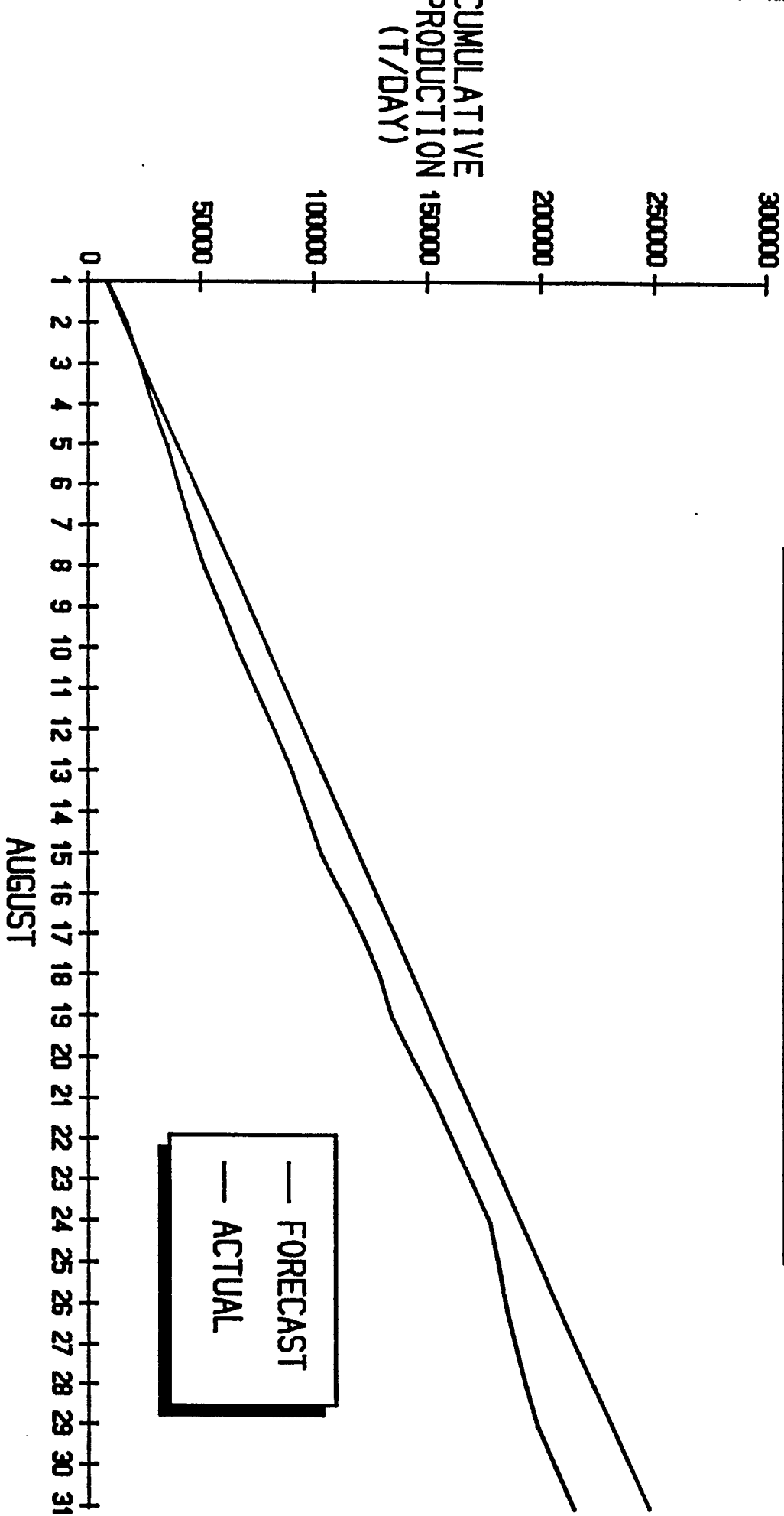
DAILY TONS MINED **TRP 1988**



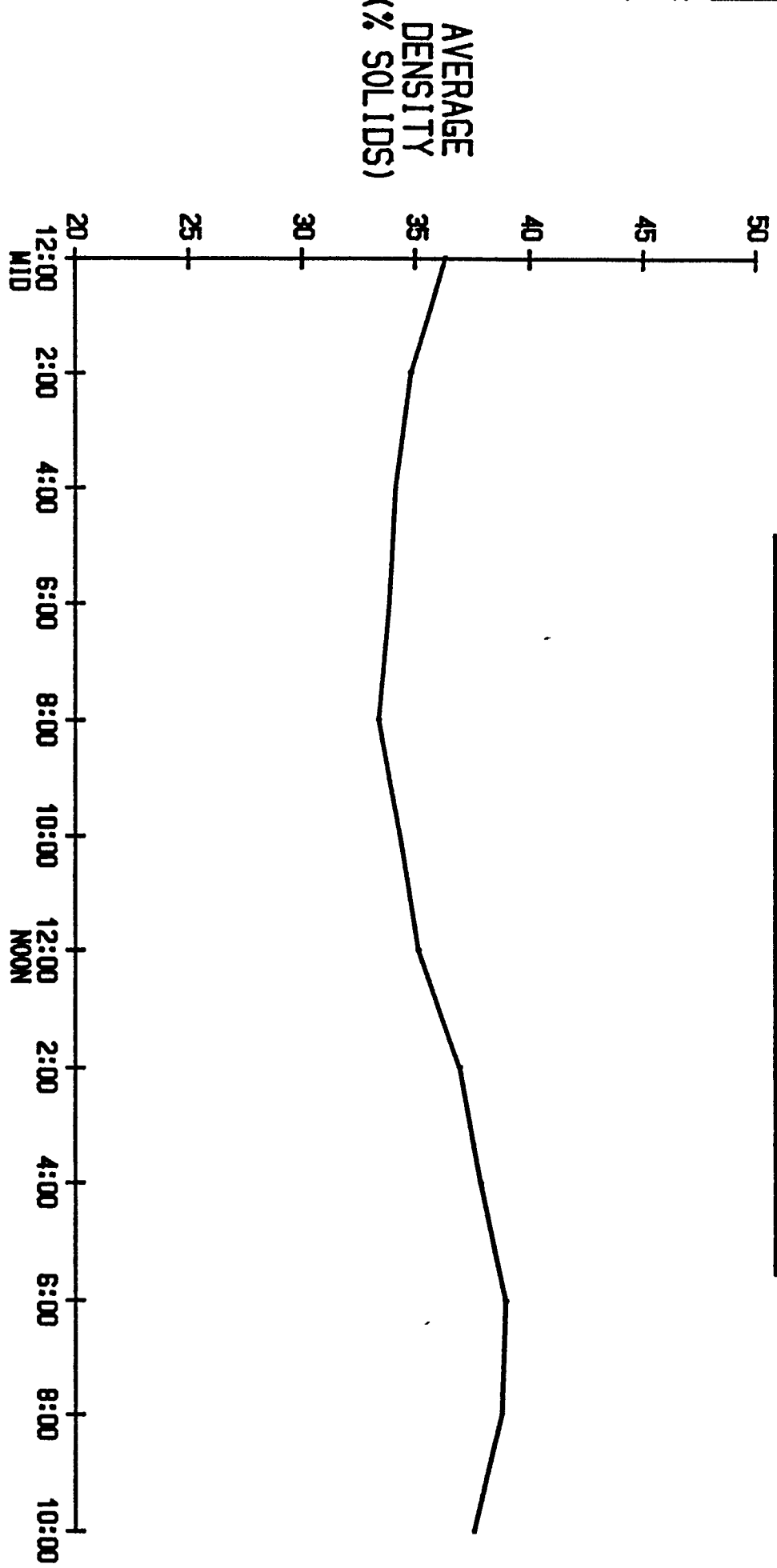
DAILY AVERAGE DENSITY (CIL FEED)
TRP 1988



**DAILY CUMULATIVE PRODUCTION
TRP 1988**



AVERAGE RECORDED DENSITIES
TRP 1988



AUGUST (M.T.D.)

G I A N T
YELLOWKNIFE MINES LIMITED

MEMO TO: S.E. El-Alfy

CC:

FROM: Don Cooper

DATE: August 09, 1988

SUBJECT: TRP - PLANT MONTH END REPORT - JULY 1988

Metallurgical

Three areas of the plant must be examined in detail to optimize the operation:

- 1) CIL recoveries - solids recoveries too low.
- 2) Wood chip removal.
- 3) Carbon strip - optimize operating parameters.

Initially CIL feed samples were taken using feed samples from the days showing poor plant recoveries. Tests were done using the same conditions as exist in the plant. A recovery of 37% on a straight leach with no carbon was obtained. Plant recoveries were in the 15 to 20% range during this time. Further bottle tests were done on the shift composites of the plant tailings. The average increase in recovery obtained over the 12 tests was 16.76%. Recovery of gold from the (solid fraction) in the plant averaged 21.80% for the month of July.

The dissolved oxygen level in the CIL tanks was checked. the saturation level at the 9 to 12°C temperature range obtained in the tanks is about 10.76 to 11.55 mg/l. Actual levels ranged from 9.2 mg/l in CIL tank No. 1 to 11.8 mg/l in tank No. 6. Tank No. 5 showed a dissolved oxygen level of 13.8 mg/l. These levels are typical and acceptable.

The metallurgical balance was re-worked to July 26th using a 24 hour retention time (i.e. the feed from day one was the tailings for day two). Net recovery difference was an increase of 0.86% over the current method of calculation.

Cyanide addition rates were increased by 50 to 100% on July 5th and maintained at these elevated levels until 8:30 AM July 19. At this time the addition rate was cut by 50%. It required 25 hours for the reduction in cyanide addition to register in the tailings, indicating that short circuiting is not necessarily occurring.

FIG. 1 shows the relationship between tons of ore fed to the CIL area and the CIL recovery. No specific conclusions can be drawn from this. The recovery problem does not appear to be related to feed rate. FIG. 2 shows plant head grade compared to recovery, and again there does not appear to be any specific trend.

FIG. 3 compares cyanide addition and recovery. Some short term trends appeared but when the addition rate was cut these trends were not maintained.

Samples taken from each CIL tank have shown much lower solution tails than have been obtained from shift samples. More work will have to be done on the sampling to ensure representative ones are taken.

Lab tests are planned to assess the effect of reclaim water on the leaching process. All lab tests to date used freshwater. these test results should be available in early August.

Cyanicides will show up by resulting in low available or free cyanide levels in plant tailings at high addition rates at the feed end. This has not been the case at the T.R.P. Since dissolved oxygen levels are near or at saturation levels soluble sulphide ions were not suspect. Pilot plant tests used pond water that was in the pond for some time whereas the new plant is using a water supply fresh from the mill and the T.R.P. Varying pH can be tested next in the plant although this was tested in the plant with no significant changes.

A second air compressor has been rented and upon arrival will be connected to help increase the intensity of agitation.

Another suggestion that will be followed up on would be to contact Hans von Michaelis of Randol International. Although not a metallurgist he may be aware of other operations that have experienced this problem.

FIG. 1 TONS/RECOVERY RELATIONSHIP
TRP 1988

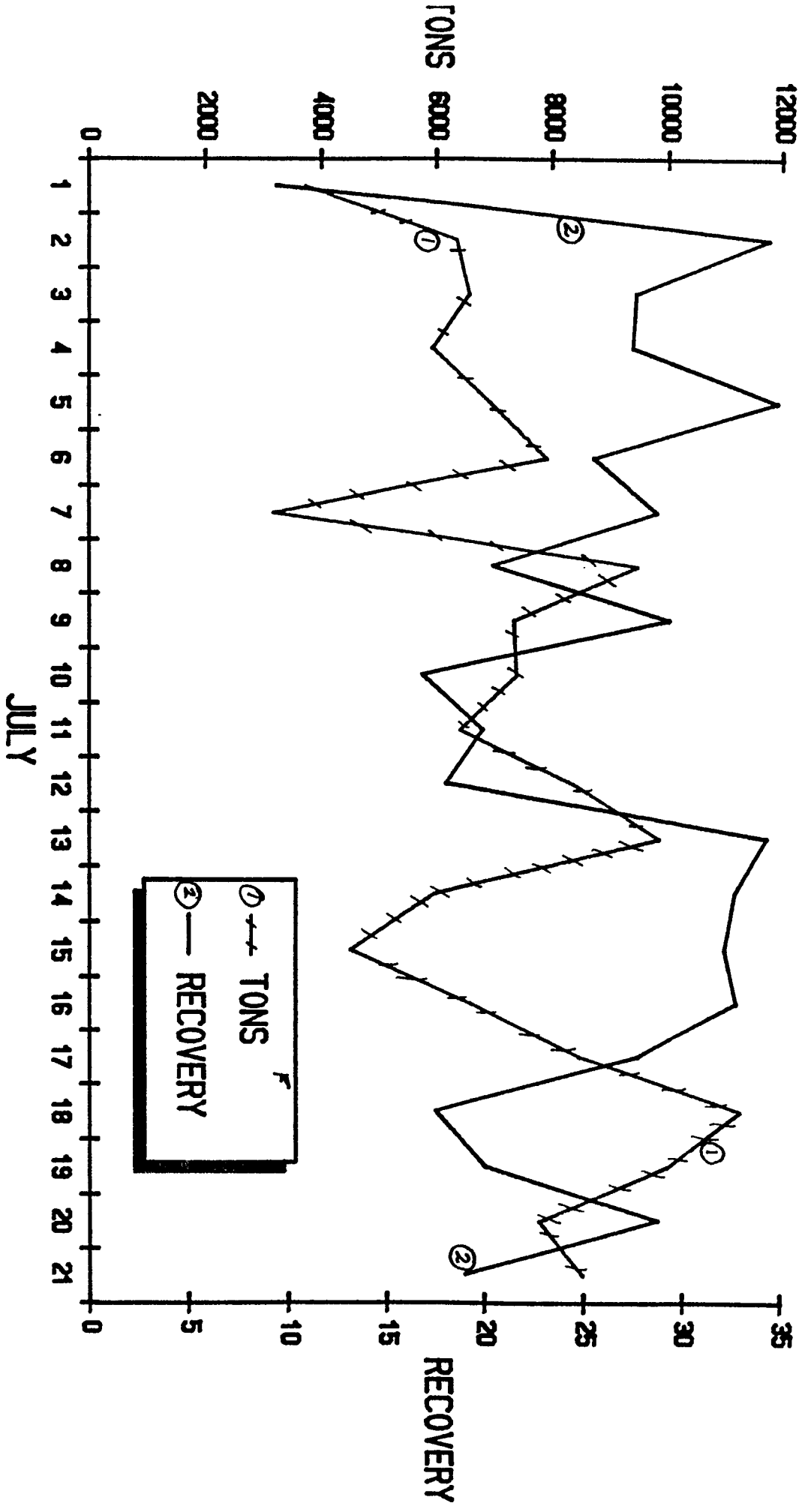


FIG. 2 HEAD GRADE/RECOVERY RELATIONSHIP
TRP 1988

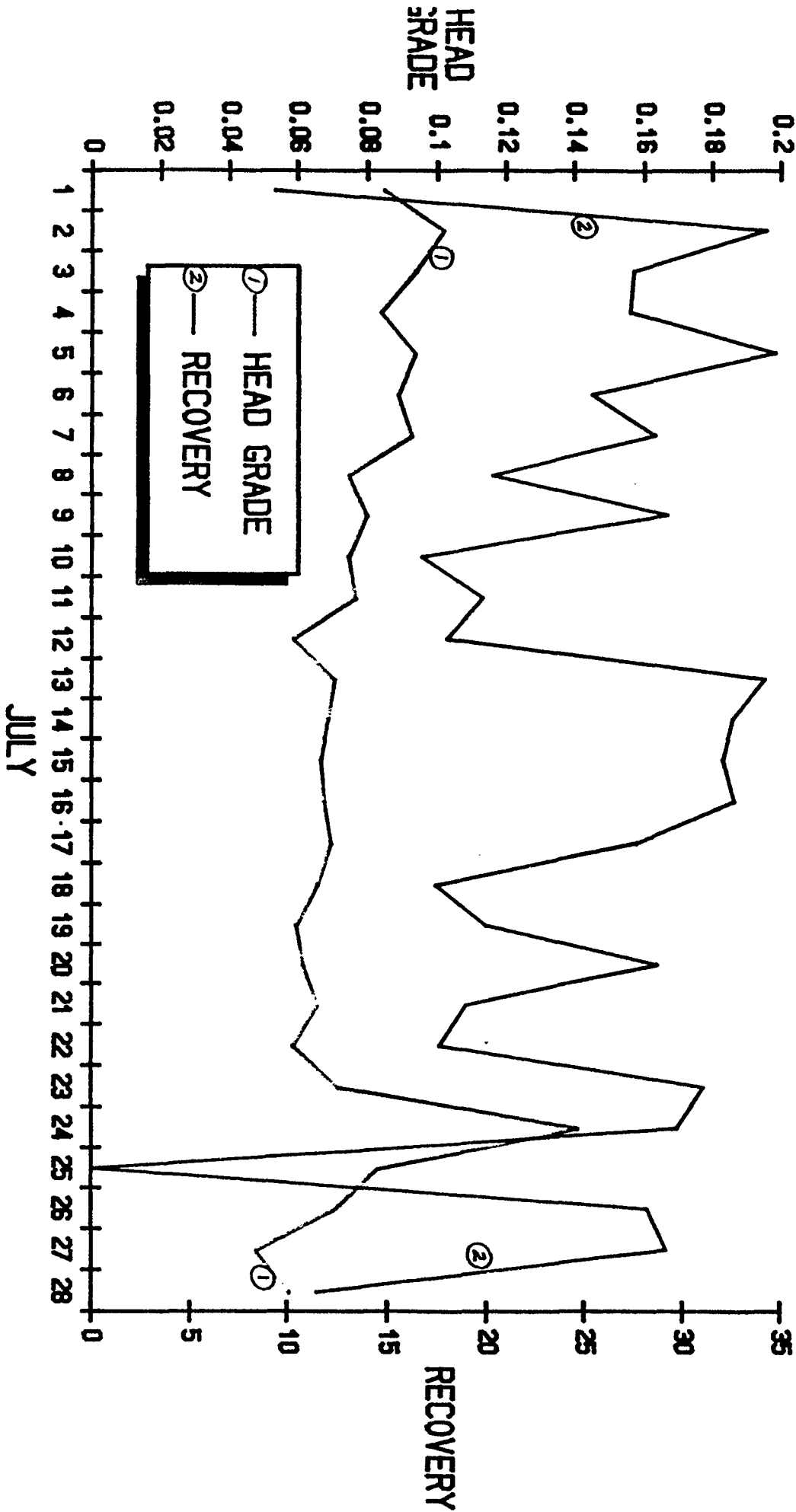
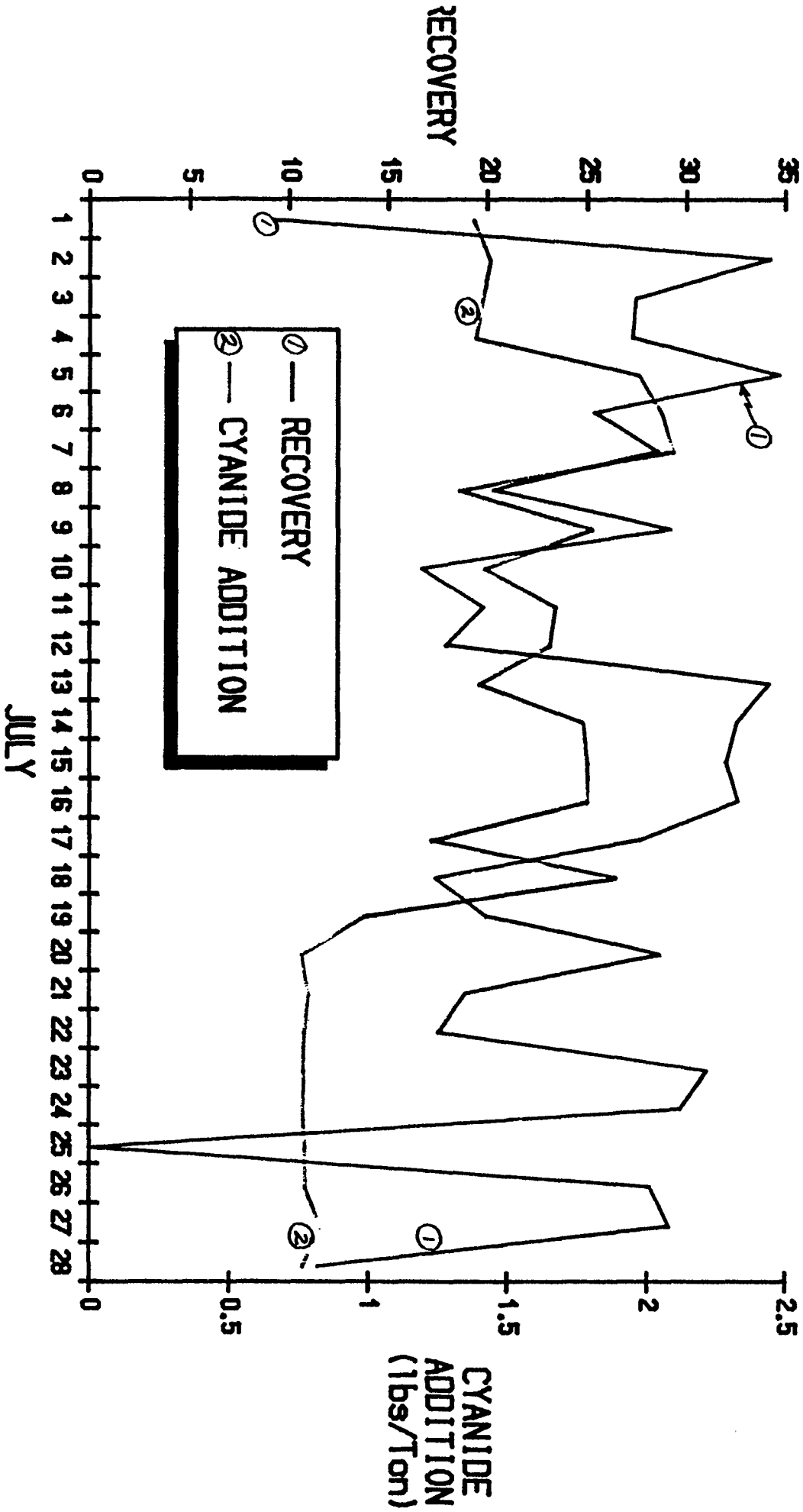


Fig 3 CYANIDE ADDITION/RECOVERY RELATIONSHIP
TRP 1988



Operations

1. Ventilation piping on Barren solution tank and cyanide mixing and holding tanks leaking at flanges. Moisture laden air drawn off condenses and leaks through flange connections. Solution leaking contains cyanide - planning to replace these pipes with fused HDPE pipe.
2. Solution heater - unit was over-sized to allow rapid heating of strip solution but the method required to allow a slow cool down period cannot be followed. Normally unit would be put on low fire to allow fluid temperature to drop slowly. Heat output on low fire still maintains temperature at 250^oF.
3. All carbon transfer lines from plant building to tanks and vice versa have had to be broken and recoupled (fused lines) to unplug and to provide drainage points.
4. Three flow transmitters and one level transmitter have been damaged by power surges. A UPS system has been requested.
5. Gland water addition to cyanide circulating pump and transfer pump has caused minor overflows from cyanide mixing and holding tanks. A solenoid and interlock arrangement is being examined for this and parts have been ordered.
6. Considerable quantities of fine wood has found its way past the screens into the CIL tanks and caused problems in stripping the carbon. the problem improved by batch number 5 but became intolerable again for batch number 6. The acid wash vessel was filled and its contents were 95 to 99% wood fibres and the remainder carbon.
7. Four batches of carbon were run through the entire system this month. All were washed and neutralized with caustic soda, stripped and regenerated. Minor operational problems were experienced with each piece of equipment. The system is designed to handle clean carbon but not wood and slurry. Several temporary piping modifications were necessary to wash the carbon in the acid wash vessel to clean it prior to stripping. the main problem was removal of wood fibres.

Mechanical

1. Head problems getting acid barrel pump to pump.
2. Welds broke on channel iron supports for No. 5 CIL tank agitator gear box.

3. Installed diffuser feed pipe on feed line to surge tank to help eliminate vibration in tank.
4. Converted CIL feed pump to water flush type gland. Lip seals were wearing through on shaft sleeves to quickly - only lasting 3 weeks.
5. Discharge screens on both strip vessels were shortened by 2 1/2 inches - couldn't be removed.
6. Mechanics worked on Toyo pumps replacing bearings and seals and preparing piping for polishing pond.
7. Removed Motor 502 - monitor water pump - repair bearings-replaced.

Instrumentation

1. Ordered spare instruments and parts.
2. Weekly calibrations on CIL feed density.
3. FIT 2026, 7006, 7008 - malfunctioning flow meters caused by power surges - returned for repairs.
4. DIT 2027 - blown fuses in detector housing - recalibrated.
5. Calibrated batch controller (Loop No. 4029).
6. Ordered new R.T.D.'s for temperature Loop 4029.
7. Removed control valves for cyanide addition to CIL 1, 2 and 3. Plugged with electrical tie wraps.
8. Calibrated pH transmitters on acid wash circuit and surge tank feed.

Electrical

1. Assisted in installation of pumps in mine for dewatering.
2. Building stands for electrical cables in monitor areas.
3. Pulling new control cable from OP2 to MCC7 (barge area) including installation of junction boxes.
4. Installed level controls for line holding tank.

5. Installed flashing over openings in plant building wall for cable tray.
6. Cable repairs in mining area; moisture sensor cables and power cables also at barge area.
7. Cleaned motors - reclaim transfer and trash screen U/F. Cleaned MCC6 mining area.
8. Installed grounding system for electrowinning cells - grounded positive terminal.
9. Installed auto stop on stand-by instrument air compressor.
10. Relocated surge tank level indicator.
11. Relocated water addition solenoid for lime slaker.
12. Examined possibility of interlocking cyanide circulating pump with CIL feed pump and using a solenoid valve for gland water controls on both cyanide transfer pump and circulating pump.
13. Grounded acid wash ventilation fan - build-up of static.
14. Disconnect/reconnect Toyo pumps when removed for repairs.
15. Worked on design for UPS (uninterruptable power supply) system for instruments.

Don Cooper
TRP Plant Superintendent

<u>Date</u>	<u>hrs</u>
July 9	15 hrs
8	10
7	12.
10	8:
6	10
11	10
13	12
12.	10 1/2
17	12
15	6 1/2
26	12
27.	12.
29	12
28	11
30	9

CAT on
NORTH Pond
 for these hrs.

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

TRP SUMMARY OF OPERATIONS

JULY 1988

General

days in month	31
operating days	31
hours in month	744
operating hours	682.73
downtime hours	61.27
availability (%)	91.76
tons processed	228,790.4
tons/operating hour	335.11
tons possible (100% avail.)	249,322.7
average feed density (% solids)	38.31

CIL

recovery to carbon	22.78
Au loaded to carbon (ozs)	3,891.59
Head grade (oz Au/ton)	0.075
Tailings grade (oz Au/ton)	0.058

Strip Circuit

No. batches processed	4
	(carbon column material, 88-01 to 03)
Tons of carbon processed (est.)	13.47
Loaded carbon avg. grade (oz Au/ton)	40.93
Stripped carbon grade (oz Au/ton)	3.20
Recovery (%)	92.19
Au loaded to steel wool (est. oz Au)	508.27

REAGENT CONSUMPTION - JULY 1988

REAGENT	MONTH		YEAR TO DATE	
	LBS *(LITRES)	LBS/TON *(LITRES/TON)	LBS	LBS/TON
² *PROPANE	² 22,109	0.097	22,109	0.050
CARBON	¹ 16,535	0.072	16,535	0.037
LIME	108,239	0.473	213,564	0.484
MURIATIC ACID	1,993	0.009	1,993	0.005
CAUSTIC SODA	29,762	0.130	49,107	0.111
SODIUM CYANIDE	242,533	1.060	439,349	0.995
STEEL WOOL	60	0.0003	60	---

- NOTE: 15 bags of fresh carbon added to CIL = 8.27 tons.
Also added 2.97 tons of carbon from the Mill's carbon columns.

Initially 386 bags were added @ 500 kg ea. = 212.744 tons (425,488 lbs)

- PROPANE: 57,228 litres were received at the end of the month.
The tank contents were 40% at the start of July and 20.5
at the end of the month - used $19.5\% \times 113,380 \text{ l} = 22,109 \text{ l}$.

This quantity was purchased on capital.

August consumption will still have 20.5% of the tank volume paid for on capital.

DOWNTIME RECORD

JULY 1988

DATE	HOURS DOWN	DESCRIPTION
July 1	1.25 2.33 7.92	Power failure low feed rate to surge tank advancing ramp
3	0.75	Belts burned off CIL feed pump.
4	0.50	Power surge.
7	3.22 0.58	Mechanical problems - Toyo pump. Trash screen U/F pump - overloading.
8	0.70 0.70	Power failure. Feed off due to plugged launder screens.
10	2.40	Exchanging Toyo pumps - repairs required.
11	4.10	Low feed rate to surge tank.
12	0.40	Low feed rate to surge tank.
13	0.92	Power failure.
14	6.48	Diffuser pipe installation - surge tank feed.
15	9.40	Conversion of CIL feed pump to water flush gland.
16	1.17 2.36 0.17	Power failure. Low feed rate to surge tank. Checking CIL feed pump - mechanical.
17	5.70	Trash screen U/F pump overloading density too high for feed rate.
20	0.40	Low feed rate to surge tank.
22	0.75 0.75	Power failure. CIL feed pump kicked out twice.
23	0.90	Power failure.
28	5.00	Toyo pumps down - mechanical.
29	1.09 1.33	Power failure. repairs to safety screen feed box - mechanical.

G I A N T

YELLOWKNIFE MINES LIMITED

MEMO TO: J.S. McAlpine

CC: S.E. El-Alfy

FROM: Don Cooper

DATE: July 05, 1988

SUBJECT: TRP (PLANT) MONTH END REPORT - JUNE 1988

Operations and Metallurgy

Solid and solution recoveries were very low throughout most of June. Recoveries from the solid fraction were improved by increasing cyanide addition from 1.00 lb/ton to 1.25 lb/ton and finally to 1.50 lb/ton. Other items checked were dissolved oxygen levels and circuit pH. It was determined that to obtain a tailings pH of 10.0 a feed pH of 10.5 is required. Dissolved oxygen levels appeared to be normal but more work is needed to ensure accurate operation of the meter and probe. Solid recoveries averaged 35.0 for June 25 to 28. They again deteriorated for the last two days. It is not yet known why this happened but due to assays not being received until July 4 it was unknown that this had occurred. Circuit changes made during this time were reducing the feed pH set point from 11.0 to 10.5 and air addition to the CIL tanks was cut back due to low plant air pressure alarms. Feed density decreased on July 1 causing a drop in the tailings cyanide content which complicated matters.

Propane pipeline work delays delayed start-up of the strip system and problems with the acid wash system metering pump caused delays in running the acid wash system. It is possible that high solution losses or low solution recoveries are being caused by fouling of the carbon. This should improve once the stripping system is operating. This area will be operational in the first week of July. Testwork to prove the above was done and results should be in during the first week of July.

The carbon removed from the carbon columns will be stripped first and based on the assays of the samples taken 85 to 90 oz. of gold should be recovered.

CARBON DATA

Tank No.	Calculated Data		June 17		June 27	
	Tons Added	Density (gms/l)	Assay oz Au/ton	Density gms/l	Assay oz Au/ton	Density gms/l
2	24.8	8.46	31.5	2.08	23.3	2.7
3	25.4	8.66	24.5	2.44	43.5	2.53
4	34.2	11.67	7.9	7.75	21.7	3.25
5	125.8	42.91	5.0	28.5	6.6	13.50
6	2.6	0.89	5.9	0.58	7.7	0.83

TOTAL 212.8 14.52* 8.27* 4.56*

* Avg. gms/l over 5 tanks; each tank = 2,659,405 litres.

Carbon loading based on assays and calculated tons:

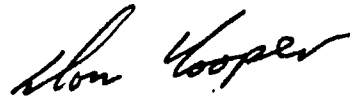
June 17 - 2,318.00 oz Au

June 27 - 3,275.18 oz Au

Due to the erratic nature of the assays the metallurgical balance data should be used to calculate carbon loading until stripping is started and a more accurate carbon assay can be obtained.

It was found that the launder screens on the CIL tanks were not seating properly and carbon was escaping between the screen frame and the launder framework. Although this does not result in a major carbon loss since escaping carbon is recovered on the safety screens it can add to small attrition losses. The screens were seated as well as possible but some continue to bypass small quantities of carbon.

Flow rates of 4000 USGPM to the surge tank were achieved but only on light density. The Trash screen underflow pump shutdown on overload at this flow rate. Maximum targets were set at 3500 USGPM for densities of 30 to 35% solids and 3200 USGPM at 35 to 40% solids. Amperage checks will be done on the 300 H.P. tailings pump motor to determine the possibility of interchanging these motors. Actual plant feed rates will need to be monitored since residence times and recoveries may be adversely affected by the high flow rates. At 2900 USGPM the residence time in the 6 tanks is 24.2 hours. At 3500 USGPM it is 20.1 hours.



Don Cooper
Plant Superintendent

TRP METALLURGICAL BALANCE
(C.I.L.)

DATE: June 30/88

MONTH

FEED	SOLIDS			SOLUTION			TOTAL
TONS	% SOLIDS	OZ AU/TON	OZ AU	TONS	OZ AU/TON	OZ AU	OZ AU
158,333.3	32.32	0.083	13,129.87	331,621.7	0.0055	1823.34	14,953.21

TAILS	SOLIDS			SOLUTION			TOTAL
TONS	% SOLIDS	OZ AU/TON	OZ AU	TONS	OZ AU/TON	OZ AU	OZ AU
158,333.3	32.32	0.067	10,621.43	331,621.7	0.0031	1031.10	11,652.53

RECOVERIES (%)

COMBINED GRADES (OZ AU/TON)

AVAILABILITY (HRS/%)

SOLIDS: 19.10
SOLUTION: 43.45
TOTAL: 22.07

HEADS: 0.094
TAILS: 0.074
LOADED TO CARBON (OZ AU)
3300.68

OP HRS (BUDGET) 720.00
OP HRS (ACTUAL) 658.34
AVAILABILITY (%) 91.44
DOWNTIME (HRS) 61.66

YEAR TO DATE

FEED	SOLIDS			SOLUTION			TOTAL
TONS	% SOLIDS	OZ AU/TON	OZ AU	TONS	OZ AU/TON	OZ AU	OZ AU
212,840.3	23.98	0.077	16,400.29	674,743.7	0.0044	2989.95	19,390.24

TAILS	SOLIDS			SOLUTION			TOTAL
TONS	% SOLIDS	OZ AU/TON	OZ AU	TONS	OZ AU/TON	OZ AU	OZ AU
212,840.3	23.98	0.062	13,292.27	674,743.7	0.0028	1888.91	15,181.18

RECOVERIES (%)

COMBINED GRADES (OZ AU/TON)

AVAILABILITY (HRS/%)

SOLIDS: 18.95
SOLUTION: 36.82
TOTAL: 21.71

HEADS: 0.091
TAILS: 0.071
LOADED TO CARBON (OZ AU)
4209.06

OP HRS (BUDGET) 1464.00
OP HRS (ACTUAL) 1278.34
AVAILABILITY (%) 87.32
DOWNTIME (HRS) 185.66*

* ESTIMATED 124 HRS FOR MAY.

REAGENT CONSUMPTION - JUNE 1988

REAGENT	MONTH		YEAR TO DATE	
	LBS *(LITRES)	LBS/TON *(LITRES/TON)	LBS	LBS/TON
PROPANE*	---	---	---	---
CARBON	---	---	---	---
LIME	34,240	0.22	105,325	0.49
MURIATIC ACID	---	---	---	---
CAUSTIC SODA	16,865	0.11	19,345	0.09
SODIUM CYANIDE	167,953	1.06	196,816	0.92
STEEL WOOL	---	---	---	---

DOWNTIME RECORD**JUNE 1988**

DATE	HOURS DOWN	DESCRIPTION
June 1	5.00	Faulty CIL feed pump controller (10 min.). Moving monitors (4 hrs 50 min).
2	2.00	Repairs to tailings pump discharge pipe.
3	0.67	Moving Toyo pump.
4	0.92	Repairs to surge tank feed line.
5	1.33	Piping changes at monitors - low feed.
10	14.42	Advancing monitors (11 hrs 15 min). Repairs to surge tank feed line.
12	1.00	Power failure.
15	11.88	Replace gland seal on CIL feed pump. Toyo pump removed, bearings shot.
17	7.58	Raising causeway to barge - ran out of process water to plant - electrical problems in wiring to barge pumps.
18	2.27	Low feed - surge tank level too low.
19	3.27	Low feed.
20	1.42	Power failure.
21	6.08	Low feed - moving monitors.
25	1.00	Power failure.
28	1.00	Low feed - electrical - running on 50 hp Toyo for about 7 hrs.
30	1.82	Power failure.
TOTAL	61.66	

MAINTENANCE

a) Mechanical

1. Added new millwright to work force - now have 3.
2. Repaired tailings pump discharge line.
3. Extended trash screen pumpbox overflow to thickener area.
4. Moved CIL feed sampler.
5. Installed baffles in caustic mix tank.
6. Purchased Clark 720 mobile crane.
7. Repairs to Robar coupling on Trash Screen U/F pump discharge line.
8. Set up lubrication schedule.
9. Levelled all main agitator gearboxes.
10. Monitor water tank O/F box relocated to East tank.
11. Extended O/F pipe for monitor water tanks to thickener area.
12. Repaired 100 hp Toyo pump - replaced bearings.
13. Replaced gland seals in CIL feed pump - seals and shaft sleeve and modified grease addition to all Warman pumps.
14. Set up German-Rupp diesel pump to pump out spill water back to tailings pumpbox - pumped out east catch basin.
15. Started work on feed line diffuser pipe to surge tank.
16. Working on acid pump - not pumping.

b) Miscellaneous

1. Painting contractor (Polar Painting) completed Monitor and Process Water Tanks.
2. Raised access road to reclaim barge.
3. Propane line from vaporizer to plant building re-installed waiting for gas inspector at end of month.

c) Electrical

1. Connected Surge Tank agitator to spare vari-speed controller.
2. Hooked up capacitors at MCC 7 (Barge area).
3. Connected ORP cyanide probe to OPl.
4. Heat traced potable water line by tank.
5. Moved CIL feed sampler wiring.
6. Fire alarm test zone.
7. Installed motion alarm on 5 ton overhead crane in plant.
8. Training module made up for new barge pump control system using programmable controller.
9. Installed 110V receptacles in plant building.
10. Repaired faulty cable to barge pump 702.
11. Started to work on cyanide and caustic mix tank interlocks to shut down agitators on start-up of transfer pumps.
12. Worked on Acid Wash pump - some wiring incorrect.

d) Instrumentation

1. Flow switch installed on feed line to solution heater.
2. ORP cyanide probe and indicator installed.
3. Reconfigured cyanide addition for gallons/ton of solids originally was gallons of cyanide/U.S. gallon of feed.
4. Feedback resistors installed in 3 density meters.
5. Replaced lime system ball valve with pinch valve - ball valves and seats wearing out in 2 weeks of operation.
6. Optimization of pH control system for CIL feed.
7. Replaced pressure element modules - monitor water pressure transmitters - calibrated for 0-400 psi.
8. Calibrated main gearbox temperature indicators.
9. Worked on Acid Wash system pH controls.

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%							21,801 incorrect actually all 90803 are locked in	-
In Process 97.60%							886,579	
Stripping Recovery 96%							851,116	

May 1988

MONTHLY REPORT COMMENTS

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

Redrain Feed

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

$$C) \text{ Grain Feed Solids} = E_{21} = \text{Feed Tons} \times \text{Feed Assay}$$

$$E_{26} = \text{Tail Tons} \times \text{Tail's Total Org.} = B_{26} \times D_{26}$$

$$H_{21} = \text{Redrain Au Org} = \text{Tons Redrain Sol} \times \text{Sol}^n \text{ Assay}$$

$$H_{26} = \text{Tail's Solution} = F_{26} \times G_{26}$$

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

$$G_{60} = 0.53 + (1.53 \times (0.53 - 0.55)) / 0.53$$

$$= 1 - \frac{\text{Tail's Sol}^n}{\left(\text{Feed's Sol}^n + \text{Redrain} \right)} = \frac{\left(\text{Feed's Sol}^n - \text{Tail's Sol}^n \right) + \text{Redrain's Sol}^n}{\left(\text{Feed's Sol}^n - \text{Tail's Sol}^n \right) + \text{Redrain's Sol}^n}$$

TRP METALLURGICAL BALANCE
(C.I.L.)

DATE: OCT. 22, 1988

DAY

RECOVERIES (%)		COMBINED GRADES oz/Ton Au.		AVAILABILITY (HRS/%)	
SOLIDS					
DISSOLUTION	23.19	HEADS	0.054	OP.HRS.(BUDG)	24.0
ADSORPTION	85.39	TAILS	0.041	OP.HRS.(ACT)	15.5
TOTAL	24.49	CIL RECOVERY		AVAIL.(%)	64.6
		TO CARBON	26.526 oz.	DOWNTIME(HRS)	8.50
SHUT DOWN FOR SEASON AT 3:40 PM.					
CIL FEED SOLUTION ASSAY: 0.0023					

MONTH TO DATE

RECOVERIES (%)		COMBINED GRADES oz/Ton Au..		AVAILABILITY (HRS/%)	
SOLIDS					
DISSOLUTION	26.71	HEADS	0.065	OP.HRS.(BUDG)	528
ADSORPTION	90.70	TAILS	0.048	OP.HRS.(ACT)	457.9
TOTAL	26.60	CIL RECOVERY		AVAIL.(%)	86.7
		TO CARBON	2694.14 oz.	DOWNTIME(HRS)	70.1

YEAR TO DATE

RECOVERIES (%)		COMBINED GRADES oz/Ton Au..		AVAILABILITY (HRS/%)	
SOLIDS					
DISSOLUTION	29.82	HEADS	0.076	OP.HRS.(BUDG)	4200
ADSORPTION	72.32	TAILS	0.059	OP.HRS.(ACT)	3772.17
TOTAL	23.18	CIL RECOVERY		AVAIL.(%)	89.8
		TO CARBON	17695.52 oz.	DOWNTIME(HRS)	427.83

$$\text{Au Extraction} = \frac{\text{Reclaim Concn} + \text{Feed Sol}^e \text{ Concn} + \text{Feed Solids Concn} - \text{Tails Solids} \times \text{Assay} - \text{Tails Sol}^e \times \text{Assay}}{\text{Reclaim Concn} + \text{Feed Sol}^e \text{ Concn}}$$

Reclaim O_3 Gold = 7.74 g

Tails Solution = 4.54 g

TRP METALLURGICAL BALANCE
(C.I.L.)

DAY

DATE: OCT. 22, 1980

FEED :				RECLAIM SOLUTION			TOTAL
Tons	Percent Solids	Ounces Au/Ton	Ounces Au.	Tons	Ounces Au/Ton	Ounces Au.	Ounces Au.
1995.2	26.51	0.050	100.57	5532.1	0.0014	7.74	108.31
TAILS :				TAILS SOLUTION			TOTAL
1995.2	26.51	0.039	77.25	5532.1	0.0008	4.54	81.79

MONTH TO DATE

FEED :				RECLAIM SOLUTION			TOTAL
Tons	Percent Solids	Ounces Au/Ton	Ounces Au.	Tons	Ounces Au/Ton	Ounces Au.	Ounces Au.
156044.8	38.80	0.063	9766.35	246149.7	0.0015	361.89	10128.24
TAILS :				TAILS SOLUTION			TOTAL
156044.8	38.80	0.046	7157.79	246149.7	0.0011	276.31	7434.10

YEAR TO DATE

FEED :				RECLAIM SOLUTION			TOTAL
Tons	Percent Solids	Ounces Au/Ton	Ounces Au.	Tons	Ounces Au/Ton	Ounces Au.	Ounces Au.
999339.1	33.34	0.074	73903.58	1997644.9	0.0012	2430.13	76333.71
TAILS :				TAILS SOLUTION			TOTAL
999339.1	33.34	0.052	51866.20	1997644.9	0.003	6771.91	50630.19

TRP METALLURGICAL BALANCE
(STRIP CIRCUIT)

DAY BATCH No.88-41 IN PROCESS.

DATE: OCT 22, 1988.

TONS OF CARBON (EST.)	LOADED CARBON		STRIPPED CARBON		CATHODE RECOVERED
	oz Au/TON	oz Au	oz Au/TON	oz Au	oz Au
0.000	0.000	0.000	0.000	0.000	0.000

STRIP CIRCUIT RECOVERY: ERR
MONTH (BATCH Nos.88-31 TO 88-40)

TONS OF CARBON (EST.)	LOADED CARBON		STRIPPED CARBON		CATHODE RECOVERED
	oz Au/TON	oz Au	oz Au/TON	oz Au	oz Au
43.282	53.698	2324.148	1.345	58.235	2265.913

STRIP CIRCUIT RECOVERY: 97.49

YEAR (BATCH Nos.88-01 TO 88-40)

TONS OF CARBON (EST.)	LOADED CARBON		STRIPPED CARBON		CATHODE RECOVERED
	oz Au/TON	oz Au	oz Au/TON	oz Au	oz Au
176.587	50.428	8904.996	2.376	419.532	8488.212

STRIP CIRCUIT RECOVERY: 95.31
TRP BULLION PRODUCED

OCTOBER 1988 (BAR Nos. TRP-009 TO TRP-011)

TOTAL WEIGHT ozs.	ASSAY FINENESS		TROY OUNCES	
	GOLD	SILVER	GOLD	SILVER
2,532.737	645.124	297.511	1,633.930	753.516

YEAR TO DATE (BAR Nos. TRP-001 TO TRP-011)

TOTAL WEIGHT ozs.	ASSAY FINENESS		TROY OUNCES	
	GOLD	SILVER	GOLD	SILVER
8,350.995	668.442	237.894	5,587.504	1,988.555

CATHODES CURRENTLY CONTAIN (ozs Au): 2900.708

(Perth) 09-368-2888

Roger Simpson

"MISAMA"

Placer Dome

9 dms IN

5 dms out CATAN S

ESTIMATED CIL CARBON GOLD INVENTORY

DATE:
OCT. 22, 1988

DAY

FROM INVENTORY	TO INVENTORY		NET CHANGE
CARBON TO STRIP oz Au	CIL RECOVERY TO CARBON oz Au	STRIPPED CARBON oz Au	PLUS (MINUS) oz Au
0.000	26.526	0.000	26.526

MONTH

FROM INVENTORY	TO INVENTORY		NET CHANGE
CARBON TO STRIP oz Au	CIL RECOVERY TO CARBON oz Au	STRIPPED CARBON oz Au	PLUS (MINUS) oz Au
2324.148	2694.16	58.235	428.247

YEAR

FROM INVENTORY	TO INVENTORY		NET CHANGE
CARBON TO STRIP oz Au	CIL RECOVERY TO CARBON oz Au	STRIPPED CARBON oz Au	PLUS (MINUS) oz Au
8905	17695.55	419.532	9269.547

CURRENT CIL CARBON GOLD INVENTORY oz Au: 9269.547

SECTION 12.

MECHANICAL DATA COMPARISON
PILOT PLANT/TRP (CIL)

ITEM	PILOT PLANT	TRP
Impeller diameter	4 ft.	150 inch
- type	hydrofoil	hydrofoil
- no. blades	3	3
- no. impellers	1	2
Tank diameter	12 ft.	47.5 ft.
Tank height	13 ft.	54.5 ft.
Tank bottom to Impeller		
(lower)	64 in.	166 in.
(upper)	-	386 in.
Tank top to Impeller		
(lower)	92 in.	488 in.
(upper)	-	268 in.
Agitator hp	7 1/2	100
Output rpm	84	25
Baffles - width	12 in.	4 ft.
- wall space	2 in.	8 in.
- number	4	4
- height above tank bottom	24 in.	8 in.
Feed pipe		
- top of tank to discharge	82 in.	32 ft.
- discharge to tank bottom	74 in.	22.5 ft.
Tank elevation differential	18 in.	24 in. (6 ft. between No. 3 and No. 4)
Impeller O/tank O (D/T)	0.33	0.26
Distance from bottom/tank O (C/T)	0.44	0.29
Dist. from bottom/blade dia.		1.10?
Dist from bot to Top Impeller		
Agitator hp watts/m ³	120	28.6

OPERATING AND METALLURGICAL DATA COMPARISON
PILOT PLANT/TRP

ITEM	PILOT PLANT	TRP		
Depth of material in pond	10 to 25 ft. - average about 15 ft	50 - 55 ft. face currently		
Feed size				
- % - 270	90.4	83.47		
- Assay oz Au/ton	0.064	0.076		
Solution head oz Au/ton (Reclaim water)	0.0017	0.0012		
Tail - calculated oz Au/ton	0.039	0.05 year		
OCT. 1988		0.048		
SEPT. 1988		0.052		
Tail Solution oz Au/ton	0.0010	0.0030 year		
OCT. 1988		0.0011		
SEPT. 1988		0.0014		
		YEAR	OCT.	SEPT.
Dissolution	38.9	29.82	26.71	28.66
Adsorption	89.7	72.32	90.70	89.40
Recovery	35.0	23.18	26.60	28.14
Feed density % solids	30			
Dissolved Oxygen mg/l.	No. 1 - 9.1, tail 9.8	No. 1 10.4, tail 12.0 at 8 to 9 degrees C. (saturated)		

OPERATING AND METALLURGICAL DATA COMPARISON
PILOT PLANT/TRP

ITEM		PILOT PLANT		TRP	
Carbon loading and distribution	Tank No.	oz Au/ton	gms/l	oz Au/ton	gms/l
	1	-----none	added-----	58.90	22.20
	2	78.5	1.8	41.20	15.90
	3	37.9	18.9	31.60	22.80
	4	15.8	8.3	18.60	16.40
	5	9.4	31.9	12.80	23.30
	6	---no sixth	tank-----	9.00	10.60
	Avg.	21.16	15.23	57.60	18.53
Carbon Added calc. gms/l.				Oct. 19.63 based on 6 tanks 11.29 - May 1 5 tanks 15.02 - May 31 5 tanks	
CIL Residence time - Hours		% SOLIDS		HOURS	
		24.5%	30%	35%	SEPT. OCT. YEAR
Note: Pilot Plant - 30% solids average std. deviation +/- 5.18 TRP - SEPT., OCT., YTD (OCT)		24.51 hours	31.4 hours	37.8 hours	28.9 26.6 28.1
Recoveries by Tank					
- Stock Tank		16.9		9.60	
- No. 1		14.3		10.84	
2		3.3		3.41	
3		1.7		0.31	
4		1.4		- 1.55	
5		1.3		1.55	
6		-		0.62	
Total		38.9		24.78	

OPERATING AND METALLURGICAL DATA COMPARISON
PILOT PLANT/TRP

ITEM		PILOT PLANT	TRP
Solid feed to each tank	Stock Tank	0.0637 (calculated)	0.0528 (.0646 calc.)
	No. 1	0.053	0.0584
	No. 2	0.044	0.0514
	No. 3	0.042	0.0492
	No. 4	0.041	0.0490
	No. 5	0.040	0.0500
	No. 6	-	0.0490
	Tail	0.039	0.0486
Solution feed to each tank	Stock Tank	-	0.0037
	No. 1	.0063	0.0048
	No. 2	.0106	0.0055
	No. 3	.0073	0.0046
	No. 4	.0036	0.0029
	No. 5	.0028	0.0019
	No. 6	-	0.0011
	Tail	.0010	0.0010

PILOT PLANT

	July 18 to August 18	August 19 to August 26
<u>Free Cyanide in Tails</u>		
lbs/ton mean	0.97	0.48
std. deviation	0.15	0.13
no. greater than mean	19	6
no. less than mean	13	2
<u>Cyanide Added</u>		
lbs.	4620	220
lbs/ton	2.33	0.52
<u>% Solids</u>		
mean	30.09	28.38
std. deviation	5.68	2.07
no. greater than mean	11	3
no. less than mean	21	5
<u>Dissolution %</u>		
mean	39.32	37.41
std. deviation	4.23	4.02
no. greater than mean	16	3
no. less than mean	16	5
<u>Adsorption %</u>		
mean	89.60	90.00
std. deviation	4.29	3.46
no. greater than mean	15	5
no. less than mean	17	3
<u>Recovery %</u>		
mean	35.32	33.76
std. deviation	4.78	4.62
no. greater than mean	14	6
no. less than mean	18	2

Don Cooper
Nov 17, 1988

