

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.

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

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

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.

<u>Date</u>	<u>hrs</u>
July 9	15 hrs
8	10
7	12.
10	8:
6	10
11	10
13	12
12.	10½
17	12
15	6½
26	12
27.	12.
29	12
28	11
30	9

CAT on
NORTH Pond
 for these hrs.

FIG. 1 TONS/RECOVERY RELATIONSHIP
TRP 1988

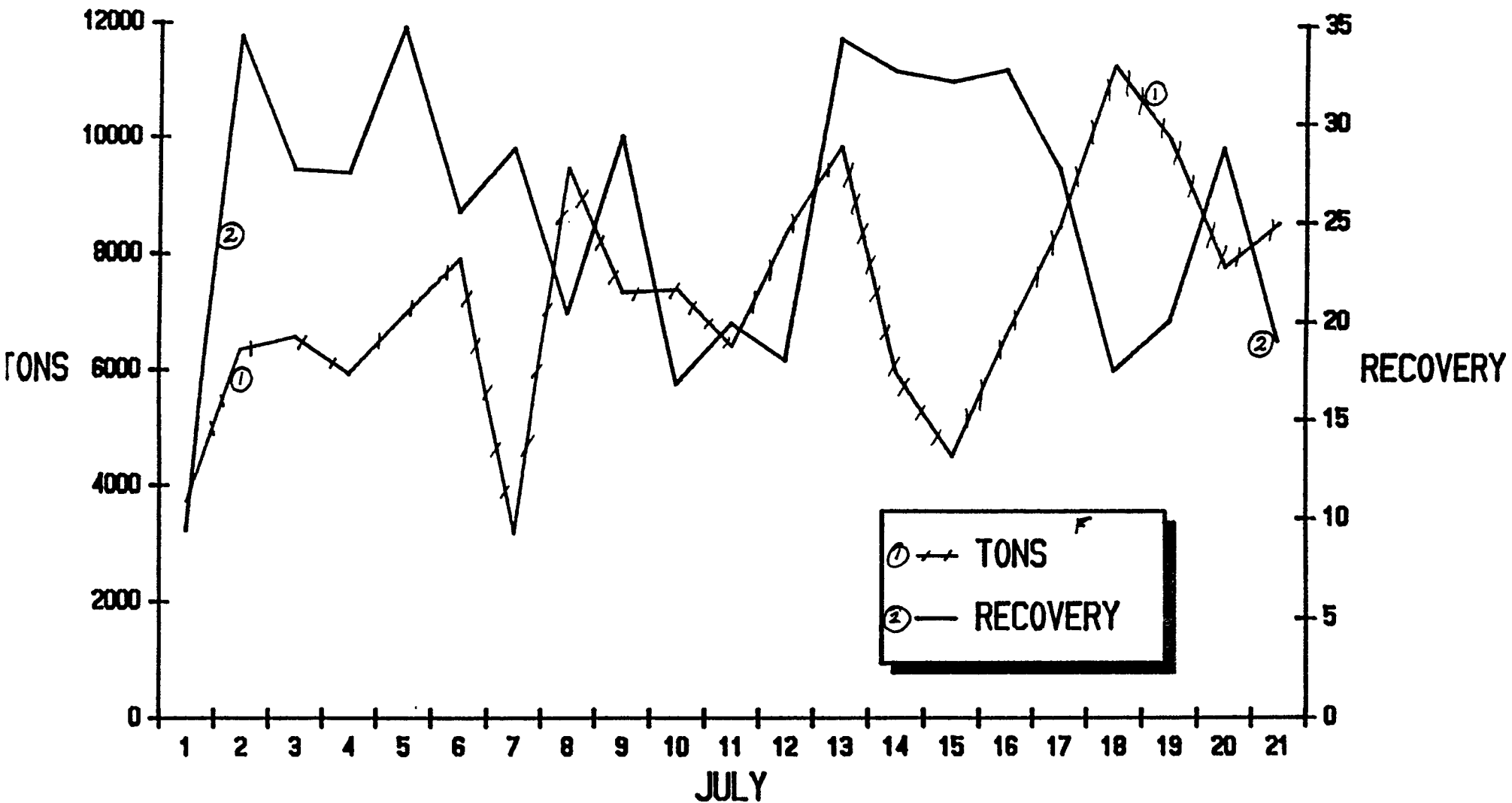


FIG. 2 HEAD GRADE/RECOVERY RELATIONSHIP
TRP 1988

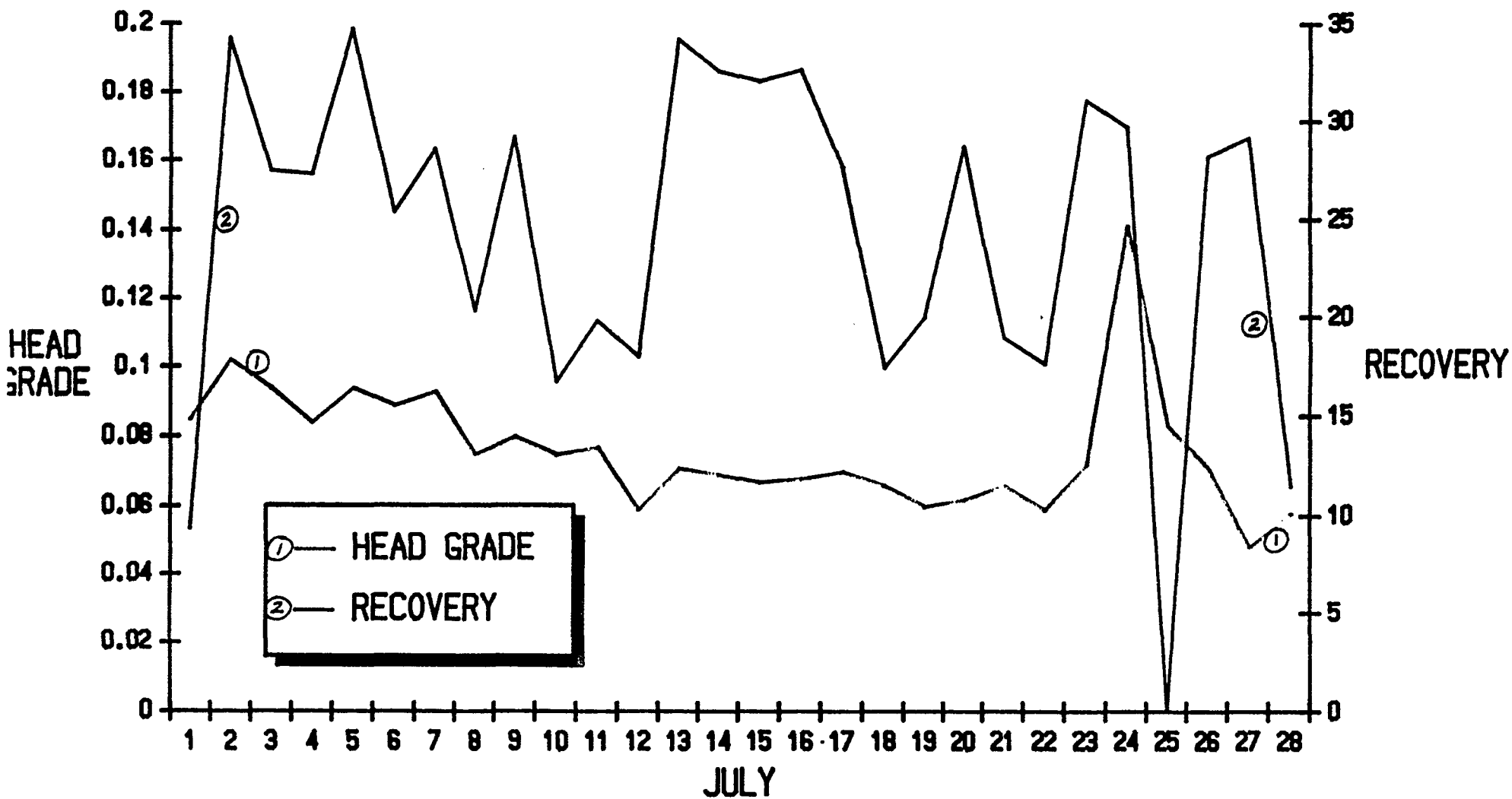
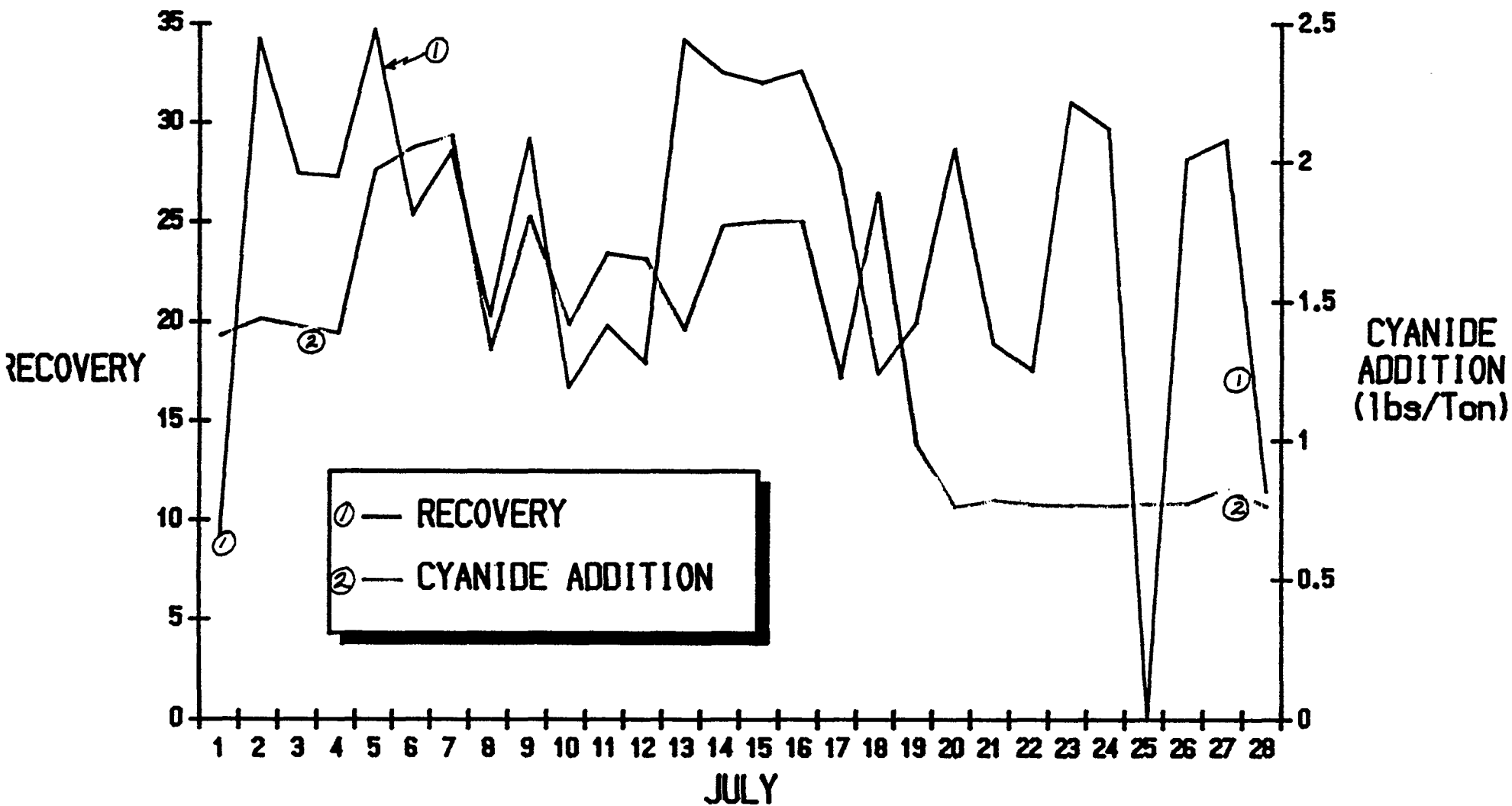


FIG 3 CYANIDE ADDITION/RECOVERY RELATIONSHIP
TRP 1988



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.