

**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:

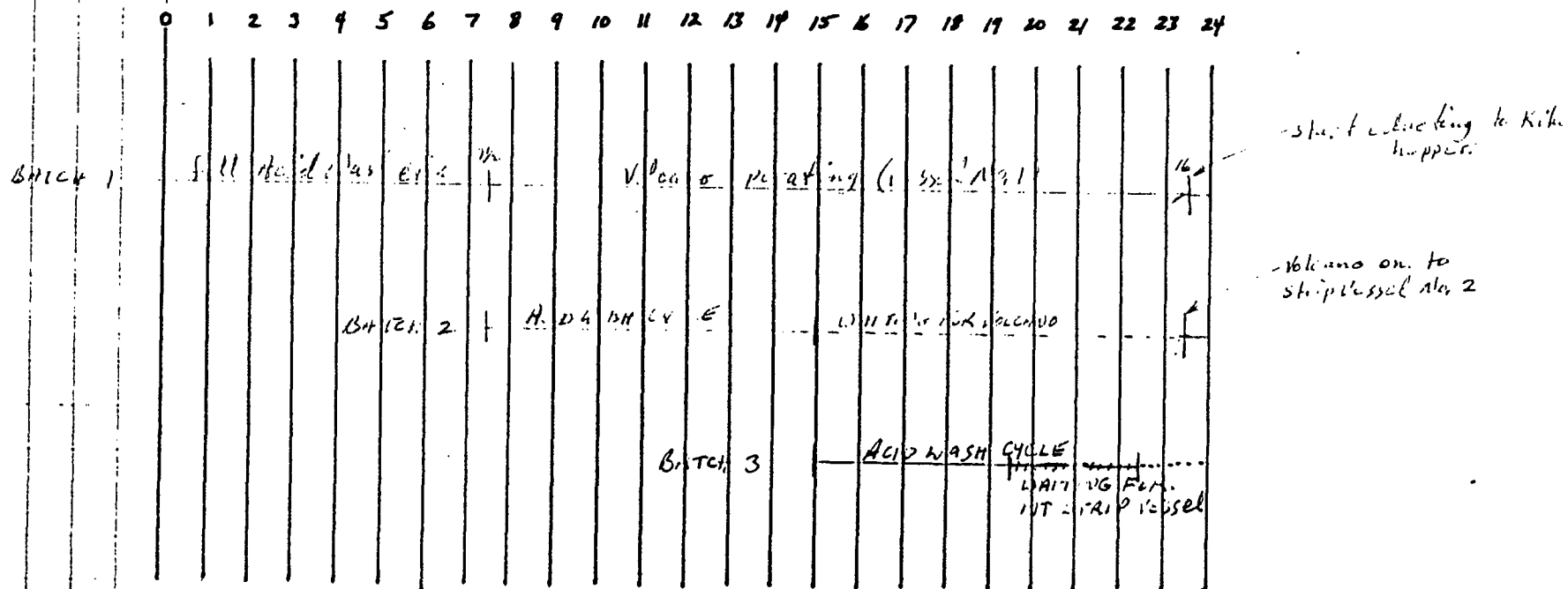
A)	ACID WASH CYCLE	<u>HRS</u>
	1. Fill Acid Wash Vessel from CIL tanks.	3
	2. Acid/Caustic/Water Wash.	1 1/2
	3. Educting from Acid Wash Vessel to Strip Vessel	<u>3</u>
	TOTAL ACID WASH CYCLE	7 1/2

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.

DAY 1



Strip Vessel - 8½ hrs waiting for previous strip to be completed
 Acid Wash Vessel - 3 hrs waiting for available strip vessel

Factor 2 complete:

educt to Kiln 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

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

VL, EL, MI

BATCH 3 COMPLETE

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 :				RECLAIM SOLUTION			TOTAL
Tons	Percent Solids	Ounces Au/Ton	Ounces Au.	Tons	Ounces Au/Ton	Ounces Au.	Ounces Au.
656655.7	31.58	0.078	51364.61	1422753.4	0.0011	1529.85	52894.47
TAILS :				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