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January 7, 2011

Mr. Peter Stewart
Malbex Resources Inc.
372 Bay Street, Suite 901
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Dear Peter,

Enclosed is our report concerning metallurgical results from bottle roll cyanidation tests on five drill composites from the Del Carmen Norte Project.

We will hold your sample rejects for thirty days from the date of this letter. If you would like us to store the samples for you, please let us know and you will be invoiced for appropriate storage costs. If you would like your samples returned, please contact us for shipping arrangements. Otherwise, your samples will be disposed of after the thirty day period.

Thank you for allowing us the opportunity to be of service on the Del Carmen Norte Project. We wish you the best in bringing it to commercial production.

Sincerely,

Jack S. McPartland
Metallurgist/V.P. Operations

JSM:mh
Enclosure



**Report
on
Bottle Roll Cyanidation Testing - Del Carmen Norte Drill Core Composites
MLI No. 3493
January 7, 2011**

for

**Mr. Peter Stewart
Malbex Resources Inc.
372 Bay Street, Suite 901
Toronto, Ontario
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EXECUTIVE SUMMARY

Direct agitated cyanidation (bottle roll) tests were conducted on five drill core composites from the Del Carmen Norte Project. The composites were identified as being either from the Rojo Grande deposit (“RG” composites) or Naciente Quebrada Pedregosa (“NQP”) composites. Each composite was tested at feed sizes of 80%-12.5mm, 6.3mm, 212 μ m and 150 μ m, to determine gold recovery, recovery rate, reagent requirements, feed size sensitivity and ore variability. Tests on the crushed (12.5mm and 6.3mm) feeds were conducted to obtain preliminary information concerning heap leach amenability. Tests on the milled feeds were conducted to determine amenability to milling/cyanidation treatment.

Summary results from the bottle roll tests are presented in Table 1.

Table 1. - Summary Metallurgical Results, Bottle Roll Tests, Del Carmen Norte Drill Core Composites

Composite	Feed Size P ₈₀	Leach Time Hours	Au Recovery, %	gAu/mt ore			Reagent Requirements kg/mt ore	
				Extracted	Tail	Calculated Head	NaCN Cons.	Lime Added
NQP1	12.5mm	96	67.6	0.69	0.33	1.02	0.17	6.2
NQP1	6.3mm	96	83.1	0.98	0.20	1.18	0.36	10.4
NQP1	212µm	72	86.8	0.92	0.14	1.06	0.15	3.8
NQP1	150µm	72	89.3	0.92	0.11	1.03	0.23	4.1
NQP2	12.5mm	96	58.9	1.22	0.85	2.07	0.22	4.0
NQP2	6.3mm	96	79.7	1.88	0.48	2.36	0.39	5.0
NQP2	212µm	72	83.9	1.67	0.32	1.99	0.13	3.3
NQP2	150µm	72	85.2	1.79	0.31	2.10	0.16	4.2
RG1	12.5mm	96	59.2	0.29	0.20	0.49	<0.07	1.2
RG1	6.3mm	96	78.3	0.54	0.15	0.69	<0.07	1.4
RG1	212µm	72	83.6	0.51	0.10	0.61	0.09	0.8
RG1	150µm	72	84.2	0.48	0.09	0.57	0.08	0.8
RG2	12.5mm	96	44.8	0.52	0.64	1.16	<0.07	1.1
RG2	6.3mm	96	61.4	0.62	0.39	1.01	0.15	1.3
RG2	212µm	72	83.3	0.90	0.18	1.08	0.08	0.9
RG2	150µm	72	82.7	0.81	0.17	0.98	0.09	0.9
RG3	12.5mm	96	67.4	0.91	0.44	1.35	0.22	1.2
RG3	6.3mm	96	80.0	1.16	0.29	1.45	0.31	2.0
RG3	212µm	72	83.2	1.09	0.22	1.31	0.21	0.9
RG3	150µm	72	82.6	1.09	0.23	1.32	0.15	0.9

All five Del Carmen Norte samples were amenable to whole ore agitated cyanidation treatment at the feed sizes evaluated. The lowest gold recovery obtained (44.8%) was from the RG2 composite at an 80%-12.5mm feed size. Gold recoveries obtained from the four other composites at the 12.5mm feed size ranged from 58.9% to 67.6%, in 96 hours of leaching. Crushing from 12.5mm to 80%-6.3mm in size resulted in an average increase in gold recovery of 16.9%. Crushing the RG2 composite to 6.3mm in size increased the gold recovery to 61.4%.

Milling the RG2 composites to 80%-212µm in size increased gold recovery to 83.3%, which was 21.9% higher than obtained at the 6.3mm feed size. Gold recoveries obtained from the four other composites at the 212µm feed size (83.2% - 86.8%) were 3% to 5% higher than obtained at the 6.3mm feed size. In general, grinding from 212µm to 80%-150µm in size increased gold recovery from the NQP composites slightly, but didn't significantly increase gold recovery from the RG composites. Head and tail screen analysis results from the 12.5mm tests indicated that finer grinding (-75µm) would be effective in significantly increasing milling/cyanidation recoveries.

Cyanide consumption was low for all feed sizes evaluated. Lime requirements varied, and were higher for the NQP composites than for the RG composites. There was also a tendency for lime requirements to be lower for the milled feeds than for the crushed feeds. This tendency may have resulted in part from the staged grinding procedures employed for the milling/cyanidation tests, which resulted in some "washing" of the milled ore before leaching.

Silver recoveries from the samples containing detectable silver were low (generally <50%) and tended to increase with decreasing feed size.

Overall, test results indicate good potential for heap leach cyanidation treatment and for whole ore milling/cyanidation treatment of the materials represented by the five composites. Indications are that relatively fine feed sizes may be required for either processing method, in order to maximize gold recoveries by cyanidation.

COMPOSITE PREPARATION AND HEAD ANALYSIS PROCEDURES AND RESULTS

A total of five drill core composites (11 - 18 kg ea.) were received for testing. Each sample was stage crushed to 80%-12.5mm (100%-19mm) in size, and was blended and split to obtain 2 kg for a bottle roll test, 2 kg for a head screen analysis, and 2 kg to be saved for potential future work. Remaining material from each composite was stage crushed to 80%-6.3mm (100%-9.5mm) in size, and was blended and split to obtain 1 kg for a bottle roll test, triplicate 0.5 kg samples for head analysis and 2.5 kg for milling/cyanidation testing. Each 2.5 kg split was stage crushed to just passing 850µm in size, and was blended and split in half to obtain two samples for milling/cyanidation tests.

Head samples were assayed using conventional fire assay fusion procedures to determine precious metal content. A single head sample from each was also submitted for an ICP scan, and sulfur speciation analyses. Head assay results and head grade comparisons are presented in Tables 2 and 3. Results from the ICP scan, mercury analysis (CVAA) and sulfur speciation analyses are presented in Table 4. Detailed composite make-up information and composite descriptions, provided by Malbex Resources, Inc. personnel, are provided in Section 1 of the Appendix.

**Table 2. - Head Assay Results and Head Grade Comparisons for Gold,
 Del Carmen Norte Composites**

Determination	Head Grade, gAu/mt ore				
	NQP1	NQP2	RG1	RG2	RG3
Direct Assay, Init.	1.28	2.15	0.67	1.18	1.47
Direct Assay, Init. (Repeat)				1.18	
Direct Assay, Dup.	1.29	2.20	0.62	1.83	1.61
Direct Assay, Dup. (Repeat)				2.01	
Direct Assay, Trip.	1.31	2.27	0.72	1.15	1.54
Direct Assay, Trip. (Repeat)				1.20	
Calc'd., Head Screen, 12.5mm	1.07	2.15	0.53	1.13	1.49
Calc'd., Bottle Roll, 12.5mm	1.02	2.07	0.49	1.16	1.35
Calc'd., Bottle Roll, 6.3mm	1.18	2.36	0.69	1.01	1.45
Calc'd., Bottle Roll, 212µm	1.06	1.99	0.61	1.08	1.31
Calc'd., Bottle Roll, 150µm	1.03	2.10	0.57	0.98	1.32
Average	1.16	2.16	0.61	1.26	1.44
Std. Deviation	0.12	0.12	0.08	0.33	0.11
Precision, %	89.7	94.4	86.9	73.8	92.4

Average head grade for the five core composites ranged from 0.61 to 2.16 gAu/mt ore. Gold head grade agreement was lower than normally expected (<90%) for three of the five composites. Gold occurrence was somewhat “spotty” for those samples, indicating the possible presence of “free milling” particulate gold values. Gold head grade standard deviation ranged from 0.08 to 0.13 gAu/mt ore, for all but one of the composites. That variability falls within normally expected analytical and experimental precision limits. Gold head grade standard deviation for the RG2 composite was significantly higher (0.33 gAu/mt ore), in large part because of the anomalously high head grade (1.83 - 2.01 gAu/mt ore) encountered with one of the direct head assay splits. Without that split, head grade standard deviation decreases to 0.08 gAu/mt ore.

Table 3. - Head Assay Results and Head Grade Comparisons for Silver, Del Carmen Norte Composites

Determination	Head Grade, gAg/mt ore				
	NQP1	NQP2	RG1	RG2	RG3
Direct Assay, Init.	<5	11	10	11	30
Direct Assay, Dup.	<5	13	9	6	20
Direct Assay, Trip.	7	12	9	13	23
Calc'd., Head Screen, 12.5mm	<1	6	9	15	26
Calc'd., Bottle Roll, 12.5mm	<1	8	9	15	27
Calc'd., Bottle Roll, 6.3mm	<1	7	9	14	27
Calc'd., Bottle Roll, 212µm	<1	7	10	14	27
Calc'd., Bottle Roll, 150µm	<1	8	10	15	27
Average	<4	9	9	13	26
Std. Deviation	>2	3	1	3	3
Precision, %	<33.3	66.7	88.9	76.9	88.5

Silver head grades were less than 10 gAg/mt ore for three of the composites. Composites RG2 and RG3 contained averages of 13 and 26 gAg/mt ore, respectively. Silver head grade standard deviation ranged from 1 to 3 gAg/mt ore, which falls within normally expected analytical and experimental precision limits.

**Table 4. - ICP Scan, Fire Assay, Mercury Analysis and Sulfur Speciation Analysis Results,
 Del Carmen Norte Drill Core Composites**

Analysis	Unit	Composite				
		NQP1	NQP2	RG1	RG2	RG3
Au*	ppm	1.29	2.21	0.67	1.43	1.54
Ag	ppm	0.39	7.15	9.61	15.80	28.30
Al	%	6.41	6.64	0.21	0.12	1.69
As	ppm	368.0	571.0	129.0	942.0	216.0
Ba	ppm	220	130	1,550	2,670	220
Be	ppm	0.30	0.41	0.17	0.08	0.14
Bi	ppm	3.80	5.60	53.60	151.50	49.90
Ca	%	0.37	0.04	0.03	0.02	0.03
Cd	ppm	0.03	0.03	0.06	0.03	<0.02
Ce	ppm	41.60	37.20	9.76	5.83	20.20
Co	ppm	2.6	1.0	1.1	10.6	10.6
Cr	ppm	13	29	25	23	20
Cs	ppm	0.53	0.63	0.32	0.29	0.69
Cu	ppm	11.7	6.9	18.2	18.0	12.4
Fe	%	1.92	2.41	1.67	2.59	2.55
Ga	ppm	20.60	21.30	1.46	1.33	9.59
Ge	ppm	0.09	0.10	<0.05	0.12	0.29
Hf	ppm	0.5	0.5	1.3	1.1	1.9
Hg	ppm	0.07	0.75	1.23	1.0	3.4
In	ppm	0.111	0.139	0.026	0.060	0.675
K	%	2.13	2.03	0.20	0.19	0.83
La	ppm	20.5	17.6	4.9	2.9	10.7
Li	ppm	3.0	4.3	1.2	0.8	1.3
Mg	%	0.01	0.01	0.01	0.01	0.01
Mn	ppm	26	17	40	50	39
Mo	ppm	2.33	2.21	3.94	3.32	4.72
Na	%	0.67	1.00	0.02	0.06	0.12
Nb	ppm	7.3	6.6	7.2	6.2	11.3
Ni	ppm	1.2	0.9	2.4	2.0	1.9
P	ppm	930	1,050	100	170	290
Pb	ppm	317.0	755.0	89.3	313.0	520.0
Rb	ppm	6.7	14.2	6.3	6.7	14.6
Re	ppm	<0.002	<0.002	<0.002	<0.002	0.002
S (Total)	%	6.50	6.72	0.45	0.58	1.91
S (Sulfate)	%	3.82	3.68	0.20	0.59	1.63
S (Sulfide)	%	1.40	1.85	0.02	0.07	0.05
Sb	ppm	20.70	8.94	148.00	253.00	172.00
Sc	ppm	3.3	3.4	2.4	2.7	4.4
Se	ppm	5	6	4	5	7
Sn	ppm	2.1	2.3	7.8	13.0	22.6
Sr	ppm	529.0	633.0	52.1	44.9	303.0
Ta	ppm	0.57	0.54	0.48	0.35	0.68
Te	ppm	4.11	2.54	2.20	5.15	8.44
Th	ppm	7.3	5.3	2.8	1.9	4.1
Ti	%	0.289	0.344	0.436	0.443	0.639
Tl	ppm	4.06	3.18	1.23	1.20	2.79
U	ppm	1.2	1.1	1.8	1.3	2.5
V	ppm	69	91	25	31	48
W	ppm	7.8	9.5	7.1	9.0	9.8
Y	ppm	1.6	1	2.8	2.3	4.7
Zn	ppm	5	5	7	6	7
Zr	ppm	17.2	15.5	61.6	37.9	88.6

* Average of triplicate direct assay. (RG-2 was an average of 6 assays).

Head analysis results showed that the NQ composites contained relatively high sulfur levels (6.5% - 6.7%). Most of that sulfur (3.7% - 3.8%) was present as sulfate sulfur. Most of the remaining sulfur (1.4% - 1.9%) was present as sulfide sulfur. The RG composites contained lower levels of total sulfur (0.5% - 1.9%), with an even higher portion (0.2% - 1.6%) present as sulfate sulfur. Sulfide sulfur content for the RG composites was very low (0.02% - 0.07%). In the case of composites NQP1, NQP2 and RG1, there was a significant portion of the total sulfur content that was not accounted for as either sulfide or sulfate sulfur. These results could indicate the presence of elemental sulfur. Additional analysis would be required to confirm this observation, and no indications of the presence of elemental sulfur were noted during bottle roll testing.

Copper content was relatively low (<20 mg/kg) for all five composites. Arsenic concentration ranged from 129 to 942 mg/kg. Mercury concentrations ranged from 0.07 to 3.4 mg/kg. Elevated levels of antimony (148 - 253 mg/kg) were noted for the "RG" composites.

BOTTLE ROLL LEACH TEST PROCEDURES AND RESULTS

Direct agitated cyanidation (bottle roll) tests were conducted on the five composites, at 80%-12.5mm, 6.3mm 212 μ m and 150 μ m feed sizes to determine gold and silver recovery, recovery rate, reagent requirements, and sensitivity to feed size. The 212 and 150 μ m feeds were stage ground using a laboratory mild steel ball mill. Bottle roll test ore charges were mixed with water to achieve 40 weight percent solids. Natural pulp pHs were measured. Lime was added to adjust the pH of the pulps to 11.0 before adding the cyanide. Sodium cyanide, equivalent to 1.0 gNaCN/L of solution, was added to the alkaline pulps.

Leaching was conducted by rolling the pulps in bottles on the laboratory rolls for 96 hours (12.5mm and 6.3mm feeds) or 72 hours (milled feeds). Rolling was suspended briefly after 2, 6, 12 (milled feeds), 24, 48, and 72 hours to allow the pulps to settle so samples of pregnant solution could be taken for gold and silver analysis by A.A. methods. Pregnant solution volumes were measured and sampled. Cyanide concentration and pH were determined for each pregnant solution. Make-up water, equivalent to that withdrawn, was added to the pulps. Cyanide concentrations were restored to initial levels. Lime was added, when necessary, to maintain the leaching pH at between 10.8 and 11.2. Rolling was then resumed.

After 72 or 96 hours, the pulps were filtered to separate liquids and solids. Final pregnant solution volumes were measured and sampled for gold and silver analysis. Final pH and cyanide concentrations were determined. Leached residues from the 12.5mm tests were used in entirety for a tail screen analysis, to determine residual precious metal content and distribution. Head screens were conducted on separate 2 kg splits of the 12.5mm feeds, to obtain recovery by size fraction data. Leached residues from the finer feeds were washed, dried, weighed, and assayed in triplicate to determine residual precious metal content.

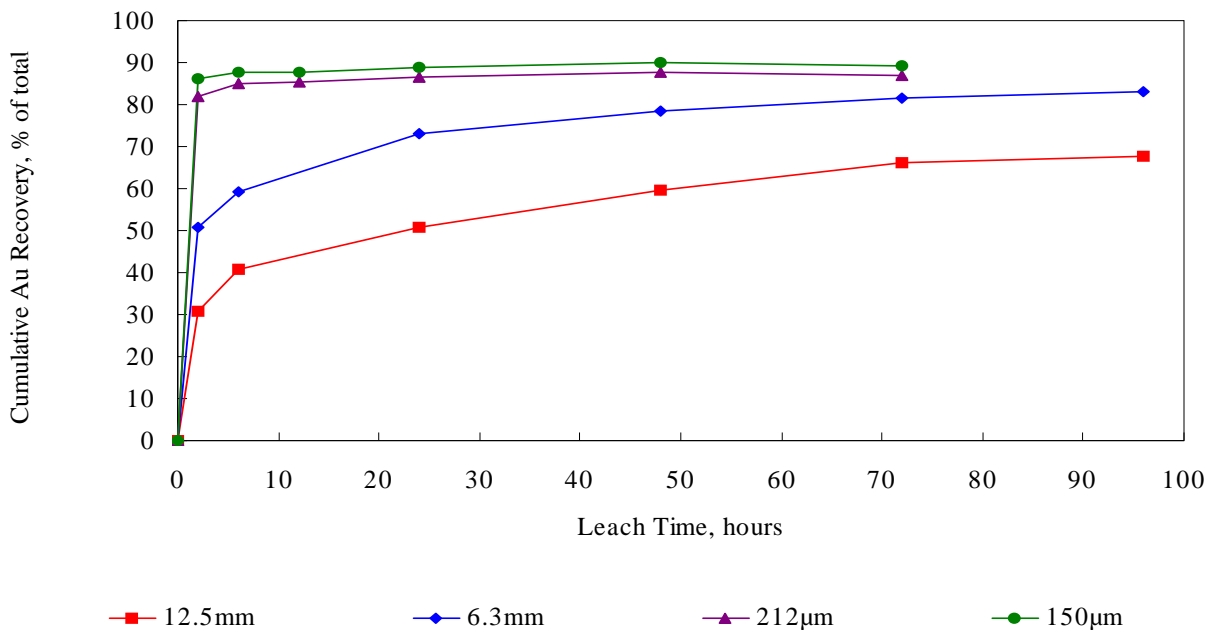
Overall metallurgical results from the direct agitated cyanidation tests are provided in Tables 5 through 9. Gold leach rate profiles are shown graphically in Figures 1 through 5. Head and tail screen results and recovery by size fraction data for the 12.5mm feeds are presented in Tables 10 through 24. Detailed bottle roll test data are provided in Section 2 of the Appendix to this report.

**Table 5. - Overall Metallurgical Results, Bottle Roll Tests,
 Del Carmen Norte NQP1 Drill Core Composite**

Metallurgical Results	Feed Size, P ₈₀			
	12.5mm	6.3mm	212µm	150µm
Extraction, % of total Au	CY-2	CY-5	CY-8	CY-11
in 2 hours	30.9	50.8	82.1	86.1
in 6 hours	40.7	59.2	85.1	87.7
in 12 hours			85.2	87.7
in 24 hours	50.8	73.0	86.4	89.0
in 48 hours	59.8	78.5	87.6	90.1
in 72 hours	66.0	81.6	86.8	89.3
in 96 hours	67.6	83.1		
Extracted, gAu/mt ore	0.69	0.98	0.92	0.92
Tail Grade, gAu/mt ore	0.33 ¹⁾	0.20 ²⁾	0.14 ²⁾	0.11 ²⁾
Calc'd Head, gAu/mt ore	1.02	1.18	1.06	1.03
Average Head, gAu/mt ore ³⁾	1.16	1.16	1.16	1.16
Ag Extraction, % of total	N/A	N/A	N/A	N/A
Extracted, gAg/mt ore	<1	<1	<1	<1
Tail Grade, gAg/mt ore	<1 ¹⁾	<1 ²⁾	<1 ²⁾	<1 ²⁾
Calc'd Head, gAg/mt ore	<2	<2	<2	<2
Average Head, gAg/mt ore ³⁾	<4	<4	<4	<4
NaCN Consumed, kg/mt ore	0.17	0.36	0.15	0.23
Lime Added, kg/mt ore	6.2	10.4	3.8	4.1
Final Solution pH	10.8	10.8	11.0	10.8
Natural pH (40% Solids)	4.0	3.9	5.7	5.1

- 1) Tail screen analysis.
- 2) Average of triplicate direct assay.
- 3) Average of all head grade determinations.

**Figure 1. - Gold Leach Rate Profiles, Bottle Roll Tests,
 Del Carmen Norte NQP1 Drill Core Composite**



Overall metallurgical results show that the NQP1 composite was amenable to direct agitated cyanidation treatment at the feed sizes evaluated. Gold recoveries obtained at 80%-12.5mm and 6.3mm feed sizes were 67.6% and 83.1%, respectively, in 96 hours of leaching. Milling the composite to as fine as 80%-150 μ m was resulted in only a marginal increase in gold recovery (89.3%). Gold recovery from the 150 μ m feed was incrementally higher than from the 212 μ m feed.

Gold recovery rates for the crushed feeds were fairly slow. Gold extraction was progressing from both at a slow rate when leaching was terminated after 96 hours. Gold recovery rates from the milled feeds were very rapid, and gold extraction was substantially complete in 6 hours of leaching. Allowed a longer leaching cycle, it is expected that gold recovery from the 6.3mm feed would be essentially the same as from the milled feeds. It is not clear, and probably unlikely that gold recovery from the 12.5mm feed would approach the recoveries obtained from the milled feeds.

Cyanide consumptions were low, and ranged from 0.15 to 0.36 kg NaCN/mt ore. Lime requirements were surprisingly variable (3.8 - 10.4 kg/mt ore), and significantly lower for the milled feeds than for the crushed feeds. It could be the case that the staged grinding procedures employed for the milled feeds resulted in the rinsing of a significant soluble sulfate component from the ore during the required screening. Further testing would be required to evaluate if this was indeed the case.

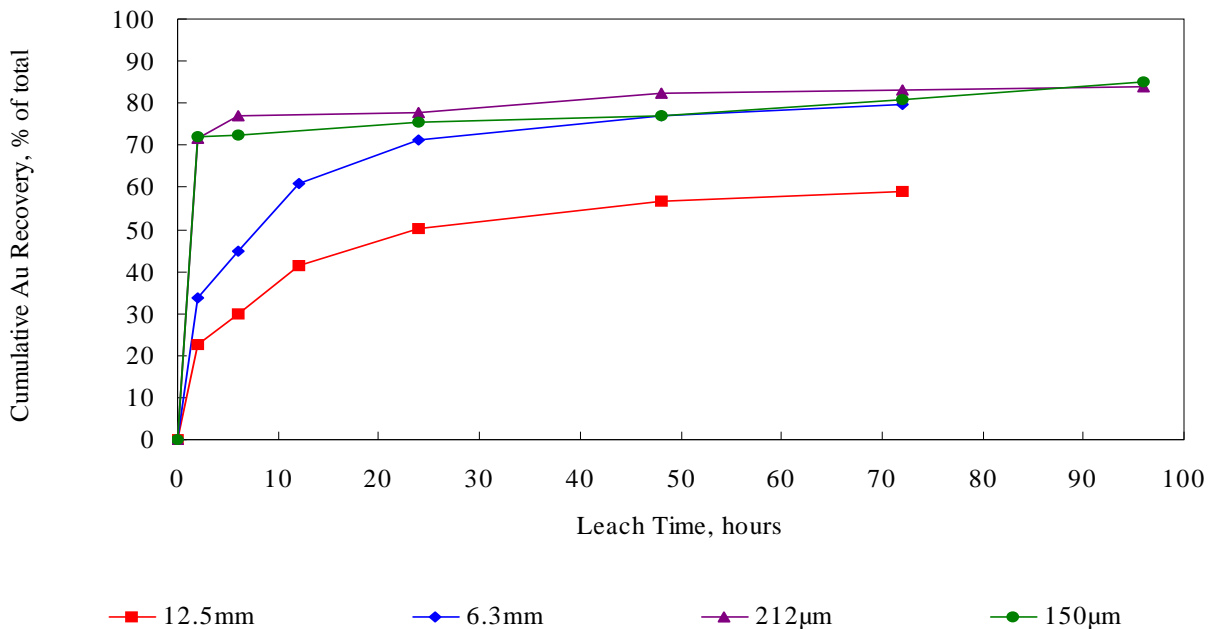
The NQP1 composite contained less than 5 gAg/mt ore. Consequently silver recovery data are not discussed here.

**Table 6. - Overall Metallurgical Results, Bottle Roll Tests,
 Del Carmen Norte NQP2 Drill Core Composite**

Metallurgical Results	Feed Size, P ₈₀			
	12.5mm	6.3mm	212µm	150µm
Extraction, % of total Au	CY-3	CY-6	CY-9	CY-12
in 2 hours	22.5	33.7	71.6	72.1
in 6 hours	29.7	44.8	77.0	72.5
in 12 hours			77.9	75.6
in 24 hours	41.5	61.0	82.4	77.1
in 48 hours	50.1	71.1	83.2	80.7
in 72 hours	56.6	77.1	83.9	85.2
in 96 hours	58.9	79.7		
Extracted, gAu/mt ore	1.22	1.88	1.67	1.79
Tail Grade, gAu/mt ore	0.85 ¹⁾	0.48 ²⁾	0.32 ²⁾	0.31 ²⁾
Calc'd Head, gAu/mt ore	2.07	2.36	1.99	2.10
Average Head, gAu/mt ore ³⁾	2.16	2.16	2.16	2.16
Ag Extraction, % of total	12.5	14.3	28.6	25.0
Extracted, gAg/mt ore	1	1	2	2
Tail Grade, gAg/mt ore	7 ¹⁾	6 ²⁾	5 ²⁾	6 ²⁾
Calc'd Head, gAg/mt ore	8	7	7	8
Average Head, gAg/mt ore ³⁾	9	9	9	9
NaCN Consumed, kg/mt ore	0.22	0.39	0.13	0.16
Lime Added, kg/mt ore	4.0	5.0	3.3	4.2
Final Solution pH	10.6	10.6	10.9	10.9
Natural pH (40% Solids)	4.6	4.1	5.1	4.6

- 1) Tail screen analysis.
- 2) Average of triplicate direct assay.
- 3) Average of all head grade determinations.

**Figure 2. - Gold Leach Rate Profiles, Bottle Roll Tests,
 Del Carmen Norte NQP2 Drill Core Composite**



Overall metallurgical results show that the NQP2 composite was amenable to direct agitated cyanidation treatment at the feed sizes evaluated. Gold recoveries obtained at 80%-12.5mm and 6.3mm feed sizes were 58.9% and 79.7%, respectively, in 96 hours of leaching. Milling the composite to as fine as 80%-150 μ m was resulted in only a moderate increase in gold recovery (85.2%). Gold recovery from the 150 μ m feed was incrementally higher than from the 212 μ m feed.

Gold recovery rates for the crushed feeds were fairly slow. Gold extraction was progressing from both at a slow rate when leaching was terminated after 96 hours. Gold recovery rates from the milled feeds were rapid, and gold extraction was substantially complete in 6 hours of leaching. Allowed a longer leaching cycle, it is expected that gold recovery from the 6.3mm feed would be essentially the same as from the milled feeds. It is not clear, and probably unlikely that gold recovery from the 12.5mm feed would approach the recoveries obtained from the milled feeds.

Cyanide consumptions were low, and ranged from 0.13 to 0.39 kg NaCN/mt ore. Lime requirements ranged from 3.3 to 5.0 kg/mt ore.

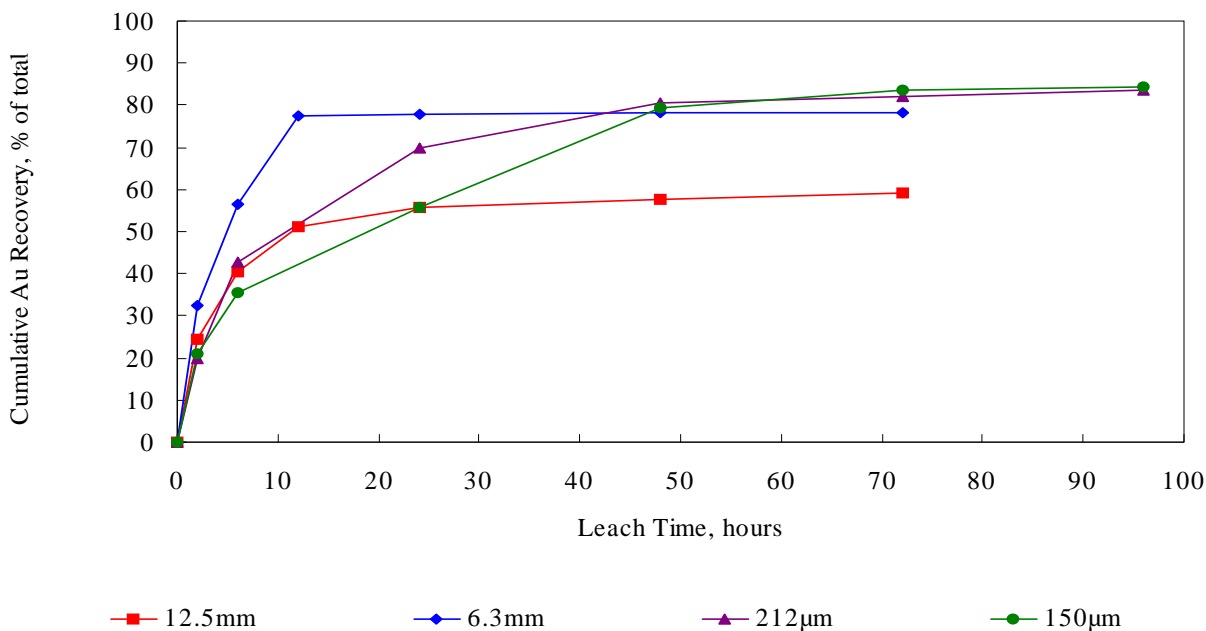
Silver calculated head grades for the NQP2 composite ranged from 7 to 8 gAg/mt ore. Silver recoveries increased from 12.5% for the 12.5mm feed to as high as 28.6% for the 212 μ m feed.

**Table 7. - Overall Metallurgical Results, Bottle Roll Tests,
 Del Carmen Norte RG1 Drill Core Composite**

Metallurgical Results	Feed Size, P ₈₀			
	12.5mm	6.3mm	212µm	150µm
Extraction, % of total Au	CY-1	CY-4	CY-7	CY-10
in 2 hours	24.5	32.6	19.7	21.1
in 6 hours	40.6	56.5	42.8	35.4
in 12 hours			69.7	55.6
in 24 hours	51.2	77.5	80.7	79.5
in 48 hours	55.9	77.9	82.2	83.5
in 72 hours	57.7	78.1	83.6	84.2
in 96 hours	59.2	78.3		
Extracted, gAu/mt ore	0.29	0.54	0.51	0.48
Tail Grade, gAu/mt ore	0.20 ¹⁾	0.15 ²⁾	0.10 ²⁾	0.09 ²⁾
Calc'd Head, gAu/mt ore	0.49	0.69	0.61	0.57
Average Head, gAu/mt ore ³⁾	0.61	0.61	0.61	0.61
Ag Extraction, % of total	33.3	44.4	50.0	50.0
Extracted, gAg/mt ore	3	4	5	5
Tail Grade, gAg/mt ore	6 ¹⁾	5 ²⁾	5 ²⁾	5 ²⁾
Calc'd Head, gAg/mt ore	9	9	10	10
Average Head, gAg/mt ore ³⁾	9	9	9	9
NaCN Consumed, kg/mt ore	<0.07	<0.07	0.09	0.08
Lime Added, kg/mt ore	1.2	1.4	0.8	0.8
Final Solution pH	11.2	10.9	10.8	11.1
Natural pH (40% Solids)	6.8	6.7	6.6	7.2

- 1) Tail screen analysis.
- 2) Average of triplicate direct assay.
- 3) Average of all head grade determinations.

**Figure 3. - Gold Leach Rate Profiles, Bottle Roll Tests,
 Del Carmen Norte RG1 Drill Core Composite**



Overall metallurgical results show that the RG1 composite was amenable to direct agitated cyanidation treatment at the feed sizes evaluated. Gold recoveries obtained at 80%-12.5mm and 6.3mm feed sizes were 59.2% and 78.3%, respectively, in 96 hours of leaching. Milling the composite to as fine as 80%-150 μ m was resulted in only a moderate increase in gold recovery (83.6%). Gold recovery from the 150 μ m feed was essentially the same as from the 212 μ m feed.

Gold recovery rates for the crushed feeds were fairly slow. Gold extraction was progressing from the 12.5mm feed at a slow rate when leaching was terminated after 96 hours. Gold extraction from the 6.3mm feed was essentially complete in 24 hours of leaching. Gold recovery rates from the milled feeds were more rapid, but significantly slower than observed with the "NQP" composites. Gold extraction from the RG1 milled feeds was substantially complete in 24 hours of leaching. It does not appear that longer leaching cycles for the crushed feeds would be effective in increasing gold recoveries to the levels obtained from the milled feeds.

Cyanide consumptions were very low, and ranged from <0.07 to 0.09 kg NaCN/mt ore. Lime requirements ranged from 0.8 to 1.4 kg/mt ore, and were lower for the milled feeds than for the crushed feeds.

Silver calculated head grades for the RG1 composite ranged from 9 to 10 gAg/mt ore. Silver recoveries increased from 33.3% for the 12.5mm feed to 50.0% for the milled feeds.

**Table 8. - Overall Metallurgical Results, Bottle Roll Tests,
Del Carmen Norte RG2 Drill Core Composite**

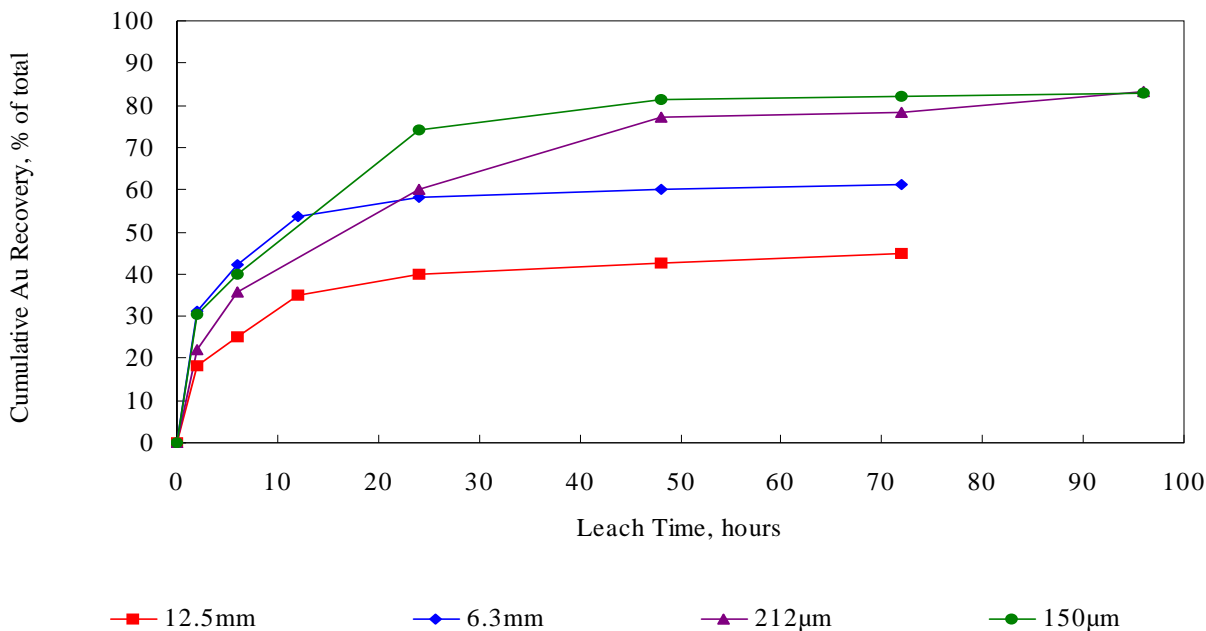
Metallurgical Results	Feed Size, P ₈₀			
	12.5mm	6.3mm	212µm	150µm
Extraction, % of total Au				
in 2 hours	18.1	31.2	22.2	30.6
in 6 hours	25.2	42.1	35.9	40.0
in 12 hours			60.1	74.2
in 24 hours	35.0	53.6	77.1	81.2
in 48 hours	40.0	58.3	78.2	82.2
in 72 hours	42.6	60.1	83.3	82.7
in 96 hours	44.8	61.4		
Extracted, gAu/mt ore	0.52	0.62	0.90	0.81
Tail Grade, gAu/mt ore	0.64 ¹⁾	0.39 ²⁾	0.18 ²⁾	0.17 ²⁾
Calc'd Head, gAu/mt ore	1.16	1.01	1.08	0.98
Average Head, gAu/mt ore ³⁾	1.26	1.26	1.26	1.26
Ag Extraction, % of total	26.7	42.9	64.3	66.7
Extracted, gAg/mt ore	4	6	9	10
Tail Grade, gAg/mt ore	11 ¹⁾	8 ²⁾	5 ²⁾	5 ²⁾
Calc'd Head, gAg/mt ore	15	14	14	15
Average Head, gAg/mt ore ³⁾	13	13	13	13
NaCN Consumed, kg/mt ore	<0.07	0.15	0.08	0.09
Lime Added, kg/mt ore	1.1	1.3	0.9	0.9
Final Solution pH	10.6	10.9	10.9	10.9
Natural pH (40% Solids)	6.2	6.4	6.9	6.7

1) Tail screen analysis.

2) Average of triplicate direct assay.

3) Average of all head grade determinations.

**Figure 4. - Gold Leach Rate Profiles, Bottle Roll Tests,
Del Carmen Norte RG2 Drill Core Composite**



Overall metallurgical results show that the RG2 composite was amenable to direct agitated cyanidation treatment at the 6.3mm and finer feed sizes. Gold recoveries obtained at 80%-12.5mm and 6.3mm feed sizes were 44.8% and 61.4%, respectively, in 96 hours of leaching. Milling the composite to as fine as 80%-150 μ m was resulted in a significant increase in gold recovery (83.3%). Gold recovery from the 150 μ m feed was essentially the same as from the 212 μ m feed.

Gold recovery rate data were similar to those discussed for the RG1 composite. Gold recovery rates for the crushed feeds were fairly slow. Gold extraction was progressing from the crushed feeds at a slow rate when leaching was terminated after 96 hours. Gold recovery rates from the milled feeds were more rapid, but significantly slower than observed with the "NQP" composites. Gold extraction from the RG2 milled feeds was substantially complete in 24 hours of leaching. It does not appear that longer leaching cycles for the crushed feeds would be effective in increasing gold recoveries to the levels obtained from the milled feeds.

Cyanide consumptions were very low, and ranged from <0.07 to 0.15 kg NaCN/mt ore. Lime requirements ranged from 0.9 to 1.3 kg/mt ore, and were lower for the milled feeds than for the crushed feeds.

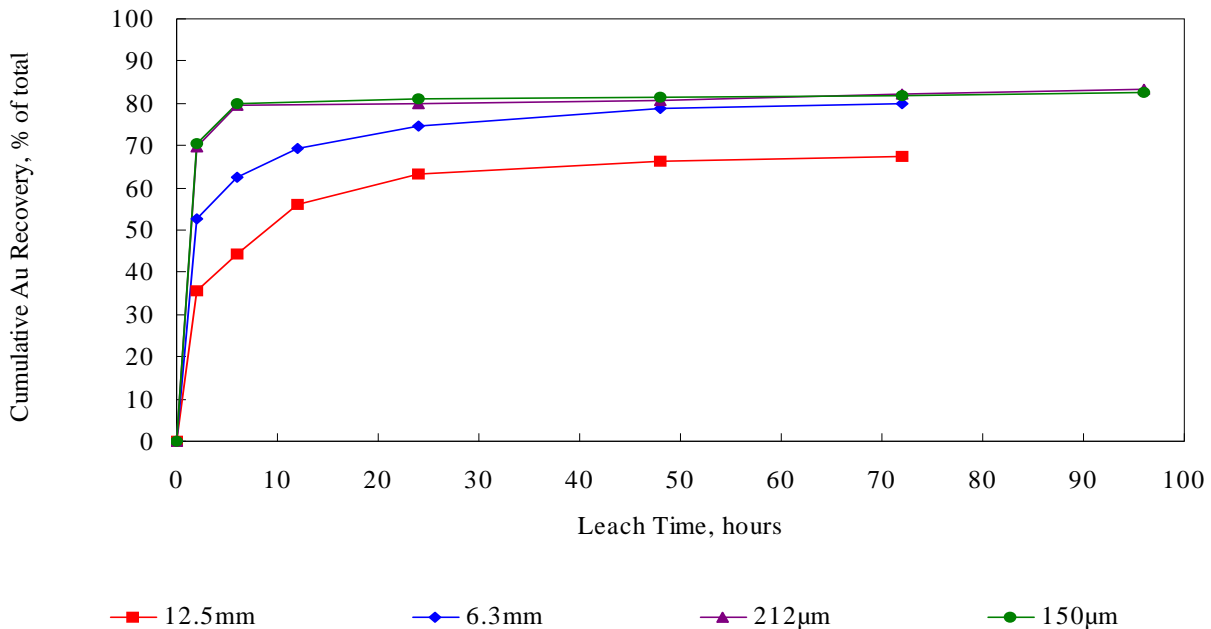
Silver calculated head grades for the RG2 composite ranged from 14 to 15 gAg/mt ore. Silver recoveries increased from 26.7% for the 12.5mm feed to 66.7% for the 150 μ m feed.

**Table 9. - Overall Metallurgical Results, Bottle Roll Tests,
 Del Carmen Norte RG3 Drill Core Composite**

Metallurgical Results	Feed Size, P ₈₀			
	12.5mm	6.3mm	212µm	150µm
Extraction, % of total Au				
in 2 hours	35.6	52.8	69.8	70.5
in 6 hours	44.5	62.4	79.4	80.1
in 12 hours			80.1	80.9
in 24 hours	56.0	69.4	80.6	81.6
in 48 hours	63.3	74.6	82.1	82.0
in 72 hours	66.4	78.7	83.2	82.6
in 96 hours	67.4	80.0		
Extracted, gAu/mt ore	0.91	1.16	1.09	1.09
Tail Grade, gAu/mt ore	0.44 ¹⁾	0.29 ²⁾	0.22 ²⁾	0.23 ²⁾
Calc'd Head, gAu/mt ore	1.35	1.45	1.31	1.32
Average Head, gAu/mt ore ³⁾	1.44	1.44	1.44	1.44
Ag Extraction, % of total	14.8	22.2	40.7	44.4
Extracted, gAg/mt ore	4	6	11	12
Tail Grade, gAg/mt ore	23	21	16	15
Calc'd Head, gAg/mt ore	27	27	27	27
Average Head, gAg/mt ore ³⁾	26	26	26	26
NaCN Consumed, kg/mt ore	0.22	0.31	0.21	0.15
Lime Added, kg/mt ore	1.2	2.0	0.9	0.9
Final Solution pH	10.8	11.0	11.1	10.9
Natural pH (40% Solids)	6.4	6.3	6.5	5.7

- 1) Tail screen analysis.
- 2) Average of triplicate direct assay.
- 3) Average of all head grade determinations.

**Figure 5. - Gold Leach Rate Profiles, Bottle Roll Tests,
 Del Carmen Norte RG3 Drill Core Composite**



Overall metallurgical results show that the RG3 composite was amenable to direct agitated cyanidation treatment at the feed sizes evaluated. Gold recoveries obtained at 80%-12.5mm and 6.3mm feed sizes were 67.4% and 80.0%, respectively, in 96 hours of leaching. Milling the composite to as fine as 80%-150 μ m resulted in only an incremental increase in gold recovery (83.2%). Gold recovery from the 150 μ m feed was essentially the same as from the 212 μ m feed.

Gold recovery rate data were similar to those discussed for the "NQP" composites. Gold recovery rates for the crushed feeds were fairly slow. Gold extraction was progressing from both at a slow rate when leaching was terminated after 96 hours. Gold recovery rates from the milled feeds were very rapid, and gold extraction was substantially complete in 6 hours of leaching. Allowed a longer leaching cycle, it is expected that gold recovery from the 6.3mm feed would be essentially the same as from the milled feeds. It does not appear that gold recovery from the 12.5mm feed would approach the recoveries obtained from the milled feeds.

Cyanide consumptions were low, and ranged from 0.15 to 0.31 kg NaCN/mt ore. Lime requirements ranged from 0.9 to 2.0 kg/mt ore, and were lower for the milled feeds than for the crushed feeds.

Silver calculated head grades for the RG3 composite were 27 gAg/mt ore. Silver recoveries increased from 14.8% for the 12.5mm feed to 44.4% for the 150 μ m feed.

Table 10. - Head Screen Analysis Results, Del Carmen Norte NQP1 Drill Core Composite, 12.5mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt		Au Distribution	
			Au	Ag	%	Cum. %
+12.5mm	19.8	19.8	0.73	<1	13.6	13.6
-12.5+9.5mm	25.7	45.5	1.05	<1	25.3	38.9
-9.5+6.3mm	20.4	65.9	0.94	<1	18.0	56.9
-6.3+1.7mm	21.1	87.0	1.13	<1	22.4	79.3
-1.7mm+420µm	6.3	93.3	1.14	<1	6.7	86.0
-420+212µm	1.4	94.7	1.04	<1 ¹⁾	1.4	87.4
-212+75µm	1.6	96.3	1.05	<1 ¹⁾	1.6	89.0
-75µm	3.7	100.0	3.18	<1	11.0	100.0
Composite	100.0		1.07	<1	100.0	

1) Insufficient sample for assay, used average adjoining assays.

Table 11. - Tail Screen Analysis Results, Bottle Leached Residue (CY-2), Del Carmen Norte NQP1 Drill Core Composite, 12.5mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt		Au Distribution	
			Au	Ag	%	Cum. %
+12.5mm	16.6	16.6	0.45	1	22.9	22.9
-12.5+9.5mm	24.7	41.3	0.49	1	37.1	60.0
-9.5+6.3mm	18.2	59.5	0.33	<1	18.4	78.4
-6.3+1.7mm	18.3	77.8	0.26	<1	14.6	93.0
-1.7mm+420µm	3.8	81.6	0.21	<1	2.4	95.4
-420+212µm	0.2	81.8	0.15 ¹⁾	<1 ²⁾	0.1	95.5
-212+75µm	0.1	81.9	0.15 ¹⁾	<1 ²⁾	0.1	95.6
-75µm	18.1	100.0	0.08	<1	4.4	100.0
Composite	100.0		0.33	<1	100.0	

1) Fractions combined for assay.

2) Insufficient sample for assay, used average adjoining assays.

Table 12. - Recovery By Size Fraction Data, Bottle Roll Test (CY-2), Del Carmen Norte NQP1 Drill Core Composite, 12.5mm Feed Size

Size Fraction	Weight, %		Assays, gAu/mt		Au Recovery, %
	Head	Tail	Head	Tail	
+12.5mm	19.8	16.6	0.73	0.45	38.4
-12.5+9.5mm	25.7	24.7	1.05	0.49	53.3
-9.5+6.3mm	20.4	18.2	0.94	0.33	64.9
-6.3+1.7mm	21.1	18.3	1.13	0.26	77.0
-1.7mm+420µm	6.3	3.8	1.14	0.21	81.6
-420+212µm	1.4	0.2	1.04	0.15 ¹⁾	85.6
-212+75µm	1.6	0.1	1.05	0.15 ¹⁾	85.7
-75µm	3.7	18.1	3.18	0.08	97.5
Composite	100.0	100.0	1.07	0.33	69.2

1) Fractions combined for assay.

Table 13. - Head Screen Analysis Results, Del Carmen Norte NQP2 Drill Core Composite, 12.5mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt		Distribution,			
					Au		Ag	
					%	Cum. %	%	Cum. %
+12.5mm	18.0	18.0	1.81	7	15.2	15.2	19.6	19.6
-12.5+9.5mm	29.6	47.6	1.56	5	21.5	36.7	23.1	42.7
-9.5+6.3mm	21.2	68.8	2.02	6	20.0	56.7	19.8	62.5
-6.3+1.7mm	20.3	89.1	2.47	7	23.4	80.1	22.2	84.7
-1.7mm+420µm	6.1	95.2	3.16	8	9.0	89.1	7.6	92.3
-420+212µm	1.3	96.5	2.87	10 ¹⁾	1.7	90.8	1.9	94.2
-212+75µm	1.0	97.5	2.97	10 ¹⁾	1.4	92.2	1.5	95.7
-75µm	2.5	100.0	6.73	11	7.8	100.0	4.3	100.0
Composite	100.0		2.15	6	100.0		100.0	

1) Insufficient sample for assay, used average adjoining assays.

Table 14. - Tail Screen Analysis Results, Bottle Leached Residue (CY-3), Del Carmen Norte NQP2 Drill Core Composite, 12.5mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt		Distribution,			
					Au		Ag	
					%	Cum. %	%	Cum. %
+12.5mm	19.2	19.2	1.10	6	25.0	25.0	17.1	17.1
-12.5+9.5mm	28.7	47.9	1.06	7	36.0	61.0	29.9	47.0
-9.5+6.3mm	18.3	66.2	0.86	6	18.6	79.6	16.3	63.3
-6.3+1.7mm	19.5	85.7	0.55	7	12.7	92.3	20.3	83.6
-1.7mm+420µm	4.3	90.0	0.40	7	2.0	94.3	4.5	88.1
-420+212µm	0.4	90.4	0.26 ¹⁾	8 ²⁾	0.1	94.4	0.5	88.6
-212+75µm	0.0	90.4	0.26 ¹⁾	8 ²⁾	0.0	94.4	0.0	88.6
-75µm	9.6	100.0	0.49	8	5.6	100.0	11.4	100.0
Composite	100.0		0.85	7	100.0		100.0	

1) Fractions combined for assay.

2) Insufficient sample for assay, used average adjoining assays.

Table 15. - Recovery By Size Fraction Data, Bottle Roll Test (CY-3), Del Carmen Norte NQP2 Drill Core Composite, 12.5mm Feed Size

Size Fraction	Weight, %		Assay, gAu/mt		Au Recovery, %
	Head	Tail	Head	Tail	
+12.5mm	18.0	19.2	1.81	1.10	39.2
-12.5+9.5mm	29.6	28.7	1.56	1.06	32.1
-9.5+6.3mm	21.2	18.3	2.02	0.86	57.4
-6.3+1.7mm	20.3	19.5	2.47	0.55	77.7
-1.7mm+420µm	6.1	4.3	3.16	0.40	87.3
-420+212µm	1.3	0.4	2.87	0.26 ¹⁾	90.9
-212+75µm	1.0	0.0	2.97	0.26 ¹⁾	91.2
-75µm	2.5	9.6	6.73	0.49	92.7
Composite	100.0	100.0	2.15	0.85	60.5

1) Fractions combined for assay.

Table 16. - Head Screen Analysis Results, Del Carmen Norte RG1 Drill Core Composite, 12.5mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt		Distribution,			
					Au		Ag	
			Au	Ag	%	Cum. %	%	Cum. %
+12.5mm	22.9	22.9	0.54	7	23.3	23.3	18.5	18.5
-12.5+9.5mm	23.8	46.7	0.49	8	22.0	45.3	21.9	40.4
-9.5+6.3mm	17.2	63.9	0.48	9	15.6	60.9	17.8	58.2
-6.3+1.7mm	20.6	84.5	0.45	8	17.5	78.4	19.0	77.2
-1.7mm+420µm	7.6	92.1	0.46	9	6.6	85.0	7.9	85.1
-420+212µm	2.1	94.2	0.60	14 ¹⁾	2.4	87.4	3.4	88.5
-212+75µm	2.1	96.3	0.44	14 ¹⁾	1.7	89.1	3.4	91.9
-75µm	3.7	100.0	1.57	19	10.9	100.0	8.1	100.0
Composite	100.0		0.53	9	100.0		100.0	

1) Insufficient sample for assay, used average adjoining assays.

Table 17. - Tail Screen Analysis Results, Bottle Leached Residue (CY-1), Del Carmen Norte RG1 Drill Core Composite, 12.5mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt		Distribution,			
					Au		Ag	
			Au	Ag	%	Cum. %	%	Cum. %
+12.5mm	19.9	19.9	0.32	7	32.4	32.4	22.2	22.2
-12.5+9.5mm	26.0	45.9	0.21	6	27.8	60.2	24.8	47.0
-9.5+6.3mm	16.2	62.1	0.18	5	14.8	75.0	12.9	59.9
-6.3+1.7mm	18.9	81.0	0.14	6	13.5	88.5	18.1	78.0
-1.7mm+420µm	5.8	86.8	0.11	6	3.3	91.8	5.5	83.5
-420+212µm	1.3	88.1	0.08 ¹⁾	7 ²⁾	0.5	92.3	1.4	84.9
-212+75µm	0.7	88.8	0.08 ¹⁾	7 ²⁾	0.3	92.6	0.8	85.7
-75µm	11.2	100.0	0.13	8	7.4	100.0	14.3	100.0
Composite	100.0		0.20	6	100.0		100.0	

1) Fractions combined for assay.

2) Insufficient sample for assay, used average adjoining assays.

Table 18. - Recovery By Size Fraction Data, Bottle Roll Test (CY-1), Del Carmen Norte RG1 Drill Core Composite, 12.5mm Feed Size

Size Fraction	Weight, %		Assay, gAu/mt		Au Recovery, %
	Head	Tail	Head	Tail	
+12.5mm	22.9	19.9	0.54	0.32	40.7
-12.5+9.5mm	23.8	26.0	0.49	0.21	57.1
-9.5+6.3mm	17.2	16.2	0.48	0.18	62.5
-6.3+1.7mm	20.6	18.9	0.45	0.14	68.9
-1.7mm+420µm	7.6	5.8	0.46	0.11	76.1
-420+212µm	2.1	1.3	0.60	0.08 ¹⁾	86.7
-212+75µm	2.1	0.7	0.44	0.08 ¹⁾	81.8
-75µm	3.7	11.2	1.57	0.13	91.7
Composite	100.0	100.0	0.53	0.20	62.3

1) Fractions combined for assay.

Table 19. - Head Screen Analysis Results, Del Carmen Norte RG2 Drill Core Composite, 12.5mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt		Distribution,			
					Au		Ag	
					%	Cum. %	%	Cum. %
+12.5mm	20.7	20.7	1.07	14	19.5	19.5	19.2	19.2
-12.5+9.5mm	23.9	44.6	1.02	16	21.5	41.0	25.4	44.6
-9.5+6.3mm	20.7	65.3	1.09	14	19.9	60.9	19.2	63.8
-6.3+1.7mm	21.5	86.8	1.18	14	22.4	83.3	20.0	83.8
-1.7mm+420µm	7.6	94.4	1.02	13	6.8	90.1	6.5	90.3
-420+212µm	1.9	96.3	1.32	23 ¹⁾	2.2	92.3	2.8	93.1
-212+75µm	1.6	97.9	1.08	23 ¹⁾	1.5	93.8	2.4	95.5
-75µm	2.1	100.0	3.32	32	6.2	100.0	4.5	100.0
Composite	100.0		1.13	15	100.0		100.0	

1) Insufficient sample for assay, used average adjoining assays.

Table 20. - Tail Screen Analysis Results, Bottle Leached Residue (CY-13), Del Carmen Norte RG2 Drill Core Composite, 12.5mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt		Distribution,			
					Au		Ag	
					%	Cum. %	%	Cum. %
+12.5mm	22.8	22.8	0.76	12	27.1	27.1	24.8	24.8
-12.5+9.5mm	22.7	45.5	0.69	12	24.5	51.6	24.7	49.5
-9.5+6.3mm	18.3	63.8	0.80	11	22.9	74.5	18.3	67.8
-6.3+1.7mm	21.9	85.7	0.60	11	20.5	95.0	21.9	89.7
-1.7mm+420µm	6.6	92.3	0.36	8	3.7	98.7	4.8	94.5
-420+212µm	1.3	93.6	0.21 ¹⁾	8 ²⁾	0.4	99.1	0.9	95.4
-212+75µm	0.3	93.9	0.21 ¹⁾	8 ²⁾	0.1	99.2	0.2	95.6
-75µm	6.1	100.0	0.09	8	0.8	100.0	4.4	100.0
Composite	100.0		0.64	11	100.0		100.0	

1) Fractions combined for assay.

2) Insufficient sample for assay, used average adjoining assays.

Table 21. - Recovery By Size Fraction Data, Bottle Roll Test (CY-13), Del Carmen Norte RG2 Drill Core Composite, 12.5mm Feed Size

Size Fraction	Weight, %		Assay, gAu/mt		Au Recovery, %
	Head	Tail	Head	Tail	
+12.5mm	20.7	22.8	1.07	0.76	29.0
-12.5+9.5mm	23.9	22.7	1.02	0.69	32.4
-9.5+6.3mm	20.7	18.3	1.09	0.80	26.6
-6.3+1.7mm	21.5	21.9	1.18	0.60	49.2
-1.7mm+420µm	7.6	6.6	1.02	0.36	64.7
-420+212µm	1.9	1.3	1.32	0.21 ¹⁾	84.1
-212+75µm	1.6	0.3	1.08	0.21 ¹⁾	80.6
-75µm	2.1	6.1	3.32	0.09	97.3
Composite	100.0	100.0	1.13	0.64	43.4

1) Fractions combined for assay.

Table 22. - Head Screen Analysis Results, Del Carmen Norte RG3 Drill Core Composite, 12.5mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt		Distribution,			
					Au		Ag	
			Au	Ag	%	Cum. %	%	Cum. %
+12.5mm	22.9	22.9	1.52	27	23.4	23.4	23.6	23.6
-12.5+9.5mm	20.2	43.1	1.32	24	17.9	41.3	18.5	42.1
-9.5+6.3mm	17.6	60.7	1.51	27	17.9	59.2	18.1	60.2
-6.3+1.7mm	22.2	82.9	1.45	27	21.7	80.9	22.8	83.0
-1.7mm+420µm	7.8	90.7	1.20	26	6.3	87.2	7.7	90.7
-420+212µm	2.2	92.9	1.06	26 ¹⁾	1.6	88.8	2.2	92.9
-212+75µm	2.2	95.1	1.00	26 ¹⁾	1.5	90.3	2.2	95.1
-75µm	4.9	100.0	2.95	26	9.7	100.0	4.9	100.0
Composite	100.0		1.49	26	100.0		100.0	

1) Insufficient sample for assay, used average adjoining assays.

Table 23. - Tail Screen Analysis Results, Bottle Leached Residue (CY-14), Del Carmen Norte RG3 Drill Core Composite, 12.5mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt		Distribution,			
					Au		Ag	
			Au	Ag	%	Cum. %	%	Cum. %
+12.5mm	19.8	19.8	0.68	23	30.9	30.9	19.9	19.9
-12.5+9.5mm	20.4	40.2	0.47	27	22.0	52.9	24.0	43.9
-9.5+6.3mm	18.5	58.7	0.45	23	19.1	72.0	18.6	62.5
-6.3+1.7mm	19.3	78.0	0.32	25	14.2	86.2	21.0	83.5
-1.7mm+420µm	6.0	84.0	0.26	22	3.6	89.8	5.8	89.3
-420+212µm	1.3	85.3	0.17 ¹⁾	19 ²⁾	0.5	90.3	1.0	90.3
-212+75µm	0.5	85.8	0.17 ¹⁾	19 ²⁾	0.2	90.5	0.4	90.7
-75µm	14.2	100.0	0.29	15	9.5	100.0	9.3	100.0
Composite	100.0		0.44	23	100.0		100.0	

1) Fractions combined for assay.

2) Insufficient sample for assay, used average adjoining assays.

Table 24. - Recovery By Size Fraction Data, Bottle Roll Test (CY-14), Del Carmen Norte RG3 Drill Core Composite, 12.5mm Feed Size

Size Fraction	Weight, %		Assay, gAu/mt		Au Recovery, %
	Head	Tail	Head	Tail	
+12.5mm	22.9	19.8	1.52	0.68	55.3
-12.5+9.5mm	20.2	20.4	1.32	0.47	64.4
-9.5+6.3mm	17.6	18.5	1.51	0.45	70.2
-6.3+1.7mm	22.2	19.3	1.45	0.32	77.9
-1.7mm+420µm	7.8	6.0	1.20	0.26	78.3
-420+212µm	2.2	1.3	1.06	0.17 ¹⁾	84.0
-212+75µm	2.2	0.5	1.00	0.17 ¹⁾	83.0
-75µm	4.9	14.2	2.95	0.29	90.2
Composite	100.0	100.0	1.49	0.44	70.5

1) Fractions combined for assay.

Head screen analysis results show that the Del Carmen Norte 12.5mm feeds contained between 0.53 and 2.15 gAu/mt ore. Contained gold values were fairly evenly distributed throughout the various size fractions, with a significant degree of enrichment in values noted in the fines (-75 μ m) size fraction. That fraction represented a relatively small portion of the feed weights, however, which limited the degree of enrichment. Head screen analysis size distribution data confirmed that the feeds were between 82% and 77.1% passing 12.5mm in size.

Tail screen analysis results showed that the 12.5mm feed bottle leached residues contained between 0.20 and 0.85 gAu/mt. Residual gold values were not evenly distributed throughout the various size fractions, but rather tended to be enriched in the coarser size fractions. These results and recovery by size fraction data indicate that gold recovery would be increased incrementally by crushing to as fine as minus 1.7mm in size, and that fine grinding (-75 μ m) would be required to maximize precious metal recoveries. In particular, recovery by size fraction data generally indicate a significant improvement in gold recovery could be achieved by grinding from -212 μ m to -75 μ m in size. Further testing would be required to confirm this observation.

CONCLUSIONS

- The Del Carmen Norte composites were amenable to whole ore direct agitated cyanidation treatment at feed sizes ranging from 80%-12.5mm to 80%-150 μ m.
- Results from crushed ore bottle roll tests indicate good potential for heap leach cyanidation treatment of the Del Carmen Norte material represented by the composites tested. The material appears to be crush size sensitive, and a relatively fine crush size may be required to maximize heap leach gold recoveries.
- Results from milling/cyanidation tests indicate good potential for whole ore milling/cyanidation treatment of the Del Carmen Norte material represented by the composites tested. Available data indicate that a relatively fine grind size (-75 μ m) may be required to maximize milling/cyanidation gold recoveries.
- Cyanide consumptions were low, at all feed sizes evaluated.
- Lime requirements varied.
- Silver recoveries generally were low, and sensitive to feed size.

RECOMMENDATIONS

We recommend that more detailed testing for optimization of milling/cyanidation conditions be performed on drill core composites representative of Del Carmen Norte material of sufficient grade for consideration of milling/cyanidation treatment. Scoping level evaluations of gravity concentration processing and flotation treatment of the higher grade materials is also recommended. Column percolation leach testing on representative drill core composites is recommended to further evaluate heap leaching of the Del Carmen Norte materials. Mineralogical characterization of all metallurgical samples tested is recommended to gain a better understanding of the ore mineralogy, and in particular to gain a better understanding of the presence and nature of any soluble sulfate and sulfide minerals.



Jack S. McPartland
Metallurgist/V.P. Operations

APPENDIX

MEMO

To: Jack McPartland, McClelland Labs
CC: Tim Warman
From: Peter W Stewart
Date: Wednesday, January 05, 2011
Re: Del Carmen Norte MET sampling program and samples

Message:

Samples:

1. Samples are sawn halves of previously sawn and halved HQ core.
2. Composites consist of quartered HQ core that will weigh between 1.5-2 kg
3. Each composite is to weigh 15-20 kg, *i.e.* ten intervals/composite (Table 1)

Composite selection:

1. Average grade of each composite is to be similar to average grade of mineralized intervals in selected holes at Rojo Grande and Naciente Quebrada Pedregosa (Table 2)
2. Each composite should be similar in general characteristics (mineralogy, alteration) to each sampled interval of mineralization
3. **Rojo Grande:** RG composites created from two longest drill intercepts of mineralization in 2009-2010 campaign
 - a. DDHC-10-20: one composite within 124.5m (5.5-130m) averaging 0.57 g/t Au & 8.8 g/t Ag; composite **RG1** spans most of interval (from 28-105m)
 - b. DDHC-10-32: two composites within 142.5m (22-164.2m) averaging 0.88 g/t Au & 19.6 g/t Ag; composite **RG2** from uppermost shallow zone of mineralization (34m @ 1.27 g/t Au & 13.6 g/t Ag), composite **RG3** from lowermost intercept (to EOH) (40m @ 1.42 g/t Au & 19.6 g/t Ag)
4. **Naciente Quebrada Pedregosa:** NQP composites from two lowermost intercepts in best hole from prospect, DDHC-10-23
 - a. Composite **NQP1** from longest +1 g/t Au intercept, no silver
 - b. Composite **NQP2** from lowermost +1 g/t Au intercept, locally high silver

Table 1 (2 pages)

	hole_id	from	to	Au	Ag	
NQP1	DDHC-10-023	135.0	136.0	0.885	nd	within 49 m (128-177m) averaging 1.11 g/t Au
		140.0	141.0	1.090	nd	
		143.0	144.0	0.854	nd	
		144.0	145.0	1.175	nd	
		145.0	146.0	0.948	nd	
		146.0	147.0	1.760	nd	
		151.0	152.0	1.105	0.2	
		155.0	156.0	1.965	nd	
		156.0	157.0	1.205	nd	
		162.0	163.0	0.832	nd	
total meters, 1/4 (HQ) core samples			10	1.18	--	
NQP2	DDHC-10-023	190.0	191.0	2.620	0.2	within 16 m (189-205m) averaging 2.64 g/t Au & 6.1 g/t Ag
		191.0	192.0	3.580	0.2	
		192.0	193.0	2.050	0.2	
		193.0	194.0	1.850	0.7	
		194.0	195.0	3.300	1.5	
		196.0	197.0	1.300	2.1	
		197.0	198.0	1.250	2.6	
		200.0	201.0	4.460	48.3	
		201.0	202.0	3.700	0.8	
		202.0	203.0	3.570	0.4	
total meters, 1/4 (HQ) core samples			10	2.77	5.7	

Table 1 (cont.)

	hole_id	from	to	Au	Ag		
RG1	DDHC-10-020	28.0	29.0	0.608	12.9	within 124.5m (5.5- 130m) averaging 0.57 g/t Au & 8.8 g/t Ag	
		29.0	30.0	0.682	9.2		
		30.0	31.0	0.589	8.5		
		32.0	33.0	0.21	3.2		
		33.0	34.0	0.42	9.9		
		62.0	63.0	1.205	7.3		
		66.0	67.0	0.551	6.7		
		68.0	69.0	0.571	6.9		
		101.0	103.0	0.48	14		
		103.0	105.0	0.465	9.9		
total meters, 1/4 (HQ) core samples			12	0.58	8.9		
RG2	DDHC-10-032	24.0	25.0	2.460	9.8	within 34 m (23-57m) averaging 1.27 g/t Au & 13.6 g/t Ag	within 142.2 m (22-164.2m) averaging 0.88 g/t Au & 13.7 g/t Ag
		25.0	26.0	1.165	8.9		
		28.0	29.0	1.160	11.8		
		29.0	30.0	1.380	13.4		
		33.0	34.0	1.305	21.1		
		38.0	39.0	1.030	13.8		
		46.0	47.0	1.250	18.4		
		47.0	48.0	1.375	14.5		
		49.0	50.0	1.010	15.4		
		54.0	55.0	0.575	14.6		
total meters, 1/4 (HQ) core samples			10	1.27	14.2		
RG3	DDHC-10-032	132.0	133.0	1.570	23.5	within 40.2m (124-164.2m) averaging 1.45 g/t Au & 19.6 g/t Ag	
		139.0	140.0	1.255	28.3		
		140.0	141.0	1.160	21.2		
		144.0	145.0	1.245	16.2		
		149.0	150.0	1.130	22.8		
		151.0	152.0	0.647	28.6		
		153.0	154.0	1.335	16.4		
		154.0	155.0	1.750	17.3		
		156.0	157.0	2.060	16.9		
		159.0	161.0	2.060	12.0		
total meters, 1/4 (HQ) core samples			11	1.42	20.3		

nd = not detected

Table 2

Comparison of Au and Ag in mineralized intervals, calculated composite grade and lab Head Assays

ID	NQP1			NQP2			RG1			RG2			RG3		
	original assay interval (49m)	composite, calculated	lab* head assay average	original assay interval (16m)	composite, calculated	lab* head assay average	original assay interval (124.5m)	composite, calculated	lab* head assay average	original assay interval (34m)	composite, calculated	lab* head assay average	original assay interval (40.2m)	composite, calculated	lab* head assay average
Au	1.11	1.18	1.29	2.64	2.77	2.21	0.57	0.58	0.67	1.27	1.27	1.43	1.45	1.42	1.54
Ag	nd	nd	nd	6.1	5.7	12	8.8	8.9	9	13.6	14.2	10	19.6	20.3	24
Fe_%	-	1.94	-	-	2.51	-	-	1.88	-	-	2.30	-	-	2.09	-
S_%	-	1.38	-	-	1.23	-	-	0.50	-	-	0.47	-	-	0.83	-
Hg	-	0.12	-	-	0.27	-	-	1.29	-	-	0.50	-	-	3.00	-
As	-	291	-	-	398	-	-	90	-	-	705	-	-	131	-
Sb	-	2.4	-	-	2.4	-	-	61.2	-	-	119.8	-	-	108.5	-
Bi	-	3.1	-	-	5.4	-	-	47.1	-	-	115.4	-	-	37.2	-
Ba	-	60	-	-	33	-	-	561	-	-	372	-	-	69	-
Cu	-	4.8	-	-	5.5	-	-	4.3	-	-	10.4	-	-	5.0	-
Pb	-	119	-	-	226	-	-	82	-	-	239	-	-	331	-
Zn	-	3.1	-	-	3.6	-	-	1.1	-	-	1.6	-	-	1.9	-
Mo	-	2.0	-	-	2.0	-	-	2.3	-	-	2.3	-	-	3.4	-
Mn	-	31.9	-	-	27.4	-	-	42.5	-	-	28.6	-	-	15.4	-
K_%	-	0.45	-	-	0.38	-	-	0.20	-	-	0.18	-	-	0.33	-
Na_%	-	0.08	-	-	0.16	-	-	0.04	-	-	0.04	-	-	0.07	-
n	10			10			10			10			10		
meters	10			10			12			10			11		

all values ppm (g/t) except where indicated

* average McClelland Labs head assays, quoted for November 29/10

nd = not detected or at detection limit (0.2 g/t Ag)

n = number of samples in composite

Bottle Roll Test

Project No. **3493**
 Test No. **CY-1**
 Composite **RG1**
 Feed Size **12.5mm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	0.67	10
Duplicate	0.62	9
Triplicate	0.72	9
Average	0.67	9
Head Screen	0.53	9

Ore Charge **1951.5** g Final Residue Wt **1914.2** g

Solution Vol. **2.92725** L

Natural pH **6.8**

Tail Screen	g Au/mt	g Ag/mt
Composite	0.20	6

Solid Density Wt. % g/L
 40.0 Cyanide Conc. Maintained at: 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	2.93	1.00	----	----	----	----	----
2	100	1.00	11.1	0.10	0.00	0.08	0.92	0.008	0.092	0.1
6	100	1.00	10.7	0.10	0.20	0.13	1.08	0.013	0.108	0.1
24	100	1.00	10.5	0.10	0.40	0.16	1.42	0.016	0.142	0.1
48	100	1.00	10.7	0.10	0.40	0.17	1.65	0.017	0.165	0.1
72	100	1.00	10.9	0.10	0.40	0.17	1.73	0.017	0.173	0.1
96	100	1.00	11.2	----	----	0.17	1.77	----	----	----

Metallurgical Results

Leach Time Hours	mg	g/mt ore	% of total
0		0.000	0.0
2	0.234	0.120	24.5
6	0.389	0.199	40.6
24	0.489	0.251	51.2
48	0.535	0.274	55.9
72	0.552	0.283	57.7
96	0.569	0.29	59.2

mg	g/mt ore	% of total
	0.000	0.0
2.693	1.380	15.3
3.253	1.667	18.5
4.357	2.232	24.8
5.172	2.650	29.4
5.571	2.855	31.7
5.861	3	33.3

Cyanide Consumed	Lime Added
	0.5
0.00	0.5
0.00	0.6
0.00	0.8
0.00	1.0
0.00	1.2
0.00	1.2

	<u>Au</u>	<u>% of Total</u>
Extracted g/mt ore	0.29	59.2
Tail assay, g/mt	0.20	
Calculated Head g/mt ore	0.49	
NaCN Consumed, kg/mt ore	<0.07	
Lime Added, kg/mt ore	1.2	

<u>Ag</u>	<u>% of Total</u>
3	33.3
6	
9	

Bottle Roll Test

Project No. 3493
 Test No. CY-2
 Composite NQP1
 Feed Size 12.5mm

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	1.28	<5
Duplicate	1.29	<5
Triplicate	1.31	7
Average	1.29	<5
Head Screen	1.07	<1

Ore Charge 2034.2 g Final Residue Wt 2032.02 g

Solution Vol. 3.05130 L

Natural pH 4.0

Tail Screen	g Au/mt	g Ag/mt
Composite	0.33	<1

Solid Density Wt. % 40.0 Cyanide Conc. Maintained at: g/L 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	3.05	3.30	----	----	----	----	----
2	100	0.95	10.2	0.25	1.00	0.21	0.03	0.021	0.003	0.095
6	100	1.00	10.4	0.10	1.25	0.27	0.04	0.027	0.004	0.1
24	100	1.00	10.2	0.39	3.00	0.33	0.07	0.033	0.007	0.1
48	100	1.05	10.7	0.00	2.00	0.38	0.05	0.038	0.005	0.105
72	100	1.00	10.8	0.10	2.00	0.41	0.05	0.041	0.005	0.1
96	100	1.00	10.8	----	----	0.41	0.05	----	----	----

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction		
	mg	g/mt ore	% of total
0		0.000	0.0
2	0.641	0.315	30.9
6	0.845	0.415	40.7
24	1.055	0.519	50.8
48	1.240	0.610	59.8
72	1.370	0.673	66.0
96	1.411	0.69	67.6

Leach Time Hours	Cumulative Ag Extraction		
	mg	g/mt ore	% of total
0		0.000	
2	0.092	0.045	
6	0.125	0.061	
24	0.221	0.108	
48	0.167	0.082	
72	0.172	0.084	
96	0.177	<1	

Reagent Requirements Cumulative kg/mt ore	
Cyanide Consumed	Lime Added
	1.6
0.07	2.1
0.08	2.7
0.08	4.2
0.14	5.2
0.17	6.2
0.17	6.2

	Au	% of Total	Ag	% of Total
Extracted g/mt ore	0.69	67.6	<1	N/A
Tail assay, g/mt	0.33		<1	
Calculated Head g/mt ore	1.02		<2	
NaCN Consumed, kg/mt ore	0.17			
Lime Added, kg/mt ore	6.2			

Bottle Roll Test

Project No. **3493**
 Test No. **CY-3**
 Composite **NQP2**
 Feed Size **12.5mm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	2.15	11
Duplicate	2.20	13
Triplicate	2.27	12
Average	2.21	12
Head Screen	2.15	6

Ore Charge **2063.1** g Final Residue Wt **2061.61** g

Solution Vol. **3.09465** L

Natural pH **4.6**

Tail Screen	g Au/mt	g Ag/mt
Composite	0.85	7

Solid Density Wt. % g/L
 40.0 Cyanide Conc. Maintained at: 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	3.09	2.25	----	----	----	----	----
2	100	1.00	10.5	0.10	0.50	0.31	0.17	0.031	0.017	0.1
6	100	1.00	10.6	0.10	1.00	0.40	0.19	0.04	0.019	0.1
24	100	0.90	10.4	0.39	2.50	0.55	0.23	0.055	0.023	0.09
48	100	1.00	10.8	0.10	2.00	0.65	0.27	0.065	0.027	0.1
72	100	1.00	11.2	0.10	0.00	0.72	0.30	0.072	0.03	0.1
96	100	0.95	10.6	----	----	0.73	0.32	----	----	----

Metallurgical Results

Leach Time Hours	mg	g/mt ore	% of total
0		0.000	0.0
2	0.959	0.465	22.5
6	1.269	0.615	29.7
24	1.773	0.859	41.5
48	2.138	1.036	50.1
72	2.419	1.173	56.6
96	2.522	1.22	58.9

mg	g/mt ore	% of total
	0.000	0.0
0.526	0.255	3.2
0.605	0.293	3.7
0.748	0.362	4.5
0.895	0.434	5.4
1.014	0.492	6.1
1.106	1	12.5

Cyanide Consumed	Lime Added
	1.1
0.00	1.3
0.00	1.8
0.15	3.0
0.14	4.0
0.14	4.0
0.22	4.0

	<u>Au</u>	<u>% of Total</u>
Extracted g/mt ore	1.22	58.9
Tail assay, g/mt	0.85	
Calculated Head g/mt ore	2.07	
NaCN Consumed, kg/mt ore	0.22	
Lime Added, kg/mt ore	4.0	

<u>Ag</u>	<u>% of Total</u>
1	12.5
7	
8	

Bottle Roll Test

Project No. **3493**
 Test No. **CY-4**
 Composite **RG1**
 Feed Size **6.3mm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	0.67	10
Duplicate	0.62	9
Triplicate	0.72	9
Average	0.67	9

Ore Charge **1003.9** g Final Residue Wt **998.3** g
 Solution Vol. **1.50585** L
 Natural pH **6.7**

Tail Assay	g Au/mt	g Ag/mt
Initial	0.16	5
Duplicate	0.18	5
Triplicate	0.13	6
Average	0.15	5

Solid Density Wt. % Cyanide Conc. Maintained at: g/L
 40.0 40.0 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	1.51	0.60	----	----	----	----	----
2	100	1.00	10.9	0.10	0.00	0.15	1.63	0.015	0.163	0.1
6	100	1.00	10.7	0.10	0.20	0.25	1.82	0.025	0.182	0.1
24	100	1.00	10.8	0.10	0.20	0.33	2.08	0.033	0.208	0.1
48	100	1.00	10.7	0.10	0.40	0.31	2.16	0.031	0.216	0.1
72	100	1.00	11.3	0.03	0.00	0.29	2.13	0.029	0.213	0.1
96	100	1.00	10.9	----	----	0.27	2.10	----	----	----

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		0.6
2	0.226	0.225	32.6	2.455	2.445	27.2	0.00	0.6
6	0.391	0.390	56.5	2.904	2.892	32.1	0.00	0.8
24	0.537	0.535	77.5	3.477	3.464	38.5	0.00	1.0
48	0.540	0.538	77.9	3.806	3.791	42.1	0.00	1.4
72	0.541	0.539	78.1	3.976	3.961	44.0	0.00	1.4
96	0.540	0.54	78.3	4.144	4	44.4	-0.07	1.4

	<u>Au</u>	<u>% of Total</u>	<u>Ag</u>	<u>% of Total</u>
Extracted g/mt ore	0.54	78.3	4	44.4
Tail assay, g/mt	0.15		5	
Calculated Head g/mt ore	0.69		9	
NaCN Consumed, kg/mt ore	<0.07			
Lime Added, kg/mt ore	1.4			

Bottle Roll Test

Project No. **3493**
 Test No. **CY-5**
 Composite **NQP1**
 Feed Size **6.3mm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	1.28	<5
Duplicate	1.29	<5
Triplicate	1.31	7
Average	1.29	<5

Ore Charge **1034.1** g Final Residue Wt **1042** g
 Solution Vol. **1.55115** L
 Natural pH **3.9**

Tail Assay	g Au/mt	g Ag/mt
Initial	0.19	<1
Duplicate	0.19	<1
Triplicate	0.22	<1
Average	0.20	<1

Solid Density Wt. % Cyanide Conc. Maintained at: g/L
 40.0 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	1.55	3.05	----	----	----	----	----
2	100	0.90	10.5	0.24	0.50	0.40	0.07	0.04	0.007	0.09
6	100	1.00	10.7	0.10	0.25	0.44	0.07	0.044	0.007	0.1
24	100	0.90	10.2	0.24	1.00	0.52	0.07	0.052	0.007	0.09
48	100	0.95	10.2	0.17	3.00	0.53	0.07	0.053	0.007	0.095
72	100	1.00	10.6	0.10	3.00	0.52	0.07	0.052	0.007	0.1
96	100	1.00	10.8	----	----	0.50	0.06	----	----	----

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000			2.9
2	0.620	0.600	50.8	0.109	0.105		0.15	3.4
6	0.723	0.699	59.2	0.116	0.112		0.14	3.7
24	0.891	0.861	73.0	0.123	0.119		0.29	4.6
48	0.958	0.927	78.5	0.130	0.125		0.36	7.5
72	0.996	0.963	81.6	0.137	0.132		0.36	10.4
96	1.017	0.98	83.1	0.128	<1		0.36	10.4

	<u>Au</u>	<u>% of Total</u>	<u>Ag</u>	<u>% of Total</u>
Extracted g/mt ore	0.98	83.1	<1	N/A
Tail assay, g/mt	0.20		<1	
Calculated Head g/mt ore	1.18		<2	
NaCN Consumed, kg/mt ore	0.36			
Lime Added, kg/mt ore	10.4			

Bottle Roll Test

Project No. **3493**
 Test No. **CY-6**
 Composite **NQP2**
 Feed Size **6.3mm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	2.15	11
Duplicate	2.2	13
Triplicate	2.27	12
Average	2.21	12

Ore Charge **1003.9** g Final Residue Wt **1000.8** g

Solution Vol. **1.50585** L

Natural pH **4.1**

Tail Assay	g Au/mt	g Ag/mt
Initial	0.50	6
Duplicate	0.43	7
Triplicate	0.52	5
Average	0.48	6

Solid Density Wt. % Cyanide Conc. Maintained at: g/L
 40.0 4.1 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	1.51	1.55	----	----	----	----	----
2	100	0.95	10.3	0.17	0.60	0.53	0.37	0.053	0.037	0.095
6	100	1.00	10.6	0.10	0.40	0.67	0.41	0.067	0.041	0.1
24	100	0.85	10.3	0.32	1.00	0.88	0.50	0.088	0.05	0.085
48	100	1.00	10.5	0.10	1.50	0.98	0.56	0.098	0.056	0.1
72	100	1.00	11.0	0.10	0.00	1.01	0.58	0.101	0.058	0.1
96	100	0.95	10.6	----	----	0.98	0.57	----	----	----

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		1.5
2	0.798	0.795	33.7	0.557	0.555	7.9	0.08	2.1
6	1.062	1.058	44.8	0.654	0.652	9.3	0.08	2.5
24	1.445	1.440	61.0	0.831	0.828	11.8	0.30	3.5
48	1.684	1.677	71.1	0.971	0.968	13.8	0.31	5.0
72	1.827	1.820	77.1	1.057	1	14.3	0.31	5.0
96	1.883	1.88	79.7	1.100	1	14.3	0.39	5.0

	<u>Au</u>	<u>% of Total</u>	<u>Ag</u>	<u>% of Total</u>
Extracted g/mt ore	1.88	79.7	1	14.3
Tail assay, g/mt	0.48		6	
Calculated Head g/mt ore	2.36		7	
NaCN Consumed, kg/mt ore	0.39			
Lime Added, kg/mt ore	5.0			

Bottle Roll Test

Project No. **3493**
 Test No. **CY-7**
 Composite **RG1**
 Feed Size **212µm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	0.67	10
Duplicate	0.62	9
Triplicate	0.72	9
Average	0.67	9

Ore Charge **1231.8** g Final Residue Wt **1213** g

Solution Vol. **1.8468** L

Natural pH **6.6**

Tail Assay	g Au/mt	g Ag/mt
Initial	0.10	5
Duplicate	0.10	4
Triplicate	0.10	5
Average	0.10	5

Solid Density Wt. % Cyanide Conc. Maintained at: g/L
 40.0 40.0 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	1.85	0.70	----	----	----	----	----
2	100	1.00	10.9	0.10	0.10	0.08	2.66	0.008	0.266	0.1
6	100	1.05	11.1	0.02	0.00	0.17	2.62	0.017	0.262	0.105
12	100	1.00	10.7	0.10	0.20	0.27	2.55	0.027	0.255	0.1
24	100	0.90	11.2	0.28	0.00	0.30	2.47	0.03	0.247	0.09
48	100	1.00	11.0	0.10	0.00	0.29	2.45	0.029	0.245	0.1
72	100	1.00	10.8	----	----	0.28	2.34	----	----	----

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction		
	mg	g/mt ore	% of total
0		0.000	0.0
2	0.148	0.120	19.7
6	0.322	0.261	42.8
12	0.524	0.425	69.7
24	0.606	0.492	80.7
48	0.618	0.501	82.2
72	0.628	0.51	83.6

Leach Time Hours	Cumulative Ag Extraction		
	mg	g/mt ore	% of total
0		0.000	0.0
2	4.912	3.988	39.9
6	5.105	4.144	41.4
12	5.237	4.252	42.5
24	5.345	4.339	43.4
48	5.555	4.509	45.1
72	5.597	5	50.0

Reagent Requirements Cumulative kg/mt ore	
Cyanide Consumed	Lime Added
	0.6
0.00	0.6
-0.07	0.6
-0.07	0.8
0.08	0.8
0.09	0.8
0.09	0.8

	Au	% of Total
Extracted g/mt ore	0.51	83.6
Tail assay, g/mt	0.10	
Calculated Head g/mt ore	0.61	
NaCN Consumed, kg/mt ore	0.09	
Lime Added, kg/mt ore	0.8	

	Ag	% of Total
	5	50.0
	5	
	10	

Bottle Roll Test

Project No. **3493**
 Test No. **CY-8**
 Composite **NQP1**
 Feed Size **212µm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	1.28	<5
Duplicate	1.29	<5
Triplicate	1.31	7
Average	1.29	<5

Ore Charge **1239.4** g Final Residue Wt **1210.1** g

Solution Vol. **1.8591** L

Natural pH **5.7**

Tail Assay	g Au/mt	g Ag/mt
Initial	0.14	<1
Duplicate	0.15	<1
Triplicate	0.13	<1
Average	0.14	<1

Solid Density Wt. % Cyanide Conc. Maintained at: g/L
 40.0 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	1.86	2.30	----	----	----	----	----
2	100	0.95	10.3	0.19	1.00	0.58	0.06	0.058	0.006	0.095
6	100	1.00	10.9	0.10	0.20	0.57	0.06	0.057	0.006	0.1
12	100	1.00	10.5	0.10	0.80	0.54	0.06	0.054	0.006	0.1
24	100	0.95	11.1	0.19	0.00	0.52	0.06	0.052	0.006	0.095
48	100	1.00	10.8	0.10	0.40	0.50	0.06	0.05	0.006	0.1
72	100	1.00	11.0	----	----	0.47	0.05	----	----	----

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction		
	mg	g/mt ore	% of total
0		0.000	0.0
2	1.078	0.870	82.1
6	1.118	0.902	85.1
12	1.119	0.903	85.2
24	1.136	0.916	86.4
48	1.151	0.928	87.6
72	1.145	0.92	86.8

Leach Time Hours	Cumulative Ag Extraction		
	mg	g/mt ore	% of total
0		0.000	
2	0.112	0.090	
6	0.118	0.095	
12	0.124	0.100	
24	0.130	0.105	
48	0.136	0.109	
72	0.123	<1	

Reagent Requirements Cumulative kg/mt ore	
Cyanide Consumed	Lime Added
	1.9
0.08	2.7
0.08	2.8
0.08	3.5
0.15	3.5
0.15	3.8
0.15	3.8

	Au	% of Total	Ag	% of Total
Extracted g/mt ore	0.92	86.8	<1	N/A
Tail assay, g/mt	0.14		<1	
Calculated Head g/mt ore	1.06		<2	
NaCN Consumed, kg/mt ore	0.15			
Lime Added, kg/mt ore	3.8			

Bottle Roll Test

Project No. **3493**
 Test No. **CY-9**
 Composite **NQP2**
 Feed Size **212µm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	2.15	11
Duplicate	2.20	13
Triplicate	2.27	12
Average	2.21	12

Ore Charge **1243.2** g Final Residue Wt **1229.5** g

Solution Vol. **1.8648** L

Natural pH **5.1**

Tail Assay	g Au/mt	g Ag/mt
Initial	0.33	5
Duplicate	0.31	5
Triplicate	0.33	4
Average	0.32	5

Solid Density Wt. % Cyanide Conc. Maintained at: g/L
 40.0 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	1.86	2.30	----	----	----	----	----
2	100	1.00	10.7	0.10	0.30	0.95	1.06	0.095	0.106	0.1
6	100	1.00	10.8	0.10	0.30	0.97	1.04	0.097	0.104	0.1
12	100	0.95	10.6	0.18	0.60	0.93	0.99	0.093	0.099	0.095
24	100	1.00	10.9	0.10	0.20	0.94	0.96	0.094	0.096	0.1
48	100	0.95	10.8	0.18	0.40	0.90	0.92	0.09	0.092	0.095
72	100	1.00	10.9	----	----	0.86	0.87	----	----	----

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		1.9
2	1.772	1.425	71.6	1.977	1.590	22.7	0.00	2.1
6	1.904	1.531	77.0	2.045	1.645	23.5	0.00	2.3
12	1.926	1.549	77.9	2.056	1.654	23.6	0.07	2.8
24	2.038	1.639	82.4	2.099	1.689	24.1	0.06	3.0
48	2.057	1.655	83.2	2.121	1.706	24.4	0.14	3.3
72	2.073	1.67	83.9	2.119	2	28.6	0.13	3.3

	<u>Au</u>	<u>% of Total</u>	<u>Ag</u>	<u>% of Total</u>
Extracted g/mt ore	1.67	83.9	2	28.6
Tail assay, g/mt	0.32		5	
Calculated Head g/mt ore	1.99		7	
NaCN Consumed, kg/mt ore	0.13			
Lime Added, kg/mt ore	3.3			

Bottle Roll Test

Project No. **3493**
 Test No. **CY-10**
 Composite **RG1**
 Feed Size **150µm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	0.67	10
Duplicate	0.62	9
Triplicate	0.72	9
Average	0.67	9

Ore Charge **1230.5** g Final Residue Wt **1217.6** g

Solution Vol. **1.8458** L

Natural pH **7.2**

Tail Assay	g Au/mt	g Ag/mt
Initial	0.09	5
Duplicate	0.09	5
Triplicate	0.09	5
Average	0.09	5

Solid Density Wt. % Cyanide Conc. Maintained at: g/L
 40.0 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	1.85	0.70	----	----	----	----	----
2	100	1.00	11.2	0.10	0.00	0.08	2.90	0.008	0.29	0.1
6	100	1.00	11.0	0.10	0.00	0.13	2.84	0.013	0.284	0.1
12	100	0.95	10.7	0.19	0.20	0.20	2.75	0.02	0.275	0.095
24	100	1.00	11.1	0.10	0.00	0.28	2.62	0.028	0.262	0.1
48	100	1.00	10.9	0.10	0.10	0.28	2.55	0.028	0.255	0.1
72	100	1.00	11.1	----	----	0.27	2.49	----	----	----

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		0.6
2	0.148	0.120	21.1	5.353	4.350	43.5	0.00	0.6
6	0.248	0.202	35.4	5.532	4.496	45.0	0.00	0.6
12	0.390	0.317	55.6	5.650	4.592	45.9	0.08	0.7
24	0.558	0.453	79.5	5.685	4.620	46.2	0.08	0.7
48	0.586	0.476	83.5	5.818	4.728	47.3	0.08	0.8
72	0.595	0.48	84.2	5.962	5	50.0	0.08	0.8

	<u>Au</u>	<u>% of Total</u>	<u>Ag</u>	<u>% of Total</u>
Extracted g/mt ore	0.48	84.2	5	50.0
Tail assay, g/mt	0.09		5	
Calculated Head g/mt ore	0.57		10	
NaCN Consumed, kg/mt ore	0.08			
Lime Added, kg/mt ore	0.8			

Bottle Roll Test

Project No. **3493**
 Test No. **CY-11**
 Composite **NQP1**
 Feed Size **150µm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	1.28	<5
Duplicate	1.29	<5
Triplicate	1.31	7
Average	1.29	<5

Ore Charge **1257.6** g Final Residue Wt **1232.8** g

Solution Vol. **1.8894** L

Natural pH **5.1**

Tail Assay	g Au/mt	g Ag/mt
Initial	0.11	<1
Duplicate	0.11	1
Triplicate	0.11	<1
Average	0.11	<1

Solid Density Wt. % Cyanide Conc. Maintained at: g/L
 40.0 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	1.89	3.60	----	----	----	----	----
2	100	0.95	10.6	0.19	0.50	0.59	0.07	0.059	0.007	0.095
6	100	1.00	10.9	0.10	0.20	0.57	0.07	0.057	0.007	0.1
12	100	0.95	10.7	0.19	0.50	0.54	0.07	0.054	0.007	0.095
24	100	1.00	11.0	0.10	0.10	0.52	0.07	0.052	0.007	0.1
48	100	1.00	10.9	0.10	0.20	0.50	0.07	0.05	0.007	0.1
72	100	0.95	10.8	----	----	0.47	0.06	----	----	----

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000			2.9
2	1.115	0.886	86.1	0.132	0.105		0.08	3.3
6	1.136	0.903	87.7	0.139	0.111		0.08	3.4
12	1.136	0.904	87.7	0.146	0.116		0.15	3.8
24	1.152	0.916	89.0	0.153	0.122		0.15	3.9
48	1.167	0.928	90.1	0.160	0.127		0.15	4.1
72	1.160	0.92	89.3	0.148	<1		0.23	4.1

	<u>Au</u>	<u>% of Total</u>	<u>Ag</u>	<u>% of Total</u>
Extracted g/mt ore	0.92	89.3	<1	N/A
Tail assay, g/mt	0.11		<1	
Calculated Head g/mt ore	1.03		<2	
NaCN Consumed, kg/mt ore	0.23			
Lime Added, kg/mt ore	4.1			

Bottle Roll Test

Project No. **3493**
 Test No. **CY-12**
 Composite **NQP2**
 Feed Size **150µm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	2.15	11
Duplicate	2.20	13
Triplicate	2.27	12
Average	2.21	12

Ore Charge **1218.9** g Final Residue Wt **1190.0** g

Solution Vol. **1.8284** L

Natural pH **4.6**

Tail Assay	g Au/mt	g Ag/mt
Initial	0.31	6
Duplicate	0.31	6
Triplicate	0.32	6
Average	0.31	6

Solid Density Wt. % Cyanide Conc. Maintained at: g/L
 40.0 4.6 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	1.83	2.90	----	----	----	----	----
2	100	1.00	10.7	0.10	0.40	1.01	1.17	0.101	0.117	0.1
6	100	1.00	10.8	0.10	0.40	0.96	1.09	0.096	0.109	0.1
12	100	0.95	10.6	0.19	0.60	0.95	1.06	0.095	0.106	0.095
24	100	0.95	10.8	0.19	0.30	0.92	1.04	0.092	0.104	0.095
48	100	1.00	10.8	0.10	0.50	0.92	1.01	0.092	0.101	0.1
72	100	1.00	10.9	----	----	0.93	0.98	----	----	----

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		2.4
2	1.847	1.515	72.1	2.139	1.755	21.9	0.00	2.7
6	1.856	1.523	72.5	2.110	1.731	21.6	0.00	3.0
12	1.934	1.587	75.6	2.164	1.775	22.2	0.08	3.5
24	1.974	1.620	77.1	2.234	1.832	22.9	0.15	3.8
48	2.066	1.695	80.7	2.283	1.873	23.4	0.16	4.2
72	2.176	1.79	85.2	2.329	2	25.0	0.16	4.2

	<u>Au</u>	<u>% of Total</u>	<u>Ag</u>	<u>% of Total</u>
Extracted g/mt ore	1.79	85.2	2	25.0
Tail assay, g/mt	0.31		6	
Calculated Head g/mt ore	2.10		8	
NaCN Consumed, kg/mt ore	0.16			
Lime Added, kg/mt ore	4.2			

Bottle Roll Test

Project No. **3493**
 Test No. **CY-13**
 Composite **RG2**
 Feed Size **12.5mm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	1.18	11
Duplicate	1.92	6
Triplicate	1.18	13
Average	1.43	10
Head Screen	1.13	15

Ore Charge **2001.8** g Final Residue Wt **1984.64** g

Solution Vol. **3.0027** L

Natural pH **6.2**

Tail Screen	g Au/mt	g Ag/mt
Composite	0.64	11

Solid Density Wt. % Cyanide Conc. Maintained at: g/L
 40.0 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	3.00	0.70	----	----	----	----	----
2	100	1.00	10.5	0.10	0.30	0.14	1.52	0.014	0.152	0.1
6	100	1.00	10.7	0.10	0.70	0.19	1.73	0.019	0.173	0.1
24	100	1.00	11.2	0.10	0.00	0.26	2.12	0.026	0.212	0.1
48	100	0.95	10.7	0.24	0.60	0.29	2.38	0.029	0.238	0.095
72	100	1.05	11.2	0.05	0.00	0.30	2.57	0.03	0.257	0.105
96	100	1.00	10.6	----	----	0.31	2.59	----	----	----

Metallurgical Results

Leach Time Hours	mg	g/mt ore	% of total
0		0.000	0.0
2	0.420	0.210	18.1
6	0.585	0.292	25.2
24	0.814	0.406	35.0
48	0.930	0.464	40.0
72	0.989	0.494	42.6
96	1.049	0.52	44.8

mg	g/mt ore	% of total
	0.000	0.0
4.564	2.280	15.2
5.347	2.671	17.8
6.691	3.342	22.3
7.683	3.838	25.6
8.492	4	26.7
8.809	4	26.7

Cyanide Consumed	Lime Added
	0.3
0.00	0.5
0.00	0.8
0.00	0.8
0.07	1.1
0.00	1.1
0.04	1.1

	Au	% of Total
Extracted g/mt ore	0.52	44.8
Tail assay, g/mt	0.64	
Calculated Head g/mt ore	1.16	
NaCN Consumed, kg/mt ore	<0.07	
Lime Added, kg/mt ore	1.1	

Ag	% of Total
4	26.7
11	
15	

Bottle Roll Test

Project No. 3493
 Test No. CY-14
 Composite RG3
 Feed Size 12.5mm

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	1.47	30
Duplicate	1.61	20
Triplicate	1.54	23
Average	1.54	24
Head Screen	1.49	26

Ore Charge 2001.8 g Final Residue Wt 1962.94 g
 Solution Vol. 3.0027 L

Natural pH 6.4

Tail Screen	g Au/mt	g Ag/mt
Composite	0.44	23

Solid Density Wt. % 40.0 Cyanide Conc. Maintained at: g/L 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	3.00	0.70	----	----	----	----	----
2	100	1.00	10.7	0.10	0.30	0.32	1.12	0.032	0.112	0.1
6	100	1.00	10.8	0.10	0.50	0.39	1.41	0.039	0.141	0.1
24	100	1.00	10.9	0.10	0.50	0.48	1.89	0.048	0.189	0.1
48	100	0.95	11.0	0.24	0.50	0.53	2.15	0.053	0.215	0.095
72	100	1.00	11.2	0.10	0.00	0.54	2.28	0.054	0.228	0.1
96	100	0.90	10.8	----	----	0.53	2.32	----	----	----

Metallurgical Results

Leach Time Hours	mg	g/mt ore	% of total
0		0.000	0.0
2	0.961	0.480	35.6
6	1.203	0.601	44.5
24	1.512	0.755	56.0
48	1.710	0.854	63.3
72	1.793	0.896	66.4
96	1.817	0.91	67.4

mg	g/mt ore	% of total
	0.000	0.0
3.363	1.680	6.2
4.346	2.171	8.0
5.928	2.961	11.0
6.898	3.446	12.8
7.503	3.748	13.9
7.851	4	14.8

Cyanide Consumed	Lime Added
	0.3
0.00	0.5
0.00	0.7
0.00	1.0
0.07	1.2
0.07	1.2
0.22	1.2

	Au	% of Total
Extracted g/mt ore	0.91	67.4
Tail assay, g/mt	0.44	
Calculated Head g/mt ore	1.35	
NaCN Consumed, kg/mt ore	0.22	
Lime Added, kg/mt ore	1.2	

Ag	% of Total
4	14.8
23	
27	

Bottle Roll Test

Project No. **3493**
 Test No. **CY-15**
 Composite **RG2**
 Feed Size **6.3mm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	1.18	11
Duplicate	1.92	6
Triplicate	1.18	13
Average	1.43	10

Ore Charge **1026.4** g Final Residue Wt **1021.7** g

Solution Vol. **1.5396** L

Tail Assay	g Au/mt	g Ag/mt
Initial	0.39	9
Duplicate	0.40	8
Triplicate	0.38	8
Average	0.39	8

Natural pH **6.4**

Solid Density Wt. % g/L
 40.0 Cyanide Conc. Maintained at: 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	1.54	0.50	----	----	----	----	----
2	100	1.00	10.8	0.10	0.20	0.21	2.65	0.021	0.265	0.1
6	100	1.00	11.1	0.10	0.00	0.27	2.83	0.027	0.283	0.1
24	100	1.00	10.5	0.10	0.40	0.33	3.36	0.033	0.336	0.1
48	100	0.95	11.1	0.17	0.20	0.34	3.44	0.034	0.344	0.095
72	100	1.00	11.3	0.10	0.00	0.33	3.38	0.033	0.338	0.1
96	100	0.95	10.9	----	----	0.32	3.24	----	----	----

Metallurgical Results

Cumulative Au Extraction				Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
Leach Time Hours	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		
2	0.323	0.315	31.2	4.080	3.975	28.4	0.00	0.7
6	0.437	0.425	42.1	4.622	4.503	32.2	0.00	0.7
24	0.556	0.542	53.6	5.721	5.574	39.8	0.00	1.1
48	0.604	0.589	58.3	6.180	6	42.9	0.08	1.3
72	0.623	0.607	60.1	6.432	6	42.9	0.07	1.3
96	0.641	0.62	61.4	6.554	6	42.9	0.15	1.3

	Au	% of Total	Ag	% of Total
Extracted g/mt ore	0.62	61.4	6	42.9
Tail assay, g/mt	0.39		8	
Calculated Head g/mt ore	1.01		14	
NaCN Consumed, kg/mt ore	0.15			
Lime Added, kg/mt ore	1.3			

Bottle Roll Test

Project No. **3493**
 Test No. **CY-17**
 Composite **RG2**
 Feed Size **212µm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	1.18	11
Duplicate	1.92	6
Triplicate	1.18	13
Average	1.43	10

Ore Charge **1210.4** g Final Residue Wt **1192** g

Solution Vol. **1.8156** L

Natural pH **6.9**

Tail Assay	g Au/mt	g Ag/mt
Initial	0.18	5
Duplicate	0.18	5
Triplicate	0.17	5
Average	0.18	5

Solid Density Wt. % g/L
 40.0 Cyanide Conc. Maintained at: 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	1.82	0.80	----	----	----	----	----
2	100	1.00	11.2	0.10	0.00	0.16	4.60	0.016	0.46	0.1
6	100	1.00	11.1	0.10	0.00	0.25	5.60	0.025	0.56	0.1
12	100	0.95	10.8	0.19	0.15	0.41	5.45	0.041	0.545	0.095
24	100	1.00	11.1	0.10	0.00	0.51	5.25	0.051	0.525	0.1
48	100	1.00	10.9	0.10	0.10	0.49	5.00	0.049	0.5	0.1
72	100	1.00	10.9	----	----	0.50	4.70	----	----	----

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		0.7
2	0.290	0.240	22.2	8.352	6.900	49.3	0.00	0.7
6	0.470	0.388	35.9	10.627	8.780	62.7	0.00	0.7
12	0.785	0.649	60.1	10.915	9	64.3	0.08	0.8
24	1.008	0.833	77.1	11.097	9	64.3	0.08	0.8
48	1.023	0.845	78.2	11.168	9	64.3	0.08	0.9
72	1.090	0.90	83.3	11.123	9	64.3	0.08	0.9

	<u>Au</u>	<u>% of Total</u>	<u>Ag</u>	<u>% of Total</u>
Extracted g/mt ore	0.90	83.3	9	64.3
Tail assay, g/mt	0.18		5	
Calculated Head g/mt ore	1.08		14	
NaCN Consumed, kg/mt ore	0.08			
Lime Added, kg/mt ore	0.9			

Bottle Roll Test

Project No. **3493**
 Test No. **CY-18**
 Composite **RG2**
 Feed Size **150µm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	1.18	11
Duplicate	1.92	6
Triplicate	1.18	13
Average	1.43	10

Ore Charge **1206.5** g Final Residue Wt **1188.2** g

Solution Vol. **1.8098** L

Tail Assay	g Au/mt	g Ag/mt
Initial	0.17	5
Duplicate	0.17	6
Triplicate	0.16	4
Average	0.17	5

Natural pH **6.7**

Solid Density Wt. % g/L
 40.0 Cyanide Conc. Maintained at: 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	1.81	0.80	----	----	----	----	----
2	100	1.05	11.1	0.02	0.00	0.20	6.10	0.02	0.61	0.105
6	100	0.95	10.9	0.19	0.00	0.25	5.60	0.025	0.56	0.095
12	100	0.95	10.7	0.19	0.20	0.46	5.75	0.046	0.575	0.095
24	100	1.00	11.0	0.10	0.00	0.48	5.45	0.048	0.545	0.1
48	100	1.00	10.9	0.10	0.10	0.46	5.20	0.046	0.52	0.1
72	100	1.00	10.9	----	----	0.44	4.90	----	----	----

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		
2	0.362	0.300	30.6	11.040	9.150	61.0	-0.07	0.7
6	0.472	0.392	40.0	10.745	8.906	59.4	0.00	0.7
12	0.878	0.727	74.2	11.576	9.595	64.0	0.08	0.8
24	0.960	0.795	81.2	11.608	9.622	64.1	0.09	0.8
48	0.972	0.805	82.2	11.701	9.698	64.7	0.09	0.9
72	0.981	0.81	82.7	11.678	10	66.7	0.09	0.9

	Au	% of Total	Ag	% of Total
Extracted g/mt ore	0.81	82.7	10	66.7
Tail assay, g/mt	0.17		5	
Calculated Head g/mt ore	0.98		15	
NaCN Consumed, kg/mt ore	0.09			
Lime Added, kg/mt ore	0.9			

Bottle Roll Test

Project No. **3493**
 Test No. **CY-19**
 Composite **RG3**
 Feed Size **212µm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	1.47	30
Duplicate	1.61	20
Triplicate	1.54	23
Average	1.54	24

Ore Charge **1214.7** g Final Residue Wt **1197.9** g

Solution Vol. **1.8221** L

Tail Assay	g Au/mt	g Ag/mt
Initial	0.22	16
Duplicate	0.21	15
Triplicate	0.23	16
Average	0.22	16

Natural pH **6.5**

Solid Density **40.0** Wt. % Cyanide Conc. Maintained at: **1.00** g/L

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	1.82	0.80	----	----	----	----	----
2	100	1.05	11.1	0.01	0.00	0.61	3.75	0.061	0.375	0.105
6	100	0.95	10.9	0.18	0.00	0.66	5.15	0.066	0.515	0.095
12	100	0.95	10.8	0.18	0.10	0.63	5.90	0.063	0.59	0.095
24	100	1.00	10.9	0.10	0.10	0.60	5.95	0.06	0.595	0.1
48	100	1.00	11.0	0.10	0.10	0.58	5.85	0.058	0.585	0.1
72	100	0.90	11.1	----	----	0.56	5.70	----	----	----

Metallurgical Results

Leach Time Hours	mg	g/mt ore	% of total
0		0.000	0.0
2	1.111	0.915	69.8
6	1.264	1.040	79.4
12	1.275	1.050	80.1
24	1.283	1.056	80.6
48	1.307	1.076	82.1
72	1.328	1.09	83.2

mg	g/mt ore	% of total
	0.000	0.0
6.833	5.625	20.8
9.759	8.034	29.8
11.640	9.583	35.5
12.321	10.144	37.6
12.734	10.483	38.8
13.046	11	40.7

Cyanide Consumed	Lime Added
	0.7
-0.08	0.7
0.00	0.7
0.07	0.7
0.06	0.8
0.06	0.9
0.21	0.9

	Au	% of Total	Ag	% of Total
Extracted g/mt ore	1.09	83.2	11	40.7
Tail assay, g/mt	0.22		16	
Calculated Head g/mt ore	1.31		27	
NaCN Consumed, kg/mt ore	0.21			
Lime Added, kg/mt ore	0.9			

Bottle Roll Test

Project No. **3493**
 Test No. **CY-20**
 Composite **RG3**
 Feed Size **150µm**

Head Assay	g Au/mt	g Ag/mt
Predicted		
Initial	1.47	30
Duplicate	1.61	20
Triplicate	1.54	23
Average	1.54	24

Ore Charge **1193.8** g Final Residue Wt **1179.2** g

Solution Vol. **1.7907** L

Natural pH **5.7**

Tail Assay	g Au/mt	g Ag/mt
Initial	0.23	15
Duplicate	0.23	15
Triplicate	0.23	14
Average	0.23	15

Solid Density Wt. % g/L
 40.0 Cyanide Conc. Maintained at: 1.00

Raw Data

Leach Time Hours	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	----	1.00	----	1.79	1.00	----	----	----	----	----
2	100	1.00	11.2	0.10	0.00	0.62	4.05	0.062	0.405	0.1
6	100	1.00	11.1	0.10	0.00	0.67	5.30	0.067	0.53	0.1
12	100	0.95	11.0	0.19	0.00	0.64	6.30	0.064	0.63	0.095
24	100	1.00	10.9	0.10	0.10	0.61	6.65	0.061	0.665	0.1
48	100	1.00	11.1	0.10	0.00	0.58	6.50	0.058	0.65	0.1
72	100	0.95	10.9	----	----	0.55	6.20	----	----	----

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		
2	1.110	0.930	70.5	7.252	6.075	22.5	0.00	0.8
6	1.262	1.057	80.1	9.896	8.289	30.7	0.00	0.8
12	1.275	1.068	80.9	12.216	10.233	37.9	0.07	0.8
24	1.285	1.077	81.6	13.473	11.286	41.8	0.08	0.9
48	1.293	1.083	82.0	13.870	11.618	43.0	0.08	0.9
72	1.297	1.09	82.6	13.982	12	44.4	0.15	0.9

	Au	% of Total	Ag	% of Total
Extracted g/mt ore	1.09	82.6	12	44.4
Tail assay, g/mt	0.23		15	
Calculated Head g/mt ore	1.32		27	
NaCN Consumed, kg/mt ore	0.15			
Lime Added, kg/mt ore	0.9			