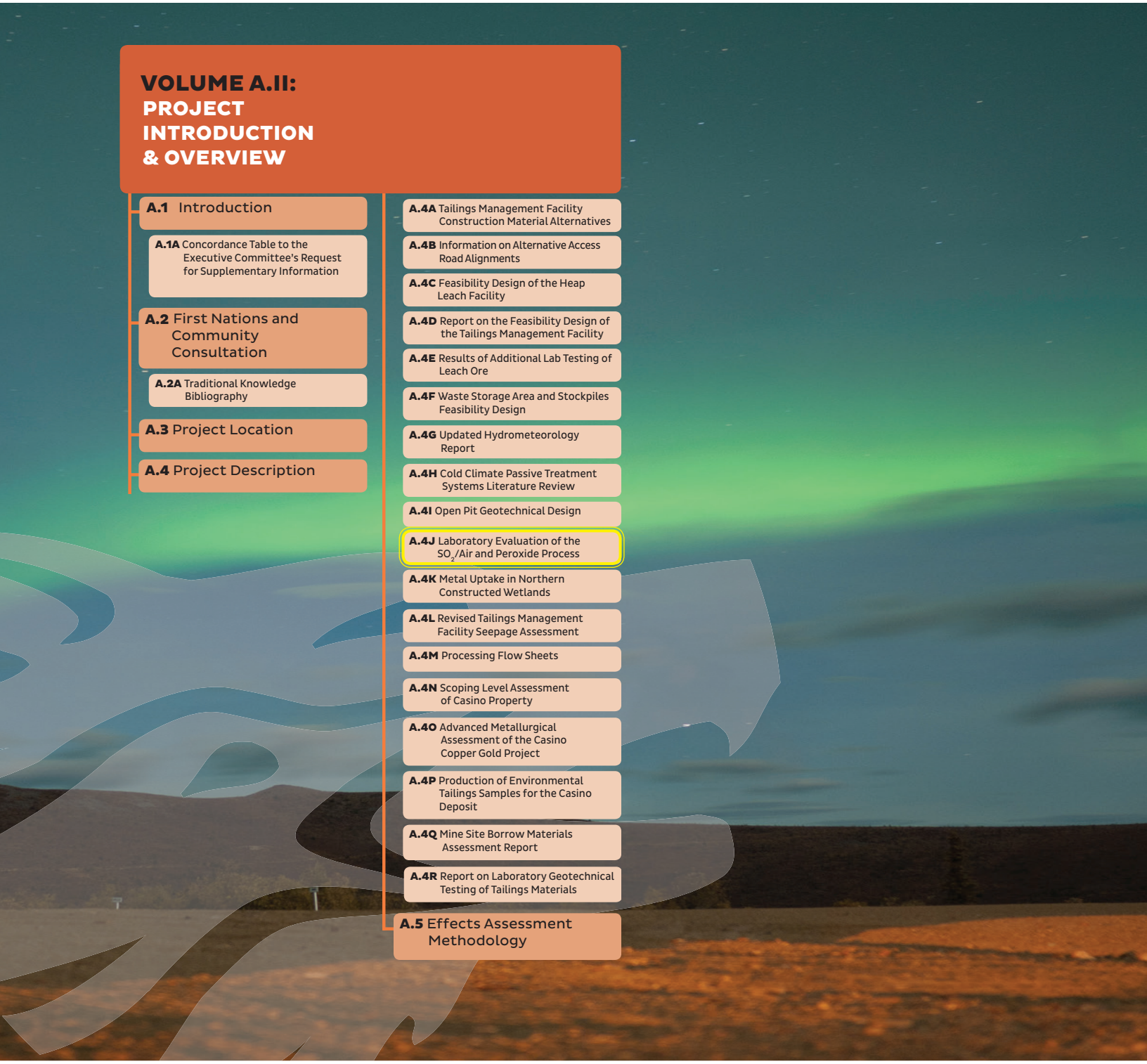
APPENDIX A.4J: Laboratory Evaluation of the SO_2/Air and Peroxide Process



LABORATORY EVALUATION OF THE SO_2/AIR AND PEROXIDE PROCESS

CYANIDE REMOVAL PROCESS FOR SOLUTION TREATMENT

FOR

Casino Project
Western Copper Corporation
Canada

January, 2010

PREPARED

BY

R&C Environmental Services Inc.
Ontario, Canada

TABLE OF CONTENTS

Statement of Confidentiality

The enclosed report contains confidential information which is intended solely for the use of the recipient Western Copper Corporation Casino Project. Terms and conditions respecting the disclosure or release of any of the contained information to any third party are prohibited.

1. EXECUTIVE SUMMARY

The SO_2/Air cyanide destruction process and the Peroxide process were successful in reducing the residual CN_{WAD} (weak acid dissociable cyanide) to below 0.20 mg/L targets put in place by Western Copper Corporation. In general a good effluent quality was achieved for both process treatments used. The levels of base metals removal also showed good improvement for both process treatments used.

The solution was effectively treated using a single stage operating with approximately 60 minutes of retention and an SO_2 dosage of 5.0 g/g CN_{WAD}. A pH of 9.50 was found to be suitable for effective cyanide removal with minimal need of lime for pH control.

The need of copper sulphate ($CuSO_4$) addition was not required for effective removal of cyanide. The copper present in the feed solution was enough for the process to be catalytic during this test program. At the actual treatment facility, copper sulphate addition will be dependent upon the relative concentration of copper in the feed.

The Peroxide process test work did show good results but did require the addition of acid to keep the pH at set point of 9.5. Please note that during normal plant conditions it is not expected that acid would be required due to higher than normal pH found in the feed solution of 12.1. The solution was effectively treated using a single stage operating with approximately 60 minutes of retention and an H_2O_2 dosage of 6:1 molar ratio to CN_{WAD} was required to meet the 0.20 mg/L CN_{WAD}. A pH of 9.50 was found to be sufficient for effective cyanide removal metal precipitation.

Due to cost of the peroxide it is suggested that based on comparison of both the SO_2/Air and Peroxide process that peroxide is not cost effective process to be used at the Casino project.

2. SCOPE OF WORK

The present test work program was undertaken at the request of Western Copper Corporation on solutions produced after test work evaluation performed on the heap leach process for recovery of metals. The work included investigations of SO_2/AIR process and Peroxide process. The laboratory program was conducted at the Barrick Technology Centre in Vancouver, British Columbia. The detailed scope of work was according to the agreement between Western Copper Corporation and R&C Environmental Consulting Services Inc. of Ontario, Canada, and included the following:

- The objectives were to test the SO_2/Air and Peroxide process for effective removal of cyanide from feeds collected after the heap leach process under normal operating conditions.
- A target of less 1.0 mg/L CN_{WAD} had been set out by Western Copper Corporation as the objective to meet the present cyanide permits required under Canadian code agreement.
- Continuous cyanide destruction by the SO_2/AIR process to determine the effectiveness of the process solution effluents.
- Continuous cyanide destruction by Peroxide process to determine the effectiveness of the process solution effluents.
- Chemical characterization (cyanide speciation, dissolved metals, pH) of all process feed and residual streams when possible by site or off site laboratories.
- Final report summarizing results of the test work program and providing operating cost estimates for the various test options as well as conclusions and recommendations for process selection.

2.1 Feed Samples

A 20 liter sample was provided from the previous test work performed on the heap leach process. Western Copper personnel identified the sample as initial preg solution from Metcon Research's leach column Cl-01, taken in December 2009. Each day the feed solution was sampled and tested for cyanide weak acid dissociable using the picric acid method. Also samples of the feed solution were tested for metal's using the ICP method. Based on the results conditions of the test were established.

3. PROCESS DESCRIPTIONS

3.1 SO_2/AIR

The SO_2/AIR process can be applied to the treatment of both cyanide solutions and pulps, however, it is in the area of slurry treatment (CIP/CIL pulps or re-pulped filter cakes from a Merrill-Crowe circuit) where the process has enjoyed a recognized worldwide reputation. Main advantages of the process are the removal of the total cyanide to levels of about 1 mg/l, in a single-stage continuous reactor and low operating costs.

The technology uses sulfur dioxide (SO_2), in various reagent forms, (sodium sulfite, sodium metabisulfite, ammonium bisulfite, liquid SO_2, and SO_2 containing roaster gas or SO_2 from burning elemental sulfur) in combination with air (or pure oxygen). Stoichiometrically, the process requires a ratio of approximately 2.5 g of SO_2/g of CN_{WAD}. The oxidation of cyanide is in accordance with one of the following overall reactions:

$$CN^- + Na_2SO_3 + O_2 \rightarrow OCN^- + Na_2SO_4$$

Or:

$$CN^- + ½\ Na_2S_2O_5 + O_2 + ½\ H_2O \rightarrow OCN^- + ½\ Na_2SO_4 + ½\ H_2SO_4$$

Or:

$$CN^- + SO_2 + O_2 + H_2O \rightarrow OCN^- + H_2SO_4$$

As shown above, the oxidation of cyanide produces cyanate (OCN^-) and, depending on the SO_2 reagent, produces sulfuric acid (H_2SO_4) as an intermediate. At the prevailing pH of the process, however, the sulfuric acid is continuously neutralized with lime producing calcium sulfate dihydrate (gypsum), as follows:

$$H_2SO_4 + Ca(OH)_2 \rightarrow CaSO_4 \bullet 2H_2O$$

The process will oxidize free cyanide and all cyanide complexes with copper, nickel, zinc, silver, and cadmium. The oxidation is catalyzed by soluble copper (Cu^{2+}), which, if required, can be supplemented by addition of copper sulfate solution. As cyanide is oxidized, metals are liberated and precipitated out of solution as hydroxides by the following reactions:

$$Me^+ + OH^- \rightarrow MeOH$$

Or:

$$Me^{2+} + 2OH^- \rightarrow Me(OH)_2$$

Cyanide present in the form of a strong complex, bound with either iron, cobalt, or gold, and is not oxidized by the process. Gold cyanide, of course, should not be a concern for a destruction unit, as it is recovered by carbon within the plant. Removal of the iron and cobalt cyanide complexes is achieved by precipitation with copper or zinc, according to the following reactions:

$$Me^{2+} + Fe(CN)_6^{4-} \rightarrow Me_2Fe(CN)_6$$

Or:

$$Me^{2+} + Co(CN)_6^{4-} \rightarrow Me_2Co(CN)_6$$

Generally, the SO_2/AIR process works best in the pH range of 8 to 9 and optimum operating pH is determined during the test work program. Optimization of both pH operating range and reagent consumption has proven to be site-specific for all ore types tested to date.

Cyanate produced by oxidation of cyanide slowly hydrolyzes to carbonate and ammonium as follows:

$$OCN^- + 2H^+ + H_2O \rightarrow CO_2 + NH_4^+$$

Or:

$$OCN^- + OH^- + H_2O \rightarrow CO_3^{2-} + NH_3$$

Depending on pH.

3.2 Hydrogen Peroxide and Caro's Acid

Hydrogen peroxide (H_2O_2) has a well-established reputation as the process of choice for treating clear cyanide solutions. The primary benefit of hydrogen peroxide is that it is a "clean" chemical in the sense that the reaction product of the H_2O_2 itself is simply water. In a peroxide treatment system there will be no appreciable increase in the dissolved solids concentration; scaling and undesirable salting conditions are avoided. This is an important factor in any flow sheet scenario incorporating a filtration stage.

The oxidation of cyanide with peroxide produces cyanate and water as shown in the following equation:

$$CN^- + H_2O_2 \rightarrow OCN^- + H_2O$$

The cyanate subsequently hydrolyzes slowly to produce ammonium and carbonate ions:

$$OCN^- + 2H^+ + H_2O \rightarrow CO_2 + NH_4^+$$

or:

$$OCN^- + OH^- + H_2O \rightarrow CO_3^{2-} + NH_3$$

depending on the pH.

Although ammonia (NH_3) is toxic to fish at low levels, it is almost entirely available in the far less toxic cationic form (NH_4^+) at the natural pH of open waterways.

If excess hydrogen peroxide is present in the treated wastewater, it rapidly decomposes to water and oxygen, presenting no environmental threat:

$$2H_2O_2 \rightarrow 2H_2O + O_2$$

Hydrogen peroxide is capable of oxidizing both "free" cyanide (CN_f) and complexes (titratable cyanide):

$$CN^-, HCN, NaCN, KCN, Ca(CN)_2, Cd(CN)_4^{2-}, Zn(CN)_4^{2-}$$

and "weak acid dissociable" cyanide (CN_{WAD}) complexes, which include the above mentioned titratable cyanide species as well as the following metal cyanide species:

$$Cu(CN)_2^-,\ Cu(CN)_3^{2-},\ Cu(CN)_4^{3-},\ Ag(CN)_2^-,\ Ni(CN)_4^{2-}$$

In contrast, the following metal cyanide complexes cannot be oxidized by hydrogen peroxide. These compounds, along with CN_{WAD} complexes, are measured as "total" cyanide (CN_{tot}):

$$Au(CN)^{2-},\ Fe(CN)_6^{3-},\ Fe(CN)_6^{4-},\ Co(CN)_6^{4-}$$

However, it is still possible to achieve CN_{tot} limits by precipitating the $Fe(CN)_6^{4-}$ with, for example, copper ions:

$$Fe(CN)_6^{4-} + 2Cu^{2+} \rightarrow Cu_2Fe(CN)_6 \text{ (solid)}$$

This can normally be accomplished by lowering the pH to 8 to 9 in the presence of copper hydroxide. Occasionally, more copper must be added in the form of copper sulfate to achieve the desired CN_{tot} level.

The cyanide destruction reaction using peroxide is relatively fast in most wastewater samples. The presence of transition metals, especially copper, helps to accelerate the reaction. However, effluents that contain little or no metals may require a catalyst in order to accommodate a treatment circuit with limited effluent retention capabilities. Copper sulfate pentahydrate additions are ideal for this purpose.

Low effluent temperatures will significantly slow down the reaction time. Therefore, cyanide destruction circuits must be designed with sufficient retention time to allow the reaction to go to completion at the lowest possible effluent temperature experienced at a particular site. If shorter retention times are desired, more copper catalyst can be added to reduce the cyanide destruction reaction time.

Hydrogen peroxide can be shipped safely at high concentrations (up to 70% by weight H_2O_2) and stored for long periods of time without appreciable loss of activity, which makes H_2O_2 an ideal choice for remote locations. H_2O_2 has proven invaluable for emergency detoxification programs, where low capital costs and quick start-up are essential requirements.

4. Analytical Procedures

Two to three reactor displacements were carried out before representative samples of treated effluent were taken. The effluents were filtered and immediately prepared for the spectrophotometric determination of cyanide (CN_p) using the buffered picric acid method.

Filtrates were also analyzed for copper (Cu), and iron (Fe) using atomic absorption. The base metals samples were analyzed by site facility or independent laboratories. Also feed and final solutions were submitted to an independent laboratory for an ICP scan and cyanide.

Note: The cyanide concentration determined by the picric acid method (CN_p) includes all the cyanide except that complexed with iron in solution. Therefore, CN_p is greater than or equal to CN_{WAD} (weak acid dissociable cyanide) and is reported as CN_{WAD} in this report. The total cyanide (CN_T) can be accurately estimated using the formula: $CN_T = CN_{WAD} + 2.795 \times Fe$ (mg/L).

5. TEST RESULTS

5.1 Test Procedures

The SO_2/AIR process was carried out in continuous mode in a properly aerated and agitated reactor, as would be the case in typical plant operations for either slurry or barren solution. Reagents (sodium metabisulfite and copper sulfate if required) were added in continuous mode and the pH was controlled by automatic addition of a lime suspension. Tests were carried out at room temperature. Samples of feed and treated effluent were taken at regular intervals for process monitoring and final samples taken at steady state conditions.

The Peroxide process was also carried out in continuous mode in an agitated reactor, unlike the SO_2/Air process the peroxide process does not require air addition due oxygen being produced by the peroxide as it decomposes. The pH was controlled by automatic addition of acid (H_2SO_4). Tests were carried out at room temperature. Samples of feed and treated effluent were taken at regular intervals for process monitoring and final samples taken at steady state conditions.

5.2 Treatment Objectives

The treatment objectives were to meet less than 1.0 mg/L CNwad in all cases. The 1.0 mg/L CN_{WAD} objective corresponds to the desired effluent quality at point of entry to the tailings pond. Please note that the treated solution would be recycled to the heap until the heap leach pad is totally rinsed and free of cyanide before any of the waters would be pumped the final tailings pond. This procedure would limit the amount of solution required to rinse out the heap.

5.3 Solution Treatment

5.3.1 SO_2/AIR

The test work was carried out in continuous mode using SMBS and air addition, and provided the overall results.

Test	pH	KG	D.O	Meta	Cu	Feed	$Ca(OH)_2$	CN load	SO_2 Ratio	Cu Ratio	$Ca(OH)_2$	Ret Time	Solution
No		mV	ppm	mL/hr.	mL/hr.	mL/hr.	mL/hr.	g/hr.	gSO_2/ gCN	ppm	g $Ca(OH)_2/gSO_2$	min	Lit/hr.
T-1	9.5	9	8.7	24	0.0	1400	0.0	0.294	5.22	0.0	0.09	58.6	1.40
T-2	9.5	-6	8.5	24	0.0	1400	0.0	0.294	4.00	0.0	0.22	58.2	1.40
T-3	9.5	-50	8.5	24	0.0	1400	0.0	0.294	3.47	0.0	0.26	58.2	1.40
AVG	9.5	-34	8.6	24	0.0	1400	0.0	0.294	4.23	0.0	0.19	58.3	1.40

Sample	No.	CNp	Cu	Fe	pH	Calculated
Feeds		ppm	ppm	ppm		CN total
Test 1		210	89.8	0.1	12.1	210.37
Test 2		210	89.8	0.1	12.1	210.37
Test 3		210	89.8	0.1	12.1	210.37
	AVG	210	89.8	0.1	12.1	210.37

Sample	No.	CNp	Cu	Fe	pH	Calculated
Treated		ppm	ppm	ppm		CN total
Test 1		0.2	0.41	0.01	9.5	0.23
Test 2		0.6	0.67	0.01	9.5	0.63
Test 3		1.1			9.5	
	AVG	0.63	0.54	0.01	9.5	

5.4 Solution Treatment Solution Treatment

5.4.1 Peroxide

The test work was carried out in continuous mode using peroxide and provided the overall results.

Test No	pH	KG mV	D.O ppm	H_2O_2 mL/hr.	Cu mL/hr.	Feed mL/hr.	H_2SO_4 mL/hr.	CN load g/hr.	H_2O_2 Molar Ratio	Cu Ratio ppm	H_2SO_4 gH_2SO_4/gH_2O_2	Ret Time min	Solution Lit/hr.
T-1	9.5	-165	11.9	24	0.0	1400	5.0	0.288	5.0	0.0	0.05	59.8	1.40
T-2	9.5	-165	10.9	24	0.0	1400	30.0	0.288	3.0	0.0	0.52	58.7	1.40
T-3	9.5	-21	9.6	24	0.0	1400	30.0	0.286	6.0	0.0	0.26	58.7	1.40
AVG	9.5	-117	10.9	24	0.0	1400	0.0	0.287	4.66	0.0	0.27	58.7	1.40

Sample Feeds	No.	CNp ppm	Cu ppm	Fe ppm	pH	Calculated CN total
T-1		**206.0**	**89.8**	**0.1**	**12.1**	**206.2**
T-2		**206.0**	**89.8**	**0.1**	**12.1**	**206.2**
T-3		**204.0**	**89.3**	**0.1**	**11.9**	**204.2**
	AVG	**205.3**	**89.5**	**0.1**	**12.1**	**205.53**

Sample Treated	No.	CNp ppm	Cu ppm	Fe ppm	pH	Calculated CN total
T-1		**0.40**	**0.61**	**0.01**	**9.5**	**0.43**
T-2		**36.3**	**61.36**	**0.01**	**9.5**	**36.33**
T-3		**0.20**	**0.50**	**0.02**	**9.5**	**0.26**
	AVG	**12.3**	**20.82**	**0.01**	**9.5**	**12.34**

6. DISCUSSION of RESULTS

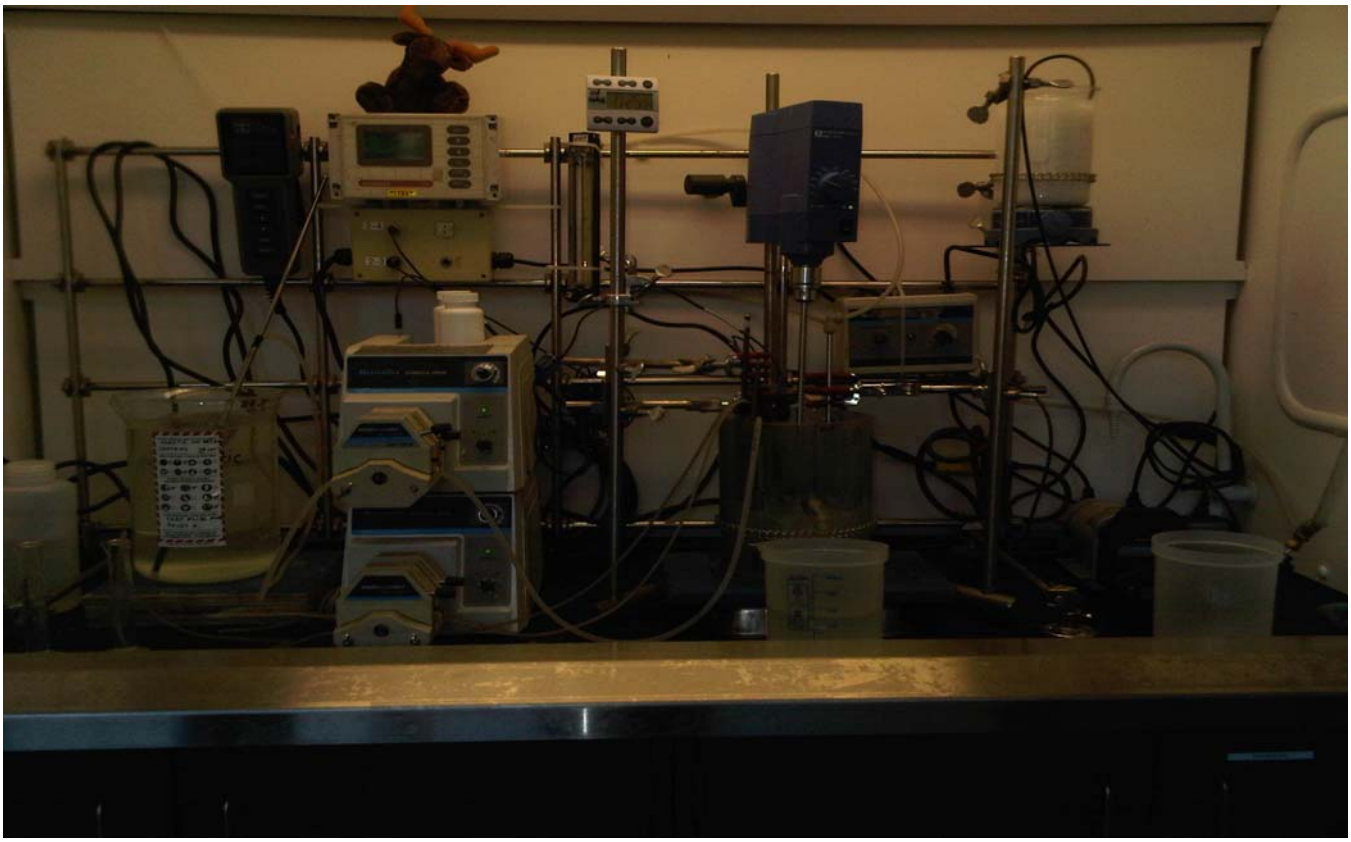
The present discussion deals with the relative effectiveness of the various treatments process options for the Casino Project.

6.1 Solution Treatment

Any discussion on the relative merits of the effectiveness of the processes (SO_2/Air, Peroxide) must center on the choice of the best result per process and the cost tonne of solution treated.

In the case of the Peroxide and SO_2/Air processes, the best result was that result that achieved the limit with the lowest reagent addition rates. The highest reasonable or typical reagent addition was chosen as the best value.

7. Typical Laboratory Set-up



8. Typical Reagent Consumptions

CASINO - PROJECT
OPERATING COST ESTIMATES:

SO_2/AIR PROCESS-USING Sodium Metabisulphite
BASIS: 1,000 m3 / day and 210 mg/L CNwad
ITEM CONSUMPTION UNIT COST OPERATING
DAILY COST: (CAD$)

SMBS 1,404 kgs/day @ 750 $/t = $379,080/year.
$Ca(OH)_2$ 210 kgs/day @ 210 $/t =$16,200/year.
TOTAL COST PER YEAR $395,280

Peroxide PROCESS-USING 70% H_20_2
BASIS: 1,000 m3 / day and 210 mg/L CNwad
ITEM CONSUMPTION UNIT COST OPERATING
DAILY COST: (CAD$)

H_2O_2 1,824 kgs/day @ 860 $/t = $564,710
H_2SO_4 0 t/yr @ 240 $/t = $157,593
TOTAL $722,303

Please Note that the above figures do not include capital and electrical cost involved in operating each of the process.

9. CONCLUSIONS AND RECOMMENDATIONS

Based on the test work, both SO_2/AIR and Peroxide effectively detoxify the effluents of the solutions tested, meeting or achieving lower than the 1.0 ppm CN_{WAD} target.

For economic reasons, the SO_2/AIR process is recommended over the peroxide process because of the advantages in operating and capital cost compared to the peroxide process. A Sulphur system configured to include a sulphur burner offers substantial operating cost savings. The additional capital for a sulphur burner would have a short payback period (based on present operating costs). Process selection for the Casino project will be highly driven by reagent pricing and capital cost. The SO2/Air process equipment can also be utilized for both solution and slurry treatment if required in the second phase of the project. On the basis of the present reagent price portfolio, the SO2/Air process is favored by a relatively inexpensive meta cost and the peroxide being penalized by quite expensive H_2O_2, reagent and capital cost.

Disclaimer

The information and statements contained herein are believed to be accurate at the time of writing, but R&C Environmental Consulting Services Inc. makes no warranty with respect thereto, including but not limited to any results to be obtained or the infringement of any proprietary rights. Use or application of such information or statements is at user's sole discretion, without any liability on the part of R&C Environmental Consulting Services Inc. Nothing herein shall be construed as a license of or recommendation for use, which infringes upon any proprietary rights.

Inspectorate IPL
11620 Horseshoe Way, Richmond, B.C., Canada V7A 4V5
T:(604) 272-7818 F:(604) 272-0851 E:ipl@inspectorate.com
www.inspectorate.com
ISO 9001:2000 Certified

Certificate#: 10B0685
Client: Western Copper Corporation
Project: Western Copper
Shipment#:
PO#:
No. of Samples: 2
Analysis #1: Ultratrace ICPMS Water Package
Analysis #2: S Zr
Analysis #3:
Comment #1:
Comment #2:
Date In: Feb 25, 2010
Date Out: Mar 04, 2010

		Al	Sb	As	Ba	Be	Bi	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Hg	Mo
Minimum detection		1	0.05	1	0.05	0.05	0.05	20	0.05	1	0.5	0.02	0.1	10	0.1	1	50	0.05	0.1	0.1
Maximum detection		100000	5000	100000	5000	5000	5000	100000	5000	500000	50000	2000	10000	500000	20000	500000	500000	5000	100000	10000
Method		3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020
Sample Name	SampleType	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Test # 1&2 (Diss)	Solution	44	0.40	2	15.40	<0.05	<0.05	<20	0.60	439234	<0.5	404.70	194.7	673	<0.1	<1	271	0.20	1.3	4175.6
Test # 1&2 (Tot)	Solution	85	1.30	<1	81.10	0.10	0.40	113	<0.05	439742	<0.5	438.40	218.3	586	0.4	<1	285	0.20	5.3	4229.6
RE Test # 1&2 (Diss)	Repeat	45	0.50	2	15.20	<0.05	<0.05	<20	0.60	436301	<0.5	402.60	192.0	675	<0.1	<1	289	0.20	1.4	4114.7

** Values highlighted (in yellow) are over the high detection limit for the corresponding methods. Other testing methods would be suggested. Please call for details.*

Inspec
11620 Horseshoe Way, Rich
T:(604) 272-7818 F:(604) 27
www.insp
ISO 9001::

Certificate#: 10B0685
Client: Western Copper Corporation
Project: Western Copper
Shipment#:
PO#:
No. of Samples: 2
Analysis #1: Ultratrace ICPMS Water Package
Analysis #2: S Zr
Analysis #3:
Comment #1:
Comment #2:
Date In: Feb 25, 2010
Date Out: Mar 04, 2010

Minimum detection	0.2	20	50	0.5	1	0.05	50	0.5	0.01	10	0.01	0.05	0.02	1	0.5	0.5
Maximum detection	20000	500000	500000	50000	500000	5000	500000	50000	1000	100000	1000	5000	10000	100000	50000	50000
Method	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020	3005A/6020
Sample Name	Ni	P	K	Se	Si	Ag	Na	S	Sr	Ti	Tl	Sn	U	V	Zn	Zr
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Test # 1&2 (Diss)	13.4	<20	7409	22.2	877	3.80	434548	554904.6	565.40	<10	0.10	9.30	0.10	5	5.1	<0.5
Test # 1&2 (Tot)	14.4	<20	7501	23.5	1732	32.00	436658	548722.4	590.20	<10	0.10	9.90	0.10	<1	9.4	0.8
RE Test # 1&2 (Diss)	13.7	<20	7506	21.1	895	3.60	432691	552541.9	570.00	<10	0.10	8.80	0.10	5	4.6	<0.5

** Values highlighted (in yellow) are over the high de*

Inspectorate IPL
11620 Horseshoe Way, Richmond, B.C., Canada V7A 4V5
T:(604) 272-7818 F:(604) 272-0851 E:ipl@inspectorate.com
www.inspectorate.com
ISO 9001:2000 Certified

Certificate#: 10B0686
Client: Western Copper Corporation
Project: Western Copper
Shipment#:
PO#:
No. of Samples: 1
Analysis #1: Au,Cond,TDS,Alk,SO4,Cl,F,Br,P,O-PO4
Analysis #2: pH,NO3-N,NO2-N,NH4,NH3-N,SCN,CN(WAD
Analysis #3: CN(T)CN-free
Comment #1: connect with job 10B0685
Comment #2:
Date In: Feb 25, 2010
Date Out: Mar 03, 2010

Minimum detection		0.01	0.01	0.1	1	1	1	0.1	0.1	0.1	0.1	0.1
Maximum detection		5000	14	999	100000	10000	10000	10000	1000	100	9999.9	9999.9
Method		FA/AAS	ENV	Env	STDM2540C	2320B	Env	Env-IC	Env-IC	Env-IC	Env-Dig_IC	Env-IC
Sample Name	SampleType	Au mg/L	pH --	Cond mS/Cm	TDS mg/L	Ttl Alk mg/L-CaCO3	SO4-2 mg/L	Cl- mg/L	F- mg/L	Br- mg/L	PO4-3(T) mg/L	O-PO4 mg/L
Test # 1&2	Solution	0.15	7.99	3.5	3186	81	1701	35.0	0.3	<0.1	<0.1	<0.1
RE Test # 1&2	Repeat	0.16	8.02	3.5	3170	81	1691	35.1	0.3	<0.1	<0.1	<0.1
Blank iPL	Blk iPL	<0.01	--	--	--	--	--	--	--	--	--	--
OXI67	Std iPL	1.82	--	--	--	--	--	--	--	--	--	--
OXI67 REF	Std iPL	1.82	--	--	--	--	--	--	--	--	--	--

** Values highlighted (in yellow) are over the high detection limit for the corresponding methods. Other testing methods would be suggested. Please call for details.*

Inspectorate IPL
11620 Horseshoe Way, Richmond, B.C., Car
T:(604) 272-7818 F:(604) 272-0851 E:ipl@ir
www.inspectorate.com
ISO 9001:2000 Certified

Certificate#: 10B0686
Client: Western Copper Corporation
Project: Western Copper
Shipment#:
PO#:
No. of Samples: 1
Analysis #1: Au,Cond,TDS,Alk,SO4,Cl,F,Br,P,O-PO4
Analysis #2: pH,NO3-N,NO2-N,NH4,NH3-N,SCN,CN(WAD
Analysis #3: CN(T)CN-free
Comment #1: connect with job 10B0685
Comment #2:
Date In: Feb 25, 2010
Date Out: Mar 03, 2010

Minimum detection	0.1	0.01	0.03	0.1	0.005	0.005	0.005	1
Maximum detection	9999.9	999	1400	1400	99999.999	99999.999	99999.999	10000
Method	Env-IC	Env	STDM4500	Env-IC	Env	4500-CN-E	4500-CN-I	Env
Sample Name	NO3-N mg/L	NO2-N mg/L	NH4 mg/L	NH3-N mg/L	Free CN- mg/L	(Total)CN- mg/L	(WAD)CN- mg/L	SCN- mg/L
Test # 1&2	1.0	59.14	14.57	11.3	0.097	0.217	0.101	3
RE Test # 1&2	1.0	60.02	14.83	11.5	0.099	0.222	0.106	3
Blank iPL	--	--	--	--	--	--	--	--
OXI67	--	--	--	--	--	--	--	--
OXI67 REF	--	--	--	--	--	--	--	--

** Values highlighted (in yellow) are over the high detection limit*