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Subject: Cost Estimate of Remaining Decommissioning and Reclamation Liabilities at Brewery Creek Mine as of September 30, 2007

Executive Summary

SteveJan Consultants Inc. (SJCI) has prepared an updated liability cost estimate for the Brewery Creek Mine located near the town of Dawson City in the Yukon Territory. The report was commissioned by the Department of Environment of the Yukon Government. The update is based on a site inspection by the author on July 25, 2007 and work completed at the site to the end of third quarter of 2007. This follows earlier liability costs estimates of the closed site undertaken in 2003 through 2006, all undertaken by SJCI.

The Brewery Creek mine is owned by Alexco Resource Corporation (Alexco), previously Viceroy Minerals Corporation. Mining operations at the site ceased in 2000 with gold recovery continuing until the end of 2001. Decommissioning and reclamation activities began in mid 2002. With the end of the summer 2007 work period, significant progress has been achieved since mine closure. However, a number of tasks remain for 2008, with longer-term monitoring and maintenance of the site expected to last for an additional 12 year period to the end of 2018.

The updated cost estimate as of September 30, 2007 is \$1.390M versus \$1.775M in September 2006 (SJCI 2006a).

SRK Consultants have prepared liability cost estimates on behalf of Alexco for the Brewery Creek Mine over the same period of time. Their report (SRK 2007a) provided an estimate of \$816,000 versus their previous September 2006 estimate of \$1.184M (SRK 2007b).

The following table outlines the most current liability estimate for the site broken down into eight cost centers as previously utilized in evaluating the decommissioning and reclamation liabilities at the site. A ninth cost center provides for mitigative contingencies.

Summary of Remaining Costs

Cost Center	September 2007 SJCI Liability Cost Estimate	September 2006 SJCI Liability Cost Estimate	September 2007 SRK Liability Cost Estimate
Mine Area Reclamation	\$243,095	\$249,905	\$99,465
Site Facilities Removal and Reclamation	\$147,223	\$168,225	\$113,673
Leach Pad Detoxification	\$0	\$0	\$0
Manpower – 2008	\$74,250	\$115,425	\$26,190
General Services & Admin (GS&A) – 2008	\$54,900	\$87,800	\$0
Process Water Treatment	\$0	\$10,500	\$0
Leach Pad Reclamation	\$45,952	\$55,143	\$21,446
Post-Closure Monitoring	\$465,450	\$485,415	\$438,840
Sub-total	\$1,030,870	\$1,172,413	\$699,614
Contingencies on above	\$146,714	\$166,144	\$79,908
Mitigative Contingencies	\$212,300	\$436,225	\$36,000
Total	\$1,389,884	\$1,774,782	\$816,000

The three reports compared above include:

- SJCI September 2007 Liability Cost Estimate - the latest estimate based on a joint site inspection on July 25, 2007 and subsequent information, as presented in this report;
- SJCI September 2006 Liability Cost Estimate - the previous estimate based on a joint site inspection on August 29, 2006; and
- SRK February 2007 Liability Cost Estimate - the most recent SRK report based on the joint site inspection on July 25, 2007.

Overall, the SJCI estimate of site closure liability has dropped by \$385,000 over the past year (i.e., September 2007 versus September 2006). The reduction is mainly due to the passing of another year of post-closure monitoring and maintenance, continued removal of site facilities, equipment and materials and reclamation of those areas, reduced General Services & Administration costs, reduced costs for continued availability of the BTC and another year of provision for the Blue Waste Rock Storage areas having passed.

However, work remains in establishing sustainable vegetation over significant portions of the minesite especially those that have suffered erosion damage and dieback of vegetation partially due to droughts over the past few years since various seeding and fertilizing campaigns have been undertaken.

Revegetation efforts at the site over the 5 years (mid-2002 to mid 2007) have not yet met the *Government of Yukon Mine Site Reclamation and Closure Policy* (Yukon 2006 draft) - Technical Guidelines-Revegetation (s.4.h) that states the basic guideline as being:

“To restore wildlife habitat through the re-establishment of a vegetative mat (food source, cover, hide, etc.) and self-sustaining native vegetation.”

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1. Introduction

Steve Januszewski of SteveJan Consultants Inc. (SJCI) has prepared this cost estimate based on acceptance of an SJCI Proposal dated August 30, 2005 to Ms. Heather Jirousek, Program Advisor-Water Resources, of the Environmental Programs Group, Department of Environment (DOE) of the Government of the Yukon (GY). This revised cost estimate considers remaining decommissioning and reclamation liabilities at the Brewery Creek mine site as of September 30, 2007.

Section 2 provides an overview of the Background and Methodology utilized in the preparation of this report. Section 3 begins with a summary of the remaining liabilities and compares them to those identified as of a year earlier. It then lists remaining liability estimates for all mine areas. Section 4 presents the Conclusions and Recommendations.

2. Background & Methodology

2.1 Background

The Brewery Creek Mine is currently owned by Alexco Resource Corp (Alexco). The site was previously owned by Viceroy Minerals Corp (VMC).

SJCI has prepared several reports for GY on issues relating to the decommissioning of the Brewery Creek Mine site commencing in late 2003. This work has included annual site inspections and liability cost estimate updates including:

- A SJCI Liability Cost Estimate of the Brewery Creek Mine as of September 30, 2007 in a report dated December 20, 2006 (2006a).
- A Liability Cost Estimate of the Brewery Creek Mine as of December 31, 2005 in a report dated May 29, 2006 (SJCI 2006c) with a follow-up discounted liability reduction schedule prepared in a prepared by SJCI and submitted to GY in July 2006 (SJCI 2006b). The report and spreadsheet included adjustments following a meeting with Brewery Creek company staff and their consultant Daryl Hockley of SRK and the Yukon Government and their consultant (the author) of SJCI in which differences in the estimates prepared by SRK and SJCI were discussed. However, no agreement was reached and it was decided to leave resolving the differences until the next annual inspection and liability cost estimate update due in late 2006;
- A Liability Cost Estimate of the Brewery Creek Mine as of September 23, 2004 in a report dated Dec 17, 2004. The revised report included adjustments to the report following a meeting with Brewery Creek company staff and their consultant Daryl Hockley of SRK and the Yukon Government with their consultant Steve Januszewski of SJCI in which differences in the estimates prepared by SRK and SJCI were discussed and agreement reached on remaining tasks and their liabilities;
- A Liability Cost Estimate of the Brewery Creek Mine as of June 15, 2004 utilizing a September 2003 Liability Cost Estimate of the site by Steffen, Robertson and Kirsten (Canada) Inc. (SRK 2003) updated with observations from a tour of the site on the above date, supplemented by progress information from GY. The report was issued by SJCI on July 16, 2004; and
- A Liability Cost Estimate for the Brewery Creek Mine as of September 2003. This date coincided with the date used by SRK on behalf of the proponent, Viceroy Minerals Corporation's (VMC) submission in November 2003. The estimate for GY provided by SJCI

included a provision for risk and a suggested Liability Reduction Schedule for the site for the years 2004-2018. The report was issued by SJCI on July 9, 2004.

This current report considers reclamation efforts undertaken by Alexco from the 4th quarter of 2006 through to the end of the 3rd quarter of 2007. It provides a breakdown of remaining closure components based on the same headings as were used in the previous reports and the 2001 *Decommissioning and Reclamation Plan* by VMC, for ease of comparison.

This report is based on information available to the author at the time of its preparation. It has been produced for the Government of Yukon by SteveJan Consultants Inc. SJCI accepts no liability for its use by any other party.

2.2 Methodology

The report provides a liability cost estimate update as of September 30, 2007 based significantly on a July 25, 2007 joint site inspection undertaken by the author, and Mr. Daryl Hockley of SRK hosted by Mr. Brad Thrall of Alexco Resources.

The previous report estimated liability as of September 2006. This provides for a one-year period between the reports, and is consistent with the majority of the annual closure liability inspections undertaken to date.

In this report, the decommissioning and reclamation plan is broken down to nine sub-sections with individual tasks below them. The first eight include the various aspects of the site and components for consideration. The ninth area incorporates additional Mitigative Contingencies, and is discussed later in this section.

The nine areas include:

1. Mine Area Reclamation
2. Site Facilities Removal and Reclamation
3. Leach Pad Detoxification (considered complete)
4. Manpower-2006
5. General Services and Administration
6. Process Water Treatment
7. Leach Pad Reclamation
8. Post Closure Monitoring and Maintenance
9. Mitigative Contingencies

Considerations in preparing the updated liability cost estimate included:

- Current status of the site based on a visual inspection by the author and others conducted on July 25, 2007;
- Information collected from the company to the end of September 2007 including the 2006 Annual Water License Report and monthly monitoring reports for the site for the first six months of 2007;
- Previous liability cost estimate reports on the site by SJCI and SRK. The general format of the cost tables and information in the first 2003 SRK report (2003) was utilized again, as they were generally accepted by GY in previous reviews of closure liability by SJCI. Percent completion of individual items was adjusted, as required based on progress reclaiming the site over the past year;

- The report makes use of contractors' costs rather than in-house Alexco costs. A number of unit costs and tasks costs were adjusted in the previous two liability cost estimate reports with 5% increases to acknowledge the effect of inflation on such work. No further adjustment was made in this latest report. The cost increases are reflective of cost of living allowance adjustments. However, they do not consider the recent boom in construction Canada wide causing some contractors prices to have risen significantly higher (especially in larger centers and areas with significant economic development);
- The report does not provide additional costs that would fall to GY should Alexco become insolvent and the government take on the task of managing the site and continuing the reclamation and decommissioning work. A considerable sum of additional monies would be required, although this is outside the normal scope of evaluating closure liability costs for a mine;
- A discounted value for the remaining (future years) tasks required to complete the decommissioning and reclamation program is not provided;
- Detailed cost tables in Section 3 include only those components with work remaining to be done. Completed tasks are not shown;
- No credit is given for re-sale or salvage values of equipment and structures from the site, as is the norm in most mine closure liability cost estimates. The bulk of structures and equipment removal has already been completed and thus the value on assets remaining on the site is limited;
- The report incorporates a contingency for uncertainties in the costs to undertake and complete the tasks specified in this report;
- The report also includes a Mitigative Contingency estimate for additional remedial actions that may be required as they are considered "possible", based on discussions with GY EMR and DOE staff and considering their role as the lead regulatory agency overseeing the minesite;
- Other changes from previous cost estimates are described in specific subsections of this report in Section 3.

3. Decommissioning and Reclamation Liabilities

The summarized results of this report are provided in Table 1, below. The Table also includes a comparison to the SJCI and SRK reports assessing the site as of a year earlier in September 2006.

Table 1
Summary of Remaining Costs

Cost Center	September 2007 SJCI Liability Cost Estimate ¹	September 2006 SJCI Liability Cost Estimate ²	September 2007 SRK Liability Cost Estimate
Mine Area Reclamation	\$243,095	\$249,905	\$99,465
Site Facilities Removal and Reclamation	\$147,223	\$168,225	\$113,673
Leach Pad Detoxification	\$0	\$0	\$0
Manpower – 2008	\$74,250	\$115,425	\$26,190
General Services & Admin (GS&A) - 2008	\$54,900	\$87,800	\$0
Process Water Treatment	\$0	\$10,500	\$0
Leach Pad Reclamation	\$45,952	\$55,143	\$21,446
Post-Closure Monitoring	\$465,450	\$485,415	\$438,840
Sub-total	\$1,030,870	\$1,172,413	\$699,614
Contingencies on above	\$146,714	\$166,144	\$79,908
Mitigative Contingencies	\$212,300	\$436,225	\$36,000
Total	\$1,389,884	\$1,774,782	\$816,000

Notes:

1. Cost for each cost center includes a contingency factor, as shown in Table 2, below
2. SJCI, 2006a
3. SRK, 2007a

The remainder of this section outlines the cost estimates in the various areas of the mine decommissioning and reclamation plan as of September 30, 2007.

An estimation of the contingency factors for each of the cost centers is provided, as shown in the table below. All of the costs contain uncertainties due to the level of detail in this report. The contingency factor used was generally between 10 and 25% depending on the uncertainty of the cost estimates in the opinion of the author. No contingency was added for the Mitigative Contingency items.

Table 2
Contingencies included in Liability Cost Estimate by Cost Center

Cost Center	Sept. 2007 Cost Estimate	Contingency Factors (%)	Contingency Factors (\$)	Total Area Cost Estimate
Mine Area Reclamation	243,095	20%	48,619	291,714
Site Facilities Removal & Reclamation	147,223	20%	29,445	176,668
Leach Pad Detoxification	0	N/A	0	0
Manpower – 2008	74,250	10%	7,425	81,675
General Services & Administration (GS&A) – 2008	54,900	10%	5,490	60,390
Process Water Treatment	0	N/A	0	0
Leach Pad Reclamation	45,952	20%	9,190	55,142
Post-Closure Monitoring	465,450	10%	46,545	511,995
Mitigative Contingencies	212,300	0%	-	212,300
Total	\$1,243,170		\$146,714	\$1,389,884

A number of individual tasks may or may not have been completed as per the decommissioning and reclamation plan, based on information collected by the author during the July 2007 site visit. For the 2007 update the status of only one item, the results of the annual geo-technical inspection was unknown at the time of the writing of this report. The inspection was understood to have been undertaken on the same date as the inspection used for this update report.

Table 3
Liability Cost Items of Uncertain Status

Description	Status Accepted for this Report	Report Sec. Reference	Comments
Annual geo-technical inspection	Completed	3.1	Inspection was undertaken during July 2007 site visit by SRK. However, a copy of the report has not been seen by the author in order to consider its conclusions. The annual geo-technical inspection was not completed in 2006.

3.1 Mine Area Reclamation

Reclamation work appears to have been limited in 2007 as it was the previous two years, after an aggressive summer season in 2004.

A number of additional areas require revegetation maintenance with supplemental seed and fertilizer or in some cases just fertilizer. This includes a number of areas suggested for attention in the last cost estimate report by SJCI (2006a). Many areas appear to have had only one application of a seed/fertilizer mix. There appears to have been significant dieback and in some cases this has led to weakened physical stability of slopes as evidenced by increased erosion gulleys and slides of materials into open pits, adjacent to the main haul road, onto the undisturbed perimeter areas, etc. Natural invasion of native species is occurring, albeit slowly as the site has now been shutdown with major reclamation work undertaken up to five years earlier. An alternative to further seeding and/or fertilizing would likely be the planting of additional tree and shrub species to encourage the natural revegetation which appears to be taking an excessive period of time to reach an acceptable density.

Only minimal areas received applications of seed and/or fertilizer by the time of the 2007 inspection and no subsequent records have been received indicating where work was undertaken. In 2006, Alexco's 2006 Annual Water License Report indicates that a total area of 81 ha received seed and/or fertilizer, at the same low application rate (25 kg/ha seed, 300kg/ha fertilizer) that was recommended in their Decommissioning and Reclamation Plan (VMC 2003). Several areas were also scarified. Alexco's 2005 Annual Water License Report shows that 35 ha received seed/fertilizer and erosion control work in 2005. The DRP states that some 180 ha were seeded and fertilized initially in 2002-2003.

Areas receiving the largest seeding and fertilizing attention in 2006 included the edge of the haul road in the Blue-Lucky areas (25ha), Blue Waste Rock Storage Area (6ha), North Golden silt stockpile (6ha) and Lower Fosters (5 ha). The sum of these areas (41ha) accounts for over half of the areas covered in 2006 (81ha).

For a number of the areas, 2006 saw its first application (e.g., Moosehead & Main Haul Road side slopes) whereas in other areas where revegetation has previously been undertaken the seeding and

fertilizing was limited to bare areas. The work undertaken in 2006 has been considered in this report.

Photographs of several reclaimed mine areas as of July 2007 are provided in Appendix A.

And a statement from the SJCI report from 2004, still applies:

Significant work has been undertaken in reclaiming mine areas in 2004. However, a number of areas have not been completed, or have over-steepened slopes that require further re-grading. In addition, several areas require total area seeding and fertilizing, and a number of areas required maintenance seeding and fertilizing due to poor take to date. This is not uncommon, but must be considered by VMC as only one application of seed and fertilizer mix rarely restores an area to required standards. It is up to VMC to demonstrate self-sustaining vegetation, that will also stabilize surfaces against the effects of long-term erosion and that is consistent with surrounding areas, is in place.

A cost for mobilization and demobilization of several pieces of equipment will be required to complete the remaining work in this area. The equipment will consist of at least a bulldozer, haul truck, backhoe, and seeding/fertilizing equipment. The equipment sizing utilized in this cost estimate report is several sizes smaller than the mine utilized during operation. The equipment should be as small as possible so as to minimize disturbances to revegetated areas (especially the main haul road) while traveling across the site to gain access to outlying areas requiring work.

Remaining cost items under the Mine Area Reclamation area include:

- Mob & Demob of several pieces of equipment and operators for remaining work;
- Ultimate removal of remaining ½ of warehouse/maintenance shop building;
- Erosion repairs estimated at 5% of original reclaimed areas including Canadian, Upper & Lower Fosters, Pacific, South Golden, Blue WRSA and Moosehead, 10% of Blue Open Pit, Lucky, North Golden, and 15% of Kokanee;
- Re-seed and fertilize significant portions of many areas previously seeded, including 25% of Canadian, Lower Fosters and Moosehead, and 50% of South & North Golden, Lucky, Upper Fosters, Pacific, Blue Open Pit and WRSA, and Kokanee;
- Ultimate scarification, re-contouring and seeding of the perimeter roads including the mine access road. For the main access road this will likely consist of reclaiming half the road width and leaving the center portion for ongoing use for ATV access for monitoring and subsequent land uses, as well as removing culverts and restoring creek crossings;
- Haul road slopes and side berms require some broadcast seeding and fertilizing (20% of area) and complete (50%) hand broadcast seeding of outlying areas;
- In 2005, a Revegetation and Metals Uptake Assessment report was commissioned (Laberge 2006a) and was included in Alexco's 2005 Annual Water License Report for the Brewery Creek Mine. The report outlines recommendations for follow-up work in both areas. A provision for undertaking remedial work and a follow-up survey is included in this report;
- In 2006, a Revegetation Assessment report was commissioned (Laberge 2007) and was included in Alexco's 2006 Annual Water License Report for the Brewery Creek Mine. The report re-iterated the need for additional control test plots as was recommended in the previous years report. A provision for the costs to implement the recommendations and undertake repeat surveys is included in the report. An update to the Laberge assessment was due to be completed in August of 2007.

A provision has been provided for an additional year's worth of active reclamation work to be undertaken in 2009, after the specified work is undertaken in 2008. The 2009 work would consist

of 25% of the erosion repair work and 100% of the total area covered with seed/fertilizer in 2008. This maintenance is required to help establish sustainable stability and vegetation in the mine areas until such time as natural invasion can become more fully established.

The author suggests an independent vegetation assessment be undertaken of the current site relative to the ultimate goal for a self-sustaining natural revegetation over the site. Over the five years site reclamation and revegetation work has been undertaken, seeding and fertilizing has been marginally successful in enabling natural invasion. An assessment is required to determine the success of this invasion towards the ultimate goal, as well as to recommend a plan of action on how to achieve the long-term goal.

Table 4 lists the individual components and an estimate of remaining work and costs by mine area.

Table 4
Mine Area Reclamation – Remaining Activities

Area and Individual Components (% Remaining as of Sep 03 ¹)	SRK Estimated Remaining Subtotals Sept 2003	Estimated % Remaining Sept. 2007 (status Sep06, if different)	Estimated Remaining Cost as of Sept. 30, 2007
<u>Mobilization / Demobilization (Contractor Equipment)</u> Mob/Demob for remaining work			\$22,050 \$22,050
<u>Canadian Open Pit</u> 2006 erosion repairs (5%) 2007 seeding & fertilizing (25%)	\$5,153	5% 25%	\$5,821 \$4,812 \$1,009
<u>Blue Open Pit</u> 2006 erosion repairs (5%) 2007 seeding & fertilizing (25%)	\$2,753	10% 50%	\$6,764 \$5,133 \$1,631
<u>Blue WRSA</u> 2006 erosion repairs (5%), 2007 seeding & fertilizing (25%) ARD study (100%)	\$20,386	10% 75% 0%	\$15,058 \$11,552 \$3,506 \$0
<u>Kokanee Open Pit</u> 2006 erosion repairs (15%), 2007 seeding & fertilizing (40%)	\$16,437	15% 50%	\$13,982 \$10,266 \$3,715
<u>North Golden Open Pit</u> 2006 erosion repairs (15%) 2007 seeding & fertilizing (40%)	\$30,286	10% 50%	\$6,471 \$4,492 \$1,979
<u>South Golden Pit</u> 2006 erosion repairs (5%) 2007 seeding & fertilizing (25%)	\$782	5% (was 10%) 50%	\$1,035 \$731 \$304
<u>Lucky Open Pit</u> 2006 erosion repairs (15%) 2007 seeding & fertilizing (25%) Covered in Mitigative Contingencies: -backfill sinkholes, stabilize slope in pit -Stabilize slump area in road-unload some additional material	\$29,217	10% 50% 50% 100%	\$3,585 \$1,711 \$1,874 \$0 \$0
<u>Upper Fosters</u> 2006 erosion repairs (5%) 2007 seeding & fertilizing (25%)	\$2,062	5% 50%	\$2,734 \$1,925 \$809
<u>Lower Fosters</u> Broadcast seed/fertilize (100%) 2006 erosion repairs (5%); 2007 seeding & fertilizing (25%)	\$4,193	0% (was 100%) 5% 25%	\$2,442 \$1,954 \$488
<u>Pacific Open Pit & Silt Borrow Area</u> sediment control works-road swale & rip-rapped channel, 2006 erosion repairs (5%); 2007 seeding & fertilizing (25%)	\$11,986	0% (was 100%) 5% 50%	\$9,520 0 \$6,951 \$2,569

Table 4
Mine Area Reclamation – Remaining Activities (continued)

Area and Individual Components (% Remaining as of Sep 03 ¹)	SRK Estimated Remaining Subtotals Sept 2003	Estimated % Remaining Sept 2007 (status Sep06, if different)	Estimated Remaining Cost as of Sept. 30, 2007
<u>Moosehead Open Pit</u> 2006 erosion repairs (5%); Decommission haul road (100%); 2007 seeding & fertilizing (25%)	\$36,743	5% 0% 15% (was 25%)	\$3,582 \$1,604 -
<u>Perimeter Roads (11 km total: main access road (7km) & other roads)</u> Scarify & Re-contour (100%) Broadcast seed / fertilize 16.5 ha (100%) (SRK estimate used) 2007 seeding and fertilizing (10%) Restoring creek crossings along main access road	\$60,840	100% 100% 10% 100% (was 0%)	\$78,957 \$63,882 \$8,250 \$825 \$6,000
<u>Re-Slope Haulroad Slopes & Side Berms (excl. Lucky area)</u> Backhoe over-steepened slopes (75%) Broadcast seed / fertilize-mechanized (100%) Broadcast seed / fertilize-hand (100%)	\$60,371	0% (was 5%) 20% 50%	\$2,812 \$0 \$221 \$2,591
<u>Main Haul Road</u> Remove Six Culverts (95%)	\$232,345	0%	\$- -
Additional year (2008) of erosion repairs & seeding / fertilizing equal to that identified above ² Erosion repairs; Seeding and Fertilizing			\$36,282 \$12,783 \$23,499
Follow-up to Studies: Revegetation Assessment-implement recommendations, conduct another re-survey; Metal Uptake Study - implement recommendations, & re-survey	\$10,000	100% (was 0%) 100% (was 0%)	\$32,000 \$10,000 \$22,000
Total	\$538,894		\$243,095

Notes

1 based on SRK 2003, Tables 5 & 6 and SJCI 2004c

2 Cost is equivalent to that provided in table for all individual areas for 1) erosion repairs and mntce to 25% of yr1 (2008) area, and 2) seeding and fertilizing of 100% of yr1 (2008) area.

3.2 Site Facilities Removal and Reclamation

Some of the remaining items include:

- Half of the main warehouse and shop building that continues to be used, as required;
- Some piping still remains consisting of 100% of the land application piping;
- The general site area requires re-grading/scarifying, capping with growth media, and revegetation;
- A small quantity of materials remain in behind of the main warehouse/shop building. This includes an assortment of process residues, carbon, slag, flux and some smaller equipment;

- In September 2005, a contaminated soil survey of the site was conducted by Access Consulting (Access 2006). It recommended establishing a land treatment farm (LTF) in the main equipment area to supplement the one in place at the Oil Storage Area, as well as on-going fertilization and tilling of the two LTFs to speed hydrocarbon degradation. This method may or may not be effective due to the cold climate of the site. On-going monitoring results will be required to determine performance. If unsuccessful, removal of the material to an off-site licensed hazardous materials landfill will be required. Based on the latest site visit, the second LTF has not been constructed;
- The same report also surveyed metal levels in site soils. It identified areas with metals in soils exceeding CSR guidelines but for which pre-mining sampling indicated natural exceedances. Several metals were also elevated at sites that had no historical/baseline sampling results. The report did not include any additional sampling in its list of recommendations;
- The sewage septic system for the remaining office/warehouse/ shop area is still available for use and will require decommissioning;
- The final cleanup of the materials in the Camp Area boneyard is effectively completed with the exception of the loaded core shacks, and a cache of fuel drums likely for the local helicopter firm which flies through the area;
- A provision has been added equivalent to the estimated cost for the eventual removal of the effluent and heap treatment systems. This includes the existing treatment ponds, piping and pond contents. The treatment ponds remain effectively unaltered since operations. The second (Barren) process pond has been partially filled with a mixture of materials to enable it to operate as a Biological Treatment Cell (BTC). The costs for decommissioning the treatment and process ponds had previously been estimated at \$75,000 (SJCI 2004b) but over the summers of 2004 and 2005 a number of the components have been removed. The current estimate is \$52,500, unchanged from last year. Provision for this future cost should remain in place until the end of the 5 year period BTC treatment period proposed to last until 2008 when it is estimated the system will no longer be required and the facilities can be decommissioned and the area permanently reclaimed.

A breakdown of the components in this section is provided in Table 5.

Table 5
Site Facilities Removal and Reclamation – Remaining Activities

Area and Individual Components % Remaining (as of Sep 03 by SRK 2003, Table 7)	SRK Estimated Remaining Subtotals Sept 2003	Estimated % Remaining Sept07 (status Sept06, if different)	Estimated Remaining Cost as of Sept. 30, 2007
Warehouse/Maintenance Shop Building (100%)	\$102,867	50%	\$58,070
Exploration Office & Core Logging Facility (100%)	\$9,372	0% (was 100%)	\$0
ADR Plant Building (100%), S&F done in '06	\$121,348	0% (was 1%)	\$0
Assay Lab Building (100%)	\$41,545	0%	\$0
Limo Silo (100%)	\$18,430	0%	\$0
ADR Plant Fresh Water Tank (100%)	\$9,066	0%	\$0
Laura Creek Pumphouse (100%)	\$14,874	0%	\$0
Surface Piping (100%)	\$26,280	0%	\$0
Removal of Land App. Piping	\$4,800	100%	\$5,513
General Site Re-grading / GM Placement/Runoff & Erosion Control	\$59,626		\$11,063
-site re-grading (100%)		15%	\$910
-Haul & place soil cover (100%)		15%	\$2,412
-Revegetation (100%)		25%	\$2,142
Culvert crossings-remove & re-slope (100%)		15% (was 30%)	\$2,800
Runoff ditches (100%)		15% (was 30%)	\$2,800
Removing Remaining Hydrocarbon Products from Boneyard	\$7,000	10%	\$1,000
Shipment of Remaining Drummed Materials in Boneyard & BTC Area	\$10,500	20%	\$2,000
Land Treatment Farming of Hydrocarbon Contaminated Soils-Main Equipment Area - yet to be done, on-going maintenance to both (100%)	\$7,120	50%	\$5,887
Close-out 3 Sewage Septic Systems	\$3,250	33%	\$1,191
Cleanup Site Boneyard (100%)	\$3,000	0%	\$0
Close out Site Landfill (100%)	\$12,426	0%	\$0
Site Contamination Survey (not included in SRK 2003) – follow-up to one done in 2005	\$15,000	0%	\$10,000
Process & Effluent Treatment System Ponds Rehabilitation (not included in SRK 2003)	\$50,000	100%	\$52,500
Total	\$696,829¹		\$ 147,223

Notes:

1 Individual numbers do not add up to total at bottom as items that were no longer applicable in Sept 2007 were not provided cells with \$0 value, for simplicity. Refer to SJCI report 2004a and 2004b for full details

3.3 Leach Pad Detoxification

No elements were considered remaining as of September 2007, as was the condition in the previous two reports.

3.4 2008 Manpower

The author understands the site minimal manned coverage in 2007 from January to mid-April and October to December, with 1 to 2 people being one site for the entire period of May to September. Based on this additional information and observations of manpower during the July 2007 site visit, an estimate for 2008 is provided in Table 6, below.

It is estimated that:

- A site manager will likely spend an estimated 2 days per month (or 10% of full-time) over the course of the year for a variety of tasks that has not been charged out to specific tasks;
- A Reclamation Supervisor would be overseeing the day-to-day work on site through the active summer season when the bulk of remaining mine area work should be completed;
- An Environmental Sampler/Caretaker will be required during the entire summer as well as to undertake off-season site security sweeps, water quality sampling, surveying, administering some final removal of assets any scrap or waste materials from the site, etc.;
- A multi-skilled tradesman who can also work as an equipment operator will be required to undertake the required erosion repairs and other work involving heavy equipment as well as various tradesman tasks around the site, during the summer season;
- Additional resources are included in Section 3.6 that apply until such time as direct discharge of heap effluent becomes the sole discharge method for waters from the heap.

Manpower charges for 2009 should drop further if proposed work for 2008 is undertaken.

Table 6
2008 Manpower Projection

Staff Member (based on SRK 2003, Table 9)	Salary \$/Annum	Time Requirement	2008 Cost
Site Manager (B. Thrall)	\$120,000	2 days/mo (10% of full-time year-round)	12,000
Process Manager/Engineer	\$100,000	-	
Reclamation Supervisor	\$100,000	50% of full-time for 4 summer months	20,000
Environmental Sampler/Site Caretaker	\$48,000	Full-time for 4mo in summer & 1 mo. total for other 7 mos.	9,000
Equipment Operator	\$60,000	50% of full-time for 4 summer months	14,000
Subtotal			55,000
Salary Burden at 35%			19,250
Total			\$74,250

3.5 General Services and Administration - 2008

Site services have been significantly wound down. There will be minimal coverage required in 2008 except for several months of summer reclamation work. No camp operations have been included in this cost estimate report as all staff will be based out of Dawson City.

The general services and administration cost center includes estimates of costs for 2008 as provided in Table 7. They include costs associated with tasks such not shown in the individual work areas such as the operation of the BTC (shown in Tables 9 & 10).

Table 7
2008 General Services & Administration

Category (based on SRK 2006, Table 10)	Area Total	Monthly Costs (\$)											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Misc. operating supplies	0												
Insurance	6,000	500	500	500	500	500	500	500	500	500	500	500	500
Freight	3,000	0	0	0	0	500	500	500	500	500	500	0	0
Propane	0	0	0	0	0	0	0	0	0	0	0	0	0
Water supply	0	0	0	0	0	0	0	0	0	0	0	0	0
Access road maintenance	8,500	1000	1000	1000	1000	1000	0	1000	0	1000	0	500	1000
General site grounds	0	0	0	0	0	0	0	0	0	0	0	0	0
Waste disposal	1,000	0	0	0	0	0	0	0	500	0	500	0	0
Light vehicle costs	10,000	250	250	250	250	1500	1500	1500	1500	1500	1000	250	250
Travel and lodging	7,200	0	400	0	400	1000	1000	1000	1000	1000	1000	0	400
Sat. phone, 2way radios	3,600	100	100	100	100	500	500	500	500	500	200	100	100
Office equipment lease/rent	1,800	100	100	100	200	200	200	200	200	200	100	100	100
Building maintenance	1,500	0	0	0	0	500	0	500	0	500	0	0	0
Safety supplies	500	0	0	0	0	200	100	0	100	0	100	0	0
Office supplies	400	0	0	0	0	100	100	0	100	0	100	0	0
Crew rotations & transportation	2,400	0	0	0	0	400	400	400	400	400	400	0	0
Staff housing (in-town)	0	0	0	0	0	0	0	0	0	0	0	0	0
Camp operations	0	0	0	0	0	0	0	0	00	0	0	0	0
Legal	6,000	500	500	500	500	500	500	500	500	500	500	500	500
Electrical Power	3,000	0	0	0	0	500	500	500	500	500	500	0	0
Total	\$54,900												

3.6 Process and Effluent Water Treatment

In 2004, a biological treatment cell (BTC) system was installed in the heap process water treatment ponds. The first pond would act as a surge pond for incoming waters from the heap. The second pond would be reconfigured to operate as a BTC and the third pond would be used as a settling pond for final polishing prior to effluent discharge to the environment. The system is reported to have seen minimal operation to date. Due to reduced influent loadings into the system and the limited time in operation, the effectiveness of the removal has not been confirmed.

However, due to the continuing low loadings feeding the BTC, a provision for the commissioning and de-bugging of the system has been removed in this cost estimate.

Land application was another method of heap effluent treatment, which was utilized in recent years including a short period in the summer of 2004. In late 2004, it was decided no future land application would be anticipated with the BTC system in place, based on discussions between VMC and GY.

The 2006 Annual Report for the Brewery Creek Mine includes monitoring data from the BTC and heap runoff systems. It states that:

... From May-June 2006, 24,750m³ of treated process solution was directly released into the Laura Creek watershed. No land application of solution occurred in 2006. Approximately 34,196m³ of fresh water from the surface of the heap and surrounding catchment was released as it was captured in the preg pond.

The costs for the process water treatment system have now been zeroed and the breakdown in provided in Table 8.

Table 8
Process Water Treatment *

Area and Individual Components % Remaining (based on SRK 2003, Table 12)	SRK Estimated Remaining Subtotals Sept 2003	Estimated % Remaining Sept, '07 (status Sept06, if different)	Estimated Remaining Cost as of Sep. 30, 2007
Water treatment / land application	\$58,000	N/A	\$0
BTC Construction	\$235,000	0%	\$0
BTC commissioning / de-bugging (not included in SRK 2004)	\$0	0% (was 20%)	\$0
System to separate heap seepage from runoff flows (included in Leach Pad Reclamation)	-	100%	\$0
Total	\$293,000		\$0

* based on SJCI 2004c, Appendix A

All process and heap effluent treatment ponds remain in place. The cost for future removal and satisfactory reclamation of these facilities and their contents remains. The cost provision for this is covered in Section 3.2 - Site Facilities Removal and Reclamation.

The following considerations were included in preparing cost estimates for General Services and Administration (GS&A) and for BTC operation:

- Annual summer program of water treatment prior to discharge;

- No employees stay on site. Personnel will commute back and forth daily from nearby towns and hamlets;
- Include quarter-time use of an operator/technician during the summer months;
- Use of a contract trades person for a number of tasks including electrical, plumbing, mechanical, etc. estimated to be 10% of full-time during the five summer months;
- Light-vehicle costs have been excluded as they are included in other areas of the cost report

Annual GS&A costs for the BTC system will be incurred until direct discharge becomes a permanent heap effluent discharge method. These costs are shown in Tables 9, below.

Table 9
General Services & Administration Until Direct Discharge of Heap Effluent-Annual Costs

Category (based on SRK 2003, Table 11)	Area Total	Monthly Costs (\$)											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<u>General Service& Admin</u>													
Misc. operating supplies	0	0	0	0	0	0	0	0	0	0	0	0	0
<u>Labour (incl Salary Burden)</u>													
Operator/Technician/Sampler (25% of \$4K/mo)	5,000	0	0	0	0	1000	1000	1000	1000	1000	0	0	0
Total	\$21,500												

Operating costs for heap effluent (process water) treatment through the BTC system are presented in Table 10.

Table 10
Process Water Treatment – Annual Operating Costs

Category (based on SRK 2003 Table 12)	Area Total	Monthly Costs					
		Apr	May	Jun	Jul	Aug	Sept
Outside assays	\$1,000	\$0	\$200	\$200	\$200	\$200	\$200
Piping & fittings	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Reagents/ Chemicals	\$1,000	\$0	\$200	\$200	\$200	\$200	\$200
Misc. maintenance supplies	\$1,000	\$0	\$200	\$200	\$200	\$200	\$200
Misc. operating supplies	\$1,000	\$0	\$400	\$200	\$200	\$0	\$200
Fuels / Lubes	\$200	\$0	\$100	\$0	\$0	\$100	\$0
Pumping	\$500	\$0	\$100	\$100	\$100	\$100	\$100
Total	\$4,700						

However, utilization of the BTC for heap effluent treatment is considered a mitigative contingency measure, and thus costing is not provided in this section. Costs for it are provided in Section 3.9, Mitigative Contingencies.

3.7 Heap Leach Pad Reclamation

Work remains to complete the reclamation of the heap leach pad. Required tasks are outlined in Table 11, below.

The area of future heap leach cell Nos. 8-10 has been considered to have been amended with a layer of growth media, although this was not inspected during the site visit. In 2004, Alexco has stated the area requires revegetation due to poor success when it was done several years ago, as was reported in the previous liability cost estimate report (SJC 2004a).

A significant erosion gully has also formed along the toe of the slope on the bench that surrounds the perimeter of the heap, along the southwest corner of the facility, immediately east of the overflow pipes that run into the process ponds. Repairs to this area will be undertaken as part of the leach pad dike breaching. Provision for this is included under the Erosion Repairs task.

There is also a depression atop the heap, which collects surface water and looks like a shallow pond from the air. The depression was assessed as part of the previous August 2006 site

inspection. It was determined to be satisfactory to leave as-is as it is likely not an issue for the long term physical and chemical stability of the heap. Previously, a provision has been included for this work as one of the Mitigative Contingencies. The site was not visited in the July 2007 site inspection.

Table 11
Heap Leach Pad Reclamation – Remaining Items *

Area and Individual Components -% Remaining (based on SRK 2003, Table 8)	SRK Estimated Remaining Subtotals Sept 2003	Estimated % Remaining Sept07 (status Sept06, if different)	Estimated Remaining Cost as of Sept. 30, 2007
Leach Pad Re-sloping and Drainage Ditches			
B'hoe work to put in ditches (100%)	\$6,336	100%	\$7,350
Breach leach pad dike mat'l (100%)	\$12,610	100%	\$13,903
Riprap/gravel in dike breach (100%)	\$2,500	100%	\$2,756
Leach Pad Revegetation (Cells 1-7)			
Broadcast seed and fertilizer (25%)	\$6,056	10% (was 25%)	\$2,671
Previously Planned Cells 8-10			
Dozer to re-contour surface (100%)	\$17,927	0%	\$0
Spread GM with dozer (100%)	\$36,447	0%	\$0
Broadcast seed & fertilizer (100%)	\$6,912	25%	\$1,905
2006 Reclamation Repairs			
Erosion repairs with dozer (10%)	\$26,738	5%	\$15,181
Broadcast seed & fertilizer (25%)	\$4,958	10% (was 25%)	\$2,186
Total	\$120,484		\$45,952

* based on SRK 2003 and SJCI 2004

3.8 Post Closure Monitoring and Maintenance

A post-closure monitoring and maintenance program to the end of the year 2018 is included based on the current Water License. Costing in this report includes site manpower, sample preparation, sample shipping, analyses and support, as well as geotechnical and reclamation inspections. Details have been provided in previous reports.

Table 12 shows the costing for the various components of the program:

- The first column lists the tasks as outlined in the previous SJCI reports (SJCI, 2004a & 2004b) that are based on the SRK report of November 2003. SJCI has previously included an adjustment in the cost estimate based on the input of other contributors in the review of the VMC Monitoring Program. This has included an additional \$30,000 for the basic monitoring program as provided by Mr. Gerry Whitley (Whitley, 2004) to GY;
- The second column shows the costs of the above elements;
- The third column provides an estimate of % of original work remaining to be done; and
- The fourth column provides the revised cost for the remaining liability.

The Whitley cost estimate (Whitley, 2004) for the 15 year provided was \$520,00 versus \$490,000 in Table 13 of their report (SRK Nov2003). SJCI has previously accepted the Whitley estimate for use in prior liability cost estimates. The \$30,000 difference between the SRK and Whitley estimates has been added to the proposed cost estimate, split evenly between the 15 years of the overall (post-closure) program.

Table 12
Post-Closure Monitoring and Maintenance

Area and Individual Components - % Remaining (based on SRK 2003, Table 13)	SRK Nov03/ SJCI *Estimated Remaining Subtotals Sept 2003	Estimated % Remaining Sept07 (status Sept06, if different)	Estimated Remaining Cost as of Sep. 30, 2007
Environmental Monitoring (2007)	\$49,500	33%	\$17,325
Environmental Monitoring (2005-2018, 14yrs total, 11 remaining)	\$440,500	79% (was 86%)	\$309,225
Helicopter for Qtrly WQ sampling			\$40,300
Reclamation Maintenance (2004-2008, 5 years total, 1 remaining)	\$20,000	20% (was 40%)	\$4,200
Inspections-geo-chem & reclm (2004-2018, 15 years total, 11 remaining)	\$75,000	73% (was 80%)	\$32,000
Reporting-monthly...annual (2004-2018, 15 years total, 11 remaining)	Previously included in task above		\$33,000
Additional cost for env. monitoring as per Whitley costing (2004-2018)	\$30,000	73% (was 80%)	\$22,000
Heap Geochem/Physical Stability & Monitoring (2004-2008)-not yet undertaken	\$7,000	75% (was 80%)	\$5,400
Laura Creek AMP monit. requirements (2004-2008)	\$10,000	20% (was 40%)	\$2,000
TOTAL	\$632,000		\$465,450

* SJCI 2004b

3.9 Mitigative Contingencies

Mitigative Contingencies are required for items that are considered possible and may require mitigation, but are not included in the current plan. Four of the five areas of concern from the previous report still remain.

1. **Heap Effluent Treatment** - The BTC was constructed in 2004 and has had minimal operation to date. A cost breakdown for confirmation of system performance is provided in Section 3.6 of this report. This section provides monies for the operation of the BTC and general site services and administration related to this undertaking. A timeframe of 5 years of operation had originally been utilized, as a Mitigative Contingency. As of September 30, 2007, just over 1 year of that timeline still remains.
2. **Lucky Roadside Stabilization** – Two portions of the slope adjacent to the access road into the Lucky Pit area are showing instability. One of these was unloaded in 2004 and 2005 but continues to show weakness with slumping of surface material. A second area, further west along the slope is quite long and is showing multiple failures along the slope (see Plate 1). It is unlikely that the slumped material or any unraveled loose will travel to the low spot of the area which is some distance away but which has a small stream originating there. There is likely no easy solution for either of the two areas. They may require some unloading, patching or minor re-contouring and then re-seeding and fertilizing. Most likely the areas will continue to slump and erode but then self-armor and vegetation will slowly become established. Continued monitoring is required. The provision remains similar to what was in place last year.

3. **Lucky Sinkhole** - An area of material subsidence continues to be apparent in the area of the open pit highwall in the form of vertical sinkholes. Two holes were noticed in the 2004 inspection, and these were found to be backfilled in the 2005 inspection. However, the latest inspection found a single hole (dimensions ~1.5m dia x 1.5m depth) in place again in a similar location (see Plate 2). A provision of \$5,000 has been included to continue to monitor this area, look for where the material may be emerging (unlikely) and to undertake any backfilling. The issue is not considered to be of a serious nature as it is likely due to a zone of voids in the backfilled area that is receiving finer materials from above.
4. **BWRSa Seepage** - A risk provision of \$161,100 has been included as an additional mitigative contingency due to the uncertainty of the performance of the cover constructed over the Blue waste rock storage area, based on discussions with GY. A provision was originally recommended in the SJCI report of July 9, 2004. A provision should remain in place until satisfactory performance can be demonstrated. The current liability estimate is based on a residual risk factor of 15% of the \$1.074M estimated cost to implement a replacement cover over the dump as was costed by SRK (2003). A revised timeline for winding down the contingency was introduced in the previous liability cost estimate report (SJCI 2006) and consists of:

<u>Date</u>	<u>% of \$1.074M</u>
2005Q	35%
2006Q	25%
2007Q	15%
2008Q	5%
2009Q	0%

Table 13
Mitigative Contingencies *

Area and Individual Components	SRK Estimated Remaining Subtotals Sept 2003	Estimated % Remaining Sept06	Estimated Remaining Cost as of Sept 30, 2006
Heap BTC GS&A (1 year) @\$5,000/a (from Table 9); PW treatment (1 year) @\$4,700/a (from Table 10)	\$1,128,000	20% (was 40%)	\$9,700 ¹
Lucky Dump stabilization	\$36,000 (SRK 2006)	100%	\$36,500
Lucky Pit Sinkhole			\$5,000
Risk Provision Component for BWRSa	\$1,074,000	15% (was 25%)	\$161,100
Total			\$212,300

Notes:

* based on SJCI 2004c, Appendix A

1 from Tables 9 and 10 (Section 3.6)

4. Conclusions and Recommendations

4.1 Conclusions

The revised liability cost estimate for the Brewery Creek mine site as of September 30, 2007 is \$1,389,884.

This number compares to \$1,775,000 as of September 30, 2006, \$2,018,000 as of September 30, 2005 and \$2,779,000 as of September 2004. It reflects the significant amount of work undertaken at the site by Alexco (and previous owner VMC) over the past several years, notably the summer of 2004.

The largest cost center is the cost for on-going post closure monitoring at \$512,000.

The liability estimate includes several Mitigative Contingency items including one for \$161,000 for possible remedial measures related to the cover over the Blue Waste Rock Storage Area, down from the original \$400,000 original provision. A provision for enhanced instrumentation and monitoring of performance of the dump was dropped by GY as improvements can be added at a later date, if considered necessary. The cost estimate also includes a provision for operation of the Biological Treatment Cell for a further one year. Overall, \$212,000 is being required as provision for mitigative contingencies, which is down significantly from the \$436,000 in the previous cost estimate report. GY continues to have a conservative risk tolerance as the regulatory agency responsible for the site, similar to that of other jurisdictions in Canada.

4.2 Recommendations

It is recommended that Alexco:

- Renew efforts to meet the previous timeline of completing reclamation tasks as was seen in 2004 and is still required as we head into 2008. It appears as though minimal work was undertaken in the area of mine area reclamation/revegetation in 2007, especially of identified areas (SJCI 2006a, SRK 2007).
- With an ultimate goal of achieving self-sustaining natural invasion over all the mine areas more aggressive revegetation efforts are required. Invasion of native species in the mine areas is occurring, but is likely occurring too slowly to reach self-sustaining levels as work has been going on for five years since mine closure and commencement of reclamation work. An alternative to further seeding and/or fertilizing would likely be the planting of seedlings of area native species to encourage the natural revegetation which appears to be taking an excessive period of time to reach an acceptable density.
- Complete remedial measures and on-going monitoring recommendations presented in Laberge's revegetation assessment report (2007) and the Revegetation and Metal Uptake Assessment report (2006a) and then undertake follow-up surveys;
- Include detailed monitoring information and interpretation of results in annual reports submitted by the company. These should be reviewed for compliance to stated plans and permits. A request in last year's report asking for the annual report to include nutrient addition and performance monitoring records for the hydrocarbon contaminated soil land

treatment farm has not been fulfilled. Monitoring data should also be assessed for performance and trends and be reported in the report;

- Consider making application to remove the treatment ponds located adjacent to the heap leach pad. These have not been used for a number of years, and are showing signs of geo-technical stress, in the form of tension cracks around the perimeter. In the short term the ponds should be unloaded of water. According to a note from Brad Thrall (Sep.13, 2007) the ponds with failure concerns have been drained. An application for approval for removal could be delayed until removal of the three larger process ponds (incl. BTC pond) is also being recommended, as this would reduce closure and reclamation costs.

It is further recommended that Government of the Yukon:

- Monitor Alexco's progress in completing identified work tasks during the next year's summer work season beginning early in the season. Significant progress should be possible to complete a number of the remaining tasks. This includes re-grading and stabilizing several mine areas and re-seeding identified portions and re-fertilizing where required, completion of site cleanup, etc; and
- On an on-going basis, regulatory staff should document information on the progress and satisfactory completion of each reclamation component as part of their inspections and report review efforts, so that this information can be incorporated into future site liability estimates.

SteveJan Consultants Inc.

Steve Januszewski, P. Eng.
Principal

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APPENDIX A

Photos From July 25, 2007 Site Inspection



Plate 1: Slumped bank in area of Lucky road (note: clipboard for scale)



Plate 2: Sinkhole atop Lucky open pit



Plate 3: Surface of Blue WRSA from helicopter



Plate 4: Western end of Lucky & view back toward North Golden