BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

DELOITTE & TOUCHE INC.

2006 ANNUAL REPORT

FRESH WATER SUPPLY DAM BREACH PROJECT
FARO MINE, YUKON

FINAL

PROJECT NO.: 0257-040-01
DATE: JANUARY 26, 2007

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Project No. 0257-040-01
January 26, 2007

Mr. Doug Sedgwick
Deloitte & Touche Inc., as Interim Receiver for Anvil Range Mining Corporation
Suite 1900, TD Centre
79 Wellington Street West
Toronto, ON M5K 1B9

RE: 2006 ANNUAL REPORT
FRESH WATER SUPPLY DAM BREACH PROJECT, FARO MINE, YUKON

Dear Mr. Sedgwick:

Please find attached our Annual Report for the Fresh Water Supply Dam Breach Project (FWSB) at Faro Mine. This report has been prepared to comply with the terms of Water Licence QZ03-058. This report contains an assessment of the physical performance of the breach, a report on the success of the re-vegetation activities and a report on the aquatic environment. Copies of this report have been issued in accordance with the distribution list noted on the cover.

If there are any questions regarding this report, or if you require any other services, please contact the undersigned at your convenience.

Yours truly,
BGC Engineering Inc.
per:

Gerry Ferris, M.Sc., P.Eng.
Geotechnical Engineer

encl.: Final report

GWF/sf

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LIMITATIONS OF REPORT

BGC Engineering Inc. (BGC) prepared this report for the account of Deloitte & Touche Inc., as Interim Receiver for Anvil Range Mining Corporation. The material in it reflects the judgement of BGC staff in light of the information available to BGC at the time of report preparation. Any use which a third party makes of this report, or any reliance on decisions to be based on it are the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

As a mutual protection to our client, the public, and ourselves, all reports and drawings are submitted for the confidential information of our client for a specific project. Authorization for any use and/or publication of this report or any data, statements, conclusions or abstracts from or regarding our reports and drawings, through any form of print or electronic media, including without limitation, posting or reproduction of same on any website, is reserved pending BGC's written approval.

1.0 INTRODUCTION

1.1 Background

The Fresh Water Supply Dam Breach (FWSB) Project was undertaken in November/December 2003, in accordance with the terms and conditions provide in Yukon Water Licence QZ03-058 (the Licence). The Licence is in effect until December 31, 2008 and provides details on reporting, effluent quality standards, monitoring and surveillance required for this project.

The 2006 Annual Report provided herein has been prepared in accordance with the provisions of Part A, Sections 13 and 14 of that Licence. This report provides a summary of the performance of the breached FWS Dam at the Faro Mine site. In addition to commentary related to the physical performance of the engineered breach section, this report provides details regarding the re-vegetation of the reservoir and the aquatic life in the South Fork Rose Creek channel, tributaries within the former reservoir and the downstream channel. Deloitte & Touche Inc. (Deloitte) is the Interim Receiver for Anvil Range Mining Corporation (ARMC) and currently manages the site activities. This report was prepared by BGC Engineering Inc. (BGC) based on information collected by BGC staff, ARMC site staff, White Mountain Consulting (WM) and Laberge Environmental Services (Laberge).

This report also presents water quality monitoring results as required by Part C, Section 25 and Part D, Section 33 of the Licence. The field monitoring information presented in this report was gathered by ARMC staff. The physical monitoring program required in Part C, Section 33 of the Licence was performed by BGC.

The annual inspection and assessment of the re-vegetation work undertaken in the former reservoir and the breach, required in Part C, Section 34, was performed by Laberge and is attached to this report.

An assessment of the riparian conditions, availability of spawning and rearing habitat and fish sampling performed by WM is attached. The need for assessment was outlined in the original design report (SRK et al. 2003) and the Environmental Management Plan (EMP) prepared as part of the Water Licence application.

1.2 Scope of Services

BGC provided a proposal (No. 06-032) for the preparation of this Annual Report. The scope of work described in the proposal was:

1. Provide input, review and interpretation of monitoring data collected by site staff at the FWSB project site. Prepare and submit monthly reports on the monitoring activities to the Water Board (as per Part A, Section 15 of the Licence).

2. Perform a May site visit to examine site conditions at the FWSB and K8 Creek project sites following the spring freshet, as recommended in the 2005 Annual report.
3. Perform a September site visit to examine conditions near the end of the open water season.
4. Prepare and submit the Annual Report for the FWSB project.

Authorization to proceed with the work was provided by Mr. Doug Sedgwick of Deloitte via a letter dated May 31, 2006.

2.0 FACILITY OVERVIEW

Faro Mine is located in the central Yukon, approximately 200 km north-northeast of Whitehorse. The mine site is situated approximately 22 km north of the Town of Faro, as shown in Figure 1. The former FWS Dam and reservoir are located south of the main access road to the Faro Mine, approximately 5 km from the mine guard house.

The FWS Dam was constructed in 1968 on the south fork of Rose Creek. The FWS Dam was a zoned earth fill dam used to store fresh water for mine-processing operations during the operational life of the mine. The FWS Dam was approximately 410 m long, 20.5 m high at its highest point and 6 to 7 m wide at the crest. The slope of the downstream face of the dam was approximately 2H:1V and the slope of the upstream face of the dam was approximately 2.6H:1V. A 30 m wide, 3.2 m deep concrete spillway is located at the north abutment of the breached dam. The crest of the FWS Dam is at a nominal elevation of 1099.3 m above mean sea level (amsl), based on the geodetic survey conducted in 2002.

The FWS Dam was breached in a controlled manner in November/December 2003, in accordance with a design and regulatory requirements prepared for that project. Design for the breach of the dam was presented in a Final Design Report (SRK et al. 2003). Information related to the construction activities during the breach was presented in an as-built construction report (SRK & BGC 2004).

The main elements of the dam breach design included (SRK et al. 2003):

- An engineered breach through the body of the dam along the approximate alignment of the original creek channel.
- Re-establishment of the pre-construction creek through the reservoir.

The design approach for the breach included the concept of adaptive management for the former reservoir and in the channel downstream of the construction area. Adaptive management in this case meant that the re-forming channel in the former reservoir and the remaining portion of Fresh Water channel would not be engineered per se as part of the breach work, but evaluated and remediated on an as-needed basis.

The breach and channel construction completed in 2003 consisted of a 315 m long section through the former footprint of the dam, as shown in Figure 2. The main components of the breach works are as follows:

- the floodplain (20 m wide),
- the channel (8 m wide),
- the erosion protection along the edge of the floodplain,
- the inlet structure and
- the five riffles within the channel.

3.0 MONITORING RESULTS

Monitoring of the flow quantity and total suspended solids (TSS) in the South Fork Rose Creek is required as part of the Licence. Two sampling points are specified in the licence: FWSB#1 is located at the gun club bridge approximately 1.5 km upstream of the limit of the reservoir and FWSB#5 is located downstream of the limits of the 2003 construction area, as shown on Figure 1. These sample points were monitored twice per month during the period of April through August. Yearly water quality monitoring is required at FWSB#6, which is located adjacent to the potential acid generating (PAG) spoil pile, as shown on Figure 1. The results of this monitoring program were submitted in a series of monthly reports to the Yukon Water Board; copies of the monthly reports are included in Appendix A.

A summary of the monitoring results obtained for FWSB#1 is contained in Table 1. Flow measurements were not collected in April and May of 2006 due to ice cover. This data is also plotted in Figure 3, showing a higher TSS value during the higher flow periods and no or minimal TSS during low flow periods. The results for FWSB#5 are contained in Table 2 and are plotted in Figure 4. Similar to the results for FWSB#1, the higher TSS values correspond to the higher flow period. Again, flow measurements were not made in April and May 2006 due to ice cover.

A comparison of the TSS measurements from 2004, 2005, and 2006 at the two stations is contained in Figure 5. This figure shows that the TSS values have dropped considerably after 2004, which was the first year after construction. The peak values have increased slightly in 2006. The plot also shows that during peak flow TSS was similar upstream and downstream of the former reservoir (2006 maximum TSS of 12 mg/L). Slightly higher values of TSS are generally observed downstream of the former reservoir as compared to upstream.

A comparison of the measured flows from 2004, 2005, and 2006 at the two stations is provided in Figure 6. This data indicates that the flow in 2006 was roughly consistent with the flow observed in 2005 and between 50% and 100% larger than in 2004.

The peak TSS values measured in 2006 were similar to those measured in 2005 and much less than those measured in 2004. The peak TSS measured in 2006 was similar upstream and downstream of the former reservoir, which indicates that the majority of the sediment generation in the reservoir has occurred. In general (i.e. non-peak) result is that TSS is higher downstream than upstream, which indicates that some sediment continues to be removed from the reservoir. These results confirm that the majority of the loose sediment deposited during the life of the reservoir has been removed by the flowing water in 2004, but that some erosion is continuing in the base of the former reservoir.

The chemical testing results for water collected at FWSB#6, the run-off from the potentially acid generating (PAG) spoil area (Figure 1), are shown in Table 3. Included on this table are the maximum discharge criteria provided in the Licence. Based on the grab sample tested, the run-off water did not exceed any of the License criteria.

4.0 GEOTECHNICAL INSPECTION

BGC staff members were on-site three times during 2006 to undertake visual inspections of the completed construction works at the FWS Dam breach and K8 locations. Mr. G. Ferris, P.Eng., visited the Faro Mine site during the periods of June 6 to 10 and August 24 to 29, 2006. The June inspection corresponded with the annual inspection visit for other facilities at Faro Mine and documented the conditions following the spring freshet period. Mr. J. Cassie, P.Eng. visited the Faro Mine during the period September 19 to 21, 2006. This inspection corresponded with the annual inspection visit for other facilities at Faro Mine and documented the conditions at the end of the open water season, during low flow.

On all occasions, the facilities were inspected during a walking tour. A camera and Dictaphone were used to record conditions and observations. The photographs, along with recorded observations, are compiled into a Field Record Summary that is kept in BGC's files. The observations made during the site visits are summarized within this section of the report. The observations of the more recent September visit took precedent over observations made in August and June.

The purpose of the site inspections was to examine the facilities in detail for evidence of deficient performance, to provide a basis for possible adjustment to the frequency of monitoring and to review points of immediate concern which require maintenance with site representatives. Upon return to the office, an inspection memo was prepared that outlined the status of the various structures inspected, highlighted items of concern and items requiring immediate attention. Copies of the inspection memos are attached in Appendix B.

Two different views of the FWSB project area are shown in Figure 7. Included on the 2004 aerial view are the locations of the inlet structure, tension crack and erosion gullies. The locations of these features in 2006, except the erosion gullies, are also shown in the top photo of Figure 7 as viewed from the dam crest.

In general, the channel section through the breach has worked as designed. The majority of the creek flow is concentrated in the channel section, even during a higher flow period (June), as shown in Figure 8. During lower flow conditions (August and September), all of the flow is contained within the channel (Figure 9). During the high flow period, erosion of some of the soil at the downstream limit of construction occurred which has created another riffle zone. The erosion has created some sloughing of the banks (Figure 9).

Channel movement has occurred within the former reservoir and sand and gravel bars have been created in the channel through the reservoir. This has resulted in changes to both the cover available for fish and to the river morphology as discussed in the aquatic report. The transition from Reach 1 to Reach 2, as defined in the aquatics report in Appendix D, is the area of main concern. Monitoring of the progression of erosion in this area is being conducted via: comparison of the position of stakes to the banks and comparison of photos of the area. This erosion has been the subject of discussion between staff member of D&T, BGC, Laberge, White Mountain and the Department of Fisheries and Oceans (DFO). The conclusion reached during 2006 was that "additional protective measures would not be required at this time". These types of changes were expected given the "adaptive management" approach selected for the channel within the former reservoir (SRK et al. 2003). Based on the discussions with DFO it was concluded that this area will require some additional monitoring during the spring freshet of 2007, further details are provided in Section 7.1. No blockage of any of the channels has occurred.

The constructed breach section is performing as designed (Figure 9) with some movement of the riprap at the crest of the riffles is occurring but nothing that requires remedial work.

Some cracks and slumping were evident above the upper limit of the erosion protection. This slumping appeared to be related to the steep nature of the excavations made to install the erosion protection. One larger-scale tension crack was encountered on the south bank of the excavation section between Riffle 1 and Riffle 2, as shown on Figure 7.

A significant slough previously developed on the south valley wall, just upstream from the south abutment of the breached dam. A view of the development of this slough is shown in Figure 10. The slough appears to be driven by seepage from the valley wall. The slough appears to be partially stabilizing itself and this process should be monitored. Visual monitoring should be undertaken to ensure that seepage water does not carry any sediment into the nearby creek.

Small erosion gullies have formed on the right bank of the breach, between the inlet structure and Riffle 1. These gullies have formed due to overland flow on the surface of the upstream seepage blanket of the dam. The gullies appear to be self-armouring as they have eroded (Figure 10), although small amounts of further erosion is expected. Due to the gully formation, a small amount of sediment has been deposited on the surface of the erosion protection and onto the floodplain surface. This amount of deposition is not significant for the performance of the erosion protection or the floodplain. Placement of a small deflection berm could arrest the development of the gullies and could be considered if the situation worsens.

During the June 2006 inspection, the berm placed around the PAG stockpile was full of water. This water was sampled (FWSB 6) and tested and the results were reported in Section 2 and summarized on Table 3.

In 2004, riprap was placed within the K8 Creek tributary in a location where significant erosion was occurring (BGC 2004). In 2005, some minor repairs were carried out following some minor movement of the riprap (BGC 2006). The minor repairs (placement of additional riprap) were completed by site personnel. The riprap appears to have arrested the erosion (Figure 11) and a distinct channel is beginning to form downstream from the borrow pit, although this process is not yet complete (Figure 11).

5.0 RE-VEGETATION

Observations of the re-vegetation efforts in the reservoir area were made by BGC in both June and September. Photos of the re-vegetated areas are shown in Figure 12, and additional photos are contained in Appendix C.

The re-vegetation monitoring program described in Part E of the License was performed in 2006 by Laberge; their full report is included as Appendix C. The Laberge report covers two aspects:

1. An assessment of the re-vegetation undertaken by Arctic Alpine Seed Ltd. in 2003 and 2004, as well as natural re-vegetation, and
2. A description of any evidence of erosion.

The evaluation of the re-vegetation success was undertaken for the five different phases of planting:

- Phase I planting occurred between Elevations 1096 and 1090 m amsl in June 2003. In July 2006, this area had an overall vegetative cover of greater than 90%, similar to 2005. Very little natural re-vegetation is occurring in this zone due to the success of the planted vegetation, dominantly Sheep Fescue.

- Phase II planting occurred between Elevations 1090 and 1086 m amsl in September 2003. In July 2006, this area had an overall vegetative cover of approximately 80%, slightly higher that the 70% observed in 2005. The increased vegetative cover created by the planted species (Sheep Fescue, Wheatgrass, Tufted Hairgrass, and Alpine Bluegrass) has limited the natural colonization of the area by pioneering plant species.
- Phase III planting occurred in September 2003 and consisted of the planting of willows in the riparian zone as a trial to show the success of the proposed planting methodology. The survival rate of about 80% at the time of the 2006 assessment, much higher the survival rate of 10% to 30% noted during the 2005 assessment.
- Phase IV planting occurred on the exposed base of the former freshwater reservoir in June and July 2004. In July 2006, this area had an overall vegetative cover varying from 80 to 100%, much denser than the 30 to 60% observed during the 2005 survey. A few small depressions in this zone remain devoid of vegetation.
- Phase V planting occurred at the dam area, the disturbed area downstream of the dam, and the floodplains adjacent to the breach in September and October 2004. In July 2006, this area had an overall vegetative cover varying from 20 to 60%, similar to the cover observed during the 2005 survey.

The floodplains adjacent to the dam breach had a vegetative cover of approximately 20%, similar to 2005. This low cover was likely due to flooding experienced during the freshets.

The northwest (downstream) wall and the southeast (upstream) wall of the breached dam showed good natural growth of willows and a few alders. A moderate (40 to 60%) cover of seeded grass species was also observed on the southeast wall. The side slopes of the breach had a 10% vegetative cover. The cover on the breach consists of both the seeded species as well as natural re-vegetation.

In addition to the above mentioned seeding, in 2003/2004, the riparian area was planted, except for a small portion of the northeast tributary where the final channel location was not yet established. Evaluation of these sites in July 2006 indicated the staked willows on the floodplains upstream and downstream of the dam breach had a survival rate of 80%. A much lower survival rate of 10% to 30% was observed for the willows staked along the upper tributaries, similar to the observations made in 2005.

The assessment of the re-vegetation performed in 2006 indicated that the site is performing very well and only continued monitoring of the bank erosion along Rose Creek and it's tributaries is recommended (Laberge 2006, Appendix C).

6.0 AQUATIC ENVIRONMENT

An evaluation of the aquatic environment, as described in SRK et al. 2003 and the EMP for the project, was completed by WM. Their full report is attached in Appendix D.

WM presented information related to fish species and habitat conditions within the five reaches covering the former reservoir, the breach section and a reach downstream from the breach construction area. This study also covered a short reach of Rose Creek downstream from the lower limit of the Rose Creek Diversion Canal and upstream from Station X14. A full description of the reaches, including justification for the reach breaks, is contained in the WM report. Assessments were conducted during the spring (between May 31 and June 2) and summer (between August 14 and 18, 2006).

The study made the following conclusions concerning habitat and fish utilization in the study areas:

- Reach 1 has a low profile with fast and turbulent water cover for small fish in the form of deep spacing between boulders; however, an increase of sand and gravel deposition has reduced the interstitial spacing during 2006. Six Arctic grayling, two Burbot and 13 Slimy Sculpins were encountered during electro-fishing (total from two passes).
- Reach 2 has undergone noticeable bank erosion along with point bar development in 2006. The cover remains limited. No Arctic grayling, no Burbot and 155 Slimy Sculpins were encountered during electro-fishing (total from two passes).
- Reach 3 has limited amounts of cover occur in the upper parts of the reach, but the cover increases from undercut banks and increased depth in the portion of this reach. Several areas of the reach may provide possible Arctic grayling spawning areas. No Arctic grayling, one Burbot and 124 Slimy Sculpins were encountered during electro-fishing (total from two passes).
- In Reach 4, the newly created channel provides good fish habitats with stable banks and channel features. Fish cover amongst the cobbles and boulders is enhanced by the depth and the adjacent riffles. One Arctic grayling, One Burbot and eight Slimy Sculpin were encountered during electro-fishing (total from two passes).
- In Reach 5, boulders and cobbles are clear of fines and provide good interstitial spacing. Well established riparian vegetation exists through the reach. Four Arctic grayling, no Burbot, three Slimy Sculpins and one Round Whitefish were encountered during electro-fishing (single pass).
- Electro-fishing was not conducted at location X-14 (Rose Creek downstream of the Rose Creek Diversion Canal) in 2006. Nine minnow traps were set in this area; however, no fish were captured.

A summary comparison (2004, 2005 and 2006) of the electro-fishing results is included as Table 4.

The conclusions of the fish utilization study were:

- Reach #1 - a general decrease in all species and age groups except for Slimy Sculpin fry, which were recorded for the first time in Reach #1.
- Reach #2 - a substantial increase in the Slimy Sculpin Adult population was observed with a corresponding decrease in the Slimy Sculpin Fry population. Burbot were observed for the first time in 2006.
- Reach #3 - a substantial increase in the Slimy Sculpin Adult population was observed with a slight decrease in the Slimy Sculpin Fry population. The population of both Arctic Grayling and Burbot observed in 2006 decreased.
- Reach #4 – An average population of Slimy Sculpin was observed. The steady decrease in the population of Arctic Grayling and Burbot continued in 2006.
- Reach #5 – All observed fish populations appeared consistent with previous years.
- Site X-14 – A significant decrease in Chinook salmon population was observed in 2006.

The aquatic assessment indicated that changes to the habitat are continuing, mostly related to the loss of overhanging banks and the creation or change to banks within the channel section. Additional data collection will be necessary before any commentary is possible on the fish utilization of the breach and de-watered reservoir. All reaches of the breach and de-watered reservoir are utilized by fish.

7.0 RECOMMENDATIONS

The following section provides summary recommendations with respect to routine inspections, monitoring, maintenance and annual inspections for 2007.

7.1 Routine Inspections and Monitoring

The following routine inspection and monitoring should be performed by site staff, as part of good practice and in order to comply with the Licence:

- Monitor the flow quantity and TSS at FWSB#1 and FWSB#5 twice per month between April and August (inclusive).
- Monitor and sample the run-off from FWSB#6 for acidity and metals, once per year.
- Perform twice monthly visual inspections of the performance of the sideslopes and constructed creek elements. The three areas of concentration should be the slough near the south abutment of the dam, the erosion gullies near the inlet on the north side of the breach, the tension crack between Riffle 2 and 3 on the south side of the breach channel and the tension cracks forming upslope from the top of the erosion protection.
- Perform twice monthly visual inspection of the portion of the fresh water channel that was not modified as part of the breach construction (part of the adaptive management).
- Perform monthly visual inspection of South Fork of Rose Creek and tributaries through the former reservoir area, checking for channel blockage.

This data should be collected and reviewed as part of the annual review of the performance of the breach and to validate the adaptive management approach taken.

Any change in condition that is noted as a consequence of this program of routine inspection must be brought immediately to the attention of the inspector's superiors. BGC should also be notified so that the condition can be evaluated and to provide any necessary geotechnical advice related to the concern at hand. Photos of any changed condition should be taken.

7.2 Annual Reviews

The purpose of annual reviews is to provide a record of the performance of the facilities. The annual inspection of the physical performance of the breach and K8 creek area should be performed in May/June and September of 2007. The annual inspection of the re-vegetation and aquatic life/habitat should be performed in July / August 2007.

The May/June inspection should be timed so that it coincides with the spring freshet as closely as possible. As discussed in Section 4.0, it was agreed that staff members from BGC, White Mountain, Laberge and DFO would conduct a site review during spring freshet. The purpose of this review during freshet would be to record any physical changes within the channel that may lead to the degradation of fish habitat and/or riparian vegetation. Specifically, the transition area from Reach 1 to Reach 2 is a main area of concern but the entire length of the channel will be reviewed during this time. This inspection will include collection of photographs and a comparison with photographs from past inspections.

7.3 Recommendations for Remedial Actions

The following recommendations for remedial actions are made:

- The slough area located near the south abutment should be reviewed in the spring and allowed to re-vegetated naturally now that the majority of movement appears to have stopped. The vegetation should limit sediment generation from this area.

8.0 CLOSURE

This report summarizes the physical conditions as observed by BGC, Laberge and WM and the water testing results as collected by site staff. Thank you for the opportunity to be of service to Deloitte & Touche and Faro Mine. Should you have any questions on this report, please contact BGC at your convenience.

Respectfully submitted,
BGC Engineering Inc.
per:

Gerry Ferris, M.Sc., P.Eng. (AB)
Geotechnical Engineer

James W. Cassie, M.Sc., P.Eng.
Specialist Geotechnical Engineer

REFERENCES

BGC Engineering Inc. 2004 K8 Creek Construction, As-built Report. Report prepared for Deloitte & Touche Inc., June 2004.

BGC Engineering Inc. 2005. Fresh Water Supply Dam Breach Project, 2005 Annual Report. Report prepared for Deloitte & Touch, February 2006.

SRK Consulting Inc., BGC Engineering Inc. and Gartner Lee Ltd. 2003. Final Breach Design, Fresh Water Supply Dan, Faro Mine. Report prepared for Deloitte and Touche Inc., April 2003.

SRK Consulting Inc. and BGC Engineering Inc. 2004. As-built Construction Report, Fresh Water Supply Dam Breach, Faro Mine. Report submitted to Deloitte and Touche Inc., February 2004 .

TABLES

Table 1 - Monitoring Results for FWSB#1

Date	TSS	Flow (m^3/s)	Comments
April 19, 2006	<1	-	refer to Note 1
April 27, 2006	<1	-	refer to Note 1
May 8, 2006	1	-	refer to Note 1
May 23, 2006	12	-	refer to Note 1
June 14, 2006	3	1.885	
June 26, 2006	<1	0.668	
July 5, 2006	2	0.675	
July 25, 2006	<1	0.577	
August 11, 2006	<1	0.653	
August 31, 2006	<1	0.681	

Note 1: The creek was ice covered and collection of reliable flow data was not possible.

Table 2 - Monitoring Results for FWSB#5

Date	TSS	Flow (m^3/s)	Comments
April 19, 2006	2	-	refer to Note 1
April 27, 2006	2	-	refer to Note 1
May 8, 2006	6	-	refer to Note 1
May 23, 2006	12	-	refer to Note 1
June 14, 2006	8	2.531	
June 26, 2006	6	0.932	
July 5, 2006	3	0.761	
July 25, 2006	1	0.681	
August 10, 2006	1	0.799	
August 29, 2006	1	0.907	

Note 1: The creek was ice covered and collection of reliable flow data was not possible.

Table 3 - Laboratory Test Results for Run-off from PAG Spoil Area (FWSB#6)

Parameter	May 24, 2006 Results (mg/L unless noted)	Laboratory Detection Limit (mg/L)	Maximum Allowable Concentration (mg/L)[2]
Temperature	8.6°C		
pH[1]	8.4		
Total Suspended Solids	2		
Total Dissolved Solids	221		
Sulphate	80.5		
Conductivity	294 µS/cm		
Total Alkalinity	45.1		
Total Hardness	133		
Total Antimony (Sb)	<0.001	0.001	0.1
Total Arsenic (As)	<0.001	0.001	0.05
Total Barium (Ba)	0.039	0.023	1
Note 1:	<0.0002	0.0002	0.02
Total Copper (Cu)	0.003	0.001	0.2
Total Lead (Pb)	0.001	0.001	0.2
Total Mercury (Hg)	<0.02 µg/L	0.02 µg/L	0.005
Total Molybdenum (Mo)	0.0008	0.0005	0.5
Total Nickel (Ni)	<0.001	0.001	0.5
Total Selenium (Se)	<0.001	0.001	0.05
Total Silver (Ag)	<0.00025	0.00025	0.1
Total Zinc (Zn)	0.005	0.005	0.5

[1] pH does not have units of mg/L.

[2]Maximum Allowable Concentrations from Water Licence QZ03-058

Table 4 - Electro-Fishing Results

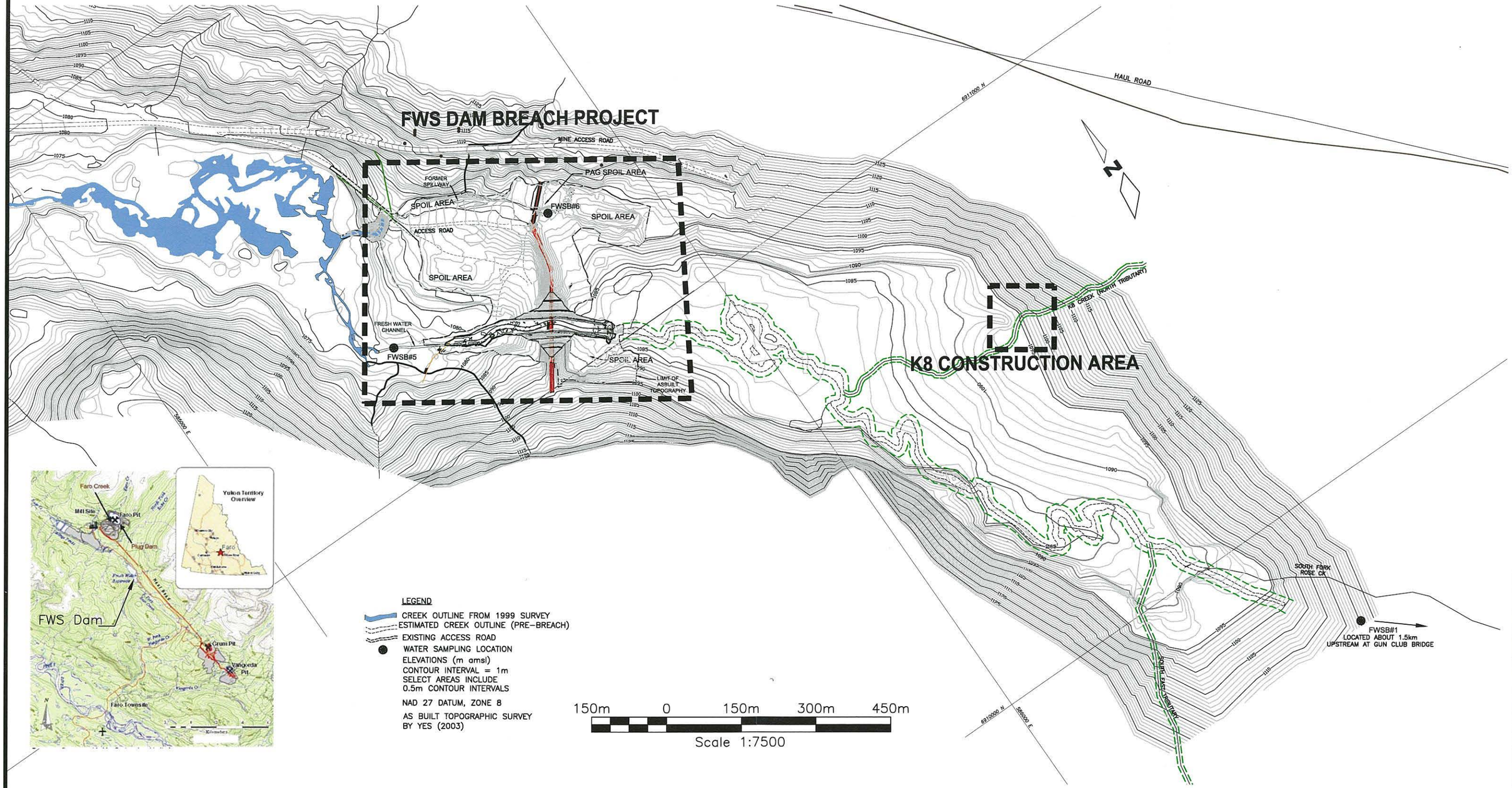
Reach	Fish Type	Total Catch*		
		2004	2005	2006
1	Arctic Grayling	31	47	6
	Burbot	11	3	2
	Slimy Sculpins	21	22	13
2	Arctic Grayling	7	5	0
	Burbot	0	0	3
	Slimy Sculpins	132	69	155
3	Arctic Grayling	5	1	0
	Burbot	11	3	1
	Slimy Sculpins	38	77	124
4	Arctic Grayling	38	4	1
	Burbot	11	1	1
	Slimy Sculpins	19	10	8
5†	Arctic Grayling	26	30	4
	Burbot	5	1	0
	Slimy Sculpins	5	11	3
	Chinook Salmon	0	1	0
	Round Whitefish	0	0	1

* Based on 2 pass block net, electro-fishing technique.

† Based on 1 pass electro-fishing technique.

FIGURES

FWS DAM BREACH PROJECT



REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.

SCALE	AS SHOWN
DATE	JAN 2007
DRAWN	REM
DESIGNED	JMS
CHECKED	GWF
APPROVED	JWC

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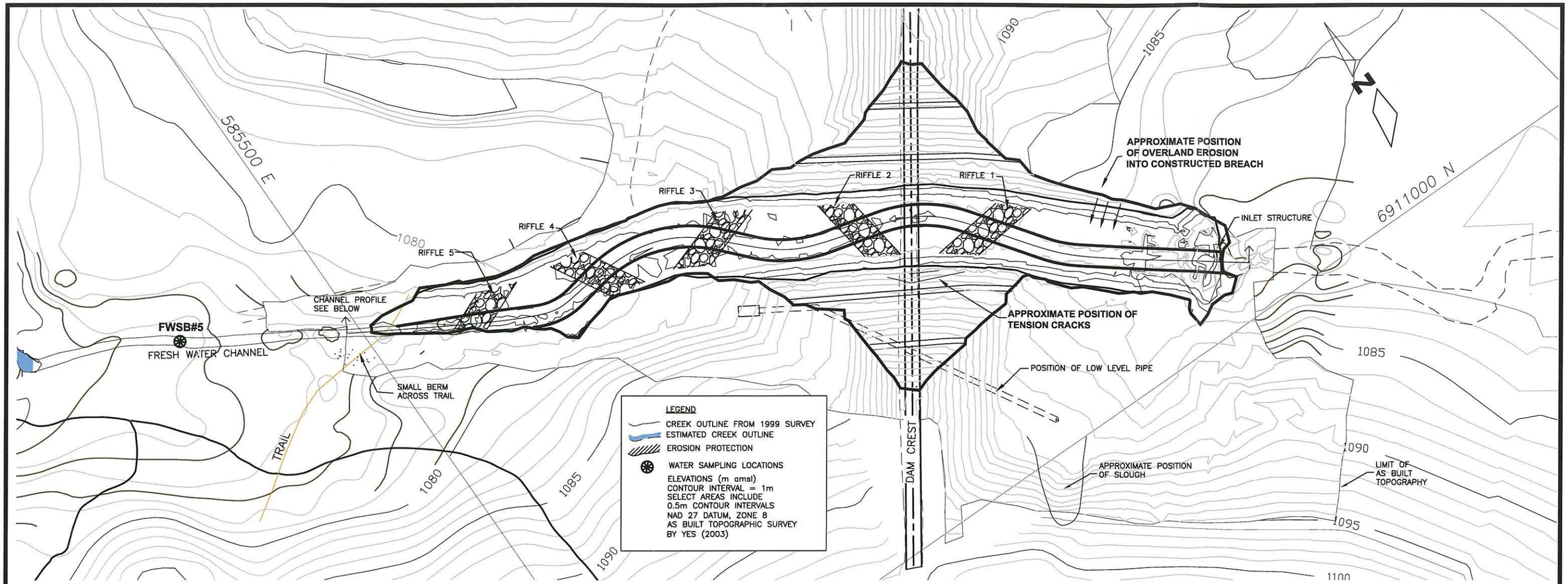
CLIENT
Deloitte & Touche

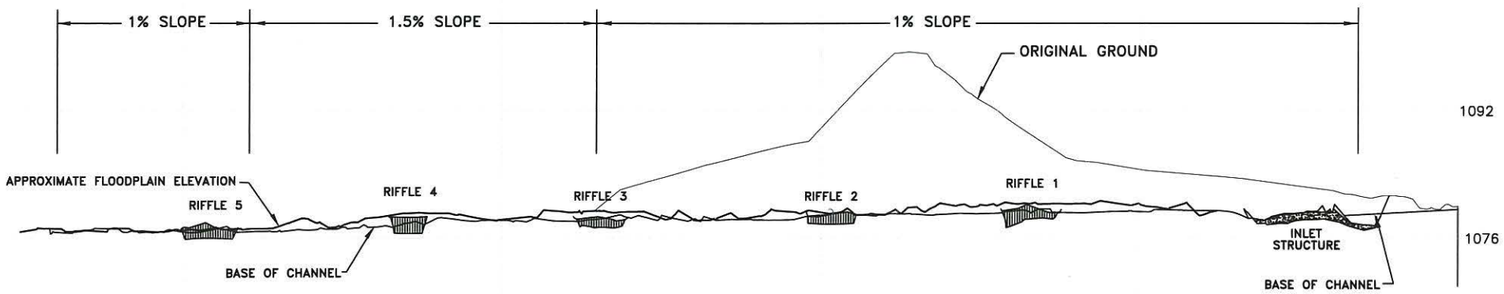
PROJECT
2006 ANNUAL REPORT, FWSB

TITLE
LOCATION PLAN

PROJECT No.	FIG No.	REV.
0257-040-01	1	0

0257-040-01 FIGURE_1.dwg





30m 0 30m 60m 90m

SCALE = 1:1500

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.

SCALE	AS SHOWN
DATE	JAN 2007
DRAWN	REM
DESIGNED	JMS
CHECKED	GWF
APPROVED	JWC

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Calgary, AB Phone: (403) 250 5185

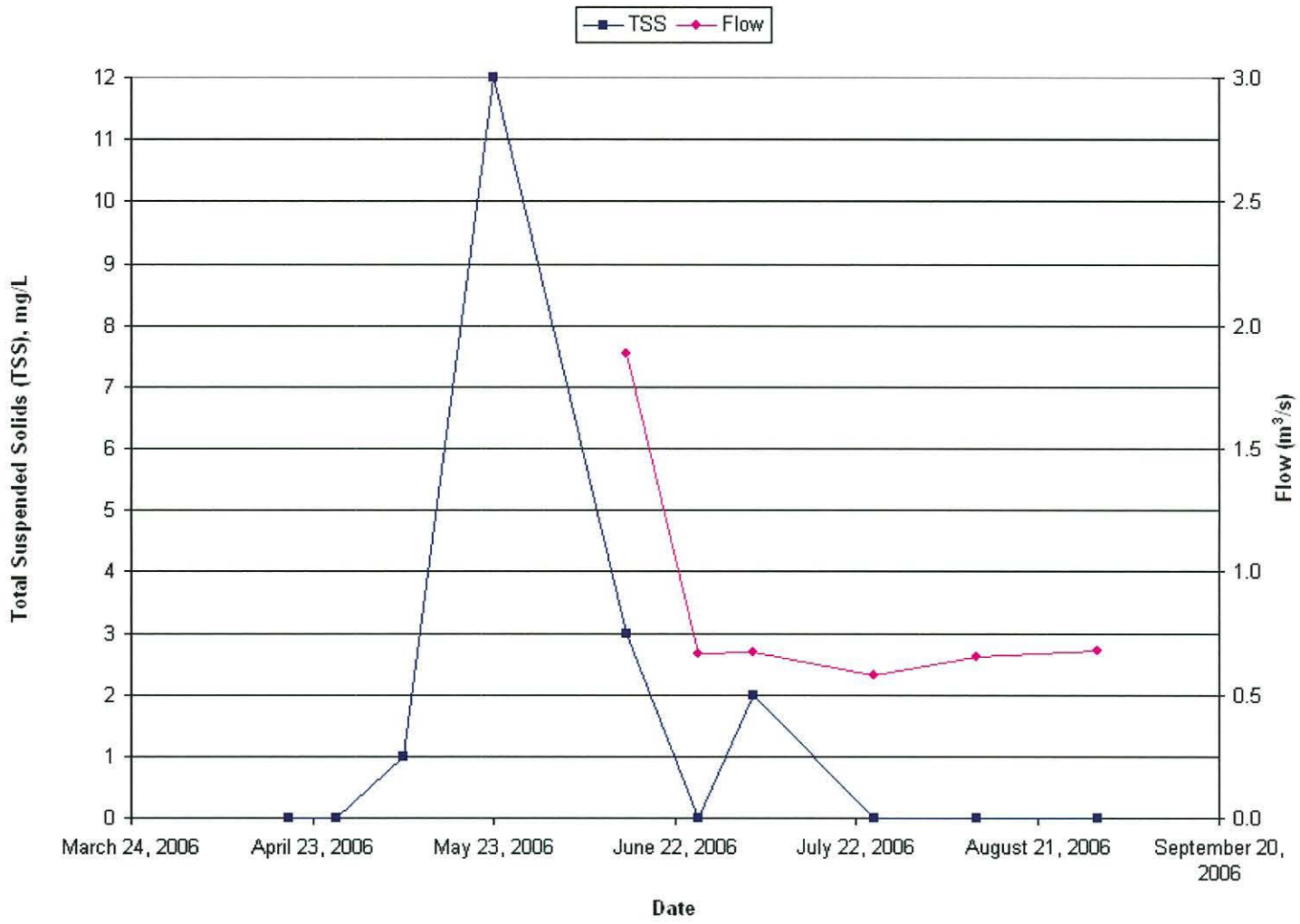
CLIENT
Deloitte & Touche

PROJECT
2006 ANNUAL REPORT, FWSB

TITLE
AS-BUILT FWSB PLAN AND PROFILE

PROJECT No.	FIG.	REV.
0257-040-01	2	0

0257-040-01 FIGURE_2.dwg



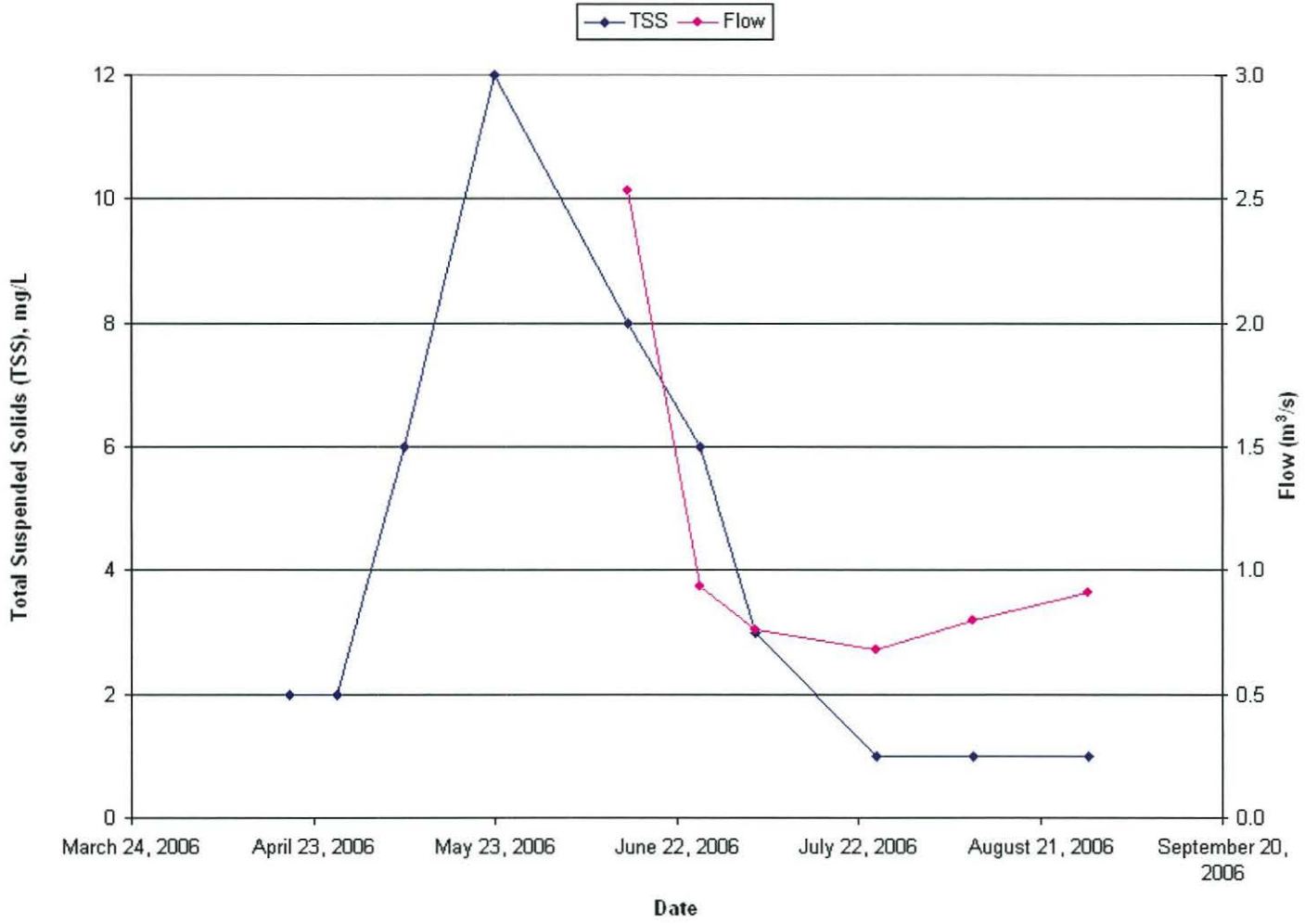
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Calgary, Alberta
Phone: (403) 250-5185

Client: Deloitte & Touche

Project: 2006 ANNUAL REPORT, FWSB

Title: MONITORING RESULTS FOR FWSB #1

Project #:	Date:	Scale:	Drawn:	Approved:	Figure:
0257-040-01	JAN 2007	NA	JMS	JWC	3



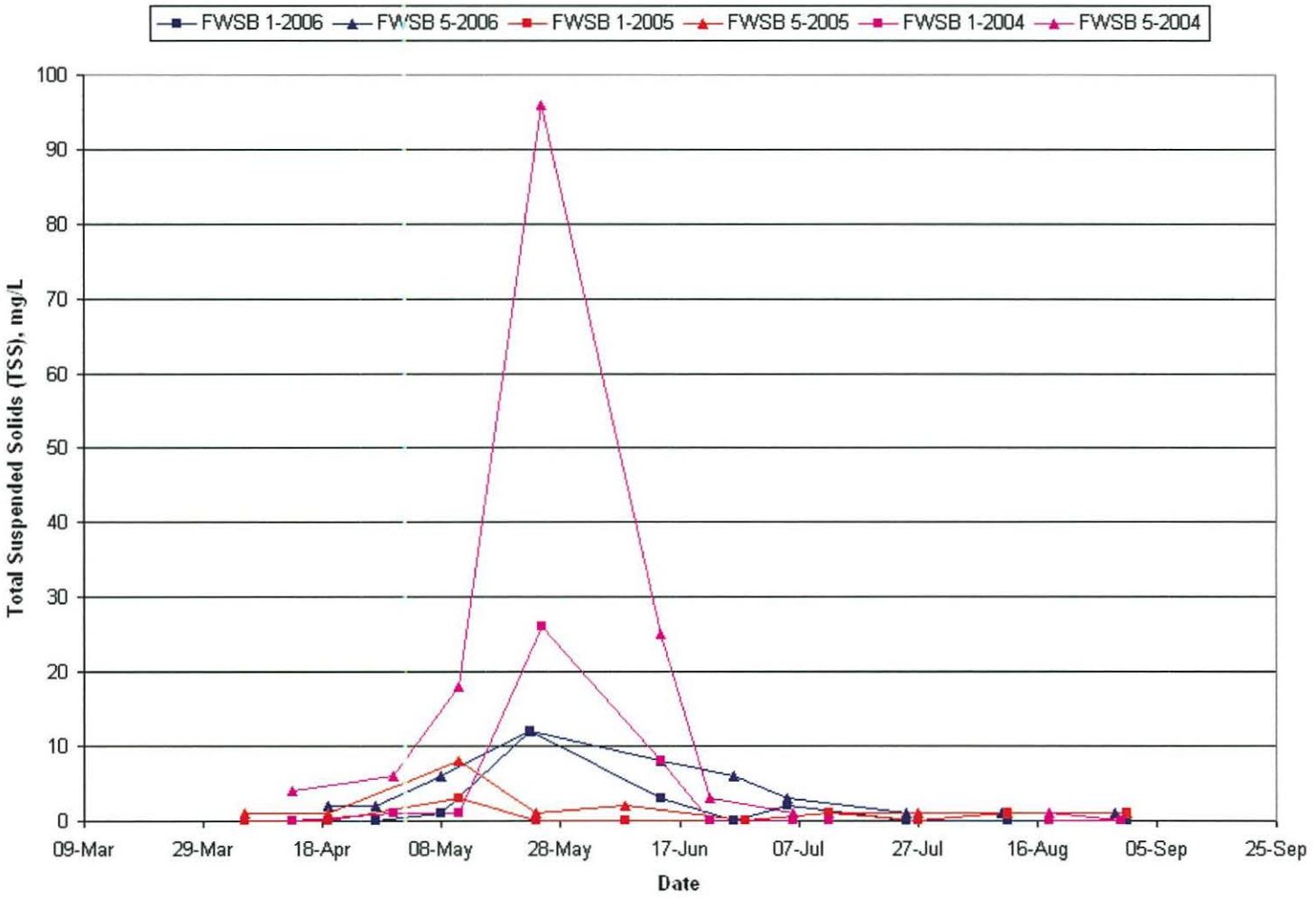
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Calgary, Alberta
Phone: (403) 250-5185

Client: Deloitte & Touche

Project: 2006 ANNUAL REPORT, FWSB

Title: MONITORING RESULTS FOR FWSB #5

Project #:	Date:	Scale:	Drawn:	Approved:	Figure:
0257-040-01	JAN 2007	NA	JMS	JWC	4



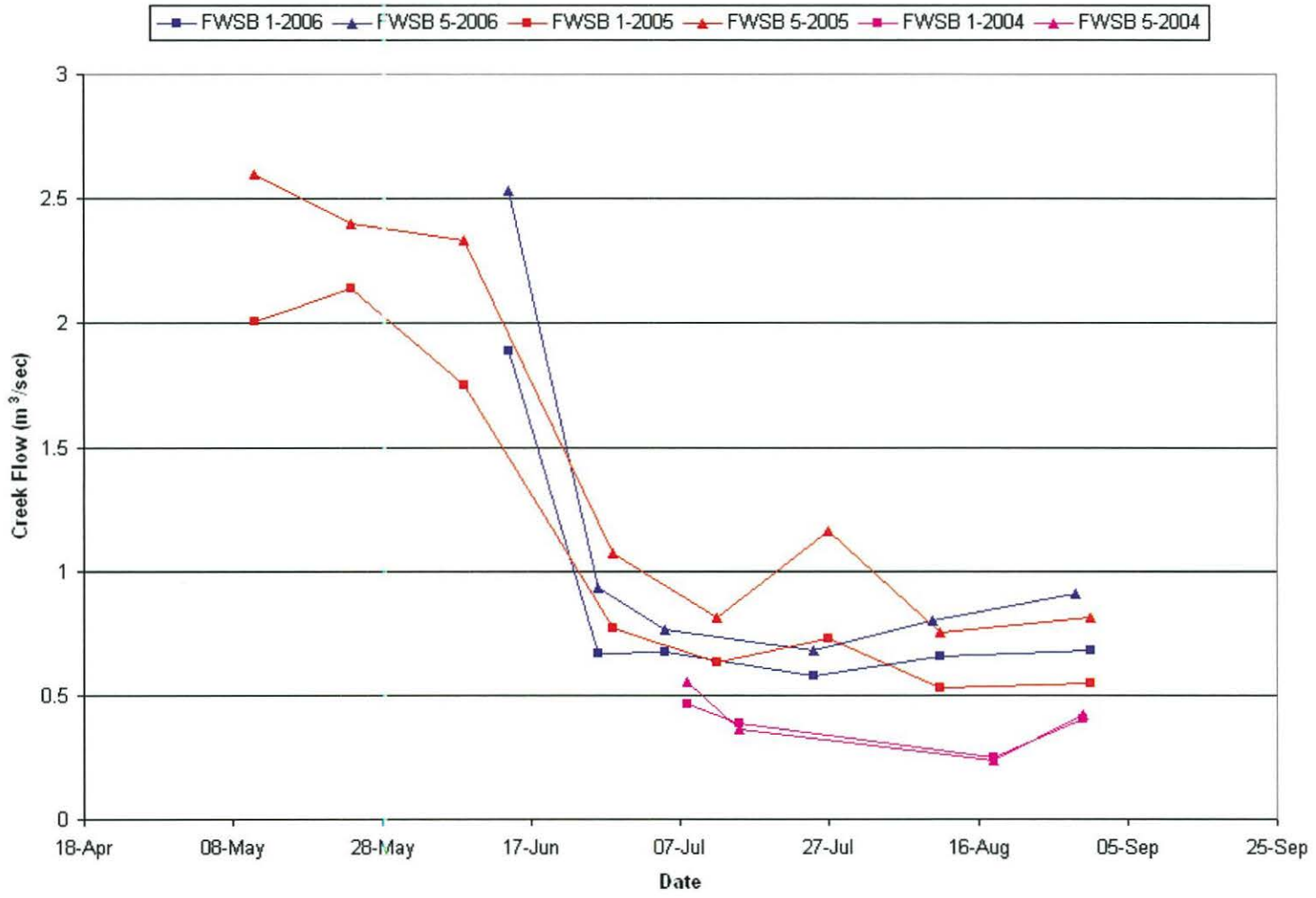
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Calgary, Alberta
Phone: (403) 250-5185

Client: Deloitte & Touche

Project: 2006 ANNUAL REPORT, FWSB

Title: COMPARISON OF TSS RESULTS, FWSB #1 AND FWSB #5

Project #:	Date:	Scale:	Drawn:	Approved:	Figure:
0257-040-01	JAN 2007	NA	JMS	JWC	5



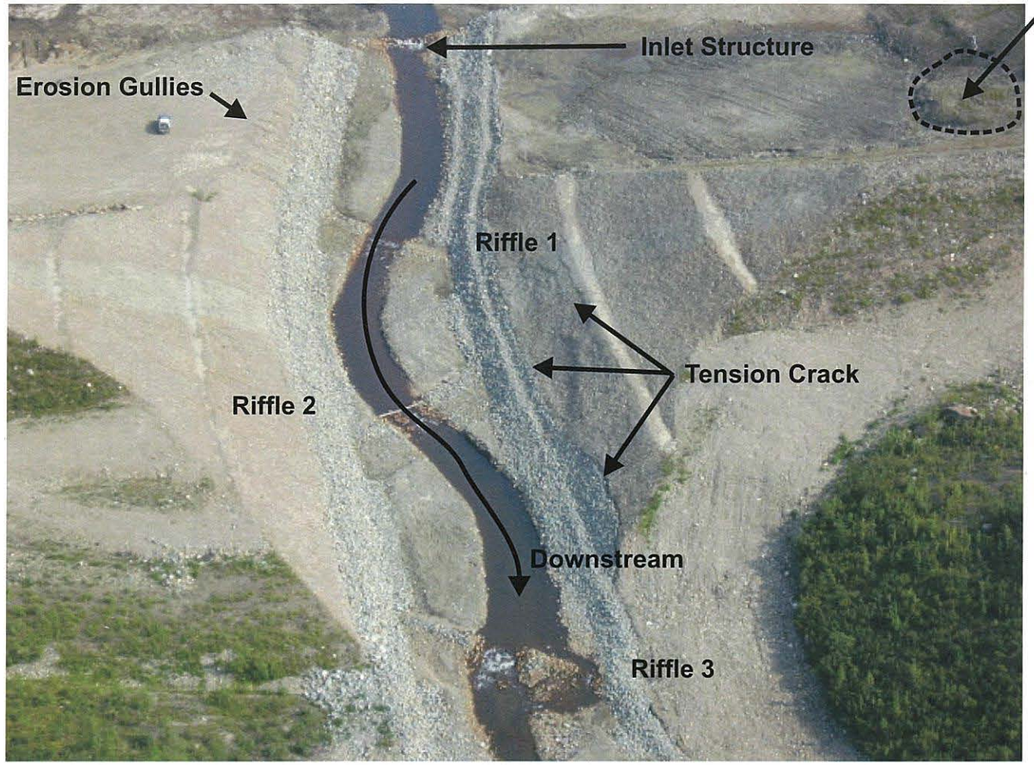
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Calgary, Alberta
Phone: (403) 250-5185

Client: Deloitte & Touche

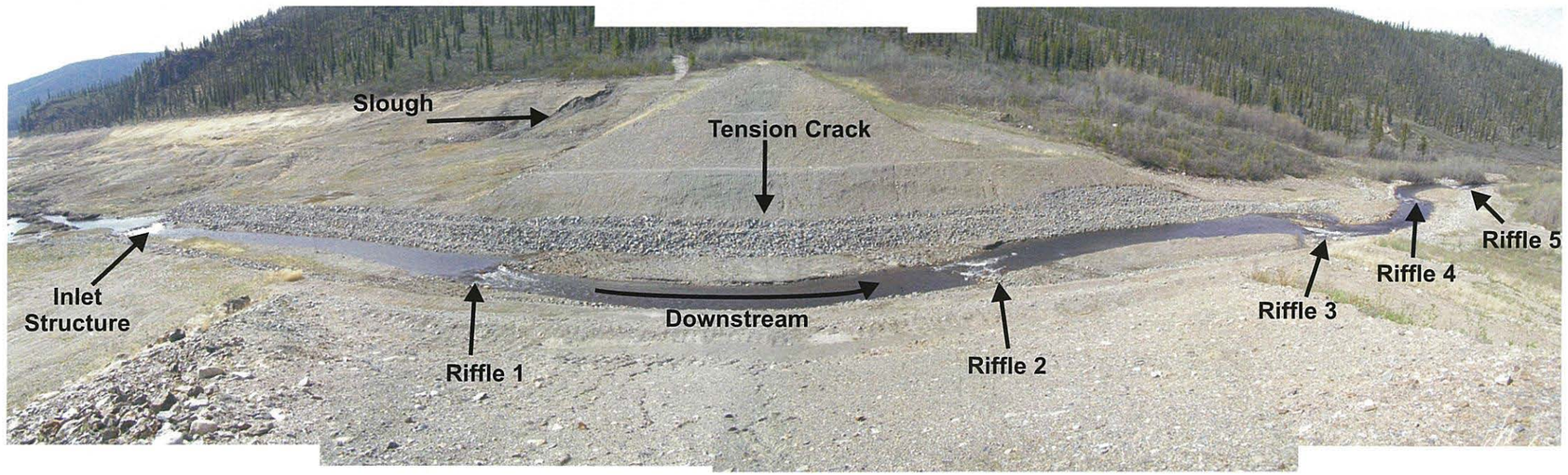
Project: 2006 ANNUAL REPORT, FWSB

Title: COMPARISON OF FLOW RESULTS, FWSB #1 AND FWSB #5

Project #:	Date:	Scale:	Drawn:	Approved:	Figure:
0257-040-01	JAN 2007	NA	JMS	JWC	6



August 2004: An aerial view of the breach section. This overview of the project shows the location of the breach and channel. Also shown is the slough on the former reservoir wall, the erosion gullies, the tension crack located between Riffle 1 and 2. The water flowing around the left side of Riffle 3 shown in this photo was repaired in September 2004.



June: The breach channel through the dam. As shown at the far left, some stream braiding has occurred upstream of the inlet structure. This photo also shows the slough, the location of tension cracks in the core of the dam and the five riffles.

CLIENT:

Deloitte & Touche

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
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SCALE:	N/A
DATE:	JANUARY 2007
DRAWN:	SLF
DESIGNED:	JMS
CHECKED:	GWF
APPROVED:	JWC

PROJECT: 2006 ANNUAL REPORT, FWSB

TITLE: 2004 TO 2006 COMPARISON OF FWS DAM BREACH

PROJECT No.	Figure No.	REV.
0257-040-01	7	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185

June: Flow in the channel and flood plain during higher flow period immediately upstream of breach. The channel has formed into a braided stream upstream of the inlet structure.

June: Looking along crest of inlet structure.

September: A view of the normal Fall water flow within the channel at Riffle 3.

June: Looking downstream at Riffle 2.

CLIENT:

Deloitte & Touche

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
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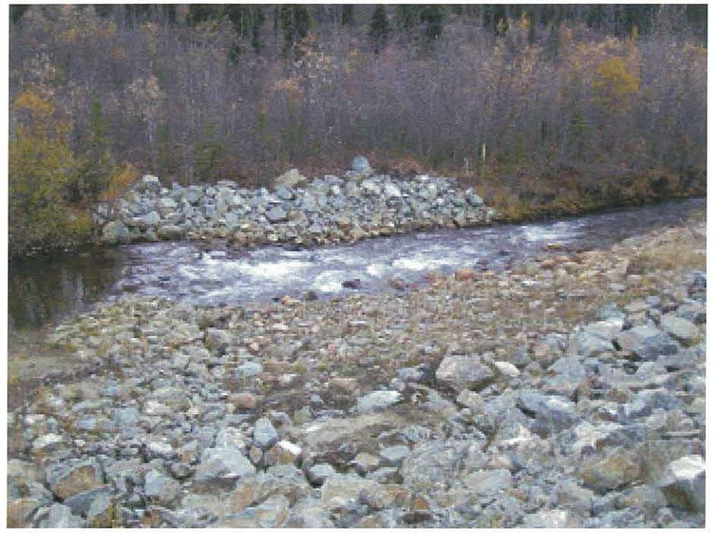
SCALE:	N/A
DATE:	JANUARY 2007
DRAWN:	SLF
DESIGNED:	JMS
CHECKED:	GWF
APPROVED:	JWC

PROJECT: 2006 ANNUAL REPORT, FWSB

TITLE: CHANNEL FLOW PHOTOS

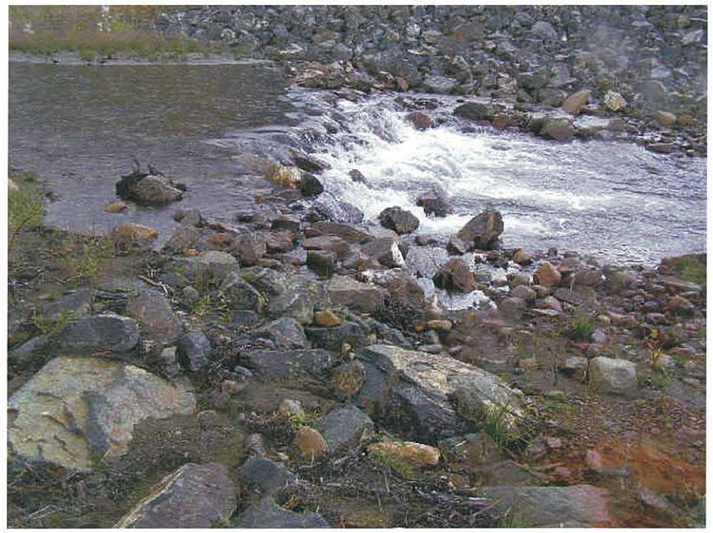
PROJECT No.	Figure No.	REV.
0257-040-01	8	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta Phone: (403) 250-5185



September: Shows the condition of Riffle 5. The riprap on the far side appears to be in good condition.

September: Flow contained in channel during low flow period near Riffle 3.



August: Looking along the crest of Riffle 3.

June: Erosion of left bank immediately downstream of the limit of the 2003 construction.

CLIENT:

Deloitte & Touche

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
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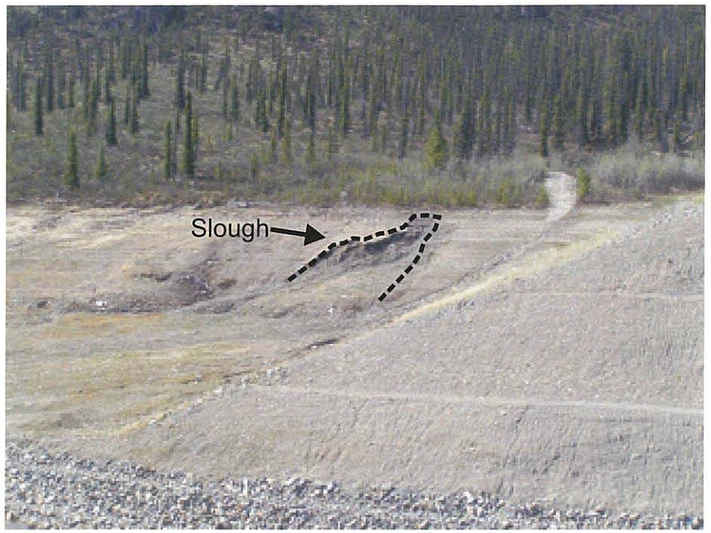
SCALE:	N/A
DATE:	JANUARY 2007
DRAWN:	SLF
DESIGNED:	JMS
CHECKED:	GWF
APPROVED:	JWC

PROJECT: 2006 ANNUAL REPORT, FWSB

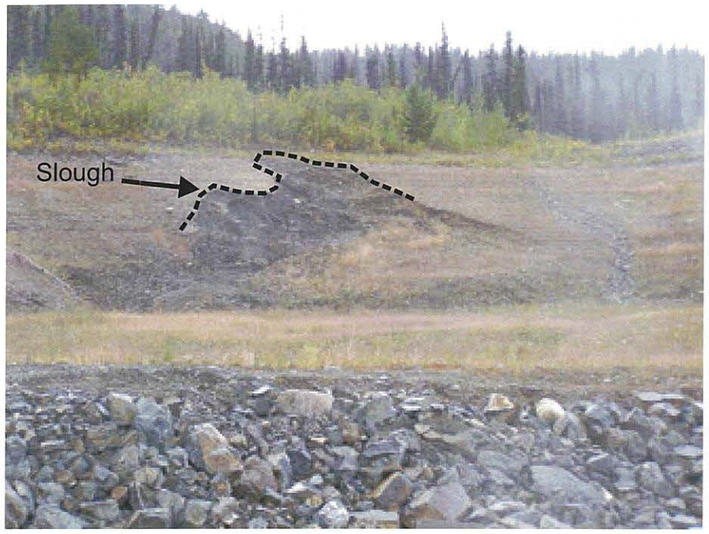
TITLE: DOWNSTREAM CHANNEL PHOTOS

PROJECT No.	Figure No.	REV.
0257-040-01	9	0

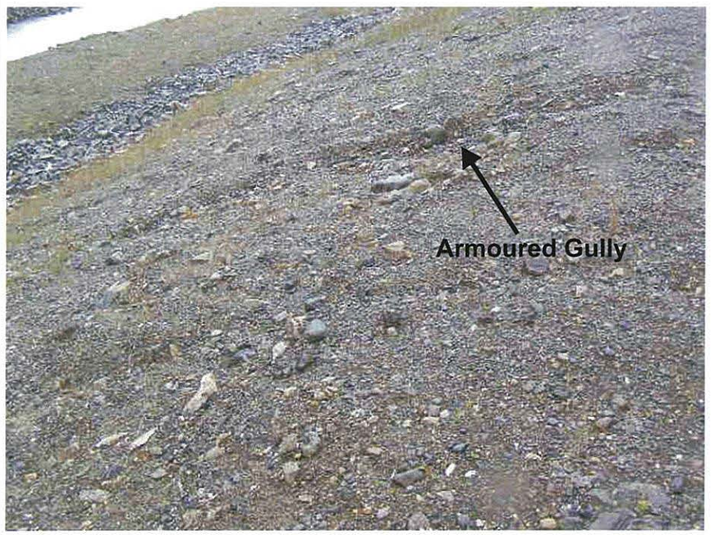
BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta Phone: (403) 250-5185



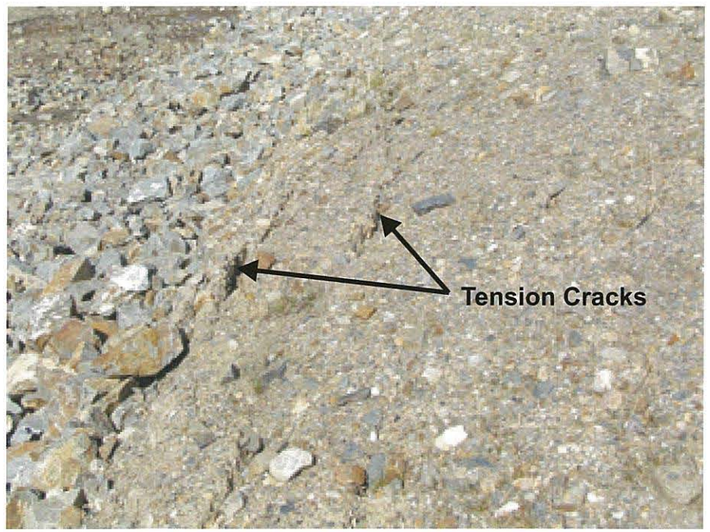
June: Shows a view of the slough located over towards the south abutment.



August: Shows a view of the slough at south abutment, which appears to be partly stabilizing itself and naturally re-vegetating.



August: View of erosional gullies which have formed on the right side of the breach. Note that these gullies appear to be self-armouring.



June: Shows longitudinal tension cracks located behind the riprap near channel.

CLIENT:

Deloitte & Touche

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
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SCALE:	N/A
DATE:	JANUARY 2007
DRAWN:	SLF
DESIGNED:	JMS
CHECKED:	GWF
APPROVED:	JWC

PROJECT		
2006 ANNUAL REPORT, FWSB		
TITLE		
VARIOUS FEATURES		
PROJECT No.	Figure No.	REV.
0257-040-01	10	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta Phone: (403) 250-5185

June: Shows a view of the creek, looking in the upstream direction.

September: View looking in the downstream direction.

June: View of K8 Creek entering the reservoir area.

June: View of the K8 Creek entering the reservoir area from the borrow pit Note that the water flow has now formed into a distinct channel at the outlet of the borrow pit.

CLIENT:

Deloitte & Touche

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	JANUARY 2007
DRAWN:	SLF
DESIGNED:	JMS
CHECKED:	GWF
APPROVED:	JWC

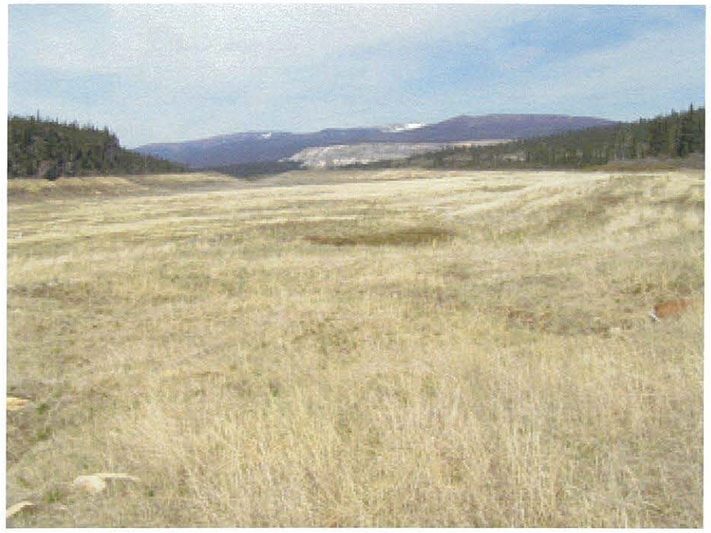
PROJECT: 2006 ANNUAL REPORT, FWSB

TITLE: K8 CREEK OBSERVATIONS

PROJECT No.	Figure No.	REV.
0257-040-01	11	A

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta Phone: (403) 250-5185

June: Shows the condition of the vegetation at the upstream end of the reservoir. The early phases of re-vegetation in the upper part of the former reservoir appears to be performing better than the later (lower) re-vegetation efforts.



June: View of vegetation in the former reservoir looking towards the breach in the background.

September: Shows an overall view of the vegetation in the former reservoir bottom. Note the recent sand and fines deposited by creek.

September: A general view of the former reservoir bottom and the upstream side of the Fresh Water Supply Dam Breach.

CLIENT:

Deloitte & Touche

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	JANUARY 2007
DRAWN:	SLF
DESIGNED:	JMS
CHECKED:	GWF
APPROVED:	JWC

PROJECT: 2006 ANNUAL REPORT, FWSB

TITLE: RE-VEGETATION OBSERVATIONS

PROJECT No.	Figure No.	REV.
0257-040-01	12	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta Phone: (403) 250-5185

APPENDIX A – MONTHLY REPORTS

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
1605, 840 - 7 Avenue SW
Calgary, Alberta T2P 3G2
Tel.: (403) 250-5185
Fax: (403) 250-5330

0257-040-01
May 4, 2006

Yukon Territory Water Board
Suite 106 - 419 Range Road
Whitehorse, Yukon
Y1A 3V1
Fax (867) 456-3890

RE: APRIL MONTHLY SAMPLING RESULTS FOR QZ03-058, FARO MINE, YUKON

Dear Board:

This letter report fulfills the monthly reporting requirement (item 15) for Water License QZ03-058 for the month of April 2006. I trust that this information is self-explanatory. However, if you have any questions please do not hesitate to contact us.

Table 1 Summary of Monthly Sampling Results, April 2006

Date	Sample	TSS (mg/L)	Flow (m^3/s)	Comments
April 19	FWSD-1	<1	note 1	Creek was ice covered
April 19	FWSD-5	2	note 1	Creek was ice covered
April 27	FWSD-1	<1	note 1	Creek was ice covered
April 27	FWSD-5	2	note 1	Creek was ice covered

Note: 1: The creek was ice covered and collection of reliable flow data was not possible. Flow measurements will commence once it is safe to do so.

Yours truly,
BGC Engineering Inc.
Per:

Gerry Ferris, M.Sc., P.Eng.
Geotechnical Engineer

GWF/sf

K:\Projects\0257 D&T\040 2006 FWSD Annual\monthly reports\April report.doc

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
1605, 840 - 7 Avenue SW
Calgary, Alberta T2P 3G2
Tel.: (403) 250-5185
Fax: (403) 250-5330

0257-040-01
June 22, 2006

Yukon Territory Water Board
Suite 106 - 419 Range Road
Whitehorse, Yukon
Y1A 3V1
Fax (867) 456-3890

RE: MAY MONTHLY SAMPLING RESULTS FOR QZ03-058, FARO MINE, YUKON

Dear Board:

This letter report fulfills the monthly reporting requirement (item 15) for Water License QZ03-058 for the month of May 2006. I trust that this information is self-explanatory. However, if you have any questions please do not hesitate to contact us.

Table 1 Summary of Monthly Sampling Results, May 2006

Date	Sample	TSS (mg/L)	Flow (m^3/s)	Comments
May 8	FWSD-1	1		Creek was ice covered
May 8	FWSD-5	6		Creek was ice covered
May 23	FWSD-1	12		Creek was ice covered
May 23	FWSD-5	12		Creek was ice covered

Flow measurements during May were not possible due to the creek being ice covered, flow measurements will commence once the ice has melted.

The results of the annual sampling at FWSD#6, the run-off water from the PAG storage area, are attached in Table 2. This table includes a column listing the maximum allowable concentration (from Water Licence QZ03-058) for each of the metals. As indicated in the table the measured concentrations for all parameters were below the allowable concentration.

Table 2 Summary of Annual Sampling for PAG stockpile (FWSB #6), May 2006

Parameter	Maximum Allowable Concentration (mg/L)	May 24, 2006 Results (mg/L unless noted)	Laboratory Detection Limit (mg/L)
Temperature		8.6	
pH		8.4	
Total Suspended Solids		2	
Total Dissolved Solids		221	
Sulphate		80.5	
Conductivity		294 µS/cm	
Total Alkalinity		45.1	
Total Hardness		133	
Total Antimony (Sb)	0.10	<0.001	0.001
Total Arsenic (As)	0.05	<0.001	0.001
Total Barium (Ba)	1.00	0.039	0.023
Total Cadmium (Cd)	0.02	<0.0002	0.0002
Total Copper (Cu)	0.20	0.003	0.001
Total Lead (Pb)	0.20	0.001	0.001
Total Mercury (Hg)	0.005	<0.02 ug/L	0.02 ug/L
Total Molybdenum (Mo)	0.50	0.0008	0.0005
Total Nickel (Ni)	0.50	<0.001	0.001
Total Selenium (Se)	0.05	<0.001	0.001
Total Silver (Ag)	0.10	<0.00025	0.00025
Total Zinc (Zn)	0.50	0.005	0.005

Yours truly,
BGC Engineering Inc.
Per:

Gerry Ferris, M.Sc., P.Eng.
Geotechnical Engineer

GWF/sf

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
1605, 840 - 7 Avenue SW
Calgary, Alberta T2P 3G2
Tel.: (403) 250-5185
Fax: (403) 250-5330

0257-040-01
July 7, 2006

Yukon Territory Water Board
Suite 106 - 419 Range Road
Whitehorse, Yukon
Y1A 3V1
Fax (867) 456-3890

RE: JUNE MONTHLY SAMPLING RESULTS FOR QZ03-058, FARO MINE, YUKON

Dear Board:

This letter report fulfills the monthly reporting requirement (item 15) for Water License QZ03-058 for the month of June 2006. I trust that this information is self-explanatory. However, if you have any questions please do not hesitate to contact us.

Table 1 Summary of Monthly Sampling Results, June 2006

Date	Sample	TSS (mg/L)	Flow (m^3/s)	Comments
June 14	FWSD-1	3	1.885	
June 14	FWSD-5	8	2.531	
June 26	FWSD-1	<1	0.668	
June 26	FWSD-5	6	0.932	

Yours truly,
BGC Engineering Inc.
Per:

Gerry Ferris, M.Sc., P.Eng.
Geotechnical Engineer

GWF/sf

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BGC ENGINEERING INC.
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1605, 840 - 7 Avenue SW
Calgary, Alberta T2P 3G2
Tel.: (403) 250-5185
Fax: (403) 250-5330

0257-040-01
July 27, 2006

Yukon Territory Water Board
Suite 106 - 419 Range Road
Whitehorse, Yukon
Y1A 3V1
Fax (867) 456-3890

RE: JULY MONTHLY SAMPLING RESULTS FOR QZ03-058, FARO MINE, YUKON

Dear Board:

This letter report fulfills the monthly reporting requirement (item 15) for Water License QZ03-058 for the month of July 2006. I trust that this information is self-explanatory. However, if you have any questions please do not hesitate to contact us.

Table 1 Summary of Monthly Sampling Results, July 2006

Date	Sample	TSS (mg/L)	Flow (m^3/s)	Comments
July 5	FWSD-1	2	0.675	
July 5	FWSD-5	3	0.761	
July 25	FWSD-1	<1	0.577	
July 25	FWSD-5	1	0.681	

Yours truly,
BGC Engineering Inc.
Per:

Gerry Ferris, M.Sc., P.Eng.
Geotechnical Engineer

GWF/sf

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BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
1605, 840 - 7 Avenue SW
Calgary, Alberta T2P 3G2
Tel.: (403) 250-5185
Fax: (403) 250-5330

0257-040-01
September 1, 2006

Yukon Territory Water Board
Suite 106 - 419 Range Road
Whitehorse, Yukon
Y1A 3V1
Fax (867) 456-3890

RE: AUGUST MONTHLY SAMPLING RESULTS FOR QZ03-058, FARO MINE, YUKON

Dear Board:

This letter report fulfills the monthly reporting requirement (item 15) for Water License QZ03-058 for the month of August 2006. I trust that this information is self-explanatory. However, if you have any questions please do not hesitate to contact us.

Table 1 Summary of Monthly Sampling Results, August 2006

Date	Sample	TSS (mg/L)	Flow (m^3/s)	Comments
August 10	FWSD-1	<1	0.653	
August 10	FWSD-5	1	0.799	
August 29	FWSD-1	<1	0.681	
August 29	FWSD-5	1	0.907	

Yours truly,
BGC Engineering Inc.
Per:

Gerry Ferris, M.Sc., P.Eng.
Geotechnical Engineer

GWF/sf

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APPENDIX B – SITE INSPECTION MEMOS

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
1605, 840 – 7 Avenue S.W., Calgary, Alberta, Canada. T2P 3G2
Phone (403) 250-5185 Fax (403) 250-5330

PROJECT MEMORANDUM

To:	**Anvil Range Mining / Deloitte &Touche**	**Fax No.:**	**(867) 994-3459**
Attention:	**Dana Haggar / Doug Sedgwick**	**CC:**	**(416) 601-5902**
From:	**Gerry Ferris, P.Eng.**	**Date:**	**June 27, 2006**
Subject:	**June Site Inspection Conditions Selected Facilities, Faro Mine, YT**		
No. of Pages (including this page): 3 Pages		**Project No:**	**0257-039-02**

Mr. Gerry Ferris, P.Eng., from BGC Engineering Inc.(BGC), undertook a visual inspection of selected facilities at Faro Mine between June 6 and 9, 2006. During this inspection the items contained in this memo were discussed on site with Mr. Dana Haggar, Mine Manager. This memo summarizes the conditions observed, along with any required maintenance or monitoring:

FWSD Breach

- Minor cracking continues in the backslope behind the rip rap on both sides of the floodplain.
- Slough at the south abutment appears to have expanded compared to last year. This slough appears to be related to seepage discharge from the valley wall. Repair of this slough can be accomplished by excavating and replacing a portion of the finer grained slough material with granular material. This would allow the water to freely drain from the slope. Following this repair the area should be re-vegetated. Until the construction is completed this area should be visually monitored.
- Erosion and bank undercutting continues downstream of the breach works, within the Fresh Water Channel. This behaviour was expected and does not require further intervention at this time.
- Otherwise appears in satisfactory condition.

K8 Creek Rehab.

- Appears in satisfactory condition.

Cross Valley Dam

- This spring there were almost no surface cracks evident on the crest of the dam.
- The water elevation in the Polishing Pond appears to be lower than typical due to the release of water through the siphon pipe. The water level appears to be lower than the lowest elevation of the rip rap. The water level in the pond should be maintained such that the water is within the zone protected by rip rap.
- In some sections of this spillway the rip rap protection has been disturbed. The rip rap in the disturbed sections should be re-instated.
- Appears in satisfactory condition.

Intermediate Dam

- No crest cracking or toe seepage noted.
- Downstream face experienced only minor rilling erosion.
- The granular material collected on the road surface (eroded down the face of the dam in previous years) should be removed in order to expose the gravel drain.
- Sludge ponds have been added to the down valley treatment system, within the Polishing Pond, at the discharge point of the Intermediate Spillway. If the emergency spillway flows near its design capacity, it is likely that these works will be destroyed.
- Recommendations for some repairs of the Intermediate Dam spillway are forthcoming in a Northwest Hydraulic consulting report on the hydraulic capacity in the Down Valley.
- Appears in satisfactory condition.

Secondary Impoundment Dam

- Upstream crest berm needs to be re-established at the north abutment to prevent crest overtopping and downstream face erosion. This is located near the fuse plug of the Rose Creek diversion Canal.
- Extensive cracking is located along the toe of the lower road surface, adjacent to the North Fork Rose Creek diversion and the start of the Rose Creek Diversion. This section of cracking opened up much more than previously experienced. This area should be graded to close the crack and ensure water does not flow into the crack, which would worsen the cracking.
- No other visual concerns were noted.

Rose Creek Diversion Channel

- Previously noted sloughs in the backslope do not appear currently active.
- No signs of cracking or settlement noted on the canal dike crest.
- Increased seepage quantity and sloughing occurring at the toe of the spoil piles, located between the Cross Valley and Intermediate Dams. Seepage and related sloughing is caused by very low polishing pond level. This sloughing has been noted since 2005 and appears to be worsening / expanding since then. This sloughing and retrogression should be monitored to ensure that the current loss of toe support does not retrogress

into a larger failure of the spoil pile. This sloughing can be repaired via the installation of granular trenches (running perpendicular to the shoreline) which would serve to collect the seepage water and lower the ground water pressure in the area.

- Otherwise appears in satisfactory condition.

North Fork Rose Creek Rock Drain

- Rock drain appears to be discharging water with no signs of significant instability.
- The following monitoring program should be followed throughout the summer period:
  - Once per week record the water levels at staff gauges NFRC 20 / 21. Once per month measure the top of the staff gauge (elevation survey).
  - Once per week measure the water elevation in the pond.
  - Once per week measure the water elevation exit at the downstream toe of the drain.
  - Once per week record the water levels at staff gauges NFRC 23 and X2. Once per month measure the top of the staff gauge (elevation survey).

North Valley Wall Interceptor Ditch

- Selected sections of the channel were inspected and found to be flowing properly.
- Appears in satisfactory condition.

Faro Creek Diversion Channel

- Some minor rip rap movement has occurred in select locations, exposing the underlying geotextile. This was likely caused by ice action during this past winter. The rip rap should be reinstated.
- Channel appears to be performing in a satisfactory manner.

In general, the inspected facilities appear in satisfactory condition and only some minor maintenance and monitoring is required. Please contact the undersigned should you have any questions or comments.

Respectfully submitted,
BGC Engineering Inc.
per:

Gerry Ferris, M.Sc., P.Eng.
Geotechnical Engineer

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
1605, 840 – 7 Avenue S.W., Calgary, Alberta, Canada. T2P 3G2
Phone (403) 250-5185 Fax (403) 250-5330

PROJECT MEMORANDUM

To:	**Anvil Range Mining / Deloitte &Touche**	**Fax No.:**	**(867) 994-3459**
Attention:	**Dana Haggar / Doug Sedgwick**	**CC:**	**(416) 601-5902**
From:	**Gerry Ferris, P.Eng.**	**Date:**	**September 7, 2006**
Subject:	**August Site Inspection Conditions Selected Facilities, Faro Mine, YT**		
No. of Pages (including this page): 4 Pages		**Project No:**	**0257-039-02**

Mr. Gerry Ferris, P.Eng., from BGC Engineering Inc.(BGC), undertook a visual inspection of selected facilities at Faro Mine between August 24 and 29, 2006. During this inspection the items contained in this memo were discussed on site with Mr. Dana Haggar, Mine Manager. This memo summarizes the conditions observed, along with any required maintenance or monitoring:

FWSD Breach

- Minor cracking continues in the backslope behind the rip rap on both sides of the floodplain.
- Slough at the south abutment appears to have expanded compared to last year. This slough appears to be related to seepage discharge from the valley wall. Repair of this slough can be accomplished by excavating and replacing a portion of the finer grained slough material with granular material. This would allow the water to freely drain from the slope. Following this repair the area should be re-vegetated. Until the construction is completed this area should be visually monitored.
- Erosion and bank undercutting continues downstream of the breach works, within the Fresh Water Channel. This behaviour was expected and does not require further intervention at this time.
- Erosion is occurring within Reach 2 of the former reservoir. This area should be visually monitored.
- A portion of K8 Creek has not yet been willow staked. This work was awaiting the channel to finalize its position, which has now occurred. The final section of this tributary should have the willow staking completed, as originally planned.
- Otherwise appears in satisfactory condition.

K8 Creek Rehab.

- Appears in satisfactory condition.

Cross Valley Dam

- The water elevation in the Polishing Pond appears to be lower than typical due to the release of water through the siphon pipe. The water level appears to have been held lower than the lowest elevation of the rip rap for some time this year. An erosion scarp has formed on the face of the dam below the lowest elevation of the rip rap. The water level in the pond should be maintained such that the water is within the zone protected by rip rap. Two courses of action are available: either buttress the scarp to stop rip rap movement or await the movement and then repair the rip rap.
- Small shrubs and trees are beginning to grow on the crest and other surfaces of the dam. This vegetation should be removed, including the roots. When the roots are removed the soil disturbed in the process should be compacted.
- In some sections of this spillway, the rip rap protection on the banks of the North Valley Wall Interceptor Ditch has been disturbed by equipment traffic some time in the past. The rip rap in the disturbed sections should be re-instated.
- Appears in satisfactory condition.

Intermediate Dam

- No crest cracking or toe seepage noted.
- Downstream face experienced only minor rilling.
- The granular soil which has eroded down the face of the dam in previous years to the road surface should be carefully removed to expose the gravel drain.
- Sludge ponds have been added to the down valley treatment system, within the Polishing Pond, at the discharge point of the Intermediate Spillway. If the emergency spillway flows near its design capacity, it is likely that these works will be destroyed.
- The water elevation in the Intermediate Pond appears to be lower than typical due to the release of water through the siphon pipe. The water level appears to have been held lower than the lowest elevation of the rip rap for some time this year and in the past. An erosion scarp has formed on the face of the dam below the lowest elevation of the rip rap. This has lead to both tension crack formation on the crest of the dam (either in the shell or rip rap) and in some locations the rip rap has slid down the face of the dam exposing the shell of the dam. If the water level rises and wave actions begin to act on these areas further erosion will occur. The rip rap should be repaired and then the water level in the pond should be maintained such that the water is within the zone protected by rip rap. Note: Rip rap was placed on the face of this dam multiple times as part of past dam raises and likely exists at lower elevations.

- Recommendations for some repairs of the Intermediate Dam spillway were made by Northwest Hydraulic Consultants (nhc)[1]. As recommended, the large boulders have been moved out of the middle portion of the spillway to the lower steep section. The riffle and pool lower section of the spillway was actively being modified into a rough apron area. This work was not yet complete but was being completed in accordance with the nhc recommendations.
- Small shrubs and trees are beginning to grow on the crest and other surfaces of the dam. This vegetation should be removed, including the roots. When the roots are removed the soil disturbed in the process should be compacted.
- Generally the dam appears in satisfactory condition, although rip rap repairs as noted above are necessary.

Secondary Impoundment Dam

- Upstream crest berm needs to be re-established at the north abutment to prevent crest overtopping and downstream face erosion.
- An excavated breach (located downstream of the diversion dam/ fuse plug) was cut through the crest of the dam at some point in the past. This area appears to have further eroded during 2005/06. Water and associated tailings have flowed through this breach and into the downstream end of the fuse plug (within the Intermediate Impoundment). This breach should be repaired.
- The area with extensive cracking near the upstream limit of the Rose Creek Diversion Canal (noted in the June 2006 inspection) has been repaired.
- No other visual concerns were noted.

Rose Creek Diversion Channel

- Previously noted sloughs in the backslope do not appear currently active.
- No signs of cracking or settlement noted on the canal dike crest.
- Instruments were installed in 2005 on the downstream side of the diversion (tailings side). A small access road was created to get to this location, and locally required over steepening of the downstream slope. This slope should be buttressed.
- Increased seepage quantity and sloughing occurring at the toe of the spoil piles, located between the Cross Valley and Intermediate Dams. Seepage and related sloughing is caused by very low polishing pond level. This sloughing has been noted since 2005 and appears to be worsening / expanding since then. This sloughing and retrogression should be monitored to ensure that the current loss of toe support does not retrogress into a larger failure of the spoil pile. This sloughing can be repaired via the installation of granular trenches (running perpendicular to the shoreline) which would serve to collect the seepage water and lower the ground water pressure in the area.
- Otherwise appears in satisfactory condition.

[1] Northwest Hydraulic Consultants 2006 Faro Mine Site Inspection. Memorandum issued to Faro Mine Closure Planning Office and Deloitte and Touche Inc., dated July 5, 2006

North Fork Rose Creek Rock Drain

- Rock drain appears to be discharging water with no signs of significant instability.
- The following monitoring program should be followed throughout the remaining open water period:
  - On a bi-weekly basis record the water levels at staff gauges NFRC 20 / 21. Once per month measure the top of the staff gauge (elevation survey).
  - On a bi-weekly basis measure the water elevation in the pond.
  - On a bi-weekly basis measure the water elevation exit at the downstream toe of the drain.
  - Once per day record the water levels at staff gauges NFRC 23 and X2. Once per month measure the top of the staff gauge (elevation survey).

North Valley Wall Interceptor Ditch

- Selected sections of the channel were inspected and found to be flowing properly.
- Appears in satisfactory condition.

Faro Creek Diversion Channel

- The areas with exposed geotextile noted in the June 2006 inspection have been repaired.
- Channel appears to be performing in a satisfactory manner.

In general, the inspected facilities appear in satisfactory condition and generally only some minor maintenance and monitoring is required. Repairs to the rip rap are required on the upstream side of the Intermediate Dam. Please contact the undersigned should you have any questions or comments.

Respectfully submitted,
BGC Engineering Inc.
per:

Gerry Ferris, M.Sc., P.Eng.
Geotechnical Engineer

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PROJECT MEMORANDUM

To:	**Anvil Range Mining/Deloitte &Touche**	**Fax No.:**	**By email**
Attention:	**Dana Haggar/Doug Sedgwick**	**CC:**	
From:	**Jim Cassie, P.Eng.**	**Date:**	**October 13, 2006**
Subject:	**September Site Inspection Conditions Selected Facilities, Faro Mine, YT**		
No. of Pages (including this page): 2		**Project No:**	**0257-039-03**

Mr. Jim Cassie, P.Eng., from BGC Engineering Inc.(BGC), undertook a visual inspection of selected facilities at Faro Mine between Sep. 19 and 21, 2006. This memo summarizes the conditions observed, along with any required maintenance or monitoring.

FWSD Breach

- Minor sloughing of the core material on the cut slopes. Monitor situation for now.
- Slough at the south abutment appears pseudo-stable. It is possible that some minor regrading of oversteepened slope in combination with seeding may be enough to stabilize the area. This potential step could be undertaken before any significant regrading and buttressing work is actually implemented.
- Channel appears in satisfactory condition.

K8 Creek Rehabilitation

- Appears in satisfactory condition.

Cross Valley Dam

- Pond level below spillway inlet causing erosion at spillway edge due to lack of riprap, where some should be placed.
- Riprap required at new lower pond elevation - especially south of access ramp.
- Remove all large vegetation (shrubs and trees) from the upstream slope and crest.
- No active cracking on crest noted.
- Appears in satisfactory condition.
-

Intermediate Dam

- No crest cracking or toe seepage noted.
- Minor sloughs on upstream side riprap - localized replacement and grading needed.
- Remove all large vegetation from the upstream side and crest.

Secondary Impoundment Dam

- No visual concerns were noted.

Rose Creek Diversion Channel

- Previously noted sloughs in the backslope do not appear currently active.
- No signs of cracking or settlement noted on the canal dike crest.
- Sloughing occurring at the toe of the spoil piles, located between the Cross Valley and Intermediate Dams. Limited consequences so would propose to monitor the situation.

North Fork Rose Creek Rock Drain

- Rock drain appears to be discharging water with no signs of significant instability.

North Valley Wall Interceptor Ditch

- Selected sections of the channel were inspected and found to be flowing properly.
- Appears in satisfactory condition.

Faro Creek Diversion Channel

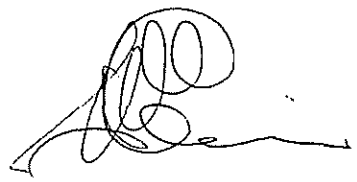
- Channel appears to be performing in a satisfactory manner. Continue to monitor retrogression.

In general, the inspected facilities appear in satisfactory condition and only some minor maintenance and monitoring is required. After the inspection tour, the items contained in this memo were discussed on site with Mr. Dana Haggar, Mine Manager.

Mr. Ferris also provided some recommendations following his June observations when site conditions were different. His recommendations should be considered in addition to the ones provided herein.

Please contact the undersigned should you have any questions or comments.

Respectfully submitted,
BGC Engineering Inc.
per:



James Cassie, M.Sc., P.Eng.
Specialist Geotechnical Engineer

APPENDIX C – RE-VEGETATION REPORT
REPORT PREPARED BY
LABERGE ENVIRONMENTAL SERVICES

2006 Revegetation Assessment

Dewatered Freshwater Reservoir

South Fork of Rose Creek, Yukon

Assessment Report Prepared for:

Deloitte & Touche Inc.

Laberge
ENVIRONMENTAL SERVICES

December 2006

Laberge
ENVIRONMENTAL SERVICES
P.O. Box 21072
Whitehorse, Y.T.
Y1A 6P7

Office Phone: 867-668-6838
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Fax: 867-667-6956

Letter of Transmittal

December 11, 2006

Doug Sedgwick
Deloitte & Touche
121 King Street West, Suite 300
Toronto, Ontario
M5H 3T9

Dear Doug:

Re: **2006 Revegetation Assessment Dewatered Freshwater Reservoir South Fork of Rose Creek, Yukon**

We are pleased to submit herewith, the above report representing the second annual assessment of the dewatered freshwater reservoir as stipulated in Part E Section 35 of Licence Number QZ03-058.

The majority of the planted species are doing very well and natural colonization of most of the areas by pioneering plant species is occurring.

Any questions or comments can be directed to the undersigned.

Sincerely,

Bonnie Burns
Laberge Environmental Services

Contents

1.0 Background

The dewatered reservoir on the south fork of Rose Creek was seeded with northern native grass species in several phases during 2003 and 2004 by Arctic Alpine Seeds Ltd. No legumes were seeded and no fertilizer was applied. The stem cuttings of woody species (primarily willows) were staked along the Rose Creek riparian zone, along the upper tributaries, and on the floodplains adjacent to the breached dam. This revegetation work is summarized in a report by Arctic Alpine Seed Ltd (2005).

Under Part E, Section 35 of Water License QZ03-058, an annual inspection and assessment of the success of the revegetation activities is to be undertaken. The first evaluation of the revegetation program was carried out during a survey in July 2005 (Laberge Environmental Services 2005). The site was resurveyed by Laberge Environmental Services in July 2006. The results of the 2006 survey are summarized in this report. Selected photographs are presented in Appendix A.

2.0 Grass Seeding Program

2.1 Phase I Zone

2.1.1 Seeding Program

The Phase I zone included 17.2 ha of the newly exposed shoreline between elevations of 1090 m and 1096 m seeded by Arctic Alpine Seed Ltd. in June 2003 (Figure 1).

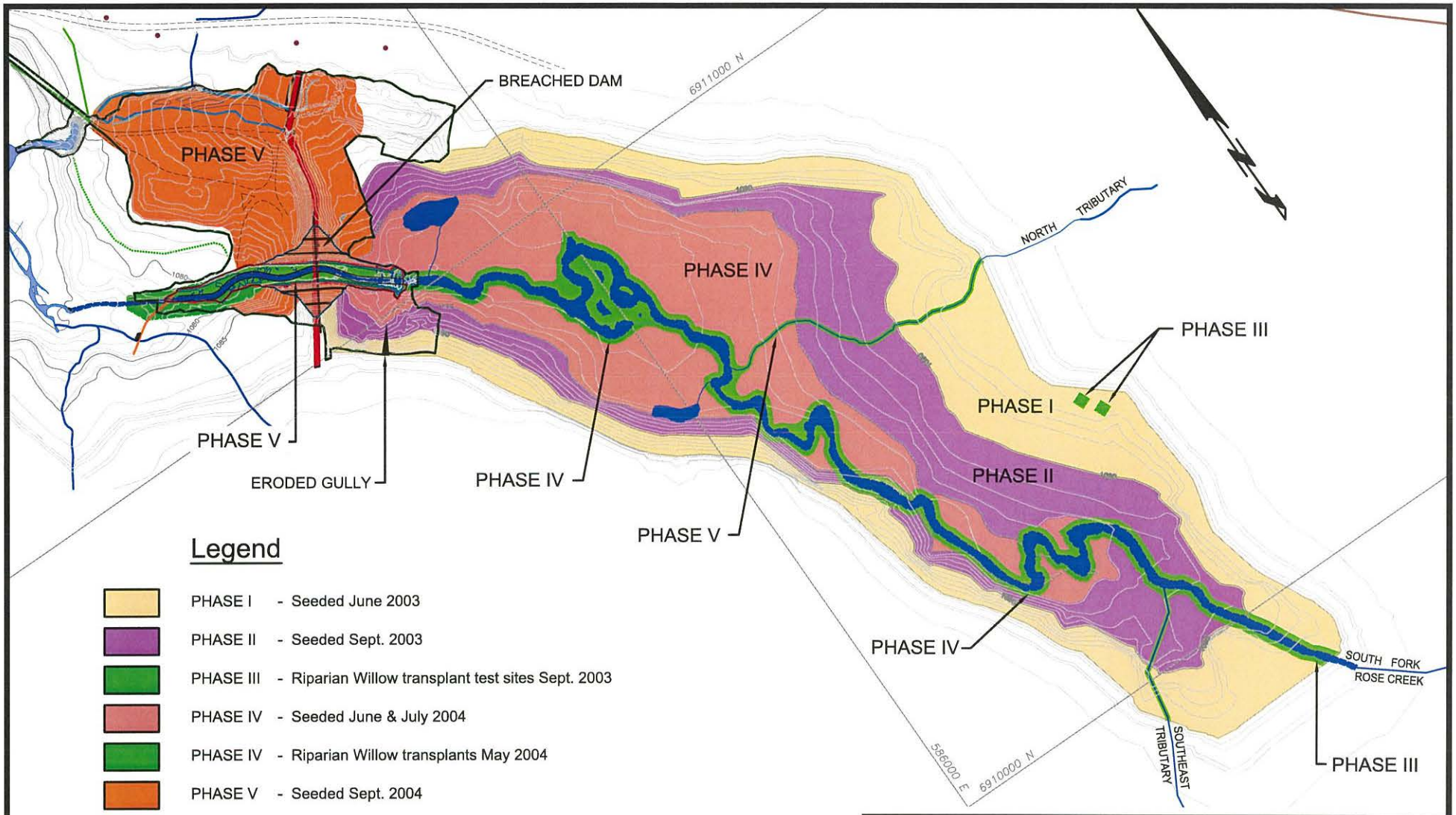
The seed mix (Lacroix 2005) included:

Sheep Fescue	(*Festuca brachyphylla*)	25.0 lb/ha	(11.34 kg/ha)
Slender Wheatgrass	(*Agropyron trachycaulus*)	25.0 lb/ha	(11.34 kg/ha)
Violet Wheatgrass	(*Agropyron violaceum*)	13.0 lb/ha	(5.89 kg/ha)
Ticklegrass	(*Agrostis scabra*)	1.0 lb/ha	(0.45 kg/ha)
Alpine Bluegrass	(*Poa alpina*)	0.5 lb/ha	(0.23 kg/ha)
Tufted Hairgrass	(*Deschampsia caespitosa*)	0.5 lb/ha	(0.23 kg/ha)
Total		65.0 lb/ha	(29.48 kg/ha)

2.1.2 July 2006 Assessment

As observed during the 2005 assessment, the Phase I seeding zone in 2006 showed a >90% vegetative cover for most of the area seeded. The Phase I zone continues to be dominated by a dense growth of Sheep Fescue with lesser amounts of Alpine Bluegrass and Tufted Hairgrass. Ticklegrass and both species of Wheatgrass were scarce in most of the Phase I zone, but were more prevalent in those patches with lighter vegetative cover. It is apparent that Wheatgrass cannot compete well on areas with a dense growth of Sheep Fescue. Ticklegrass was not as evident as it was during the 2005 survey.

All the seeded grass species observed in the Phase I zone in July 2006 were in seed.



Laberge
ENVIRONMENTAL SERVICES

REVEGETATION OF THE DEWATERED FRESHWATER RESERVOIR

November 29, 2005		Figure 1

The dense cover of seeded grasses, along with a thick layer of grass litter (primarily the previous years' growth of Sheep Fescue), has inhibited the growth of naturally occurring pioneering plant species in the Phase I zone. Foxtail Barley (*Hordeum jubatum*) and willows (*Salix* spp.) have invaded a few areas with less dense seeded species, and a few aspen (*Populus tremuloides*) have colonized steeper, well-drained slopes. Broad-leaved Willow-herb (*Epilobium latifolium*) has colonized the banks of the north tributary on the upper slope. Tansy Mustard (*Descurainia incana*) was not as prevalent a colonizer in the Phase I zone as it was in 2005.

2.2 Phase II Zone

2.2.1 Seeding Program

The Phase II zone included 17.5 ha of the newly exposed shoreline between elevations of 1086 m and 1090 m seeded by Arctic Alpine Seed Ltd. in September 2003 (Figure 1).

The seed mix (Lacroix 2005) included:

Sheep Fescue	(*Festuca brachyphylla*)	25.0 lb/ha	(11.34 kg/ha)
Slender Wheatgrass	(*Agropyron trachycaulus*)	25.0 lb/ha	(11.34 kg/ha)
Violet Wheatgrass	(*Agropyron violaceum*)	13.0 lb/ha	(5.89 kg/ha)
Ticklegrass	(*Agrostis scabra*)	1.0 lb/ha	(0.45 kg/ha)
Alpine Bluegrass	(*Poa alpina*)	0.5 lb/ha	(0.23 kg/ha)
Tufted Hairgrass	(*Deschampsia caespitosa*)	0.5 lb/ha	(0.23 kg/ha)
Total		65.0 lb/ha	(29.48 kg/ha)

2.2.2 July 2006 Assessment

The overall coverage in the Phase II zone was approximately 80%, somewhat higher than observed during the 2005 survey. The visual distinction between the coverage in the Phase I and Phase II zones was less obvious than in the previous year's survey.

Most of the Phase II seeding zone on the northeast side was dominated by Sheep Fescue and Wheatgrass with much lesser amounts of Tufted Hairgrass and Alpine Bluegrass. Tufted Hairgrass was more prevalent toward the southern end (inlet) of the former reservoir. There was little evidence of Ticklegrass on the northeast side in the Phase II zone.

On the southwest side of the former reservoir, the Phase II seeding zone was dominated by Sheep Fescue with some Tufted Hairgrass and Alpine Bluegrass. Wheatgrass coverage was inconsistent, although quite prevalent on the steep northeast-facing slope below the cliff. Ticklegrass was evident only in scattered dense patches.
All grass species seeded in the Phase II zone were in seed at the time of the July 2006 survey.

The denser vegetative cover in the Phase II seeding zone has limited the natural colonization of the area by pioneering plant species. Species observed during the 2006 survey include willows (*Salix* spp.), chickweed (*Stellaria* sp.), Yellow Cress (*Rorippa palustris*), Tansy Mustard (*Descurainia incana*), Fireweed (*Epilobium angustifolium*), Willowherb (*Epilobium ciliatum*), Annual Hawk's-beard (*Crepis tectorum*), Mastadon Flower (*Senecio congestus*), Smooth Brome (*Bromus inermis*), Blue-joint (*Calamagrostis canadensis*), and Foxtail Barley (*Hordeum jubatum*).

2.3 Phase IV Zone

2.3.1 Seeding Program

The Phase IV zone included approximately 17 ha of the newly exposed bottom of the former freshwater reservoir. This area was seeded by Arctic Alpine Seed Ltd. in June and early July 2004.

The seed mix (Lacroix 2005) used for the Phase IV zone included:

Sheep Fescue	(*Festuca brachyphylla*)	25.0 lb/ha	(11.34 kg/ha)
Slender Wheatgrass	(*Agropyron trachycaulus*)	25.0 lb/ha	(11.34 kg/ha)

Violet Wheatgrass	(*Agropyron violaceum*)	13.0 lb/ha	(5.89 kg/ha)
Ticklegrass	(*Agrostis scabra*)	1.0 lb/ha	(0.45 kg/ha)
Alpine Bluegrass	(*Poa alpina*)	0.5 lb/ha	(0.23 kg/ha)
Tufted Hairgrass	(*Deschampsia caespitosa*)	0.5 lb/ha	(0.23 kg/ha)
Total		65.0 lb/ha	(29.48 kg/ha)

2.3.2 July 2006 Assessment

The growth of seeded grass species on the valley bottom in 2006 was considerably denser than observed during the 2005 survey. Vegetative coverage on most areas ranged from 80 to 100%.

The composition of seeded grass species varied across the Phase IV zone. Dense stands of Sheep Fescue with lesser amounts of Tufted Hairgrass and Alpine Bluegrass were found on the higher level areas of the valley bottom. Nearly pure stands of Tufted Hairgrass occurred in wetter areas. Other seeded areas had a good mix of Sheep Fescue, Tufted Hairgrass and Alpine Bluegrass with lesser amounts of Wheatgrass. Very little Ticklegrass was found in the Phase IV zone.

The Phase IV zone has many small wetlands and ponds rimmed with sedges (*Carex aquatilis*, *Carex pachystachya* and *Carex brunescens*), Blue-joint Reed-grass (*Calamagrostis canadensis*), Cottongrass (*Eriophorum* spp.), Mastadon Flower (*Senecio congestus*) and occasionally Alkali Grass (*Puccinellia* sp.). A few small depressions in the Phase IV zone remain void of vegetation.

The seeded grasses in the Phase IV zone were much better developed than observed in 2005 and nearly all grasses were in seed at the time of the 2006 survey.

Yellow Cress (*Rorippa palustris*) and Mastadon Flower (*Senecio congestus*) were the dominant colonizing plant species of the valley bottom. Other plants colonizing this zone include willows (*Salix* spp.), Shrub Birch (*Betula glandulosa*), Fireweed (*Epilobium angustifolium*), Grass-of-Parnassus (*Parnassia palustris*), Foxtail Barley (*Hordeum*

jubatum), Golden Saxifrage (*Chrysoplenium tetandrum*), Common Timothy (*Phleum pratense*), and rushes (*Juncus* spp.). Tansy Mustard (*Descurainia incana*) was also found but was not nearly as prevalent as during the 2005 survey.

2.4 Phase V Zone

2.4.1 Seeding Program

The Phase V zone includes the dam area, the disturbed area downstream of the dam, and the floodplains adjacent to the dam breach. These areas were seeded by Arctic Alpine Seed Ltd. in September and October 2004 (Figure 1).

The seed mix (Lacroix 2005) used for the Phase V zone, excluding the floodplains, included:

Sheep Fescue	(*Festuca brachyphylla*)	25.0 lb/ha	(11.34 kg/ha)
Slender Wheatgrass	(*Agropyron trachycaulus*)	25.0 lb/ha	(11.34 kg/ha)
Violet Wheatgrass	(*Agropyron violaceum*)	13.0 lb/ha	(5.89 kg/ha)
Ticklegrass	(*Agrostis scabra*)	1.0 lb/ha	(0.45 kg/ha)
Alpine Bluegrass	(*Poa alpina*)	0.5 lb/ha	(0.23 kg/ha)
Tufted Hairgrass	(*Deschampsia caespitosa*)	0.5 lb/ha	(0.23 kg/ha)
Total		65.0 lb/ha	(29.48 kg/ha)

The seed mix (Lacroix 2005) used for the floodplains included:

Sheep Fescue	(*Festuca brachyphylla*)	4.00 kg/ha
Violet Wheatgrass	(*Agropyron violaceum*)	4.00 kg/ha
Ticklegrass	(*Agrostis scabra*)	1.00 kg/ha
Tufted Hairgrass	(*Deschampsia caespitosa*)	1.00 kg/ha
Total		10.00 kg/ha

2.4.2 July 2006 Assessment

The July 2006 assessment of the floodplains adjacent to the dam breach showed that the vegetative cover ranged from 20% to 60%. The seeded grass species were predominantly Sheep Fescue and Tufted Hairgrass, with lesser amounts of Wheatgrass. Most of these grasses were in seed at the time of the assessment. Blue-joint Reed-grass (*Calamagrostis canadensis*) had colonized a few wet depressions. Some natural regeneration of willows (*Salix* spp.) was also occurring.

The northwest (downstream) wall of the breached dam has a good natural growth of Willows (*Salix* spp.) along with a few mountain alders (*Alnus crispa*). There was little evidence of seeded grass species on this face of the dam.

The southeast (upstream) wall also has good growth of Willows with a moderate (40 to 60%) cover of seeded grass species. These grasses are mostly Wheatgrass along with some Sheep Fescue and Alpine Bluegrass.

The sides of the dam breach had sparse (about 10%) vegetative cover. Seeded grass species included Sheep Fescue, Wheatgrass and Alpine Bluegrass. Due to high compaction, the clay core of the breached dam has almost no vegetation.

Natural revegetation of the dam includes, in addition to Willows and Alders, Yellow Cress (*Rorippa palustris*), Fireweed (*Epilobium angustifolium*), Foxtail Barley (*Hordeum jubatum*), and Tansy Mustard (*Descurainia incana*). A strip of sedge (*Carex brunescens*) still occurs at the old water line on the upstream side of the dam.

The vegetative cover on the areas seeded downstream of the dam was quite variable at the time of the 2006 assessment (overall approximately 20%). Seeded species included Sheep Fescue, Tufted Hairgrass, Alpine Bluegrass and Wheatgrass.

Plant species naturally colonizing this area included Felt-leaf Willow (*Salix alaxensis*), Balsam Poplar (*Populus balsamifera*), Alpine Milk-vetch (*Astragalus alpinus*), Broad-leaved Willow-herb (*Epilobium latifolium*), Fireweed (*Epilobium angustifolium*), Bear Root

(*Hedysarum alpinum*), Common Yarrow (*Achillea millefolium*), Foxtail Barley (*Hordeum jubatum*), Tansy Mustard (*Descurainia incana*), Hawk's-beard (*Crepis nana*), Fleabane (*Erigeron* sp.), Paintbrush (*Castilleja* sp.), Blue-joint Reed-grass (*Calamagrostis canadensis*) and Common Horsetail (*Equisetum arvense*).

2.5 Vitality of Seeded Grass Species

The seeded grass species all appeared to have normal growth forms at the time of the 2006 assessment. The growth of the seeded grasses in the Phase IV zone (two growth seasons) showed as much vigor as those in the Phase I and Phase II zones (three growth seasons).

The average plant heights were:

Sheep Fescue	80 cm
Tufted Hairgrass	80 cm
Wheatgrass	75 cm
Ticklegrass	30 cm
Alpine Bluegrass	30 cm

All seeded grass species were in seed in each of the seeding zones at the time of the 2006 assessment.

The average rooting depths of the seeded grass species on the valley bottom were:

Sheep Fescue	100 mm
Tufted Hairgrass	300 mm
Wheatgrass	100 mm
Ticklegrass	50 mm
Alpine Bluegrass	120 mm

These rooting depths were considerably greater (except for Ticklegrass) than those measured during the 2005 survey.

3.0 Shrub Establishment Program

3.1 Shrub Harvest and Establishment

Stem cuttings from locally occurring species of shrubs (primarily willows) were harvested from a site downstream of the breached dam and staked at a number of sites in the dewatered reservoir (Figure 1). These included a willow transplant test site at the east end of the reservoir (Phase III program, September 2003), willow stem cutting transplants along the riparian zone on the main channel of Rose Creek (part of the Phase IV program, June 2004) and willow stem cutting transplants along the two main tributaries as well as on the floodplains adjacent to the dam breach (Phase V program, September and October 2004).

The shrub species selected were:

Diamond-leaf Willow	(*Salix pulchra*)
Felt-leaf Willow	(*Salix alaxensis*)
Scouler's Willow	(*Salix scouleriana*)
Barclay's Willow	(*Salix barclayi*)
Trembling Aspen	(*Populus tremuloides*)
Balsam Poplar	(*Populus balsamifera*)
Soapberry	(*Shepherdia canadensis*)
White Spruce	(*Picea glauca*)

3.2 July 2006 Assessment

The staked willows on the floodplains upstream and downstream of the dam breach had a survival rate of about 80% at the time of the 2006 assessment. The most successful species were Diamond-leaf Willow, Felt-leaf Willow and Balsam Poplar. Many of the staked willows have died off at the top but are sprouting well at ground level.

The staked willows in the Rose Creek riparian zone and the lower reaches of the two tributaries also had a high rate of survival (approximately 80%). Felt-leaf Willows are the most successful of the shrubs staked along the creek.

As noted during the 2005 survey, a much lower rate of survival (10% to 30%) was noted for the willows staked along the upper reaches of the two tributaries.

4.0 Natural Revegetation

A considerable number of plant species are naturally colonizing the dewatered reservoir as discussed in previous sections. The plant species colonizing the dewatered reservoir are pioneering species normally found on disturbed sites in this region. The most common species are those from the Mustard Family, including Yellow Cress (*Rorippa palustris*) and Tansy Mustard (*Descurainia incana*), although Tansy Mustard is not as widespread as in 2005. Mastadon Flower (*Senecio congestus*) and willows (*Salix* spp.) are also common, along with sedges (*Carex* spp.) and rushes (*Juncus* spp.) in the valley bottom wetlands.

As in 2005, the colonization of the site by undesirable invasive species does not appear to be a problem. The small amounts of Common Dandelion (*Taraxacum officionale*) and Annual Hawk's-beard (*Crepis tectorum*) found on the site are to be expected in any disturbed site in this region. The non-native grass species, Common Timothy (*Phleum pretense*), Foxtail Barley (*Hordeum jubatum*) and Smooth Brome *(Bromus inermis*) are also commonly found in the area.

5.0 Evidence of Erosion

The soil erosion site noted in 2005 on the south side of the reservoir, just upstream from the breached dam, has not significantly changed. Only minor signs of new soil attrition were observed. The groundwater seepage into the cut, approximately half way down the slope, was estimated to be only 50 mL/second. This flow is considerably less than that observed in 2005 (2 L/second).

Some bank erosion along the upper reaches of the main tributary has taken place. This occurred during the high waters of the spring freshet (late May and early June 2006).

6.0 Summary

Overall the revegetation of the dewatered freshwater reservoir has been successful. Although at first glance it appears that large areas of the reservoir contain dead grasses, the pinkish-brown hue is actually the inflorescence of the abundant Sheep Fescue found throughout all of the revegetated areas. Sheep Fescue dominates most of the Phases and plants were healthy and propagating. The following are summarized specifics.

- With the exception of Ticklegrass, the seeded grass species appear well established based on the increased rooting depths and the abundance of propagating plants. Ticklegrass appears not to be competing well with the other species.

- A much denser growth of seeded grasses is now occurring in the valley bottom. Visual distinctions between the various seeding zones were not so evident during the 2006 survey.

- The growth of seeded grasses on the walls of the dam breach remains sparse. There is little evidence of erosion on these highly compacted surfaces.

- The dense growth of grass on the upper steep slopes of the reservoir, although somewhat inhibiting the colonization by naturally occurring plant species, is most likely preventing soil erosion.

- The soil erosion site noted during the 2005 assessment has not deteriorated significantly. Some bank erosion on the upper reaches of Rose Creek has occurred during the spring freshet.

- Much of the dewatered reservoir is being colonized by pioneering plant species. Willows, Mastadon Flower and Yellow Cress are the most widespread species. Tansy Mustard is not as common as observed in 2005. Sedges and rushes are common in the valley bottom wetlands.

- The invasion of the area by unwanted invasive plant species is so far not a significant problem.

- The stem cuttings of woody species, particularly willows, are surviving well on the floodplains adjacent to the dam breach, in the Rose Creek riparian zone, and on the lower reaches of the two tributaries. The survival rate of the cuttings staked on the upper reaches of these tributaries is poor.

7.0 Recommendations

The gully that formed on the south side of reservoir in 2005 appears to have stabilized and very little further erosion has occurred over the past year. It is recommended that this site be left alone and allowed to revegetate naturally, which appears to be currently occurring. However, the site should be monitored regularly.

Continued monitoring of the bank erosion along Rose Creek and its tributaries is also recommended.

8.0 References

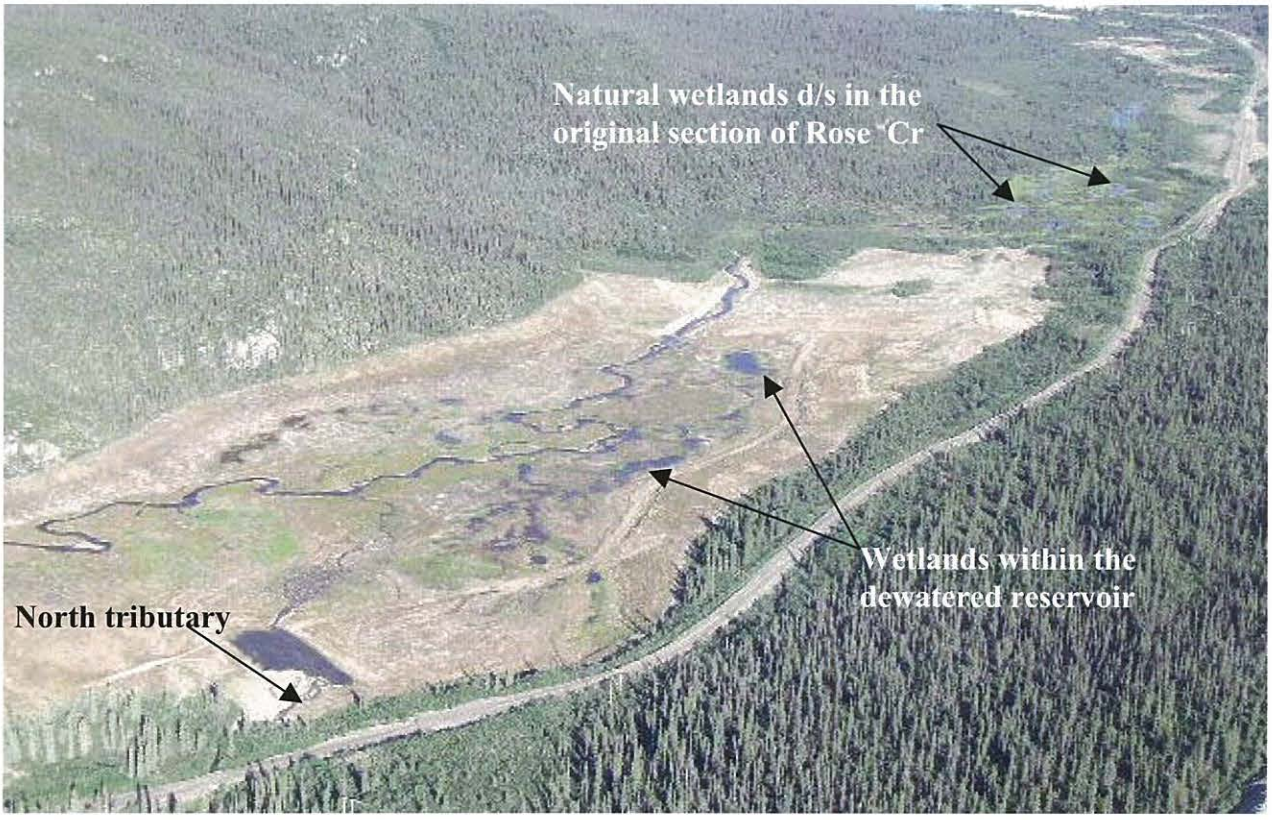
Arctic Alpine Seed Ltd. 2005. Anvil Range Mining Complex, Faro, Yukon. Former Fresh Water Supply Reservoir. Reservoir Site Revegetation and Rose Creek Riparian Zone Rehabilitation. Project Report 2003-2004. Prepared for Deloitte & Touche Inc.

Laberge Environmental Services. 2005. 2005 Revegetation Assessment – Dewatered Freshwater Reservoir – South Fork of Rose Creek, Yukon. Assessment Report Prepared for Deloitte & Touche Inc.

Lacroix, Denis. 2005. Personal comments and notes. (Mr. Lacroix was Arctic Alpine Seed Ltd's site manager for the freshwater reservoir revegetation project during the 2003 and 2004 field seasons).

APPENDIX A

SITE PHOTOGRAPHS, JULY 2006



Overall view of the northeast half of the dewatered reservoir, July 2006

Overall view of the southwest section of the dewatered reservoir, July 2006.

Sparse growth in some areas of Phase V, July 2006

Fairly good growth of Sheep Fescue in Phase V below the breach area, July 2006.

Some erosion of the banks near the inlet, July 2006.

Lush growth of sedges around a wetland area of the valley floor, July 2006.

Sparse growth on the breached walls of the dam. Note that very little growth has taken place on the core of the dam.

Good growth of transplanted willows and seeded grasses in the flood plain of the breach.

Panoramic view of the eroded gully, July 2006.

The breached section. The eroded gully in the background. July 2006.

The eroded gully appears to be stabilizing and new grass growth is occurring on the earth that slumped last season.

Stu Withers identifying a clump of Tufted Hairgrass. Grasses now cover 80 to 100% of the valley floor, looking southwest.

Good grass growth on the valley floor, looking northeast towards the breach. July 2006.

A transplanted spruce is surviving but not thriving, although some branches support new growth, July 2006.

Mastodon Flower was prolific in the wetter areas of the valley floor.

APPENDIX D – AQUATIC REPORT
REPORT PREPARED BY
WHITE MOUNTAIN CONSULTING

2006

FISH HABITAT AND FISH UTILIZATION ASSESSMENTS WITHIN THE DE-WATERED FRESHWATER SUPPLY RESERVOIR

ANVIL RANGE MINE SITE
FARO, YUKON
June/August 2006

Prepared For: Deloitte and Touche Inc.
January, 2007

WHITE MOUNTAIN ENVIRONMENTAL CONSULTING

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1.0 INTRODUCTION

The Freshwater Reservoir at the Faro Mine Site was permanently de-watered during fall and early winter of 2003 with the construction of a new channel through the old dam site. Monitoring of channel stability and fish utilization has occurred annually since. The following report details the 2006 evaluation of fish habitat in the reformed channels and fish utilization and distribution in the vicinity of the de-watered reservoir. The assessment was committed to in the *Environmental Management Plan for the Breaching of the Fresh Water Supply Dam at the Faro Mine* (EMP). Evaluations of fish habitat and fish distribution in Rose Creek through the reservoir basin were conducted during early June and mid August, 2006, the same timing as in previous assessments.

2.0 STUDY AREA

The Freshwater Reservoir Basin was created over a reach of the South Fork of Rose Creek. Within the reservoir basin two small tributaries join the South Fork of Rose Creek. The 2003 breach of the freshwater dam re-exposed the original channel and the creeks, since dewatering, flow mostly in their original channels. The fish habitat and fish utilization assessments of Rose Creek occurred within the newly exposed channel, the small tributaries, the newly created channel through the breach, in the lower section of the South Fork of Rose Creek immediately downstream of the breach, and Rose Creek in the vicinity of water sample site X14. These monitoring locations meet the objectives set out by the EMP.

Rose Creek, within the study area was divided into 5 distinct reaches for this investigation during the 2004 investigation (Figure 1). The sample reaches remain the same except for reach 5, which during the 2006 investigation was separated into two separate reaches designated reach 5a and 5b. A description of all the reaches follows:

Reach #1
Begins 30 meters above the upstream edge of the old reservoir basin and extends downstream approximately 340 meters (photos #1, 2 and 3). The break between Reach #1 and #2 was set just downstream of the confluence of the south east tributary at a point where slope of the basin decreases sharply from 4% to 1%, correspondingly the velocity decreases and substrates become finer.

Reach #2
Reach 2 flows from the end of Reach #1 for approximately 690 meters to the start of Reach #3 (photos # 5 and 6). The break between Reach #2 and #3 was set at a point where slope decreases from 1% to <0.5%, velocity and substrate size decrease again, the channel becomes deeper and the creek begins to meander after a long, relatively straight run.

Reach #3
From the downstream end of Reach #2 this reach flows for approximately 950 meters to the site of the old Coffer dam at the downstream end of the reservoir basin (photos # 7, 8, 9, 10 and 11). The Coffer Dam represents the upstream edge of construction activities resulting from the decommissioning of the dam.

Reach #4

Flows through the 265 meter reach where dam breach and channel construction activities occurred in 2003 (photos # 12, 13, 14, 15, 16, 17, 18 and 19). The reach starts at the old Coffer Dam site and continues through the breach to the downstream limit of 2003 channel modifications.

Reach #5
During the 2006 investigations Reach 5 was separated into a two part reach. Reach 5a begins at the downstream limit of 2003 construction activities and flows 220 meters through the constructed channel built at the same time as the dam in 1968. Reach 5b extends approximately 75 meters into the unmodified native channel in an area that has recieved significant gravel depositions over the past two years.

Site X-14
Site X-14 is located below the dewatered fresh water reservoir at the downstream end of the diversion channel and just upstream of the outlet from the settling ponds. The site extends upstream from water sampling site X-14 to the limit of the lower steep section of the diversion canal. This site was the site of release for a large number of fish salvaged from the reservoir basin during de-watering in 2003.

3.0 METHODS

Methods used in 2006 to assess fish habitat and fish utilization were as similar as possible to those used during all previous investigations. The 2006 assessments were conducted during spring, between May 31 and June 2 and summer, between August 14 and 18. The June investigation served as a post freshet assessment to identify areas of channel instability, general fish utilization and to identify potential barriers to fish movements. Detailed evaluation of fish habitats and assessments of fish utilization within the study area were conducted during August.

Prior to initiating field activities a license to collect fisheries information was obtained through DFO. The investigations were conducted under the authority of License to Collect Fish No. 06-15.

During the initial evaluation conducted in 2004, Rose Creek within the reservoir basin was divided into three separate reaches based on channel slope and corresponding channel morphology. The constructed channel through the breach and the previously modified channel downstream of the old reservoir were also described as separate reaches. The 5 reaches are shown in Figure 1.

Field maps generated in 2004 were used to ensure the 2005 and 2006 investigations re-sampled the same fishing locations and features established in 2004. A hand held GPS was used to document observation locations and elevations. A laser range finder was used to measure distances within each reach. Habitat evaluations throughout the study area included assessments of creek width (wet and dry), water depth, velocity (floating object technique), bank stability, bottom substrates, available cover and riparian vegetation.

Both ground and air photographs representative of each reach and unique features of the channel were taken during both field sessions to provide a record for long term monitoring of habitat stability.

During the 2006 field investigations an area of high erosion at the upstream end of Reach 2 was mapped and measured. Painted stakes were placed so that the extent of erosion that may occur during 2007 freshet can be monitored.

Reach 5 (below the breach) was divided into two distinct reaches during the 2006 investigation to delineate between different habitat types. Reach 5a consists of the previously modified channel downstream of the breach (modified during construction of the reservoir) and Reach 5b consists of 75 meters of the native channel below all construction activities.

Fish utilization and distribution was assessed with a variety of techniques to ensure capture of all species present. Crew members wore polarized sunglasses at all times to assist in fish viewing. All visual observations were recorded.

Minnow trapping was conducted with "Gee type" minnow traps (¼" mesh). Traps were baited with salmon roe (Yukon River origin) suspended in the trap in a perforated plastic bag. Traps were set in all habitat types for an overnight period with the total time of set ranging from 17.5 to 25.6 hours. A total of 55 minnow traps, spaced approximately 50 meters apart, were set throughout the reservoir basin, through the breach and into the old constructed channel. This includes; 14 traps in reach #1, 1 in the South East Tributary, 10 in reach #2, 9 in reach #3, 10 in reach #4, 6 traps in reach #5 and an additional 9 traps were set at site X-14.

A simple site description was recorded for each trap set and velocities at each location were visually estimated. This style of minnow trapping has previously been shown to be highly effective for the capture of juvenile chinook salmon (jcs). This technique is also effective for the capture of slimy sculpin and burbot juveniles, however, is not viewed as a reliable tool for documenting Arctic grayling. Several of the traps set in 2005 and 2006 were set in such a way as to create a "fyke" trap, designed to assist in the capture of juvenile Arctic grayling migrating up or down stream along the shoreline. Minnow trapping data has been presented as catch per trap per 24 hours of soak time.

Electro-fishing was conducted with a Smith-Route POW type 12A back pack, battery powered electro-fisher. The operator was accompanied by two crew members with dip nets. Fish utilization within the newly created channel and the newly exposed channel sections were assessed using a 2 pass block net, electro-fishing technique during the summer evaluations and a single pass with no nets during the spring. Block nets (1/4" rochel weave) were installed in the creek 100 meters apart at sites established in 2004. Effort, measured in seconds of shocking time, varied between the reaches due to complexity of habitats and the number of fish encountered.

During 2006, electro-fishing below the breach was, as in 2004 and 2005 conducted as a single pass over a 100 meter reach with no block nets.

Angling was conducted with light spin casting gear and a variety of small lures and flies. Effort was recorded as minutes fished.

Visual observation surveys of the glide areas in reaches 2 and 3 were repeated and all Arctic grayling observed were recorded.

All fish captured were identified as to species and recorded; a sub-sample of the fish captured was measured (live) for fork length (+/- 1 mm). All fish captured were handled delicately to allow for live release.

Catch per unit of effort for electro-fishing results from 2004, 2005 and 2006 were calculated as the number of fish caught per 100 seconds of electro-fishing time to allow comparison between the catches from the different years. The total catches from both the first and second passes were combined for this calculation.

4.0 RESULTS

At the time of the June investigation water levels had receded from the peak flows of spring freshet. Water levels within the study area were moderate and rising with visibility limited to a maximum of 1.5 meter depth by a high degree of tannin staining, suspended organic material and shifting sands.

During the August investigation flows had receded from June levels and channel conditions including bank stability and fish habitats were clearly visible. Water levels during the August, 2006 investigations were similar to those of 2005 and slightly higher than those of August, 2004.

Within the Reservoir Basin, "organic mats" or "root mats", the remnants of old vegetation dating from the time the reservoir was originally flooded continue to provide channel stability, however the stability of these mats continues to weaken. Woody materials that hold the organic mats intact had maintained structural integrity while under water but have continually weakened over the past 3 summers. In 2005 these same branches were brittle and snapped off easily, during 2006 branches that had been exposed to the air crumbled to dust with light pressure. Large woody materials within the basin, which have maintained structural integrity, consist of occasional spruce stumps; all other large woody material was removed mechanically prior to flooding. Most small and unconsolidated woody debri loosened from the banks has been washed from the reservoir basin.

During 2006 a previously seen pattern of erosion occurred extensively throughout the basin, but predominantly in Reach 2 and 3. The main erosion occurs during the freshet when exposed banks undercut a distance of 1 to 2 meters, the remaining organic mat "rolled" down covering the exposed banks, likely as the water dropped. This pattern of erosion leaves the creek channel looking stable; however the creek channel continues to become wider and shallower. "Rolled" banks were far less stable during 2006 than in past years investigations (photo 9) and it was difficult to determine during which year the banks had rolled.

Banks within the newly exposed channel of Rose Creek remain mostly confining and abrupt although the development of non-confining banks in reach 3 progressed significantly during 2006 (photo 12).

Point bar and sand bar development has increased throughout the reservoir basin as have sand and gravel depositions out of the channel (freshet deposits). An increase in instream gravel deposition in Reach 5b was noted and depositions of fine sand in small

eddies behind boulders was observed as far down stream as the confluence of the South Fork and North Fork of Rose Creek.

The Department of Fisheries and Oceans, Whitehorse (DFO) initiated assessments of stream widening through the reservoir basin in 2005 (A. von Finster 2005). In their study measurements of channel width were made at 50 meter intervals through the exposed basin in 2005 and again at the same location in 2006. Results from the 2005 investigation used an estimation of bank location prior to 2005. The basic conclusion of the DFO report was that the creek channel had widened an average of 2.1 meters since dewatering by 2005. This estimate is likely low as original bank locations were estimated based on 2005 bank structure and given the described pattern of erosion it would have been extremely difficult to know if banks had eroded prior to the 2005 measurements.

4.1 Fish Habitat

Flows of Rose Creek and the south east tributary within the reservoir basin continue to flow in the previously existing channels exposed in 2004. Flow from the North Tributary flows into an old gravel pit/ pond before flowing out into the reservoir basin. Channel development has progressed and although indistinct in several short areas, has developed an above ground channel that enters Rose Creek near its original (prior to flooding) confluence. Both the South East and the North Tributaries provide little in the way of fish habitat.

A significant flood event on Rose Creek occurred during May, 2005. This flood event flushed the channel of Rose Creek clear of fine organics during 2005. Some new organic materials were noted in the flows during 2006, these likely originated from bank slough within the reservoir basin.

In its current state Rose Creek provides a variety of fish habitats, but in limited amounts for all life stages of Arctic grayling and slimy sculpin and for juvenile burbot. Removal of fine organics decreased the channels ability to support sculpin fry. Flushing of small woody debri has left the channel in the lower two reaches very open with little instream cover for larger fish such as adult grayling. The creek channel has also flattened to some extent and deep undercut banks are uncommon except for immediately upstream of the old Coffer Dam site.

Reach #1
Has low profile, moderately stable and abrupt banks topped by the remnant organic mats from pre flooding with boulder/gravel substrates underneath. In the upper areas of the reach the finer materials from the organic overlay have continued to erode leaving branches and large woody debri over an exposed bank of coarse material with boulders and gravel. The reach has fast and turbulent flows. An increase in sand and gravel depositions through this reach has reduced the interstitial spacing; cover for small fish.

Two erosion points that occurred during the freshet of 2004 where channel widths were extended between 8 and 12 meters at outside corners have remained stable. The corner at the lower erosion point does seem to cause flows during freshet to veer right, and out of the main channel. At the time of dewatering the reservoir basin, the channel immediately downstream from this point was filled with silt. As a result channelization work was conducted in November of 2003 to train the channel into its present location.

In the lower section of Reach 1 banks continued to erode slightly and organic bank cover continues to degrade and slump into the channel. The deep spacing between boulders has had finer materials deposited and interstitial fish cover has been reduced (see photos 1-6).

Reach #2
This reach had considerable bank movement of the outside corners at a tight "S" bend near the top of the reach during 2004. Point bars that developed on the inside corners were composed of sandy material in 2004, by 2006 these same point bars consisted of gravel and the deep pools have become shallower. Below the meanders, Reach #2 flows as a relatively straight channel with low stable banks and laminar flows. Areas with higher banks through this area were extensively undercut and had collapsed into the creek during 2004. There were no collapsed banks remaining in the reach during the 2006 investigations, the instream material had been removed by the freshet and no new collapses were in evidence. Several small areas of instream deposition have occurred through the reach, mostly on point bars and in areas near the meanders in the upper part of the reach. The composition of deposition materials in these areas has become coarser since 2004. Cover within the reach is very limited; the original substrates remain and consist mostly of well consolidated cobbles and gravel (see photos 7 & 8).

Reach #3
Had large areas of under cut and collapsed banks in 2004 and again in 2006, many of the collapsed banks were washed out during the freshet. Extensive gravel bar formations continue to build within the mid section of the reach. Deeper pools in the lower portions of the reach have stabilized and some infilling has occurred although new deeper channel areas have also formed. The two small islands located upstream of the Coffer Dam have continued to erode and the channel on the right bank has filled in and widened from 1.5 meters to >3 meters and become non-confining. Limited amounts of cover occur in the upper parts of the reach; available cover does increase closer to the breach with steeply cut banks and increased depth (see photos 9-18).

Reach #4
The newly constructed channel has very stable banks and channel features. Sediment infilling of the new rip rap in low flow areas continues and the constructed riffles have maintained their shape through high flow events. Some movement of native materials used in reconstruction of the riffles occurred in 2004 and has now stabilized. Low velocity areas had light silt coverings over boulders and cobbles in 2004, all above surface fines were absent during the 2005 and 2006 investigations. In general the newly created channel provides good fish habitats. Fish cover amongst the cobbles and boulders is enhanced by depth and by the adjacent riffles. Deep spacing between the rip-rap has filled substantially with fines since construction (see photos 19 & 20).

Reach #5
During 2006 investigations this reach was divided into 2 separate reaches. Reach 5a, immediately downstream of the 2003 construction the creek flows in a previously constructed channel built at the same time as the reservoir. The banks are stable and clear of deposition. Boulders and cobbles remain clear of fines and provide good interstitial spacing. Well established riparian vegetation exists through the reach. The

channel in this reach was constructed nearly arrow straight and generates a high flow velocities that limits fish utilization.

Reach 5b is the section of Rose Creek below the constructed channel. The native channel in this reach has become a deposition point for gravels washed from the reservoir basin (see photos 21 & 22).

Site X-14
The downstream end of the diversion channel with boulder step rapids between deep pools consists of a very stable man made channel that provides excellent fish habitat with a good variety of turbulent pools and associated riffles. The native channel below the diversion channel provides a mix of habitat types with long glide areas, deep flowing pools, side pools and shallow gravel riffles. Cover is provided by depth, large woody debri, root wads and submerged willows. Erosion and deposition occur in a natural pattern with deep cut banks opposite and upstream from deposition areas. Excellent cover for larger fish occurs in the deep corner pool 80 meters down stream of the diversion channel.

4.2 Fish Utilization

In general fish utilization of the reservoir basin has decreased since dewatering. Electro-fishing results varied for each reach within the newly exposed and newly created channels (Table 1) with the numbers of most species in most reaches decreased from previous year catches (Table 2). The exception to the general decrease was slimy sculpin adults which were well dispersed and far more abundant in reaches # 2 and #3 than in the other reaches or in previous years, however they were less common in the other reaches than in previous years. Sculpin fry (0+ years) were common only in Reach #3 as in 2005; however the numbers of sculpin fry recorded during 2006 were half of those recorded during 2005. Arctic grayling juveniles were uncommon in all reaches during 2006 except for reach 5b below all construction activities. Adult Arctic grayling were uncommon in the Reservoir Basin during 2006 and the only adults recorded were visual observations in reach 3. Burbot numbers have steadily declined through the reservoir basin since dewatering and in 2006 were absent from the newly constructed channel through the breach.

General visual observations relating to Arctic grayling distribution through all reaches of the reservoir basin indicated that adult and sub adult were uncommon through most of the newly exposed channel during both June and August investigations of 2006. A visual inspection of the entire length of the newly exposed channel resulted in a count of 3 adult, 6 sub-adult Arctic grayling and 4 adult round whitefish, most within 80 meters of the breach. The same inspection from 2005 counted 6 adult and sub-adult Arctic grayling most of which were within 100 meters of the breach, the inspection conducted in 2004 counted 48 adult and sub-adult Arctic grayling. A low number of Arctic grayling in all reaches was also recorded during the block net surveys.

Reach # 1
During the two pass block net surveys the first pass recorded 3 juvenile Arctic grayling and 8 adult and 1 fry slimy sculpins. The second pass recorded 3 juvenile Arctic grayling, 3 adult and 1 fry slimy sculpins and 2 sub-adult burbot (Table 1). This

represents a general decrease in all species and age groups except it is the first time sculpin fry were recorded in this reach (Table 2).

A total of 14 minnow traps were set in Reach #1 (Appendix 2) for an average time of 17.2 hours. One trap captured a single burbot sub-adult and no other fish were captured (Table 3). A single trap was placed in the South East Tributary 10 meters upstream of the Rose Creek confluence; set at the same location as in previous investigations, this trap has not captured fish in any of the investigations including 2006.

Reach # 2

During the two pass block net surveys the first pass recorded 83 adult slimy sculpins. The second pass recorded 72 adult slimy sculpins (Table 1). This represents a substantial increase in the numbers of slimy sculpin adults and as substantial a drop in the number of slimy sculpin fry and juvenile Arctic grayling (Table 2).

A total of 10 minnow traps were set in Reach #2 (Appendix 2) for an average time of 17.1 hours each. A total of 3 burbot sub-adults were captured. This was the highest catch of burbot from this reach which has in the past supported both sculpins and juvenile grayling juvenile and not burbot (Table 3).

Reach # 3

During the two pass block net surveys the first pass recorded 28 adult and 26 fry slimy sculpins. The second pass recorded 18 adult and 52 fry slimy sculpins and 1 sub-adult burbot (Table 1). This represents an increase in the number of adult slimy sculpins and a slight decrease in the numbers of sculpin fry (Table 2).

A total of 9 minnow traps were set in Reach #3 (Appendix 2) for an average time of 18.6 hours each. Traps did not capture any fish in this reach during 2006 (appendix 2). Minnow trap catches from previous years have been low (Table 3).

Reach # 4

During the two pass block net surveys the first pass recorded 1 juvenile Arctic grayling and 5 adult slimy sculpin. The second pass recorded 3 adult slimy sculpin and 1 sub-adult burbot (Table 1). This represents an average count of sculpins and continues a steady decrease in the number of burbot and grayling in the constructed channel (Table 2).

A total of 10 minnow traps were set in Reach #4 (Appendix 2) for an average time of 23 hours each. A total catch of 1 slimy sculpin was captured. This represents the first time sculpin have been caught in this reach and a decrease in burbot and juvenile grayling (Table 3).

Reach # 5

Electro-fishing in Reach #5 was conducted as a single pass survey separated into two areas reach 5a and 5b. In reach 5a immediately below the constructed channel a single large slimy sculpin and an adult round whitefish were recorded. In 5b 4 juvenile Arctic grayling and 2 adult slimy sculpin were recorded (Table 1). This distribution of fish in the reach is similar to past results but with a decrease in the numbers of all species. The exception being this was the first time an adult round whitefish was recorded (Table 2)

A total of 6 minnow traps were set in Reach #5 (Appendix 2) for an average time of 17.2 hours each. One trap captured a single sub-adult burbot. Similar results were recorded in previous years (Table 3).

Site X-14

Electro-fishing at site X-14 was not conducted during 2006.

A total of 9 minnow traps were set at site X-14 from the lower end of the Rose Creek diversion channel to the confluence of the tailings discharge channel with Rose Creek. Traps were set for an average time of 17.2 hours. No fish were captured (Appendix 2). This represents a significant decrease in juvenile chinook abundance from previous years.

Table 1: Electro-fishing block net survey results from Rose Creek, in the de-watered reservoir basin, through the breach of the old dam and downstream of construction activities from August, 2006.

			Catch		
Site	Pass #	Shock time (seconds)	Arctic Grayling	Slimy Sculpin	Other
Reach #1	1	1,041	3 juv	8 adult 1 fry	0
	2	980	3 juv	3 adult 1 fry	2 burbot
Reach #2	1	1,155	0	83	0
	2	1,024	0	72	0
Reach #3	1	1,571	0	28 adult 26 fry	0
	2	1,361	0	18 adult 52 fry	1 burbot
Reach #4	1	885	1 juv	5	0
	2	734	0	3	1 burbot
Reach #5a	1	246	0	1	1 R whitefish
Reach #5b	1	207	4 juv	2	0

Juv. =juvenile, sub.ad = sub adult,

Table 2: Catch per unit of effort for electro-fishing block net surveys of Rose Creek Dewatered Reservoir channel comparing 2004, 2005 and 2006 total catches. Results have been presented as # of fish captured per 100 seconds of shock time for 2 passes combined

Reach	Year	Ag ad	Ag sub-ad	Ag Juv.	SS ad	SS fry	BB	jcs and other
#1	2004	0	0.16	0.84	0.68	0	0.36	0
	2005	0.12	0.12	1.60	0.86	0	0.12	0
	2006	0	0	0.30	0.54	0.10	0.10	0
#2	2004	0	0	0.23	1.49	2.79	0	0
	2005	0	0	0.24	2.68	0.62	0	0
	2006	0	0	0	7.11	0	0	0
#3	2004	0.05	0.05	0.16	1.44	0.58	0.58	0
	2005	0	0	0.07	0.36	5.14	0.21	0
	2006	0	0	0	1.56	2.66	0.03	0
#4	2004	0	0.07	1.21	0.64	0	0.37	0
	2005	0	0	0.28	0.07	0.07	0.14	0
	2006	0	0	0.06	0.49	0.00	0.06	0
#5	2004	1.14	1.14	0.68	0.56	0	0.23	0
	2005	0	0.17	4.96	1.50	0.34	0	0.17
#5a	2006	0	0	0	0.41	0	0	0.41 RWF
#5b	2006	0	0	2.00	1.00	0	0	

Fish species codes for table 2: Ag ad= Arctic grayling adult, Ag Juv.= Arctic grayling juvenile, SS ad= slimy sculpin adult, SS fry= slimy sculpin fry, BB= burbot, jcs= juvenile chinook salmon, RWF= round whitefish.

Table 3: A comparison of summarized of minnow trapping results from the Rose Creek Dewatered Reservoir channel for the years 2004 '05 and '06. Catches are expressed as the number of fish captured per trap per 24 j\hrs.

Site	Date	#traps	S. sculpin	A. grayling	burbot	jcs
Reach #1	2004	7	0.12	0	0.12	0
	2005	10	0.21	0.62	0.07	0
	2006	15	0	0	0.09	0
Reach #2	2004	14	0	0.12	0.06	0
	2005	9	0.08	0.08	0.17	0
	2006	10	0	0	0.42	0
Reach #3	2004	18	0.06	0	0	0
	2005	10	0	0.19	0.09	0
	2006	9	0	0	0	0
Reach #4	2004	6	0	1.04	0	0
	2005	9	0	0.65	0.20	0
	2006	10	0.10	0	0	0
Reach #5	2004	5	0	0.15	0.14	0
	2005	5	0	0.17	0.17	0
	2006	6	0	0	0.20	0
Site X-14	2004	14	0.14	0	0.14	1.61
	2005	9	0	0.08	0	0.62
	2006	9	0	0	0	0

FIGURE 1: Map Legend

Reach #1

1 Delta area formed during the life of the reservoir where Rose Creek entered the old reservoir. Reservoir influence extending 20 meters upstream of the edge of the reservoir high water mark is now stable. The braided channel existed as 4 separate channels and has now stabilized into 3 channels that continue to enter the old reservoir basin. Fish habitats upstream of the reservoir basin consist of a single well defined channel with boulders being the predominant substrate. The 3 channels now converge into a single channel at the edge of the former reservoir basin.

2 Substrates consist of large boulders with some gravel infill to produce stepped rapids with active bank erosion on both sides.

3 Extensive erosion occurred on the left bank in 2004, the channel has straightened and continues to erode the banks, the channel has widened and little deposition occurs in this area.

4 Minimal erosion continues to occur on both banks leaving a margin of washed boulders with the organic mat cover of the bank continuing to erode into the channel during high water events.

5 The channel has widened from 4 meters to 7 meters since dewatering. Well defined banks continue to confine the channel into a stepped boulder rapid. Protection of the banks by old root mats continues to decrease as the integrity of the woody materials fails.

6 A wide corner wash with a mid channel gravel bar (during low water) has formed as the creek makes a tight turn to the right. During high water the creek flows are deflected by the high bank on the lower left of the curve causing flows to jump the bank and flow over a gravel deposition area on the right bank. This site did not have a defined channel after dewatering in 2003 and crews were forced to locate the previous channel and physically encourage the flows to move into the present channel.

Reach #2

7 Extensive erosion of the right bank immediately upstream of the corner has produced a large amount of granular materials resulting in significant new deposition in the large corner pool and the adjacent point bar that has joined with a small sand island within the original channel observed in 2004.

8 Deposition has been occurring in the corner downstream while banks in this area are relatively stable

9 The outside corner of the meander that moved 8-10 meters during spring of 2004 has remained stable with little erosion occurring during 2006.

10 Shallow pool on outside corner, with extensive erosion during 2004 continues as a point of deposition with the adjacent point inside the curve stabilizing.

11 Long (175 meters) straight stretch partially confined by the hillside on the left bank. Right bank is low (0.4 meters) with exposed boulder edges. Small cobble and gravel substrates typical of reach 2 were remain clean of all fines and the banks are mostly stable.

12 A deep pool formed on the right bank by a 3-4 meter high eroding bank consisting of aggregate materials has been scoured out leaving a stable cobble bottomed pool.

13 Small amounts of ground flow from the North Tributary, comes to surface 20 meters from right bank and flows into Rose Creek in an old channel of the North Tributary.

14 Large sand and gravel deposit opposite deeply eroded outside corners continue to build. The sand depositions are now above the ordinary high water mark and are braiding. The creek substrates consist of gravel and cobble.

Reach #3

15 The mid channel gravel bar has extended.

16 The North Tributary is forming a channel that enters Rose Creek at the location where the tributary historically entered Rose Creek.

17 Series of undercut and collapsing banks on both banks with associated deep side pools >1 meter depth. The banks are steep, unstable and consist of eroding rolled banks.

18 Gravel bar formations with active bank movement continuing.

19 Channel actively shifting, banks are low and are continuing to become less confining in a flat flood plain area, gravel bar formations continue to grow and the channel is becoming braided.

20 Bank erosion occurred again in 2006 leaving large deposition areas, the channel consists of 40% gravel bar and continues to develop braiding.

21 Old meander scroll channel remains wet and exists as a small slough.

22 Small side slough is becoming a wetland area attached to the main flow.

23 Banks continue to "roll" and the channel has become wider and deeper.

24 Channel braids and the two small islands, upstream of the old coffer dam consisting of very fragile, unconsolidated mud experienced considerable erosion during 2006. The channel on the right bank has opened from 1.5 meters to as wide as 4 meters and the banks have become non-confining. Banks upstream of the old coffer dam are very unstable.

Reach #4

25 Inlet structure constructed at the upstream margin of the newly created channel. Steep rip rap rock, rapid, 1.2 meters in height has shown a slight decrease in slope

26 First constructed riffle in the breach.

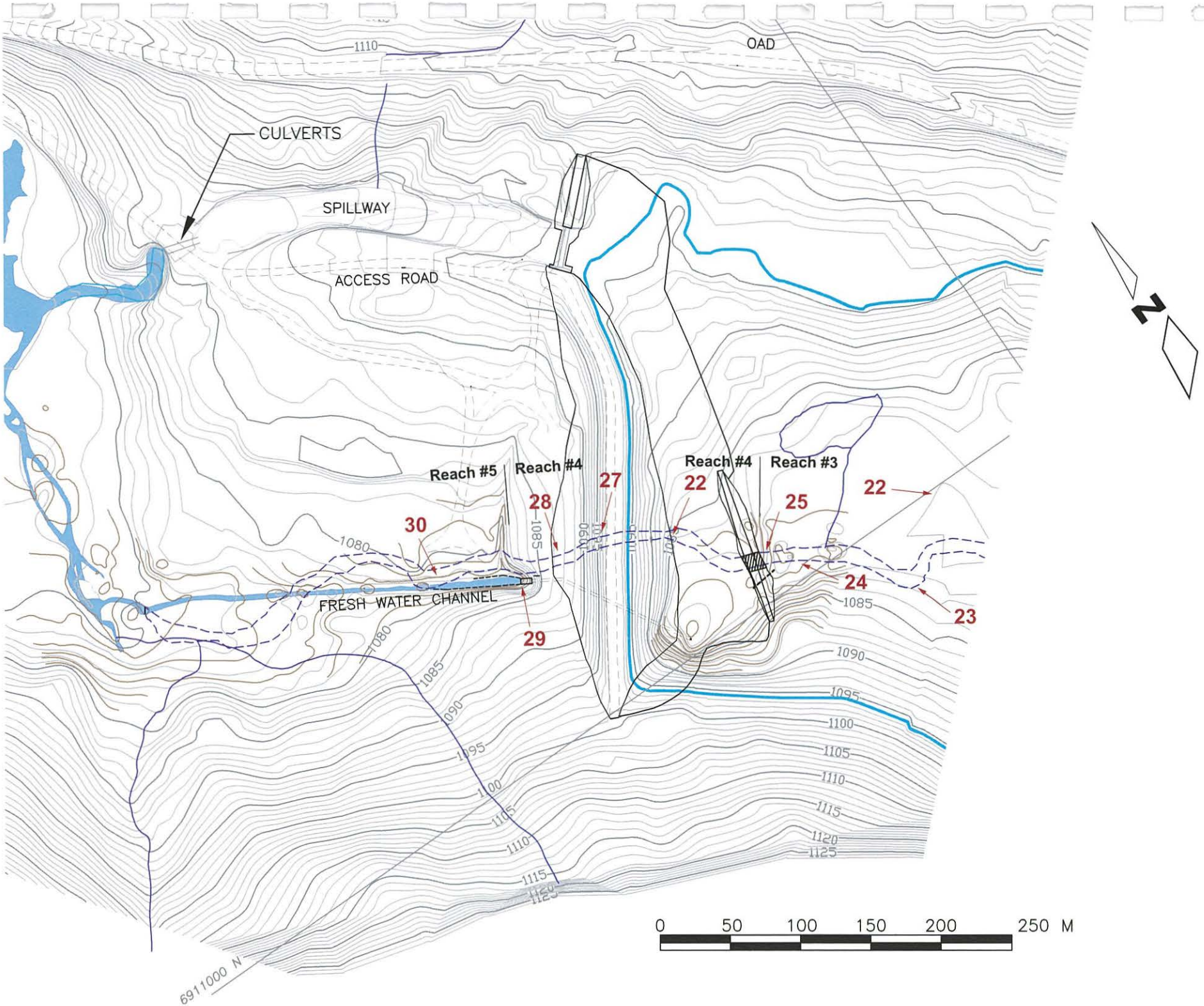
27 Second constructed riffle in the breach.

28 Third constructed riffle in the breach.

29 Boulder armor ends directing flow into channel built at the time of original dam construction.

Reach #5

30 End of channel built at the time of original dam construction.


CULVERTS
SPILLWAY
ACCESS ROAD
OAD
Reach #5
Reach #4
Reach #4
Reach #3
30
28
27
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FRESH WATER CHANNEL
1080
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1090
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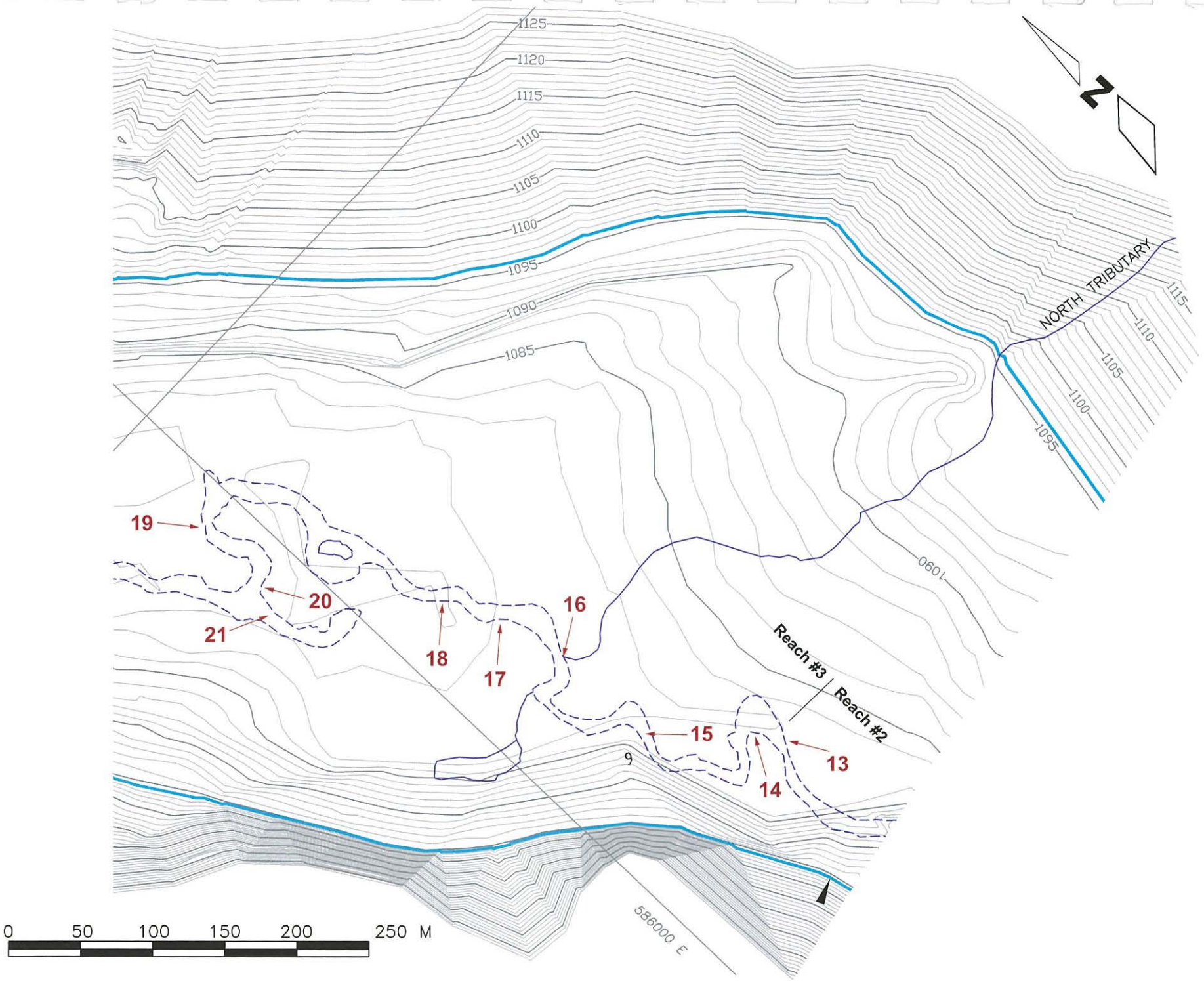
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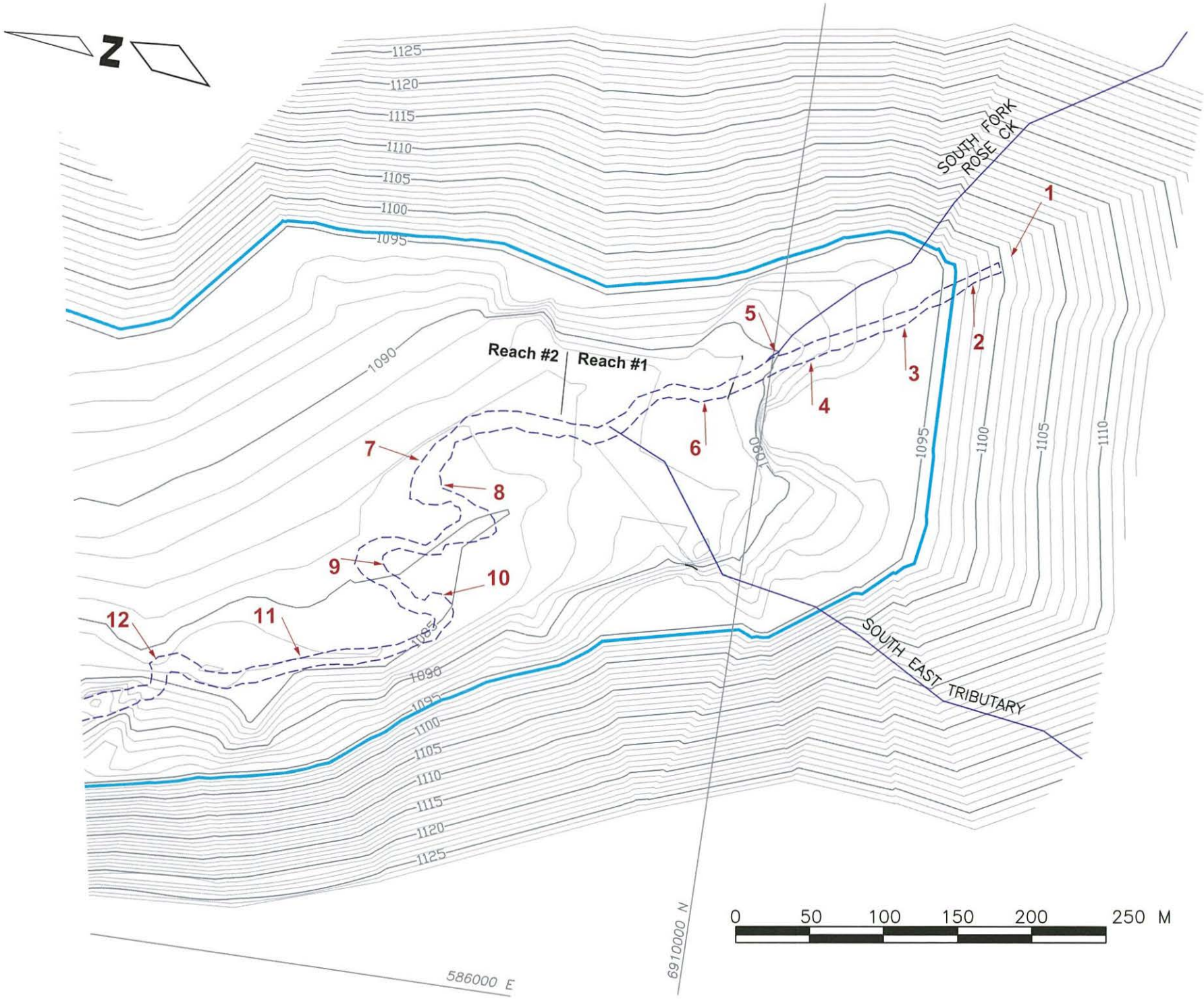
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SOUTH FORK ROSE CK
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Reach #2
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586000 E
6910000 N

APPENDIX 1

GENERAL SITE DESCRIPTIONS

LOCATION: Reach #1

UTM upstream end: Zone 8V 5 86 518 E / 69 09 900 N
Elevation: 3,608 feet
Site Location Description: South Fork Rose Creek at the upstream end of de-watered reservoir.
Date Sampled: August 10, 11, and 12, 2004
August 16 and 17, 2005
August 14 and 15, 2006

CHANNEL CHARACTERISTICS:

Reach Length:	370 meters
Average Channel Width:	7.0 meters
Average Wetted Width:	4.5 meters
Slope	4%
Average Depth:	0.3 meters
Average Velocity	>1 meters per second
% Pool, Riffle, Run / Glide:	45 % short runs, 25% stepped rapids over boulders and 30% small pools
Cover	Boulder pools, turbulence and perched boulders and cobbles
Overhead vegetation	Non-existent
Riparian Vegetation	newly planted grasses, willow stems and poplar stems

BED MATERIAL:

Unconsolidated
50% boulder, >35% cobble, <10% gravel, 5% sand (sand only in deposition points along side areas)

BANK CHARACTERISTICS: Banks rise an average of 0.8 meters; evidence of erosion from 2004, 2005, and 2006 occurs on both banks exposing old vegetation mats. Two separate areas of significant erosion occurred within reach #1 during the 2004 freshet, channel movements of 8 to 10 meters were recorded. On top of the banks fine silts to a depth of 15 cm have been newly deposited. Grass plantings from the fall of 2003 and the spring of 2004 have established growth. Some of the willow and black poplar plantings from spring 2004 have taken.

STREAM FLOW CHARACTERISTICS: Flows consist of a stepped rapid consisting of 30% boulder pools mixed with short run areas 2-5 meters in length between boulder steps.

PHOTOS: See photos 1-6.

LOCATION: South East Tributary

UTM at confluence with Rose Creek: Zone 8V 5 63 383 E / 69 10 127 N
Elevation: 3,573 feet
Site Location Description: Small tributary within the reservoir basin that feeds into Rose Creek.
Date Sampled: August 10, 11, 2004
August 15, 2005
August 14 and 15, 2006

CHANNEL CHARACTERISTICS:

Reach Length:	<250 meters
Average Channel Width:	2.75 meters
Average Wetted Width:	2.75 meters
Average Depth:	0.15 meters
Average Velocity	<0.5 meters per second
% Pool, Riffle, Run / Glide:	90% riffle/ run, and 10% small pools
Cover	limited; boulders, some organic debri and turbulence
Overhead vegetation	Non-existent
Riparian Vegetation	lower reach has grass planted in 2004, upper reach has well established grass planted in fall of 2003

BED MATERIAL: Substrates become finer moving downstream from the edge of the old reservoir to the confluence with Rose Creek. A decrease in slope occurs 100 meters from the edge of the old reservoir basin.

Upper reach 80% boulder, 20% cobble.
Lower reach 35% boulder, 35% cobble, 20% gravel and 10% sand

BANK CHARACTERISTICS: Upper 100 meters is entrenched with abrupt banks that rise to a maximum of 1.5 meters and are eroding. Lower 150 meters also entrenched with banks consistently rising abruptly to 0.6 meters.

STREAM FLOW CHARACTERISTICS: Upper 100 meters is 100% boulder strewn run with organic deposition area at slope change, lower 250 meters is 90% riffle run with 2 small pools (10%) near Rose Creek

LOCATION: Reach #2

UTM at upstream end: Zone 8V 5 86 379 E / 69 10 178 N
Elevation: 3,567 feet
Site Location Description: Reach starts approximately 340 meters downstream of the edge of the old reservoir basin and extends approximately 690 meters downstream.
Date Sampled: August 9, 2004
August 15,16,17, 2005
August 14 and 15, 2006

CHANNEL CHARACTERISTICS:

Reach Length:	690 meters
Average Channel Width:	7.0 meters
Average Wetted Width:	6.5 meters
Average Depth:	0.18 meters
Slope	>1%
Average Velocity	>1 meters per second
% Pool, Riffle, Run / Glide:	20% riffles, 60% glide and 20% pools
Cover	very little cover, some provided by deep corner pools
Overhead vegetation	non-existent
Riparian Vegetation	new grass and willow plantings

BED MATERIAL: Substrates become finer moving down the reach. Cobbles, common in the upper portions of the reach become rare in the lower portion.

Occasional boulder, 30% cobble, 60% gravel, 10% sand

BANK CHARACTERISTICS: Mostly entrenched rising abruptly an average of 0.4 meters. Banks consist of eroding vegetative mat.

STREAM FLOW CHARACTERISTICS: Long glide areas interspersed with occasional gravel riffles. A total of 6 large pools occur.

PHOTOS: See photos 7 and 8

LOCATION: Reach #3

UTM upstream end: Zone 8V 5 86 148 E / 69 10 551 N
Site Location Description: Reach extends from just upstream of the old North Tributary confluence to the site of the old coffer dam.
Date Sampled: August 10, 11, 2004
August 15, 16, and 17, 2005
August 14, 15, and 16, 2006

CHANNEL CHARACTERISTICS:

Reach Length:	Approximately 950 meters
Average Channel Width:	6.0 meters
Average Wetted Width:	5.5 meters
Average Depth:	0.4 meters
Slope	0.5%
Average Velocity	>0.5 meters per second
% Pool, Riffle, Run / Glide:	10% riffles, 80% glide and 10% pools
Cover	Very limited, small riffles and occasional pool
Overhead vegetation	Non-existent
Riparian Vegetation	newly seeded grass

BED MATERIAL: Loosely consolidated gravels and sand, cobbles and boulders firmly consolidated.

10% boulder, 10% cobble, 70% gravel, 10% sand (sand in deposition points only)

BANK CHARACTERISTICS: 70% of banks cut and eroding with rise to flood plain varying from 0.2 meters to 1.0 meters, 30% deposition points

STREAM FLOW CHARACTERISTICS: Channel is predominantly flat and featureless with occasional side pools

PHOTOS: See photos 9-18

LOCATION: North Tributary

UTM old channel confluence with Rose:
Site Location Description: Small tributary that enters Rose Creek from the West
Date Sampled: August 10, 2004
August 16, 2005
August 15, 2006

BED MATERIAL: Substrates consist primarily of fine gravels and sand with heavy orange colored siltation. Boulders in a steep area upstream of the old gravel pit pond have been placed to protect from head-ward erosion.

BANK and STREAM FLOW CHARACTERISTICS: The channel of this tributary within the reservoir basin has become more distinct since dewatering; during spring flows this tributary entered the reservoir basin cascading down a boulder shoot immediately below the road then formed a pond in an old gravel pit. Flows exit the pond through a well defined channel for 60 meters before filtering out through several small channels. Flows reconvene before entering Rose Creek as a single channel.

PHOTOS: see photo 11

LOCATION: Reach #4

UTM Upstream end of reach: Zone 8V 5 85 764 E / 69 11 037 N
Site Location Description: Reach extends from the old coffer dam through the breach of the old dam.
Date Sampled: August 10, 2004
August 15, 16 and 17, 2005
August 14, 15 and 16, 2006

CHANNEL CHARACTERISTICS:

Reach Length:	265 meters
Average Channel Width:	6.0 meters
Average Wetted Width:	5.5 meters
Average Depth:	0.3 meters
Average Velocity	<0.5 meters per second
% Pool, Riffle, Run / Glide:	10% riffles/ rapid, 90% glide
Cover	riffle areas and interstitial spaces along shoreline blast rock
Overhead vegetation	non-existent
Riparian Vegetation	none

BED MATERIAL: Substrates are heavily silted in glide areas.

60% angular boulder, 20% cobble, 20% gravel, % sand

BANK CHARACTERISTICS: Confining and stable banks consist of stepped and contoured blast rock constructed during 2003.

STREAM FLOW CHARACTERISTICS: Channel is flat flowing predominantly as a glide, riffle/ rapids as constructed.

PHOTOS: See photos 19 and 20

LOCATION: Reach #5

UTM upstream end: Zone 8V 05 83 690 E / 69 12 366 N
Site Location Description: downstream of the breach and construction activity
Date Sampled: August 13, 2004
August 16 and 17, 2005
August 15 and 16, 2006

CHANNEL CHARACTERISTICS:

Reach Length:	5a, 260 meters; 5b, 75 meters
Average Channel Width:	3.0 meters
Average Wetted Width:	3.0 meters
Average Depth:	0.4 meters
Average Velocity	1.0 meters per second
% Pool, Riffle, Run / Glide:	20% riffles, 50% run and 5% pools (pools along edges and at corners)
Cover	Perched cobbles, steep banks, occasional corner pools and turbulence below riffles
Overhead vegetation	5% coverage from willows and dwarf birch
Riparian Vegetation	willow, poplar, some cinquefoil and sedges

BED MATERIAL: Substrates highly compacted and consolidated.

10% boulder, 80% cobble, 10% gravel with very few fines

BANK CHARACTERISTICS: Banks are well defined and confining, rising 0.6 meters to an open flood plain. This reach was a constructed channel built at the time of the original dam construction

STREAM FLOW CHARACTERISTICS: Creek bottom is flat and the channel flows arrow straight through the constructed channel. Meanders at the downstream end are straightening and flows may shift to original channel in subsequent high water events. Significant gravel depositions have formed at the downstream end of the old constructed channel within the first 50 meters of the native channel.

Reach 5 has been separated into 2 distinct reaches (2006) to distinguish between the constructed channel and the native channel. Reach 5a, the channel constructed in 1968, extends 260 meters from the 2003 construction to the native channel. Reach 5b extends 75 meters into the native channel area that has experienced significant sand and gravel deposition since dewatering of the reservoir basin.

PHOTOS: See photos 21 and 22

LOCATION: Site X-14

Site Location Description: Rose Creek from the downstream end of the diversion channel to 100 meters downstream of the confluence with the tailings pond channel.
Dates Sampled: August 14 and 15, 2004
August 17 and 18, 2005
August 15 and 16, 2006

CHANNEL CHARACTERISTICS:

Reach Length:	360 meters
Average Channel Width:	17.0 meters
Average Wetted Width:	8.0 meters
Average Depth:	0.7 meters
Average Velocity	0.5 meters per second
% Pool, Riffle, Run / Glide:	10% riffles, 80% glide/run and 10% pools
Cover	deep pools, collapsed banks and instream woody debri
Overhead vegetation	15% coverage from willows and occasional spruce sweeper
Riparian Vegetation	willow, sedges and occasional spruce

BED MATERIAL: Substrates loosely compacted and mobile.

Small cobble patches near riffles 15%, 85% gravel

BANK CHARACTERISTICS: Wide gravel aprons opposing actively eroding cut banks

STREAM FLOW CHARACTERISTICS: The channel flows consistently with a deep side opposite of a gravel apron with occasional flat channels near riffle areas.

APPENDIX 2

Minnow Trapping Results
(See attached excel files)

2006 Aquatic Life Minnow Trapping Catch Records
Faro Fresh Water Reservoir Basin

Location	date set	date lift	species	fork length (mm)	comments
Reach 1					
trap#1; 20m u/s Reach 2; side channel	31/05/2006	01/06/2006	Arctic grayling	55	
trap#1; 20m u/s Reach 2; side channel	31/05/2006	01/06/2006	Arctic grayling	55	
trap#1; 20m u/s Reach 2; side channel	31/05/2006	01/06/2006	Arctic grayling	55	
trap#1; 20m u/s Reach 2; side channel	31/05/2006	01/06/2006	Arctic grayling	60	
trap#1; 20m u/s Reach 2; side channel	31/05/2006	01/06/2006	Arctic grayling	60	
trap#1; 20m u/s Reach 2; side channel	31/05/2006	01/06/2006	Arctic grayling	65	
trap #2; 5m u/s trap #1	31/05/2006	01/06/2006	Arctic grayling	65	
Reach 2					
trap #2; 40m d/s trap #1	31/05/2006	01/06/2006	slimy sculpin	10	fry; new hatch!
Reach 1					
trap #10; 25m u/s trap #9	14/08/2006	15/08/2006	burbot	172	
Reach 2					
trap #6; 40m d/s trap #5	14/08/2006	15/08/2006	burbot	????	
trap #6; 40m d/s trap #5	14/08/2006	15/08/2006	burbot	????	
trap #9; 50m d/s trap #8	14/08/2006	15/08/2006	burbot	175	
Reach 4					
trap #10; 15m d/s groin 6	14/08/2006	15/08/2006	slimy sculpin	64	

2006 Aquatic Life Minnow Trapping Catch Records

Location	date set	date lift	time set	time lift
Faro Fresh Water Reservoir Basin				
Reach 1				
trap#1; 20m u/s Reach 2; side channel	31/05/2006	01/06/2006	17:30	17:00
trap #2; 5m u/s trap #1	31/05/2006	01/06/2006	17:35	17:05
trap #3; 30m u/s trap #2	31/05/2006	01/06/2006	17:45	17:05
trap #4; 20m u/s trap #3	31/05/2006	01/06/2006	17:50	18:30
Reach 2				
trap #1; 15m d/s Reach1	31/05/2006	01/06/2006	18:00	17:50
trap #2; 40m d/s trap #1	31/05/2006	01/06/2006	18:00	17:45
trap #3; 90m d/s trap #2	31/05/2006	01/06/2006	18:05	16:05
trap #4; 25m d/s trap #3; block site	31/05/2006	01/06/2006	18:08	16:08
Reach 3				
trap #1; 5m u/s groin 1	31/05/2006	01/06/2006	18:30	14:00
trap #2; 20m u/s trap #1	31/05/2006	01/06/2006	18:35	14:05
trap #3; 30m u/s site #1	31/05/2006	01/06/2006	18:35	14:05
Reach 4				
trap #1; 40m d/s groin1	31/05/2006	01/06/2006	18:40	13:00
trap #2; 40m d/s groin 2	31/05/2006	01/06/2006	18:40	13:00
trap #3; 10m d/s groin 3	31/05/2006	01/06/2006	18:45	13:00
Reach 1				
trap #1; d/s end	14/08/2006	15/08/2006	16:40	09:55
trap #2; 10m u/s trap #1	14/08/2006	15/08/2006	16:40	09:55
trap #3; southeast tributary, 50m d/s Rose Creek	14/08/2006	15/08/2006	16:50	10:05
trap #4; 55m u/s trap #2	14/08/2006	15/08/2006	16:45	10:00
trap #5; 40m u/s trap #4	14/08/2006	15/08/2006	16:45	10:00
trap #6; 20m u/s trap #5	14/08/2006	15/08/2006	16:50	10:05
trap #7; 50m u/s trap #6	14/08/2006	15/08/2006	16:50	10:05
trap #8; 45m u/s trap #7	14/08/2006	15/08/2006	17:00	10:15
trap #9; 37m u/s trap #8	14/08/2006	15/08/2006	17:00	10:15
trap #10; 25m u/s trap #9	14/08/2006	15/08/2006	17:05	10:20
trap #11; 20m u/s trap #10	14/08/2006	15/08/2006	17:10	10:20
trap #12; basin edge	14/08/2006	15/08/2006	17:15	10:20
trap #13; u/s edge right channel	14/08/2006	15/08/2006	17:15	10:25
trap #14; main channel; immediately u/s reservoir	14/08/2006	15/08/2006	17:20	10:20
trap #15; 25m u/s FWR	14/08/2006	15/08/2006	17:20	10:20
Reach 2				
trap #1; 25m d/s Reach 1	14/08/2006	15/08/2006	17:35	10:50
trap #2; 30m d/s trap #1	14/08/2006	15/08/2006	17:40	10:50
trap #3; 45m d/s trap #2	14/08/2006	15/08/2006	17:45	10:50
trap #4; 30m d/s trap #3	14/08/2006	15/08/2006	17:50	10:50
trap #5; 40m d/s trap #4	14/08/2006	15/08/2006	17:55	10:55
trap #6; 40m d/s trap #5	14/08/2006	15/08/2006	17:55	10:55
trap #7; 180m d/s trap #6	14/08/2006	15/08/2006	18:00	11:00
trap #8; 50m d/s trap #7	14/08/2006	15/08/2006	18:05	10:05
trap #9; 50m d/s trap #8	14/08/2006	15/08/2006	18:10	10:05
trap #10; 48m d/s trap #9	14/08/2006	15/08/2006	18:15	10:05
Reach 3				
trap #1; u/s breach; 5m u/s groin 1	15/08/2006	16/08/2006	20:30	15:00
trap #2; 5m u/s trap #1	15/08/2006	16/08/2006	20:30	15:00
trap #3; 10m u/s trap #2;	15/08/2006	16/08/2006	20:30	15:00
trap #4; isle top of old coffer dam	15/08/2006	16/08/2006	20:30	15:00
trap #5; top of cofferd?? isles on bank	15/08/2006	16/08/2006	20:30	15:00
trap #6; 50m u/s isles	15/08/2006	16/08/2006	20:30	15:10
trap #7; 10m u/s trap #6	15/08/2006	16/08/2006	20:35	15:10
trap #8; 50m u/s trap #7	15/08/2006	16/08/2006	20:40	15:20
trap #9; 50m u/s trap #8	15/08/2006	16/08/2006	20:40	15:20
Reach 4				
trap #1; the breach; groin 1	14/08/2006	15/08/2006	18:50	17:50
trap #2; 10m d/s site #1	14/08/2006	15/08/2006	18:50	17:50
trap #3; 40m d/s trap #2	14/08/2006	15/08/2006	18:50	17:50
trap #4; 40m d/s trap #2; opposite trap #3	14/08/2006	15/08/2006	18:55	17:55
trap #5; 10m d/s groin 2	14/08/2006	15/08/2006	19:00	18:00
trap #6; top of groin 3	14/08/2006	15/08/2006	19:00	19:00
trap #7; 8m d/s trap #4	14/08/2006	15/08/2006	19:05	18:05
trap #8; d/s groin 5	14/08/2006	15/08/2006	19:05	18:05
trap #9; 40m d/s trap #8	14/08/2006	15/08/2006	19:15	18:15
trap #10; 15m d/s groin 6	14/08/2006	15/08/2006	19:15	18:15
Reach 5				
trap #1; u/s end gun barrel	15/08/2006	16/08/2006	20:00	17:00
trap #2; 35m d/s trap #1	15/08/2006	16/08/2006	20:00	16:50
trap #3; 35m d/s trap #2	15/08/2006	16/08/2006	20:05	16:45
trap #4; 40m d/s trap #3	15/08/2006	16/08/2006	20:05	16:35
trap #5; 17m d/s trap #4; end of gun barrel	15/08/2006	16/08/2006	20:05	16:20
trap #6; side channel; 30m d/s gun barrel	15/08/2006	16/08/2006	20:05	16:20
X-14; end of diversion				
trap#1; 100m d/s last groin	17/08/2006	18/08/2006	18:20	11:40
trap #2; 50m d/s groin	17/08/2006	18/08/2006	18:20	11:40
trap #3; 20m d/s groin	17/08/2006	18/08/2006	18:20	11:40
trap #4; 20m d/s groin	17/08/2006	18/08/2006	18:30	11:30
trap #5; 2m d/s groin	17/08/2006	18/08/2006	18:30	11:30
trap #6; u/s groin 1	17/08/2006	18/08/2006	18:35	11:35
trap #7; 2m d/s groin	17/08/2006	18/08/2006	18:40	11:30
trap #8; 2m d/s 2nd groin	17/08/2006	18/08/2006	18:40	11:30
trap #9; 2m u/s 2nd groin	17/08/2006	18/08/2006	18:40	11:30

APPENDIX 3: Photographs

Photo #1: Reach 1 entering the dewatered Reservoir basin from the right. The South East Tributary enters Rose Creek from the bottom, August, 2005.

Photo #2: Rose Creek entering the reservoir basin 2006.

Photo #3: Reach 1, 2006 looking downstream at deflection point mid way in reach.

Photo #4: Reach 1 entering the basin in 2004.

Photo #5: Ongoing erosion on reach 1, 2006.

Photo #6: Continuing erosion in Reach 1 during 2006 at location of major erosion from 2004.

Photo #7: Upstream end of reach 2, August, 2006 with showing erosion bank on lower right and gravel deposition from freshet flows on left

Photo #8: Active erosion bank in upper reach 2, 2006

Photo #9: Eroding "rolled" banks in reach 3, 2006.

Photo # 10: Gravel bar development and non-confining banks in reach 3, 2006.

Photo #11: Channel development of the North Tributary entering Rose Creek, 2006.

Photo #12: Sand and gravel bar development with non-confining banks in reach 3, 2006.

Photo #13: Aerial view for comparison to photo # 13 of lower section of Reach #3 showing deposition areas and extent of gravel bar formation during 2004.

Photo #14: The same bend as in photo #12 in 2006, note increase in non-confining banks.

Photo # 15: Aerial view of the downstream end of Reach #3 in 2004 for comparison of island formation above the old coffer dam site.

Photo #16: Rose Creek entering the breach, August, 2005. Note channel development outside of islands in comparison to photo # 14 from 2004.

Photo # 17: The downstream end of reach 3 at the old coffer dam in August of 2006. Channel widening and instream deposition are clearly visible in comparison to photos # 14 and 15.

Photo #18: Active erosion at the site of the old coffer dam, 2006.

Photo #19: Flows through the breach, 2006.

Photo #20: Aerial view for comparison from 2004 of the constructed channel within the breach.

Photo #21: Gravel deposition at the downstream end of reach 5, 2006.

Photo #22: Rose Creek downstream of the breach showing gravel deposition areas and natural channel formations, 2006.

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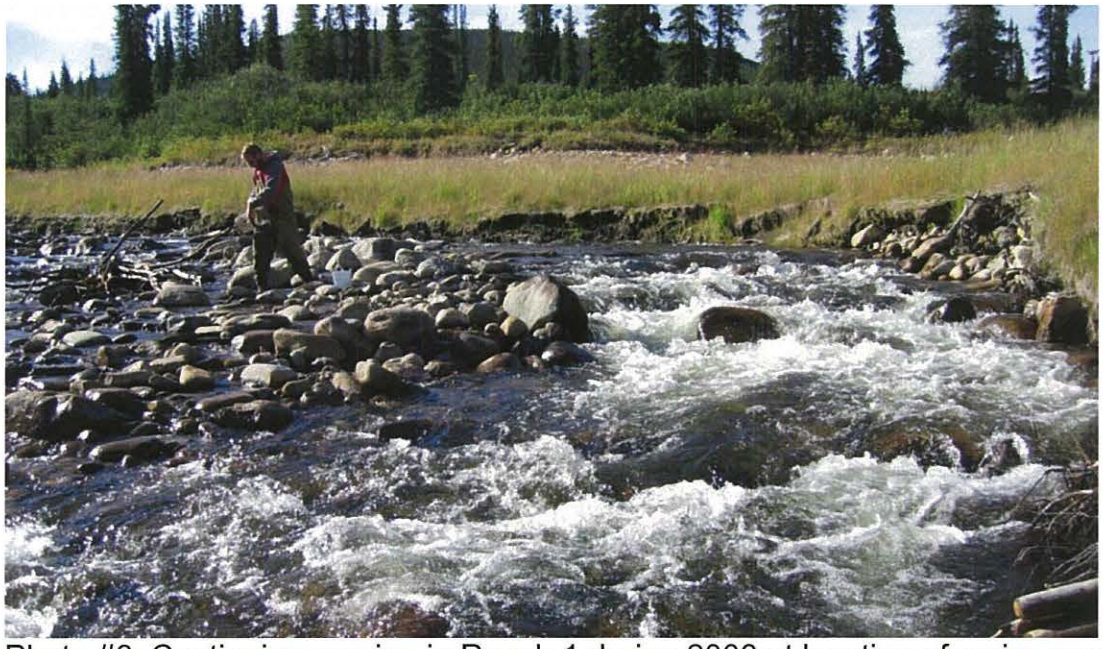

Photo #6: Continuing erosion in Reach 1 during 2006 at location of major erosion from 2004.

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Photo #18: Active erosion upstreseam of the old coffer dam, 2006.

Photo #19: Flows through the breach, 2006.

Photo #20: Aerial view for comparison from 2004 of the constructed channel within the breach.

Photo #21: The transition between reaches 5a and 5b. The gravel deposition areas are reach 5b, the straight channel on the right of the photo is reach 5a, 2006.

Photo #22: Rose Creek downstream of the breach (and photo 21) showing gravel deposition areas and natural channel formations, 2006.