CULLATON LAKE GOLD MINES LTD

WATER LICENCE N6L2-0940

ANNUAL
WATER LICENCE REPORT
1996

PREPARED BY:
HOMESTAKE CANADA INC
P.O. BOX 11115, 1100 - 1055 WEST GEORGIA STREET
VANCOUVER, B.C.
V6E 3P3

March 1997

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PREAMBLE

The Cullaton Lake Gold Mines property is located in the southern part of the District of Keewatin in the Northwest Territories. The property is 250 km west of Arviat, N.W.T., 400 km northwest of Churchill, Manitoba and 645 km north of Thompson Manitoba. The mine was in operation for four years, from 1981 to 1985. Since September 1985 the mine has remained in a care, maintenance and decommissioning phase.

Cullaton Lake Gold Mines Ltd. is wholly owned by Homestake Canada Inc.

The current water licence (N6L2 - 0940) from the Northwest Territories Water Board was renewed on September 1, 1995 and is effective until August 31, 1999. In July 1996 the water licence was transferred to the jurisdiction of the Nunavut Water Board.

As per this Water Licence, the Company is required to file a yearly report pursuant to Section 13(2) of the Northern Inland Waters Act and Section 15(1) of the Regulations, outlining details on water use or waste disposal at Cullaton Lake Gold Mine.

1.0 HIGHLIGHTS

A Draft Abandonment and Restoration Plan was submitted to DIAND and the Northwest Territories Water Board in April 1995. Comments were received following this submission. A revised Abandonment and Restoration (A & R) Plan was submitted in March 1996 to both DIAND and the Northwest Territories (NWT) Water Board. This A & R Plan was subsequently forwarded to the Nunavut Water Board.

The Cullaton Lake water licence was renewed as a B Licence on September 1, 1995 for a period of 4 years. It expires August 31, 1999. In July 1996 the water licence was transferred from the NWT Water Board to the jurisdiction of the Nunavut Water Board.

Homestake Canada personnel presented an overview of the proposed 1996 decommissioning work to the NWT Water Board Technical Advisory Committee on June 3, 1996. A similar presentation was made to the Nunavut Water Board on October 30, 1996.

Phase 2 of the *Cold Storage Kinetic Tests* report was submitted to DIAND and to the Nunavut Water Board on August 12, 1996.

Beak Consultants Ltd. completed an oxygen consumption study on the covered tailings during the summer. The resultant report was forwarded to DIAND, Water Resources Division and the Nunavut Water Board on December 5, 1996.

A geotechnical inspection of the tailings dam was completed by Trow Consulting Engineers during the period of September 15 - 18, 1996. Copies of the report were forwarded to DIAND, Water Resources Division and the Nunavut Water Board on December 6, 1996.

Decommissioning and Reclamation International Inc. (DRI) was on site during the summer and fall to continue the decommissioning work. Personnel from J. P. Consulting & Services, contracted by Homestake, accompanied the decommissioning crew to oversee the decommissioning work.

Water samples were taken on July 4, July 12 and Sept 20, 1996. Thermistor readings were taken on June 21, September 19 and September 26 as part of ongoing monitoring of the temperature regime in the tailings.

Paul Smith, Inspector under the Northwest Territories Water Act, carried out a water licence inspection on August 17, 1996.

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2.0 DETAILED SUMMARY

2.1 WATER LICENCE RENEWAL

Homestake applied for a water licence renewal on April 28, 1995. A revised 'B' Licence was granted effective September 1, 1995, expiring August 31, 1999. As part of the licence renewal, the Company submitted a revised Abandonment and Restoration Plan in 1996 to DIAND, to the NWT Water Board and to the Nunavut Water Board.

2.2 WATER QUALITY MONITORING

Water sampling continued at Cullaton Lake Mine this year. Sampling is required at 6 stations, once in the late spring and once again after August 1. Water was sampled three times during the summer season, twice in July (once by government personnel), and again in September. In September, Station 940-22 had no visible seepage, therefore no water sample was taken. All sampling results were well within the limits prescribed in the Water Licence N6L2-0940. See Appendix 1 for water quality results.

A DIAND Water Resources inspection was conducted on August 12. A copy of the inspection report and the Company's response is attached in Appendix 2.

2.3 TAILINGS

Trow Consulting Engineers completed a geotechnical inspection of the tailings area dams this summer. The inspection report concluded that the tailings dams are stable under the current site conditions. A recommendation that the exposed liner on tailings Dam 2 be removed, will be followed up in 1997. The inspection report is attached in Appendix 2.

Homestake staff competed an inspection of the tailings area during a site visit in September 1996. After digging into the tailings overburden material in a number of locations across the tailings, it was found that the depth of overburden material was less than the 1.4 metres of material described in the Abandonment and Restoration Plan. As a result of this finding, the Company has arranged for the placement of additional cover material on the tailings in 1997.

2.4 THERMISTORS

In order to prevent possible acid generation, reclamation of the tailings area has involved two oxygen-limiting methods; a water cover overlying the eastern portion of the tailings impoundment area and a till / mine rock cover on the remaining Shear and B-Zone tailings area. The application of the till / mine rock cover was intended to reduce oxygen infiltration, and to raise the level of permafrost in the tailings. Raising the permafrost level in the tailings will help to retain them in a permanently frozen condition which may prevent development and migration of acid drainage. Thermistors were installed in the covered tailings in August 1991 in order to monitor any rise in permafrost levels.

Thermistor readings have been taken during the spring and late summer months since 1991. Readings from 1992 to 1994 show an upward trend in the permafrost levels. In 1995 the level remained steady. The depth of the summer active zone has been observed to have decreased over the years from 2.8 m to approximately 2.3 m in depth.

In 1996 thermistor readings were taken at Thermistors # 1, 2, 3, and 4 once in June and twice in September (see Appendix 1). At the end of the 1996 summer season, the depth of the active zone remained stationary with respect to 1995 readings. With the placement of additional overburden on the tailings in 1997 (see Section 2.3) we anticipate seeing a resumption in the upward trend in permafrost levels in the future.

2.5 ROCK QUARRY

During the Company's 1995 meeting in Yellowknife with DIAND and the NWT Water Board, agreement was reached to use the quarry pit for disposal of non-salvageable materials. During 1995 some of the non-salvageable materials from the dismantling of the primary mill building were placed in the quarry. Other non-salvageable materials were placed alongside the quarry pit for crushing and burial in 1996. In 1996, the DRI decommissioning crew moved the remainder of the non-salvageable material to the quarry pit for crushing and burial. Some of this material was buried; the remainder will be crushed and buried in the pit in 1997.

2.6 MILL COMPLEX DISMANTLING

The decommissioning crew was on site from June 26 to July 31, and again from August 28 to September 18. During that time the remainder of the mill and auxiliary buildings were dismantled, as were the accommodation buildings.

Inert, non-salvageable material was placed adjacent to the quarry pit for crushing and burial. Salvageable equipment was either flown to Thompson, Manitoba or Arviat, NWT, or was stacked at the airstrip for removal by ice train during the winter of 1996/97 and in 1997 by Hercules transport.

The crew returned for a week in November to prepare the site for next season.

2.7 STUDIES AT CULLATON LAKE

2.7.1 CANMET reports: Phase 1 and Phase 2

The *Phase 2: Cold Temperature Leaching* report was completed by CANMET and received by Homestake Canada in mid-1996. The report was distributed to DIAND, the NWT Water Board and the Nunavut Water Board late in 1996. The CANMET study, *Phases 1 and 2*, is now complete. The study concludes that, under laboratory conditions, oxidation and acid generation occur in both the B Zone and Shear Zone tailings. However, the rate of acid generation is low and decreases with a decrease in temperature. As noted above, HCI has chosen to cover a portion of the tailings with a water cover and a portion with overburden to reduce oxidation.

2.7.2 Oxidation Study

An oxygen consumption survey of the covered tailings was completed this year by Beak Consultants. The study results indicate that covering the tailings material has resulted in an overall decrease, by one order of magnitude, of oxygen consumption within the tailing mass. See Appendix 2 for a copy of the report.

2.7.3 Geotechnical Report of Tailings Containment Area

A geotechnical survey was carried out this year. The report concludes that the tailings dams appear to be in good condition with no signs or distress or erosion. A copy of the report is attached in Appendix 2.

2.8 MISCELLANEOUS

Equipment required for hauling and spreading fill, and for general maintenance remains at the site. This includes a 426 JCI truck, a D8K, 415 JCI truck, 966D loader, 950 loader, cargo truck, fuel truck and two jeeps.

3.0 1997 PROPOSED WORK SCHEDULE

Homestake Canada Inc. intends to complete the remaining decommissioning work in 1997. This includes removing the remaining Atco buildings, removing all salvageable material from the site, and disposing of all non-salvageable material as per our revised A & R Plan.

As well, the crew will cover portions of the tailings area with additional overburden, and seed and fertilize the tailings area and portions of the decommissioned mill site. Selection of seed has been made based on results of a vegetation survey completed during the September site visit, and subsequent discussion with an arctic vegetation consultant (Alaska Biological Research, ABR Inc.). Seed selection may include *Poa glauca* (Tundra Bluegrass), *Poa* *arctica* (Alpine Bluegrass), *Arctagrostis latifolia* (Alyeska Polargrass), *Festuca ruba* (Arctared Fescue), and *Deschampsia caespitosa* (Tufted Hairgrass). Final selection will depend upon commercial availability.

APPENDIX 1

Water Quality Data
Thermistor Data

HOMESTAKE CANADA INC.
Cullaton Lake Water Quality
1996

STATION: 940-2: POND #1 DISCHARGE

Date	TOTAL ARSENIC mg/l	TOTAL COPPER mg/l	TOTAL CYANIDE mg/l	TOTAL LEAD mg/l	TOTAL NICKEL mg/l	TOTAL ZINC mg/l	SUSPENDED SOLIDS mg/l
07/04/96	<0.001	<0.01	0.007	<0.05	<0.05	<0.01	3.5
07/12/96	0.0087	0.0007	0.043	0.006	0.0035	<0.005	
09/20/96	<0.001	<0.01	0.002	<0.05	<0.05	<0.01	2.0
JUN 1996 - SEP 1996							
Mean	0.0036	0.0069	0.017	0.035	0.0345	0.008	2.8
Minimum Value	0.0010	0.0007	0.002	0.006	0.0035	0.005	2.0
Maximum Value	0.0087	0.0100	0.043	0.050	0.0500	0.010	3.5

HOMESTAKE CANADA INC.
Cullaton Lake Water Quality
1996

STATION: 940-3: POND #2 DISCHARGE

Date	TOTAL ARSENIC mg/l	TOTAL COPPER mg/l	TOTAL CYANIDE mg/l	TOTAL LEAD mg/l	TOTAL NICKEL mg/l	TOTAL ZINC mg/l	SUSPENDED SOLIDS mg/l
07/04/96	0.001	0.14	0.002	0.16	<0.05	0.04	1.5
07/12/96	0.0021	0.0043	<0.004	<0.002	0.0038	<0.005	
09/20/96	<0.001	<0.01	0.001	<0.05	<0.05	0.02	1.6
JUN 1996 - SEP 1996							
Mean	0.0014	0.0514	0.002	0.071	0.0346	0.022	1.6
Minimum Value	0.0010	0.0043	0.001	0.002	0.0038	0.005	1.5
Maximum Value	0.0021	0.1400	0.004	0.160	0.0500	0.040	1.6

HOMESTAKE CANADA INC.
Cullaton Lake Water Quality
1996

STATION: 940-18: TAILINGS POND #1 SPILLWAY

Date	TOTAL ARSENIC mg/l	TOTAL COPPER mg/l	TOTAL CYANIDE mg/l	TOTAL LEAD mg/l	TOTAL NICKEL mg/l	TOTAL ZINC mg/l	SUSPENDED SOLIDS mg/l
07/04/96	0.001	<0.01	0.007	<0.05	<0.05	<0.01	2.8
09/20/96	<0.001	<0.01	0.002	<0.05	<0.05	<0.01	1.0
JUN 1996 - SEP 1996							
Mean	0.001	0.01	0.005	0.05	0.05	0.01	1.9
Minimum Value	0.001	0.01	0.002	0.05	0.05	0.01	1.0
Maximum Value	0.001	0.01	0.007	0.05	0.05	0.01	2.8

HOMESTAKE CANADA INC.
Cullaton Lake Water Quality
1996

STATION: 940-19: TAILINGS POND #1 PIESOMETER

Date	TOTAL ARSENIC mg/l	TOTAL COPPER mg/l	TOTAL CYANIDE mg/l	TOTAL LEAD mg/l	TOTAL NICKEL mg/l	TOTAL ZINC mg/l	SUSPENDED SOLIDS mg/l
07/04/96	0.001	<0.01	0.007	<0.05	<0.05	<0.01	12.4
09/20/96	<0.001	<0.01	0.002	<0.05	<0.05	<0.01	1.2
JUN 1996 - SEP 1996							
Mean	0.001	0.01	0.005	0.05	0.05	0.01	6.8
Minimum Value	0.001	0.01	0.002	0.05	0.05	0.01	1.2
Maximum Value	0.001	0.01	0.007	0.05	0.05	0.01	12.4

HOMESTAKE CANADA INC.
Cullaton Lake Water Quality
1996

STATION: 940-20: EAST SIDE OF TAILINGS POND #1

Date	TOTAL ARSENIC mg/l	TOTAL COPPER mg/l	TOTAL CYANIDE mg/l	TOTAL LEAD mg/l	TOTAL NICKEL mg/l	TOTAL ZINC mg/l	SUSPENDED SOLIDS mg/l
07/04/96	0.001	<0.01	0.007	<0.05	<0.05	0.01	4.3
09/20/96	<0.001	<0.01	0.001	<0.05	<0.05	0.02	2.7
JUN 1996 - SEP 1996							
Mean	0.001	0.01	0.004	0.05	0.05	0.01	3.5
Minimum Value	0.001	0.01	0.001	0.05	0.05	0.01	2.7
Maximum Value	0.001	0.01	0.007	0.05	0.05	0.02	4.3

HOMESTAKE CANADA INC.
Cullaton Lake Water Quality
1996

STATION: 940-22: TAILINGS POND #1 NE CORNER

Date	TOTAL ARSENIC mg/l	TOTAL COPPER mg/l	TOTAL CYANIDE mg/l	TOTAL LEAD mg/l	TOTAL NICKEL mg/l	TOTAL ZINC mg/l	SUSPENDED SOLIDS mg/l
07/04/96	0.001	<0.01	0.007	<0.05	<0.05	<0.01	3.8
JUN 1996 - SEP 1996							
Mean	0.001	0.01	0.007	0.05	0.05	0.01	3.8
Minimum Value	0.001	0.01	0.007	0.05	0.05	0.01	3.8
Maximum Value	0.001	0.01	0.007	0.05	0.05	0.01	3.8

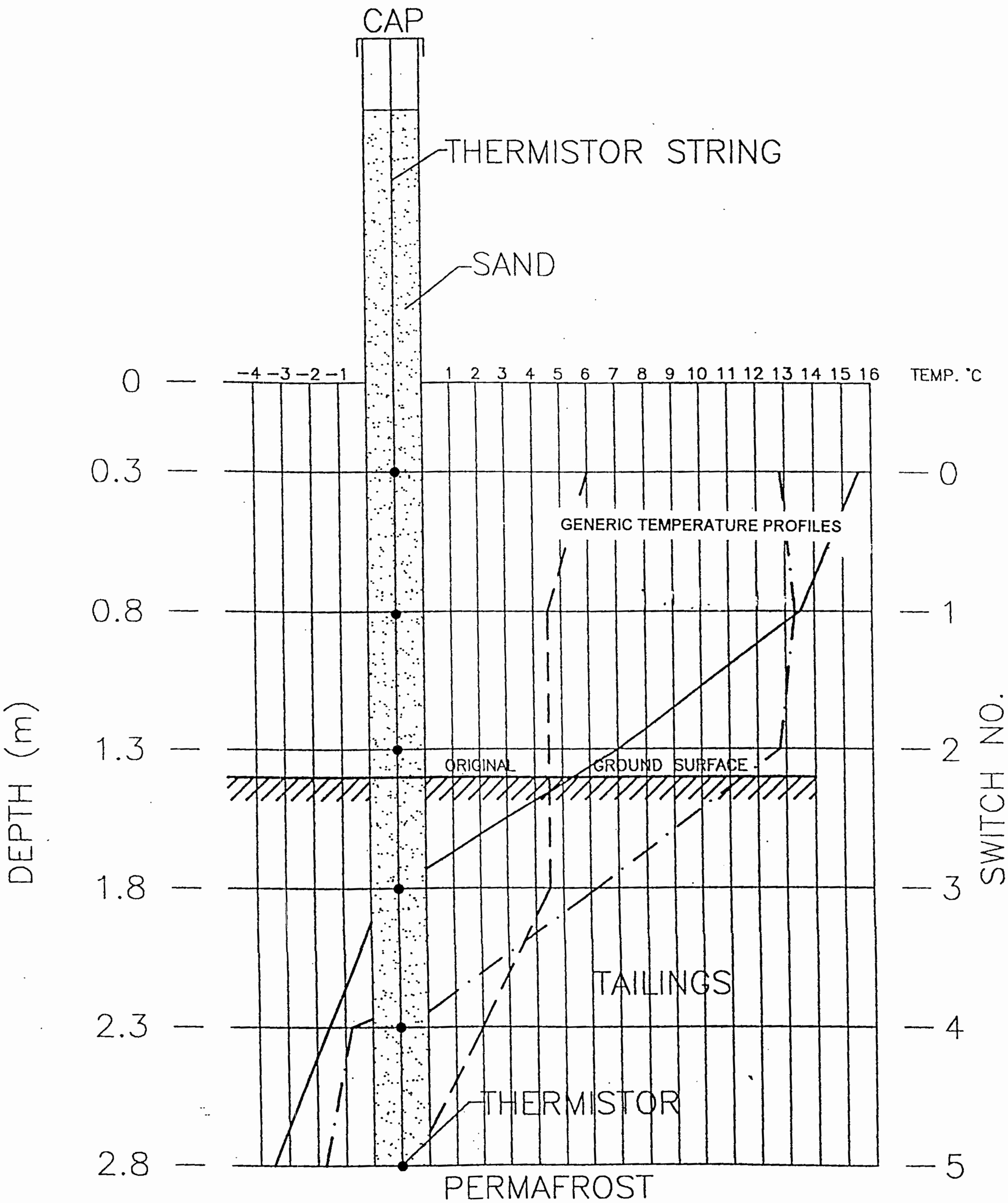
TEMP. AT CULLATON LAKE THERMISTORS (1991 TO 1996)

No.1	0	1	2	3	4	5
Aug-91	13.2	12.8	10.8	7.2	5.2	0.8
Sep-91	11	11.2	8.8	5.4	3	0.5
Jul-92	13.5	13.6	13.5	4.4	-0.9	-2.1
Aug-92	6.2	5.1	5.1	3.6	0.9	-0.4
Jul-93	33.1	16	6.8	0	-1.3	-2.1
Jul-93	13.7	12	7.6	1.5	-1	-1.8
Jun-94	15.6	11.3	5	-0.2	-2.1	-3.3
Jul-94	15.6	11.3	4.6	-0.7	-2.6	-3.6
Jul-94	19.6	14	9.2	4.9	-0.2	-1.3
Sep-94	23	14	8.4	4.7	1.1	-0.9
Jun-95	35.99	18.51	3.74	-0.76	-2.18	-3.13
Sep-95	7.36	5.25	2.97	1.44	0.32	-0.27
Oct-95	3.42	1.64	1.73	1.25	0.41	-0.26
Jun-96	12.06	7.36	2.05	-0.32	-1.95	-3.22
Sep-96	7.9	6.4	7.7	4.8	1.8	-0.2
Sep-96	10.1	8.6	5.3	4.5	2.2	-0.1

No.2	0	1	2	3	4	5
Aug-91	13	13	13.2	10.2	6	0.5
Sep-91	10.8	11	10	5.2	3	0.4
Jul-92	13.3	13.6	13.4	6.2	-0.5	-2
Aug-92	6.5	5.5	5.2	4.7	2.3	-0.2
Jul-93	34.5	29.4	12.4	5.2	-0.5	-1.8
Jul-93	13.7	13.4	12.3	7.8	0.6	-1.4
Jun-94	15.4	15.3	9.3	2.4	-1.1	-3
Jul-94	15.4	15.2	8	1.7	-1.8	-3.4
Jul-94	20.2	19.3	11.1	9.1	2.2	-1
Sep-94	16.9	9.4	7.7	5.5	2.6	-0.2
Jun-95	29.36	7.07	0.64	-1.15	-2.16	-3.43
Sep-95	7.45	3.33	2.16	0.82	0.08	-0.6
Oct-95	3.11	1.23	1.51	0.84	-0.38	-0.56
Jun-96	11.81	3.12	1.23	-0.74	-2.15	-3.56
Sep-96	8.12	6.89	5.93	3.26	0.72	-0.64
Sep-96	14.37	4.71	4.89	3.48	1.07	-0.57

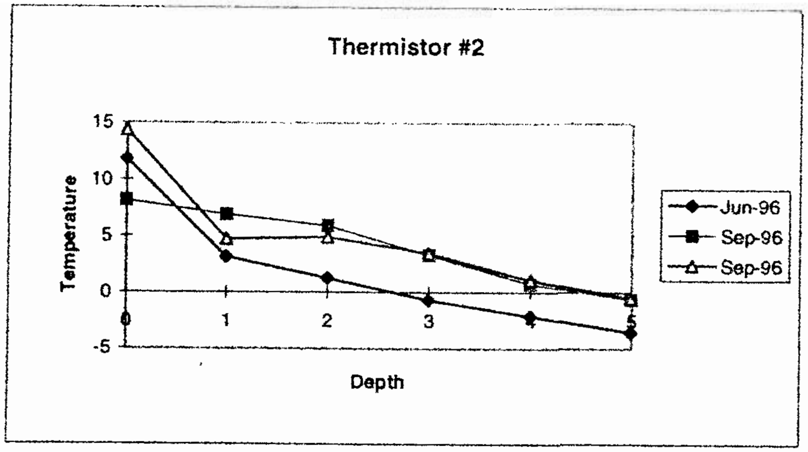
No.3	0	1	2	3	4	5
Aug-91	12.8	13	12.8	11	6.5	0.8
Sep-91	9.8	9.2	8.4	5.8	3.2	0.5
Jul-92	12.8	12.6	12.5	5.2	-0.6	-1.9
Aug-92	6.2	4.7	4.6	4.1	2	-0.2
Jul-93	32.5	22	9.2	1.2	-0.9	-1.9
Jul-93	13.8	13.1	10	3.4	-0.6	-1.5
Jun-94	15.3	13.6	7	0.1	-1.7	-3.3
Jul-94	15.3	13.6	6.8	0	-1.8	-3.5
Jul-94	20.2	18.5	10.1	5.7	0.1	-1.3
Sep-94	21.3	10	7.3	4.5	1.6	-0.4
Jun-95	32.39	8.71	-0.2	-1.93	-3.23	-4.2
Sep-95	7.53	4.34	2.25	0.89	0.12	-0.48
Oct-95	3.45	1.76	1.57	1	0.12	-0.44
Jun-96	11.65	4.86	1.33	-0.84	-2.47	-3.82
Sep-96	8.5	7.51	6.49	3.33	0.7	-0.48
Sep-96	13.25	6.4	5.19	3.65	1.09	-0.39

No.4	0	1	2	3	4	5
Aug-91	15	14.2	16.8	12	6.2	1
Sep-91	11	11.5	11	6.8	4	0.6
Jul-92	12.9	13.3	12.7	5.2	-0.7	-1.7
Aug-92	6	4.8	4.6	4.5	2	-0.2
Jul-93	32.9	22	9.2	1	-1	-1
Jul-93	13.4	12.9	10.5	-3	-0.7	-1.5
Jun-94	15.4	13.3	6.7	-0.1	-2	-3.1
Jul-94	15.4	13.2	6.7	-0.2	-2	-3.2
Jul-94	19.5	14.5	6.8	4.2	-0.4	-1.5
Sep-94	23.1	17.5	6.8	4.5	1	-0.6
Jun-95	36.25	25.04	5.79	-1.02	-2.38	-3.53
Sep-95	7.29	4.79	3.43	1.13	0.18	-0.39
Oct-95	3.57	2.16	1.29	0.95	0.22	-0.39
Jun-96	11.6	9.17	3.19	-0.51	-2.13	-3.42
Sep-96	9.33	7.83	7.16	4.18	1.29	-0.43
Sep-96	14.11	10.54	4.95	3.85	1.63	-0.35



THERMISTOR STRING CONFIGURATION

INSTALLED AUGUST 23, 1991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1
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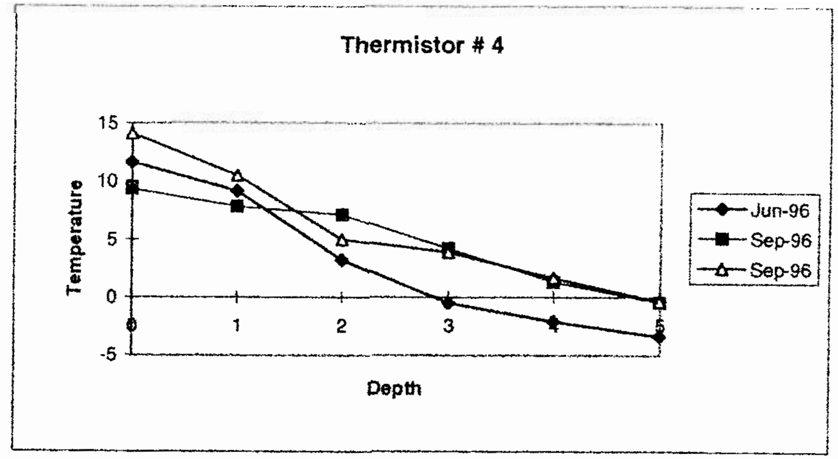
3
4
5
Depth
Jun-96
Sep-96
Sep-96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Depth
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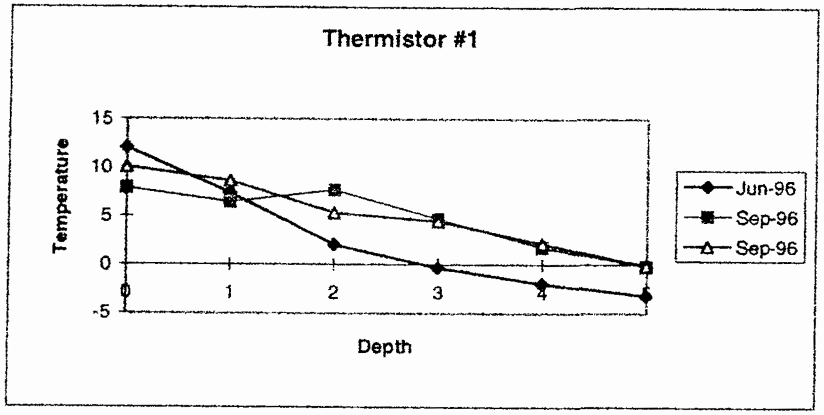
Sep-96
Sep-96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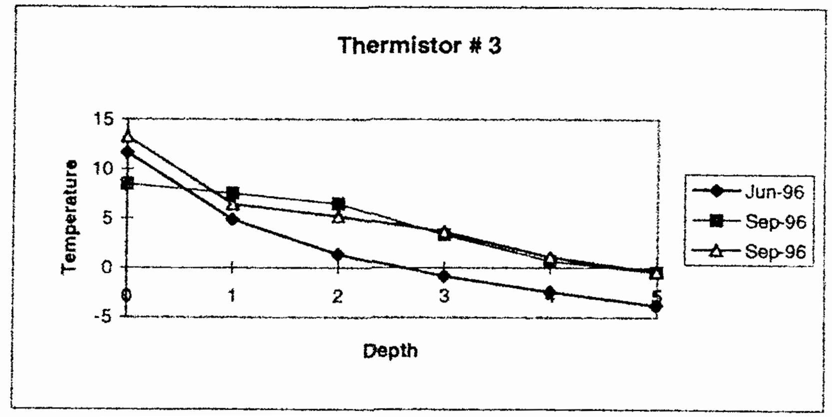
0
-5
0
1
2
3
4
5
Depth
Jun-96
Sep-96
Sep-96


Thermistor # 3
Temperature
15
10
5
0
-5
0
1
2
3
4
5
Depth
Jun-96
Sep-96
Sep-96

APPENDIX 2

Oxidation Study
Geotechnical Inspection Report
DIAND Inspection Report

AN OXYGEN CONSUMPTION SURVEY OF THE SULPHIDE TAILINGS AT CULLATON LAKE, N.W.T.

Final Report to:

HOMESTAKE CANADA INC.

Prepared by:

BEAK INTERNATIONAL
INCORPORATED
14 Abacus Road
Brampton, Ontario
L6T 5B7

November 1996
BEAK Ref. 20532.1

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1.0 INTRODUCTION

The Cullaton Lake property is a former gold mine that has been decommissioned. The focus of this investigation is the non-flooded portion of the tailings impoundment that occupies an area of approximately 6 hectares adjacent to the former mill site. The tailings were covered by a coarse-grained layer of gravel-boulder sandy till mixed with blast rock. The purpose of the cover was two-fold: firstly, to decrease oxygen migration into the tailings and, secondly, to provide thermal insulation to encourage the development of permafrost conditions in the tailings. It was expected that permafrost conditions in the tailings would prevent oxidation of the sulphide minerals and subsequent impact on the quality of water adjacent to the tailings. BEAK was contracted by Homestake Canada Inc. to provide a rapid assessment of the oxidation status of the non-flooded tailings using a newly developed field technique referred to as an Oxygen Consumption Measurement.

The purpose of this investigation was to measure the rates of oxidation of the existing tailings under the coarse-grained cover. These measurements were made over a one week period in July 1996 at 17 locations across the covered tailings. Control measurements were also made on a small area of uncovered tailings and on tailings with the cover temporarily removed by excavating a small diameter hole through the cover material. The resulting oxygen consumption measurements were used to calculate the rate of sulphide mineral oxidation in the tailings. The effects of the present cover were compared to the probable condition in uncovered tailings. The implications of the existing conditions and recommendations for further action are discussed.

2.0 FIELD SITE BACKGROUND

The Cullaton Lake tailings impoundment is located at the former Cullaton Lake Gold Mines Ltd. location in the district of Nunavut, Keewaitin Sub-District of the Northwest Territories. The property is located approximately 620 km north of Thompson, Manitoba and 416 km northwest of Churchill, Manitoba. The site is underlain by continuous permafrost that develops a moderate active zone during the summer season. The property is owned by Homestake Canada Inc. and has been under care and maintenance since September 1985 when production ceased. As part of their Abandonment and Restoration Plan, the tailings impoundment was covered with a waste rock and overburden cover to act as an oxygen diffusion barrier and to promote the development of permafrost conditions in the tailings and subsequently limit sulphide mineral oxidation.

The tailings impoundment consists of two tailings derived from two distinct ore bodies, the Shear Zone and the "B" Zone ores. The "B" Zone deposit is a gold bearing iron formation located in a turbiditic sedimentary basin that forms part of the Rankin Inlet - Ennadi Archean greenstone belt . Pyrrhotite and pyrite are the dominate sulphide minerals present, with minor amounts of arsenopyrite and chalcopyrite. The Shear Zone is a discontinuous ridge of orthoquartzite with gold mineralization found in altered shears, breccias, pyritic shears, and pyritic sericitic impure quartzite. The dominate sulphide mineral in the Shear Zone is pyrite (Clulow 1996).

3.0 METHODS AND MEASUREMENTS

On site work was conducted during the period of July 25th through July 31st. During this time testing equipment was installed and oxygen consumption method measurements were conducted.

The Oxygen Consumption Method testing procedure consists of the installation of 7" O.D., thin-wall aluminum tubing vertically through the tailings cover and into the tailings below (see Appendix A for a detailed description of the method). This establishes a well defined testing area on the tailings. Aluminum tubes are usually installed by pounding with a sledge and collar system but the cobbley nature of the cover precluded tube installation using this method. To facilitate installation, the cover was manually excavated and the underlying tailings exposed. The tubes were then pounded into the tailings until remaining stick-up was approximately equal to the cover thickness at that location. The cover was replaced both around and in the tube and compacted to approximate the original cover composition. The tube was then left approximately 48 hours to allow for the re-establishment of steady-state oxygen profiles.

A small headspace (0.01 to 0.02 m) above the cover surface was maintained in the tube. This headspace was capped for a short period of time, usually 1 to 2 hours, for the actual oxygen consumption determination. Time series data for oxygen concentration in the headspace and ambient temperature were collected using a laptop computer and datalogger system. Ambient temperature data was recorded to allow for data correction of errors induced due to temperature fluctuations.

The cover thickness at the Cullaton Lake site has been reported at 1.5 m. However during this visit and the installation of 17 oxygen consumption method test points the greatest cover thickness encountered was 0.90 m. Table 1 details the cover thickness at the testing point locations.

TABLE 1: COVER THICKNESS AT TESTING LOCATIONS

	Thickness (m)
TRANSECT 1	
A	61
B	89
C	71
D	70
E	62
F	68
G	69
H	58
J	62
Average	**68**
TRANSECT 2	
A	72
B	67
C	60
Average	**76**
TRANSECT 3	
A	90
B	90
C	88
Average	**89**

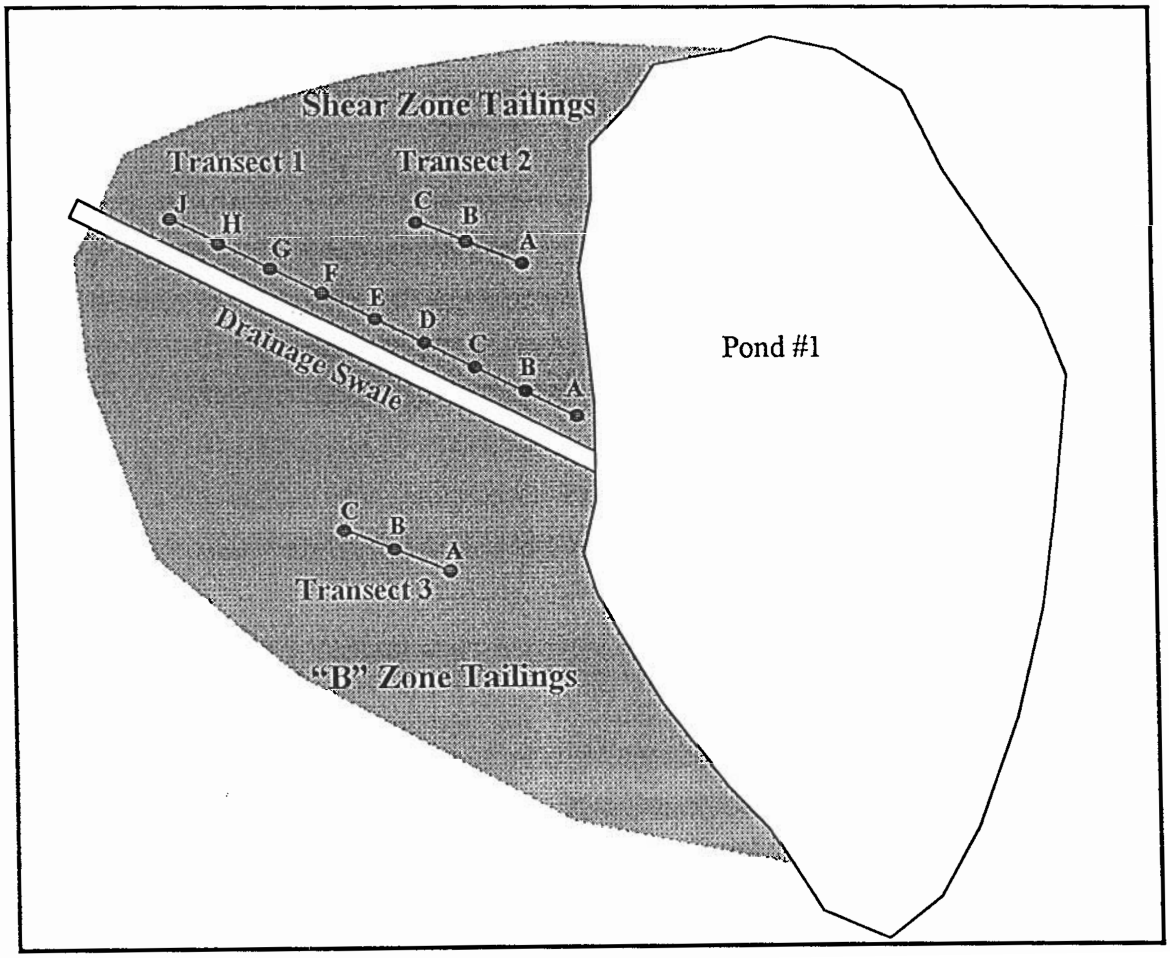
The overall average cover thickness based on observed data is considerably less than the designed thickness of 1.5 m. Two small areas located on the tailings impoundment exhibited bare tailings with no cover. One area was comprised of exposed tailings with partially established vegetation. This area was located on the "B" Zone tailings. The second area was located on the Shear Zone tailings and was comprised of exposed tailings with minor water ponding.

Three transects were installed on the Cullaton Lake tailings impoundment and are shown in Figure 1. Transect #1 is parallel to the drainage swale that bisects the impoundment. Transect #1 is located on Shear Zone tailings covered by cobbley till cover and consists of nine testing points at a 15 m spacing. These are labeled 1A-1J (to prevent possible confusion the letter "i" was not used). Tube 1A is located 3 m from the shore of Pond #1. Transect #2 is also located on the covered Shear Zone tailings. This transect consists of three testing points with a spacing of 15 m. These are identified as 2A, 2B, and 2C. Tube 2A is 25 m from the shore of pond #1. Transect #2 is parallel to Transect #1 at a distance of approximately 100 m. Transect #3 is located on the covered "B" Zone tailings. This transect also consists of three testing points with a spacing of 15 m. These are identified as 3A, 3B, and 3C. Tube 3A is approximately 50 m from the shore of pond #1. Transect #3 is also parallel to the drainage swale and is located approximately 200 m from Transect #1. In addition to the three transects two tests were performed on Shear Zone tailings without cover. One of there tests was conducted on the area of exposed tailings with minor water ponding. Despite the high moisture content evident by local ponding, this test yielded a high oxidation rate. This testing point is referred to as the control for Transect 1 and was located near testing point F. The second test on uncovered Shear Zone tailings was conducted by the manual removal of the cover and the installation of a testing point. This testing point is referred to as the control of Transect 2 and was located at Transect 2 testing point C.

3.1 Oxygen Consumption Data Collection

The sampling tubes were temporally closed with an air tight cap to measure the flux of oxygen into the tailings. Sensors located in the cap measure gaseous oxygen content in the sealed headspace of the tube as well as temperature. The measurement is conducted over 1 to 2 hours with readings recorded every minute. The resultant time series of oxygen content values are corrected for sensor drift induced by temperature fluctuations

FIGURE 1: LOCATION OF OXYGEN CONSUMPTION METHOD TRANSECTS AND TEST POINTS



and reduced to provide a value corresponding to flux of oxygen across the air-tailings boundary.

Due to the brevity of the field visit duplicate testing was not possible. Valid test data were collected on 13 of the 15 tubes installed in the cover and on both control testing points located on the Shear Zone tailings. An example of a plot of oxygen log normalized concentration over time in the headspace of the tube is shown in Figure 2.

3.2 Correction of Temperature Induced Sensor Drift

The oxygen sensors exhibit an inverse relationship between temperature and oxygen concentration reading due to the exothermic nature of the electrolytic reaction employed by the sensor in the measurement of oxygen. A decrease in ambient temperature during the test could cause a false low to be calculated for the oxygen consumption rate and conversely, warming during a test could cause a false high calculation of flux. A temperature correction factor for the sensor was developed in the laboratory. The average temperature fluctuation measured during flux measurements was always less than 3^0C for any individual test. The temperature correction factor was employed on all data collected.

3.3 Calculation of Oxidation Rates and Loadings

Data derived from the oxygen consumption method provide flux values with the units of moles O_2 consumed per unit area of tailings surface per unit time. This can be converted to a mass flux of products per area of tailings surface per time based on the oxidation equations for the sulphide minerals present, and further converted into an equivalent mass of $CaCO_3$ required for neutralization.

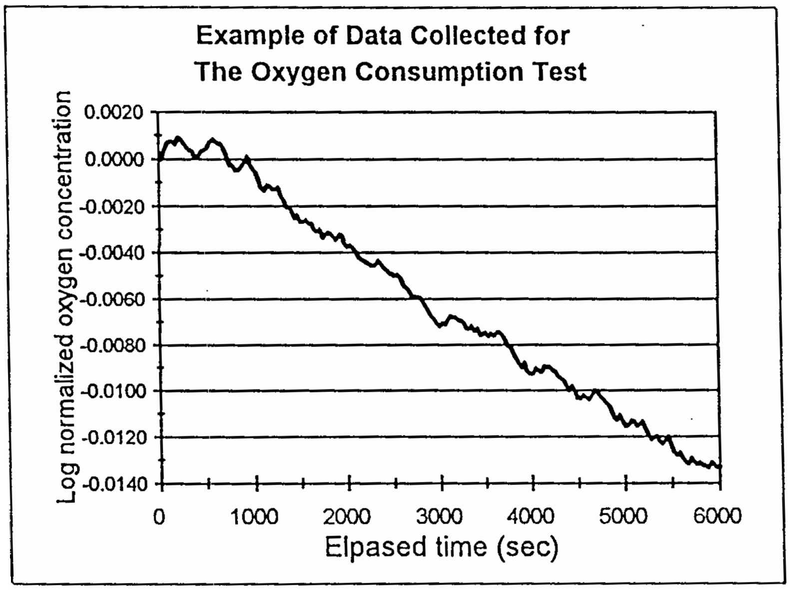
The oxidation of pyrite can be described by the following two equations

$$FeS_2 + {}^7/_2O_{2(g)} + H_2O \longrightarrow Fe^{2+} + 2SO_4^{2-} + 2H^+ \qquad (1)$$

$$Fe^{2+} + {}^1/_4O_{2(g)} + {}^5/_2H_2O \longrightarrow Fe(OH)_3 + 2H^+ \qquad (2)$$

Assuming that complete oxidation occurs as described in equations 1 and 2 the overall reaction can be written as:

FIGURE 2: PLOT OF LOG NORMALIZED OXYGEN CONCENTRATION VERSUS TIME FOR A TYPICAL OXYGEN CONSUMPTION TEST



$$FeS_2 + {}^{15}/_4 O_{2(g)} + {}^{7}/_2 H_2O \longrightarrow Fe(OH)_3 + 2SO_4^{2-} + 4H^+ \quad (3)$$

Similarly the oxidation of pyrrhotite can be described as:

$$Fe(1\text{-}x)S + (2\text{-}({}^{x}/_2))O_{2(g)} + xH_2O \longrightarrow 2SO_4^{2-} + (1\text{-}x)Fe^{2+} + 2xH^+ \quad (4)$$

Where x varies between 0 and 0.125 depending on the crystallographic structure. For the purposes of calculating acid production estimates for this study the oxidation of pyrrhotite can be described by the sulphide reaction:

$$FeS + 2O_{2(g)} \longrightarrow SO_4^{2-} + Fe^{2+} \quad (5)$$

Similar to the Fe^{2+} generated by the oxidation of pyrite, the Fe^{2+} generated in equation (5) can be further oxidized as described in equation (2). Thus the overall oxidation of pyrrhotite can be written as:

$$FeS + {}^{9}/_2 O_2 + {}^{5}/_2 H_2O \longrightarrow SO_4^{2-} + Fe(OH)_3 + 2H^+ \quad (6)$$

From Equation (3) it can be seen that the consumption of 1 mole of O_2 through pyrite oxidation can ultimately generate 1.07 moles of acid. Similarly one mole of O_2 consumed through pyrrhotite oxidation can generate 0.44 moles of acid. It is this generated acid that can lead to the degradation of receiving waterbodies due to acidification and mobilization of trace metals such as zinc and nickel that are often associated with mine tailings.

The buffering of the acid generated from the above equations is usually reported as the mass of equivalent calcite ($CaCO_3$) required for neutralization. The equation that governs this buffering can be expressed as:

$$CaCO_3 + H^+ \longrightarrow Ca^{2+} + HCO_3^- \quad (7)$$

From equation (7) we see that one mole of calcite is required for the neutralization of one mole of acid generated under near neutral conditions.

4.0 RESULTS

Data derived from the oxygen consumption method provide a measurement of the flux of oxygen with the units of moles O_2 consumed per unit area of tailings surface per unit time. This can be converted to a mass flux of products per area per time based on the oxidation equations for the sulphide minerals present (equations 3, and 6), and further converted into an equivalent mass of $CaCO_3$ required for neutralization. Based on these manipulations the results for the Cullaton Lake tailings impoundment are listed in Tables 2a-c. Results for the "B" Zone tailings were calculated assuming the sulphide minerals oxidizing are 1) pyrite only and 2) a mixture of pyrite and pyrrhotite in equal proportions.

TABLE 2a: OXYGEN CONSUMPTION VALUES AND EQUIVALENT RATES OF ACID GENERATION GIVEN AS $CaCO_3$ IN TONNES PER HECTARE PER YEAR FOR TRANSECT 1, SHEAR ZONE TAILINGS

Test Location	Moles $O_2/m^2/a$	Equiv. $CaCO_3$ (tonnes/ha/a)
Control	128	73-137
Tube A	33	19-35
Tube B	22	13-24
Tube C	14	8-15
Tube D	12	7-14
Tube E	3	2-3
Tube G	7	4-8
Tube H	3	2-3

TABLE 2b: OXYGEN CONSUMPTION VALUES AND EQUIVALENT RATES OF ACID GENERATION GIVEN AS $CaCO_3$ IN TONNES PER HECTARE PER YEAR FOR TRANSECT 2, SHEAR ZONE TAILINGS

Test Location	Moles $O_2/m^2/a$	Equiv. $CaCO_3$ (tonnes/ha/a)
Control	82	47-88
Tube A	2	1-2
Tube B	<0.1	<0.09
Tube C	7	4-7

Note: The calculated range for equivalent $CaCO_3$ is based on the oxidation of pyrite as described in equations 1 and 2.

TABLE 2c: OXYGEN CONSUMPTION VALUES AND EQUIVALENT RATES OF ACID GENERATION GIVEN AS $CaCO_3$ IN TONNES PER HECTARE PER YEAR FOR TRANSECT 3, "B" ZONE TAILINGS

Test Location	Moles $O_2/m^2/a$	[1]Equiv. $CaCO_3$ (tonnes/ha/a)	[2]Equiv. $CaCO_3$ (tonnes/ha/a)
Tube A	9	5-10	5-7
Tube B	9	5-10	5-7
Tube C	12	7-13	7-10

Note: [1] Assumes only pyrite present.
[2] Assumes equal parts of pyrrhotite and pyrite present.

5.0 DISCUSSION

5.1 Effect of Cover

The application of the waste rock and overburden cover can potentially lower oxidation rates and subsequent acid generation by acting as a thermal blanket promoting permafrost development in the tailings, by acting as a diffusion barrier for oxygen transport, and by limiting evapotransporation and providing a higher moisture content in the underlying tailings. The effectiveness of the applied cover to limit oxidation of the "B" Zone and Shear Zone tailings can be examined by comparing the test results on covered tailings to that for the control tests. The cover reduced the oxygen consumption rates by approximately one order of magnitude for the Shear Zone tailings area. While no control test was available for comparison in the "B" Zone tailings area it can be assumed that a similar reduction in rates is occurring there. The cover thickness on the "B" Zone tailings was, on average, slightly thicker than that of the Shear Zone area. This might imply a greater effectiveness due to the increased diffusion resistance caused by a thicker cover. Local variation in the measured oxygen consumption rate are dominantly due to variation in cover thickness, tailings mineralogy, and moisture profiles within the tailings and the cover.

5.2 Implications for Water Quality

The oxidation of Shear and "B" Zone tailings have been investigated by column leach studies at 25°C (Davé 1992), and later at cooler temperatures of 2°C and 10°C (Clulow 1996). The data from Clulow (1996) provides correlation between sulphate and selected metals released during the laboratory leaching test. Nickel and zinc were selected for comparison because of the good correlation with sulphate shown in the data reported by Clulow (1996) and because these metals are relatively mobile and less affected by neutralization of low pH waters. Other dissolved species such as ferrous iron, copper and arsenic may also be of concern but were not considered here. A summary of sulphate to metal ratios for nickel and zinc for both "B" Zone and Shear Zone tailings are given in Table 3.

TABLE 3: CORRELATION BETWEEN SULPHATE AND SELECTED METALS FOR COLUMN LEACH EXPERIMENTS REPORTED BY CLULOW (1996)

	Shear Zone	"B" Zone
$^{*}SO_4/Ni$ No. of Points R^2	1,600 22 0.83	15,000 8 0.3
SO_4/Zn No. of Points R^2	3,200 22 0.73	N/A

* Concentrations reported in mg/L

N/A - Zinc concentrations below detection limit of 0.002 mg/L

To project these ratios to actual field conditions the sulphate loadings resulting from sulphide mineral oxidation are estimated from the measured oxygen consumption rates and the stoichiometry of the sulphide mineral oxidation reactions. The estimated loading rates can be converted to approximate annual pore water concentrations by dividing the loading rate by an estimated annual infiltration rate appropriate for the site. This calculation provides an indirect indication of maximum potential pore water concentrations. It is important to remember that these values represent a theoretical possible loading and that they only consider chemical interactions as present in the column leach studies of Clulow (1996). These concentrations are not predictions of actual pore water concentrations but are to be viewed as comparative scenarios to gain insight into the effectiveness of the applied cover and possible future impacts only. Estimated maximum potential pore water concentrations are listed in Tables 4 and 5. These values are based on the measured oxygen consumption rates and correlation between sulphate and selected metal concentration reported by Clulow (1996) for column leach tests conducted in the laboratory at 10°C.

The range of concentrations are based on the two tests performed on two sites of uncovered tailings located on the Shear Zone section of the tailings impoundment. These estimated values suggest that the cover may be reducing pore water metal concentrations by more than an order of magnitude in the Shear Zone tailings.

Similar calculations were conducted on data collected from the "B" Zone tailings. The ranges reported in Table 5 represent two scenarios 1) the sulphide mineral component of the "B" Zone tailings is a mixture of pyrite and pyrrhotite in equal proportions and 2) the sulphide mineral component is pyrite only. A control test was not conducted on the "B" Zone tailings. Estimated potential pore water concentration values reported for exposed "B" Zone tailings were calculated using the ratio of exposed to covered oxygen consumption rates measured for the Shear Zone tailings. From values reported in Table 5 it can be seen that the cover may be responsible for decreasing the estimated maximum potential pore water concentrations by approximately an order of magnitude.

5.3 Contrasts Between the Shear and "B" Zone Tailings

The depositional history of the Shear Zone and "B" Zone ore deposits and the resulting tailings mineralogy have been reported by Davé (1992) and by Clulow (1996). From the

TABLE 4: ESTIMATED MAXIMUM POTENTIAL PORE WATER CONCENTRATIONS FOR SHEAR ZONE TAILINGS

Species	SHEAR ZONE TAILINGS	
	Exposed (mg/L)	Covered (mg/L)
Ni	263-411	14-38
Zn	129-202	7-19

TABLE 5: ESTIMATED MAXIMUM POTENTIAL PORE WATER CONCENTRATIONS FOR "B" ZONE TAILINGS

Species	"B" ZONE TAILINGS	
	Exposed (mg/L)	Covered (mg/L)
Ni	26-37	2.4-3.4
Zn	0.10-0.15	<0.015

material characterization for column leaching tests by Clulow (1996) the "B" Zone tailings contain, on average 2.31% S and the Shear Zone tailings contain, on average 0.4% S. The higher sulphur content, an indication of higher sulphide mineral content in the "B" Zone would suggest that it is this portion of the impoundment that would be experiencing greater oxidation rates and therefore contributing greater loadings to the pore water. However, the column leaching experiments of Clulow (1996), and data from this study indicate that the Shear Zone tailings represent a more important concern for metal loadings. The average measured oxygen consumption rate for all tests on the covered Shear Zone tailings was approximately 12 moles O_2 / m^2 / year. This is very similar to the average value measured for the "B" Zone tailings of 10 moles O_2 / m^2 / year. This finding indicates that despite the notably higher sulphide mineral content of the "B" Zone tailings the oxygen consumption rates are approximately equal. This may be explained by the presence of a slightly thicker cover on average, over the "B" Zone tailings. The average cover thickness for test points on the "B" Zone tailings was 0.89 m. The average cover thickness for the test points located on the Shear Zone tailings was 0.69 m. This increased cover thickness on the "B" Zone tailings may have contributed to a greater cover effectiveness by increased diffusion resistance.

Despite the variable cover thickness on the Shear and "B" Zone tailings, an overall decrease in oxygen consumption rates of approximately one order of magnitude was observed for all tests conducted compared to the uncovered Shear Zone tailings.

6.0 CONCLUSIONS

The existing cover on the tailings at Cullaton Lake is on the order of 0.70m thick. The cover material is a cobbely till with the finest fraction being a sandy loam. In theory, this type of material would not be expected to act as an efficient oxygen barrier to reduce sulphide mineral oxidation in the underlying tailings. The measured oxygen consumption rates, however, suggest that the oxidation rates below the cover are about a factor of ten lower than those measured for exposed tailings. This reduction in oxidation rates may be the result of decreased oxygen diffusion through the cover but may also be from the lower temperatures in the tailings due to the thermal insulating properties of the cover or due to increased moisture in the tailings resulting from decreased evaporation rates through the cover. It is probable that the lower oxidation rates result from a combination of all these processes. The data do suggest, however, that a thicker layer of cover material would result in lower rates of oxidation and hence lower rates of metal loadings to the local subsurface water.

7.0 RECOMMENDATIONS

It is suggested that the cover thickness be increased to meet the original specification of approximately 1.5m if better thermal insulation and increased resistance to diffusive transport of oxygen are to be achieved. Additional oxygen consumption measurements could be conducted after construction of the final cover to confirm the increased effectiveness of the thicker cover.

8.0 REFERENCES

Clulow, V. (1996). Column leaching characteristics of Cullaton Lake B and Shear Zone Tailings. Phase 2: Cold temperature leaching Final Report. Final Report to Homestake Canada Ltd.

Davé, N. K. (1992). Column Leaching Characteristics of Cullaton Lake B and Shear Zone Tailings. Phase I: Room Temperature Leaching. Division Report MSL 92-4. Prepared for International Corona Corporation.

Trow Thunder Bay Branch

Trow Consulting Engineers Ltd.
807 Harold Crescent, Thunder Bay
Ontario, Canada. P7C 5H8
Telephone: (807) 623-9495
Facsimile: (807) 623-8070

December 5, 1996

Reference No. F-90132-B/E

Homestake Canada Ltd.
1000-700 West Pender Street
Vancouver, B.C.
V6C 1G8

Attention: Sharon Meyer

RE: Cullaton Lake Gold Mine

Dear Ms. Meyer:

At your request, Trow Consulting Engineers Ltd. visited the Cullaton Lake Gold Mine property during the period of September 15 - 18, 1996 to examine the tailings containment areas.

TAILINGS POND AREA NO. 1

A visual examination around Tailings Area No. 1 was carried out. The containment dam appears to be in good condition with no signs of distress or erosion. Some small wet areas were present on the downstream toe at the south end of the tailings area. However, it is unclear if the wet areas are due to seepage or the large amount of rainfall which had fallen prior to this site visit. There is no evidence of soil loss in these wet areas and they do not appear to present any instability to the dam. The approximate location of these wet areas are shown on Drawing No. 1.

The spillway appears to be in good condition with the exception of a small area on the south upstream side where the liner is exposed. A trickle of water was flowing over the spillway during this time. The water elevation was approximately 94.0 m[1], which is at the same level it was during our site visit in June of 1994. Although this only compares two time periods, it is an indicator that the drainage area has a positive water balance.

There were no exposed tailings in the pond, shoreline, or covered areas. However, the tailings were within approximately 150 mm of the water surface on the western shoreline, adjacent to the covered

[1] Elevations are referenced to a temporary benchmark located on a concrete slab at the east corner of the mill building with a local elevation of 100.00 m, previously established by HIW Surveys Ltd. in 1990.

tailings area near the interface between the B-zone and Shear zone tailings. Photographs 1 and 2 show evidence of the tailings being close to the surface of the water.

A surface depression was ponded with reddish brown water in the B-zone covered tailings area. This area is shown on Photographs 3 and 4 and on Drawing No. 1.

TAILINGS AREA 2

Since the dams in Tailings Area 2 are not required, much of the material which was used for the dams has been removed and was used for cover over the former tailings beach near the former mill building in Tailings Area 1. There was some material still available which could be used for additional cover material, if needed.

The water level in Tailings Pond No. 2 was low during this site visit and appeared to be at a similar elevation to what was measured in 1994 (elev: 89.4 m). It is expected that the water level will remain low under the present conditions.

A long stretch of liner (approx. 75 m) in the dam has been exposed and damaged at the northwest end of Tailings Area 2. Since the amount of material in the dam has been reduced, it is expected that more of this liner could be exposed as a result of erosion. Consideration could be given to removing some of the exposed liner and filter cloth and burying it in the quarry to ensure it does not become air- borne and present a hazard to wildlife, for instance.

SUMMARY

The tailings dams appear to be stable under the current site conditions. Some minor repair work around the main spillway should be addressed to cover the exposed liner. Consideration should be given to removing the exposed and damaged sections of liner in Tailings Area 2.

The water level in Tailings Pond No. 1 was the same this year as it was in June, 1992 and there were no exposed tailings in the area.

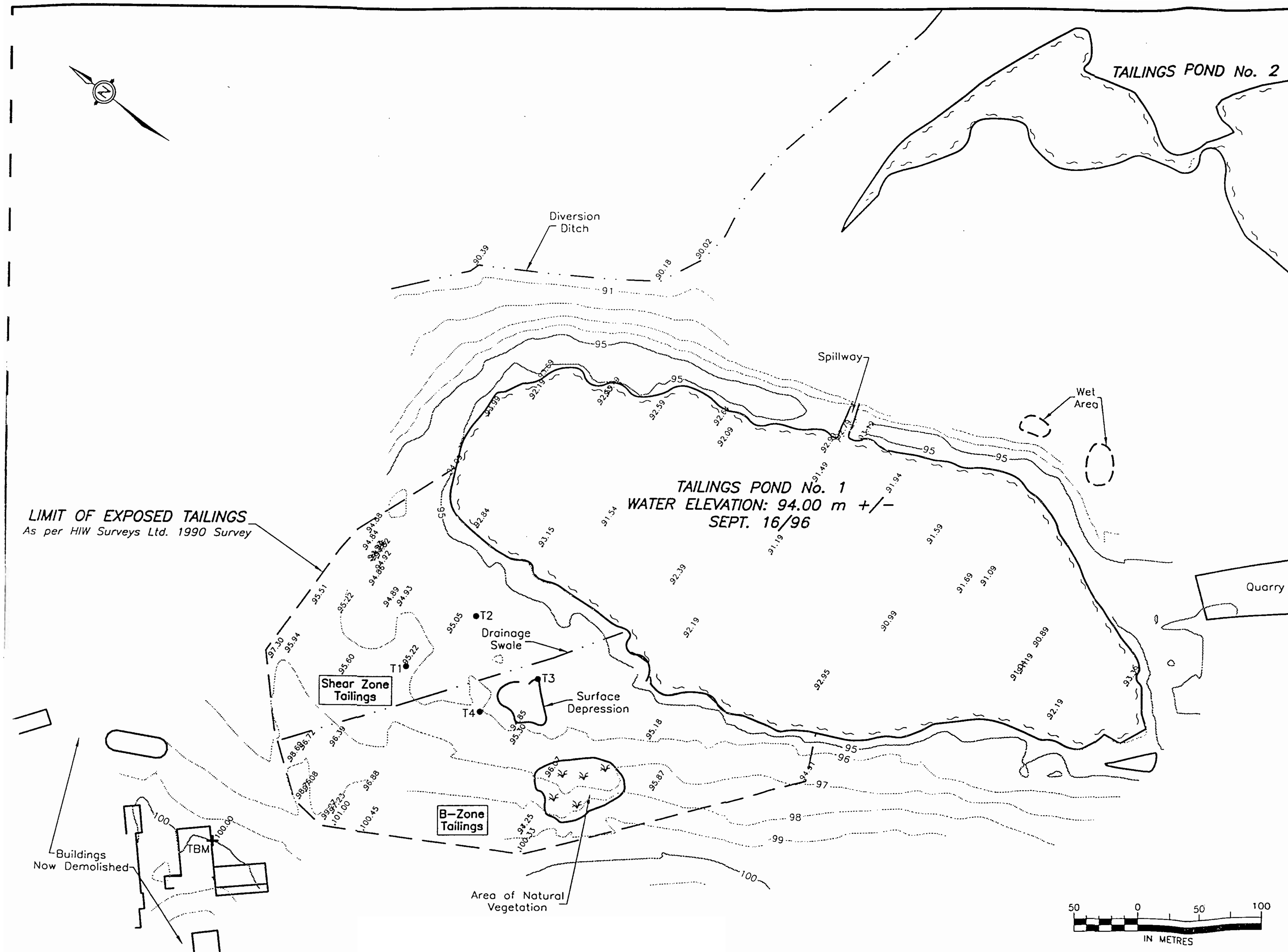
If you have any comments or questions regarding this letter, please contact us at your convenience.

Yours truly,
TROW CONSULTING ENGINEERS LTD.

Don Kaluza, P. Eng.

R.B. Dodds, PhD., P. Eng.

Demetri Georgiou, MASc., P. Eng.
Branch Manager



TROW CONSULTING ENGINEERS LTD.
Thunder Bay, Ontario, Canada

LEGEND

+TBM	Temporary Benchmark
• T2	Thermistors
95.05	Elevation from HIW Survey (1990)

NOTES:

1) Elevations are in metres and referenced to a TBM located on concrete slab at North East corner of mill. Assumed Elevation 100.00m

2) Limit of Covered Tailings from HIW Surveys Ltd., Sketch Plan Showing Tailings Pond Survey, Drawing No. 5, dated 11/10/90.

3) Contours are shown in 1m intervals and represent 1996 conditions. Spot elevations represent conditions in 1990.

Client: Homestake Canada	
Project: Cullaton Lake Gold Mine	
Title: Tailings Pond Area No. 1	
Project No. F-90132-B/E	Dwg. No.: 1
Drawn By: DT	Reviewed By:
Date: Nov. 27/96	
Scale: 1:3000	

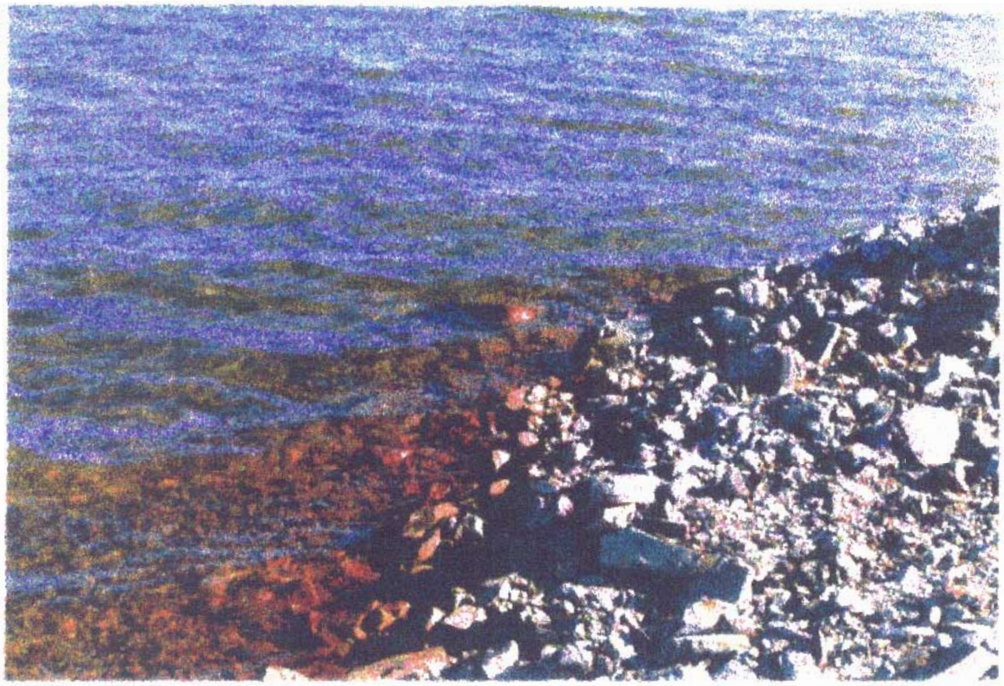


Figure 1: Tailings near surface at west shoreline

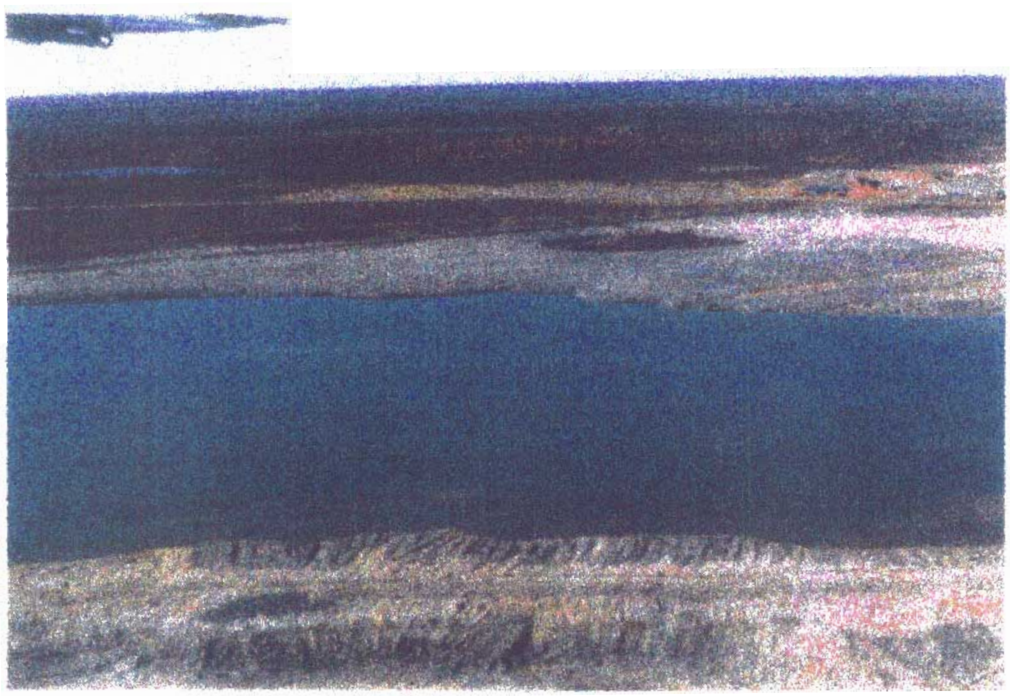


Figure 2: Tailings near surface of water, aerial view looking west.

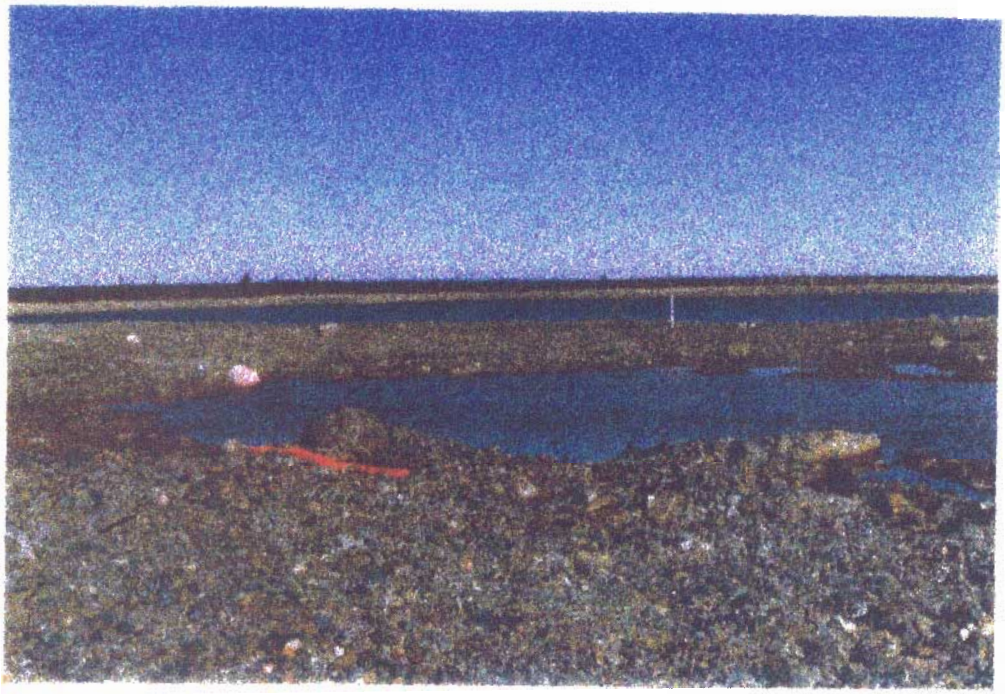


Figure 3: Surface depression in B-zone covered tailings area

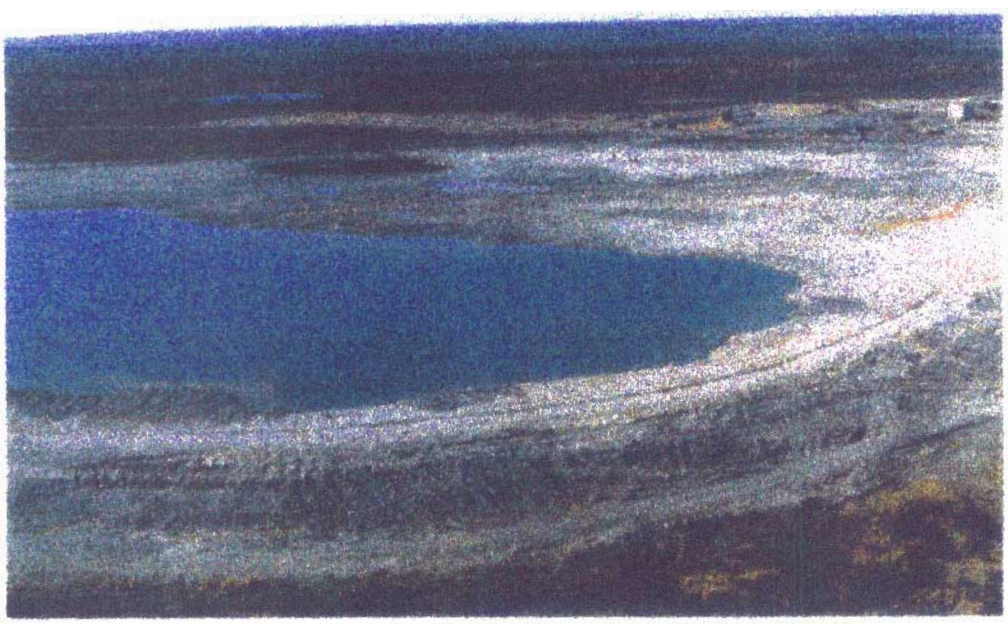


Figure 4: Aerial view of surface depression in B-zone covered tailings area

1996 INSPECTION REPORT

ON

CONDITIONS OF LICENCE NUMBER N6L2-0940

HELD BY: 759290 ONTARIO INC.

OPERATED BY

HOMESTAKE CANADA INC., CULLATON LAKE GOLD MINES LTD.

BY

PAUL SMITH

INSPECTOR UNDER THE NORTHWEST TERRITORIES WATERS ACT

DIAND NWT REGION

NUNAVUT DISTRICT

IQALUIT, NT

DATE: November 4, 1996
WATER REGISTER: N6L2-0940
LAND LEASES: 65G/8-1-20, 65G/7-1, 65G/7-2-2

INSPECTION REPORT - 1996

CULLATON LAKE GOLD MINES LTD.

WATER LICENCE N6L2-0940

On August 17, 1996, a water licence inspection was carried out on the above noted water licence by Paul Smith, Water Resources Officer and Henry Kablalik, Resources Management Officer both of DIAND, Nunavut District.

No representatives of of Homestake Canada Inc. nor their contrators were on site during the inspection, although evidence was available to indicate that they had been there recently and that presumably would be returning at some point in the near future to continue with additional A+R work.

A walking inspection of the main camp site, tailings disposal area and quarry/burial pit was made. Low level fly-bys were made of the Kognak River, airstrip and Sheer Lake zone areas. A comprehensive photographic record was made of the site.

Water samples were collected at SNP Stations 0949-2, -3 and -7. Water samples were also collected on June 21 at these locations along with 0940-5. Both sets of results are attached and indicate that all discharges were well within licence limits. The flow rate from the final treatment pond was about 2L/s. The dam had been used as landfill material, but the remaining material had yet to be contoured (as indicated in the A+R plan).

Abandonment and Restoration activites were judged against photographs taken in August of 1995. It was apparent that some activity had been carried out as some buildings had been torn down. The quarry/burial pit had been drained, but perhaps had started to refill as it still had water within it. There is little evidence that the Licensee is making a concerted effort to compact materials being placed into the burial pit. While individual pieces may be compacted, the overall effect when material is being dumped into the pit is that there are a large number of voids. This will lead to frost heaving and the eventual exposure of buried material as it is forced to the surface.

Those areas identified in the 1995 inspection relating to hydrocarbon stained ground were inspected. The inspector would take issue with the statement made by Ms. Sharon Meyer in her September 25, 1995 letter to Dan Elliott providing an explanation to the cause of the oil stained ground. While on-site, there were indications that waste oil handling and storage techniques practiced by the Licensee's contractor is sloppy. Keeping in mind that the contractors were off site, there were open fuel containers and improper disposal practices

.../2

evident (including a 55 gal drum that had been cut in half to form a bucket. Within this bucket, and with about 2 cm of free board, was a reddish hydrocarbon material (brake or hydraulic fluid)). The practices obsevered need to be corrected as what was seen was not acceptable.

Many of the buildings and associated infrastructure was still on site and had not been salvaged nor torn down. Previous correspondence (1995 Annual Report) from the Licensee indicated that all A+R work was to be completed during the field season of 1996 (now passed). The Licensee is requested to provide this office with an update, prior to what is required in the Annual Report as required under Part B, Item 2 of the licence, with a list of A+R activities that was accomplished this field season and what is planned in terms of upcoming activities.

The Licensee is also requested to specifically address the activities it had planned to carry out in order to reduce it's land lease holdings so that the total land held under lease could include the area for the quarry/burial pit.

Paul Smith

Paul Smith
Inspector under the NWT Waters Act

HOMESTAKE

December 3, 1996

Paul Smith
Water Resources Officer
DIAND Nunavut District
Box 100
Iqaluit, NT
X0A 0H0

Dear Mr. Smith:

Re: Your November 14, 1996 Letter Outlining the August 17, 1996 Cullaton Lake Inspection - Water Licence N6L2-0940

Thank you for the copy of the inspection report for the above noted water licence inspection. Please find below our response to the issues outlined in your letter.

2.a. Request for Abandonment & Restoration Plan Update. As per our Water Licence requirements, we will be submitting an annual report in March 1997 outlining the abandonment and restoration activities that occurred this past summer, as well as what remains to be completed in 1997. However, in summary, our reclamation crew was on site from June 26 to July 31 and again from August 28 to September 18. The crew returned to the site in early November for a 10 day period. All buildings at the minesite have been dismantled, with the exception of the service shop for the decommissioning equipment remaining on site. Salvageable materials have been removed from the site or are stored at the airstrip for removal next season. An ice train scheduled for mid-December will remove some salvaged materials this winter. Atco trailers remain at Shear Lake as an accommodation area for the reclamation crew.
As noted in the attached letter, we will be covering the tailings area with additional material in the spring of 1997. The non-salvageable materials observed in and around the quarry pit will be crushed and reburied in the quarry pit in 1997.

2.b. Hydrocarbon Handling. During my site inspection in September I noted that the handling and storage of hydrocarbon materials was adequate at that time and did not reflect the practices you observed earlier in the year. As well, the crew had removed the area of stained soil and disposed of it as agreed during our May 25, 1996 meeting with DIAND.

2.c. Land Exchange. The two areas of land being excluded from Lease 3600, in exchange for an area to include the quarry pit, did not require any reclamation activities. Therefore no work was undertaken there this summer. Please see attached map for the location of these excluded areas.

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3. A geotechnical inspection was completed in mid-September this year, as required by our Water Licence. This report has not yet been received in our office. When we receive the report, we will forward a copy to DIAND as well as to the Nunavut Water Board.

I trust this letter answers your questions regarding the activities at the Cullaton Lake site this past season. When you have finalized the dates of your 1997 inspection, please let us know so that we can arrange for one of our representatives to accompany you on your visit. Should you have any other questions or concerns please do not hesitate to contact me.

Yours truly,
HOMESTAKE CANADA INC.

Sharon Meyer

Sharon Meyer
Environmental Analyst

attachments

cc. Nunavut Water Board
Water Resources Division, DIAND
Land Resources, DIAND

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HOMESTAKE

November 29, 1996

Shelley Thibaudeau
Water Resources Division
DIAND
P.O. Box 1500
Yellowknife, NT
X1A 2R3

Philippe di Pizzo, Executive Director
Nunavut Water Board
P.O. Box 119
Goja Haven, NT
X0E 1J0

Dear Sir/Madam;

Re: Abandonment & Restoration Plan Update - Cullaton Lake Gold Mines

The reclamation crew on site this summer completed the majority of decommissioning work at our Cullaton Lake property. In our Abandonment and Restoration Plan (A & R Plan), we had anticipated that by the end of the 1996 season all dismantling, salvage and disposal of buildings and materials would have been completed. However, some additional work will need to be completed during the summer of 1997. This work is outlined below.

1. Some non-salvageable material placed in the quarry pit prior to 1996 had not been completely compacted. This material was removed from the pit in 1996 and will be crushed and placed back into the pit in 1997, along with any remaining non-salvageable materials from the 1996 decommissioning work.

2. During our September site inspection at our Cullaton Lake property, it was discovered that the cover on the tailings was not as deep as we had previously believed. In order to address this deficiency, we intend to remove more material from Dam 2 (our A & R Plan outlined the removal of material from Dam 2 and the placement of that material over the tailings in Pond 1) and cover the tailings with this additional material. This work was started in 1996 and will be completed during the 1997 work season.

3. In order to expedite the placing of additional cover on the tailings, we would like to remove some rocky material adjacent to the tailings area (see attached map) and use it as cover material, along with the material from Dam 2 referred to above. **Will we require any special permit or permission to remove this additional material?**

4. We are putting together a plan to seed and fertilize the tailings area and former mill site in 1997, using an arctic seed mix as selected by our vegetation consultants. If

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such a plan can be developed this winter, we intend to seed and fertilize many of the disturbed areas of the site in the late summer, 1997.

If you have any questions or comments on our 1997 plans, please do not hesitate to contact me.

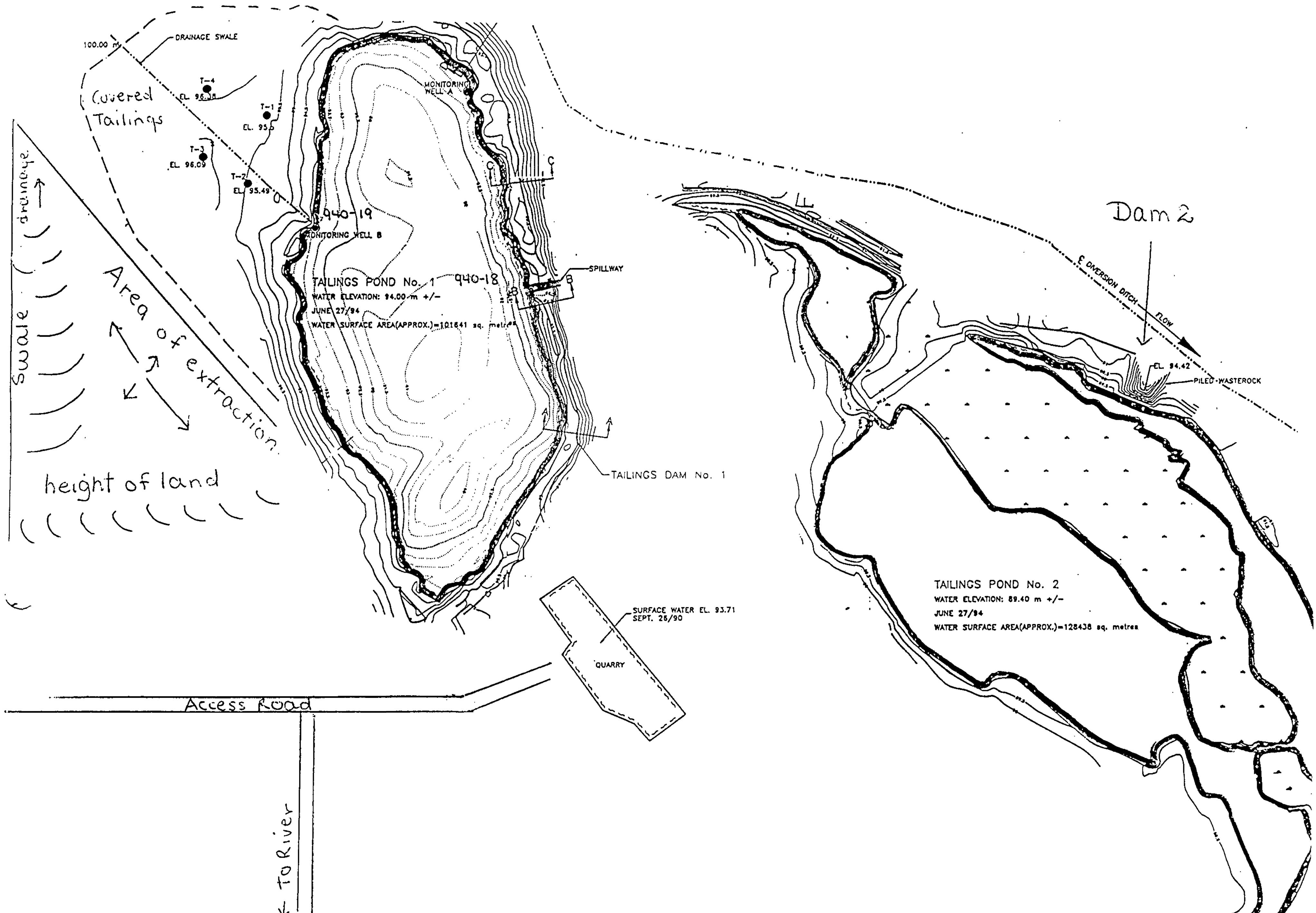
Yours truly,
HOMESTAKE CANADA INC.

Sharon Meyer

Sharon Meyer
Environmental Analyst

attachments

cc. S. Bradbury, DIAND Land Administration


100.00 m
DRAINAGE SWALE
Covered Tailings
T-4
EL 96.38
T-1
EL. 95.5
T-3
EL. 96.09
T-2
EL. 95.49
940-19
MONITORING WELL B
MONITORING WELL A
TAILINGS POND No. 1
940-18
WATER ELEVATION: 94.00 m +/-
JUNE 27/94
WATER SURFACE AREA(APPROX.)=101641 sq. metres
SPILLWAY
TAILINGS DAM No. 1
SURFACE WATER EL. 93.71
SEPT. 25/90
QUARRY
drainage
Swale
Area of extraction
height of land
Access Road
to River
Dam 2
DIVERSION DITCH
FLOW
EL. 94.42
PILED WASTEROCK
TAILINGS POND No. 2
WATER ELEVATION: 89.40 m +/-
JUNE 27/94
WATER SURFACE AREA(APPROX.)=128438 sq. metres

HOMESTAKE

VIA COURIER

March 12, 1996

DIAND - Land Administration
P.O. Box 1500
Yellowknife, NWT
X1A 2R3

Attention: Ms. Sandra Bradbury, Land Administrator

Dear Ms. Bradbury:

Re: NWT LEASE 3600 (File 65G/7-1)

With reference to that correspondence from Annette McRobert to William Napier dated February 6, 1996, and to our telephone discussions of late last year, this letter is to advise you that Homestake Canada Inc. still wishes to amend the above-referenced lease.

It is Homestake's intention to decrease the size of lease 3600 as follows: (1) by removing approximately 11.4 ha from the northwest corner of parcel "C", and (2) by removing parcel "E" in its entirety. It is then Homestake's wish to amend the area of parcel "D" by adding approximately 11.4 ha to the southwest corner of that parcel; this added area should more than adequately cover the area of disturbance surrounding the quarry pit which is situated in that location.

As requested, a copy of a portion of the lease map is enclosed, upon which we have sketched both the areas for exclusion and the area to be added. Approximate measurements have been provided in the sketch map, for your reference.

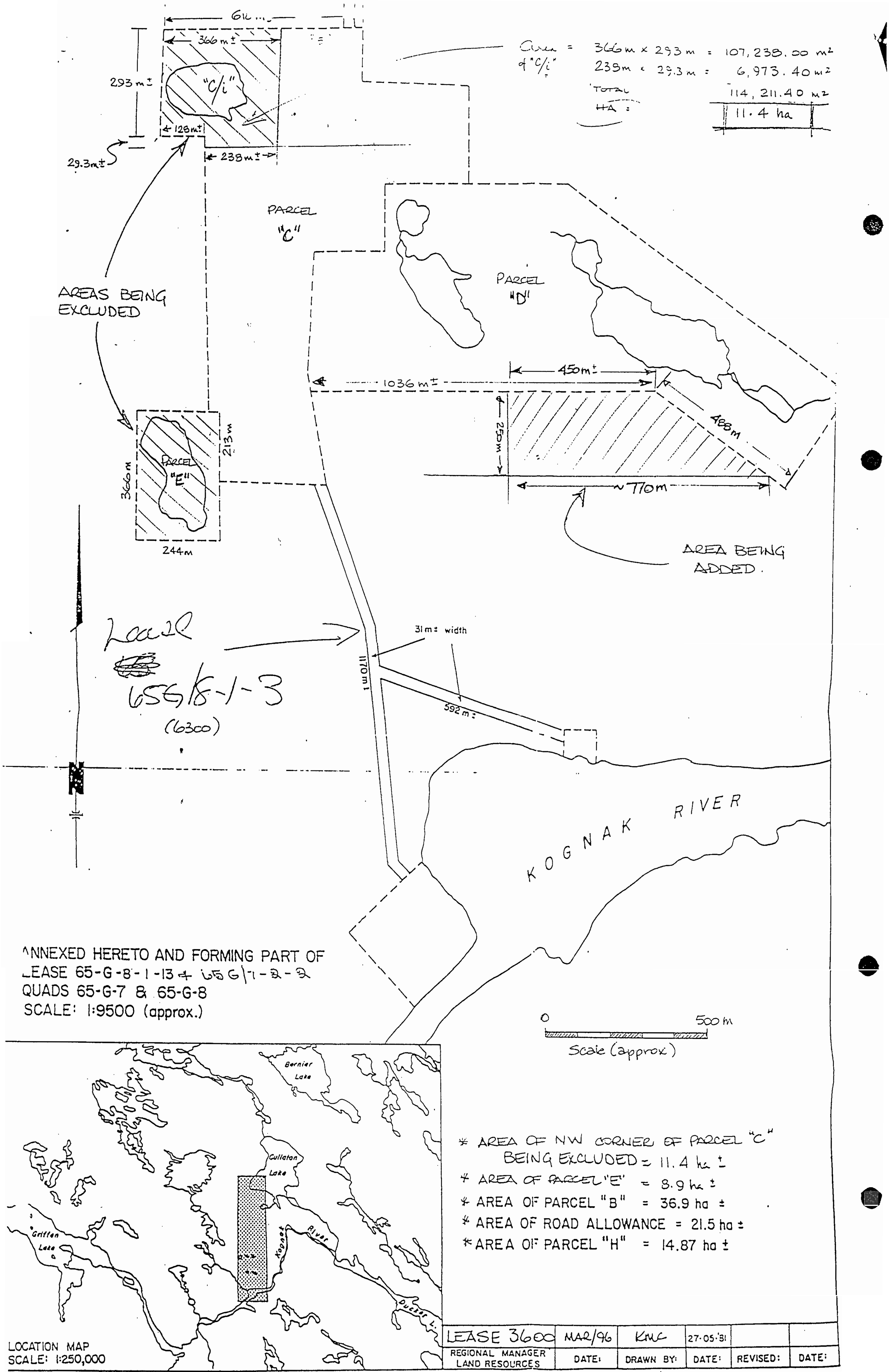
Please be further advised that it is Homestake's intention to renew NWT leases 65G/7-2-2 (Minesite), 65G/8-1-20 (Airstrip), and 3600 (File 65G/7-1 (Minesite)) shortly.

I shall be out of the office until the week of March 18th but I will call you on my return to discuss this matter. In the meantime, I thank you for your assistance in this matter.

Sincerely,
HOMESTAKE CANADA INC.

ORIGINAL SIGNED BY:

E.J. (Gene) Gulajec
Manager, Canadian Lands
KMC/kmc
encls
ORIGINALLY SENT VIA FACSIMILE



Area of "C/i" = 366m x 293m = 107,238.00 m2
238m x 29.3m = 6,973.40 m2
Total HA: 114,211.40 m2
11.4 ha
366m ±
293m ±
128m ±
238m ±
29.3m ±
"C/i"
PARCEL "C"
PARCEL "D"
AREAS BEING EXCLUDED
1036m ±
450m ±
250m
488m
~770m
AREA BEING ADDED.
PARCEL "E"
213m
366m
244m
Lease 65G/8-1-3 (6300)
31m ± width
1170m ±
592m ±
KOGNAK RIVER
ANNEXED HERETO AND FORMING PART OF
LEASE 65-G-8-1-13 + 65G/7-2-2
QUADS 65-G-7 & 65-G-8
SCALE: 1:9500 (approx.)
0
500m
Scale (approx)
Bernier Lake
Culleton Lake
Griffin Lake
Kognak River
Ducker L.
LOCATION MAP
SCALE: 1:250,000
* AREA OF NW CORNER OF PARCEL "C" BEING EXCLUDED = 11.4 ha ±
* AREA OF PARCEL "E" = 8.9 ha ±
* AREA OF PARCEL "B" = 36.9 ha ±
* AREA OF ROAD ALLOWANCE = 21.5 ha ±
* AREA OF PARCEL "H" = 14.87 ha ±
LEASE 3600
REGIONAL MANAGER LAND RESOURCES
MAR/96
DATE:
KMC
DRAWN BY:
27-05-'81
DATE:
REVISED:
DATE:
HOMESTAKE CANADA INC.