

Nunavut Water Board

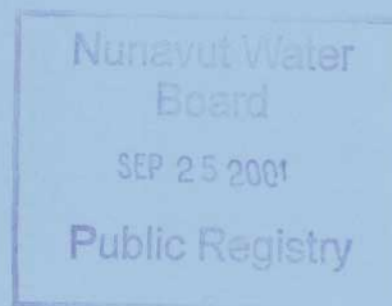
Notes of Site Visit Cullaton Lake Property, Nunavut August 24, 2001

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September 21, 2001
P13808.01

Nunavut Water Board
P.O. Box 119
Gjoa Haven, NT
X0E 1J0

Attention: Ms. Dionne Filiatrault, P.Eng.
Technical Advisor

Dear Ms. Filiatrault:

**Licence NWB1CUL9902
Cullaton Lake Property
Notes of Site Visit
August 24, 2001**

Enclosed are three (3) bound copies of the report, containing the notes on my recent site visit to Cullaton Lake Property, Nunavut. I also include a CD-ROM disk, containing the Adobe Acrobat file (pdf files) of the report.

I hope that the above is satisfactory for your purpose. Should you have further queries, please contact me.

Yours very truly,

RAH:sep

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Encl

R. A. Halim, P.Eng, P.E.
Senior Geotechnical Engineer
Acres International Limited

Table of Contents

1	Introduction	1
2	Daily Log of Activities	2
2.1	Friday, August 24, 2001	2
2.2	Saturday, August 25, 2001	2
2.3	Sunday, August 26, 2001	2
3	Observations	3
3.1	Background Information	3
3.2	Visited Areas of the Property	4
3.3	Discussions	5
3.3.1	The Airstrip Area	5
3.3.2	Shear Lake Area	6
3.3.3	B-Zone Mine and Mill Complex	9
3.3.4	Kognak River	11
4	Conclusions and Recommendations	12
5	References	14

Figures

Appendix A - Photographs

1 Introduction

A site visit to the Cullaton Lake property was carried out on August 24, 2001 by Mr. Ramli Halim, P.Eng. Mr. Halim is a senior geotechnical engineer at Acres International Limited (Acres), Winnipeg, Manitoba, and a consultant to the Nunavut Water Board (NWB). The visit to the mine was authorized by the NWB through Ms. Dionne Filiatrault, P.Eng, the technical advisor for the NWB. The Cullaton Lake property is currently owned by Homestake Canada Inc. (Homestake), and has been undergoing site reclamation and restoration work since 1985. The purpose of the site visit was to review the site conditions at the property, and to observe Homestake's activities at the site. The Cullaton Lake property is regulated by NWB under the conditions of Water Licence No. NWB1CUL9902, which was issued on September 1, 1999 and expires on October 31, 2002.

The site visit was conducted with Mr. Vernon Betts, Manager of Environmental, Health and Safety for Homestake. Mr Betts made the arrangement for the air charter from Thompson, Manitoba to the site. He was conducting what he described as the final inspection for Homestake's reclamation activities at the site. This report summarizes the observations and comments made during the site visit.

2 Daily Log of Activities

2.1 Friday, August 24, 2001

- ▶ Travelled in the afternoon by commercial air carrier (Calm Air) from Winnipeg to Thompson, Manitoba. Met Mr. Betts at the airport. He was on his transit flight from Vancouver, B.C. The flight to Thompson was delayed for an hour due to bad weather. Arrived in Thompson approximately at 21:30h. Overnight in Thompson.

2.2 Saturday, August 25, 2001

- ▶ Flew with Mr. Betts on a Calm Air charter flight from Thompson to Cullaton Lake, Nunavut at 07:50h. The flight was arranged by Mr. Betts, and utilized a Cessna single engine Grand Caravan aircraft. Arrived at the site at approximately 09:20h.
- ▶ Conducted site visit until 14:30h. The weather at the site was mainly sunny, no rainfall, approximately 15 °C.
- ▶ Took off at 14:50h and returned to Thompson. Arrived at Thompson at approximately 17:10h. Overnight in Thompson.

2.3 Sunday, August 26, 2001

- ▶ Departed Thompson by commercial air carrier (Calm Air) in the morning for a return flight to Winnipeg.
- ▶ Arrived Winnipeg at about 13:00h. End of the trip.

Note: All times are Winnipeg time, which follows the Central Daylight Saving Time.

3 Observations

3.1 Background Information

The Cullaton Lake property is located in the southern part of the District of Keewatin in the Nunavut Territory, at 61°16' N latitude and 98°30' longitude. The property is located approximately 250 km west of Arviat, NT, 400 km northwest of Churchill, Manitoba and 600 km north of Thompson, Manitoba (see Figure 1). Cullaton Lake is a former underground gold mine, which ceased operation in September 1985. Access to the site is by helicopter or fixed wing airplanes. A 4400 ft long gravel airstrip is located at the north end of the property, and to the south of Cullaton Lake.

The Cullaton Lake area lies within the Churchill Structural province of the Canadian Shield. The mine was partially developed in 1975 by O'Brien Gold Mines. Further exploration work was carried out in 1980, resulting in the decision to develop the mine. The gold mine was in operation for four years between 1981 and 1985, and produced about 100,000 ounces of gold. The ore body is located in two ore zones: B-zone ore, and Shear Lake ore. The B-zone ore is located between Cullaton Lake to the north, and Kognak River to the south. It is located approximately 6 km south of the air strip. The shear lake ore is located adjacent to Shear Lake, approximately 4 km north of B-zone ore and 2 km south of the air strip.

The property lies in the zone of discontinuous permafrost. The landscape is generally flat, barren, and with no visible mountains or major hills. It only contains minor undulations and some rocky outcrops.

The hummocky terrain consists of either bedrock covered with shallow surficial soils, or a bouldery glacial till cover with localized shallow soil deposits. The climate is characterized by low temperatures, low precipitation, strong winds and a short growing season. The landscape is generally devoid of trees, except in the vicinity of the lakes and Kognak river. In these areas, a stunted growth of black spruce and willows exist.

3.2 Visited Areas of the Property

A map of the Cullaton Lake property and its surrounding area is shown in Figure 2. The visited areas are broken down into the following areas :

The Airstrip Area

The airstrip is located southwest of Cullaton Lake. It is a gravel air strip, which is oriented in a west to east direction. Gravel stockpiles, as well as open areas where the fuel storage tanks used to be located, are located to the south of the runway. An old site drawing (c. 1975-1980) shows an old camp to the northwest of the airstrip and near the shoreline of Cullaton Lake. At one time, the camp was connected to the air strip with a gravel road or trail.

The Shear Lake Area

The Shear Lake is located approximately 2 km south of the airstrip and 4 km north of the B-zone mine complex. Homestake set up a camp in this area in June 2001 for use during the reclamation work. Shear Lake is the location of the gold mine portal into the Shear Lake ore zone. The lake is approximately 500m long and 120m wide. The water from the lake drains in an easterly direction via a creek which exits the midpoint of the lake. The creek passes through a series of other small lakes, before its water eventually drains into the Kognak River.

The B-Zone Mine and Mill Complex

The main mine and mill complex is located between the Kognak River and Cullaton Lake. The gold mine started operations in this area in 1975, with the development of a 110m decline. The ore deposit in this area was identified as the B-zone ore deposit. The mine and mill complex also included two tailings ponds, identified as Tailings Pond No. 1, and Tailings Pond No. 2. Tailings Pond No. 2 acts as a polishing pond, before discharging water to the surrounding swamps. A quarry pit was located to the south of Tailings Pond No. 1.

Kognak River

Kognak River is located approximately 2km south of the main mill complex. The river flows in an easterly direction and drains into Hudson Bay. South of the main mine and mill complex, the river widens after passing through a constriction area and some water rapids. A pump house and a water intake structure used to be located at the Kognak river, with water pipelines running northerly from the river to the mill site. An old exploration camp is located to the west of the pump house area, and just to the north of the rapids.

3.3 Discussions

3.3.1 The Airstrip Area

Photographs which were taken in the airstrip area are presented in Appendix A (Photos 1 to 9 inclusive). Part of the airstrip is located directly south of Cullaton Lake, approximately 400m from the lake (Photo 1). The airstrip itself appears to be in good condition. At the time of the site visit, it was observed that the airstrip was not equipped with a windsock or runway lights. It is understood that when the mine is finally abandoned, the airstrip will be left in its present condition.

A former work area exists to the south to southwest of the airstrip. This area was used for storage of supplies and materials, during loading and unloading of the airplanes. A HS 748 turboprop airplane had landed at the site earlier in the day of the site visit. Old or used tires from some heavy construction equipment, which had been left at the site, were loaded into the airplane. The airplane left Cullaton Lake for Churchill, Manitoba a few hours later.

Numerous water puddles were observed in the work area (Photos 5 to 8) at the time of the site visit. Mr. Bill Millward, Homestake's site manager who is responsible for the camp and reclamation work at the site, indicated that there had been a few rainfalls in the days prior to the site visit. Granular stockpiles (Photo 9), and a small pit filled with water were also observed along the south end of the work area.

A shack and some piles of wood are located to the southwest of the airstrip, and along the side of the access road to the mine (Photo 5). Mr. Betts mentioned that the shack and the wood will be left at the site for the use of local hunters and trappers, and could also be used as an emergency shelter.

In general, the airstrip has been cleared of any structures, waste materials, scrap metals, etc. Once the camp supplies and other items which were stored in the work area are removed, there will be no other structures/materials left in this area, except for the airstrip, the shack and the piles of wood. It is understood that the small pit adjacent to the granular stockpiles will be used to bury items during the final phases of the cleanup, and prior to completion of the reclamation work.

3.3.2 Shear Lake Area

Photographs which were taken in the Shear Lake area are presented in Appendix A (Photos 10 to 36 inclusive). The photographs depict conditions at Homestake's temporary campsite, the Shear Lake area, and the waste rock stockpile areas. Photos 10 and 11 show aerial views of the site. The access road which runs from the airstrip to the main B-zone mine/mill complex passes through an area located to the east of the lake.

Camp Site

Homestake's camp site for the 2001 reclamation work was located at the north end of Shear Lake, and along the west side of the access road. The camp consisted of 5 tents for living quarters and 4 service tents (one each for dining room, kitchen, laundry/bathroom and recreation facilities). In addition, four steel containers for refrigerated food storage, water purification and a diesel generator, as well as 4 portable toilets were observed at the back of the camp site (Photos 12 and 13).

Mr. Millward provided the following information related to the camp's operation :

- ▶ The camp was set up in mid June 2001. It is suitable for up to 30 persons. At the time of the site visit, there were approximately 18 persons living in the camp.
- ▶ Construction equipment consisted of : 2 Volvo A25 trucks, 1 CAT D6B dozer, 2 CAT 315B excavators, 1 forklift loader, 1 man handler forklift, 2 F350 Ford pick-up trucks, and 1 service truck. All of the heavy equipment and transport vehicles were brought to the site using Hercules air transports.
- ▶ The main construction activities at the site was subcontracted to Ledcor Industries of Edmonton, Alberta. The camp facilities and services were provided by PTI Camp Services. Some of the construction equipment and vehicles were supplied by United Rentals.
- ▶ The reclamation work was in its final week. They intended to start demobilization on the first week of September 2001. Similar to the mobilization activities, camp and construction equipment will be air-lifted using Hercules airplanes. Demobilization will take approximately a week, with twice daily flights from the site to Churchill or Thompson, Manitoba.

Mr. Millward indicated that all of the camp equipment and supplies will be removed from the camp site at the end of the work. Solid wastes and garbage

from the camp will be burnt, and the camp's sewage will be disposed of in a trench and buried. The camp site will be cleared and returned to its original condition.

Shear Lake

The camp operation did not appear to be producing any disturbance on Shear Lake (Photos 14 and 15). Water was withdrawn from the lake for camp usage using a portable water pump. The mine portal at Shear Lake (Photos 22 and 23) had been blocked and covered with granular fill. Some structures, such as the old camp building, miscellaneous old equipment and parts, and an old yellow bus, which were shown in some of the photos taken during the 1999 site visit had been removed and cleared. This area was relatively clean and free from any debris. Some landscaping work had been carried out in this area as part of the reclamation work.

The old gravel dam which separates the Shear Lake and another water body located to the north of the lake (Photos 16 and 17) was not disturbed and remained in similar condition as before. It is understood that the dam was constructed prior to the dewatering activities in 1984.

The drainage creek from the lake is shown on Photos 18 to 21 inclusive. The water in the creek crosses the access road through four, 6 in. diameter culvert pipes under the roadway. At the time of the site visit, however, the drainage water overflowed the roadway, as the water level at Shear Lake was relatively higher than normal. The region had experienced some heavy rainfalls prior to the site visit date. Mr. Millward indicated that they plan to retrieve all the culvert pipes under the access road, as they withdraw from the site.

Waste Rock Stockpile

A waste rock stockpile was previously reported to be spread out in front of the mine portal at Shear Lake. The stockpile (old waste stockpile) was located to the east of the access road. Homestake estimated that the volume of the waste rock in this area was up to approximately 35000 m³. However, this estimate was based only on reports and had never been actually surveyed. They also indicated that some of the waste rock had been removed from the site. Photos 24 and 25 show the remnant of the old stockpile area, after the materials were removed and stockpiled at another location as part of the reclamation work in 2001.

Observations at the location of the old waste stock pile showed that there was no waste rock at depths below the ground surface. Photos 26 to 28 show that a layer of dark peat was encountered at the base of the stockpile at approximately the same level with the original ground surface level in the surrounding area.

During the reclamation work this year, Homestake removed the waste rock from the old waste rock stockpile location, and placed it on another prepared location across the road from the old stockpile. Mr. Millward indicated that a base pad was prepared in the new area prior to the placement of the waste rock materials. The new site was cut into a rock outcrop along the east bank of the Shear Lake. The newly placed waste rock stockpile was then capped with a minimum 1m thick layer of glacial till materials, obtained from the surrounding area (Photos 29 to 36 inclusive). For erosion protection, they planned to seed the area prior to demobilization.

The thickness of the capping material, as well as the final quantity of the waste rock being placed at the new location could not be confirmed. Mr. Betts indicated that the quantity was much lower than the previously estimated quantity, and believed that most of what was left at the old site prior to the removal had been the waste rock mixed with the base pad for the stockpile. Mr. Millward mentioned that photographs were taken during the construction of the new waste rock stockpile. He also had kept records on some basic chemical tests performed on the water samples taken from Shear Lake during this work period. No instrumentation was installed in the vicinity of the new stockpile material. They planned to leave the capped, compacted and contoured berm to be as natural as possible. The final finished grade of the new stockpile was higher than the surrounding area, so that all surface water will drain away from the stockpile berm.

Some minor erosion was noted to have occurred along the side slopes of the finished berm. (Photos 35 and 36). The site of the old waste rock area was cleared, and freed of all waste rock materials. Cobble and boulder size stones were left in the area, so that it would remain to have a natural appearance. Mr. Millward indicated that they might place some patches of grass taken from the surrounding area to facilitate growth of vegetation in the old stock pile area. To confirm that traces of metal or chemical concentrations from the old and new stock piles do not leach into the creek, some chemical test will be required on water samples taken from the lake and the drainage creek areas.

Homestake's plan to bury and cap the waste rock materials at the Shear Lake did not follow their original plan, which had been to bury these materials under water at the Shear Lake. It is understood that the work was carried out at the site, as they were awaiting approval for the original plan from Canada - Department of Fisheries and Oceans (DFO). They indicated that they were running out of time as the reclamation work for the summer was nearing an end. Mr. Betts indicated that they plan to send the revised plan, together with the actual construction report, to NWB for approval.

3.3.3 B-Zone Mine and Mill Complex

Photographs which were taken in the mine and mill complex areas are presented in Appendix A (Photos 37 to 68 inclusive). Aerial views of the site are presented in Photos 37 to 39 inclusive.

Access Road

Ruts from construction vehicle activity were noticeable along the access road, particularly along some sections of the access road between the airstrip and Shear Lake. Mr. Millward indicated that they plan to grade the road as they demobilize the camp and retreat toward the airstrip area.

Between Shear Lake and the main mine and mill complex, there are a total of six creek crossings on the access road. In each of these crossings, three to four 6 in. diameter culvert pipes have been used under the roadway (Photos 41 and 42). They intend to retrieve these culvert pipes as they demobilize from the site. They also plan to seed portions or patches of the roadway, so that re-vegetation along the roadway will occur more quickly.

Old Mine and Mill Complex

During the mining years, the mine and mill complex consisted of various structures, such as the living quarters (bunk house), mine portal and ventilation shaft, storage buildings and areas, waste dump, ore stockpiles, crusher plant, fuel storage tanks, and the mill building. At the time of the site visit, the only remaining structures in the area which could still be seen were the concrete pads where the fuel storage tanks sit. These pads were used to place and store the core boxes (Photo 45). It is understood that these core boxes will be left as shown in the photo. The mine portal and ventilation shaft outlet structures were blocked, backfilled and contoured with granular

fill materials. All that remain are the two granular mounds where these two structures were formerly located (Photos 43 and 44). Other structures, such as the concrete pads and footings, remnants of buildings, waste materials (such as old tanks, machinery parts, etc) had all been cleared from the site. Mr. Millward mentioned that the concrete pads and footings, old tanks, etc were broken apart or cut into pieces and buried in the quarry pit.

Dry Tailings Area

The dry tailings area is located between the mill complex and the tailings ponds. The area had been capped and seeded. Some instrumentation, such as thermocouples and some piezometers were located in this area (Photos 46 to 49 inclusive). The area, which had been seeded in the previous years, was covered with patches of arctic grass. No reclamation work is carried out in this area for the 2001 program.

Quarry Pit

An old quarry pit is located to the south of Tailings Dam No. 1. The southern portion of the pit was used for burial of inert, waste materials, such as metal structures, concrete pads, steel tanks, old machinery parts and equipment, etc. The work in this area was almost complete (Photos 50, 51, 54 to 56 inclusive) at the time of the site visit. The area had been cleared, and some grass seeding had been undertaken in the area. A flat bed for the truck (Photo 56) would be hauled to the airstrip and would be removed from the site as part of the demobilization.

The northern portion of the pit contained some water, forming a small pond. The side slopes of the pit had been recently graded (Photos 52 and 53). This pit was proposed to be left as a pond.

Tailings Ponds and Dams

The condition of the dam at Tailings Pond No. 1 was generally satisfactory. The dam has a wide crest, and has a relatively flat downstream slope. Occasional areas of grass and weeds grow along the crest and downstream slope of the dam. It was observed that the pond appeared to have adequate freeboard. No sign of distress, slumping or stability problems were observed along the dam. No seepage nor erosion were noticeable during the site visit. The downstream toe area of the pond showed some depressions filled with water, but no seepage was evident in these areas. These water puddles were assumed to be formed from recent rainfalls in the area. Photos 57 to 68 were taken in the tailings pond area.

Photos 64 to 68 show the spillway conditions at Tailings Pond No. 1. Water was flowing through the spillway at the time of the site visit. The steel weir which had previously been placed at the downstream end of the spillway had been removed. Some exposed geomembrane was still visible in this area (Photo 68), and Homestake stated that they plan to cover the geomembrane before they move off the site.

A site visit was not carried out to the Tailings Pond No. 2 area (Photo 59) because of limited time. In addition, recent heavy rainfalls had made any vehicle access difficult, and may have lead to further damage to the area. There is no reclamation work carried out in this area for the 2001 program. As part of the water license requirements which were regulated by NWB, Trow Consulting Engineers, which is the geotechnical consultant to Homestake had carried out a dam inspection earlier this year.

3.3.4 Kognak River

Photographs which were taken in the area are presented in Appendix A (Photos 69 to 73 inclusive). Photos 69 and 70 provide an aerial view of the site.

The remaining structure which can still be recognized in this area was the gravel road from the B-zone main complex. Some patches of grass and weeds have already covered some parts of this section of the road. The pump house, the water intake and pipelines were removed a long time ago, and only the gravel pads still remained in the area (Photos 72 and 73). The old exploration camp could be seen from pump house area (Photo 71), but could not be accessed due to time limitations. It is understood that this area has been abandoned for more than 15 years, and no construction activities was scheduled for the reclamation work in 2001.

4 Conclusions and Recommendations

In general, the site has been cleaned and is generally free from debris, old structures and waste materials associated with the mining operation activities. The reclamation work undertaken in 2001 was intended to complete all of the previous abandonment and reclamation activities, which have been on-going since the last mining operation ceased in 1985.

Before final demobilization from the site, Homestake has indicated that they plan to carry out the following activities:

- ▶ Remove a flat bed from the quarry pit area.
- ▶ Bury inert, waste materials and cap the southern portion of the quarry pit.
- ▶ Retrieve all of the drainage pipe culverts from under the roadway and hauled away from the site as part of demobilization.
- ▶ Grade the access road, so that all the ruts from construction traffic will be recontoured.
- ▶ Leave the core boxes on the concrete pads in the main mill complex.
- ▶ Remove all of the structures in the camp. Burn all the solid waste/garbage from the camp, and bury the camp's sewage in a trench.
- ▶ Leave the shack and wood supplies for emergency use by the local trappers and hunters.
- ▶ Provide random seeding on some sections of the access road, in the quarry pit area, in the camp area, and in the new and old waste rock stockpile areas at Shear Lake.
- ▶ Clear and bury any waste materials in the work area to the south of the airstrip, and level the small pit in the area.
- ▶ Leave the airstrip for usage as an emergency landing airstrip.

Some of these final activities may need to be checked during coming or future inspections of the site. The majority of the reclamation work at the site is generally complete. Other requirements which were stipulated in the water license, such as monitoring the water chemistry at compliance points, instrumentation readings, dam and dike inspection, etc. will need to be carried out until all of the requirements for the abandonment plan are complete, and all of the results of the tests, inspection and instrumentation readings are satisfactory to both the NWB, and other government agencies.

Based on the site visit, it would appear that Homestake has been making all of the final efforts in addressing the environmental issues related to the mining operation,

taking action in regard to the disposal of the waste rock stockpile at Shear Lake, and following the final abandonment and restoration plan for the Cullaton Lake property.

It should be noted that the burial and capping of the waste rock at the Shear Lake site was carried out without obtaining prior approval from NWB. Some of the concerns which may need to be checked and confirmed include the following :

- ▶ Adequacy of constructed capping thickness for the waste rock. No records were available to confirm the 1m thickness of the capping fill. Homestake indicated that construction photographs were taken during the actual work at the site, and should be made available to NWB for records.
- ▶ Adequacy of the preparation of the base pad of the new waste rock stockpile.
- ▶ Concerns related to the potential leaching of the waste rock to the surrounding soil, and to Shear Lake.
- ▶ Short and long term water quality at the drainage creek from Shear Lake. Monitoring and sampling of water will be required to determine if there is any increase in metal concentration levels in the water as a result of the reclaimed activity at this site.
- ▶ Effectiveness of the grass seeding on the capped fill at the new waste rock berm/pile, and potential erosion from water run-off at this site.
- ▶ Drainage in the area surrounding the new waste rock berm/pile.
- ▶ Concerns related to potential piping, if any, of the capping materials into the underlying waste rock materials.
- ▶ Regrowth of vegetation in the old waste rock stockpile.

The above concerns/issues may need to be addressed and checked during future site visits and inspection, and sampling and testing programs will need to be continued until satisfactory test results are all obtained.

5 References

1. Homestake Canada Inc., "Application for Approval of Disposal of Shear Lake Waste Rock Located at the Cullaton Lake property", Report to Nunavut Water Board, February 2001.
2. Acres International Limited, "Notes of Site Visit - Cullaton Lake Mine - July 24, 1999", Report to Nunavut Water Board, August 1999.
3. Homestake Canada Inc., "Cullaton Lake Gold Mines Ltd - Final Abandonment and Restoration Plan", Submitted to DIAND - Land Division, and the NWT Water Board, March 1996.