

REPORT ON 1983 REMEDIAL WORKS

PROJECT: MINE WASTE DUMPS
CLINTON CREEK ASBESTOS MINES

LOCATION: CLINTON CREEK, YUKON TERRITORY

CLIENT: BRINCO MINING LIMITED
CASSIAR DIVISION

OUR FILE: PB 3169 01 01

NOVEMBER 4, 1983

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PB 3169 01 01 B-1003 - SKETCH OF REMEDIAL WORKS
PERFORMED IN SEPT. 1983

1. INTRODUCTION

This report presents a description of the remedial works carried out in September, 1983 on the channel of Clinton Creek at the outlet of Hudgeon Lake. The work was carried out where Clinton Creek flows over waste dump material deposited during operation of the Clinton Creek asbestos mine, northwest of Dawson City, Yukon Territory.

The objective of the 1983 work was to prevent further erosion of the left bank of the channel. A deep erosion gully was created during the 1982 and 1983 freshets when the stream flow escaped from a rock ribbed section of channel constructed in 1981.

2. SUMMARY

The program of work originally proposed for 1983 was presented in a report by Klohn Leonoff Ltd., dated August 16, 1983. Minor amendments to the proposed work plan were agreed on in a meeting on August 31, 1983 attended by Mr. C. Caron of Brinco, the Yukon Territory Water Board's technical consultant Mr. Milos Stepanek, and by representatives of Klohn Leonoff. The agreed-upon program consisted of the following components:

- plug and backfill the channel which in 1982 eroded around the previously-installed rock ribbed channel.
- relocate Clinton Creek away from the eroded left bank.
- install channel lining, complete with geotextile filter, on the left bank of Clinton Creek for a distance of about 600 ft downstream from the culverted outlet of Hudgeon Lake.
- install an erosion resistant outlet downstream of the culverts.
- excavate an emergency overflow channel in the road embankment at the outlet.
- install additional movement monitoring points on the waste dump near the outlet; establish survey profile of Clinton Creek channel bottom; and establish survey cross-sections of the channel.

The work proposed was intended to lead to abandonment of the waste dump in 1985, at which time the culverts at Hudgeon Lake would be removed. Monitoring of the dump movements and downcutting of the channel will be carried out by Brinco up to 1985.

Because of the lateness of the season, an abbreviated work program was agreed upon for 1983. The work was carried out in the period September 17 to 27 and was supervised by N. Hooper of Klohn Leonoff. The work was hindered by weather which was extremely cold for this time of year, even by Yukon standards. Following were the main items accomplished:

- relocation of the stream channel away from the eroded left bank area.
- plugging of the upstream end of the eroded channel and placement of riprap lining, complete with geotextile filter, in the area of the plug.
- excavation of an emergency overflow channel in the road embankment at the outlet.
- installation of an additional monitoring point on the waste dump near the outlet and establishment of a survey profile of the channel bottom.

3. DESCRIPTION OF 1983 REMEDIAL WORK

A description of the work performed in September 1983 follows.

Initially, the creek was diverted to the right hand side by using a D6 Cat to remove the right-hand ends of the rock weirs. The upstream end of the erosion gully was then backfilled with mine waste to the former road level to form a plug. The mine waste was obtained from the toe of the waste dump on the right hand side of the creek. The plug was then constructed to full height, about 11 feet above the creek bed level and geotextile filter fabric was placed on the sloping face. A further 12 inches of mine waste was placed on top of the geotextile and

riprap slope protection was installed. The filter fabric (Mirafi P-600X) was obtained from Canada Nylex. The riprap was borrowed from the remains of the rock weirs. The channel as it is now formed has riprap rock placed along each side of the creek to the toe of the original rock weirs, but does not have riprap lining across the creek bed. The previously installed rock ribs, which may have caused overtopping of the channel banks during the 1982 freshet, have been removed.

A low point was formed in the road embankment over the culverts to ensure that the lake would spill into the creek channel in the event that the culverts become blocked. Mr. Bob Clarke from Cassiar Division performed survey work during the construction period. This included survey of closure points at the toe of the waste dump, establishment of a new survey reference pin near the culverts and a longitudinal profile down the creek. Survey cross-sections were not obtained due to the inclement weather conditions.

Although the construction work was hampered by record low temperatures for September (-21°C) and minor equipment malfunctions, the work was completed in the allotted time frame.

Drawing B-1003 and the photographs in Appendix 1 illustrate the construction work carried out.

4. CONCLUSIONS AND RECOMMENDATIONS

1. The work carried out in 1983 is expected to prevent erosion of the left bank of Clinton Creek channel in the area downstream of the outlet of Hudgeon Lake during the 1984 runoff period.

A low, emergency overflow area has been constructed in the road embankment across Clinton Creek to provide protection against a sudden release of water from Hudgeon Lake that might bypass the protected area, should plugging of the culverts occur.

November 3, 1983

2. The additional monitoring point that has been established and the longitudinal profile of Clinton Creek channel that has been obtained will assist in assessing the stability of the dump and the stream channel prior to abandonment.
3. We recommend that Brinco complete the remainder of the work proposed for the channel during summer 1984. The remaining work includes the following:
 - complete backfilling of the left bank erosion channel.
 - complete the left bank channel lining for the entire length proposed.
 - construct the erosion resistant outlet downstream of the culverts.
 - establish survey cross-sections and carry out mapping of the waste dump stream channel.

Klohn Leonoff Ltd.



Peter C. Mighthall, P.Eng.

PCL/ld

APPENDIX I

PHOTOGRAPHS



Photograph 1: Channel diverted to right hand side of creek. Ends of rock weirs removed.



Photograph 2: Looking downstream - rock weirs removed at right hand side.



Photograph 3: Constructing plug at upstream end of left bank erosion channel.



Photograph 4: Plug formed - ready for geotextile.



Photograph 5: Geotextile placed on slope of plug.



Photograph 6: Placing 12 inch of Mine Waste over geotextile.



Photograph 7: Left bank protection with riprap in place.



Photograph 8: Finished left bank protection. Note bottom weir left intact.



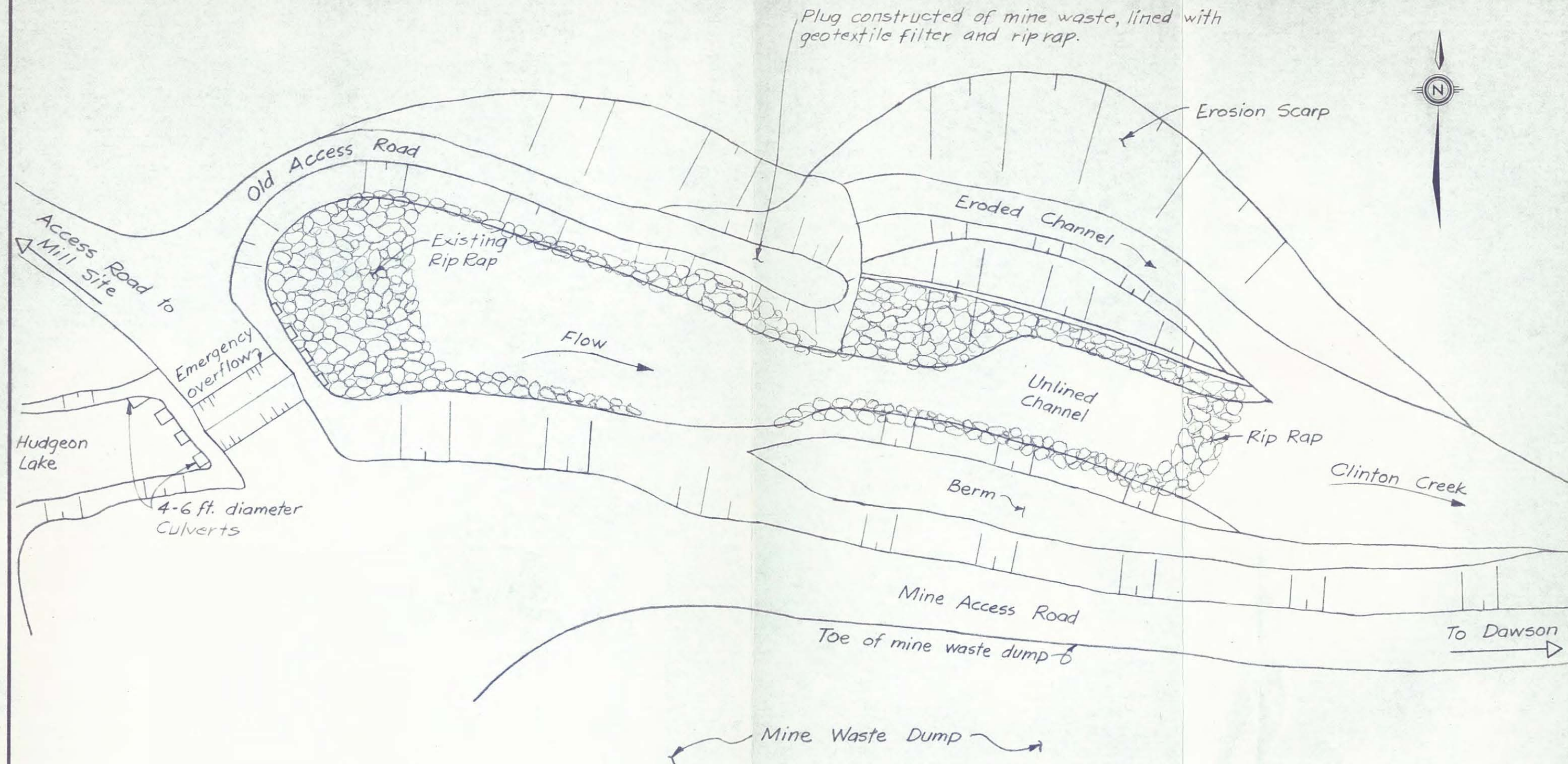
Photograph 9: Riprap at outlet of culverts.



Photograph 10: Low point over culverts forming emergency overflow channel.

DRAWINGS

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PERFORMED IN SEPT. 1983



TO BE READ WITH KLOHN LEONOFF REPORT DATED NOV. 04, 1983

SCALE 1" = 50' (approx.)

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KLOHN LEONOFF LTD.
CONSULTING ENGINEERS

CLIENT: BRINCO MINING LIMITED
CASSIAR DIVISION

PROJECT
CLINTON CREEK MINE WASTE DUMP

TITLE
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