SURFICIAL GEOLOGY
ANALYSIS OF
BURN CLAIM GROUP

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March 31, 1980

Placer Development Limited,
700 Burrard Building,
1030 West Georgia Street,
Vancouver, British Columbia
V6E 3A8

Attention: Mr. J.J. Hylands, Senior Geologist

Dear Mr. Hylands:

Please find enclosed a report entitled "Surficial Geology, Analysis of Burn Claim Group". The report is based entirely on re-evaluation of data of the Burn Claim Group as supplied by your company. Five copies of the report are submitted. Only one copy of Map 1 is submitted with the reports. The map is a hand drawn copy as it is our understanding that your company will complete drafting of the final copy.

Detailed plans for field work have not been set up. These may be drawn up at your convenience in the future.

Sincerely,

L.A. Bayrock, Ph.D., P.Geol.
President

LAB/mp
Encls:

SURFICIAL GEOLOGY
ANALYSIS OF
BURN CLAIM GROUP

MARCH 1980

Prepared for

PLACER DEVELOPMENT LIMITED

by

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TABLE OF CONTENTS

.....ii

Table of Contents ii

SURFICIAL GEOLOGY
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INTRODUCTION

Terms of Reference:

To analyse by surficial geology techniques the available data of the Burn Claim Group in order to localize the origin of the molybdenum anomalies. To make recommendations for field investigations for the summer of 1980.

Background Material:

The following maps and photographs served as background material for the study:

(1)	Cu/Mo soil geochemistry	1:5,000
(2)	Overburden depths and outcrop locations	1:5,000
(3)	South area, outcrops and boulders	1:4,800
(4)	Compilation of geology, 2 maps, Burn Property	1:4,800
(5)	Sepia of topography	1:5,000
(6)	Aerial photographs	
	A 23557-5, 6, 7, 8, 28, 29, 30, 31	
	A 23556-210, 211, 212, 213	

In addition to the above, drilling logs were examined in the offices of Placer Development during a meeting with Mr. J.J. Hylands on March 12th, 1980.

The geology map has been reduced to a scale of 1:5,000 in order to facilitate correlations.

The surficial geology of the area was interpreted on aerial photographs and supplemented by drilling records on the property. The aerial photographs are to a scale of approximately 1:80,000 and thus an accurate delineation of the deposits is difficult.

SURFICIAL GEOLOGY

Glacial History:

The area has been glaciated by an ice sheet which covered all of the mountains and flowed more-or-less in an easterly direction across the area. It is assumed that this stage of glaciation coincided with the Classical Wisconsin Maximum. During the following recession the Continental ice sheet disappeared and was replaced by valley glaciers. The valley glaciers originated in cirques and flowed down the major valleys.

In the Burn Claim area three pronounced cirques are present which were active during the last stages of deglaciation. The glaciers originated in the cirques and flowed down the valleys to the north. All previous surficial deposits in the area were thus removed by the valley glaciers. This means that only the valley stage surficial deposits are present within the Burn Claim area.

Surficial Deposits:

The following types of surficial deposits have been recognized on aerial photographs in the Burn Claim Area:

(1) bedrock outcrop covered with very thin and intermittent colluvium;

(2) rock outcrop covered by thin colluvium;

(3) rock outcrop covered by colluvium derived from bedrock and pre-existing till;

(4) ground moraine till;

(5) lateral moraine;

(6) end moraine;

(7) outwash;

(8) alluvial fan;

(9) landslide;

(10) thick landslide deposits

Very Thin Colluvium Over Bedrock: (Map Symbol "R")

This map unit is present at high elevations. Numerous bedrock outcrops are present throughout this unit. The

surficial material covering the bedrock is thin and of local derivation. It is the product of frost weathering of the exposed bedrock.

Thin Colluvium Over Bedrock: (Map Symbol "C/R")

This unit occurs in elevation below the very thin colluvium over bedrock. Bedrock outcrops are present throughout. The cover of colluvium is thicker than in the first discussed unit. In places the colluvium may be two or three meters thick, especially at lower elevations.

All of the colluvium is locally derived from bedrock by frost shattering. The colluvium in this unit may have received some contribution from weathered bedrock from above.

The directions of transportation of colluvium across this unit are shown by arrows on Map 1.

Bedrock and Till Colluvium Over Bedrock: (Map Symbol "CT/R")

This map unit occurs in the southern portion of the Burn Claim area in elevation below the previous unit. No bedrock outcrops are present in this unit. The colluvium is thick and is derived from bedrock and from pre-existing till. The movement of the colluvium is shown by arrows on Map 1.

Ground Moraine Till: (Map Symbol "GM")

Till is unsorted material deposited directly from a glacier. Ground moraine is a thin till sheet from one to five meters in thickness. Most of ground moraine material is of local origin. The transportation distances in ground moraine are generally short. Thus ground moraine reflects

the composition of the underlying bedrock with a very small displacement.

Ground moraine is present on more gentle slopes as compared to the colluvium units.

Some down hill movement by soil and rock creep has taken place on the ground moraine.

Lateral Moraine: (Map Symbol "LM")

Lateral moraine is a thick accumulation of till and other glacial debris on the side of a valley glacier. The lateral moraine unit as delineated on Map 1 is present in elevation below the ground moraine. The composition of the lateral moraine may be of local or distal origin. In areas where lateral moraine is thick the down hill portions of the moraine have a distant origin. The lateral moraine portion which is against the bedrock or uppermost in elevation is usually derived locally.

Because of the small scale of the photographs and the heavy tree cover, an accurate boundary of the moraine could not be delineated.

In the central portion of the Burn Claim area a lateral moraine is delineated with the symbol "LM?". This area may not be a lateral moraine but an end moraine derived during the last stages of glaciation by a glacier originating in the cirque directly west of it.

The lateral moraine to the north of the above area is a proper moraine. Nevertheless, it is criss-crossed by numerous V-shaped gullies. These gullies were produced by debris torrents. Some of the V-shaped gullies are shown on Map 1 by arrows. Thus a large portion of the lateral moraine in this area may be covered by material originating directly in the upslope direction. These materials may have been derived from colluvium and ground moraine.

End Moraine: (Map Symbol "M")

A hummocky end moraine covers the valley floor of the area. The materials of the moraine are derived from valley glaciers which originated in the cirques on the property and also from the southeast in the valley.

The lateral moraine having the map symbol "LM?" may be an end moraine of the cirque glacier directly to the west of it.

In the northern portion of the claim area a creek is located which incised itself into the underlying materials producing a gully. Twenty to twenty-five meters of till is exposed along the gully. This unusual thickness of till may indicate that that area is covered by an end moraine. The origin of the materials of this end moraine is to be found along the valley in the cirque of that creek.

Outwash: (Map Symbol "OW")

North of the end moraine in the valley is an area of outwash. This outwash was produced by the meltwater which

originated from the glacier depositing the end moraine. The exact boundary between the moraine and the outwash could not be determined on aerial photographs.

Alluvial Fan: (Map Symbol "AF")

A small alluvial fan is present at the foot of a steep slope in the southern portion of the claim area. The materials of the fan originated directly upslope from its location. The fan may contain a large portion of fine grained material as it received mud flows.

Landslide: (Map Symbol "LS")

In the northern portion of the claim area the creek has a sharp displacement to the northeast. This displacement was caused by a landslide which originated half way up the slope. Side scarps of the landslide are still discernible on aerial photographs as erosion has not obliterated the landforms. The movement of the material involved in the slide was considerable as evidenced by displacement of the creek.

Two additional landslides are probably present to the south of the first one. These have been marked as "LS?" and LSA?" on the maps.

Thick Landslide Deposits: (Map Symbol "LSA")

A landslide may be divided into two portions: an area from which material has been removed or partly removed and an area where the sliding material has accumulated.

The materials which accumulated from the landslide in the northern portion of the area diverted the creek producing a bow.

Two other areas suggestive of landslide accumulation zones are present to the south of the first one. Since these are indefinite they have been marked on the map with the symbol "LSA?".

MOLYBDENUM SOIL ANOMALIES:

Molybdenum soil geochemistry results have been contoured using the following divisions:

0 - 9 ppm
10 - 19 ppm
20 - 39 ppm
40 - 79 ppm
80 - 159 ppm
160+ ppm

The results of the contouring have been transferred to the map showing surficial deposits, Map 1. Also on the same map the alaskite border has been delineated using Placer Development Limited bedrock map.

A number of significant anomalies occur throughout the area. The anomalies discussed in this report are designated on the map, Map 1, by capital letters.

Anomaly A:

The anomaly is comprised of two high spots with a horse shoe shaped high background area which is over 40 ppm. The anomaly is located on the up hill portion of the alaskite. The surficial materials in which the anomaly is located is definitely of local origin and reflects the composition of the underlying bedrock. This anomaly is not associated with alaskite but is adjacent to it.

Anomaly B:

Anomaly B is positioned on the up hill slope in respect to the alaskite. The material in which the anomaly occurs is ground moraine. This ground moraine is relatively thin as evidenced by nearby drill holes. The origin of the anomaly is local bedrock. This anomaly may be partly associated with the alaskite but a large portion of it is adjacent to it.

Anomaly C:

This anomaly is relatively large and is positioned almost entirely west or up slope from the alaskite. The origin of this anomaly is local bedrock as it is located in ground moraine. Some displacement of the anomaly may be present. The glacial movement which deposited this ground moraine came from the southeast, thus the anomaly could be displaced to the northwest by about 50 meters. Anomaly C is not associated with alaskite as shown on Map 1.

Anomaly D:

Anomaly D is the highest anomaly in the area. It is positioned in ground moraine. At this location the division between ground moraine and lateral moraine cannot be determined accurately. This means that the anomaly could have been displaced by glacial action from 50 to 150 meters to the northwest. The bedrock origin of the anomaly thus may be partly in the alaskite and partly in the monzonite which is adjacent to it to the west.

Anomalies E and F:

Anomaly F is located in materials which have been moved by landsliding down hill probably from Anomaly D. Anomaly E may be partly transported and partly in place. Thus it is interpreted here that Anomalies D, E and F were originally all at the location of D or nearby.

Anomaly G:

Anomaly G is a high background area which more-or-less begins on the up hill portion near the alaskite border and partly on the alaskite. The anomaly did not originate from materials of Anomaly C as there is a low background area separating the two. This anomaly is interpreted as originating from the alaskite and the alaskite border.

Anomaly H:

Anomaly H begins near the alaskite border. It forms a high background area with a significant low background area adjacent to it in the up hill direction. It is considered that the origin of this anomaly is near the alaskite border.

Anomaly I:

Anomaly I is positioned similarily to Anomaly H. It originates not in the alaskite but outside of it. The high count value of 210 ppm of this anomaly is likely located very near the bedrock source.

Anomaly J:

Anomaly J has its origin near the alaskite border but it also has a weak continuation to Anomaly A. It is interpreted that the main source of Anomaly J is near the alaskite border.

Anomaly K:

This anomaly is located in the area of the end moraine deposited by a valley glacier originating in the cirque west of the claim property. The anomaly may reflect mineralization underlying the anomaly or it may be transported anomaly from outside of the Burn Claim area.

MINERALIZED ERRATICS

The outcrop and boulder map of the Burn Claim Group shows a distinct separation of boulder lithologies conforming to outcrop patterns. This is specifically in the areas of very thin colluvium, thin colluvium, and ground moraine. This indicates that a majority of the rocks found on the surface in those areas are of very local origin. It may be extrapolated from the above that soil geochemical anomalies in those areas are also of local origin. The above substantiates the local character of anomalies A, B, C, D, G, H, I and J.

In the area of questionable lateral moraine, LM?, a large number of mineralized alaskite boulders have been located. These boulders form a horse shoe pattern in distribution and are interpreted as forming a portion of the end moraine which was deposited from the cirque glacier flowing from west to east.

The lack of soil geochemistry anomalies in the southern portion of the alaskite from which these boulders derived may signify that mineralization in this area is weak.

CONCLUSIONS

Molybdenite mineralization is definitely associated with alaskite as evidenced by molybdenite found in alaskite erratics and some outcrops.

Anomalies A, B, C, and D show that significant molybdenum mineralization is present in monzonite adjacent to the west of alaskite. The anomalies found in the monzonite are of very high values which may be correlated to higher mineralization in the monzonite.

Anomalies G, H, I and J are positioned similarly to the first anomalies, but they occur in porphoritic granite.

The area of anomaly K may form a continuation of the anomalies associated with alaskite or adjacent to it. On the basis of the present data no definite conclusions can be drawn.

RECOMMENDATIONS

The above conclusions are postulates based on detailed examination of the available data and interpretation of the anomalies using surficial geology as a background. In order to substantiate the above findings surficial geology examinations of the property should be conducted. The following points should be examined:

(1) Lithologic composition of surficial materials at anomalies up slope from the alaskite in order to ascertain the host rocks of mineralization of that area.

(2) Lithologic analysis of anomalies occurring down slope from the alaskite. This should show if the anomalies G, H, I and J originate from porphoritic granite or from the alaskite or maybe even from the monzonite.

(3) The material associated with anomaly K should be investigated in order to show if the anomaly is of local origin or has been derived from the Burn Claim or from the valley west of the Burn Claim. There is a possibility that anomaly K may form an extension of the anomalies surrounding the alaskite.

LSA

LS

LSA ?

OW

LM

A

GM

C/R

R

GM ?

LM ?

LS ?

LSA ?

AF

CT/R

M

W/L 1626

W/L 1620

W/L 1480

SURFICIAL

R - Very thin Colluvium over Bedrock

C/R- Thin Colluvium over Bedrock

CT/R - Bedrock & Till Colluvium over Bedrock

GM- Ground Moraine Till

LM - Lateral Moraine

↗ - Colluvial Transport

M - End Moraine

OW- Outwash

AF - Alluvial Fan

LS- Landslide

LSA- Thick Landslide Deposits

↗ - Post Glacial Drainage Channels

SUBSURFACE

A - Alaskite

SOIL MOLYBDENUM

+80 ppm Mo

40-79 ppm Mo

20-39 ppm Mo

10-19 ppm Mo

0 100 200 300 400 500

METRES

Scale and elevation datum based on limited ground control resulting in good relative, but uncertain absolute map accuracy

Compiled from aerial photography at an approximate scale of 1: 80,000 in the month of SEPT 1973

PLACER DEVELOPMENT LTD.

KWANIKA CREEK

SURFICIAL GEOLOGY

(By Bayrock)

McElhanney

McElhanney Surveying & Engineering Ltd

1200 West Pender Street Vancouver B.C., Canada

Scale :- 1: 5,000

Contour Interval: 10 Metres

Date: AUG. 1974/MAY 1980

Job No: 06630-0

Sheet No: 1 of 1

This reference scale bar has been added to the original image. It will therefore shrink or stretch as the image, therefore it can be used as a reference for the original size.

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