

STATE OF ALASKA  
DIVISION OF MINES AND MINERALS

GEOCHEMICAL INVESTIGATION AND BEDROCK OBSERVATION  
of  
LOGGING ROADS AT RATZ HARBOR,  
PRINCE OF WALES ISLAND

By  
William H. Race  
Mining Engineer

Repeat title and  
author here

## INTRODUCTION

April      April

This investigation was undertaken from ~~May~~ 15 to ~~May~~ 21 by the Division of Mines and Minerals to determine if the <sup>recent</sup> construction of logging roads in Southeastern Alaska would reveal enough new exposures of bedrock to materially aid in geological and geochemical investigation<sup>s</sup>. The roads have been built as a result of logging operations <sup>of</sup> the Ketchikan Pulp Company. The roads ~~are~~ are engineered by the Pulp Company, approved by the U.S. Forest Service and constructed either by contractors or loggers. The Ratz Harbor road was being constructed by Keil and Peterman, Inc., who provided <sup>lodging</sup> ~~logging~~ for Race.

The accompanying maps indicate the extent of the road system at Ratz Harbor. There are approximately 23 miles of road constructed to date. Logging was being done by Straights Logging Company on three sidings.

## LOCATION

Ratz Harbor is located on the ~~East~~ side of Prince of Wales Island at <sup>W</sup> longitude  $132^{\circ}36'$  and <sup>N</sup> latitude  $55^{\circ}53'$ . It is approximately 50 miles northwest of Ketchikan, Alaska.

## GEOLOGY

The geology of Prince of Wales Island and in particular the Kasaan Peninsula has been described in the following U.S. Geological Survey Bulletins.

- Bulletin 347, The Ketchikan and Wrangell Mining Districts, Alaska
- Bulletin 800, Geology and Mineral Deposits of Southeastern Alaska
- Bulletin 1058-H, Geology of Part of the Craig C-2 Quadrangle and Adjoining Areas, Prince of Wales Island, Southeastern Alaska
- Bulletin 1090, Iron and Copper Deposits of Kasaan Peninsula, Prince of Wales Island, Southeastern Alaska
- Bulletin 1108-B, Geology of the Craig Quadrangle, Alaska

Bulletin 1108-B <sup>shows</sup> ~~has~~ the inland area of Ratz Harbor <sup>to be</sup> ~~mapped as~~ diorite, while the points

on either side of the harbor entrance are mapped as graywacke, slate, and andesitic volcanic rocks. The area to the west of the diorite is mapped as undifferentiated intrusive rocks, determined by photo interpretation. The undifferentiated intrusive rocks may include complexes of the metamorphic rocks.

Observations <sup>of the road construction exposures</sup> made during the course of this investigation substantiated <sup>the USGS mapping.</sup> ~~these facts as~~

~~applied to exposures made during the course of road construction.~~ Unfortunately the road

system did not penetrate to the west far enough to enter the area of possible metamorphism.

The igneous rock did, however, grade into granodiorite, and in one exposure was found to be a

coarse-grained granite. The hill directly east of Big Lake (Ratz) contained several diorite

dikes. Sparse pyritization was found in the area of Big Lake. The volcanics at the entrance

of the harbor also contained pyrite. Gabbro containing magnetite was found near the contact

→ of the diorite

? with the volcanics between Ratz and Little Ratz Harbor.

Very little quartz was observed. However, a <sup>3</sup> inch quartz vein containing pyrite was found in a quarry between Big Lake and Trumpeter Lake.

A sample of granodiorite containing pyrite assayed 0.03% Cu. This sample was taken

↳ from an exposure east of Big Lake and shown on the map as RHR-1. <sup>Table I.</sup> ~~An assumed assay~~ <sup>on rock samples shown on the map as RHR.</sup>  
GEOCHEMICAL INVESTIGATION AND RESULTS

A total of 35 field samples were processed and 10 samples representing larger water-sheds or <sup>anomalous</sup> ~~anomalous~~ field results were bagged for laboratory analysis. Samples were taken

→ of soil-sediments adjacent to streams. No screening was attempted though care was taken to exclude vegetation and large particles. Carbon tetrachloride was used because of difficulty in shipping gasoline by <sup>air</sup>~~airplane~~. This substitution led to confusion because the water and soil floated on the carbon tetrachloride and didn't seem to give as definite a color differential as the University of Alaska white gasoline method. One <sup>particular</sup> stream ~~in particular~~ was sampled and field-tested because of the rusty appearance of the stream sediments. The rust seemed to be absorbed by the carbon tetrachloride, giving a very strong brown copper reaction. This stream did prove to carry more than the normal amount of copper, yet certainly ~~was not~~ <sup>was not</sup> the bonanza indicated by the field tests.

Laboratory results shown on <sup>Table II</sup> ~~the accompanying table~~ indicate that the streams flowing into Big Lake from the <sup>west (2)</sup> ~~east~~ and south carry anomalous amounts of copper or zinc. The table also indicates anomalous amounts of copper and zinc to the north of Little Lake. Both of these areas were covered with snow at the time of the field trip.

~~Contamination during laboratory analysis~~ <sup>analyses was completed by</sup> ~~was experienced in~~ the Division of Mines <sup>Juneau</sup> ~~Juneau~~ Ketchikan Assay Office and the U.S. Bureau of Mines Juneau Laboratory. The table presented is a result of the Bureau's <sup>analyses of total copper, lead, zinc content,</sup> ~~analysis~~ but the high value samples of each laboratory compare favorably in that the same samples have appreciably higher <sup>metallic</sup> ~~metallic~~ content than the apparent background. Background level in <sup>three areas of igneous rocks near Juneau</sup> ~~an igneous area~~ has been determined by Henry C. Berg, U.S. Geological Survey, <sup>in his</sup> "Preliminary Report of Reconnaissance Geochemistry of Stream Sediments From Three Areas Near Juneau, Alaska."

According to Berg, ranges from 10 to 70  
Background for copper ~~ranged from 10 to 70~~ ppm, lead ~~ranged~~ from 0 to less than 10 ppm, and  
zinc ~~ranged~~ from less than 25 <sup>to 75</sup> ppm.

#### CONCLUSION

The logging road of Ratz Harbor revealed many new bedrock exposures. The effort of collecting geochemical samples was greatly reduced. Geochemistry revealed the existence of copper and zinc in unknown quantities to the west and south of Big Lake and to the north of Little Lake. Metalization probably occurs in the igneous rocks near the area of possible metamorphism.

TABLE I  
X-ray Spectrographic Analyses of Rock Samples

<u>Sample No.</u>	<u>Major Elements</u>	<u>Minor Elements</u>	<u>Trace Elements</u>
1R	Silicon Iron	Calcium Aluminum	Potassium, Titanium Manganese (0.1%), Strontium Nickel, Zirconium (?)
2R	Silicon Iron	Calcium, Aluminum Potassium, Strontium	Titanium, Manganese Rubidium
etc	etc	etc	

# Div. of Mines and Minerals

Form M-1-8-62-3M

Assay Office ... Anchorage, Alaska ...

Date ... June 25, 1964 ...

JUN 26 1964

Div. Mines &amp; Minerals

## REPORT OF ASSAY

On samples received from ... Bill Race ... - Div. of Mines &amp; Minerals ...

Address ... Juneau, Alaska ...

Assay No.	Sample Marked	OUNCES PER TON		Value per Ton	Percentage of
		GOLD	SILVER		
16361	#1 R			Qualitative X-ray Spectrographic Analysis #337	
				Major Elements: Silicon, Iron	
				Minor Elements: Calcium, Aluminum	
				Trace Elements: Potassium, Titanium, Manganese (est. 0.1%), Strontium, Nickel, Zirconium (not positive on Zr).	
16362	#2 R			#338	
				Major Elements: Silicon, Iron	
				Minor Elements: Calcium, Aluminum, Potassium <del>XXXXXXXX</del> Strontium	
				Trace Elements: Titanium, Manganese (est. 0.05%), Rubidium.	
16363	#3 R			#339	
				Major Elements: Silicon, Iron	
				Minor Elements: Calcium, Aluminum	
				Trace Elements: Potassium, Titanium, Strontium, Manganese (est. 0.15%), Rubidium, Nickel, Copper, Zinc	
16364	#4 R			#340	
				Major Elements: Silicon, Iron	
				Minor Elements: Calcium, Aluminum	
				Trace Elements: Strontium, Potassium, Titanium, Manganese (est. 0.1%), Nickel.	



Assayer.

Division of Mines  
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Assay Office .....Continued.....

Date .....June 25, 1964.....

## REPORT OF ASSAY

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JUN 26 1964

On samples received from .....Bill Race.....

DIV. Mines &amp; Minerals

Address .....Continued.....

Assay No.	Sample Marked	OUNCES PER TON		Value per Ton	Percentage of
		GOLD	SILVER		

16365

#5

#341

Major Elements: Silicon, Iron

Minor Elements: Calcium, Aluminum,  
TitaniumTrace Elements: Potassium, Manganese (est.  
0.15%) Nickel, Copper, Zinc, Rubidium,  
Strontium

16366

#6

#342

Major Elements: Silicon, Iron

Minor Elements: Calcium, Aluminum, Titanium

Trace Elements: Potassium, Manganese (est.  
0.15%), Nickel, Zinc.

16367

#7

#343

Major Elements: Silicon, Iron

Minor Elements: Calcium, Aluminum,  
PotassiumTrace Elements: Nickel, Manganese (est. 0.1  
Copper, ~~Zinc~~, Lead, Strontium, Rubidium,  
Titanium

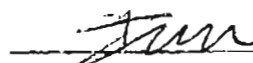
16368

#8

#344

Major Elements: Silicon, Iron

Minor Elements: Calcium, Aluminum

Trace Elements: Potassium, Titanium,  
Chromium, Manganese (est. 0.05%), Nickel  
Rubidium, Strontium

Assayer.



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Date June 25, 1964

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JUN 26 1964

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## REPORT OF ASSAY

On samples received from Bill Race

Address Continued

Assay No.	Sample Marked	OUNCES PER TON		Value per Ton	Percentage of
		GOLD	SILVER		
16369	#9				#345
				Major Elements: Silicon, Iron	
				Minor Elements: Calcium, Titanium, Aluminum	
				Trace Elements: Potassium, Manganese (est. 0.1%), Nickel, Zinc, Strontium	
16370	#10				#346
				Major Elements: Silicon, Iron	
				Minor Elements: Calcium, Titanium, Aluminum	
				Trace Elements: Potassium, Manganese (est. 0.1%), Nickel, Copper, Strontium, Zinc.	
16371	#11				#347
				Major Elements: Silicon, Iron	
				Minor Elements: Calcium, Titanium, Aluminum	
				Trace Elements: Potassium, Manganese (est. 0.1%), Zinc, Strontium	
16472	#12				#348
				Major Elements: Silicon, Iron	
				Minor Elements: Calcium, Aluminum	
				Trace Elements: Potassium, Titanium, Manganese (est. 0.1%), Nickel, Zinc, Strontium.	



Assayer.

Division of Mines  
and Minerals

Form M-1-8-62-3M

Assay Office Anchorage, Alaska

Date June 25, 1964

REPORT OF ASSAY

JUN 26 1964

Div. Mines & Minerals

On samples received from Bill Race

Address Continued

Assay No.	Sample Marked	OUNCES PER TON		Value per Ton	Percentage of
		GOLD	SILVER		
16441	#13				#349

Major Elements: Silicon

Minor Elements: Calcium, Titanium

Trace Elements: Potassium, Manganese (est. 0.15%), Nickel, Copper, Zinc, Rubidium.

*Handwritten notes:*  
OIL  
3000

*Handwritten signature:* J. W. Mitchell

J. W. Mitchell

Assayer.

Geochem: Cu, Pb, Zn  
Ratz Harbor

BUREAU OF MINES

REC'D. JUNEAU

No. \_\_\_\_\_

Report to ~~MAX~~ Div. Mines & Minerals

# Chemical Laboratory Report

JUN 9 1964

Div. Mines & Minerals

Date received May 11, 1964

Date reported May 26, 1964

[illegible]

Remarks: Reject cuts supplied by Al Gooch,  
Assayer, Ketchikan Laboratory

Signed C. Birch (Analyst)

UNITED STATES DEPARTMENT OF THE INTERIOR  
BUREAU OF MINESGeochem: Cu, Pb, Zn  
Ratz Harbor

RECEIVED, JUNEAU

No. \_\_\_\_\_

Report to ~~XXX~~ Div. Mines & Minerals

## Chemical Laboratory Report

JUN 9 1964

Date received May 11, 1964

Div. Mines &amp; Minerals

Date reported May 26, 1964

Serial No.	DESCRIPTION	Lot No.	Cu p.p.m.	Pb p.p.m.	Zn p.p.m.				Sp. Wt. g.			
64-234	Race-RHS-1		37	10	40				0.40			
235	" " 2		72	4	160				0.35			
236	" " 3		38	21	40				0.08			
237	" " 4		180	4	180				0.36			
238	" " 5		31	23	55				0.09			
										No reject available		
239	" " 7		23	< 2	90				0.20			
240	" " 8		138	54	65				0.56			
241	" " 9		46	< 2	60				0.37			
242	" " 10		14	31	85				0.17			

Remarks: Reject cuts supplied by Al Gooch,  
Assayer, Katchikan Laboratory

U. S. GOVERNMENT PRINTING OFFICE 16-33663-3

Signed C. Birch

(Analyst)

UNITED STATES DEPARTMENT OF THE INTERIOR  
BUREAU OF MINES

JUN 9 1964

No. \_\_\_\_\_

Geochem: Cu, Pb, Zn  
Ratz HarborReport to ~~Min~~ Div. Mines & Minerals

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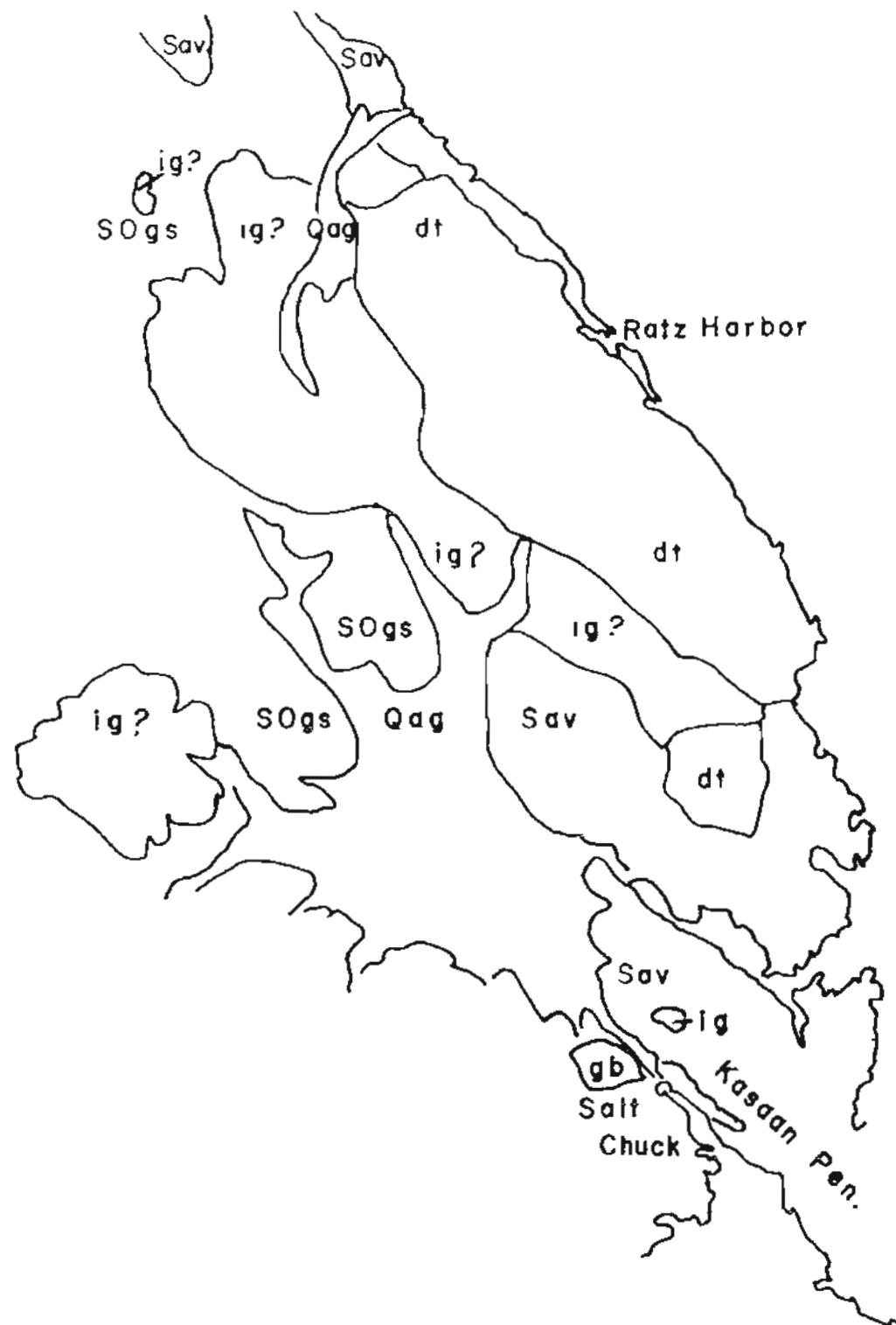
Remarks: Reject cuts supplied by Al Gooch,  
Assayer, Ketchikan Laboratory

U. S. GOVERNMENT PRINTING OFFICE 16-33533-3

Signed C. Birch (Analyst)

SOgs Graywack—black slate  
Sav Andesitic volcanics  
dt Diorite  
ig? intrusive rocks undifferentiated  
Qag Alluvium  
gb Gabbro

4 miles



GEOCHEMICAL INVESTIGATION

&

BEDROCK OBSERVATION

of

LOGGING ROADS AT RATZ HARBOR

PRINCE OF WALES ISLAND

April 1964

Scale 1" = 1/2 mi.

== logging road

-- planned "

○ geochemical field sample

② " lab. "

2R bedrock sample

# quarry

W.H. RACE

