

R E P O R T

ON

CHURN DRILLING

AT THE MOUTH OF FORSTER CREEK - 1954

BUGABOO PLACERS

GOLDEN MINING DIVISION, BRITISH COLUMBIA

by

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Vancouver, B. C.

February 15th, 1955

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EUGENE PLACERS
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Preliminary reconnaissance and surface sampling on #165 S.P.M.L. and #157 P.M.L. (BB3-4 Group) at the mouth of Forster Creek, at the time of staking in 1953, inferred 10 to 15 million yards of dredging ground averaging about .05 lb. Nb_2O_5 /yd.

During August and September, 1954, a limited program of reconnaissance churn drilling was carried out on #165 S.P.M.L. Bud Henning, drilling contractor, of Cranbrook, B. C., supplied his own truck-mounted churn drill and helper; St. Eugene Mining Corporation cleared access and drilling sites, and provided sampling crew, general assistance and supervision. The drilling contract was based on a rate of \$12.00 per hour for all drilling, pulling casing, and moving. Total payment to the contractor was \$1,485. for 272 feet of drilling; giving a cost of \$5.45 per foot (not including sampling and access).

Concentration tests by G.M.I. on panning tailings samples from Vowell Creek had shown earlier that panning losses in fine sands were considerably greater than tabling losses. Hence it was decided that subsequent sample concentration should be done on some form of portable table. The Stephan Corporation of Sacramento, California, claimed to have a portable machine that would make a complete heavy min-

eral recovery from our placer sands. This machine was purchased.

Field tests on the Stephan portable concentrator showed higher losses and more erratic recovery than panning. The machine could not be used to concentrate churn drill samples, but it was modified to screen and split these samples, and later it was used on high grade coarse sands to produce a 1000 lb. sample of concentrate for metallurgical testing.

For concentration of churn drill sample splits, a lab-size Wilfley table was rented from C. M. & S., Kimberley, B. C., and set up in a laboratory belonging to Columbia Gypsum Products, at Athalmer for tabling. Checks on this method of sample concentration indicate that recovery was good and losses consisted mainly of mixed grains. The largest error arose from unequal spacing of the sample splitter bars and inaccuracy in measurement of volume of the splits. The probable error from this cause is about 10%, but it would tend to fall equally, high and low, to affect average grade by less than 5%. The overall probable error of sample drilling and concentration is about 10% for average grade of holes, and about 15% for individual samples.

Drilling consisted of 9 holes totalling 272'. Location of holes is shown on the "Plan of Placer Leases at the Mouth of Forster Creek" at back. The irregular pattern of holes was governed by accessibility for the truck-mounted drill. The plan shows the surface trace of sections A-A', B-B' & C-C'. Plan and sections show probable area, depth, and grade of gran-

itic alluvium; and glacial and recent geology in the valley. Detailed drill hole sections and sampling results are shown on a separate sheet for each hole. The following table shows average grade and dredge section for drill holes, arranged from north to south along Section A-A'.

	<u>Hole No.</u>	<u>Dredge Section</u>	<u>Ave. Grade lb. Nb₂O₅ / Yd.</u>	<u>Grade X Section</u>
	6	19'	.025	
	5	9'	.116	
	3	12'	.060	.72
	4	20'	.052	1.04
X	2	22'	.079	1.74
	7	23'	.065	1.50
	8	13'	.028	
	1	17'	.044	
X	9	14'	.086	1.20
		91'	.068	= $\frac{6.20}{91'}$

X - Dredging Ground (Holes 3, 4, 2, 7 and 9) .068 lb. Nb₂O₅/Yd
 .009 lb. U₃O₈/Yd
 Ratio = 7.6

Holes 3, 4, 2, 7 and 9 all average above .05 lb Nb₂O₅/Yd. This grade has been taken as a tentative cutoff grade for Forster Mouth, and ground running above this grade has been shaded solid red on plan and sections. Dredge sections for these holes vary from 12' to 23' and average 18'. Average grade is .068 lb. Nb₂O₅/Yd.

Hole #5 averaged .116 lb. Nb₂O₅/Yd for 9' but has not

been included in the calculations because it is located in an old filled channel cut through silts and clays similar to those in hole #6.

Present assumptions are that depth of granitic alluvium decreases going upstream (observed depth is close to zero about the middle of #157 P.M.L.). Average grade should increase slightly going upstream, and is assumed to be about 0.1 lb Nb_2O_5/Yd on section B-B'. Going downstream the average grade will drop, but it may be possible to follow old channels with a grade well above average. The present channel flows north and has covered some swamps with granitic alluvium running about .05 lb Nb_2O_5/Yd , but depth is unknown.

The inferred estimate for Forster Mouth is 5 million yards averaging .07 lb. Nb_2O_5/Yd , or 1 million yards averaging .09 lb. Nb_2O_5/Yd . Average dredging depth would be about 15 ft.

All samples were analyzed for uranium but results were inconsistent and are being checked by Q.M.I. The results gave an average $\frac{Nb_2O_5}{U_3O_8}$ ratio of 7.6 for ground averaging above .05 lb. Nb_2O_5/Yd . This figure may be fairly accurate; if so, the estimate becomes:

5 million yards @ .07 lb. Nb_2O_5 & .009 lb. U_3O_8/Yd .
or 1 million yards @ .09 lb. Nb_2O_5 & .01 lb. U_3O_8/Yd .

The potential dredging ground at the mouth of Forster Creek is shallow and free from boulders; the season would be at least 9 months. Buried logs might give some trouble, but dredging cost would be well below average for the Eugaboo Placers, perhaps about 15¢ per yard.

The generally accepted history of glacial and recent alluvial deposits in this portion of the Columbia Valley has been borne out by the drilling. The so-called glacial lake silts must have filled, or nearly filled, the valley up to the level of the present side terraces with materials derived from the side streams and rivers. This fill was cut down by a river with considerably greater flow than the present upper Columbia. The main flow may have been southward at some stage, bringing waters of the Kicking Horse and Spillimacheen Rivers through this portion of the valley. More recently, the Kootenay River has almost certainly choked its southward channel and flowed north through the Columbia at times. It overflowed into the Columbia in a minor way during the summer of 1954.

At present the flow of the Upper Columbia is small and it has been unable to carry the load of alluvium brought in by the side streams, and is silting up its bed and flooding the valley. The side streams have thrown fan-dams across the valley to form Columbia and Windermere Lakes. Numerous swamps and smaller lakes occupy the rest of the valley and the river meanders through these behind natural levees.

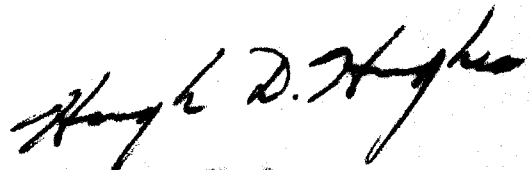
The maximum depth of recent alluvium noted in the drill holes on Forster Mouth was 37 ft. It is probable that the depth of recent alluvium in the main valley does not exceed 50 feet.

Section B-B' shows a possible deeper channel against the north side of the valley. The only evidence suggesting such a channel is the lack of step-down terraces on that side. The ground in the vicinity of the present channel was too

swampy to permit drilling closer to the north side.

Vancouver, B. C.



February 15th, 1955


A handwritten signature in cursive script that reads "Hugh D. Hughes". The signature is written in dark ink and is positioned above the typed name.

Hugh D. Hughes,
Geologist.




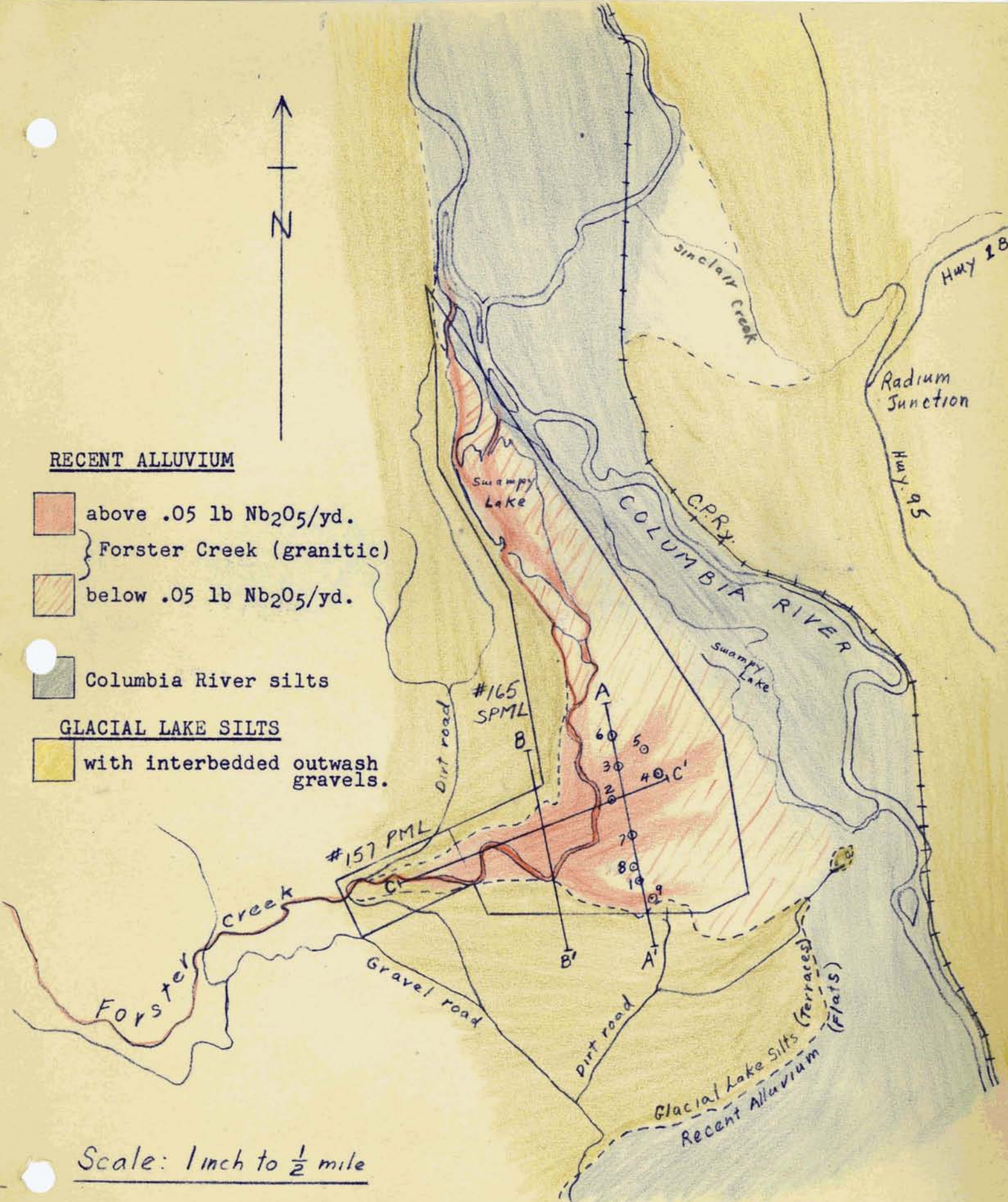
RECENT ALLUVIUM

-  above .05 lb Nb₂O₅/yd.
 -  below .05 lb Nb₂O₅/yd.
- } Forster Creek (granitic)

 Columbia River silts

GLACIAL LAKE SILTS

 with interbedded outwash gravels.



Scale: 1 inch to 1/2 mile

PLAN OF PLACER LEASES
at the
MOUTH OF FORSTER CREEK
Showing 1954 Churn Drilling.

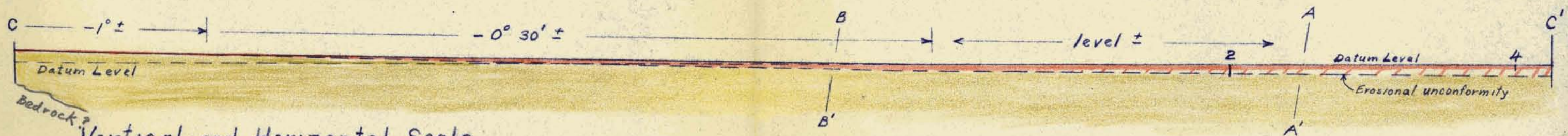


Churn drill holes projected to vertical section on 168°

- Recent Alluvium (granitic) above .05 lb. Nb_2O_5 /yd.
- Recent Alluvium (granitic) below .05 lb. Nb_2O_5 /yd.
- Glacial Lake Silt - with interbedded outwash gravel



C Probable vertical section on 168° across mouth of Forster Creek Canyon



Vertical and Horizontal Scale
1 inch to 400 feet

Probable longitudinal section on 068° thru hole #2

HOLE #1

FORSTER MOUTH - 1954

BUGABOO PLACERS

7-5/8" Shoe 6-1/2" Core

Section (materials in tenths)	Sample Interval (inches)	Shoe Vol.	Core Pumped (inches)	Core Vol.	Bucket Vol.	Sample No.	Wt. Conc. (gms)	% Heavy Mins. (Est.)	% Nb	lb. Nb ₂ O ₅	Nb ₂ O ₅	
		Cu Yd 1000		Cu Yd 1000	Cu Yd 1000					Cu Yd 1000	(core)	Cu Yd x Interval
	Humus & Silt 1'4"	<u>16</u>				No Sample				000	.00	
	3 gravel Twigs 6 sand Water 4'6" 2 clay layers 5'	<u>44</u>	43	36	<u>26</u>	7	404	<u>21</u>	90	<u>.40</u>	.010	.44
RECENT ALLUVIUM (granitic)	4 Gravel 5 Sand 1 fines thin seams clay	<u>144</u>	141	130	<u>93</u>	74	425	<u>456</u>	90	<u>.38</u>	.059	8.5
Basal Cgl. Erosional Unconformity	4 gravel 4 sand 2 fines 17' clay	<u>60</u>	59	60	<u>43</u>	28	426	<u>272</u>	30	<u>.21</u>	.042	2.4
Glacial Lake Silt	Yellow silt & clay 26'	Volume(243 Ratios(1		162 .66	109 .45	Not sampled						
										Ave. <u>.043</u>	<u>11.4</u> 264"	
										<u>.044</u>	<u>8.9</u> 204"	

HOLE #1

Table Recovery

HOLE #2

FORSTER MOUTH - 1954

BUGABOO PLACERS

7-5/8" Shoe 6-1/2" Core

Section (materials in tenths)		Sample Interval (inches)	Shoe	Core		Bucket	Sample No.	Wt. Conc (gms)	% Heavy Mins. (Est.)	% Nb	lb. Nb ₂ O ₅	
			Vol. Cu Yd 1000	Core Vol Cu Yd 1000	Core Vol Cu Yd 1000	Vol. Cu Yd 1000					Cu Yd (core)	Nb ₂ O ₅ Yd Interval
Recent Alluvium (granitic)	1 gravel 8 sand 1 fines	Water 3'7" 5'	59	52	37	10?	405	174	65	.39	.058	3.5
	3 gravel 2 sand 2 fines	1 thin clay layer 9'	82	80	57	64?	406	496	100	.42	.115	9.6
	4 gravel 4 sand 2 fines	14'8"	59	60	43	40	407	224	100	.46	.076	4.6
	1 gravel 7 sand 2 fines	twigs in clay layers 17'	55	58	41	14	Discarded in error			Est. .050	2.8	
	Log at 22' 8"		Not sampled									
	1 gravel 1 sand 8 fines		6" gravel Mainly clay layers with twigs 26' 29'	Volume(255 Ratios(1	178 .70		128 .50					
Basal Cgl. Erosional Unconformity	2 gravel ± clay 6 sand 2 fines	Brown sand 35'					21'8" Dredge Section		Ave. .079	20.5 260"		
Glacial Outwash	7 gravel) 2 sand) semi- 1 fines) cemented	40'					12' Dredge Section Table Recovery		.091	13.1 144"		

HOLE #2

HOLE #4

FORSTER MOUTH - 1954

BUGABOO PLACERS

Section (materials in tenths)	7 1/2" Shoe		6 1/2" Core		Bucket Vol. Cu Yd 1000	Sample No.	Wt. Conc (gms)	% Heavy Mins (Est.)	% Nb	lb. Nb ₂ O ₅ Cu Yd (Core)	Nb ₂ O ₅ Yd x Interval	
	Sample Interval (inches)	Shoe Vol. Cu Yd 1000	Core Pumped (inches)	Core Vol. Cu Yd 1000								
Recent Alluvium (granitic)	2 gravel 8 sand water 4' 5'	60	57	60	43	31	410	264	45	.16	.031	1.9
	5 gravel 2 sand 3 fines 10'	60	57	58	41	39	411	310	75	.30	.072	4.3
	± swamp Silty clay 14'	48	45	34	24	-	No Sample		-	-	-	-
	16'	36	34	30	21?	35	412	380	90	.30	.103	3.7
	7 gravel 2 sand 1 fines 17'	36	34	26	19?	32	436	285	60	.26	.073	2.6
	20'	48	45	56	40?	42	4.3	244	45	.19	.035	1.7

Bucket Vol. used for last 10'

Volume { 227 164(?) 179
 Ratios { 1 .72(?) .79

HOLE #4

Dredge Section

24' .049 14.2 / 288^W
 20' .052 12.5 / 240^W
 10' .052 6.2 / 120^W

Table Recovery

7 1/2" Shoe 6 1/2" Core

Section (materials in tenths)		Sample Interval (inches)	Shoe Vol. Cu Yd / 1000	Core Pumped (inches)	Core Vol. Cu Yd / 1000	Bucket Vol. Cu Yd / 1000	Sample No.	WT. Conc (gms)	% Heavy Mins. (Est.)	% Nb	lb. Nb ₂ O ₅ (Cu Yd (core))	Nb ₂ O ₅ Yd X Interval
Recent Alluvium (granitic)	Clay Water 4'6" with twigs 9'	<u>108</u>						Not Sampled				
	2 gravel sand 3 fines 13'	<u>60</u>	57	56	<u>40</u>	33	416	<u>228</u>	55	<u>.29</u>	.052	3.1
	2 sand 8 fines } at top twigs 14'	<u>60</u>	57	78	<u>56</u>	42	417	<u>260</u>	55	<u>.30</u>	.044	2.6
	Sandy Clay 19'							No sampled				
	Blue Clay Twigs	Volume (11.4 Ratios (1			96 .84	75 .66						
Erosional Unconformity	37'	31' - 42'	Open Hole									
Glacial Outwash	"Hardpan" 42'											

Dredge Section 19' Ave. .025 5.7 / 228"
Table Recovery

HOLE #6

HOLE #7

FORSTER MOUTH - 1954

BUGABOO PLACERS

7 1/2" Shoe 6 1/2" Core

Section (materials in tenths)		Sample Interval (Inches)	Shoe Vol. Cu yd / 1000	Core Pumped (inches)	Core Vol. Cu Yd / 1000	Bucket Vol. Cu Yd / 1000	Sample No.	Wt. Conc (gms)	% Heavy Mins (Est.)	% Nb	lb; Nb ₂ O ₅ Cu Yd (Core)	Nb ₂ O ₅ Yd / X Interval
Recent	Silty Water Clay	2' - 4'6"	96	60	43	30	418	212	45	.28	.043	4.2
Alluvium	1 gravel 7 sand twigs 2 fines	8' - 12'	48	55	39	52 x 57	419	578	80	.38	.121	5.8
	Bits wood	12' - 14'4"	28	52	37	39 43	420	270	50	.21	.041	1.2
(Granitic)	5 gravel Log at 15'6"	14'4" - 16'6"	26	38	27	32 17.5 17.5	421 437	103 72	55 70	.31 .40	.058 .055	1.4
	3 sand 2 fines	16'6" - 23'	78	83	59	54	422	432	50	.30	.069	5.4
Basal Cgl.	4g 4s 2f	23' - 24'8"	60	63	45	44	423	212	35	.15	.022	
Erosional Unconformity	3 gravel) mainly 5 sand) semi- 2 fines) cemented with yellow clay	28' - 33'	60	80	57	38	424	120	35	.15	.010	
		33' - 39'	72	96	68	61	Discarded					
	39' - 44'	72	78	56	31	Discarded						
	44' - 45'	72	78	56	31	Discarded						
Yellow Clay	50'6"	} Open hole xg' to 16'6" Core rising - Bucket Vol. +10% used in calculations { 512 431 381 { +26 { 457 { .93 .62										
HOLE #7	Volume Ratios	{ 1 { .93 .62 { Table Recovery { Dredge Section { 23' .065 18.0 / 276" { 12' .069 10.0 / 144"										

