Mr. [illegible] I. Hunter
Chief
Hydrology Division

J.C. Foweraker
Head
Groundwater Section

June 23 75

Jordan River Correctional Camp
Water Supply Investigation

0239013

General

Following a request from the Department of Public Works, Fred Chwojka and I made an investigation of possible springs and well sites in the above-mentioned area for an alternate supply to the present source on Clinch Creek. Assistance was given in line cutting, in order to provide access through the thick bush, by the staff and inmates of the camp. The bulk of the field work was done by Mr. Chwojka. Figure No. 1 shows the location of the camp and the existing and newly constructed trails. Figure No. 2 is a more detailed map of the camp area and location of the present water source to the camp.

Geology

Figure No. 3 is a bedrock geology map of the area. The camp site area, indeed all the area below the road between Clinch and Rosemond Creek, is underlain by Sooke Sediments, sandstones and sandstone-conglomerate. In the creek bottom on the west sides near the camp pump and dam however, is an outcrop of gabbro, which is in contact with the overlying sandstones and conglomerate. The gabbro appears to be more fractured and jointed than the overlying sandstone which is massive in appearance and shows little to no jointing in a number of exposures that were examined.

Figure No. 4 describes in brief note form the surficial geology of the coastal area. The area between Clinch and Rosemond Creek is described as a disected remnant of a kame (?) terrace. Certainly over 60 feet of sands, silts and gravels (some dirty), some showing typical ice contact features etc., have been observed in exposures. Two dry holes drilled in the camp site area (see Figure No. 5) indicate the terrace and associated sands and gravels reach a thickness of 100 feet.

Spring Sites

A number of sketches have been prepared by Fred Chwojka of the general area and these are described below in figures six to nine. Figure No. 6 shows the access trails which were cut to intersect a number of spring flows observed from the beach. The approximate flows in gallons per minute, the location of three sampling points, approximate distances from the camp etc. are also shown. Using two precision altimeters approximate elevations were obtained by Mr.

. . . 2

Chwojka and these are shown with respect to a base of -15 feet at sea level. It was felt that more precise surveying through the thick bush is not warranted at this early stage of the investigation.

Figure No. 7 shows details of a spring located in gravels. At this location is a till layer, which in turn is apparently overlying (?) tertiary conglomerate. The spring flow has carved through the till sequence and exposes the (?) tertiary conglomerate which appears to form a prominent escarpment below to the beach. A sample sent to the laboratory was taken at the point indicated in Figure No. 7. Flow at the top above the escarpment is estimated at about 5 gpm. See Appendix for further data on samples taken for laboratory analyses. These results may not be made available for some weeks.

Figure No. 8 shows the spring area from which sample No. 2 was taken. This spring is referred to as "Fred's" spring in this report. Water issues at the base of sand and gravel layers usually along a silt lens or other less permeable strata. A wooden box structure could be constructed at the site where the sample is taken and several flows converge. The estimated combined flow from Fred's spring is approximately 10 gallons per minute. Distance to the camp from Fred's spring is approximately 2000 feet.

Figure No. 9 to the west of the beach access trail shows a spring area where No. 3 sample was taken for laboratory analyses. Estimated combined flow is approximately five gallons per minute. Distance to the camp is approximately 1200 feet. A wooden box structure could be constructed at this site from which water could be pumped to the camp at a later date if required.

Recommendations

Fred's spring (sample No. 2 site) and the spring west of the beach access trail (at sample No. 3 site) would both meet the minimum camp requirement of five gallons per minute. Both springs are apparently fed from groundwaters issuing from sand and gravels of the upper unconsolidated deposits making up the dissected kame (?) terrace, and ice contact deposits.

In order to determine if this flow will remain constant or will diminish during the summer months. It is suggested that wooden box structures and "collector" ditches be constructed on both spring areas mentioned above with a view to collecting the spring flows and allowing the overflow to issue from one point from the wooden box through a pipe overflow or weir. These flows should be measured once a week and the rate, time and date recorded. Meanwhile, the camp can continue to use the existing source. More sophisticated collector devices can be designed for the spring areas if required, including the placing of sand - and gravel-packed horizontal collector well screens, etc.

An alternative to the above is to drill and construct one or two wells. Well Site No. 1 would be near the beach access trail turnoff, on the old logging

. . . 3

road which runs southeast from the camp. This site is clearly marked. This drill hole would only penetrate to the base of the sand and gravel deposits and would (hopefully)intersect the groundwater flows which issue as the various springs mentioned above.

Well Site No. 2 is suggested on the opposite side of Clinch Creek to the present pump and dam site for the camp. Gabbroic rock showing joints and fracturing is present on the west side at this location and an old logging road could perhaps be cleared off to allow drilling rig access to the site. There was insufficient time available, however, to explore the old logging road and to see if, in fact, it joins the highway above. Further field work would be required if, a well site is to be considered at this location. Rock fractures in the gabbro are considered to be more favourable for storage of groundwater and the above site would avoid the necessity for additional drilling in overlying sandstone and conglomerates which are considered to be less likely to yield groundwater in this area.

Further field work could also be done to explore for spring locations downstream on either side of Clinch Creek.

I would summarize the foregoing as follows:

Two spring areas could be considered for development to provide a water source for the camp. One site is approximately 1200 feet from the camp and provides a present flow of about five gallons per minute, the second spring "Fred's" spring provides a flow of about 10 gallons per minute, but it is located approximately 2000 feet from the camp.

It is recommended that if these sites are a possibility for future water supply that wooden collector boxes and associated collector ditches be constructed at one or both sites now, and the flows monitored on a weekly basis to see if flow is diminished during the ~~early~~ summer months. and into the mid September period

Two well site areas are suggested for consideration. One site on the old logging road is expected to encounter over 100 feet of sand and gravels and may (?) encounter groundwater flows immediately above the bedrock.

Approximate costs for this well are as follows:

Mobilization	=	$ 250.00
Drill and case 8-inch hole to 100 feet at $21.00 per foot	=	$2,100.00
Development 8 hours at $30.00 per hour	=	$ 240.00
Pumping test 24 hours at $30.00 per hour	=	$ 720.00
Screen and fittings	=	$ 750.00
		$4,060.00
	say	$5,000.00

. . . 4

The second well site is located to avoid unnecessary expenditure on drilling through expected barren sandstone and conglomerate. Gabbroic rocks are found in sites on the opposite side of the river to the present pump and dam site for the camp. A 300-foot well located on the old logging road on the opposite side could intercept groundwater in rock fractures in the gabbro.

Approximate cost of a well which may yield one to three gallons per minute are as follows:

Overburden 10 feet at $21.00 cased	=	$ 210.00
8-inch rock hole at $13.00 per foot to 300 feet	=	$3,900.00
Mobilization	=	$ 250.00
Development and pumping test 30 hours at $30.00 per hour	=	$ 900.00
Access road and site preparation	say	$2,000.00
	Total	$7,260.00

A final note: Clinch Creek appears at present to still be flowing strongly. Rosemond Creek due to the fact that a relief camp was at one time sited near the creek, would perhaps indicate a more reliable summer flow being available in this Creek.

Pipe line cost to this creek could be considerably reduced if the Department of Highways were to consider a wet crushing plant and then needed to bring water from Rosemond Creek to the gravel pits for this purpose.

JCF

J.C. Foweraker
Head
Groundwater Section

JCF/jw

Jordan River Camp Area Samples June 16, 1975

Sample No. 1 Most easterly flow:

Temp.	48°F 9°C
Micromhos	50
Iron	0.5 mg/1
Sodium Chloride	25 mg/1
Hardness	2 Grains/Gall.
pH	7.5

Sample No. 2 West of above sample #1:

Temp.	49°F 9.5°C
Micromhos	65
Iron	0.3
Sodium Chloride	25 mg/1
Hardness	2 Grains/Gall.
pH	7.5

Sample No. 3 West of beach trail, first flow below camp Jordan River

Temp.	49°F 9.5°C
Micromhos	Nil
Iron	0.3
Sodium Chloride	12.5 mg/1
Hardness	3 Grains/Gall.
pH	6.5

Jordan River Camp Area Samples June 10, 1975

Sample No. 1 Rosemond Creek on Branch 50 under Bridge:

Temp.	52°F 11°C
Micromhos	Nil
Iron	0.5 mg/l
Sodium Chloride	12.5 mg/l
Hardness	1 Grain/Gall.

Sample No. 2 Boulder Creek Camp pump pond:

Temp.	58°F 14°C
Micromhos	Nil
Iron	0.5 mg/l
Sodium Chloride	12.5 mg/l
Hardness	1 Grain/Gall.

Sample No. 3 (Boulder Creek side) west branch of Rosemond Creek under bridge on Branch 50 extension due west:

Temp.	52°F 11°C
Micromhos	Nil
Iron	0.5 mg/l
Sodium Chloride	12.5 mg/l
Hardness	1 Grain/Gall.

F. Chwojka
Engineering Assistant
Groundwater Section

FC/jw

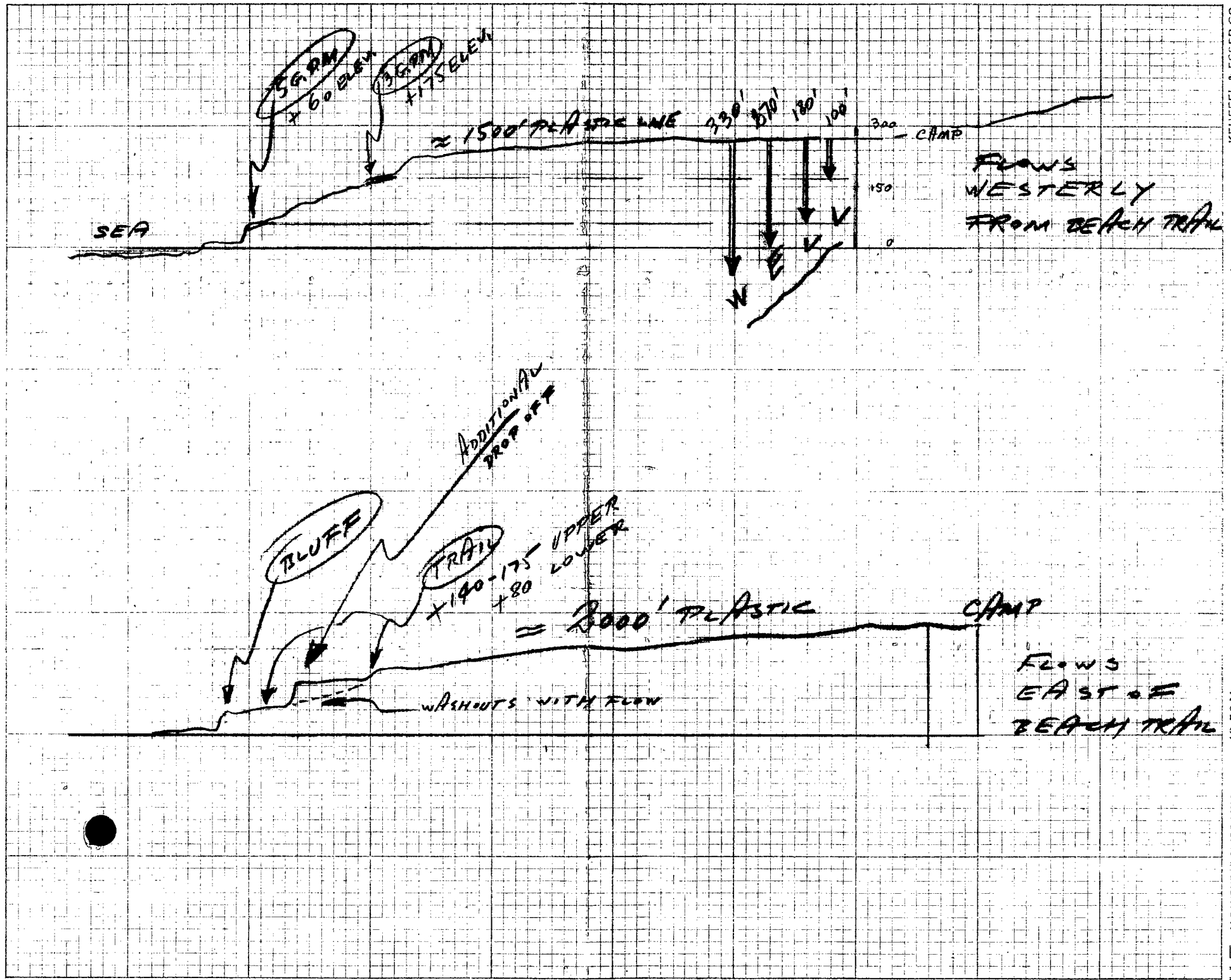


FIGURE N°4

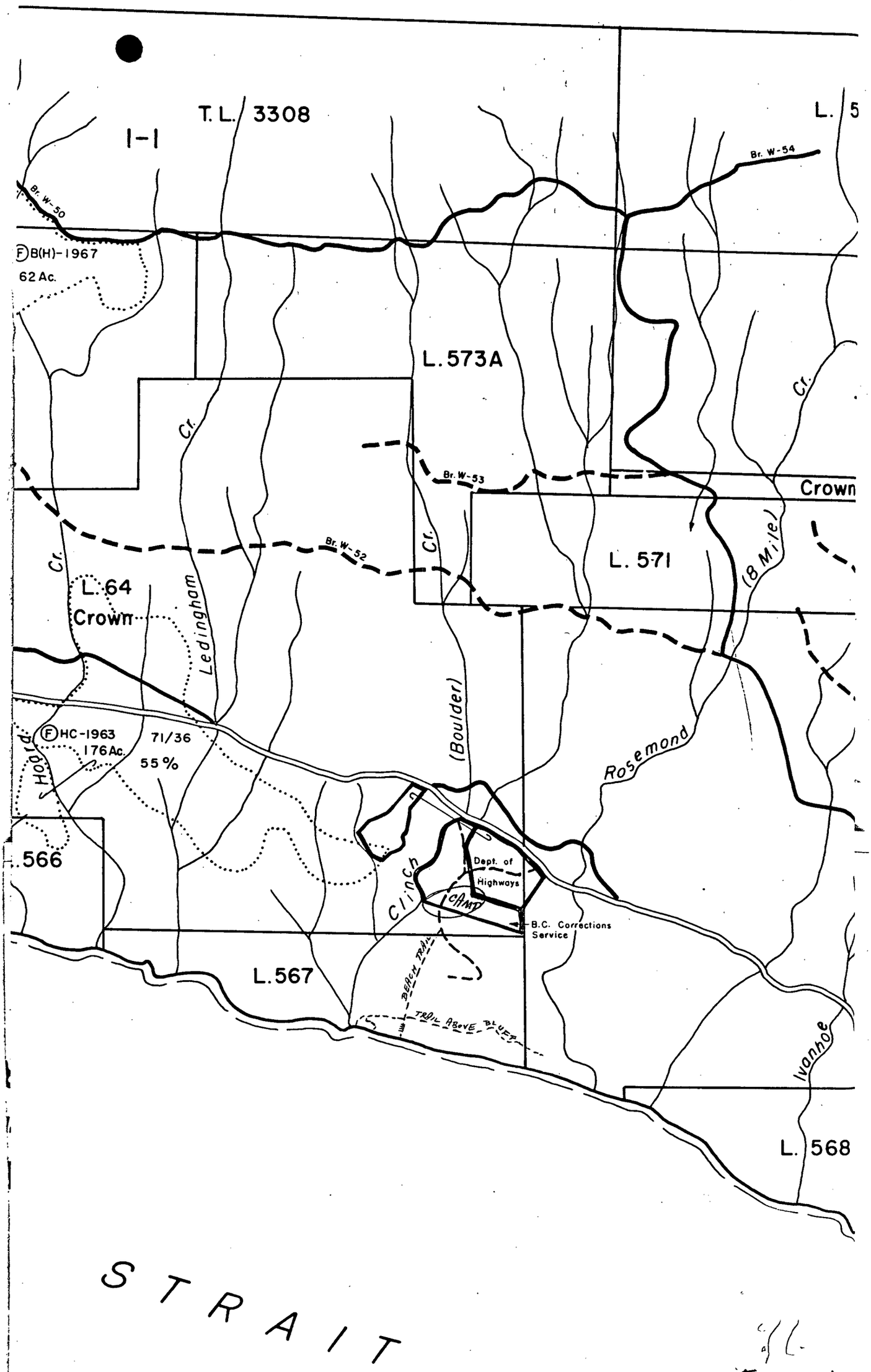

T. L. 3308
I-1
L. 5
Br. W-54
Br. W-50
(F) B(H)-1967
62 Ac.
L. 573A
Cr.
Br. W-53
Crown
Br. W-52
Cr.
L. 571
(8 Mile)
L. 64
Crown
Ledingham
(Boulder)
(F) HC-1963
176 Ac.
71/36
55 %
Hoard
Rosemond
566
Clinch
Dept. of Highways
CAMP
B.C. Corrections Service
L. 567
BEACH TRAIL
TRAIL ACROSS RIVER
Ivanhoe
L. 568
STRAIT

Figure 1.

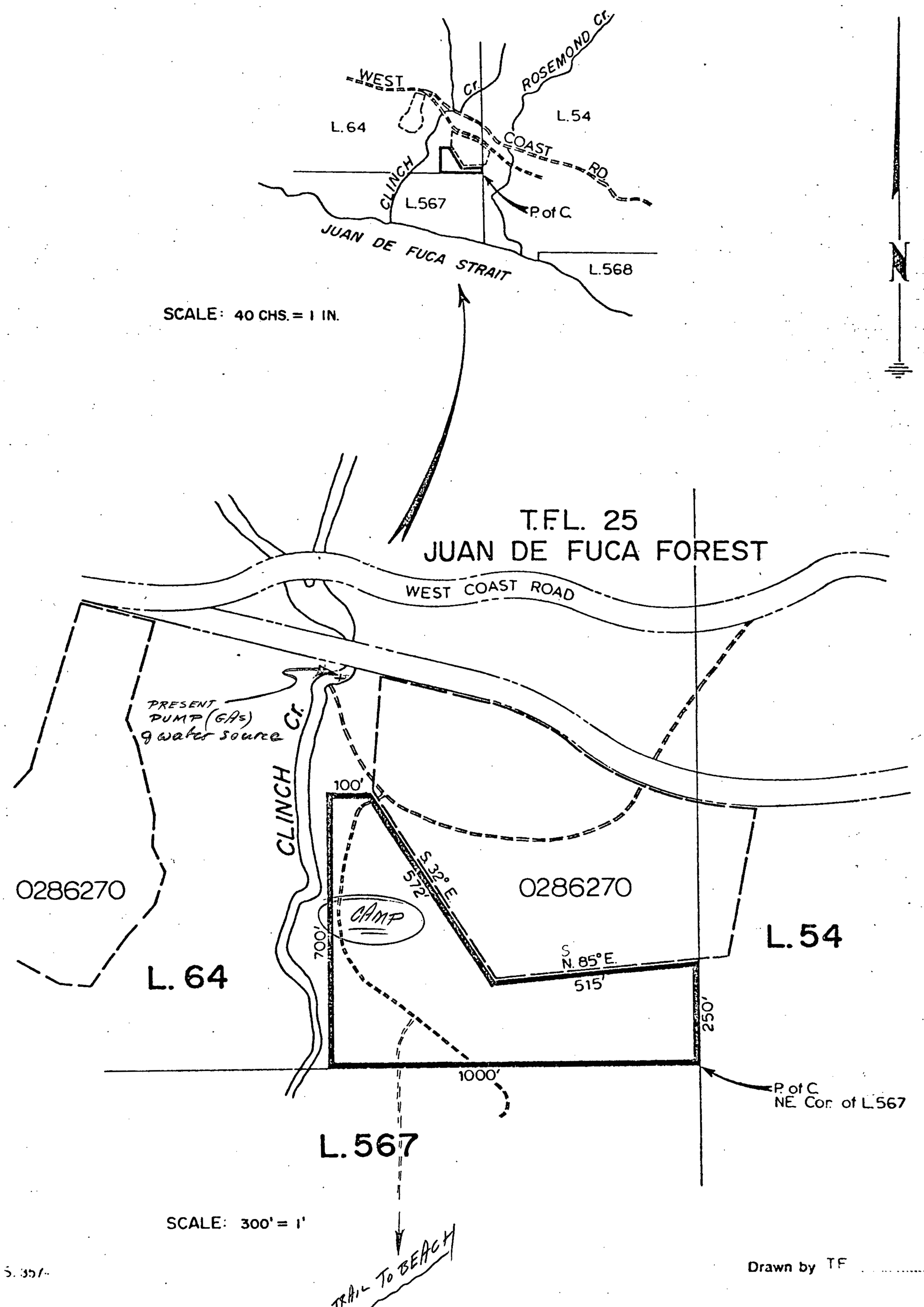
strict RENFREW
on No. 6 Compt. No. 1
ase T.F.L. 25 & FILE

BRITISH COLUMBIA
FOREST SERVICE

EXHIBIT A
Date NOV. 18 1974
Atlas Ref. 92 C/NE (E½)

MAP NOTATION 0331083 (INMATES CAMPSITE)

Shown .... Acres ± 14 R.D. 23 Scale .... 1 in



S. 357

Drawn by TF

Figure N° 2

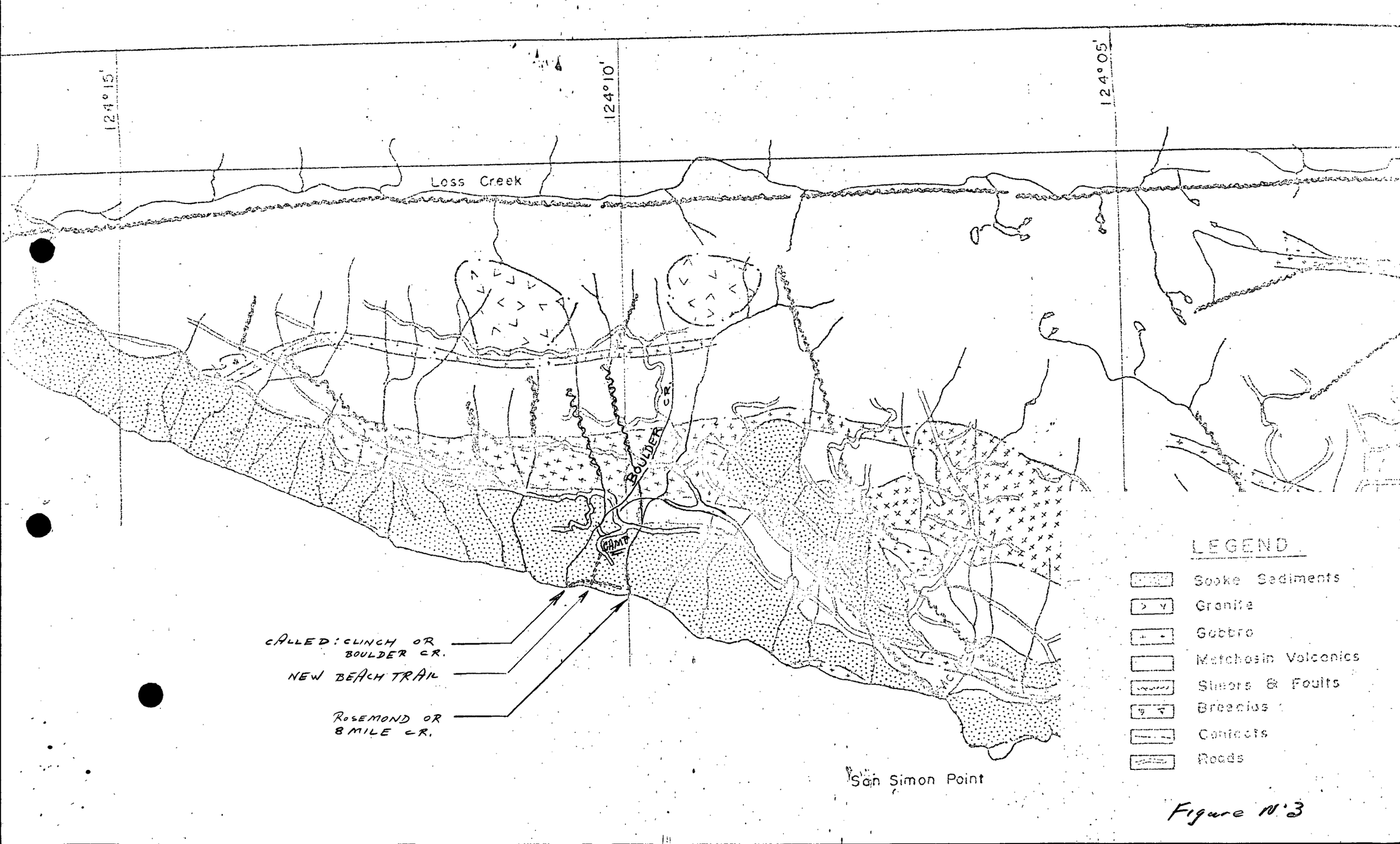

124°15'
124°10'
124°05'
Loss Creek
BOULDER CR.
CAMP
CALLED: CLINCH OR BOULDER CR.
NEW BEACH TRAIL
ROSEMOND OR 8 MILE CR.
San Simon Point
LEGEND
Sooke Sediments
Granite
Gabbro
Metchosin Volcanics
Slopes & Faults
Breccias
Contacts
Roads

Figure N°3

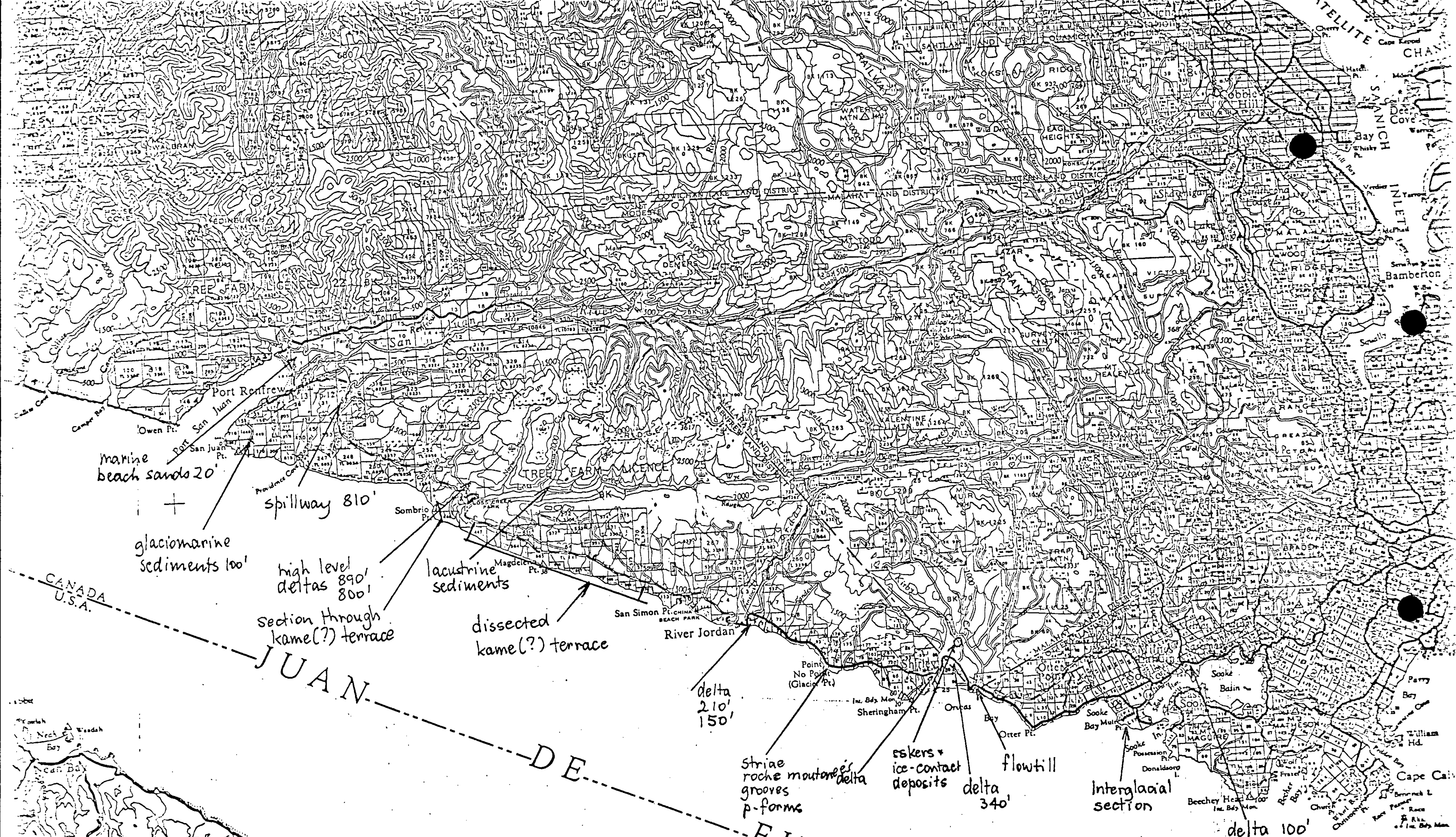

marine beach sands 20'
glaciomarine sediments 100'
spillway 810'
high level deltas 890' 800'
section through kame(?) terrace
lacustrine sediments
dissected kame(?) terrace
delta 210' 150'
Striae
roche moutonée
grooves
p-forms
delta
eskers + ice-contact deposits
delta 340'
flowtill
Interglacial section
delta 100'
Port Renfrew
Port San Juan
Owen Pt.
San Juan Pt.
Sombrio Pt.
Magdelena Pt.
San Simon Pt.
River Jordan
Point No Point (Glacier Pt.)
Sheringham Pt.
Orveas Bay
Otter Pt.
Sooke Bay
Sooke Basin
Beechey Head
Becher Bay
Parry Bay
William Hd.
Bamberton
Cobble Hill
Deep Cove
Saanich Inlet
Cowichan Lake Land District
Malahat Land District
Renfrew Land District
Tree Farm Licence
Sooke Lake
Valentine Mtn
Waterloo Mtn
Koksilah Ridge
Eagle Heights
Canada
U.S.A.
Juan de Fuca
Neah Bay

Figure № 9

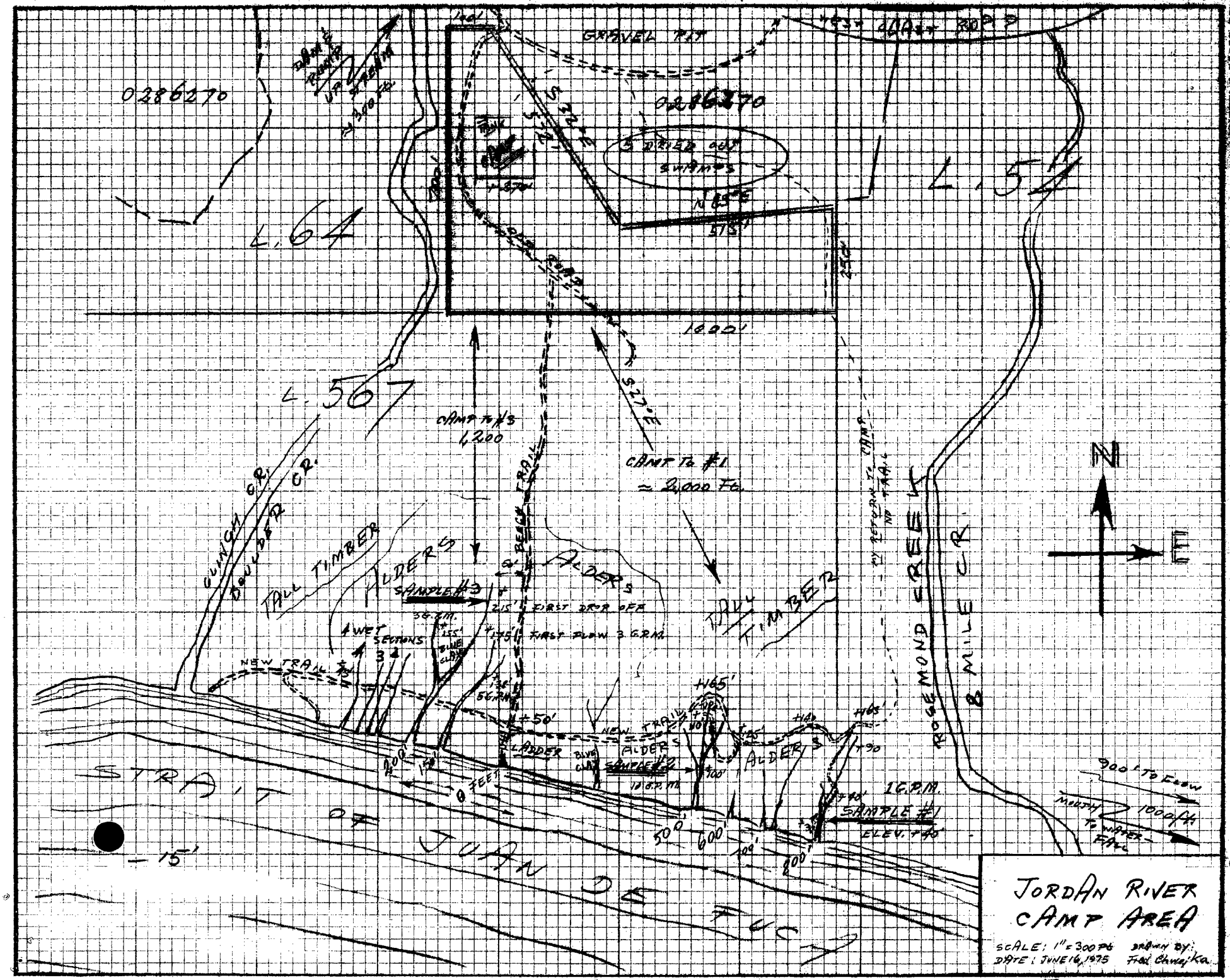
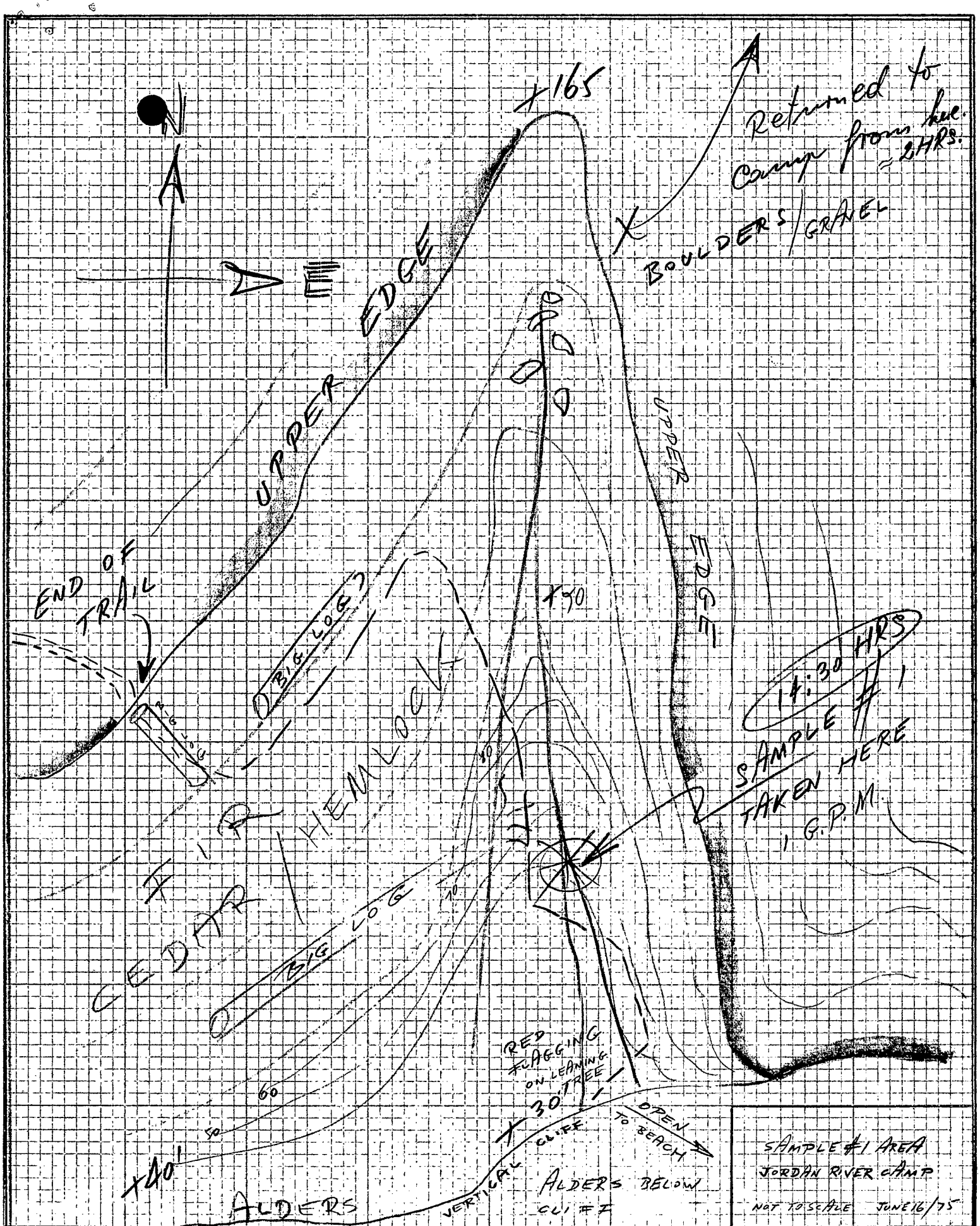

GRAVEL PIT
0286270
L.64
L.56
L.55
CAMP TO #3
4,200
CAMP TO #1
≈ 2,000 Ft.
SAMPLE #3
SAMPLE #2
SAMPLE #1
ELEV. +40'
ROSEMOND CREEK
8 MILE CR
TALL TIMBER
ALDERS
NEW TRAIL
BEACH TRAIL
CRUNCH
BOWLDER
STRAIT OF JUAN DE FUCA
JORDAN RIVER
CAMP AREA
SCALE: 1" = 300 Ft
DATE: JUNE 16, 1975
DRAWN BY: Fred Chmajka

Figure 6.



Figure

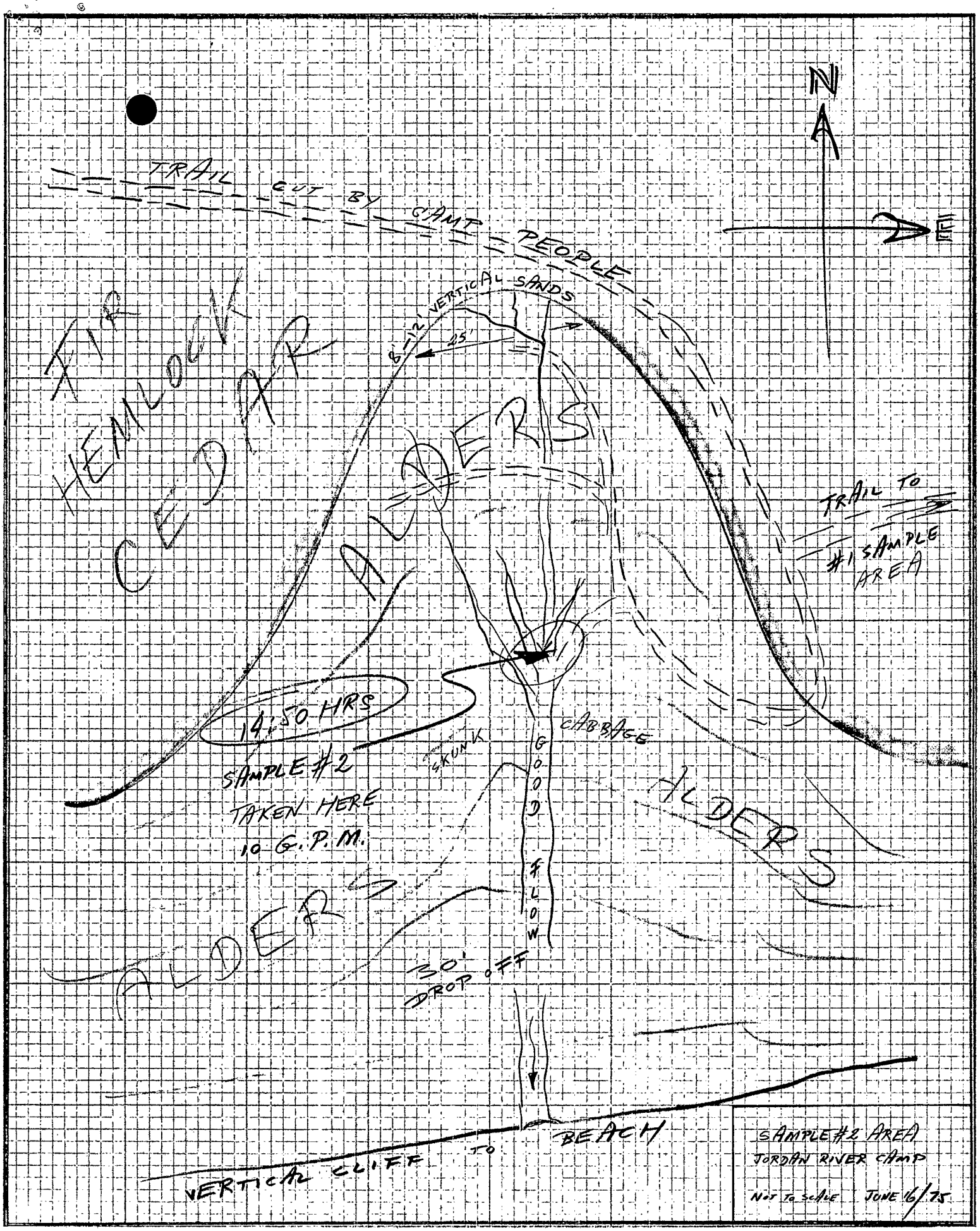


Figure No.

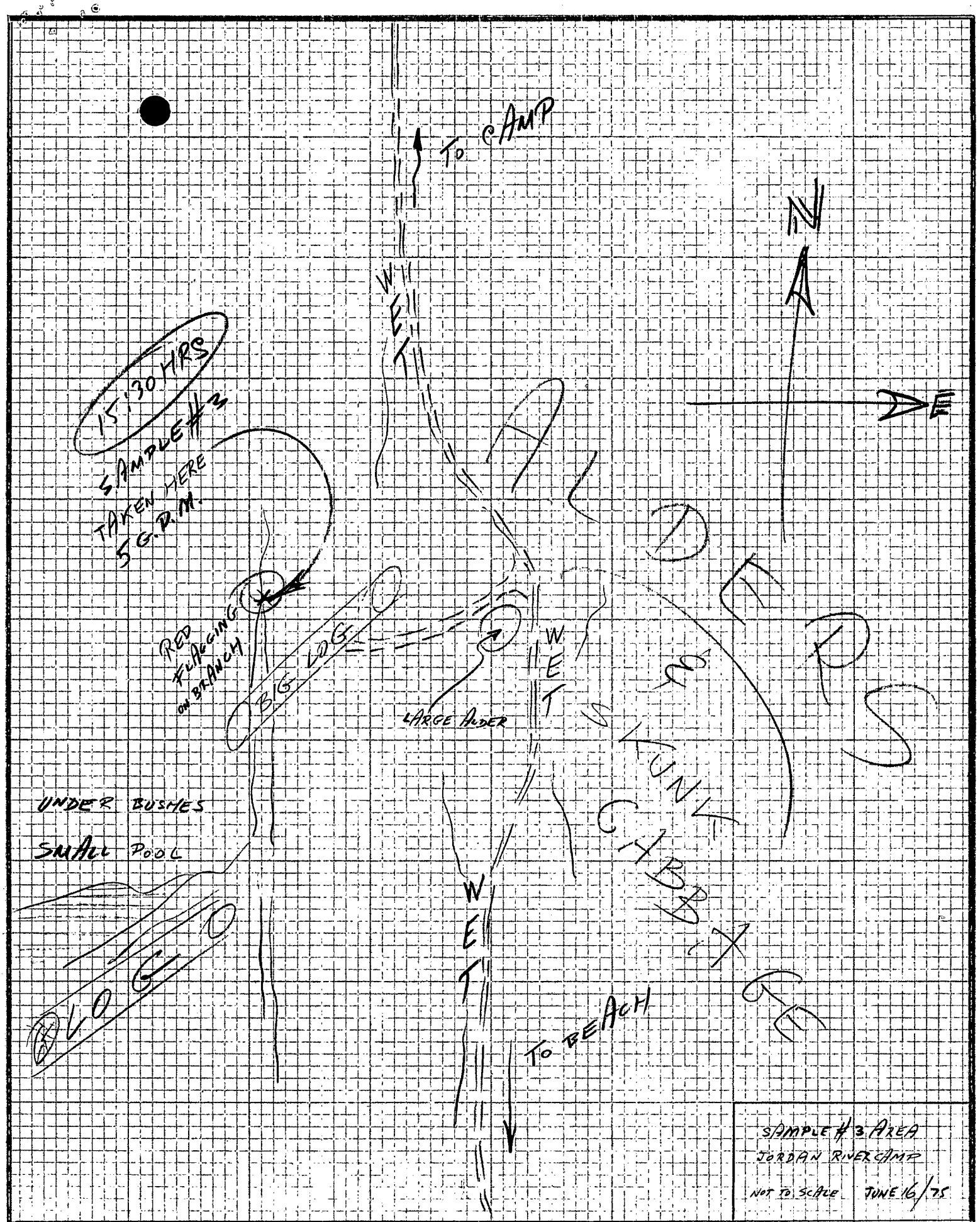


Figure 3