GEOLOGY AND GEOCHEMISTRY
OF A PORTION OF THE
NIFTY 2 AND NIFTY 5 CLAIMS
SKEENA MINING DIVISION

NTS 93D/9W

52° 35' N, 126° 25' W

Owned By

United Mineral Services

Operated By

Pan Ocean Oil Ltd.

Work Done By

J. R. Woodcock Consultants

Report By

R. J. Bailes

May 29, 1977

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GEOLOGY AND GEOCHEMISTRY OF A PORTION OF THE NIFTY 2 AND NIFTY 5 CLAIMS SKEENA MINING DIVISION

INTRODUCTION

The Nifty claims are located about 15 miles north-northeast of Hagensborg, British Columbia on the east side of the Noosgulch River (Figure A). A logging road extends up the Noosgulch River from the Bella Coola highway to the southern boundary of the Keen Claims. Nifty 2 and Nifty 5 Claims are about 4 miles north of the end of this logging road and are accessible by helicopter from Hagensborg (Figures A and B).

The property was discovered in 1931. A 25 foot adit was driven underneath the mineralized zone, however, there is little documentation of the work performed at that time. In the early 1960's, Cominco did some trenching, but allowed the property to lapse. The property was staked by United Mineral Services in the summer of 1977 and was subsequently optioned to Pan Ocean Oil Ltd. of Calgary, Alberta in August, 1977.

At the request of M. D. McInnis of Pan Ocean Oil Ltd., J. R. Woodcock and T. Booth assisted by L. Walker and P. Stanneck spent nine (9) days examining the property. A geological survey, covering an area about 300 meters square in the vicinity of the main showings, was carried out at a scale of 1:500. Seventy-three (73) soil samples were taken and analyzed for Pb and Zn; and nineteen (19) rock chips were taken and analyzed for Cu, Pb, Zn, Ba and Ag. A total of 1,825 meters of grid were cut as a control for the soil sampling.

FIGURE A

PAN OCEAN OIL LTD. CALGARY ALBERTA			
PROPERTY LOCATION MAP — NIFTY CLAIMS — BRITISH COLUMBIA			
DATE	SCALE	NTS	DRAWING NO.
LB/AUG.,'77	1 : 250,000	93 D	A-0032

-3-

Tzeetsaytsul Creek

TWEEDSMUIR PROVINCIAL PARK

CARIBOO M.D. / SKEENA M.D.

52° 30'

126° 20'

KEEN 3 (15)

NIFTY 7 (18)

KEEN 2 (18)

NIFTY 2

NIFTY 1

KEEN 1 (18)

KITIMAT RANGE

NIFTY 3 (8) (16)

N. osgulch River (18)

NIFTY 6 (18)

NIFTY 4 (20)

NIFTY 5 (20)

AREA SURVEYED

126° 25'

52° 30'

Talcheazoone Lakes

52° 35'

126° 30'

126° 30'

NOTE:
Boundaries established by topo map.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

FIGURE B
NIFTY CLAIMS
SHOWING AREA SURVEYED

DATE	SCALE	NTS	DRAWING NO.
LB/ JUN., 1978	1 : 50,000	93 D/9	B-0184

Woodcock submitted a report to Pan Ocean Oil Ltd. summarizing the field work results. Woodcock's report forms the basis for this report and is often quoted.

GEOLOGY

The geology of the property was described by Woodcock as follows (Figure 1):-

"Rock Units

Four main rock units comprise the mapped volcanic strata. These include: (1) a base of interbedded acid and intermediate volcanics; (2) the acid volcanic pile; (3) porphyritic andesite which formed north-east of the acid volcanic pile and interfingered with the acid volcanics; and (4) the capping andesitic volcanics which rest on a disconformity above the underlying two rock units.

"The Volcanic Base: The base on which the acid volcanic pile was deposited is a sequence of interbedded acid and intermediate volcanic rocks. These can be mapped in the forested area downslope from the Main Gossan. They can be traced from the gulley which exposes the Central Gossan, southeasterly to where they are intersected by the crosscutting andesite dike and related volcanics or to where they are obscured by very coarse rubble coming from these andesites.

"The lowest horizon mapped is a dark green coloured volcanic rock of intermediate composition, probably andesite. Much of it could be flow rock as the evidence of fragments is minimal. This has only been mapped in the east part of the area of investigation. It could probably be traced further to the southeast with more mapping.

"Overlying the andesite horizon is a fine grained acid volcanic, generally grey or white and generally weathering to a white cherty appearance. This is similar to the lower strata within the acid volcanic pile; however, the rock type does tend to get a

darker colour with a greenish tint towards the northwest. It does contain lithic fragments up to two centimeters across. The matrix is possibly a tuffaceous rock.

"Overlying the acid volcanic horizon and probably interlayered with it is a relatively coarse fragmental (fragments in the larger size of the tuff classification) characterized by a green colour. In places fragments of white chert are included and in places the fragments are epidotized. However, most of the green colour is probably due to chlorite. The chlorite or grey colour becomes more intense in a northwesterly direction.

"A dark grey fine-grained volcanic rock occurs in several places within this lower sequence and also as a few thin layers within the acid volcanic pile. This is probably an andesite. In places it has been mapped as a separate unit or rock type.

"The Acid Volcanic Pile: On the map (Figure 1) the acid volcanics have been divided into five units. Some of these are legitimate divisions where the relationships between the units can be determined in the field; in other cases such subdivisions include areas of acid volcanic rock whose relationship to the adjacent units is still unknown.

1. "The white to light grey acid volcanic rock forming most of the Main Gossan and fingering southeastward into the andesitic volcanics has a very fine-grained matrix which is probably tuffaceous. It contains abundant disseminated pyrite and some obvious lithic fragments. In places, the abundance of pyrtie makes it a grey colour and in other places it has a greenish tint. However, throughout most of the units it is light grey to white and it generally weathers a white colour.
2. "At the top of the white tuffaceous unit is a pyrite lapillistone in which abundant pyrite (some is as fragments) is mixed with white volcanic fragments and lapilli. Much of this highly pyritiferous rock has been separated out as a unit on Figure 1, in other places, areas of local disseminated pyrite are indicated with orange hachures. Under the hand lens, much of the rock appears to be mainly pyrite; however, its low specific gravity and its lack of conductivity indicates a very porous rock.

3. "The bedded acid volcanics of Northwest Gossan, where examined, includes two types of strata. In one type, thinly bedded white-weathering fine-grained rock is interbedded with greenish grey beds generally less than ten centimeters thick. These thinly bedded zones are interbedded with more massive beds of fine-grained greyish green rock. The thinly bedded parts of this unit are very pyritic. This area of light coloured acid volcanics is separated from the acid volcanics of Central Gossan by a dike system.

"Smaller areas of thinly bedded acid volcanics on the lower slope of Central Gossan have also been included within this unit. However, this second area of thinly bedded volcanics is bounded by minor faults and its correlation with acid volcanics of other areas is uncertain.

4. "The upper parts of Central Gossan contain highly pyritic fragmental rock in direct contact with the overlying andesitic volcanic caprock. This changes downward into less pyritic acid volcanics. The change downward is somewhat irregular, partly due to minor faults which cut this gossan area.

"Lying along the south side of Central Gossan, is an area of acid volcanics which are very fine-grained, weather white, are generally grey to greenish grey on the fresh surface, and have relatively low pyrite content. These rocks have been mapped as a separate unit because their relationship to the other acid volcanic units is unknown, because they generally have a darker fresh surface and because they have a low pyrite content.

"A fault bounds this unit on the northwest. A fault may separate this questionable unit from the acid volcanics of Main Gossan; however, if such fault does exist, it cannot be mapped because of lack of exposure.

"The Andesite Dike and Flows: Andesite,which contains white feldspar phenocrysts,occurs as a dike cutting the acid volcanics below the trail. This dike expands upward and changes to flow rock which fills a basin or a relatively low lying area on the east side of the acid volcanic pile. The rock type on the northwest part of this large mass of volcanic rock is similar to that found lower down in the dike. However, toward the southeast, (away from the dike) the volcanic rock becomes epidotized.

"A small layer of pyritite acid volcanics appears to be completely interlayered with this andesitic volcanic horizon. However, whether this area of acid volcanics is actually an interlayer within the andesitic unit dicating continuing acid volcanism or whether its apparent interlayering is due to geometry is not known.

"The Caprock: The capping andesitic volcanics may be underlain by a disconformity. Faults which cut through the acid volcanics of Central Gossan do not appear to displace the andesitic volcanics of the caprock. These faults may be very minor in displacement; however, some of them have up to ten centimeters of gouge and some of them can be traced for tens of meters through the underlying acid volcanics.

"Thus is appears that there has been erosion prior to deposition of the caprock. Such erosion had to be subaqueous. The caprock volcanics rest directly on pyrite lapillistone (e.g. at Central Gossan) and the pyrite lapillistone under the disconformity is not oxidized except for the small amount of oxidation induced by the present aerial exposure.

"The lower 0.5 meters of the caprock overlying the pyrite lapillistone of Central Gossan is bleached. This probably indicates incorporation of some pyrite and formation of some acid during deposition.

"Miscellaneous Andesitic Dikes: Several dikes of an andesitic composition (field identification) cut the acid volcanics; some of these acted as feeders for overlying andesitic volcanics. Most striking of these is the porphyritic andesite dike which expands drastically upward before it merges the large area of similar rock type which has been interpreted as a basin of andesitic lavas (see previous section).

"Dark green andesitic dikes occur throughout the area, generally less than one meter thick. These are characterized by lack of pyrite and by presence of tension (or shrinkage) gashes. Central Dike is of similar rock type; however, it is much thicker than normal. It cuts through the northwest part of Main Gossan. Galena mineralization has been mapped on both sides of this dike.

"A dark coloured, possibly andesitic, porphyry dike forms the prominent cliffs of the Northwest Dike System. This dike rock merges with an enlarged area of similar volcanic rock at its lower end. Although this mass of rock at the lower end of the dike has been included within the same rock unit, more detailed mapping aided by thin section work might separate it from the dike rock as volcanic rock."

Gossan Areas

The gossan areas were differentiated and named for ease of reference by Woodcock (Figures 1 and 2). These names are Main Gossan, Central Gossan, Northwest Gossan and Trail Gossan. The gossan zones are associated with high pyrite content, but are not coincident with high lead, zinc or silver values. Gossan zones occur stratigraphically below the main showings (Main Gossan, Trail Gossan) and on about the same horizon as the showings (Central Gossan, Northwest Gossan), but never stratigraphically above the showings. The gossan zones are associated with pyritic acid volcanics.

Woodcock described the gossan zones as follows:-

"Main Gossan is coincident with the upper part of the white fine-grained acid volcanic pile. Much of this might be a pyrite-rich lapillistone. Pyrite fragments are mixed with lithic fragments or with barite fragments or with jasper fragments. In places the white rock is grey with abundance of fine-grained pyrite evenly distributed throughout.

"Central Gossan has extremely high pyrite content at the top. Obvious pyrite fragments are embedded in a pyrite-lithic matrix. High pyrite content changes sharply downward to lesser amounts of pyrite within the acid volcanic pile. In place, there may be sharp changes in pyrite content across small faults.

"The relatively thinly bedded volcanics of Northwest Gossan contain considerable pyrite. All rock types, including the more massive greyish green beds, weather a very yellow colour. The yellow limonite is especially noticeable in the inaccessible vertical cliffs that extend up to the andesite caprock."

Assay results from chip samples across the Northwest Gossan (W77-328), Main Gossan (W77-369&370), Central Gossan (W77-315) and Trail Gossan (W77-367 & 368) yielded very low results in Pb, Zn and Ag (see Figure 2).

Mineralization

The best assay results were obtained in chip samples along trenches A and B which tested the massive barite zone and the massive sulphide zone respectively.

Chip samples W77-357 to 359 in trench "A" assayed 0.72% Pb, 2.37% Zn, and 5.69 oz/ton Ag, over an apparent width of 11.2 meters (true width of about 7 meters). This zone is open for about 3.5 meters to the north and has a potential width of more than 10 meters.

A grab sample from the north end of the trench, about 20 meters east of zone A (at Station 18), yielded 0.07% Pb, 0.21% Zn and 3.66 oz/ton Ag.

Zone "B" was sampled by chip samples W77-361 to 365 and yielded 2.32% Pb, 6.40% Zn and 2.50 oz/ton Ag over an apparent width of 9 meters (true width of about 7 meters). This zone is cut off on the northwest by the Central Andesite Dike, however, it continues on the north side of the dike for about 5 meters, at which point it is covered by talus.

Woodcock made the following observations about the mineralized zones:-

"Barite mineralization overlies or is associated with the galena on both sides of Central Dike and minor amounts are also found in the trench near Station 14. Abundant pyrite, some of which appears to be a barite-pyrite fragmental, occurs in the "barite trench", between Stations 16 and 17. The most intense barite mineralization occurs in the trench at Station 17 and in a pile of rock removed from the trench at Station 18.

"Jasper occurs in minor amounts above the barite mineralization south of Central Dike and as a mixture with pyrite in exposures at the head of a trench southwest of Station 14."

In summary, the various mineralization types (massive sulphides, massive barite and disseminated pyrite) occur in acid volcanic rocks which are stratrigraphically between two andesite units. The mineralized rocks are exposed along the strike for about 200 meters (Figure 1), however, the galena-sphalerite-silver rich zone is only exposed for a strike length of about 80 meters, and lies stratigraphically above the disseminated pyrite zone.

Structure

The geological structure was described by Woodcock as follows:-

"The bedding attitudes taken in the acid volcanic pile of the Main Gossan, the mineralized zone, the underlying volcanic formations and the overlying caprock strike between 90° and 110° azimuth and dip between 40° and 50° northeast.

"Attitudes taken on bedding in the Central Gossan zone generally strike east to northeast and dip 40° to 50° northwest. This indicates a change in a northwesterly direction; possible across a fault.

"Well bedded acid volcanic rock is exposed north of the Northwest Dike System. Bedding attitudes in this area are consistent with dips between 40° and 50° northwest.

"Several attitudes were taken away from the area of mineralization. One measurement on bedded pyrite zones along the creek west of Noosgulch River indicated a strike of 0° azimuth and a dip of 40° west. Another attitude taken higher on the mountain to the south of this same creek and west of Noosgulch River indicated a strike of 90° azimuth and a dip of 75° south. An attitude taken on some highly sheared and epidotized andesitic volcanics in the creek about one half mile below camp indicated a strike of 0° azimuth and a dip of 5° south.

"Faults have been mapped in several places. There are several which cut and displace the Central Gossan area. Some of these place highly pyritic acid volcanics adjacent to slightly pyritic acid volcanics. The mapped fault lying along the east side of Central Gossan dips 55° southwest. This fault contains about ten centimeters of comminuted rock or gouge. Another small fault separates the so-called andesite porphyry from the acid volcanics. These faults, if they have had any displacement, must have produced an irregular surface and this irregular surface must

have been removed by subaqueous erosion prior to deposition of the overlying andesitic caprock. The contact or the so-called "disconformity" does not appear to be offset by the little mapped faults.

"A more important fault separates the Central Gossan from Northwest Gossan. This fault appears to juxtaposition andesitic caprock on the east with acid volcanics on the west. The porphyry dike has has been injected along this fault system and now separates the two gossan areas and forms a conspicuous resistant ridge. The small sliver of pyritic acid volcanics which lies between the dike and the caprock andesites and appears to project upward into the caprock may be a sliver of the northwest block of bedded acidic volcanics. This interpretation is uncertain as the definitive exposures are on inaccessible cliffs.

"The area between Main Gossan and Central Gossan is highly covered by vegetation and overburden. Possibly a fault occurs in this area to separate the small exposures of highly pyritic rock of the Main Gossan zone from the relatively low pyrite light grey fine-grained acid volcanics to the northwest. The map also shows a block of what appears to be andesitic caprock completely surrounded by faults. This vertical thin layer of andesitic rock may be a gravity slide from the caprock. However, other interpretations are possible (e.g. a dike).

"Most of the apparent lateral discontinuities between acid volcanics of the Main Gossan and the adjacent andesitic volcanics to the east probably result from deposition in gulleys and basins."

GEOCHEMISTRY

Soil samples were taken on four (4) grid lines which were spaced 75 meters apart (Figures 1-7). The grid lines were slashed, blazed and ribboned; stations were established at 25 meter horizontal distances on the lines. Slope changes were recorded and the approximate elevations appear on Figures 3 and 4.

The soil sample grid was located east along strike from the main showings to test the possible extension of the favourable horizon in that direction. The area over the main showings and directly west of the main showings is well exposed, and where not exposed is mainly talus covered and, therefore, not particularly well suited for soil sampling.

A total of seventy-three (73) soil samples were collected at 25 meter intervals on the grid. Locally, good podsol was developed and in this case the rusty B horizon was sampled. More commonly, no soil horizons were developed due to downslope creep resulting in mixing of soil and talus fines; in this case the resulting soil is greyish to dark brown in colour and was sampled at a depth of about 20 to 30 centimeters.

The soils were submitted to Vangeochem Lab. Ltd. in Vancouver for analyses. The results of the analyses are shown on Figures 6 and 7. The method of analysis is described in Appendix I.

Samples L408, L416, L415 and L414 which occur on line 00E, downslope from trench "A", were highly anomalous in Pb and anomalous in Zn. In addition, Pb values above 40 ppm (generally considered anomalous) occurred at numerous sample sites on the grid, whereas Zn had very low values elsewhere on the grid.

The high lead soil values and relatively subdued zinc soil values could be due to the much higher solubility of zinc resulting in zinc being washed out of the soils by surface runoff. More extensive soil sampling is needed before any definite conclusions can be made in this regard.

The soil sampling results also indicated that lead and zinc mineralization does not extend as far as line 75 E. The samples should, however, be run for Ag before an extension of the "ore" zone in this direction is discounted.

Rock Chip Geochemistry

A comparison of rock chip geochemistry to assay results was carried out. This comparison involved analysis of the rock chip samples shown on Figure 2 by both geochemical and assay methods, and was intended to test the reliability of geochemistry for various elements.

Some of the geochemical and assay analyses were done by Vangeochem Lab Ltd. of Vancouver and some by Bondar-Clegg and Co. Ltd. of Vancouver, and, for comparison, some were duplicated by both labs. The results of this comparison are shown on Table I and are summarized as follows:-

Ag — Good correlation exists between the two methods and the two labs for silver.

Zn — Geochemical and assay results, even at the higher ranges show good correlation. The few samples analyzed by both labs show fair correlation.

Pb — Poor correlation exists between lead geochemical and assay values. In addition, poor correlation exists between the two laboratories for geochemical results.

Ba — The geochemical values for barium show no correlation to the assay results and are considered to be worthless.

In summary, the comparison tests on rock chip samples at Nifty indicated that zinc and silver geochemical analyses were reliable, lead geochemical analyses were unreliable although they were useful, and the barium geochemical analyses were totally unreliable.

TABLE I

ANALYSES COMPARISON

NIFTY PROPERTY

		LEAD				BARIUM			ZINC				SILVER				GOLD
		(ppm)		(%)		(ppm)		(%)	(ppm)		(%)		(ppm)		(oz./ton)		(oz/ton)
Sample No.	Comments	Van.	B.C.	Van.	B.C.	Van.	B.C.	B.C.	Van.	B.C.	Van.	B.C.	Van.	B.C.	Van.	B.C.	B.C.
W 77-313	Jasper (grab)	520	520		0.07	50	200	<0.01	340					31.0		0.77	
	Central Gossan																
W 77-315	2.5 m	20	52			115	1,100	0.027	105					0.4			
W 77-328	9 m	42	32			205	700	0.02	66					0.6			
W 77-356	Crab-Barite Zone	8	54		0.07	1,100	1,800	50.61	2,100					>100		3.66	
	Barite Trenches																
W 77-357	3.2 m	35	520	0.29	0.31	1,000	1,900	39.72	9,400			1.05		>100	8.70	8.80	0.004
W 77-358	3.0 m	60	460	0.24	0.24	3,350	1,750	31.49	3,500			0.41		>100	7.83	8.24	0.003
W 77-359	5 m	600	12,000	1.27		1,800	1,500	7.63	37,500			4.38		85	2.47		
W 77-360	4.5 m	450	1,850	0.28		1,750	3,500	6.33	5,500			0.71		18	0.35		
	Massive Sulphide Zone																
W 77-361	3 m	2,130	8,600	2.40		245	1,850	0.29	53,000			6.33		78	2.18		
W 77-362	0.4 m	>10,000		7.32					>10,000		15.20		180		5.80		0.004
W 77-363	1.7 m	1,220		4.26					>10,000		13.20		110		3.63		
W 77-364	0.8 m	580		1.86					>10,000		6.30		70		2.03		
W 77-365	3.5 m	260		0.58		3,350			12,200			1.45			1.67		
W 77-366	0.9 m	2,430		13.69					>10,000		8.60		133		4.35		0.002
	Trail Gossan																
W 77-367	6 m	1,430			0.18	165			1,830			0.21			0.43		
W 77-368	12 m	500			0.09	95			2,050			0.24			0.23		
	Main Gossan																
W 77-369	6 m	72			0.02	575			550						0.11		
W 77-370	3 m	120			0.03	125			235						0.13		
	Lower Gossan																
W 77-383	7 m	45			0.02	500			650			0.08			0.04		

Van. - Vangeochem Lab. Ltd.
B.C. - Bondar-Clegg & Co. Ltd.
___ - Preferred Analyses Underlined
$BaSO_4$ = 58.8% Ba

ppm - Geochemical analyses, expressed in parts per million.
% - Assays, expressed in percent.

STATEMENT OF COSTS

WAGES:

J. R. Woodcock, Geologist	
Aug. 10 to Aug. 19, 1977: Office Preparations 9 3/4 hours @ $37.50/hour	$ 366.00
Aug. 20 to Aug. 31, 1977: Field Work 12 days @ $225.00/day	2,700.00
T. Booth, Geologist	
Aug. 20 to Sept. 1, 1977	
12 days @ $110.00/day	1,320.00
5 hours @ $18.00/hour	90.00
L. Walker, Assistant	
Aug. 19 to Aug. 31, 1977	
12 1/2 days @ $70.00/day	875.00
P. Stanneck, Assistant	
Aug. 18 to Sept. 2, 1977	
15 1/2 days @ $70.00/day	1,085.00
SUB TOTAL	$ 6,436.00

FOOD AND ACCOMMODATIONS:

Aug. 19, 1977:	Meals for P. Stanneck/Walker	$ 3.84
	Meals for P. Stanneck/Walker	4.95
	Hotel Accommodations for above	25.20
Aug. 20, 1977:	Meals for P. Stanneck/Walker	7.60
	Meals for P. Stanneck/Walker	3.50
	Meals for P. Stanneck/Walker	13.20
	Accommodation for Walker, Stanneck, Woodcock, Booth in Bella Coola and meals for Woodcock and Booth	125.45
Aug. 21-29/77:	Camp Accommodation for 4 men 9 days @ $16.32/manday	587.00
Aug. 30, 1977:	Room & Board - 4 men @ Hagensborg	60.00
	Lunches	7.90
Aug. 31, 1977:	Hotel - Stanneck	17.85
	Meals - Stanneck	4.95
		4.30
Sept. 1, 1977:	Hotel - Stanneck	14.70
	Meals - Stanneck	3.55
		3.84

FOOD AND ACCOMMODATIONS (cont)

Sept. 2, 1977:	Meals	$ 3.40
		1.50
	SUB TOTAL	$ 893.25

TRAVEL COSTS

Aug. 19, 1977:	P.W.A. - Kelowna - Williams Lake for L. Walker	$ 41.40
Aug. 19, 1977:	Vehicle Gas Vancouver-Williams Lake	47.01
Aug. 20, 1977:	Taxis in Vancouver	26.00
	Woodcock & Booth - Airfare Vancouver to Bella Coola	160.00
	Excess Baggage	16.00
Aug. 21&30/77:	Transwest Helicopter - Flight Rpts. #00809 & 00815 - Mobilization and Demobilization of camp & personnel	$ 1,160.00
Aug. 31, 1977:	Woodcock, Booth, Walker - Airfare Bella Coola to Vancouver	240.00
	Taxi in Vancouver	15.00
	Walker - Airfare Vancouver to Kelowna	35.75
August, 1977:	Vehicle Rental (17 days)	369.60
August & Sept., 1977:	Vehicle Gas - Williams Lake - Bella Coola, in Bella Coola and return to Vancouver	113.70
Sept. 1, 1977:	Tire Repair	7.00
	SUB TOTAL	$ 2,231.46

GEOCHEMICAL ANALYSES AND ASSAYS

Sept. 6, 1977:	73 Soil Samples analyzed for Pb and Zn @ $2.10 each	$ 153.30
Sept. 19/77:	15 Geochem rock chips analyzed for Ba, Cu, Pb, Zn, Mn, @ $5.00 each	75.00
	4 Geochem rock chips analyzed for Cu, Pb, Zn, Ag @ $4.00 each	16.00
	4 Rock samples assayed for Cu, Pb, Ag and Zn @ $20.00 each	80.00
	6 Rock samples assayed for Pb, Ag, and Zn @ $15.00 each	90.00

GEOCHEMICAL ANALYSES AND ASSAYS (cont)

Sept. 23, 29, 1977 :	4 Rock samples assayed for Ag, Pb, and Zn @ $16.00 each	$ 64.00
	1 Rock sample assayed for Zn @ $5.50 each	5.50
	9 Rock samples analyzed for Pb, Zn, and Ba @ $5.50 each	46.80
Oct. 5, 1977:	4 Rock samples assayed for Ag, Pb, and Zn @ $16.00 each	64.00
	1 Rock sample assayed for Pb and Ag @ $10.50 each	10.50
Nov. 7, 1977:	4 Rock samples assayed for Au @ $5.00 each	20.00
	SUB TOTAL	$ 625.10

MISCELLANEOUS COSTS:

Aug. 19, 1977:	Cedar Lathes	$ 5.19
Sept. 6, 1977:	Nylon Chain	31.99
Sept. 26, 1977:	Batteries for Walkie Talkie	4.69
	Phone Charges	53.91
	SUB TOTAL	$ 95.78

Cost of Report Preparation	$ 1,356.98
TOTAL COSTS	$11,638.57

APPORTIONMENT OF COSTS

The surveyed area lies approximately 50% on Nifty 2 and 50% on Nifty 5, therefore, costs are apportioned as follows:-

Nifty 2:	50% of $11,638.57	$5,819.29
Nifty 5:	50% of $11,638.57	$5,819.28

AUTHOR'S QUALIFICATIONS

I, R. J. Bailes of 355 - 4th Avenue S. W. Calgary, Alberta,

-Am a graduate of McGill University (1967) with a B.Sc. honours degree in Geology.

-Am a graduate of the University of Manitoba (1976) with a M.Sc. in Earth Sciences.

-Am a Professional Geologist in the Province of Alberta.

-Have worked in the mineral exploration field with various companies since 1967 as a Geologist, Senior Geologist and Advanced Geologist.

-Am presently employed by Pan Ocean Oil Ltd. as an Advanced Geologist.

R. J. Bailes
Advanced Geologist

APPENDIX I

GEOCHEMICAL SAMPLE PREPARATION AND ANALYSIS METHOD

1. Sample Preparation:

   (a) Geochemical rock, silt and soil samples were shipped to the labs by Greyhound Bus Express. The rock samples were either stored in 8"x13" plastic bags or in 4"x9" cotton mailing bags. The silt and soil samples were stored in the wet strength 3 1/2" x 6 1/2" Kraft paper bags.

   (b) The wet samples were dried in a ventilated oven over-night.

   (c) The dried soil or silt samples were sifted by a shaking machine with an 80 mesh stainless steel sieve. The plus 80 mesh fraction materials were rejected and the minus 80 mesh fraction materials were transferred into a coin envelope for analyses later.

   (d) The dried rock samples were crushed and pulverized by using a jaw crusher and a disc mill to minus 100 mesh. The pulverized samples were stored in a 4" x 6" paper bags for later analyses.

2. Method of Digestion:

   (a) 0.50 gram of the minus 80 mesh samples were used. Samples were weighed out by using a top-loading balance.

   (b) Samples were heated in a sand bath with nitric and perchloic acids (15% to 85% by volume).

   (c) The digested samples were diluted with demineralized water to a fixed volume and shaken.

3. Method of Analysis:

Cu, Pb, Zn and Ag analyses were determined by using a Techtron Atomic Absorption Spectrophotometer Model AA4 or AA5 with their respective hollow cathode lamps. The digested samples were aspirated directly into an air and acetylene flame. The results in parts per million, were calculated by comparing a set of their respective standards to calibrate the atomic absorption spec. units.

N

Northwest Gossan

Central Gossan

Northwest Dike System

Central Dike

Main Gossan

Andesite Dike

Trail Gossan

Boulder Talus from Andesite Bluffs

Large Blocks of Andesite Caprock

NIFTY 5

NIFTY 2

L 10000 E

L 10075 E

L 10150 E

125N

100N

75N

50N

25N

0

25S

50S

75S

100S

125S

150S

175S

LEGEND

15	Dark green porphyry dike
14	Caprock – andesite volcanics
13	Andesite dikes
12	Barite
11	Sulfide – aphanitic mineralization
10	Jasper
9	Highly pyritic acid volcanics, includes pyrite – lithic lapillistone
8	Dike and lava of prophyritic andesite
7	Main pile of aphanitic white to grey pyritic volcanics
6	Northwest block aphanitic white to grey pyritic volcanics
5	Aphanitic light colored volcanics; uncertain correction
4	Dark grey lava interbedded with acid volcanics
3	Light colored fragmental; changing to green color at northwest end
2	Lower bed light colored aphanitic volcanics
1	Green andesite – dacite volcanics

SYMBOLS

- Bedding with dip
- Geology contact (defined, approximate, assumed)
- Fault
- Surveyed station
- Float
- Contour interval 5 meters
- Adit
- Bench
- Trench

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6735

PAN OCEAN OIL LTD.

NIFTY PROPERTY

GEOLOGY

SCALE 1:500

0 5 10 20 30 METRES

0 25 50 100 FEET

J.R. WOODCOCK CONSULTANTS LIMITED

Date Sept. 3, 1977 Figure No. 1

TRENCH "B"
ENLARGED 5×

TRENCH "A"
ENLARGED 5×

W77-315 (2.5m)
52 ppm Pb
105 ppm Zn
0.4 ppm Ag
0.027 % Mo

W77-328 (9m)
32 ppm Pb
66 ppm Zn
0.6 ppm Ag
0.02% Mo

W77-365 (3.5m)
0.58 % Pb
1.45 % Zn
1.67 oz/t Ag

W77-364 (0.8m)
1.86 % Pb
6.30 % Zn
2.03 oz/t Ag

W77-363 (1.7m)
4.26 % Pb
13.20 % Zn
3.63 oz/t Ag

W77-362 (0.4m)
7.32 % Pb
15.20 % Zn
5.8 oz/t Ag
0.004 oz/t Au

W77-361 (3m)
2.4 % Pb
6.33 % Zn
2.18 oz/t Ag
0.29 % Mo

W77-366 (0.9m)
13.60 % Pb
8.6 % Zn
4.35 oz/t Ag
0.002 oz/t Au

W77-313 (grab)
0.07 % Pb
0.03 % Zn
31 ppm Ag
<0.01 % Mo

W77-369 (6m)
.02 % Pb
.04 % Zn
11 oz/t Ag

W77-370 (3m)
0.03 % Pb
0.02 % Zn
0.13 oz/t Ag

W77-357 (3.2m)
0.31 % Pb
1.05 % Zn
8.7 oz/t Ag
0.004 oz/t Au
39.72 % Mo

W77-358 (3m)
0.24 % Pb
0.41 % Zn
7.83 oz/t Ag
0.003 oz/t Au
31.49 % Mo

W77-359 (5m)
1.27 % Pb
4.38 % Zn
2.47 oz/t Ag
7.63 % Mo

W77-360 (4.5m)
0.28 % Pb
0.71 % Zn
0.35 oz/t Ag
6.59 % Mo

W77-356 (grab)
0.07 % Pb
0.21 % Zn
3.66 oz/t Ag
50.61 % Mo

W77-368 (12m)
0.09 % Pb
0.24 % Zn
0.23 oz/t Ag

W77-367 (6m)
0.18 % Pb
0.21 % Zn
0.43 oz/t Ag

W77-383 (7m)
0.02 % Pb
0.08 % Zn
0.04 oz/t Ag

Northwest Gossan
Central Gossan
Northwest Dike System
Central Dike
Andesite Dike
Main Gossan
Trail Gossan
Large Blocks of Andesite Caprock
Boulder Talus from Andesite Bluffs
Adit
NIFTY 5
NIFTY 2

L 1000E
L 1075E
L 1150E
125N
100N
75N
50N
25N
0
25S
50S
75S
100S
125S
150S
175S

LEGEND

15	Dark green dacitic tuff
14	Massive andesite volcanics
13	Andesite dikes
12	Rhyolite
11	Quartz-sericite-pyrite alteration
10	Rhyolite
9	Highly pyritic acid volcanics; includes pyrite-lithic fragmental tuff
8	Massive and flow banded porphyritic andesite
7	Massive gray aphanitic white to grey pyritic volcanics
6	Northwest block aphanitic white to grey pyritic volcanics
5	Aphanitic light colored volcanics; uncertain correlation
4	Dark grey lava interbedded with acid volcanics
3	Light colored fragmental; changing to green color at northwest end
2	Lower bed light colored aphanitic volcanics
1	Green andesite – dacite volcanics

SYMBOLS

- Bedding with dip
- Geology contact (defined, approximate, assumed)
- Fault
- Surveyed station
- X X Float
- 1250 Contour interval = 5 meters
- Adit
- Bench
- Trench
- X 342 Rock sample location and number (note: all sample numbers should have the prefix W)
- 365(3.5m) Chip sample location (length of sample)

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
6735
NO.

PAN OCEAN OIL LTD.

NIFTY PROPERTY

ROCK SAMPLE NUMBERS
AND ASSAY RESULTS

SCALE 1:500

0 5 10 20 30 METRES
0 25 50 100 FEET

J.R. WOODCOCK CONSULTANTS LIMITED

Date Sept. 3, 1977 Figure No. 2

N

Northwest Gossan

Central Gossan

Northwest Dike System

Central Dike

Main Gossan

Ardesite Dike

Large Blocks of Andesite Caprock

Boulder Talus from Andesite Bluffs

L 1000E

L 1075E

L 1150E

125N

100N

75N

50N

25N

0

25S

50S

75S

100S

125S

150S

175S

1310

1305

1300

1295

1290

1285

1280

1275

1270

1265

1260

1255

1250

1245

1240

1235

1230

1225

1220

1215

1210

1205

1200

1195

1190

1185

1180

1175

1170

1165

1160

1155

1150

1145

LEGEND

- Dark green porphyritic lava
- Massive andesite outcrop
- Andesite dikes
- Quartz
- Clay - sphalerite mineralization
- Gossan
- Highly pyritic acid volcanics; includes pyrite - cherty tuff
- Lake and lava of prophyritic andesite
- Main pile of aphanitic white to grey pyritic volcanics
- Northwest block aphanitic white to grey pyritic volcanics
- Aphanitic light colored volcanics; uncertain correction
- Dark grey lava interbedded with acid volcanics
- Light colored fragmental; changing to green color at northeast end
- Lower bed light colored aphanitic volcanics
- Green andesite — dacite volcanics

SYMBOLS

- Bedding with dip
- Geology contact (defined, approximate, assumed)
- Fault
- Surveyed station (elevation in meters)
- X X Float
- Contour interval 5 meters
- Adit
- Bench
- Trench

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
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NO.

PAN OCEAN OIL LTD.

NIFTY PROPERTY

ELEVATIONS OF SURVEY STATIONS

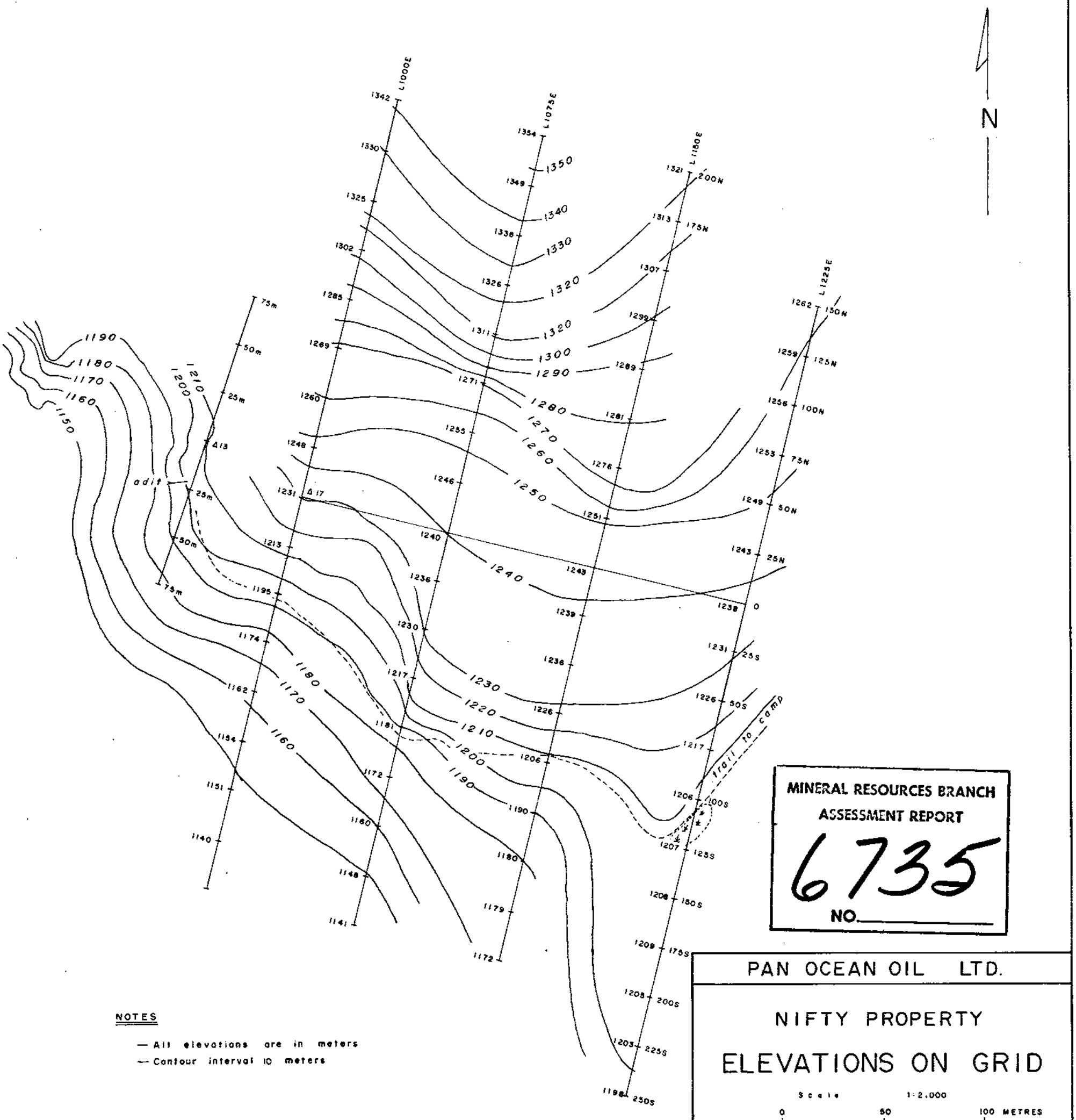
SCALE 1:500

0 5 10 20 30 METRES

0 25 50 100 FEET

J.R. WOODCOCK CONSULTANTS LIMITED

Date Sept. 3, 1977 Figure No. 3



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
6735
NO.

NOTES

— All elevations are in meters
— Contour interval 10 meters

PAN OCEAN OIL LTD.

NIFTY PROPERTY

ELEVATIONS ON GRID

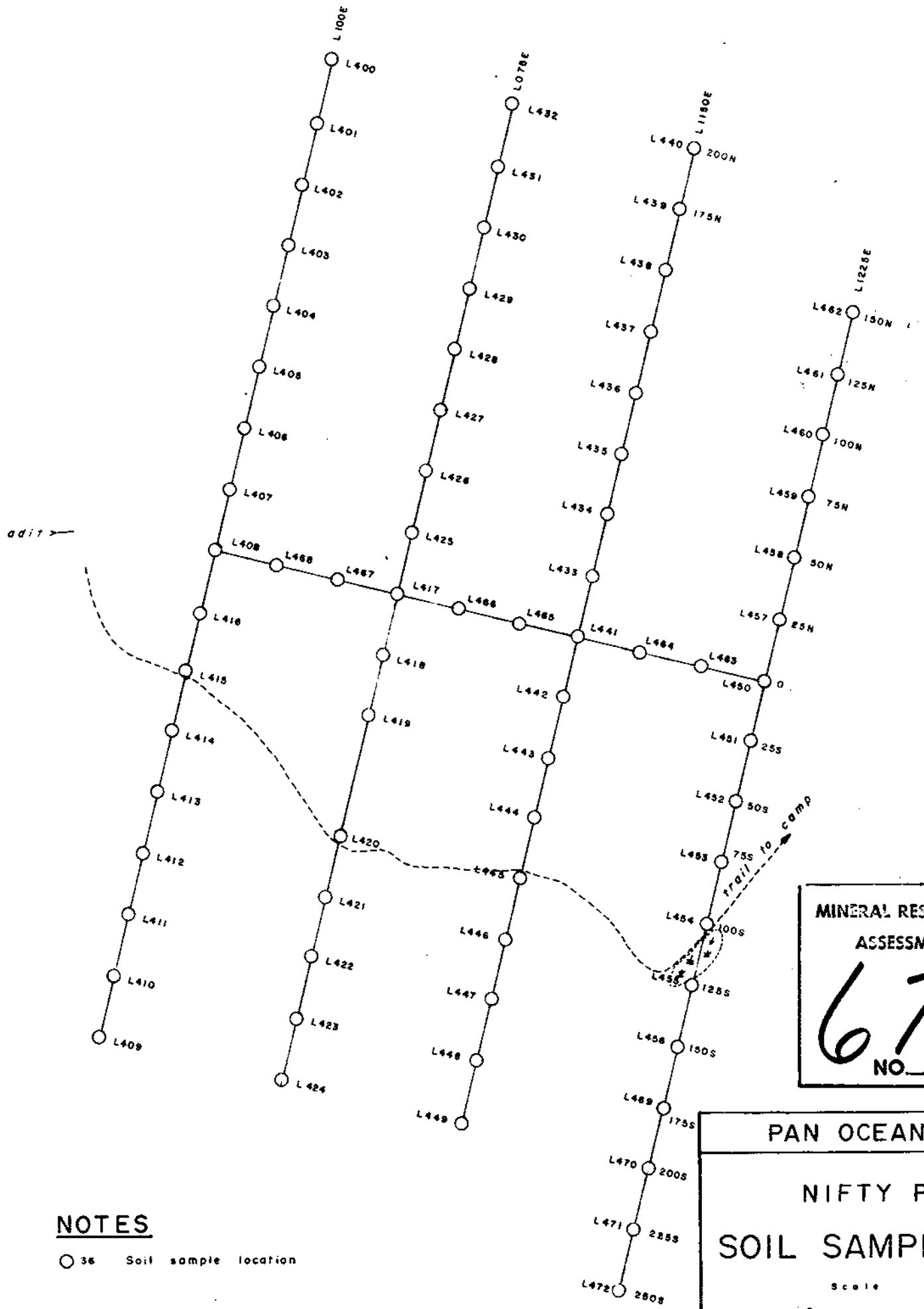
Scale 1:2,000

0 50 100 METRES

0 100 200 300 FEET

J.R. WOODCOCK CONSULTANTS LIMITED

Date Sept. 3, 1977 Figure No. 4



NOTES

○ 36 Soil sample location

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6735

PAN OCEAN OIL LTD.

NIFTY PROPERTY

SOIL SAMPLE NUMBERS

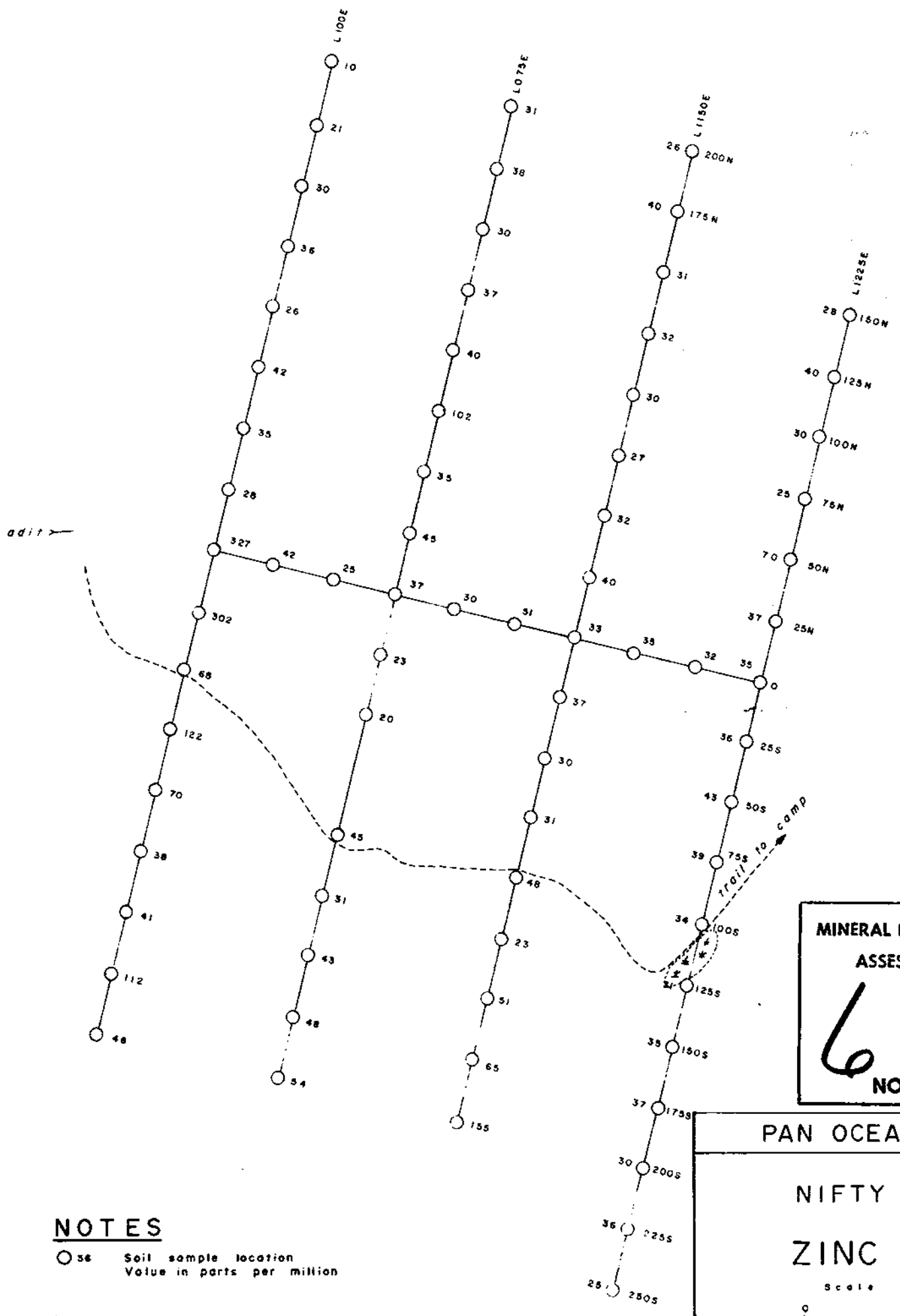
Scale 1:2,000

0 50 100 METRES

0 100 200 300 FEET

J.R. WOODCOCK CONSULTANTS LIMITED

Date Sept. 3, 1977 Figure No. 5



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6735

NOTES

○ 56 Soil sample location
Value in parts per million

PAN OCEAN OIL LTD.

NIFTY PROPERTY

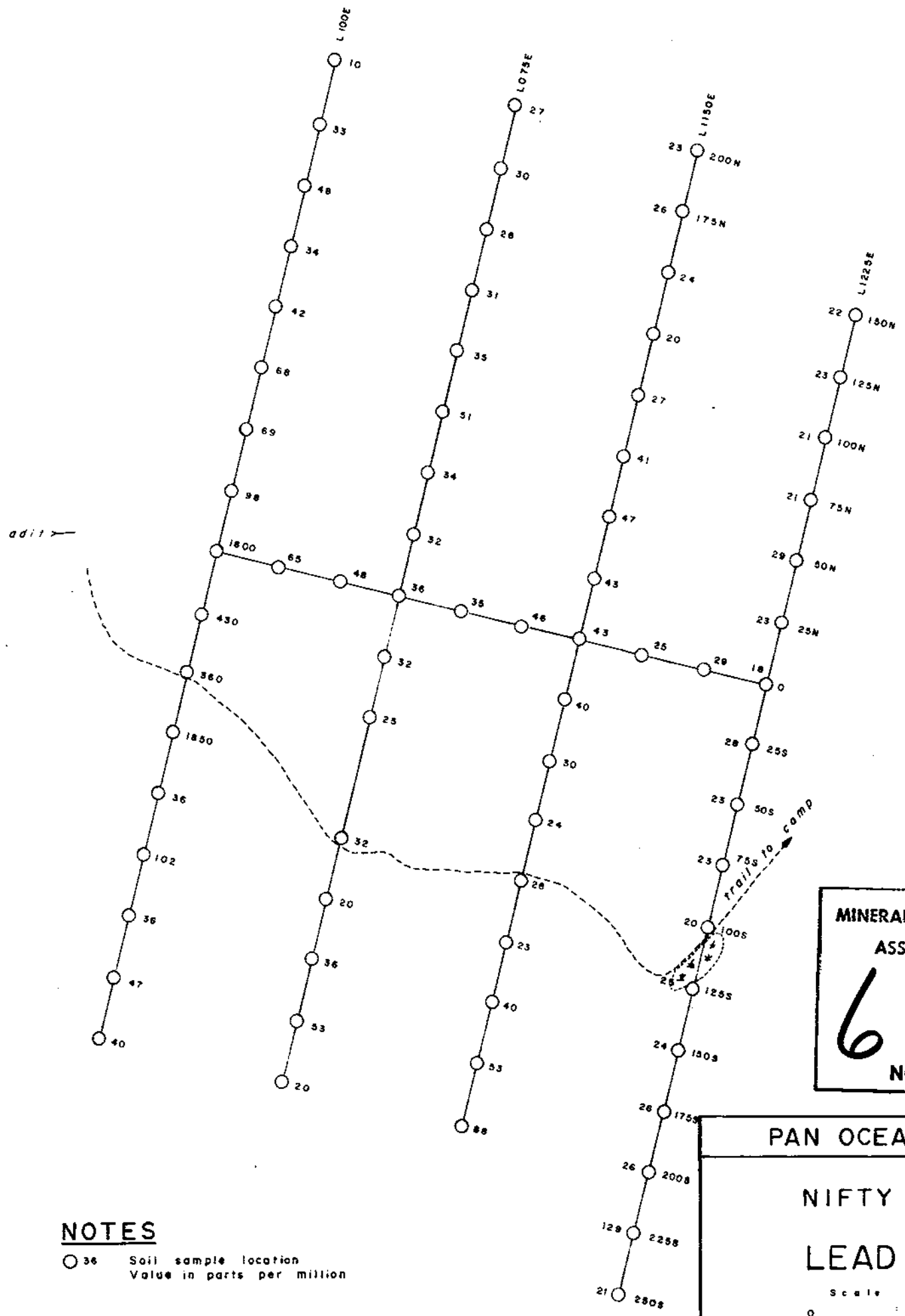
ZINC IN SOIL

Scale 1:2,000

0 50 100 METRES
0 100 200 300 FEET

J.R. MacCOCK CONSULTANTS LIMITED

Date Sept. 3, 1977 Figure No. 6



N

adit

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
6735
NO.

NOTES

○ 36 Soil sample location
Value in parts per million

PAN OCEAN OIL LTD.

NIFTY PROPERTY

LEAD IN SOIL

Scale 1:2,000

0 50 100 METRES

0 100 200 300 FEET

J.R. WOODCOCK CONSULTANTS LIMITED

Date Sept. 3, 1977 Figure No. 7