A Geophysical Report

The HILL, KEV & TI Claim Groups

(490, 1200, N.E.)

Claims Surveyed: HILL 1,2,4,5-13,

15 - 20

Survey Dates: August 14th - 29th,

Sept. 18th - October 9th, 1972

Peter E. Walcott, P.Eng.

A REPORT

The Hill, Kev, & TI Claim Gr. 49°, 120°, N.E.

Claims surveyed:

NETIC HILL 1,2,4,5-13, 15-20

ON

GROUND MAGNETIC, ELECTROMAGNETIC

AND

INDUCED POLARIZATION SURVEYS

Paradise Lake, Aspen Grove Area, British Columbia

Department of Mines and Petroleum Resources ASSESSMENT REPORT

NITRACELL CANADA LTD.

Vancouver, British Columbia

BY

PETER E. WALCOTT & ASSOCIATES LIMITED

Vancouver, British Columbia

DECEMBER 1972

TABLE OF CONTENTS

		Page
	INTRODUCTION	1
	PREVIOUS WORK	2
	PURPOSE	3
	PROPERTY, LOCATION & ACCESS	4
	GEOLOGY	5
	SURVEY SPECIFICATIONS	6
	DISCUSSION OF RESULTS	8
	SUMMARY, CONCLUSIONS & RECOMMENDATIONS	1.1
	APPENDIX	
	COST OF SURVEY	i
	PERSONNEL EMPLOYED ON SURVEY	ii ·
	CERTIFICATION	iii
#	LOCATION MAP	
	PROFILES OF I.P. RESULTS	
	ACCOMPANYING MAPS - Scale 1" = 200 ft.	MAP POCKET
(‡	MAGNETOMETER SURVEY	W-158-1
ŧ3	E.M. SURVEYS	W-158-2
‡ 4	-CLAIMS AND GRID	W-158-3
1		

INTRODUCTION.

Between August 14th and 29th, 1972, Peter E. Walcott & Associates Limited carried out a programme, consisting of line cutting, magnetometer surveying, and electromagnetic and induced polarization test surveying, over part of a property, located in the Aspen Grove area of British Columbia, held by Nitracell Canada Limited.

The surveys were carried out over a handcut line grid, the lines of which were turned off at right angles from a N 45° W baseline, and which were chained and picketed at 100 foot intervals.

Readings of relative vertical intensity of the earth's field were taken every 50 feet along the picket lines using a McPhar M 700 fluxgate magnetometer.

Measurements with a Crone C.E.M. unit operating at a frequency of 5010 Hz. and using the vertical shootback technique were made over the main showings on Line O and 2 E on the E.M. test survey. Readings were also taken using a Ronka E.M. 16 unit on Lines O, 2 E, 4 E and 6 E respectively.

Measurements (first to fourth separation) of apparent resistivity and frequency effect (the I.P. response parameter) were made using the "dipole - dipole" method of surveying with a 100 foot dipole and frequencies of 0.3 and 5 c.p.s. over the showings on Line 6 E.

As a result of the test surveys it was decided to extend the grid to the east, and to cover the whole grid using the induced polarization survey technique. Readings were taken with a 100 foot dipole as far as Line 20 E and with a 200 foot dipole from there eastwards.

Magnetic readings were also taken at 100 foot intervals over the extension of the line grid.

The I.P. data are presented in contour form on individual line profiles contained in this report as is the E.M. data (profile form), while the magnetic data is presented in contour form on a plan map of the line grid, Map W-158-1, that accompanies this report.

PREVIOUS WORK

Previous work on the property consists of

- 1. Adits driven into mineralized area about turn of the century.
- Exploration of the property area by Consolidated Skeena Mines in 1961.
- Linecutting and geochemical surveying by Nitracell Canada Ltd. in 1972.

The results of this work are documented in a report by M. Kierans P.Eng. dated December 1972.

PURPOSE

The purpose of the geophysical surveys was to try to

- Outline the contact between the volcanics and the sediments using the magnetic method.
- Confirm the presence of massive sulphide mineralization on the property by electromagnetic techniques.
- 3. Determine the possible presence of disseminated sulphide mineralization as suggested by the favourable geology by induced polarization methods.

PROPERTY, LOCATION AND ACCESS

The property is situated in the Nicola Mining Division of British Columbia, and consists of the following claims:

HILL 1 - 42, 47 - 60, 65 - 126, 201 - 229, 250 - 264

KEV 1 - 78, 81 - 84, 89 - 92

TI 1 - 10

The claims are located some 7 miles west of Paradise Lake at the headwaters of Pothole Creek, some 20 miles southeast of the town of Merritt, British Columbia.

Access is obtained from Merritt by two wheel drive vehicle along Highway #5 towards Princeton, and thence by dirt road from a turn off 4 miles south of Aspen Grove (the property is approximately 10 miles east of the highway).

GEOLOGY

The reader is referred to a report by M.D. Kierans P.Eng.

SURVEY SPECIFICATIONS

The induced polarization (I.P.) survey was carried out using a system manufactured by McPhar Geophysics Limited of Don Mills, Ontario. Measurements with this sytem are made in the frequency domain.

The system consists basically of three units, a receiver, a transmitter and a motor generator. - The transmitter, which obtains its power from the 2.5 kw 400 cycle generator driven by a gasoline engine, injects current into the ground at two electrodes C_1 and C_2 at two preselected frequencies, while the receiver, a very stable and sensitive potentiometer tuned to the frequency selected, makes measurements of observed voltages across the potential electrodes P_1 and P_2 .

The data recorded in the field consists of careful measurements of the current (I) flowing through electrodes C_1 and C_2 , the voltage (V) appearing between the potential electrodes P_1 and P_2 on the low frequency, and the "percentage apparent frequency effect" appearing between P_1 and P_2 (the receiver is designed to measure directly

the %age F.E. =
$$\frac{(P_a \text{ low} - P_a \text{ high}) \times 100}{P_a \text{ high}}$$

The apparent resistivity (P_a) in ohm-feet is proportional to the ratio of the measured voltage and current, the proportionality factor depending on the geometry of the array used. In practise P_a is plotted.

A third parameter termed the "metal factor" is also calculated by dividing the apparent frequency effect by P_a and multiplying by 1000.

The survey was carried out using the "dipole - dipole" electrode array. This electrode configuration and the methods of presenting the results are illustrated in the appendix. Depth penetration with this array is increased or decreased by increasing or decreasing "a" and/or n.

In practise the equipment is set up at a particular station of the line to be surveyed; three transmitting dipoles are laid out to the rear, measurements are made for all possible combinations of transmitting and receiving dipoles, the latter consisting of two porous pots filled with an electrolyte copper sulphate solution "a" feet apart, up to the fourth separation, i.e. n = 4; the equipment is moved 3 "a" feet along the line to the next set-up.

SURVEY SPECIFICATIONS cont'd

A 100 foot dipole was used as far as 20 E and then a 200 foot dipole was used from there eastwards.

The magnetic survey was carried out using a McPhar M 700 fluxgate magnetometer. This instrument measures variations in the vertical component of the earth's field to an accuracy of ± 10 gammas. Corrections for diurnal variations were made by tying-in to previously established base stations at intervals not exceeding two hours.

Readings of this survey were taken at 50 foot station intervals from Line 8 W to 16 E, and at 100 foot station intervals from Line 20 E to Line 52 E.

The basic principle of any electromagnetic survey is that when conductors are subjected to primary alternating fields secondary magnetic fields are induced in them. Measurements of these secondary fields give indications as to the size, shape and conductivity of conductors. In the absence of conductors no secondary fields are obtained.

The electromagnetic test survey was carried out using both Crone C.E.M. unit and a Ronka E.M. 16 unit.

In the former case the vertical shootback technique was employed whereby each unit measures the direction of the total magnetic field (in degrees from the horizontal) while the other unit acts as a transmitter (held vertically). The resultant reading obtained on addition of the two measured angles is independent of substantial differences in elevation, and is plotted midway between the two coils.

Readings on the test survey were taken every 100 feet along Lines O and 2 E using a coil separation of 200 feet and a frequency of 5010 Hz.

In the latter case the E.M. 16 unit utilizes the V.L.F. radio stations that exist for submarine communications whereby the receiver, i.e. the E.M. 16 unit, measures the vertical components of the secondary fields that might be induced by concentric horizontal magnetic fields created by the station's vertical antennae.

Readings with this instrument were taken every 50 feet along the picket lines on Lines O, 2 E, 4 E and 6 E respectively.

DISCUSSION OF RESULTS

Electromagnetic Test Surveys - Map W-158-2

Four conductors were observed on the limited E.M. 16 survey, three of which had reverse quadrature crossovers while the fourth, conductor A. exhibited a normal quadrature crossover.

The locations of conductors A and B were confirmed by the Crone survey using the 5010 Hz. frequency.

Conductor A exhibited different characteristics from conductor B on both the E.M. 16 and Crone surveys.

Conductor A was not discernible from the results of the Crone survey using a lower frequency of 1830 Hz.

None of the four conductors correlated with I.P. effects from the later I.P. survey.

A large resistivity low coincided with the location of conductor A. No resistivity low was obtained over that of conductor B on Line 4 E but the resistivity was decreasing upon approaching the location of conductor B on Line 2 E (the resistivity survey did not extend over that location).

No response was obtained with either instrument over the showing, not even on paced lines in the direction of the primary field, i.e. perpendicular to the transmitter direction, on the E.M. 16 survey.

Magnetic Survey

The magnetic survey showed the area surveyed to be underlain by two magnetically different rock units, units M1 and M2 on Map W-158-1, believed by the writer to correspond to the volcanics and the sediments respectively.

Although this contact appears offset at two locations no faulting is evident from the magnetic pattern in the volcanics.

No definitive magnetic response was obtained over the showings indicating the absence of substantial magnetite and/or pyrrhotite mineralization.

A northeasterly trending fault indicated by a series of magnetic lows is observed in the northwestern corner of the survey area.

DISCUSSION OF RESULTS cont'd

I.P. Survey

The results of the I.P. survey, as can be seen from the individual line profiles, showed most of the area surveyed to be underlain by a low frequency effect background above which five anomalous zones are readily discernible.

These zones, the locations of which are shown on Map W-158-1, are best discussed individually.

Zone 1 - This zone is located within the volcanics near the contact with the sediments, as interpreted from the magnetics. Its location roughly corresponds with that of the known mineralization. It has a strike length of some 1400 feet and a maximum indicated width of some 100 feet. It is essentially a zone of low to moderate frequency effect response with no corresponding resistivity low, and has a shallow causative source with the best responses being obtained on the first separation measurements on Lines 6 E and 8 E respectively.

Zone 2 - This zone is located in the interpreted sediments and extends southwards and westwards from the interpreted contact with the volcanics. It has a strike length of some 600 feet and a maximum width of some 400 feet. It is essentially a zone of moderate to strong frequency effect response having essentially a shallow causative source as evidenced by shallow spacing response and the "pant leg" effect on Lines 12 E&14 E and appears to deepen to the west as hown by the overall lower response being highest on the second separation measurements. Again no corresponding resistivity low, indicative of good conductivity, was obtained.

Zone 3 - This zone has only limited magnetic coverage, being located at the end of the magnetometer survey area, and is incompletely defined on Lines 14 E, 16 E and 20 E being open both to the south and the west. From the magnetics it appears to be located in the volcanics, but from the nature of the I.P. response, i.e. very strong shallow response on Lines 14 & 16 E and accompanying pant leg effect on the 100 foot dipole measurements in contrast to a low to moderate response on the larger separations on 200 foot dipole readings on Line 20 E, the writer believes it to consist of two separate zones, one having a shallow causative source in the sediments, the other a deeper source in the volcanics (topography being taken into account).

DISCUSSION OF RESULTS cont'd

I.P. Survey

 $\underline{\text{Zone 4}}$ - Zone 4 extends from the interpreted contact out into the sediments. It is a zone of moderate to strong response extending from Line 4 E to Line 5 W.

Zone 5 - This is a zone of moderate response located in the interpreted sediments on Line $5\ W_{\bullet}$

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Between August 14th and 29th, 1972, Peter E. Walcott & Associates Limited carried out geophysical test surveying over a property held by Nitracell Canada Limited.

The property, known as the HILL Group, is located in the Aspen Grove area of British Columbia.

As a result of the test surveys, magnetometer and induced polarization surveys were conducted during the period September 18th to October 9th, 1972.

The E.M. test surveys failed to detect the known mineralization. However they did locate the presence of four weak conductors.

The magnetic survey appeared to define the contact between the volcanics and the sediments but did not show any diagnostic magnetic pattern over the known mineralization.

The I.P. survey detected the presence of five anomalous zones, one of which appeared to correlate with the known mineralization.

Only one of these, i.e. Zone 1 over the known mineralization, appears to lie within the volcanics, the others with the possible exception of part of Zone 3 lying in the interpreted sediments.

All of the above zones, as defined on the 100 foot dipole work, showed up in the smaller separations.

As a result the writer concludes that

- (1) All of the I.P. zones have shallow causative sources and should be expected to have some geochemical expression if they contained economic sulphides.
- (2) The causative source of Zone 1 is probably similar mineralization as that occurring in the adit.
- (3) Zones 2, 4, 5 and most of 3 probably have causative sources of graphite and/or pyrite.
- (4) That part of Zone 3 on Line 20 E could have economic sulphide mineralization as part of its causative source.
- (5) The E.M. anomalies were most probably caused by differences in conductivity in the overburden and/or bedrock.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS cont'd

He therefore suggests that three holes be drilled to test the nature of the I.P. anomalies. The holes should be:

Hole #1 - This hole should be drilled through the best mineralization and through the I.P. anomaly on Line 6 E.

Hole #2 - This 50° hole should be drilled northwards along Line 4 E so as to intersect 0 + 75 S 300 feet perpendicularly below the surface. This hole tests both Zones 1 and 4.

Hole #3 - This 50° hole should be drilled the best way on Line 12 E (geology and topography) so as to intersect 5 + 50 S 75 feet perpendicularly below the surface. This hole tests Zone 2.

Should the results prove encouraging in Zones 2 and 4 then further holes should be drilled to further investigate these and other zones.

He further suggests that the results of the magnetic survey be correlated with the geology to the east of Line 16 E, and that the former survey be extended in an effort to determine the location of the contact between the volcanics and the sediments in and around Zone 3.

Respectfully submitted,

PETER E. WALCORT & ASSOCIATES LIMITED

Peter E. Walcott, P.Eng. Geophysicist

for Sheer

December 1972

Vancouver, British Columbia

APPENDIX

COST OF SURVEY

Peter E. Walcott & Associates Limited undertook the original linecutting and E.M. and I.P. test surveys on a daily basis while conducting the magnetic survey on a line mileage basis.

They then undertook the I.P. survey on a daily basis, and the additional magnetic coverage on a line mileage basis.

Mobilization and draughting were extra so that the total cost of services provided by Peter E. Walcott & Associates Limited was \$9,794.16.

PERSONNEL EMPLOYED ON SURVEY

NAME	OCCUPATION	ADDRESS Peter E. Walcott & Assoc. 605 Rutland Court, Coquitlam, B.C.		DATES Aug. 25th - 29th, Oct. 14th & 15th, Dec. 4th - 12th, 72	
Peter E. Walcott	Geophysicist				
G. MacMillan	Geophysical Operator	1;	Ħ	Aug. 14th - 17th, Sept. 18th - Oct. 9th Nov. 4th - 30th, 72	
L. Perreault	22	ti	11	Aug. 18th - 23rd, 72	
V. Pashniak	18	† \$. H	Sept. 18th - Oct. 9th 1972	
K. Drobot	16 .	11	1f	Sept. 18th - Oct. 9th 1972	
P. Charlie	Helper	11	**	Aug. 14th - 23rd, 72	
E. Joe	Helper		11	Sept. 28th - Oct. 9th 1972	
J. Walcott	Typing	ii	58	Dec. 28th, 1972	

CERTIFICATION

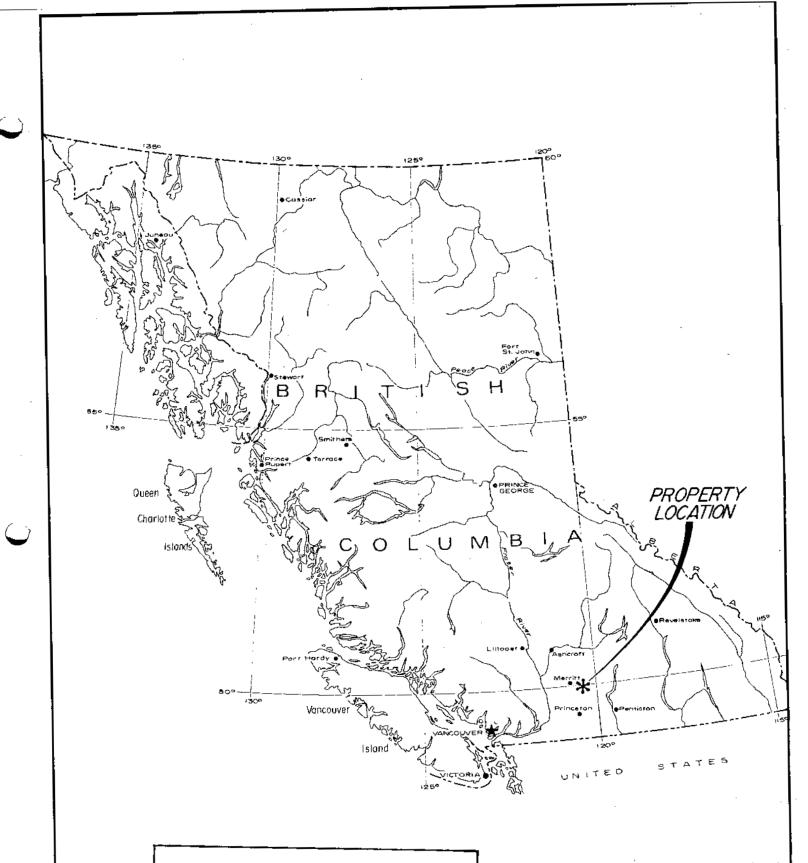
I, Peter E. Walcott of the Municipality of Coquitlam, British Columbia, hereby certify that:

- 1. I am a Graduate of the University of Toronto in 1962 with a B.A.Sc. in Engineering Physics, Geophysics Option.
- I have been practising my profession for the last ten years.
- 3. I am a member of the Association of Professional Engineers of British Columbia, Ontario and the Yukon Territory.
- 4. I hold no interest, direct or indirect, in the securities or properties of Nitracell Canada Limited, nor do I expect to receive any.

Peter E. Walcott, P.Eng.

Vancouver, British Columbia

December 1972



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO 4229 MAP #1

NITRACELL CANADA LTD.

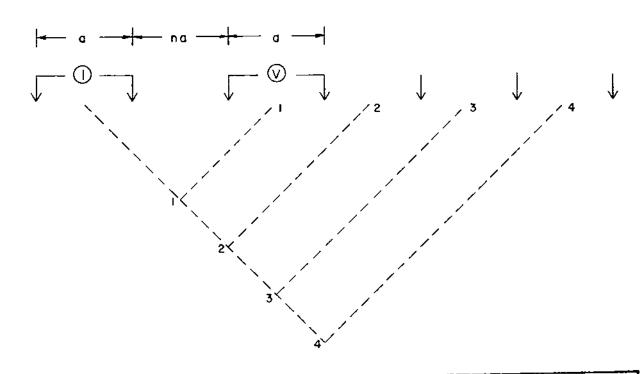
HILL CLAIM GROUP, PARADISE LAKE AREA NICOLA M.D., B.C

LOCATION MAP

SCALE: | "= 136 Mls.

ALTAIR drofting services 1td.

DIPOLE - DIPOLE ARRAY



Department of

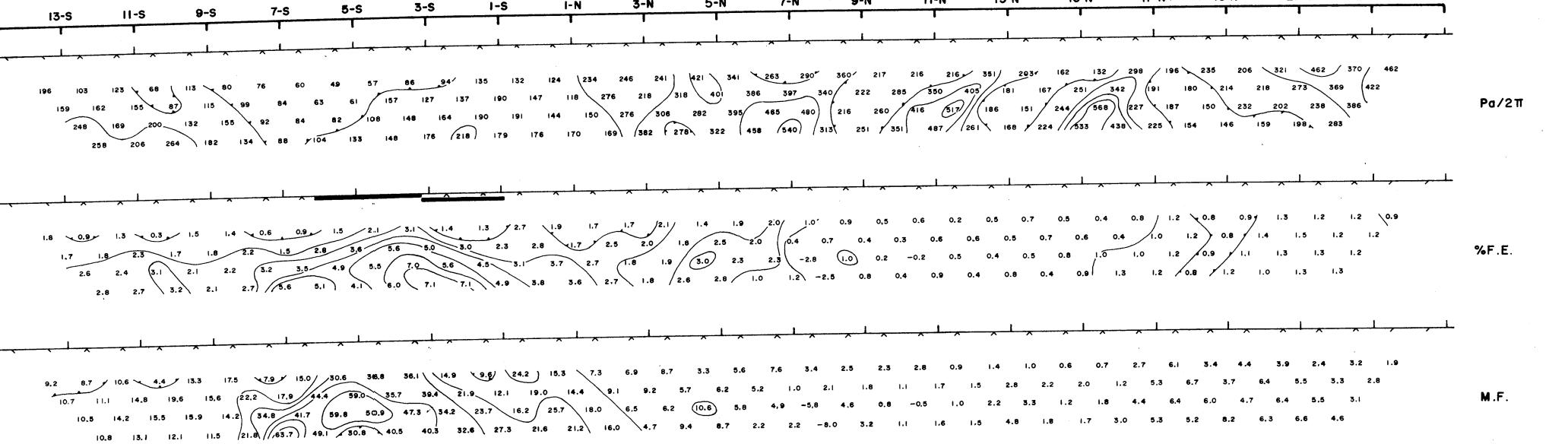
Mines and Petroleum Resources

ASSESSMENT REPORT

NO. 4229 MAP

ANOMALOUS ZONE

POSSIBLE ANOMALOUS ZONE

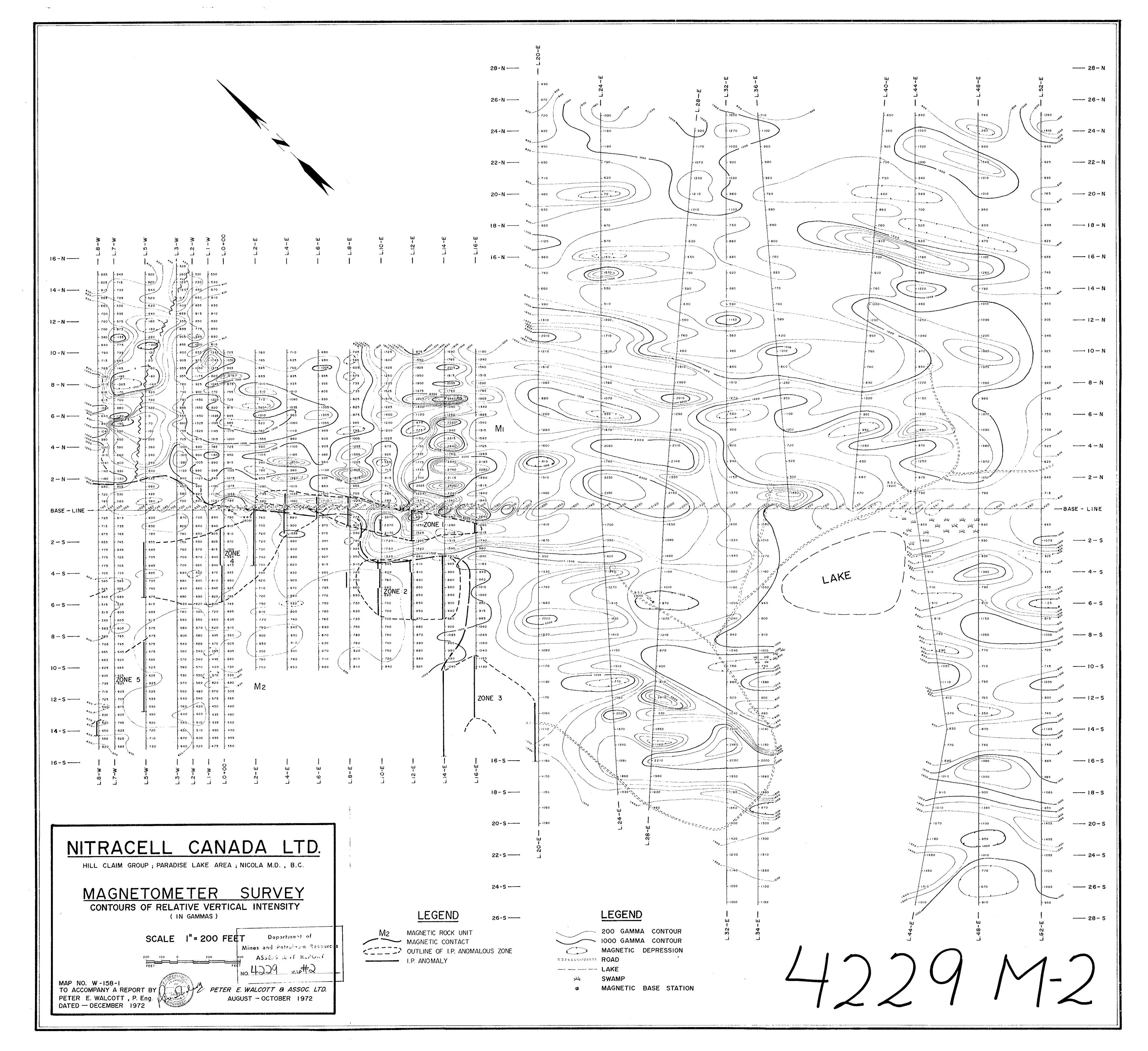


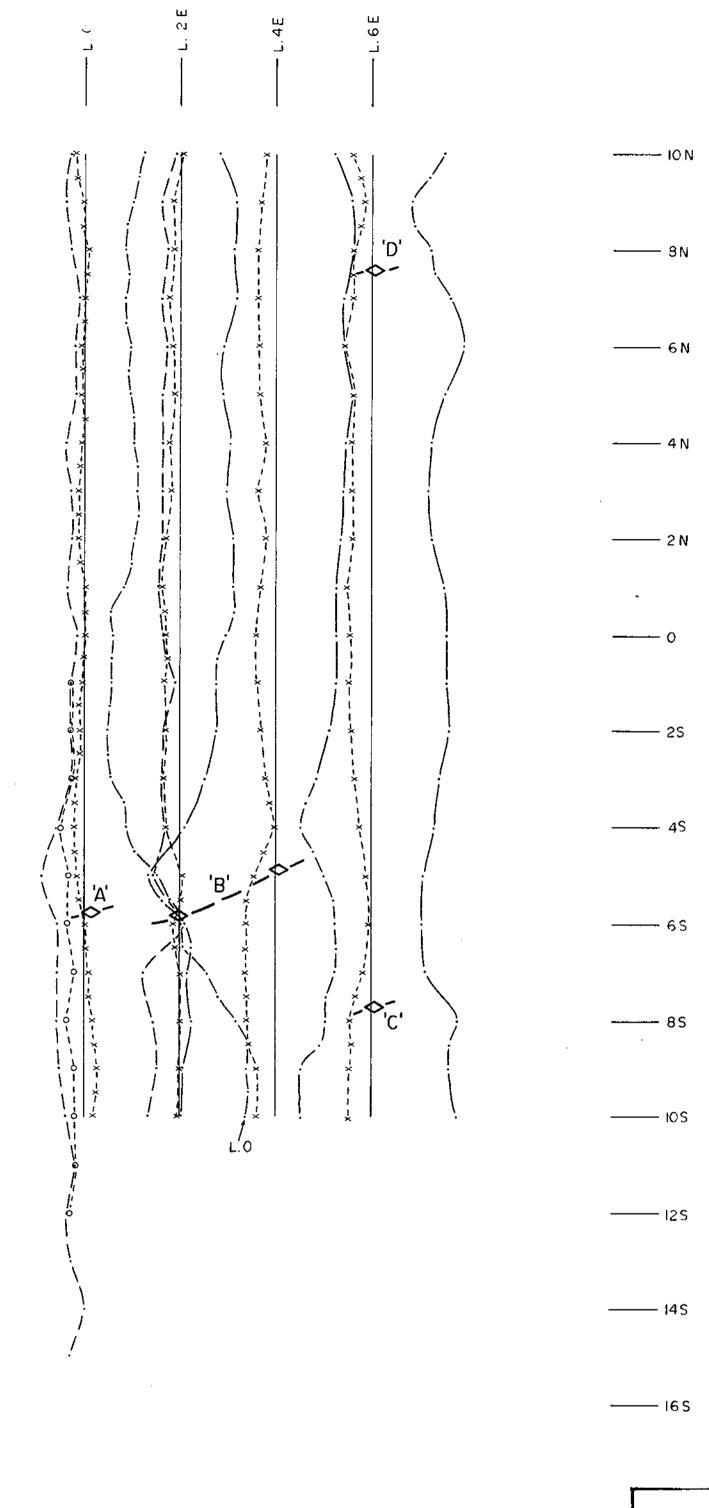
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4229 MSP

NITRACELL CANADA LTD.

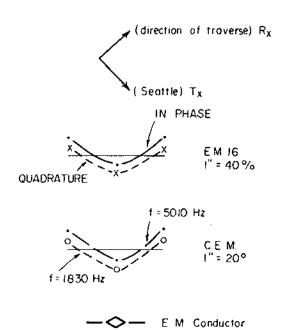
LINE 0+00

SCALE I" = 200 FEET
FREQUENCY 0.3 8 5.0 C.P.S
(a = 100')





LEGEND



Day riment of Mines and Cotrolaum Resources Asul a gur kürükt

NITRACELL CANADA LTD.

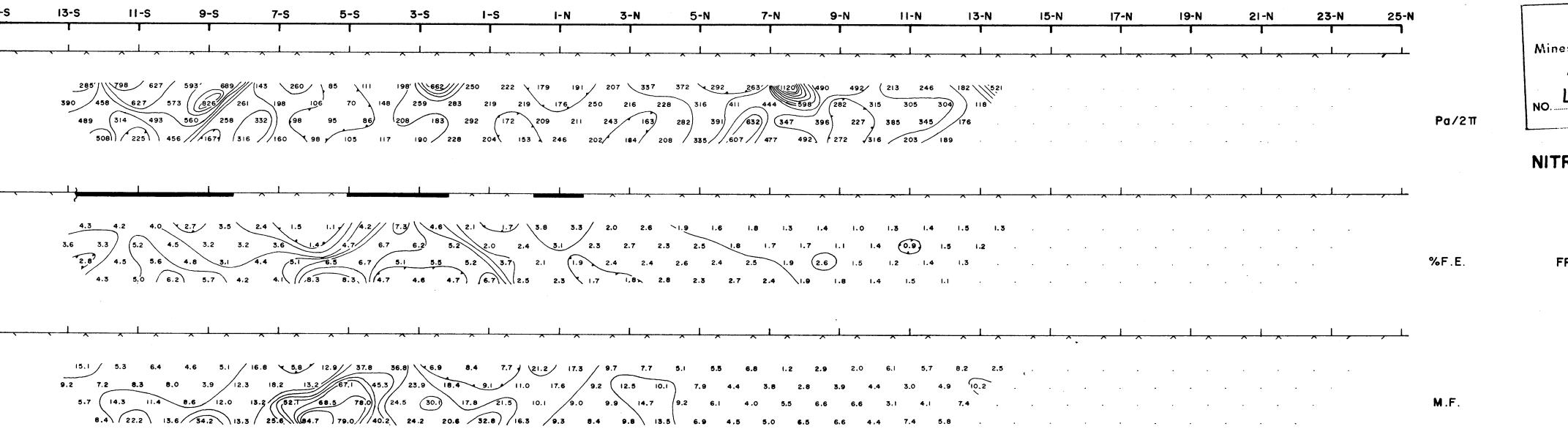
HILL CLAIM GROUP, PARADISE LAKE AREA, NICOLA M.D. , B.C.

C.E.M. & E.M. 16 ELECTROMAGNETIC SURVEY

PROFILES OF DIP ANGLES AND IN 8 OUT OF PHASE

SCALE I INCH = 200 MAP NO. W+158-2
TO ACCOMPANY A REPORT BY AND DEC. 1972

PETER E. WALCOTT B ASSOC LTD.
AUGUST-OCT 1972



Mines and Potroleum Resources

ASSESSMEAT REPORT

NO. 4229 AP

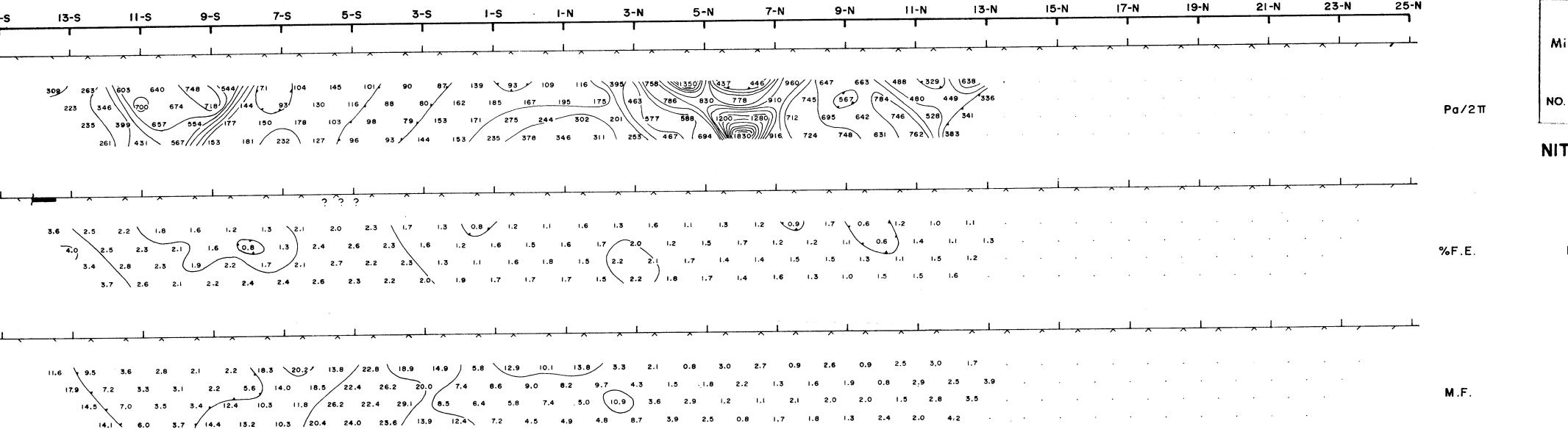
NITRACELL CANADA LTD.

LINE 5-W

SCALE I" = 200 FEET

FREQUENCY 0.3 & 5.0 C.P.S.

(a = 100')



Department of

Mines and Potroleum Resources

ASSESSMENT REPORT

NO. 4229

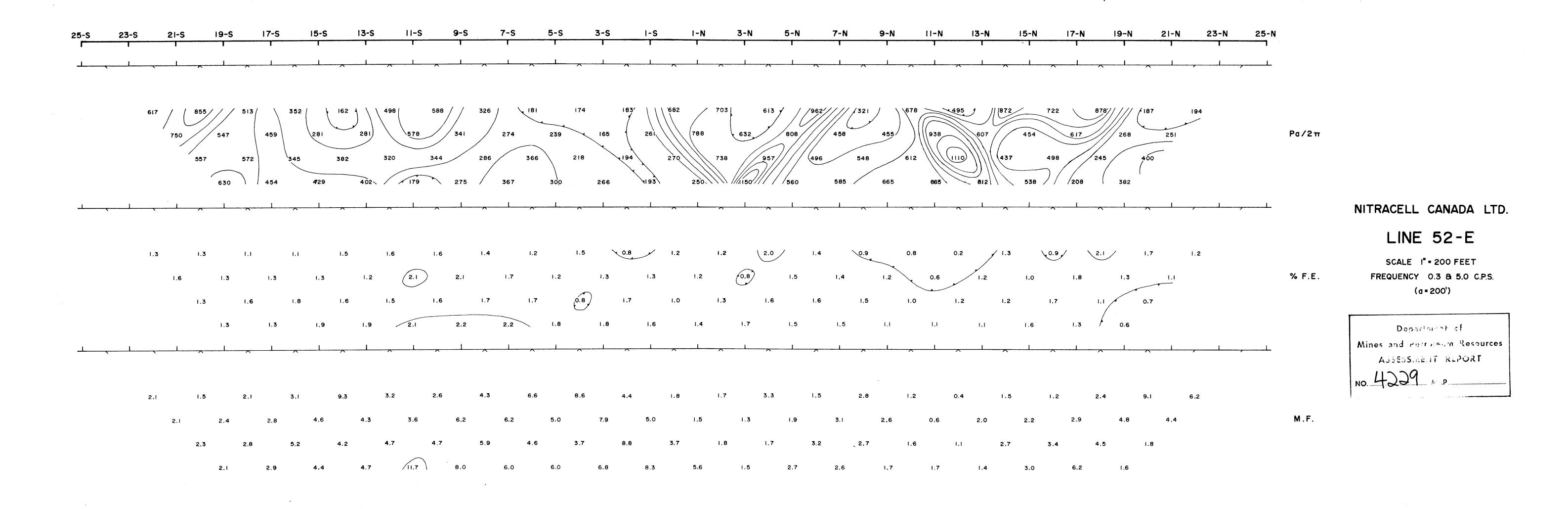
NITRACELL CANADA LTD.

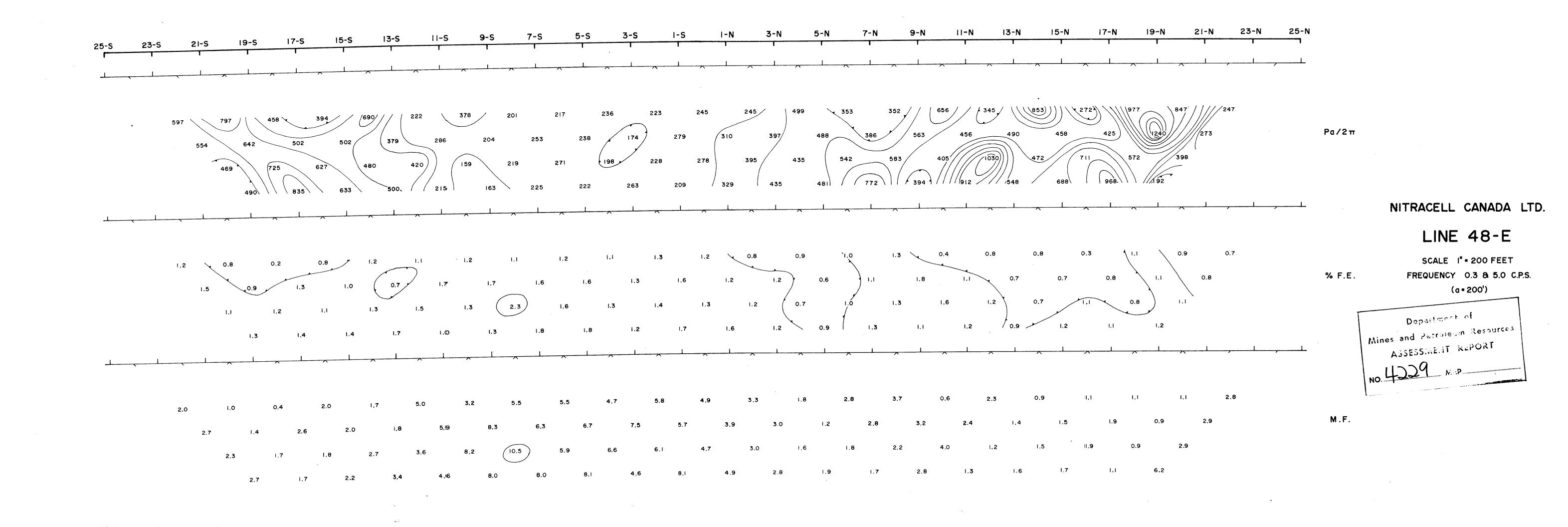
LINE 8-W

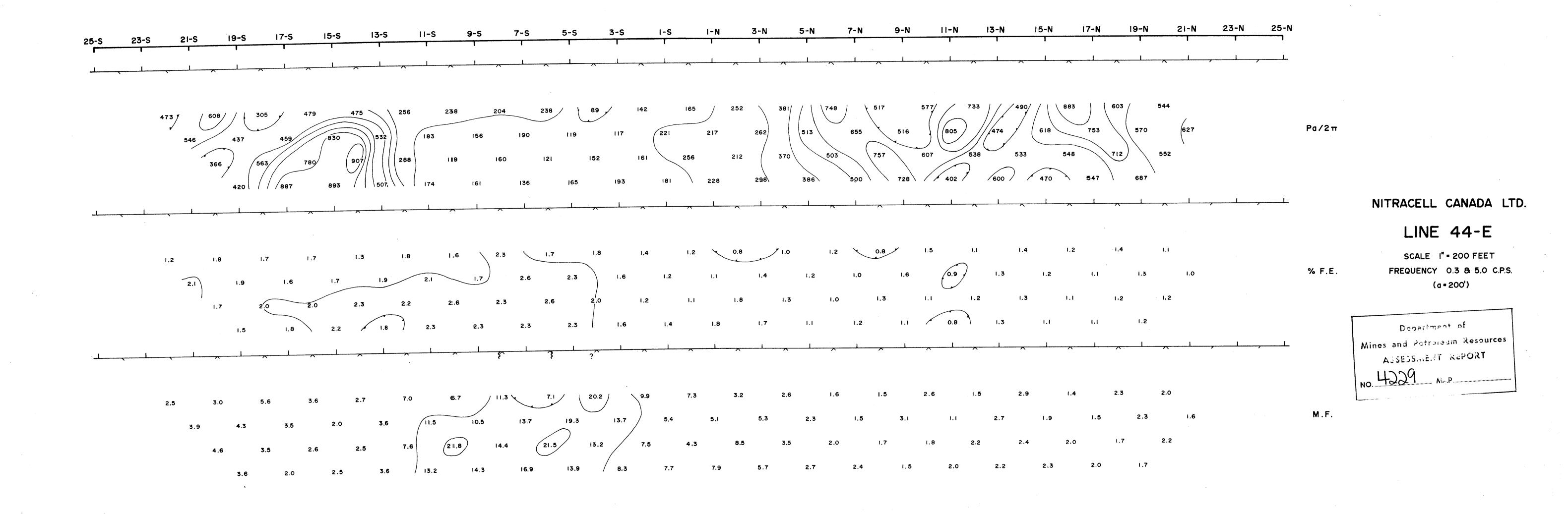
SCALE I" = 200 FEET

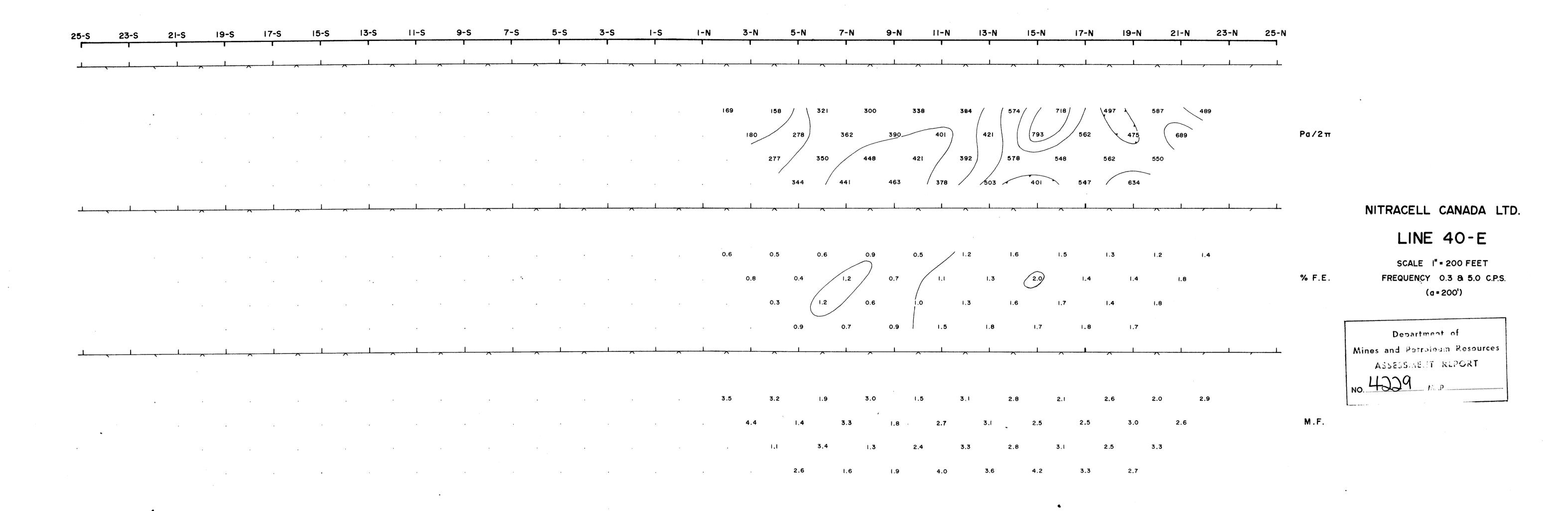
FREQUENCY 0.3 & 5.0 C.P.S.

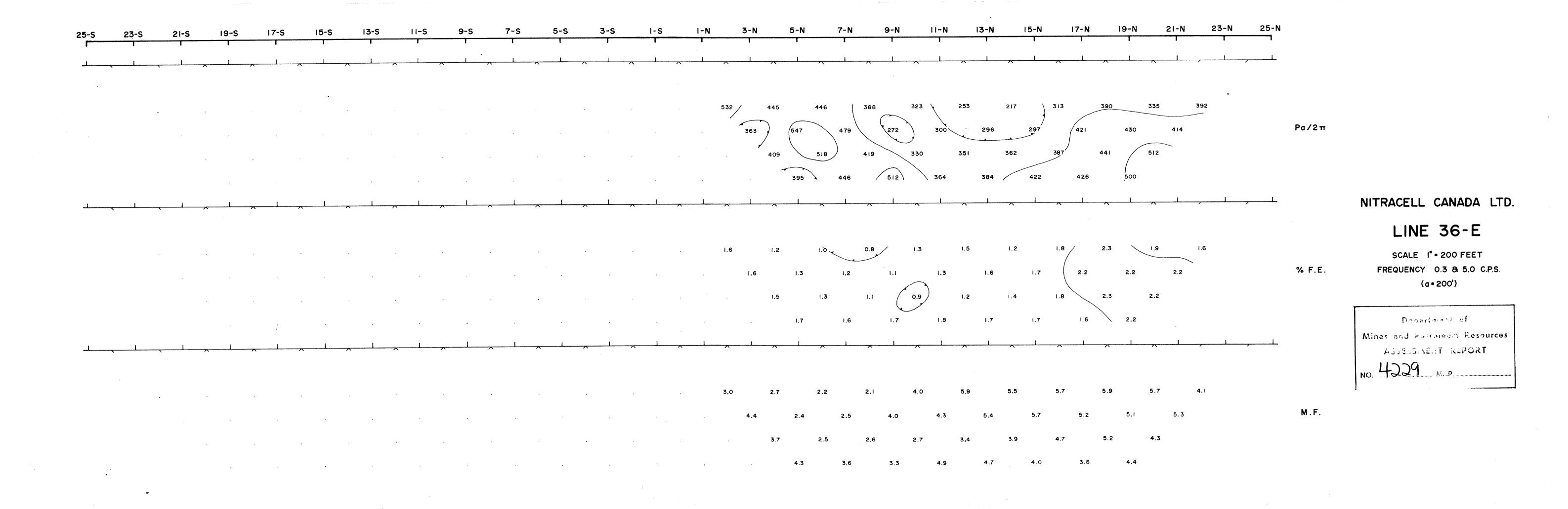
(a = 100')

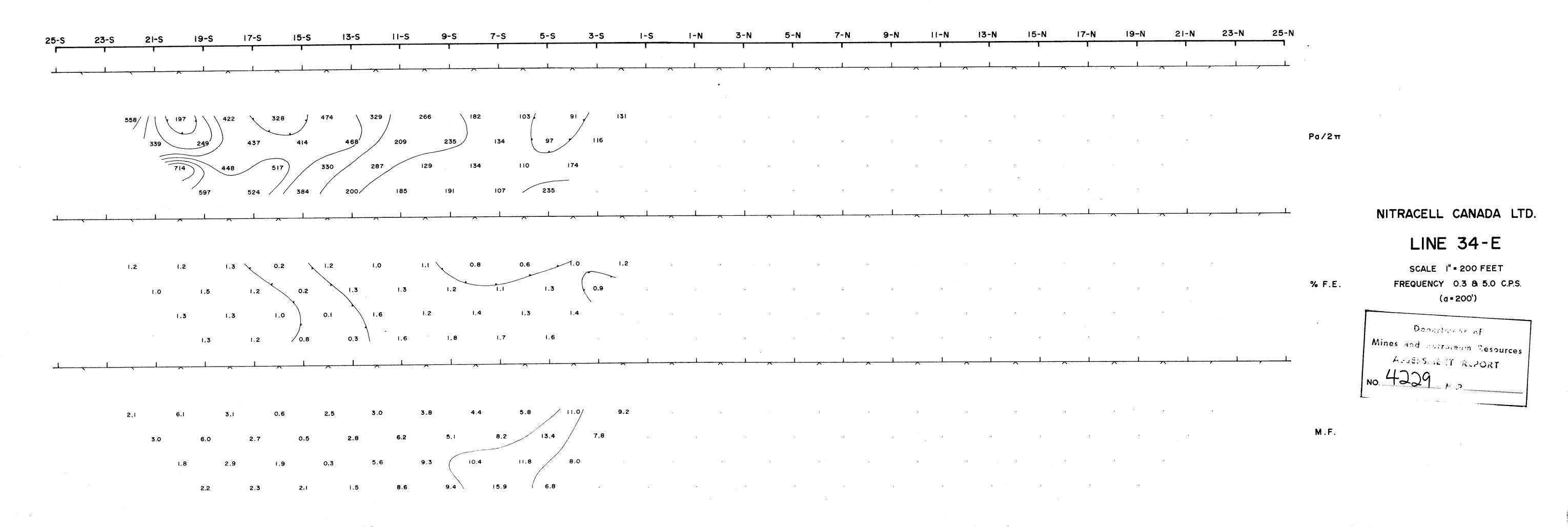


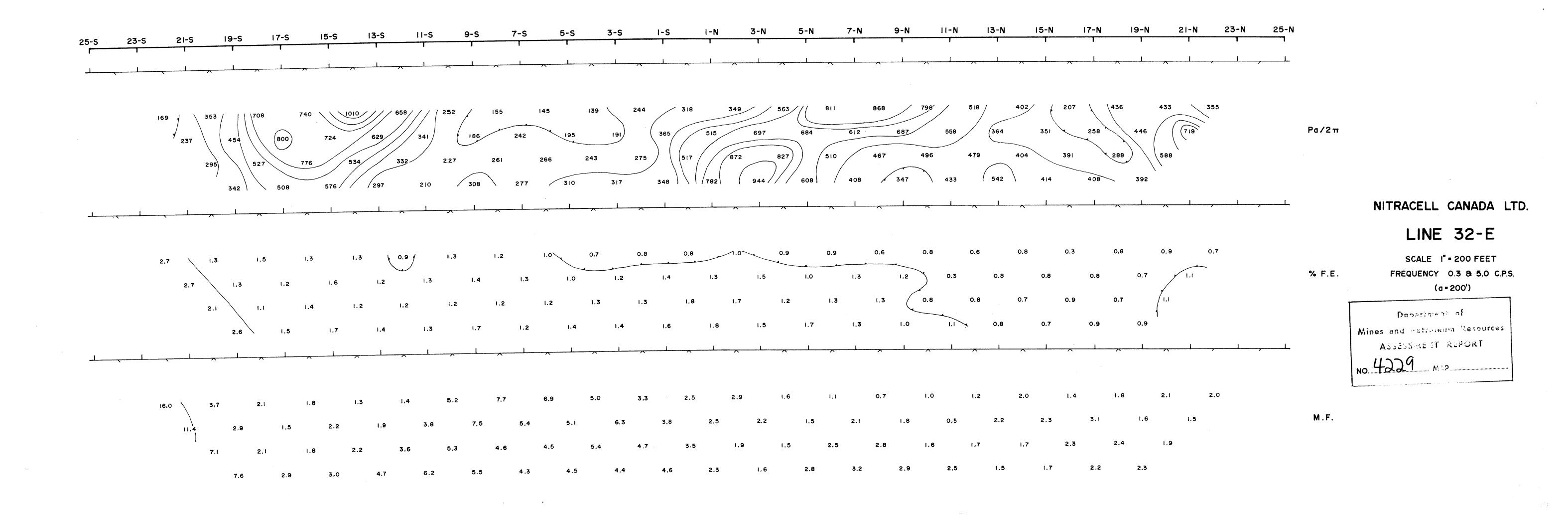


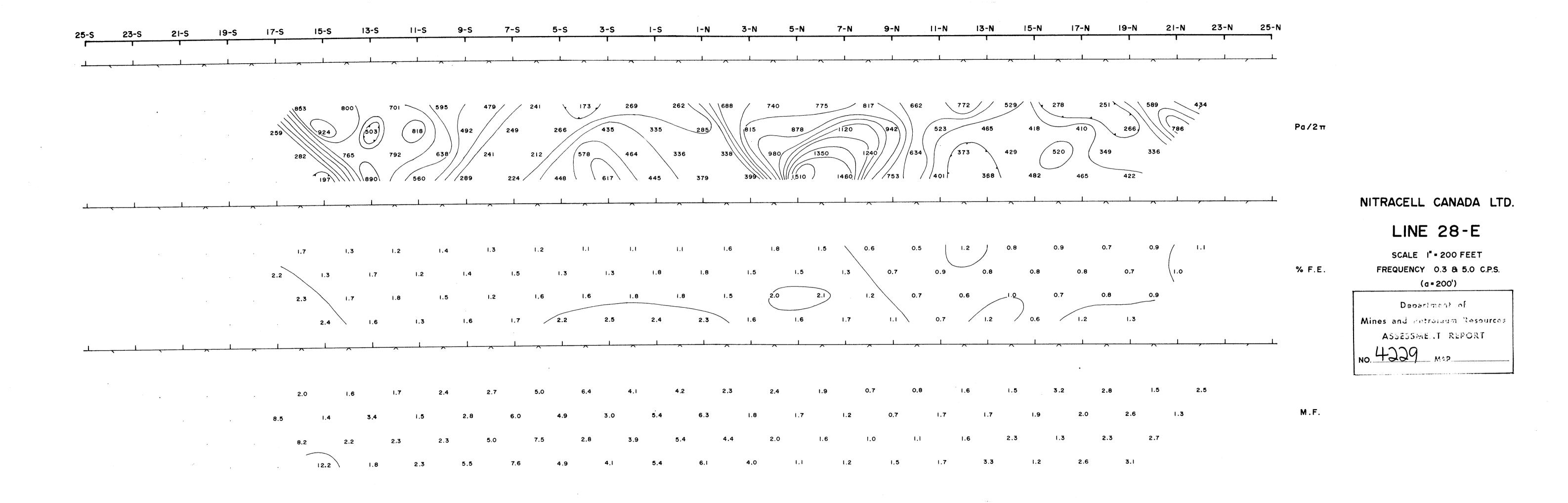


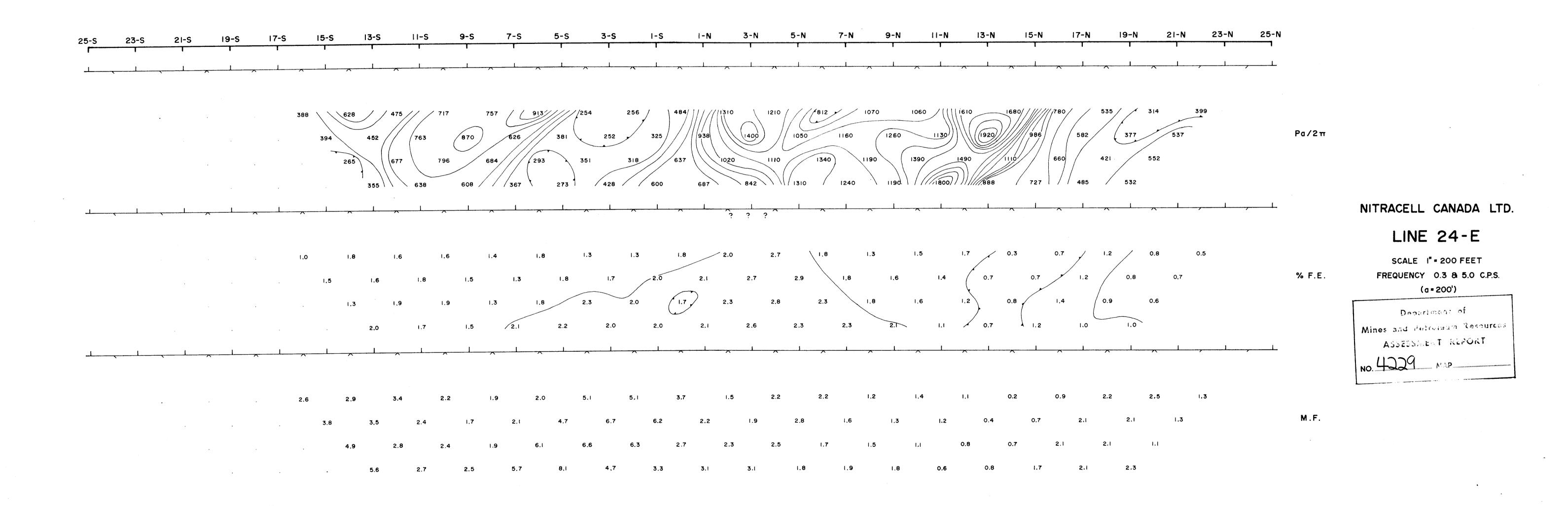


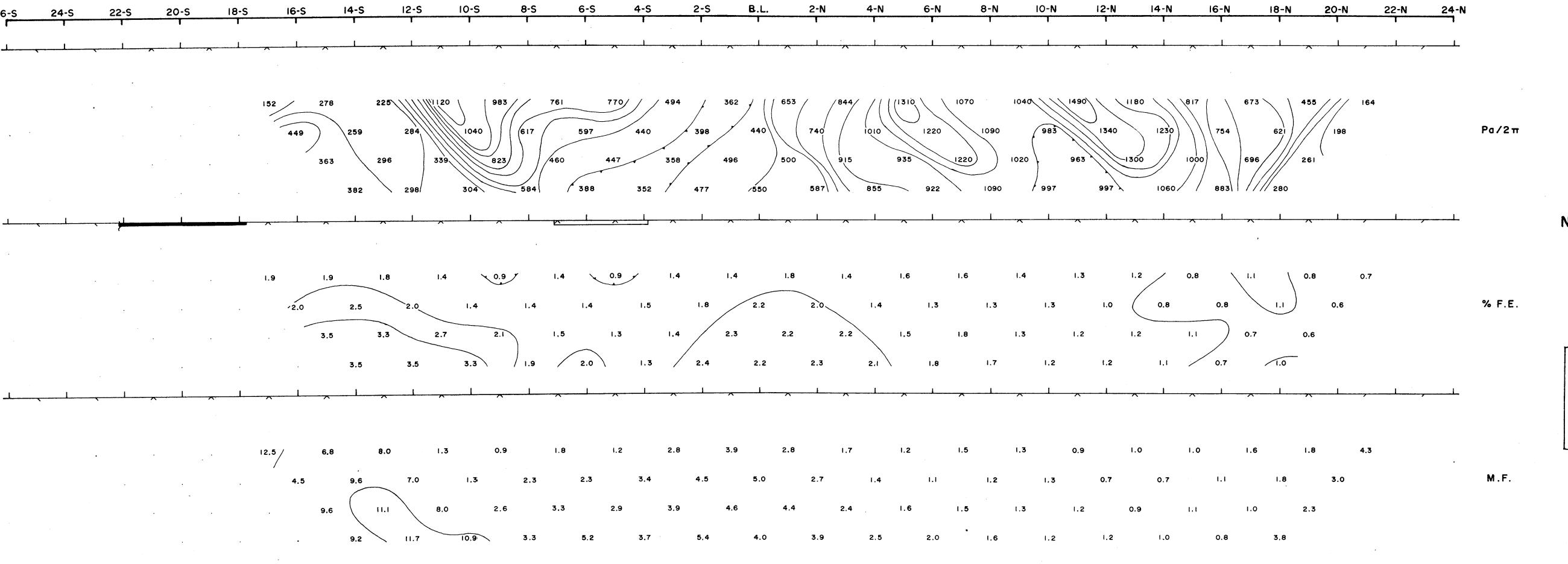












NITRACELL CANADA LTD.

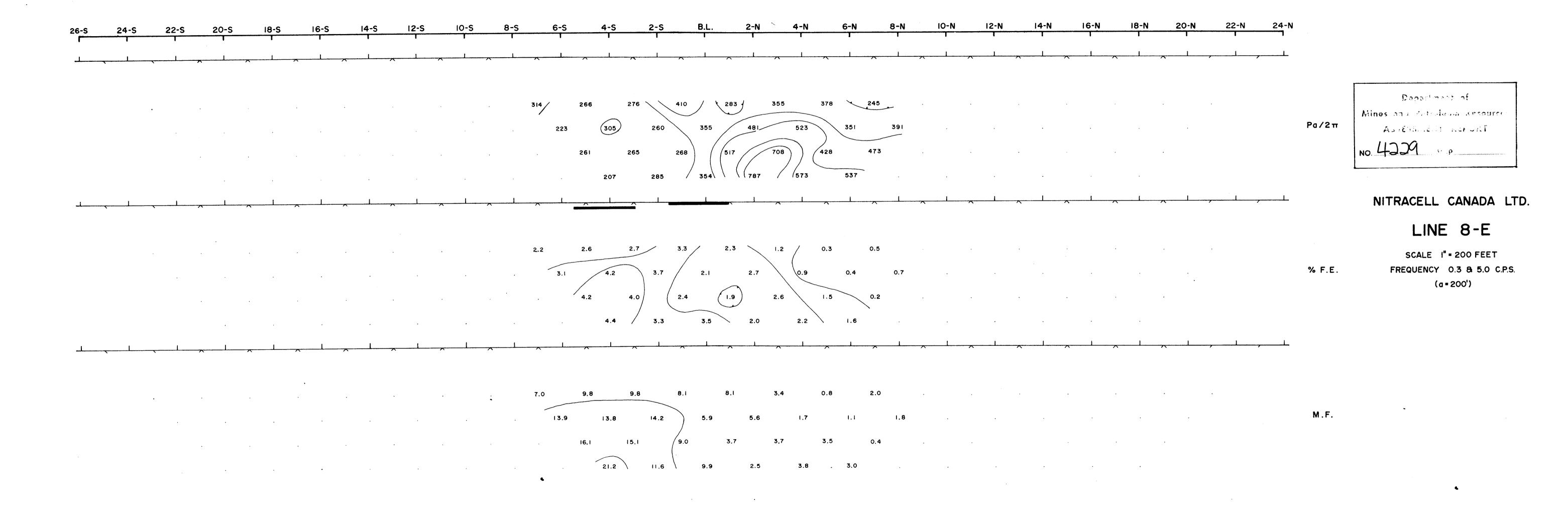
LINE 20-E

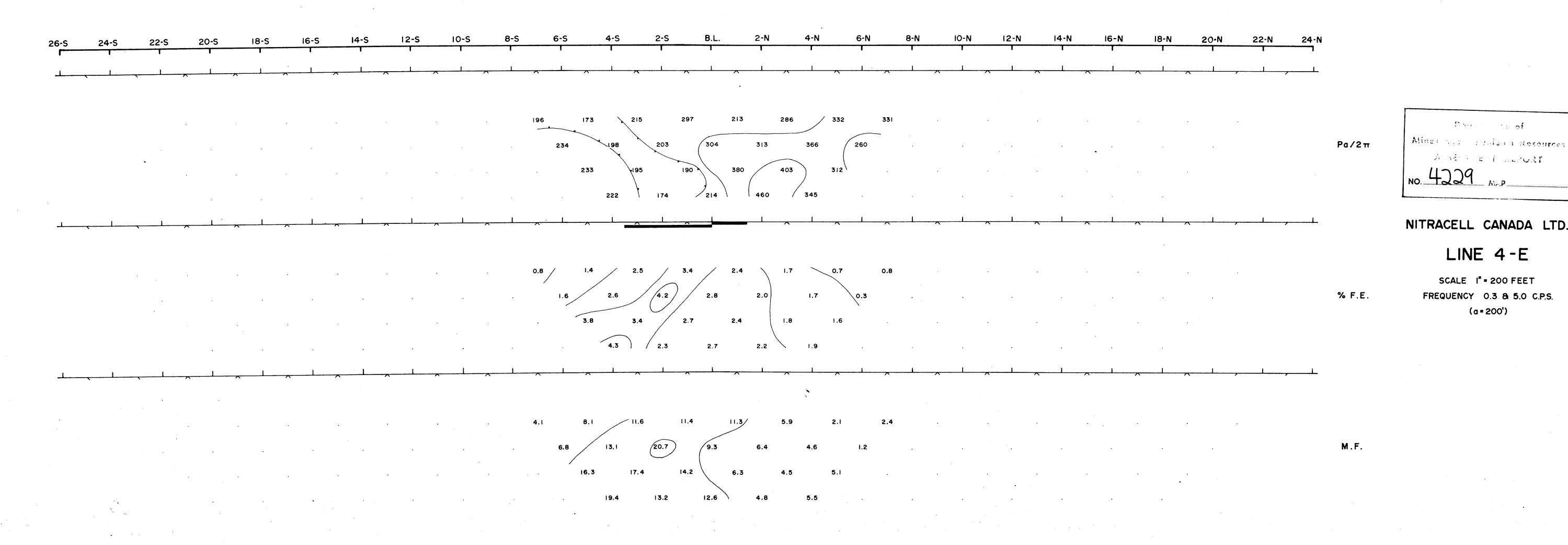
SCALE I" = 200 FEET

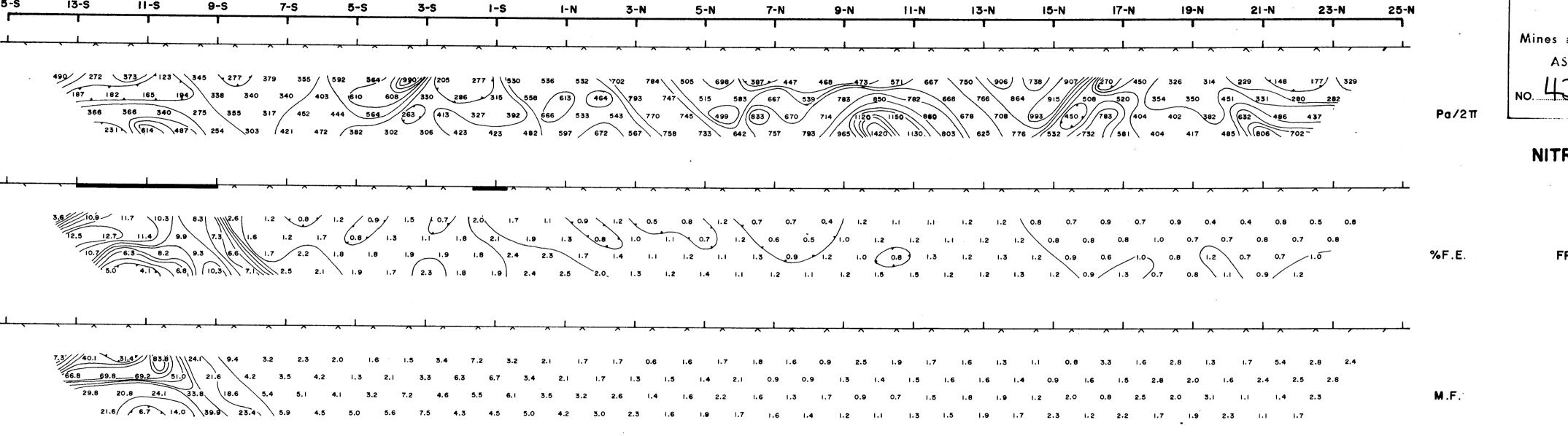
FREQUENCY 0.3 & 5.0 C.P.S.

(a = 200')

Department of
Mines and Petroleum Resources
ASSESS.MENT REPORT
NO. 4229 MAP







Department of

Mines and Petroleum Resources

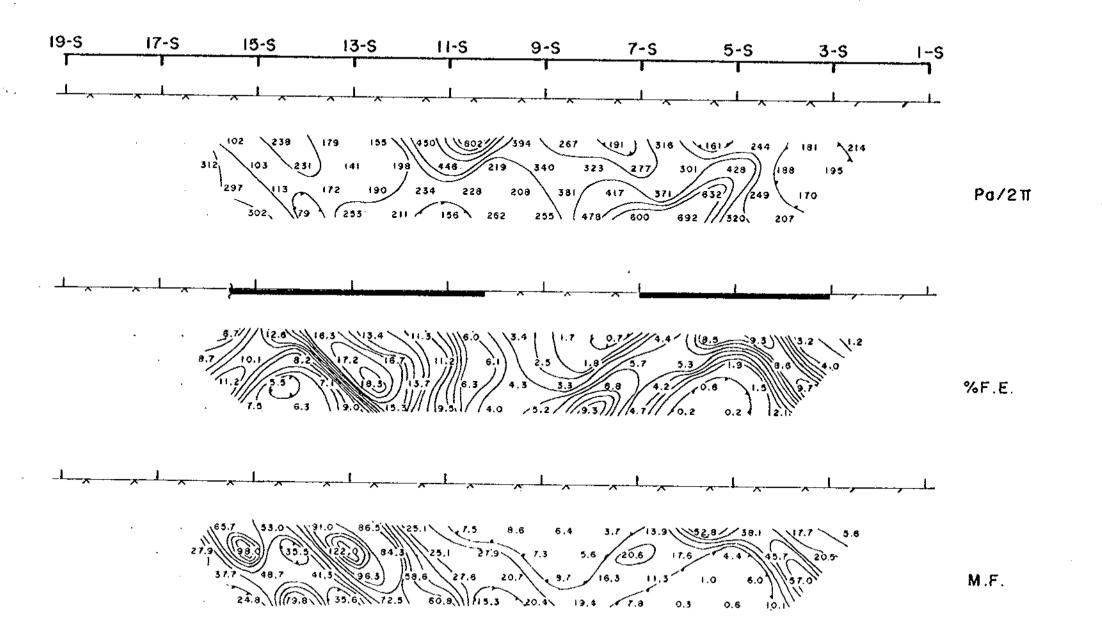
ASSESSMENT REPORT

NO. 4229 MAP

NITRACELL CANADA LTD.

LINE 16-E

SCALE I*= 200 FEET
FREQUENCY 0.3 & 5.0 C.P.S.
(a=100')

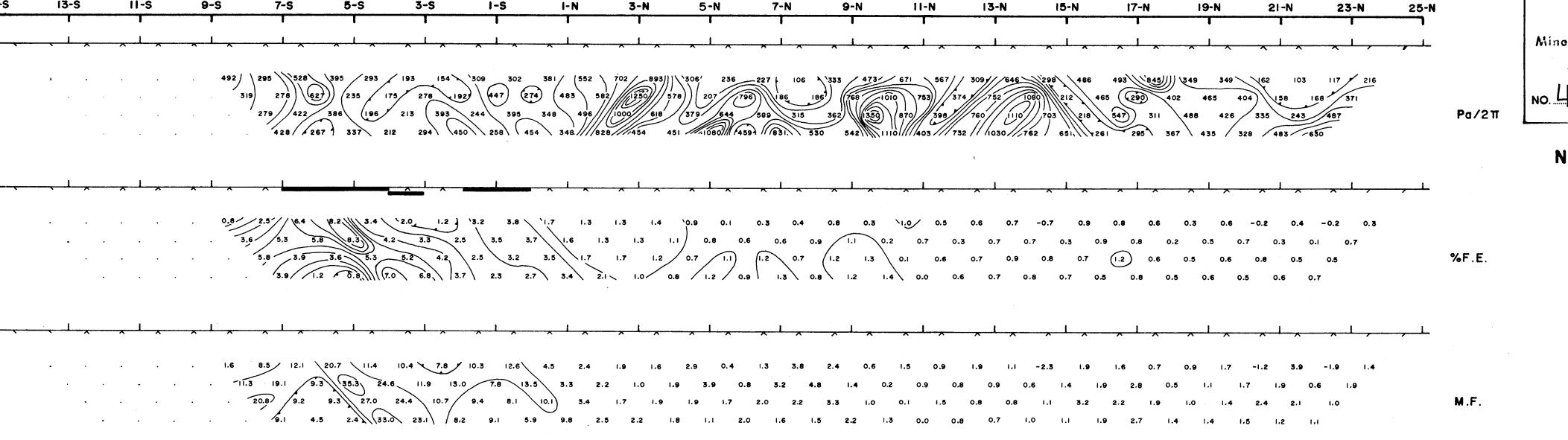


Department of
Mines and retroloum Resources
AUSESSIMENT REPORT
NO. 4229

NITRACELL CANADA LTD.

LINE 14-E

SCALE I" = 200 FEET
FREQUENCY 0.3 & 5.0 C.P.S.
(a = 100')



Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 429 MAP

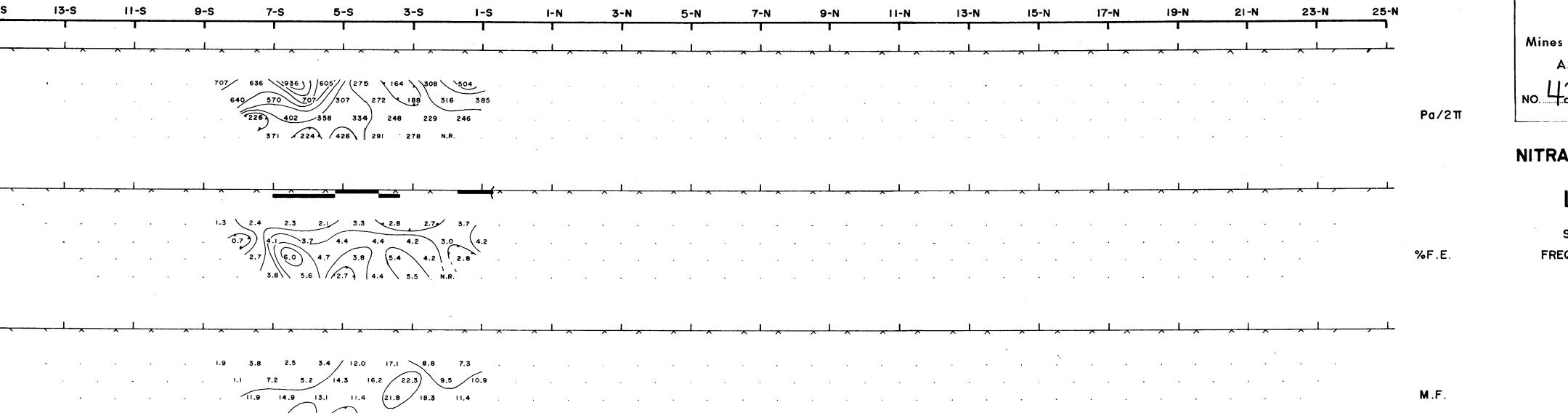
NITRACELL CANADA LTD.

LINE 12-E

SCALE I" = 200 FEET

FREQUENCY 0.3 8 5.0 C.P.S.

(a = 100')



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4229 MAP

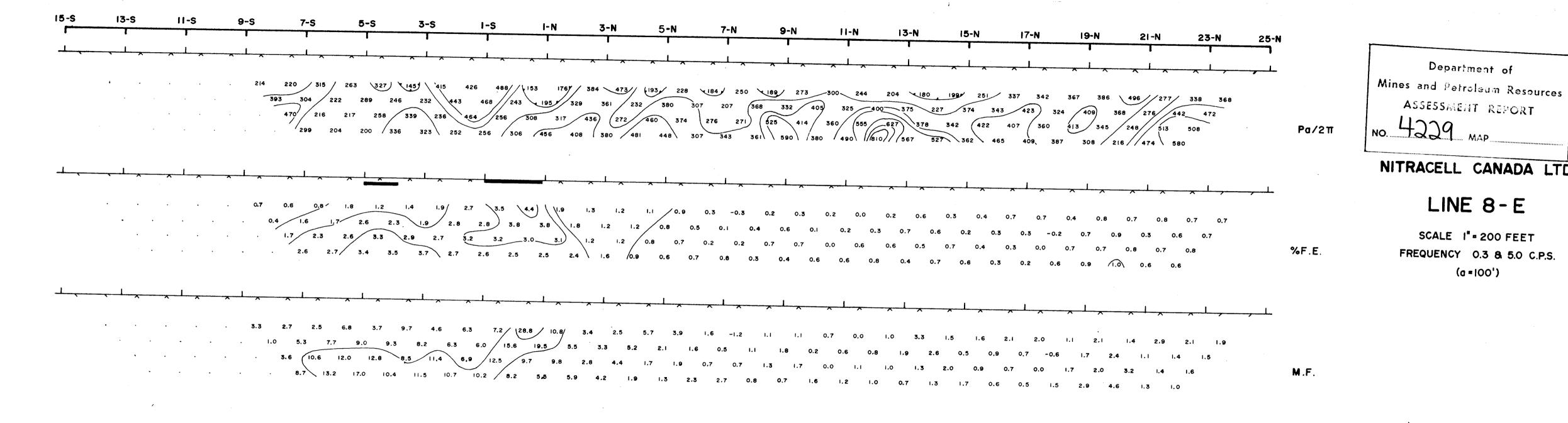
NITRACELL CANADA LTD.

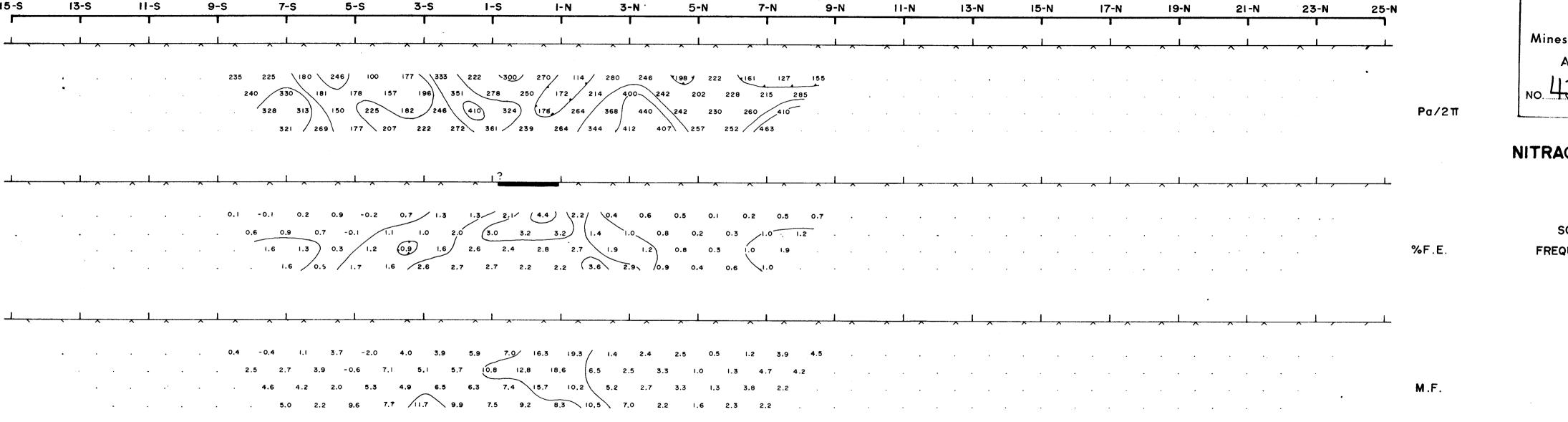
LINE 10-E

SCALE I" = 200 FEET

FREQUENCY 0.3 8 5.0 C.P.S.

(a = 100')





Department of

Mines and Petroleum Resources

ASSESSMENT REPORT

NO. 4329 MAP

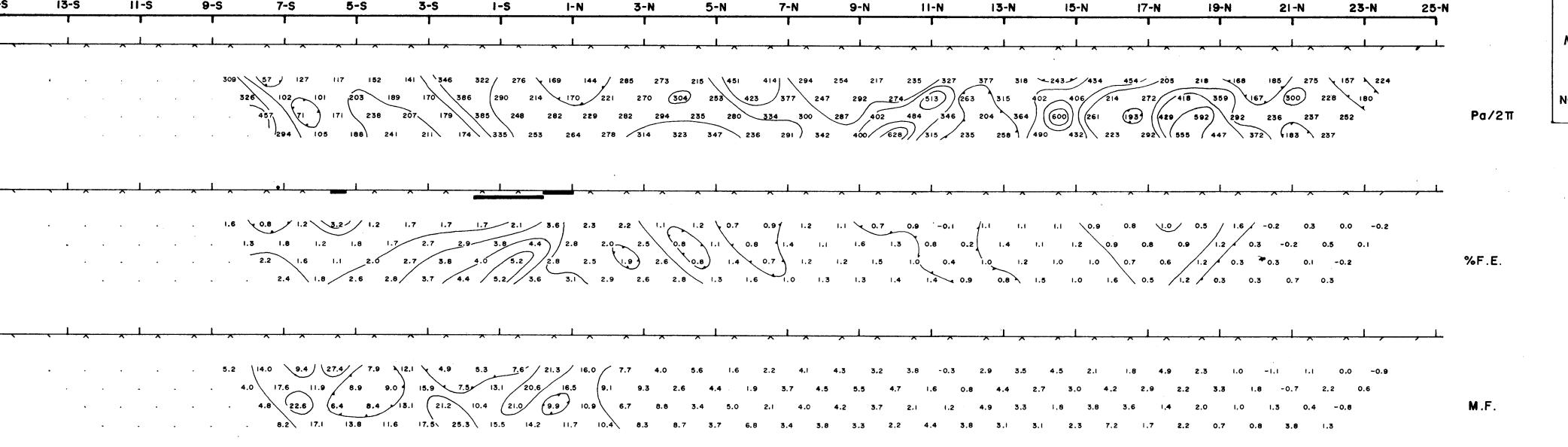
NITRACELL CANADA LTD.

LINE 6-E

SCALE I" = 200 FEET

FREQUENCY 0.3 & 5.0 C.P.S.

(a = 100')



Department of

Mines and Petroleum Resources

ASSESSMENT REPORT

NO. 4229 MAP

NITRACELL CANADA LTD.

LINE 4-E

SCALE 1" = 200 FEET
FREQUENCY 0.3 & 5.0 C.P.S.
(a=100')

