INDUCED POLARIZATION SURVEY
ENGLISH - ZAVITZ PROPERTY
PROJECT 1673

ENGLISH AND ZAVITZ TOWNSHIPS
PORCUPINE MINING DISTRICT, ONTARIO
42A/3

RECEIVED

MAY 30 1988

MINING LANDS SECTION

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MAY, 1988

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SUMMARY

In December of 1987, an Induced Polarization (IP) - resistivity survey was carried out over the northeastern portion of a group of claims owned (100%) by Esso Resources Canada Limited. in English and Zavitz Townships, northern Ontario. The survey was conducted for Esso Minerals Canada by JVX Ltd. of Toronto. The purpose of the survey was 1) to determine the response to known gold occurrences, particularly the "43N showing", 2) to geophysically trace these showings under areas of overburden cover and 3) to outline other IP anomalies which might prove to be targets of interest.

The IP survey was hampered by poor weather and ground conditions, with the result that only eight (8) lines were surveyed for a total of 6.4 km of surveying (versus a planned 20 km of surveying). The IP survey mapped 41 anomalies, most of which are grouped/classified into eight zones of anomalous responses, labelled Zones 1 to 8 on Map 1 accompanying this memo.

Zone 4 (Anomalies D and E on L-43N and Anomaly D on L-44N) coincides with the "43N gold showing" in Fe-tholeiitic basalts. Zones 5, 7 and 8 occur in areas of minor outcrop but appear to be associated with carbonate-altered mafic to ultramafic rocks and warrant further investigation. Further IP surveying is also recommended (1) to fill the survey "gap" between Line 40N and Line 43N, and (2) south of L-38N to fully outline Zones 6, 7 and 8 which appear to extend south of the present survey area.

LOCATION AND ACCESS

The property is located about 38 km south of Timmins, Ontario in south eastern English Township and south western Zavitz Township (Figure 1). Access to the property is via all weather roads south of Timmins on Pine Street. 57.5 km south of Timmins the Matachewan Highway leads east. At a point 7.5 km east a power line crosses the highway. Going north on the power line access road a bridge spans the Redstone River at the 5.0 km point. This is the best camp site for working on the claims. The powerline road continues about 2 km north on the claims to line 41N. Four wheel drive is needed for the last 1 km because of a large swamp and ruts. Driving time from Timmins to line 41N is about 1 1/2 hours.

CLAIMS

The property consists of 48 claims in English and Zavitz Townships (Figure 2). The claims are 100% owned by Esso Resources Canada Limited.

English Township Claims

CLAIMS	NO. OF CLAIMS	RECORDING DATE
986767-986771	5	July 2, 1987
996971-996976	6	July 2, 1987
997694-997710	17	July 2, 1987
997713-997714	2	July 2, 1987
997718-997723	6	July 2, 1987
997504-997505	2	Aug 31, 1987

Zavitz Township Claims

986763-986766	4	July 2, 1987
997711-997712	2	July 2, 1987
997715-997717	3	July 2, 1987
997506	1	Aug 31, 1987

The southern property boundary adjoins claims being explored by Placer-Dome. Open ground exists on the other sides of the claim block.

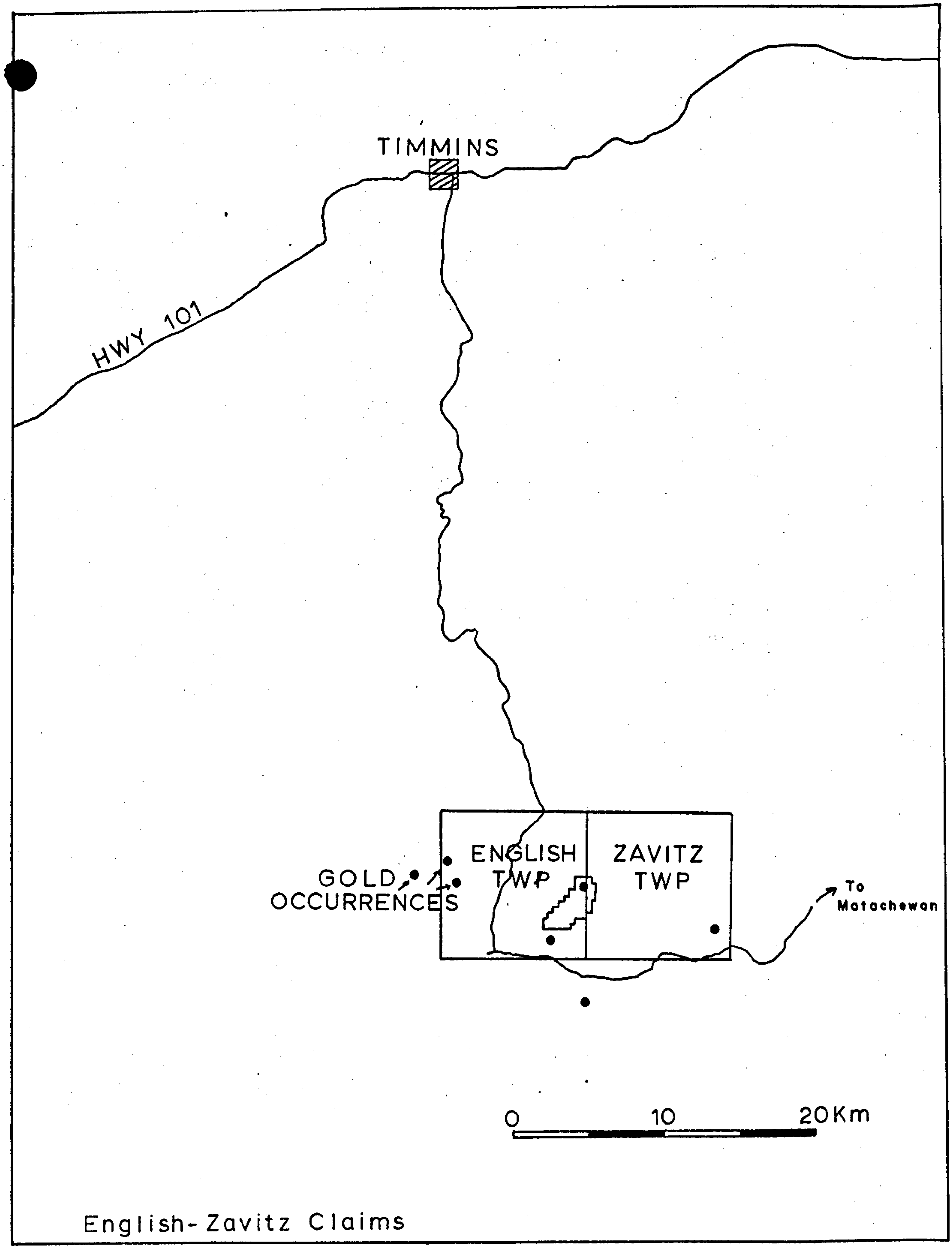


Fig. 1: Location Map

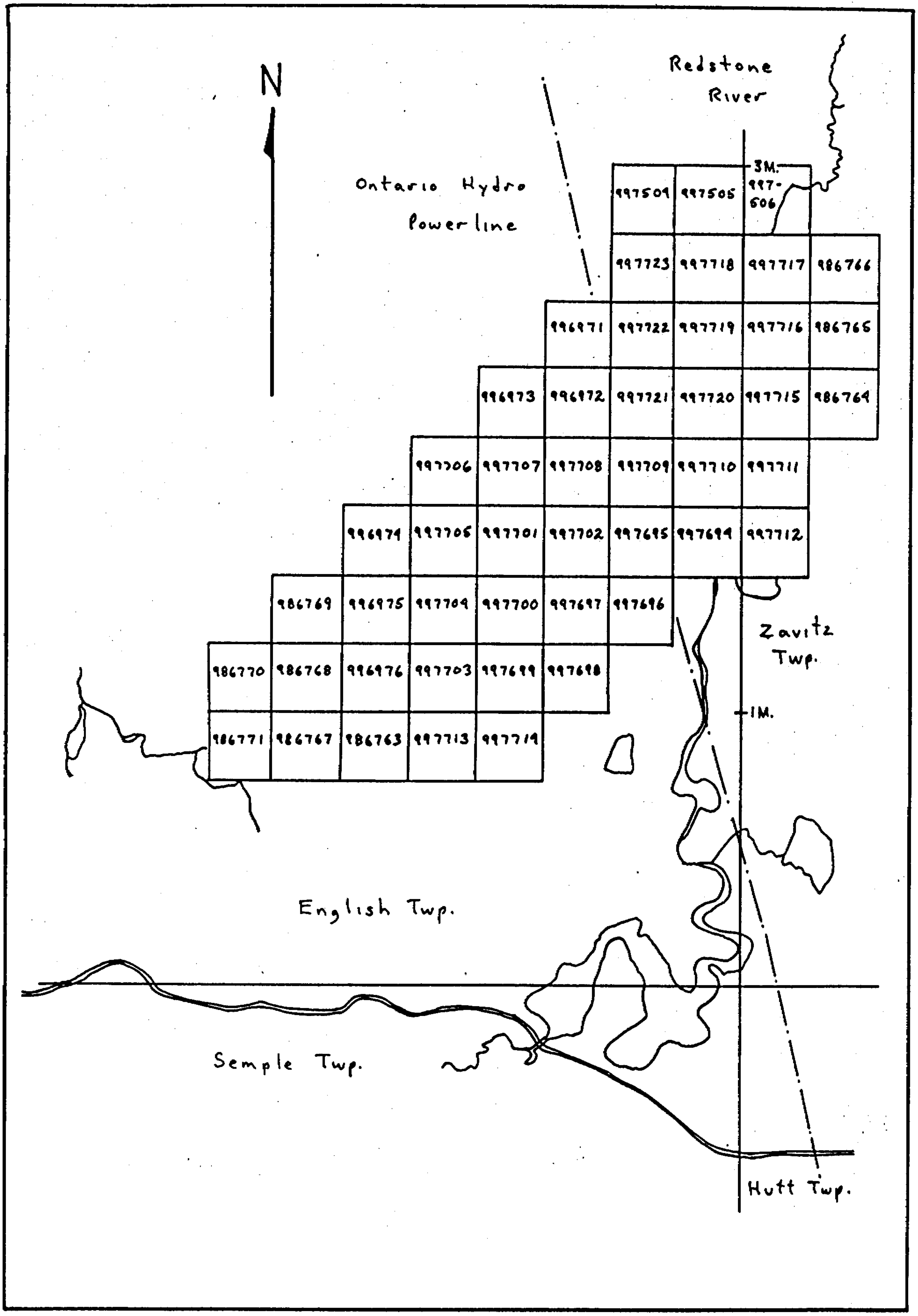


Fig.2: Claim Map

GENERAL GEOLOGY

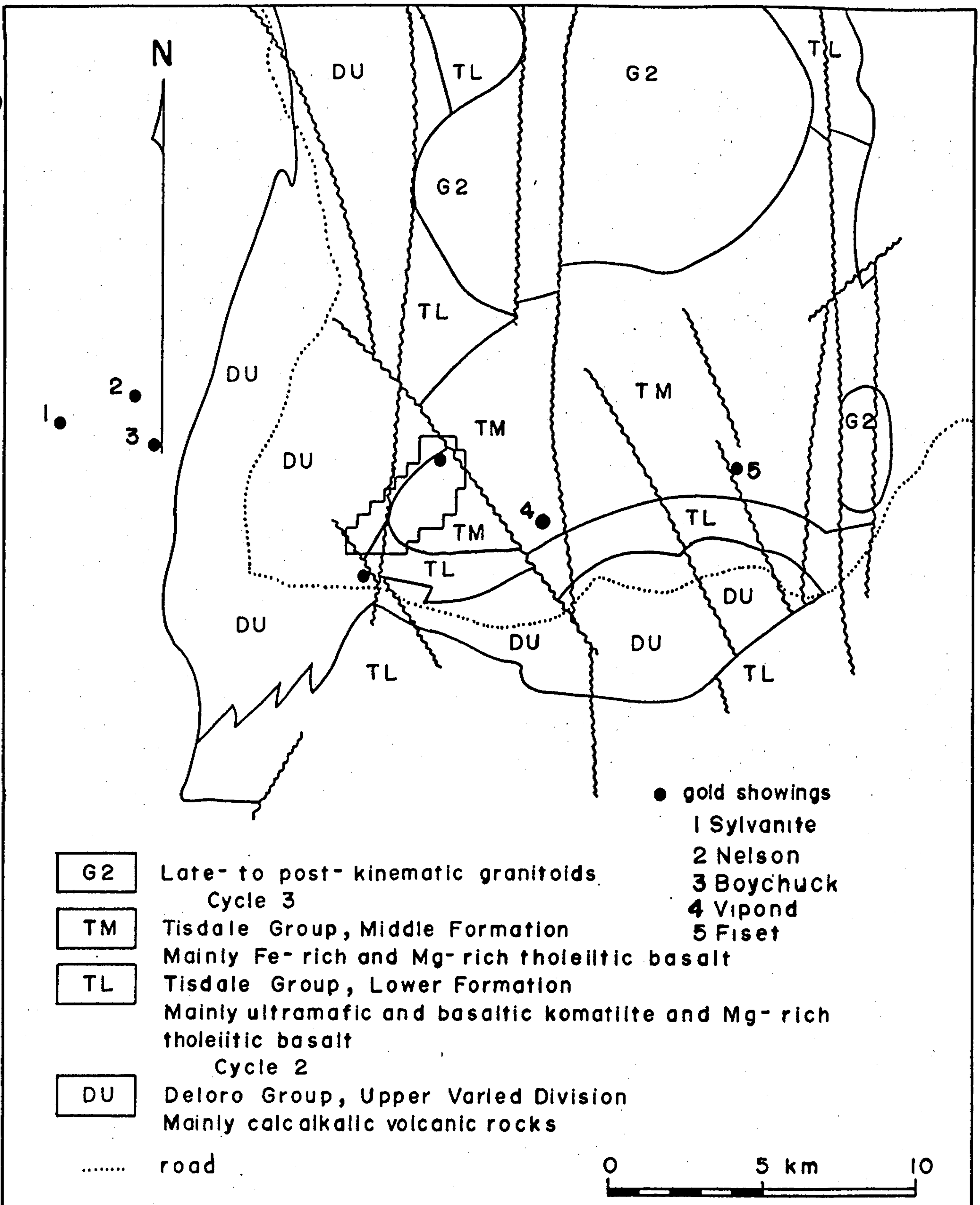
The Townships of English and Zavitz were mapped by Bright in 1967 and 1968 and included in an area of regional mapping by Pyke in 1972. Brights final report on the area (1984) provides a 1 inch to 1/2 mile geology map of the area. Fig. is from OGS Map 2484 (1983). The oldest volcanic cycle in the area is the Archean Deloro Group. In the figure area the upper sequence of the Deloro Group is preserved and consists of calcalkalic volcanic rocks, minor mafic volcanic rocks and oxide and sulphide iron formations. The Deloro Group rocks are overlain by the Lower and Middle Formations of the Tisdale Group. The Lower Formation, mainly ultramafic and basaltic komatite and magnesium-rich tholeiitic basalt, occurs across the property but is not completely shown in figure 3. It is overlain by the Middle Formation, mainly iron-and magnesium-rich tholeiitic basalts, to the east on the claim block. The area has been folded into tight isoclinal folds along roughly east-west fold axes, intruded by granitoids, and faulted by mainly north-south faults.

The property is on the contact between the Deloro and Lower Formation Tisdale Group. Most gold producers in the Porcupine camp are near this contact and in the Lower or Middle Formation of the Tisdale Group. Bright's map 2290 indicates carbonate alteration in outcrops, along a powerline and north west of Steve Lake, interpreted to be felsic rocks of the Deloro Group. Field examination indicated the rocks to be carbonate altered ultramafic rocks which were probably derived from the Lower Formation of the Tisdale Group. Map 2345 by Pyke (1978) interprets the area of carbonate altered ultramafic rocks to be Tisdale Group. (Fig. 4). A reconnaissance traverse located quartz-tourmaline veining with 640 ppb Au in an area of mafic volcanic rocks enclosed by carbonate altered ultramafic rocks. Claims were staked over the open portion of the carbonate altered ultramafic rocks.

PROPERTY GEOLOGY

General Statement

The geology of the east portion of the property is shown on Map 1. A diabase dyke striking about 040 appears to separate Deloro Group rocks on the west from mafic and ultramafic Tisdale Group rocks on the east. Iron Formation occurs along the west contact of the diabase in a thin sedimentary band at the top of a felsic volcanic section. Locally (L47-48N, 230-320E) carbonate altered ultramafic rock occurs within Deloro Group lithologies.



General Geology, English - Zavitz Property

after OGS-MEQR MAP 2484, 1983

Fig. 3.

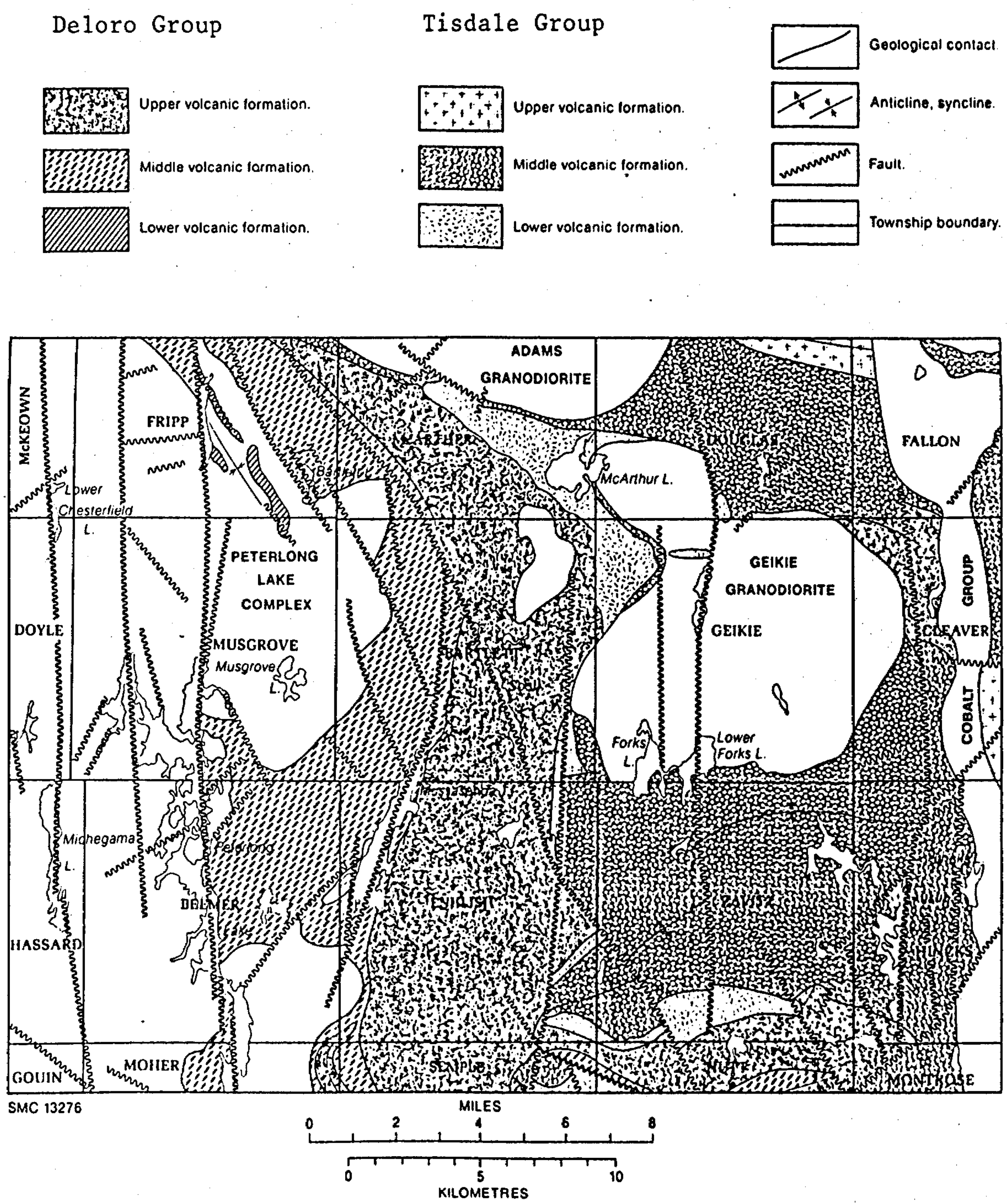


Fig. 4: General Geology, after Pyke (1978). The northeast striking band of Tisdale Group, Lower Volcanic Formation on the English Zavitz township boundary is the band of carbonate altered ultramafic rock referred to in this report.

A 200 to 400 m wide band of carbonate altered ultramafic rocks occurs on the east side of the diabase dyke. It contains lenses of tholeiitic basalts and is overlain by basalt to the east. This mafic-ultramafic section is probably within the Tisdale Group. However, two small outcrops of felsic volcanic rocks occur in it (146, 725 and 895E) indicating that it may be Deloro Group. Bright (1984) includes it with the Deloro Group (Fig. 3), but Pyke (1978) interprets it to be Lower Formation Tisdale Group (Fig. 4).

The band of carbonate altered ultramafic rocks is 3000 m long and open. It is terminated, probably on claim P-997506, by a north west striking right lateral fault which has not been located on the property but is known from regional geology (Fig. 3). The ultramafic rocks probably continue to the south boundary of the property and onto ground being explored by Placer-Dome.

Gold occurs in a lens of mafic volcanic rocks, enclosed by carbonate altered ultramafic rocks, and associated with quartz veining and pyrite. Gold also occurs in aplite bodies intruded into the ultramafic rocks associated with quartz veining and pyrite. Sulphide-oxide facies iron formation on the west side of the diabase dike locally contains anomalous gold.

Felsic and Sedimentary Rocks

The oldest rocks on the property are the predominately felsic volcanic rocks of the Deloro Group. They occur to the west of the diabase dike which roughly follows the baseline on the property. They vary from massive, aphanitic rhyolite to lapilli tuff and block tuff with a chloritic matrix. The rhyolites are locally magnetic with areas and crude bands of disseminated magnetite. They are interbedded with silica-oxide-sulphide facies iron formation which locally is cut by quartz veins and contains anomalous gold. The only other sedimentary rocks observed were banded cherts associated with oxide facies iron formation.

Massive and locally tuffaceous basalt occurs on the west side of the diabase dike in a few localities. It has not been observed in contact with felsic rocks and can not be separated megascopically from the basalts on the east side of the diabase.

Bedding in the felsic and sedimentary rocks is quite variable. On a regional scale the area is on the north limb of the synline striking 050 . Observed bedding varies from 035° to 090° with dips from 45°N through to vertical and to 70° SE around L40 and L48. Bedding on L22N is 145° /45° NE, roughly at right angles to the regional trend. Foliation is very poorly developed. Two observations of foliation or shearing were consistent with the regional trend and were 035-045° /70° SE.

Ultramafic Rocks

A 200 to 400 m wide band of ultramafic rocks occurs on the west side of the diabase dike and locally single outcrops occur on the east side. The ultramafic rocks are altered to a chlorite-actinolite-talc assemblage and locally exhibit spinifex texture and polygonal jointing. Most of the ultramafic outcrops are converted to a light to medium green carbonate-chlorite rock which is mainly ankerite and only locally calcitic. Sampling for gold has indicated mainly background values and two locations with 67 and 60 ppb Au respectively (2840N, 230E, and L38N, 200E). Old pits occur in an outcrop area along the powerline where quartz veins up to 1.0 m thick cut the carbonate altered ultramafic rocks.

The carbonate altered ultramafic rock is commonly massive and medium-grained. Rarely it contains up to 2% disseminated pyrite and 2% quartz veins.

Ten samples of ultramafic rock were analysed and plotted on the Jensen cation diagram. They plot in the basaltic and ultramafic komatiite fields and are probably Lower Formation Tisdale Group. One outcrop mapped as chloritic basalt is basaltic komatiite from the Jensen plot.

Basalt

A section of basalt with an unknown thickness occurs along the east side of the ultramafic rocks and locally is within them. The basalts are mainly fine-grained, massive and locally anygdaloidal or vesicular. They are chloritic, very dark colored and non-magnetic to strongly magnetic. foliation is absent to weak and locally moderately strong in areas of carbonate alteration around L41N, 750E.

On Jensen cation plot one sample plots in the Mg-tholeiitic field and two plots in the calcalkaline basalt field. All three samples fall in the tholeiitic field on an AFM diagram. This indicates that the basalts are leucoxene-bearing basalt outcrops on strike with the 43 N showing are Fe-tholeiitic basalts on both the Jensen and AFM diagrams.

The basaltic section appears to consist of both Mg-and-Fe-tholeiitic flows. The Fe-tholeiites are leucoxene-bearing or strongly magnetic where cut by quartz vein stockworks, or very chloritic. One outcrop mapped as chloritic basalt chemically is a basaltic komatiite (Sample 3054).

Basalts probably underlie the portion of the property south west of L39N between the ultramafic band and Steve Lake-Redstone River. This area is unmapped and mainly covered by cedar or bullrush swamp.

Aplite and Chloritic Granite

A granitic rock occurs as small, isoated outcrops or patches of outcrops possibly comprising elongate stocks 200 m long by 50 m wide. The rock is commonly a pale pink to grey aplite or less commonly a granite with abundant chlorite that weathers like lamprophyre. The aplite is massive, hard, unaltered, but locally is intensely fractured and filled with up to 15% quartz vein stockwork and minor to 5% disseminated pyrite. This mineralized aplite contains up to 76 ppb Au. A soil sample of 5000 ppb Au on L44N is over an aplite subcrop area.

The aplite has been observed to intrude carbonate altered ultramafic rock and occurs close to the 43N showing. The association of quartz veining, disseminated pyrite and some anomalous gold values may indicate that the aplites are pre-gold mineralization and may have intruded into zones of deformation and alteration like the porphyries in the Porcupine camp.

Diabase

A 50 to 200 m wide diabase dike crosses the property roughly along the baseline. The diabase appears to separate Deloro Group rocks to the west from Tisdale Group rocks to the east and may have intruded along an existing zone of structural weakness and alteration. The diabase consists of a medium to coarse-grained leucodiabase phase which is commonly weakly or non-magnetic and a strongly magnetic fine-grained phase. Iron formation or strongly magnetic rhyolite commonly occurs along the west side of the diabase making it difficult to determine the exact location of the diabase contact from magnetics.

Syenite

A diabase outcrop on L27N is cut but a medium-to coarse-grained syenite dyke.

43 N SHOWING

Gold values have been located on the property in four rock types all closely related to the 200 to 400 m wide band of carbonate altered ultramafic rocks (Map 1). Although economic grades are not indicated from surface sampling, a long and wide zone of hydrothermally altered rocks with associated quartz veining, pyritization and gold is present. Gold has been located in carbonated ultramafic rocks (up to 67 ppb Au), in quartz veined and pyritic aplite (up to 76 ppb Au) and in Fe-tholeiitic basalt (up to 1200 ppb Au).

The 43 N showing is a mineralized area located at 43 N, 550E. A poorly exposed subcrop area of Fe-tholeiite basalt is locally cut by a strong quartz vein stockwork with disseminated pyrite in veins and in vein wallrocks. The basalt is fine-grained, chloritic and strongly magnetic. It is cut by a random stockwork of quartz veins from 1 mm to 2 cm thick. The best mineralized areas contain 3-5% quartz veining and 5% pyrite.

The size and abundance of the quartz veins and the presence of wallrock pyrite is similar to that locally seen in aplite unit. The mineralization in basalt may be related to an aplite contact zone although the immediate contact rocks are carbonate ultramafic rocks from 4240N to 4350N.

IP SURVEY

The IP survey was carried out using a pole-dipole array with a dipole spacing of 25 metres; readings were obtained at up to six times the dipole spacing, i.e. n=1 to 6 (see Fig. 3b in Appendix 1). Eight (8) lines - 38N, 39N, 40N, 43N, 44N, 45N, 46N and 47N - were surveyed for a total of 6.4 km of surveying.

The survey results are presented in standard pseudosection format, at a scale of 1:1250, with two pseudosections per survey line. The first pseudosection shows the calculated, apparent resistivity divided by 100 and the observed chargeability for the eighth slice (IPR-11 designation M7) which is taken over the period from 690 to 1050 milliseconds after transmitter current is shut off (see Fig. 3a). The apparent resistivity and chargeability units of measurement are ohm-metres and millivolts per volt (MV/V), respectively. The second pseudosection shows the calculated spectral parameters Tau (time constant) and theoretical chargeability (Cole-Cole M-IP) derived by comparing the measured decay curve with a library of known model curves. The time constant Tau is shown in seconds. The Cole-Cole amplitude factor M is shown in millivolts per volt (MV/V).

TABLE 1

IP ANOMALY LIST

LINE	SURVEY COVERAGE	ANOMALY/ STATION	APP. RES. (OHM-M)	CHARG. (mV/V)	COLE-COLE M (mV/V)	TAU (Sec.)	REMARKS
38N	25E-750E	A 50E-75E	390	22 (N=1)	649	0.1 (Low)	Adjacent to powerline; Mapped as diabase; Low Tau suggests source is fine grained.
		B 150E-200E	3970	16 (N=1)	211	30/100 (High)	Located under powerline, east of diabase; High Tau indicates a coarse grained source; carbonate-chlorite ultramafics in outcrop at 200E; Forms part of Zone 6 (See Map 1); May consist of two narrow, closely spaced sources; Bedrock/Culture?
		C 300E-325E	1370	10 (N=1)	152	0.1/0.01 (Low)	Fine grained source; Carbonate-Chlorite ultramafics mapped in outcrop at 325E; Forms part of Zone 7 which is open to the south of L-38N.
		D 350E-375E	4010	7 (N=1)	186	0.01 (Low)	Fine grained source; No immediate outcrop; In ultramafics?; Forms part of Zone 7; Zone of medium to low resistivity located east of Anomaly D (400E to 450E), indicative of shear/fault zone.
		E 525E-550E	3300	4 (N=1)	106	0.01 (Low)	Weak, questionable anomaly; No outcrop; High res. on N4 to N6 suggests a narrow zone of alteration (silicification?); Zone 8 (Map 1).
39N	25E-675E	A 0E-25E B 50E-75E	1410 3260	12 (N=1) 11 (N=1)	235 369	0.01 (Low) 1.0 (Low)	Anomalies A & B are not fully outlined by the present survey; Immediately under powerline; Bedrock or powerline source(s)?; Mapped as diabase.
		C 125E-150E	2680	19 (N=1)	541	100/10 (High)	Zone 6; Adjacent to powerline; Mapped as chlorite-actinolite-talc ultramafics; Coarse grained source indicated from high Tau.
		D 175E-200E	6820	9 (N=1)	216	.01 (Low)	Questionable anomaly; Located at or near contact with zone of high (6000-9000 ohm-m) resistivity extending from 175E to 275E; At east contact of diabase with ultramafics.
		E 350E-375E	2950	16 (N=1)	555	.01/1 (Low)	Definite bedrock anomaly; Fine grained source; Forms part of Zone 7; In ultramafics; Granite intrusive mapped immediately west of Zone E at 330E.
		F 575E-600E	9470	5 (N=1)	97	.03 (Low)	Weak anomaly; In vicinity of outcrops of weakly carbonate altered Mg tholeiitic basalts; Zone 8 (Map 1).

TABLE 1

IP ANOMALY LIST

LINE	SURVEY COVERAGE	ANOMALY/ STATION	APP. RES. (OHM-M)	CHARG. (mV/V)	COLE-COLE M (mV/V)	TAU (Sec.)	REMARKS
44N	25E-925E	D 500E-525E	7600	20 (N=1)	386	.01 (Low)	Definite anomaly; Forms part of Zone 4 coincident with gold showing; Fine grained disseminated sulphides; Located immediately west of a low resistivity zone (shear/fault) in the vicinity of 575E-625E.
		E 675E-725E	7300	9 (N=1)	190	.1 (Low)	Possible anomaly; May be due to contact effect between rocks of low and high resistivity; Forms part of a broad zone of higher chargeability values east of 675E; Interpreted as forming part of Zone 5 (Map 1).
		F 850E-875E	3000	14 (N=1)	444	30 (High)	Observed on L-44N only but may possibly extend north along the east edge of the survey area (See L-45N). Coarse grained source; No immediate outcrop.
45N	25E-825E	A 25E-50E B 75E-100E	3060 870	12 (N=1) 33 (N=1)	454 485	.1 (Low) 10/100 (High)	Anomalies A & B probably constitute one broad, anomaly caused by a single bedrock source; The apparent grain size may be variable (low to high Tau); There is no immediate outcrop in the vicinity of these anomalies; A & B are located west of diabase dike in Deloro group of rocks.
		C 175E-250E	2600	17	512	1.0-30 (Low-High)	This anomaly appears to occur within or near west edge of diabase dike; Medium to coarse grained source; Higher resistivity values may be indicative of rock type (diabase); Start of Zone 2 which is open to the northeast.
		D 425E-450E	1860	20	566	100 (High)	Forms part of Zone 3; Mapped as altered ultramafic rocks; Grain size appears to be quite variable; Medium to high resistivities may be indicative of alteration effect.
		E 675E-725E	4920	8	183	.1 (Low)	Questionable, weak anomaly; Forms part of Zone 5 (Map 1); Located at or near possible contact with rocks of higher resistivity to the east (altered ultramafics?)
46N	25E-800E	A 75E-125E	1420	22 (N=1)	641	.1-1.0 (Low)	Forms part of Zone 1; Fine grained bedrock source; No immediate outcrop; In Deloro Group rocks; Located west of diabase dike.
		B 250E-285E	1900	17 (N=1)	499	30-100 (High)	Zone 2; Striking roughly NE-SW; Intermediate resistivity with high Tau suggests coarse grained, minor sulphides; Appears to be located along west edge of diabase dike; No outcrop in immediate vicinity of anomaly.

TABLE 1

IP ANOMALY LIST

LINE	SURVEY COVERAGE	ANOMALY/ STATION	APP. RES. (OHM-M)	CHARG. (mV/V)	COLE-COLE M (mV/V)	TAU (Sec.)	REMARKS
40N	25E-925E	A 0E?	10,000?	20 (N=1)	648	.01 (Low)	This anomaly is not fully outlined by the present survey, hence a proper interp. is not possible; Under/adjacent to powerline; At west contact of diabase with felsic volcanics of the Deloro Group.
		B 175E-200E	2520	21 (N=1)	572	100/30 (High)	No immediate outcrop; Located east of dike in ultramafic rocks; High Tau suggests a coarse grained bedrock source; Forms part of Zone 6 which is open to the north of L-40N.
		C 275E-325E	7090	8 (N=1)	153	.01 (Low)	Isolated weak anomaly associated with a zone of higher app. resistivity (7000-9000 ohm-m); Fine grained, bedrock source; No immediate outcrop but located within what is mapped as ultramafic rocks.
		D 450E-475E	4220	5 (N=1)	87	.03 (Low)	Weak, isolated anomaly associated with a zone of med. to high app. res.; Improves slightly with depth; In ultramafic rocks.
		E 650E-700E	6500	9 (N=1)	345	.01 (Low)	Located on west flank of a definite IP anomaly; Associated with a narrow zone of high res. possibly due to silicification; In vicinity of outcrops of weakly carbonate altered, Mg tholeiitic basalts; Zone 8 (Map 1).
		F 725E-750E	8800	11 (N=1)	218	.01 (Low)	With anomaly E forms part of Zone 8; In weakly carbonate altered, Mg tholeiitic basalts; Zone 8 is open to the north of L-40N; Fine grained sulphides.

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TABLE 1

IP ANOMALY LIST

LINE	SURVEY COVERAGE	ANOMALY/ STATION	APP. RES. (OHM-M)	CHARG. (mV/V)	COLE-COLE M (mV/V)	TAU (Sec.)	REMARKS
43N	25E-775E	A 25E-50E B 75E-100E	1660 1140	27 (N=1) 26 (N=1)	689 653	.01 (Low) 100/30 (High)	Anomalies A & B may represent two closely spaced bedrock sources, as indicated, or one wide/broad bedrock source; The high Tau values indicate a coarse grained Source; A narrow zone of low resistivity is observed from 50E to 75E suggestive of a broad source versus two separate sources for these anomalies; A and B form part of Zone 1 which is observed on Lines 43N to 47N; West edge of diabase dike, possibly associated with iron formation at top of felsic volcanic section in Deloro Group of rocks.
		C 300E-350E	3290	18 (N=1)	522	30/100 (High)	Definite, broad, bedrock source; High Tau suggests a coarse grained source; Forms part of Zone 2 observed on Lines 43N to 47N; East of diabase dike; No immediate outcrop; In ultramafic rocks?
		D 500E-525E	3450	11 (N=1)	170	.01 (Low)	Narrow bedrock source; Appears to improve with increasing N; Coincident with 43N gold showing in Fe tholeiite basalts; No distinct res. anomaly; Forms part of Zone 3 which is open to south of L-43N and extends north to L-44N; Ultramafic rocks.
		E 550E-575E	8220	20 (N=1)	416	.03/.01 (Low)	Narrow bedrock source which may indicate east limb of a broad, bedrock source extending from 500E to 575E; Forms part of Zone 3; Coincident with 43N showing (see above).
		F 625E-650E	7160	9 (N=1)	200	.03 (Low)	Weak, possible bedrock anomaly within a broad zone of med. to high res; Mapped as weakly carbonate altered ultramafics.
44N	25E-925E	A 50E-125E	500	32 (N=1)	750	30-100 (High)	Forms part of Zone 1 (Map 1); Coarse grained semi-massive sulphides; Outcrop of rhyolite at 0+60E; Deloro Group; Definite bedrock anomaly.
		B 350E-375E	2600	10 (N=1)	225	.03/.01 (Low)	Possible bedrock anomaly; Forms part of Zone 2; Fine grained disseminated sulphides; Mapped as basalts.
		C 400E-425E	7100	10 (N=1)	231	.03 (Low)	Similar to Anomaly B; Fine grained source in basalts.

TABLE 1

IP ANOMALY LIST

LINE	SURVEY COVERAGE	ANOMALY/ STATION	APP. RES. (OHM-M)	CHARG. (mV/V)	COLE-COLE M (mV/V)	TAU (Sec.)	REMARKS
46N	25E-800E	C 500E-550E	2580	12 (N=1)	443	.01 (Low)	Zone 3; In aplite (intrusive) near east edge of diabase dike; Fine grained source; A narrow zone of low resistivity is observed east of Anomaly C from 650E to 700E (shear/fault zone?)
		D 700E-750E	3570	8 (N=1)	170	.1 (Low)	Zone 5; Located east of narrow zone of low resistivity discussed above; Fine grained source; Minor sulphides; High resistivity may indicate zone of increased silicification. of Zone 5 (Map 1).
47N	25E-750E	A 75E-100E	760	31 (N=1)	727	100 (High)	Forms part of Zone 1 which is open to the north of Line 47N; Coarse grained source as compared to fine grained source on Lines 43N to 46N; Low resistivity suggests semi-massive sulphides; Small outcrop of rhyolite observed 30-40 metres west of this anomaly.
		B 350E-375E	2500	2 0 (N=1)	654	.01/.1 (Low)	Forms part of Zone 2 which is also open to the north; Fine grained source; Iron formation (chert with minor magnetite) observed along strike to the northeast.
		C 575E-625E	4550	9.4 (N=1)	214	.01 (Low)	Fine grained source; Weak anomaly suggests very minor sulphides; Forms part of Zone 3 which is open to the northeast of the present survey area; Coincident with outcrop of carbonate-chlorite altered ultramafic rocks.

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The time constant Tau is considered to be a semi-quantitative measure of grain size of the polarizable source. A long time constant (high Tau) indicates a coarse grained source and a short time constant (low Tau) indicates a fine grained source. This is important in gold exploration as gold is often associated with fine grained sulphide mineralization.

The Cole-Cole M parameter is also very useful because theoretically it is not affected by resistivity. Normally, low resistivity tends to suppress the measured chargeability, decreasing its amplitude. In areas of very high resistivity, the measured chargeability moves sympathetically with the high resistivities. Therefore, when a high chargeability anomaly correlates with a resistivity high, it is impossible to know when anomaly is caused by sulphides. The M parameter helps in the selection of chargeability anomalies associated with resistivities that have a high probability of being caused by sulphides. This is important in gold exploration because gold mineralization is often associated with sulphides within or near zones of silicification (high resistivity).

CONCLUSION

The IP survey mapped 41 anomalies. Most of the anomalies are grouped into eight (8) zones of anomalous responses - labelled Zones 1 to 8 on Map 1 - based on similarities in amplitude and/or character of the measured chargeability, calculated apparent resistivity and spectral parameters. Table 1 provides a list of the IP anomalies together with interpretation comments.

Two anomaly groupings or zones may be of significance for gold exploration. Zone 4 is coincident with the 43N gold showing (Map 1). The three anomalies in Zone 4 have moderate to high chargeability, low to moderate theoretical chargeability and low Tau indicating a fine-grained sulphide source. A low resistivity zone, possibly indicating a shear, occurs subparallel to Zone 4 along its north east side.

Anomaly E on line 39N is the most significant anomaly in Zone 7. It has moderate chargeability, high theoretical chargeability and a low Tau. A low resistivity zone, possibly indicating a shear occurs along the east side of Zone 7.

Both Zone 4 and 7 occur along the east margin of altered ultramafic rocks and are partly flanked on the east by zones of low resistivity possibly indicating a shear. Zone 4 coincides with a gold showing and Zone 7 is on strike with quartz veining in altered ultramafic rocks in the vicinity of L36N, 350E.

An isolated anomaly at 40N, 725 to 750E is within an area of carbonate alteration and weak shearing in Mg tholeiitic basalt. The anomaly has a moderate chargeability, high theoretical chargeability, low Tau and high resistivity. It may be caused by fine-grained sulphides.

RECOMMENDATIONS

Machine stripping and sampling should be done in the vicinity of IP zones 4 and 7 and anomaly F on line 40N in Zone 8. If the results are encouraging IP surveying should be done on lines 41N and 42N and on lines south of 38N prior to diamond drilling.

REFERRENCES

Bright, E.G., 1984
Geology of the Ferrier Lake - Canoeshed Lake Area, O.G.S. Report 231, 60 p. (includes Maps 2289. 2290. 2291).

Pyke, D.R., 1978
Geology of the Peterlong Lake Area, O.G.S. Report 171, 53 p. (includes Map 2345).

APPENDIX I

SURVEY PROCEDURES

INDUCED POLARIZATION SURVEY

A. Theory

The induced polarization method (IP) is based on the electrochemical phenomenon of "over-voltage", that is; on the polarization of electrical charges at the boundaries of discrete metallic minerals, such as sulphides and also clay minerals, that may occur in pore spaces in the rock volume when current is introduced into the ground by means of grounded electrodes.

All naturally occurring sulphides of metallic lustre, as well as some oxides and graphite, give marked induced polarization responses when present in sufficient volume even when such materials occur in low concentrations and in the form of discrete unconnected particles. Thus, induced polarization has general application to the direct detection of disseminated sulphide deposits. Each rock and soil type also exhibits an induced polarization response, usually confined to a relatively low amplitude range, which is characteristic of the mineral or soil. However, certain clays and "laminar" minerals including serpentine, sericite and chlorite may give rise to an anomalous response. These effects are attributed largely to "membrane" polarization.

In order to measure IP effects in a volume of rock, a current is introduced into the ground by means of two grounded current electrodes and the resulting potential differences or voltages are measured across two potential electrodes.

In practice, two different techniques are used, namely "Time Domain" and "Frequency Domain". For the Time Domain technique a direct current is allowed to flow for several seconds and then cut off. When the external current flow is cut off the polarized electrical charges return to their former states in a finite period of time. This phenomenon can be observed by measuring the voltage of the ground. Over a period of time, the observed polarization voltage decays to its background value. Its amplitude and period of decay is an indication of the amount of polarizable material as well as a crude indicator of the type of polarizable material detected. The current waveform induced in the ground and the resulting voltages set up are shown in Fig. 3a.

B. Field Measurements - Time Domain

The field measurements taken with the Time Domain technique are as follows:

1. The applied current, Ia, flowing through the two current electrodes;

2. The difference in potential, Vp, existing between the potential electrodes while the current, Ia, is flowing;

3. The apparent chargeability, Ma, which is the IP effect for one current pulse, where chargeability is defined as:

$$Ma = \frac{Vs}{Vp} \times 1000 \text{ mV/V}$$

where Ma - apparent chargeability

Vs - secondary or polarization voltage measured during the "current off" part of the cycle.

Vp - primary ground voltage measured during the "current on" part of the cycle.

From 1 and 2 above, the calculated apparent resistivity is defined as:

$$\rho_a = G \times \frac{Vp}{Ia} \text{ (ohm-m)}$$

where ρ_a - apparent resistivity

Vp - as defined above

Ia - transmitter current

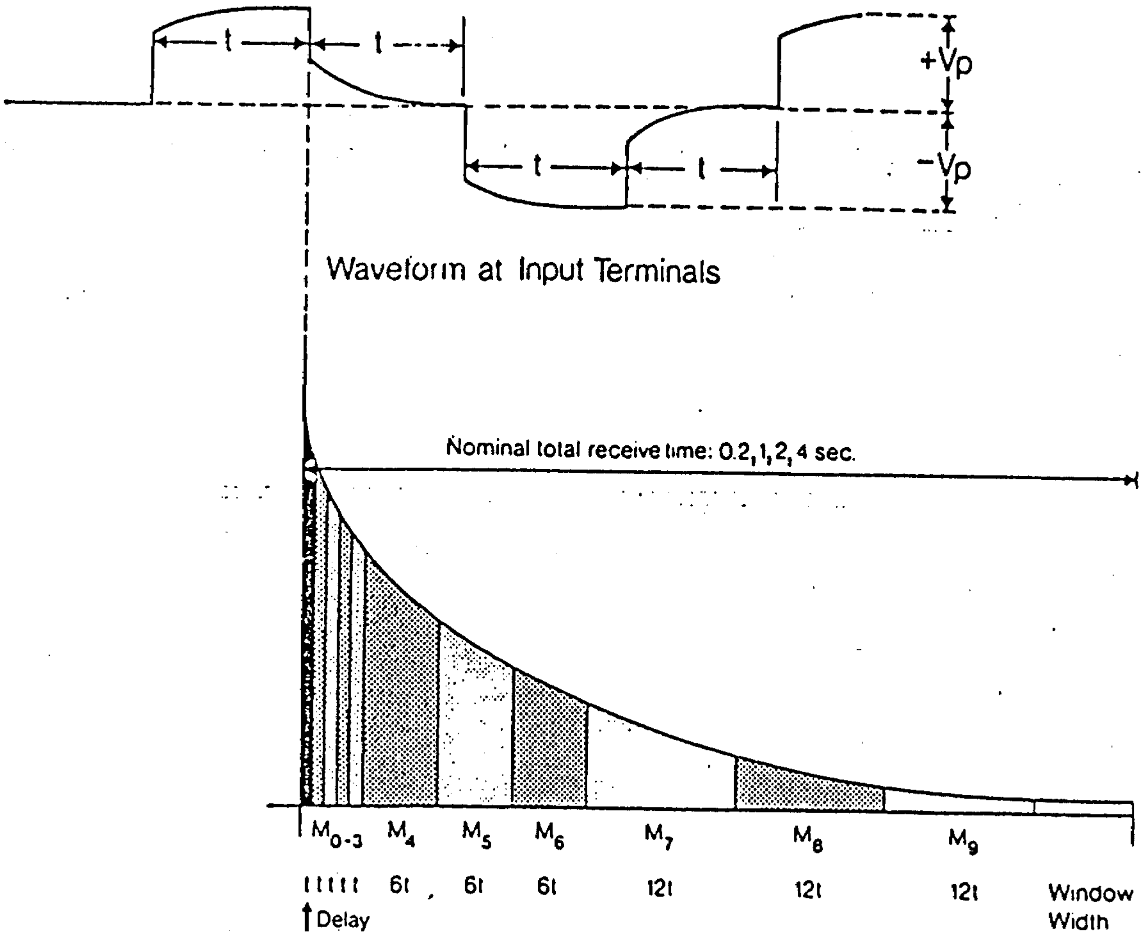
G - Geometric factor dependent on type of electrode array and its size

C. <u>Equipment and Survey Procedures</u>

A Scintrex time domain IP system was used, consisting of an IP and DC resistivity transmitter and an IPR-11 IP receiver.

The pole-dipole (Fig. 3b) array configuration was used for this survey. All lines were surveyed using a dipole length of 25 metres. Measurements were made at up to six times the dipole length, i.e. N = 1 to 6.

All the surveying was done on parallel, pre-cut lines. The transmitting electrodes consisted of stainless steel rods, while the receiving electrodes were comprised of porous ceramic pots filled with a saturated copper sulphate solution.



IPR-11 Timing for the Slices of an IP Decay Curve, where t represents t_{tx}

IPR-11 Timing Data

MODE Sec.	SLICE	DURATION ms	FROM ms	TO ms	MID-POINT ms
t=2.0	0	30	30	60	45
	1	30	60	90	75
	2	30	90	120	105
	3	30	120	150	135
	4	180	150	330	240
	5	180	330	510	420
	6	180	510	690	600
	7	360	690	1050	870
	8	360	1050	1410	1230
	9	360	1410	1770	1590

Figure 30

METHOD USED IN PLOTTING POLE-DIPOLE INDUCED POLARIZATION AND RESISTIVITY RESULTS

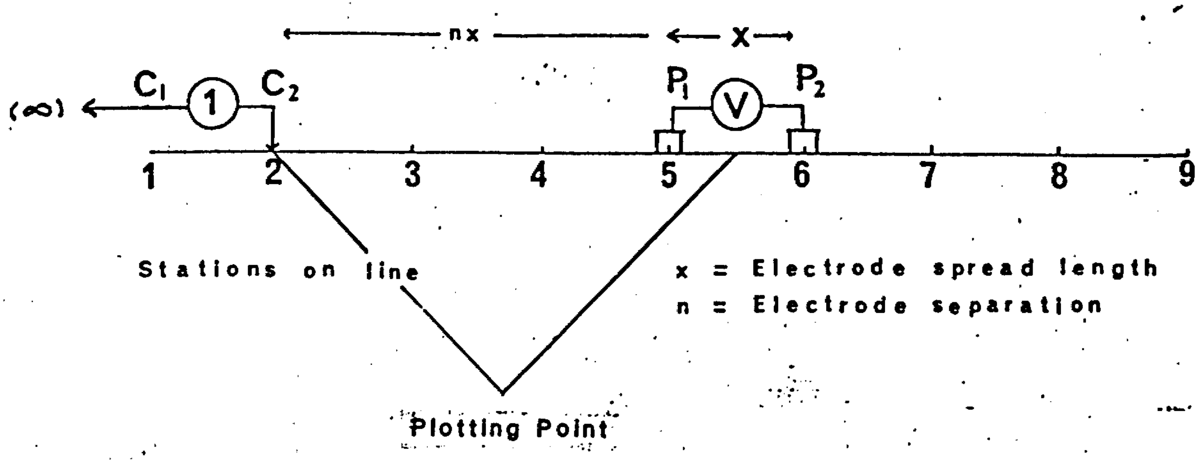


Fig. 3 b

APPENDIX 2

Confirmation of Technical Days and Invoices

JVX Ltd.

33 Glen Cameron Road, Unit 2, Thornhill, Ontario, Canada L3T 1N9 Tel: (416) 731-0972

12 May 1988

Mining Lands Section
Ministry of Northern Development and Mines
6610 Whitney Block
Toronto, Ontario
M7A 1W3

Attention: T. Soobrian

Re: Esso Minerals Canada Limited

Sir:

JVX Ltd. certifies that from 14 to 23 December 1988, IP surveys were performed on the English and Zavitz Townships properties of Esso Minerals Canada Limited.

Man-time expended on the project totalled 50 man-days in the field and 2 man-days in the office.

Yours truly,

James Whyte

enc.

Geophysical Consulting & Service to the Mining Industry

MAN-DAY REPORT FOR JOB 8799 (ESSO MINERALS CANADA LIMITED, ENGLISH TWP.)

Field Operations

Neil Hughes	14/12-19/12	6 work days
Charles Wakefield	14/12-19-12	6 work days
Howard Northfield	20/12-23/12	4 work days
Brian Fox	20/12-23/12	4 work days
Greg Hartford	14/12-23/12	10 work days
Arthur Blais	14/12-23/12	10 work days
Jean Therrien	14/12-23/12	10 work days

TOTALS: 50 MAN-DAYS PRODUCTION

Office Operations

Professional: (Total 15 h)
Zdenek Duchoslav 8.5 h
Howard Northfield 4 h
Carson Austin 2.5 h

Drafting and Clerical: (Total 0.5 h)
Helen Lewis 0.5 h

ESSO MINERALS CANADA
120 ADELAIDE STREET WEST, P.O. BOX 4029, STATION "A"
TORONTO, ONTARIO M5W 1K3
(416) 968-5200

S. B. MacEACHERN
Regional Exploration Manager

May 6th, 1988

File: 16.73.A01
English-Zavitz, 42A/3

Mining Lands Section
Ministry of Northern Development & Mines
Room 6610, Whitney Block
Parliament Building
Toronto, Ontario
M7A 1W3

Attention: T. Soobrian

Dear Sir:

Re: IP Surveying in English Twp.

I certify the following:

JVX Ltd. performed IP surveying for Esso Minerals Canada in December, 1987 and pseudosection preparation in January 1988. The work was paid for as invoiced by JVX Ltd. on their invoices of December 29, 1987, number 776 and February 24, 1988, number 869.

Dane Bridge, geologist, and Lloyd Wilson, geophysicist, were involved with field supervision, field interpretation, final interpretation and report preparation for 5 days and 4 days respectively between December 23, 1987 and March, 1988.

Yours truly,

R. Civello
Accountant

RC:zr

1673 B02
charged 901

JVX Ltd.
33 Glen Cameron Road, Unit 2, Thornhill, Ontario, Canada L3T 1N9 Tel: (416) 731-0972

Invoice No. 869
Our file: 8799
Your file:

February 24, 1988

Esso Minerals Canada Ltd.
P.O. Box 290
637 Algonquin Avenue East
Timmins, Ontario
P4N 7N6

Attention: Dane Bridge

Re: IP pseudosections, English Twp. project

IP pseudosections, 6.225 km @ $40/km......................$	249.00
Spectral pseudosections, 6.225 km @ $40/km................	249.00
TOTAL THIS INVOICE.......................................$	498.00

PLEASE REMIT BY COURIER

English - Zavitz
1673 B02

JVX Ltd.

33 Glen Cameron Road, Unit 2, Thornhill, Ontario, Canada L3T 1N9 Tel: (416) 731-0972

Invoice No. 776
Our file: 8799
Your file:

December 29, 1987

Esso Minerals Canada Ltd.
P.O. Box 290
637 Algonquin Avenue East
Timmins, Ontario
P4N 7N6

Attention: Dane Bridge

Re: English Twp. project, 14-23 Dec.

Mobilization-demobilization	$ 3000.00
3 construction days @ $1100/day	3300.00
7 production days @ $1500/day	10500.00
Camp rental, 9 days @ $150/day	1350.00
Truck and supplies, 9 days @ $100/day	900.00
Food, 45 man-days @ $30/man-day	1350.00
Total	$ 20400.00
Down payment	(10000.00)
TOTAL THIS INVOICE	$ 10400.00

PLEASE REMIT BY COURIER

APPENDIX 3

STATEMENT OF QUALIFICATIONS

I, Dane Bridge, of 205 Cherry Street, Timmins, Ontario certify that:

I am a graduate in Geology of the University of Manitoba with a B.Sc Hons. in 1969 and a M.Sc in 1972.

I have been practicing my profession continuously since graduation

I am a member of the Geological Association of Canada.

I have no interest in the properties or securities of Coniagas Mines Limited nor Beaverhead Resources Ltd.

I have supervised all phases of exploration on the HN property

Dated April, 1988

Dane Bridge

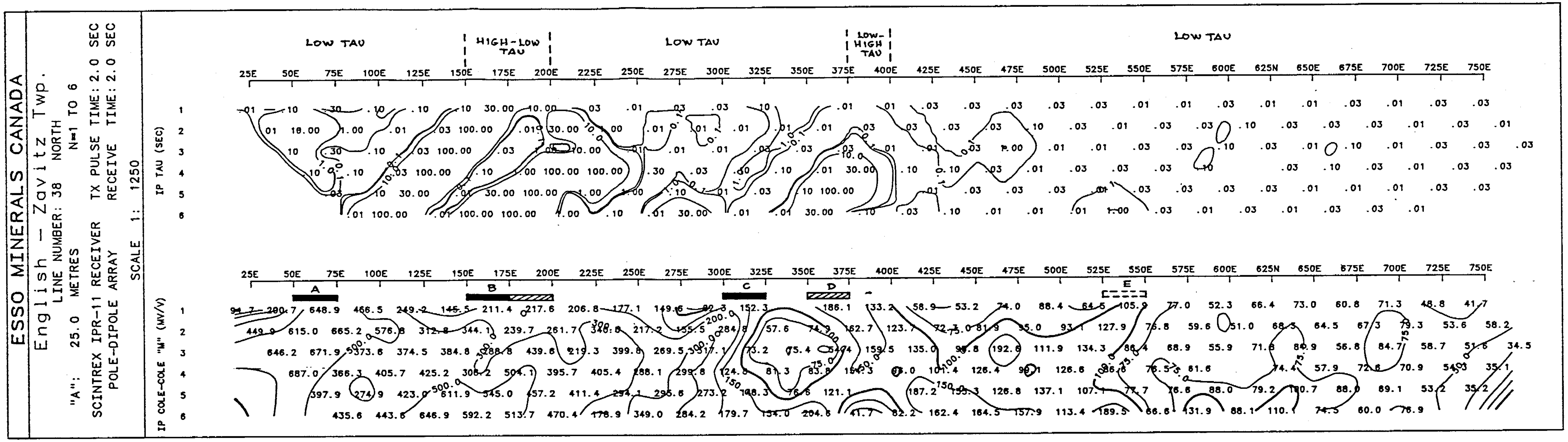
QUALIFICATIONS OF AUTHOR

Lloyd M. Wilson attended Memorial University of Newfoundland between 1966 and 1971, graduating with a B.A. (Honors) degree in Mathematics. From May, 1971 to October, 1973, Mr. Wilson worked full-time in oil and gas exploration for Amoco Canada Petroleum Co. Ltd. in Calgary, Alberta, specializing in gravity, magnetic and seismic methods. Since then he has had eleven years of experience as a mineral exploration geophysicist - three with Geoterrex Ltd. (1973-1976) in Ottawa and eight with Esso Minerals Canada in Toronto (1978-86). For the past six years he has been involved in project planning, supervision, geophysical field activities, report writing and the training and supervision of student personnel for Esso Minerals Canada. He is a member of the Society of Exploration Geophysicists, the Prospectors and Developers Association, CIMM (Toronto Branch), KEGS (Canadian Society of Exploration Geophysicists) and MGLS (Minerals and Geotechnical Logging Society).

Lloyd M. Wilson

Lloyd M. Wilson

April 1, 1986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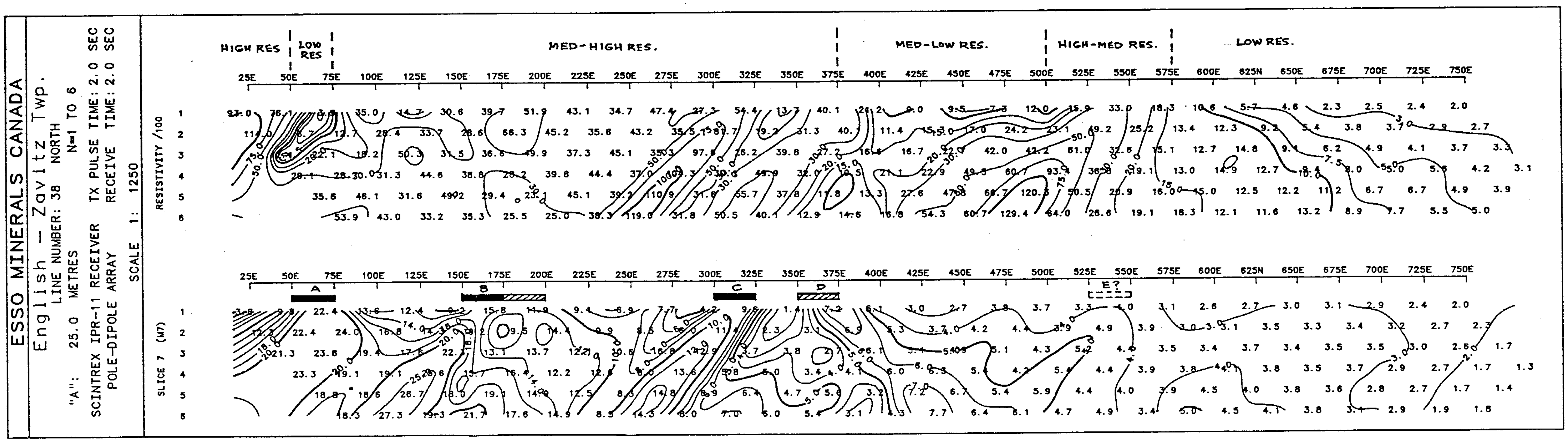
POLE-DIPOLE ARRAY RECEIVE TIME: 2.0 SEC
SCALE 1: 1250
LOW TAU
HIGH-LOW TAU
LOW TAU
LOW-HIGH TAU
LOW TAU
IP TAU (SEC)
IP COLE-COLE "M" (MV/V)
A
B
C
D
E

2.11251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LOW RES
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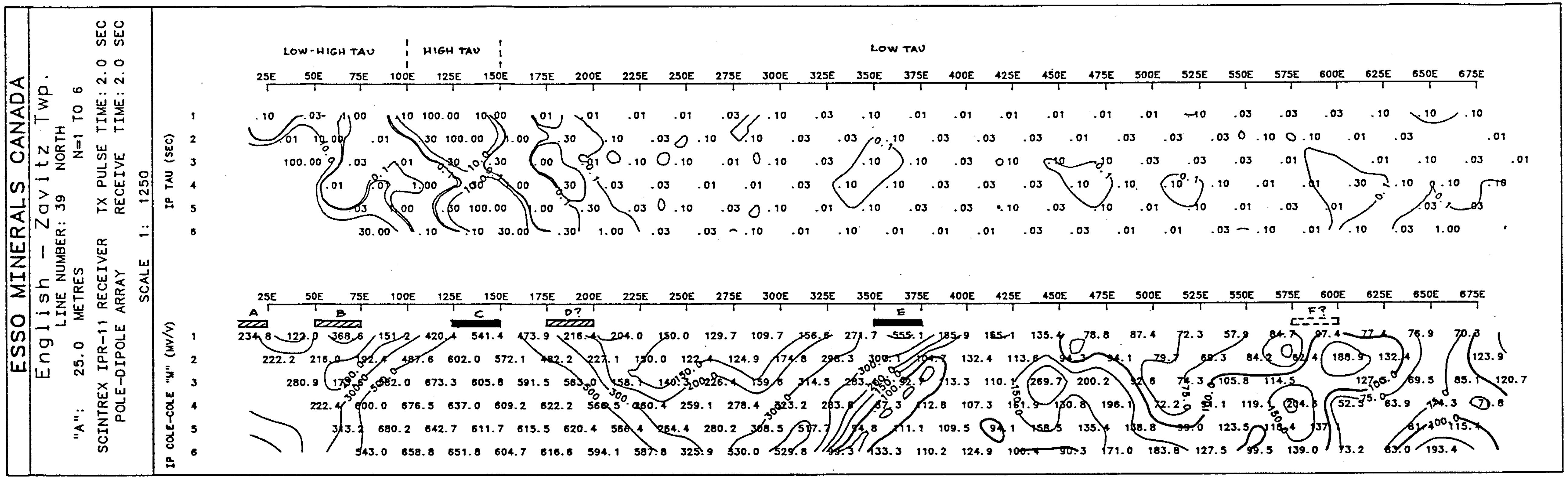
B
C
D
E?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HIGH TAU
LOW TAU
IP TAU (SEC)
IP COLE-COLE "M" (MV/V)
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B
C
D?
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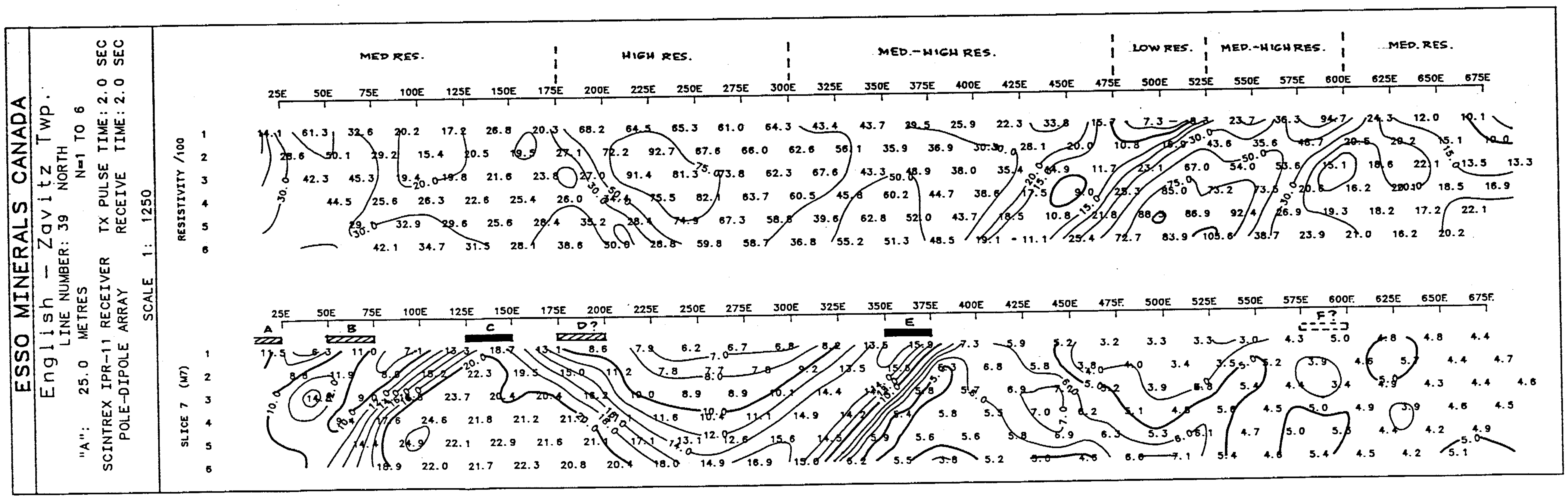
F?

2.11251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HIGH RES.
MED.–HIGH RES.
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MED.–HIGH RES.
MED. RES.
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SLICE 7 (M7)
A
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D?
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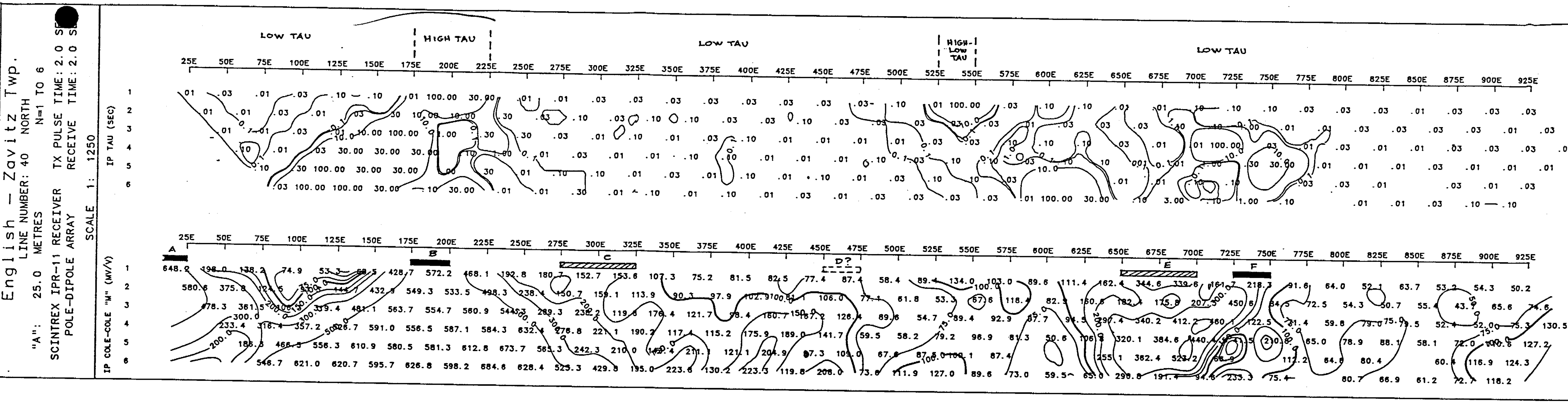
F?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HIGH TAU
LOW TAU
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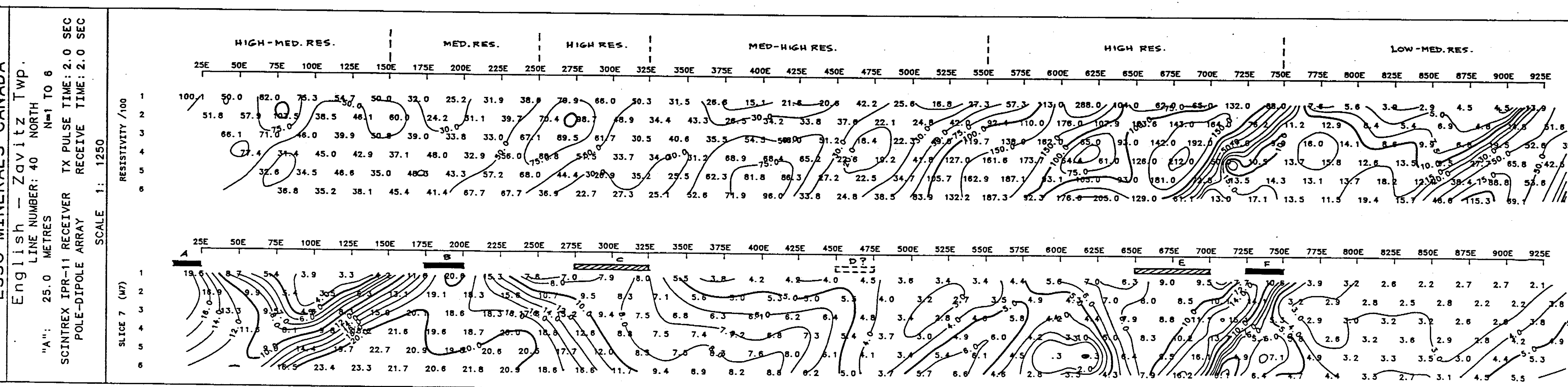
F

2.11251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MED. RES.
HIGH RES.
MED-HIGH RES.
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SLICE 7 (MT)
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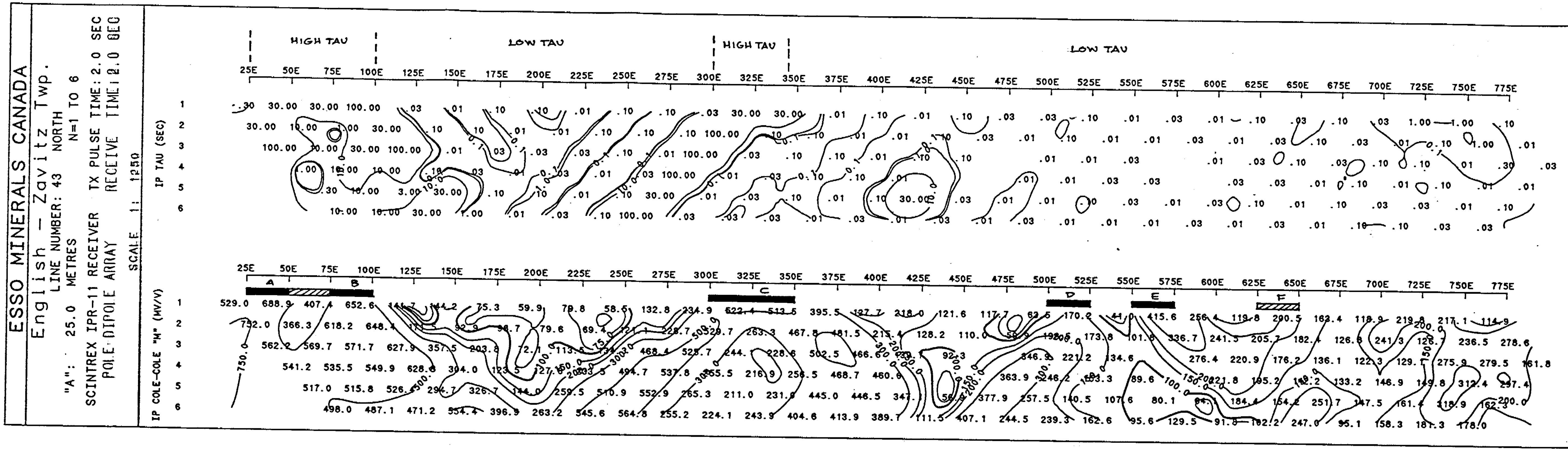
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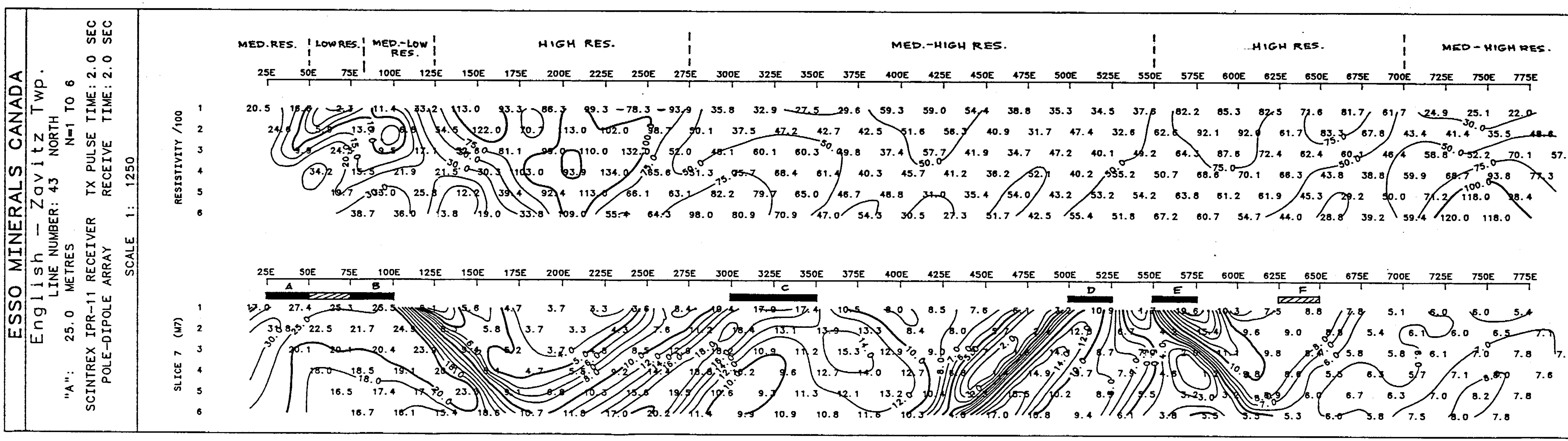
IP COLE-COLE "M" (MV/V)
HIGH TAU
LOW TAU
HIGH TAU
LOW TAU

2.11251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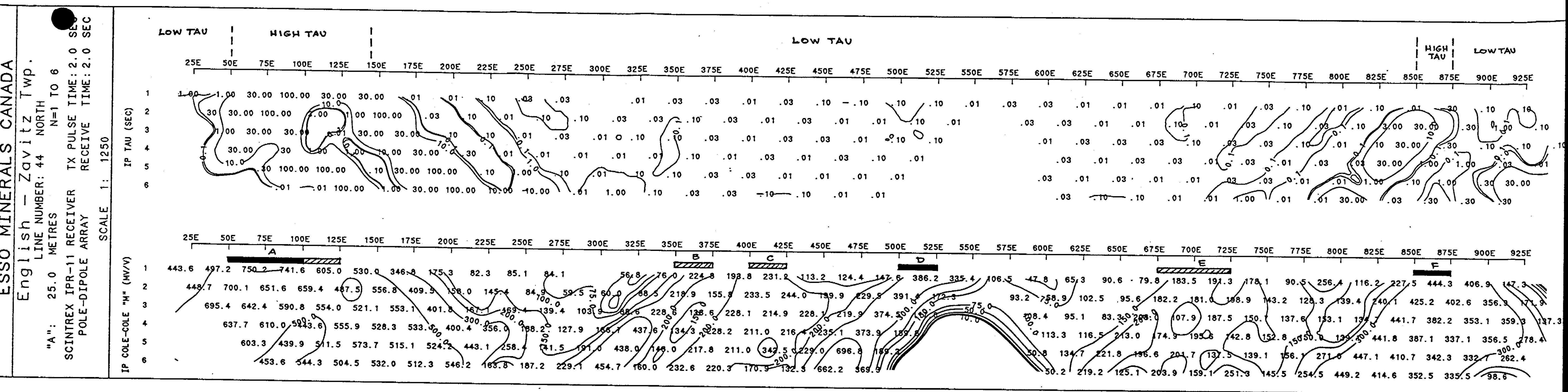
MED.-HIGH RES.
HIGH RES.
MED-HIGH RES.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HIGH TAU
LOW TAU
HIGH TAU
LOW TAU
IP TAU (SEC)
IP COLE-COLE "M" (MV/V)
A
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C
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E
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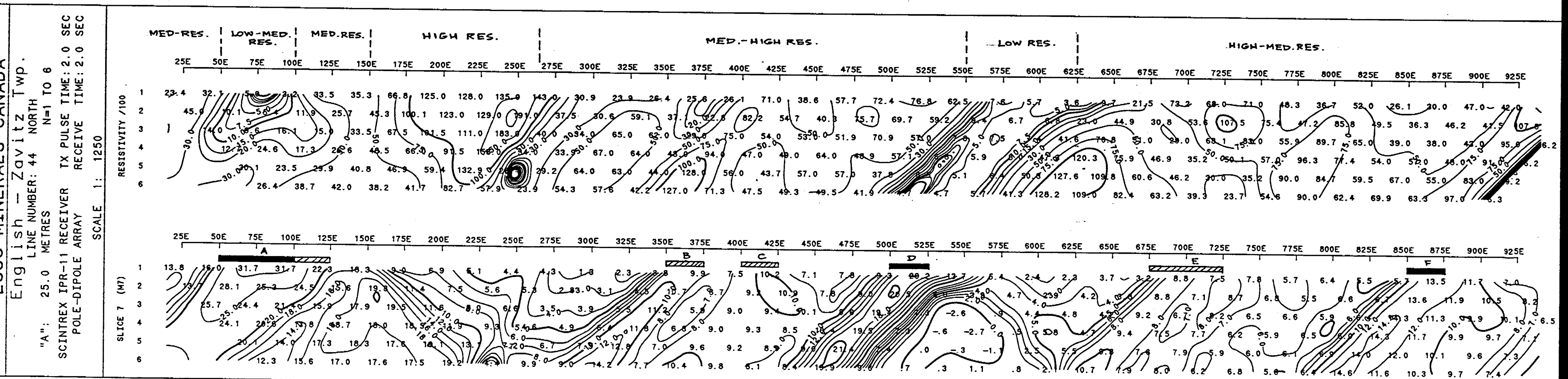
2.11251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MED.RES.
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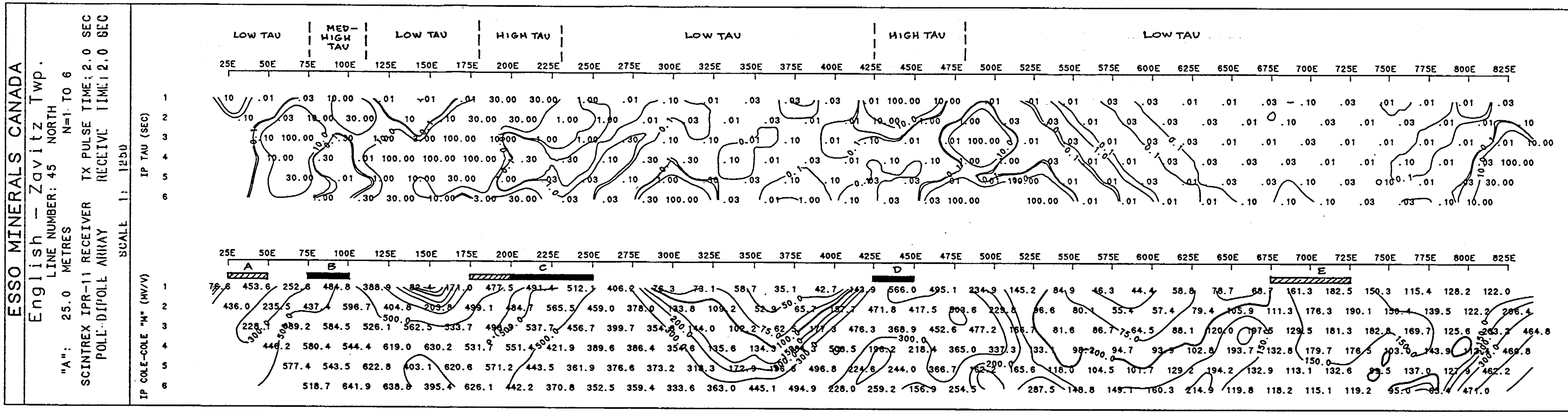
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B
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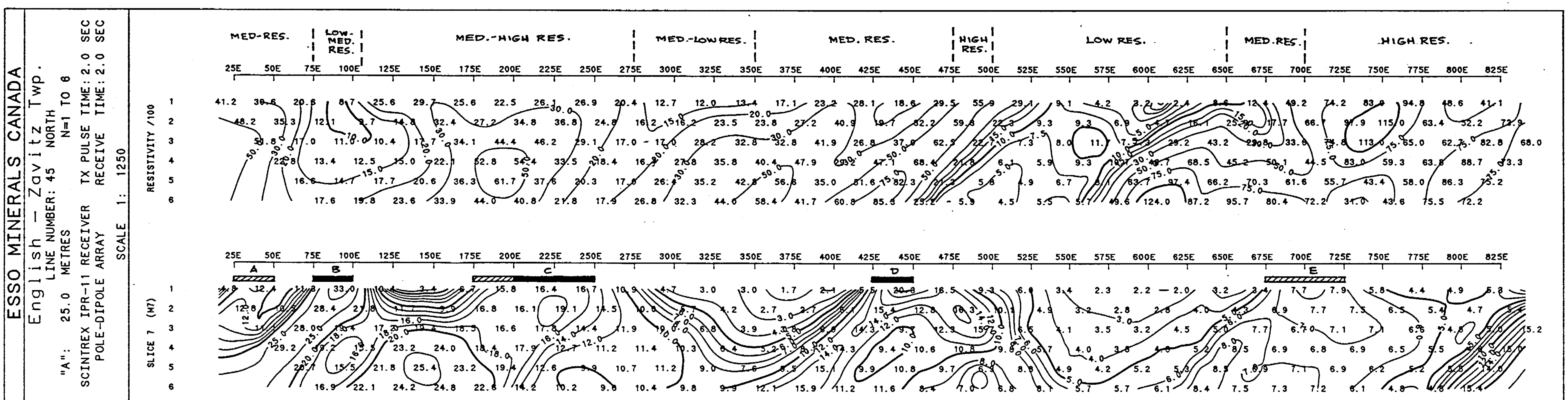
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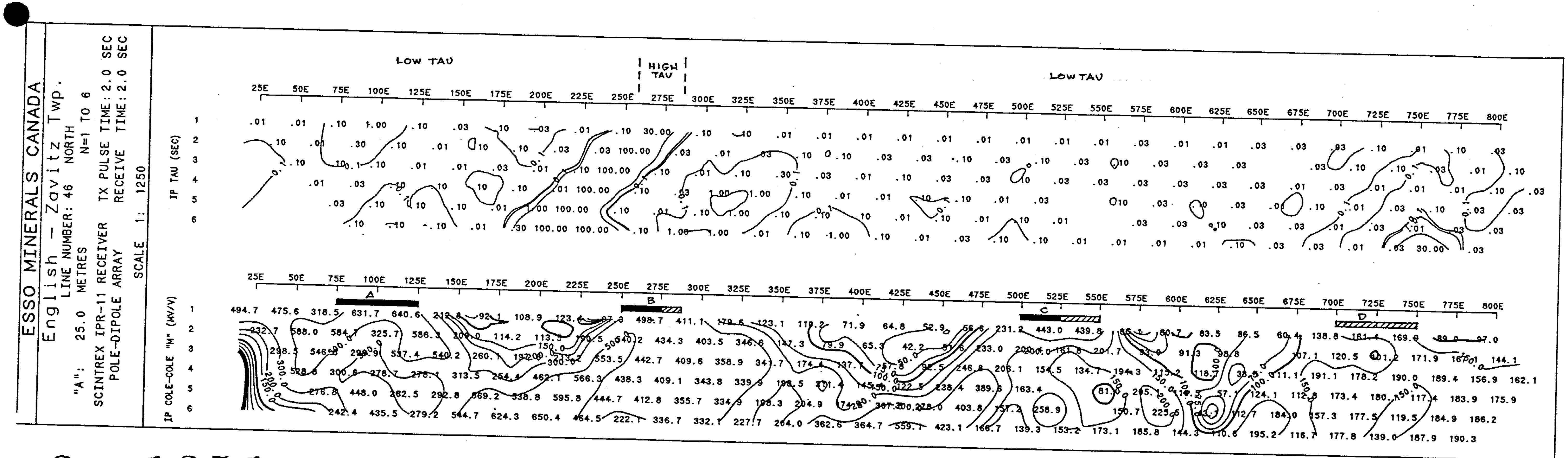
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SCALE 1: 1250
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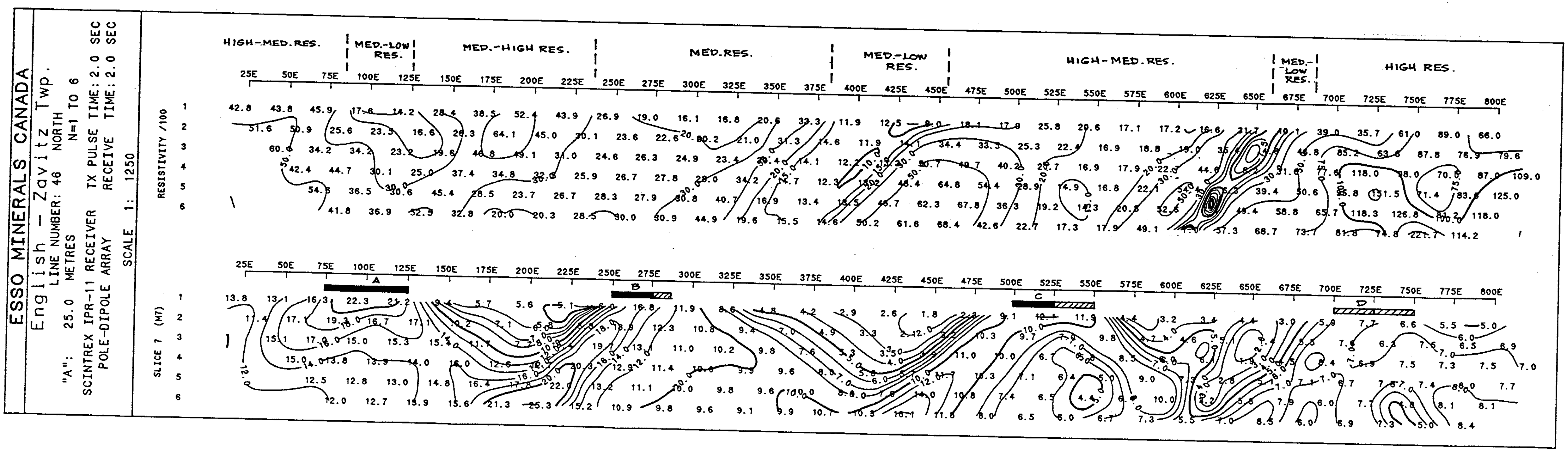
HIGH TAU
LOW TAU
IP TAU (SEC)
IP COLE-COLE "M" (MV/V)
A
B
C
D

2.11251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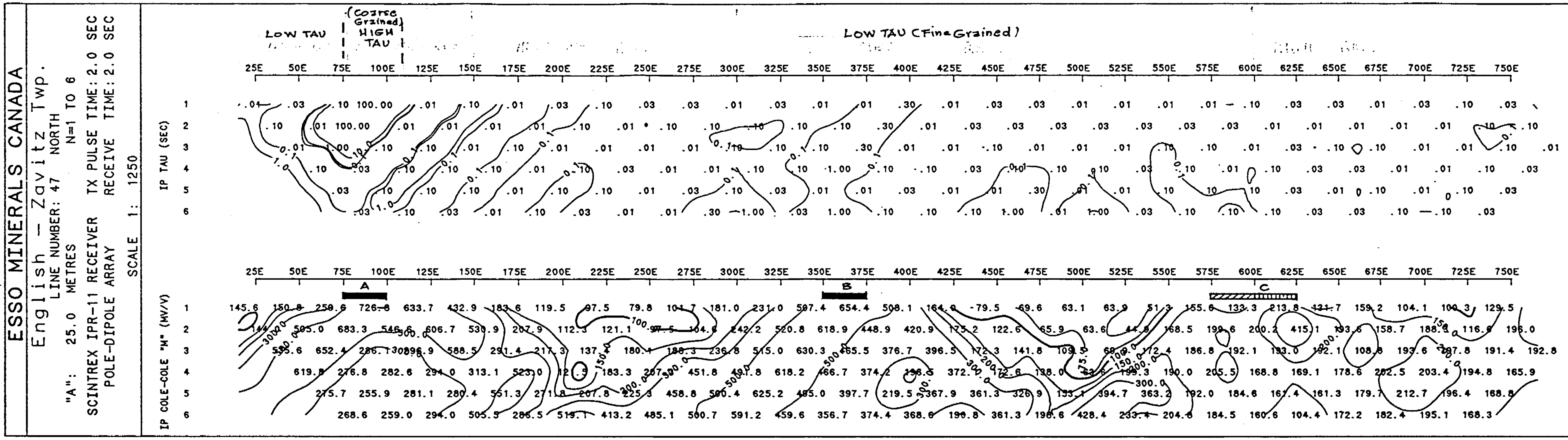
MED.-LOW RES.
MED.-HIGH RES.
MED. RES.
MED.-LOW RES.
HIGH-MED. RES.
MED.-LOW RES.
HIGH RES.
RESISTIVITY /100
SLICE 7 (MT)
A
B
C
D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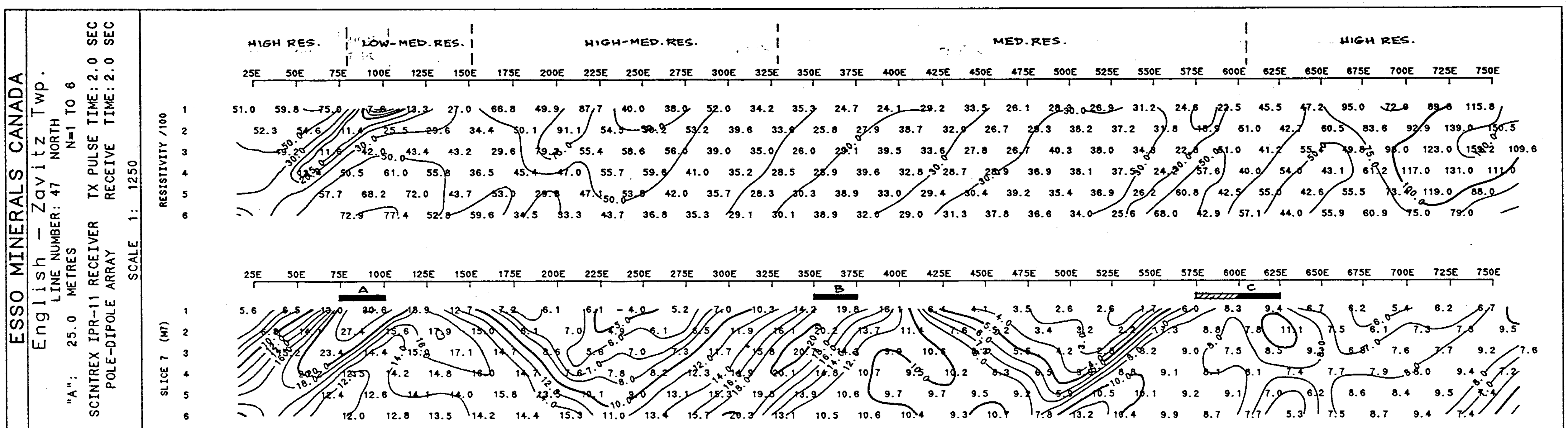
SCALE 1: 1250
LOW TAU
(Coarse Grained) HIGH TAU
LOW TAU (Fine Grained)
IP TAU (SEC)
IP COLE-COLE "M" (MV/V)
A
B
C

2.11251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HIGH RES.
LOW-MED. RES.
HIGH-MED. RES.
MED. RES.
HIGH RES.
RESISTIVITY /100
SLICE 7 (MT)
A
B
C

ESSO MINERALS CANADA

THIRD FLOOR, HOLLINGER BUILDING
637 ALGONQUIN AVENUE EAST, P.O. BOX 290
TIMMINS, ONTARIO P4N 7N6
TELEPHONE: (705) 267-6680

DANE A. BRIDGE
District Geologist, Timmins

File: 1673 A.01
English-Zavitz,
42A/3

May 27, 1988

Mining Lands Section
Ministry of Northern Development
and Mines
Room 6610, Whitney Block
Parliament Building
Toronto, Ontario
M7A 1W3

ATTN: T. Soobrian

RE: Induced Polarization Survey, English-Zavitz Property

Dear Mr. Soobrian

Enclosed are two copies of the above report. The report of work form is affixed to the front of the report.

RECEIVED

MAY 30 1988

MINING LANDS SECTION

Yours truly

Dane Bridge

cc. J. Pire (Toronto file copy)
R. Gashinski (Report of Work only)

Ministry of
Northern Development
and Mines

Ontario

Ministère du
Développement du Nord
et des Mines

July 27, 1988

Your file: W8806-173
Our file: 2.11251

Mining Recorder
Ministry of Northern Development and Mines
60 Wilson Avenue
Timmins, Ontario
P4N 2S7

Dear Sir:

Re: Notice of Intent dated July 12, 1988
Geophysical (Induced Polarization) Survey
submitted on Mining Claims P 986766 et al
in the Townships of English and Zavitz

The assessment work credits, as listed with the above-mentioned Notice of Intent, have been approved as of the above date.

Please inform the recorded holder of these mining claims and so indicate on your records.

Yours sincerely,

W.R. Cowan, Manager
Mining Lands Section
Mines & Minerals Division

Whitney Block, Room 6610
Queen's Park
Toronto, Ontario
M7A 1W3

Telephone: (416) 965-4888

D.KRM:pl
Enclosure

cc: Mr. G.H. Ferguson
Mining and Lands Commissioner
Toronto, Ontario

Esso Resources Limited
Box 4029
Station A
Toronto, Ontario
M5N 1K3

Resident Geologist
Timmins, Ontario

Ministry of Northern Development and Mines

Ontario

Technical Assessment Work Credits

File
2.11251

Date	Mining Recorder's Report of Work No.
July 12, 1988	W8806-173

Recorded Holder	Esso Resources LIMITED
Township XXXX	English and Zavitz

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	
Electromagnetic ____ days	
Magnetometer ____ days	
Radiometric ____ days	
Induced polarization 47.44 days	P 997504 to 506 inclusive 997716 to 719 inclusive 997722-723
Other ____ days	
Section 77 (19) See "Mining Claims Assessed" column	
Geological ____ days	
Geochemical ____ days	
Man days [x] Airborne [ ]	
Special provision [ ] Ground [ ]	
[ ] Credits have been reduced because of partial coverage of claims.	
[ ] Credits have been reduced because of corrections to work dates and figures of applicant.	

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims

[X] not sufficiently covered by the survey [ ] insufficient technical data filed

P 986766
986971-972
997701-702
997707 to 710 inclusive
997715
997720-721

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geologocal - 40; Geochemical - 40; Section 77(19) - 60.

828 (85/12)

Ministry of Northern Development and Mines
Ontario

Report of Work
(Geophysical, Geological, Geochemical and Expenditures)

DOCUMENT No. W8806·173

Mining Act 2.11251

Instructions: – Please type or print.
– If number of mining claims traversed exceeds space on this form, attach a list.
Note: – Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.
– Do not use shaded areas below.

Type of Survey(s): Induced Polarization

Township or Area: English - Zavitz

Claim Holder(s): Esso Resources Limited

Prospector's Licence No.: T-872

Address: Box 4029, Station A, Toronto, Ontario M5N 1K3

Survey Company: JVX Ltd.

Date of Survey (from & to): 14 Day 12 Mo. 87 Yr. | 23 Day 12 Mo. 87 Yr.

Total Miles of line Cut: 6.225 km

Name and Address of Author (of Geo-Technical report): Dane Bridge, Esso Minerals Canada, Box 290 Timmins, Ontario P4N 7N6

Credits Requested per Each Claim in Columns at right

Special Provisions	Geophysical	Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	Electromagnetic	
	Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	Radiometric	
	Other	
	Geological	
	Geochemical	
Man Days	Geophysical	Days per Claim
Complete reverse side and enter total(s) here	Electromagnetic	
7 credits on 21 claims	Magnetometer	
	Radiometric	
	Other	20.3
	Geological	
	Geochemical	
Airborne Credits		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	
	Magnetometer	
	Radiometric	

PORCUPINE MINING DIVISION RECEIVED MAY 31 1988

RECEIVED MAY 30 1988 MINING LANDS SECTION

Mining Claims Traversed (List in numerical sequence)

Prefix	Number	Expend. Days Cr.
P	986766	
	996971	
	996972	
	997504	
	997505	
	997506	
	997701	
	997702	
	997707	
	997708	
	997709	
	997710	
	997715	
	997716	
	997717	
	997718	
	997719	
	997720	
	997721	

Prefix	Number	Expend. Days Cr.
P	997722	
	997723	

RECEIVED JUN 27 1988 MINING LANDS SECTION

RECORDED MAY 31 1988

Expenditures (excludes power stripping)

Type of Work Performed:

Performed on Claim(s):

PORCUPINE MINING DIVISION RECEIVED MAY ...

Calculation of Expenditure Days Credits

Total Expenditures				Total Days Credits
$	÷	15	=	

Instructions

Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Total number of mining claims covered by this report of work: 21

For Office Use Only		
Total Days Cr. Recorded	Date Recorded	Mining Recorder
426.3	MAY 31, 1988	[signature]
	Date Approved as Recorded	Branch Director
	Please See Revised Statement.	

Date: May 11, 1988 — Recorded Holder or Agent (Signature): [signature]

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying

Dane Bridge, Esso Minerals Canada, Box 290 Timmins, Ontario P4N 7N6

Date Certified: May 27, 1988 — Certified by (Signature): [signature]

Assessment Work Breakdown

Man Days are based on eight (8) hour Technical or Line-cutting days. Technical days include work performed by consultants, draftsmen, etc..

Type of Survey: Induced Polarization

Technical Days				Technical Days Credits		Line-cutting Days		Total Credits		No. of Claims		Days per Claim
61	X	7	=	427	+	0	=	427	÷	21	=	20.3

Type of Survey

Technical Days				Technical Days Credits		Line-cutting Days		Total Credits		No. of Claims		Days per Claim
	X	7	=		+		=		÷		=	

Type of Survey

Technical Days				Technical Days Credits		Line-cutting Days		Total Credits		No. of Claims		Days per Claim
	X	7	=		+		=		÷		=	

Type of Survey

Technical Days				Technical Days Credits		Line-cutting Days		Total Credits		No. of Claims		Days per Claim
	X	7	=		+		=		÷		=	

X crew: 5 men x 10 days	=	50 days
X drafting, 1 man x 2 days	=	2
Bridge, 5 days	=	5
Wilson, 4 days	=	4
TAL		61 days

Ministry of Northern Development and Mines

Ontario

Geophysical-Geological-Geochemical Technical Data Statement

File ______________

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey(s) Induced Polarization

Township or Area English-Zavitz

Claim Holder(s) Esso Resources Canada Limited

Survey Company JVX Ltd.

Author of Report Dane Bridge

Address of Author Box 290 Timmins, Ontario P4N 7N6

Covering Dates of Survey 14/12/87 - 23/12/87 (linecutting to office)

Total Miles of Line ~~Cut~~ Surveyed 6.225 km

SPECIAL PROVISIONS CREDITS REQUESTED

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

	DAYS per claim
Geophysical	
—Electromagnetic	
—Magnetometer	
—Radiometric	
—Other	
Geological	
Geochemical	

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer ______ Electromagnetic ______ Radiometric ______
(enter days per claim)

DATE: ______________ SIGNATURE: ______________
Author of Report or Agent

MINING CLAIMS TRAVERSED
List numerically

(prefix) (number)

(Actual claims covered by IP surveying. For 21 claims with credits requested see Report of work)

P-997504
997505
997506

P-997716
997717
997718
997719
997722
997723

If space insufficient, attach list

TOTAL CLAIMS 9

OFFICE USE ONLY

Res. Geol. ______________ Qualifications ______________

Previous Surveys

File No.	Type	Date	Claim Holder

837 (85/12)

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS – If more than one survey, specify data for each type of survey

Number of Stations ________ Number of Readings ________

Station interval ________ Line spacing ________

Profile scale ________

Contour interval ________

MAGNETIC

Instrument ________

Accuracy – Scale constant ________

Diurnal correction method ________

Base Station check-in interval (hours) ________

Base Station location and value ________

ELECTROMAGNETIC

Instrument ________

Coil configuration ________

Coil separation ________

Accuracy ________

Method: ☐ Fixed transmitter ☐ Shoot back ☐ In line ☐ Parallel line

Frequency ________ (specify V.L.F. station)

Parameters measured ________

GRAVITY

Instrument ________

Scale constant ________

Corrections made ________

Base station value and location ________

Elevation accuracy ________

INDUCED POLARIZATION / RESISTIVITY

Instrument Scintrex IPR-11 receiver, IPC-7-2.5 kw transmitter

Method ☒ Time Domain ☐ Frequency Domain

Parameters – On time 2.0 seconds Frequency ________

– Off time 2.0 Range ________

– Delay time 690 milliseconds

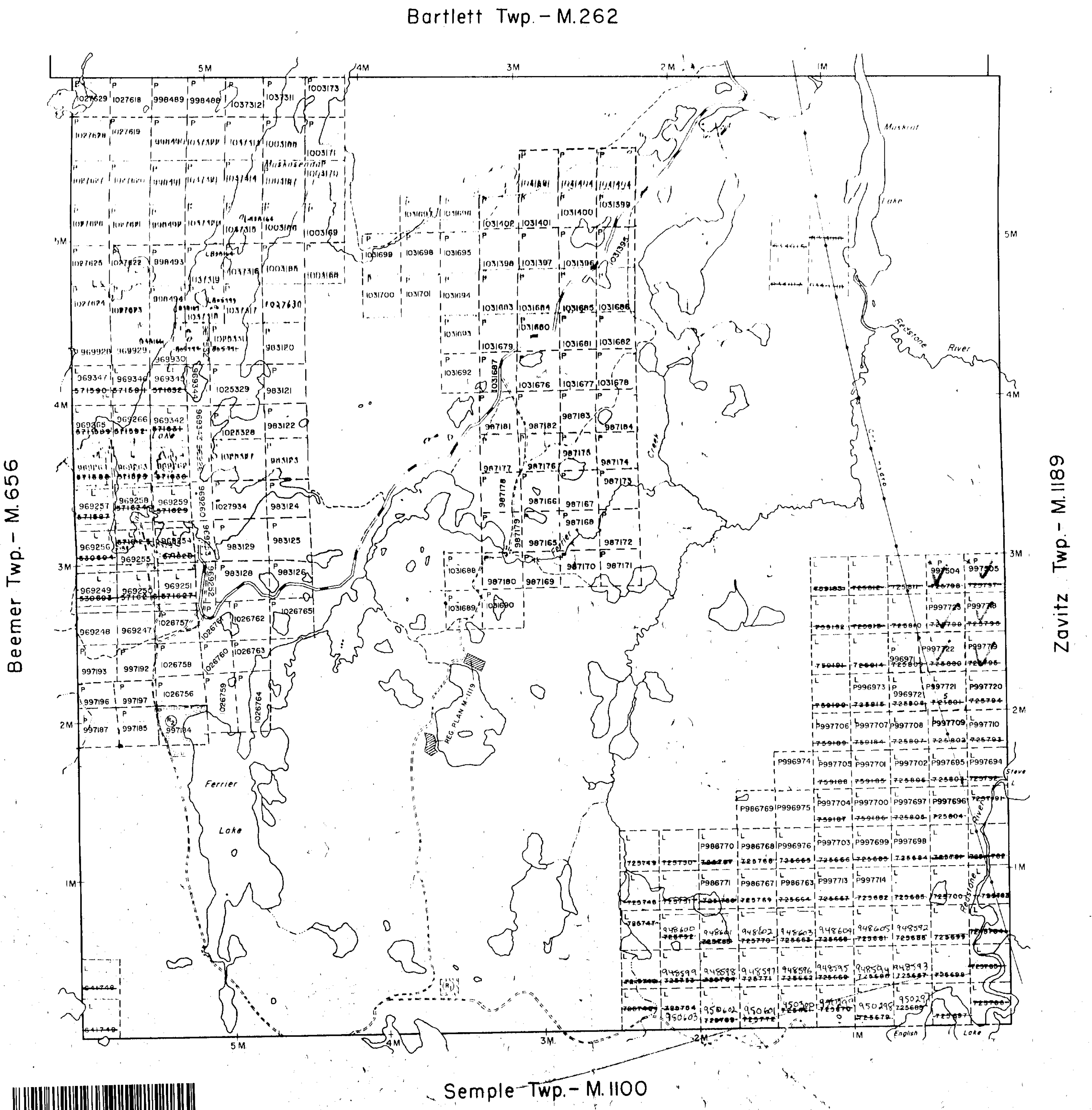
– Integration time 690 to 1050 milliseconds after off time

Power 8 hp motor generator

Electrode array pole-dipole

Electrode spacing 25 metres, reading N = 1 to 6

Type of electrode steel



THE TOWNSHIP OF ENGLISH

DISTRICT OF SUDBURY

PORCUPINE MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

PATENTED LAND	Ⓟ
CROWN LAND SALE	C.S.
LEASES	Ⓛ
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
ROADS	
IMPROVED ROADS	
KING'S HIGHWAYS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	⚒
CANCELLED	C.
PATENTED S.R.O.	⊖

NOTES

400' surface rights reservation along the shores of all lakes and rivers.

Areas withdrawn from staking under Section of the Mining Act (R.S.O. 1970).

	No.	File	Date	Disposition
(R1)	W.18/77	83582	28/2/77	S.R.O.
(R2)	W.19/78	188543	10/4/78	S.R.O.
(R3)	W.30/78	192219	2/6/78	S.R.O.

APR 5 19

#5

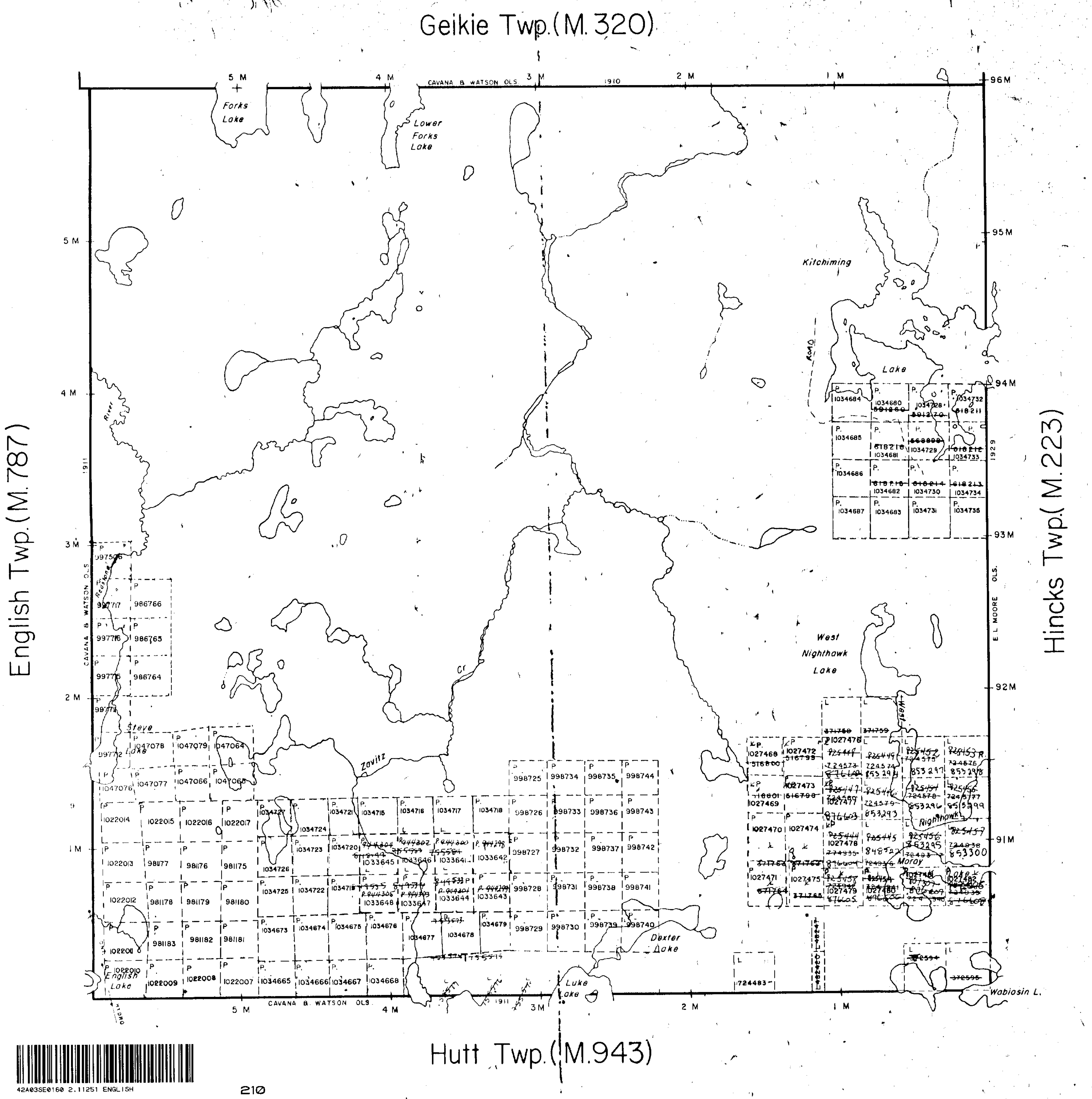
PLAN NO.- M.787

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

42A03SE0160 2.11251 ENGLISH

200

Bob K.



THE TOWNSHIP OF ZAVITZ

DISTRICT OF SUDBURY

PORCUPINE

MINING DIVISION

SCALE: 1-INCH 40 CHAINS

LEGEND

PATENTED LAND	Ⓟ
CROWN LAND SALE	C.S.
LEASES	Ⓛ
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
ROADS	
IMPROVED ROADS	
KING'S HIGHWAYS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	⚒
CANCELLED	C.

NOTES

400' SURFACE RIGHTS RESERVATION ALONG THE SHORES OF ALL LAKES AND RIVERS.

PORCUPINE MINING DIVISION RECEIVED JUN 15 1998

PLAN NO. M. 1189

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

LEGEND

- 5 Intrusive Rocks
  - 5A Syenite
  - 5B Diabase
  - 5C Aplite
  - 5D Fine to med. grained granite with chlorite
- 4 Sedimentary Rocks
  - 4A Iron formation - chert, magnetite, pyrite
  - 4B Iron formation - chert with minor magnetite
- 3 Rhyolite
  - 3A Massive, aphanitic
  - 3B Ash tuff
  - 3C Lapilli tuff
  - 3D Lapilli-block tuff with chlorite matrix
  - 3E Sericite-chlorite schist
- 2 Ultramafic Rocks
  - 2A Chlorite-actinolite-talc
  - 2B Carbonate-chlorite
  - 2C Spinifex texture
- 1 Basalt
  - 1A Massive, aphanitic
  - 1B Chloritic
  - 1C Carbonate altered
  - 1D Mafic tuff
  - 1E Vesicular
  - 1F Leucoxene-bearing

Definite IP Anomaly

Possible IP Anomaly

2.11251

ESSO MINERALS CANADA

ENGLISH-ZAVITZ

GEOLOGY-EAST HALF

WITH IP ANOMALY LOCATIONS

D.B.		1
	1:2500	
L. WILSON FEB./88	42 A/3	Aug, 1987

To accompany memo by L. Wilson dated Feb. 1988

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