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LUINA EL 17/93
JOINT VENTURE

ANNUAL REPORT
APRIL 1996 - MARCH 1997

Author: N K McGunnigle
P W Basford

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Pasminco Exploration - Melbourne

MPI Gold Pty Ltd - Melbourne

Submitted By: P W Basford

Accepted By:

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SUMMARY

Work undertaken to date within Luina EL 17/93 has included both regional and prospect scale exploration. The main focus of the regional work has been the acquisition of aeromagnetic data over the tenement, as well as regional mapping to continue to refine the geological knowledge of the region. The aeromagnetic data indicates a complex geological history, with numerous structures present.

Mapping and ground magnetic work was conducted down Betts Track as part of the regional reconnaissance work.

Prospect work has included further soil sampling and a ground magnetic survey over the Arthur Dam grid. Diamond drill hole AD3 tested the geochemical anomaly repeated in previous soil sampling work, with no obvious source indicated. Best assay indicated was 1m @ 0.25% Zn and 0.28% Pb.

DHEM was conducted down the drill hole. Two anomalies were indicated, one of which possibly relates to the serpentinite.

Costean work was carried out over the projected positions of the AD3 and AD2 drill holes. The costeans were mapped and sampled. Diamond drill hole AD4 was drilled to test a gossan in the southern costean as well as to further test mineralisation intersected in AD2. Best assays include:

3m @ 2.4% Zn, 2.25% Pb, 0.25ppb Au
2m @ 1.62% Zn, 0.55% Pb

An orientation soil survey was also conducted over the Arthur Dam grid.

RECOMMENDATIONS

A proposed work program for the coming year includes the following:

Regional

- Investigation of MPI and Placer stream sediment anomalies, and repeat sampling to confirm obvious anomalies.
- Statistical analyses of all previous stream sediment surveys to define trends and subtle anomalies.
- Geological and structural mapping in the Magnet Mine area.
- Regional mapping and rock sampling.
- Investigate bulls-eye magnetic structures which may be related to skarn assemblages.

Arthur Dam area

- It is recommended that further soil sampling should be undertaken along Arthur Dam grid lines cut to the north and the south of the present soil data set to investigate possible extension of anomalous geochemistry along strike.
- Follow up work of AD2 and AD4 is recommended in an attempt to understand the style of alteration and mineralisation Arthur Dam, and direct subsequent work in the area. This should include MALM down hole AD4 to determine the extent of mineralisation intersected.
- The NW-SE cross-structures identified in ground magnetic data over the Arthur Dam grid require further assessment to aid in structures and possible depth control on mineralisation. A programme of shallow drill holes (diamond or RC) in a fence line targeting the highest Pb geochemistry is recommended for future work to define depth of mineralisation.
- Repeat the DHEM work on hole AD3.

1 INTRODUCTION

The Luina EL 17/93 is located 10km SW of Waratah on the Waratah Road (Figure 1). It covers 70km^2 from the Magnet Mine area immediately west of Waratah township to Wilson River in the south. A joint venture agreement between MPI Gold Pty Ltd (MPI), the registered holder of EL 17/93, and Pasminco Australia Ltd (Pasminco) was signed in February 1996.

This Annual Report for EL 17/93 covers the period from April 1996 to March 1997. Work completed in this period was carried out by Pasminco, the tenement managers, and includes the acquisition of a detailed regional aeromagnetic survey, geological mapping and sampling in addition to the GIS database. Work in the Arthur Dam area has included a ground magnetics survey, C horizon soil sampling, excavation of two costeans and the drilling two diamond drill holes which have all contributed to the geological database.

The Magnet Pb-Ag-Zn and Cleveland Sn Mines lie within the Licence, along with numerous other small Sn and base metal shows. Base metal mineralisation appears to be hosted by Precambrian and Cambrian volcano-sedimentary sequences, with all reported occurrences being vein-style.

Much of the EL area is Crown Land, covered by patches of rainforest and forestry, ti-tree scrub and button grass plains. Access is provided by Waratah Road, numerous logging and HEC access tracks, and walking tracks. Much of the area is accessible only by foot.

2 TENURE

Luina EL 17/94 was issued to Pasminco Australia Limited in February1996, in a joint venture agreement between the registered licence holders MPI Gold Ltd Pty and Pasminco Australia Ltd. The licence area covers 70km^2, which excludes the Cleveland Mine Lease land area of 4.1km^2 (84M/8M) and a 0.6km^2 Sand and Gravel Mining Lease (58M/87) located on the Magnet Road.

The land tenure of the area comprises predominantly Crown Land, as non-allocated, Deferred Forest Land, and Mt Ramsay Recommended Area for Protection. The area also contains State Forest land and minor Private Property (Figure 2).

3 PREVIOUS EXPLORATION AND MINING

A comprehensive bibliography of reports on previous exploration in the Waratah-Luina area is included in McGunnigle (1995). Previous exploration conducted in the area is summarised in Table 1.

The Magnet Mine is thought to have been first discovered in 1877 by W.R. Bell, but was not investigated until 1890 when Bell was able to relocate his find. The Magnet Silver Mining Co. was formed in 1895 and worked the mine with various success until 1933. From 1933 to 1940 the mine was controlled by four separate organisations, none of whom found it a successful venture. Production from the mine totalled approximately 630,000t @ 6% Pb, 7% Zn and 394 g/t Ag up to 1940 when operations ceased (Cottle, 1951).

Modern exploration in the area commenced in the early 1970's and has been undertaken within several exploration licences since then (Table 1). The work has included extensive stream sediment sampling and geological mapping, a range of geophysical surveys and several drill holes. Numerous Sn and base metal anomalies have been discovered in the area, although much of the anomalism is thought to be related to contamination from the Magnet and Mt Bischoff Mines.

In the Magnet Mine area modern exploration began during 1970 with stream sediment sampling undertaken by Comstaff. All results however were discarded due to cultural contamination. A Sn stream sediment anomaly thought not to be related to the mine was located in 1972, and meaningful exploration began in 1975 with the establishment of a grid from Magnet to Mt Bischoff. Mapping, soil sampling, ground magnetics and EM surveys resulted in one diamond drill hole (BAB1) targeted at an EM anomaly, and two holes (MAG1, MAG2) drilled to test the southern extension of the Magnet Mine Pb-Ag-Zn vein. BAB1 failed to intersect any evidence of mineralisation, whilst MAG1 and MAG2 intersected moderate patchy mineralisation plus extensive zones of stoping. No

further activity was undertaken by Comstaff, and much of the area was surrendered from EL 5/63 during 1985.

During the 1980's the Tasmanian Mines Department carried out exploration on the Luina and Wombat Flat exempt areas (Collins, 1983; Brown 1986). This work included magnetic and DIGHEM surveys and soil geochemistry. The programme culminated in the drilling of two holes at Arthur Dam which targeted coincident magnetic and soil geochemical anomalies. The holes intersected sheet-like pyrrhotite-chalcopyrite bearing veins (AD1) and sphalerite-galena quartz stockwork veining (AD2) in Eocambrian andesites and volcaniclastics.

RGC held ground in the area from 1990-1993 primarily focussing on potential Renison-style Sn mineralisation, specifically carbonate replacement Sn deposits such as those mined at Mt Biscoff and Cleveland.

4 GEOLOGY

4.1 Regional Geology

The regional geology of the Waratah-Luina area consists of Precambrian to Ordovician rocks of the Dundas Trough (Figure 3). Lithologies which are well described in Brown (1986) include carbonates, intermediate to mafic volcanics and ultramafics. The Devonian Meredith Granite outcrops in the southern and eastern extent of EL 17/93. Observations from field mapping are included in the summaries of outcropping lithologies below, and sample numbers quoted are consistent with descriptions included in Appendix 2.

4.2 Oonah Formation

A block of Oonah Formation of approximately 17km^2 in size surrounds the Mt Bischoff Mine and extends below Tertiary basalt to the east. The Proterozoic Oonah Formation is composed of pale grey quartz rich sandstones, pale grey siltstones, dark grey shales, dolomites and minor mafic lavas and volcaniclastics. A high degree of deformation often allows distinction from younger rocks.

The Oonah Formation has been divided into upper and lower successions on the basis of lithology. The lower sequence is dominated by micaceous quartz sandstones and siltstone with minor interbedded phyllitic mudstone. The upper Oonah has a greater abundance of mudstone and shale with dolomite and occasional intercalated mafic volcanics.

The Oonah Formation in the Mt Bischoff area is comprised of a shale and siltstone succession with thick units of dolomite that correlates to the upper sequence. It is inferred that the Oonah/Crimson Creek Formation contacts northeast and east of Magnet Mine are faulted, possibly involving significant over thrusting of Precambrian over the Eocambrian sequences.

Correlates of the Success Creek Group underlie the Crimson Creek Formation north of the Meredith Granite to the west of EL 17/93, and mapping from Brown (1986) indicates a conglomerate and sandstone dominated sequence.

4.3 Crimson Creek Formation / Cleveland-Waratah Association

The Crimson Creek Formation interpreted by Brown (1986) to occur to the north and east of the Meredith Granite is now doubted to be a correlate of the Formation, but rather it is thought to belong to a different association termed the Cleveland-Waratah Association (J Everard, pers. comm.). The unit will be referred to as the Crimson Creek Formation in this report however.

The formation is comprised largely of basalt lavas (78013), basaltic volcaniclastics, and finely bedded siltstone and mudstone (78017). Brown (1986) notes that it becomes more basaltic to the north of the Meredith Granite. Thin carbonate horizons occur in the formation but rarely outcrop.

Contact metamorphism of the unit by the Meredith Granite has resulted in hornfelsing of the sediments about the granite. It is likely that this magnetic signature will add to the complexity of responses when using magnetics as an exploration tool in the area.

4.4 Eocambrian pyroxenite and basalt lava sequences

Mixed intermediate to mafic volcanics dominate an area to the west of Arthur Dam and are mapped also in an area between Magnet and Mt Bischoff mines. The volcanics are referred to as high-magnesian andesites and low-titanium tholeiite basalts by Brown (1986). They most commonly range in textures from interstratified volcaniclastics to lava and lava breccia and are believed to be mostly subaqueously emplaced.

Lava and lava breccia ranges from vesicular, fine to coarse grained porphyritic to basaltic pyroxenite intercalated with volcaniclastic sandstone and siltstone. Outcrop is green to grey-brown in colour, slightly to highly chloritic with goethite weathered surfaces. Andesite is feldspar-pyroxene phyric, with pyroxene phenocrysts up to 10mm in size (and up to 20% abundance), and commonly contain amygdales infilled with chlorite, carbonate and/or silica (78007). Spilitic basalt is characterised by classic spherulitic-spray spilite textures, and fine grained feldspar $\pm$ pyroxene (78011).

Within a basin approximately 5km SW along Betts track, a variety of volcaniclastic and conglomeritic textures are observed in boulder outcrops. The variety of textures which range from fine grained tuff and coarse sandstone to conglomerate are interpreted to be comprised of pumiceous and tuffaceous beds and mass flow deposits (78009). Weathering has exposed relict shapes of eroded feldspar and pyroxene crystals within vesicular and tubular pumice clasts.

The pyroclastic genesis of the agglomerates and bedded volcaniclastics is so far unique to the basin area in EL 17/93. The mineralogy of pumice clasts in the units infers an intermediate mineralogical composition (ie. andesite to dacite) and although it is possible that they may be related to the high magnesian andesites in the area, these units may be unrelated to formations previously identified and analysed in the region.

4.5 Serpentinite

A serpentinised NNE striking wedge of ultramafic rock outcrops to the east of the mafic volcanic units, clearly exposed approximately 1.5km down Betts track. In fresh outcrop

it is observed as a complex of dark to light grey and green-black swirly, fractured and sheared mafic unit (36803). In places an apparent clastic texture is created by the presence of fragments within a grey, fine-grained, vein-like netted matrix. The serpentinite is interpreted to have been tectonically emplaced.

The serpentinite unit is highly magnetic and is distinctive in both the ground and aeromagnetic data sets.

4.6 Ordovician to Devonian sediments

A sequence of Ordovician to Devonian sediments overlie the Crimson Creek Formation and associated ultramafic rocks within a small syncline to the north of the Meredith Granite in the Mt Stewart-Heazlewood area. These sediments belong to the conformable Gordon Limestone-Eldon Group sequence, and the Gordon Limestone at the base of the sequence may have a stratigraphic thickness of up to 500m. It is overlain by the Crotty Sandstone, a white, friable, quartz rich unit up to 400m in thickness, which forms a prominent ridge around the edge of the syncline. Much of the sequence is poorly exposed and covered by alluvium.

4.7 Meredith Granite

The Meredith Granite has been radiometrically dated at 356 Ma, using both K-Ar and Rb-Sr methods (Brown, 1986). Around the north-eastern tip and eastern margin, the granite is porphyritic close to the contact, containing feldspar (up to 25mm) and biotite phenocrysts (up to 15mm) (78006). The granite becomes increasingly equigranular towards the core, and contains biotite throughout. Zones of greisenization and concentrations of tourmaline veining are common and conspicuous close to the granite margins. Quartz feldspar porphyry dykes related to the Meredith Granite occur at Mt Bischoff and at Deep Gully Creek.

4.8 Tertiary Basalt

Tertiary Basalt overlies Crimson Creek Formation in the north of Luina EL 17/93. In the area, the basalt cover may be up to 300m in thickness, and consists of flows ranging from

less than 1m to greater than 10m thick. Fluvial and lacustrine sediments occur between basalt flows, ranging from mud to gravel grain size.

Magnetic character and variation in thickness of the basalt severely hinders interpretation of sub-basalt magnetic features.

4.9 Known Mineralisation

The Waratah-Luina area is well known for large replacement-style Sn deposits (Cleveland, Mt Bischoff), but lesser known for Pb-Zn mineralisation.

The largest base metal orebody discovered and mined to date is Magnet, from which approximately 630,000t @ 6% Pb, 7% Zn and 394 g/t Ag were extracted. Magnet lies in the northern part of EL 17/93. The orebody has a strike length of 90m, a true width averaging 5.5m, and was worked to 365m vertical depth. The orebody is described as occupying a steep W-NW dipping fracture system within an early Cambrian mafic/ultramafic body known as the Magnet dyke, close to its discordant footwall contact with early Cambrian sedimentary rocks.

The ore at Magnet consists of sphalerite and argentiferous galena with lesser amounts of arsenopyrite, pyrite, boulangerite, pyrargyrite, tetrahedrite and chalcopyrite in a gangue of manganosiderite.

Other base metal prospect sites are discussed in Nye (1923), however all are small vein style galena dominated accumulations that were worked to a shallow depth only.

The Cleveland Sn-Cu deposit located just within the western boundary of EL 17/93 comprises several stratabound lenses of pyrrhotite-cassiterite-stannite-chalcopyrite mineralisation formed by metasomatic replacement of limestone beds. The limestone belongs to the Crimson Creek Formation and forms part of a transitional sequence between mafic volcanics and overlying turbidites. The tabular sulphide lenses range up to 30m in thickness, and are disrupted by a series of sub-parallel reverse faults that are thought to have been conduits for the mineralisation.

At Mt Bischoff, massive pyrrhotite has partially replaced a 40-60m thick dolomite bed within a sequence of turbiditic sandstone, siltstone and shale of the Oonah Formation. Quartz-feldspar porphyry dykes intrude this sequence. Other mineralisation styles include topazised porphyry dykes and late stage quartz-carbonate-fluorite veins.

5 WORK COMPLETED

During the 1996 - 1997 period, work undertaken on Luina EL 17/93 has continued to contribute to the regional database established in Pasminco's GIS. A regional aeromagnetic survey was completed in conjunction with neighbouring EL's 48/94 and 49/94, and regional geological mapping and ground geophysics undertaken. Work completed in the Arthur Dam area includes C horizon soil geochemistry, ground magnetic surveying, mapping and rock chip sampling of two costeans and drilling of two diamond holes totaling 317.7m.

5.1 Regional Activity

5.1.1 Regional Data Compilation

A regional database for the Luina area includes adjacent EL's 48/94 (Waratah) (Pasminco) and 49/94 (Whyte River) which is also Joint Ventured with MPI Gold Pty Ltd. The database which was initiated last year in Pasminco's GIS, has been continually updated with relevant data.

Information available includes previous stream sediment and soil geochemistry (MPI Gold, 1994; Placer, 1988; Comstaff, 1977; and Collins 1983), water and drainage maps, roads, tracks and access in the area, known mineralisation and possible sources of contamination.

5.2 Field Activity

Geological mapping was undertaken during the year as part of a regional mapping program (Figure 4). Mapping in the EL has concentrated outwards from the Arthur Dam

area, and includes Betts track, the Cleveland HEC access tracks and some of the Magnet mine area. Observations of regional lithologies are reported in Appendix 1, and descriptions of selected rock samples collected during mapping are included with corresponding thin section descriptions in Appendix 2. The samples reported are representative specimens for various outcropping lithologies and alteration types observed in the area, and include several from adjacent EL 48/94.

Observations of geology and contacts from ground mapping have been discussed with respect to the magnetic responses along Betts track and regional responses with interpretation from observations from the regional aeromagnetic data.

Assay results of rock chip samples taken through the year are reported in Appendix 3.

Two samples selected for XRD mineralogy are described in Appendix 4.

5.3 Previous Stream Sediment Surveys

Comstaff (1977), Placer (1988) and MPI Gold (1994) have all conducted regional stream sediment surveys over areas covered by the current Luina EL 17/93. A preliminary review of Placer and MPI Gold's regional stream sediment surveys in the 1995 - 1996 year indicates anomalous Zn $\pm$ Pb $\pm$ Cu values along a NNW trending strike from south of Arthur Dam to Magnet Mine. Anomalous Zn was detected with values up to 1389ppm (disregarding highly anomalous samples collected downstream, north and east of Magnet Mine, which are related to contamination from mine workings).

Statistical analyses of the data sets are yet to be completed, however, some anomalous values have been followed up on the ground. Anomalous values from the MPI data set in the basin area 5km SW along Betts track appear to be derived from ridges to the south and east of the anomalies. Other MPI results followed up on ground appear to be from legitimate sample areas but are not in proximity of any significant outcrop.

5.4 Aeromagnetic Survey

A detailed aeromagnetic survey was flown over Luina EL 17/93 in conjunction with a survey over Waratah EL 49/94 and Whyte River EL 48/94. UTS Geophysics were contracted to conduct the survey, with specifications of 100m line spacing, flight lines

East-West and flight height to average 50m. Navigation was through the use of Real-time GPS, and height above ground level was monitored using radar altimeter. Figure 5 and 6 are TMI images of the data.

Data over the Luina licence can be separated into 16 domains based on magnetic character. Correlation with the regional geology as compiled by Brown (1986) is variable (note Brown is used only as a guide). In a broad sense, several of the contacts inferred by Brown are evident, however, the individual geological units interpreted vary significantly from that observed in the aeromagnetic data. This may be due to magnetite variation within units, however, this would not explain all the differences.

Cultural responses that may be within the data set include the former townships of Magnet and Luina, the Cleveland mine, Magnet Mine workings and powerlines that run through the area. It is probable that other small cultural responses exist within the data. These need to be checked against the aerial photographs and ground truthed. It should be noted that the Godkins Lodes are located on the western edge of the licence.

5.4.1 Magnetic Domains

The 16 magnetic domains have been characterised by the observed magnetic signature and the regional geological interpretation (see Figure 7 for interpretation). The zones are related to an interpretation of aeromagnetic data over the Waratah EL 49/94 and corresponding zone numbers have been used (see McGunnigle 1996).

Zone 1 - A magnetically quiet response related to the sub-cropping Meredith granite. The interpreted contact of the granite follows Browns 1986 interpretation for most areas except in the southern area where the magnetic data infers a break in the magnetic package of zone 2. There appears to be a magnetically quiet zone separating the southern part of zone 2 from the upper part. There are also isolated magnetic highs within the granite (see zone 13).

Zone 2 - The major NE-SW trending package of highly magnetic rocks along the eastern edge of the licence is denoted as zone 2. The magnetic signature is high amplitude and

high frequency, and contains a number of continuous magnetic units. A number of NW-SE structural breaks can be observed throughout the zone. There appears to be a break at the southern end of the zone, with the unit appearing 'within' the granite. This southern units contains a number of NW-SE and NE-SW cross structures.

Geology consists of sediments and basalt lavas (Crimson Creek Formation), an ultramafic serpentinite and hornfelsed sediments. Mapping and drilling in the area confirms the existence of these lithologies, however, they can not be distinguished from each other using the magnetics.

Zone 3 - This zone is similar in character to zone 2 and contains high frequency responses as well as several discrete and continuous magnetic units. The north-western edge of this zone overlies the Luina licence, extending east and south-east to cover Waratah EL 48/94. The unit may represent some former folded sequence.

Geological components of this unit are either comprised of the Crimson Creek Formation or the Cleveland-Waratah Associations, however, it is interpreted that there may be ultramafics within the unit, similar to that observed in zone 2.

Zone 4 - This is characterised by the bland magnetic response on the NE corner of the tenement. The signature is moderately similar to that observed over the granite, however, it correlates with Oonah formation. The western contact, trending NE-SW, appears to be a large fault plane (thrust?).

Zone 5 & 6 - These two zones appear to be absent within Luina EL 17/93.

Zone 7 - This area consists of a weakly magnetic signature which extends from the NE of the tenement, in a SW direction, and is interpreted to be derived from a thin sheet of Tertiary Basalts overlying Crimson Creek Formation. The zone appears to be bounded by a NW-SE fault. The magnetic interpretation has distinguished this zone as different from zone 9 due to the Tertiary Basalt cover. Both units were mapped as one large zone of Crimson Creek Formation by Brown.

Zone 8 - This magnetically quiet zone is in contact with the Oonah formation, located between zones 4 and 7. It is similar to a number of areas within the magnetic data but is distinguished to correlate with a region of low Titanium tholeiitic basalts, as indicated in the geological interpretation.

Zone 9 - This covers the north-western portion of the tenement and extends to the south down the western edge of the licence. It consists of a dominantly bland magnetic response and is interpreted to be related to the Crimson Creek Formation. The actual extent of this unit is undetermined.

Zone 10 - A small fault bounded area of moderate magnetic response, trending slightly east of north at the northern end of the tenement characterises this zone. Located within it is a complex magnetic high, which correlates with mapped gabbro units. Two linear anomalies located at the southern end of the zone may relate to Crimson Creek basalts.

Zone 11 - There are two areas in the licence attributed as zone 11. Both consist of complexly folded magnetic units. The first is located at the northern end of the licence, the second is located south-west of the first, towards the central western edge of the EL boundary. Both correlate to the position of a high magnesium andesites, the second located proximal to the Cleveland Sn mine. Geological interpretation indicates a long continuous zone of the andesite, however, this region is not evident in the magnetic data.

Zone 12 - This consists of moderate to poorly magnetic areas in the remainder of the licence and areas between attributed zones. Correlation with specific geological units is difficult.

Zone 13 - A series of magnetic highs are located within the Meredith granite. It is not ascertained if all are related to the same geological units, as some contain indications of linear magnetic highs within the response (Crimson Creek basalts?), whilst others are isolated 'bulls-eye' anomalies.

Zone 14 - The large high frequency magnetic unit in the centre of the EL correlates to Crimson Creek basalts and lavas. 'Folded' magnetic bands are evident within the units,

which contain a number of NW-SE structures through it. Some of the boundary of this zone may be faulted contacts.

Zone 15 - This zone is made up of a fault bounded area, containing an apparent fold, SE of zone 14. There is no direct correlation with geology.

Zone 16 - A fault bounded area containing linear NNE trending magnetic units defines zone 16. There may be some association with this zone and zone 10 further north, which contains similar linear structures. At the southern end of zone 16 there appears to be a magnetic low 'within' a linear feature which may be related to some magnetite destruction event. The western linear anomaly could actually be related to the features in zone 15, however, this would imply major movement on both NW-SE faults between the two zones.

Zone 17 - This zone is also split into two areas, both of which are located towards the southern end of the licence. The two are grouped together as they are broad deep features with some shallow components (high frequency features). The smaller of the two contains a possible folded structure, terminated to the west by a NNE trending fault. The second feature is large and contains what appears to be more bulls-eye type magnetic highs. It should be noted that the sources of the two 'anomalous' areas may be unrelated.

Zone 18 - This zone runs along the western edge of the tenement, with a moderate amplitude signature. It is related to either Crimson Creek Formation or units further west associated with the Heazlewood Ultramafic complex.

5.4.2 Structural Framework

The structure of the area consists of a number of NE-SW and NW-SE faults and lithological contacts. In some areas there is apparent displacements with both dextral and sinistral movement indicated. There is also evidence of N-S and E-W contacts in the centre of the licence around zones 14 to 16. The area also contains responses that resemble folded units.

The highly magnetic units of zones 2 and 3 may indicate a fold, with the west limb sheared off and displaced. The data does not indicate any major structure that would produce such an effect. There is also evidence of a break at the southern end of zone 2, with part of the unit appearing within the granite.

5.5 Arthur Dam area

5.5.1 Arthur Dam Grid Soil Sampling Survey

Soil sampling over the Arthur Dam grid reported in last years Annual Report was continued with sampling from an additional two grid lines, 100S and 200S (Figure 8). Anomalous Pb, Zn, As, Cu, Ag and Au geochemistry over these lines also showed to be coincident with previous sampling by Collins (1983). The methods employed for the surveys, results and basic single element statistics are reported in Appendix 5.

While it is not possible to define a source for the geochemical anomalies identified in these surveys, the following conclusions and recommendations have been drawn from observations:

1 Pb is the least mobile of the elements sampled in both the 'A' and 'C' horizon surveys. A subtle halo of decreasing Pb appears to zone away from the most anomalous value in both soil surveys. The strong coincident (and lesser mobile) anomalous Pb suggests that it is the most repeatable element.

2 'A' horizon Pb geochemistry correlates well with 'C' horizon data, making it a possible alternative reconnaissance soil sample method for future surveys. The dispersion of other elements sampled in the 'A' horizon however restricts the potential of this method.

3 Highly coincident As and Pb geochemistry in the 'C' horizon results suggest that As and Pb could be geochemically related in the mineralisation type, and if so, As may be a good indicator of Pb-related mineralisation in the Arthur Dam area. The relative immobility of Pb suggests that As may also be a lesser mobile element in these conditions.

4 The subtle NNE trending anomalous zone identified from the previous soil geochemistry survey is repeated in these results and coincides with the local foliation of the C horizon rocks identified in nearby outcrop. It is possible that the anomalous geochemistry is in fluids which have moved along fractures controlled by regional foliation. It is recommended that further sampling should be undertaken along grid lines cut to the north and the south of the present soil data set to investigate possible extension of anomalous geochemistry along strike.

5.5.2 Costeans

Two costeans were excavated parallel to Arthur Dam grid lines 400N and 100S in the Arthur Dam grid area, Luina EL 17/93 (Figure 9). The costeans approximately parallel the surface projections of DDH AD3 (collared at 400N, 05W) and DDH AD2 (130S, 80E) and were designed to investigate bed rock exposure and zones of alteration and mineralisation over soil geochemical anomalies at 400N, 60-100E and 100S, 160-220E. Detailed surface mapping, rock chip sampling and soil profile mapping was undertaken in both costeans. The northern and southern costeans total 200m and 256m respectively.

Mapping

Detailed mapping of each of the costeans is presented on 1: 100 scale plan and profile maps of the costeans (Figures 10 & 11).

Northern Costean - 400N

The surface geology exposed in the costean is variably altered intermediate to mafic volcanics, typical of the Arthur Dam area pyroxenites. Textures range from a grey to green coloured volcaniclastic ± micaceous sandstone to pyroxene phyric and chloritic altered lava. Chloritic alteration is commonly moderate to strongly pervasive, and chlorite and carbonate commonly replaces amygdales and phenocrysts in the volcanics. Minor carbonate ± quartz veins are also present, and in places goethite is observed replacing carbonate.

A mild to moderate-strong NE striking cleavage is developed in many of the rocks exposed. Dip of the fabric averages 50-60° to the west. Some quartz-carbonate veining is developed parallel to this major fabric direction eg. sample 78408 (022/60°W), which also shows traces of galena.

Increasing shear fabric in pale grey and bleached volcaniclastic sandstone is exposed in the costean from about 76m NE of the baseline. At about 80m NE, a north striking (006 °) fault with soft, grey pug on the plane bounds massive and blocky micaceous sandstone to the NE which has an orange-grey goethitic surface. Coincidence of anomalous Zn soil geochemistry about this part of the grid line suggests that the mapped fault may provide a pathway for fluids to migrate to surface. However, analysis of the rock chip results in this area shows the highest Zn values to be obtained from a goethitic horizon 20m to the SW, from samples 78258 (1100ppm) to 78261 (2060ppm).

Southern Costean 100S

Abundant bedrock is exposed over the AD4 drill pad at the south western end of the costean, with variable textures ranging from fine grained porphyritic and amygdaloidal volcanics, pyroxene phyric (up to 10mm) lava and volcaniclastics and spilitic basalt. Chlorite and carbonate alteration commonly replaces phenocrysts, with goethite after carbonate. With increasing depth to bedrock along the costean to the NE (from local grid 130mE) the volcanics are dark blue to green in colour, moderately to strongly chloritic with variable sericite, manganese and talc, and moderate to strong cleavage. The cleavage fabric is observed increasing to the NE from (local grid) 128mE, averaging 070°, dipping steeply W to near vertical.

More intense chlorite ± sericite ± talc alteration appears to accompany an increased foliation fabric. Chlorite, carbonate, quartz are the dominant pervasive alteration types with variable sericite and talc in particularly schistose fabrics. Quartz-carbonate veining has been mapped and rock chip sampled in selected places (Appendix 3). Goethite replaces carbonate in places.

Rock chip samples 78410 - 78419 were taken from a goethitic horizon at 210 - 220mE, where carbonate-quartz veining is observed in gossanous and manganiferous bedrock. Cleaved mafic volcanic parent rock is weathered to orange-brown on the surface, with carbonate in spots and veinlets parallel to the cleaved fabric. Chlorite and manganese alteration dominate, with minor amphibole alteration observed in fine laths. Carbonate and quartz forms open spaced and massive veins with goethite and traces of mineralisation.

Rock Chip Sampling

Both costeans were chip sampled, from bedrock exposure where possible, at 2m (continuous) sample intervals. 1m intervals were sampled for 6m (78420 - 78425) between sample numbers 78170 - 78174 and 10m (78410 - 78419) between sample numbers 78145 - 78151 in the 100S costean, where increased chlorite-silica in a cleaved fabric and a cleaved chloritic-goethitic zone with amphibole alteration were observed. Ten rock chip samples from selected altered and mineralised exposures in the costeans are described in Appendix 3. Assays of all rock chip sampling are reported in Appendix 6.

Rock chip assays in the northern costean were disappointing overall. The best Pb and Zn results are in goethitic volcanics and hangingwall to a faulted puggy zone. Best results are:

8m @ 708ppm Pb and 1638ppm Zn, and
8m @ 1800ppm Zn

It is possible that the fault and cleavage fabric have provided a pathway for fluids, hence proximity of the highest Pb and Zn with the puggy fault and cleavage development. However, the best anomalies were in goethitic horizons with associated elevated Fe (up to 11.9%).

In the southern costean, anomalous Pb-Zn-As-Ag values are highly coincident in goethitic zones in foliated mafic volcanics. The 1m spaced sample interval from 210 -

220mE also showed fine amphibole alteration which formed an alteration halo in DDH AD2. Best results include:

Pb - 36m @ 3460ppm (100S, 170E - 240E), including 1m @1.16% Pb
Zn - 22m @ 2311ppm (100S, 194E - 116E), including 1m @ 0.5%Zn
As - up to 1270ppm
Ag - 15 - 30ppm

Anomalous Au was detected with values of up to 0.65g/t (at approximately 240E) along the costean NE of the above anomalies. It is thought that quartz veins exposed in this part of the costean are associated with Au mineralisation, and does not appear to be immediately related to base metal mineralisation.

Soil Profiles

The soil profile from each costean was mapped from the side exposure, illustrated respective to each costean in Figures 10 and 11. Soil profile thickness was influenced partly by topography, where for example, a leached E horizon was developed with thicker profiles in topographic lows. The soil profiles were generally composed of :

O (A_0) horizon Dark brown, partly decomposed organic matter 20 - 40 cm

A (A_1) horizon Chocolate brown, silt loam 40cm average

± E (A_2) horizon Mottled and leached, light brown and grey zone of eluviation approx. 20cm where present

± B horizon Mottled orange-brown, Fe-enriched clayey horizon up to 20 cm where present

C horizon Weathered rock ranging from blue-grey, soft, chloritic schistose saprolite to goethitic massive saprolite. 20 - 40 cm

Conclusions

Anomalous Pb, Zn, As, Ag and Au correlates to anomalous zones identified in C horizon soil geochemistry sampling. In the northern costean, the best Pb and Zn results are isolated in goethitic horizons and hangingwall to a faulted, puggy zone. In the southern costean, the anomalous values are in goethitic zones in foliated mafic volcanics, where goethite has commonly replaced carbonate.

5.5.3 Ground Magnetics

A total of 9.5km of ground magnetic data was collected over the Arthur Dam grid in early April. A further 1km was collected along an oblique cross-line to the Arthur Dam grid, across the inferred strike of 'influence' (see Figure 8 for location of grid lines).

Data for both surveys was collected using a GEM GSM-19F magnetometer. Data was recorded at one second intervals along the line (equates to approximately 1.5m), with control pegs spaced 20m to convert data from time to distance. Base station data was collected using a Scintrex OMNI-IV magnetometer, sampling every ten seconds. Data was diurnally corrected to 61700nT and editing of data consisted of removing anomalies associated with culture (eg. overhead power line, of which two occur within the grid area) and removal of instrument noise (eg large spikes associated with rapid movement of magnetometer). Data in the regions containing noise related to the power lines has been removed (ie line 300N, 200E; line 100N, 75W; line 170N, 0E; line 0E, 170N).

The dominant signature observed in the data from the Arthur Dam grid is that produced by the serpentinite. It was crossed on line 300N, coming to surface at around 350E (local grid co-ordinates). The effect of the serpentinite can be seen throughout the data due to the gradual build up in magnetic intensity on the eastern side of the grid.

The remainder of the data contains isolated and strike limited magnetic highs and lows. These smaller amplitude anomalies (as compared to the serpentinite) generally strike across the grid from south to north and slightly to the west. An analysis of each profile is given.

Profiles

All profiles are located in Appendix 7.

Line 900N - no obvious anomalous responses, however, a build up in response at 80E does not fit with the data observed on 800N, and may be considered slightly anomalous. A possible second feature is at 170W.

Line 800N - no obvious responses observed, but does include very minor feature at 170W.

Line 700N - no obvious features, possible minor feature at 10W.

Line 600N - a complex feature exists on this line between 100W and 0. It appears to involve two magnetic sources, however, the low between needs further consideration. A very small, near surface response is also observed at 110E.

Line 500N - the dominant feature is the high from the serpentinite at the eastern end, however, five other magnetic anomalies are present on this line, at 265W, 100W, 40W, 10W and 5E. All are shallow, with the two anomalies at 100W and 40W possibly related to the feature on line 600N.

Line 450N - no responses observed.

Line 400N - the dominant response is the serpentinite, with an additional four other responses, at 275W, 100W, 35W and 40E. The anomalies at 100W and 30W may be linked to those on lines 500N and 600N.

Line 350N - possible response at 0, however, not well defined.

Line 300N - this line is full of complex magnetic signatures, excluding the serpentinite to the east. The first is the series of three lows at 140W, 110W and 20W. Also included are three small highs at 200W, 0 and 30E, with a fourth possible at 50E.

Line 170N (along the road) - this line contains the largest responses of the entire grid. Again it crosses the serpentinite (390E), however, there are four other anomalies, two of which are possible good correlations to the trend of the surface geochemistry. These are at 20E and 50E. A very shallow feature exists at 170W which appears to be caused by a cultural feature, and a fourth high is on the western flank of the serpentinite response at 290E. The anomaly at 20E has a depth component to it and is not expected to be related to either the power lines or the road.

Line 100N - apart from serpentinite response on the east end of the line, indicated by the high and cross-over at 395E, there is a small amplitude response at 70E. The serpentinite response has a strange shaped top, with what appears to be two small interfering shallow responses. There is also a small build up at the west side of the serpentinite response, which may be a second small amplitude anomaly.

Line 0N - the gradient on this line indicates proximity to the serpentinite, however, there is an interference pattern anomaly between 100E and 130E. This is assumed to be caused by two shallow magnetic bodies.

Line 100S - this line contains two small anomalies. A low at 100E may be an effect of dipolar magnetism relating to the anomaly on line 0N, whilst the other anomaly is observed at 200E. The line also passes over the serpentinite but does not cross it entirely.

Line 200S - two small anomalies are also evident on this line, one at 210E which is related to the anomaly on line 100S, the other, a shallow feature, at 10E. The serpentinite is further east from the end of the line.

Line 300S - a very noisy line containing several small signatures, the most prominent being the broad wavelength anomaly at 245E which was previously observed on lines 100S and 200S. Other features are at 150E and 370E.

Line 400S - another noisy line which contains several confusing signatures, the most significant of which is between 370E and 400E. The data indicates an interference style

response, with at least one magnetic body present. The negative response may be either structural or alteration related. A near surface response is indicated at 260E, which may be culture or may be related to the anomaly on the previous three lines. There are also several shallow response at the beginning of the line between 0 and 40E

Line 500S - three anomalies are apparent on this line, the first at 415E, which is also evident on line 400S. The second is at 275E, which may be related to the surface response on line 400S, with the third at 30E indicating two small bodies which may be related to responses recorded on line 400S.

Line 0E (baseline) - the base line data contains several responses, most of which will have been mentioned above. The data is dominated by two specific signatures, the first and most obvious is the large high centred at 180N. This anomaly is the same as observed on line 170N (along the road). The small low on the south side is possibly a dipolar response. The other prominent feature is the change in background values north and south of the aforementioned anomaly. Data to the north is vastly lower, building to a higher level at the northern end. This may be caused by changes in depth to basement, a result of a cross structure interpreted in the data. Other anomalies of note on this line are at 250N, 300N, 380N, 450-500N, 700N and 750N. Some minor anomalism occurs south of the major feature at 50S, 100S, 120S, 170S, 195S and 250S. Data from 250S to 500S is extremely spiky in nature and difficult to assess, however, there does appear to be some longer wavelength features below the noise at 450S and 350S.

Contour Plots

Contour plots were generated using both local grid co-ordinates and AMG co-ordinates (Figures 12 and 13 respectively). The most prominent feature displayed in the contour data is the serpentinite, which runs along the east side of the local grid. From the AMG plot, it appears as if the serpentinite runs approximately NE-SW. At the southern end of the grid, the response appears to rotate slightly, towards the south in AMG space.

An apparent E-W structure (AMG space) is located around 5407200N, which appears to separate the intensity of response north and south of the grid (Figure 14). This is

represented in profile of the baseline (0E). North of this structure data indicates small anomalies, whilst south of this structure more intense magnetic features are apparent. This structure is also observed to affect the serpentinite response.

The anomaly located at the intersection of the road, baseline and power lines is evident as a large bullseye in the local grid, however, its pattern is distorted in AMG space. This feature appears along strike from the large amplitude response recorded on line 0N, and from the feature on line 300N at 250E. This strike roughly coincides with the soil geochemical pattern.

A small string of anomalies on lines 400N, 500N and 600N may all be related. These features may be related to those south of the structure, however, this would imply a change in strike, as well as change in physical properties (eg. depth of burial, percent associated magnetite).

Theoretical sections for AD2 were drawn on lines 100S and 200S, assuming the hole was drilled at 60 degrees. Mineralisation intersections have been located to determine if there is any possible link between them and magnetic data collected over the two lines. No anomalism is recorded directly above the approximate locations of the intersections. There are anomalies around 200E, however. If the source of these anomalous features are related in any way to mineralisation, then it would imply that mineralised 'veins' are enclosed in a structure that dips between 40 and 55 degrees. There is no evidence to support a theory of the anomalies at 200E being associated with mineralisation, or that the mineralisation intersected in AD2 extends at the angle suggested above.

It should be recognised that soil anomalism recorded on lines 100S and 200S generally coincide with the magnetic feature around 200E on lines 100S, 200S and 300S.

Cross-line Data

The single cross-line was surveyed to determine if there existed cross structures parallel to grid lines, as inferred in the contoured data.

Data collected along the single cross-line (Figure 15) indicates a large basement response at the 'south' end of the line, centred at 250m, contrasted by lower background at the north end of the line, as observed in the baseline along the grid. This basement feature may be related to the serpentinite dipping shallowly under the southern end of the grid, however, this is not qualified.

Several small amplitude shallow source anomalies are evident in the data, at 460m, 635m, 805m, 950m and 980m. The anomaly at 460m correlates with the feature observed on line 10N, 120E. The amplitude of the anomaly is smaller than that observed on the grid, indicating that the cross line did not pass over the top of the feature. A confusing small high and low on line 300N, 20W is proximal to the small high observed at 805m. The anomalies at 950m and 980m, located between lines 400N and 500N, may relate to the two highs observed on line 400N, 100W and 40W. This is tenuous as there are no similar features on line 500N.

There is also evidence for several cross-structures, located at 270m, 310m, 490m, and 610m. Drill hole AD2 is located within the interpreted cross-structures at 270 and 310m. These structures may related to the fluid /mineralisation pathway.

The gap in the data is caused by the interference from overhead power lines, and the high amplitude shallow anomaly at the south-end of the gap must be treated with caution. However, the feature at 635m does correlate with a very shallow anomaly observed on line 170N AD grid (traverse along the road).

5.6 Betts Track

Ground magnetic data was collected along Betts Track in March 1996. A total of 1.4 km of the Track falls within Luina EL 17/93, whilst the first 0.8 km from the main Waratah to Savage River road lie within Waratah EL 48/94.

Data was collected using the GSM-19F magnetometer, taking readings every second along the line (equating to a sample every 1.5m). A topo-counter was used along the track to generate control points spaced fifty metres apart to convert time to distance.

Base station data was collected using a Scintrex OMNI-IV magnetometer, sampling every ten seconds, to correct data for diurnal variation.

A single, idealistic profile has been created for the data (Figure 16), even though the line direction varied from south to west along the traverse.

Three data regions are visible in the profile, the first consisting of a moderately erratic, medium frequency signature between 1150m and 1500m. No geological units were observed in outcrop along this region, however, it is interpreted to relate to moderately buried Crimson Creek Formation.

The extremely erratic signature contained between 1500m and 1800m is the second province. This signature may be related to the serpentinite, however, it is not as distinct as that observed on the Arthur Dam grid. There is marked increase in outcrop geology in this region, with several interpreted to be Serpentinite, which explains the high magnetic and high frequency response. It should be noted however that the magnetic response is confined between 1500m and 1800m whilst the Serpentinite outcrop was found between 1750m and 2000m. The mismatch in geology and ground magnetics may be a combination of the geology not being located accurately on the map and the fact that the geophysical data was measured using a topo-counter which can produce location errors along a survey from such factors as stretching and breakage.

The remainder of the track from 1800m to 2200m is the third province. This may actually contain part of the response associated with province two, however, the last section of the line appears similar to that observed over the granite along Butlers Road. Outcrop in this area indicates the presence of basaltic lavas from 2000m to the end of the ground magnetic survey.

5.7 Drilling

5.7.1 DDH AD3

DDH AD3 was drilled in the northern part of Arthur Dam grid, collared at local grid coordinates 400N, 05W (AMG 369724.6mE, 5407333.3mN; Figure 17). It was planned

to test a Zn dominant soil geochemistry anomaly by drilling at a dip of 45° parallel to the 400N grid line, AMG 140°. The anomalous geochemistry, up to 1234ppm Zn and 833ppm Pb (at 60E), is thought to be part of a NNE striking trend of anomalous soil geochemistry, extending over the sampled grid lines 200S to 400N.

The results are discussed below, and a graphic log of AD3 is included in Appendix 8, and section illustrated in Figure 18.

Lithologies

Lithologies intersected in AD3 is dominated by variably textured mafic volcanics, including lava, lava breccia, hyaloclastite and volcaniclastics. The core varies from dark grey to green in colour, with moderate to strong chlorite alteration of all lithologies. Pyroxene ± feldspar phyric lava is commonly interbedded with sandstone-siltstone sized volcaniclastics and brecciated lava. Amygdales, filled with chlorite are also common in the lava and lava clasts. From 46.6 - 70.5m, quenched vesicular (?perlitic) clasts are altered to carbonate, and in places breccia and volcaniclastic matrices have been replaced by carbonate, most commonly calcite.

Alteration and Mineralisation

Chlorite alteration is commonly pervasive in all lithologies, varying from slight to strong. Traces of talc occurs with the strongest chlorite alteration. Carbonate is present as calcite and also as a yellow-cream much less reactive (Mg or Mn + Fe) form. It is predominantly in network veinlets more or less parallel (and infilling) the general foliation in variable, slight to moderate, abundance. The yellow-cream carbonate is dominant from 45 - 77.2m and 162.5 - 209m in small blotchy patches along veins parallel to foliation and replacing grains and clasts in medium-fine grained volcaniclastics and breccia. Calcite also replaces the breccia matrix and volcaniclastic beds. Silica in veinlets is minor, filling vugs and spaces in carbonate veins where present.

Mineralisation in AD3 occurs as very minor disseminated pyrite, and minor sulphide mineralisation in carbonate-quartz veins. The best intersections at 48.3 - 48.5m and

153.5m show cross-cut and cleavage parallel carbonate veins with sphalerite, galena and pyrite (interpreted paragenesis) and later quartz-chlorite. Figure 20 illustrates the mineralisation and alteration assemblages at these intersections.

Geochemical assays for AD3 are included in Appendix 9.

Structure

There is a general foliation throughout the drill core, which increases in places with alteration. Orientations of the general foliation and quartz-carbonate veins were achievable in several sections of the drill core. Mineralised veins (M_1 and M_2) and foliation generally plot with a 310-320/ 90-40° SW strike, and mineralised quartz-carbonate veins (M_3) have a strike and dip of 085/70° N (Figure 19).

Apparent faults occur between 35 - 47m and 167 - 177m. Within the first of these zones, rubbly core extends from 35.0 - 37.0m , with a puggy fault at 34° to Local Core Axis (LCA) at 36.5m. At 44.3m, carbonate-sericite-chlorite accompanies a fault at 29° LCA, and a puggy fault at 46.8m lies at 22° LCA. Puggy and sheared zones at 28° LCA and 30° LCA extend from 167.15 - 167.3m and 169,7 - 169.9m respectively. The fault angles are in a similar range to the core angle of general cleavage intersected in the hole.

Discussion

Results from DDH AD3 were disappointing, and do not explain anomalous Zn soil geochemistry above the hole. The mineralisation intersected occurs as very minor disseminated pyrite, and minor pyrite, sphalerite and galena is visible in carbonate-quartz veins, most notably at 48.3 - 48.5m and 153.5m. Structural readings show increasing foliation development with increasing alteration. Foliation and mineralised veins generally plot with a 310-320/ 90-40° SW strike, and mineralised quartz-carbonate veins (M_3) have a strike and dip of 085/70° N. These readings are beneficial in providing structural information for the Arthur Dam area.

The negative results suggest that despite the NNE striking trend of high Zn soil geochemistry, perhaps Zn is not the best indicator element in this environment

5.7.2 DHEM

DDH AD3 was surveyed with DHEM, axial probe only, on 17 May 1996, using the CRONE PEM system. Two loops were used for the survey (Figure 20), one placed over the collar (loop 14-96), the other north of the collar overlying the hole at depth (loop 15-96). The survey was recorded using a 10 msec time base and 0.5 msec ramp on the receiver. The transmitter had a very fast shut off (unknown speed) which causes ringing in the primary pulse as it decays. A 15 ohm resistor was placed in the loop to decrease the amplitude of the ringing. Twenty channels of data were recorded from 0.05 to 6.2 msecs. A peak current of 4 Amps was circulated through both loops. The hole was surveyed to 220m.

The crystal clocks were used to sync the transmitter and receiver for this survey. The following day the clocks were found to be malfunctioning and as such data from this survey may be suspect.

Loop 14-96

The data from this loop indicates a mid-time off hole conductor at around 100m down the hole (Figure 21). The anomaly is dominantly a negative response. This could either be a body above the hole and orientated in a near vertical position or a flat lying body below the hole. The flat lying body below the hole is more likely as it is primarily null coupled for loop 15-96 and not seen by that loop. A vertical body should have been observed when surveying with loop 15-96.

Loop 15-96

Data from this loop indicates a large conductor directly below the hole (Figure 22). This body would need to be very conductive to account for the build up in secondary field from 60m down the hole to the anomaly. It can not be determined if this response is due to a problem with the crystal clocks or a real conductor.

It is expected that the serpentinite is directly below the hole. There have been reported cases where serpentinite bodies have produced electromagnetic anomalies (pers comm John Bishop), however, one can not confidently say if this is the cause of the anomaly.

5.7.3 Soil Orientation Survey

As discussed in McGunnigle 1996, several 'A' and 'C' horizon soil samples were collected from the Arthur Dam grid along 300N and 400N. The 'C' horizon samples results defined a prominent Zn and Pb anomaly on line 400N which was consistent with sampling by previous workers.

Diamond hole AD3 was drilled to test the lithologies underlying this 'C' horizon anomaly. The hole returned very poor results and the source of the anomaly has not been defined.

After this exercise it was decided to trench two traverses:- one along 400N and one along 100S and the drill trace of AD2. A detailed soil survey was conducted along 100S using the trench as well as 20m spaced auger holes.

The aim of the orientation survey was to identify which soil horizon, size fraction elements and analysis would be best to define surface anomalism above significant mineralisation, such as that intersected in AD2.

The traverse went from 0E to 380E with samples collected every 20m.

From every 20m easting 7 samples were taken:- 3 'A' horizon, 3 'B' horizon and 'I' large 'C' horizon which was latter split by AL5 into 5 portions. The 'A' horizon was defined as dark brown humic-rich soil generally at depths 0-0.15m. The 'B' horizon consisted of grey-brown clay (±Fe mottles) in which no primary rock fabric was present. This zone was generally at 0.2m - 0.5m depth. 'C' horizon samples comprised saprock ± clay and were taken from or immediately above the hard semi-fresh rock interface, generally at 0.8m - 1.1m depth but as shallow as 0.3m depth.

Equipment was cleaned between samples and sample bags were numbered randomly.

Details of the survey are tabulated below and results are contained in Appendix 13.

Horizon	Fraction	Lab	Analysis
A	total	ALS	Perchloric acid digest-ICPAES/Au by 50g fire assay, flame AAS
A	total	Analabs	MMI
A	total	ALS	Humic-weak ammonia acid digest
B	total	ALS	Perchloric acid digest-ICPAES/Au by 50g fire assay, flame AAS
B	total	Analabs	MMI
B	total	ALS	Regoleach-ICPMS
C	total	ALS	Perchloric acid digest-ICPAES/Au by 50g fire assay, flame AAS
C	$^{+}$20#	ALS	Perchloric acid digest-ICPAES/Au by 50g fire assay, flame AAS
C	$^{-}$20,$^{+}$80#	ALS	Perchloric acid digest-ICPAES/Au by 50g fire assay, flame AAS
C	$^{-}$80#	ALS	Perchloric acid digest-ICPAES/Au by 50g fire assay, flame AAS
C	$^{-}$200#	ALS	Perchloric acid digest-ICPAES/Au by 50g fire assay, flame AAS

5.7.4 DDH AD4

DDH AD4 was drilled to test mineralisation continuity between massive mineralisation intersected at 100m depth in DDH AD2 (12m @ 5% Zn, 1% Pb, 0.6g/t Au) and 15m of anomalous Pb-Zn (Au) rock chip geochemistry at surface in the 100S costean (see Appendix 10 for drill hole proposal). It was collared on the northern side of the costean, at 369467mE, 5406863mN, and completed at 97.7m (Figure 17).

Drilling and logging of AD4 was carried out by contract geologist Dave Gardner. A graphic log is presented in Appendix 11, and section in Figure 23.

Lithology

Lithologies intersected in AD4 are typical of the Arthur Dam area. Variably textured intermediate to basic volcanics include lava, lava breccia and volcaniclastics. The core varies from dark grey to green in colour, with moderate to strong chlorite alteration of all lithologies. The volcanics are commonly feldspar ± hornblende phyric, with replacement of phenocrysts to carbonate and sericite-chlorite respectively.

Structure

Structural data from oriented core was analysed using the DIPS 2.2 package. 177 structural measurements were used and classified into 11 coded groups for data selection:

Structure type:	Structure code for DIPS
cleavage	clv
fracture	fx
rough fracture	fxrough
fracture with slickensides	fxslick
fractures with carbonate on surface	fxcb
fractures with cleavage coplanar	fxclv
cleavage with carbonate on surfaces	clvcb
cleavage with fractures	clvfx
carbonate veins	cbvn
sulphide veins	vnsulph
faults and shear zones	clvFAULT

Only one lineation was recorded from the hole. The results are presented in Table 2.

The dominant cleavage dips 60-70° to the NW, with a second cleavage dipping very shallowly to the N. Fractures are dominantly dipping NW in the major cleavage direction but have shallower dips (45-65 °). Cleavage related fractures (including those with

slickensides) show much stronger groupings of orientations than other fractures (see Table 2). Carbonate veins, some of which contain minor pyrite, show a scatter of orientations which trend more or less parallel to the dominant cleavage.

Alteration and Mineralisation

Chlorite and sericite alteration is commonly pervasive in all lithologies, varying from slight to strong. Carbonate alteration has been logged as siderite as the carbonate oxidises quickly and only reacts to acid when powdered. Siderite is present both as fine pervasive and spotty alteration. It is also observed to replace feldspar phenocrysts and is the dominant vein type. Some carbonate has altered to clay, most commonly between 56.9 - 68.9m. Pervasive fine carbonate is present commonly as calcite from 68.9m.

Mineralisation in AD4 occurs as very minor disseminated pyrite, and minor sulphide mineralisation in quartz-carbonate veins. A 0.1m vein of massive sphalerite-galena was intersected from 55.7-55.8m, and zones of quartz-carbonate veins contain fine stringers of sphalerite-galena. Geochemical assays for AD4 are reported in Appendix 12.

Discussion

Minor mineralisation intersected in AD4 is vein style, related to carbonate-quartz veins which roughly parallel the major NE striking cleavage. It is probable that veining is controlled by this dominant fabric direction. AD4 was planned to intersect quartz stockwork mineralisation down dip from the 100S costean and up dip from DDH AD2, assuming the foliation to be a controlling factor. The target zone interpreted from mineralisation discovered so far was to intercept Pb-Zn + Au at 50-70m. Only minor vein-style Pb-Zn mineralisation at this depth has shown that stockwork mineralisation intersected in AD2 is not continuous to anomalous geochemistry exposed at the surface in the 100S costean. Therefore, while veining, mineralisation and anomalous geochemistry in the Arthur Dam area appears to be controlled by the dominant NE striking fabric direction, depth to mineralisation along strike is unknown. It is possible that subtle NW-SE cross-structures which are observed in the ground magnetic data may have a controlling factor over mineralisation.

6 ENVIRONMENTAL DISTURBANCE AND REHABILITATION

Reconstruction of Betts Track, south of Waratah Road, was undertaken during the 1996-1997 period to provide vehicle access into more remote parts of EL 17/93 to the south. The first 770m of the track lies within EL 48/94 which then continues into Luina EL 17/93. The track was excavated to 6km for 4WD access, where after vegetation has been cleared from the track providing access for foot and 4WD bike. Rehabilitation at the point of the track where access changes from vehicle to foot (or bike) was undertaken in January 1997, repairing damage to part of the track.

An additional cross line was cut oblique to previous cutting on the Arthur Dam grid. No rehabilitation has been carried out on the grid to date.

Costeans were created in two regions of the Arthur Dam grid, both of which have been rehabilitated by filling to ground level. Rehabilitation work was undertaken in January 1997.

Track access to DDH AD3 and DDH AD4 and costean track access was completed in conjunction with TDR regulations. All tracks and drill sites were rehabilitated in January 1997.

7 EXPENDITURE

Pasminco Exploration

EL 17/93 Luina, Tasmania

Expenditure Statement

For the 12 month period ended 31/03/97

	3021
	$
Personnel	90,767
Travel & Accommodation	5,180
Geological Consultants	-
Geochemical Consultants & Assays	13,138
Geophysical Surveys & Consultants	24,766
Other Consultants	21,792
Drilling	28,021
Stores & Supplies	3,636
Vehicles Plant & Equipment	6,634
Land	5,617
Computing	3,584
Office	21,000
Administration Fee	22,414
TOTAL	**$ 246,549**

8 KEYWORDS AND LOCALITY

BASIC VOLCANICS, BRECCIA, GRANITE, CARBONATE, BASE METALS, TIN, GOLD, REPLACEMENT, STOCKWORKS, VEINS, PRECAMBRIAN, CAMBRIAN, DEVONIAN, ORDOVICIAN, TERTIARY, DATA REVIEW, GEOLOGY, GEOCHEMISTRY, GEOPHYSICS, AEROMAGNETICS, GROUND MAGNETICS

BURNIE SK5503, LUINA, RUSSELL, DUNDAS

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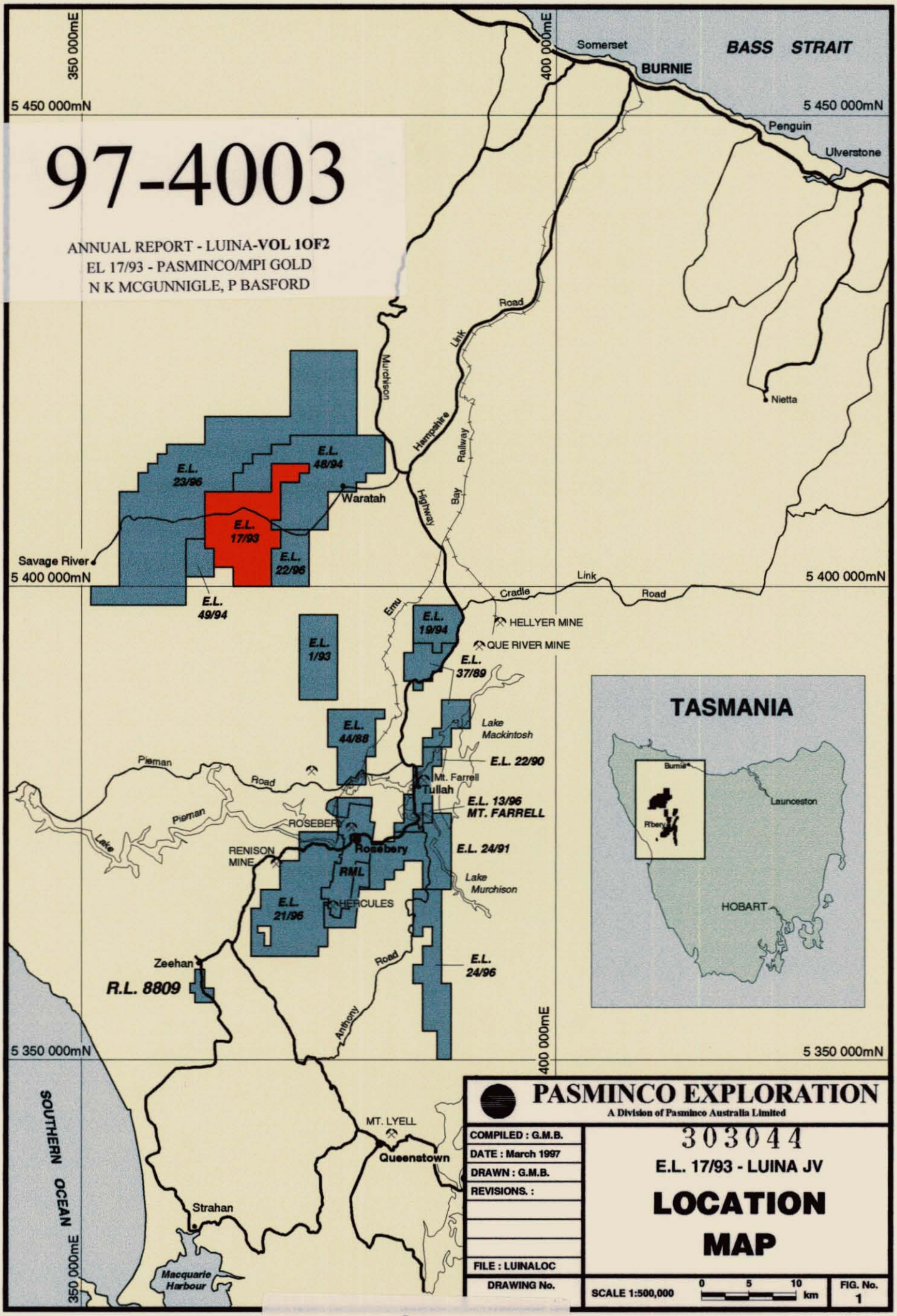
Shaw, R.W.L. & Everett, M.P., 1985b Final Report on areas surrendered to the Department of Mines Tasmania, June 1985. EL 5/63 Area 5. Unpub. Rpt. Comstaff Pty. Ltd.


97-4003
ANNUAL REPORT - LUINA-VOL 1OF2
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUNNIGLE, P BASFORD
350 000mE
400 000mE
5 450 000mN
5 400 000mN
5 350 000mN
BASS STRAIT
Somerset
BURNIE
Penguin
Ulverstone
Nietta
Waratah
Savage River
Murchison Highway
Hampshire Bay Railway
Cradle Mountain Link Road
Emu
HELLYER MINE
QUE RIVER MINE
E.L. 23/96
E.L. 48/94
E.L. 17/93
E.L. 22/96
E.L. 49/94
E.L. 1/93
E.L. 19/94
E.L. 37/89
E.L. 44/88
E.L. 22/90
E.L. 13/96 MT. FARRELL
E.L. 24/91
E.L. 21/96
E.L. 24/96
R.L. 8809
Lake Mackintosh
Lake Murchison
Mt. Farrell
Tullah
Pieman Road
Lake Pieman
ROSEBERY
Rosebery
RENISON MINE
RML
HERCULES
Zeehan
Anthony Road
MT. LYELL
Queenstown
Strahan
Macquarie Harbour
SOUTHERN OCEAN
TASMANIA
Burnie
Launceston
HOBART
PASMINCO EXPLORATION
A Division of Pasminco Australia Limited
COMPILED : G.M.B.
DATE : March 1997
DRAWN : G.M.B.
REVISIONS. :
FILE : LUINALOC
DRAWING No.
303044
E.L. 17/93 - LUINA JV
LOCATION MAP
SCALE 1:500,000
0 5 10 km
FIG. No. 1
5 cm

360 000mE
365 000mE
370 000mE
375 000mE
5 410 000mN
5 405 000mN
5 400 000mN

SAVAGE RIVER RAP

MT. RAMSAY RAP

E.L. 17/93

E.L. 48/94

E.L. 49/94

58M/87

84M/84

Mount Cleveland

Cleveland Mine

Luina

Arthur Dam

Magnet Dam

Mount Bischoff 1785

Bischoff

WARATAH

Bischoff Reservoir

Waratah Reservoir

Transmission Lines

Magnet Creek

Magnet Road

Whyte River

Mount Cleveland Road

Hazlewood River

Hoblit Creek

Hoblit Road

Bells Creek

Whyte R.

Little Castray R.

Castray River

Waratah

Arthur River

Butlers Road

Arthur Dam Road

Bischoff Rd. Sth

Ramsay River

Wilson R.

Moor Ck

Betts

Track

KEY

- RAP – Recommended Area for Protection
- Private Freehold Land
- Deferred Forest
- State Forest – Multiple Use Forest
- Mine Lease
- Savage River Australian Heritage Commission Registered Entry
- Proposed Tarkine Wilderness Area Register of National Estate

303045

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : G.M.B.	E.L. 17/93 – LUINA JV
DATE : April 1996	**LAND TENURE**
DRAWN : G.M.B.	
REVISIONS :	
FILE : 50_LNALT	
DRAWING No. 321–GN–003	SCALE 1:50,000 (0 – 1 km)
	FIG. No. 2

5 cm

97-4003

ANNUAL REPORT - LUINA-**VOL 1OF2**
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUNNIGLE, P BASFORD

360 000mE
365 000mE
370 000mE
375 000mE
5 410 000mN
5 405 000mN
5 400 000mN

E.L. 48/94 BOUNDARY
E.L. 17/93 BOUNDARY
E.L. 49/94 BOUNDARY

WARATAH
Waratah Road
Mount Bischoff
Bischoff
Mount Cleveland
Mount Cleveland Road
Luina
Cleveland Mine
Arthur Dam
Magnet Dam
Magnet
Betts Prospect
Waratah Reservoir
Transmission Lines

LEGEND

QUATERNARY

(6) Qra — Marsh and swamp deposits: alluvium, river gravels.

TERTIARY

(57) Tb — Tholeiitic and alkali olivine basalt.

(9) Ts — Sediments

DEVONIAN/SILURIAN

(22) SDu
(44) Sa — Siltstone; mudstone and calcareous siltstone (correlate of the Amber Formation)
(21) Sc — Quartz sandstone with minor mudstone and granule conglomerate (correlate of Crotty Formation)

ORDOVICIAN

(39) Ol — Limestone and impure limestone with variable texture (correlate ot the Gordon Limestone)

COCAMBRIAN

(69) Ecc — Volcaniclastic lithicwacke, siltstone, mudstone and tholeiitic basalt (correlate of Crimson Creek Formation)

(71) Eccb — Areas of dominantly basalt.

(27) Ecq — Quartzwacke and minor mudstone (possible correlate of the Success Creek Group)

PRECAMBRIAN

(13) Po — Indurated quartz sandstone, siltstone and mudstone (correlate of the Oonah Formation)

(64) Pws — Schistoze quartz sandstone, siltstone and mudstone (correlate of the "Whyte Schist")

Igneous Rocks

TERTIARY

(57) Tb — Tholeiitic and alkali olivine basalt.

DEVONIAN

(17) Dg — Porphyritic fine to coarse-grained biotite granite/adamallite.

CAMBRIAN

(20) Eg — Fine to coarse-grained gabbro.

(48) Ebp — Massive ultramafic cumulate.

(35) (28) Ebu Ebm — Massive and pillow aphyric basalt flows, commonly brecciated (low-titatium Tholeiitic)

(23) Eba — Porphyritic (orthopyroxene, chromite), high-magnesium andesite, commonly with pillow and breccia flows.

(65) Et — Tonalite and associated rocks.

(45) Esp — Serpentinized, layered peridotite and pyroxenite.

(49) Esd — Serpentinized dunite with areas of interlayered pyroxene-bearing dunite.

97-4003

ANNUAL REPORT - LUINA-VOL 1OF2
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUINNIGLE, P BASFORD

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED: NKM/GMB	303046
DATE : April 1995	E.L. 17/93 - LUINA JV
DRAWN : G.M.B.	GEOLOGY
REVISIONS :	5 cm
FILE : 25_1GEOL	SCALE 1:25,000 0 1 km
DRAWING No. 321-GL-004	FIG. No. 3

LEGEND

1. GENERAL FORM

Rock type, colour, grain size, overall texture, constituents and textures, alteration, mineralisation.
Rock Types can be combined using a -
Subordinate Rock Types are separated by /
Each Descriptor Group is separated by ,
Descriptors within a group are separated by .
Derwent series 19 colours (in brackets) are intended for the Cambrian sequences.

2. ROCK TYPES

Lavas or Intrusives or Volcaniclastics	**L I V**	o	(14)	acid
		i	(46)	intermediate
		b	(49)	basic
		u	(22)	ultrabasic
		r		rhyolite
		d	(11)	dacite
		n	(46)	andesite
		ba	(49)	basalt
		g	(20)	granite
		di	(22)	diorite
		do	(45)	dolerite
		gb	(25)	gabbro
		s	(23)	serpentinite
Sediments or Volcaniclastics	**S V**	bsh	(35)	black shale
		sh	(36)	shale
		slt	(35)	siltstone
		sst	(39)	sandstone
		w	(37)	greywacke
		cong	(39)	conglomerate
		bx		breccia
		tbd		turbidite
		mxf		mass flow
		cht	(34)	chert
		lst	(65)	limestone
		dol	(65)	dolomite
		Fe	(64)	iron formation
		gl	(4)	glacial deposits
		fgl	(4)	fluvioglacial deposits
		alv	(4)	alluvial deposits
		col	(4)	colluvial deposits (talus)
		qzt		quartzite
Metamorphic and Tectonic Rocks	**M**	sht	(38)	schist
		qzt	(40)	quartzite
		hf	(50)	hornfels
		sk	(50)	skarn
		mb	(48)	marble
		m		mylonite
		fz		fault breccia (pug)
Colours should be hatched				
Unassigned		?		Use alone or as a qualifier to other rock types where uncertain

3. DESCRIPTORS

Colour :

ple	pale	bl	blue
dk	dark	wht	white
gy	grey	yel	yellow
or	orange	buf	buff
bk	black	grn	green
pk	pink	ppl	purple
rd	red	crm	cream
brn	brown	kha	khaki

Grainsize :

fg	fine grained
mg	medium grained
cg	coarse grained
vcg	very coarse grained

4. MAPPING SYMBOLS

- Strike and Dip of Strata (25)
- Strike and dip of inverted strata
- Strike and dip of cleavage or foliation (60)
- Plunge of lineation (50)
- Geological boundary position accurate
- Geological boundary position approximate
- Mine
- Abandoned prospect or mine
- Costean or trench
- Diamond drill hole, including projection
- Unconformity
- Fault
- Fault with dip (70)
- Thrust Fault
- Plunging antiform
- Plunging synform
- Shear/strong cleavage
- Vein

DESCRIPTORS continued

Overall Texture :

ft	flow banded
ftx	flow brecciated
hyt	hyaloclastic
pill	pillowed
pep	pepentic
mtv	massive
lam	laminated
aph	aphyric
por	porphyric
peg	pegmatitic
bd	bedded
xbd	cross bedded
ufs	upwards fining sequence
ps	poorly sorted
cs	clast supported
ms	matrix supported
fol	foliated
clvd	cleaved
shd	sheared
bx	brecciated
aug	augen
vnd	veined

Constituents & Internal Texture :

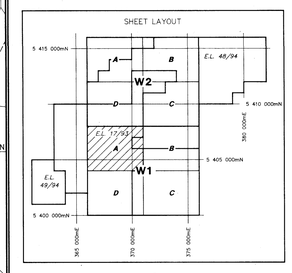
ply	polymict
t	lithic
pm	pumice
xl	crystal
vit	vitric
spn	spherulites
ves	vesicles
amy	amygdales
wsp	wisps
sty	stylolites
f	feldspar
q	quartz
mic	micaceous
cal	calcareous
px	pyroxene
hb	hornblende
cr	chromite
mag	magnetite

Alteration :

bch	bleached
dtx	destructured
ded	dedolised
alb	albitised
co	carbonatised
chl	chloritised
ser	sericitised
kao	kaolinitised
ep	epidotised
sil	silicified
f	feldspar
fuc	fuchsitic

Mineralisation :

dis	disseminated
v	vein
str	stringer
mxv	massive
bnd	banded
cla	clasts
gos	gossan
sph	sphalerites
py	pyrite
po	pyrrhotite
asp	arsenopyrite
gn	galena
sp	sphalerite
cp	chalcopyrite
ba	barite
mag	magnetite
hm	haematite
lm	limonite
au	gold
ag	silver
to	tourmaline
q	quartz
cb	carbonate
sd	siderite
mn	manganese carbonate
fl	fluorite



5 cm

GRID CONVERGENCE 12°
GN
MN
GRID/MAGNETIC 12.0°

97-4003

ANNUAL REPORT - LUINA-VOL 1OF2
EL 17/93 - PASMINCO/MPI GOLD
N.K.MCGUINNIGLE, P.BASFORD

303047

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : N.K.M.	E.L. 17/93 -LUINA JV
DATE : Feb., 1996	**FACTUAL GEOLOGY**
DRAWN :	SHEET W1-A
REF. :	
REVISIONS :	
DRAWING No.	SCALE 1:5000 (0 200 m) FIG. No. 4

366 000mE
367 000mE
368 000mE
369 000mE
370 000mE
371 000mE
5 404 000mN
5 403 000mN
5 402 000mN
5 401 000mN
5 400 000mN
Swamp
Creek
Junction
River
Mount
Creek
E.L. 17/93
E.L. 48/94
78009
78008
78006
W1
W2
A
B
C
D
5 415 000mN
5 410 000mN
5 405 000mN
5 400 000mN
380 000mE
356 000mE
370 000mE
375 000mE
SHEET LAYOUT
GRID CONVERGENCE 1.0°
GRID/MAGNETIC 12.0°
TN
GN
MN
5 cm

LEGEND

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Rock type, colour, grain size, overall texture, constituents and textures, alteration, mineralisation.
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		dol	(65)	dolomite
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		fgl	(4)	fluvioglacial deposits
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		m		mylonite
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DESCRIPTORS continued

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fbx	flow brecciated
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pep	peperitic
mav	massive
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aph	aphyric
por	porphyric
peg	pegmatitic
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xbd	cross bedded
ufs	upwards fining sequence
ps	poorly sorted
cs	clast supported
ms	matrix supported
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clvd	cleaved
shd	sheared
ba	brecciated
aug	augen
vnd	veined

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pm	pumice
xl	crystal
vit	vitric
sph	spherulites
ves	vesicles
amy	amygdales
wsp	wisps
sty	stylolites
f	feldspar
q	quartz
mic	micaceous
cal	calcareous
px	pyroxene
hb	hornablende
ct	chlorite
mag	magnetite

Alteration :

bch	bleached
dtx	de-textured
ox	oxidised
alb	albitised
co	carbonatised
chl	chloritised
ser	sericitised
kao	kaolinitised
ep	epidotised
sil	silicified
f	feldspar
fuc	fuchsitic

Mineralisation :

dis	disseminated
v	vein
str	stringer
mav	massive
bnd	banded
cla	clasts
gos	gossan
sul	sulphides
py	pyrite
po	pyrrhotite
asp	arsenopyrite
gn	galena
sp	sphalerite
cp	chalcopyrite
ba	barite
mag	magnetite
hm	haematite
sb	stibnite
au	gold
ag	silver
to	tourmaline
q	quartz
cb	carbonate
sd	siderite
mn	manganese carbonate
fl	fluorite

4. MAPPING SYMBOLS

- Strike and Dip of Strata (25)
- Strike and dip of inverted strata
- Strike and dip of cleavage or foliation (60)
- Plunge of lineation (50)
- Geological boundary position accurate
- Geological boundary position approximate
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- Diamond drill hole, including projection
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- Fault
- Fault with dip (70)
- Thrust Fault
- Plunging antiform
- Plunging synform
- Shear/strong cleavage
- Vein

97-4003

ANNUAL REPORT - LUINA VOL 10/2
EL 17/93 - PASMINCO/MPI GOLD
N.K McGUINNIGLE, PRAXFORD

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : N.K.M.	203048
DATE : Jan. 1997	E.L. 17/93 - LUINA JV
DRAWN :	**FACTUAL GEOLOGY**
REVISIONS :	**SHEET W1-D**
FILE :	
DRAWING No.	SCALE 1:5000 (0 100 200 m)
	FIG. No. 5

5 412 000mN
5 411 000mN
5 410 000mN
5 409 000mN
5 408 000mN
366 000mE
367 000mE
368 000mE
369 000mE
370 000mE
371 000mE
E.L. 48/94 BOUNDARY
E.L. 17/93 BOUNDARY
Worlds Creek
Worlds Creek
Seven Mile Creek
Seven Mile Creek
Worlds Road
Magnet Dam
Mineral
Mineral
River
Flood spoke
MAP 55 1405/96
MAP 55 1405/96
MAP 55 1473/79
MAP 55 1471/72
GEOPHYSICS 55 355/32222
MAG1
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LEGEND

1. GENERAL FORM

Rock type, colour, grain size, overall texture, constituents and textures, alteration, mineralisation.
Rock Types can be combined using a -
Subordinate Rock Types are separated by /
Each Descriptor Group is separated by ,
Descriptors within a group are separated by .
Derwent series 19 colours (in brackets) are intended for the Cambrian sequences.

2. ROCK TYPES

Lavas or Intrusives or Volcaniclastics	**L I V**	a	(14)	acid
		i	(46)	intermediate
		b	(43)	basic
		u	(23)	ultrabasic
		r		rhyolite
		d	(11)	dacite
		n	(46)	andesite
		ba	(43)	basalt
		g	(20)	granite
		di	(22)	diorite
		do	(45)	dolerite
		ga	(23)	gabbro
		s	(23)	serpentinite
Sediments or Volcaniclastics	**S V**	bsh	(35)	black shale
		sh	(36)	shale
		slt	(35)	siltstone
		sst	(28)	sandstone
		w	(31)	greywacke
		cong	(28)	conglomerate
		bx		breccia
		tbd		turbidite
		mdf		mass flow
		cht	(34)	chert
		lst	(65)	limestone
		dol	(66)	dolomite
		Fe	(64)	iron formation
		gl	(4)	glacial deposits
		fgl	(4)	fluvioglacial deposits
		alv	(4)	alluvial deposits
		cvl	(4)	colluvial deposits (talus)
		qzt		quartzite
Metamorphic and Tectonic Rocks	**M**	sht	(3)	schist
		qzt	(42)	quartzite
		ht	(C)	hornfels
		sk	(C)	skarn
		mb	(4)	marble
		m		mylonite
		fz		fault breccia (pug)
Colours should be hatched				
Unassigned		?		Use alone or as a qualifier to other rock types where uncertain

3. DESCRIPTORS

Colour :

pa	pale	bl	blue
dk	dark	wht	white
gy	grey	yel	yellow
or	orange	brn	brown
bk	black	gn	green
pk	pink	cm	cream
rd	red	khk	khaki

Grainsize :

fg	fine grained
mg	medium grained
cg	coarse grained
vcg	very coarse grained

4. MAPPING SYMBOLS

- Strike and Dip of Strata
- Strike and dip of inverted strata
- Strike and dip of cleavage or foliation
- Plunge of lineation
- Geological boundary position accurate
- Geological boundary position approximate
- Mine
- Abandoned prospect or mine
- Costeam or trench
- Diamond drill hole including projection
- Unconformity
- Fault
- Fault with dip
- Thrust Fault
- Plunging antiform
- Plunging synform
- Shear strong cleavage
- Vein

DESCRIPTORS continued

Overall Texture :

fb	flow banded
fbx	flow brecciated
hyl	hyaloclastic
pill	pillowed
pep	pepentic
mav	massive
blo	blocky
aph	aphyric
por	porphyric
peg	pegmatitic
bd	bedded
xbd	cross bedded
ufs	upwards fining sequence
ws	well sorted
ps	poorly supported
ms	matrix supported
fol	foliated
clvd	cleaved
shd	sheared
bx	brecciated
aug	augen
vnd	veined

Constituents & Internal Texture :

ply	polymict
li	lithic
pm	pumice
xl	crystal
vit	vitric
sph	spherulites
ves	vesicles
amy	amygdales
wsp	wisps
sty	stylolites
f	feldspar
q	quartz
mic	micaceous
cal	calcareous
px	pyroxene
hb	hornblende
cr	chromite
mag	magnetite

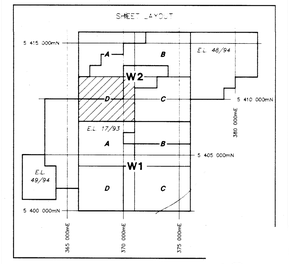
Alteration :

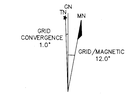
bch	bleached
dtx	de-textured
ox	oxidised
alb	albitised
co	carbonatised
chl	chloritised
ser	sericitised
kao	kaolinitised
ep	epidotised
sil	silicified
f	feldspar
fuc	fuchsitic

Mineralisation :

dis	disseminated
v	vein
str	stringer
mav	massive
bnd	banded
cla	clasts
gos	gossan
sul	sulphides
py	pyrite
po	pyrrhotite
asp	arsenopyrite
gl	galena
sp	sphalerite
cp	chalcopyrite
ba	barite
mag	magnetite
hm	haematite
sm	smoky
au	gold
ag	silver
tm	tourmaline
q	quartz
cb	carbonate
sd	siderite
mn	manganese carbonate
fl	fluorite

SHEET LAYOUT





97-4003

ANNUAL REPORT - LUINA VOL 1OF2
EL 17/93 - PASMINCO MT GOLD
N.W. MOUNT DARLEY, TASMANIA

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED :	N.K.M.
DATE :	Jan., 1997
DRAWN :	
REVISIONS :	
FILE :	
DRAWING No.	

303049
E.L. 17/93 - LUINA JV

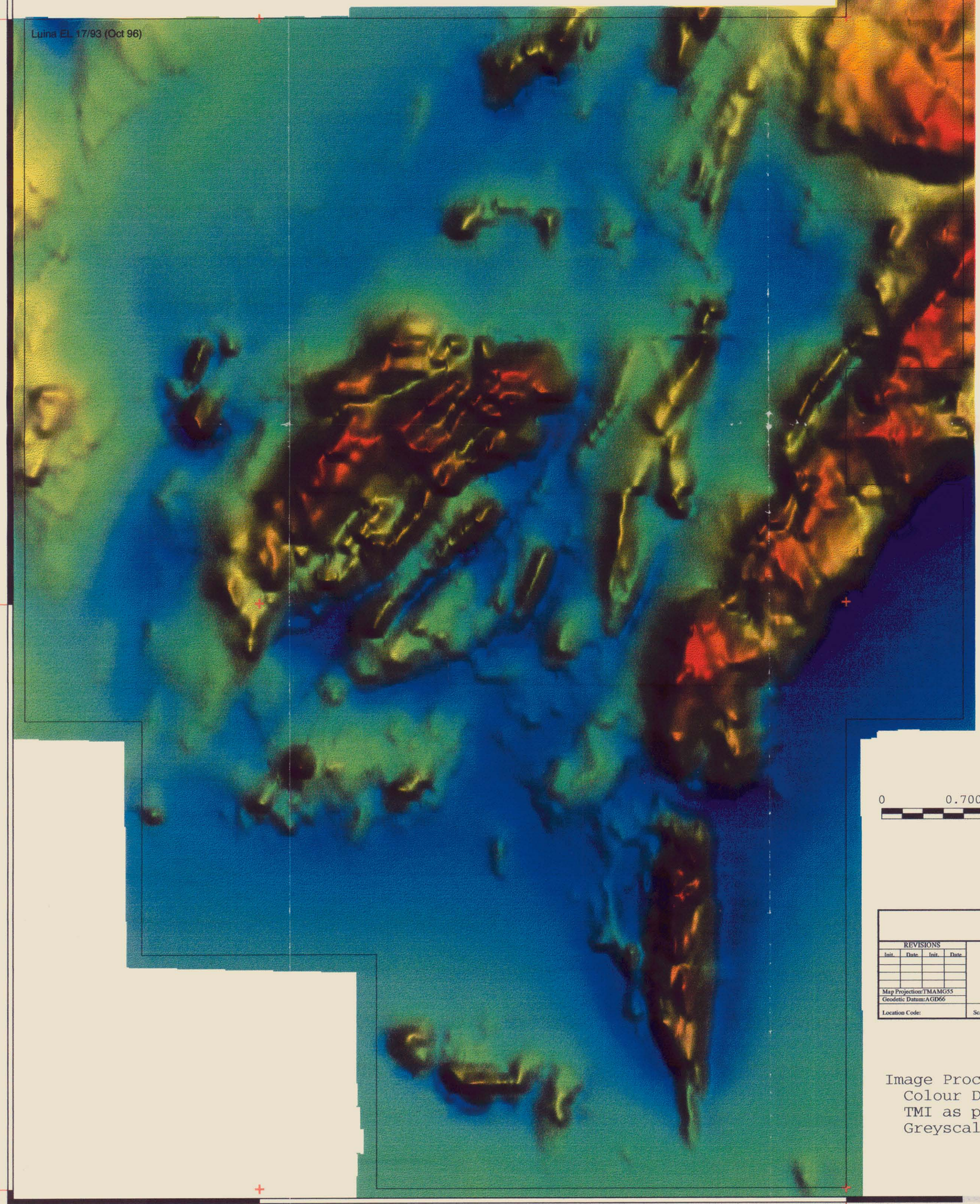
FACTUAL GEOLOGY

SHEET W2-D

SCALE 1:5000 (0 100 200 m)

FIG. No. 6

NORTH WEST TASMANIA - MAGNETICS
Luina EL 17/93 Area
1:25000



5410000N
5405000N
5400000N
365000E
370000E

GN
MN

Scale 1:25 000
0 0.700 1.400 2.100 2.800 3.500
Kilometers

5 cm

303050

Pasminco Australia Ltd
Melbourne - Exploration

REVISIONS				TASMANIA NORTH WEST TASMANIA - MAGNETICS Waratah EL 17/93 Area Colour Drape, TMI as Pseudo, Sun NE 45 70 luina_mag_cd_ne_25.alg		Compiled: AMR
Init.	Date	Init.	Date			Printed: Novajet111
						Traced:
Map Projection:TMAMG55						Checked:
Geodetic Datum:AGD66						
Location Code:				Scale: 1:25 000	Date: 17 January 1997	Plate No.

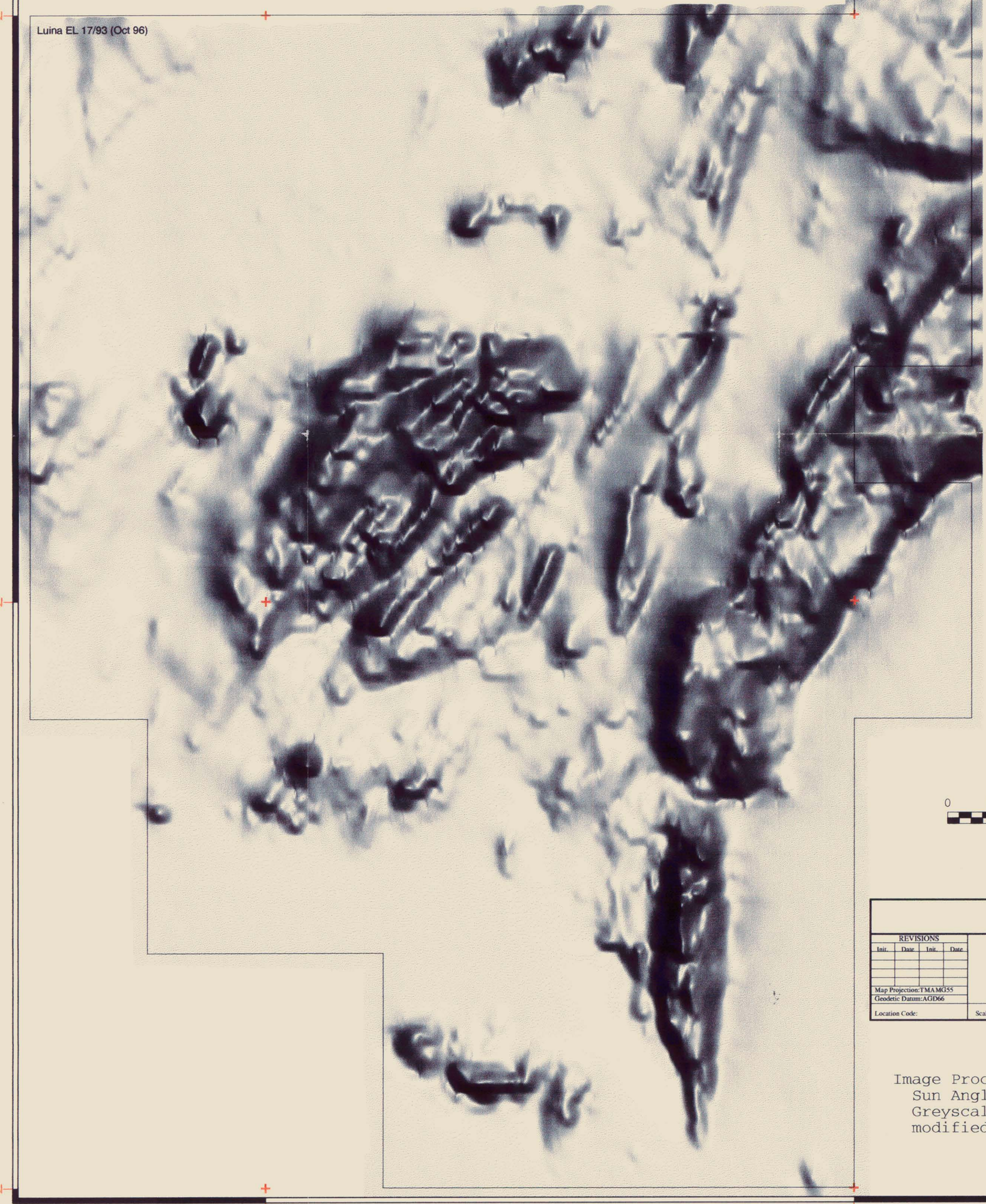
Image Processing: On ERMapper
Colour Drape Image
TMI as pseudocolour, gaussian stretch
Greyscale sun angle NE 45 73, log stretch.

97-4003

Figure 7

ANNUAL REPORT - LUINA-**VOL 1OF2**
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUNNIGLE, P BASFORD

NORTH WEST TASMANIA - MAGNETICS
Luina EL 17/93 Area
1:25000



97-4003

ANNUAL REPORT - LUINA-**VOL 1OF2**
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUNNIGLE, P BASFORD

GN MN

Scale 1:25 000
0 0.500 1.000 1.500 2.000 2.500
Kilometers

5 cm

Pasminco Australia Ltd
Melbourne - Exploration

REVISIONS				TASMANIA NORTH WEST TASMANIA - MAGNETICS Waratah EL 17/93 Area Greyscale, Sun Angle NE 45 70 luina_mag_sun_ne_25.alg		Compiled: AMR
Init.	Date	Init.	Date			Printed: Novajet111
						Traced:
Map Projection:TMAMG55						Checked:
Geodetic Datum:AGD66						
Location Code:				Scale: 1:25 000	Date: 17 January 1997	Plate No.

303051

Image Processing: On ERMapper
Sun Angle Image
Greyscale sun angle NE 45 73,
modified linear stretch.

Figure 8

ANNUAL REPORT - LUINA-**VOL 1OF2**
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUNNIGLE, P BASFORD

365 000mE 370 000mE 375 000mE 380 000mE

5 410 000mN

5 405 000mN

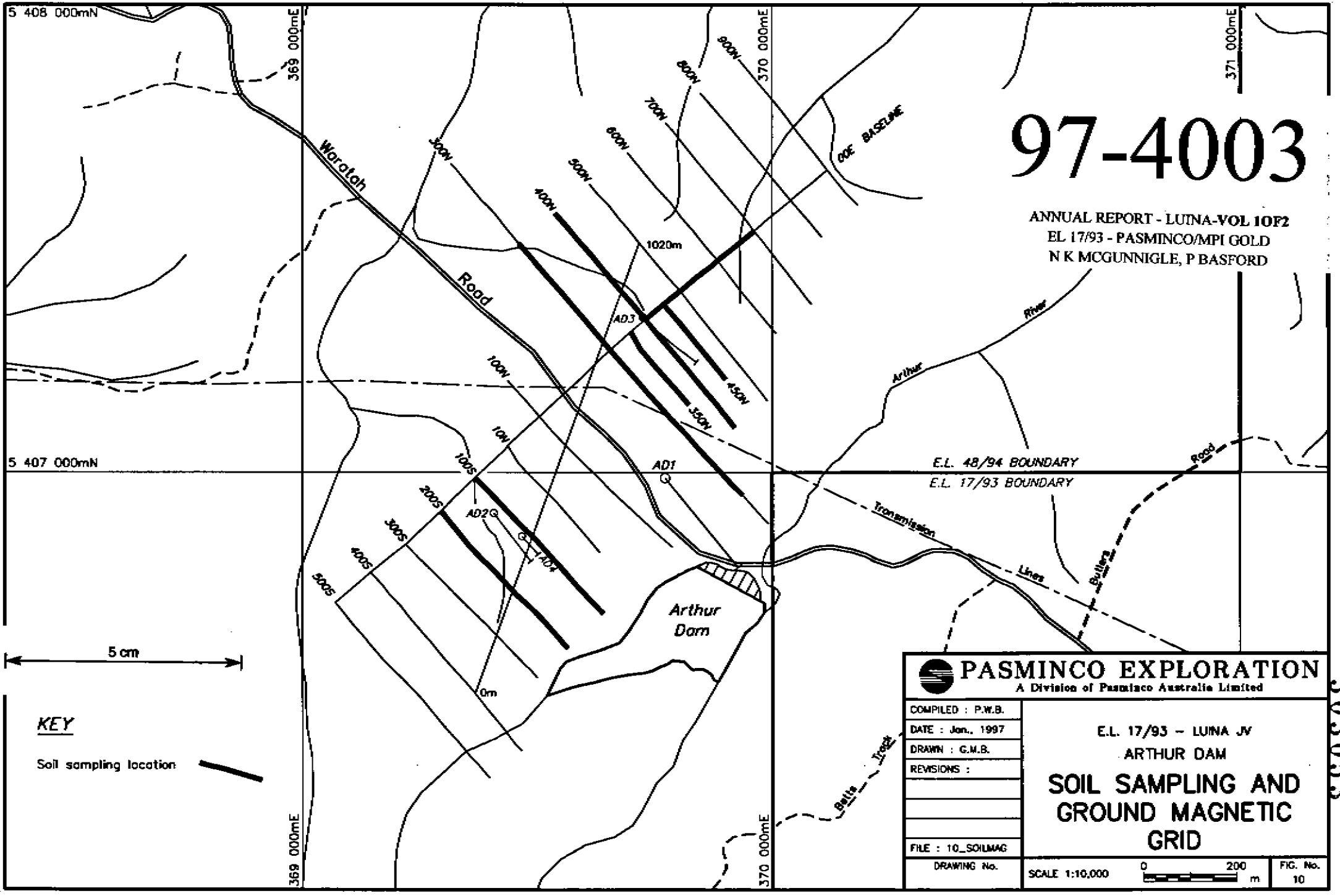
5 400 000mN

LEGEND

- H Magnetic high
- L Magnetic low
- Fault - position accurate
- Fault - position inferred
- Geology boundary - position accurate
- Geology boundary - position inferred
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5
- Zone 6
- Zone 7
- Zone 8
- Zone 9
- Zone 10
- Zone 11
- Zone 12
- Zone 13
- Zone 14
- Zone 15
- Zone 16
- Zone 17
- Zone 18

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

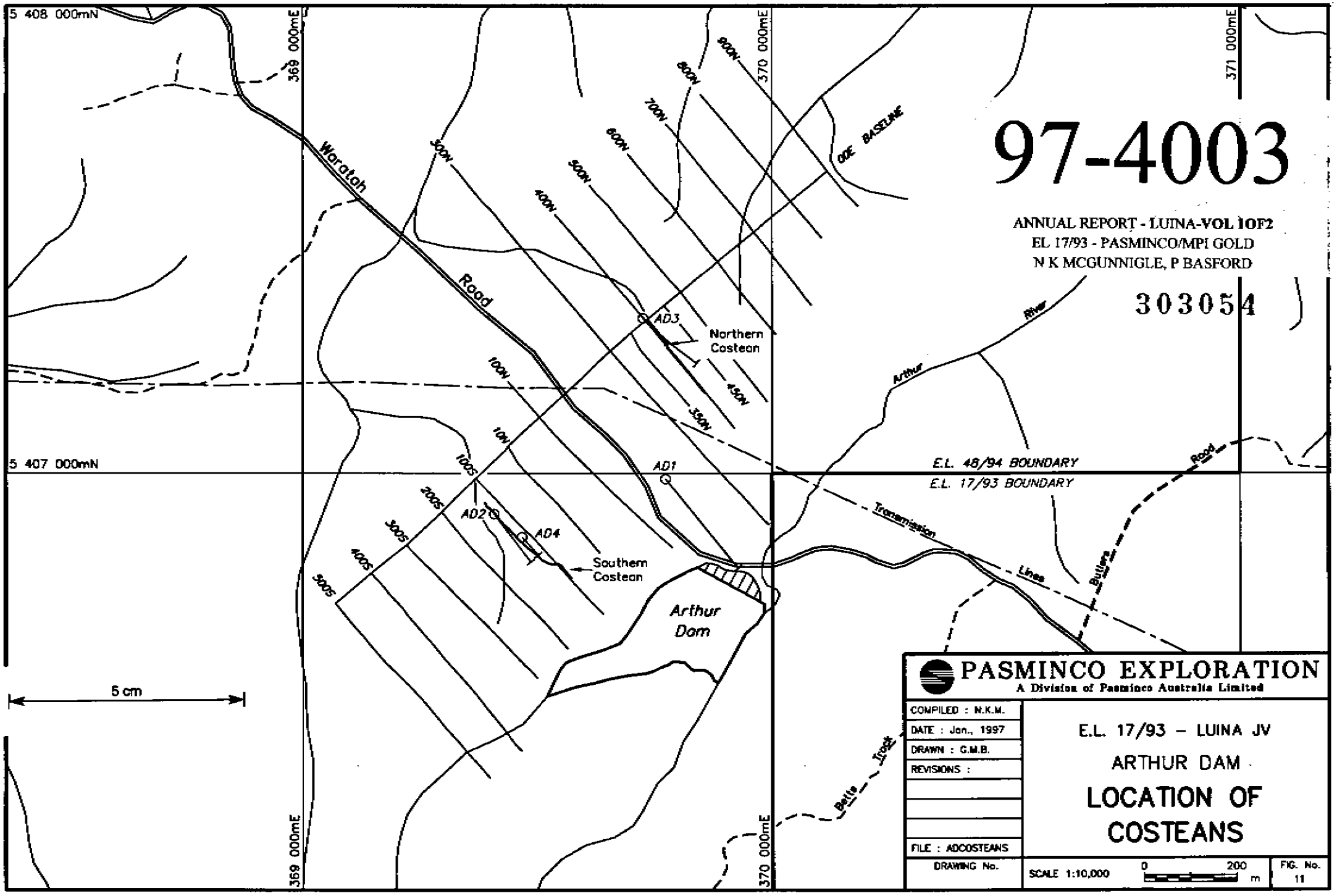
COMPILED : P.W.B.	E.L. 17/93 - LUINA JV
DATE : March 1997	**AEROMAGNETIC INTERPRETATION**
DRAWN : G.M.B.	
FILE : 25_MAGINT	
DRAWING No.	SCALE NTS 0 1 km — FIG. No. 9

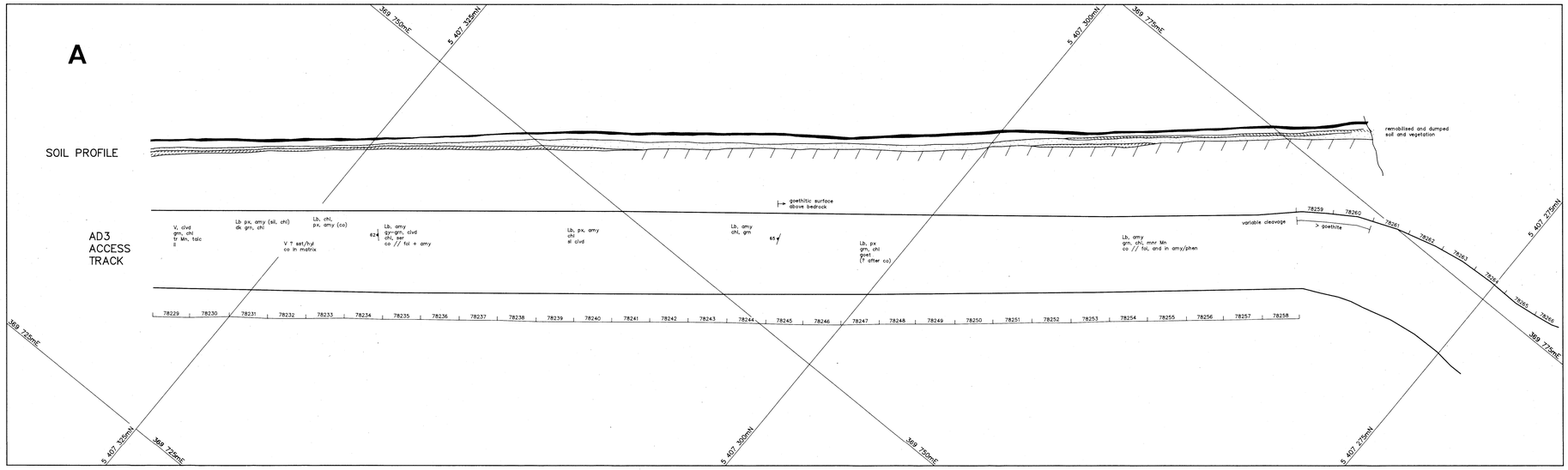


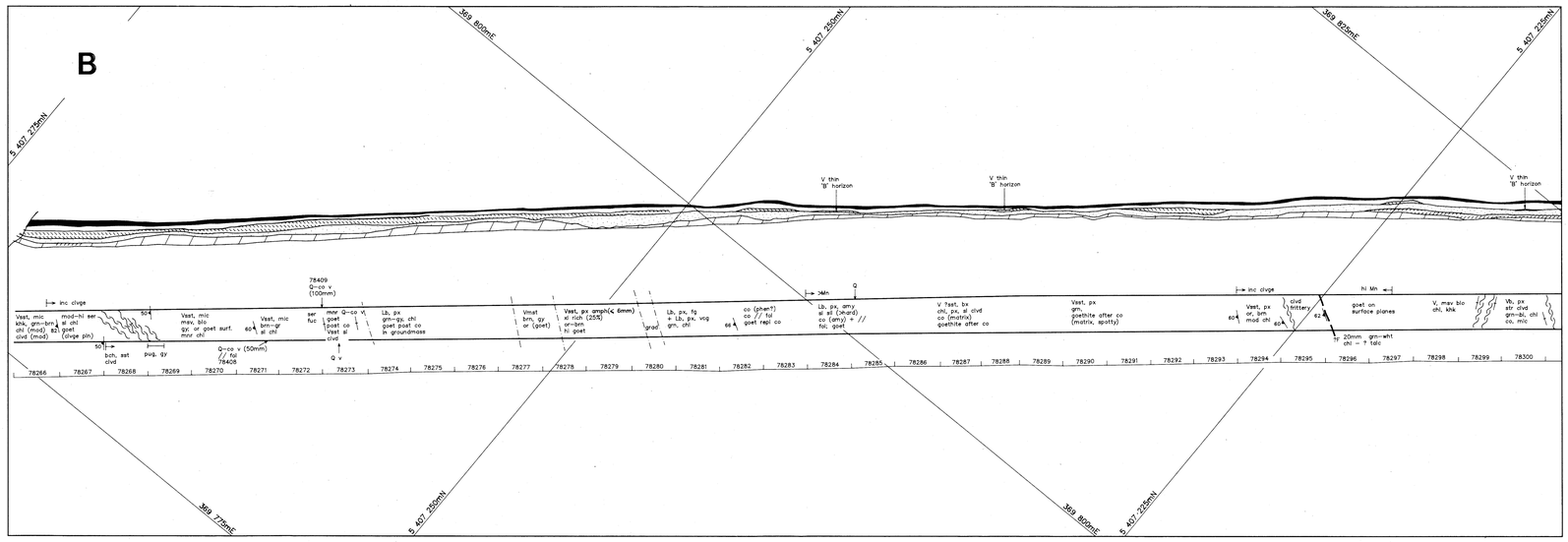
97-4003

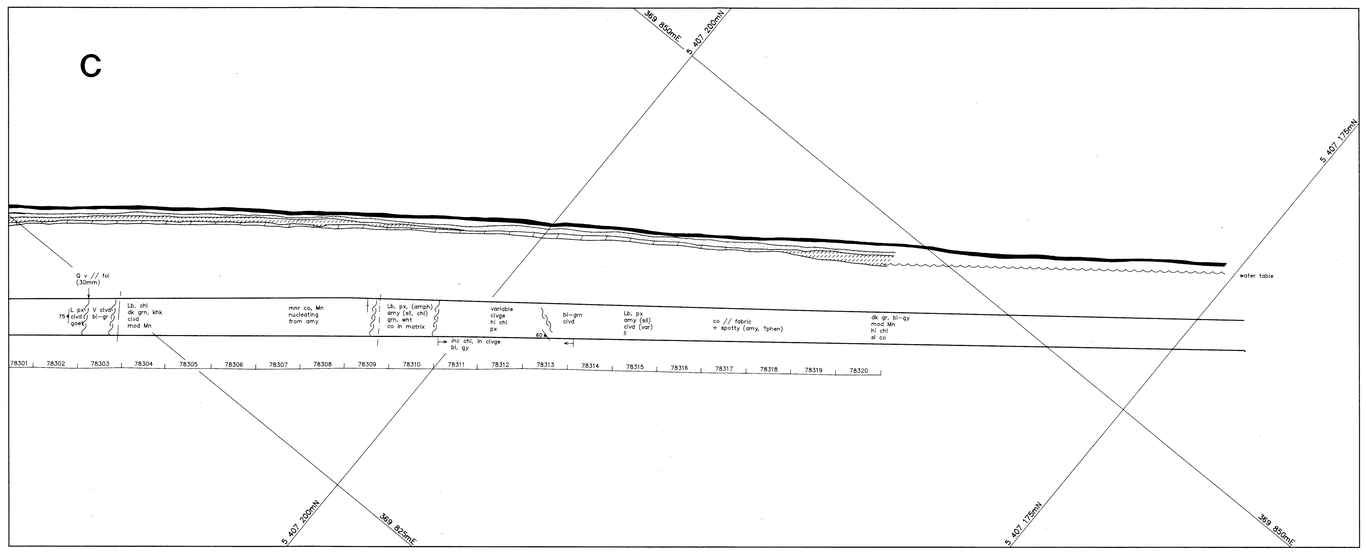
ANNUAL REPORT - LUINA-VOL 1OF2
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUNNIGLE, P BASFORD

30303


97-4003
ANNUAL REPORT - LUINA-VOL 1OF2
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUNNIGLE, P BASFORD
303054
5 408 000mN
5 407 000mN
369 000mE
370 000mE
371 000mE
Waratah
Road
900N
800N
700N
600N
500N
400N
300N
100N
10N
100S
200S
300S
400S
500S
AD1
AD2
AD3
AD4
Northern Costean
Southern Costean
Arthur Dam
Arthur River
E.L. 48/94 BOUNDARY
E.L. 17/93 BOUNDARY
Transmission Lines
Butler Road
Bells Track
5 cm
PASMINCO EXPLORATION
A Division of Pasminco Australia Limited
COMPILED : N.K.M.
DATE : Jan., 1997
DRAWN : G.M.B.
REVISIONS :
FILE : ADCOSTEANS
DRAWING No.
E.L. 17/93 – LUINA JV
ARTHUR DAM
LOCATION OF COSTEANS
SCALE 1:10,000
0 200 m
FIG. No. 11







LEGEND

ROCK TYPES

Lavas or Volcaniclastics L / V — b basic

Volcaniclastics V — sst sandstone; cht chert

Tectonic Rocks — sht schist

DESCRIPTORS

Colour:

ple	pale	bl	blue
dk	dark	wht	white
gy	grey	yel	yellow
or	orange	buf	buff
blk	black	grn	green
pk	pink	ppl	purple
rd	red	crm	cream
brn	brown	khk	khaki

Grainsize:

fg	fine grained
mg	medium grained
cg	coarse grained
vcg	very coarse grained

Overall Texture:

hyl	hyaloclastic
mxv	massive
blo	blocky
por	porphyric
clvd	cleaved
shd	sheared
fol	foliated

Constituents & Internal Textures:

xl	crystal
amy	amygdales
goet	goethitic
q	quartz
mic	micaceous
leuc	leucoxene
px	pyroxene
il	ilmnite
epid	epidote
amph	amphibole
phen	phenocrysts

Alteration:

ca	carbonatised
chl	chloritised
ser	sericitised
fuc	fuchsitic

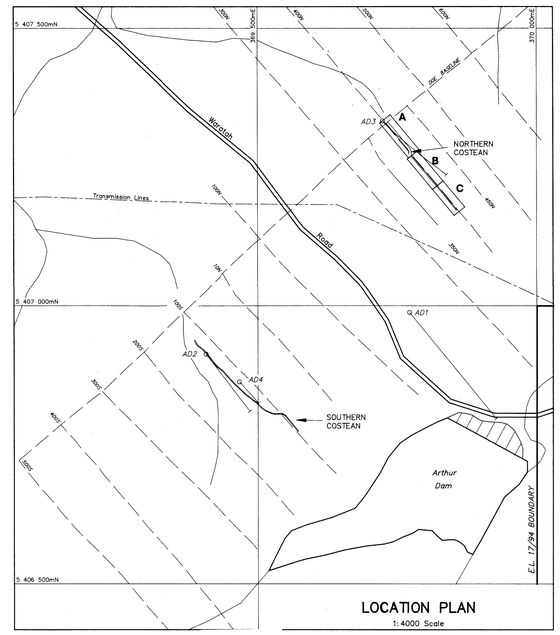
Mineralisation:

v	vein
mav	massive
sp	sphalerite
q	quartz

SOIL PROFILE LEGEND

HORIZON

- O (Ao) Organics/humic
- A (A1) Dark brown silty loam
- E (A2) Mottled and leached, grey-brown eluviated zone
- B Mottled orange brown, Fe-rich and clayey
- C (A3) Weathered bedrock
- Highly cleaved (blue-green) weathered rocks
- D Bedrock



LOCATION PLAN

1: 4000 Scale

5 cm

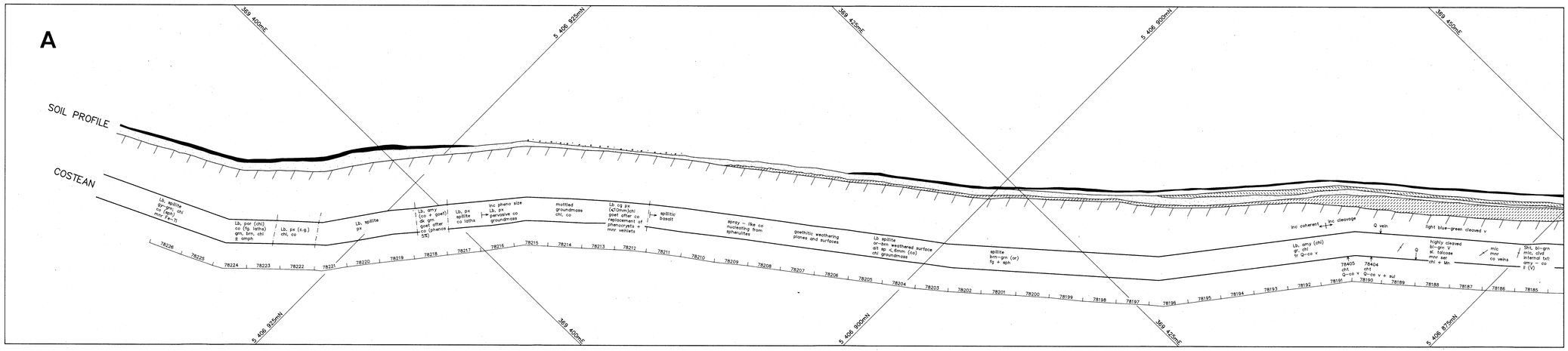
303055

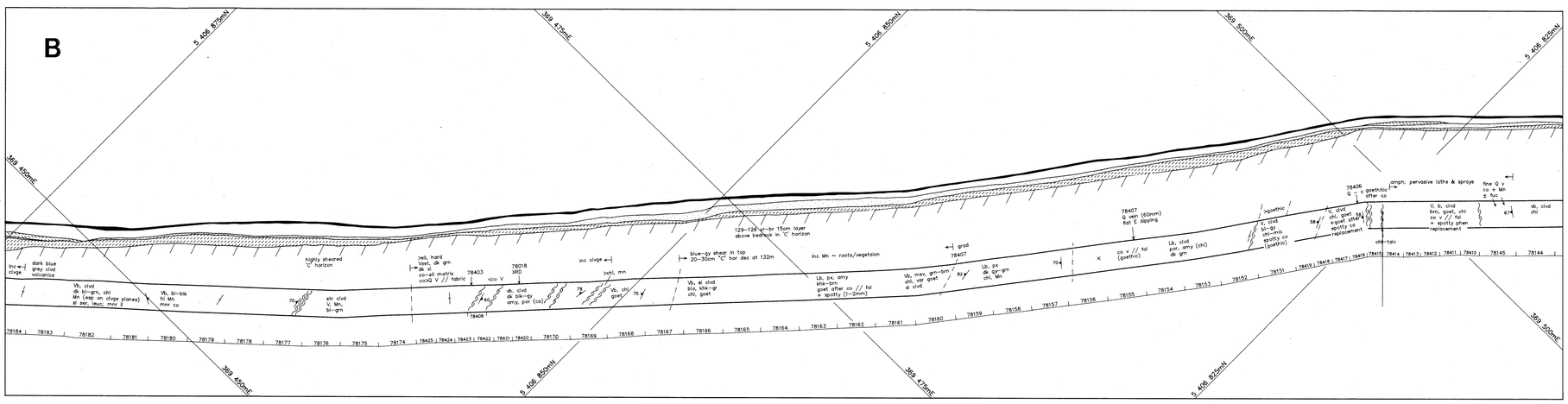
PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

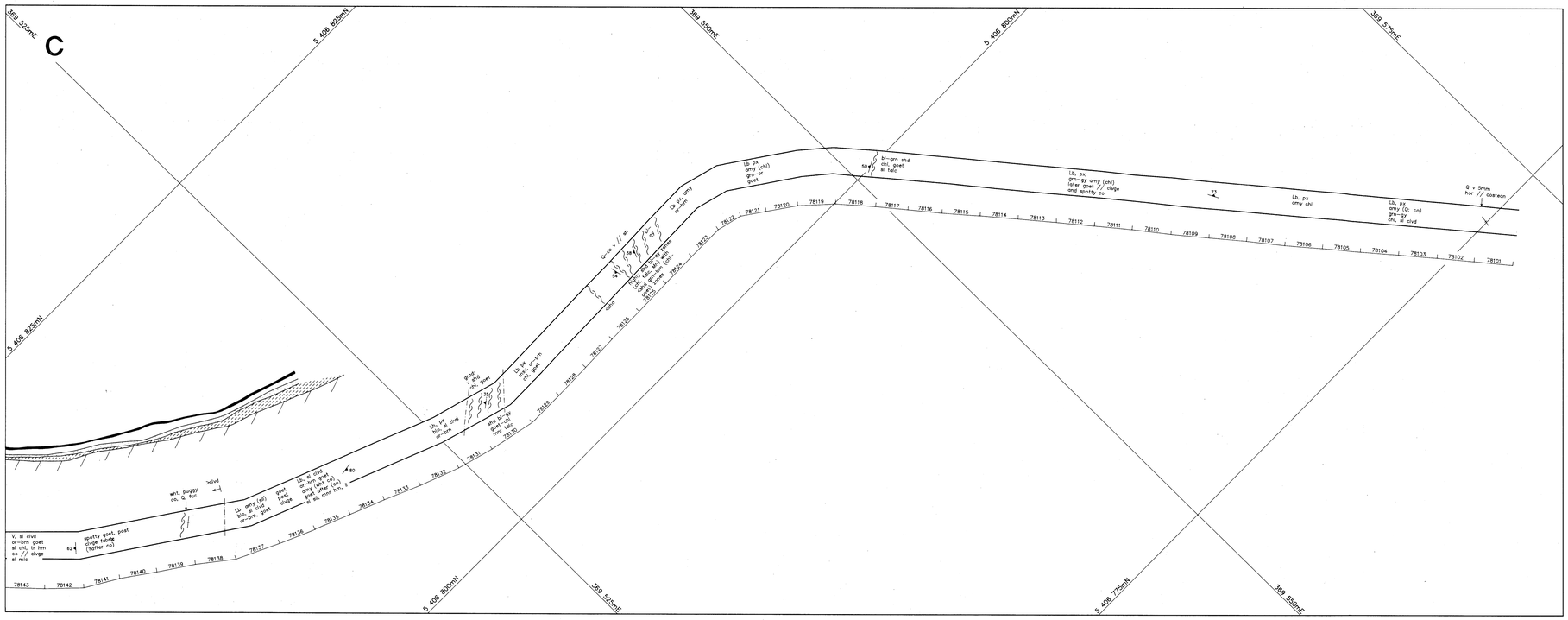
COMPILED : N.K.M.	E.L. 17/94 – LUINA JV
DATE : Jan., 1997	ARTHUR DAM
DRAWN : G.M.B.	**PLAN AND PROFILE OF NORTHERN COSTEAN (400N)**
REVISIONS :	SHOWING MAPPING AND SAMPLE LOCATIONS
FILE : AD Costean North	
DRAWING No.	SCALE 1:100 (0 2 4 m) — FIG. No. 12

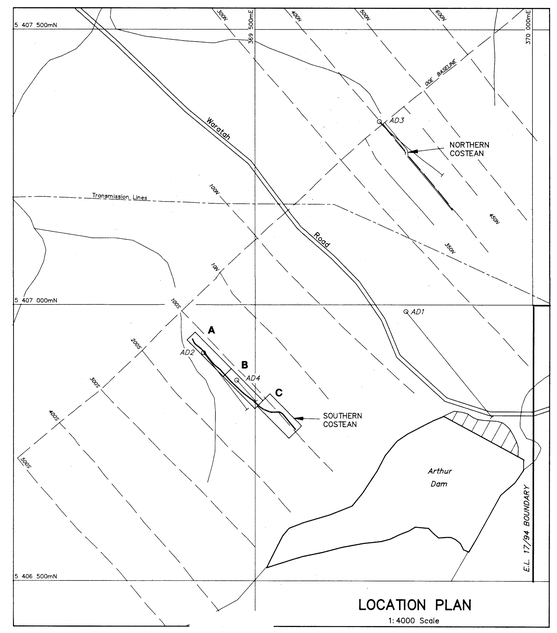
97-4003

ANNUAL REPORT - LUINA - VOL 1092
EL 1795 - PASMINCO - 100% OWNED
N.K.MCCONNIGLE & P.MAYFORD









LEGEND

ROCK TYPES

Lavas or Volcaniclastics: L, V — b basic

Volcaniclastics: V — sst sandstone; cht chert

Tectonic Rocks: sh1 schist

DESCRIPTORS

Colour:

ple	pale	bl	blue
dk	dark	wht	white
gy	grey	yel	yellow
or	orange	buf	buff
blk	black	grn	green
pk	pink	ppl	purple
rd	red	crm	cream
brn	brown	khk	khaki

Grainsize:

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mg	medium grained
cg	coarse grained
vcg	very coarse grained

Overall Texture:

hyl	hyalocastic
mav	massive
blo	blocky
por	porphyric
clvd	cleaved
shd	sheared
fol	foliated

Constituents & internal Textures:

xl ,	crystal
amy	amygdales
goet	goethitic
q	quartz
ŝ	sinuous
leuc	leucocene
px	pyroxene
li	limnite
spili	spilite
amph	amphibole
phen	phenocrysts

Alteration:

co	carbonatised
chl	chloritised
ser	sericitised
fuc	fuchsitic

Mineralisation:

v	vein
mav	massive
sp	sphalerite
q	quartz

SOIL PROFILE LEGEND

HORIZON

- O (Ao) Organics/humic
- A (A1) Dark brown silty loam
- E (A2) Mottled and leached, grey~brown eluviated zone
- B Mottled orange brown, Fe~rich and clayey
- C (A3) Weathered bedrock
- Highly cleaved (blue~green) weathered rocks
- // // D Bedrock

AMG NORTH

5 cm

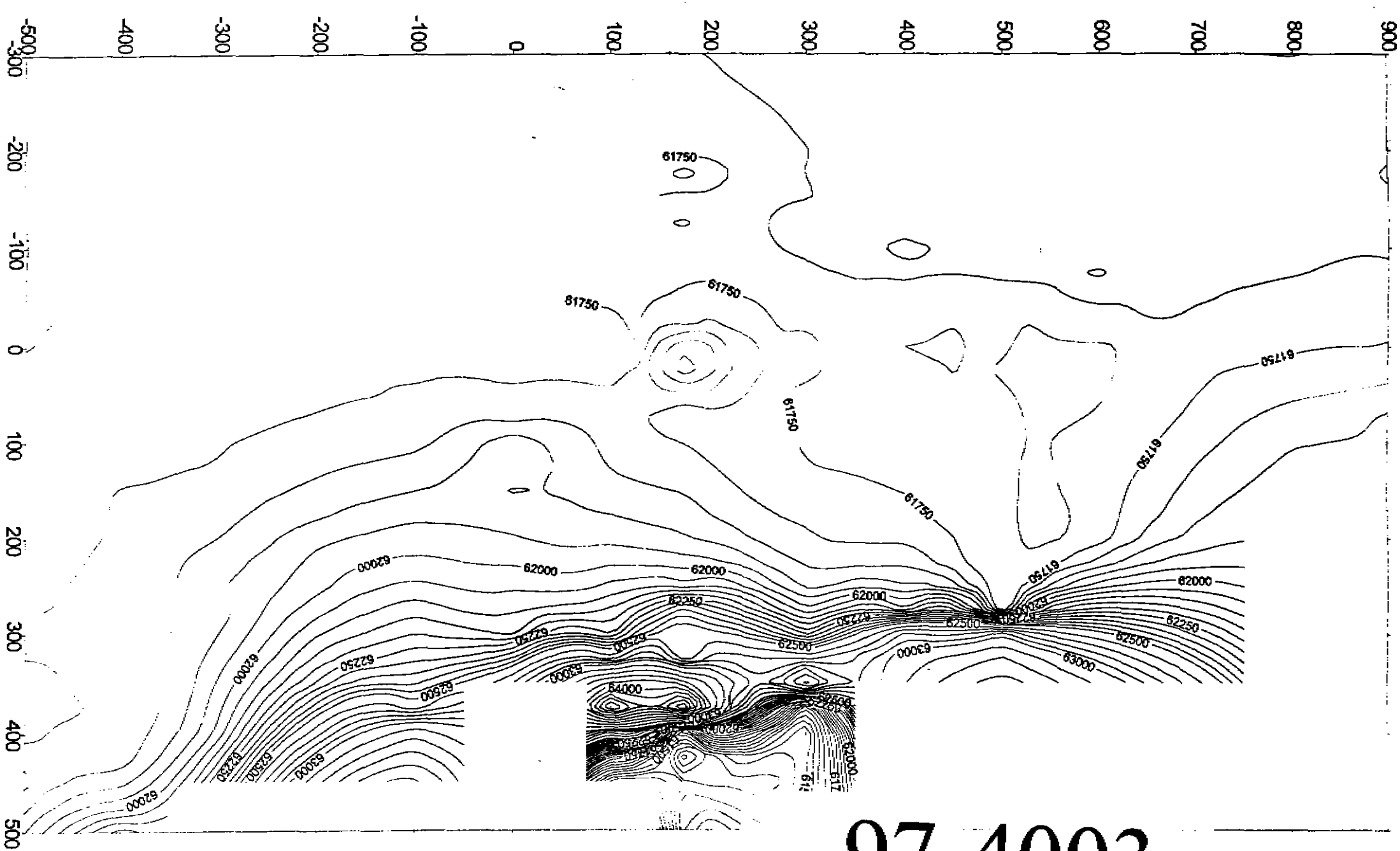
303056

97-4003

ANNUAL REPORT ~ LUINA VOL 10P2
(1) P.J. ALLEN (2) S.M. ROBERTS
S.A. MCGUINNESS, P. RADFORD

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : N.K.M.	E.L. 17/94 ~ LUINA JV
DATE : Jan., 1997	ARTHUR DAM
DRAWN : G.M.B.	PLAN AND PROFILE OF SOUTHERN COSTEAN (100S) SHOWING MAPPING AND SAMPLE LOCATIONS
REVISIONS :	
FILE : AD Costean South	
DRAWING No.	SCALE 1:100 (0 1 2 3 4 m) — FIG. No. 13



97-4003

Fig. 14

303057

ANNUAL REPORT - LUINA-VOL 1OF2
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUNNIGLE, P BASFORD

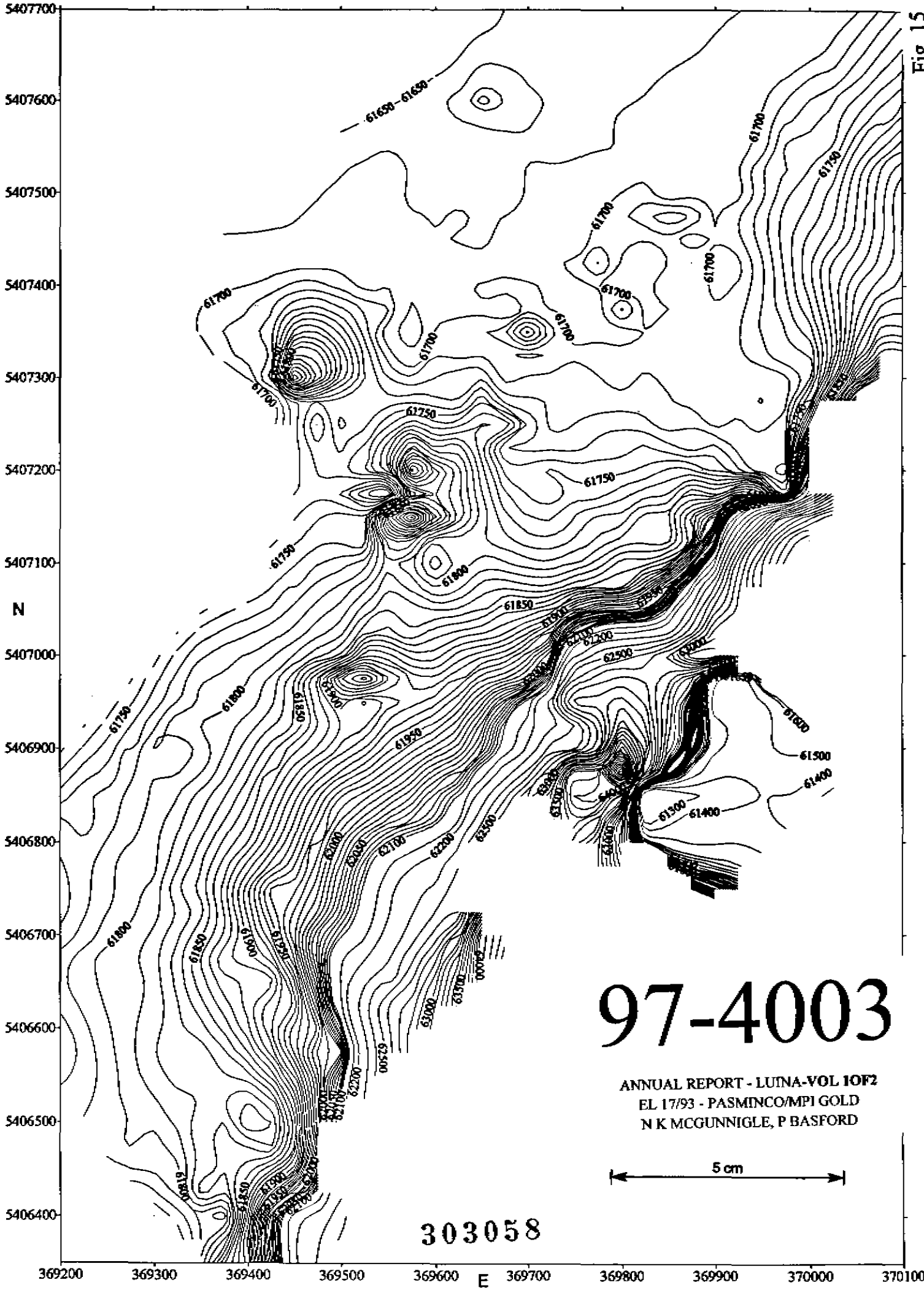


Fig. 15

97-4003

ANNUAL REPORT - LUINA-VOL 1OF2
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUNNIGLE, P BASFORD

303058

97-4003

ANNUAL REPORT - LUINA-**VOL 1OF2**
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUNNIGLE, P BASFORD

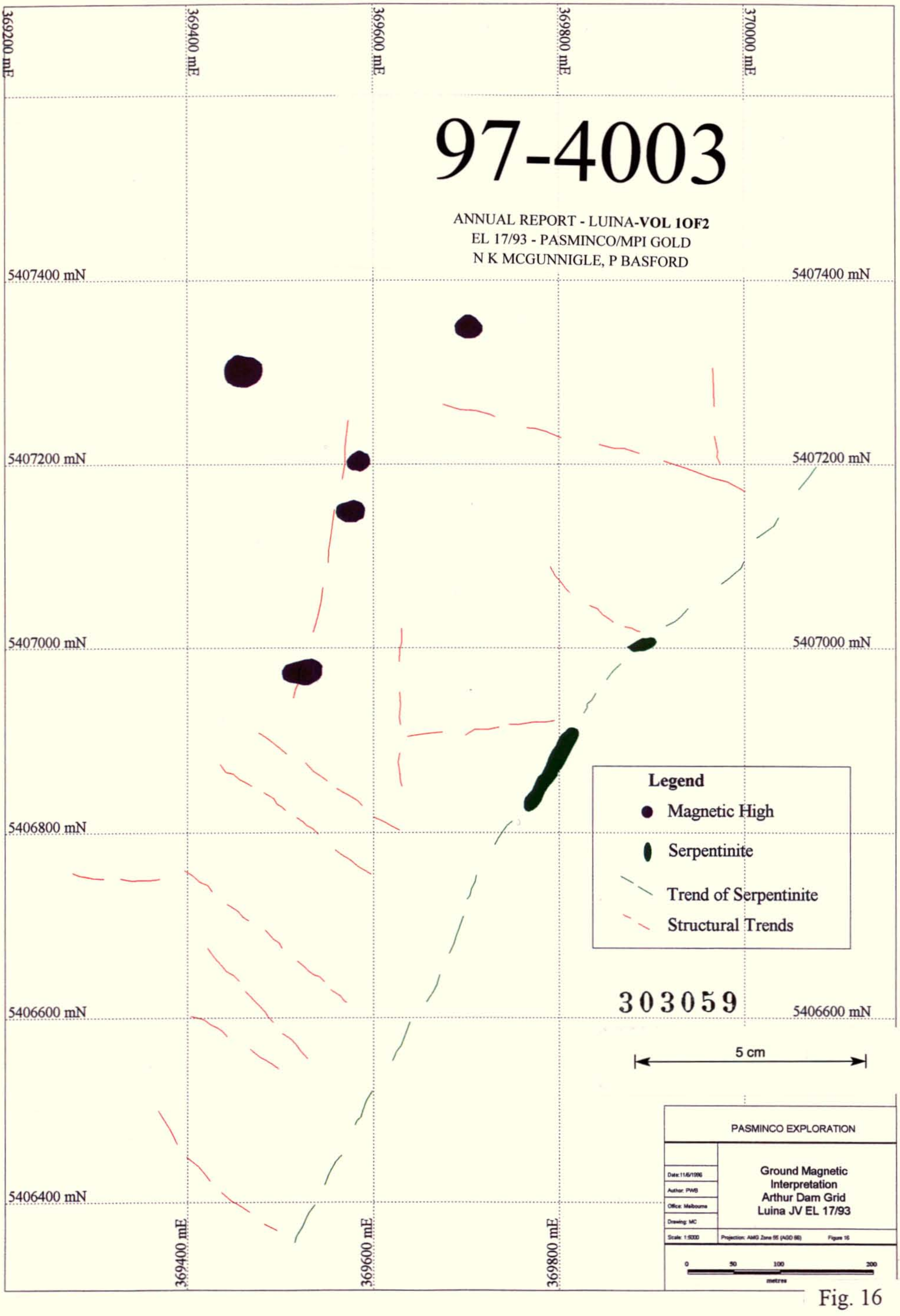
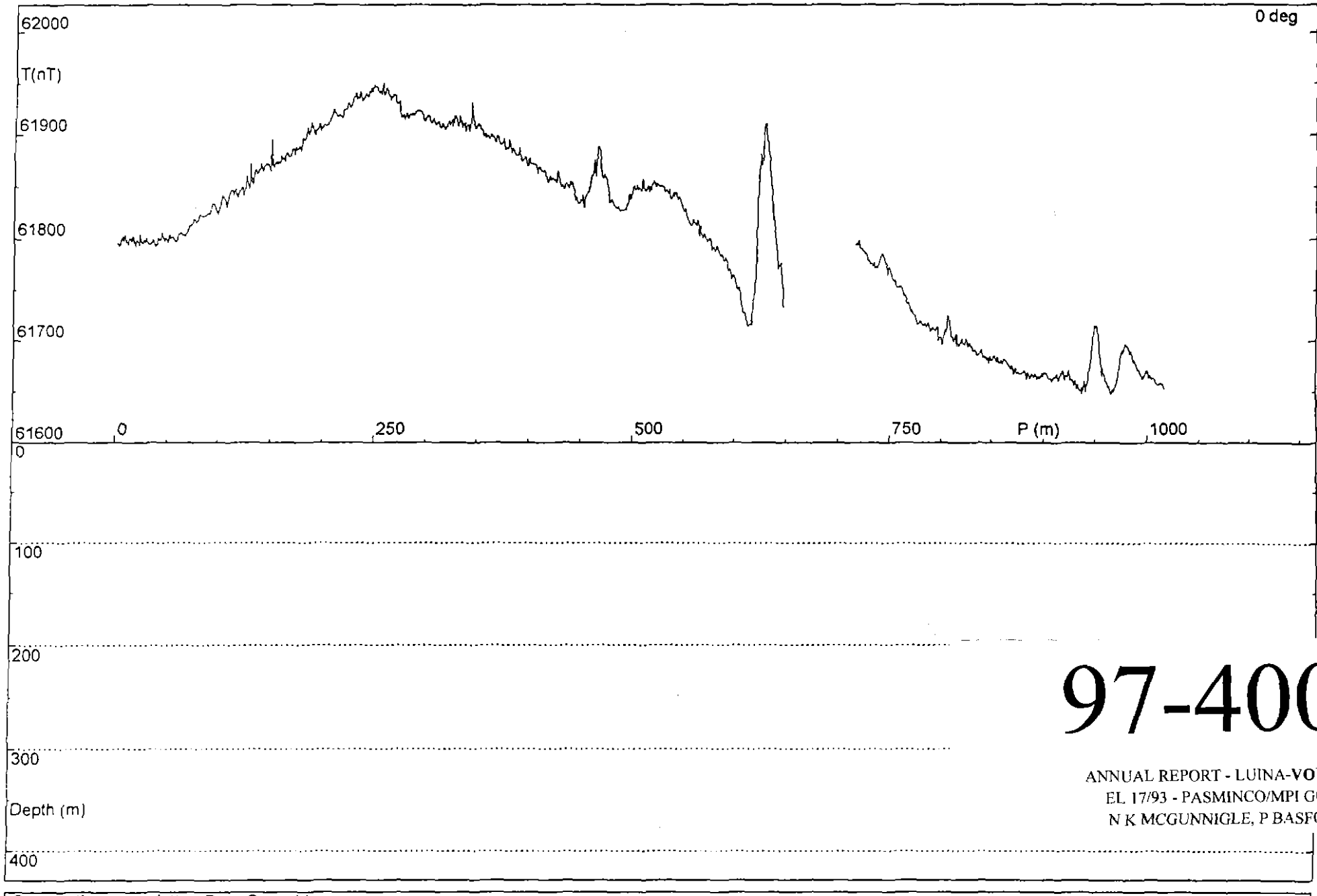


Fig. 16



97-4003

ANNUAL REPORT - LUINA-**VOL 1OF2**
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUNNIGLE, P BASFORD

203060

Fig. 17

Ground Magnetic Traverse - Betts Track
Luina EL 17/93

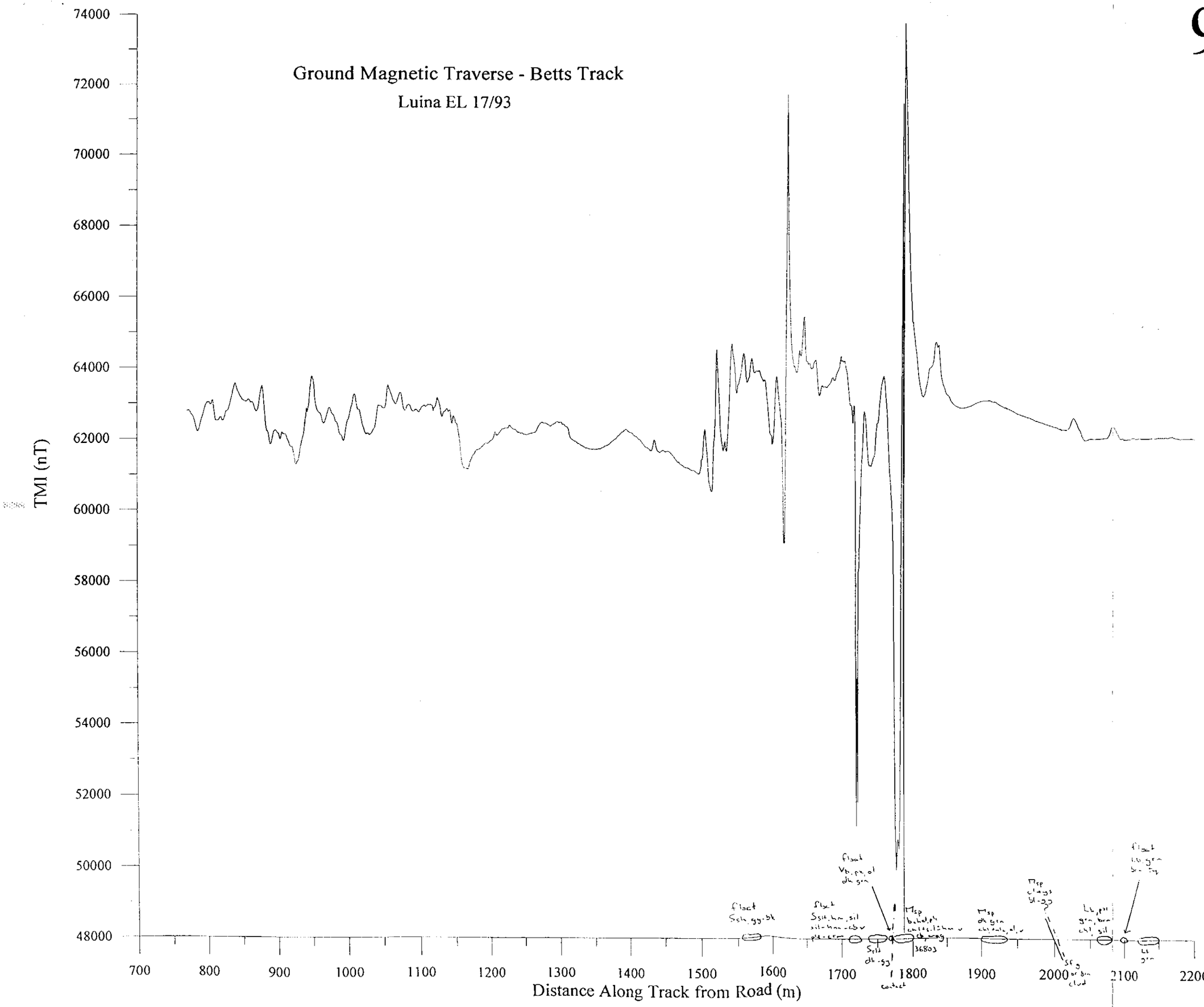
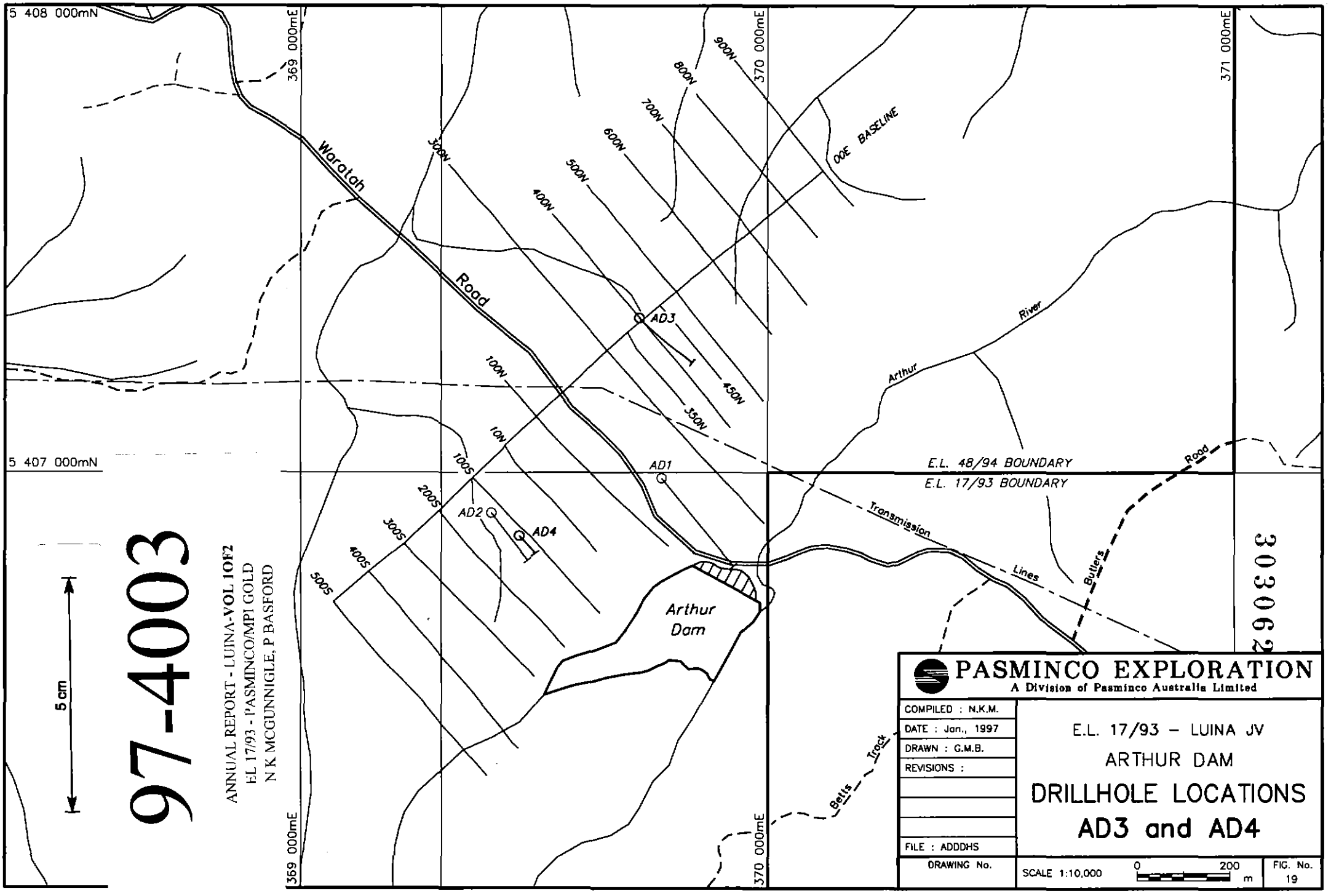
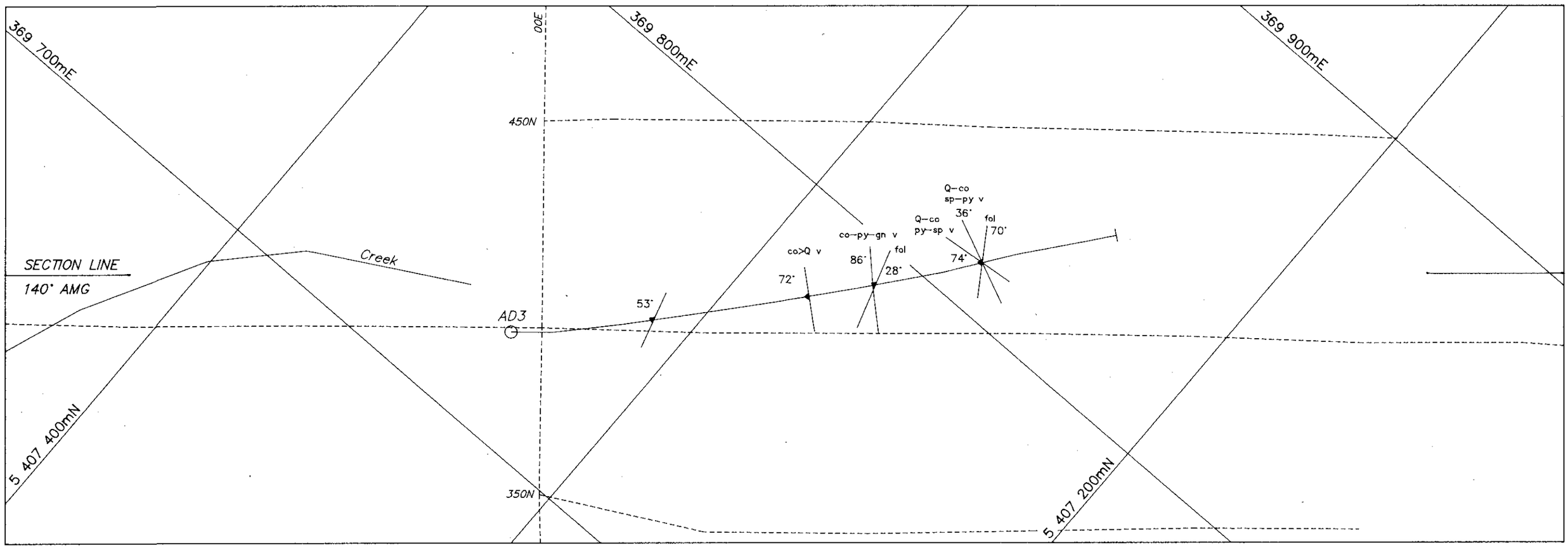
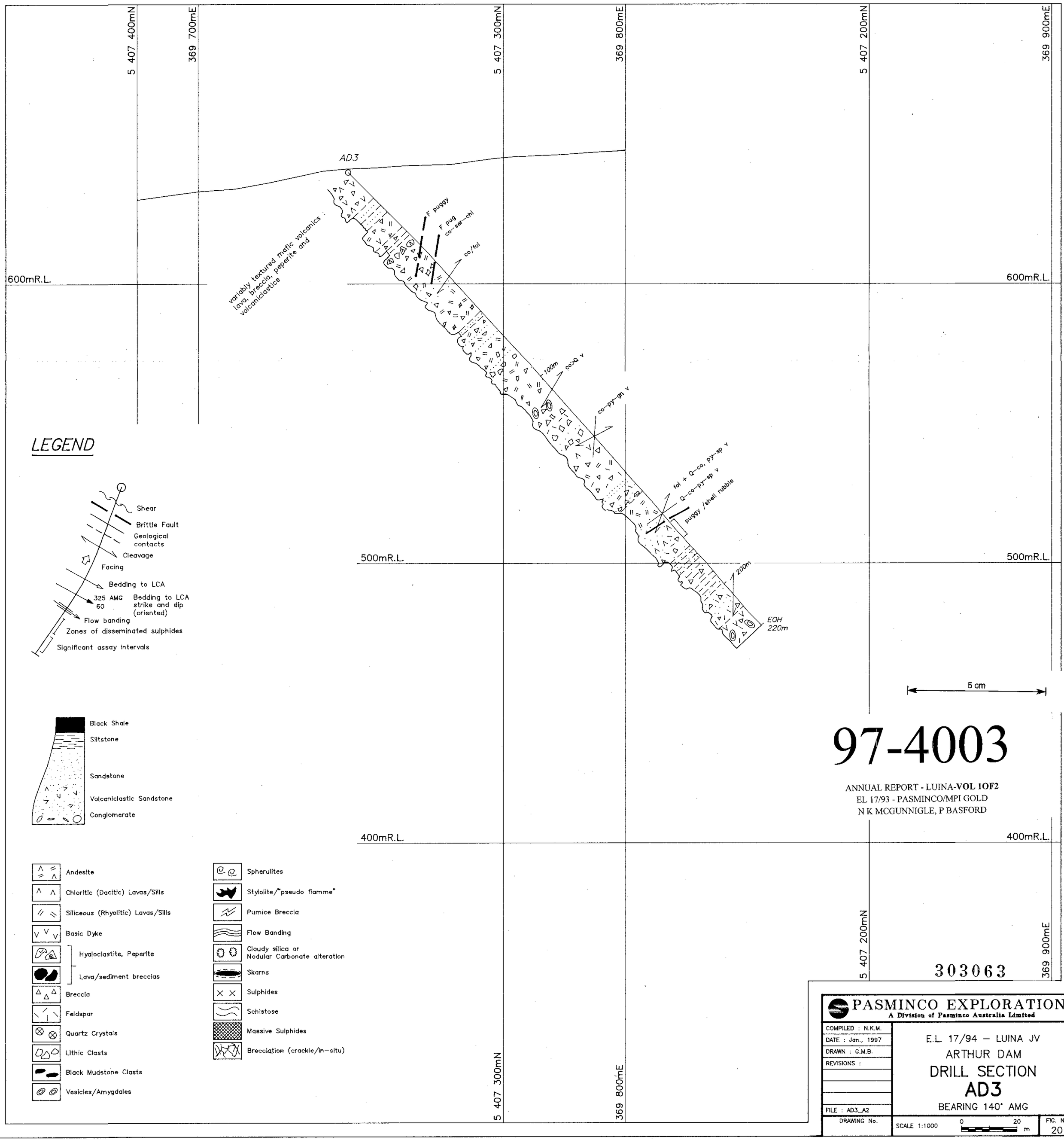


Fig. 18

369725E 5401300N







LEGEND

- Shear
- Brittle Fault
- Geological contacts
- Cleavage
- Facing
- Bedding to LCA
- 325 AMG / 60 — Bedding to LCA strike and dip (oriented)
- Flow banding
- Zones of disseminated sulphides
- Significant assay intervals

- Black Shale
- Siltstone
- Sandstone
- Volcaniclastic Sandstone
- Conglomerate

- Andesite
- Chloritic (Dacitic) Lavas/Sills
- Siliceous (Rhyolitic) Lavas/Sills
- Basic Dyke
- Hyaloclastite, Peperite
- Lava/sediment breccias
- Breccia
- Feldspar
- Quartz Crystals
- Lithic Clasts
- Black Mudstone Clasts
- Vesicles/Amygdales
- Spherulites
- Stylolite/"pseudo flamme"
- Pumice Breccia
- Flow Banding
- Cloudy silica or Nodular Carbonate alteration
- Skarns
- Sulphides
- Schistose
- Massive Sulphides
- Brecciation (crackle/in-situ)

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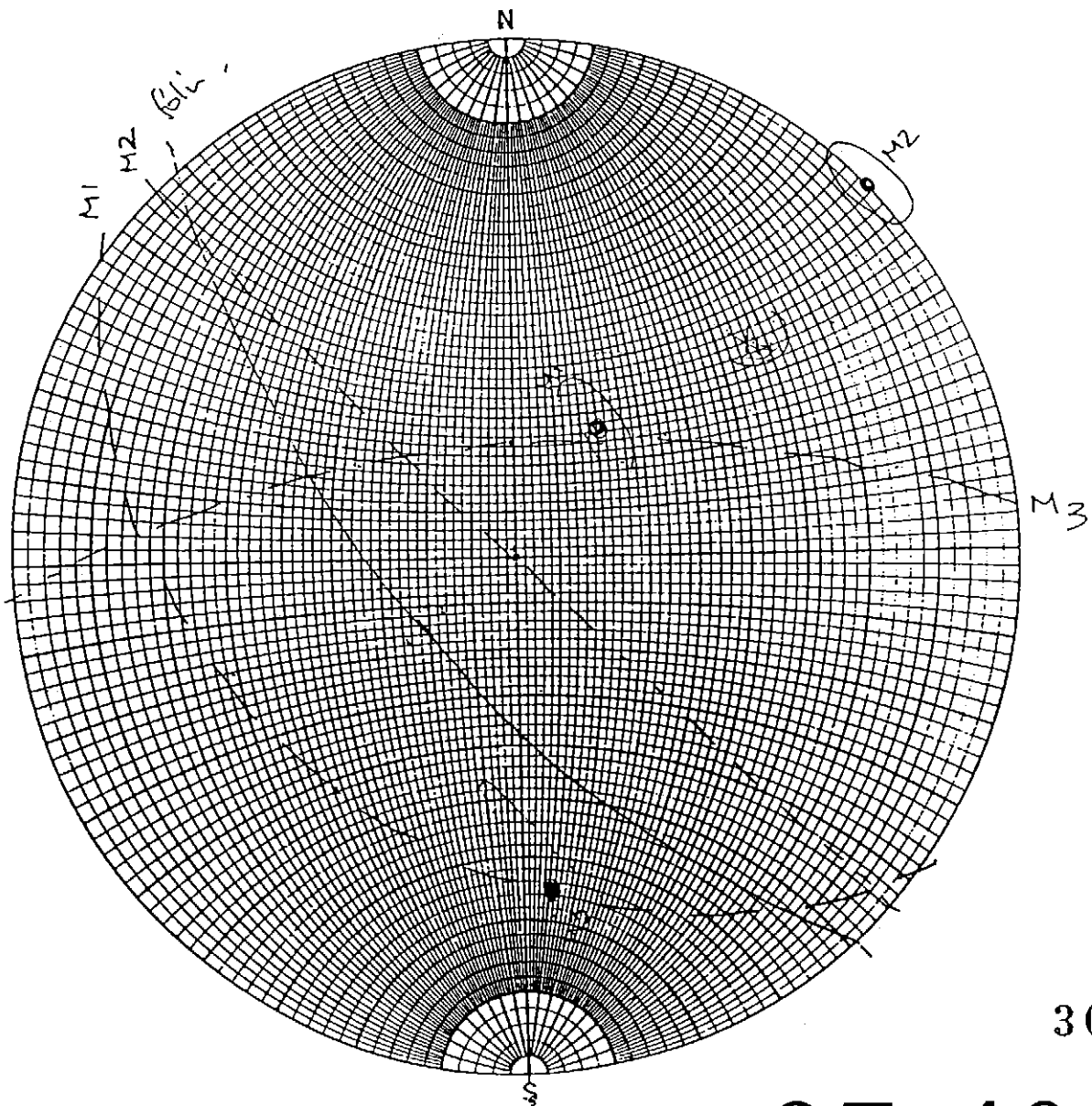
ANNUAL REPORT - LUINA-**VOL 1OF2**
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUNNIGLE, P BASFORD

303063

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : N.K.M.	E.L. 17/94 – LUINA JV
DATE : Jan., 1997	ARTHUR DAM
DRAWN : G.M.B.	DRILL SECTION
REVISIONS :	AD3
	BEARING 140° AMG
FILE : AD3_A2	
DRAWING No.	SCALE 1:1000 (0 20 m) — FIG. No. 20

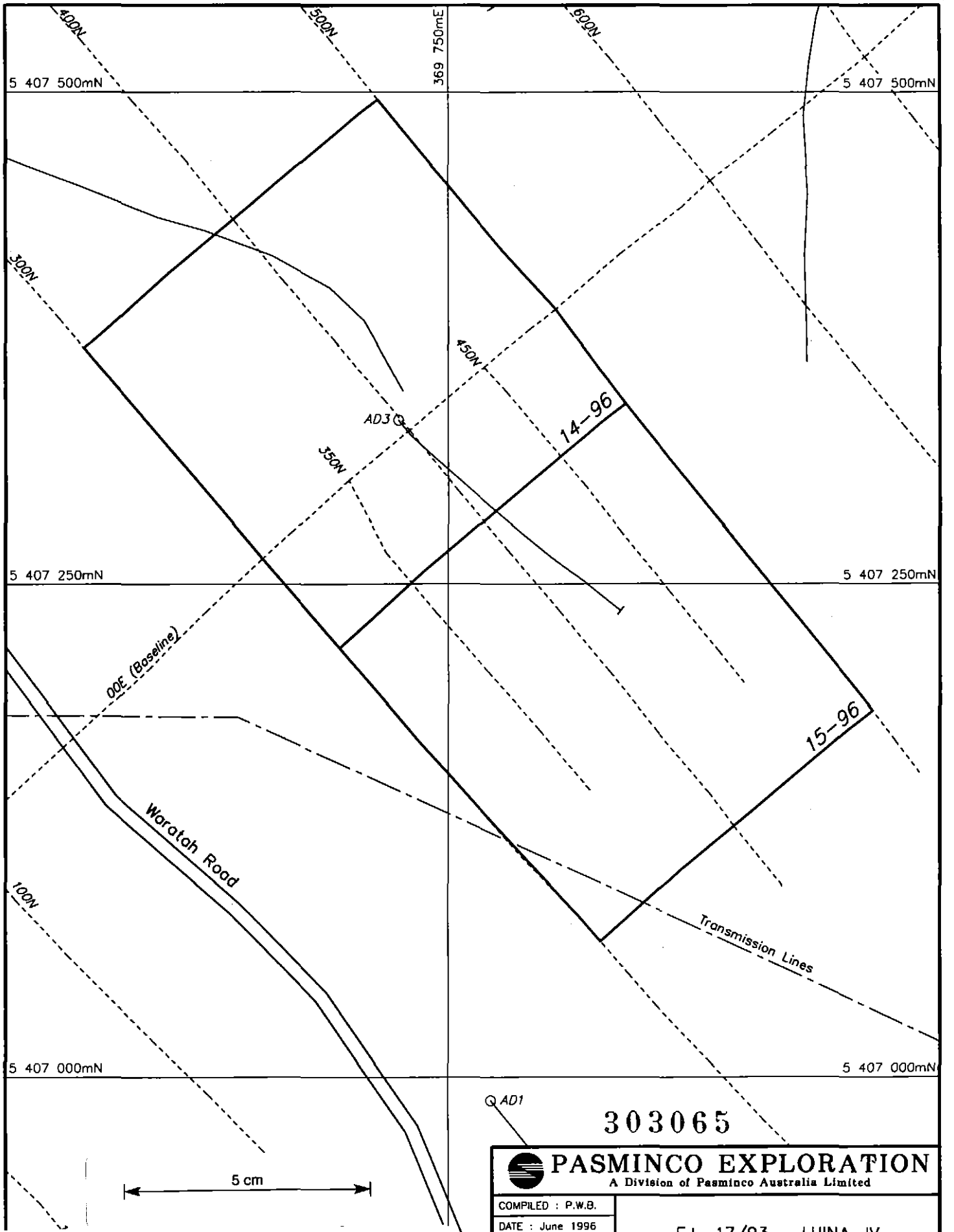
Figure Stereoplot showing trends of mineralised veins intersected in DDH AD3



ANNUAL REPORT - LUINA-**VOL 1OF2**
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUNNIGLE, P BASFORD

5 cm

Fig. 21



303065

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : P.W.B.	E.L. 17/93 – LUINA JV
DATE : June 1996	ARTHUR DAM
DRAWN : G.M.B.	DHEM LOOP LAYOUT
REVISIONS :	AD3
FILE : LLAD3	
DRAWING No.	SCALE 1:2500 0 50 m
	FIG. No. 22

97-4003

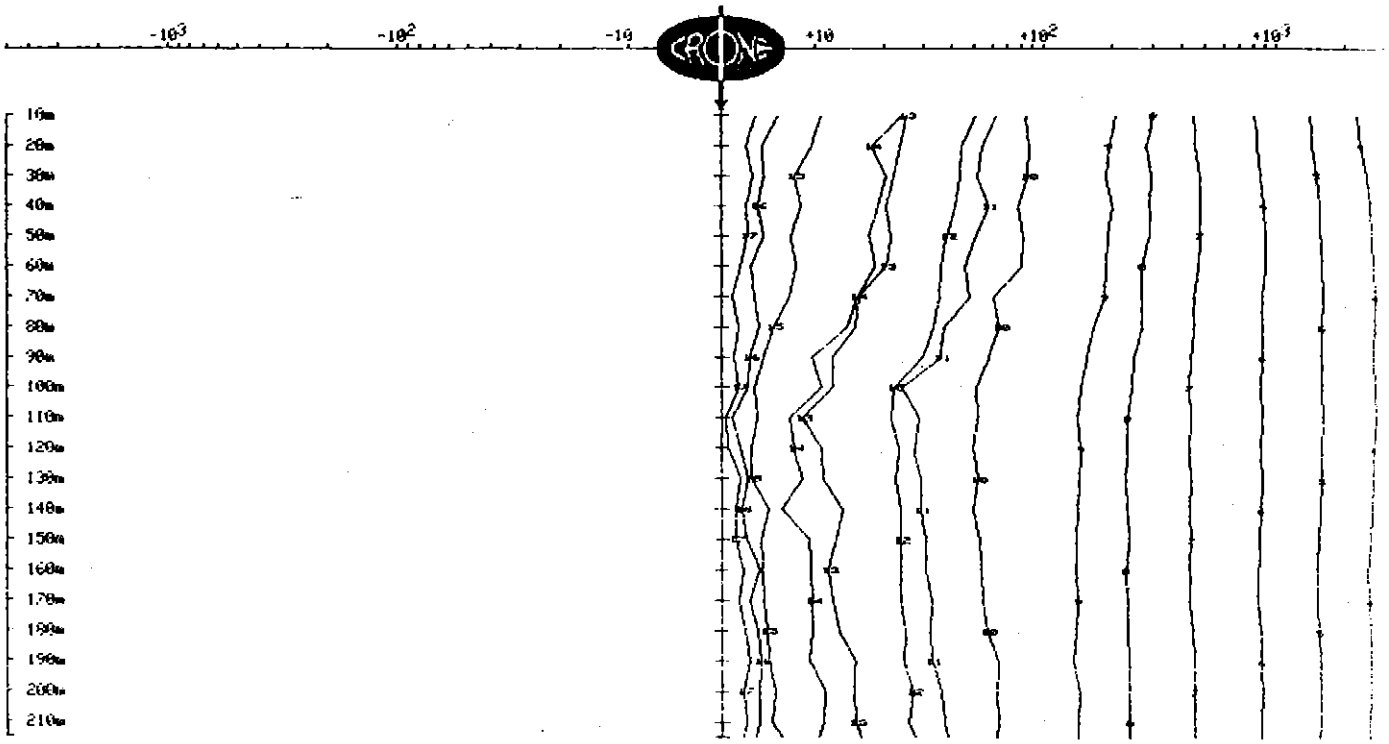
ANNUAL REPORT - LUINA-**VOL 1OF2**
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUNNIGLE, P BASFORD

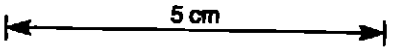
Pasminco Exploration
BOREHOLE PEM

Client	: BURNIE, Tasmania	Hole	: AD3
Grid	: Arthur Dam	Tx Loop	: 14-96
Date	: May 17, 1996	File name	: AD3.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 17 channels

Scale: 1:2500





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ANNUAL REPORT - LUINA-**VOL 1OF2**
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUNNIGLE, P BASFORD

303066

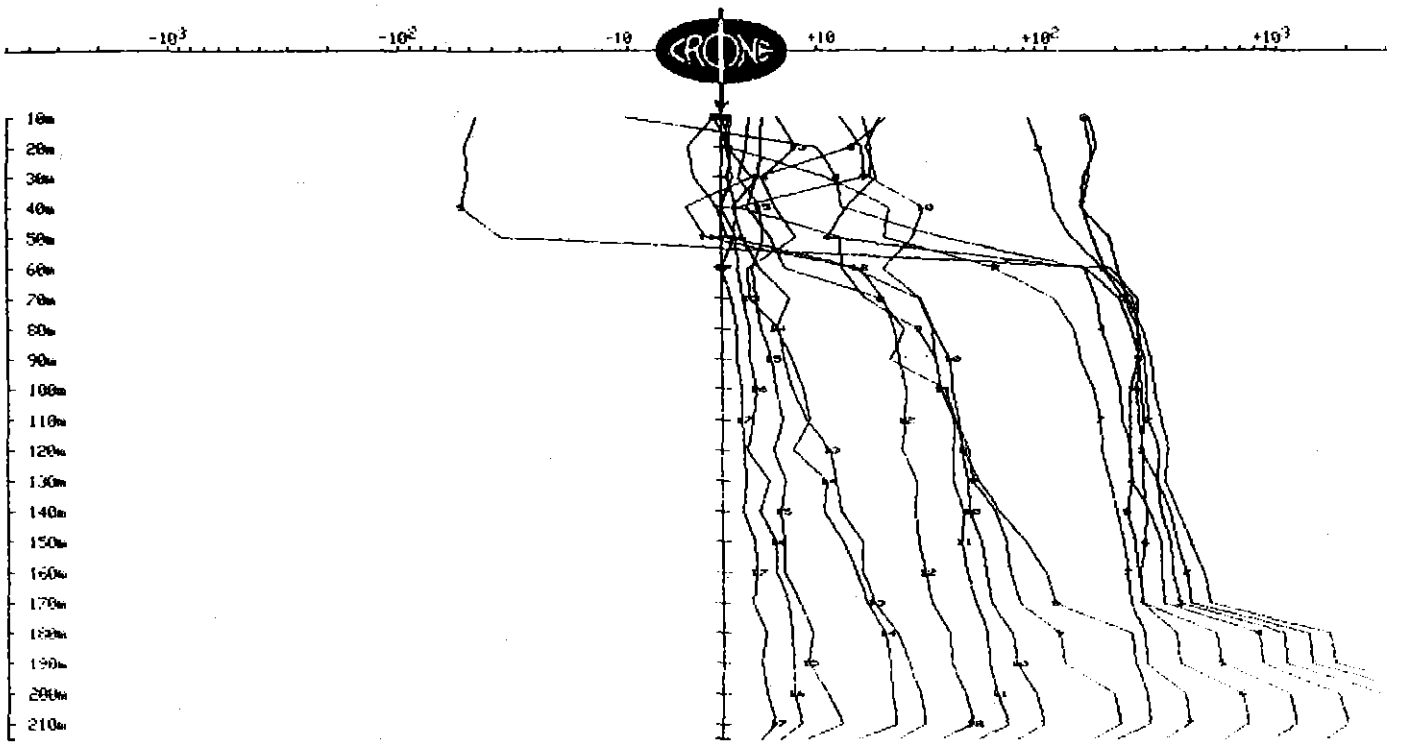
Fig. 23

Pasminco Exploration
BOREHOLE PEM

Client	: BURNIE, Tasmania	Hole	: AD3
Grid	: Arthur Dam	Tx Loop	: 15-96
Date	: May 17, 1996	File name	: AD3L2.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 17 channels

Scale: 1:2500



5 cm

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Vol 1 of 2

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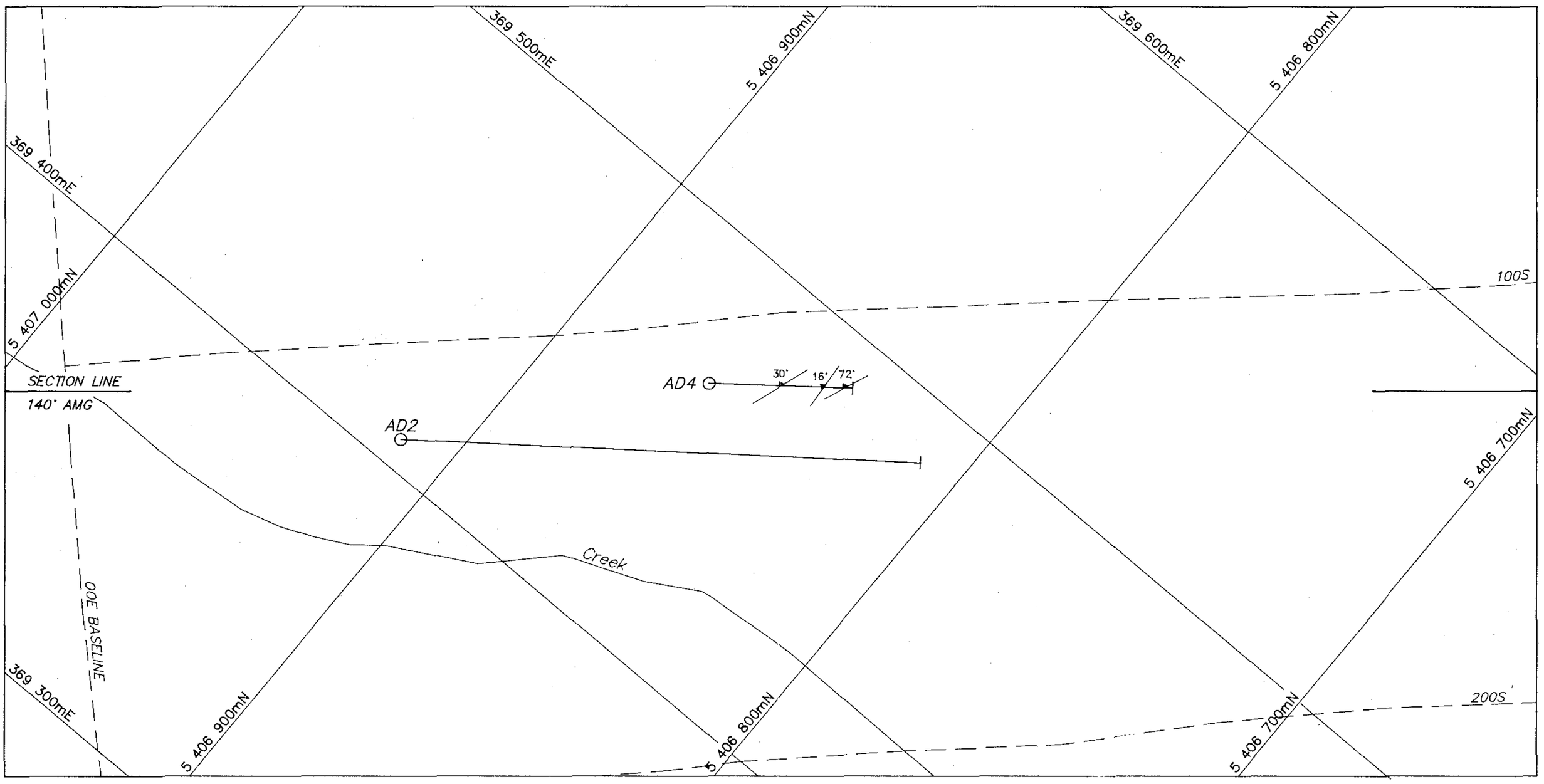
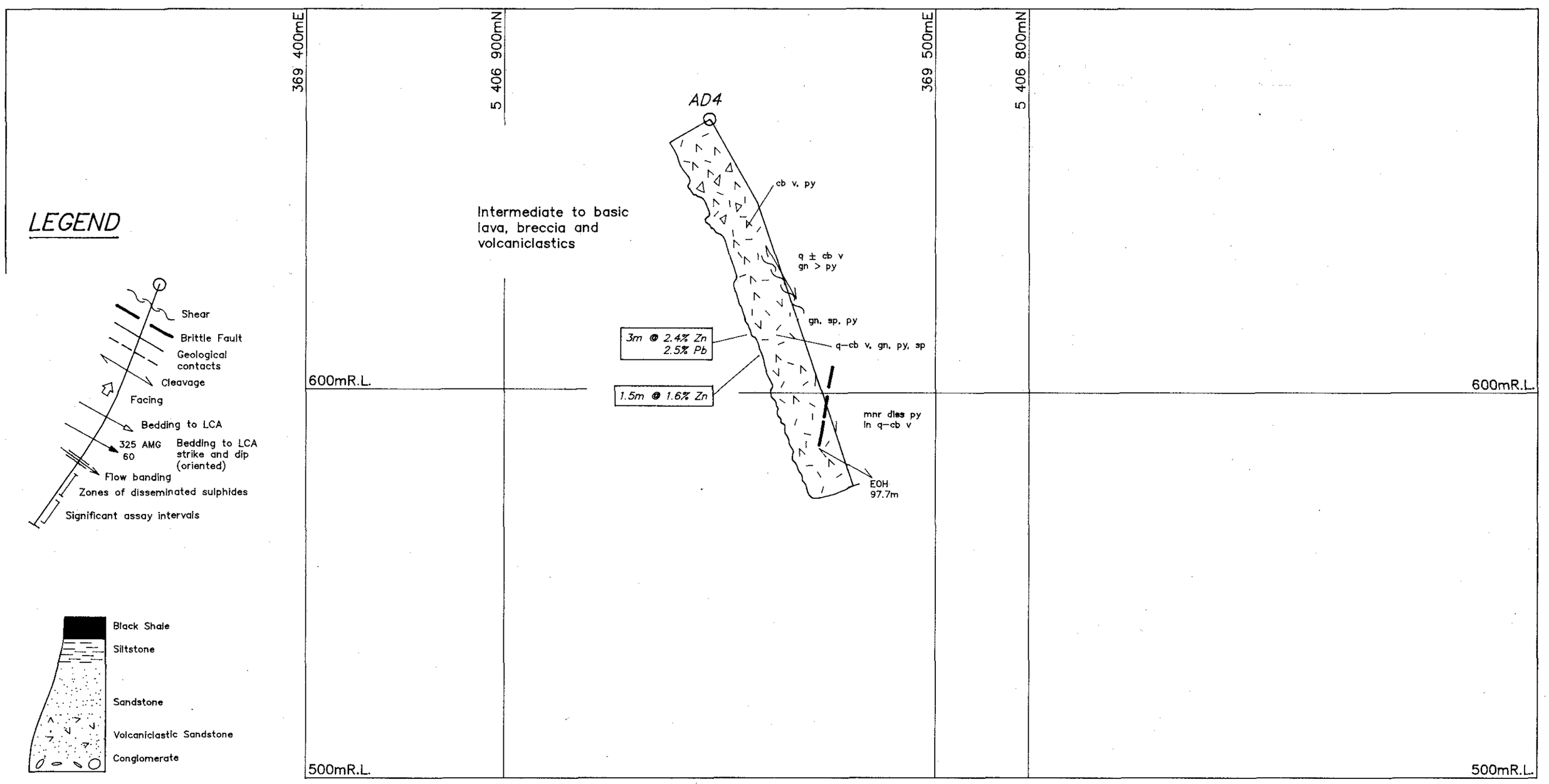
Fig. 24





LEGEND

Intermediate to basic lava, breccia and volcaniclastics

- Andesite
- Chloritic (Dacitic) Lavas/Sills
- Siliceous (Rhyolitic) Lavas/Sills
- Basic Dyke
- Hyaloclastite, Peperite
- Lava/sediment breccias
- Breccia
- Feldspar
- Quartz Crystals
- Lithic Clasts
- Black Mudstone Clasts
- Vesicles/Amygdales
- Spherulites
- Stylolite/"pseudo flamme"
- Pumice Breccia
- Flow Banding
- Cloudy silica or Nodular Carbonate alteration
- Skarns
- Sulphides
- Schistose
- Massive Sulphides
- Brecciation (crackle/in-situ)

5 cm

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PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : N.K.M.	E.L. 17/94 – LUINA JV
DATE : Jan., 1997	ARTHUR DAM
DRAWN : G.M.B.	DRILL SECTION
REVISIONS :	AD4
	BEARING 140° AMG
FILE : AD4_A2	
DRAWING No.	SCALE 1:1000 (0 20 m)
	FIG. No. 25

TABLE 1. PREVIOUS EXPLORATION IN THE WARATAH AREA

1870's- 1940 *Early prospecting.*
Discovery of tin ore in Tinstone Creek and Mt Bischoff tin deposit. 1877: Magnet Mine discovered, producing approx. 630,000t @ 6% Pb, 7% Zn and 394 g/t Ag (1895 - 1940). 1890's: small discoveries of Ag-Pb, Au, Sn, Cu and Fe lodes opened up.

1963-1989 *EL 5/63, 7AP/AM, Comstaff Pty Ltd (plus BHP Co Ltd).*
1969+: Stream sediment sampling, reconnaissance mapping, gridding and soil sampling around the eastern margin of Meredith Granite.
Early 1970's: Extensive stream sediment sampling and geological mapping (Shaw and Everett, 1985a, b; BHP, 1988), regional TURAM EM survey, CRONE EM and magnetic surveys over 3 grids. Drilled BAB1, MAG1 and MAG2.
1981: Investigation of Deep Gully Creek anomaly; gridding, soil geochemistry, geological mapping, ground magnetics and aeromagnetics identified anomalous tin.
1983: Regional DIGHEM survey identified anomalies in the Deep Gully Creek area (not further investigated). BHP joint-ventured into EL 5/63 in 1985 and drilled BR1.
1984: 5 holes drilled through Tertiary cover.

1963-1989 *EL 1/63, Cominco Exploration Pty Ltd.*
1974 helimag survey, 52m line spacing; 1980 - 1981 DIGHEM EM and stream sediment geochemistry.

1983-1985 *Department of Mines, Luina and Wombat Flat Exempt areas.*
Regional mapping (Brown, 1986), magnetic and DIGHEM surveys and soil geochemistry. Two holes drilled at Arthur Dam, AD1 and AD2.

1988-1990 *EL 46/88, Billiton Australia.*
Gridding of 1983 Comstaff DIGHEM anomaly; geological mapping, ground magnetics and UTEM. Drilling intersected background levels of tin and basemetals.

1989-1990 *EL 47/88 Placer Exploration Ltd.*
Regional stream sediment sampling, rock chip geochemistry (Magnet Mine) and resampling of MAG1, MAG2 and BAB1.

1990-1993 *EL 12/90, EL 15/90, RGC Exploration Ltd.*
Regional data review, magnetic and gravity interpretation of existing data, mapping and rock chip sampling and regional gravity survey led to initiation of Deep Gully Creek Grid and multi-element soil geochemistry. Geochemical anomaly identified close to the Waratah River (remains untested).

1991-1992 *EL 21/90, Geopeko.*
1: 25 000 compilation maps of Comstaff stream sediment data. Limited water and rock float sampling.

1994- *EL 17/93, EL 49/94, MPI Gold Pty Ltd.*
Regional stream sediment sampling, rock chip sampling (Magnet Mine) and resampling of AD1 and AD2.

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DDH AD4 STRUCTURAL DATA FROM ORIENTED CORE
Data Analysed Using DIPS 2.2 Software Package

303070

	strike/dip				
	structure types used	**no. of data points**	**strong groupings**	**weak groupings**	**comments**
cleavage	clv clvfx clvcb clvFAULT	22	047/67NW 096/16N		
	clv fxclv clvcb clvfx clvFAULT	65	050/45-65NW	101/20N 081/55N	this combination shows the weak sub-horizontal structural direction
fractures	fx fxrough	38		045/63NW	scattered data
	fxslick	24	017/34W		very strong grouping
	fxclv	43	050/50NW	080/57N	weaker group overlaps main group
	fxrough fx fxslick fxcb	63		110/44N 044/80NW 020/31W	very scattered data groupings probably not significant
carbonate veining	cbvn	48		053/68NW	very scattered data

Table 2

97-4003 (CF)

303071

APPENDICES

Re

97-4003

ANNUAL REPORT - LUINA-**VOL 2OF2**
EL 17/93 - PASMINCO/MPI GOLD
N K MCGUNNIGLE, P BASFORD

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Appendix 1

Regional lithologies.

303073

PASMINCO
EXPLORATION

Memorandum

To: Mike Quayle
cc: Marcus Tomkinson

From: Nicola McGunnigle

Date: 29 July 1996

Subject: **Regional Geology - Waratah Project Area**
EL's 17/93, 48/94, 49/94

Summary

The main geological formations and structures in the Waratah Project area have been described from geological mapping and recorded on 1 : 5000 scale maps. A range of samples have been collected for thin section, whole rock and XRD analyses, with the purpose of describing representative lithologies and alteration types in the area.

Conclusions and recommendations

Six main lithological groups (and associated facies) have been identified in the area. Representative samples selected for thin sectioning require petrological descriptions, which should assist with determining the characteristics of these groups. Continued field mapping and follow up of the more ambiguous lithologies eg. Betts basin volcanics is required. A small study of the lithogeochemistry of representative samples will be beneficial to determine geochemical characteristics of identified lithologies and determine any association or distinctions between groups. The use of XRD analyses, thin and polished sections are recommended to determine alteration and mineralisation charcteristics in the area, particularly in the Magnet and Arthur Dam areas. Also recommended with regional mapping is the follow up of known small prospects in the area and rock chip sampling.

Introduction

Regional mapping in the Waratah-Luina area has been carried out on a regular basis since management of the EL's commenced in the last quarter of 1995. Mapping has extended outwards from the Arthur Dam area, with the best outcrop exposed in road cuttings, creeks and quarry workings. Geology has been recorded on the Waratah 1: 5000 Sheets (WI and W2, A-D), with the intention of producing a Pasminco 1: 25 000 Geology map for the area.

Current published maps for the area include Brown (1986), which I believe should be treated as a guideline for the broad geological features only as it appears to be mapped from minimal outcrop and groundwork. A 1: 25 000 colour interpretation of the Government Geology Map has been compiled as a temporary map for the office and is available on MapInfo.

A Division of Pasminco Australia Limited
ACN 004 074 962

Level 7, 380 St Kilda Road, Melbourne Vic 3004
GPO Box 1291K, Melbourne Vic 3001

Telephone (03) 9288 0333
Facsimile (03) 9288 0211

Described below are the main geological formations and structures which I have observed from field mapping. During the mapping period, a range of representative samples of lithologies and alteration has been collected for whole rock, thin section and XRD analyses. Please refer to the database for these A description of sample specimens, location, number, and analysis is included as Appendix 1.

Lithologies

Not all lithological units over the project area have been mapped to date. Those covered have been mapped by description, and include the following groups:

Basalt lava and volcaniclastics (Crimson Creek Formation)
Pyroxenite and mafic volcanic (and Betts basin volcaniclastic) sequences
Serpentinite
Ultramafic intrusions
Granite

Basalt volcanics
The basalts in the area, mapped as Crimson Creek Formation by Brown (1986) are defined as a succession of rocks dominated by compacted mudstone with volcaniclastic and lava horizons. Turbiditic sequences of volcaniclastic lithicwackes and laminated siltstone and mudstone are interbedded with [tholeiitic (Brown, 1986)] basalt. Bedded siltstone-shale appears to be fairly uniform in composition, and ranges from black, dark red to crimson, to grey-fawn in colour. In places, eg. Magnet Road, siltstone is interbedded with a pale brown to yellow, medium to coarse grained micaceous sandstone (78012), which also contains feldspar, quartz and ilmenite. Soil above the sandstone is characterised by a yellow brown colour and slightly granular texture, contrasting to reddish brown soils above the finer grained units.

Variations of the fine grained siltstone-shale beds is most likely to be related to the relative proportion of mafic detritus in its composition in a particular area. For example, the grey-fawn siltstone-chert exposed in the quarry along Magnet Road (5409650mN, 369150mE) contains relatively little mafic component compared to the black and dark-red mudstones observed further to the east, and south eg. Arthur Dam. Hornfels is observed in sediments located close to the granite contact, eg Butlers Road, as a black, dense, sometimes pyritic outcrop with varying magnetic response. Interpretation of ground magnetic data along Butlers Road suggests that the occurrence of high frequency shallow sources may be granite related alteration effects (Basford, 1996). Hornfelsing rapidly decreases away from the granite contact to black shale.

Crimson Creek volcaniclastic beds exposed in the Magnet area and to the east of Arthur Dam have a dominant NE-SW strike, dipping to the west. In the gully west of Arthur Dam, approx. 5407200mN, 367800mE (accessed by HEC tracks and Cleveland tramway), steep west dipping beds (roughly N-S striking) are observed proximal to steep east dipping beds, inferring a tight fold axis in the area. Beds further to the west are again dipping to the west, which suggests anticline-synclinal development in local area.

Basalt lava

Lava horizons, interspersed with the Crimson Creek sediments are common in the area. The lavas are dark grey to black, aphyric and feldspar phyric, and include pillow lavas and sills. In outcrop, fine feldspar laths are observed (up to 0.5mm) in the groundmass, which is commonly manganese altered on weathering. Aphyric basalt exposed on the Cleveland Tram Road may be basalt sills associated with the sequence. Textures associated with pillow lavas were observed in an area dominated by basalt west of Arthur Dam (5407200mN, 366600mE), which is easily accessed via the Cleveland Tram Road. Infilling of amygdales or vesicles is also apparent. On the Magnet Road (5409075mN, 369090mE) emplacement of basalt in siltstone-sandstone sediments is observed. Hyaloclastite ± peperitic margins are observed on the margins of the pillow sequence on Magnet Road.

What is interpreted to be altered basalt is exposed in a creek bed accessed by the HEC line west of Arthur Dam (5407020mN, 368320mE). It is altered to green and red in colour, with increased green alteration on the weathered surfaces, and contains large irregularly shaped vugs (up to 15mm) which have been filled with carbonate (Hand specimen 78016).

Intermediate to mafic volcanics - pyroxenite and basalt lava sequences

Mixed intermediate to mafic volcanics dominate an area to the west of Arthur Dam. These are referred to as high-magnesian andesites and low-titanium tholeiite basalts by Brown (1986). They are so far the only known sequences of their type in Tasmania, derived within the Dundas Trough. The volcanics range in texture, most commonly as interstratified volcaniclastics, lava and lava breccia believed to be mostly subaqueously emplaced. A wide variety of interesting textures are exposed in the basin accessible by Betts track, including interbedded pumiceous breccia, agglomerate and tuffaceous sediments.

Lava and lava breccia outcrops range from vesicular, fine to coarse grained porphyritic to basaltic pyroxenite. Examples of these are exposed along the track and drill pad site of DDH AD2, intercalated with volcaniclastic sandstone and siltstone. Outcrop is green to grey-brown in colour, slightly to highly chloritic with goethite weathered surfaces. Andesite is feldspar-pyroxene phyric, with pyroxene phenocrysts up to 8mm in size (and up to 20% abundance), and commonly contain amygdales infilled with carbonate and/or silica. Spillitic basalt is characterised by classic spherulitic-spray spillite textures, and fine grained feldspar ± pyroxene. Aphyric mafic volcanics, eg. hangingwall to alteration zone along Magnet Road (5417300mN, 372000mE; Sample 78013) are dark green, chloritic and slightly silicic. A sample from this location has been taken for petrographic examination.

This distinguishable volcanic package has been collared at each of the 3 diamond holes drilled in the Arthur Dam area. The core shows the complexity of the intercalated sequences, incorporating a range of rapidly changing textures over 10's of metres of depth (to 220m in AD2). The abundance of lava breccia, hyaloclastite and interpreted peperite intercalated with bedded sediments suggests emplacement in a

subaqueous environment. Alteration of the sequence varies from slightly to highly chloritic, with minor to moderate sericite in places, and minor to moderate carbonate alteration. Carbonate most commonly occurs in veinlets and matrix replacement in volcaniclastic and hyaloclastite beds.

Local NNE striking cleavage increases within this sequence, particularly around the Arthur Dam grid and Magnet alteration zones. A strong fabric is observed in the most highly altered areas, with carbonate veinlets and replacement having developed parallel to the fabric. At Arthur Dam, cleavage development exposed in two costeans coincides with anomalous Pb, Zn, As, Au and Ag rock chip geochemistry. This will be discussed in more detail in a subsequent report

Betts basin volcanics and volcaniclastics

Approximately 5km along Betts track, a variety of volcaniclastic and conglomeritic textures are observed in boulder outcrops. Textures which are well exposed on weathered surfaces are oblitered internally by alteration overprint when broken. The preliminary selection of samples for thin section examination will assist in the determination of these internal textures, and with the detailed mapping which is required in the area.

A matrix supported conglomerate boulder is located slightly to the north of Betts Track (5403765mN, 367090nE). The conglomerate is poorly sorted, containing clasts from 2-4mm to 150mm, composed of pyroxene-feldspar phyric, chloritic lava and volcaniclasitics, and red-brown sandstone. Clasts vary from coarse grained gravel to rounded pebbles. Fabric is dipping steeply to the north, striking 090° (AMG).

A variety of textures located in the basin include bedded agglomerate, ranging from fine grained tuffaceous through to coarse sandstone matrix, with small gravel sized clasts (2-5mm, up to 10mm)(5403350mN, 367180mE). Weathering of the clasts is vesicular with an inferred fibrous nature in places, within an apparent glass shard like matrix. Tubular clasts show a different fabric orientation to the local foliation which strikes 107° (AMG). The outcrop is interpreted to be comprised of pumiceous and tuffaceous beds, either airfall and/or re-sedimented pyroclastic sandstone-lapillistone.

At 5403360mN, 367040mE (78009), large pumice clasts are exposed in agglomeritic (mass flow?) boulder outcrops, proximal to bedded volcaniclastics similar to the beds described above. Weathering exposes the relict shapes of eroded feldspar and pyroxene crystals within the pumice clasts, which also appear to be vesicular, and slightly tubular. Pumice clasts are up to 80mm in size, averaging 5-8mm and comprise 5-10% abundance within a green-grey chloritically altered matrix.

The pyroclastic genesis of the basin agglomerates and bedded volcaniclastics is so far unique to the Waratah project area. The mineralogy of pumice clasts in the units is an essential link to petrogenesis, and until detailed geochemistry is carried out, the relict shape of eroded pyroxene and feldspar crystals in the weathered surface of outcrops infers an intermediate mineralogical composition (ie. andesite to dacite). The sequences, comprised of possible mass flow breccias and tuffs, or re-sedimented

pyroclastic mass flow and tuff deposits, may be unrelated to the formations previously identified and analysed in the region. It is possible that they may be related to the high magnesian andesites in the area.

Serpentinite

A serpentinised NNE striking wedge of ultramafic rock outcrops to the east of the mafic volcanic units, clearly exposed approximately 1.5km down Betts track (eg. 5406540mN, 369135mE). The serpentinite is highly weathered to blue-green coloured (expanding) clays where broken. Where fresher, it is observed as a complex of dark to light grey and green-black swirly, fragmented, fractured and sheared mafic unit. In places an apparent clastic texture is created by the presence of fragments within a grey, fine-grained, vein-like netted matrix. It is clearly seen in DDH AD1 which intersected serpentinite from 95.0 - 155.0m.

The northern contact of the serpentinite with mafic volcaniclastics is exposed on Betts track (5405620mN, 369250mE). It is highly altered and deformed, with quartz-carbonate veins parallel to the shear fabric, bleaching and hematite alteration overprinting the original lithology (Sample 36803). The southern contact clearly exposed at the surface of Betts track (540500mN, 369070mE) has a sharp (?faulted) contact with adjacent mafic volcanics, striking 037° (AMG). The serpentinite is interpreted to have been tectonically emplaced.

The serpentinite is highly magnetic, and is distinctive in both the ground and aeromagnetic data sets. Six 'C' horizon soil samples were taken over the serpentinite body, located by the ground magnetic response, in an attempt to define the background geochemistry for future surveys (Sample No's: 36832 - 36838).

Granite

The Meredith Granite is a creamy buff coloured, medium to coarse grained equigranular to porphyritic biotite granite (78006). Biotite phenocrysts are up to 5mm in size, but are predominantly fine grained (<1mm) in the groundmass. Feldspar phenocrysts are present up to 25mm long. The granite is increasingly porphyritic and finer grained towards the margins where late stage quartz tourmaline veins are observed, often lining sheeted fractures, with tourmaline up to 40mm eg. Butlers Road (5407350mN, 372090mE), and South Bishoff track (5405385mN, 372070mE). Zones of greisenisation are also common along the margins of the granite.

The Meredith granite has a low frequency gravity response, observed in aeromagnetic data and a ground magnetic survey conducted along Butlers Road (Basford, 1996). Interpretation of the ground magnetic data suggests that low frequency responses over areas marginal to the granite which are mapped as hornfels, are most likely to be related to the granite which is now covered on the surface by a thin veneer of hornfels.

Ultramafic rocks

Ultramafics have been mapped in the area by Brown (1986), and an intrusive

sequence is located 700m west of Waratah Road, exposed along the AD2/HEC access track (5407200mN, 368800mE). The unit is dark green to black in colour, and is moderately to highly chloritised, particularly along grooved (?slickenslide) textures on fractured surfaces (78014). It is possible that the ultramafic in this location has been tectonically (or at least partially) emplaced.

Ambiguous lithologies

Proximal to the Meredith Granite contact in the creek draining from Betts basin, some unusual lithologies were observed. Located between the granite (78006; 5402860mN, 367345mE) and volcaniclastic sandstone (78008: 5402980mN, 367400mE), some complex flowbanded ± bedded units were observed. The flowbanded unit is pale grey, bleached and apparently massive in outcrop, and may be a lava associated with the pyroclastic-volcaniclastics observed in the basin or perhaps is extrusively related to the granite. Additional observations of flowbanding/bedding were also observed in this area, proximal to the granite contact. As these lithologies are in the area of anomalous stream sediment geochemistry, it is recommended that they are followed up with more detailed mapping and sampling.

Alteration

Alteration types in the Waratah area are related to lithology (ie. chemistry). The andesite and pyroxenite volcanics are characteristically moderately to highly chloritic. With increasing foliation, carbonate veinlets parallel the fabric, which are replaced with goethite where exposed at surface. Manganese alteration is also common in the area, with black manganese present on weathered surface planes and fractures.

Alteration associated with mineralisation is complex, but is characterised as vein-style quartz-carbonate, with chlorite, sericite and occasional trace of hematite. Carbonate is again replaced by goethite on weathering, producing gossanous outcrop eg, Magnet Road (Sample 36802) and the Magnet Gossan (75514).

A representative range of samples have been collected for XRD analysis to assist with correlative thin section mineralogy and a more thorough undersatanding of alteration types in the area. Sample type and location are listed in Appendix 1.

Known Mineralisation

Historically, the Waratah area is well known for its large replacement-style Sn deposits (Cleveland, Mt Biscoff). The largest basemetal orebody discovered and mined to date is Magnet, from which approximately 630 00t @ 6% Pb, 7% Zn and 394g/t Ag were extracted. The orebody is described as occupying a steep WNW dipping fracture system within an early Cambrian mafic/ultramafic body known as the "magnet dyke", close to its discordant footwall contact with early Cambrian sedimentary rocks (Cottle, 1953). One possible interpretation of this geology is tectonic movement of the andesite-pyroxenite units, which have consequently been sheared, and thrust against earlier sediments.

There are numerous small base metal prospect sites in the the area, which according to Nye (1923) are small vein style galena dominated accumulations that were worked to a shallow depth only. A few of these have been investigated eg. Campbells Galena Prospect (75513; 5406830mN, 371555mE), a small costean at 5410190mN, 369870mE, (36801, 36802), old tin shows and workings along South Bischoff Road and Wombat Creek track, and several adits located on the hillside west of Magnet Creek (south of Magnet Mine) which proved inaccessible.

Anomalous soil geochemistry over the Arthur Dam Grid identified by the Mines Department (Collins, 1983) has been followed up with further soil geochemistry to confirm a NNE striking anomalous Pb-Zn zone (McGunnigle, *in prep*). Two costeans excavated over the grid were rock chip sampled, revealing anomalous Pb, Zn, As, Au and Ag values in goethitic horizons in cleaved mafic volcanics. Goethite commonly replaces carbonate along cleavage planes and in veins. Quartz appears to fill vugs in carbonate veins, and surface outcrops to coincide with the best Au assays (0.6g/t over 4m). It is believed that the anomalous metal values are associated with mineralisation in quartz-carbonate veins, similar to stockwork veins and massive sulphide mineralisation observed at 100-123m in DDH AD2 (McGunnigle, 1996). It is possible that mineralisation intersected in AD1 (minor) and AD2 is part of a stockwork of veins in the region.

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McGunnigle, N.K., 1996. Arthur Dam Mineralisation Paragenesis. Pasminco Exploration Memorandum.

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Appendix 2

PASMINCO EXPLORATION

Memorandum

To: Sally Dibben

From: Nicola McGunnigle

Date: 12 November 1996

Subject: Rock and thin section descriptions - Waratah Project Area
EL's Luina 17/93 and Waratah 48/94

Summary

Hand specimen and thin section descriptions have been reported for representative rock samples collected from the Waratah Project area. The sample numbers and locations correspond to geology described in an earlier memorandum (re: file number, July 1996).

Introduction

During regional field mapping in the Waratah Project area, representative rock samples were collected for various outcropping lithologies and alteration types. A collection of these was listed in Appendix 1 (attached) of an earlier memorandum on the regional mapping in the area (re: file no). Thin sections of selected samples have since been examined, and both hand and thin section descriptions are reported here. The rock samples and thin sections have been catalogued for future reference.

Hand and Thin Section Descriptions - Waratah Project Area

78001 Massive galena in carbonate

5410750mN
370270mE
Magnet Mine dump
EL 17/923
polished thin section

Reason Collected To investigate mineralisation and alteration styles at Magnet Mine and to add to regional database.

Hand Specimen Description

Coloform banded carbonate with massive galena in vugs and inter-banding. Goethite on weathered surface.

A Division of Pasminco Australia Limited
ACN 004 074 962

Level 7, 380 St Kilda Road, Melbourne Vic 3004
GPO Box 1291K, Melbourne Vic 3001

Telephone (03) 9288 0333
Facsimile (03) 9288 0211

Thin section description

Intergrown coloform carbonate exhibits composite and cockade growth textures, commonly in bands. Remnant galena and pyrite is interspersed along carbonate banding, where 'sieve textures' parallel to bands are common. Late brown ankerite and/or siderite has consumed sulphides; galena and pyrite are observed on margins and in the cores of this late phase carbonate which has infilled vugs in earlier banded carbonate and sulphides.

78002 **Coloform carbonate-quartz and galena**

5410750mN
370270mE
Magnet Mine dump
EL 17/93
polished thin section

Reason collected To investigate mineralisation and alteration styles at Magnet Mine and to add to regional database.

Hand Specimen Description

Coloform banded carbonate-quartz with finely inter-banded galena in vugs. Yellow-cream (high Fe carbonate?) alteration also replaces vugs in banding.

Thin Section Description

Coloform banded and cockade intergrown carbonate with minor sulphides including galena, pyrite and sphalerite, with a late phase carbonate. Mineralisation paragenesis appears to be:

galena
pyrite
sphalerite

Late siderite/ankerite fills vugs and veins between banding, replacing and consuming along the margins and fractures of sulphides which are commonly only remnant along margins.

78005 **Pyroxene basalt lava**

5410200mN
369760mE
Magnet Road
EL 17/93
thin section

Reason Collected Volcanics HW to Magnet Gossan

Add to regional geological database

Hand Specimen Description

Dark green, highly altered, pyroxene-phyric mafic lava. Relict and zoned pyroxene phenocrysts have been replaced by chlorite ± carbonate, which is also pervasive throughout the groundmass. Quartz and carbonate veinlets cross-cut a minor foliation.

Thin Section Description

This sample is highly altered and is most likely of basaltic lava origin. Anhedral and highly resorbed pyroxene (?augite) is remnant within an intensely quartz-chlorite-epidote ± carbonate altered matrix. Very fine grained epidote (?) replaces carbonate on the margins and as a whole. The matrix exhibits a mild foliation, with quartz veins developed (± carbonate-siderite?) parallel to the foliation. Minor opaques (possibly sulphide?) occur with some quartz veins.

78006 **Meredith Granite**

5402860mN
367345mE
Betts Basin
EL 17/93
thin section

Reason collected Sample of Meredith Granite for geological database.

Hand Specimen Description

Medium to coarse grained porphyritic granite. Pink feldspars up to 15mm comprise 30% of the rock, and biotite, sized up to 4mm constitutes about 5%. Coarse grained quartz up to 15mm are observed.

Thin Section Description

This sample is a granular textured granite composed primarily of medium to coarse grained quartz and feldspar, with 3-4% biotite. Feldspar includes plagioclase, with twinning observed in some crystals, and potassic feldspar which is commonly grainy in appearance (as a result of alteration). Brown and green biotite are present as variably sized crystals and glomerocrysts.

78707 **Pyroxene Andesite Lava**

5404004mN
367730mE
Betts Track

EL 17/93

Reason Collected To add to regional geological database

Hand Specimen Description

Pale green-grey porphyritic andesite. The grey groundmass has mottled chlorite ± carbonate alteration. Relict phenocrysts are dark green, replaced by chlorite, and constitute approximately 3%. Pseudomorph shapes suggest that the phenocrysts were originally pyroxene.

Thin Section Description

This sample shows a relict hyalocrystalline and vesicular groundmass with pseudomorphs of tabular (now sub- euhedral) feldspar laths and pyroxene phenocrysts (now altered to chlorite-actinolite). Pyroxene is replaced by chlorite in whole, or partly with corona textures developing on the margins. Granular chlorite commonly forms the outer margins which are often rimmed by quartz. Prismatic actinolite has grown inwards from the margins and also within the chlorite where it has wholly replaced pyroxene. Vesicles are infilled with chlorite and/or quartz, and a fine quartz-chlorite vein is observed in the section. Minor Fe-Ti oxides are also observed.

78008 **Silicified Volcanic**

5402980mN
367400mE
Betts basin ridge
EL 17/93

Reason Collected To investigate unidentified geology and alteration types in the Betts basin area.

Hand Specimen Description

Grey to green, highly silicified ?volcaniclastic sandstone. Weathered surface resembles fine to medium grained sandstone, while internal textures are obliterated by pervasive silica alteration. Euhedral ilmenite crystals are observed.

Thin Section Description

The overall mottled texture is dominated by a complex mosaic lattice of very fine intergrown amphibole (?tremolite) needles, with patches of fine grained granular secondary quartz. Some larger (fine to medium grained) subhedral-anhedral and ragged crystals of amphibole are possibly paramorphs or pseudomorphs of original amphibole or pyroxene crystals. This suggests amphibolisation (uralisation) of the sample. Pseudomorphs of what appear to be feldspar crystals are altered and overgrown on the margins by extensive amphibolisation and silica. These may

represent original composition of the sample. Long, fine and medium grained needles of amphibole crystals are also observed to be earlier than the widespread very fine grained matrix. Quartz infills fractures in the sample indicating later silicification. 2-3% fine to medium grained sub-euhedral Fe-Ti oxide (?ilmenite) is present.

78009 **Pumice Breccia**

5403365mN
367180mE
Betts Basin
EL 17/93
thin section

Reason Collected Representative sample of pumiceous outcrop in Betts basin area.

Hand Specimen Description

Grey pumiceous mass flow or resedimented pyroclastic deposit. Pumice clasts highlighted in the weathered surface are vesicular and tubular, with larger clasts containing relict crystal shapes characteristic of feldspar and proxene. The matrix is mostly altered to sericite-chlorite, with clasts commonly altered to chlorite also.

Thin Section Description

Chlorite-sericite altered pumice breccia. Pumice clasts are fibrous and swirly, commonly altered to sericite or chlorite in the matrix, and contain altered and pseudomorphed feldspar and pyroxene crystals. Feldspar has been replaced by silica and fine chlorite $\pm$ actinolite and pyroxene with chlorite-actinolite. Pumice vesicles are infilled with sericite, carbonate $\pm$ silica. The matrix of the breccia is highly sercitic-chloritic with chlorite-silica replacement of clasts and vesicles. Fine chlorite $\pm$ actinolite is common with granular quartz.

78010 **Bononitic lava**

5407150mN
372970mE
Butlers Road
EL 48/94
thin section

Reason Collected To investigate alteration assemblage
Add to regional geological database

Hand Specimen Description

Dark grey to black boninitic lava. Fine pyroxene laths and phenocrysts (up to 2mm) constitute approximately 10%, with additional amphibole phenocrysts also. The dark grey groundmass appears to be altered to chlorite.

Thin Section Description

Pyroxene phyric subophitic boninite lava. Abundant (20-30%) relict subhedral to euhedral pyroxene (± hornblende?) laths altered to chlorite-actinolite are embedded in a groundmass of amphibole. It is not clear whether the amphibole is original or is a product of uralisation. Minor rutile is present also with amphibole. Chlorite has replaced some of the groundmass which was probably originally of high glass composition. Chlorite is also common on the margins of phenocrysts and around pyroxene cumulates.

78011 **Spillitic basalt**

5410340mN
369850mE
Magnet Road
EL 17/93
thin section

Reason Collected To investigate alteration assemblage.
To add to regional geological database.

Hand Specimen Description

This sample of spillitic basalt is weathered brown-black with goethite-manganese on weathering and joint surfaces. Chlorite-manganese has replaced relict phenocrysts (?feldspar) which highlights spillitic sprays. Goethite has also replaced carbonate, after phenocrysts. Medium grained ?amphibole alteration is observed in the groundmass.

Thin Section Description

Highly chloritic and weathered spillite. Relict pyroxene and feldspar phenocrysts up to 1-2mm are set in a mosaic-textured goethitic and chloritic groundmass. The groundmass texture is reminiscent of snowflake texture derived from devitrification of felsic glass. Feldspar laths in the sprays are intermittent with chlorite and goethite. Vesicles are infilled with chlorite and quartz. The overall composition also appears to be vesicular. It is thought to be spillitic (quenched) lava of mafic composition which has undergone extensive chlorite alteration and weathering.

78012 **Micaceous Sandstone**

5410860mN
370340mE

Magnet Road
EL 17/93
thin section

Reason Collected To add to regional geological database

Hand Specimen Description

Pale brown-green micaceous sandstone. Medium grained, slightly chloritic sandstone contains clasts of feldspar, mica and Fe-Ti oxides.

Thin Section Description

This sandstone is comprised of medium to coarse grained crystals in a very fine matrix weathered to brown (Fe-rich clays). Dominant medium grained crystals are subrounded to rounded mica, plagioclase and rounded quartz. Quartz also appears to replace pyroxene, for which pseudomorphs are observed. Amphibolisation of finer pyroxene crystals to tremolite-actinolite is also apparent. Very fine grained chlorite and rutile are observed in the matrix and on the margins of crystals, and rutile in needle-like sprays. Apatite is also observed on plagioclase and relict pyroxene crystals.

78013 **Basalt lava**

5407200mN
366375mE
Magnet Road
EL 17/93
thin section

Reason Collected Add to regional geological database

Hand Specimen Description

Dark grey, massive aphyric basalt. Occasional fine grained feldspar are visible in outcrop.

Thin Section Description

Weathered and altered aphyric basalt lava composed of intergrown pyroxene (?augite) and feldspar (?plagioclase) with 2-3% Fe-Ti oxides. Feldspar phenocrysts are sub-euhedral, sericitised around margins and finely sericitised within. Augite occurs ophitic-like between feldspar phenocrysts and is variably altered to actinolite. Fe-Ti oxides are quite large and comprise 2-3%. The groundmass is moderate to highly sericitised with chlorite interstices and very minor rutile.

78017 **Volcanogenic Siltstone**

5406770mN
369998mE
Cleveland Tramway
EL 17/93
thin section

Reason Collected To add to regional geological database

Hand Specimen Description

Fawn-brown coloured siltstone. Fine grained with mafic volcanic provenance including mica and leucoxene.

Thin Section Description

This sample is a volcanogenic siltstone unit which is relatively weathered and altered. Very fine grained siltstone is intercalated with fine grained siltstone of matching composition. Clasts are comprised of predominantly subround to rounded crystals within a matrix highly weathered to Fe-rich clays (including goethite). Subrounded feldspar (?plagioclase) is orientated sub-parallel to bedding. Ragged and subrounded tremolite-actinolite has formed from amphibolisation of pyroxene. Rounded quartz clasts are also present.

Appendix 3

Rock chip assays

Luina Rock Chip Assays

Sample #	AMG_E	AMG_N	Cu	Pb	Zn	Mn	Fe%	As	Co	Ni	Ag	Au	Bi	Sn	W	Mo
36801	369870	5410190	33	-3	878	16500	26.9	5			4	-0.008				
36802	369870	5410190	45	-3	908	14500	26.9	8			2	-0.008				
36803	369120	5405530	12	159	1281	3613	14.1	885			-1	-0.008				
36804	370015	5410350	17	920	4715	100000	14.5	923			4	-0.008				
36807	369325	5407182	41	-3	40	121	1.99	35			-1	-0.008				
36808	369630	5407255	49	4	85	620	4.58	8			-1	-0.008				
36818	369784	5407161	44	116	119	294	3.42	14			-1	-0.008				
36819	369823	5407145	47	60	102	110	4.52	34			-1	-0.008				
36842	369220	5406846	27	-3	46	423	9.03	6			-1	-0.008				
75801	369220	5406846	53	-3	49	649	0	2			-1	-0.008		7	-10	
75871A	369220	5406846	29	-3	53	531	0	0			-1	-0.008		4	-10	
75877	369220	5406846	38	3	52	640	0	0			-1	-0.008		-3	-10	
78401	369290	5407030	39	-5	47	698	4.81	5	33	155	-1	0.002	-5			-2
78402	369280	5407070	4	-5	7	91	0.99	1	-5	16	-1	0.012	-5			3

Appendix 4

XRD (2 samples)

PASMINCO EXPLORATION

Memorandum

To: Sally Dibben

From: Nicola McGunnigle

Date: 2 December 1996

Subject: **XRD Mineralogy of two samples, Luina EL 17/93**

Summary

Two samples were collected for XRD analysis from the Luina tenement to aid in determining alteration types in the area. Sample 78004 from the alteration zone hangingwall to the Magnet Gossan correlates well with the regional quartz-carbonate-chlorite alteration, and includes siderite, dolomite, mica (/illite) and a trace of sphalerite. Alteration in sample 78018 from soft, sheared bedrock exposed in the southern costean at Arthur Dam is composed of chlorite, quartz and talc.

Introduction

Two samples from Luina EL 17/93 were sent to Amdel Laboratories in Adelaide for semi-quantitative determination of mineralogy by X-ray diffraction. The samples were selected for analysis to assist with identifying alteration types proximal to known mineralisation in the area.

Sample locations

Sample 78004 was taken from a zone of alteration which is hanging wall to the Magnet gossan along Magnet Road (5410200mN, 370080mE). The original rock type resembles nearby aphyric and chloritic volcanics which have undergone silicification. In outcrop, alteration to carbonate is also evident with traces of sphalerite.

Sample 78018 is from a chloritic and talcose zone in the southern costean trenched at Arthur Dam grid (corresponding to assay sample number 78420, 5406854mN, 369470mE). The bedrock exposed in this zone is cleaved and sheared in the dominant NE striking direction. Outcrop is highly sheared, pale blue to grey in colour and extremely soft.

Results

The minerals detected by semi-quantitative XRD were reported by Amdel in approximate decreasing order of abundance:

78004		78018	
Siderite	CD	Chlorite	D
Quartz	CD	Quartz	SD
Dolomite	A	Talc	Tr-A
Mica/illite	A		
Chlorite	Tr-A		
Sphalerite	Tr		

Semi-quantitative abbreviations:

D = Dominant. Used for the component apparently most abundant, regardless of its probable percentage level.

CD = Co-dominant. Used for two (or more) predominating components, both or all of which are judged to be present in roughly equal amounts.

SD = Sub-dominant. The next most abundant component(s) providing its percentage level is judged above about 20.

A = Accessory. Components judged to be present between the levels of roughly 5 and 20%.

Tr = Trace. Components judged to be below about 5%.

Discussion

The samples were both collected to aid in determination of alteration types in the Luina EL. XRD analysis of 78004 in the alteration zone hangingwall to Magnet gossan confirms visual observations of alteration, and correlates well with the regional quartz-carbonate-chlorite alteration related with mineralisation. It is probable that alteration fluids have been controlled by the dominant local fabric direction, with mineralisation at Magnet being vein-style.

Alteration in the soft, schistose bedrock exposed in the southern Arthur Dam costean (78018) confirms field observations of chlorite-quartz-talc alteration. The sample location was compared to rock chip geochemistry results to investigate whether this alteration style is related to anomalous geochemistry reported. Sample 78018 lies just outside 1m spaced sampling over a goethitic horizon exposed in the costean which assayed 6m @ 0.6 % Pb (including 1m @ 1.16% ppm Pb) and 11m @ 21 ppm Ag. The assay results over the schistose XRD sample interval were well below the mean calculated for 16m of high geochemistry results (eg. 78420 = 599ppm Pb, x = 2489ppm Pb). Although it is difficult to say whether the chlorite-quartz-talc alteration is associated with lower geochemistry results (including lower Fe), it appears that the most anomalous geochemistry is coincident with the goethitic horizon, ie. high Fe%.

303094

Appendix 5

Arthur Dam Soil geochemistry

Memorandum

PASMINCO
EXPLORATION

To: Sally Dibben

From: Nicola McGunnigle

Date: 18 August 1996

Ref: nkm\96305

Subject: **A and C horizon Soil Geochemistry - Arthur Dam Grid**
Luina EL 17/93

Summary

'A' and 'C' Horizon soil geochemistry surveys were conducted over the refurbished Arthur Dam grid between January and April 1996. Results show that Pb is the least mobile element sampled in both horizons, and that 'C' Horizon geochemistry replicates earlier soil sampling in the area, with anomalous Pb $\pm$ Zn in a NNE striking trend.

Conclusions and Recommendations

While it is not possible to define a source for the geochemical anomalies identified in these surveys, the following conclusions and recommendations have been drawn from observations:

1 - Pb is the least mobile of the elements sampled in both the 'A' and 'C' horizon surveys. A subtle halo of decreasing Pb appears to zone away from the most anomalous value in both soil surveys. The strong coincident (and lesser mobile) anomalous Pb suggests that it is the most repeatable element.

2 - 'A' horizon Pb geochemistry correlates well with 'C' horizon data, making it a possible alternative reconnaissance soil sample method for future surveys. The dispersion of other elements sampled in the 'A' horizon however restricts the potential of this method.

3 - Highly coincident As and Pb geochemistry in the 'C' horizon results suggest that As and Pb could be geochemically related in the mineralisation type, and if so, As may be a good indicator of Pb-related mineralisation in the Arthur Dam area. The relative immobility of Pb suggests that As may also be a lesser mobile element in these conditions.

4 - The subtle NNE trending anomalous zone identified from the previous soil geochemistry survey is repeated in these results and coincides with the local foliation

A Division of Pasminco Australia Limited
ACN 004 074 962

Old Burnie Railway Station, Burnie TAS 7320
GPO Box 886, Burnie TAS 7320

Telephone (004) 317 477
Facsimile (004) 318 949

of the C horizon rocks identified in nearby outcrop. It is possible that the anomalous geochemistry is in fluids which have moved along fractures controlled by regional foliation. It is recommended that further sampling should be undertaken along grid lines cut to the north and the south of the present soil data set to investigate possible extension of anomalous geochemistry along strike.

Introduction

A soil geochemistry survey was conducted over the refurbished Arthur Dam grid, in Luina EL 17/93, between January and April 1996. The objective of the survey was to follow up coincident 'A' and 'C' horizon soil geochemistry anomalies produced in independent surveys by Baker (1986) and Collins (1983) respectively (Figure 1). Confirmation of the anomalies reiterates the existance of base metal anomalies in the area and also validates the data for future reference.

Soil Sampling Methods - January 1996

To follow up the previous soil sampling over the Arthur Dam grid, it was decided to initially sample both the 'A' and 'C' horizons over two previously sampled lines (300N and 400N) and along part of the baseline (from 400N to 700N). A small orientation survey of the soil horizons was conducted over a few sites in the initial stages of soil sampling, mainly to familiarise the samplers with the soil horizon characteristics. The 'A' and 'C' horizons are defined as:

A - the dark zone of humus-rich accumulation beneath the leaf litter, and

C - the weathered bedrock, commonly blue-grey in colour, composed of clay and coarse sand sized rock chips. For each orientation site, notes were taken on site conditions, eg. topography, vegetation types, and a small pit was dug to describe the soil profile (Appendix 1). The soil types are illustrated in Figure 2.

Sample repeats were collected every 20 samples, for both horizon surveys, and results are inclusive in Appendices 2 and 3. A soil "standard" from local grid coordinate 300S, 0E, an area which from previous surveys appears to have low soil geochemistry, was included in each sample batch for both A and C horizon soils.

The first sample set was followed up with C horizon soil sampling from new lines cut at 350N and 450N. A third set of C horizon soils was taken along grid lines 100S and 200S in April. The results shown in Figure 4 include the three C horizon soil surveys.

Sampling of 'A' Horizon Soils

Sampling was undertaken at 20m spaced intervals along refurbished Arthur Dam grid lines 300N, 400N, and the base line from 400N to 700N. To collect the humic horizon, a small hole was dug, excessive root material was removed, and about 500g of the the dark brown, loamy soil was collected. Sample depth was most commonly from 10cm (below leaf litter and thickest root material) to 25cm. The samples collected in plastic sample bags, and no preliminary drying or sieving of the samples was required as the method employed (Baker, 1986) involved the determination of

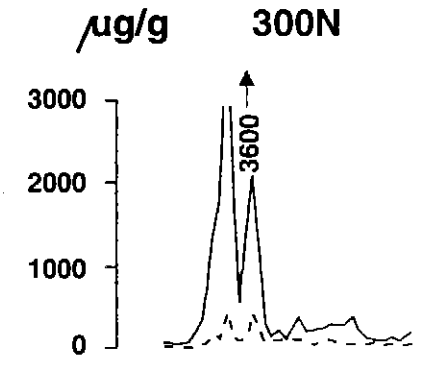
PASMINCO EXPLORATION

ARTHUR DAM AREA

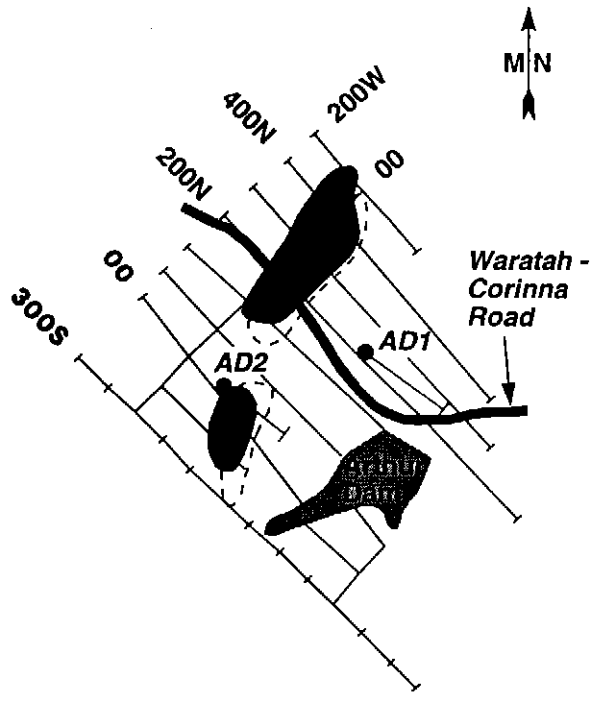
SOIL ANOMALIES

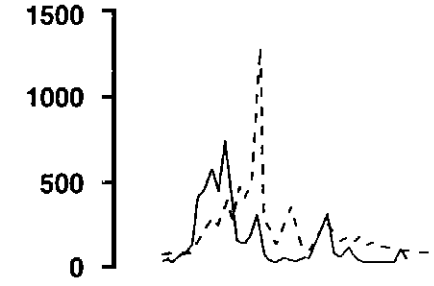
'A' Soil Horizon Organics Data

'C' Soil Horizon Data

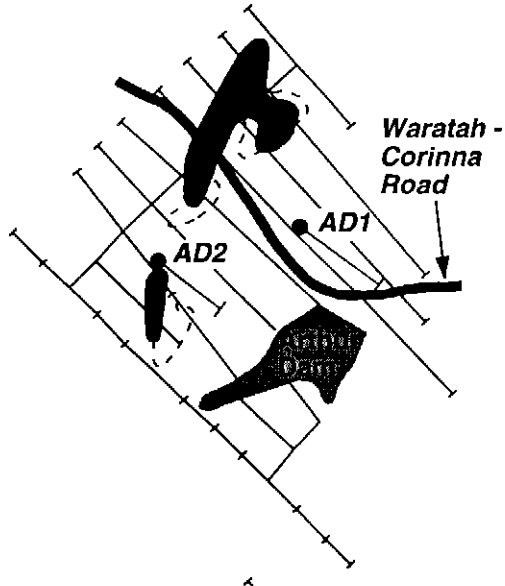


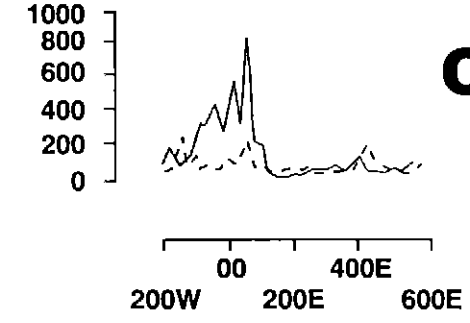
LEAD



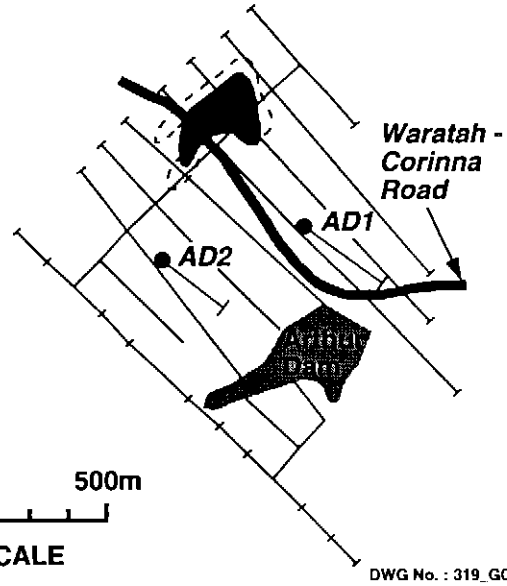


ZINC





COPPER



FILE: AD_SANOM

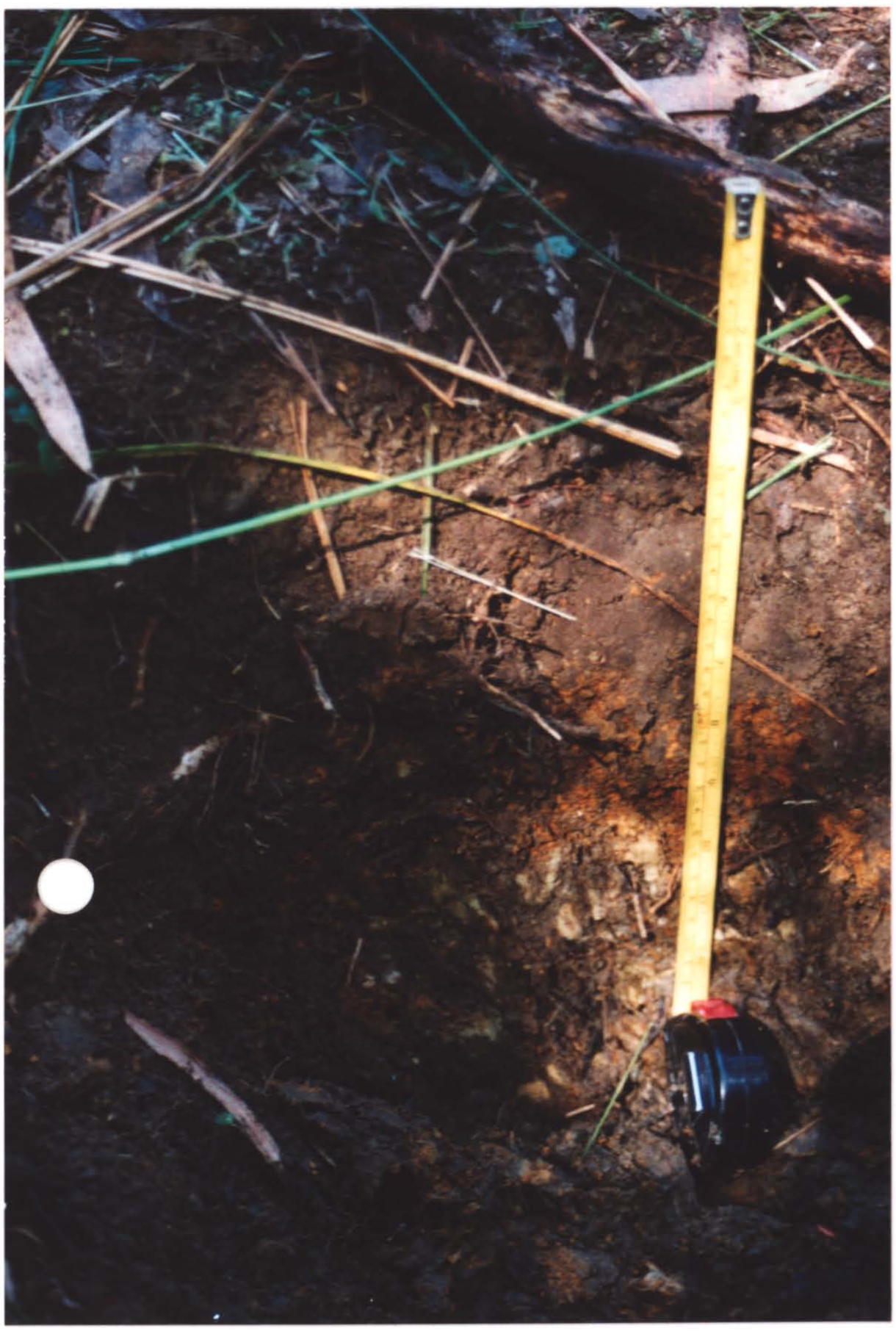
DWG No. : 319_GC-007

FIGURE 1

5 cm

Figure 2 Soil types in the Arthur Dam area

2a) 'A' and 'B' Horizon soils at local grid coordinates 300N, 00E.
A-B contact at 19 cm depth.



2b) 'C' Horizon soil, local grid coordinates 400N, 140E.

metals in extracted humic substances. Samples were sent to Bill Baker at Mineral Resources Tasmania for analysis. Results are included in Appendix 3, and Figures 6a-c and 7a-c.

Sampling of 'C' Horizon Soils

The C Horizon soils were most commonly intersected at 0.5 - 1.0m sample depth and were collected by hand auger. The horizon depth, colour and composition was noted at each auger hole, and approximately 1kg of soil extracted for analysis. The soil varied from blue-grey micaceous soft rock to mottled green-orange sandy clay (± rock chips). The samples were sent to Analabs in Cooee for drying and standard base and precious metal analyses (Appendix 3; Figures 3a-g and 4a-g).

Results

Soil Geochemistry Statistics: C Horizon Soils

Pb - The background values for Pb (Figure 3a) includes at least the lower 90% of the sample set. A slight upward curve is observed on the probability plot at 90% (251ppm), disrupting the smoothly increasing background curve. The values from 251 to 503ppm (up to 95%) may be considered "slightly high". Anomalous values lie in the upper 5th percentile, from 689ppm Pb, totalling 7 samples.

A proportional plot of the C Horizon Pb geochemistry is illustrated on a plan view of the Arthur Dam Grid (local grid coordinates) (Figure 4a). The most anomalous values (1.21% and 1857ppm in red) lie on grid line -100, and 400N (833 and 748ppm). It is difficult to ascertain any distributional trends in anomalous values >689ppm because of an unsampled area between the northern and southern sample sets on the grid, however, high and anomalous values on lines -100 and -200 are in a roughly north striking trend.

Zn - The probability plot for Zn (Figure 3b) clearly illustrates a jump from background to slightly anomalous values at 496ppm (88th percentile). A small group of values lie from 88-91.5%, commencing a steeper growth curve in values from the background figures. From 91.5-94%, Zn values cluster from 711-748ppm. The most anomalous values in the upper 6% range from 878ppm to 6500ppm.

Zn geochemistry on Figure 4b shows the most anomalous values (719, 6500 and 916ppm) on grid line -100 (180E, 200E and 220E respectively). These are coincident with the best Pb anomalies. The second 'cluster' of Zn anomalies ranging from 1041-1234ppm are located on line 400N, also coincident with the second highest Pb anomalies. The lowest anomalous value of 496ppm Zn at -200, 220E is located in the "zone" of slightly anomalous Pb. Other anomalies in the northern part of the sample set are in the broad region of anomalous Pb values, and perhaps are more dispersed in the sample media due to Zn being a more mobile element than Pb.

Cu - A gradual increase in backgound Cu values to 94% is seen on the probability plot for Cu (Figure 3c) and it is possible that the steeper probability curve observed is due

to greater mobility of Cu. High and anomalous C Horizon Cu values are contained in the upper 6.1% and 4.25% respectively (112-124ppm and >140ppm). The best Cu value of 428ppm is the most significant anomaly, most importantly when compared to the next highest value of 196ppm.

Cu geochemistry (Figure 4c) shows a random dispersion of the higher Cu values in the northern part of the sample area. This could be due to the mobility of Cu, which does not show any significant comparison with Pb or Zn values over this part of the grid. The best anomaly is located at -200, 20E. Slighlty elevated values are also observed on line -200 at 200E and 220E, which is coincident with elevated Pb and Zn results. However, the lack of correlation of Cu with other elements, particularly in the highly anomalous zone around -100, 200E suggests that Cu is not associated with the same mineralisation as Pb and Zn anomalies, or that dispersion of it as a mobile element restricts the use of Cu as an indicator element for identifying geochemical target areas for further investigation in this sample set. It is likely that the mobility of Cu will restrict its uses in future surveys.

As- A small group of elevated As values lies just above background level (< 124ppm) (Figure 3d) ranging from 185 - 196ppm. High to anomalous As includes values in the upper 4.24% of the sample set, from 259-458ppm and >885ppm. The best As anomaly is 5500ppm.

Anomalous As values are highly coincident with Pb anomalies when proportional symbol plots of the elements are compared (Figure 4d). Th highest As values show good correlation to the respective highest Pb values when located on the Arthur Dam Grid coordinates. These results suggest that As and Pb could be geochemically related in the mineralisation type that they may represent, and if so, As may be a good indicator of Pb-related mineralisation in the Arthur Dam area. The relative immobility of Pb as an element, and respective correlation to As values suggests that As may also be a lesser mobile element in these conditions, and hence a good indicator element.

Mn - The probability plot for Mn shows a small group of outliers either side of the major cluster of steeply increasing (background) values (Figure 3e). These values in the high range (> 855ppm) form the upper 7.8% of the population and could be considered to be "high" Mn values. Two, maybe three, values in the sample set (1017, 1088 and 1296ppm) appear to be anomalous.

The high and anomalous Mn results are seen on the proportional plot (Figure 4e), most significantly at 400N, -100; 300N, 180E; and 300N, -60. These results do not correlate directly with any C Horizon geochemistry, suggesting that the distribution of Mn is influenced by controlling factors such as lithologies, structure and vegetation. The scavenging properties of Mn and affinity with vegetation matter (below surface) suggest that vegetation types may be related to Mn distribution, and that elevated Mn levels in the C horizon may correlate with high base metal values sampled in the A horizon.

Ag - C Horizon geochemical results for Ag clearly show a background value lower than detection limit (1ppm) (Figure 3f). 4 samples detected 1ppm, located at 300,

300E, -100, 0E and -200, 220E, 240E which indicates traces of Ag. These values lie outside the anomalous zone at -100, 160-220E, where Ag ranges from 1ppm, peaking at 8ppm (Figure 4f). This anomalous zone coincides with the best Pb, As and Zn values, and it is likely that these elements are associated with and may act as indicators for slightly elevated Ag.

Au - Like Ag, the background level for Au over the Arthur Dam C Horizon soil sample area is lower than detection limit. A cluster of values lies just higher than detection limit, up to 0.02ppb, however, the most anomalous in the sample set are those in the upper 3% of the population, > 0.024ppb. The best Au value was detected in the coincident anomalous zone on gridline -100, 220E (Figure 4g). There is no consistent correlation of Au with any particular element other than the overall anomalous area observed on line -100.

Discussion of C Horizon Geochemistry

Anomalous geochemistry was identified from outlying values observed on each probability plot for each element. Pb and As appear to correlate the best, with coincident Zn, Ag and Au $\pm$ Cu characterising the -100 anomalous zone on the grid. The association of particular elements more than likely reflects association of respective mineralisation in the area, with a greater proportion of lesser mobile elements eg. Pb, showing anomalous values closer to the source of the anomalies.

The C Horizon Data shows broad geochemical correlations to the C Horizon data collected by Collins (1983), which is illustrated on Figure 5 with the location of the refurbished grid for comparison. The most anomalous zone at -100, 160E - 200E is clearly expressed in the Pb values, and the highest Zn coincides with anomalous Zn at 400N, 80E. The overall correlation of data confirms the presence of anomalous geochemistry over the grid, and provides geochemistry for grid lines not sampled in the Pasminco soil sampling programme.

There appears to be a NNE striking trend of anomalous Pb $\pm$ Zn over the soil lines collected by Collins (1983). The inclusion of sampling northeast along the baseline in the first Pasminco soil survey was an initial attempt to see if this trend (observed from preliminary observation of Collins' data) continued in this direction. The limited samples collected infers that this may be so. It is recommended that further samples should be collected along the grid lines cut to the north and south of the present soil data set to investigate possible extension of the anomaly along strike.

Soil Geochemistry Statistics: A horizon soils

Pb - The probability plot for Pb geochemistry detected in A horizon soil samples (Figure 6a) shows a much steeper distribution curve than that produced by C horizon soil geochemistry. There is an apparent change in the distribution curve above the 95th percentile, indicating anomalous values in the upper 5% of the sample set (>960ppm). These anomalous Pb values are located on Arthur Dam Grid local coordinates 400N 60 & 80E and 300N, 0E (Figure 7a). There are small haloes of decreasing Pb zoned away from the most anomalous values.

When compared to the C Horizon Pb geochemistry taken from corresponding sample sites (local grid coordinates, Figure 4a), the results correlate quite encouragingly. The 3 best A horizon Pb anomalies coincide with anomalous C horizon Pb results. What appear to be additional elevated A horizon values, observed particularly along line 400N, are actually regarded as background values when referring to the probability plot, and in fact equivilate to background values in the C results also. The relationships observed highlights this statistical approach to identifying anomalous values. Apart from the isolated Pb anomaly observed in the C horizon results at 540N not being apparent in the A horizon data, the A horizon geochemistry correlates respectively to C Horizon data for Pb, making it a possible alternative reconnassaince soil sample method for future surveys.

Zn - The probability plot for Zn in A horizon soils also shows a steep distribution curve, with a few outliers plotting from the main cluster of results (Figure 6b). High Zn values lying outside the main cluster are in the upper 10% of the sample set, totaling 5 samples >350ppm. The best Zn anomaly of 590ppm is located at 400N, -60.

The distribution of the higher A horizon Zn values (Figure 7b) appears to be dispersed to the northwest, when compared to anomalous C horizon Zn results. The difference in grid location of the sample horizons may be due to preferential distribution or greater mobility of Zn in one of either horizons eg. attraction to particular humic substance in the A horizon, or dispersion by groundwater movement or topography in either horizon.

Cu - A steady increase in Cu is also seen in A horizon soils (Figure 6c). Within this sample set, 2 samples of 320ppm and 400ppm appear to be outliers of the main distribution in the upper 2% of the sample set. No sound correlation can be made when compared to C horizon data (Figures 7c and 4c).

Summary of A Horizon sampling as a method

Dispersion of Cu and Zn in the A horizon has a greater variation than Pb, when compared to C horizon sample results. The observation that A and C horizon Pb geochemistry has a greater correlation suggests that Pb is a more reliable indicator in multiple horizons, or, within a greater variation of conditions, and less susceptible to mobility. Correlation with C Horizon geochemistry suggests that A horizon sampling for Pb may be a possible alternative reconnaisance method, however, the reliability of a single element restricts the potential of the method somewhat.

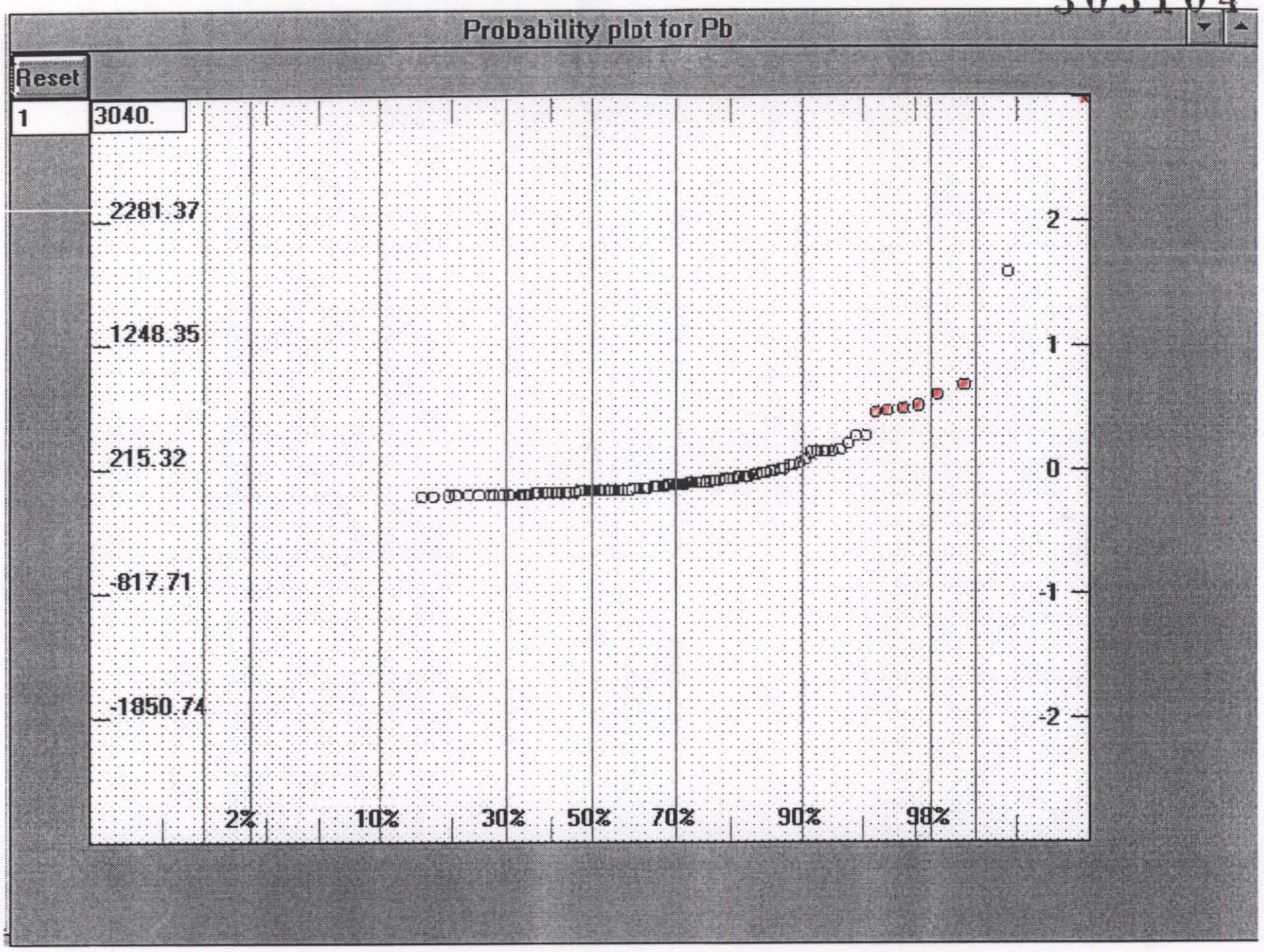
When compared to the C horizon Mn results, A horizon Zn, Pb and Cu results all show interesting distribution patterns. As discussed, C horizon Mn values appear to be influenced by some outside controlling factor, and as an element well known for its scavenging properties and affinity to vegetation matter, it seems to be a reasonable observation for A horizon data to show a rough correlation with Mn. C horizon Pb, Zn and Cu does not correlate well with Mn however, hindering the potential for Mn application.

Vegetation and Soil Geochemistry

The generalised vegetation types over the Arthur Dam grid consist of scrub (mainly ti tree and cutting grass), button grass and rain forest (Figure 8). It is most likely that any correlation of vegetation with the geochemical values will be reflected in the A Horizon results, however it is difficult to establish a relationship, if it exists, within the small area sampled for A soils. Elevated values of Pb, Zn and Cu in the A Horizon are located mainly in the scrub with the exception of the highest Pb anomaly which is on the margins of scrub and button grass plains (to the southeast).

The sporadic distribution of elevated Mn in the C Horizon appears to be at sample sites beneath scrubby vegetation. It is possible that Mn in this horizon is related to the presence of surface vegetation via roots penetrating the soft, foliated C Horizon. It is possible for chelate complexes of Mn^{2+} to form at the root surface. The dispersion of Mn in C Horizon soils over Arthur Dam Grid, and the coincidence of root vegetation in the vicinity of elevated values suggests a relationship between vegetation and Mn. It is possible that a lesser defined but similar relationship exists between humic substances in the A horizon soils and elevated Zn and Cu values in this horizon.

Lesser mobile elements such as Pb should not be as susceptible to influence by vegetation or hydromorphic processes and are therefore more reliable indicators of nearby sources of the anomalies.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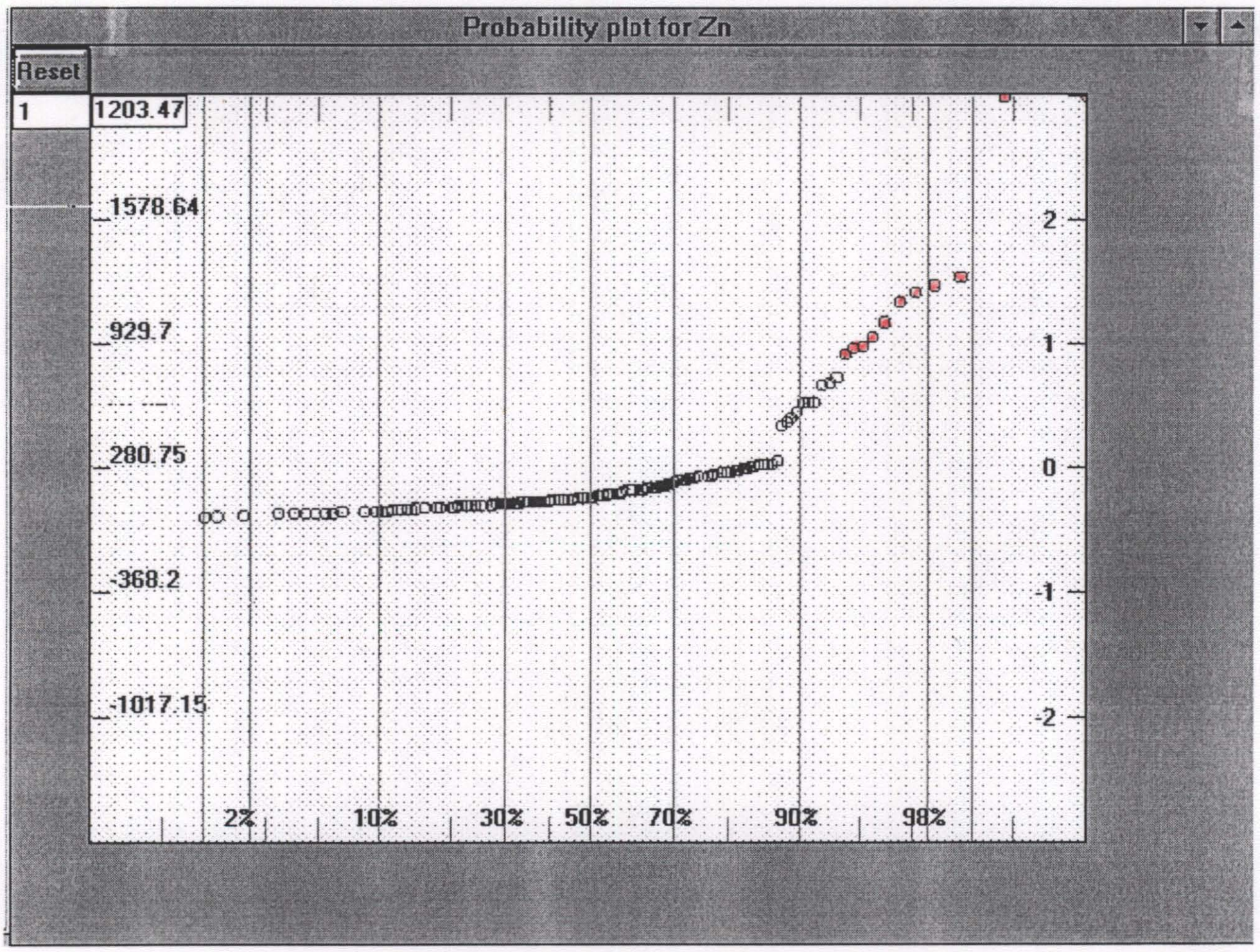
1
3040.
2281.37
1248.35
215.32
-817.71
-1850.74
2%
10%
30%
50%
70%
90%
98%
2
1
0
-1
-2

Fig. 3a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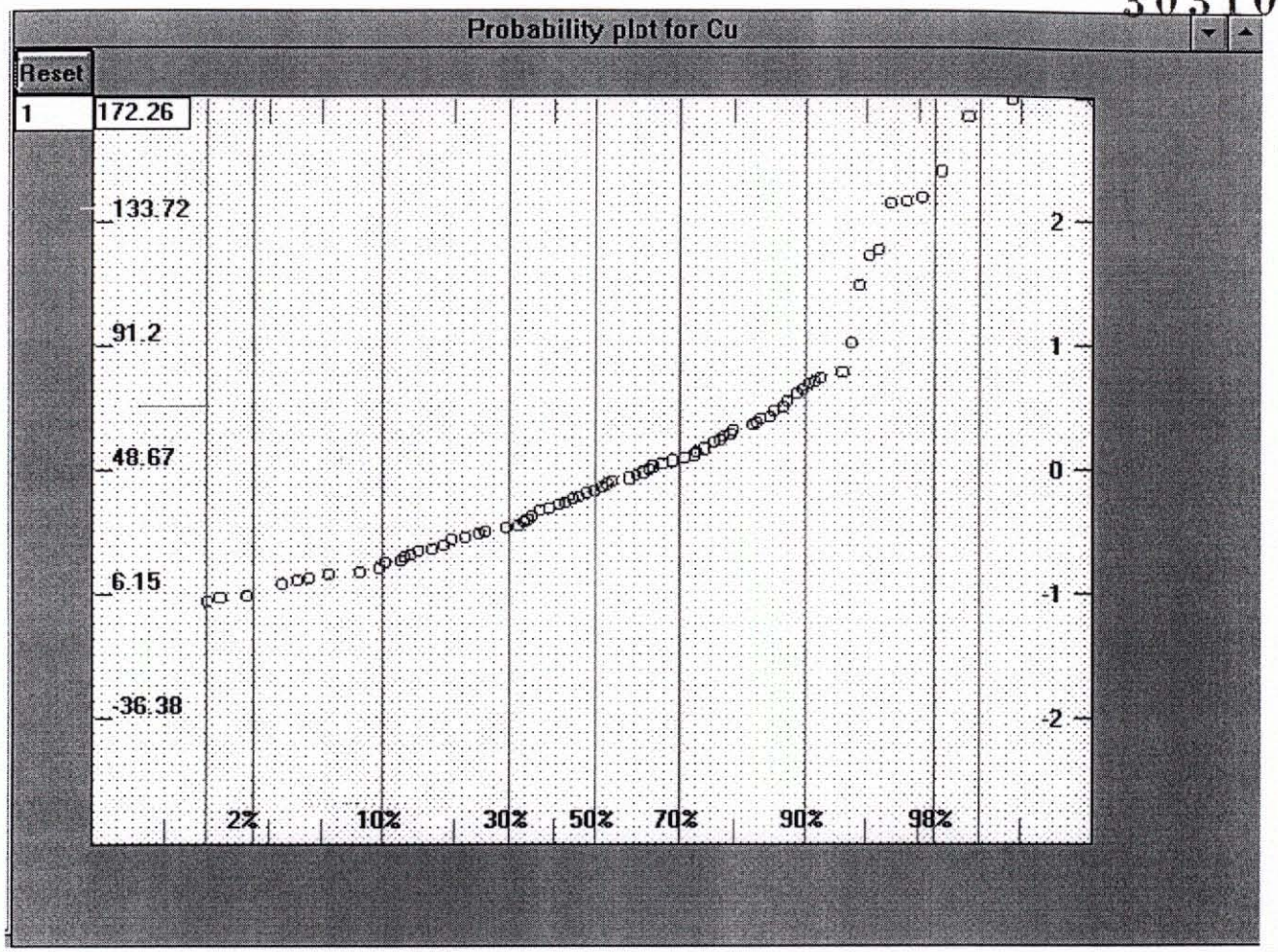
10%
30%
50%
70%
90%
98%
2
1
0
-1
-2

Fig. 3b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133.72
91.2
48.67
6.15
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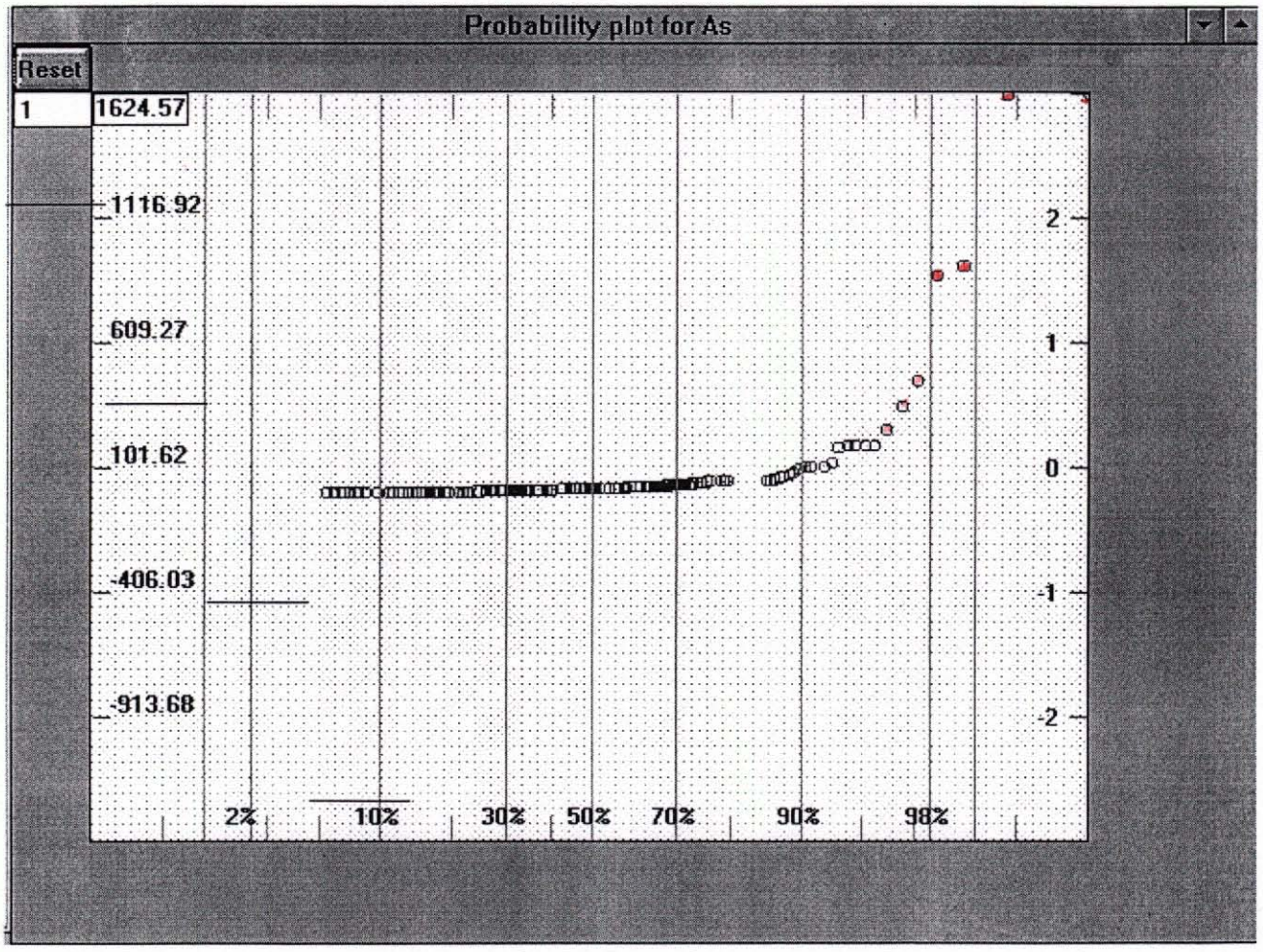
2%
10%
30%
50%
70%
90%
98%
2
1
0
-1
-2

Fig 3c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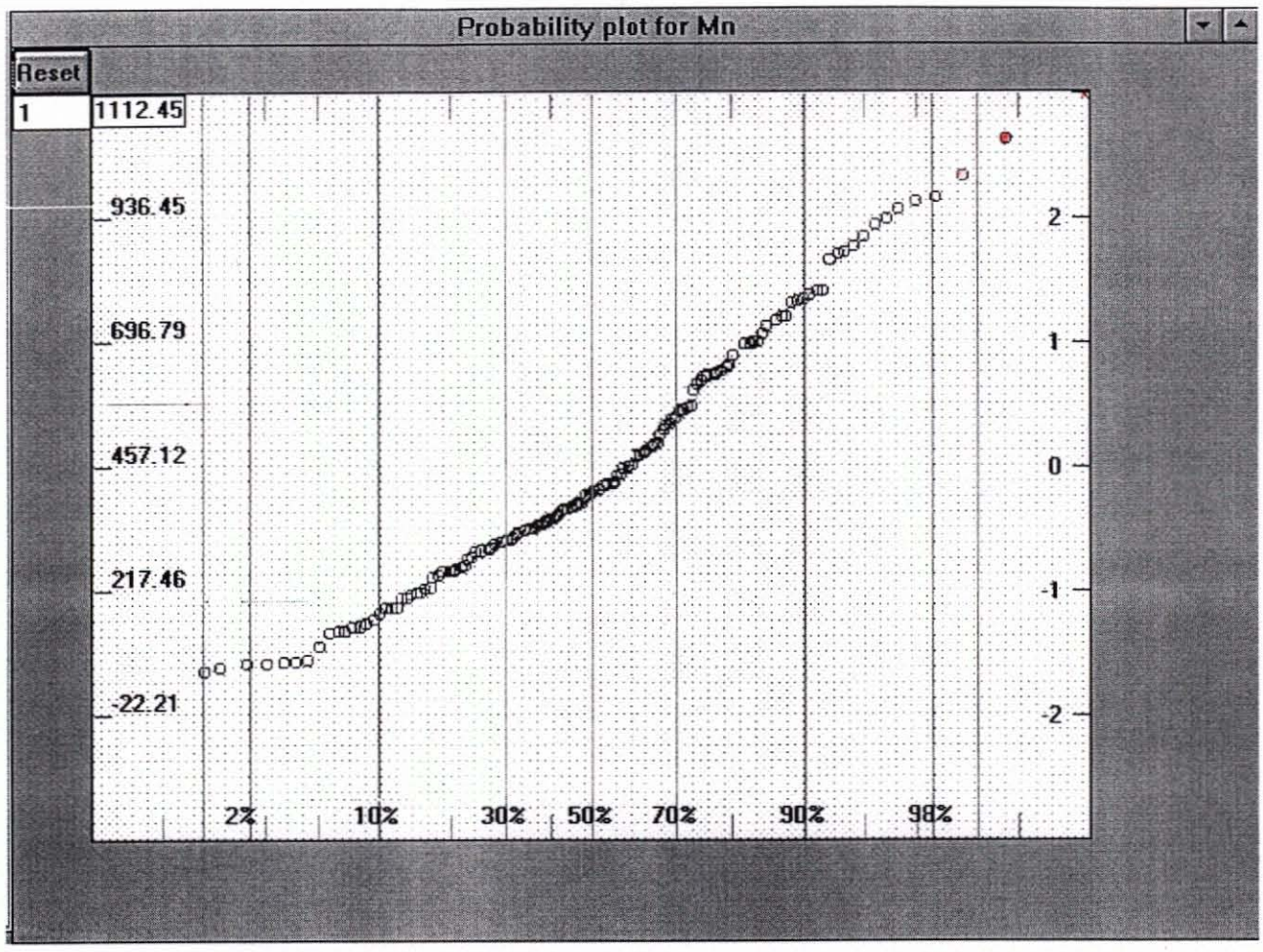
2%
10%
30%
50%
70%
90%
98%
2
1
0
-1
-2

Fig. 3d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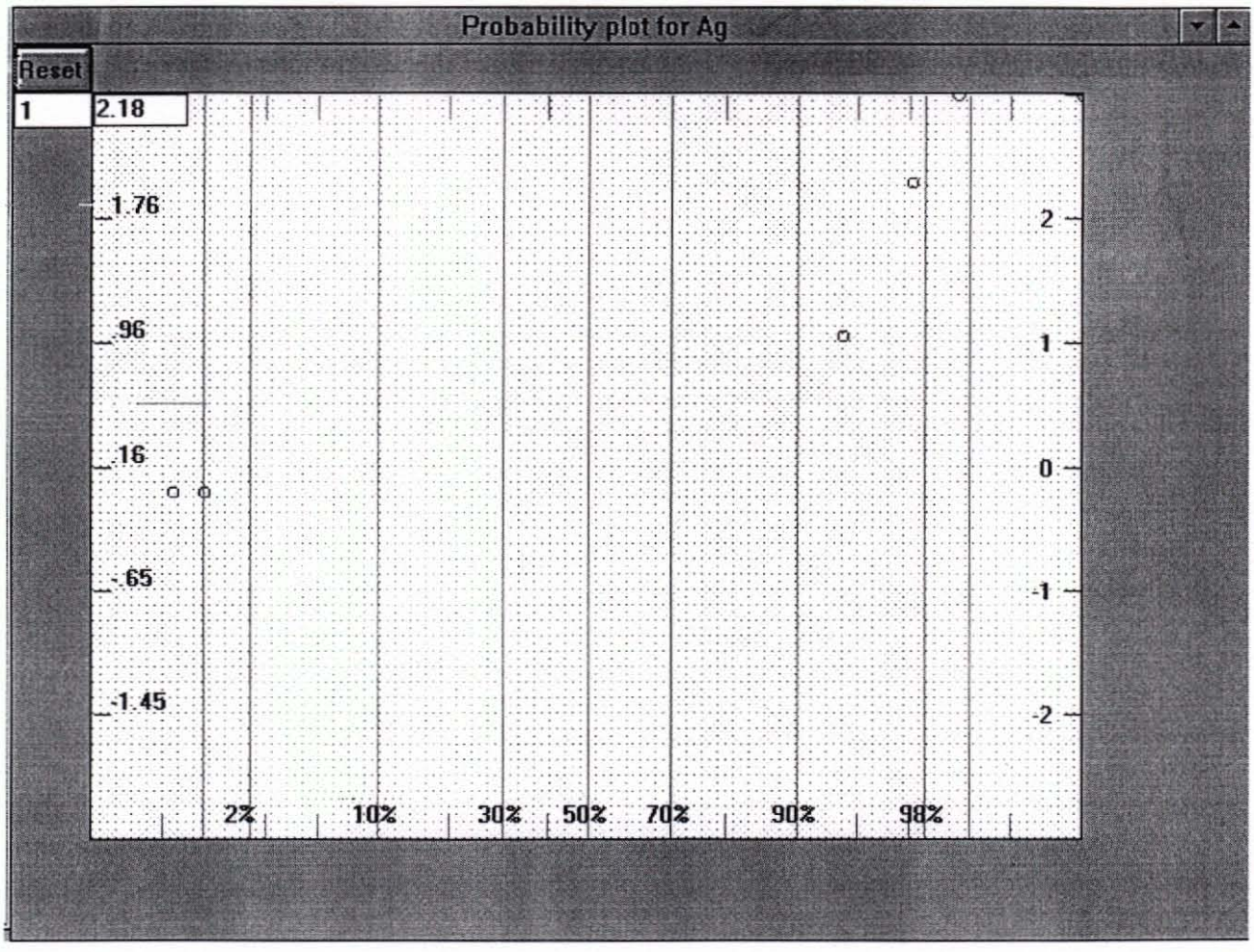
696.79
457.12
217.46
-22.21
2
1
0
-1
-2
2%
10%
30%
50%
70%
90%
98%

Fig. 3e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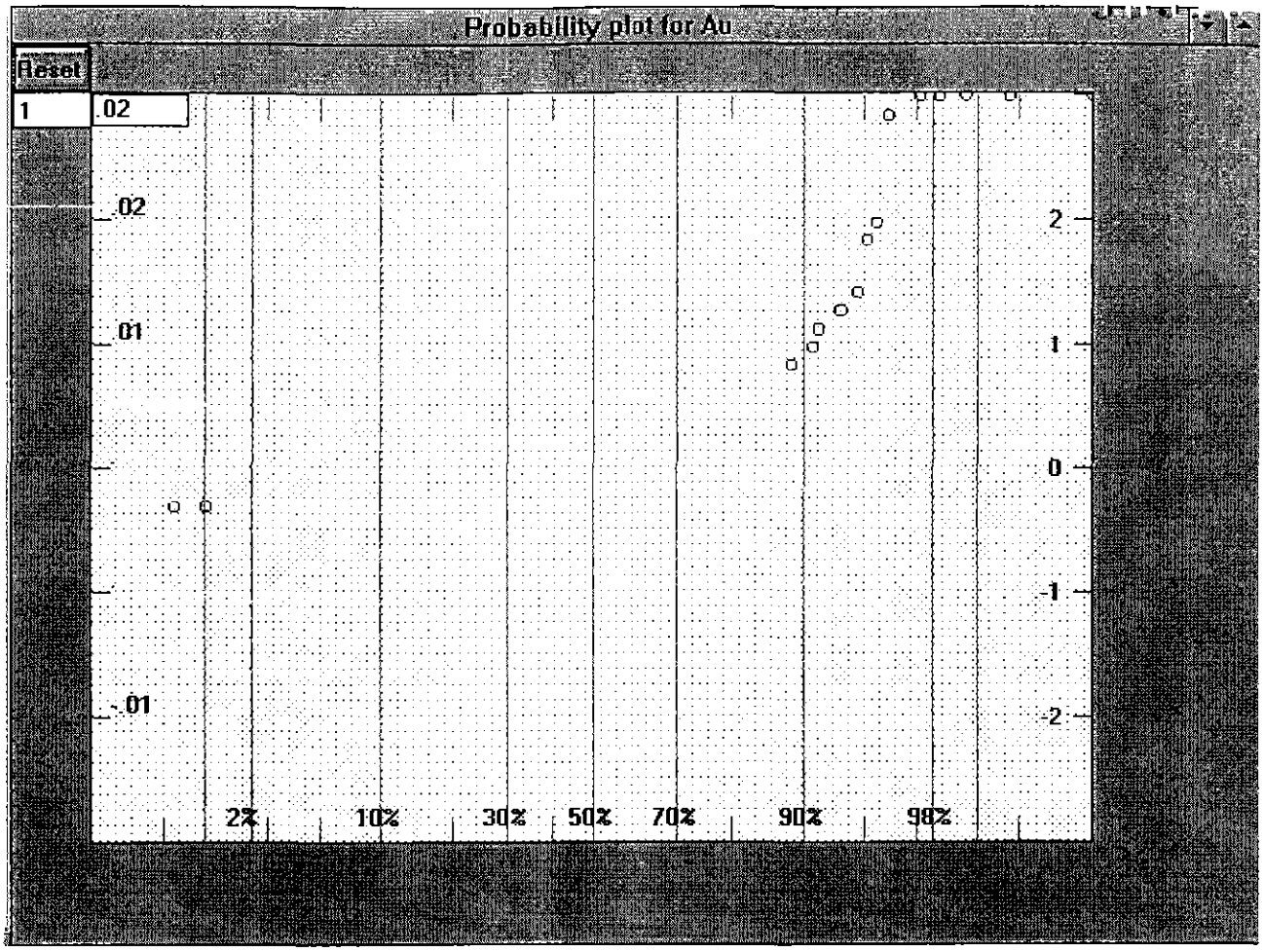
1.76
.96
.16
-.65
-1.45
2
1
0
-1
-2
2%
10%
30%
50%
70%
90%
98%

Fig. 3f


Probability plot for Au
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.02
.01
.01
2
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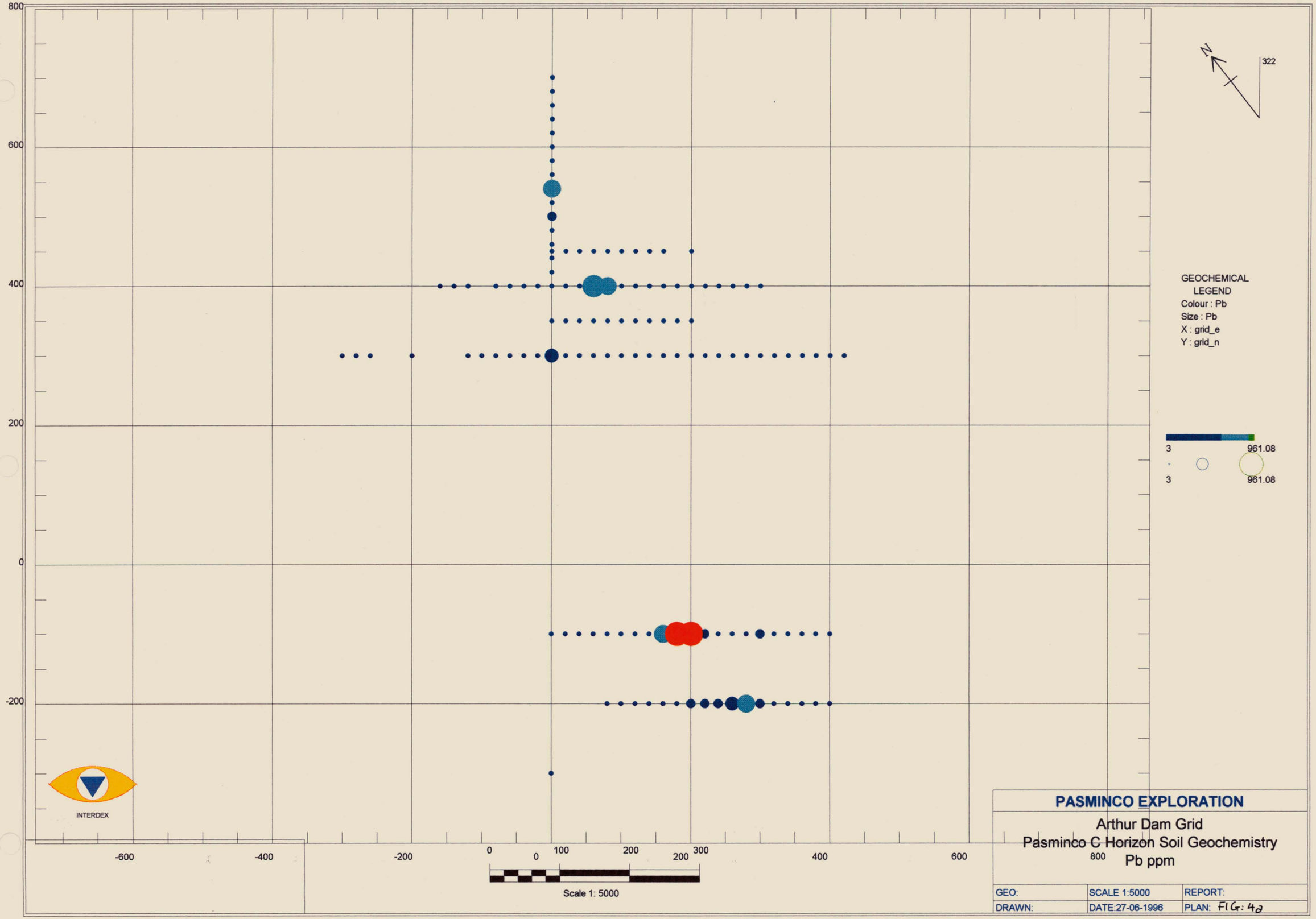
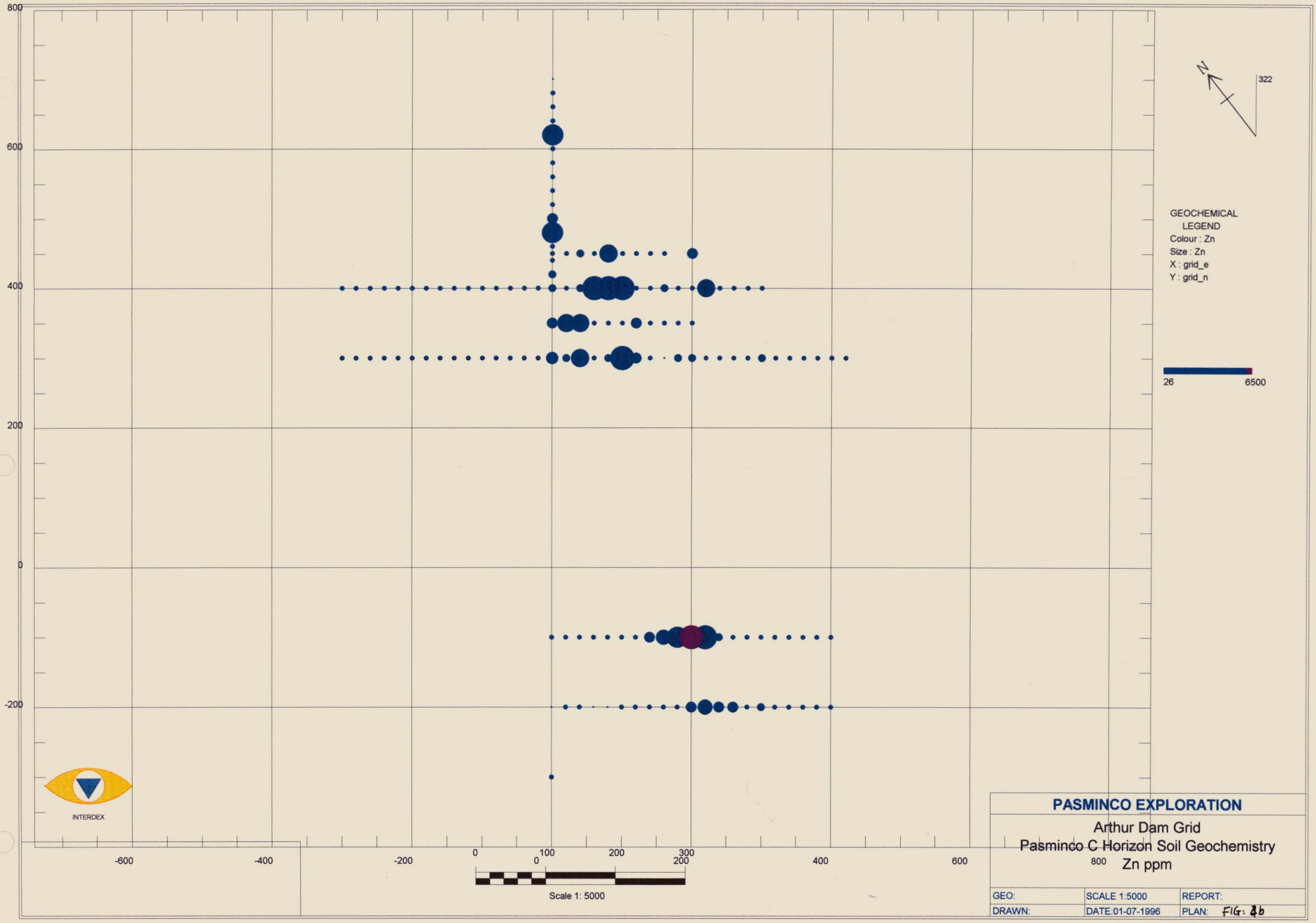
0
-1
-2
2%
10%
30%
50%
70%
90%
98%

Fig. 3g

303108


800
600
400
200
0
-200
-600
-400
-200
0
100
200
300
400
600
800
0
200
N
322
GEOCHEMICAL
LEGEND
Colour : Pb
Size : Pb
X : grid_e
Y : grid_n
3
961.08
3
961.08
INTERDEX
Scale 1: 5000
PASMINCO EXPLORATION
Arthur Dam Grid
Pasminco C Horizon Soil Geochemistry
Pb ppm
GEO:
SCALE 1:5000
REPORT:
DRAWN:
DATE:27-06-1996
PLAN: FIG: 4a
5 cm

303109



PASMINCO EXPLORATION

Arthur Dam Grid

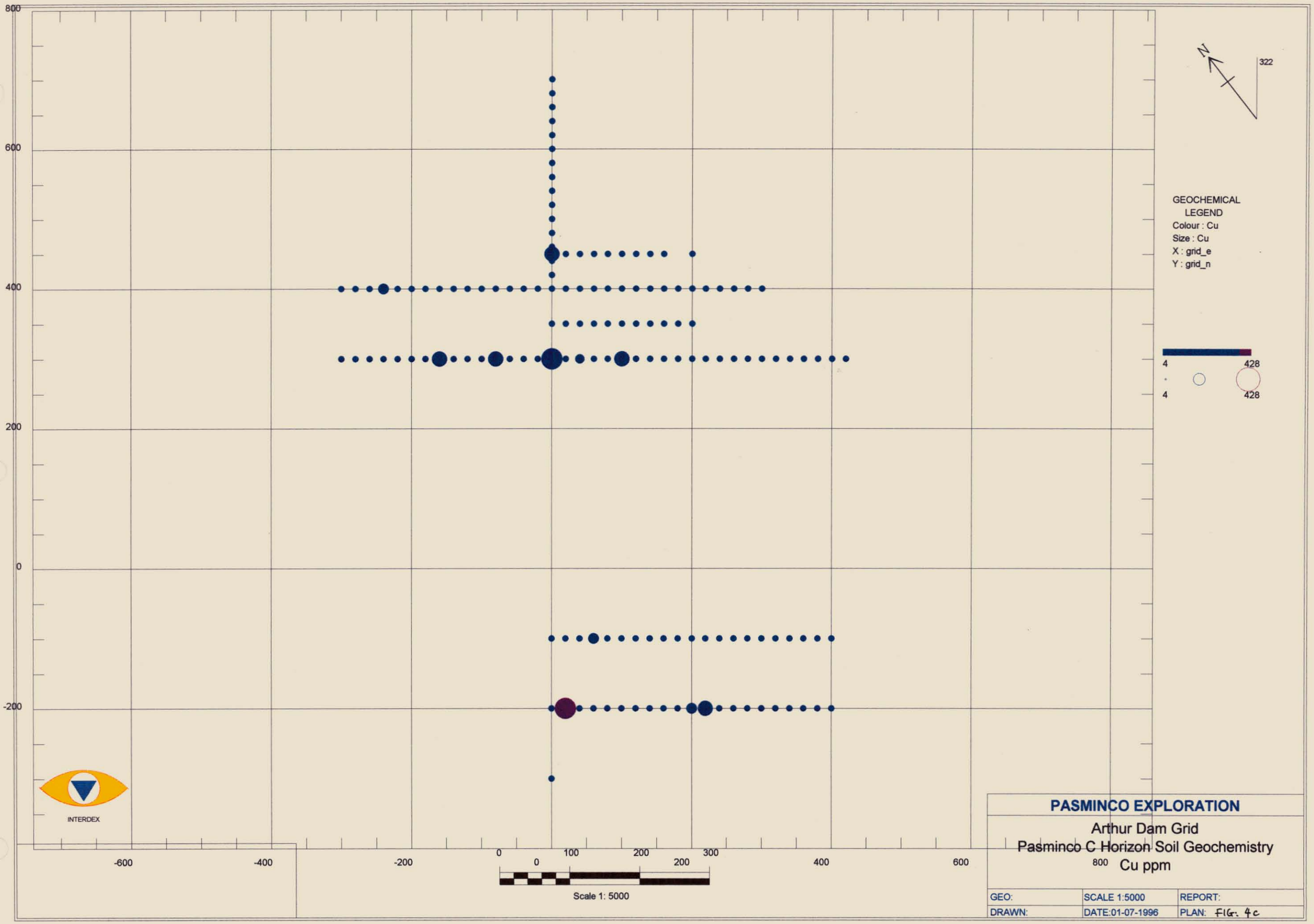
Pasminco C Horizon Soil Geochemistry

800 Zn ppm

GEO:	SCALE 1:5000	REPORT:
DRAWN:	DATE:01-07-1996	PLAN: FIG: 4b

5 cm

303110



PASMINCO EXPLORATION

Arthur Dam Grid

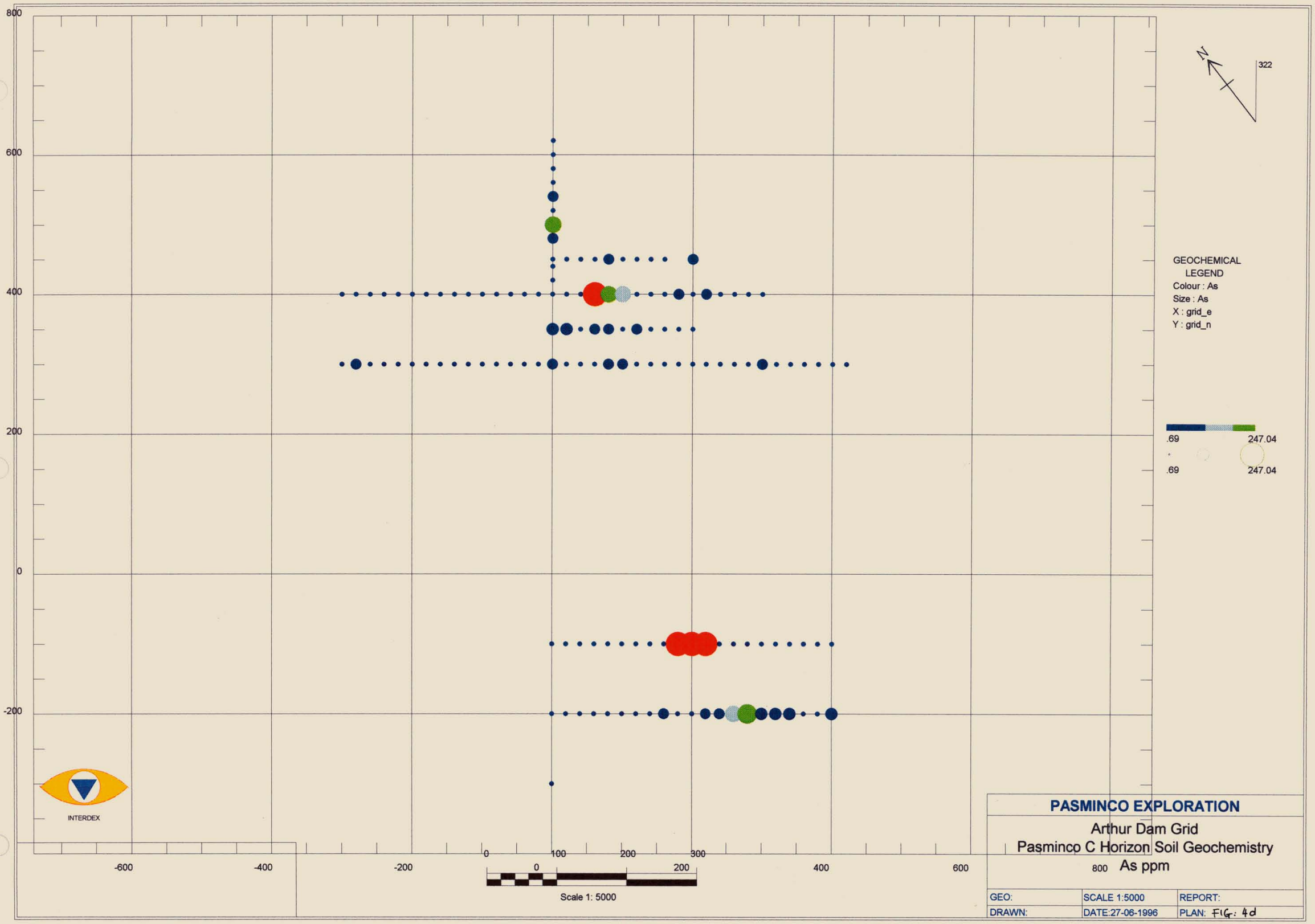
Pasminco C Horizon Soil Geochemistry

800 Cu ppm

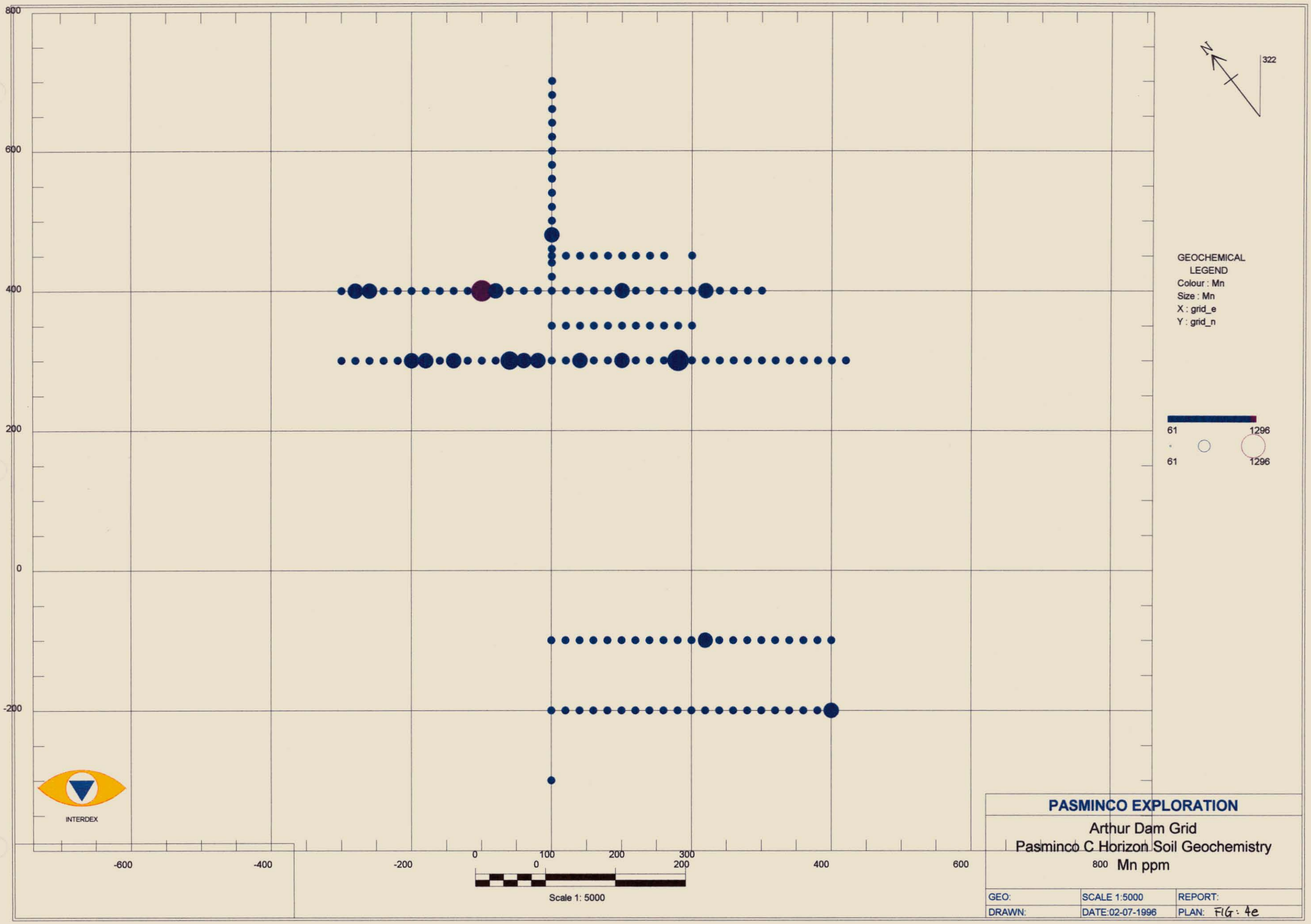
GEO:	SCALE 1:5000	REPORT:
DRAWN:	DATE:01-07-1996	PLAN: FIG. 4c

5 cm

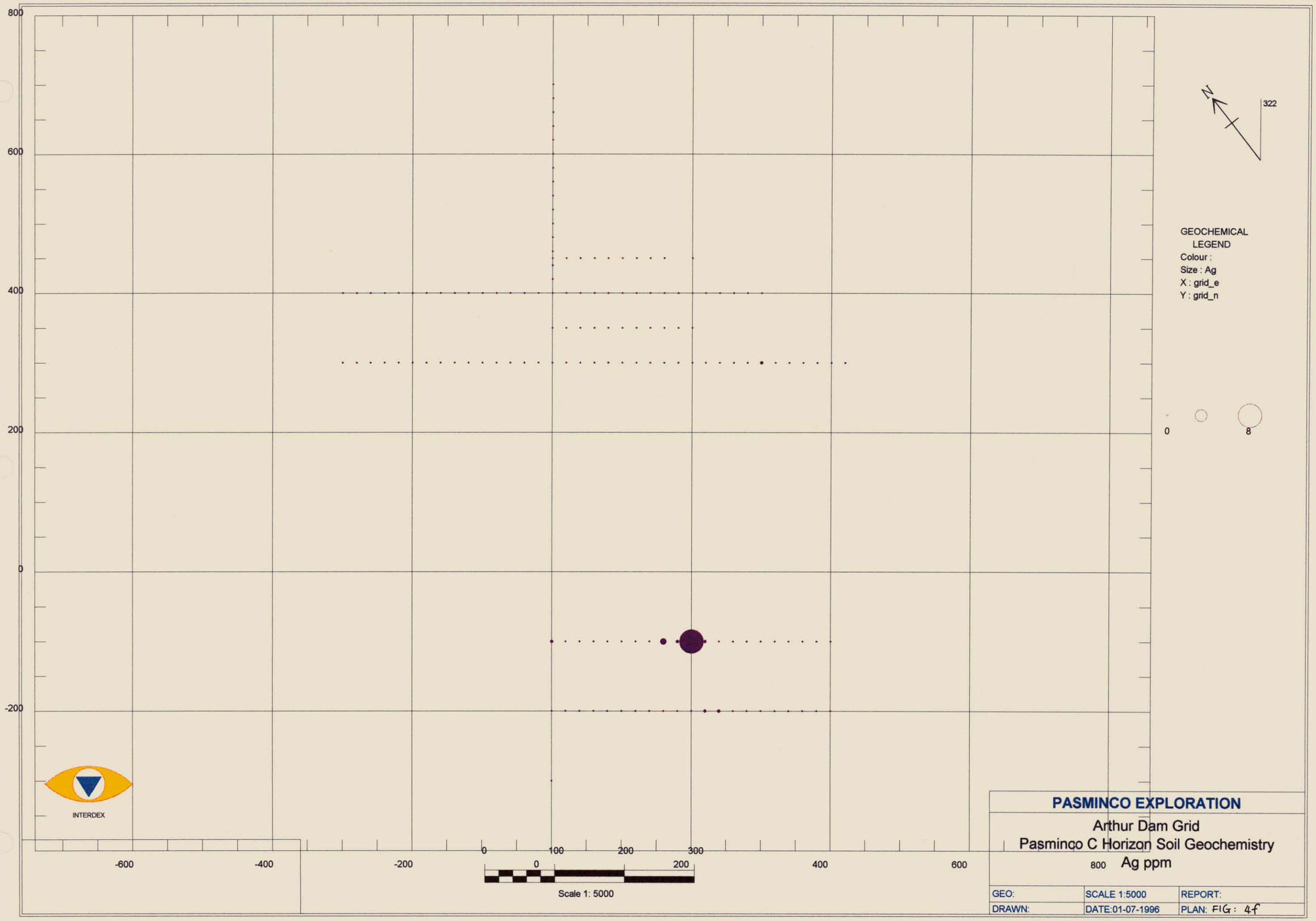
303111


800
600
400
200
0
-200
-600
-400
-200
0
100
200
300
0
200
400
600
Scale 1: 5000
N
322
GEOCHEMICAL
LEGEND
Colour : As
Size : As
X : grid_e
Y : grid_n
.69
247.04
.69
247.04
INTERDEX
PASMINCO EXPLORATION
Arthur Dam Grid
Pasminco C Horizon Soil Geochemistry
800 As ppm
GEO:
SCALE 1:5000
REPORT:
DRAWN:
DATE:27-06-1996
PLAN: FIG: 4d
5 cm

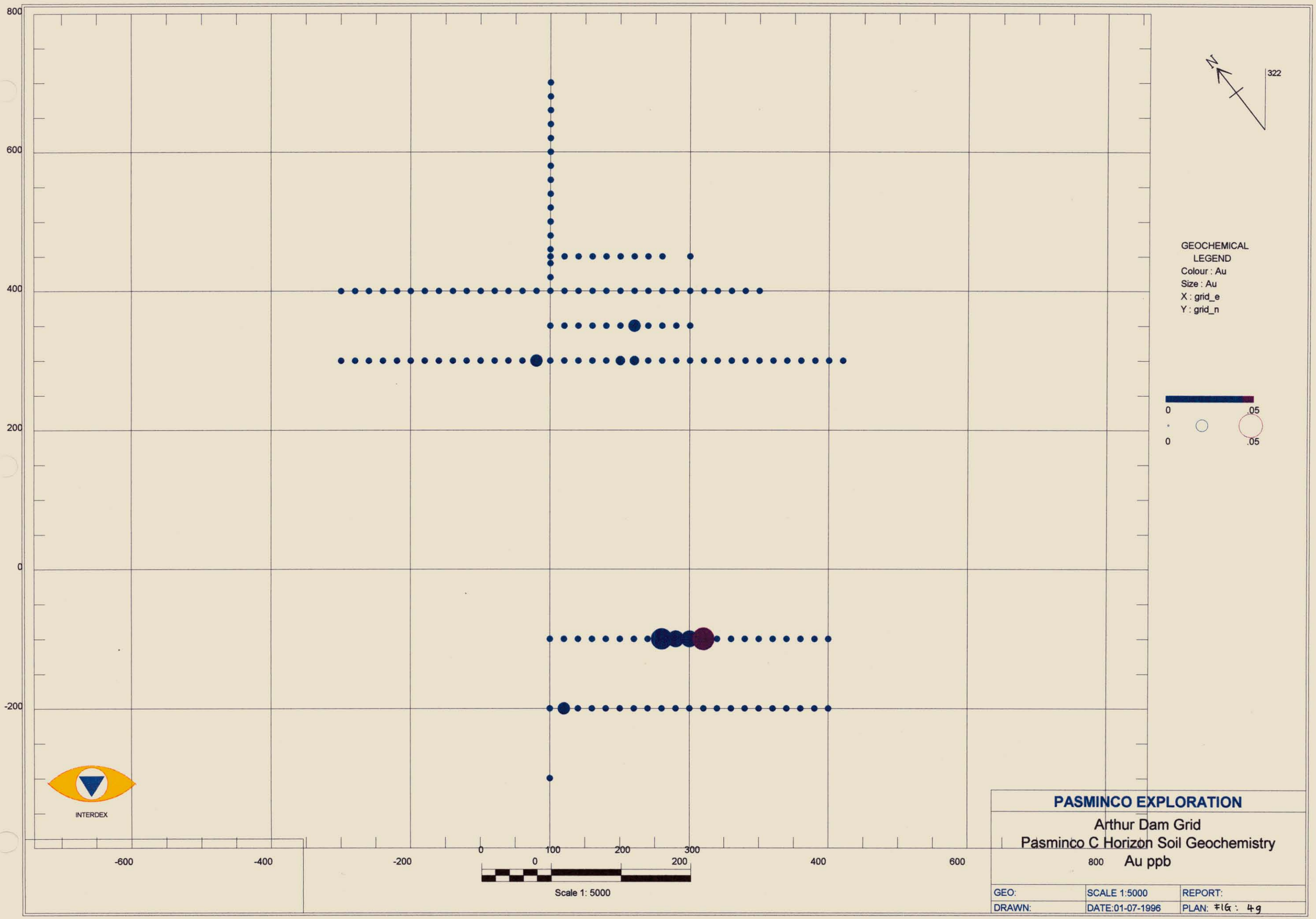
303112


800
600
400
200
0
-200
-600
-400
-200
0
100
200
300
200
400
600
Scale 1: 5000
N
322
GEOCHEMICAL
LEGEND
Colour : Mn
Size : Mn
X : grid_e
Y : grid_n
61
1296
61
1296
INTERDEX
PASMINCO EXPLORATION
Arthur Dam Grid
Pasminco C Horizon Soil Geochemistry
800 Mn ppm
GEO:
SCALE 1:5000
REPORT:
DRAWN:
DATE:02-07-1996
PLAN: FIG: 4e
5 cm

303113


800
600
400
200
0
-200
-600
-400
-200
0
100
200
300
0
200
400
600
Scale 1: 5000
N
322
GEOCHEMICAL
LEGEND
Colour :
Size : Ag
X : grid_e
Y : grid_n
0
8
INTERDEX
PASMINCO EXPLORATION
Arthur Dam Grid
Pasminco C Horizon Soil Geochemistry
800 Ag ppm
GEO:
SCALE 1:5000
REPORT:
DRAWN:
DATE:01-07-1996
PLAN: FIG: 4f
5 cm

303114


N
322
GEOCHEMICAL
LEGEND
Colour : Au
Size : Au
X : grid_e
Y : grid_n
0
.05
0
.05
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400
200
0
-200
-600
-400
-200
0
100
200
300
200
400
600
Scale 1: 5000
INTERDEX
PASMINCO EXPLORATION
Arthur Dam Grid
Pasminco C Horizon Soil Geochemistry
800 Au ppb
GEO:
SCALE 1:5000
REPORT:
DRAWN:
DATE:01-07-1996
PLAN: Fig: 49
5 cm

368800 mE 368900 mE 369000 mE 369100 mE 369200 mE 369300 mE 369400 mE 369500 mE 369600 mE 369700 mE 369800 mE 369900 mE 370000 mE 370100 mE 370200 mE 370300 mE 370400 mE 370500 mE 370600 mE 370700 mE

5407400 mN
5407300 mN
5407200 mN
5407100 mN
5407000 mN
5406900 mN
5406800 mN
5406700 mN
5406600 mN
5406500 mN
5406400 mN
5406300 mN
5406200 mN

Pb ppm
2000
1000
200

Zn ppm
2000
1000
200

Cu ppm
500
250
50

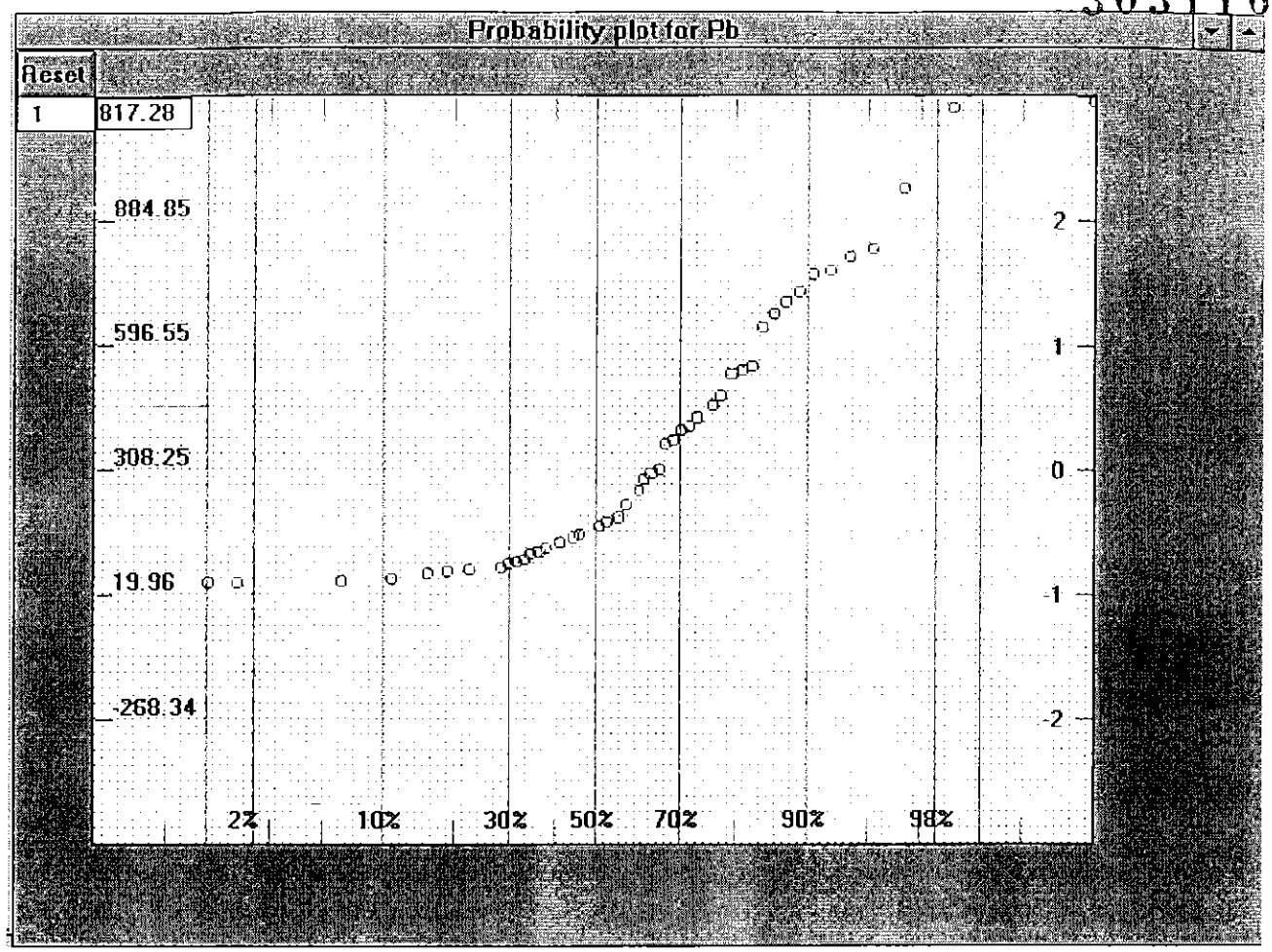
5 cm

PASMINCO EXPLORATION

Arthur Dam Grid
C Horizon Soil Geochemistry
Collins, 1983
Cu, Pb, Zn ppm

Date: 8/7/1990
Author: N.K.M.
Office: Burnie, TASMANIA
Drawing: FIG : 5

0 50 100 metres
Scale 1:5,000


Probability plot for Pb
Reset
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817.28
884.85
596.55
308.25
19.96
-268.34
2
1
0
-1
-2
2%
10%
30%
50%
70%
90%
98%

Fig. 6a

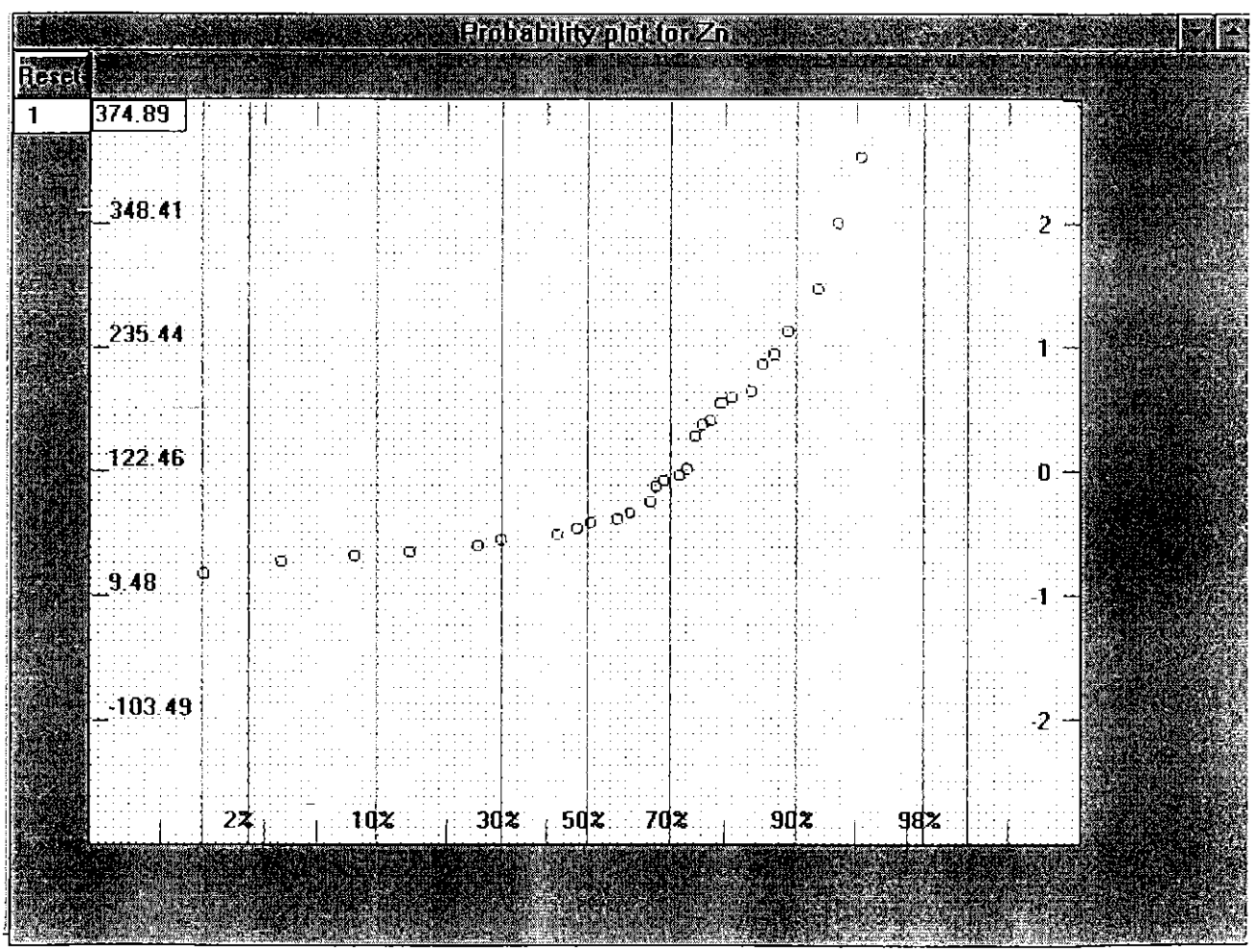

Probability plot for Zn
Reset
1
374.89
348.41
235.44
122.46
9.48
-103.49
2
1
0
-1
-2
2%
10%
30%
50%
70%
90%
98%

Fig. 6b

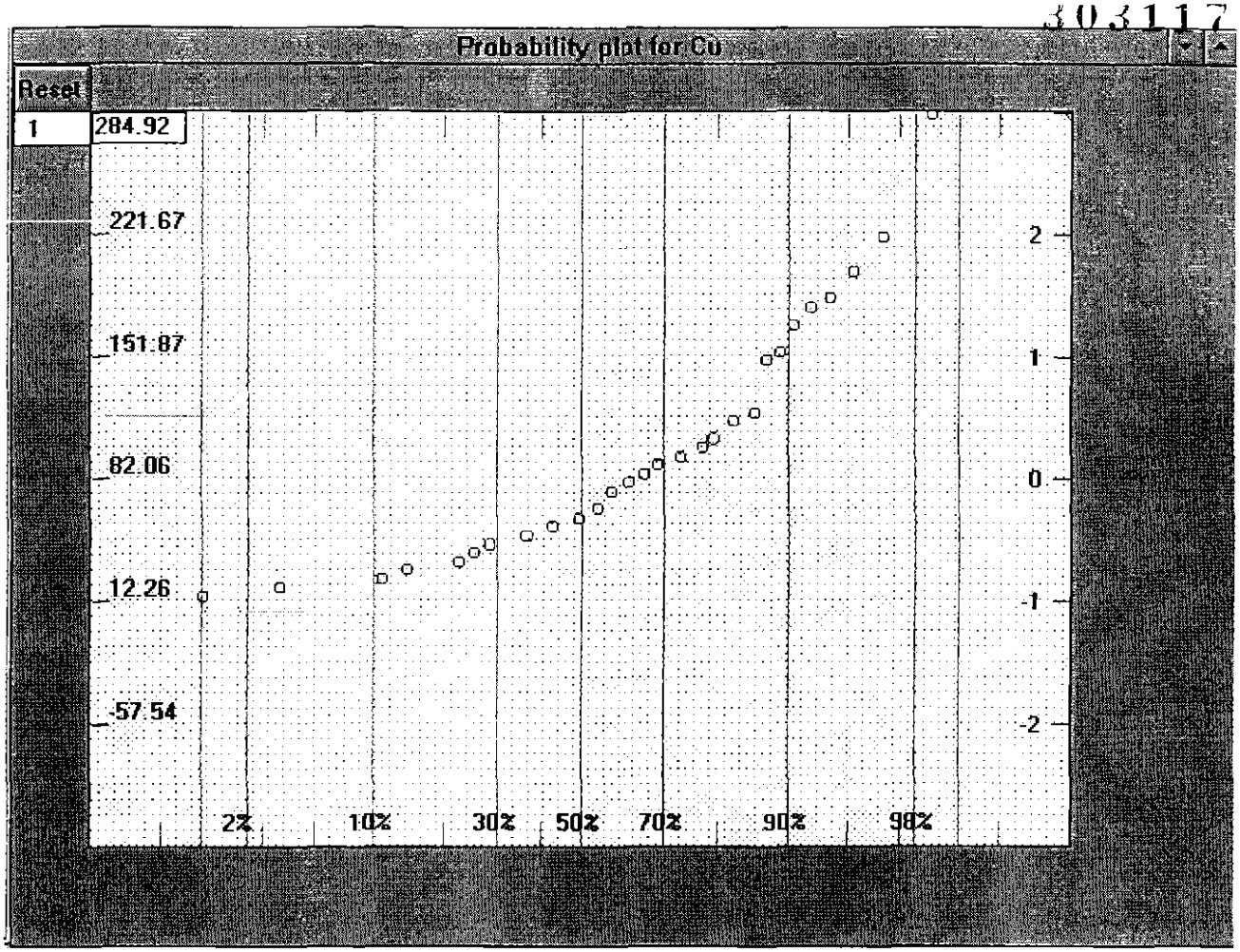
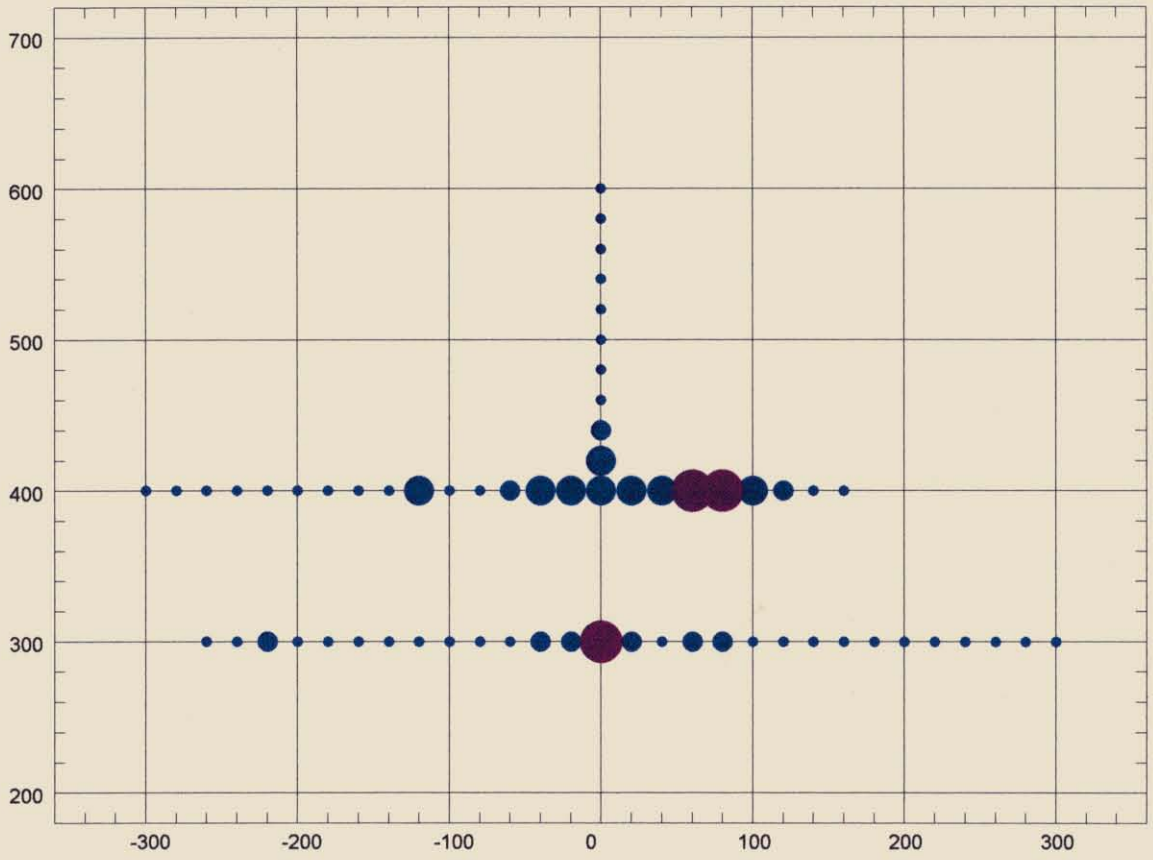
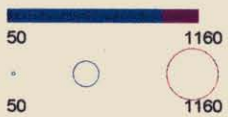

Probability plot for Cu
Reset
1
284.92
221.67
151.87
82.06
12.26
-57.54
2
1
0
-1
-2
2%
10%
30%
50%
70%
90%
98%

Fig. 6c

303118



GEOCHEMICAL
LEGEND
Colour : Pb
Size : Pb
X : grid_e
Y : grid_n



INTERDEX

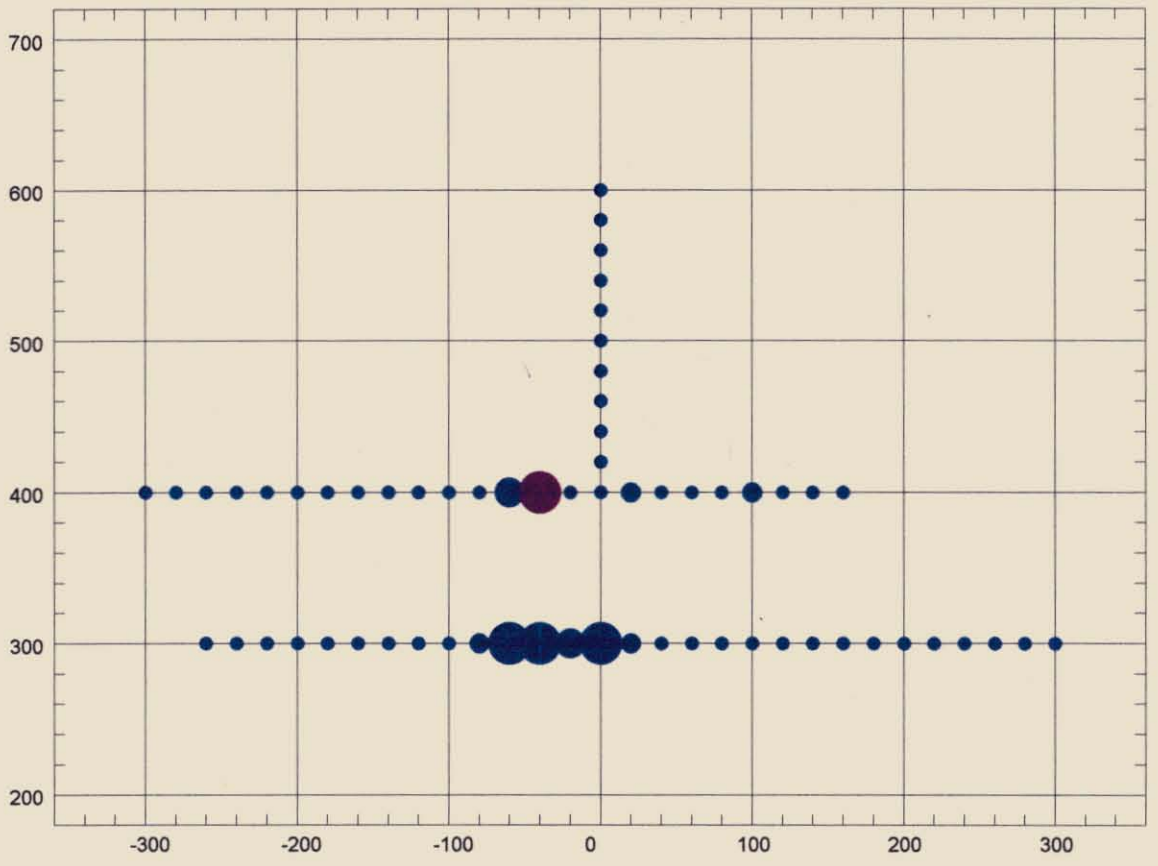
PASMINCO EXPLORATION

Arthur Dam Grid
A Horizon Soil Geochemistry
Pb ppm

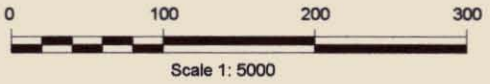
GEO:	SCALE 1:5000	REPORT:
DRAWN:	DATE:01-07-1996	PLAN: FIG: 7a

5 cm

303119



GEOCHEMICAL
LEGEND
Colour : Zn
Size : Zn
X : grid_e
Y : grid_n

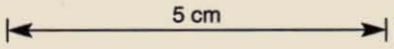


INTERDEX

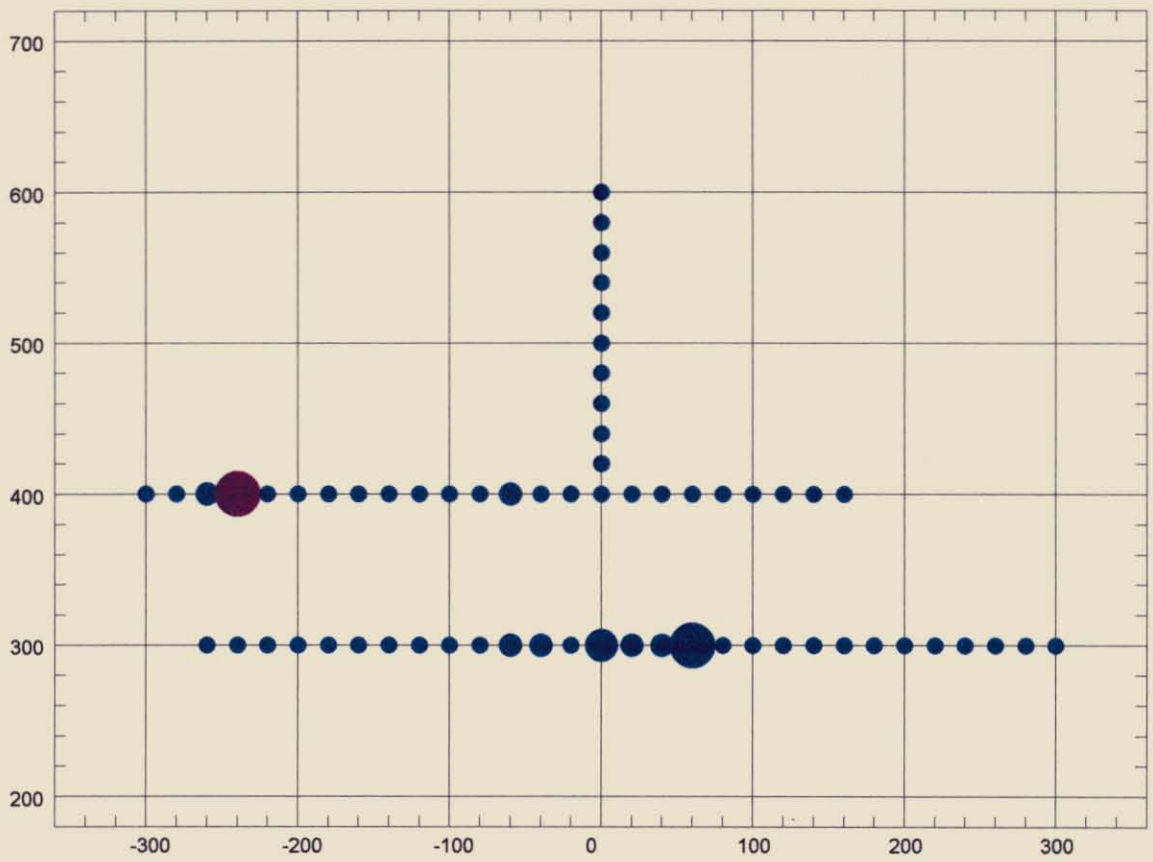
PASMINCO EXPLORATION

Arthur Dam Grid
A Horizon Soil Geochemistry
Zn ppm

GEO:	SCALE 1:5000	REPORT:
DRAWN:	DATE:01-07-1996	PLAN: FIG: 7b



303120



N
322

GEOCHEMICAL
LEGEND
Colour : Cu
Size : Cu
X : grid_e
Y : grid_n

15
400
15
400

0
100
200
300
Scale 1: 5000

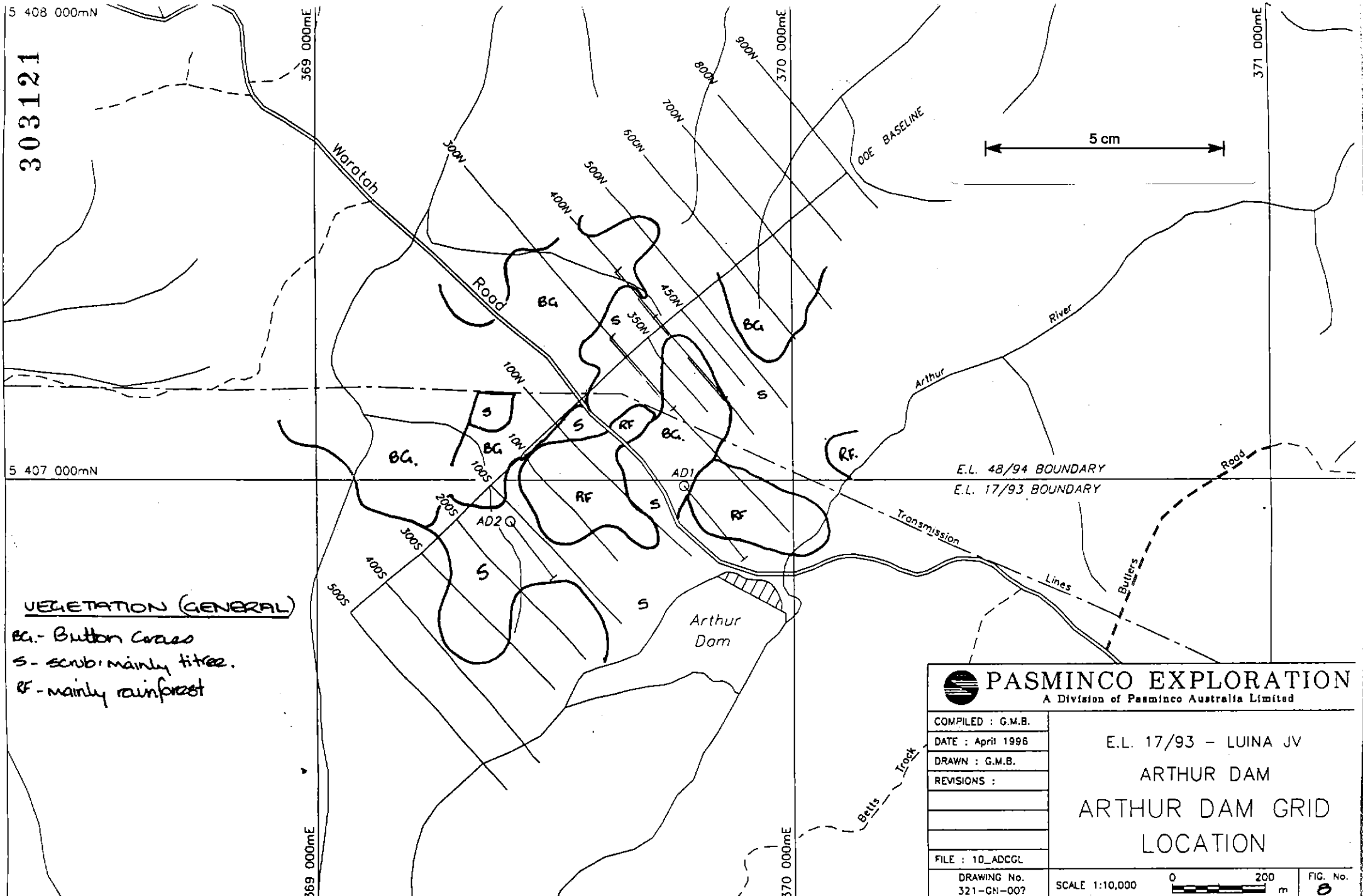
INTERDEX

PASMINCO EXPLORATION

Arthur Dam Grid
A Horizon Soil Geochemistry
Cu ppm

GEO:	SCALE 1:5000	REPORT:
DRAWN:	DATE:01-07-1996	PLAN: FIG: 7c

5 cm


5 408 000mN
5 407 000mN
369 000mE
370 000mE
371 000mE
3031121
Waratah Road
00E BASELINE
100N
200N
300N
400N
500N
600N
700N
800N
900N
350N
450N
5 cm
Arthur River
E.L. 48/94 BOUNDARY
E.L. 17/93 BOUNDARY
AD1
AD2
100S
200S
300S
400S
500S
Transmission Lines
Butlers Road
Betts Track
Arthur Dam
BG.
S
RF
VEGETATION (GENERAL)
BG.- Button Grass
S - scrub: mainly titree.
RF - mainly rainforest
PASMINCO EXPLORATION
A Division of Pasminco Australia Limited
COMPILED : G.M.B.
DATE : April 1996
DRAWN : G.M.B.
REVISIONS :
FILE : 10_ADCGL
DRAWING No. 321-GN-007
E.L. 17/93 - LUINA JV
ARTHUR DAM
ARTHUR DAM GRID LOCATION
SCALE 1:10,000
0 200 m
FIG. No. 8

303122

SOIL SAMPLING

PROJECT Warrick **SAMPLE No.** 36506/36507

CODE 3012 **SAMPLER** NKM

MAP/PHOTO _____ **REF** _____ **DATE** 18-1-96

GRID Arthur Vom **NORTH** 400N **EAST** 100W (local)

ELEVATION _____ **ATTITUDE** -

SAMPLE type A + C horizon soil

REGIONAL **Geology** _____

Topography Flat lying plains

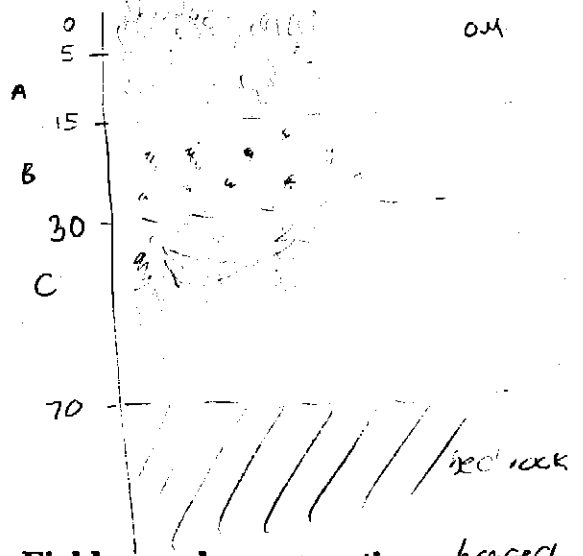
Vegetation Banra, button grass, sparse eucalypt

SAMPLE SITE outcrop geology _____

Depth A: 5-15 cm C: 30-70 **Soil type** _____ **Unit** _____

Colour dark brown mottled **Composition** _____ **Slope** _____

SOIL PROFILE DESCRIPTION



OM - organic matter, dense button grass roots & litter, + fauna

A - Dark brown, loamy, slightly clayey soil with very minor sand-silt component. Abundant roots present. Moist, smooth silky soil

B - Mid-chocolate brown clay ± 100cm soil with orange-brown weathering mottled streaks around rock frags (≤ 5mm) Slightly 'nutty' consistency with some roots still penetrating this

C - yellow brown with blue-green mottles. Granular soil, semi-"clay" consistency (sticks together, but only one finger - partially clay. Slightly sandy occ.

Field sample preparation bagged

Analyses required _____

Remarks Improved drainage, but moist soil under dense button grass mat

Appendix 1

Soil Profile Descriptions

303124

SOIL SAMPLING

PROJECT Nowata **SAMPLE No.** 36504/36505

CODE 3019 **SAMPLER** NKM

MAP/PHOTO _____ **REF** _____ **DATE** 19-1-96

GRID Arthur Dam **NORTH** 400N **EAST** 00E (100col)

ELEVATION _____ **ATTITUDE** _____

SAMPLE type A & C horizon soils

REGIONAL **Geology** _____

Topography flat lying, mare open scrub area

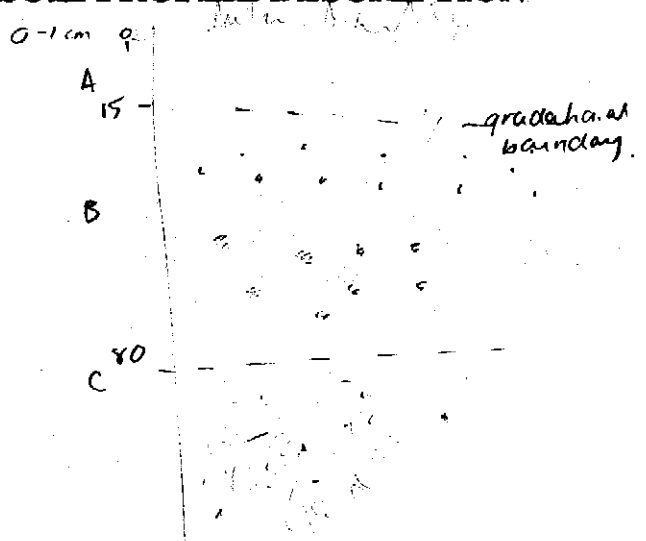
Vegetation tiree scrub + cutty grass

SAMPLE SITE outcrop geology _____

Depth A 1- C _____ **Soil type** _____ **Unit** _____

Colour mid brown **Composition** _____ **Slope** _____

SOIL PROFILE DESCRIPTION



- very thin org. layer, soil litter + decay
A: chocolate brown silt-loam (smooth) soil occ fine roots penetrating thru rel. moist

B: Moist, mid-brown soil with mottled patch of orange-brown, leading from mid rock fragments (av. 5mm) slightly sandy loamy soil & slightly sticky (sandy clay (10cm) small peds, well struct soil; min. roots

C: Greeny brown soil (dull brown with mid to yellow & blue patches, clay, + micaceous content (vermiculite white, flat, square min) occ rock fragment (≤ 25mm, av 5), greeny-brown coarsed volcanic (c to sh. -feld-phyric

Field sample preparation _____

Analyses required _____

Remarks Deep (>1m) A & B horizons. Anoxic C horizon (augers), moist to 90cm, wet 90-95 dryer & crumby.

303125

SOIL SAMPLING

PROJECT Waratah **SAMPLE No.** 36508/36509

CODE 3019 **SAMPLER** NKM

MAP/PHOTO _____ **REF** _____ **DATE** 18-1-96

GRID Arthur Dam **NORTH** 400N **EAST** 200 W (local)

ELEVATION _____ **ATTITUDE** _____

SAMPLE type A + C horizon soil

REGIONAL **Geology** _____

Topography flat lying, slightly uphill from 06-07 site

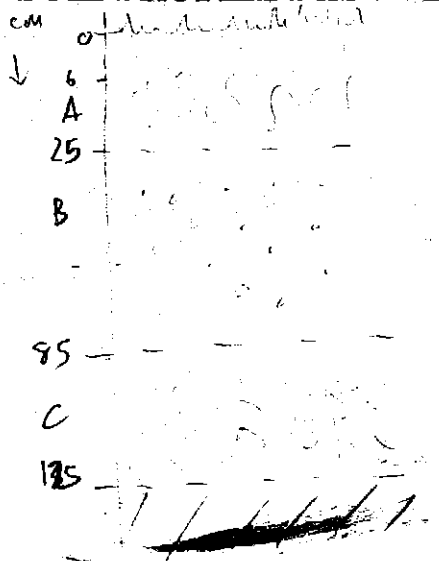
Vegetation button grass, (coarse) + hi tree scrub

SAMPLE SITE outcrop geology _____

Depth A 0-25cm C 85-125 **Soil type** A + C **Unit** _____

Colour A dark brown mottled green-brown C **Composition** A moist loamy soil / C gravelly clay **Slope** _____

SOIL PROFILE DESCRIPTION



OM - dense button grass roots, dry, sandy, with organic matter

A = Chocolate brown, moist, porous soil (light) with mod-hi organic matter, slight clayey-loamy

B = mid brown, slightly mottled (orange-brown streaky) moist soil with silty-loamy txt

C = Green-brown mottled granular soil with abundant sand-gravelly fragments (~20%) composed of volcanics. Moist soil, with mod clay (sticky) content)

Field sample preparation _____

Analyses required _____

Remarks _____

303126

SOIL SAMPLING

PROJECT WARATAH **SAMPLE No.** 75870/71

CODE 3019 **SAMPLER** NKM

MAP/PHOTO _____ **REF** _____ **DATE** 31-1-96

GRID Arthur Dam **NORTH** 3005 **EAST** 00E

ELEVATION 640m **ATTITUDE** –

SAMPLE type A + C Horizons: standards for Arthur Dam Grid soil sampling

REGIONAL Geology Ebw - high Mg Andesite, volcaniclastics, lavas, breccia

Topography Flat lying valley, slight upslope to W & E

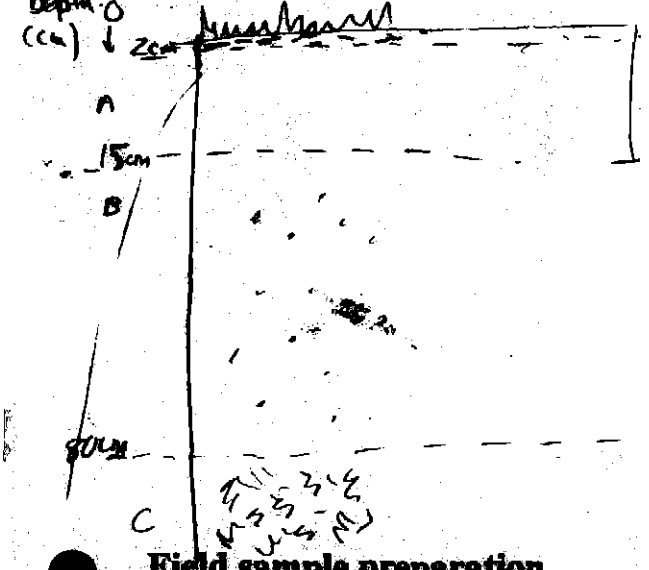
Vegetation Established rainforest, leaf grain cover & thin org. matter

SAMPLE SITE outcrop geology –

Depth sampled 5-10cm [80cm-1m **Soil type** A + C Horizons **Unit** _____

Colour A: fan brown / C: mottled **Composition** see below. **Slope** _____

SOIL PROFILE DESCRIPTION



2cm — organic matter. decomposed leaf, litter (dark brown to black)

A = medium fan brown coloured, moist, clay loam

B = mottled fan brown and orange, moist clay

[com id. some v. wid rock, in situ. orange clay

C = orange with green-grey mottles; granular clay with small (ground up from augering) rock bags. = blue-green, wid, slaty "slatey"

Field sample preparation _____

Analyses required Standards for AD soil survey

Remarks _____

adasoil.xls

lgc_samp	lgc_jobno	flag	grid_n	grid_e	Cu	Pb	Zn	Ag	Mn	As	Au	Sn	W
36515	11596	19	400	-300	76	2.9	72	0.9	652	1	0.007	7	9
36517	11596	19	400	-280	13	2.9	80	0.9	780	9.2	0.007	2.9	9
36519	11596	19	400	-260	50	2.9	85	0.9	882	3.3	0.008	5	9
36521	11596	19	400	-240	124	2.9	115	0.9	563	5.4	0.008	2.9	9
36523	11596	19	400	-220	13	2.9	176	0.9	728	2	0.007	5	9
36525	11596	19	400	-200	80	2.9	114	0.9	424	3.1	0.007	4	9
36527	11596	19	400	-180	23	2.9	71	0.9	605	2.3	0.007	2.9	9
36529	11596	19	400	-160	70	24	120	0.9	617	11	0.007	2.9	9
36531	11596	19	400	-140	55	12	101	0.9	549	6.2	0.007	4	9
36533	11596	19	400	-120	79	30	146	0.9	378	18	0.007	5	9
36535	11596	19	400	-100	55	2.9	121	0.9	1296	6.3	0.008	6	9
36537	11596	19	400	-80	53	11	84	0.9	779	6.8	0.007	2.9	9
36539	11596	19	400	-60	56	47	158	0.9	443	11	0.007	7	9
36541	11596	19	400	-40	54	47	121	0.9	634	16	0.007	6	9
36543	11596	19	400	-20	27	77	176	0.9	456	21	0.01	4	9
36545	11596	19	400	0	28	106	241	0.9	346	26	0.007	9	9
36547	11596	19	400	20	42	50	184	0.9	340	8.5	0.01	6	9
36549	11596	19	400	40	35	57	233	0.9	386	46	0.007	2.9	9
36551	11596	19	400	60	33	833	1234	0.9	480	259	0.007	4	9
36553	11596	19	400	80	60	748	1041	0.9	694	191	0.007	14	9
36555	11596	19	400	100	25	190	1200	0.9	954	190	0.007	8	9
36557	11596	19	400	120	12	44	144	0.9	302	19	0.007	2.9	9
36559	11596	19	400	140	28	10	66	0.9	222	17	0.007	8	9
36561	11596	19	400	160	39	28	234	0.9	380	18	0.007	5	9
36563	11596	19	400	180	62	120	170	0.9	294	50	0.007	8	9
36565	11596	19	400	200	32	251	163	0.9	309	47	0.009	8	9
36567	11596	19	400	220	43	39	542	0.9	977	69	0.007	22	9
36569	11596	19	400	240	52	9	83	0.9	374	7.7	0.007	4	9
36571	11596	19	400	260	45	33	82	0.9	360	12	0.007	2.9	9
36573	11596	19	400	280	4	6	138	0.9	298	20	0.007	10	9
36575	11596	19	400	300	5	31	125	0.9	86	25	0.008	9	9
36577	11596	19	300	-300	44	18	99	0.9	633	6.9	0.007	2.9	9
36579	11596	19	300	-280	26	3	68	0.9	632	6	0.007	2.9	9

C horizon soils
assay results

36581	11596	19	300	-260	35	10	67	0.9	250	4.8	0.007	2.9	9
36583	11596	19	300	-240	36	2.9	64	0.9	746	0.7	0.007	2.9	9
36585	11596	19	300	-220	59	2.9	74	0.9	747	1.4	0.007	5	9
36587	11596	19	300	-200	62	11	85	0.9	795	3.5	0.011	5	9
36589	11596	19	300	-180	36	2.9	130	0.9	900	1.9	0.01	2.9	9
36591	11596	19	300	-160	141	2.9	119	0.9	728	1.5	0.007	4	9
36593	11596	19	300	-140	37	2.9	110	0.9	796	1.3	0.007	2.9	9
36595	11596	19	300	-120	26	2.9	88	0.9	697	1.5	0.007	2.9	9
36597	11596	19	300	-100	72	12	181	0.9	484	1.9	0.007	6	9
36599	11596	19	300	-80	140	8	166	0.9	464	7.2	0.007	2.9	9
75801	11596	19	-300	0	53	2.9	49	0.9	649	2.2	0.007	7	9
75803	11596	19	300	-60	42	8	197	0.9	1017	6.3	0.007	5	9
75805	11596	19	300	-40	46	31	135	0.9	866	14	0.007	2.9	9
75807	11596	19	300	-20	69	27	94	0.9	788	14	0.022	6	9
75809	11596	19	300	0	196	503	318	0.9	741	75	0.007	5	9
75811	11596	19	300	20	78	48	233	0.9	633	33	0.007	4	9
75813	11596	19	300	40	92	9	621	0.9	925	11	0.007	8	9
75815	11596	19	300	60	51	36	214	0.9	347	6.7	0.007	2.9	9
75817	11596	19	300	80	53	214	255	0.9	715	50	0.007	8	9
75819	11596	19	300	100	142	175	962	0.9	772	50	0.015	5	9
75821	11596	19	300	120	50	82	282	0.9	389	15	0.016	12	9
75823	11596	19	300	140	45	58	143	0.9	278	18	0.007	14	9
75825	11596	19	300	160	14	44	27	0.9	78	6	0.007	15	20
75827	11596	19	300	180	82	144	252	0.9	1088	28	0.007	12	9
75829	11596	19	300	200	62	87	233	0.9	411	25	0.007	13	9
75831	11596	19	300	220	42	79	166	0.9	264	23	0.007	13	9
75833	11596	19	300	240	67	39	97	0.9	671	26	0.007	10	9
75835	11596	19	300	260	25	39	95	0.9	213	19	0.007	12	9
75837	11596	19	300	280	72	108	158	0.9	317	42	0.012	12	9
75839	11596	19	300	300	40	48	229	0.9	401	52	0.007	9	9
75841	11596	19	420	0	38	149	251	0.9	378	48	0.007	6	25
75843	11596	19	440	0	14	33	147	0.9	334	8.6	0.007	5	9
75845	11596	19	460	0	58	14	168	0.9	456	0.4	0.007	2.9	9
75847	11596	19	480	0	56	138	711	0.9	934	50	0.007	8	9

75849	11596	19	500	0	62	367	269	0.9	136	192	0.007	12	9
75851	11596	19	520	0	56	31	106	0.9	296	18	0.007	12	9
75853	11596	19	540	0	45	689	70	0.9	150	50	0.007	28	9
75855	11596	19	560	0	17	9	60	0.9	206	1.1	0.007	2.9	9
75857	11596	19	580	0	17	25	90	0.9	141	21	0.007	6	9
75859	11596	19	600	0	40	43	121	0.9	414	5.5	0.007	4	9
75861	11596	19	620	0	14	93	748	0.9	700	42	0.007	11	9
75863	11596	19	640	0	25	21	68	0.9	157	0.4	0.007	2.9	9
75865	11596	19	660	0	21	14	72	0.9	404	0.4	0.007	6	9
75867	11596	19	680	0	26	4	52	0.9	343	0.4	0.007	5	9
75869	11596	19	700	0	18	7	41	0.9	244	0.4	0.011	2.9	9
75871	11596	19	-300	0	29	2.9	53	0.9	531	0.4	0.007	4	9
75873	11596	19	300	-120	31	3	81	0.9	671	0.4	0.007	2.9	9
75875	11596	19	300	-280	45	54	167	0.9	426	50	0.007	11	9
75877	11596	19	-300	0	38	3	52	0.9	640	0.4	0.007	2.9	9
75879	11596	19	400	100	25	166	1147	0.9	871	124	0.007	5	9

sample	amg east	amg north	Cu	Pb	Zn	Mn	Fe%	As	Ag	Au	Sn	W
36515	369537	5407556	76	-3	72	652		1	-1	-0.008	7	-10
36517	369550	5407541	13	-3	80	780		9	-1	-0.008	-3	-10
36519	369564	5407526	50	-3	85	882		3	-1	0.008	5	-10
36521	369576	5407511	124	-3	115	563		5	-1	0.008	-3	-10
36523	369589	5407496	13	-3	176	728		2	-1	-0.008	5	-10
36525	369602	5407481	80	-3	114	424		3	-1	-0.008	4	-10
36527	369616	5407466	23	-3	71	605		2	-1	-0.008	-3	-10
36529	369628	5407450	70	24	120	617		11	-1	-0.008	-3	-10
36531	369641	5407435	55	12	101	549		6	-1	-0.008	4	-10
36533	369653	5407419	79	30	146	378		18	-1	-0.008	5	-10
36535	369666	5407404	55	-3	121	1296		6	-1	0.008	6	-10
36537	369679	5407389	53	11	84	779		7	-1	-0.008	-3	-10
36539	369692	5407373	56	47	158	443		11	-1	-0.008	7	-10
36541	369705	5407358	54	47	121	634		16	-1	-0.008	6	-10
36543	369718	5407343	27	77	176	456		21	-1	0.01	4	-10
36545	369730	5407328	28	106	241	346		26	-1	-0.008	9	-10
36547	369743	5407313	42	50	184	340		8	-1	0.01	6	-10
36549	369755	5407297	35	57	233	386		46	-1	-0.008	-3	-10
36551	369768	5407282	33	833	1234	480		259	-1	-0.008	4	-10
36553	369781	5407267	60	748	1041	694		191	-1	-0.008	14	-10
36555	369794	5407251	25	190	1200	954		190	-1	-0.008	8	-10
36557	369807	5407236	12	44	144	302		19	-1	-0.008	-3	-10
36559	369820	5407221	28	10	66	222		17	-1	-0.008	8	-10
36561	369832	5407206	39	28	234	380		18	-1	-0.008	5	-10
36563	369845	5407190	62	120	170	294		50	-1	-0.008	8	-10
36565	369857	5407174	32	251	163	309		47	-1	0.009	8	-10
36567	369870	5407159	43	39	542	977		69	-1	-0.008	22	-10
36569	369883	5407144	52	9	83	374		8	-1	-0.008	4	-10
36571	369895	5407128	45	33	82	360		12	-1	-0.008	-3	-10
36573	369908	5407112	4	6	138	298		20	-1	-0.008	10	-10
36575	369920	5407097	5	31	125	86		25	-1	0.008	9	-10

36577	369461	5407491	44	18	99	633		7	-1	-0.008	-3	-10
36579	369474	5407476	26	3	68	632		6	-1	-0.008	-3	-10
36581	369487	5407461	35	10	67	250		5	-1	-0.008	-3	-10
36583	369500	5407445	36	-3	64	746		1	-1	-0.008	-3	-10
36585	369513	5407430	59	-3	74	747		1	-1	-0.008	5	-10
36587	369526	5407415	62	11	85	795		4	-1	0.011	5	-10
36589	369539	5407400	36	-3	130	900		2	-1	0.01	-3	-10
36591	369552	5407385	141	-3	119	728		2	-1	-0.008	4	-10
36593	369565	5407370	37	-3	110	796		1	-1	-0.008	-3	-10
36595	369578	5407355	26	-3	88	697		2	-1	-0.008	-3	-10
36597	369591	5407339	72	12	181	484		2	-1	-0.008	6	-10
36599	369604	5407324	140	8	166	464		7	-1	-0.008	-3	-10
36801	369870	5410190	33	-3	878	16500	26.9	5	4	-0.008		
36802	369870	5410190	45	-3	908	14500	26.9	8	2	-0.008		
36803	369120	5405530	12	159	1281	3613	14.1	885	-1	-0.008		
36804	370015	5410350	17	920	4715	100000	14.5	923	4	-0.008		
36805	372700	5407420	19	165	26	160	0.93	3030	-1	-0.008		
36806	373000	5406680	61	6	104	971	13.2	38	-1	-0.008		
36807	369325	5407182	41	-3	40	121	1.99	35	-1	-0.008		
36808	369630	5407255	49	4	85	620	4.58	8	-1	-0.008		
36809	369693	5407296	29	92	293	569	9.91	85	-1	-0.008		
36810	369706	5407281	28	26	616	314	9.54	94	-1	-0.008		
36811	369718	5407266	38	97	572	315	7.42	30	-1	-0.008		
36812	369731	5407251	52	140	146	184	4.32	50	-1	-0.008		
36813	369744	5407235	65	107	83	80	1.91	51	-1	-0.008		
36814	369757	5407221	66	159	211	186	3.38	47	-1	-0.008		
36815	369770	5407206	80	223	287	570	4.65	50	-1	0.022		
36816	369784	5407191	49	41	190	338	3.8	15	-1	-0.008		
36817	369797	5407176	62	263	221	140	2.32	27	-1	-0.008		
36818	369784	5407161	44	116	119	294	3.42	14	-1	-0.008		
36819	369823	5407145	47	60	102	110	4.52	34	-1	-0.008		
36820	369769	5407360	151	30	87	334	4.49	12	-1	-0.008		
36821	369782	5407346	26	87	219	333	4.96	16	-1	-0.008		
36822	369795	5407331	29	266	227	203	1.66	9	-1	-0.008		

36823	369808	5407315	11	119	62	76	0.8	9	-1	-0.008		
36824	369820	5407300	30	171	622	225	8.02	50	-1	-0.008		
36825	369838	5407277	30	98	174	267	9	22	-1	-0.008		
36826	369850	5407262	58	54	113	262	3.29	10	-1	-0.008		
36827	369863	5407246	32	40	160	185	3.12	16	-1	-0.008		
36828	369882	5407223	35	7	84	429	4.95	15	-1	-0.008		
36830	369900	5407200	41	132	241	407	3.53	50	-1	-0.008		
36831	369900	5407200	43	104	296	329	3.43	35	-1	-0.008		
36832	369856	5407036	41	48	235	351	8.26	47	1	-0.008		
36833	369870	5407022	28	91	209	624	4.96	32	-1	-0.008		
36834	369884	5407007	13	35	106	257	9.5	26	-1	-0.008		
36835	369897	5406993	10	44	103	439	4.42	25	-1	-0.008		
36836	369911	5406978	28	40	110	695	7.1	19	-1	-0.008		
36837	369925	5406963	80	36	106	424	7.88	38	-1	-0.008		
36838	369939	5406949	37	47	95	256	4.56	37	-1	-0.008		
36842	369220	5406846	27	-3	46	423	9.03	6	-1	-0.008		
36843	369368	5406989	50	195	165	551	3.94	15	1	-0.008		
36844	369381	5406975	64	8	99	499	4.64	12	-1	-0.008		
36845	369395	5406960	60	4	109	575	5.84	4	-1	-0.008		
36846	369409	5406946	122	7	160	333	7.44	7	-1	-0.008		
36847	369422	5406931	33	7	107	671	8.14	4	-1	-0.008		
36848	369436	540917	47	11	100	568	6.37	5	-1	-0.008		
36849	369449	5406902	35	69	139	215	3.89	17	-1	-0.008		
36850	369463	5406888	51	118	274	313	4.03	16	-1	-0.008		
36851	369477	5406874	75	718	519	518	4.31	26	2	0.036		
36852	369492	5406860	40	1857	719	483	4.96	352	1	0.032		
36853	369505	5406846	66	12100	6500	479	22.2	5500	8	0.03		
36854	369518	5406831	52	361	916	855	10.1	458	1	0.05		
36855	369532	5406816	45	63	253	321	8.08	27	-1	-0.008		
36856	369545	5406801	22	45	72	173	4.5	25	-1	-0.008		
36857	369558	5406786	46	35	96	359	9.89	14	-1	-0.008		
36858	369571	5406771	37	307	211	282	4.69	38	-1	-0.008		
36859	369585	5406756	28	26	112	164	4.92	18	-1	-0.008		
36860	3699598	5406741	13	28	98	71	3.47	30	-1	-0.008		

36861	369612	5406727	22	58	118	149	7.31	28	-1	-0.008		
36862	369626		20	21	89	365	4.32	14	-1	-0.008		
36863	369640	5406698	6	14	57	82	4.22	16	-1	-0.008		
36864	369640	5406698	6	14	49	61	3.18	16	-1	-0.008		
36865	369296	5406917	48	-3	36	460	3.93	3	-1	-0.008		
36866	369308	5406901	428	-3	70	642	4.46	8	-1	0.024		
36867	369320	5406886	51	-3	47	504	3.55	3	-1	-0.008		
36868	369333	5406870	15	-3	39	489	4.98	3	-1	-0.008		
36869	369345	5406855	23	4	36	387	4.24	2	-1	-0.008		
36870	369358	5406839	46	129	70	309	3.35	5	-1	-0.008		
36871	369372	5406825	39	15	56	357	3.42	4	-1	-0.008		
36872	369386	5406811	52	46	118	537	4.57	12	-1	-0.008		
36873	369400	5406797	47	229	180	355	3.46	54	-1	-0.008		
36874	369414	5406782	36	201	135	411	3.69	36	-1	-0.008		
36875	369428	5406768	112	381	300	420	5.52	27	-1	-0.008		
36876	369441	5406753	170	365	496	489	4.69	49	1	-0.008		
36877	369454	5406739	48	372	295	256	3.37	62	1	-0.008		
36878	369469	5406726	69	494	271	497	3.2	185	-1	-0.008		
36879	369483	5406712	21	701	122	296	3.04	196	-1	-0.008		
36880	369497	5406698	45	426	264	214	6.13	103	-1	-0.008		
36881	369511	5406684	22	110	91	258	6.45	107	-1	-0.008		
36882	369525	5406669	29	69	112	457	6.42	103	-1	-0.008		
36883	369538	5406654	51	79	178	384	6.6	22	-1	-0.008		
36884	369550	5406639	21	78	76	375	7.07	16	-1	-0.008		
36885	369564	5406624	28	19	43	969	8.61	102	-1	-0.008		
36886	369564	5406624	20	42	49	541	8.38	13	-1	-0.008		
75801	369220	5406846	53	-3	49	649		2	-1	-0.008	7	-10
75803	369617	5407309	42	8	197	1017		6	-1	-0.008	5	-10
75805	369630	5407293	46	31	135	866		14	-1	-0.008	-3	-10
75807	369642	5407278	69	27	94	788		14	-1	0.022	6	-10
75809	369655	5407263	196	503	318	741		75	-1	-0.008	5	-10
75811	369668	5407248	78	48	233	633		33	-1	-0.008	4	-10
75813	369682	5407232	92	9	621	925		11	-1	-0.008	8	-10
75815	369695	5407217	51	36	214	347		7	-1	-0.008	-3	-10

75817	369708	5407202	53	214	255	715		50	-1	-0.008	8	-10
75819	369721	5407187	142	175	962	772		50	-1	0.015	5	-10
75821	369734	5407172	50	82	282	389		15	-1	0.016	12	-10
75823	369748	5407157	45	58	143	278		18	-1	-0.008	14	-10
75825	369761	5407142	14	44	27	78		6	-1	-0.008	15	20
75827	369775	5407126	82	144	252	1088		28	-1	-0.008	12	-10
75828	379300	5352800	67		304							
75829	369788	5407111	62	87	233	411		25	-1	-0.008	13	-10
75831	369802	5407097	42	79	166	264		23	-1	-0.008	13	-10
75833	369816	5407082	67	39	97	671		26	-1	-0.008	10	-10
75834	380040	5358338	42		92							
75835	369830	5407067	25	39	95	213		19	-1	-0.008	12	-10
75836	379925	5358000	43		24							
75837	369843	5407052	72	108	158	317		42	-1	0.012	12	-10
75839	369856	5407036	40	48	229	401		52	-1	-0.008	9	-10
75841	369746	5407341	38	149	251	378		48	-1	-0.008	6	25
75843	369761	5407354	14	33	147	334		9	-1	-0.008	5	-10
75844	378300	5352750	12		225							
75845	378530	5353590	9		8							
75845A	369776	5407367	58	14	168	456			-1	-0.008	-3	-10
75847	379050	5354350	10		60							
75847A	369791	5407379	56	138	711	934		50	-1	-0.008	8	-10
75848	380400	5358200	9		107							
75849	380240	5359100	1		17							
75849A	369805	5407390	62	367	269	136		192	-1	-0.008	12	-10
75850	380650	5359550	1		26							
75851	380500	5359400	-2		21							
75851A	369822	5407405	56	31	106	296		18	-1	-0.008	12	-10
75852	379915	5358240	29		51							
75853	380040	5358330	10		70							
75853A	369838	5407418	45	689	70	150		50	-1	-0.008	28	-10
75855	369854	5407430	17	9	60	206		1	-1	-0.008	-3	-10
75857	369869	5407442	17	25	90	141		21	-1	-0.008	6	-10
75859	369884	5407455	40	43	121	414		6	-1	-0.008	4	-10

75861	369899	5407468	14	93	748	700		42	-1	-0.008	11	-10
75863	369915	5407480	25	21	68	157			-1	-0.008	-3	-10
75864	381075	5354630	4		313							
75865	381050	5357300	23		11							
75865A	369931	5407493	21	14	72	404			-1	-0.008	6	-10
75866	381100	5358100	4		12							
75867	381095	5358095	2		6							
75867A	369946	5407505	26	4	52	343			-1	-0.008	5	-10
75868	380850	5355250	21		76							
75869	380470	5356220	48		69							
75869A	369962	5407518	18	7	41	244			-1	0.011	-3	-10
75870	380050	5355550	37		130							
75871	380050	5358350	60		103							
75871A	369220	5406846	29	-3	53	531			-1	-0.008	4	-10
75872	380050	5358350	19		25							
75873	380050	5358350	14		123							
75873A	369578	5407355	31	3	81	671			-1	-0.008	-3	-10
75874	379957	5358280	20		106							
75875	380050	5358350	30		57							
75875A	369474	5407476	45	54	167	426		50	-1	-0.008	11	-10
75876	380003	5358314	8		8							
75877	369220	5406846	38	3	52	640			-1	-0.008	-3	-10
75879	369794	5407251	25	166	1147	871		124	-1	-0.008	5	-10

A horizon soils assay results

TASMANIA DEVELOPMENT AND RESOURCES

MINERAL RESOURCES TASMANIA — LABORATORY SERVICES

ANALYTICAL RESULTS SHEET

303136

MRT 96

PASMINCO - HUMINEX ANALYSES

local N	local E	MRT Reg. No.	Client Field No.	% Soluble Humics In Soil	Pb : C (ppm)	Zn : C (ppm)	Cu : C (ppm)
400N	300W	960324	36701	1.7	95	70	85
	280W	960325	36702	1.4	145	75	115
	260W	960326	36703	1.5	80	85	180
	240W	960327	36704	1.9	80	60	400
	220W	960328	36705	1.7	105	65	75
	200W	960329	36706	2.1	70	50	80
	180	960330	36707	1.4	145	75	100
	160	960331	36708	2.0	190	45	120
	140	960332	36709	1.9	190	50	115
	120	960333	36710	1.4	670	170	90
	100	960334	36711	1.9	130	55	45
	80	960335	36712	3.4	370	185	80
	60	960336	36713	1.1	460	350	150
	40	960337	36714	1.3	700	590	105
	[illegible]	960338	36715	1.4	770	190	90
	[illegible]	960339	36716	1.5	720	195	65
	[illegible]	960340	36717	3.2	760	250	60
	[illegible]	960341	36718	2.0	800	190	60
	[illegible]	960342	36719	1.7	960	165	45
	[illegible]	960343	36720	2.0	1160	70	30
	[illegible]	960344	36721	1.5	820	250	30
	[illegible]	960345	36722	1.2	430	115	50
	[illegible]	960346	36723	1.4	260	60	45
	[illegible]	960347	36724	1.5	300	45	20
300N	260W	960348	36725	1.9	160	50	40
	240	960349	36726	2.0	200	40	95
	220	960350	36727	1.0	550	55	85
	200	960351	36728	1.8	155	40	60
	180	960352	36729	1.8	380	45	75
	160	960353	36730	2.2	50	65	55
	140	960354	36731	2.1	60	50	75
	120	960355	36732	2.4	50	40	30
	100	960356	36733	1.5	60	155	95
	80	960357	36734	1.5	100	230	90
	STANDARD	960358	36735	1.4	85	250	90
	60W	960359	36736	1.5	160	410	185
	40W	960360	36737	2.1	400	410	170

TASMANIA DEVELOPMENT AND RESOURCES

MINERAL RESOURCES TASMANIA — LABORATORY SERVICES

ANALYTICAL RESULTS SHEET

303137

PASMINCO - HUMINEX ANALYSES

		MRT Reg. No.	Client Field No.	% Soluble Humics In Soil	Pb : C (ppm)	Zn : C (ppm)	Cu : C (ppm)
300N	20W	960361	36738	2.5	540	290	105
	00E	960362	36739	2.6	1150	410	220
	20E	960363	36740	2.5	480	220	200
	40	960364	36741	6.0	310	125	155
	60	960365	36742	5.9	530	95	320
	80	960366	36743	6.7	430	85	55
	100	960367	36744	6.6	290	120	50
	120	960368	36745	3.8	85	60	95
	140	960369	36746	3.5	55	80	50
	160	960370	36747	4.0	55	60	25
	180	960371	36748	5.2	50	80	20
	200	960372	36749	4.6	60	45	15
	220	960373	36750	3.2	55	50	20
	240	960374	36751	3.9	70	30	20
	260	960375	36752	2.9	75	50	25
	280	960376	36753	2.9	115	60	55
	300E	960377	36754	4.2	160	85	45
420N	00E	960378	36755	3.0	640	115	55
440N	00	960379	36756	4.9	410	60	45
460N		960380	36757	3.2	130	65	35
480N		960381	36758	2.8	230	55	40
500N		960382	36759	1.9	180	60	50
520		960383	36760	2.3	80	75	30
540		960384	36761	3.0	75	60	20
560		960385	36762	2.4	80	75	35
580		960386	36763	2.4	120	50	30
600		960387	36764	2.1	230	110	65

W.E.BAKER
MANAGER LABORATORY SERVICES
April 19, 1996

303138

Appendix 6

Arthur dam costaining

Memorandum

PASMINCO
EXPLORATION

To: MJ Tomkinson

From: NK McGunnigle

Date: 20 June 1996

Subject: **ARTHUR DAM COSTEANING - LUINA EL 17/93**

Summary

Two costeans excavated parallel to Arthur Dam grid lines 400N and 100S were mapped and rock chip sampled in order to investigate bed rock exposure and help to explain anomalous soil geochemistry in these areas. Anomalous geochemistry in the costeans coincides with anomalous zones identified in earlier C horizon soil geochemistry.

In the northern (400N) costean, the best Pb and Zn results occur in goethitic volcanics and hangingwall to a faulted puggy zone. Best results are:
8m @ 708ppm Pb and 1638ppm Zn, and
8m @ 1800ppm Zn

In the southern (100S) costean, anomalous values are in goethitic zones in foliated mafic volcanics. Best results include:
Pb - 36m @ 3460ppm (100S, 170E - 240E), including 1m @1.16% Pb
Zn - 22m @ 2311ppm (100S, 194E - 116E), including 1m @ 0.5%Zn
As - up to 1270ppm
Ag - 15 - 30ppm (As and Ag appear to coincide with anomalous Pb)
Au - up to 0.65g/t (100S, 240E)

Conclusions and Recommendations

Anomalous Pb, Zn, As, Ag and Au correlates to anomalous zones identified in C horizon soil geochemistry sampling. In the northern costean, the best Pb and Zn results are isolated in goethitic horizons and hangingwall to a faulted, puggy zone. In the southern costean, the anomalous values are in goethitic zones in foliated mafic volcanics, where goethite has commonly replaced carbonate.

Recommended follow up includes:
1) A soil horizon orientation survey to investigate the best profile and method of analysis for future soil surveys in the area.
2) Analysis of the chloritic-talcose alteration by X-Ray Diffraction to determine mineralogy and any associations with mineralisation.
3) A short diamond drill hole to test at shallow depth an area between anomalous

Introduction

Two costeans were excavated parallel to Arthur Dam grid lines 400N and 100S in the Arthur Dam grid area, Luina EL 17/93 (Figure 1). The costeans approximately parallel the surface projections of DDH AD3 (collared at 400N, 05W) and DDH AD2 (130S, 80E) and were designed to investigate bed rock exposure and zones of alteration and mineralisation over soil geochemical anomalies at 400N, 60-100E and 100S 160-220E. The soil profiles were also mapped. The costeans each total 200m and 256m respectively.

Work Completed

Costeaning was carried out over 11 - 12 June 1996 by Groves Contracting, Tasmania. The vegetation was first cleared before the trenches were excavated by a 1.4m rock bucket. The trenches average 0.8m high, clearly exposing soil profiles and 0.1-0.4m of bedrock. The northern costean continues NE from the AD3 access track, paralleling the drill hole along surface. The southern costean was designed to parallel DDH AD2 and the 100S grid line, but curves N at 240E to avoid clearing thicker vegetation and crosses the grid line at 255E

Mapping
Detailed mapping of each of the costeans is presented on 1: 100 scale plan and profile maps of the costeans (see figures 12 & 13 of main report).

Northern Costean - 400N
The surface geology exposed in the costean is variably altered intermediate to mafic volcanics, typical of the Arthur Dam area pyroxenites. Textures range from a grey to green coloured volcaniclastic $\pm$ micaceous sandstone to pyroxene phyric and chloritic altered lava. Chloritic alteration is commonly moderate to strongly pervasive, and chlorite and carbonate commonly replaces amygdales and phenocrysts in the volcanics. Minor carbonate $\pm$ quartz veins are also present, and in places goethite is observed replacing carbonate.

A mild to moderate-strong NE striking cleavage is developed in many of the rocks exposed. Dip of the fabric averages 50-60° to the west. Some quartz-carbonate veining is developed parallel to this major fabric direction eg. sample 78408 (022/60°W), which also shows traces of galena.

Increasing shear fabric in pale grey and bleached volcaniclastic sandstone is exposed in the costean from about 76m NE of the baseline. At about 80m NE, a north striking (006 °) fault with soft, grey pug on the plane bounds massive and blocky micaceous sandstone to the NE which has an orange-grey goethitic surface. Coincidence of anomalous Zn soil geochemistry about this part of the grid line suggests that the mapped fault may provide a pathway for fluids to migrate to surface. However, analysis of the rock chip results in this area shows the highest Zn values to be obtained from a goethitic horizon 20m to the SW, from samples 78258 (1100ppm) to 78261 (2060ppm).

obtained from a goethitic horizon 20m to the SW, from samples 78258 (1100ppm) to 78261 (2060ppm).

Southern Costean 100S

The depth of this costean varies considerably more than the northern costean, however, excellent bedrock exposure has been achieved. Abundant bedrock is exposed over the AD4 drill pad, with variable textures ranging from fine grained porphyritic and amygdaloidal volcanics, pyroxene phyric (up to 10mm) lava and volcaniclastics and spilitic basalt. Chlorite and carbonate alteration commonly replaces phenocrysts, with goethite after carbonate. With increasing depth to bedrock along the costean (from local grid 130mE) the volcanics are dark blue to green in colour, moderately to strongly chloritic with variable sericite, manganese and talc, and moderate to strong cleavage. The cleavage fabric is observed increasing to the NE from (local grid) 128mE, averaging 070°, dipping steeply W to near vertical.

More intense chlorite ± sericite ± talc alteration appears to accompany an increased foliation fabric. Chlorite, carbonate and silica are the dominant pervasive alteration types with variable sericite and talc in particularly schistose fabrics. Quartz-carbonate veining has been mapped and rock chip sampled in selected places (Appendix 1). Goethite replaces carbonate in places.

Rock chip samples 78410 - 78419 were taken from a goethitic horizon at 210 - 220mE, where carbonate-quartz veining is observed in gossanous and manganiferous bedrock. Cleaved mafic volcanic parent rock is weathered to orange-brown on the surface, with carbonate in spots and veinlets parallel to the cleaved fabric. Chlorite and manganese alteration dominate, with minor amphibole alteration observed in fine laths. Carbonate and quartz forms open spaced and massive veins with goethite and traces of mineralisation.

Rock Chip Sampling

Both costeans were chip sampled, from bedrock exposure where possible, at 2m (continuous) sample intervals. 1m intervals were sampled for 6m (78420 - 78425) between sample numbers 78170 - 78174 and 10m (78410 - 78419) between sample numbers 78145 - 78151 in the 100S costean, where increased chlorite-silica in a cleaved fabric and a cleaved chloritic-goethitic zone with amphibole alteration were observed. Ten rock chip samples from selected altered and mineralised exposures in the costeans are described in Appendix 1. Assays of all rock chip sampling are reported in Appendix 2.

Rock chip assays in the northern costean were disappointing overall. The best Pb and Zn results are in goethitic volcanics and hangingwall to a faulted puggy zone. Best results are:
8m @ 708ppm Pb and 1638ppm Zn, and
8m @ 1800ppm Zn

It is possible that the fault and cleavage fabric have provided a pathway for fluids, hence proximity of the highest Pb and Zn with the puggy fault and cleavage

development. However, the best anomalies were in goethitic horizons with associated elevated Fe (up to 11.9%).

In the southern costean, anomalous Pb-Zn-As-Ag values are highly coincident in goethitic zones in foliated mafic volcanics. The 1m spaced sample interval from 210 - 220mE also showed fine amphibole alteration which formed an alteration halo in DDH AD2. Best results include:
Pb - 36m @ 3460ppm (100S, 170E - 240E), including 1m @1.16% Pb
Zn - 22m @ 2311ppm (100S, 194E - 116E), including 1m @ 0.5%Zn
As - up to 1270ppm
Ag - 15 - 30ppm

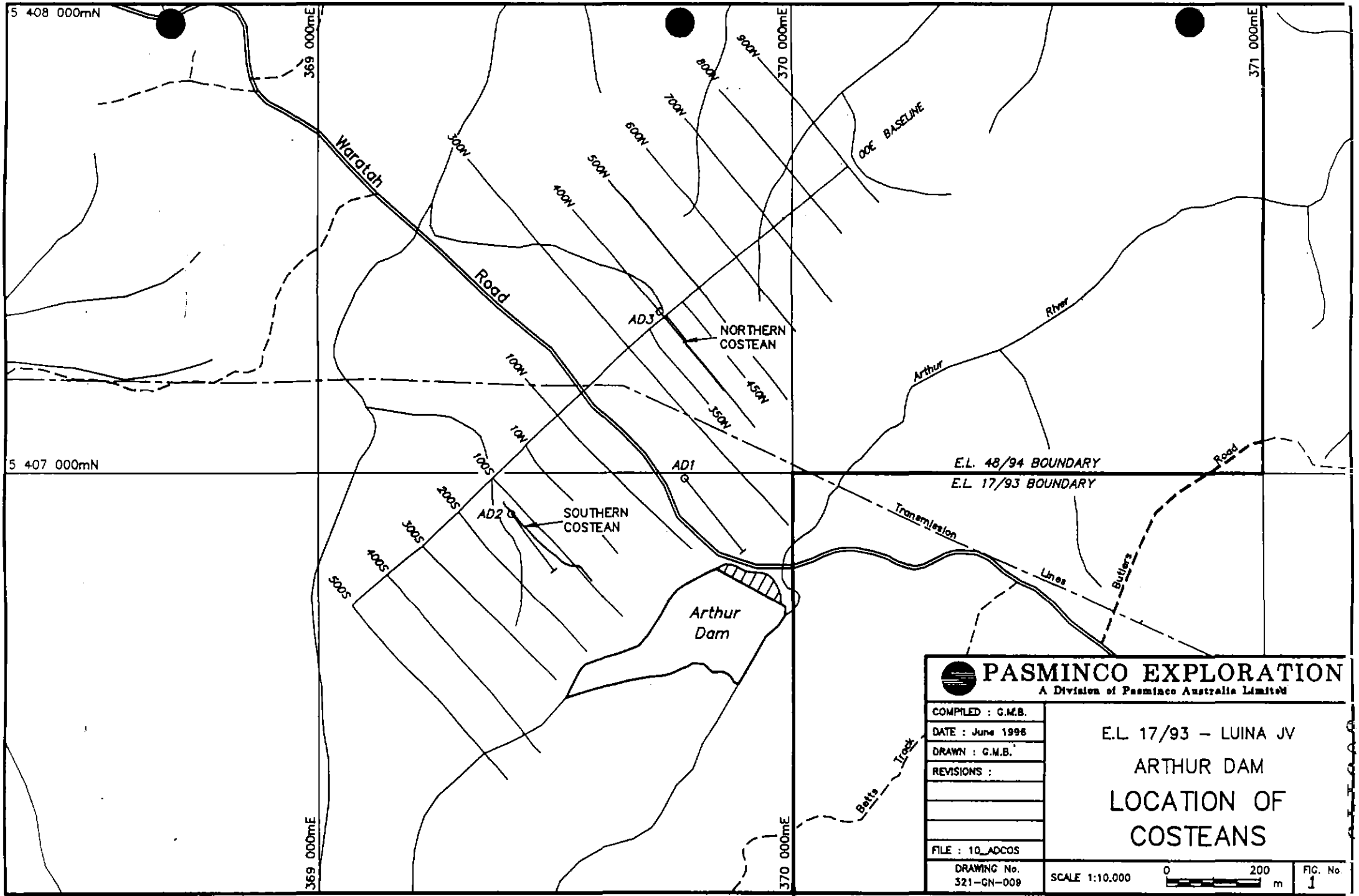
Anomalous Au was detected with values of up to 0.65g/t (at approximately 240E) along the costean NE of the above anomalies. It thought that quartz veins exposed in this part of the costean are associated with Au mineralisation, and does not appear to be immediately related to base metal mineralisation.

Soil Profiles

The soil profile from each costean was mapped from the side exposure, presented in Figures 2 and 3. Soil profile thickness was influenced partly by topography, where for example, a leached E horizon was developed with thicker profiles in topographic lows. The soil profiles were generally composed of :

O (A_0) horizon Dark brown, partly decomposed organic matter
20 - 40 cm
A (A_1) horizon Chocolate brown, silt loam
40cm average
± **E (A_2) horizon** Mottled and leached, light brown and grey zone of eluviation
approx. 20cm where present
± **B horizon** Mottled orange-brown, Fe-enriched clayey horizon
up to 20 cm where present
C horizon Weathered rock ranging from blue-grey, soft, chloritic schistose saprolite to goethitic massive saprolite.
20 - 40 cm

A soil orientation survey over part of the southern costean and grid line 100S will be undertaken to follow up variables in soil horizon geochemistry. Results will be reported in an additional memorandum.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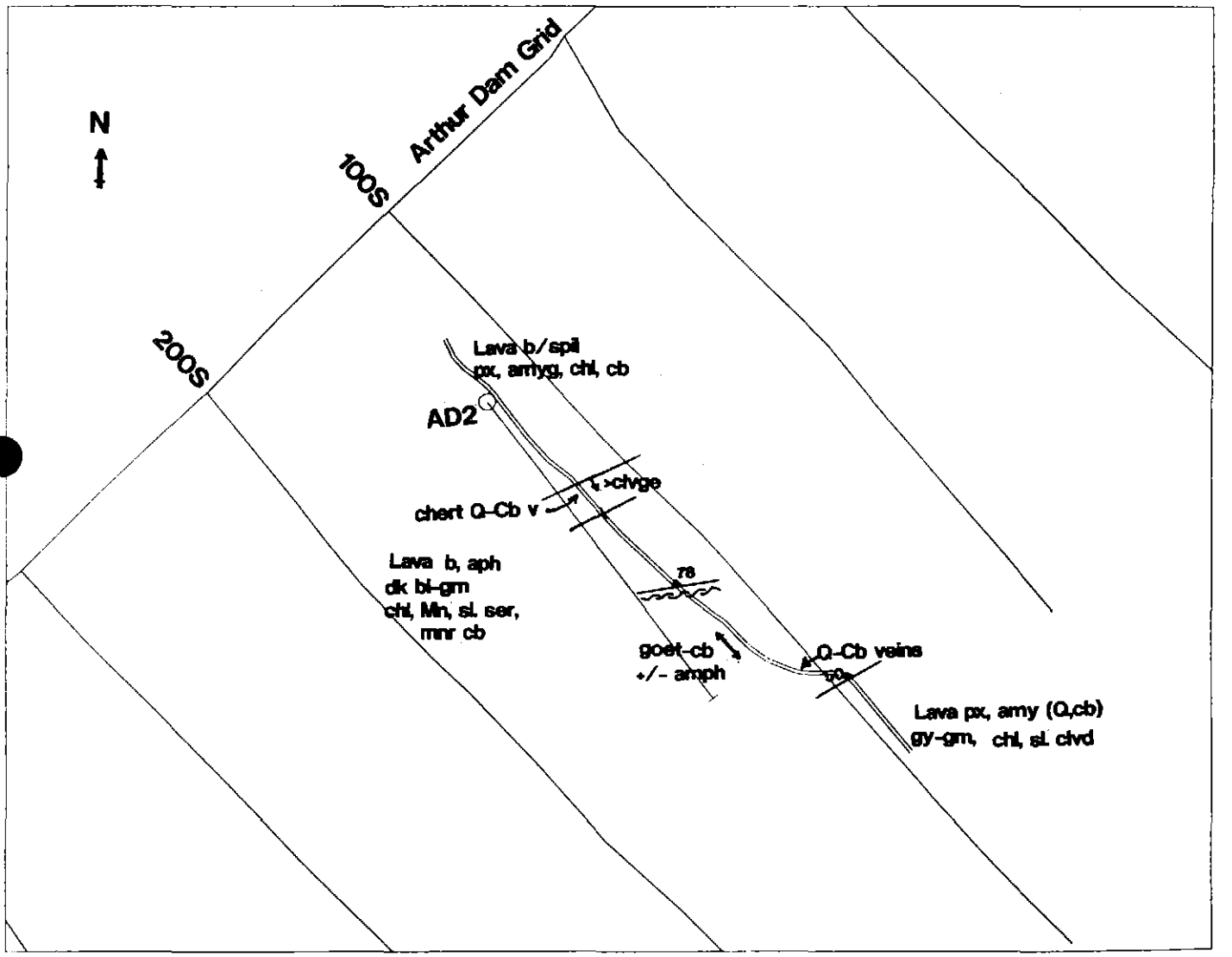
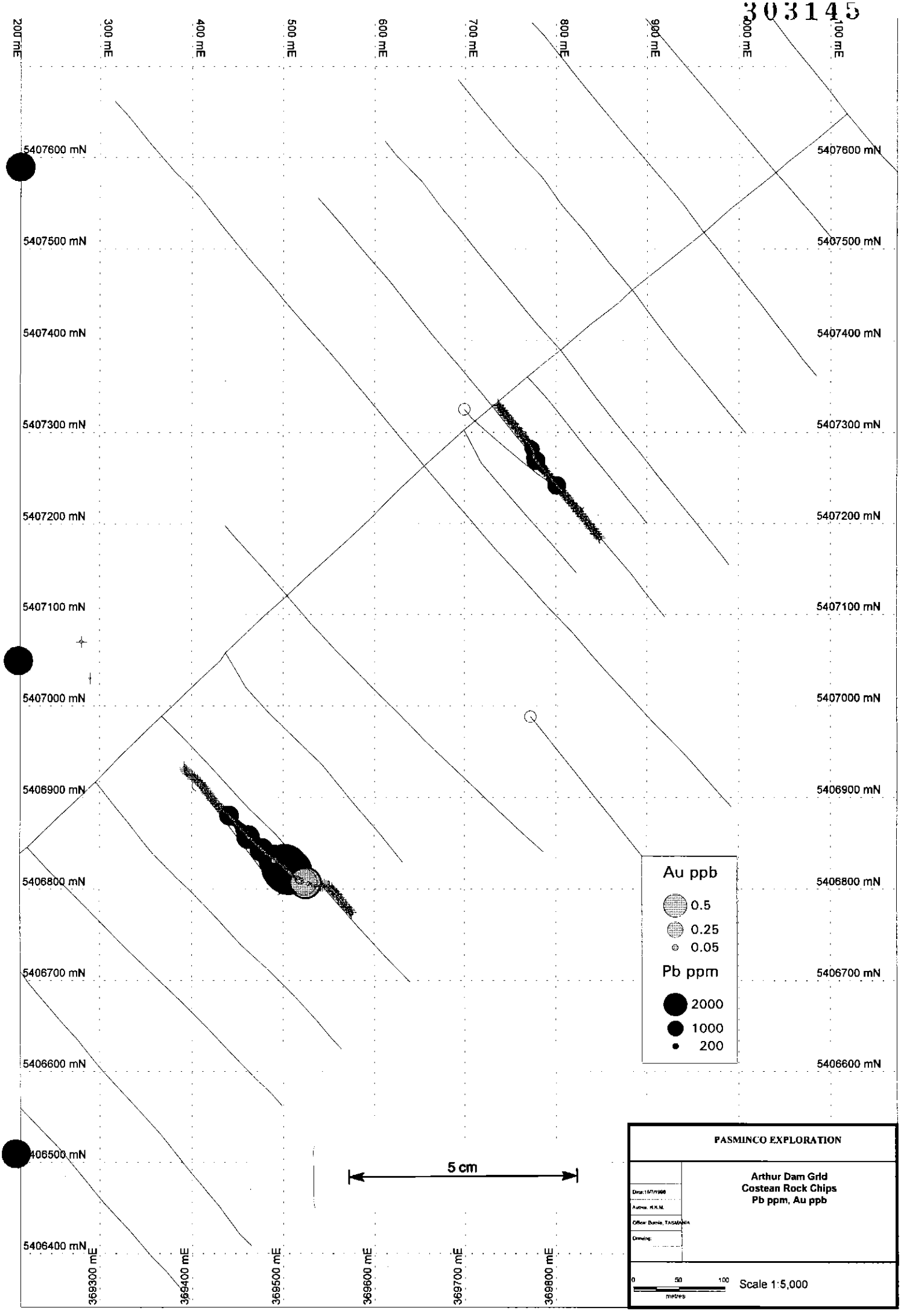
370 000mE
371 000mE
Waratah
Road
900N
800N
700N
600N
500N
400N
300N
100N
10N
100S
200S
300S
400S
500S
00E BASELINE
AD3
NORTHERN COSTEAN
450N
350N
AD1
AD2
SOUTHERN COSTEAN
Arthur Dam
E.L. 48/94 BOUNDARY
E.L. 17/93 BOUNDARY
Arthur River
Transmission Lines
Butlers Road
Betts Track
PASMINCO EXPLORATION
A Division of Pasminco Australia Limited
COMPILED : G.M.B.
DATE : June 1996
DRAWN : G.M.B.
REVISIONS :
FILE : 10_ADCOS
DRAWING No. 321-GN-009
E.L. 17/93 – LUINA JV
ARTHUR DAM
LOCATION OF COSTEANS
SCALE 1:10,000
0 200 m
FIG. No. 1
5 cm



PASMINCO EXPLORATION A Division of Pasminco Australia Limited		
COMPILED : N.R.M.	Arthur Dam Grid Southern Costean Geology	
DATE : 19 July 1996		
DRAWN :		
REF. :		
REVISIONS :		
DRAWING No.	SCALE 1 : 2500 0 50m	FIG. No.

5 cm


200 mE
300 mE
400 mE
500 mE
600 mE
700 mE
800 mE
900 mE
1000 mE
1100 mE
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5407400 mN
5407300 mN
5407200 mN
5407100 mN
5407000 mN
5406900 mN
5406800 mN
5406700 mN
5406600 mN
5406500 mN
5406400 mN
369300 mE
369400 mE
369500 mE
369600 mE
369700 mE
369800 mE
Au ppb
0.5
0.25
0.05
Pb ppm
2000
1000
200
5 cm
PASMINCO EXPLORATION
Arthur Dam Grid
Costean Rock Chips
Pb ppm, Au ppb
Scale 1:5,000
metres

Appendix 1

Rock descriptions

78401 AD2 Track

Green-brown coloured chloritic (undistinguished) volcanic with pervasive fine-medium grained amphibole laths and sprays. Goethitic brown weathering surface.

Quartz and carbonate are present in veins (up to 15mm) (± sulphides?), and quartz has crystallised in open spaces.

78402 AD2 Track - float

Crystalline quartz, open space filling and fracture fill.

78403 Costean 100S,

Green, cleaved, porphyritic and slightly silicic and chloritic mafic volcanics with abundant fine carbonate veinlets parallel and cross-cutting the foliation. Quartz is present on the margins of some veins. Pseudomorphed phenocrysts, constituting 5-6%, have been replaced by chlorite. Carbonate is also present in fine 'blotches', possibly replacing phenocrysts. Minor ilmenite is observed.

78404 Costean 100S, 178.4m

Coloform and crystalline creamy-fawn carbonate has filled spaces between quartz veins in cream-brown coloured chert. Fine grained chlorite is present along quartz crystal interfaces in the veins.

78405 Costean 100S, 180.2m

Abundant fine grained carbonate veins within a fractured, and in places brecciated, brown-grey chert in a matrix of silicified carbonate. Quartz has formed on the margins of some veins, in massive and crystalline form, with later carbonate ± mineralisation filling vugs and spaces. Carbonate has also formed in fine crystalline sprays in patches and along net-veins. Late quartz veins cross-cut veining and brecciation.

78406 Costean 100S, 96m

Carbonate-quartz veining in gossanous, goethitic and manganiferous bedrock. Cleaved mafic volcanic parent rock is weathered to orange-brown on the surface, with carbonate in spots and veinlets parallel to the cleaved fabric. Chlorite and manganese alteration dominate, with minor amphibole alteration observed in fine laths. Carbonate and quartz forms open spaced and massive veins with some carbonate altered to goethite. Goethitic margins occur in places ± mineralisation.

78407 Costean 100S, 118m

Finely brecciated and highly silicified dark green volcanics with minor chlorite-manganese alteration. Quartz veins exposed at bedrock surface show open spaced quartz crystals.

78408 Costean 400N, 85.6mE (south side of costean)

Quartz veins in moderately silicified, slightly chloritic, micaceous sandstone. A 50mm vein is parallel to the general foliation (022/60°W), and shows traces of galena.

78409 Costean 400N, 88.0mE (north side of costean)

Quartz-carbonate vein (100mm) exposed cross-cutting fabric. Open spaces in quartz crystallisation are filled by carbonate, which is slightly goethitic. Traces of galena are observed in the quartz, with minor chlorite ± manganese.

Chlorite-sericite-fuchsite alteration parallels the western contact of the vein with yellow-green micaceous sandstone host rock.

Costean Rock Chip Assays

Sample	AMG_E	AMG_N	Costean	Cu	Pb	Zn	Mn	Fe%	As	Co	Ni	Ag	Au	Bi	Mo
78101	369575	5406774	South	45	116	315	439	7.05	14	17	98	1	0.002	-5	-2
78102	369574	5406775	South	49	127	283	428	7.85	22	24	142	1	0.004	-5	-2
78103	369573	5406777	South	43	39	130	373	5.56	6	40	250	1	0.002	-5	-2
78104	369572	5406778	South	30	12	54	444	5.95	2	46	248	1	0.005	-5	-2
78105	369570	5406780	South	43	10	62	510	7.23	6	48	269	1	0.001	-5	-2
78106	369569	5406781	South	45	22	69	531	8.13	3	45	251	1	0.002	-5	-2
78107	369568	5406783	South	50	-5	53	560	6.59	4	52	284	1	0.002	-5	-2
78108	369566	5406784	South	56	12	61	449	7.21	4	50	277	1	0.002	-5	-2
78109	369565	5406786	South	62	10	61	477	7.91	2	53	254	1	0.004	-5	-2
78110	369564	5406788	South	52	14	64	425	7.38	3	54	298	1	0.004	-5	-2
78111	369563	5406789	South	85	9	46	499	6.77	2	42	218	1	0.003	-5	-2
78112	369561	5406791	South	46	-5	46	534	6.78	1	45	257	1	0.001	-5	-2
78113	369560	5406792	South	47	-5	64	511	8.84	3	52	308	1	0.002	-5	-2
78114	369559	5406794	South	51	-5	63	516	7.79	2	55	332	1	0.002	-5	-2
78115	369558	5406795	South	48	-5	61	561	8.07	3	48	272	1	0.001	-5	-2
78116	369556	5406797	South	44	-5	65	562	8.19	3	53	315	1	0.002	-5	-2
78117	369555	5406798	South	77	-5	60	589	7.77	5	45	253	1	0.001	-5	-2
78118	369554	5406799	South	32	-5	72	544	9.15	3	44	269	1	0.003	-5	-2
78119	369553	5406801	South	25	-5	41	526	9.62	2	39	238	1	0.001	-5	-2
78120	369551	5406802	South	37	19	80	406	7.38	2	38	253	1	0.001	-5	-2
78121	369550	5406803	South	43	-5	53	433	6.86	2	42	269	1	0.001	-5	-2
78122	369549	5406804	South	38	-5	36	450	6.82	-1	47	273	1	0.001	-5	-2
78123	369547	5406804	South	37	-5	34	464	5.81	1	40	248	1	0.002	-5	-2
78124	369545	5406805	South	36	9	40	459	5.29	-1	41	274	1	0.002	-5	-2
78125	369543	5406804	South	39	-5	43	457	5.39	1	42	281	1	0.002	-5	-2
78126	369541	5406804	South	36	5	72	435	5.82	2	40	246	1	0.008	-5	-2
78127	369539	5406804	South	58	14	110	499	7.91	7	41	240	1	0.002	-5	-2
78128	369537	5406804	South	35	106	154	557	7.36	30	43	255	1	0.003	-5	-2
78129	369535	5406804	South	30	271	247	635	6.33	26	40	224	1	0.003	-5	-2
78130	369533	5406804	South	32	160	120	480	4.78	24	41	249	1	0.002	-5	-2
78131	369531	5406805	South	34	132	168	378	6.3	11	47	267	1	0.004	-5	-2
78132	369529	5406805	South	49	313	272	249	7.23	25	36	257	1	0.005	-5	-2
78133	369527	5406806	South	590	1360	686	190	8.92	459	19	236	4	0.018	-5	-2
78134	369525	5406807	South	341	3460	1340	267	9.85	424	12	127	7	0.733	-5	-2
78135	369523	5406808	South	196	2190	817	384	8.77	788	16	204	4	0.63	-5	-2

78136	369521	5406808	South	50	1070	978	775	9.83	276	20	225	2	0.012	-5	-2
78137	369519	5406809	South	147	1000	805	701	9.53	285	13	181	4	0.065	-5	-2
78138	369517	5406810	South	276	1700	617	190	9.47	577	6	130	3	0.048	-5	-2
78139	369516	5406812	South	208	1340	677	148	7.64	578	6	98	6	0.018	-5	-2
78140	369514	5406813	South	109	1010	578	269	7.97	361	12	206	3	0.009	-5	-2
78141	369512	5406814	South	70	1680	1290	611	10.54	249	34	478	2	0.002	-5	-2
78142	369511	5406815	South	36	1420	1190	482	9.1	306	18	311	2	0.004	-5	-2
78143	369509	5406816	South	95	1100	1330	1440	7.17	396	12	243	7	0.01	-5	-2
78144	369508	5406818	South	154	2300	3340	1820	10.46	581	18	305	22	0.012	-5	-2
78145	369506	5406819	South	243	6710	2270	1300	9.35	733	18	303	15	0.012	-5	-2
78151	369498	5406827	South	45	1260	1190	1040	6.01	80	50	270	1	0.002	-5	-2
78152	369496	5406828	South	34	867	941	534	4.96	24	43	234	1	0.001	-5	-2
78153	369494	5406829	South	45	1060	499	1030	5.48	25	40	219	1	-0.001	-5	-2
78154	369493	5406831	South	33	721	447	629	5.44	32	32	176	1	0.006	-5	-2
78155	369491	5406832	South	65	3260	814	956	6.17	541	24	138	5	0.041	-5	-2
78156	369489	5406833	South	43	1340	590	752	5.39	128	33	168	2	0.011	-5	-2
78157	369488	5406834	South	40	1380	737	801	6.06	166	35	170	1	0.004	-5	-2
78158	369486	5406835	South	36	1320	614	608	4.68	40	41	206	1	0.006	-5	-2
78159	369485	5406837	South	48	997	510	510	4.49	58	34	161	1	0.002	-5	-2
78160	369483	5406838	South	33	1050	525	539	4.81	95	38	149	1	-0.001	-5	-2
78161	369481	5406839	South	59	1130	590	547	5.23	120	41	176	1	0.001	-5	-2
78162	369480	5406841	South	48	1010	580	548	5.12	132	40	165	1	0.005	-5	-2
78163	369478	5406842	South	45	959	546	518	5.2	167	42	187	1	0.004	-5	-2
78164	369477	5406843	South	57	2000	454	490	6.97	414	42	360	2	0.013	-5	-2
78165	369476	5406845	South	27	1260	487	437	5.86	301	36	285	1	0.01	-5	-2
78166	369474	5406846	South	46	1110	666	524	6.06	335	39	255	1	0.008	-5	-2
78167	369473	5406847	South	31	843	757	435	4.97	127	33	156	1	0.011	-5	-2
78168	369471	5406849	South	83	678	578	528	4.54	37	34	208	1	0.006	-5	-2
78169	369470	5406850	South	66	705	480	544	4.34	23	36	250	1	0.004	-5	-2
78170	369468	5406852	South	53	1030	461	528	4.38	31	39	221	2	0.009	-5	-2
78174	369462	5406857	South	78	1930	619	625	5.84	22	82	332	1	0.016	-5	-2
78175	369461	5406858	South	67	1330	486	3890	6.32	41	100	285	1	0.008	-5	-2
78176	369460	5406860	South	31	740	362	673	6.09	36	58	259	1	0.005	-5	-2
78177	369458	5406861	South	29	487	327	608	5.1	12	53	289	1	0.004	-5	-2
78178	369457	5406863	South	26	654	294	539	4.63	8	52	237	-1	0.004	-5	-2
78179	369455	5406864	South	39	583	324	609	4.13	29	39	176	1	0.005	-5	-2

78180	369454	5406866	South	48	625	221	715	4.03	63	31	142	1	0.01	-5	-2
78181	369453	5406867	South	18	429	272	619	4.07	10	43	172	-1	0.002	-5	-2
78182	369451	5406869	South	23	348	253	564	3.49	7	36	126	-1	0.002	-5	-2
78183	369450	5406870	South	30	211	189	487	3.78	11	34	148	-1	0.008	-5	-2
78184	369448	5406872	South	25	166	145	517	4.96	21	45	209	-1	0.001	-5	-2
78185	369447	5406873	South	51	176	145	474	4.44	16	55	182	-1	0.002	-5	-2
78186	369446	5406875	South	52	70	121	397	4.14	13	39	164	-1	0.002	-5	-2
78187	369444	5406876	South	46	64	203	413	4.05	10	41	165	-1	-0.001	-5	-2
78188	369443	5406878	South	35	78	176	441	3.86	7	40	171	-1	0.004	-5	-2
78189	369442	5406879	South	32	98	121	586	3.74	12	34	139	1	0.001	-5	-2
78190	369441	5406881	South	45	81	143	550	4.82	13	33	189	-1	0.002	-5	-2
78191	369440	5406882	South	47	316	126	539	4.1	10	31	178	-1	0.004	-5	-2
78192	369438	5406883	South	34	8	115	680	4.79	6	42	240	-1	-0.001	-5	-2
78193	369436	5406885	South	48	-5	96	803	6.44	7	51	238	-1	-0.001	-5	-2
78194	369435	5406886	South	33	-5	91	782	6.7	6	49	223	-1	0.002	-5	-2
78195	369433	5406887	South	107	6	99	786	6.79	8	47	258	-1	-0.001	-5	-2
78196	369432	5406888	South	110	5	88	769	7.86	9	37	156	-1	0.003	-5	-2
78197	369430	5406890	South	61	5	98	740	7.44	8	37	155	-1	0.006	-5	-2
78198	369429	5406891	South	32	-5	115	1080	7.2	6	39	144	-1	0.005	-5	-2
78199	369427	5406893	South	38	-5	129	1120	7.94	9	42	156	-1	-0.001	-5	-2
78200	369426	5406894	South	87	6	121	950	7.47	7	39	147	-1	-0.001	-5	-2
78201	369425	5406896	South	55	-5	132	1010	8.71	9	46	159	-1	0.001	-5	-2
78202	369423	5406897	South	31	-5	103	827	7.11	10	37	128	-1	-0.001	-5	-2
78203	369422	5406899	South	40	-5	130	1160	9.05	8	45	146	-1	-0.001	-5	-2
78204	369421	5406900	South	33	-5	121	1060	8.7	9	45	154	-1	0.001	-5	-2
78205	369420	5406902	South	41	-5	111	851	8.31	11	42	165	-1	0.001	-5	-2
78206	369418	5406904	South	74	-5	108	852	8.09	11	47	167	-1	-0.001	-5	-2
78207	369417	5406905	South	68	-5	101	883	7.71	11	42	140	-1	0.002	-5	-2
78208	369416	5406907	South	27	-5	93	940	7.76	10	43	126	-1	0.002	-5	-2
78209	369415	5406909	South	30	-5	88	836	7.56	7	42	133	-1	0.002	-5	-2
78210	369414	5406910	South	126	-5	84	809	7.44	8	41	136	-1	0.004	-5	-2
78211	369412	5406912	South	21	-5	76	842	6.87	7	39	124	-1	0.001	-5	-2
78212	369411	5406913	South	155	-5	89	763	6.76	4	42	263	-1	0.001	-5	-2
78213	369410	5406914	South	76	-5	122	633	7.51	6	42	328	-1	-0.001	-5	-2
78214	369409	5406916	South	131	-5	126	623	7.27	8	41	341	-1	0.001	-5	-2
78215	369407	5406918	South	71	-5	151	751	6.62	8	39	297	-1	0.001	-5	-2

78216	369406	5406919	South	62	-5	159	773	6.56	7	41	282	-1	0.005	-5	-2
78217	369404	5406920	South	93	-5	121	696	6.35	5	35	193	-1	0.004	-5	-2
78218	369403	5406922	South	68	8	136	659	7.03	6	35	202	-1	0.002	-5	-2
78219	369401	5406923	South	114	6	126	637	6.87	6	31	166	-1	-0.001	-5	-2
78220	369400	5406924	South	64	-5	106	658	6.49	3	29	134	-1	-0.001	-5	-2
78221	369398	5406925	South	97	6	107	563	6.84	6	33	192	-1	0.004	-5	-2
78222	369396	5406926	South	87	-5	94	632	6.66	2	33	172	-1	-0.001	-5	-2
78223	369395	5406928	South	93	-5	114	565	7.76	4	38	260	-1	0.002	-5	-2
78224	369394	5406929	South	54	-5	101	515	7.02	4	38	246	-1	0.002	-5	-2
78225	369393	5406931	South	63	-5	101	606	6.1	3	37	194	-1	0.002	-5	-2
78226	369392	5406933	South	88	-5	100	831	5.55	1	30	124	-1	0.001	-5	-2
78229	369736	5407330	North	61	62	151	451	4.51	2	41	230	-1	-0.001	-5	-2
78230	369737	5407329	North	52	47	137	487	4.52	2	45	219	-1	0.001	-5	-2
78231	369738	5407327	North	18	68	95	247	2.77	2	26	114	-1	0.001	-5	-2
78232	369739	5407326	North	20	58	158	481	5.37	2	51	198	-1	-0.001	-5	-2
78233	369741	5407324	North	18	77	180	409	5.05	3	42	192	-1	-0.001	-5	-2
78234	369742	5407322	North	31	74	184	387	4.89	6	43	193	-1	0.002	-5	-2
78235	369743	5407321	North	36	131	216	345	4.85	8	46	226	-1	-0.001	-5	-2
78236	369744	5407319	North	45	121	201	286	4.32	5	44	241	-1	0.002	-5	-2
78237	369746	5407318	North	50	102	177	315	3.81	2	34	187	-1	0.004	-5	-2
78238	369747	5407316	North	56	59	222	391	5.05	3	49	215	-1	0.001	-5	-2
78239	369748	5407315	North	49	21	173	358	4.79	3	41	208	-1	0.001	-5	-2
78240	369749	5407313	North	51	45	194	346	4.63	5	44	218	-1	0.007	-5	-2
78241	369751	5407312	North	46	49	194	335	4.59	5	40	211	-1	0.002	-5	-2
78242	369752	5407310	North	38	44	251	364	5.03	5	40	228	-1	0.002	-5	-2
78243	369753	5407309	North	61	27	193	418	4.55	3	37	204	-1	0.002	-5	-2
78244	369755	5407307	North	50	30	265	443	5.08	3	39	215	-1	0.002	-5	-2
78245	369756	5407305	North	41	12	358	458	5.43	4	47	243	-1	-0.001	-5	-2
78246	369757	5407304	North	53	41	309	361	4.93	4	33	195	-1	0.005	-5	-2
78247	369758	5407302	North	66	11	245	274	3.78	9	28	149	-1	0.004	-5	-2
78248	369760	5407301	North	39	17	507	791	7.2	9	68	327	-1	0.001	-5	-2
78249	369761	5407299	North	72	40	540	513	5.22	11	61	250	-1	-0.001	-5	-2
78250	369762	5407298	North	67	29	382	400	5.02	4	41	182	-1	0.005	-5	-2
78251	369763	5407296	North	51	23	230	238	2.97	4	18	122	-1	0.005	-5	-2
78252	369764	5407295	North	34	37	221	256	3.27	11	16	114	-1	0.017	-5	-2
78253	369766	5407293	North	46	54	350	432	5.35	21	26	213	-1	0.002	-5	-2

78254	369767	5407291	North	31	176	356	1410	6.58	32	7	68	-1	0.004	-5	-2
78255	369768	5407290	North	38	65	527	377	4.54	19	22	217	-1	0.002	-5	-2
78256	369770	5407288	North	45	103	778	308	4.71	15	30	281	-1	0.001	-5	-2
78257	369771	5407287	North	23	220	949	353	5.82	12	34	276	-1	-0.001	-5	-2
78258	369772	5407285	North	66	620	1100	344	10.11	348	25	286	1	0.004	-5	-2
78259	369773	5407284	North	49	763	1340	684	11.87	326	16	241	1	0.005	-5	-2
78260	369774	5407282	North	73	919	2050	1370	9.43	746	14	229	4	0.014	-5	-2
78261	369775	5407280	North	87	531	2060	1260	5.67	142	20	245	2	0.009	-5	-2
78262	369776	5407278	North	29	186	401	599	5.22	123	20	209	-1	0.002	-5	-2
78263	369776	5407276	North	32	171	348	657	4.26	115	19	196	-1	0.002	-5	-2
78264	369776	5407274	North	51	248	576	962	4.81	178	10	151	2	0.01	-5	-2
78265	369776	5407272	North	70	836	744	479	4.54	383	-5	44	-1	0.01	-5	-2
78266	369778	5407269	North	66	1370	340	318	3.87	746	-5	26	1	0.015	-5	-2
78267	369779	5407267	North	61	358	272	545	4.47	175	-5	40	-1	0.002	-5	-2
78268	369781	5407266	North	52	516	249	278	3.24	159	-5	30	1	0.012	-5	-2
78269	369782	5407264	North	39	441	244	359	3.79	120	-5	42	1	0.008	-5	-2
78270	369783	5407263	North	34	263	428	508	4.69	78	-5	42	1	0.002	-5	-2
78271	369784	5407261	North	37	301	314	676	4.25	207	-5	55	1	0.004	-5	-2
78272	369786	5407260	North	29	338	183	389	3.08	101	-5	43	1	0.004	-5	-2
78273	369787	5407258	North	89	72	459	383	8.57	75	29	293	-1	0.001	-5	-2
78274	369788	5407257	North	40	78	474	403	10.63	124	43	367	-1	0.003	-5	-2
78275	369790	5407255	North	48	30	222	286	6.94	39	26	248	-1	0.002	-5	-2
78276	369791	5407254	North	47	47	293	400	10.63	42	51	396	-1	0.002	-5	-2
78277	369792	5407252	North	24	114	749	544	10.33	230	34	383	-1	0.001	-5	-2
78278	369793	5407251	North	85	175	725	456	12.17	177	31	404	1	0.005	-5	-2
78279	369795	5407249	North	31	160	352	343	9.81	204	30	336	-1	0.005	-5	-2
78280	369796	5407248	North	22	76	336	318	9.91	85	28	324	-1	0.002	-5	-2
78281	369797	5407246	North	52	92	460	477	10.13	44	41	408	-1	0.006	-5	-2
78282	369799	5407245	North	34	293	1120	777	11.98	237	35	370	1	0.005	-5	-2
78283	369800	5407243	North	26	518	1890	761	10.95	530	29	324	3	0.007	-5	-2
78284	369801	5407242	North	58	1330	2460	1770	11.34	931	33	284	2	0.011	-5	-2
78285	369803	5407240	North	61	778	1720	2450	8.09	282	36	288	3	0.006	-5	-2
78286	369804	5407238	North	52	143	525	1310	8.08	26	86	312	-1	0.004	-5	-2
78287	369805	5407237	North	57	164	404	722	7.8	18	88	318	-1	0.002	-5	28
78288	369806	5407236	North	38	58	177	470	6.24	10	46	221	-1	-0.001	-5	16
78289	369808	5407234	North	42	65	123	373	6.96	8	38	197	-1	0.001	-5	13

78290	369809	5407233	North	18	21	84	1060	6.14	6	43	227	-1	-0.001	-5	10
78291	369810	5407231	North	34	33	97	549	6.8	7	43	232	-1	-0.001	-5	8
78292	369811	5407230	North	31	25	93	543	6.53	6	33	205	-1	0.002	-5	6
78293	369813	5407228	North	16	22	107	463	6.03	8	39	235	-1	-0.001	-5	4
78294	369814	5407226	North	32	37	115	344	6.39	7	28	177	-1	0.001	-5	5
78295	369815	5407225	North	40	61	139	315	5.87	6	28	175	-1	0.004	-5	4
78296	369817	5407223	North	31	16	66	396	5.74	4	27	138	-1	0.004	-5	3
78297	369818	5407222	North	32	11	55	499	6.25	6	28	143	-1	0.001	-5	2
78298	369819	5407220	North	36	20	72	403	5.67	4	36	162	-1	0.002	-5	2
78299	369820	5407219	North	46	9	107	327	4.4	5	32	227	-1	0.003	-5	2
78300	369822	5407217	North	82	-5	34	310	4.08	2	30	272	-1	0.002	-5	2
78301	369823	5407216	North	39	-5	31	314	3.97	3	31	254	-1	0.002	-5	-2
78302	369824	5407214	North	28	-5	35	334	4.22	2	33	280	-1	-0.001	-5	-2
78303	369825	5407213	North	38	7	57	345	5.23	6	37	275	-1	0.007	-5	2
78304	369827	5407211	North	44	44	84	353	5.72	9	41	251	-1	0.004	-5	2
78305	369828	5407210	North	34	-5	51	398	5.81	6	40	221	-1	-0.001	-5	-2
78306	369829	5407208	North	40	-5	47	389	5.34	5	33	199	-1	-0.001	-5	-2
78307	369830	5407207	North	31	6	58	368	6.34	11	37	197	-1	0.004	-5	-2
78308	369832	5407205	North	32	-5	46	461	5.37	7	36	186	-1	0.004	-5	-2
78309	369833	5407203	North	30	12	74	317	4.36	8	42	178	-1	0.004	-5	-2
78310	369834	5407202	North	103	5	95	397	5.62	8	49	201	-1	0.011	-5	-2
78311	369836	5407200	North	49	141	267	331	4.58	23	49	320	-1	0.006	-5	-2
78312	369837	5407199	North	67	68	203	349	4.2	12	45	279	-1	0.004	-5	-2
78313	369838	5407197	North	46	20	111	400	5	7	39	269	-1	0.005	-5	-2
78314	369839	5407195	North	22	10	94	479	4.94	7	38	218	-1	0.005	-5	-2
78315	369841	5407194	North	33	57	163	297	4.41	12	40	251	-1	0.004	-5	-2
78316	369842	5407192	North	32	47	151	338	4.09	10	41	226	-1	0.001	-5	-2
78317	369843	5407191	North	9	26	116	355	4.14	7	40	220	-1	0.003	-5	-2
78318	369844	5407189	North	9	13	80	429	4.67	6	41	232	-1	0.008	-5	-2
78319	369845	5407188	North	38	25	102	341	3.77	7	38	242	-1	-0.001	-5	-2
78320	369847	5407186	North	40	31	107	427	5.31	12	41	275	-1	0.008	-5	-2
78321	369848	5407184	North	31	69	105	345	4.21	9	37	232	-1	0.004	-5	-2
78401	369290	5407030	South	39	-5	47	698	4.81	5	33	155	-1	0.002	-5	-2
78402	369280	5407070	South	4	-5	7	91	0.99	1	-5	16	-1	0.012	-5	3
78403	369786	5407262	North	46	-5	59	2660	4.88	3	40	279	-1	0.001	-5	-2
78404	369442.1	5406879	South	9	6	7	82	0.91	3	-5	7	-1	0.002	-5	3

78405	369441	5406881	South	16	1460	38	459	1.24	16	5	24	60	0.002	-5	-2
78406	369501	5406825	South	79	5100	2830	1740	9.17	850	25	289	47	0.019	-5	-2
78407	369485	5406837	South	88	1240	169	1220	3.79	59	-5	24	4	0.002	-5	3
78408	369785	5407261	North	25	223	213	1160	3.87	131	-5	43	2	0.004	-5	3
78409	369786	5407260	North	12	38	36	80	0.98	17	-5	13	-1	-0.001	-5	3
78410	369505	5406821	South	237	8880	1980	1290	9.14	506	20	289	20	0.018	-5	-2
78411	369504	5406821	South	196	6820	2380	1890	9.58	758	21	302	28	0.016	-5	2
78412	369503	5406822	South	95	5300	2430	3230	9.39	318	25	343	15	0.002	-5	2
78413	369503	5406823	South	116	11600	2880	3490	11.06	401	27	358	20	0.019	-5	2
78414	369502	5406824	South	108	7550	3630	1930	11.21	788	30	327	30	0.015	-5	-2
78415	369501	5406824	South	46	4510	4980	3180	9.04	1270	34	345	4	0.008	-5	-2
78416	369501	5406825	South	42	2090	3070	1850	8.27	771	40	415	2	0.004	-5	-2
78417	369500	5406825	South	47	1770	2350	1380	6.81	180	39	419	2	0.006	-5	-2
78418	369499	5406826	South	46	992	1620	619	5.85	171	40	259	-1	0.001	-5	-2
78419	369498	5406827	South	33	862	1050	460	4.95	89	39	238	-1	-0.001	-5	-2
78420	369467	5406853	South	36	599	414	433	3.72	24	37	189	1	-0.001	-5	-2
78421	369466	5406854	South	55	939	578	361	4.23	19	40	206	2	0.003	-5	-2
78422	369465	5406854	South	58	1240	778	418	4.55	36	46	253	1	0.007	-5	-2
78423	369465	5406855	South	55	875	681	461	4.48	25	44	269	1	0.002	-5	-2
78424	369464	5406856	South	85	1230	521	764	4.93	49	44	265	1	0.012	-5	-2
78425	369463	5406856	South	66	1690	728	491	5.82	26	68	305	1	0.017	-5	-2

303155

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM219 0.001	Au PM219 ppm CHECKS 0.001	Cu ppm IC580 2	Pb ppm IC580 5	Zn ppm IC580 2	Ag ppm IC580 1
78101		0.002		45	116	315	1
78102		0.004		49	127	283	1
78103		0.002		43	39	130	1
78104		0.005		30	12	54	1
78105		0.001		43	10	62	1
78106		0.002		45	22	69	1
78107		0.003	0.001	50	<5	53	1
78108		0.002	0.002	56	12	61	1
78109		0.004	0.003	62	10	61	1
78110		0.004		52	14	64	1
78111		0.003		85	9	46	1
78112		0.001		46	<5	46	1
78113		0.002		47	<5	64	1
78114		0.002		51	<5	63	1
78115		0.001		48	<5	61	1
78116		0.002		44	<5	65	1
78117		0.001		77	<5	60	1
78118		0.003		32	<5	72	1
78119		0.001		25	<5	41	1
78120		0.001		37	19	80	1
78121		0.001		43	<5	53	1
78122		0.001		38	<5	36	1
78123		0.002		37	<5	34	1
78124		0.002		36	9	40	1
78125		0.002		39	<5	43	1
78126		0.007	0.009	36	5	72	1
78127		0.002		58	14	110	1
78128		0.003		35	106	154	1
78129		0.003		30	271	247	1
78130		0.002		32	160	120	1

COMMENTS:

Pb values >1.00% reassayed by Method A101.
Ag values >25ppm reassayed by Method A101.

• This is the Final Report which supersedes any preliminary reports with this batch number.

• Results apply to sample(s) as submitted by client.

Alice Springs Laboratory
Phone: (089) 52 6020 Fax: (089) 52 6028
Bendigo Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
Brisbane Laboratory
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Charters Towers Laboratory
Phone: (077) 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
Mt Isa Laboratory
Phone: (077) 49 5545 Fax: (077) 49 5546
New Zealand Laboratory
Phone: (07) 575 7654 Fax: (07) 575 7641
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

All pages of this report have been checked and approved for release.

303150

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM219 0.001	Au PM219 ppm CHECKS 0.001	Cu ppm IC580 2	Pb ppm IC580 5	Zn ppm IC580 2	Ag ppm IC580 1
78131		0.004		34	132	168	1
78132		0.005		49	313	272	1
78133		0.018		590	1360	686	4
78134		0.862	0.604	341	3460	1340	7
78135		0.614	0.645	196	2190	817	4
78136		0.013	0.011	50	1070	978	2
78137		0.066	0.063	147	1000	805	4
78138		0.057	0.038	276	1700	617	3
78139		0.018		208	1340	677	6
78140		0.009		109	1010	578	3
78141		0.002	0.003	70	1680	1290	2
78142		0.004	0.003	36	1420	1190	2
78143		0.009	0.011	95	1100	1330	7
78144		0.012		154	2300	3340	22
78145		0.012		243	6710	2270	15
78151		0.002		45	1260	1190	1
78152		0.001		34	867	941	1
78153		<0.001		45	1060	499	1
78154		0.006		33	721	447	1
78155		0.046	0.035	65	3260	814	5
78156		0.012	0.009	43	1340	590	2
78157		0.004	0.005	40	1380	737	1
78158		0.006		36	1320	614	1
78159		0.002		48	997	510	1
78160		<0.001		33	1050	525	1
78161		0.001		59	1130	590	1
78162		0.005		48	1010	580	1
78163		0.005	0.003	45	959	546	1
78164		0.013	0.014	57	2000	454	2
78165		0.010		27	1260	487	1

~240 E, 100S

10 x 1m spaced samples #78410 - 78419

COMMENTS:

• This is the Final Report which supersedes any preliminary reports with this batch number.

• Results apply to sample(s) as submitted by client.

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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM219 0.001	Au PM219 ppm CHECKS 0.001	Cu ppm IC580 2	Pb ppm IC580 5	Zn ppm IC580 2	Ag ppm IC580 1
78166		0.008		46	1110	666	1
78167		0.011		31	843	757	1
78168		0.006		83	678	578	1
78169		0.004		66	705	480	1
78170		0.009		53	1030	461	2
78174		0.016		78	1930	619	1
78175		0.008		67	1330	486	1
78176		0.005		31	740	362	1
78177		0.004		29	487	327	1
78178		0.004		26	654	294	<1
78179		0.005		39	583	324	1
78180		0.010		48	625	221	1
78181		0.002		18	429	272	<1
78182		0.002		23	348	253	<1
78183		0.008		30	211	189	<1
78184		0.001		25	166	145	<1
78185		0.002		51	176	145	<1
78186		0.002	0.002	52	70	121	<1
78187		<0.001		46	64	203	<1
78188		0.004		35	78	176	<1
78189		0.001		32	98	121	1
78190		0.002		45	81	143	<1
78191		0.004		47	316	126	<1
78192		<0.001		34	8	115	<1
78193		<0.001		48	<5	96	<1
78194		0.002		33	<5	91	<1
78195		<0.001		107	6	99	<1
78196		0.003		110	5	88	<1
78197		0.006		61	5	98	<1
78198		0.005		32	<5	115	<1

COMMENTS:

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AUSTRALIAN LABORATORY SERVICES P/L

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ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM219 0.001	Au PM219 ppm CHECKS 0.001	Cu ppm IC580 2	Pb ppm IC580 5	Zn ppm IC580 2	Ag ppm IC580 1
78199		<0.001	<0.001	38	<5	129	<1
78200		<0.001	0.001	87	6	121	<1
78201		0.001	<0.001	55	<5	132	<1
78202		<0.001		31	<5	103	<1
78203		<0.001		40	<5	130	<1
78204		0.001		33	<5	121	<1
78205		0.001		41	<5	111	<1
78206		<0.001		74	<5	108	<1
78207		0.002		68	<5	101	<1
78208		0.002		27	<5	93	<1
78209		0.002		30	<5	88	<1
78210		0.004		126	<5	84	<1
78211		0.001		21	<5	76	<1
78212		0.001		155	<5	89	<1
78213		<0.001		76	<5	122	<1
78214		0.001		131	<5	126	<1
78215		0.001		71	<5	151	<1
78216		0.005		62	<5	159	<1
78217		0.004		93	<5	121	<1
78218		0.002		68	8	136	<1
78219		<0.001		114	6	126	<1
78220		<0.001	0.001	64	<5	106	<1
78221		0.004		97	6	107	<1
78222		<0.001		87	<5	94	<1
78223		0.002		93	<5	114	<1
78224		0.002		54	<5	101	<1
78225		0.002		63	<5	101	<1
78226		0.001		88	<5	100	<1
78229		<0.001		61	62	151	<1
78230		0.001		52	47	137	<1

1000 ↑ — 78226
4000N ↓ — 78229

COMMENTS:

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AUSTRALIAN LABORATORY SERVICES P/L
A.C.N. 009 936 029

ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM219 0.001	Au PM219 ppm CHECKS 0.001	Cu ppm IC580 2	Pb ppm IC580 5	Zn ppm IC580 2	Ag ppm IC580 1
78231		0.001		18	68	95	<1
78232		<0.001		20	58	158	<1
78233		<0.001		18	77	180	<1
78234		0.002		31	74	184	<1
78235		<0.001	0.003	36	131	216	<1
78236		0.002	0.002	45	121	201	<1
78237		0.004	0.003	50	102	177	<1
78238		0.001		56	59	222	<1
78239		0.001		49	21	173	<1
78240		0.007		51	45	194	<1
78241		0.002		46	49	194	<1
78242		0.002		38	44	251	<1
78243		0.002		61	27	193	<1
78244		0.002		50	30	265	<1
78245		<0.001		41	12	358	<1
78246		0.005		53	41	309	<1
78247		0.004		66	11	245	<1
78248		0.001		39	17	507	<1
78249		<0.001		72	40	540	<1
78250		0.005		67	29	382	<1
78251		0.005		51	23	230	<1
78252		0.017		34	37	221	<1
78253		0.002		46	54	350	<1
78254		0.004		31	176	356	<1
78255		0.002		38	65	527	<1
78256		0.001	<0.001	45	103	778	<1
78257		<0.001		23	220	949	<1
78258		0.004		66	620	1100	1
78259		0.005		49	763	1340	1
78260		0.014		73	919	2050	4

COMMENTS:

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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT	Au	Au PM219	Cu	Pb	Zn	Ag
	UNIT	ppm	ppm	ppm	ppm	ppm	ppm
	METHOD	PM219	CHECKS	IC580	IC580	IC580	IC580
	L.O.R.	0.001	0.001	2	5	2	1
78261		0.009		87	531	2060	2
78262		0.002		29	186	401	<1
78263		0.002		32	171	348	<1
78264		0.010		51	248	576	2
78265		0.010		70	836	744	<1
78266		0.015		66	1370	340	1
78267		0.002		61	358	272	<1
78268		0.012		52	516	249	1
78269		0.009	0.007	39	441	244	1
78270		0.002	0.003	34	263	428	1
78271		0.004	0.004	37	301	314	1
78272		0.004		29	338	183	1
78273		0.001		89	72	459	<1
78274		0.003		40	78	474	<1
78275		0.002		48	30	222	<1
78276		0.002		47	47	293	<1
78277		0.001		24	114	749	<1
78278		0.005		85	175	725	1
78279		0.005	0.005	31	160	352	<1
78280		0.002		22	76	336	<1
78281		0.006		52	92	460	<1
78282		0.005		34	293	1120	1
78283		0.007		26	518	1890	3
78284		0.011		58	1330	2460	2
78285		0.006		61	778	1720	3
78286		0.004		52	143	525	<1
78287		0.002		57	164	404	<1
78288		<0.001		38	58	177	<1
78289		0.001		42	65	123	<1
78290		<0.001		18	21	84	<1

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AUSTRALIAN LABORATORY SERVICES P/L

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ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM219 0.001	Au PM219 ppm CHECKS 0.001	Cu ppm IC580 2	Pb ppm IC580 5	Zn ppm IC580 2	Ag ppm IC580 1
78291		<0.001		34	33	97	<1
78292		0.002	<0.001	31	25	93	<1
78293		<0.001	<0.001	16	22	107	<1
78294		0.001	<0.001	32	37	115	<1
78295		0.004		40	61	139	<1
78296		0.004		31	16	66	<1
78297		0.001		32	11	55	<1
78298		0.002		36	20	72	<1
78299		0.003		46	9	107	<1
78300		0.002		82	<5	34	<1
78301		0.002		39	<5	31	<1
78302		<0.001		28	<5	35	<1
78303		0.007		38	7	57	<1
78304		0.004		44	44	84	<1
78305		<0.001		34	<5	51	<1
78306		<0.001		40	<5	47	<1
78307		0.004		31	6	58	<1
78308		0.004	0.003	32	<5	46	<1
78309		0.003	0.005	30	12	74	<1
78310		0.011	0.011	103	5	95	<1
78311		0.006		49	141	267	<1
78312		0.004		67	68	203	<1
78313		0.005		46	20	111	<1
78314		0.005		22	10	94	<1
78315		0.004		33	57	163	<1
78316		0.001		32	47	151	<1
78317		0.003		9	26	116	<1
78318		0.008		9	13	80	<1
78319		<0.001		38	25	102	<1
78320		0.008		40	31	107	<1

COMMENTS:

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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

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ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

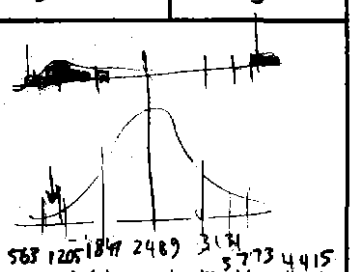
SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM219 0.001	Au PM219 ppm CHECKS 0.001	Cu ppm IC580 2	Pb ppm IC580 5	Zn ppm IC580 2	Ag ppm IC580 1
78401		0.002		39	<5	47	<1
78402		0.012		4	<5	7	<1
78403		0.001		46	<5	59	<1
78404	cherty rock chips (6-ctw)	0.002		9	6	7	<1
78405		0.002		16	1460	38	60 *
78406	gossanous rock chip →	0.019		79	5100	2830	47
78407		0.002	0.002	88	1240	169	4
78408		0.004		25	223	213	2
78409		<0.001		12	38	36	<1
78410	goethitic zone	0.018		237	8880 (7850)	1980	20
78411		0.016		196	6820	2380	28
78412		0.002		95	5300 (8450)	2430	15
78413		0.019		116	1.16%	2880	20
78414		0.015		108	7550 (6030)	3630	30
78415	1m spaced samples	0.008		46	4510	4980	4
78416		0.004		42	2090 (1930)	3070	2
78417		0.006		47	1770	2350	2
78418	(210-220 E) 100 S	0.001		46	992 (927)	1620	<1
78419		<0.001		33	862	1050	<1
78420	A.L.D. sample 78018 →	<0.001		36	599	414	1
78421		0.003		55	939	578	2
78422	1m spaced samples	0.007		58	1240	778	1
78423		0.002		55	875	681	1
78424		0.012		85	1230	521	1
78425		0.017		66	1690	728	1
78321		0.004	0.005	31	69	105	<1
				16m @ 3536 ppm Pb	18m @ 3246 ppm Pb	16m @ 1687 ppm Zn	16m @ 14.6 ppm Ag

COMMENTS:

$$\sigma = \sqrt{\frac{\Sigma(x)^2}{n-1}} = \sqrt{\frac{39821(2489)^2}{(15)}}$$

?642

$\bar{x} = 2489$
$\sigma_n = 2651.7$
$\Sigma = 39821$
$\sigma_{n-1} = 2739$



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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT	As	Fe	Mn	Co	Mo	Ni
	UNIT	ppm	%	ppm	ppm	ppm	ppm
	METHOD	IC580	IC580	IC580	IC580	IC580	IC580
	L.O.R.	1	0.01	5	5	2	5
78101		14	7.05	439	17	<2	98
78102		22	7.85	428	24	<2	142
78103		6	5.56	373	40	<2	250
78104		2	5.95	444	46	<2	248
78105		6	7.23	510	48	<2	269
78106		3	8.13	531	45	<2	251
78107		4	6.59	560	52	<2	284
78108		4	7.21	449	50	<2	277
78109		2	7.91	477	53	<2	254
78110		3	7.38	425	54	<2	298
78111		2	6.77	499	42	<2	218
78112		1	6.78	534	45	<2	257
78113		3	8.84	511	52	<2	308
78114		2	7.79	516	55	<2	332
78115		3	8.07	561	48	<2	272
78116		3	8.19	562	53	<2	315
78117		5	7.77	589	45	<2	253
78118		3	9.15	544	44	<2	269
78119		2	9.62	526	39	<2	238
78120		2	7.38	406	38	<2	253
78121		2	6.86	433	42	<2	269
78122		<1	6.82	450	47	<2	273
78123		1	5.81	464	40	<2	248
78124		<1	5.29	459	41	<2	274
78125		1	5.39	457	42	<2	281
78126		2	5.82	435	40	<2	246
78127		7	7.91	499	41	<2	240
78128		30	7.36	557	43	<2	255
78129		26	6.33	635	40	<2	224
78130		24	4.78	480	41	<2	249

COMMENTS:

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AUSTRALIAN LABORATORY SERVICES P/L

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ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC580 1	Fe % IC580 0.01	Mn ppm IC580 5	Co ppm IC580 5	Mo ppm IC580 2	Ni ppm IC580 5
78131		11	6.30	378	47	<2	267
78132		25	7.23	249	36	<2	257
78133		459	8.92	190	19	<2	236
78134		424	9.85	267	12	<2	127
78135		788	8.77	384	16	<2	204
78136		276	9.83	775	20	<2	225
78137		285	9.53	701	13	<2	181
78138		577	9.47	190	6	<2	130
78139		578	7.64	148	6	<2	98
78140		361	7.97	269	12	<2	206
78141		249	10.54	611	34	<2	478
78142		306	9.10	482	18	<2	311
78143		396	7.17	1440	12	<2	243
78144		581	10.46	1820	18	<2	305
78145		733	9.35	1300	18	<2	303
78151		80	6.01	1040	50	<2	270
78152		24	4.96	534	43	<2	234
78153		25	5.48	1030	40	<2	219
78154		32	5.44	629	32	<2	176
78155		541	6.17	956	24	<2	138
78156		128	5.39	752	33	<2	168
78157		166	6.06	801	35	<2	170
78158		40	4.68	608	41	<2	206
78159		58	4.49	510	34	<2	161
78160		95	4.81	539	38	<2	149
78161		120	5.23	547	41	<2	176
78162		132	5.12	548	40	<2	165
78163		167	5.20	518	42	<2	187
78164		414	6.97	490	42	<2	360
78165		301	5.86	437	36	<2	285

COMMENTS:

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• Results apply to sample(s) as submitted by client.

Alice Springs Laboratory
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305103

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC580 1	Fe % IC580 0.01	Mn ppm IC580 5	Co ppm IC580 5	Mo ppm IC580 2	Ni ppm IC580 5
78166		335	6.06	524	39	<2	255
78167		127	4.97	435	33	<2	156
78168		37	4.54	528	34	<2	208
78169		23	4.34	544	36	<2	250
78170		31	4.38	528	39	<2	221
78174		22	5.84	625	82	<2	332
78175		41	6.32	3890	100	<2	285
78176		36	6.09	673	58	<2	259
78177		12	5.10	608	53	<2	289
78178		8	4.63	539	52	<2	237
78179		29	4.13	609	39	<2	176
78180		63	4.03	715	31	<2	142
78181		10	4.07	619	43	<2	172
78182		7	3.49	564	36	<2	126
78183		11	3.78	487	34	<2	148
78184		21	4.96	517	45	<2	209
78185		16	4.44	474	55	<2	182
78186		13	4.14	397	39	<2	164
78187		10	4.05	413	41	<2	165
78188		7	3.86	441	40	<2	171
78189		12	3.74	586	34	<2	139
78190		13	4.82	550	33	<2	189
78191		10	4.10	539	31	<2	178
78192		6	4.79	680	42	<2	240
78193		7	6.44	803	51	<2	238
78194		6	6.70	782	49	<2	223
78195		8	6.79	786	47	<2	258
78196		9	7.86	769	37	<2	156
78197		8	7.44	740	37	<2	155
78198		6	7.20	1080	39	<2	144

COMMENTS:

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ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT	As	Fe	Mn	Co	Mo	Ni
	UNIT	ppm	%	ppm	ppm	ppm	ppm
	METHOD	IC580	IC580	IC580	IC580	IC580	IC580
	L.O.R.	1	0.01	5	5	2	5
78199		9	7.94	1120	42	<2	156
78200		7	7.47	950	39	<2	147
78201		9	8.71	1010	46	<2	159
78202		10	7.11	827	37	<2	128
78203		8	9.05	1160	45	<2	146
78204		9	8.70	1060	45	<2	154
78205		11	8.31	851	42	<2	165
78206		11	8.09	852	47	<2	167
78207		11	7.71	883	42	<2	140
78208		10	7.76	940	43	<2	126
78209		7	7.56	836	42	<2	133
78210		8	7.44	809	41	<2	136
78211		7	6.87	842	39	<2	124
78212		4	6.76	763	42	<2	263
78213		6	7.51	633	42	<2	328
78214		8	7.27	623	41	<2	341
78215		8	6.62	751	39	<2	297
78216		7	6.56	773	41	<2	282
78217		5	6.35	696	35	<2	193
78218		6	7.03	659	35	<2	202
78219		6	6.87	637	31	<2	166
78220		3	6.49	658	29	<2	134
78221		6	6.84	563	33	<2	192
78222		2	6.66	632	33	<2	172
78223		4	7.76	565	38	<2	260
78224		4	7.02	515	38	<2	246
78225		3	6.10	606	37	<2	194
78226		1	5.55	831	30	<2	124
78229		2	4.51	451	41	<2	230
78230		2	4.52	487	45	<2	219

COMMENTS:

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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC580 1	Fe % IC580 0.01	Mn ppm IC580 5	Co ppm IC580 5	Mo ppm IC580 2	Ni ppm IC580 5
78231		2	2.77	247	26	<2	114
78232		2	5.37	481	51	<2	198
78233		3	5.05	409	42	<2	192
78234		6	4.89	387	43	<2	193
78235		8	4.85	345	46	<2	226
78236		5	4.32	286	44	<2	241
78237		2	3.81	315	34	<2	187
78238		3	5.05	391	49	<2	215
78239		3	4.79	358	41	<2	208
78240		5	4.63	346	44	<2	218
78241		5	4.59	335	40	<2	211
78242		5	5.03	364	40	<2	228
78243		3	4.55	418	37	<2	204
78244		3	5.08	443	39	<2	215
78245		4	5.43	458	47	<2	243
78246		4	4.93	361	33	<2	195
78247		9	3.78	274	28	<2	149
78248		9	7.20	791	68	<2	327
78249		11	5.22	513	61	<2	250
78250		4	5.02	400	41	<2	182
78251		4	2.97	238	18	<2	122
78252		11	3.27	256	16	<2	114
78253		21	5.35	432	26	<2	213
78254		32	6.58	1410	7	<2	68
78255		19	4.54	377	22	<2	217
78256		15	4.71	308	30	<2	281
78257		12	5.82	353	34	<2	276
78258		348	10.11	344	25	<2	286
78259		326	11.87	684	16	<2	241
78260		746	9.43	1370	14	<2	229

COMMENTS:

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AUSTRALIAN LABORATORY SERVICES P/L

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ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT	As	Fe	Mn	Co	Mo	Ni
	UNIT	ppm	%	ppm	ppm	ppm	ppm
	METHOD	IC580	IC580	IC580	IC580	IC580	IC580
	L.O.R.	1	0.01	5	5	2	5
78261		142	5.67	1260	20	<2	245
78262		123	5.22	599	20	<2	209
78263		115	4.26	657	19	<2	196
78264		178	4.81	962	10	<2	151
78265		383	4.54	479	<5	<2	44
78266		746	3.87	318	<5	<2	26
78267		175	4.47	545	<5	<2	40
78268		159	3.24	278	<5	<2	30
78269		120	3.79	359	<5	<2	42
78270		78	4.69	508	<5	<2	42
78271		207	4.25	676	<5	<2	55
78272		101	3.08	389	<5	<2	43
78273		75	8.57	383	29	<2	293
78274		124	10.63	403	43	<2	367
78275		39	6.94	286	26	<2	248
78276		42	10.63	400	51	<2	396
78277		230	10.33	544	34	<2	383
78278		177	12.17	456	31	<2	404
78279		204	9.81	343	30	<2	336
78280		85	9.91	318	28	<2	324
78281		44	10.13	477	41	<2	408
78282		237	11.98	777	35	<2	370
78283		530	10.95	761	29	<2	324
78284		931	11.34	1770	33	<2	284
78285		282	8.09	2450	36	<2	288
78286		26	8.08	1310	86	<2	312
78287		18	7.80	722	88	28	318
78288		10	6.24	470	46	16	221
78289		8	6.96	373	38	13	197
78290		6	6.14	1060	43	10	227

COMMENTS:

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AUSTRALIAN LABORATORY SERVICES P/L
A.C.N. 009 936 029

ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT	As	Fe	Mn	Co	Mo	Ni
	UNIT	ppm	%	ppm	ppm	ppm	ppm
	METHOD	IC580	IC580	IC580	IC580	IC580	IC580
	L.O.R.	1	0.01	5	5	2	5
78291		7	6.80	549	43	8	232
78292		6	6.53	543	33	6	205
78293		8	6.03	463	39	4	235
78294		7	6.39	344	28	5	177
78295		6	5.87	315	28	4	175
78296		4	5.74	396	27	3	138
78297		6	6.25	499	28	2	143
78298		4	5.67	403	36	2	162
78299		5	4.40	327	32	2	227
78300		2	4.08	310	30	2	272
78301		3	3.97	314	31	<2	254
78302		2	4.22	334	33	<2	280
78303		6	5.23	345	37	2	275
78304		9	5.72	353	41	2	251
78305		6	5.81	398	40	<2	221
78306		5	5.34	389	33	<2	199
78307		11	6.34	368	37	<2	197
78308		7	5.37	461	36	<2	186
78309		8	4.36	317	42	<2	178
78310		8	5.62	397	49	<2	201
78311		23	4.58	331	49	<2	320
78312		12	4.20	349	45	<2	279
78313		7	5.00	400	39	<2	269
78314		7	4.94	479	38	<2	218
78315		12	4.41	297	40	<2	251
78316		10	4.09	338	41	<2	226
78317		7	4.14	355	40	<2	220
78318		6	4.67	429	41	<2	232
78319		7	3.77	341	38	<2	242
78320		12	5.31	427	41	<2	275

COMMENTS:

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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC580 1	Fe % IC580 0.01	Mn ppm IC580 5	Co ppm IC580 5	Mo ppm IC580 2	Ni ppm IC580 5
78401		5	4.81	698	33	<2	155
78402		1	0.99	91	<5	3	16
78403		3	4.88	2660	40	<2	279
78404		3	0.91	82	<5	3	7
78405		16	1.24	459	5	<2	24
78406		850	9.17	1740	25	<2	289
78407		59	3.79	1220	<5	3	24
78408		131	3.87	1160	<5	3	43
78409		17	0.98	80	<5	3	13
78410		506	9.14	1290	20	<2	289
78411		758	9.58	1890	21	2	302
78412		318	9.39	3230	25	2	343
78413		401	11.06	3490	27	2	358
78414		788	11.21	1930	30	<2	327
78415		1270	9.04	3180	34	<2	345
78416		771	8.27	1850	40	<2	415
78417		180	6.81	1380	39	<2	419
78418		171	5.85	619	40	<2	259
78419		89	4.95	460	39	<2	238
78420		24	3.72	433	37	<2	189
78421		19	4.23	361	40	<2	206
78422		36	4.55	418	46	<2	253
78423		25	4.48	461	44	<2	269
78424		49	4.93	764	44	<2	265
78425		26	5.82	491	68	<2	305
78321		9	4.21	345	37	<2	232

COMMENTS:

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AUSTRALIAN LABORATORY SERVICES P/L
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ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Bi ppm IC580 5	SDS ALS 1				
78101		<5	2307				
78102		<5	2307				
78103		<5	2307				
78104		<5	2307				
78105		<5	2307				
78106		<5	2307				
78107		<5	2307				
78108		<5	2307				
78109		<5	2307				
78110		<5	2307				
78111		<5	2307				
78112		<5	2307				
78113		<5	2307				
78114		<5	2307				
78115		<5	2307				
78116		<5	2307				
78117		<5	2307				
78118		<5	2307				
78119		<5	2307				
78120		<5	2307				
78121		<5	2307				
78122		<5	2307				
78123		<5	2307				
78124		<5	2307				
78125		<5	2307				
78126		<5	2307				
78127		<5	2307				
78128		<5	2307				
78129		<5	2307				
78130		<5	2307				

COMMENTS:

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AUSTRALIAN LABORATORY SERVICES P/L
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ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Bi ppm IC580 5	SDS ALS 1				
78131		<5	2307				
78132		<5	2307				
78133		<5	2307				
78134		<5	2307				
78135		<5	2307				
78136		<5	2307				
78137		<5	2307				
78138		<5	2307				
78139		<5	2307				
78140		<5	2307				
78141		<5	2307				
78142		<5	2307				
78143		<5	2307				
78144		<5	2307				
78145		<5	2307				
78151		<5	2307				
78152		<5	2307				
78153		<5	2307				
78154		<5	2307				
78155		<5	2307				
78156		<5	2307				
78157		<5	2307				
78158		<5	2307				
78159		<5	2307				
78160		<5	2307				
78161		<5	2307				
78162		<5	2307				
78163		<5	2307				
78164		<5	2307				
78165		<5	2307				

COMMENTS:

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ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Bi ppm ID580 5	SDS ALS 1				
78166		<5	2307				
78167		<5	2307				
78168		<5	2307				
78169		<5	2307				
78170		<5	2307				
78174		<5	2307				
78175		<5	2307				
78176		<5	2307				
78177		<5	2307				
78178		<5	2307				
78179		<5	2307				
78180		<5	2307				
78181		<5	2307				
78182		<5	2307				
78183		<5	2307				
78184		<5	2307				
78185		<5	2307				
78186		<5	2307				
78187		<5	2307				
78188		<5	2307				
78189		<5	2307				
78190		<5	2307				
78191		<5	2307				
78192		<5	2307				
78193		<5	2307				
78194		<5	2307				
78195		<5	2307				
78196		<5	2307				
78197		<5	2307				
78198		<5	2307				

COMMENTS:

• This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

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Bendigo Laboratory
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303174 AUSTRALIAN LABORATORY SERVICES P/L
A.C.N. 009 936 029

ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Bi ppm IC580 5	SDS ALS 1				
78199		<5	2307				
78200		<5	2307				
78201		<5	2307				
78202		<5	2307				
78203		<5	2307				
78204		<5	2307				
78205		<5	2307				
78206		<5	2307				
78207		<5	2307				
78208		<5	2307				
78209		<5	2307				
78210		<5	2307				
78211		<5	2307				
78212		<5	2307				
78213		<5	2307				
78214		<5	2307				
78215		<5	2307				
78216		<5	2307				
78217		<5	2307				
78218		<5	2307				
78219		<5	2307				
78220		<5	2307				
78221		<5	2307				
78222		<5	2307				
78223		<5	2307				
78224		<5	2307				
78225		<5	2307				
78226		<5	2307				
78229		<5	2307				
78230		<5	2307				

COMMENTS:

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ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Bi ppm IC580 5	SDS ALS 1				
78231		<5	2307				
78232		<5	2307				
78233		<5	2307				
78234		<5	2307				
78235		<5	2307				
78236		<5	2307				
78237		<5	2307				
78238		<5	2307				
78239		<5	2307				
78240		<5	2307				
78241		<5	2307				
78242		<5	2307				
78243		<5	2307				
78244		<5	2307				
78245		<5	2307				
78246		<5	2307				
78247		<5	2307				
78248		<5	2307				
78249		<5	2307				
78250		<5	2307				
78251		<5	2307				
78252		<5	2307				
78253		<5	2307				
78254		<5	2307				
78255		<5	2307				
78256		<5	2307				
78257		<5	2307				
78258		<5	2307				
78259		<5	2307				
78260		<5	2307				

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ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Bi ppm IC580 5	SDS ALS 1				
78261		<5	2307				
78262		<5	2307				
78263		<5	2307				
78264		<5	2307				
78265		<5	2307				
78266		<5	2307				
78267		<5	2307				
78268		<5	2307				
78269		<5	2307				
78270		<5	2307				
78271		<5	2307				
78272		<5	2307				
78273		<5	2307				
78274		<5	2307				
78275		<5	2307				
78276		<5	2307				
78277		<5	2307				
78278		<5	2307				
78279		<5	2307				
78280		<5	2307				
78281		<5	2307				
78282		<5	2307				
78283		<5	2307				
78284		<5	2307				
78285		<5	2307				
78286		<5	2307				
78287		<5	2307				
78288		<5	2307				
78289		<5	2307				
78290		<5	2307				

COMMENTS:

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ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Bi ppm IO580 5	SOS ALS 1				
78291		<5	2307				
78292		<5	2307				
78293		<5	2307				
78294		<5	2307				
78295		<5	2307				
78296		<5	2307				
78297		<5	2307				
78298		<5	2307				
78299		<5	2307				
78300		<5	2307				
78301		<5	2307				
78302		<5	2307				
78303		<5	2307				
78304		<5	2307				
78305		<5	2307				
78306		<5	2307				
78307		<5	2307				
78308		<5	2307				
78309		<5	2307				
78310		<5	2307				
78311		<5	2307				
78312		<5	2307				
78313		<5	2307				
78314		<5	2307				
78315		<5	2307				
78316		<5	2307				
78317		<5	2307				
78318		<5	2307				
78319		<5	2307				
78320		<5	2307				

COMMENTS:

• This is the Final Report which supersedes any preliminary reports with this batch number.

• Results apply to sample(s) as submitted by client.

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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: ROCK CHIPS PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Bi ppm IC580 5	SDS ALS 1				
78401		<5	2307				
78402		<5	2307				
78403		<5	2307				
78404		<5	2307				
78405		<5	2307				
78406		<5	2307				
78407		<5	2307				
78408		<5	2307				
78409		<5	2307				
78410		<5	2307				
78411		<5	2307				
78412		<5	2307				
78413		<5	2307				
78414		<5	2307				
78415		<5	2307				
78416		<5	2307				
78417		<5	2307				
78418		<5	2307				
78419		<5	2307				
78420		<5	2307				
78421		<5	2307				
78422		<5	2307				
78423		<5	2307				
78424		<5	2307				
78425		<5	2307				
78321		<5					

COMMENTS:

• This is the Final Report which supersedes any preliminary reports with this batch number.
• Results apply to sample(s) as submitted by client.

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AUSTRALIAN LABORATORY SERVICES P/L

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ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: DUPLICATES PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Cu ppm IC580 2	Pb ppm IC580 5	Zn ppm IC580 2	Ag ppm IC580 1	As ppm IC580 1	Fe % IC580 0.01
*** 78109		63	10	60	1	3	8.38
Original Result		62	10	61	1	2	7.91
*** 78119		26	<5	47	1	3	10.64
Original Result		25	<5	41	1	2	9.62
*** 78129		31	269	248	1	26	6.48
Original Result		30	271	247	1	26	6.33
*** 78158		36	1390	644	1	46	4.98
Original Result		36	1320	614	1	40	4.68
*** 78168		80	680	569	1	41	4.50
Original Result		83	678	578	1	37	4.54
*** 78181		17	415	270	<1	9	4.01
Original Result		18	429	272	<1	10	4.07
*** 78205		42	<5	111	<1	9	8.19
Original Result		41	<5	111	<1	11	8.31
*** 78215		74	<5	151	<1	6	6.68
Original Result		71	<5	151	<1	8	6.62
*** 78225		66	<5	106	<1	5	6.40
Original Result		63	<5	101	<1	3	6.10
*** 78251		50	25	239	<1	4	3.08
Original Result		51	23	230	<1	4	2.97

COMMENTS:

Results which appear on this report are routine laboratory duplicates for QUALITY CONTROL purposes.

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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: DUPLICATES PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Cu ppm IC580 2	Pb ppm IC580 5	Zn ppm IC580 2	Ag ppm IC580 1	As ppm IC580 1	Fe % IC580 0.01
*** 78261		86	541	2110	2	146	5.83
Original Result		87	531	2060	2	142	5.67
*** 78271		36	302	330	1	205	4.26
Original Result		37	301	314	1	207	4.25
*** 78295		38	72	139	<1	8	5.79
Original Result		40	61	139	<1	6	5.87
*** 78305		32	<5	53	<1	7	5.90
Original Result		34	<5	51	<1	6	5.81
*** 78315		33	59	165	<1	13	4.47
Original Result		33	57	163	<1	12	4.41
*** 78419		33	872	1060	<1	89	4.99
Original Result		33	862	1050	<1	89	4.95
*** 78420		38	611	420	1	24	3.80
Original Result		36	599	414	1	24	3.72

COMMENTS:

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• Results apply to sample(s) as submitted by client.

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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: STAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: DUPLICATES PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Mn ppm IC580 5	Co ppm IC580 5	Mo ppm IC580 2	Ni ppm IC580 5	Bi ppm IC580 5	SDS ALS 1
*** 78109		519	55	<2	268	<5	2307
Original Result		477	53	<2	254	<5	2307
*** 78119		577	43	<2	262	<5	2307
Original Result		526	39	<2	238	<5	2307
*** 78129		642	41	<2	228	<5	2307
Original Result		635	40	<2	224	<5	2307
*** 78158		641	42	<2	218	<5	2307
Original Result		608	41	<2	206	<5	2307
*** 78168		526	33	<2	206	<5	2307
Original Result		528	34	<2	208	<5	2307
*** 78181		611	42	<2	170	<5	2307
Original Result		619	43	<2	172	<5	2307
*** 78205		838	43	<2	162	<5	2307
Original Result		851	42	<2	165	<5	2307
*** 78215		756	40	<2	297	<5	2307
Original Result		751	39	<2	297	<5	2307
*** 78225		634	39	<2	204	<5	2307
Original Result		606	37	<2	194	<5	2307
*** 78251		277	19	<2	133	<5	2307
Original Result		238	18	<2	122	<5	2307

COMMENTS:

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• Results apply to sample(s) as submitted by client.

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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

ANALYTICAL REPORT

CONTACT: MS N MCGUNNIGLE
CLIENT: PASMINCO EXPLORATION
ADDRESS: P.O. BOX 886
BURNIE TASMANIA
7320

LABORATORY: SIAFFORD
BATCH NUMBER: ST15244
SUB BATCH: 0
No. OF SAMPLES: 236
DATE RECEIVED: 21/06/96
DATE COMPLETED: 28/06/96

ORDER No.: 2307 SAMPLE TYPE: DUPLICATES PROJECT: 3021

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Mn ppm IC580 5	Co ppm IC580 5	Mo ppm IC580 2	Ni ppm IC580 5	Bi ppm IC580 5	SDS ALS 1
*** 78261		1300	20	<2	252	<5	2307
Original Result		1260	20	<2	245	<5	2307
*** 78271		677	<5	<2	55	<5	2307
Original Result		676	<5	<2	55	<5	2307
*** 78295		311	28	<2	174	<5	2307
Original Result		315	28	4	175	<5	2307
*** 78305		403	39	<2	225	<5	2307
Original Result		398	40	<2	221	<5	2307
*** 78315		302	40	<2	254	<5	2307
Original Result		297	40	<2	251	<5	2307
*** 78419		462	39	<2	239	<5	2307
Original Result		460	39	<2	238	<5	2307
*** 78420		442	39	<2	192	<5	2307
Original Result		433	37	<2	189	<5	2307

COMMENTS:

• This is the Final Report which supersedes any preliminary reports with this batch number.

• Results apply to sample(s) as submitted by client.

Alice Springs Laboratory
Phone: (089) 52 6020 Fax: (089) 52 6028
Bendigo Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
Brisbane Laboratory
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Charters Towers Laboratory
Phone: (077) 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
Mt Isa Laboratory
Phone: (077) 49 5545 Fax: (077) 49 5546
New Zealand Laboratory
Phone: (07) 575 7654 Fax: (07) 575 7641
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

303183

Appendix 7

Andr dam
grand megrettes

PASMINCO
EXPLORATION

MEMORANDUM

TO: NK McGunnigle

FROM: PW Basford

DATE: 11 June, 1996

REF: pwb\96168

SUBJECT: **GROUND MAGNETICS; ARTHUR DAM GRID - LUINA EL 17/93**

Summary

A ground magnetic survey has been conducted over the Arthur Dam grid, with data collected over three days in early April. The total length surveyed over the grid is 9.5 line km.

Conclusion and Recommendations

Comparison and correlation between magnetic data and geology has not been successful due to the lack of outcrop available. The serpentinite intersected in AD1 is evident in the data and appears to outcrop/sub-crop at the eastern edge of the grid. The unit has an apparent NE-SW strike for most of the length of the grid. A structure has been interpreted to exists running from 300W, 200N to 250E, 500N, which appears to affect the strike of serpentinite. The structure also appears to segment the area into two districts, north and south of the feature. Data to the north has a lower background level and contains abundant, small amplitude, small wavelength responses, whilst data south of the structure contains larger responses, as well as broader wavelength responses.

Three specific anomalies recommended for immediate follow up are listed below.

1. The large high located over the road, observed on lines 170N and 0E needs to be looked at. As the grid is at a 45 degree angle to AMG, it is difficult to estimate a depth to the top of the source, however, it is estimated to be between 20 and 40m. Drilling a short hole may be the best option to investigate the source, however, the establishment of line 200N may further ai definition of the anomaly. Geochemistry on this line may also aid in defining the source.

It is assumed that the source does not come from the road and is not related to the power lines. Data from line 0E indicates its independence from the road and also precludes the possibility of some cultural structure across the road. Magnetic susceptibility readings taken along the road by S Dibben confirmed the assumption of the road not being the source.

A Division of Pasminco Australia Limited
ACN 004 074 962

Old Burnie Railway Station Burnie TAS 7320
GPO Box 886, Burnie TAS 7320

Telephone (004) 317 477
Facsimile (004) 318 949

2. A large amplitude response on line 0N should also be further investigated. This feature is likely to be buried to a depth of around 10-15m. Soil sampling over this line may aid in defining a possible source.

3. The anomaly on lines 100S, 200S and 300S should also be investigated. These broad wavelength, low amplitude features coincide in the general area of soil anomalism for lines 100S and 200S.

Comparisons between soil geochemistry and magnetics have provided no clear evidence for any links. Geological and geochemical information gained from trenching may enable more conclusive links to be established.

The intersection in AD2 does not directly correlate with any magnetic signatures on lines 100S and 200S, however, there is an anomaly that may represent the up-dip extension of the mineralisation. This may also become clearer after trenching.

Data collection

Data was collected using the GSM-19F fast sampling magnetometer, with readings taken every second along the line. Base station data was collected using the Scintrex OMNI-IV magnetometer, sampling every ten seconds. Data has subsequently been corrected for diurnal variation. Control pegs spaced twenty metres apart were used to convert time sampling to station sampling.

Both profiles and contours have been generated for the Arthur Dam grid data.

Interpretation

The dominant signature observed in the data from the Arthur Dam grid is that produced by the serpentinite. It was crossed on line 300N, coming to surface at around 350E (local grid co-ordinates). Throughout the remainder of the data, the effect of the serpentinite can be seen on the eastern side of the grid with the gradual build up in magnetic intensity.

The remainder of the data contains isolated and strike limited magnetic highs and lows, as well as the occasional power line cultural response. Two power lines exist in the region of the grid, one large high voltage line and a second small line (probably containing telephone cables). The best evidence of the power line interaction can be seen on line 300N at 200E and line 100N at 75W. Evidence of the smaller power line can be seen on the baseline data, line 0E at 170N and also on line 170N at 0E.

Data affected by interference with the power lines has been removed, however, the overall integrity of the surrounding data does not appear to have been altered.

Profile Analysis

Excluding the serpentinite, the Arthur Dam grid is full of small amplitude anomalies that in total generally strike across the grid from south to north and slightly to the west. An analysis of each line is set out below, which also includes proposed strike directions and limits for each feature.

Line 900N - no obvious anomalous responses, however, a build up in response at 80E does not fit with the data observed on 800N, and may be considered slightly anomalous. A possible second feature is at 170W.

Line 800N - no obvious responses observed, but does include very minor feature at 170W.

Line 700N - no obvious features, possible minor feature at 10W.

Line 600N - a complex feature exist on this line between 100W and 0. It appears to involve two magnetic sources, however, the low between needs further consideration. A very small, near surface response is also observable at 110E.

Line 500N - the dominant feature is the high from the serpentinite at the east end, however, five other magnetic anomalies are present on this line, at 265W, 100W, 40W, 10W and 5E. All are shallow, with the two anomalies at 100W and 40W possibly related to the feature on line 600N.

Line 450N - no responses observed.

Line 400N - again the dominant response is the serpentinite, and again there are four other responses, at 275W, 100W, 35W and 40E?. The anomalies at 100W and 30W may be linked to those on lines 500N and 600N.

Line 350N - possible response at 0, however, not well defined.

Line 300N - this line is full of complex magnetic signatures, excluding the serpentinite to the east. The first is the series of three lows at 140W, 110W and 20W. Also included are three small highs at 200W, 0 and 30E, with a fourth possible at 50E.

Line 170N (along the road) - this line contains the largest responses of the entire grid. Again it crosses the serpentinite (390E), however, there are four other anomalies, two of which are possible good correlations to the trend of the surface geochemistry. These are at 20E and 50E. A very shallow feature exists at 170W which appears to be caused by a cultural feature, and a fourth high is on the western flank of the serpentinite response at 290E. The anomaly at 20E has a depth component to it and is not expected to be related to either the power lines or the road.

Line 100N - apart from serpentinite response on the east end of the line, indicated by the high and cross-over at 395E, there is a small amplitude response at 70E. The serpentinite response has a strange shaped top, with what appears to be two small interfering shallow response. There is also a small build up at the west side of the serpentinite response, which may be a second small amplitude anomaly.

Line 0N - the gradient on this line indicates proximity to the serpentinite, however, there is an interference pattern anomaly between 100E and 130E. This is assumed to be caused by two shallow magnetic bodies.

Line 100S - this line contains two small anomalies, one a low at 100E, which may be an effect of dipolar magnetism relating to the anomaly on line 0N. The other anomaly is at 200E. The line also passes over the serpentinite but does not cross it entirely.

Line 200S - two small anomalies are also evident on this line, one at 210E which is related to the anomaly on line 100S, the other, a shallow feature, at 10E. The serpentinite is further east from the end of the line.

Line 300S - a very noisy line containing several small signatures, the most prominent being the broad wavelength anomaly at 245E, which was previously observed on lines 100S and 200S. Other features are at 150E and 370E?

Line 400S - another noisy line which contains several confusing signatures, the most significant of which is between 370E and 400E. The data indicates an interference style response, with at least one magnetic body present. The negative response may be either structural or alteration related. A near surface response is indicated at 260E, which may be culture or may be related to the anomaly on the previous three lines. There are also several shallow response at the beginning of the line between 0 and 40E

Line 500S - three anomalies are apparent on this line, the first at 415E, which is also evident on line 400S. The second is at 275E, which may be related to the surface response on line 400S, with the third at 30E indicating two small bodies which may? be related to responses recorded on line 400S.

Line 0E (baseline) - the base line data contains several responses, most of which will have been mentioned above. The data is dominated by two specific signatures, the first and most obvious is the large high centred at 180N. This anomaly is the same as observed on line 170N (along the road). The small low on the south side is a possible dipolar response. The other prominent feature is the change in background values north and south of the aforementioned anomaly. Data to the north is vastly lower, building to a higher level at the northern end. This may be caused by changes in depth to basement, a result of a cross structure interpreted in the data. Other anomalies of note on this line are at 250N, 300N, 380N?, 450-500N, 700N and 750N. Some minor anomalism occurs south of the major feature at 50S, 100S, 120S, 170S, 195S and 250S. Data from 250S to 500S is extremely spiky in nature and difficult to assess, however, there does appear to be some longer wavelength features below the noise at 450S and 350S.

Contour Analysis

Contour plots of the data have been generated using SURFER, with the method of minimum curvature used for gridding. Artefacts have been reduced by excluding all contours outside the grid area. To achieve this a 50m buffer zone was generated from which interpolation ceased.

A number of plots have been generated to highlight different aspects of the data. These plots are in both local grid co-ordinates and AMG co-ordinates.

The most prominent feature displayed in the contour data is the serpentinite, which runs along the east side of the local grid. From the AMG plot, it appears as if the serpentinite runs approximately NE-SW. At the southern end of the grid, the response appears to rotate slightly, towards the south in AMG space.

An apparent E-W structure (AMG space) is located around 5407200N, which appears to separate the intensity of response north and south of the grid. This is represented in profile of the baseline (0E). North of this structure data indicates small anomalies, whilst south of this structure more intense magnetic features are apparent. This structure is also observed to affect the serpentinite response.

The anomaly located at the intersection of the road, baseline and power lines is evident as a large bullseye in the local grid, however, its pattern is distorted in AMG space. This features appears along strike from the large amplitude response recorded on line 0N, and from the feature on line 300N at 250E. This strike roughly coincides with the soil geochemical pattern.

A small string of anomalies on lines 400N, 500N and 600N may all be related. These features may be related to those south of the structure, however, this would imply a change in strike, as well as change in physical properties (eg. depth of burial, percent associated magnetite).

No other major features are evident in the data, however, it will be compared to the aeromagnetic data once it is available.

Relationship between magnetic data and AD2

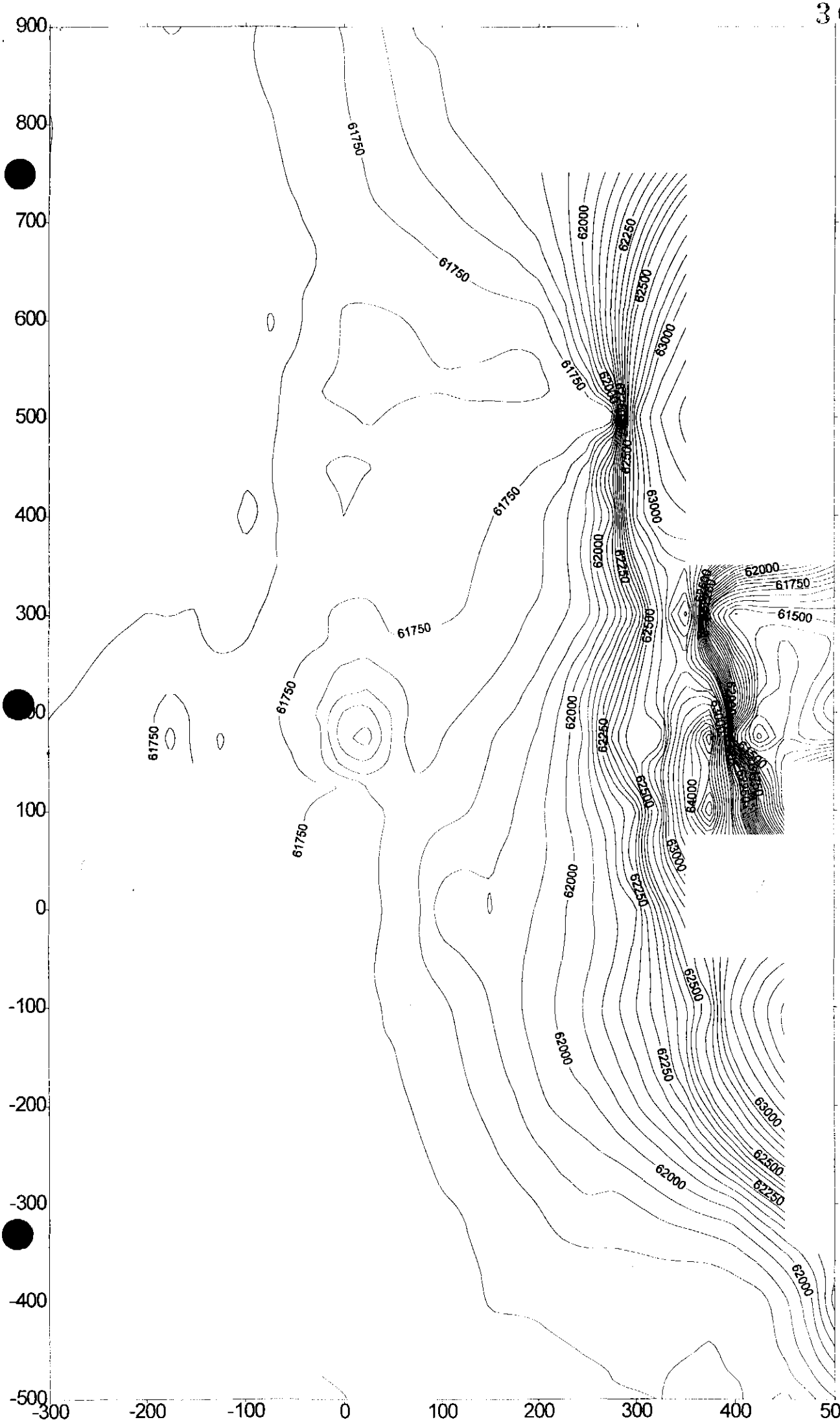
The theoretical section of AD2 has been drawn on lines 100S and 200S, assuming the hole was drilled at 60 degrees. Mineralisation intersections have been located to determine if there is any possible link between them and magnetic data collected over the two lines. No anomalism is recorded directly above the approximate locations of the intersections. There is however, anomalies around 200E. If the source of these anomalous features are related in any way to mineralisation, then it would imply the 'veins' are enclosed in a structure that dips between 40 and 55 degrees. There is no evidence to support a theory of the anomalies at 200W being associated with mineralisation, or that the mineralisation intersected in AD2 extends at the angle suggested above. Results from trenching may better qualify the above theory.

Relationship between magnetic data and soil geochemistry

Soil geochemistry collected by Pasminco is currently limited to lines 300N, 350N, 400N, 450N, 0E between 400N and 700N, 100S and 200S.

Anomalism recorded on 100S and 200S generally coincide with the magnetic feature around 200E on lines 100S, 200S and 300S.

Soil anomalies recorded on lines 400N and 300S may correlate with very small magnetic features. Larger anomalies however are located further west along these lines. The soil anomalies also appear to correlate close to the interpreted AMG E-W structure.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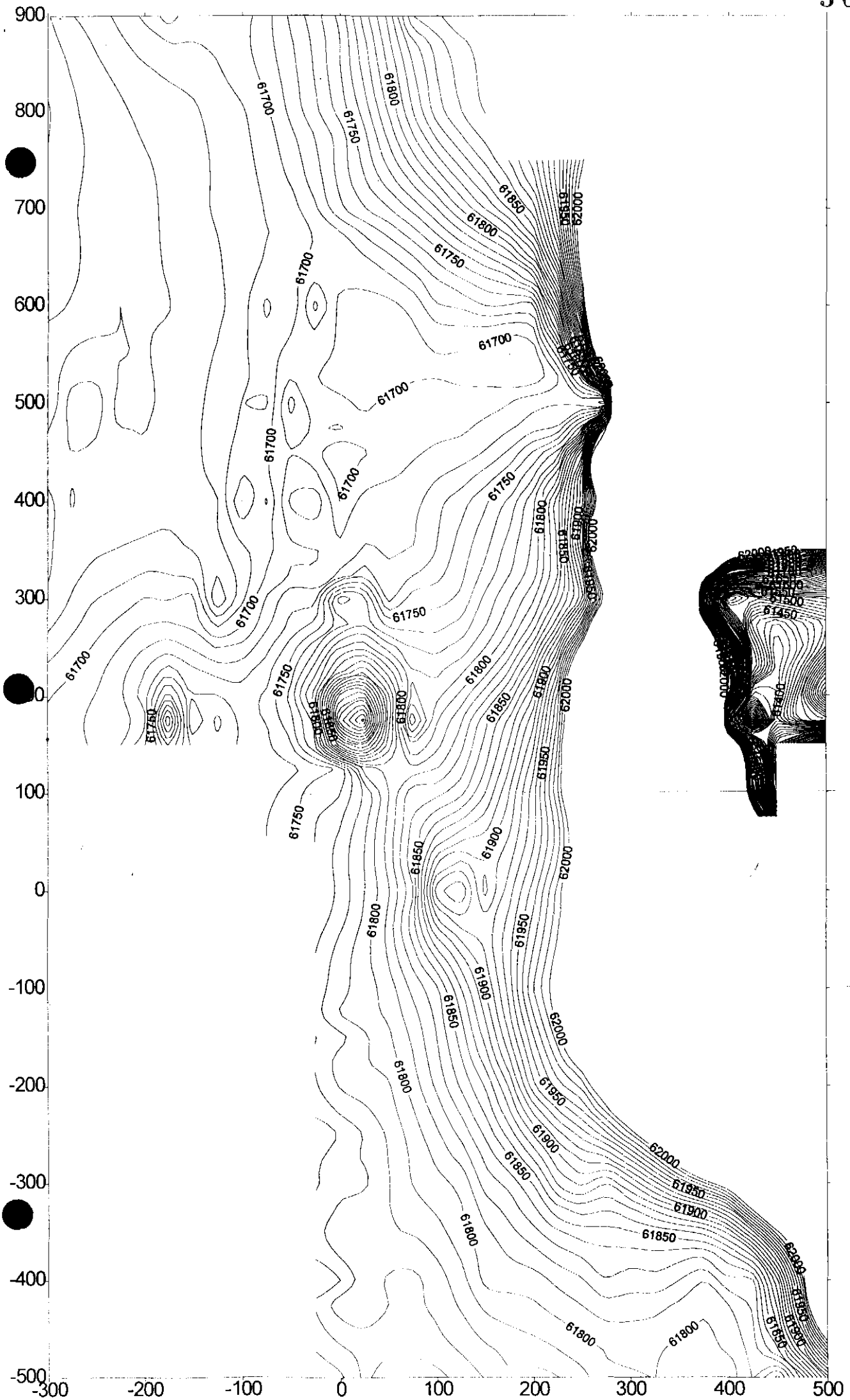
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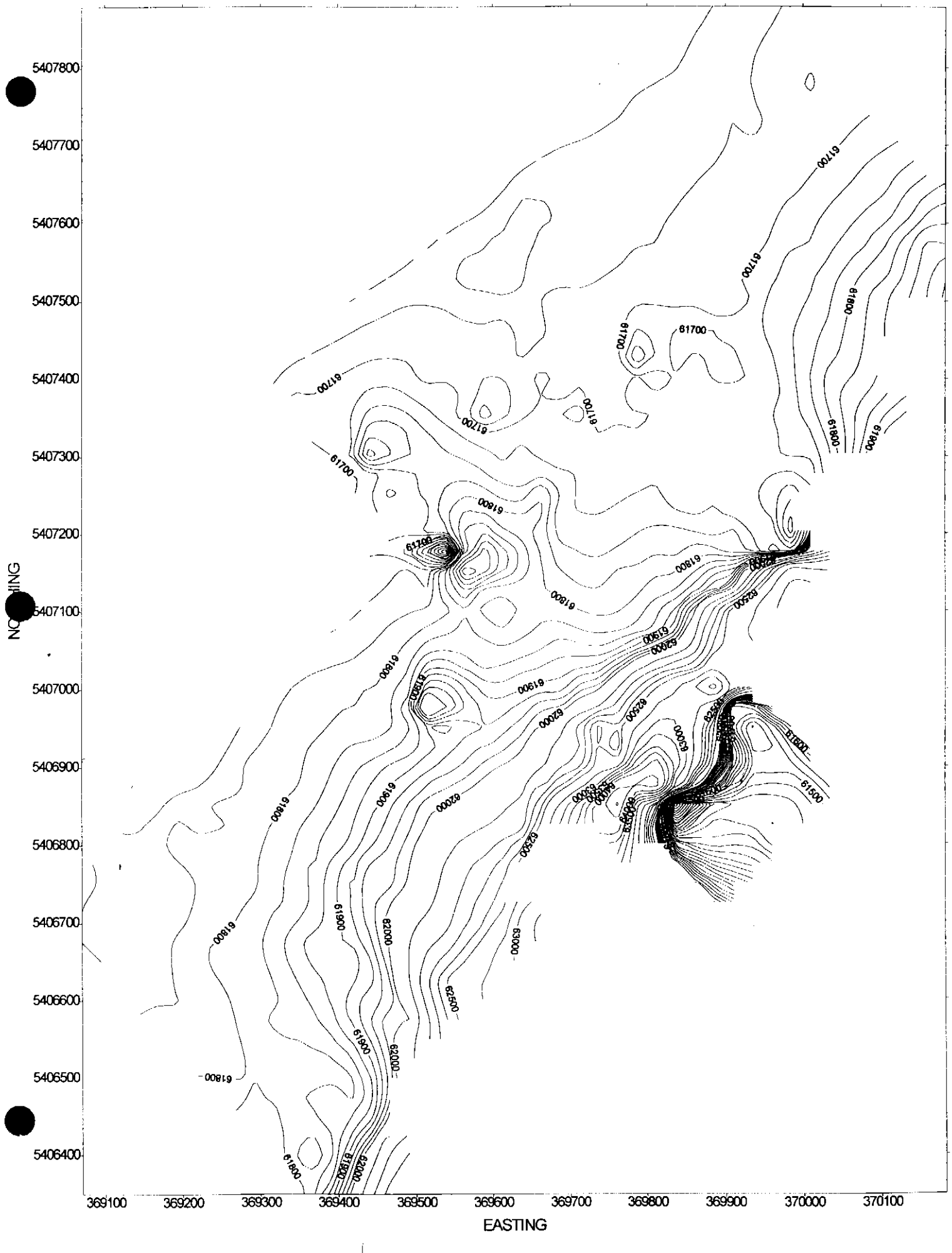
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NORTHING
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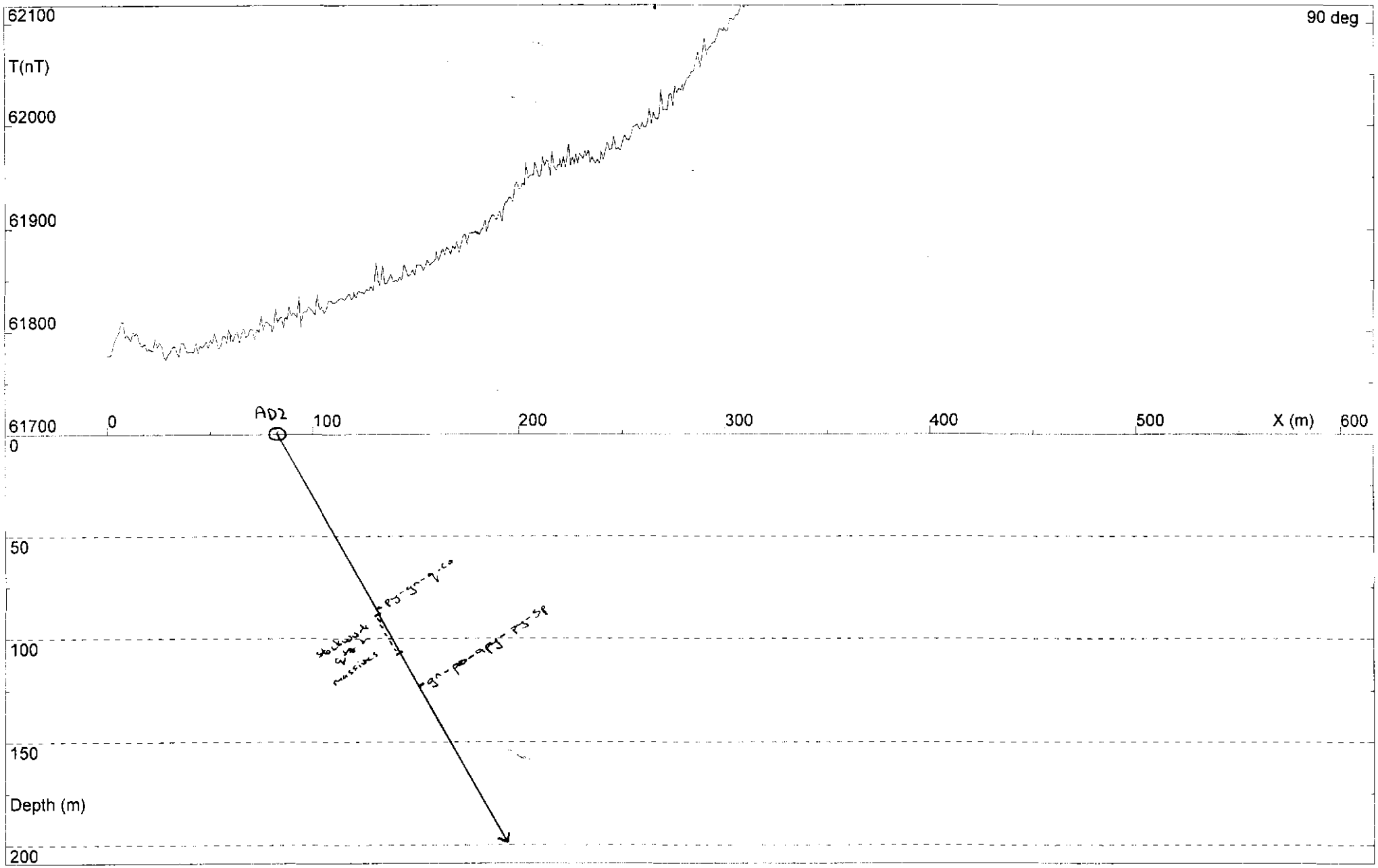
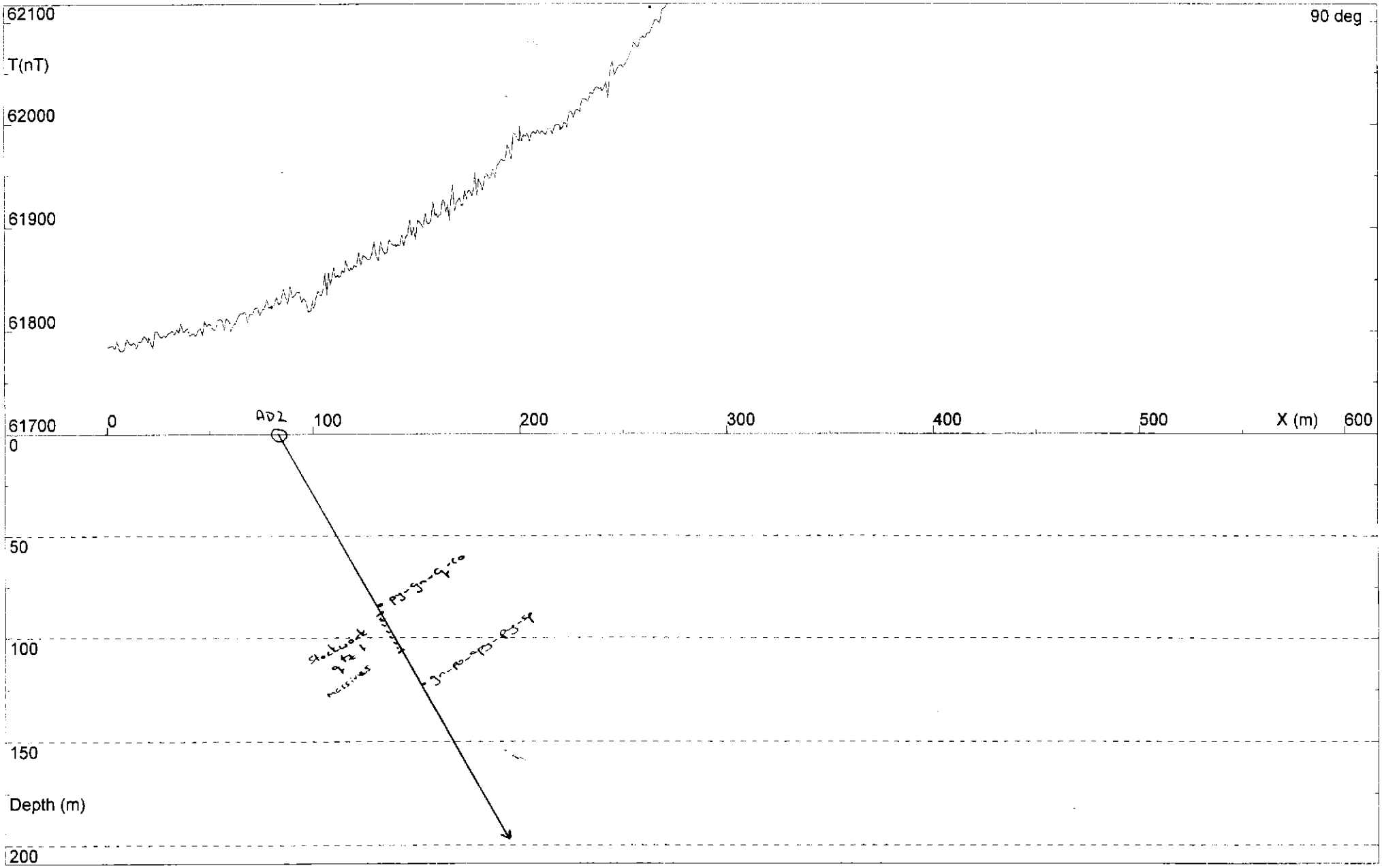
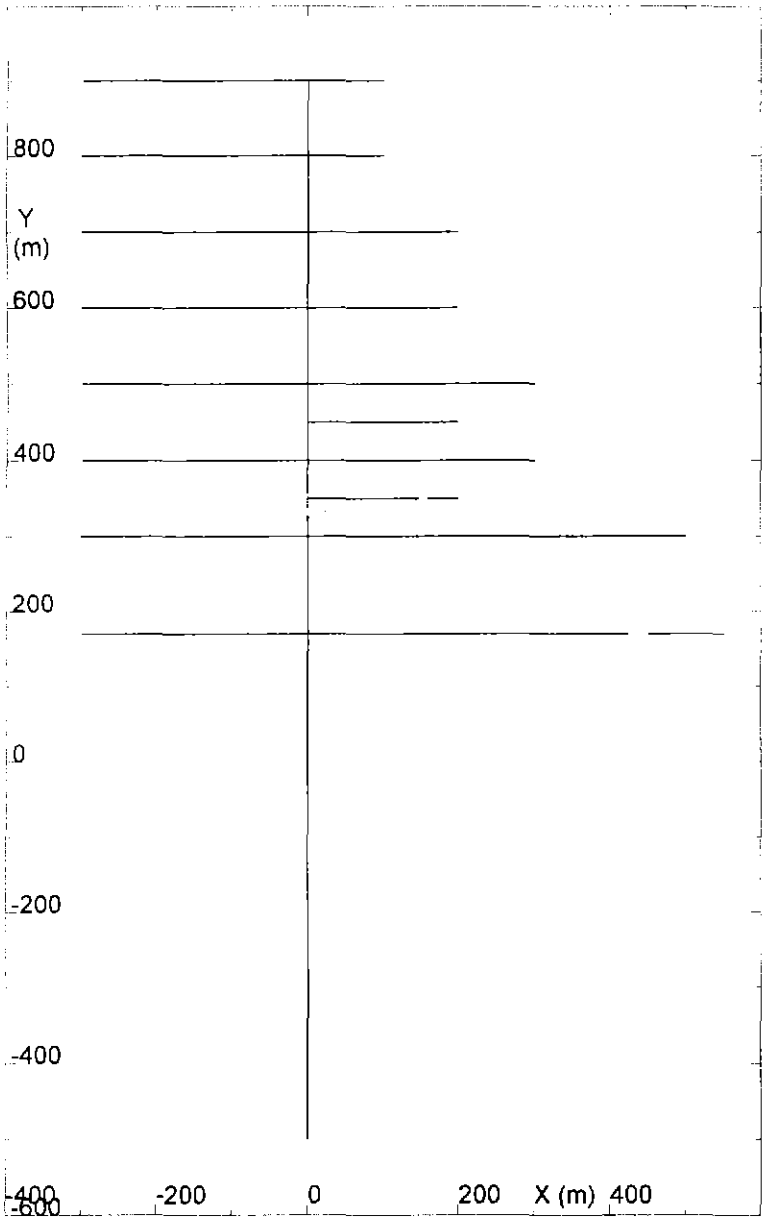
5 cm



Observations: Arthur Dam Grid - Luina EL 17/93
Profile #2; 200S
Model:
Calculation mode: Total Magnetic Intensity

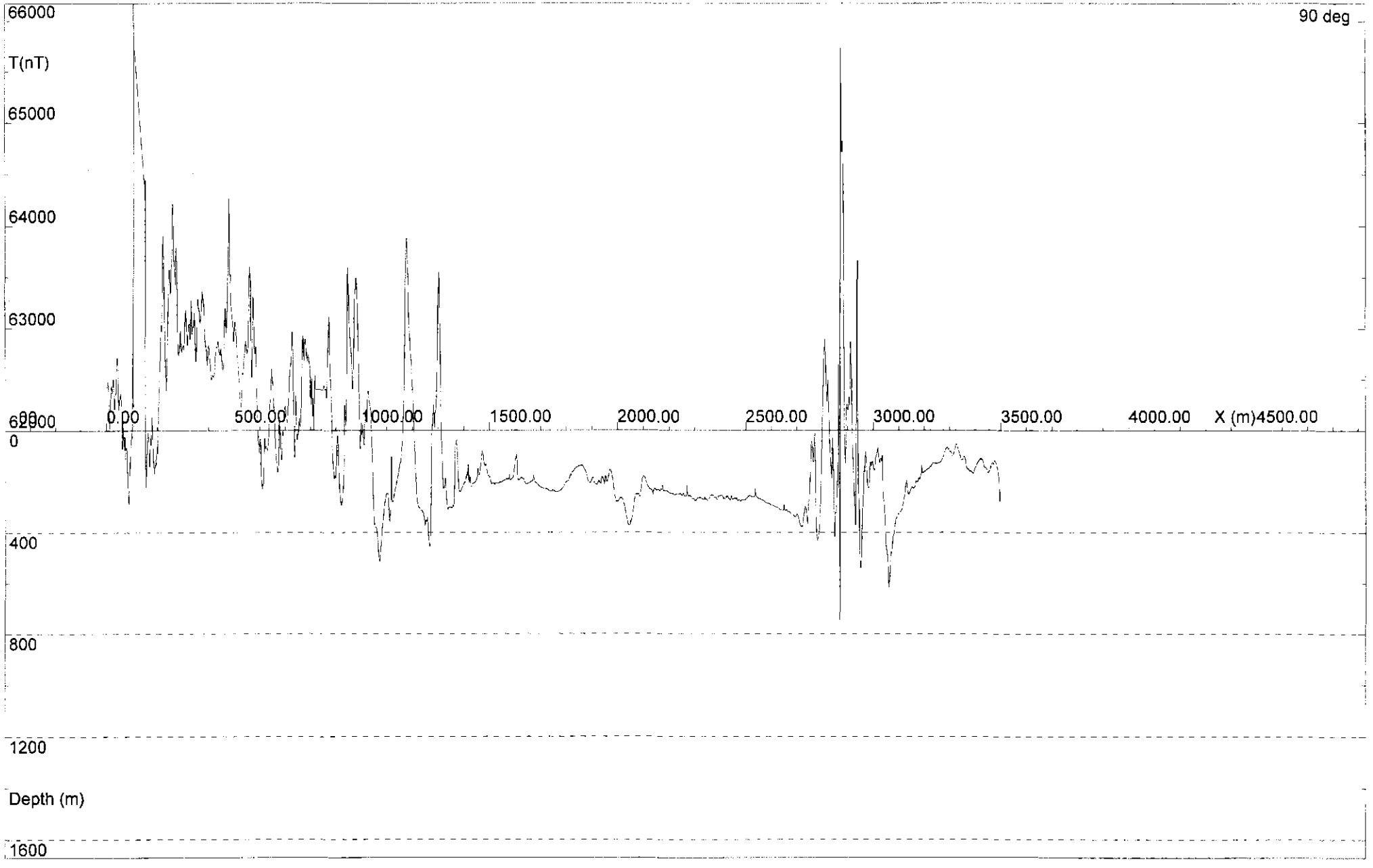


Observations: Arthur Dam Grid - Luina EL 17/93
Profile #1; 100S
Model:
Calculation mode: Total Magnetic Intensity

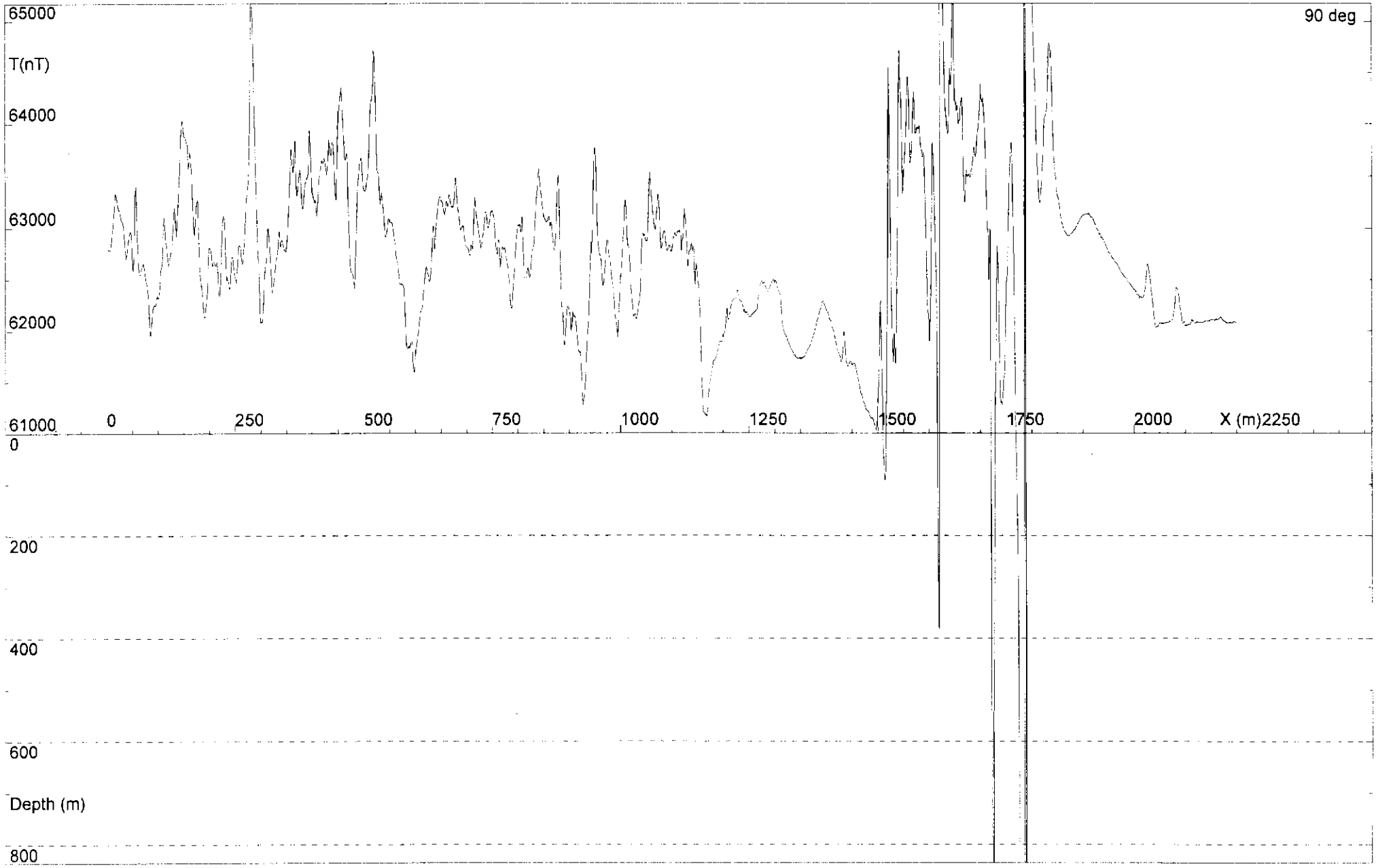


Observations: Arthur Dam Grid - Ground Magnetics
Model:

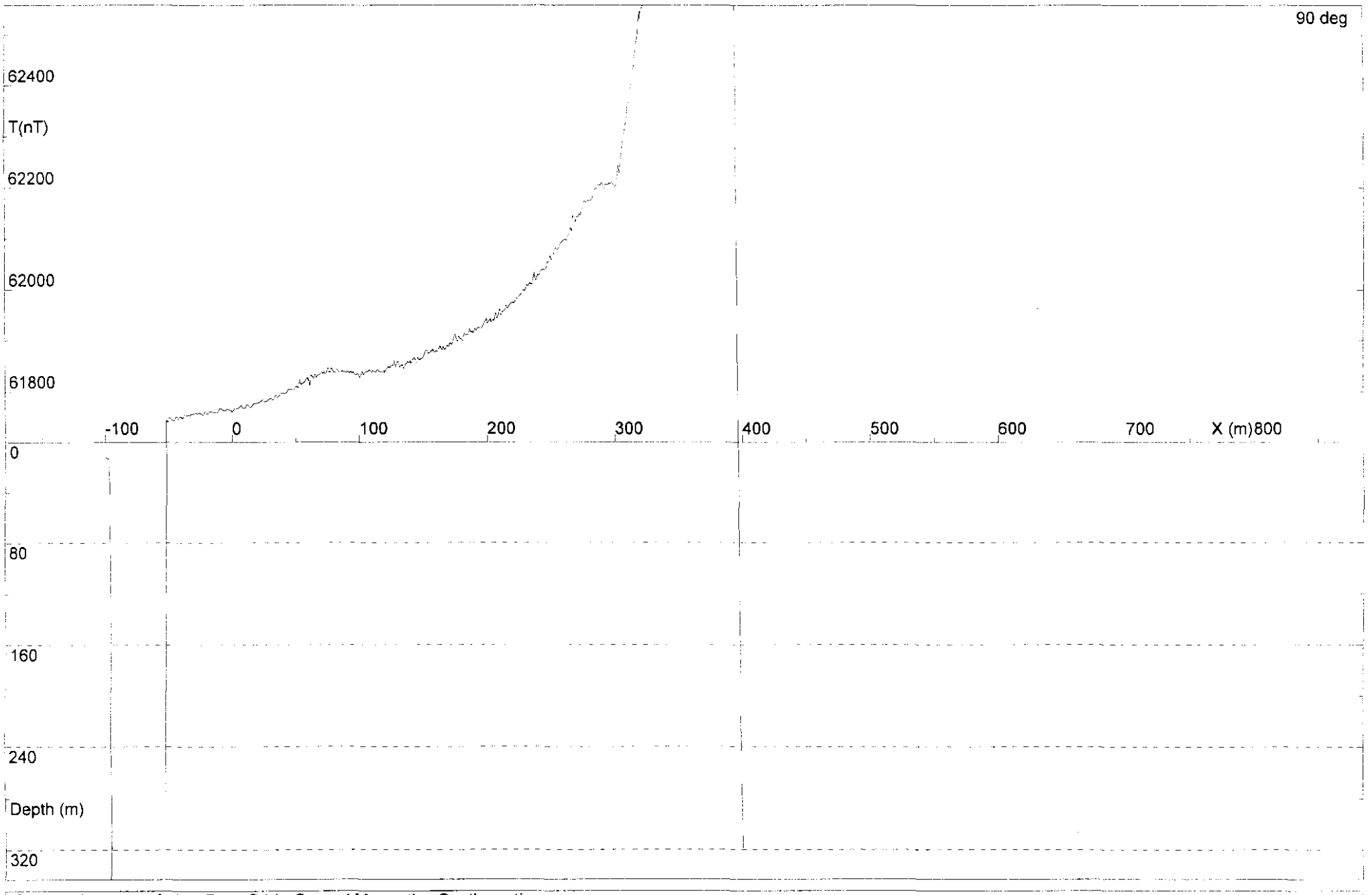
POTENT v3.06 Plan drawn at 14:50 04/04/1996 for Pasminc



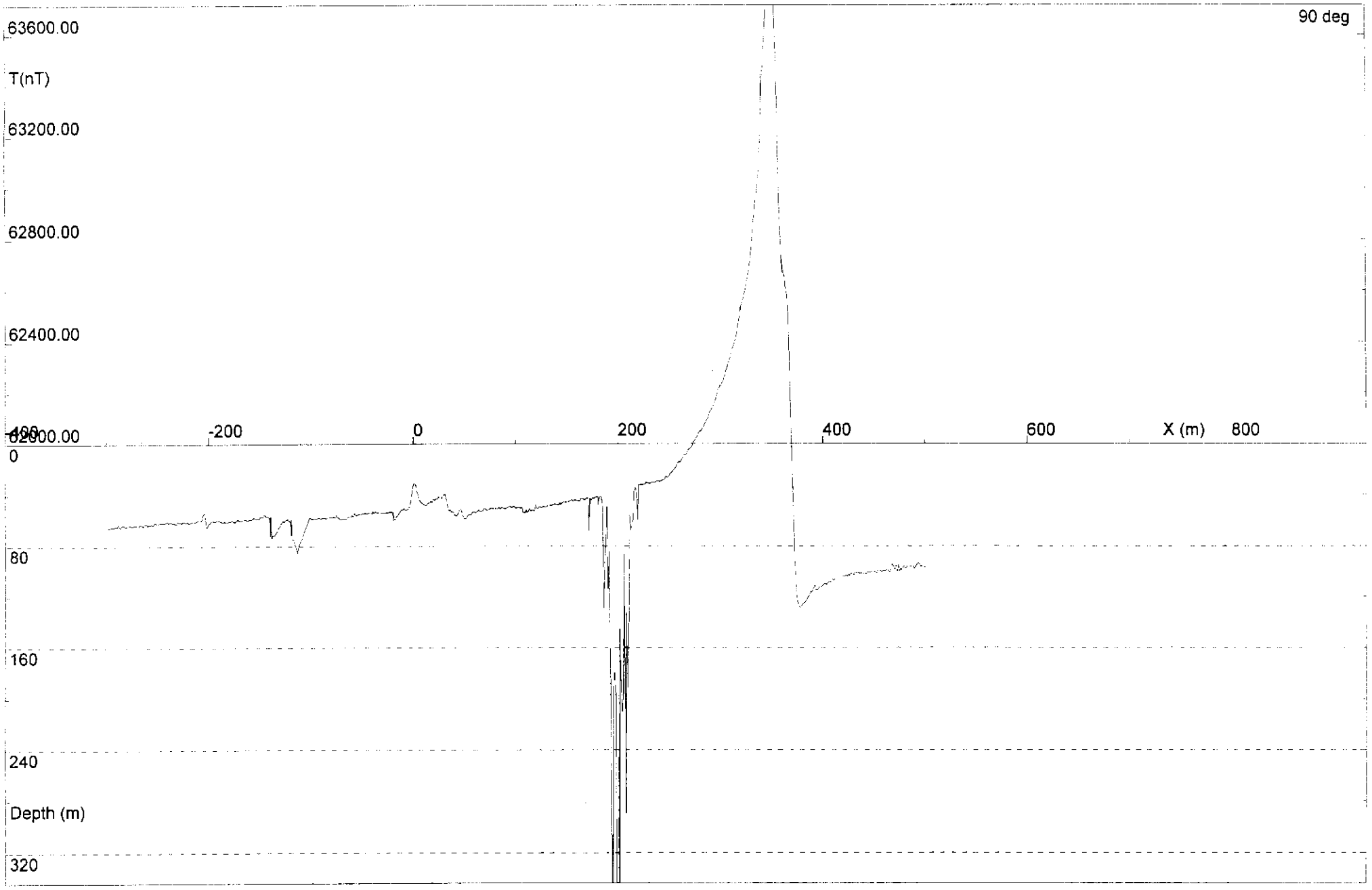
Observations: Butlers Road Ground Magnetics
Profile #1; 1
Model:
Calculation mode: Total Magnetic Intensity



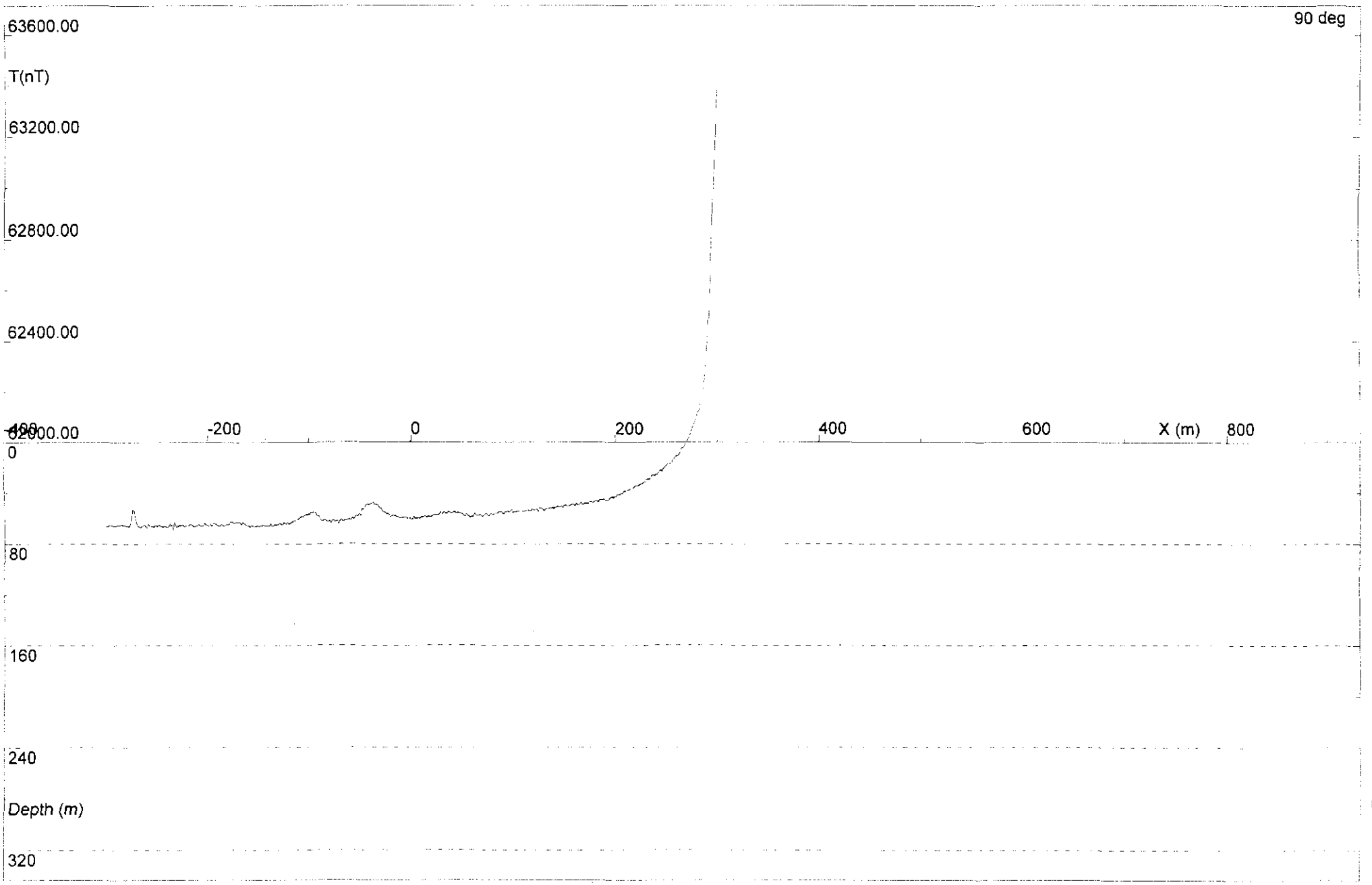
Observations: Betts Track Ground Magnetics
Profile #1; 2
Model:
Calculation mode: Total Magnetic Intensity



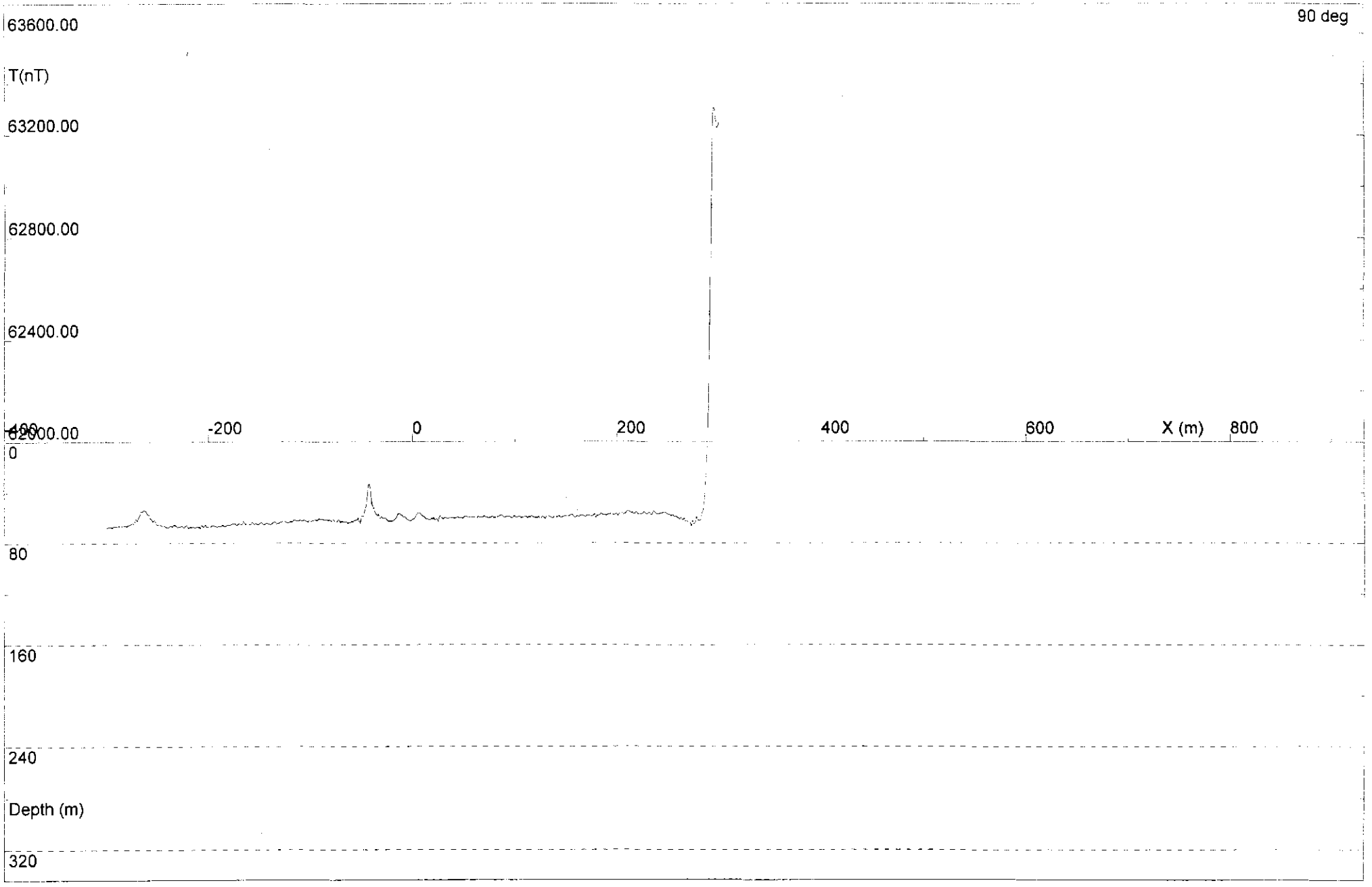
Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #7; 100N
Model:
Calculation mode: Total Magnetic Intensity



Observations: Arthur Dam Grid - Ground Magnetics
Profile #1; 300N
Model:
Calculation mode: Total Magnetic Intensity

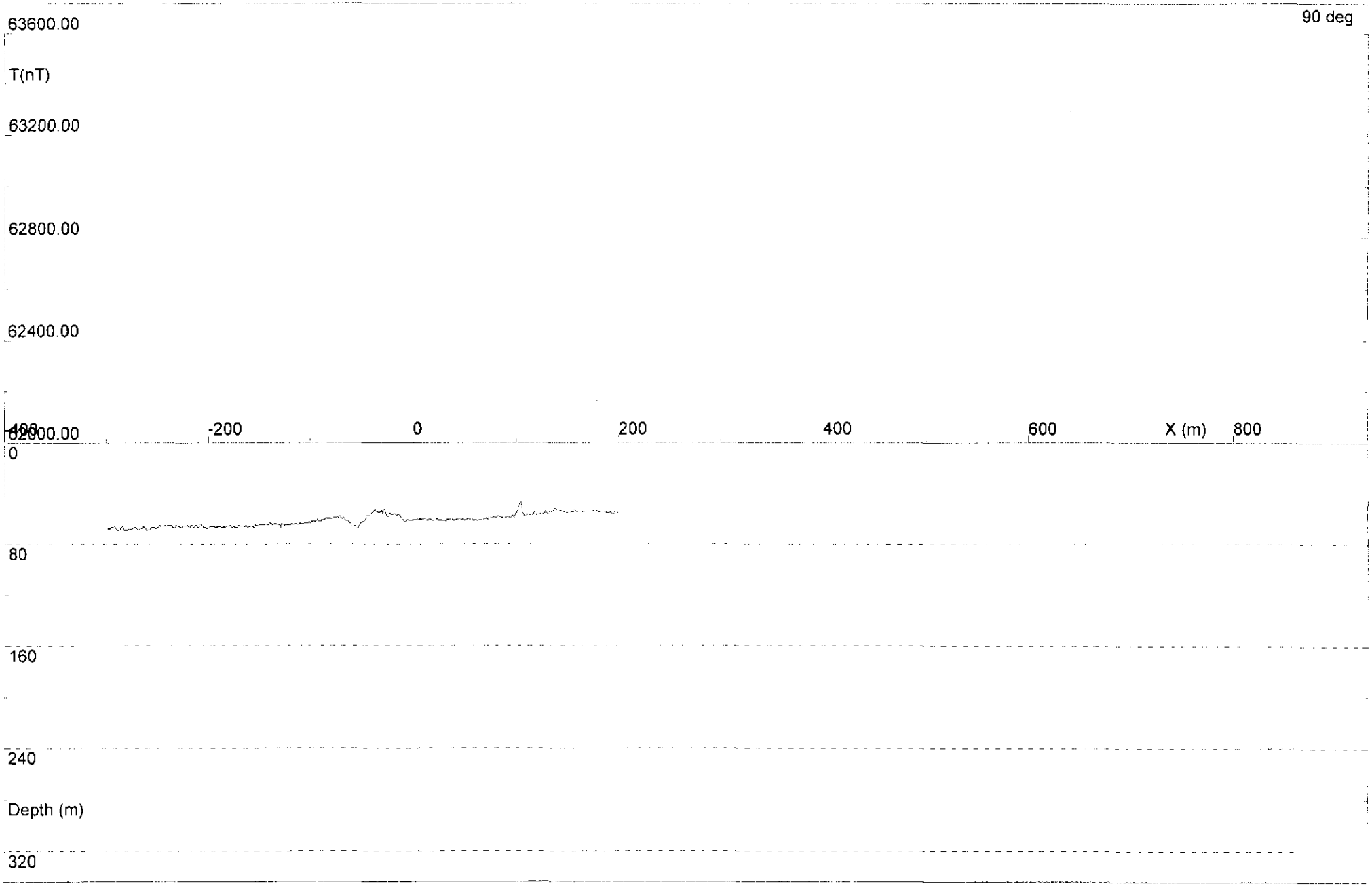


Observations: Arthur Dam Grid - Ground Magnetics
Profile #2; 400N
Model:
Calculation mode: Total Magnetic Intensity

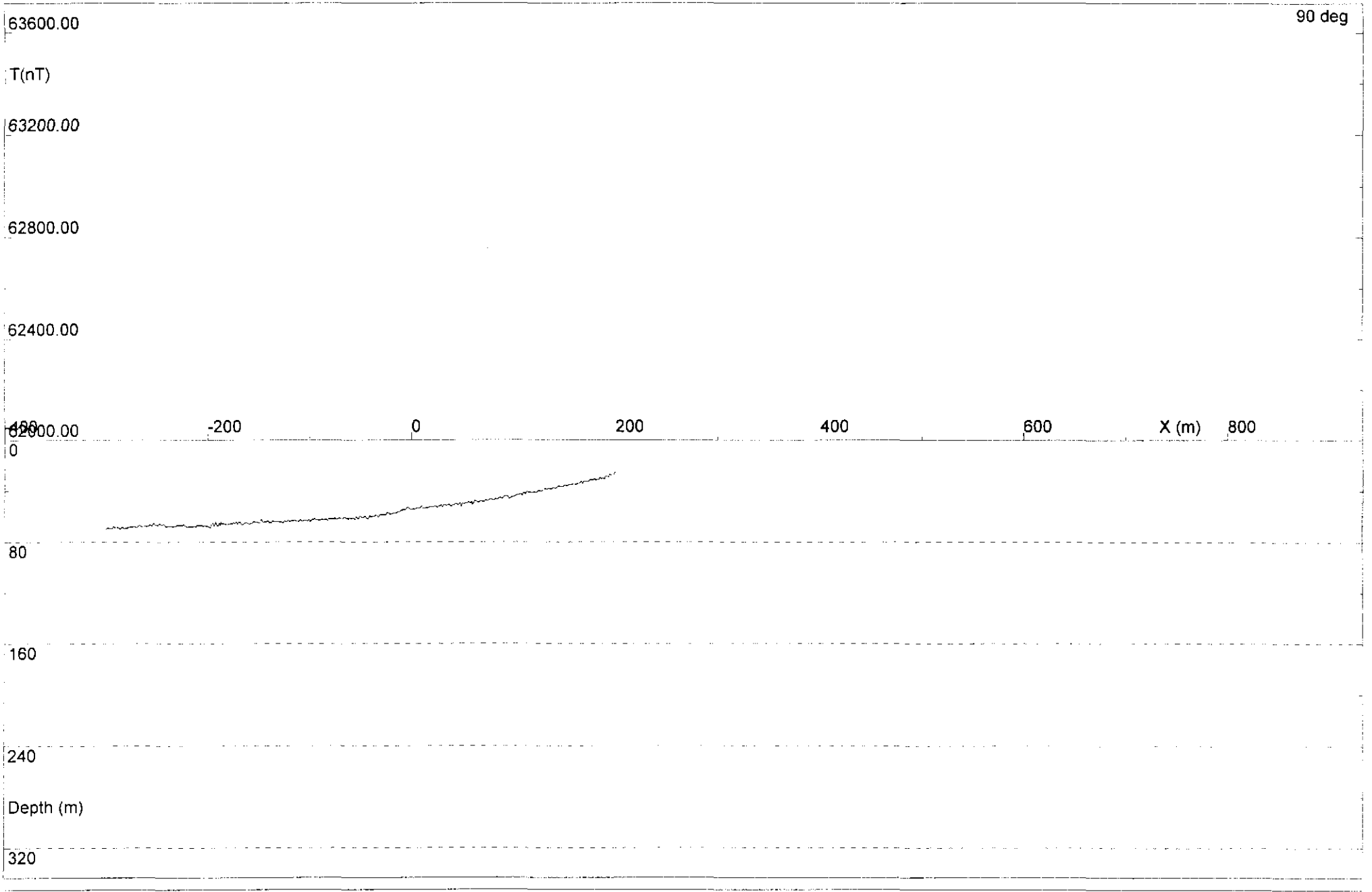


Observations: Arthur Dam Grid - Ground Magnetics
Profile #3; 500N
Model:
Calculation mode: Total Magnetic Intensity

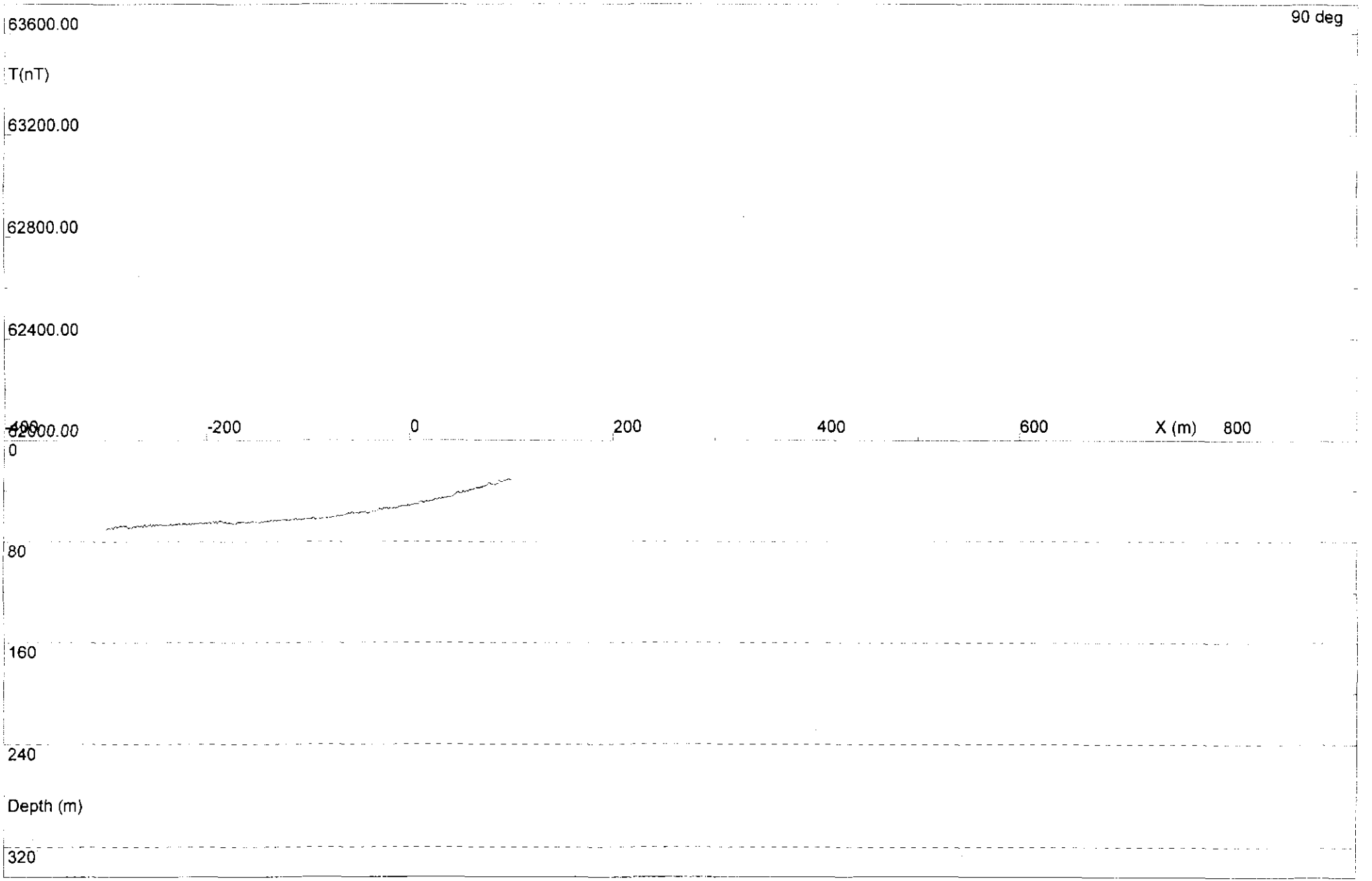
303200



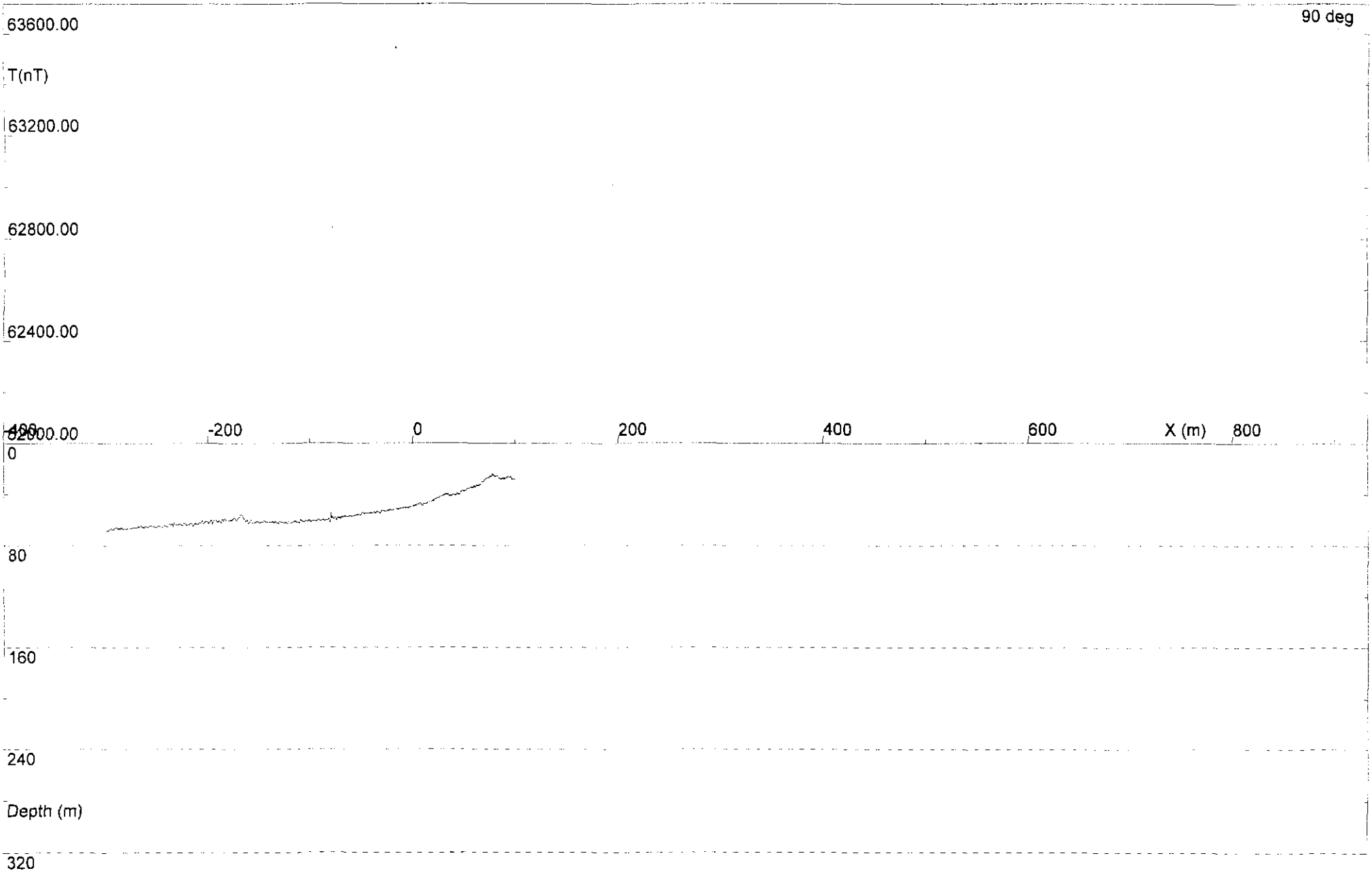
Observations: Arthur Dam Grid - Ground Magnetics
Profile #4; 600N
Model:
Calculation mode: Total Magnetic Intensity



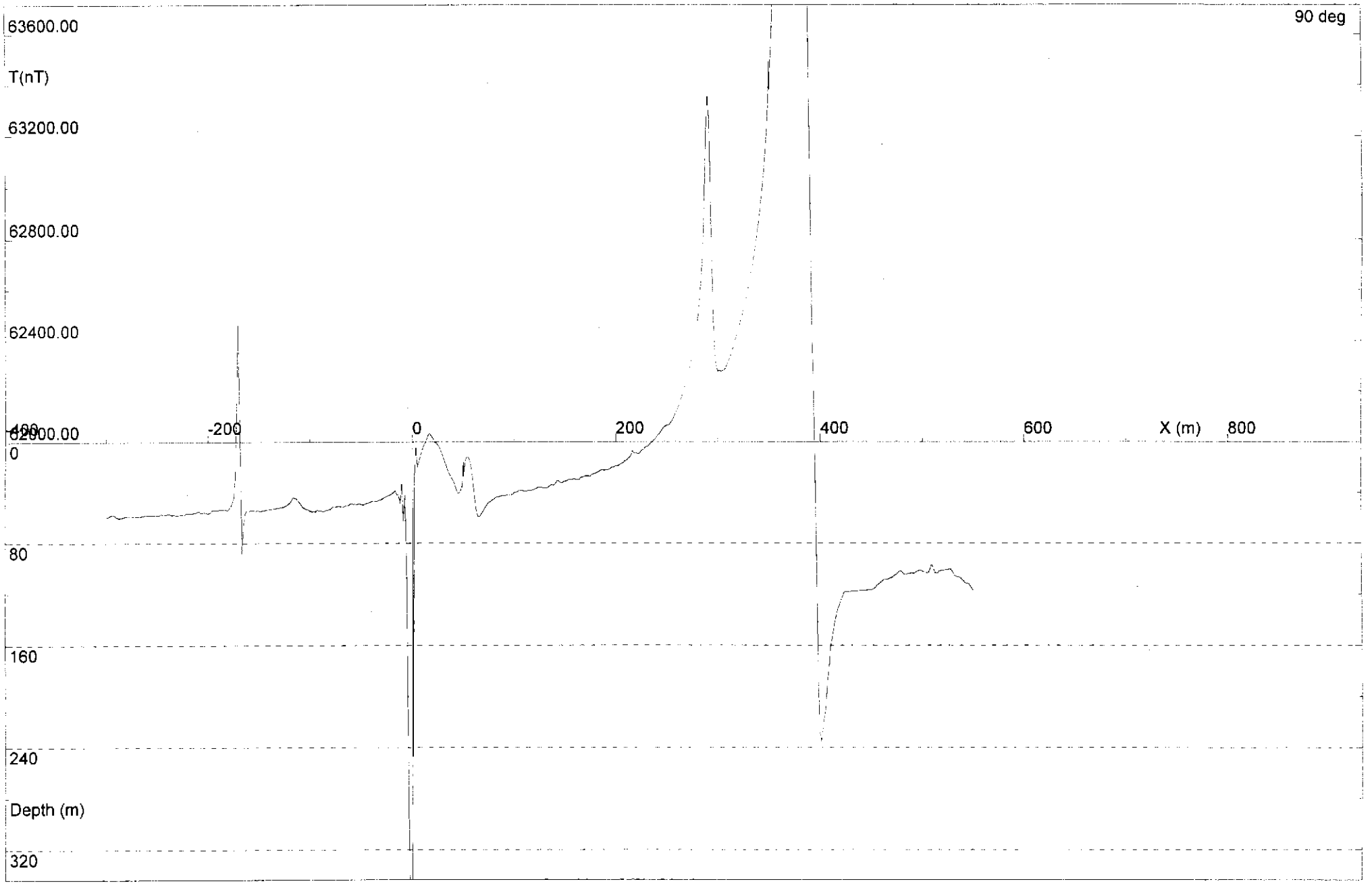
Observations: Arthur Dam Grid - Ground Magnetics
Profile #2; 700N
Model:
Calculation mode: Total Magnetic Intensity



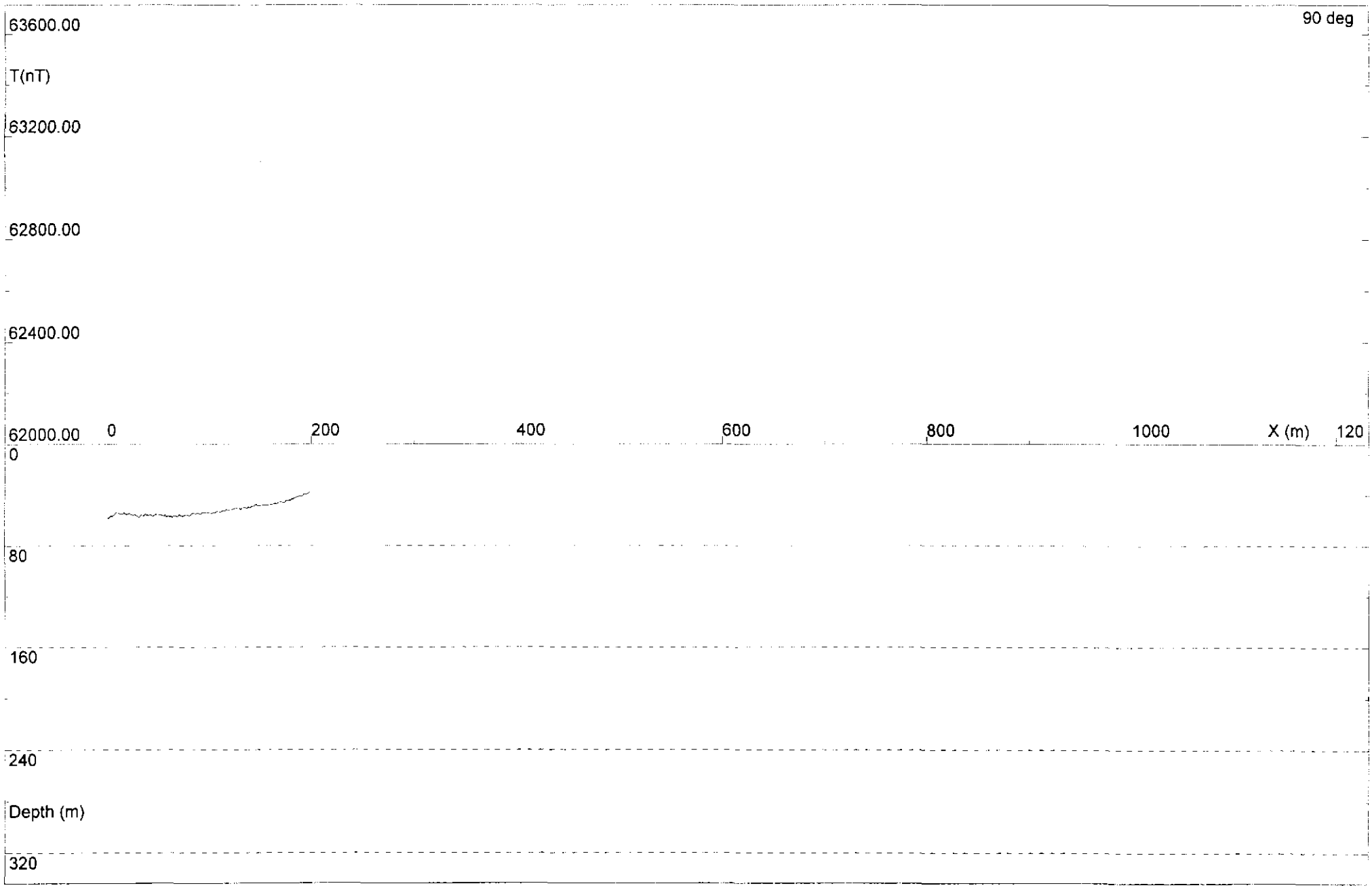
Observations: Arthur Dam Grid - Ground Magnetics
Profile #3; 800N
Model:
Calculation mode: Total Magnetic Intensity



Observations: Arthur Dam Grid - Ground Magnetics
Profile #4; 900N
Model:
Calculation mode: Total Magnetic Intensity



Observations: Arthur Dam Grid - Ground Magnetics
Profile #5; 170N
Model:
Calculation mode: Total Magnetic Intensity



Observations: Arthur Dam Grid - Ground Magnetics
Profile #2; 350N
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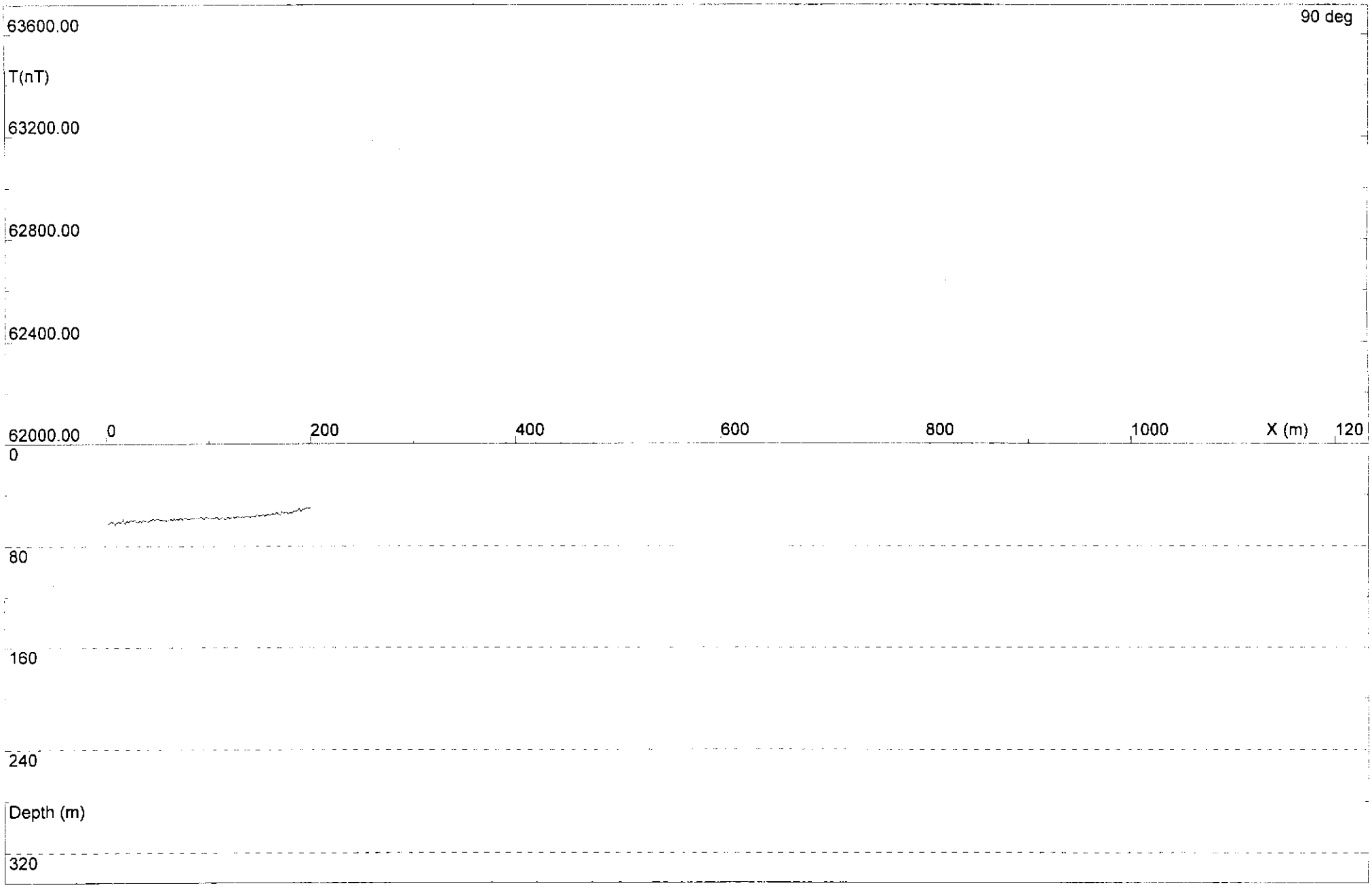
Calculation mode: Total Magnetic Intensity



Observations: Arthur Dam Grid - Ground Magnetics
Profile #3; 450N
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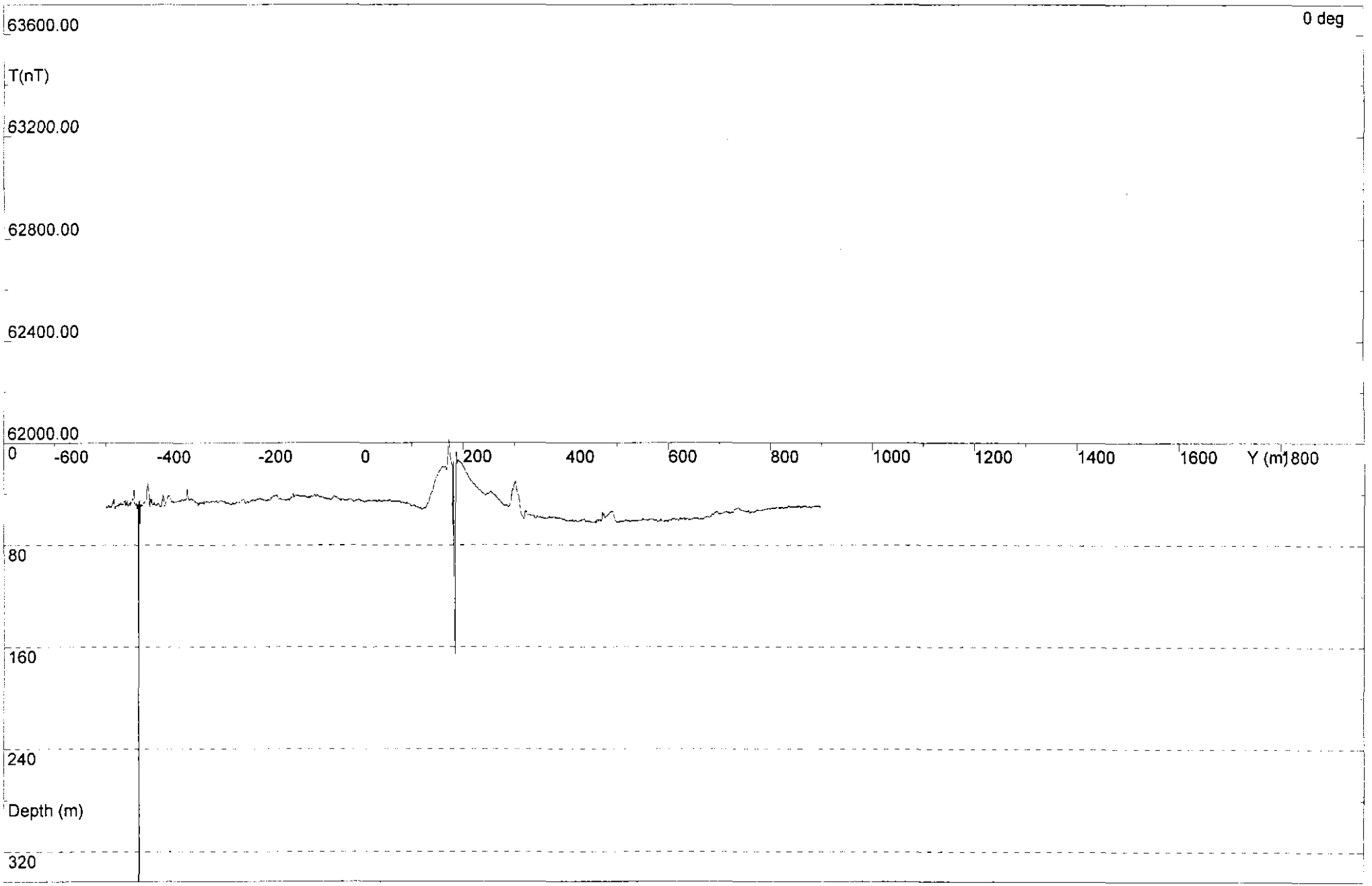
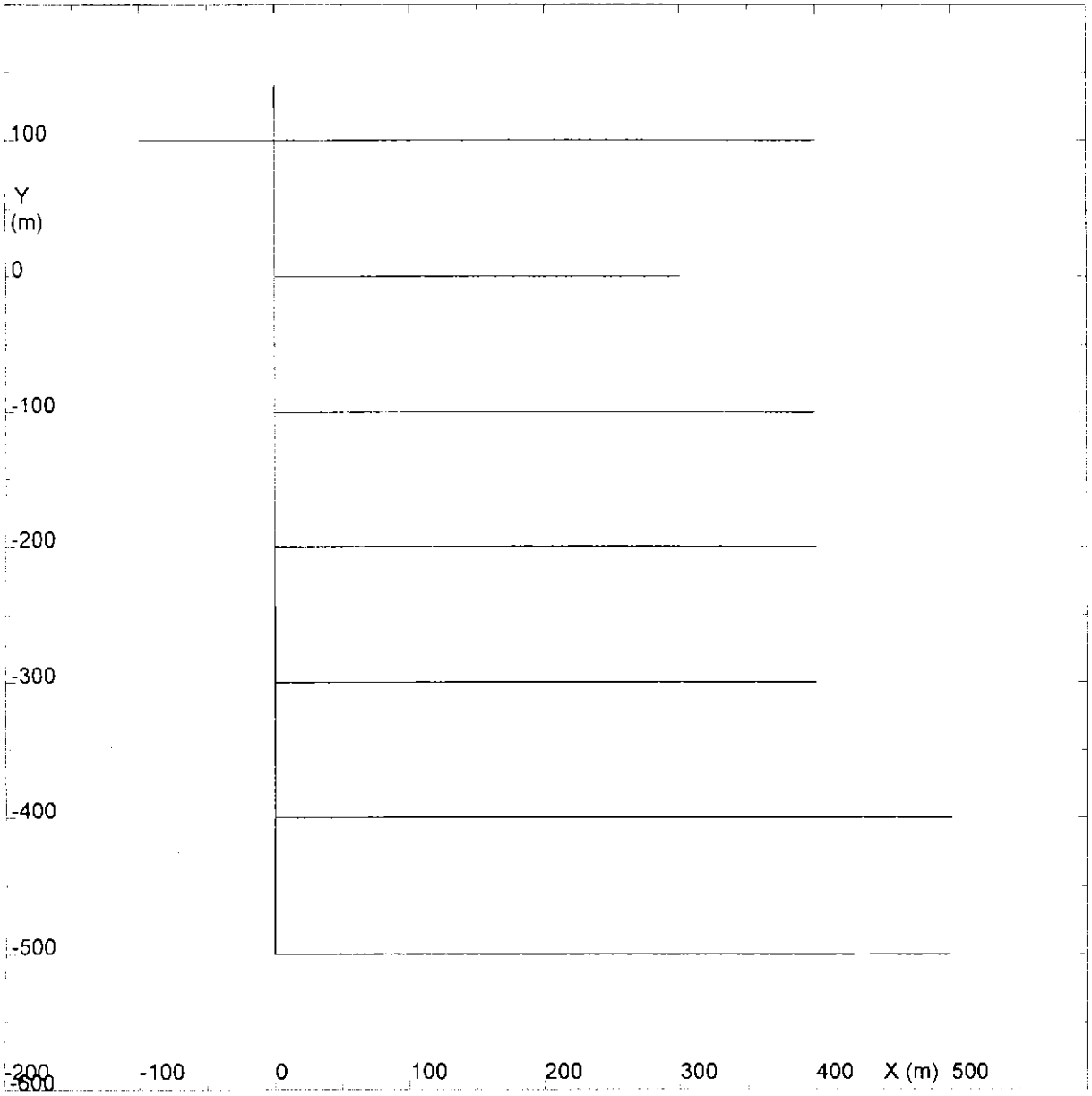
Calculation mode: Total Magnetic Intensity



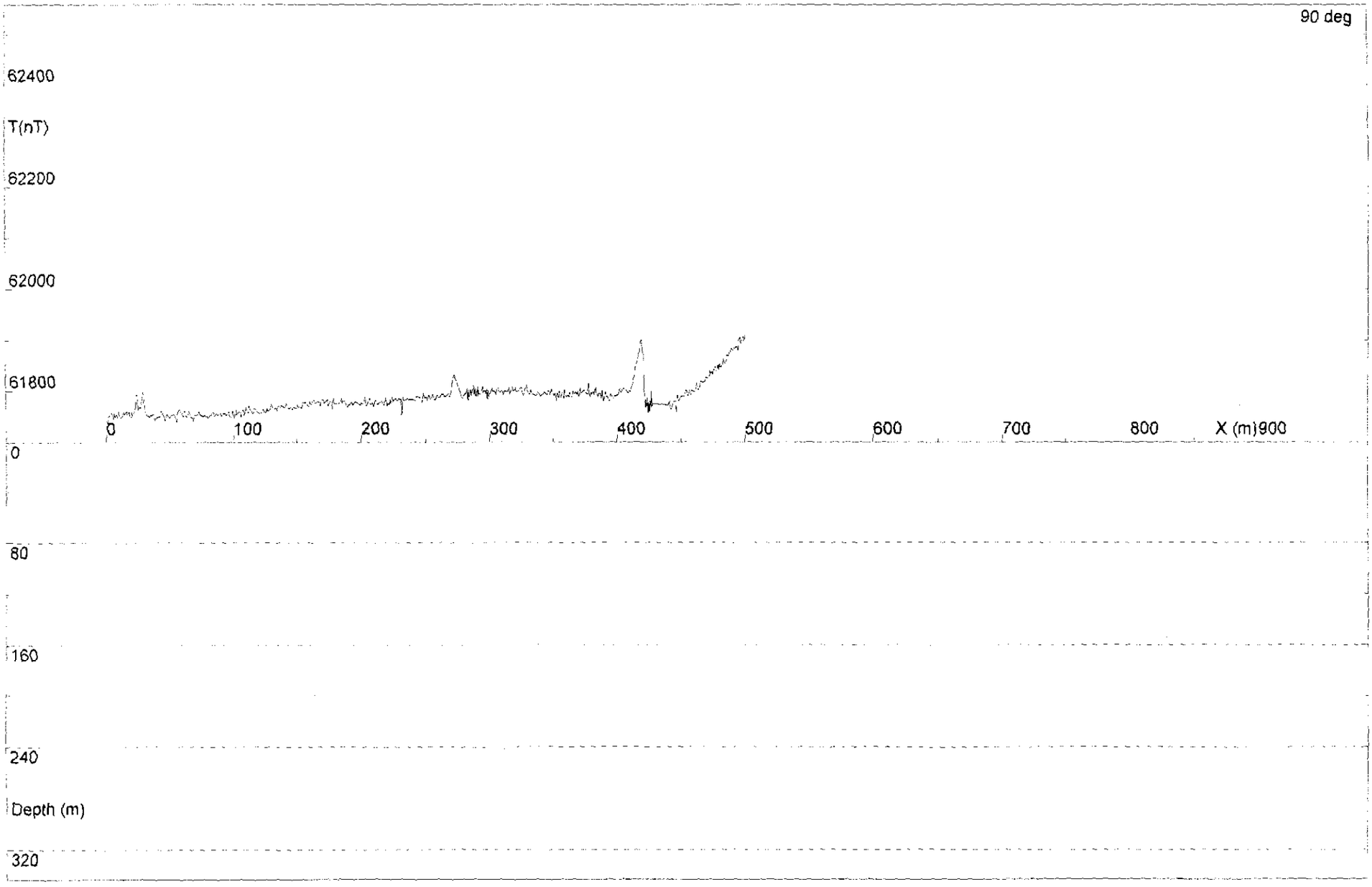
Observations: Arthur Dam Grid - Ground Magnetics
Profile #4; 0E (Baseline)
Model:
Calculation mode: Total Magnetic Intensity



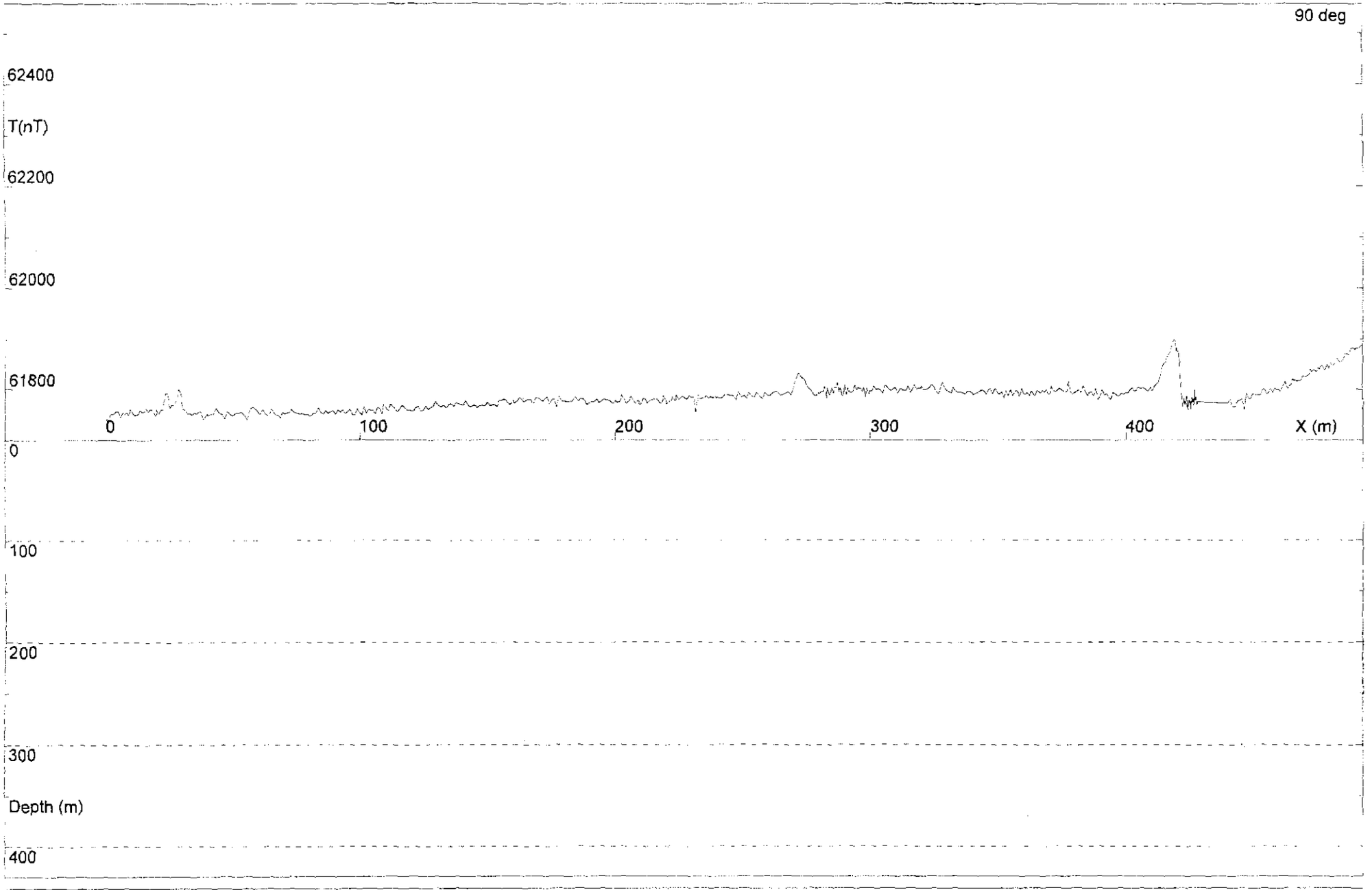
Observations: Arthur Dam Grid - Ground Magnetics South section

Model:

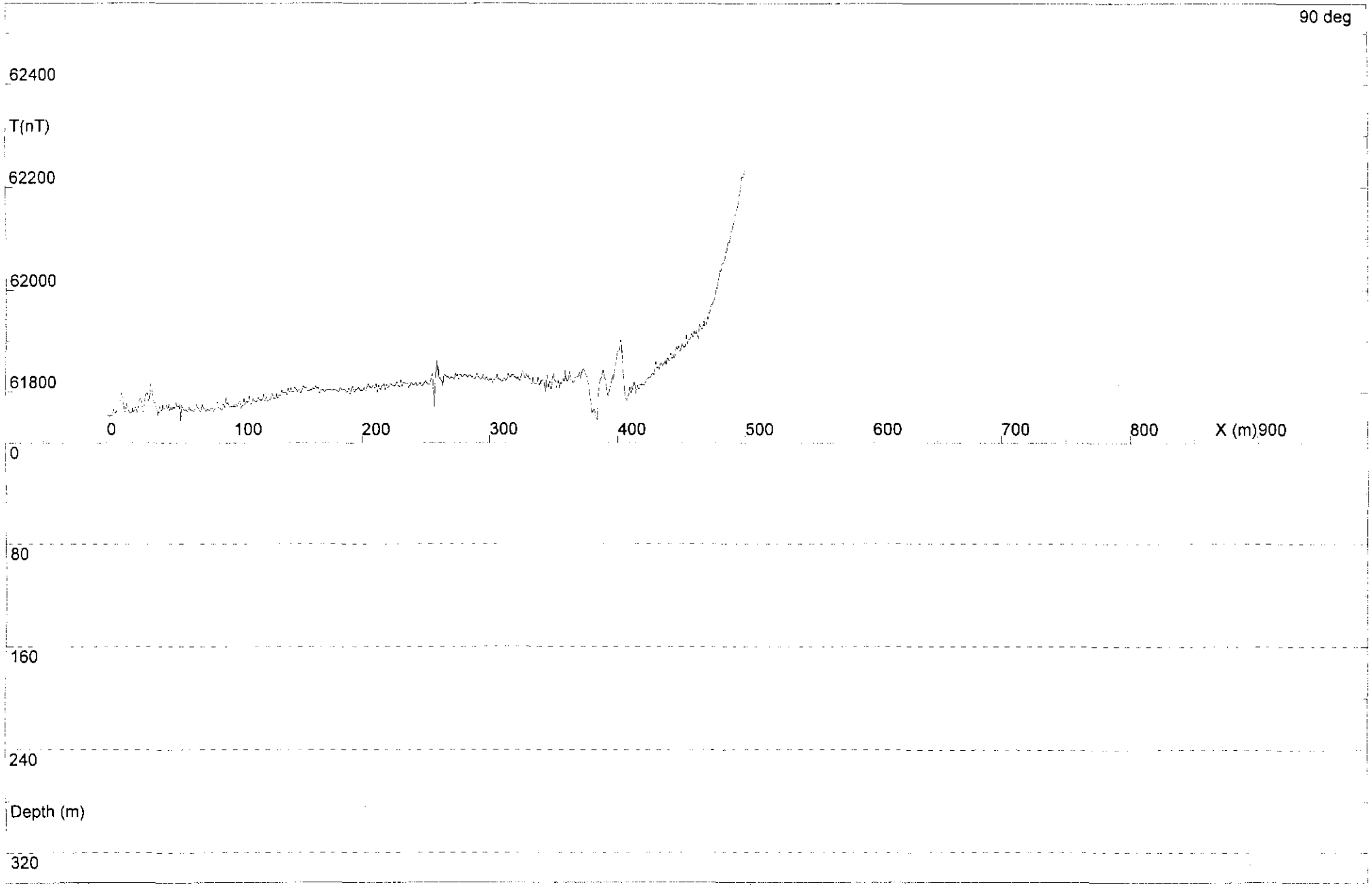
POTENT v3.06 Plan drawn at 17:00 10/04/1996 for Pasminco Exploration



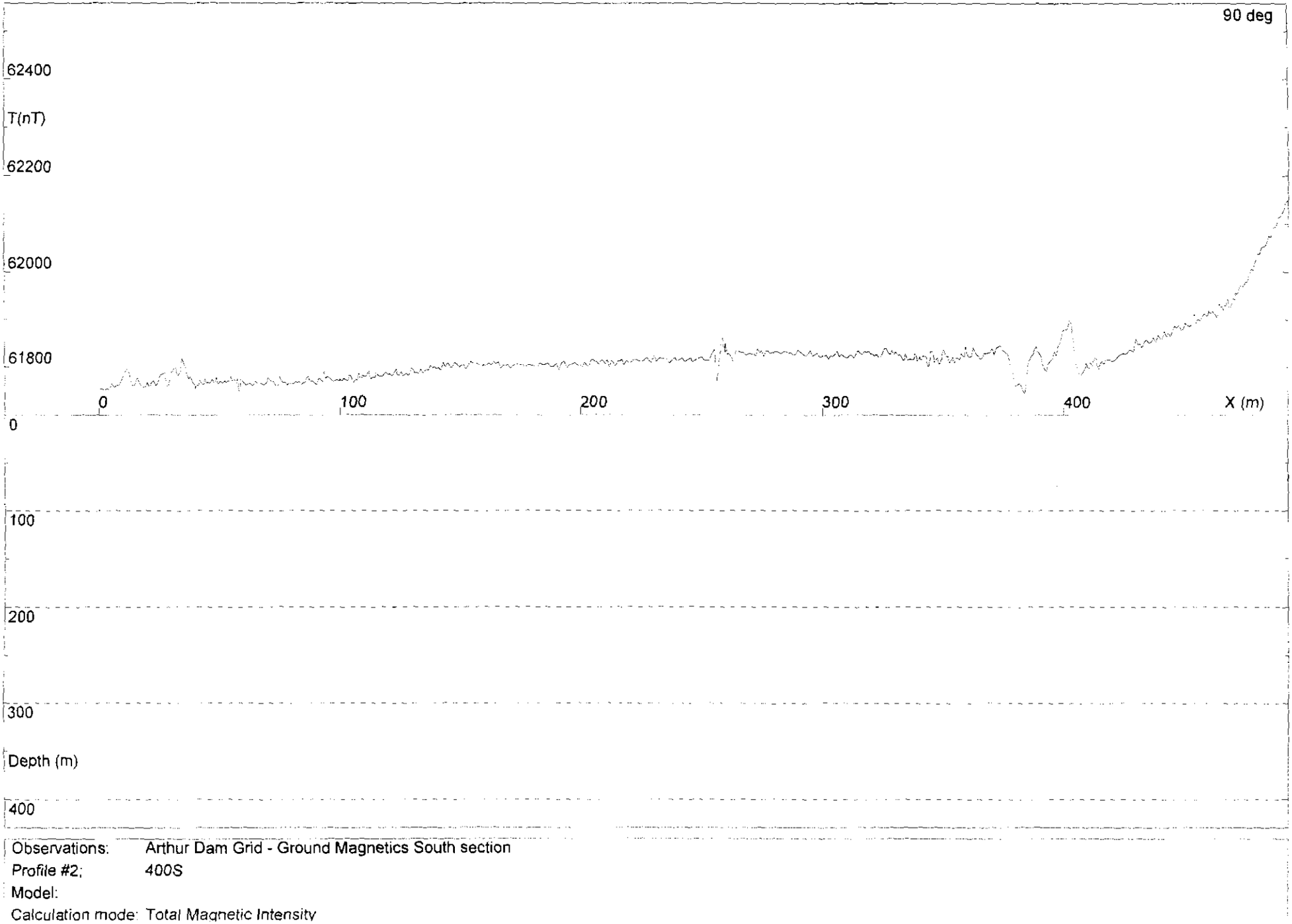
Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #1; 500S
Model:
Calculation mode: Total Magnetic Intensity



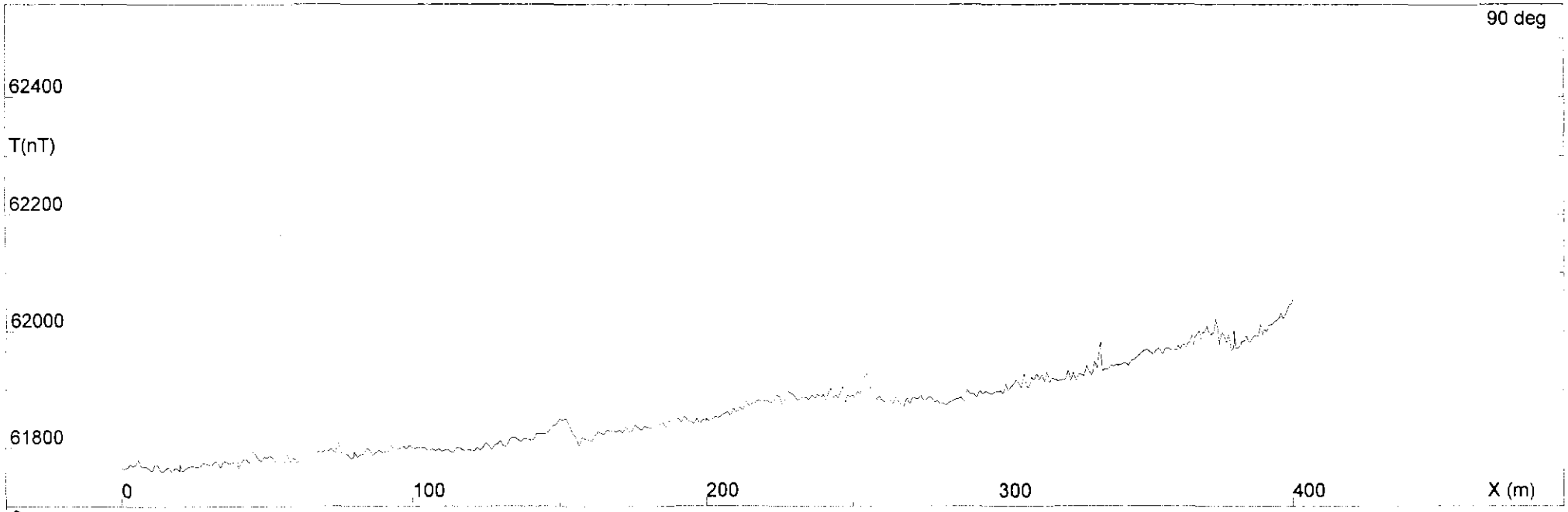
Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #1; 500S
Model:
Calculation mode: Total Magnetic Intensity

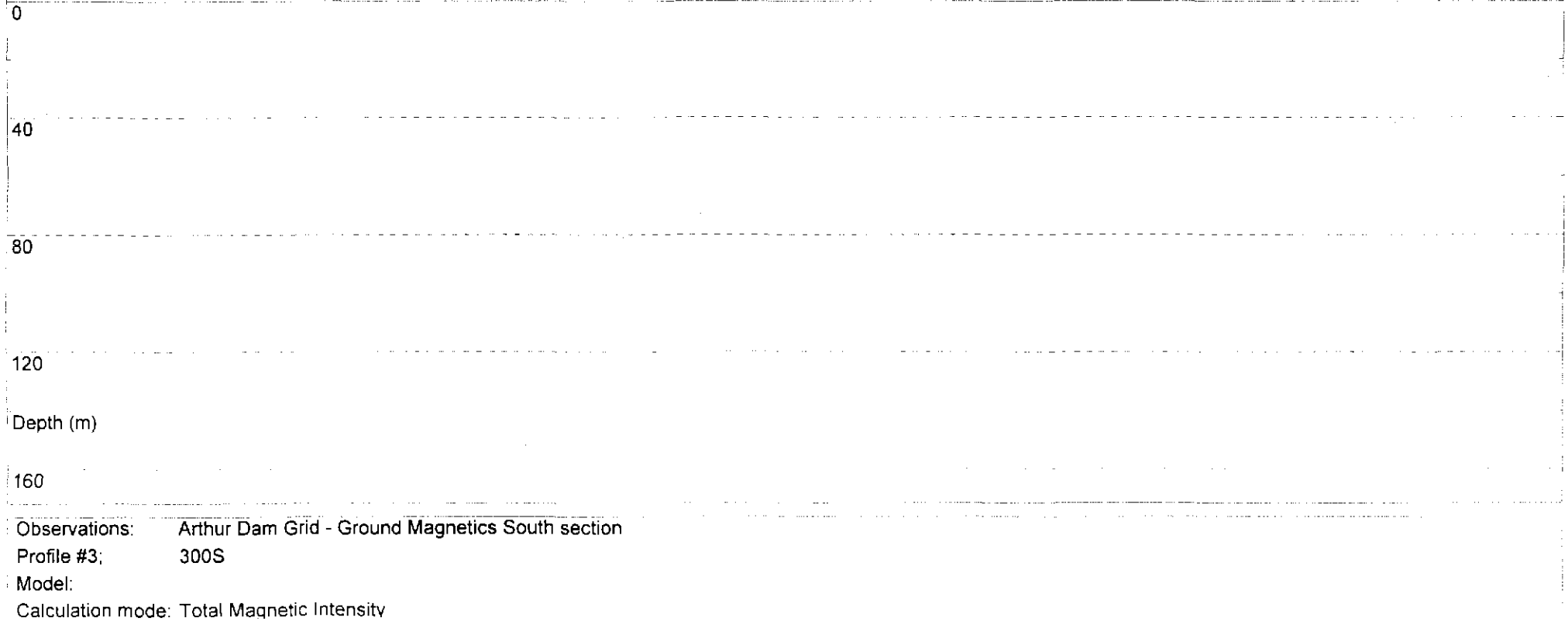


Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #2; 400S
Model:
Calculation mode: Total Magnetic Intensity

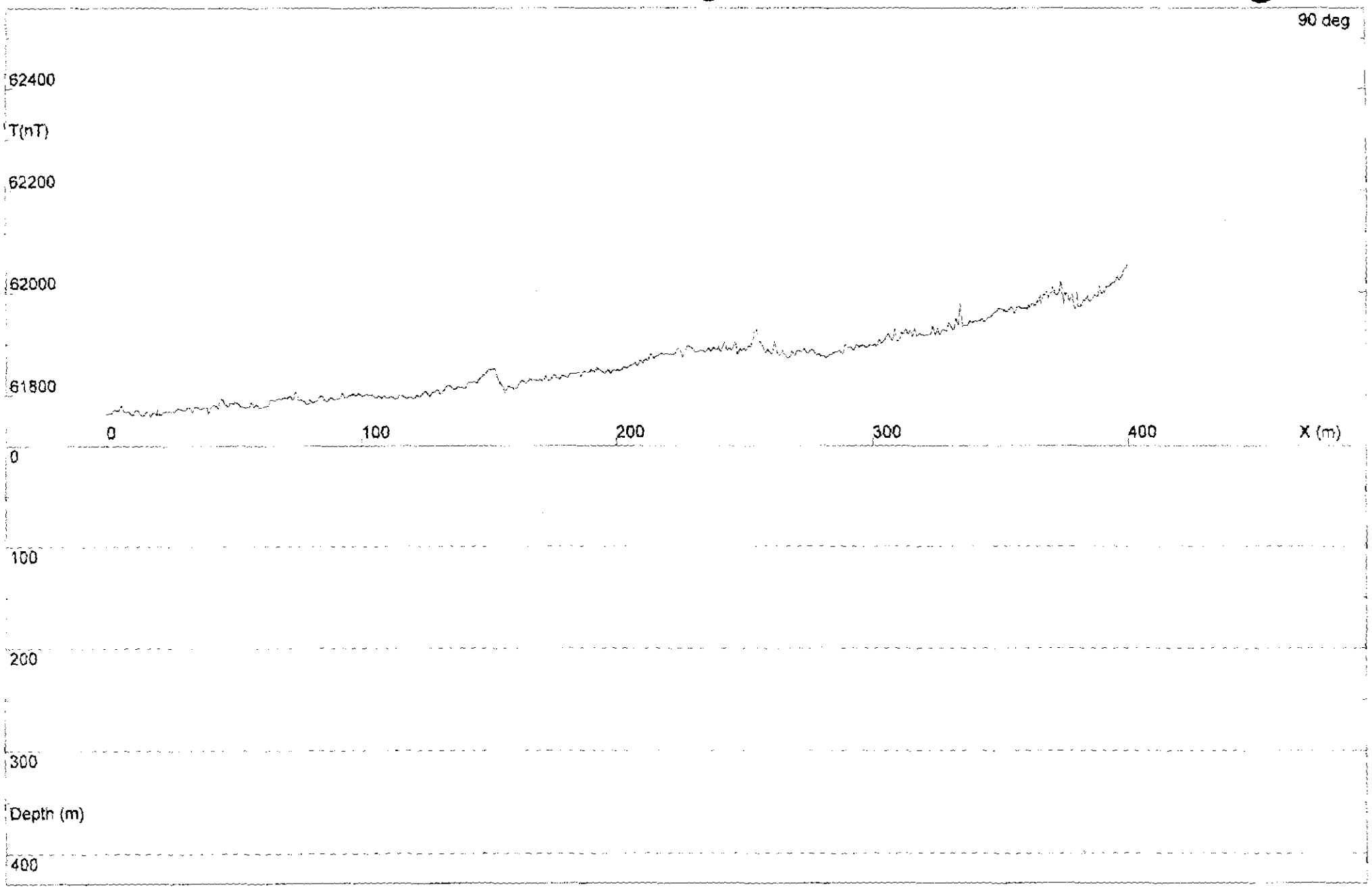


Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #2; 400S
Model:
Calculation mode: Total Magnetic Intensity

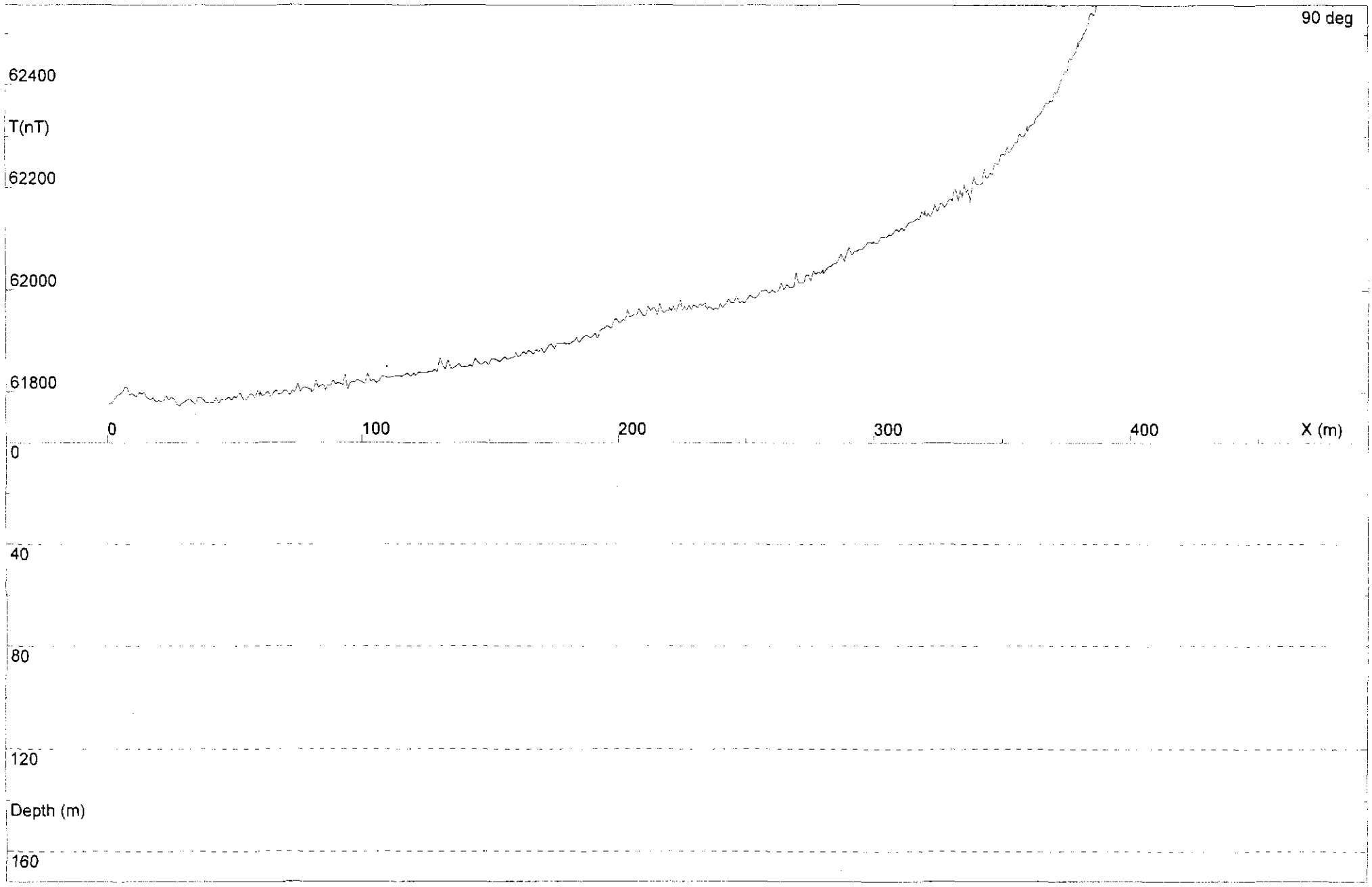




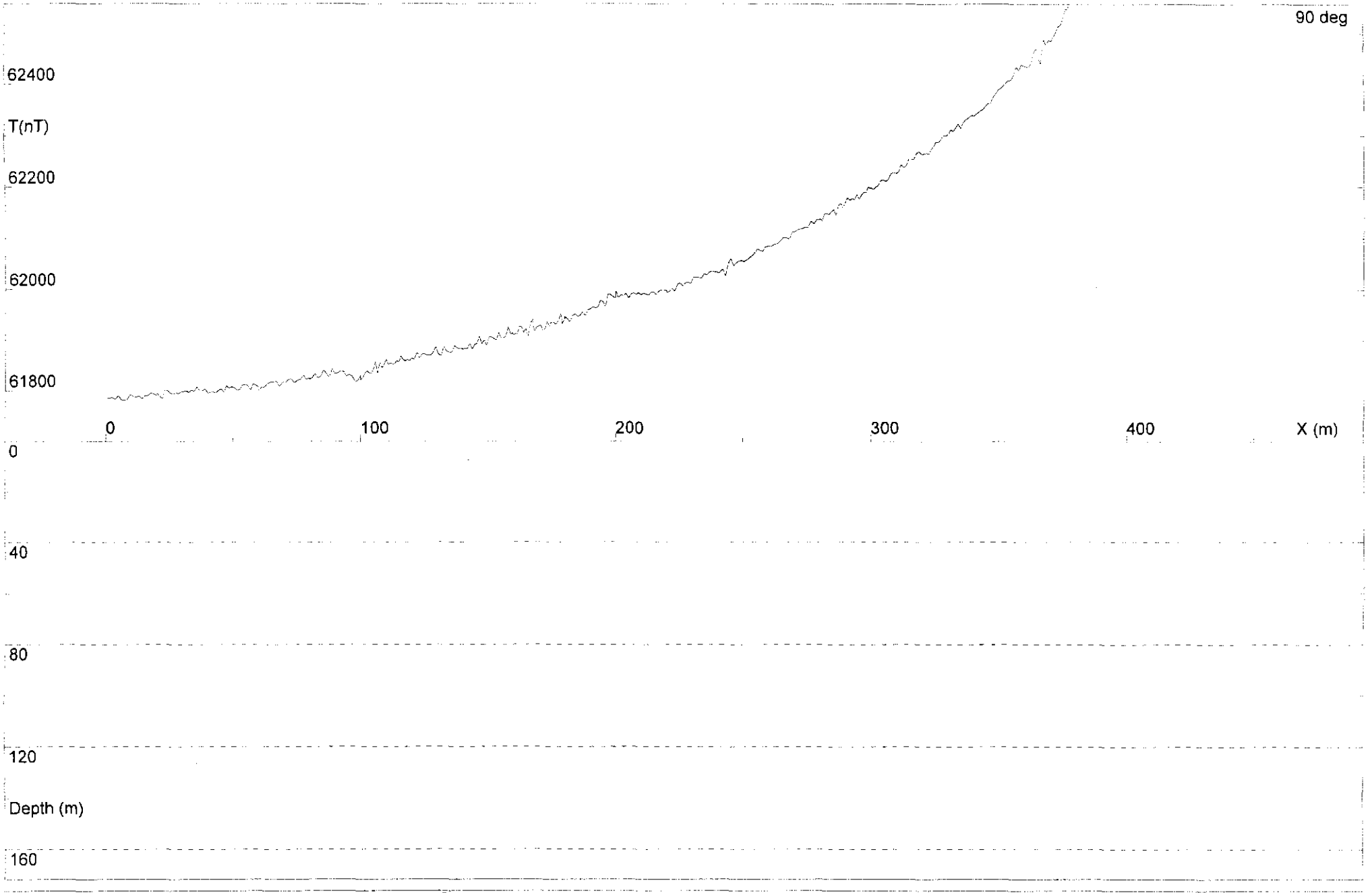
Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #3; 300S
Model:
Calculation mode: Total Magnetic Intensity



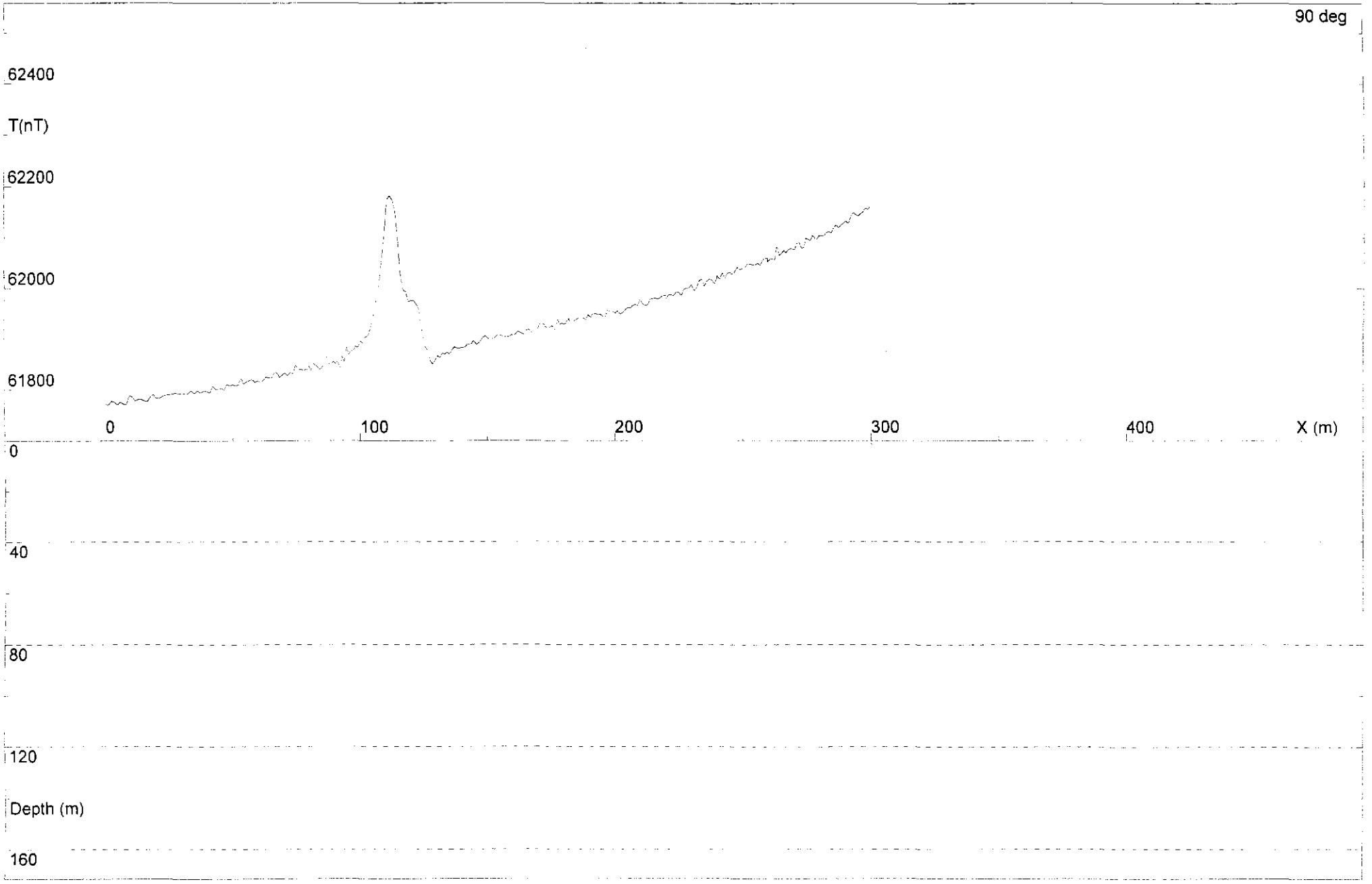
Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #3; 300S
Model:
Calculation mode: Total Magnetic Intensity



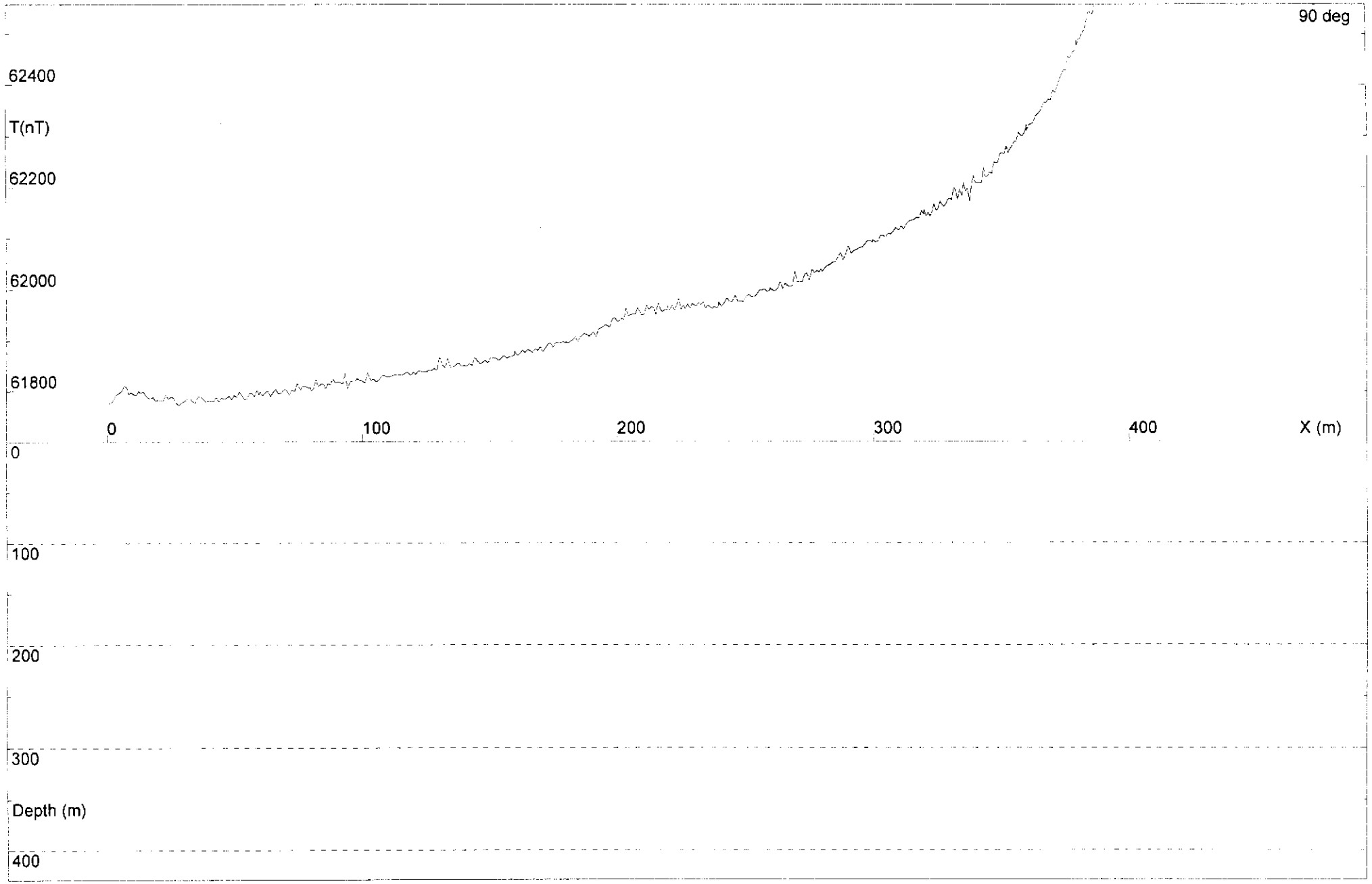
Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #4; 200S
Model:
Calculation mode: Total Magnetic Intensity



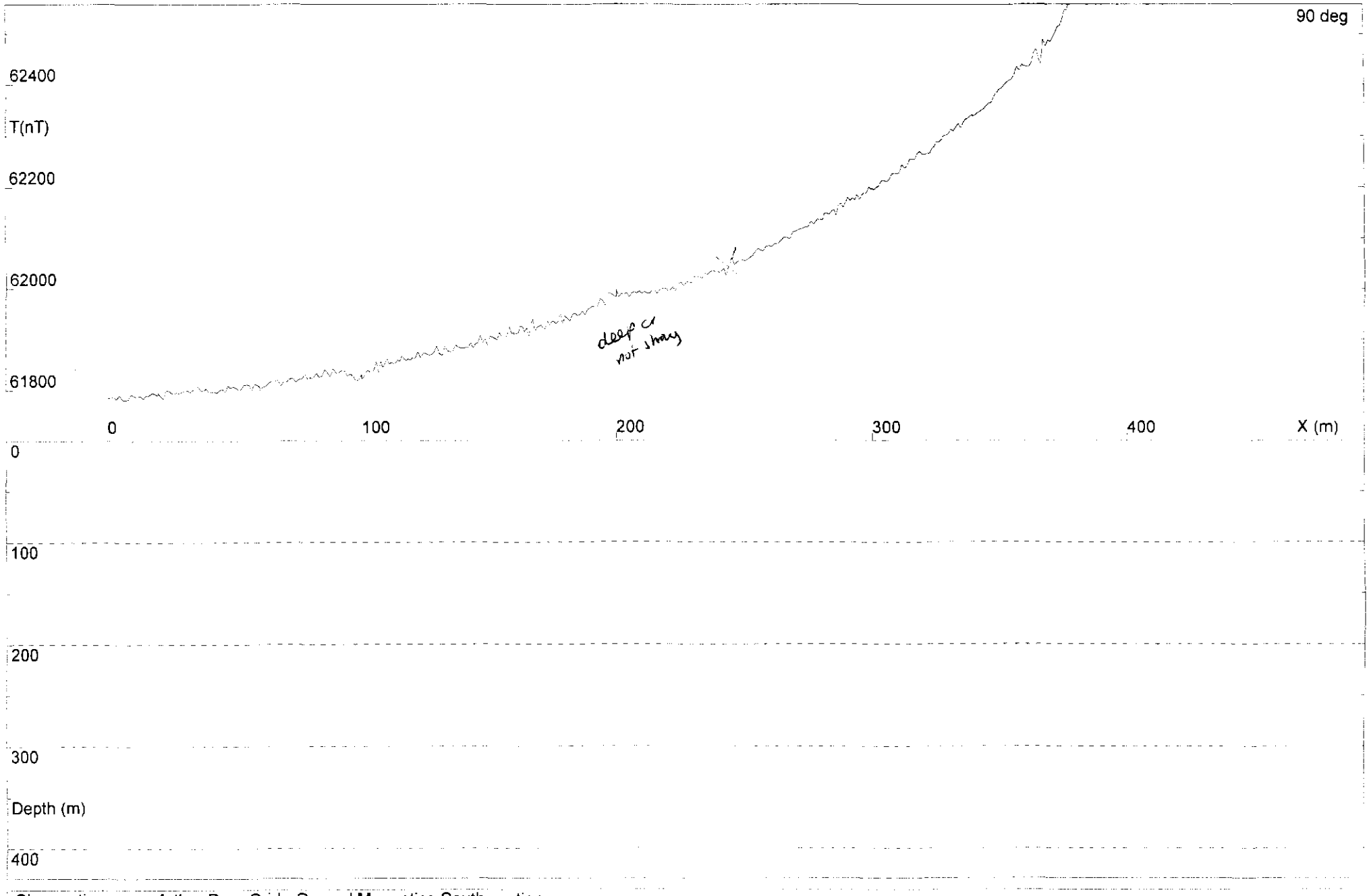
Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #5; 100S
Model:
Calculation mode: Total Magnetic Intensity



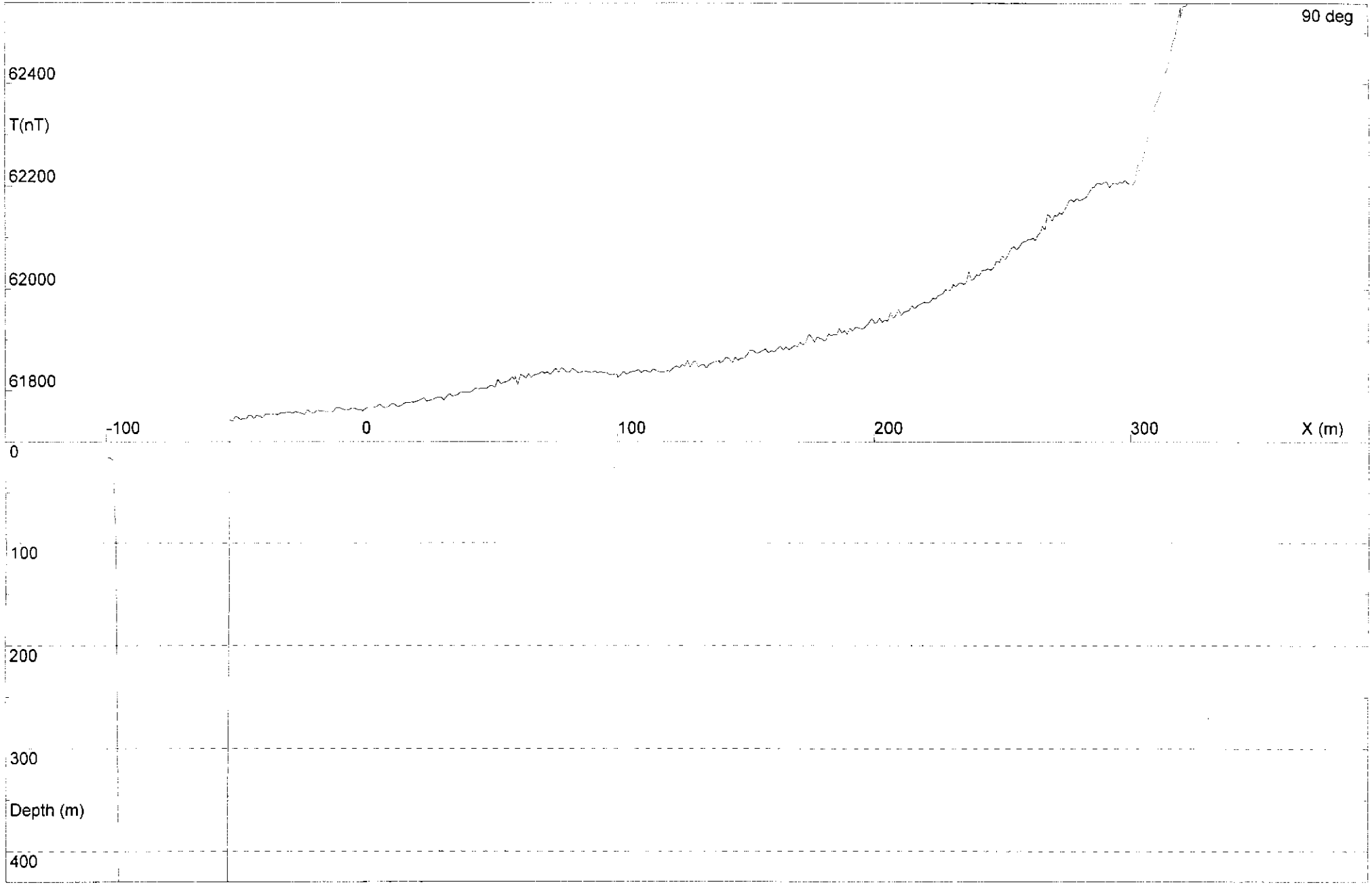
Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #6; 0N
Model:
Calculation mode: Total Magnetic Intensity



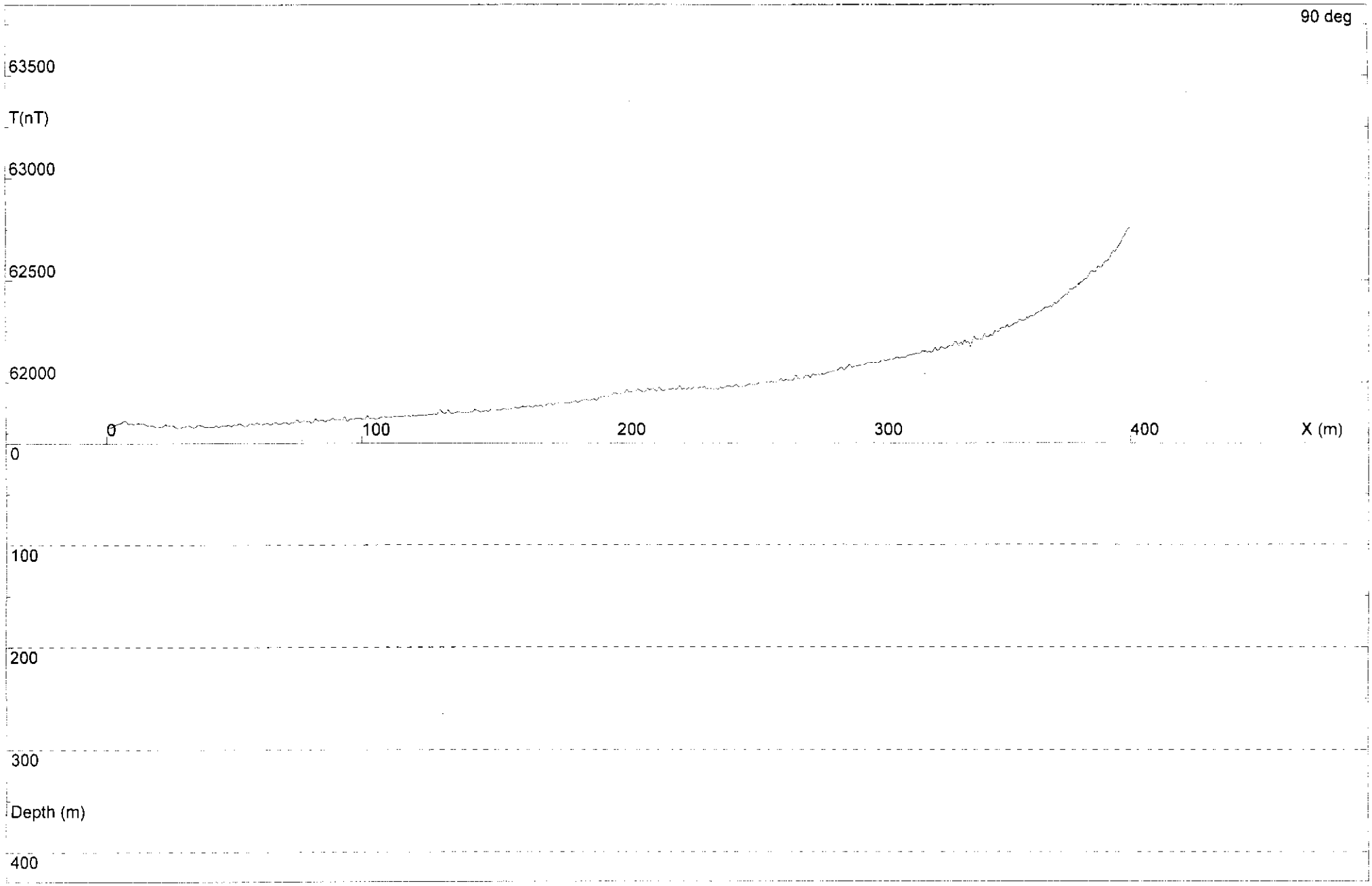
Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #4; 200S
Model:
Calculation mode: Total Magnetic Intensity



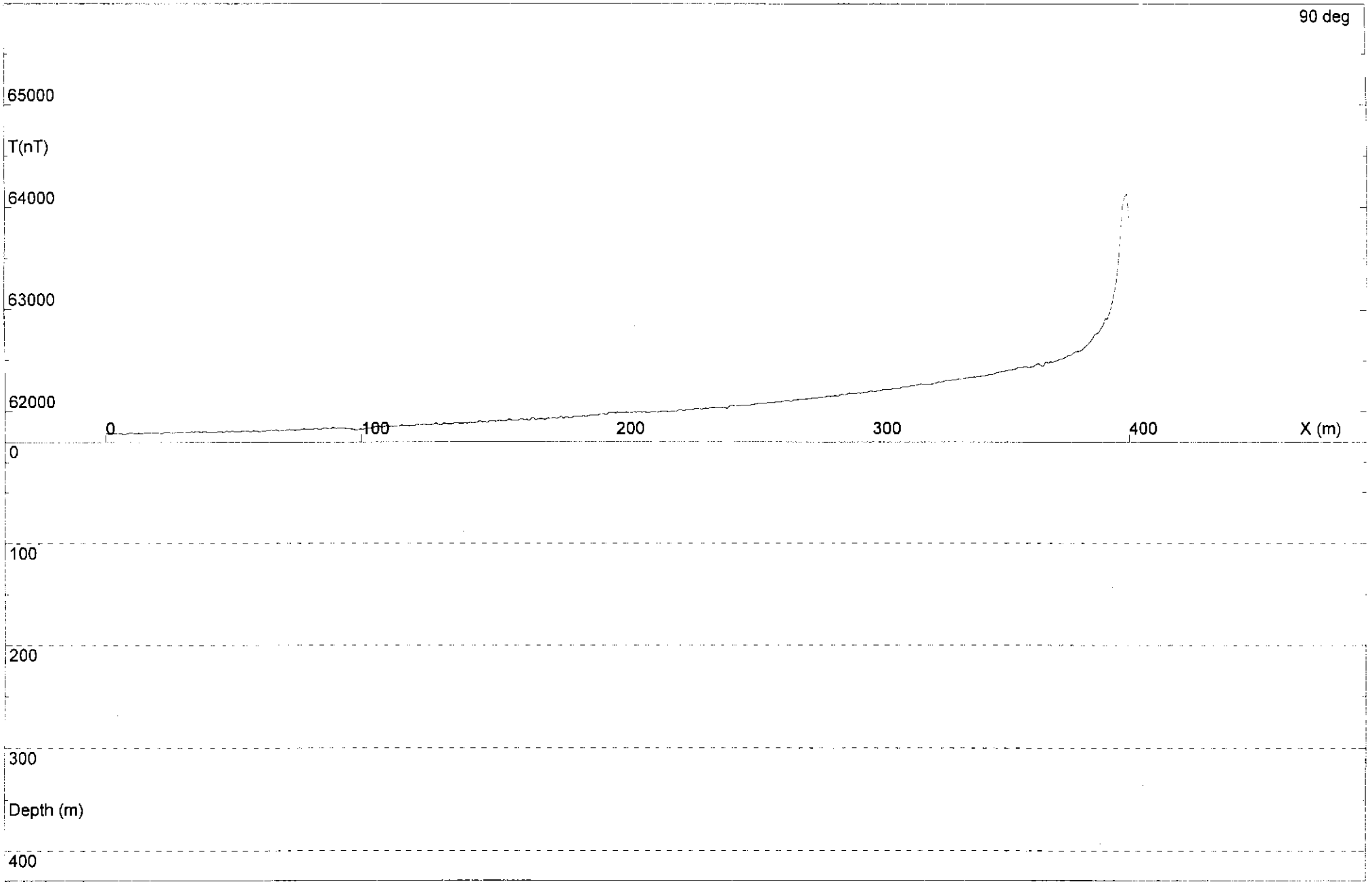
Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #5: 100S
Model:
Calculation mode: Total Magnetic Intensity



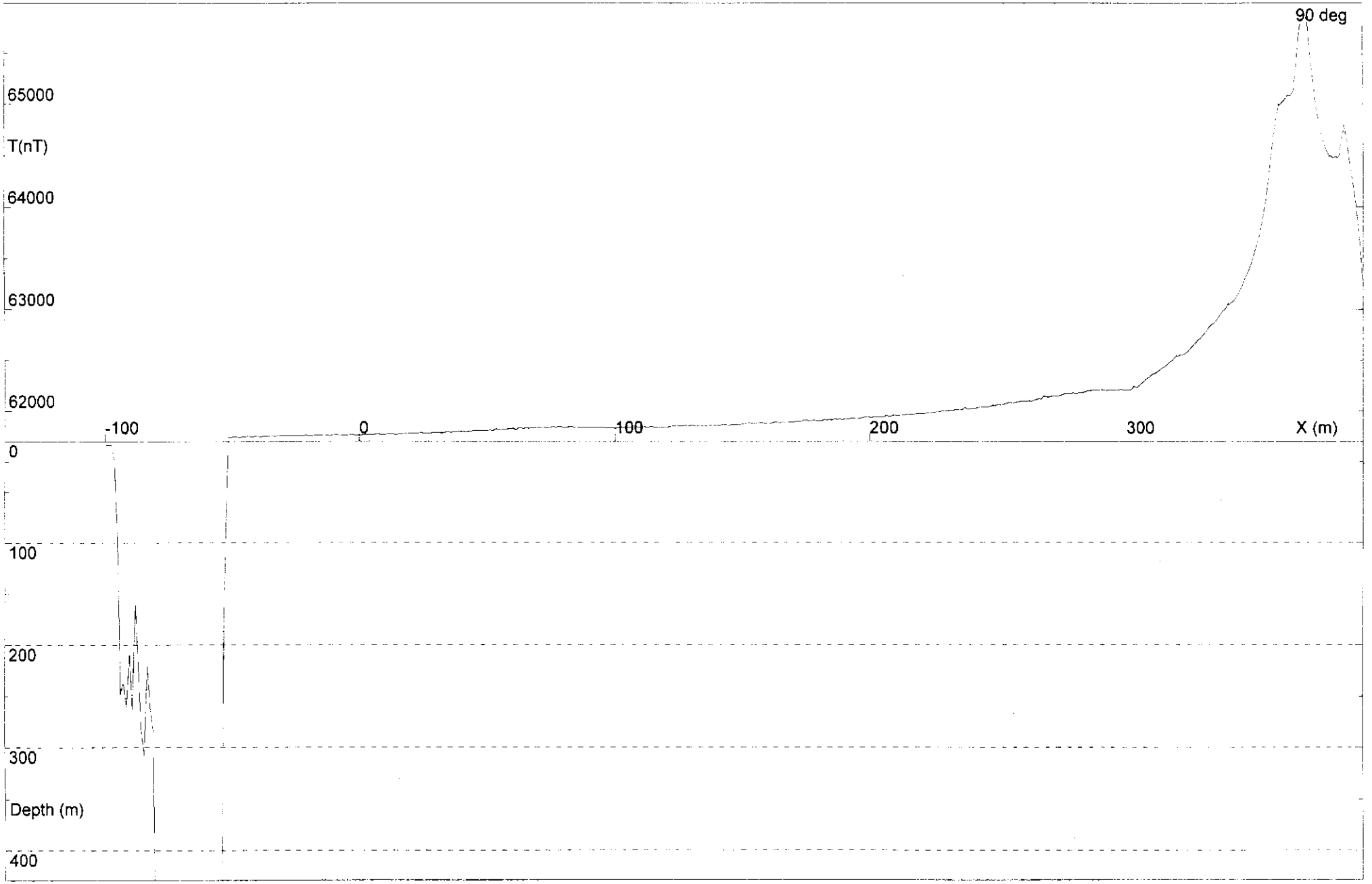
Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #7; 100N
Model:
Calculation mode: Total Magnetic Intensity



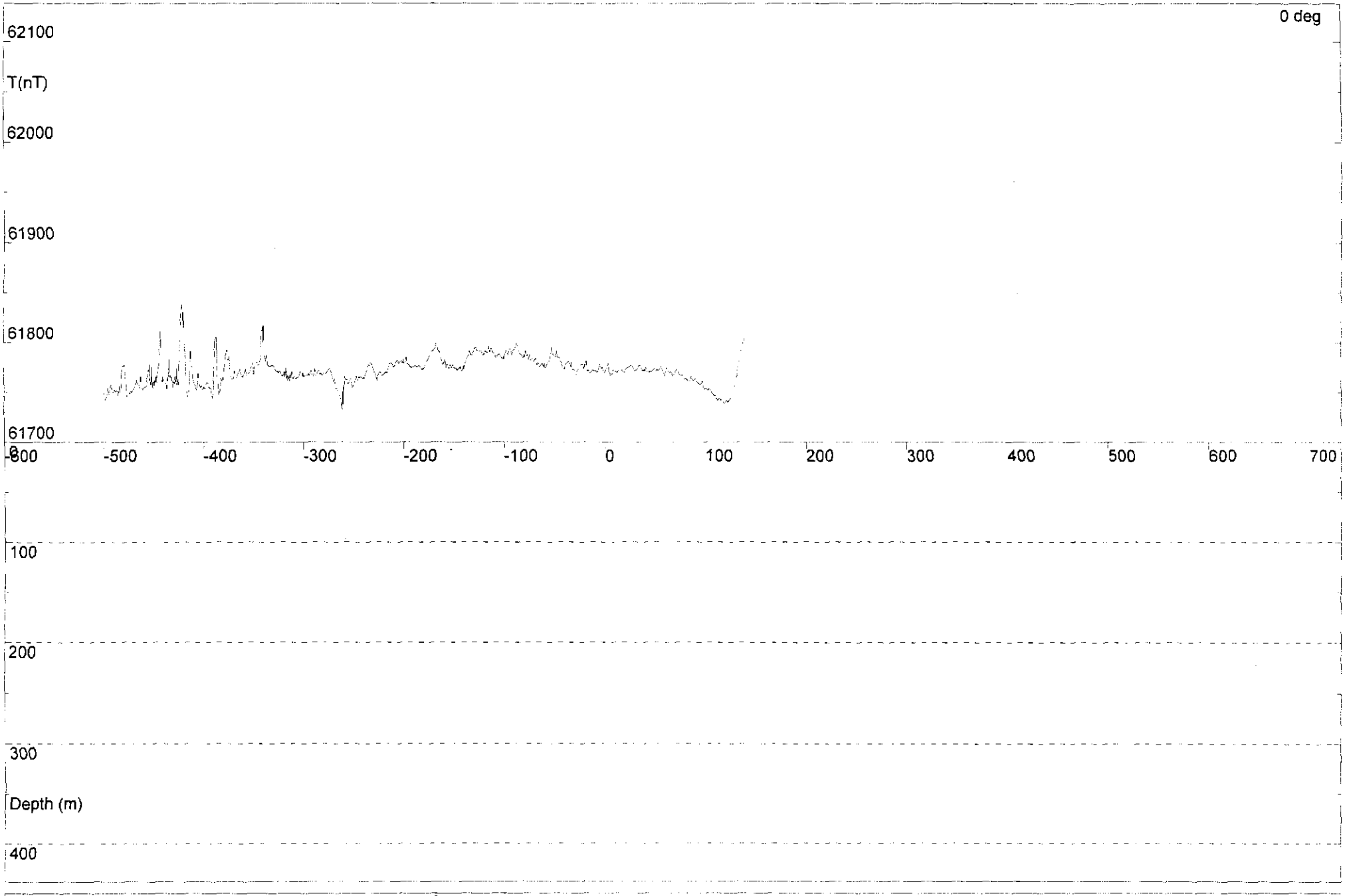
Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #4; 200S
Model:
Calculation mode: Total Magnetic Intensity



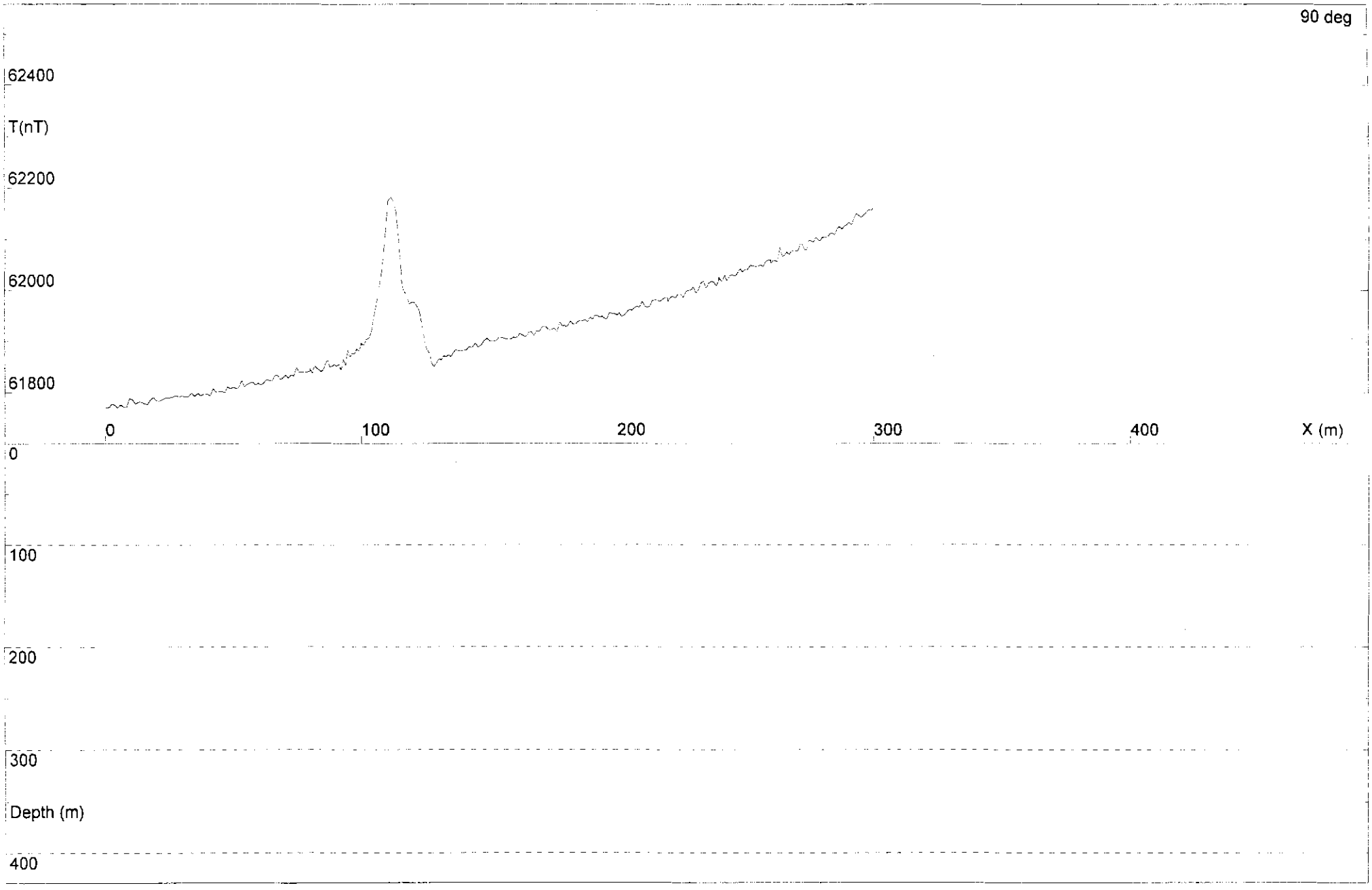
Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #5; 100S
Model:
Calculation mode: Total Magnetic Intensity



Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #7; 100N
Model:
Calculation mode: Total Magnetic Intensity



Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #8; 0E (Baseline)
Model:



Observations: Arthur Dam Grid - Ground Magnetics South section
Profile #6; 0N
Model:
Calculation mode: Total Magnetic Intensity

Appendix 8

Drilling

PASMINCO EXPLORATION
DIAMOND DRILL HOLE LOG

Hole ID
AD3

DRILLING

Location	LUINA EL 17/93
Project	
Prospect	ARTHUR DAM
Design By	N.K. MCGUNNIGLE
Logged By	N.K. MCGUNNIGLE
Relogged	
Commenced	1 MAY 1996
Completed	16 MAY 1996
Drilled By	DIAMOND DRILLING TASMANIA
Drill Rig	

OBJECTIVE

To test a Zn-Pb soil geochemistry anomaly.

RESULT

Cleavage parallel and east-west striking veins of carbonate and late quartz show minor galena, sphalerite and/or pyrite.

COLLAR SURVEY (AMG)

DOWNHOLE SURVEY (AMG)

SIGNIFICANT CORE LOSS

POOR GROUND CONDITION ZONES

HOLE SIZE

HOLE CONDITIONS AFTER COMPLETION

SIGNIFICANT INTERSECTIONS

PASMINCO EXPLORATION

DIAMOND DRILL HOLE LOG

Hole No. AD3

PROJECT:

Vertical Scale 1 : 200

5 cm

Page 1 of 1

DESCRIPTION					GRAPHIC			
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth	Lith	Struct	STRUCTURES
5.00	14.80	VARIABLY TEXTURED VOLCANICS Dark grey-green pyroxene phyric lava interbedded with volcaniclastics and breccia. At 5.2m, lava is composed of 10% pyroxene (up to 3mm, av 0.5 -1mm) and <2% feldspar. Intercalated fine grained tuffaceous sediments are strongly chloritic. Lava breccia is composed of amygdaloidal and pyroxene phyric clasts in a mid-grey matrix of px-feld lava with peperitic and mixed sediment margins.	highly chloritised, moderately sericitic in veinlets/cleavage planes, minor carbonate in veinlets	Traces of fine grained disseminated pyrite in and along margins of carbonate veinlets parallel to foliation. Trace of magnetite.				FIRST CLEAVAGE A40
14.80	17.50	VOLCANICLASTICS Fine-medium grained intercalated siltstone shale volcaniclastics	highly chloritised, carbonate has preferentially replaced coarser seds and infilled fractures in places, with trace of hematite in places +/- talc					FAULT A10
17.50	21.00	Intermixed pyroxene phyric lava and volcanoclastic sandstone-siltstone.	20mm calcite vein with sericitic margins					A36
21.00	26.70	LAVA BRECCIA Autoclastic and hyaloclastic andesite, containing clasts of chloritically altered pyroxene, 8-10% abundance, averaging 1mm. Amygdales in clasts and matrix filled with chlorite.	highly chloritised, carbonate has infilled vesicles and amygdales and replaced matrix in breccia, minor carbonate-sericite veinlets					
26.70	28.90	Dark grey-green intermixed lava and sediments with some peperitic-hyaloclastic textures	highly chloritised, slightly sericitised, minor talc					

PASMINCO EXPLORATION

DIAMOND DRILL HOLE LOG

Hole No. **AD3**

PROJECT:

Vertical Scale 1 : 200

DESCRIPTION					GRAPHIC			
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth	Lith	Struct	STRUCTURES
26.70	28.90	Dark grey-green intermixed lava and sediments with some peperitic-hyaloclastic textures	highly chloritised, slightly sericitised, minor talc	Traces of fine grained disseminated pyrite in and along margins of carbonate veinlets parallel to foliation. Trace of magnetite.				
28.90	30.60	SEDIMENTS Fine grained, green-grey chloritic-talcose sediments with occasional intermixed fine grained sericitic ?lava						
30.60	46.60	VOLCANICS Intermixed lava breccia, hyaloclastite and volcaniclastics composed of dark green-grey pyroxene phyric lava and clasts, rounded chert and angular bedded siltstone-sandstone clasts. Some hyaloclastite matrix is replaced by carbonate.	highly chloritised. Carbonate has replaced hyaloclastite matrix and sandstone beds; minor sericite lies on margins of fractures; traces of talc in matrix		30			FIRST CLEAVAGE A36 FAULT A40 FAULT A34 pug
			highly chloritised. carbonate (calcite) in veinlets with very minor silica (infilling cavities); traces of talc on cleavage planes	Silica-hematite clast (10mm) contains spotty sphalerite and pyrite	40			FIRST CLEAVAGE A29
			moderately chloritised. change to cream coloured Mn-Fe carbonate in net veinlets parallel to cleavage; minor late silica in carbonate veinlets					FIRST CLEAVAGE A36 FAULT A29 FAULT A38 pug
46.60	57.60	LAVA Green-grey pyroxene phyric lava containing quenched vesicular and porphyritic clasts (with convex edges), preferentially carbonate altered. Pyroxene constitutes 3%, < 2mm (up to 4mm in clasts). Decreasing grainsize downhole		DISSEMINATED minor sphalerite disseminated minor pyrite disseminated. plus sphalerite in carbonate veinlets +/- parallel to LCA				FIRST CLEAVAGE A15 FAULT A22 pug
			moderately chloritised. carbonate parallel to cleavage and clast replacement; minor quartz, infilling cavities; late carbonate-quartz veins cross-cutting cleavage	DISSEMINATED trace pyrite associated with alteration. -carbonate parallel to cleavage	50			FIRST CLEAVAGE D53

5 cm

PASMINCO EXPLORATION

DIAMOND DRILL HOLE LOG

Hole No. AD3

PROJECT:

Vertical Scale 1 : 200

Page of 1

DESCRIPTION					GRAPHIC			
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth	Lith	Struct	STRUCTURES
46.60	57.60	LAVA Green-grey pyroxene phyric lava containing quenched vesicular and porphyritic clasts (with convex edges), preferentially carbonate altered. Pyroxene constitutes 3%, < 2mm (up to 4mm in clasts). Decreasing grainsize downhole	moderately chloritised. carbonate parallel to cleavage and clast replacement: minor quartz, infilling cavities: late carbonate-quartz veins cross-cutting cleavage	DISSEMINATED trace pyrite associated with alteration. -carbonate parallel to cleavage	60			
57.60	90.40	MIXED LAVA-SEDIMENTS Grey-green pyroxene phyric lava and breccia with vesicular pyroxene phyric clasts (as above) intermixed with reworked breccia and volcaniclastics. Some amygdales in clasts infilled with chlorite> silica. Peperitic and hyaloclastic contacts common.		DISSEMINATED trace sphalerite disseminated trace galena disseminated. in carbonate-quartz veinlets parallel to cleavage				
				DISSEMINATED minor galena disseminated trace sphalerite disseminated. in carbonate-quartz vein	70			
			carbonatised. yellow-cream in 'stringers' parallel to bedding (and cleavage) textures					
			slightly fuchsitic	DISSEMINATED trace pyrite disseminated. with quartz filling spaces in carbonate				
			moderately chloritised. calcite>carbonate in net veinlets +/- parallel to cleavage: minor late silica in veinlets: traces of sericite		80			

5 cm

PASMINCO EXPLORATION

DIAMOND DRILL HOLE LOG

Hole No. AD3

PROJECT:

Vertical Scale 1 : 200

Page of 1

DESCRIPTION					GRAPHIC			
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth	Lith	Struct	STRUCTURES
57.60	90.40	MIXED LAVA-SEDIMENTS Grey-green pyroxene phyric lava and breccia with vesicular pyroxene phyric clasts (as above) intermixed with reworked breccia and volcaniclastics. Some amygdales in clasts infilled with chlorite> silica. Peperitic and hyaloclastic contacts common.	moderately chloritised. calcite>carbonate in net veinlets +/- parallel to cleavage; minor late silica in veinlets: traces of sericite	DISSEMINATED trace pyrite disseminated Ver minor disseminated pyrite on margins of (<) sphalerite, present with quartz (post carbonate)				
90.40	90.80	CONTACT: faulted		DISSEMINATED trace pyrite disseminated	90			
90.80	91.50	grey, peperitic. CONTACT: missing		DISSEMINATED trace pyrite disseminated trace magnetite disseminated				
91.50	92.60	INTERMEDIATE LAVA grey. fine grained porphyritic						
92.60	120.50	MIXED LAVA-SEDIMENTS Pyroxene-leucoxene phyric, amygdaloidal (chlorite filled) mafic volcanics, massive and brecciated, intermixed with bedded volcaniclastic sandstone and breccia. Leucoxene increases to up to 10% in some beds.		DISSEMINATED trace pyrite disseminated	100 110			FIRST CLERVAGE D60 carbonate

5 cm

PASMINCO EXPLORATION

DIAMOND DRILL HOLE LOG

Hole No. AD3

PROJECT:

Vertical Scale 1 : 200

DESCRIPTION					GRAPHIC			
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth	Lith	Struct	STRUCTURES
92.60	120.50	MIXED LAVA-SEDIMENTS Pyroxene-leucoxene phyric, amygdaloidal (chlorite filled) mafic volcanics, massive and brecciated, intermixed with bedded volcaniclastic sandstone and breccia. Leucoxene increases to up to 10% in some beds.	moderately chloritised. calcite>carbonate in net veinlets +/- parallel to cleavage; minor late silica in veinlets; traces of sericite highly chloritised, moderately carbonatised. vesicles infilled with carbonate	DISSEMINATED trace pyrite disseminated				
120.50	122.90	Hyaloclastite/mixed sediment-lava contact with porphyritic volcanic unit composed of medium grained dark (chloritic) rimmed phenocrysts, up to 20%			120			
122.90	128.00	VOLCANICLASTIC Coarse grained sandstone composed of reworked and rounded olivine +/- feldspar, replaced by chlorite and carbonate respectively. Bedded and cleaved.	carbonate + chlorite-sericite in veinlets/cleavage planes carbonate-quartz veins cuts foliation; trace fuchsite					
128.00	134.00	LAVA Peperitic, slightly brecciated contact with fine grained dark grey porphyritic volcanics. Increasing clast size to reworked volcanic breccia at 129.5m, containing very finely vesicular clasts, and bedded volcaniclastics from 130m.					FAULT A40 pug	
		VOLCANICLASTICS Sandstone and breccia containing rounded clasts of porphyritic (pyroxene + amphibole < 6%) volcanics in a pale grey matrix, and reworked rimmed pyroxene and pink feldspar crystals.	highly chloritised. increasing carbonate in veinlets anastomising about cleavage and minor brecciation; carbonate>quartz (infilling spaces)	DISSEMINATED very minor pyrite disseminated	130		FIRST CLEAVAGE D2B carbonate	
		INTERMIXED VOLCANICS Variably textured lava, breccia, hyaloclastite and volcaniclastics containing pyroxene +/- feldspar +/- amphibole phenocrysts and chlorite filled vesicles in a medium grey groundmass/matrix. Lava is porphyritic up to 15%, including pink feldspar glomerocrysts up to 10mm (154.0-154.3) and pyroxene up to 8mm. Volcaniclastics include most commonly bedded sandstone to mass flow breccias, containing clasts of green-grey porphyritic lava and rounded silicic sandstone.	highly chloritised. carbonate in cleavage planes and replacing clasts and sandstone beds; minor silica; minor sericite on margins of carbonate veins	DISSEMINATED trace galena disseminated trace sphalerite disseminated. in carbonate-quartz vein DISSEMINATED trace sphalerite disseminated trace galena disseminated. in carbonate-quartz veining DISSEMINATED trace pyrite associated with alteration				
134.00	139.70							

5 cm

PASMINCO EXPLORATION

DIAMOND DRILL HOLE LOG

Hole No. AD3

PROJECT:

Vertical Scale 1 : 200

Page of 1

DESCRIPTION					GRAPHIC		
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth / Lith	Struct	STRUCTURES
139.70	213.20	INTERMIXED VOLCANICS Variably textured lava, breccia, hyaloclastite and volcaniclastics containing pyroxene +/- feldspar +/- amphibole phenocrysts and chlorite filled vesicles in a medium grey groundmass/matrix. Lava is porphyritic up to 15%, including pink feldspar glomerocrysts up to 10mm (154.0-154.3) and pyroxene up to 8mm. Volcaniclastics include most commonly bedded sandstone to mass flow breccias, containing clasts of green-grey porphyritic lava and rounded silicic sandstone.	highly chloritised. carbonate in cleavage planes and replacing clasts and sandstone beds; minor silica; minor sericite on margins of carbonate veins	minor pyrite replacing carbonate in sandstone beds Traces of pyrite>galena in carbonate vein Traces of galena>pyrite in carbonate vein DISSEMINATED trace sphalerite disseminated trace galena disseminated. in carbonate-quartz DISSEMINATED trace pyrite disseminated Traces of pyrite>galena, disseminated on margins of carbonate vein DISSEMINATED trace pyrite disseminated. in 10mm carbonate-quartz vein	140 150 160		FIRST CLEAVAGE A23 FIRST CLEAVAGE A40 carbonate FIRST CLEAVAGE D44 carbonate FAULT A28 shear pug
			chlorite pervasive and replaced clasts/crystals; Fe-Mn carbonate blotchy in veinlets and cleavage planes, and clast replacment > abundant than calcite; minor silica and sericite				

5 cm

PASMINCO EXPLORATION

DIAMOND DRILL HOLE LOG

Hole No. AD3

PROJECT:

Vertical Scale 1 : 200

Page of 1

DESCRIPTION					GRAPHIC			
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth	Lith	Struct	STRUCTURES
139.70	213.20	INTERMIXED VOLCANICS Variably textured lava, breccia, hyaloclastite and volcaniclastics containing pyroxene +/- feldspar +/- amphibole phenocrysts and chlorite filled vesicles in a medium grey groundmass/matrix. Lava is porphyritic up to 15%, including pink feldspar glomerocrysts up to 10mm (154.0-154.3) and pyroxene up to 8mm. Volcaniclastics include most commonly bedded sandstone to mass flow breccias, containing clasts of green-grey porphyritic lava and rounded silicic sandstone.	chlorite pervasive and replaced clasts/crystals: Fe-Mn carbonate blotchy in veinlets and cleavage planes, and clast replacment > abundant than calcite: minor silica and sericite	DISSEMINATED trace galena disseminated trace pyrite disseminated. in rubbly carbonate-chlorite core DISSEMINATED trace pyrite disseminated DISSEMINATED trace pyrite disseminated trace galena disseminated. in calcite veinlets DISSEMINATED trace pyrite disseminated trace galena disseminated	170 180 190			FAULT A30 shear pug
			strong pervasive chlorite: moderate carbonate replacement of m-f.g. crystals in bedded volcaniclastics and in cleavage planes: minor late silica					

5 cm

PASMINCO EXPLORATION

DIAMOND DRILL HOLE LOG

Hole No. AD3

PROJECT:

Vertical Scale 1 : 200

Page of 1

DESCRIPTION					GRAPHIC			
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth	Lith	Struct	STRUCTURES
139.70	213.20	INTERMIXED VOLCANICS Variably textured lava, breccia, hyaloclastite and volcaniclastics containing pyroxene +/- feldspar +/- amphibole phenocrysts and chlorite filled vesicles in a medium grey groundmass/matrix. Lava is porphyritic up to 15%, including pink feldspar glomerocrysts up to 10mm (154.0-154.3) and pyroxene up to 8mm. Volcaniclastics include most commonly bedded sandstone to mass flow breccias, containing clasts of green-grey porphyritic lava and rounded silicic sandstone.	strong pervasive chlorite; moderate carbonate replacement of m-f.g. crystals in bedded volcaniclastics and in cleavage planes; minor late silica carbonate vein (pre-cleavage)	DISSEMINATED trace pyrite disseminated trace galena disseminated. in carbonate veinlets parallel to cleavage	200 210			FIRST CLEAVAGE A40 FIRST CLEAVAGE A45
213.40	220.00	Massive volcanics. Grey, massive unit, moderately silicieous with chlorite in fractures and ?replacing phenocrysts. Possibly intrusive. LAVA BRECCIA Brecciated contact with dark grey, mafic volcanic lava breccia, highly chloritic including infilling of amygdales, and some clasts altered to carbonate.	moderately silicified. chlorite patchy, in fractures highly chloritised. carbonate replacement and minor veinlets		220			

5 cm

303236

Appendix 9

AD3 Assays

Hole_ID	Sample	From	To	Cu	Pb	Zn	Mn	Fe%	Co	As	Ag	Au
AD3	78323A	6	8	66	5	36	1140	4.18	36	8	-1	0.001
AD3	78324A	8	10	34	-5	33	851	4.27	34	11	-1	0.001
AD3	78325A	10	12	63	-5	36	767	4.48	31	7	-1	0.002
AD3	78326A	12	14	61	-5	33	997	4.51	31	11	-1	-0.001
AD3	78327A	14	16	54	5	34	1210	3.76	29	9	-1	-0.001
AD3	78328A	16	18	38	-5	34	1620	4.31	34	9	-1	-0.001
AD3	78329A	18	20	39	-5	37	773	4.82	36	7	-1	-0.001
AD3	78330A	20	22	28	-5	35	1100	4.26	35	10	-1	-0.001
AD3	78331A	22	24	48	-5	36	1160	4.45	35	12	-1	-0.001
AD3	78332A	24	26	42	-5	31	1330	4.19	31	11	-1	0.001
AD3	78333A	26	28	52	-5	28	1010	4.03	31	8	-1	0.001
AD3	78334A	28	30	29	9	21	655	2.91	22	7	-1	-0.001
AD3	78335A	30	32	26	5	31	815	3.94	28	8	-1	-0.001
AD3	78336A	32	34	30	-5	29	1620	3.39	30	11	-1	0.002
AD3	78337A	34	36	31	5	35	1290	3.87	32	9	-1	-0.001
AD3	78338A	36	38	52	11	59	1020	4.64	37	11	-1	-0.001
AD3	78339A	38	40	36	5	39	1230	4.82	38	11	-1	-0.001
AD3	78340A	40	41	32	-5	33	987	4.45	36	10	-1	-0.001
AD3	78341A	41	42	21	-5	35	1240	4.25	33	10	-1	-0.001
AD3	78342A	42	44	31	-5	38	1290	4.87	37	10	-1	0.001
AD3	78343A	44	46	32	10	43	1140	4.77	37	16	-1	-0.001
AD3	78344A	46	47.5	20	6	51	3790	6.39	43	21	-1	-0.001
AD3	78345A	47.5	48.5	13	187	1310	4930	6.99	54	110	-1	-0.001
AD3	78346A	48.5	49.5	32	2810	2520	7930	9.59	49	154	3	0.001
AD3	78347A	49.5	51	30	42	115	3480	7.38	44	24	-1	0.001
AD3	78348A	51	53	33	14	119	3600	7.33	42	9	-1	0.001
AD3	78349A	53	55	35	5	487	5930	8.92	48	14	-1	-0.001
AD3	78350A	55	57	42	9	793	2530	5.99	47	17	-1	0.001
AD3	78351A	57	59	26	-5	123	2510	5.99	38	12	-1	-0.001
AD3	78352A	59	61	12	5	125	3200	5.79	40	20	-1	0.001
AD3	78353A	61	63	27	15	98	3890	6.62	38	15	-1	-0.001
AD3	78354A	63	65	18	-5	70	3370	6.6	39	18	-1	0.001
AD3	78355A	65	67	36	6	56	3270	6.69	44	17	-1	0.002
AD3	78356A	67	69	28	20	55	2460	6.26	45	26	-1	-0.001
AD3	78357A	69	70	22	5	84	2940	6.16	42	14	-1	-0.001

AD3	78358A	70	71	52	418	437	3410	5.67	39	20	-1	-0.001
AD3	78359A	71	73	37	5	77	1470	5.02	41	12	-1	0.002
AD3	78360A	73	75	21	-5	37	1190	4.4	36	11	-1	-0.001
AD3	78361A	75	77	31	-5	43	2180	5.35	44	22	-1	0.001
AD3	78362A	77	79	28	-5	41	1310	4.8	38	12	-1	-0.001
AD3	78363A	79	81	31	-5	35	1110	4.6	37	11	-1	-0.001
AD3	78364A	81	83	29	-5	39	1190	4.82	37	11	-1	0.001
AD3	78365A	83	85	33	-5	39	1300	5.08	39	11	-1	-0.001
AD3	78366A	85	87	20	-5	33	1100	4.53	35	9	-1	-0.001
AD3	78367A	887	89	22	-5	37	927	3.66	31	8	-1	-0.001
AD3	78368A	89	91	35	-5	28	862	3.41	29	7	-1	0.001
AD3	78369A	91	93	26	-5	31	802	4.07	31	9	-1	0.001
AD3	78370A	93	95	13	-5	30	842	4.21	29	7	-1	-0.001
AD3	78371A	95	97	19	-5	26	603	3.44	26	5	-1	-0.001
AD3	78372A	97	99	38	6	27	678	3.8	37	9	-1	0.001
AD3	78373A	99	101	28	-5	25	781	3.68	37	8	-1	-0.001
AD3	78374A	101	103	46	5	25	621	3.4	34	10	-1	0.001
AD3	78375A	103	105	55	-5	24	839	3.25	32	7	-1	0.001
AD3	78376A	105	107	30	-5	26	905	3.31	30	8	-1	0.001
AD3	78377A	107	109	33	-5	22	836	3.39	31	6	-1	0.001
AD3	78378A	109	111	57	5	23	808	3.09	29	9	-1	-0.001
AD3	78379A	111	113	33	-5	28	948	3.4	28	8	-1	-0.001
AD3	78380A	113	115	38	-5	31	710	3.64	31	7	-1	-0.001
AD3	78381A	115	117	25	-5	36	1240	3.7	29	10	-1	-0.001
AD3	78382A	117	119	29	-5	37	1210	4.42	34	8	-1	-0.001
AD3	78383A	119	121	25	5	52	1500	4.57	37	14	-1	0.028
AD3	78384A	121	123	4	-5	64	1280	4.33	37	12	-1	0.001
AD3	78385A	123	125	18	6	43	1230	3.48	33	11	-1	0.001
AD3	78386A	125	127	27	8	34	1020	4.05	35	10	-1	0.001
AD3	78387A	127	129	24	18	36	806	3.9	31	8	-1	-0.001
AD3	78388A	129	131	56	7	31	872	3.61	32	7	-1	0.001
AD3	78389A	131	133	19	21	52	829	3.78	33	7	-1	0.001
AD3	78390A	133	134.5	33	5	50	1130	3.94	34	9	-1	0.001
AD3	78391A	134.5	136	24	-5	54	1170	4.56	37	10	-1	-0.001
AD3	78392A	136	137	18	5	49	1470	4	35	37	-1	0.001
AD3	78393A	137	138	18	99	103	1350	3.97	31	11	-1	0.001

AD3	78394A	138	139	22	-5	56	1020	4.62	35	9	-1	0.001
AD3	78395A	139	141	19	9	46	1040	4.26	35	9	-1	0.001
AD3	78396A	141	143.5	33	-5	30	1080	4.1	35	9	-1	-0.001
AD3	78397A	143.5	145.5	27	-5	35	1070	4.29	35	7	-1	0.002
AD3	78398A	145.5	146.5	32	-5	35	1020	4.71	36	8	-1	0.001
AD3	78399A	146.5	147.5	31	8	35	1090	4.43	36	8	-1	0.001
AD3	78400A	147.5	149	24	-5	37	1190	4.96	36	8	-1	0.001
AD3	78426	149	151	36	5	66	1150	4.78	38	11	-1	0.001
AD3	78427	151	153	34	9	42	1210	4.77	37	13	-1	0.001
AD3	78428	153	154	79	206	416	1560	4.39	39	40	-1	0.001
AD3	78429	154	156	43	22	56	1000	3.98	33	14	-1	0.001
AD3	78430	156	158	40	7	41	1070	3.71	32	11	-1	0.002
AD3	78431	158	160	31	6	55	1220	4.84	38	10	-1	-0.001
AD3	78432	160	162	41	7	60	1370	4.48	39	24	-1	0.001
AD3	78433	162	164	29	11	45	1150	4.56	37	11	-1	0.001
AD3	78434	164	166	22	33	130	3180	4.59	47	102	-1	0.002
AD3	78435	166	168	12	20	194	4700	4.46	49	183	-1	0.001
AD3	78436	168	170	23	19	98	2680	4.19	47	91	-1	0.001
AD3	78437	170	172	60	27	95	2230	3.51	43	96	-1	0.001
AD3	78438	172	173	49	59	150	1780	3.77	40	77	-1	-0.001
AD3	78439	173	174	75	15	131	1760	3.74	38	47	-1	-0.001
AD3	78440	174	176	36	54	134	1690	3.91	45	55	-1	-0.001
AD3	78441	176	178	26	15	69	1390	3.88	41	19	-1	-0.001
AD3	78442	178	179	67	37	87	2490	3.69	42	52	-1	0.001
AD3	78443	179	180	93	29	54	1720	3.19	35	21	-1	0.001
AD3	78444	180	181	44	12	62	1320	3.31	35	21	-1	0.001
AD3	78445	181	182	57	5	56	910	3.61	39	15	-1	0.001
AD3	78446	182	183	23	10	45	1050	3.55	35	8	-1	0.002
AD3	78447	183	184	7	-5	51	965	3.04	33	14	-1	0.001
AD3	78448	184	186	15	22	26	789	1.89	23	12	-1	0.001
AD3	78449	186	188	25	8	52	1180	3.59	36	16	-1	-0.001
AD3	78450	188	190	35	-5	37	1120	3.98	40	12	-1	0.001
AD3	78451	190	192	38	5	37	1160	3.78	42	10	-1	-0.001
AD3	78452	192	194	45	10	31	976	3.81	39	9	-1	-0.001
AD3	78453	194	196	16	5	21	760	2.48	27	6	-1	-0.001
AD3	78454	196	198	29	28	45	812	2.35	30	9	-1	-0.001

AD3	78455	198	200	38	37	39	833	2.92	34	11	-1	-0.001
AD3	78456	200	202	34	9	47	1020	3.26	37	11	-1	0.001
AD3	78457	202	204	38	7	48	1140	3.61	36	16	-1	-0.001
AD3	78458	204	206	34	5	33	1050	3.68	38	12	-1	0.001
AD3	78459	206	208	53	9	86	2990	4.74	50	102	-1	0.001
AD3	78460	208	210	24	42	88	1620	4.51	54	42	-1	-0.001
AD3	78461	210	212	44	5	31	1250	3.88	40	11	-1	0.001
AD3	78462	212	214	40	-5	29	960	3.8	36	10	-1	0.001
AD3	78463	214	216	33	-5	33	1110	4.17	43	10	-1	-0.001
AD3	78464	216	218	30	-5	28	940	3.74	38	9	-1	-0.001
AD3	78465	218	220	24	-5	52	1040	4.17	43	10	-1	-0.001

Appendix 10

PASMINCO
EXPLORATION

MEMORANDUM

To: Sally Dibben

From: Nicola McGunnigle

Date: 28 August 1996

Subject: DDH AD4 proposal, Luina EL 17/93

Summary

A short DDH is recommended to follow up massive mineralisation intersected in DDH AD2 and anomalous Pb-Zn (Au) rock chip geochemistry exposed in the 100S costean, Arthur Dam grid, Luina EL 17/93.

Conclusions and Recommendations

A 100m DDH is recommended to test between the zone of mineralisation intersected in AD2, at 100 - 123.1m, and anomalous rock chip samples from the costean at 100S, Arthur Dam grid. AD4 is proposed to drill at:

collar: 5406861mN
369465mE
azimuth: 132° AMG
dip: 60°
depth: 100m

The target zone to intercept Pb-Zn and Au is 50 - 70m.

Introduction

The Tasmanian Mines Department DDH AD2 drilled in 1985 targeted anomalous 'C' horizon Pb geochemistry along Arthur Dam grid line 100S. Mineralisation was intersected in quartz stockwork veins from 100 - 123.1m, with best intersections including:

12m @ 5% Zn, 1% Pb, 0.6g/t Au
3m @ 9.21% Zn, 8.34% Pb, 0.5g/t Au
3m @ 1.52% Zn, 0.75% Pb, 0.65g/t Au.

A costean dug along grid line 100S in June 1996 (Pasminco Exploration) was rock chip sampled at 2m intervals, and at 1m intervals at selected sites. Best assays include:

5m @ 0.8% Pb, 0.27% Zn
with 1m @ 1.16% Pb, 0.28% Zn

At surface, the zone is in altered and highly foliated mafic volcanics. Abundant quartz-carbonate veins are observed both parallel and cross-cutting the foliation. Goethite is common after carbonate, and the zone is variably goethitic at surface. No sulphides are visible.

A Division of Pasminco Australia Limited
ACN 004 074 962

Level 7, 380 St Kilda Road, Melbourne Vic 3004
GPO Box 1291K, Melbourne Vic 3001

Telephone (03) 9288 0333
Facsimile (03) 9288 0211

Best Au assays include 4m @ 0.68g/t A, which are located 25m southeast of the base metal anomalies, in the vicinity of outcropping quartz veins.

Discussion

Mineralisation is believed to be vein style, and correlates with an increased development of N-NE striking foliation and goethitic horizons. Veining may be controlled by this fabric direction which coincides with NE striking anomalous Pb-Zn soil geochemistry observed over the Arthur Dam grid. It is possible also that subtle NW-SE cross-structures which are observed in the ground magnetic data may have a controlling factor over mineralisation.

DDH AD2 was drilled at 60°, more or less parallel to grid line 100S (142.75° AMG). The foliation over the anomalous costean rock chip samples dips 58° W with a strike of 030°. Proposed DDH AD4 aims to intersect quartz stockwork mineralisation down dip from the costean and up dip from AD2, assuming the foliation to be a controlling factor. A strong SE trending vertical joint/vein set observed in the anomalous part of the costean is another possible control.

Appendix 11

PASMINCO EXPLORATION
DIAMOND DRILL HOLE LOG

Hole ID
AD4

DRILLING

Location	LUINA EL 17/93
Project	
Prospect	ARTHUR DAM
Design By	N.K. McGunnigle
Logged By	D. Gardner
Relogged	
Commenced	
Completed	
Drilled By	A.T.E.
Drill Rig	A.T.E. Gopher Rig

OBJECTIVE

To test mineralisation continuity between a massive Zn-Pb-Au intercept in AD2 and anomalous Pb-Zn (-Au) rock chip geochemistry exposed in the 100S costean at Arthur Dam grid.

RESULT

Results were disappointing. Intersections include a 0.1m vein of massive sphalerite-galena and 1m zone of quartz-carbonate with fine stringers of sphalerite-galena.

COLLAR SURVEY (AMG)

5406863·2m N
369466·6m E

DOWNHOLE SURVEY (AMG)

depth	Azimuth (AMG)	Dip
47·7m	142·0	-71
97·7m	142·5	-71·5

SIGNIFICANT CORE LOSS

POOR GROUND CONDITION ZONES

HOLE SIZE

HOLE CONDITIONS AFTER COMPLETION

SIGNIFICANT INTERSECTIONS

PASMINCO EXPLORATION

DIAMOND DRILL HOLE LOG

Hole No. AD4

PROJECT:

Vertical Scale 1 : 200

FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION
0.00	2.90	INTERMEDIATE LAVA , BASIC LAVA WITH MINOR INTERMEDIATE VOLCANICLASTIC brown grey, medium grained fine grained, cleaved. oxidised lava? and volcaniclastics?. CONTACT: indistinct	moderately oxidised, moderately sericitised	
2.90	3.40	INTERMEDIATE VOLCANICLASTIC black grey, fine grained, bedded. fg bedded? ash. CONTACT: conformable mixed	highly sideritic, moderately chloritised, slightly sericitised. carbonate alteration is recorded as siderite as the caebonate oxidises quickly, and only reacts to acid when powdered	
3.40	6.20	INTERMEDIATE LAVA cream black, medium grained, porphyritic, feldspar phyric hornblende phyric. lava, intermediate feldspar hornblende (pyroxene?) phyric with pervasive Fe? carbonate alteration. CONTACT: conformable mixed		DISSEMINATED minor pyrite on fractures minor as stringers. pyrite on fractures, between breccia fragments, and in fine stringers. Rare chalcopyrite eg 8.9m in siderite vein
6.20	13.00	INTERMEDIATE LAVA , BASIC LAVA WITH MINOR INTERMEDIATE VOLCANICLASTIC black, fine grained, massive. massive fg black lava, some patches of brecciation and/or clasticcs. CONTACT: gradational	moderately chloritised, slightly sideritic. some minor siderite spotting	
13.00	16.80	INTERMEDIATE LAVA , BASIC LAVA AND BRECCIA black grey, fine grained very coarse grained, brecciated. lava becoming increasingly brecciated downhole (small patch matrix supported at 16.2m) fine pervasive carbonate alteration (reacts when powdered) and some carbonate replacement of fine feldspar? phenocrysts. CONTACT: indistinct	moderately chloritised, moderately sideritic. siderite spotting increases, fuchsite? spots at 10.4m	
16.80	19.90	INTERMEDIATE LAVA green cream, fine grained medium grained, cleaved porphyritic, hornblende phyric feldspar phyric vitric. strongly cleaved originally felsic? lava now strongly sericite altered, fine hornblende phenocrysts (to 0.5mm) altered to sericite/chlorite, some epidote? and/or fuchsite? alteration. CONTACT: indistinct	highly sericitised, moderately chloritised. some fuchsite? spotting	
19.90	21.10	INTERMEDIATE LAVA grey white, medium grained, porphyritic, feldspar phyric hornblende phyric vitric. much coarser less altered and less cleaved lava than the above interval, some fine pervasive carbonate still. CONTACT: gradational	highly sideritic, slightly chloritised. pervasive siderite alteration as well as spotting	
21.10	25.40	BRECCIA CONTAINING CLASTS OF INTERMEDIATE LAVA grey black, fine grained very coarse grained, brecciated, feldspar phyric hornblende phyric vitric. fg lava clasts (mainly jigsaw fit, clast supported) some coarser grained clasts (f hb phyric) toward the bottom of the interval (these clasts similar to the lithologies above and below this interval). CONTACT: gradational	slightly chloritised, slightly sericitised, slightly sideritic	DISSEMINATED trace pyrite on fractures
25.40	29.70	INTERMEDIATE LAVA grey, medium grained, porphyritic, feldspar phyric hornblende phyric vitric. v similar to the interval 19.9-21.1m, and AD2 136m. CONTACT: indistinct	highly sideritic, moderately chloritised. moderately sericitised. alteration, especially carbonate increases in the coarser grained, more permeable? units	

GRAPHIC

Depth | Lith | Struct | STRUCTURES

STRUCTURES: FAULT pug; FIRST CLEAVAGE A70; FAULT A70 pug; PRIMARY FABRIC A50; FAULT pug; VEIN A5 carbonate quartz; VEIN; FIRST CLEAVAGE A45 strong

5 cm

PASMINCO EXPLORATION

DIAMOND DRILL HOLE LOG

Hole No. AD4

PROJECT:

Vertical Scale 1 : 200

DESCRIPTION					GRAPHIC			
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth	Lith	Struct	STRUCTURES
25.40	29.70	INTERMEDIATE LAVA grey, medium grained, porphyritic, feldspar phyric hornblende phyric vitric. v similar to the interval 19.9-21.1m, and AD2 136m. CONTACT: indistinct	highly sideritic, moderately chloritised. moderately sericitised. alteration, especially carbonate increases in the coarser grained, more permeable? units		30	Lba		
29.70	42.80	BASALT grey black, fine grained, massive, feldspar phyric. fg intermediate-basic lava, small f phenocrysts altered to Fe? cabonate in places, rock varies from black to light grey due to alteration fronts spreading out from fractures etc.. CONTACT: indistinct	slightly sideritic, slightly chloritised. increase in carbonate spotting after 34.5		40			
42.80	56.50	INTERMEDIATE LAVA , INTERMEDIATE VOLCANICLASTIC ALTERATION ZONE DEFORMED ZONE grey, medium grained, cleaved, vitric. strongly cleaved and altered (sericite, chlorite, some carbonate) volcanics, probably mostly mg lavas. Several shear/fault zones. CONTACT: indistinct	moderately sideritic, moderately sericitised. significant epidote alteration, some of this may be fuchsite highly sideritic. highly sericitised. moderately chloritised. strong alteration	DISSEMINATED galena minor pyrite in veins. fine quartz annd quartz carbonate veins (often at low angles to LCA) possible minor chalcopyrite and sphalerite VEIN 2% haematite. quartz veining and specular hematite (brown/red streak). some green staining that looks alot like oxidised copper?? MASSIVE 20% galena in veins 5% sphalerite. some oxidised copper in vein, hematite/sphalerite percentages may vary, vein gangue is quartz DISSEMINATED pyrite in veins minor on fractures	50			FIRST CLEAVAGE A50 strong

5 cm

PASMINCO EXPLORATION

DIAMOND DRILL HOLE LOG

Hole No. AD4

PROJECT:

Vertical Scale 1 : 200

Page of 1

DESCRIPTION					GRAPHIC			
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth	Lith	Struct	STRUCTURES
42.80	56.50	INTERMEDIATE LAVA , INTERMEDIATE VOLCANICLASTIC ALTERATION ZONE DEFORMED ZONE grey, medium grained, cleaved, vitric. strongly cleaved and altered (sericite, chlorite, some carbonate) volcanics, probably mostly mg lavas. Several shear/fault zones. CONTACT: indistinct	highly sideritic, highly sericitised, moderately chloritised. strong alteration	DISSEMINATED pyrite in veins minor on fractures		Vi		FIRST CLEAVAGE A50 strong
56.50	56.90							
56.90	59.40							
59.40	60.80	INTERMEDIATE VOLCANICLASTIC , INTERMEDIATE LAVA black, fine grained, massive. ash (or lava?) slightly brecciated in places may grade into interval below (bleaching). CONTACT: gradational	only very weak alteration,some of the carbonate veinings have altered to clays	STRINGER galena pyrite. stringers of sulphide in a quartz carbonate vein (some sphalerite may be siderite or hematite.	60	m/a		VEIN quartz carbonate galena
60.80	68.90	INTERMEDIATE VOLCANICLASTIC , INTERMEDIATE LAVA grey, fine grained, massive. ash (or lava?) brecciated in places, quite pyritic	quartz carbonate					
		MINERALISATION/ALTERATION white grey. quartz-carbonate veining with stringers of pyrite/sphalerite/galena	moderately chloritised, moderately sericitised, moderately sideritic. some of the carbonate alteration has decayed to clay	DISSEMINATED minor galena in veins. carbonate vein at 5-10 to LCA				FIRST CLEAVAGE strong
68.90	97.70	INTERMEDIATE LAVA , INTERMEDIATE VOLCANICLASTIC , ALTERATION ZONE grey green, medium grained, cleaved. similar to interval 42.8-56.5m strongly cleaved and altered (sericite, chlorite, some carbonate) variations in apparent grain size may well be due to alteration, possible amygdales? 64.6-65m with carbonate (to clays?) rims. CONTACT: gradational	moderately chloritised, slightly sideritic, slightly sericitised. dark green, the matrix altered to clays in places, there is still pervasive fine carbonate, which is now often calcite		70			
		INTERMEDIATE LAVA , BASIC LAVA WITH MINOR INTERMEDIATE VOLCANICLASTIC grey green, medium grained fine grained, massive porphyritic, hornblende phyric feldspar phyric. fg-mg andesite-baslat lavas, with small amounts of fg clastics (some fragments are bedded,suggestions of So insome places in core. Many of the differences in grain size and colour may be due to alteration high lighting some phenocrysts or areas of matrix		DISSEMINATED galena minor pyrite in veins. sulphides in 2cm vein parallel to LCA				FIRST CLEAVAGE
					80			

5 cm

303249

PASMINCO EXPLORATION

DIAMOND DRILL HOLE LOG

Hole No. AD4

PROJECT:

Vertical Scale 1 : 200

DESCRIPTION					GRAPHIC			
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth	Lith	Struct	STRUCTURES
68.90	97.70	INTERMEDIATE LAVA , BASIC LAVA WITH MINOR INTERMEDIATE VOLCANICLASTIC grey green, medium grained fine grained, massive porphyritic, hornblende phyric feldspar phyric. fg-mg andesite-baslat lavas, with small amounts of fg clastics (some fragments are bedded,suggestions of So insome places in core. Many of the differences in grain size and colour may be due to alteration high lighting some phenocrysts or areas of matrix	moderately chloritised, slightly sideritic, slightly sericitised, dark green, the matrix altered to clays in places, there is still pervasive fine carbonate, which is now often calcite	DISSEMINATED minor pyrite in veins. 1cm carbonate quartz vein sub-parallel to LCA, possible galena and chalcopyrite DISSEMINATED trace pyrite. rare pyrite generally associated with veining	90 100 110			FIRST CLEAVAGE

5 cm

Appendix 12

AD4 Assays

Hole_ID	Sample	From	To	Cu	Pb	Zn	Mn	Fe%	Ni	As	Ag	Au
AD4	76901	0	2	47	287	226	533	4.3	189	20	-1	0.02
AD4	76902	2	4	42	5	89	1210	4.38	242	10	-1	-0.01
AD4	76903	4	6	40	5	300	1820	5.1	385	18	-1	-0.01
AD4	76904	6	8	78	7	425	945	5.27	108	6	-1	-0.01
AD4	76905	8	10	47	10	470	1530	4.8	53	3	-1	0.01
AD4	76906	10	12	-2	-5	307	1100	4.88	75	17	-1	0.03
AD4	76907	12	14	-2	-5	253	866	6.24	79	19	-1	-0.01
AD4	76908	14	16	24	23	257	1000	5.51	62	5	-1	0.02
AD4	76909	16	18	45	-5	548	1760	5.34	229	7	-1	-0.01
AD4	76910	18	20	34	6	526	3530	6.4	414	16	-1	0.02
AD4	76911	20	22	294	9	63	1490	4.96	312	11	-1	0.01
AD4	76912	22	24	47	17	68	851	4.65	70	4	-1	-0.01
AD4	76913	24	26	18	5	76	1270	5.72	227	6	-1	0.01
AD4	76914	26	28	52	7	55	1270	5.18	288	8	-1	-0.01
AD4	76915	28	30	35	5	91	1160	5.16	247	10	-1	-0.01
AD4	76916	30	32	23	-5	370	1030	5.29	64	16	-1	-0.01
AD4	76917	32	34	83	23	289	712	5.24	61	24	-1	-0.01
AD4	76918	34	36	102	29	1230	2160	5.45	60	18	-1	-0.01
AD4	76919	36	38	58	15	1380	2520	6.08	70	23	-1	-0.01
AD4	76920	38	40	113	6	2640	3210	6.18	64	43	1	0.01
AD4	76921	40	42	105	1100	3460	5360	6.33	53	50	4	-0.01
AD4	76922	42	44	54	1260	5410	11300	8.45	271	391	4	0.01
AD4	76923	44	46	26	77	1220	2890	4.83	285	93	-1	-0.01
AD4	76924	46	48	15	67	1940	2790	4.44	273	9	-1	-0.01
AD4	76925	48	50	13	85	1200	2240	5.42	335	10	-1	-0.01
AD4	76926	50	52	45	230	1270	8220	7.08	331	43	-1	-0.01
AD4	76927	52	55	139	22500	24000	13400	7.08	342	3185	36	0.25
AD4	76928	55	56	19	230	626	6930	8.55	176	259	-1	-0.01
AD4	76929	56	57	1140	202	1300	2660	6.9	58	66	3	0.01
AD4	76930	57	59	1170	168	1020	3260	6.72	47	31	5	0.01
AD4	76931	59	60	595	7100	15300	12700	8.74	49	184	15	0.03
AD4	76932	60	61	306	3990	17100	23800	11.13	83	360	8	0.04
AD4	76933	61	63	9	630	1670	9500	7.48	324	326	2	0.01
AD4	76934	63	65	20	178	559	6640	6.88	248	149	-1	0.01
AD4	76935	65	67	19	241	1030	4460	6.62	281	120	-1	0.01

AD4	76936	67	69	24	13	197	2600	5.45	284	31	-1	-0.01
AD4	76937	69	71	35	5	44	1260	4.62	239	10	-1	-0.01
AD4	76938	71	73	37	5	36	813	4.48	242	10	-1	-0.01
AD4	76939	73	75	22	-5	43	939	4.25	190	5	-1	0.01
AD4	76940	75	77	69	-5	34	962	3.78	123	2	-1	-0.01
AD4	76941	77	79	18	-5	32	723	3.86	215	5	-1	-0.01
AD4	76942	79	81	41	-5	33	780	3.65	216	6	-1	-0.01
AD4	76943	81	83	28	-5	33	790	4.15	193	6	-1	-0.01
AD4	76944	83	85	72	438	42	845	3.63	189	9	-1	-0.01
AD4	76945	85	87	30	-5	41	705	3.85	217	5	-1	-0.01
AD4	76946	87	89	36	13	44	793	4.94	151	14	-1	-0.01
AD4	76947	89	91	65	-5	49	1020	5.03	186	10	-1	0.01
AD4	76948	91	93	32	-5	47	956	5.05	194	8	-1	-0.01
AD4	76949	93	95	25	-5	40	856	4.27	170	3	-1	-0.01
AD4	76950	95	97	34	-5	32	863	3.85	129	5	-1	-0.01

Appendix 13

sample	amg east	amg north	grid east	grid north	Cu	Pb	Zn	Fe%	Mn	As	Ag	Au	Cd	Ni	Co
78941	369531.8	5406816	240	-100	13	92	82	5.13	126	31	<1	0.12	1	96	13
78942	369611.9	5406727	360	-100	15	79	79	6.49	153	28	<1	0.004	2	80	10
78943	369571.4	5406771	300	-100	14	321	112	2.13	237	23	<1	0.004	<1	25	<5
78944	369435.9	5406917	100	-100	23	36	59	6.36	591	12	<1	<0.001	2	72	22
78945	369505	5406846	200	-100	35	2240	509	9.59	5240	382	1	0.021	4	156	116
78946	369367.5	5406989	0	-100	16	45	46	4.53	323	12	<1	0.002	1	120	17
78947	369518.3	5406831	220	-100	44	775	239	10.24	384	355	1	0.029	3	91	8
78948	369558.4	5406786	280	-100	7	30	17	1.63	41	9	<1	0.009	1	36	<5
78949	369408.9	5406946	60	-100	20	27	37	4.51	167	9	<1	<0.001	1	64	7
78950	369449.4	5406902	120	-100	29	64	96	8.39	1240	16	<1	0.002	2	132	43
78951	369491.7	5406860	180	-100	44	2060	597	8.9	7250	694	2	0.028	4	165	67
78952	369598.3	5406741	340	-100	11	87	66	4.56	100	50	<1	0.003	1	65	<5
78953	369584.7	5406756	320	-100	16	126	87	3.98	418	41	<1	0.005	<1	106	12
78954	369419	5406935	75	-100	83	22	103	6.64	528	10	<1	0.001	1	156	24
78955	369367.5	5406989	0	-100	10	52	33	4.25	105	11	<1	0.001	<1	100	8
78956	369531.8	5406816	40	-100	28	32	73	6.51	398	11	<1	0.004	1	177	23
78957	369477.4	5406874	160	-100	35	2780	465	11.49	3770	903	2	0.025	3	97	98
78958	369463.1	5406888	140	-100	44	681	223	7.33	1140	131	<1	0.01	2	64	23
78959	369545.3	5406801	260	-100	11	56	35	4.59	119	15	<1	0.004	<1	108	8
78960	369625.8	5406713	380	-100	17	72	81	7.79	307	24	<1	0.005	2	120	15

A Horizon Soil Sample Results

Bi	Mo	V	Cr	P	grid id	date	sample type	job	sds	tenement	prospect	lithology
<5	7	14	594	203	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	6	53	662	180	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	8	58	246	405	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	8	112	283	138	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	7	26	1110	264	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	6	<10	996	184	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	6	69	928	325	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	4	18	205	39	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	5	79	305	130	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	6	46	706	255	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	6	50	988	413	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	5	81	767	187	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	4	<10	922	231	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	6	112	214	115	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	4	14	628	102	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	5	26	492	181	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	5	68	748	419	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	6	125	347	562	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	4	16	750	109	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege
<5	4	21	950	293	Arthur Dam	10/07/96	A Horizon	ST15417	2361	EL 17/93	Arthur Dam	d/brown soil+vege

A Horizon Soil Sample Results

sample	amg east	amg north	grid east	grid north	Cu	Pb	Zn	Ag	Au	Cd	Ni	Pd	Co
78901	369419	5406935	75	-100	120	80	420	1.56	<0.25	6	360	<0.25	41
78902	369435.9	5406917	100	-100	120	140	940	1.53	<0.25	12	250	<0.25	84
78903	369598.3	5406741	340	-100	100	320	1160	0.71	<0.25	12	240	<0.25	16
78904	369505	5406846	200	-100	120	9720	3160	12.55	0.69	74	405	<0.25	228
78905	369477.4	5406874	160	-100	80	10800	4960	16.06	1.09	50	455	<0.25	265
78906	369491.7	5406860	180	-100	120	4160	5380	11.75	1.11	148	625	<0.25	119
78907	369545.3	5406801	260	-100	100	220	360	1.16	<0.25	6	445	<0.25	42
78908	369625.8	5406713	380	-100	80	80	880	<0.25	<0.25	12	215	<0.25	35
78909	369531.8	5406816	240	-100	80	560	740	0.65	<0.25	12	395	<0.25	40
78910	369558.4	5406786	280	-100	120	340	520	1.96	1.18	4	485	<0.25	52
78911	369518.3	5406831	220	-100	140	2540	1420	4.53	0.74	14	195	<0.25	18
78912	369611.9	5406727	360	-100	80	180	860	0.78	<0.25	6	405	0.25	38
78913	369367.5	5406989	0	-100	60	40	200	0.81	<0.25	8	645	<0.25	85
78914	369531.8	5406816	40	-100	100	100	500	0.73	<0.25	10	675	0.25	79
78915	369571.4	5406771	300	-100	80	500	1260	<0.25	<0.25	14	65	<0.25	5
78916	369584.7	5406756	320	-100	80	240	780	0.32	<0.25	10	520	<0.25	42
78917	369367.5	5406989	0	-100	140	220	240	0.74	<0.25	8	625	<0.25	98
78918	369408.9	5406946	60	-100	40	80	620	0.25	<0.25	6	250	<0.25	25
78919	369449.4	5406902	120	-100	120	120	1040	0.94	<0.25	16	255	0.25	190
78920	369463.1	5406888	140	-100	200	2460	1820	1.37	0.36	30	85	<0.25	113

A Horizon Sample Results - MMI Analysis

grid id	date	sample type	job	sds	tenement	prospect	lithology
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege
Arthur Dam	10/07/96	AhorizonMMI	1900	2357	EL 17/93	Arthur Dam	d/brown soil+vege

A Horizon Sample Results - MMI Analysis

sample	amg east	amg north	grid east	grid north	Cu	Pb	Zn	Fe%	Mn	As	Ag	Au	Ni	Co	Ba	Bi	Ca	K	Mg	Mo
78921	369584.7	5406756	320	-100	1.1	0.9	0.5	0.067	2	0.55	-0.05	-0.01	0.1	0.06	-1	-0.01	144	60	28	0.2
78922	369518.3	5406831	220	-100	5.4	31	1.8	0.478	5	6.63	-0.05	-0.01	0.42	0.24	-1	-0.01	110	68	49	-0.1
78923	369531.8	5406816	240	-100	1.3	4.3	0.5	0.233	1	0.94	-0.05	-0.01	0.32	0.2	-1	-0.01	42	37	49	-0.1
78924	369598.3	5406741	340	-100	1.3	2.4	0.1	0.15	1	1.32	-0.05	-0.01	0.68	0.12	-1	-0.01	31	43	18	-0.1
78925	369571.4	5406771	300	-100	1.1	3.8	1.3	0.179	2	0.96	-0.05	-0.01	-0.01	0.05	1	-0.01	112	115	76	-0.1
78926	369611.9	5406727	360	-100	2.9	3	1	0.432	2	0.52	-0.05	-0.01	0.22	0.06	-1	-0.01	97	71	47	-0.1
78927	369531.8	5406816	40	-100	2.6	0.5	-0.1	0.075	1	0.13	-0.05	-0.01	0.33	0.17	-1	-0.01	35	22	48	-0.1
78928	369545.3	5406801	260	-100	2.4	1	-0.1	0.09	-1	0.19	-0.05	-0.01	0.19	0.1	-1	-0.01	35	34	28	-0.1
78929	369625.8	5406713	380	-100	2.2	2.6	0.2	0.55	6	0.39	-0.05	-0.01	1.1	0.4	-1	-0.01	50	55	269	-0.1
78930	369558.4	5406786	280	-100	2	3.6	0.1	0.362	2	0.5	-0.05	-0.01	0.24	0.1	-1	-0.01	17	49	207	-0.1
78931	369449.4	5406902	120	-100	1.9	1.7	0.3	0.36	46	0.22	-0.05	-0.01	0.19	1	1	-0.01	34	35	44	-0.1
78932	369408.9	5406946	60	-100	0.8	0.3	-0.1	0.096	1	0.1	-0.05	-0.01	0.21	0.08	-1	-0.01	34	47	51	-0.1
78933	369419	5406935	75	-100	1.5	0.3	0.4	0.114	5	0.09	-0.05	-0.01	0.5	0.14	-1	-0.01	64	30	26	-0.1
78934	369435.9	5406917	100	-100	1.1	0.6	0.5	0.129	25	0.12	-0.05	-0.01	0.62	0.79	-1	-0.01	48	43	65	-0.1
78935	369491.7	5406860	180	-100	2.5	39.4	4.4	0.194	138	7.05	-0.05	-0.01	1.88	0.93	-1	-0.01	128	57	103	-0.1
78936	369477.4	5406874	160	-100	2.7	55.3	3.3	0.203	59	6.65	-0.05	-0.01	1.04	1.72	-1	-0.01	181	52	58	-0.1
78937	369463.1	5406888	140	-100	3.1	23.2	1.2	0.239	47	2.59	-0.05	-0.01	-0.01	0.74	1	-0.01	46	67	65	-0.1
78938	369367.5	5406989	0	-100	1.8	0.8	-0.1	0.092	4	0.16	-0.05	-0.01	1.03	0.26	-1	-0.01	70	11	452	-0.1
78939	369505	5406846	200	-100	2.9	60.1	2.6	0.359	90	4.96	-0.05	-0.01	0.63	0.86	-1	-0.01	65	43	155	-0.1
78940	369367.5	5406989	0	-100	2.5	0.8	-0.1	0.035	1	0.18	-0.05	-0.01	0.34	0.23	-1	-0.01	33	27	39	-0.1

A Horizon Sample Results - Humic Analysis

Pt	Sb	S	Te	Se	W	grid id	date	sample type	job	sds	tenement	prospect	lithology
-0.001	0.2	116	0.01	0.2	1	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
0.001	0.84	225	-0.01	0.3	0.4	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
-0.001	0.1	126	-0.01	0.1	0.7	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
-0.001	1.52	118	-0.01	0.2	0.6	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
0.001	0.05	178	-0.01	-0.1	0.4	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
-0.001	0.45	163	-0.01	0.2	0.3	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
-0.001	-0.01	81	-0.01	0.2	0.9	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
0.001	-0.01	103	-0.01	0.2	0.8	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
-0.001	0.26	186	-0.01	0.2	0.4	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
-0.001	0.05	116	-0.01	0.2	0.5	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
0.001	0.21	135	-0.01	0.1	0.4	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
-0.001	-0.01	79	-0.01	-0.1	0.8	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
0.001	0.03	92	-0.01	-0.1	1	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
-0.001	-0.01	98	-0.01	0.1	-0.1	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
-0.001	0.92	126	-0.01	0.2	-0.1	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
-0.001	1.12	140	-0.01	0.1	-0.1	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
0.001	0.67	128	-0.01	-0.1	-0.1	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
0.001	-0.01	68	-0.01	0.1	-0.1	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
0.001	0.36	129	-0.01	0.1	-0.1	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege
0.001	-0.01	58	-0.01	0.3	0.2	Arthur Dam	10/07/96	AhorizonHumic	ST15419	2358	EL 17/93	Arthur Dam	d/brown soil+vege

A Horizon Sample Results - Humic Analysis

sample	amg east	amg north	grid east	grid north	Cu	Pb	Zn	Fe%	Mn	As	Ag	Au	Cd	Ni	Cr
78466	369584.7	5406756	320	-100	15	48	61	3.38	76	19	<1	0.003	1	77	611
78467	369518.3	5406831	220	-100	60	890	332	7.46	396	542	1	0.041	<1	101	1060
78468	369491.7	5406860	180	-100	51	1740	551	9.26	568	1140	1	0.032	<1	126	1020
78469	369611.9	5406727	360	-100	18	83	89	5.82	137	36	<1	0.001	<1	80	801
78470	369625.8	5406713	380	-100	16	62	88	3.34	198	19	<1	0.003	<1	115	769
78471	369505	5406846	200	-100	44	1680	634	6.23	439	374	1	0.02	<1	174	1350
78472	369367.5	5406989	0	-100	59	20	43	4.94	667	9	<1	<0.001	<1	189	1320
78473	369531.8	5406816	240	-100	41	96	272	8.33	244	27	<1	<0.001	<1	275	1440
78474	369598.3	5406741	340	-100	12	82	66	4.13	70	64	<1	0.001	<1	66	550
78475	369477.4	5406874	160	-100	63	2320	554	15.98	815	2180	1	0.034	<1	89	936
78476	369571.4	5406771	300	-100	11	332	96	1.46	187	22	<1	0.004	<1	26	205
78477	369449.4	5406902	120	-100	33	53	93	4.8	340	21	<1	<0.001	<1	131	645
78478	369558.4	5406786	280	-100	26	55	68	6.2	181	19	<1	0.001	<1	151	885
78479	369435.9	5406917	100	-100	27	28	98	8.68	702	10	<1	0.001	<1	124	395
78480	369545.3	5406801	260	-100	20	31	49	4.16	165	10	<1	0.005	<1	161	868
78481	369408.9	5406946	60	-100	65	10	72	7.61	372	9	<1	<0.001	<1	117	362
78482	369531.8	5406816	40	-100	22	21	59	3.8	290	10	<1	0.001	<1	151	511
78483	369367.5	5406989	0	-100	11	15	27	2.84	264	6	<1	0.038	<1	100	904
78484	369419	5406935	75	-100	64	11	111	6.88	552	10	<1	0.001	<1	242	665
78485	369463.1	5406888	140	-100	40	540	198	3.66	248	71	<1	0.015	<1	53	293

B Horizon Soil Sample Results

Co	Bi	P	Mo	V	grid id	date	sample type	job	sds	tenement	prospect	lithology
10	<5	97	<2	49	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	p/brown clay mottled
5	<5	231	<2	88	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay mottled
37	<5	276	<2	87	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	green/brown clay mottled
12	<5	126	<2	63	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	tan/brown clay mottled
13	<5	126	<2	39	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay mottled
50	<5	189	<2	57	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay
49	<5	25	<2	42	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay mottled
43	<5	68	<2	35	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay
<5	<5	109	<2	86	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay
71	<5	293	<2	114	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	brown clay mottled
<5	<5	251	<2	54	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay
24	<5	100	<2	65	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	brown clay mottled
19	<5	102	<2	53	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	tan/green clay mottled
30	<5	131	<2	143	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	tan clay+tan mafic rx
16	<5	87	<2	30	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay mottled
17	<5	121	<2	129	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	tan clay+tan mafic rx
21	<5	92	<2	64	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay
13	<5	100	<2	11	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay mottled
29	<5	142	<2	95	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	tan clay+tan mafic rx
10	<5	399	<2	115	Arthur Dam	10/07/96	Bhorizon	ST15542	2359	EL 17/93	Arthur Dam	brown clay mottled

B Horizon Soil Sample Results

sample	amg east	amg north	grid east	grid north	Cu	Pb	Zn	Ag	Au	Cd	Ni	Pd	Co
78961	369598.3	5406741	340	-100	160	700	780	3.81	<0.25	8	560	<0.25	32
78962	369463.1	5406888	140	-100	280	5300	1580	16.44	0.29	14	115	<0.25	18
78963	369531.8	5406816	240	-100	200	2400	1160	5.17	<0.25	6	345	<0.25	49
78964	369518.3	5406831	220	-100	400	14600	1760	47.54	6	4	585	<0.25	34
78965	369571.4	5406771	300	-100	100	1140	780	3.98	0.61	8	340	<0.25	12
78966	369505	5406846	200	-100	180	31900	3440	34.69	1.18	30	605	<0.25	170
78967	369449.4	5406902	120	-100	280	460	980	3.24	<0.25	6	545	<0.25	112
78968	369558.4	5406786	280	-100	200	720	620	2.87	<0.25	6	985	<0.25	114
78969	369435.9	5406917	100	-100	100	140	260	1.34	<0.25	4	355	<0.25	42
78970	369419	5406935	75	-100	120	80	280	1.58	<0.25	4	405	<0.25	44
78971	369584.7	5406756	320	-100	160	620	780	1.95	<0.25	6	850	<0.25	74
78972	369625.8	5406713	380	-100	140	320	1060	4.15	<0.25	14	875	<0.25	87
78973	369611.9	5406727	360	-100	160	500	840	2.68	<0.25	4	540	<0.25	45
78974	369408.9	5406946	60	-100	120	80	180	1.46	<0.25	<2	410	<0.25	36
78975	369367.5	5406989	0	-100	<20	200	160	<0.25	<0.25	8	635	0.35	158
78976	369367.5	5406989	0	-100	40	40	160	0.43	<0.25	4	540	<0.25	69
78977	369477.4	5406874	160	-100	240	36400	3220	78.8	3.05	26	640	0.26	193
78978	369531.8	5406816	40	-100	<20	80	220	1.91	<0.25	6	1455	<0.25	172
78979	369491.7	5406860	180	-100	200	25800	3340	75.2	2.39	20	825	0.38	118
78980	369545.3	5406801	260	-100	140	340	300	2.94	<0.25	4	885	<0.25	77

B Horizon Sample Results - MMI Analysis

grid id	date	sample type	job	sds	tenement	prospect	lithology
Arthur Dam	10/07/96	BhorizonMMI	1900	2358	EL 17/93	Arthur Dam	p/brown clay mottled
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	grey/brown clay mottled
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	green/brown clay mottled
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	tan/brown clay mottled
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	grey/brown clay mottled
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	grey/brown clay
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	grey/brown clay mottled
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	grey/brown clay
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	grey/brown clay
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	brown clay mottled
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	grey/brown clay
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	brown clay mottled
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	tan/green clay mottled
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	tan clay+tan mafic rx
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	grey/brown clay mottled
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	tan clay+tan mafic rx
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	grey/brown clay
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	grey/brown clay mottled
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	tan clay+tan mafic rx
Arthur Dam	10/07/96	BhorizonMMI	1900	2357	EL 17/93	Arthur Dam	brown clay mottled

B Horizon Sample Results - MMI Analysis

sample	amg east	amg north	grid east	grid north	Cu	Pb	Zn	Fe%	Mn	As	Ag	Au	Na	Ni	Co	Ba	Bi	Ca
78466	369584.7	5406756	320	-100	4.83	24.5	11	0.832	11	403	17	1	36	9.77	1.41	<1	30	66
78467	369518.3	5406831	220	-100	17.2	322	60.3	0.978	57	6300	422	4	22	13.7	1.08	<1	92	27
78468	369491.7	5406860	180	-100	13.5	1020	100	1.07	71	10000	743	2	21	19.6	4.16	<1	41	77
78469	369611.9	5406727	360	-100	5.26	34	16	1.1	22	289	35	<1	29	10.8	1.65	<1	50	92
78470	369625.8	5406713	380	-100	6.95	25.1	22.5	0.735	35	215	29	<1	41	22.8	3.63	<1	36	65
78471	369505	5406846	200	-100	14.7	606	161	0.709	71	2320	393	3	21	41.9	12.7	<1	63	76
78472	369367.5	5406989	0	-100	33.8	19.7	10	0.982	121	36	<5	<1	32	34.3	17.5	18	101	438
78473	369531.8	5406816	240	-100	11.7	46.8	53.2	0.603	28	14	24	<1	11	44.4	6.64	<1	24	10
78474	369598.3	5406741	340	-100	4.89	39.3	11	0.872	8	1110	49	<1	31	8.55	0.62	<1	54	49
78475	369477.4	5406874	160	-100	10.7	1100	91.1	1.49	191	8850	686	5	23	14.2	8.64	<1	35	102
78476	369571.4	5406771	300	-100	4.99	87.5	9.9	0.534	13	2240	41	<1	24	3.04	0.16	3	93	102
78477	369449.4	5406902	120	-100	11.7	30.6	24.4	0.745	46	66	27	<1	23	21.4	6.77	2	40	50
78478	369558.4	5406786	280	-100	9.92	30.3	18.3	0.825	28	24	14	<1	22	28.7	4.03	<1	27	65
78479	369435.9	5406917	100	-100	7.13	32.3	13.4	1.04	37	40	15	<1	30	14.4	2.48	5	34	41
78480	369545.3	5406801	260	-100	8.33	24.8	13.4	0.625	29	26	16	<1	18	34.5	3.67	<1	29	45
78481	369408.9	5406946	60	-100	12.5	22.6	13.8	1.14	37	10	10	<1	24	15	2.31	2	40	33
78482	369531.8	5406816	40	-100	8.72	23.5	13.3	0.636	43	72	18	<1	24	30.9	5.61	<1	38	97
78483	369367.5	5406989	0	-100	4.43	15.7	6.58	0.568	44	129	11	<1	22	17.6	3.6	<1	27	110
78484	369419	5406935	75	-100	11.8	21.2	14.8	0.835	50	41	14	<1	18	19.8	2.98	2	34	107
78485	369463.1	5406888	140	-100	15.3	206	51.4	0.467	40	2100	234	<1	24	9.23	2.42	6	46	61

B Horizon Sample Results - Regoleach Analysis

K	Mg	Mo	Pt	Sb	S	Te	W	grid id	date	sample type	job	sds	tenement	prospect	lithology
207	1100	<10	<1	217	104	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	p/brown clay mottled
117	1160	<10	<1	1210	75	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay mottled
138	1100	<10	<1	859	50	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	green/brown clay mottled
177	1600	<10	<1	733	107	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	tan/brown clay mottled
278	2450	<10	<1	462	140	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay mottled
174	2320	<10	<1	500	50	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay
692	4790	<10	4	6	42	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay mottled
63	2640	<10	<1	25	29	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay
159	539	<10	<1	3160	122	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay
143	1030	<10	<1	2850	67	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	brown clay mottled
150	327	17	<1	334	99	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay
104	3010	<10	<1	297	99	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	brown clay mottled
129	2940	<10	<1	34	50	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	tan/green clay mottled
108	1160	<10	<1	84	72	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	tan clay+tan mafic rx
159	2740	<10	<1	29	83	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay mottled
92	1760	<10	<1	33	49	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	tan clay+tan mafic rx
48	2870	<10	<1	55	102	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay
65	2850	<10	<1	7	123	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	grey/brown clay mottled
76	1850	<10	<1	59	72	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	tan clay+tan mafic rx
279	1300	11	<1	1100	207	<5	<5	Arthur Dam	10/07/96	Bhorizonregoleach	ST15542	2359	EL 17/93	Arthur Dam	brown clay mottled

B Horizon Sample Results - Regoleach Analysis

sample	amg east	amg north	grid east	grid north	Cu	Pb	Zn	Fe%	Mn	As	Ag	Au	Cd	Ni	Co	Bi
78981	369435.9	5406917	100	-100	46	6	111	6.96	803	8	-1	0.018	-1	160	43	-5
78982	369477.4	5406874	160	-100	64	1040	639	4.45	609	179	4	0.06	-1	180	36	-5
78983	369367.5	5406989	0	-100	62	18	44	4.91	695	4	-1	0.007	1	205	47	-5
78984	369367.5	5406989	0	-100	37	19	46	4.16	568	6	-1	0.006	-1	183	44	-5
78985	369395.3	5406960	40	-100	64	17	88	4.15	541	4	-1	0.006	-1	337	63	-5
78986	369449.4	5406902	120	-100	95	22	135	5.02	671	7	-1	0.008	-1	258	41	-5
78987	369408.9	5406946	60	-100	145	6	104	6.5	463	3	-1	0.005	-1	187	32	-5
78988	369463.1	5406888	140	-100	59	248	260	4.28	379	30	1	0.007	-1	79	22	-5
78989	369419	5406950	75	-100	81	7	110	6.3	604	4	-1	0.003	-1	239	33	-5
78990	369518.3	5406831	220	-100	143	1000	1410	8.11	1420	411	4	0.017	-1	232	11	-5
78991	369491.7	5406860	180	-100	100	1630	899	5.42	757	267	4	0.066	-1	182	24	-5
78992	369505	5406846	200	-100	38	3180	890	4.25	612	40	2	0.019	3	252	56	-5
78993	369611.9	5406727	360	-100	32	62	176	6.67	294	14	-1	0.006	-1	198	30	-5
78994	369558.4	5406786	280	-100	66	21	71	8.02	360	6	-1	0.007	-1	255	36	-5
78995	369571.4	5406771	300	-100	64	130	159	4.2	100	37	1	0.012	-1	78	<5	-5
78996	369625.8	5406713	380	-100	19	13	66	6.05	457	8	-1	0.004	-1	202	29	-5
78997	369545.3	5406801	260	-100	47	<5	65	7.86	377	3	-1	0.008	-1	245	36	-5
78998	369598.3	5406741	340	-100	12	23	154	4.14	98	96	-1	0.047	-1	128	7	-5
78999	369531.8	5406816	240	-100	33	162	219	7.94	265	13	-1	0.008	-1	244	37	-5
79000	369584.7	5406756	320	-100	72	30	98	6.37	227	15	-1	0.009	-1	155	20	-5

C Horizon Soil Sample Results

Mo	Cr	P	V	grid id	date	sample type	job	sds	tenement	prospect	lithology
2	141	112	137	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	tan clay+tan mafic rx
2	696	180	71	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	tan clay+tan mafic rx
-2	1030	28	26	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	grey chl-seri schist
-2	1040	33	23	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	grey chl-seri schist
-2	413	50	10	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	grey/green chl-seri-clay
-2	549	76	63	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	green mafic saprock
-2	129	113	122	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	green mafic saprock
2	290	254	132	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	green mafic saprock,chert
-2	328	112	90	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	tan clay+tan mafic rx
2	1030	96	97	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock, silicified
-2	627	209	78	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	green/blue chl mafic+clay
-2	885	71	22	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	green/blue chl mafic+clay
-2	1020	76	19	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	d/tan Fe saprock
-2	914	71	40	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	tan/green saprock
-2	1570	346	71	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
-2	1130	94	37	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
-2	1330	160	29	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
-2	1660	57	69	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	tan Fe saprock
-2	1380	39	22	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
-2	781	83	41	Arthur Dam	10/07/96	totalChorizon	ST15418	2360	EL 17/93	Arthur Dam	green/tan saprock

C Horizon Soil Sample Results

sample	amg east	amg north	grid east	grid north	Cu	Pb	Zn	Fe%	Mn	As	Au	Cd	Ni	Co	Bi	Mo	Cr
78981	369435.9	5406917	100	-100	44	<5	123	7.61	902	1	0.003	-1	169	50	-5	-2	140
78982	369477.4	5406874	160	-100	56	740	583	3.88	561	140	0.045	-1	162	34	-5	-2	541
78983	369367.5	5406989	0	-100	59	11	37	4.56	641	2	0.006	-1	180	47	-5	-2	908
78984	369367.5	5406989	0	-100	33	17	39	3.73	499	3	0.004	-1	160	42	-5	-2	994
78985	369395.3	5406960	40	-100	51	13	67	3.52	442	3	0.001	-1	296	70	-5	-2	468
78986	369449.4	5406902	120	-100	82	20	121	4.41	577	5	0.001	-1	229	41	-5	-2	538
78987	369408.9	5406946	60	-100	148	<5	101	6.03	476	1	0.005	-1	174	36	-5	-2	173
78988	369463.1	5406888	140	-100	42	230	191	3.31	358	26	0.011	-1	58	21	-5	-2	237
78989	369419	5406950	75	-100	81	<5	119	6.45	652	2	0.001	-1	266	41	-5	-2	337
78990	369518.3	5406831	220	-100	133	810	1290	7.54	1340	358	0.018	-1	216	14	-5	-2	803
78991	369491.7	5406860	180	-100	87	1340	793	5.03	544	285	0.038	-1	164	26	-5	-2	529
78992	369505	5406846	200	-100	31	2180	855	4.06	593	22	0.007	3	238	61	-5	-2	898
78993	369611.9	5406727	360	-100	26	41	151	5.57	237	10	0.001	-1	163	29	-5	-2	662
78994	369558.4	5406786	280	-100	63	20	67	7.69	338	5	0.006	-1	241	39	-5	-2	606
78995	369571.4	5406771	300	-100	59	103	145	4.04	64	34	0.003	-1	64	8	-5	-2	1200
78996	369625.8	5406713	380	-100	17	8	57	5.52	414	6	0.001	-1	183	31	-5	-2	772
78997	369545.3	5406801	260	-100	42	<5	60	7.05	340	3	0.001	-1	226	39	-5	-2	600
78998	369598.3	5406741	340	-100	6	15	73	1.87	48	46	<0.001	-1	55	7	-5	-2	548
78999	369531.8	5406816	240	-100	26	134	168	6.18	196	8	0.001	-1	180	31	-5	-2	725
79000	369584.7	5406756	320	-100	78	23	85	5.65	203	11	<0.001	-1	132	22	-5	-2	466

C Horizon +20# Soil Sample Results

P	V	grid id	date	sample type	job	sds	tenement	prospect	lithology
114	151	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan clay+tan mafic rx
159	68	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan clay+tan mafic rx
21	50	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	grey chl-seri schist
32	34	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	grey chl-seri schist
40	18	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	grey/green chl-seri-clay
65	69	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green mafic saprock
94	125	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green mafic saprock
224	98	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green mafic saprock,chert
94	93	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan clay+tan mafic rx
79	92	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock, silicified
227	74	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green/blue chl mafic+clay
62	38	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green/blue chl mafic+clay
55	21	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	d/tan Fe saprock
71	43	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan/green saprock
336	74	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
83	50	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
143	31	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
22	33	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan Fe saprock
26	19	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
70	50	Arthur Dam	10/07/96	plus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green/tan saprock

C Horizon +20# Soil Sample Results

sample	amg east	amg north	grid east	grid north	Cu	Pb	Zn	Fe%	Mn	As	Ag	Au	Cd	Ni	Co	Bi	Mo
78981	369435.9	5406917	100	-100	36	<5	79	4.78	497	3	-1	0.005	-1	124	30	-5	-2
78982	369477.4	5406874	160	-100	67	1230	659	4.46	580	185	4	0.056	1	181	38	-5	-2
78983	369367.5	5406989	0	-100	56	25	48	4.42	626	8	-1	0.006	-1	176	42	-5	-2
78984	369367.5	5406989	0	-100	32	18	43	3.95	530	3	-1	0.01	1	165	40	-5	-2
78985	369395.3	5406960	40	-100	59	16	79	3.63	451	3	-1	<0.001	1	289	57	-5	-2
78986	369449.4	5406902	120	-100	82	20	118	4.43	600	8	-1	<0.001	1	228	39	-5	-2
78987	369408.9	5406946	60	-100	137	<5	99	6.24	420	3	-1	<0.001	-1	178	32	-5	-2
78988	369463.1	5406888	140	-100	63	275	304	4.66	406	30	1	0.005	1	96	28	-5	-2
78989	369419	5406950	75	-100	72	6	86	5.37	434	4	-1	<0.001	-1	175	27	-5	-2
78990	369518.3	5406831	220	-100	153	1090	1510	8.65	1460	434	3	0.021	-1	243	14	-5	-2
78991	369491.7	5406860	180	-100	107	1960	946	5.65	697	294	4	0.11	1	189	28	-5	-2
78992	369505	5406846	200	-100	42	3830	896	4.13	568	53	3	0.014	4	235	55	-5	-2
78993	369611.9	5406727	360	-100	29	72	167	5.82	250	15	-1	0.003	-1	169	29	-5	-2
78994	369558.4	5406786	280	-100	72	33	78	8.29	352	7	-1	0.006	-1	269	41	-5	-2
78995	369571.4	5406771	300	-100	60	142	150	3.95	87	36	1	0.006	1	68	8	-5	-2
78996	369625.8	5406713	380	-100	17	12	60	5.52	408	8	-1	0.003	1	178	29	-5	-2
78997	369545.3	5406801	260	-100	59	5	75	9.41	432	5	-1	0.005	-1	275	44	-5	-2
78998	369598.3	5406741	340	-100	16	41	208	5.41	130	118	-1	0.003	-1	164	14	-5	-2
78999	369531.8	5406816	240	-100	39	183	247	8.8	289	12	-1	0.003	-1	271	45	-5	-2
79000	369584.7	5406756	320	-100	67	37	104	6.34	214	15	-1	0.003	-1	155	23	-5	-2

C Horizon -20#,+80# Soil Sample Results

Cr	P	V	grid id	date	sample type	job	sds	tenement	prospect	lithology
142	87	94	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan clay+tan mafic rx
646	172	74	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan clay+tan mafic rx
901	27	45	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	grey chl-seri schist
1160	30	36	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	grey chl-seri schist
451	39	20	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	grey/green chl-seri-clay
433	56	62	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green mafic saprock
194	104	119	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green mafic saprock
368	264	125	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green mafic saprock,chert
403	114	91	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan clay+tan mafic rx
883	112	107	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock, silicified
575	217	88	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green/blue chl mafic+clay
810	81	35	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green/blue chl mafic+clay
734	72	26	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	d/tan Fe saprock
726	70	52	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan/green saprock
1160	328	75	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
712	83	44	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
1170	200	53	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
845	76	61	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan Fe saprock
1080	45	41	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
769	86	54	Arthur D	10/07/96	plus80minus20#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green/tan saprock

C Horizon -20#,+80# Soil Sample Results

sample	amg east	amg north	grid east	grid north	Cu	Pb	Zn	Fe%	Mn	As	Ag	Au	Cd	Ni	Co	Bi
78981	369435.9	5406917	100	-100	77	10	100	4.96	486	5	-1	0.011	-1	129	29	-5
78982	369477.4	5406874	160	-100	91	1860	729	4.62	644	207	6	0.124	1	187	37	-5
78983	369367.5	5406989	0	-100	68	43	71	4.87	683	4	-1	0.005	-1	193	46	-5
78984	369367.5	5406989	0	-100	33	20	50	4.26	551	4	-1	0.006	-1	179	41	-5
78985	369395.3	5406960	40	-100	72	19	94	4.32	525	2	-1	0.003	-1	323	56	-5
78986	369449.4	5406902	120	-100	95	20	128	4.88	641	5	-1	0.001	1	250	43	-5
78987	369408.9	5406946	60	-100	129	5	86	6.29	362	1	-1	0.001	-1	165	28	-5
78988	369463.1	5406888	140	-100	74	320	330	5.27	456	31	1	0.005	-1	99	31	-5
78989	369419	5406950	75	-100	58	10	64	4.97	325	4	-1	0.001	-1	134	20	-5
78990	369518.3	5406831	220	-100	181	1390	1710	10.2	1690	514	3	0.027	-1	283	17	-5
78991	369491.7	5406860	180	-100	139	2820	973	6.17	700	359	7	0.107	-1	190	30	-5
78992	369505	5406846	200	-100	60	6300	964	4.81	609	105	4	0.022	6	244	56	-5
78993	369611.9	5406727	360	-100	37	119	194	7.63	299	15	-1	0.003	-1	203	33	-5
78994	369558.4	5406786	280	-100	95	31	92	10.55	426	6	-1	0.008	-1	332	51	-5
78995	369571.4	5406771	300	-100	66	155	150	4.08	98	36	-1	0.006	-1	66	6	-5
78996	369625.8	5406713	380	-100	21	16	68	6.71	472	7	-1	0.001	-1	204	35	-5
78997	369545.3	5406801	260	-100	75	9	82	12.28	529	3	-1	0.003	-1	313	50	-5
78998	369598.3	5406741	340	-100	23	50	305	8.59	170	184	-1	0.003	-1	258	19	-5
78999	369531.8	5406816	240	-100	53	258	315	12.87	380	18	-1	0.004	-1	349	55	-5
79000	369584.7	5406756	320	-100	75	45	105	7.03	232	13	-1	0.004	-1	162	23	-5

C Horizon -80# Soil Sample Results

Mo	Cr	P	V	grid id	date	sample type	job	sds	tenement	prospect	lithology
-2	137	108	97	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan clay+tan mafic rx
-2	721	203	90	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan clay+tan mafic rx
-2	1330	37	51	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	grey chl-seri schist
-2	1330	40	41	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	grey chl-seri schist
-2	711	49	32	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	grey/green chl-seri-clay
-2	577	77	69	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green mafic saprock
-2	149	116	118	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green mafic saprock
-2	242	307	154	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green mafic saprock,chert
-2	281	140	90	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan clay+tan mafic rx
-2	1310	133	124	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock, silicified
-2	865	249	100	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green/blue chl mafic+clay
-2	1180	115	52	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green/blue chl mafic+clay
-2	1360	103	49	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	d/tan Fe saprock
-2	1260	83	75	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan/green saprock
-2	1300	356	86	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
-2	1630	105	61	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
-2	1840	264	85	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
-2	2050	124	94	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan Fe saprock
-2	2090	64	79	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
-2	969	105	65	Arthur Dam	10/07/96	minus80#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green/tan saprock

C Horizon -80# Soil Sample Results

sample	amg east	amg north	grid east	grid north	Cu	Pb	Zn	Fe%	Mn	As	Ag	Au	Cd	Ni	Co	Bi
78981	369435.9	5406917	100	-100	48	12	81	5.54	501	13	-1	0.12	-1	127	28	-5
78982	369477.4	5406874	160	-100	92	2600	785	4.64	678	341	6	0.164	-1	183	35	-5
78983	369367.5	5406989	0	-100	69	43	49	4.95	681	9	-1	0.017	-1	195	47	-5
78984	369367.5	5406989	0	-100	34	32	44	4.39	574	8	-1	0.018	-1	181	42	-5
78985	369395.3	5406960	40	-100	83	30	111	4.98	590	10	-1	0.02	-1	363	62	-5
78986	369449.4	5406902	120	-100	113	41	158	5.7	707	14	-1	0.041	1	282	50	-5
78987	369408.9	5406946	60	-100	143	10	92	7.31	392	7	-1	0.04	-1	180	31	-5
78988	369463.1	5406888	140	-100	80	372	362	6.1	513	46	1	0.026	-1	105	33	-5
78989	369419	5406950	75	-100	64	15	78	6.05	388	9	-1	0.02	-1	158	21	-5
78990	369518.3	5406831	220	-100	184	1420	1770	10.72	1740	564	3	0.059	-1	291	16	-5
78991	369491.7	5406860	180	-100	142	3000	1040	6.55	753	400	7	0.18	-1	207	30	-5
78992	369505	5406846	200	-100	61	6500	1060	5.17	675	108	6	0.035	6	264	58	-5
78993	369611.9	5406727	360	-100	37	115	221	8.88	343	24	-1	0.008	-1	224	34	-5
78994	369558.4	5406786	280	-100	95	30	92	11.35	440	16	-1	0.005	-1	331	49	-5
78995	369571.4	5406771	300	-100	66	173	168	4.38	132	44	-1	0.021	-1	68	-5	-5
78996	369625.8	5406713	380	-100	21	25	80	7.58	512	17	-1	0.015	-1	220	34	-5
78997	369545.3	5406801	260	-100	82	12	92	14.28	594	11	-1	0.061	-1	348	51	-5
78998	369598.3	5406741	340	-100	23	66	329	9.55	175	215	1	0.02	-1	278	17	-5
78999	369531.8	5406816	240	-100	53	302	332	14.02	396	29	-1	0.014	-1	358	56	-5
79000	369584.7	5406756	320	-100	83	50	123	7.57	256	22	-1	0.005	-1	165	20	-5

C Horizon -200# Soil Sample Results

Mo	Cr	P	V	grid id	date	sample type	job	sds	tenement	prospect	lithology
-2	117	140	119	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan clay+tan mafic rx
-2	398	225	103	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan clay+tan mafic rx
-2	899	44	43	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	grey chl-seri schist
-2	802	49	36	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	grey chl-seri schist
-2	401	69	42	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	grey/green chl-seri-clay
-2	427	130	85	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green mafic saprock
-2	114	146	143	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green mafic saprock
-2	169	359	179	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green mafic saprock,chert
-2	390	179	109	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan clay+tan mafic rx
-2	939	151	130	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock, silicified
-2	552	268	111	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green/blue chl mafic+clay
-2	974	127	55	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green/blue chl mafic+clay
-2	1090	125	51	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	d/tan Fe saprock
-2	1060	96	83	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan/green saprock
-2	1270	397	98	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
-2	1070	133	67	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
-2	1090	313	95	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
-2	1730	143	124	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan Fe saprock
-2	1600	72	88	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	tan saprock
-2	782	115	70	Arthur Dam	10/07/96	minus200#Chorizon	ST15418	2360	EL 17/93	Arthur Dam	green/tan saprock

C Horizon -200# Soil Sample Results

Appendix 14

PASMINCO
EXPLORATION

Memorandum

To: Barry Murphy

From: Nicola McGunnigle

Date: 4 February 1997

Subject: **Stream Sediment Survey Follow-up**
Luina EL 17/93

Introduction

MPI Gold conducted a regional stream sediment survey over Luina EL 17/93 in 1994. A preliminary review of the results indicates anomalous Zn $\pm$ Pb $\pm$ Cu values along a NNW trending strike from south of Arthur Dam to Magnet Mine (Figure 1). Anomalous Zn was detected with values up to 1389ppm in a basin located 5km SW along Betts Track. Highly anomalous samples collected downstream (north and east) of Magnet Mine have been disregarded as related to contamination from mine workings.

Work conducted and recommendations for follow up

Statistical analyses of the data sets were going to be assessed by a geochemist in 1996 and are yet to be completed. Some anomalous values have been followed up on the ground, including values from the basin area accessed by Betts Track. The source of these anomalies appears to be derived from ridges to the south and east, on the contact of the Meredith granite with intermediate-mafic volcanic units.

It is recommended that the Betts Track anomalies are followed up to confirm their existence. Stream sediment sampling equipment could easily be aquired from another Pasminco site to repeat sampling at several of the sites and to also collect samples from a few additional tributaries draining into the anomalous area. It is also recommended to trial several size fractions in the sampling procedures to investigate methods for any future stream sediment sampling surveys.

It would be ideal for the results of follow-up sampling to be reported in the 1996-1997 Luina Annual Report (year ending March 1997). Any subsequent follow up to this work will depend on the results. If anomalous Zn is repeated, follow up geochemistry such as soil sampling over several lines in the area is highly recommended. Complications that may be associated with soil sampling in the area could extend from the basin topography creating a ponding effect and false anomalism in soil values.

For the statistical analysis of stream sediment data and any subsequent work that may

A Division of Pasminco Australia Limited
ACN 004 074 962

Level 7, 380 St Kilda Road, Melbourne Vic 3004
GPO Box 1291K, Melbourne Vic 3001

Telephone (03) 9288 0333
Facsimile (03) 9288 0211

follow, it is recommended to determine the geochemistry of the main lithologies in the area for background values, particularly Zn. It is important to know the geochemistry of the granite, especially if streams are draining off the ridges about the contact of the granite with volcanics.