SUMMARY SEISMIC INTERPRETATION

ONSHORE TASMANIA

SEL 13/98

For

Great South Land Minerals Limited

By

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30 November 2004

LIST OF FIGURES

Figure 31 Regional seismic line – Golden Valley Section showing thickening of Permian (basal) across TZ1. TZ1 is wrenched and is associated with Tertiary Basalts

INTRODUCTION

Greg Blackburn of Terratek Petroleum Consultants Pty Ltd was commissioned by Great South Land Minerals Ltd (GSLM) to provide a technical report on the exploration prospectivity of the onshore Tasmania Basin, in particular a review and geophysical assessment of their Tasmania Basin Seismic Survey (TB-01) acquired in 2001. Greg reviewed and interpreted the seismic data during 13-17 November 2004.

SPECIAL EXPLORATION LICENSE (SEL 13/98)

Special Exploration License SEL 13/98, which covers an area of 30,356 square kilometres, was granted for an initial period of five years, that expired on 18 May 2004. The license has been subsequently renewed, with GSLM proposing to spend $21.5 million over the next five years, including an exploration program of 2000km of seismic and the drilling of four stratigraphic and two exploration wells.

PETROLEUM SYSTEMS

Proterozoic

Proterozoic oil and gas occurs onshore Australia and is a major source in Oman. Oil stains have been reported on shales in Tasmania, but this may have migrated from younger rocks. Recently sampled Proterozoic shales (Black River Dolomite) from north-west Tasmania have high TOC's and apparently low maturity (C Burrett & A Chester per. comm.). Rock samples inspected by the author had both strongly developed bedding and cleavage. While rocks of this age are traditionally regarded as basement to the Late Carboniferous to Jurassic Tasmania Basin and older late Cambrian – Early Devonian Wurawina Supergroups (Bacon et al. 2000), their prospectivity cannot never-the-less be totally discounted if relatively undeformed or slightly deformed section can be found.

Proterozoic-Cambrian rocks are exposed in a narrow zone, beneath shallow cover in the south-western portion of the Longford Sub-basin, at O'Connor Peak and Little Billop. The rocks are part of a large continuous volcanic belt that outcrops extensively in western Tasmania and is referred to as the Dundas Element by Seymour and Calver (1995). These are possible correlates of the Crimson Creek Formation (Crawford 1991, Forsyth et al. 1995). The rocks consist of slate, phyllite and basic volcanic rock (tuffs) with minor limestone beds (Matthews 1983). Matthews (1983) reported Precambrian dolomite at Brumby's Creek, with Cambrian quartz sandstone and minor conglomerates occurring NW of the Longford Sub-basin at Beaconsfield. The surface exposures are probably reactivated thrusted inliers as shown on figure 1.

Wurawina Supergroup

The Wurawina Supergroup consists of Late Cambrian to Early Ordovician, shallow marine to fluvial siliclastic rocks (Denison Group) overlain by approximately 1.5km of predominantly micritic, shallow marine, warm water Ordovician limestone (Gordon Group), then up to 5km of shallow marine, Silurian to Early Devonian siliclastic rocks (Eldon Group) (Bacon et al. 2000).

GSLM (2004 Annual Report) have concluded that

1) Source rocks are present within the Ordovician Gordon Group Upper Limestone Member but are unable to quantify their thickness.
2) Wet gas and oil have been confirmed within the Gordon Limestone suggesting that generation has taken place.
3) Most of the Gordon Limestone is present day in the wet gas to dry gas window.

Alan Chester (2003) states that maturation indices including Tmax, conodont CAI and biomarkers show that the Ordovician carbonates in Central Tasmania are in the wet to dry gas windows, with the upper limestone member has fair to good TOC source potential. On limited sample analysis the kerogen is thought to be algal, with C27, C28, C29 ratios suggesting a carbonate oil source and diasterane/pristine – phytane ratios indicating anoxic conditions.

Key reservoirs include possible palaeokarst limestone, which may be difficult to find, reefs within the Gordon Limestone and sandstones within the Siluro – Devonian Eldon Group.

Karst features are commonly seen in sub-aerially exposed Gordon Group limestone (Eugenana (Burns, 1964), Florentine Valley (Goede 1976), Tyenna (Calver 1992), Ida Bay (Household and Spate 1990), Lake Sydney (Kiernan 1989 and possibly Moina (Hughes 1957)). Palaeo-karst reservoirs are likely to be found where the Gordon Limestone was sub-aerially exposed before Parmeener Supergroup deposition. At Ida Bay and along the eastern margin of the Florentine Valley Upper Carboniferous tillites unconformably overlie the palaeo-karsted Ordovician limestones and caves were formed within the limestone (Bendall et al., 2000).

Directly overlying the Gordon Limestone in the Tiger Range area to the south of the Central Highlands is the Arndell Sandstone. This fine-grained sandstone, which is up to 250m thick, has low porosities (5%), but may act as a possible gas reservoir. Intra-formational shales or basal tillites of the Parmeener Group could seal these sands.

The structure of the Wurawina Supergroup beneath the Tasmania Basin is mainly inferred from visible structures in the northern and western Tasmania and by comparison with other fold and thrust belts.

Lower Parmeener Supergroup

The glaciomarine Lower Parmeener Supergroup, is targeted in hydrocarbon exploration and contains mature potential source, reservoir and seal rocks (Reid & Burrett 2004). Basal diamictites are overlain by carbonaceous and pyritic siltstone of the Woody Island Formation, containing the alga Tasmanites, which is accumulated in places as the Tasmanite Oil Shale. The siltstone has low TOC and type III kerogens, the oil shale high TOC and type I kerogens. The widespread freshwater sandstones and carbonaceous siltstones (Liffey Group) form the principal reservoir target. Porosities are best within the Golden Valley region where porosities of up to 18% have been recorded in medium to coarse sandstones (Maynard, 1996). The average porosity of the Liffey Group is 10.9%. In most sections, the middle 15-20m of the unit has a range of fair to good reservoir potential. However, the Ross RG146 and Tunbridge 1 drillholes lying to the east of the other sections have poorer reservoir quality because of finer grain size (Bacon et al., 2000) The unit has good TOC and type II and III kerogens. Porosity is fair to good, but permeability is limited by quartz and carbonate cements. Vitrinite reflectance analysis indicates maturity across much of the middle Tasmania Basin, in respect of the Woody Island Formation and Liffey Group.

Upper Parmeener Supergroup

The upper Parmeener Supergroup consists of up to 400m of terrestrial sandstones and minor siltstones and coals succession of Late Permian to Late Triassic age. The prospectivity of this unit is thought to be low.

A complete Permian field outcrop and seismic section is located in the Golden Valley (Figures 2 & 3).

Jurassic Dolerite

Tholeiitic dolerite was intruded into the Tasmanian crust during the Middle Jurassic, mainly as sheets in the flat lying sediments of the Tasmania Basin. The sheets are typically 400 – 500m thick and dolerite is currently exposed over much of the Tasmania Basin (Bacon et al. 2000).

Inferred Jurassic – Cretaceous sediment cover

Apatite fission track analysis of surface samples suggests that a section of 2.5 – 4km thick has been inferred to be removed by erosion (O'Sullivan and Kohn, 1997). Liu et al. 2004) have modeled part of the Tasmania Basin using Petromod and conclude from studying the results attained with different models of possible eroded thickness and heat flow rate change during dolerite intrusion that the heat flow and structural history have strongest control on hydrocarbon generation, migration and preservation. More modest overburden thicknesses were used, however heat flows are relatively high, but not inconsistent with known information. They note significantly different maturation and expulsion times depending on the timing of erosion. The seismic data does not support their model for the Triassic unit being eroded, commencing 175Ma as Tertiary sediments rest unconformably on Jurassic dolerite.

Tertiary Section

The Tertiary sediments of the Longford Sub-basin cover an area of ~ 950 sq kms extending from Quamby Brook in the north, to Lake River and Hummocky Hills in the south; and from the foothills of the Great Western Tiers in the west to the flanks of Grassy Hut Tier and Mt Arnon in the east. These sediments disconformably and unconformably overlie the Mesozoic of the Parmeener Supergroup and Jurassic Dolerite. Direen (1995) suggests that the basin formed by a series of predominantly north-west trending Jurassic normal faults, that have produced a series of half grabens. Tertiary sediments reach a known maximum thickness of 793m in the north of the Sub-basin ("Sunny Rises" oil well). Lithologies present are coarse to fine grained sandstone, siltstone, shales, gravels, conglomerates and lignite beds. Volcanism was prevalent during the mid to late Tertiary, producing a variety of basalts.

Matthews (1983) sub-divided the Tertiary stratigraphy as follows:

a) Palaeocene to Eocene; clay sand and lignite
b) Mid Eocene to Pliocene; basalts clay and sand
c) Pliocene to Pleistocene; laterite, soils and aeolian dunes.

Lane (2002) further refined Matthew's stratigraphy and introduced eight sequences based on seismic interpretation. His youngest sequence (S1 unit) was dated as Mid – Late Eocene and includes conglomerates, coarse – fine sandstone, siltstone shale lignite and basalt deposited on a regional unconformity surface.

Sutherland (1971) noted that the basaltic lavas were found to be Late Eocene to Early Pliocene in age.

Carey 1958, Longman & Leaman, 1971 and Leaman 1992 have described the major basin margin normal faults. They have noted that the faults are pre-dolerite, as they have controlled the form of the dolerite intrusions about their axes. The west bounding Tiers Fault as defined geophysically (Longman & Leaman, 1971 and Leaman, 1992) is much more extensive than that mapped geologically. Seismic evidence suggests that this fault forms part of a major pre-Permian thrust system, that was down-faulted and subsequently wrenched and inverted (Figures 4, 6 & 8). Late inversion and wrenching is more prominent along the faults to the east where prominent flower structures are mapped (Figure 6). Seismic flattening on the upper Tertiary Sequence 1 unit (Late Eocene) suggests contemporaneous deposition and faulting within the troughs (Figures 5, 7, & 9). Trough shapes vary according to the reactivation and extensions of the pre-existing easterly dipping older faults. Subsequent wrenching and inversion resulted in broad Tertiary folds, often orientated to the north-east (Figures 4, 10 & 11) and flower structures. Tertiary basalt intrusion is associated with later movement of these faults, which are thought to be active from the Late Eocene – Early Pliocene. These events appear to have not been previously recognized by earlier workers. This late movement severely downplays the prospectivity of the Longford Troughs as the final structures were formed very late with little chance of subsequent migration and charge. Any pre-existing feature is likely to have been reactivated with likely loss of trapped hydrocarbons.

SEISMIC SURVEY

Acquisition

Trace Energy Services acquired 659.2 line kilometers of vibroseis seismic data across the Central Highlands and in the Northern Midlands areas commencing 10 March – 25 June 2001 (Figure 11). The survey was acquired in two parts due to Trace having contractual commitments elsewhere midway through the survey.

Data Recorded By:	Trace Terracorp
Date Recorded:	10 March – 25 June 2001
Seismic Source:	
Number Vibrators	Four
Number Sweeps per VP	2 sweeps each station no move up (standing sweeps)
Vibrator Spacing	Vibrators centred on station 12.5m pad to pad
Source Array length	37.5m
Sweep Length	8 secs
Sweep Frequency	6-80 Hz sweep
Sweep Type	Linear
Recording System:	I/O System Two
Format	IEEE SEGD
Record Length	14 secs
Sample Interval	2ms
Low cut filter	5.5 Hz
High cut filter	Out
Receivers:	
Geophone Type	Sensor SM4 10Hz
Group Interval	25m

Number of Groups	240 or 360
Spread Type	Split Spread
Spread 360 Channel	4487.5 – 12.5 – X – 12.5 – 4487.5
Spread 240 Channel	2987.5 – 12.5 – X – 12.5 – 2987.5

Table 1: Key seismic survey recording parameters

The seismic data was recorded as 240 trace off road and 360 trace on road. Further details are included in GSLM's 2002 Annual Report and in particular Appendices A –D and also their 2003 Annual Report and in particular Appendix A.

Processing

The data was processed by Robertson Research (Australia) Pty Ltd using a conventional processing stream, including three passes of velocity analysis (last pass DMO velocities), residual statics and finite difference migration. The data was further enhanced using a time space variant multi-channel dip and coherency Tau-P filter. Further details are included in Robertson's Processing Report submitted July 2003.

The quality of the seismic data set is highly variable, probably reflecting the underlying geology (e.g. pre-Permian structuring and regions containing thick dolerite intrusions) as well as variable surface relief and sub-cropping geology (e.g. dolerite). Much of the seismic survey was restricted to shooting along existing roads and although this data was processed using crooked line techniques, data degradation is likely.

WELL CONTROL

Dungrove 1

This well was drilled by Mobil Energy Minerals at the south-western end of the Hunterston Dome and intersected ~340m of Parmeener Supergroup sediments before terminating within Jurassic dolerite. This well is offset from seismic line TB01-TC, which appears to have a thicker, shallower dolerite section. The well appears to be west of possible north-north-west orientated fault trends and hence within a different fault block (Figures 12 & 13). The Liffey Group is present towards the base of the well. Bundella Group muds were the lowest Permian units drilled.

Golden Valley 1

This well intersected 194m of Parmeener Supergroup sediments unconformably overlying 6.4m of Gordon Limestone. The Stockers Tillite is thin in the well (6.4m) (Figures 2 & 3). The Liffey Group is 16.2m thick in the well.

Hunterston 1

The Hunterston Dome was drilled to a depth of 1324m, through Jurassic dolerite, Lower Parmeener Supergroup and into Precambrian dolomite basement (Figures 12 & 13). The base of the Parmeener Supergroup does not outcrop in the area and the well revealed the absence of the extensive glacial diamictites present elsewhere in the Tasmania Basin (Reid et al. 2003). A conglomeritic facies was found in place of the Bundella Mudstone and Woody Island Siltstone. The deformed basement dolomites have a similar lithology to the undeformed Black River Dolomite of northwestern Tasmania. Porosity within the Liffey Group varies from 4-9%. Dolerite was encountered from 134 –784.4m and represents multiple intrusive events, evidenced by internal contacts between differing grainsize textures (Reid et al., 2003).

Tunbridge RGT 451

This stratigraphic bore drilled 905.7m of Parmeener Supergroup before intersecting 6.8m of interpreted Precambrian strata (Figures 14, 15 & 16). The numerous Tertiary basalt zones recorded within the lower Quamby unit probably coincide with the faults associated with the nearby flower structure and is thought to have formed during the Late Tertiary (Figure 13). Sub-horizontal contacts, chilled contacts, brecciation and carbonate and montmorillonite infill associated with these basalts are further evidence. The Permian appears to thicken slightly over the re-activated normal fault that once formed part of the deeper thrust system. The basal Stockers Tillite is almost 200m thick at this location.

Porosity within the Liffey Group ranges 2-18%

Annadale 1 (Figures 14,15,16 &17)

Ross 1

This well is located away from seismic control. Porosity within the Liffey Group ranges 1-15%

Woodbury 1 (Figures 15,16 &17)

SEISMIC – WELL CONTROL

Tertiary

Limited wireline logging was carried out on the "Sunny Rises" oil well (OP1) within the Longford Sub-basin. SP, gamma and resistivity logs were run to a depth of 560m at OP 1, some 128m less than total depth. Other wireline logs in the area are only for shallow bores. Lane (2002) used this bore to calibrate the seismic grid over the Longford Sub-basin. The well is situated 250m southeast of SP 450 on seismic line TB01-PM. The well bottoms out in dolerite basement. (p14 of report). Lane tied the logs to the seismic data using the seismic processed stacking velocities.

Parmeener Supergroup & Jurassic Dolerite

Approximate seismic velocities for the Jurassic dolerite (6000m/s), Triassic sandstones (3000m/s) and Permian siliclastics (4000- 4500m/s) have been used by GSLM (Burrett 2002. Stacey (2004) subsequently refined these seismic velocities following downhole velocity survey at Hunterston 1. His recorded interval velocities are Ferntree Mudstone (4100m/s), dolerite (top 5170m/s, intermediate 6040m/s and 7190m/s and basal 6550m/s), Cascade Group (5190m/s), Liffey Group (4160m/s) and Bundella Formation (4350m/s). Stacey does not record the seismic velocities within the Precambrian dolomitic basement.

PREVIOUS INTERPRETATIONS

Preliminary analyses of the TB-01 seismic by Dr M Swift, Mr I Reid and Mr A Stacey survey identified several potential anticlinal / domal traps.

Two small anticlinal structures have been recognized by I Reid in the Parmeener Supergroup beneath the Longford Sub-basin (Macquarie River and Hummocky Hills) (Figures 18, 19 & 19a). Dr Swift subsequently identified an anticline near Bracknell within the Tertiary infill of the Longford Sub-basin.

Several large anticlinal-domal structures (from west to east: Mt Arrowsmith, Derwent Bridge, Bronte/Bellevue, Steppes, Hunterston, Scotts Tier and Interlaken: (Figure 20) have been identified in the Central Plateau area by Dr Swift and Mr Stacey. Burrett (2003) reviews of these structures.

Anticlines in the generally gently dipping Parmeener Supergroup are found to overlie anticlines with steeper limbs in the Devonian fold-thrust belt beneath the basal Permian unconformity.

REGIONAL OVERVIEW BASED ON SEISMIC INTERPRETATION

The Longford Sub-basins appear to overlie a thick pre-Permian section. Proterozoic rocks outcrop near the western end of TB01-PG (green event on figure 21). This event is interpreted at ~3.35 – 4.0 sec on the eastern part of the seismic line. It is possible that the

Tiers Fault acted as a normal fault following the Proterozoic deposition, with a thick section of Wurawina section deposited to the east. It is postulated that the Tamar Lineament to the east of the seismic line had a similar disposition with another depocentre to the east. It is difficult to interpret within the Wurawina depocentre due to the intense thrusting, which has probably resulted from reactivation of the pre-existing normal faults. Thrusting in particular is intense along the Tiers Fault, with the Proterozoic section severely back thrusted to the west (Figure 22). Similar lower angle back thrusts at the eastern end of the seismic line are probably indicative of the nearby Tamar Lineament (Figure 23). This thrusting is probably associated with the Tabberaberan Orogeny followed by a period of erosion and non-deposition prior to the early Parmeener deposition. Thrusting is more subdued and of a lower angle away from the depocentre (see seismic line TB01-ST figures 24 & 25). The southern extension of the Tiers Fault system is probably to the east of the seismic line. Further to the west, broad folded and thrusted structures are present (Figure 26). Initial deposition of the lower Parmeener glaciogene sediments tends to overly the older Wurawina depocentre. The Central Highlands and most likely the area to the east of the Tamar Lineament were elevated at the time of deposition. The base Permian unconformity is often more erosional within these high areas, probably reflecting the elevation and glacial processes that occurred during this time. The high amplitude basal Parmeener reflectors probably represent the tillite. This character diminishes towards the hinterland areas, reflecting non-deposition or thin tillite deposition. Minor re-activation of some pre-existing thrust faults produced some syn-depositional normal faulting during the Permian, which in general appears to be thickening towards the Tamar Lineament. Further extension during the Middle Jurassic enabled dolerites along these old trends, with major sills often formed on the downthrown blocks of the major re-activated faults.

Major extension occurred during the Palaeocene resulting in small grabens within the Longford area. Later wrenching of these faults resulted in extensive flower structures and inversion of structures. This later event is extensive throughout the Central Highlands and is critical in the location of the Tertiary volcanics (Figure 27).

LEADS & PROSPECTS

The Bellevue Lead, based on the limited scope and time of this study appears the most promising of the mapped leads, particularly as it is relatively unaffected by the Late Tertiary movements.

The Bellevue structure consists of large anticlinal and fault structures both within the Wurawina and Parmeener Supergroups Figures 28 & 29). Bronte/Bellevue is a 6500m long anticline with a closure of 25msec (Parmeener). (see Stacey 2002). The Parmeener Supergroup (including dolerite) extends to 0.5 sec below surface (about 1200m). Swift identifies the sequence between 1.1secs and 2secs below surface as being limestone by comparison with very similar seismic characteristics in the onshore Cambro-Ordovician Georgina Basin of Queensland. This identification would then make the 1 sec overlying sequence the uppermost Ordovician-Devonian Eldon (or Tiger Range) Group with a thickness of between 1,500m and 2,300m. A similar thickness is suggested for the underlying Arenig-Ashgill Gordon Group limestone with another 1 sec (approx 2,000m) for the underlying siliciclastics of the Upper Cambrian to Tremadoc Denison Group. Thus a full sequence of the Wurawina Supergroup is very probably present in an up to 9,000m long anticlinal structure with at least 3-way dip closure. The Wurawina Supergroup at Bellevue is similar in thickness to that in the Florentine Valley to the southwest. Potential commercial reservoir targets at Bellevue are:

- The 'middle' Permian Liffey Group sandstones (at approx. 1,000m depth)
- The sandstone formations of the Eldon/Tiger Range Groups (at approx. 1,550m-1,700m)
- The Upper Ordovician limestones of the Upper Limestone Member of the Benjamin Limestone Fm, particularly vuggy porosity horizons and reef and near reef facies at 2,500+m below surface.

RECOMMENDATIONS

Other leads are likely to be found with further interpretation. For example the Gordon Limestone is likely to be karst, immediately beneath the base Permian unconformity, rotated fault blocks of Gordon Limestone are present in the same area, or alternatively fracture porosity is likely to be found within these rocks within the intensely fractured thrust zones these three new play types are all illustrated on figures 30 & 31.

Further seismic interpretation of the pre-Permian is required to further understand the regional structure.

More fieldwork is required to confirm many of the seismic interpretations.

ACKNOWLEDGEMENTS

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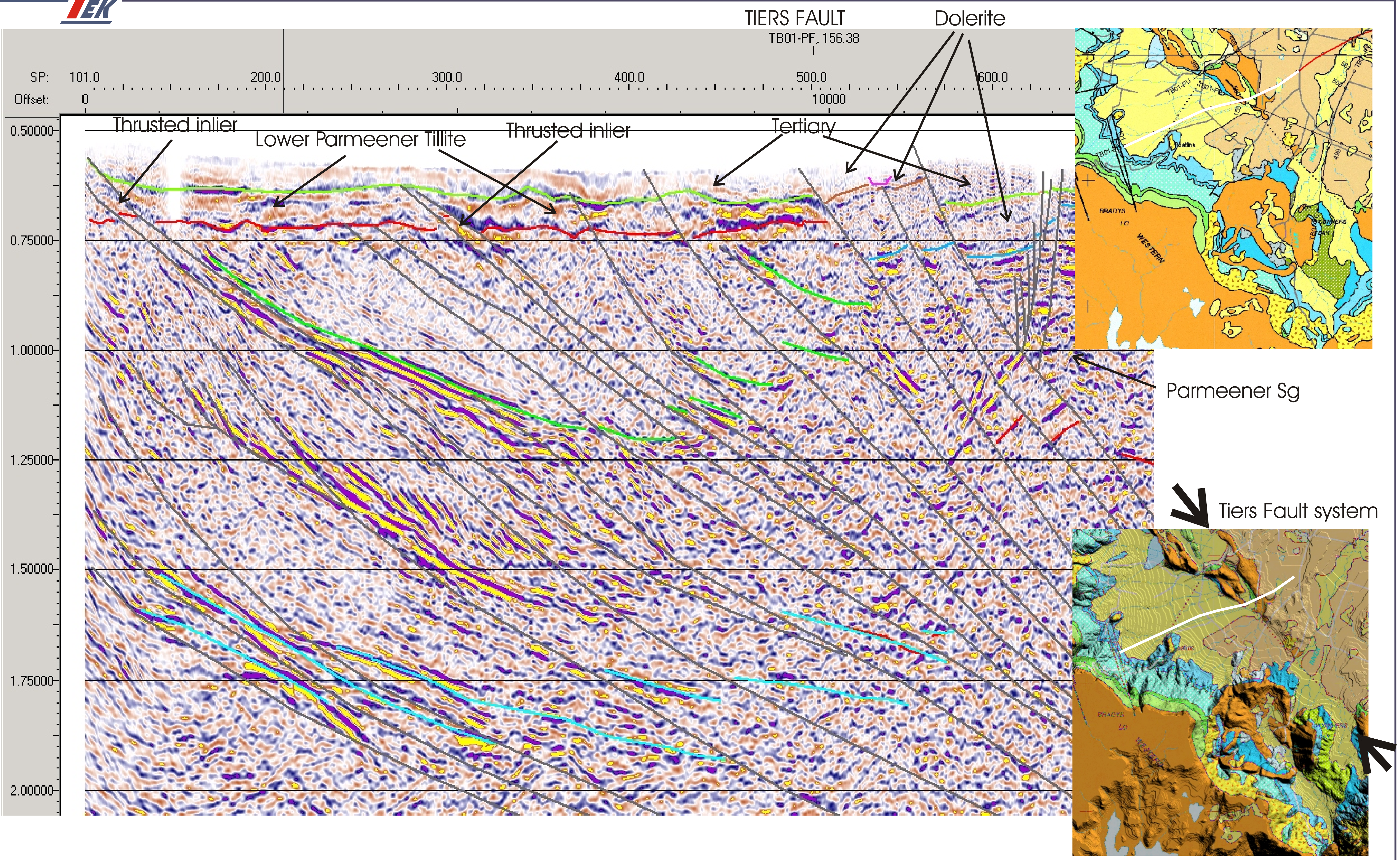
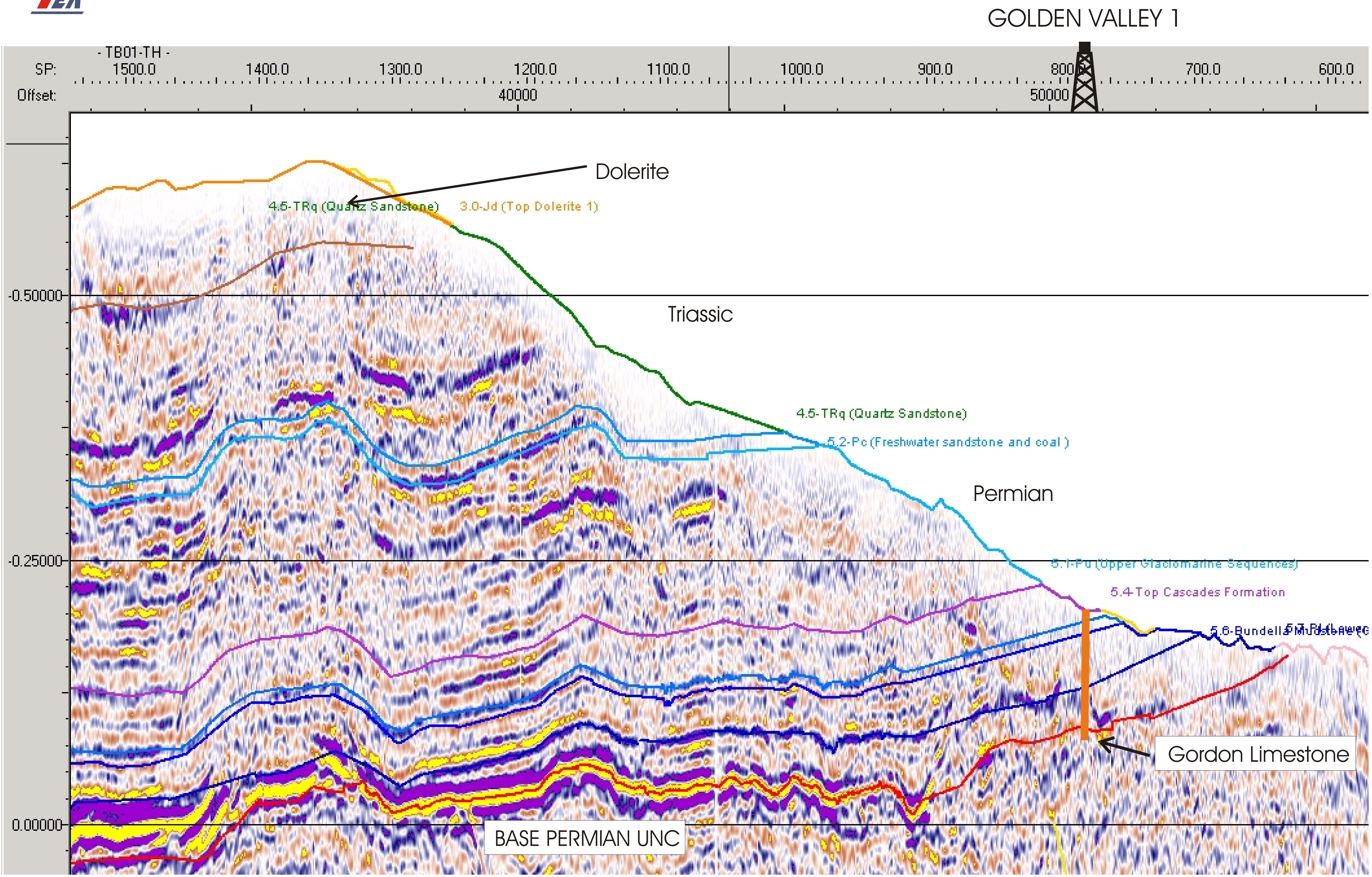


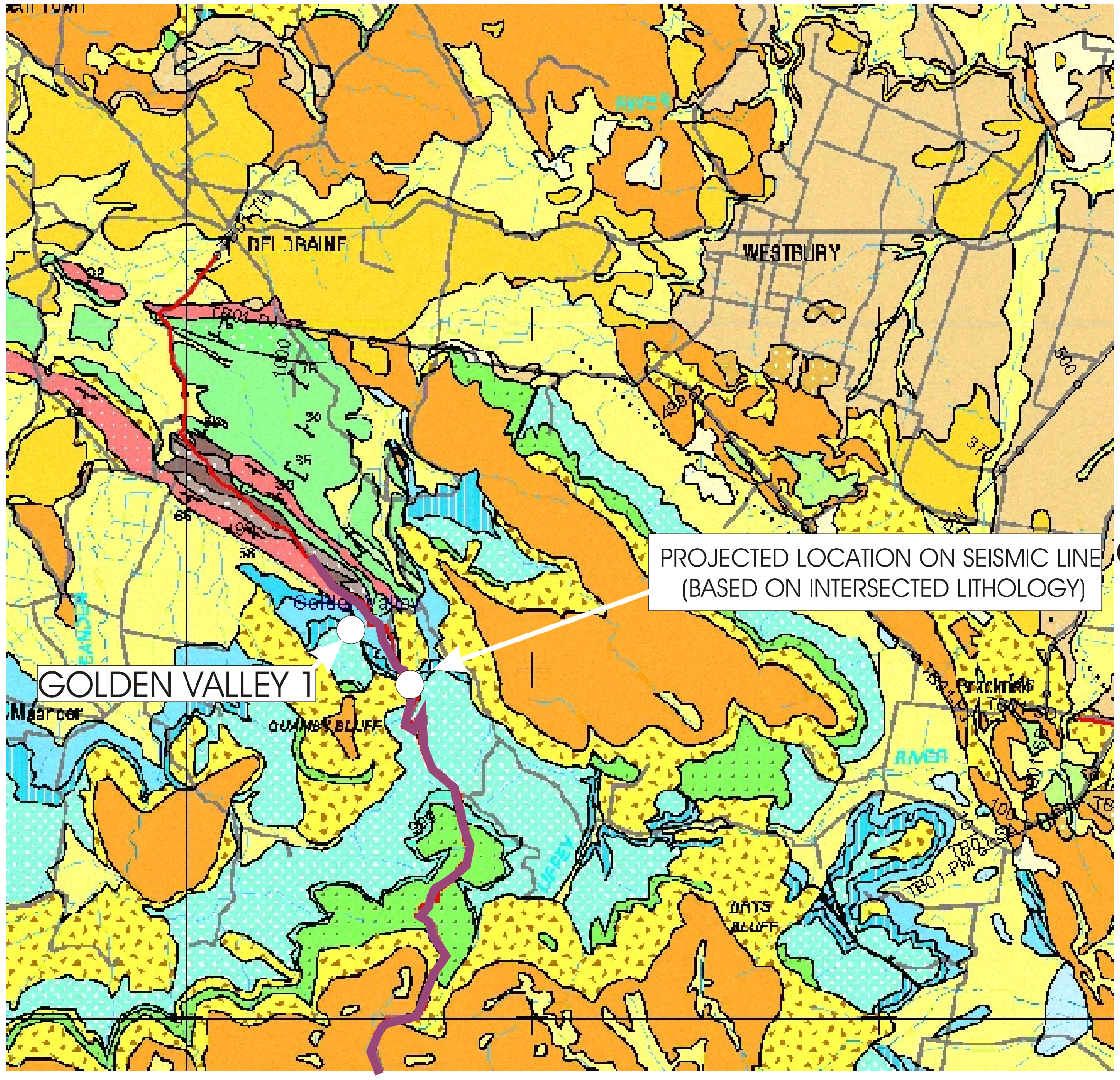
PRE PERMIAN THRUSTING OF PROTEROZOIC (?) SECTION
LONGFORD SUB-BASIN

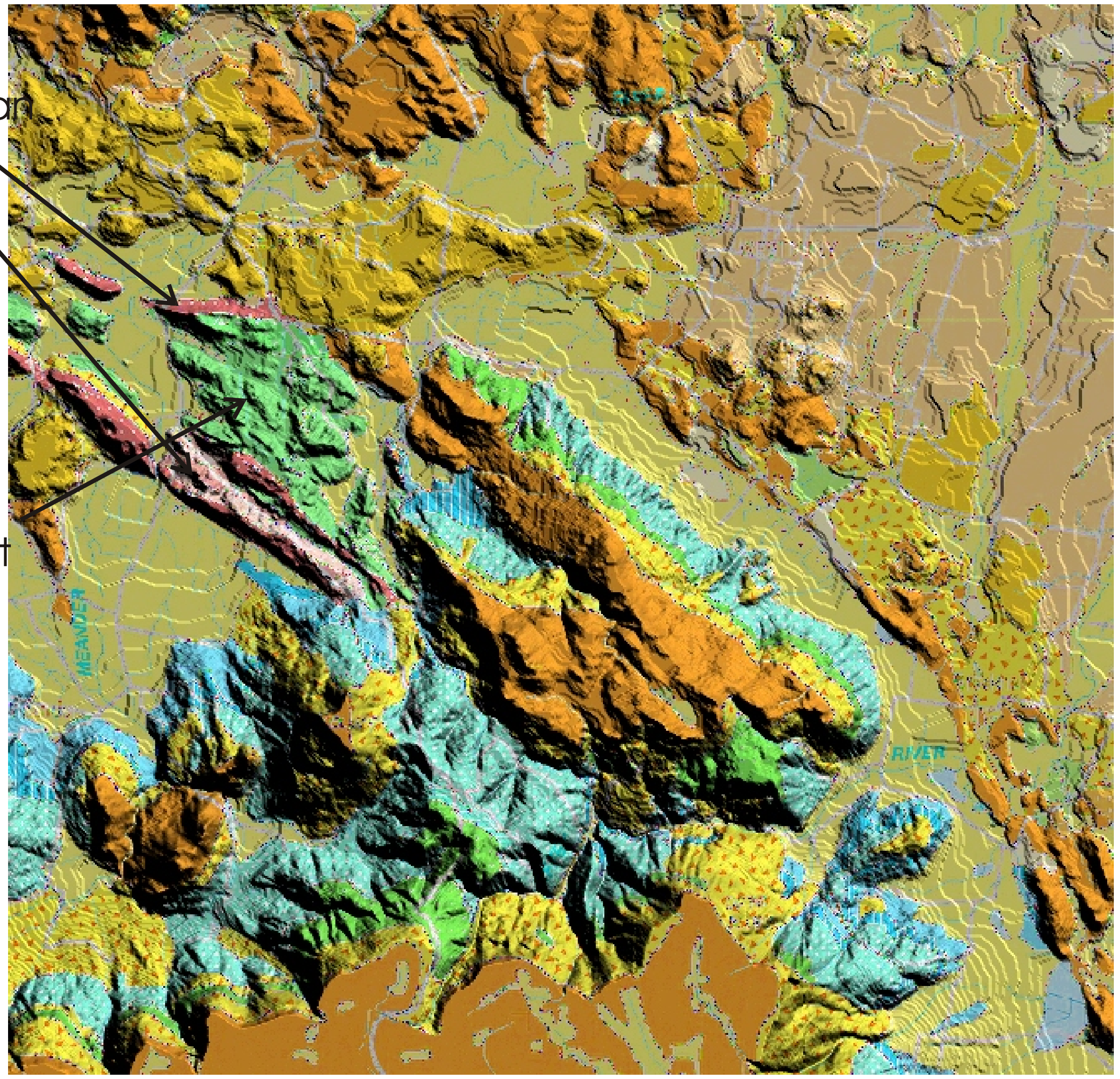
Figure 1

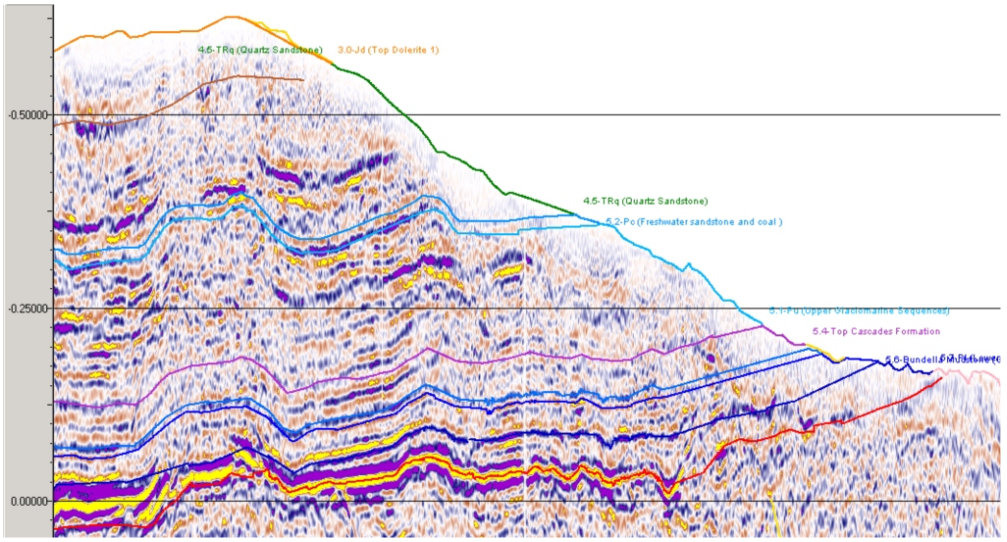


PARMEENER SUPER GROUP TYPE SECTION
GOLDEN VALLEY

Figure 2

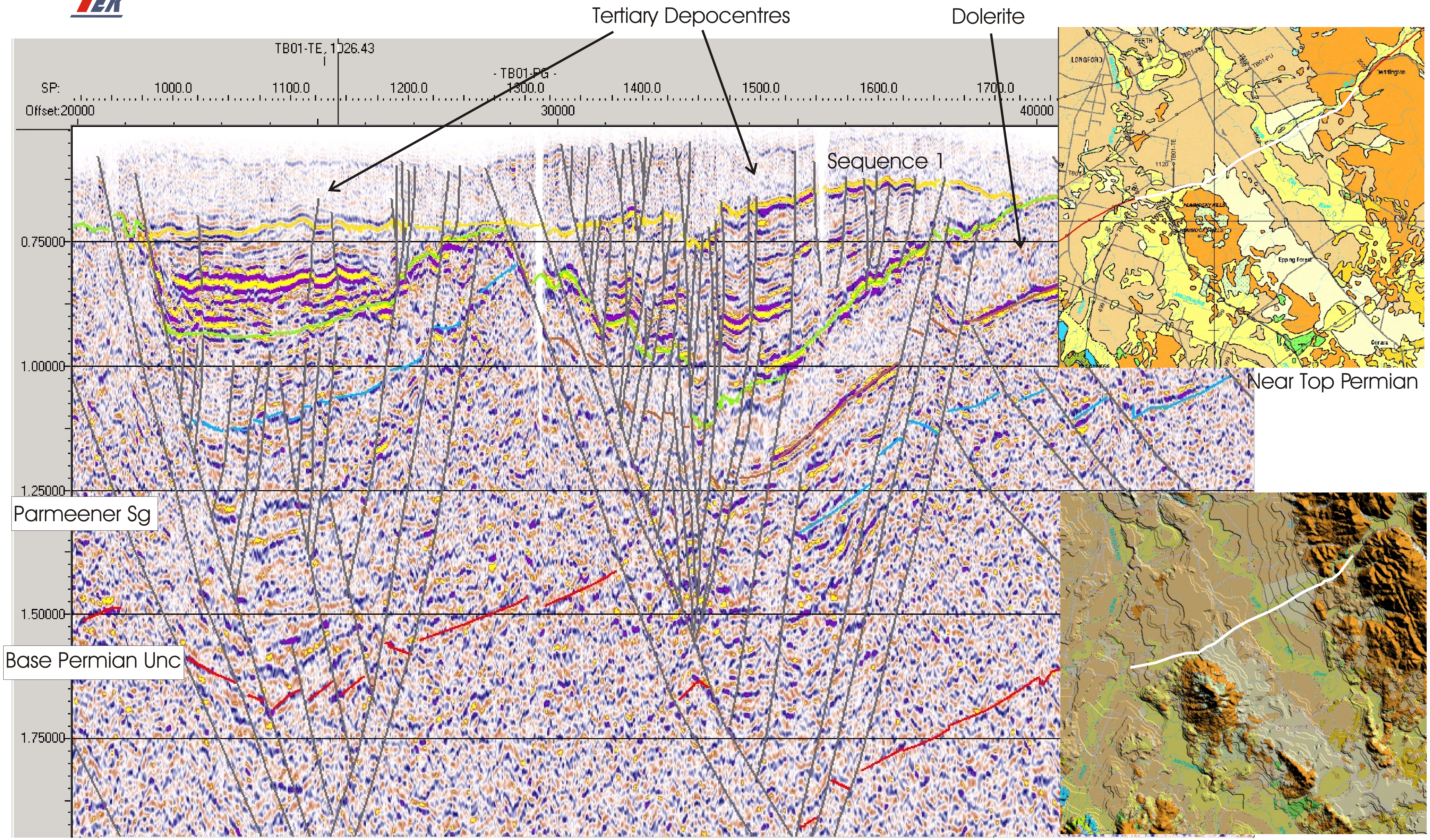






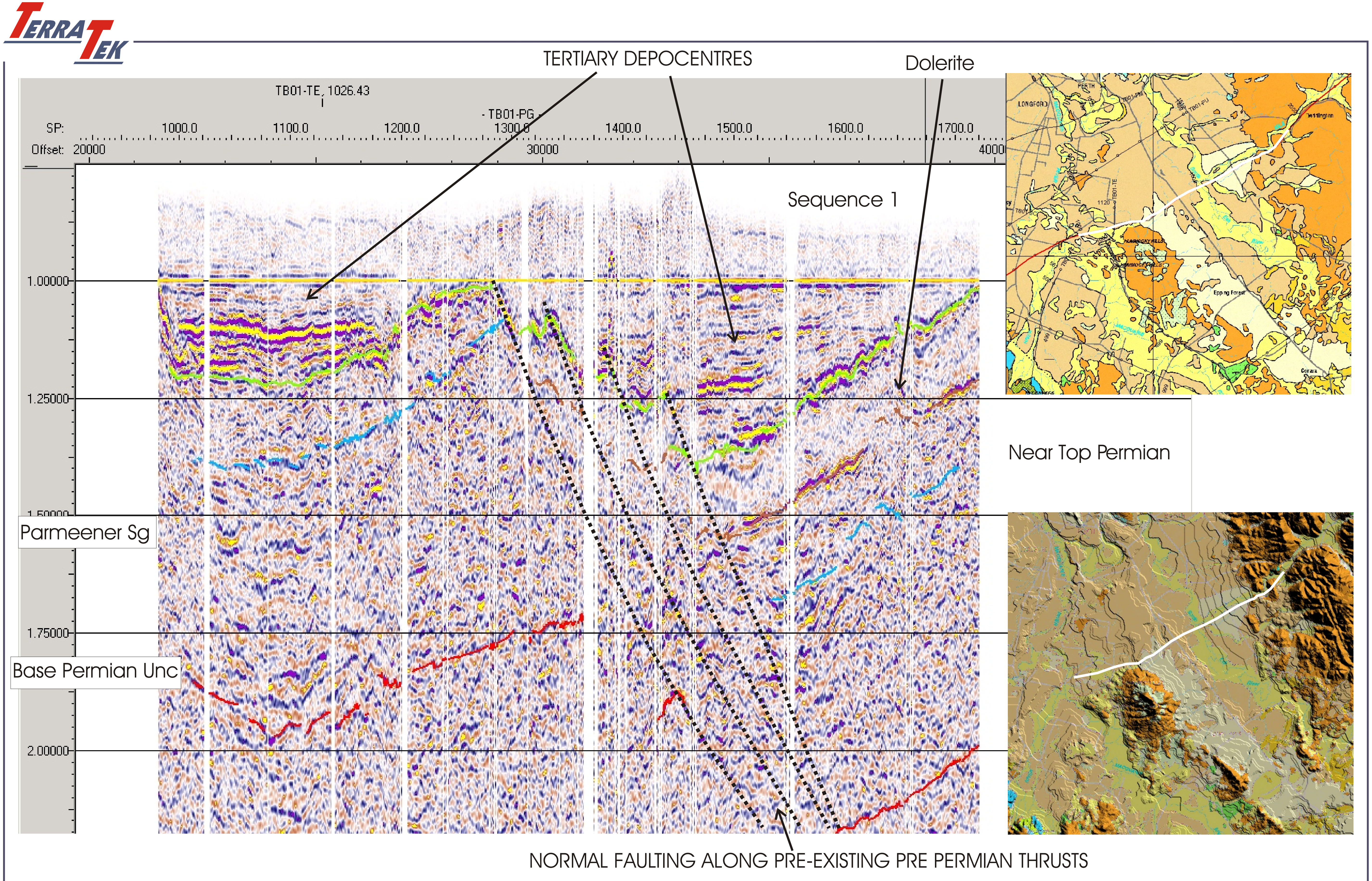
PARMEENER SUPER GROUP TYPE SECTION AND SEISMIC LINE
GOLDEN VALLEY

Figure 3



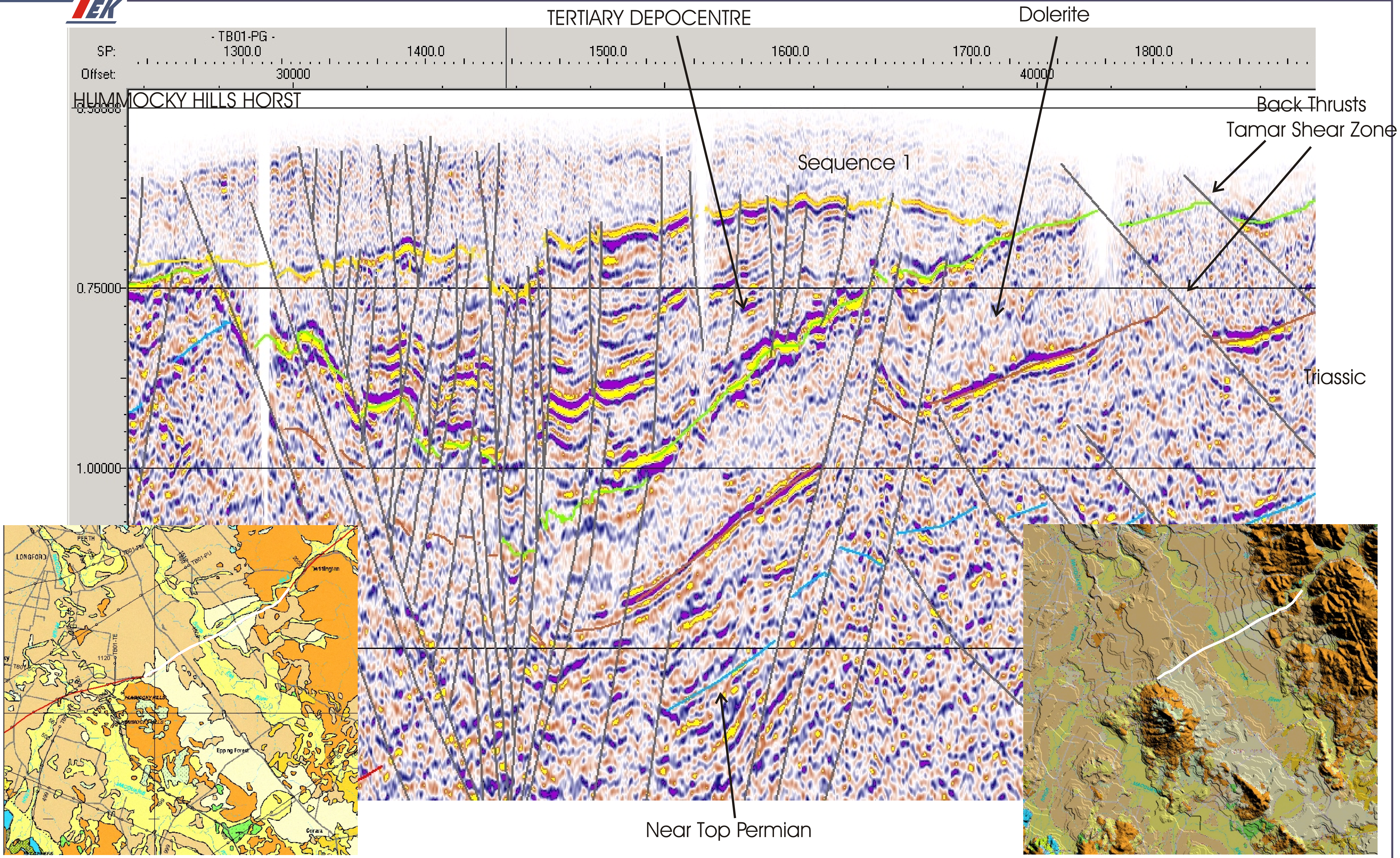
TERTIARY DEPOCENTRES THAT HAVE BEEN INVERTED AND WRENCHED ALONG THEIR WEST BOUNDING FAULTS
LONGFORD SUB-BASIN

Figure 4



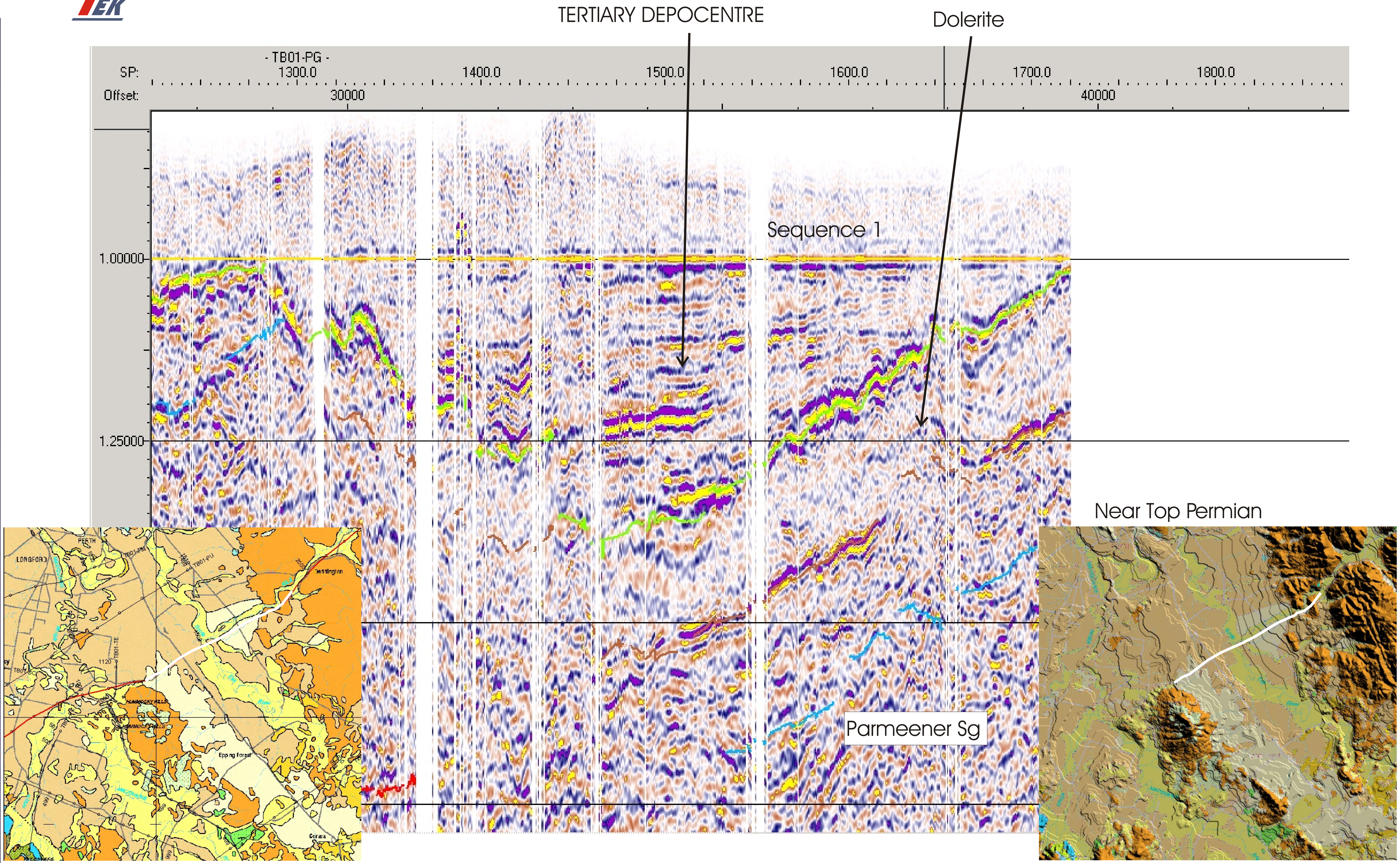
FLATTENED SEISMIC SECTION ON BASE SEQUENCE 1 SHOWING RECONSTRUCTION
TERTIARY DEPOCENTRES DURING LATE EOCENE
LONGFORD SUB-BASIN

Figure 5



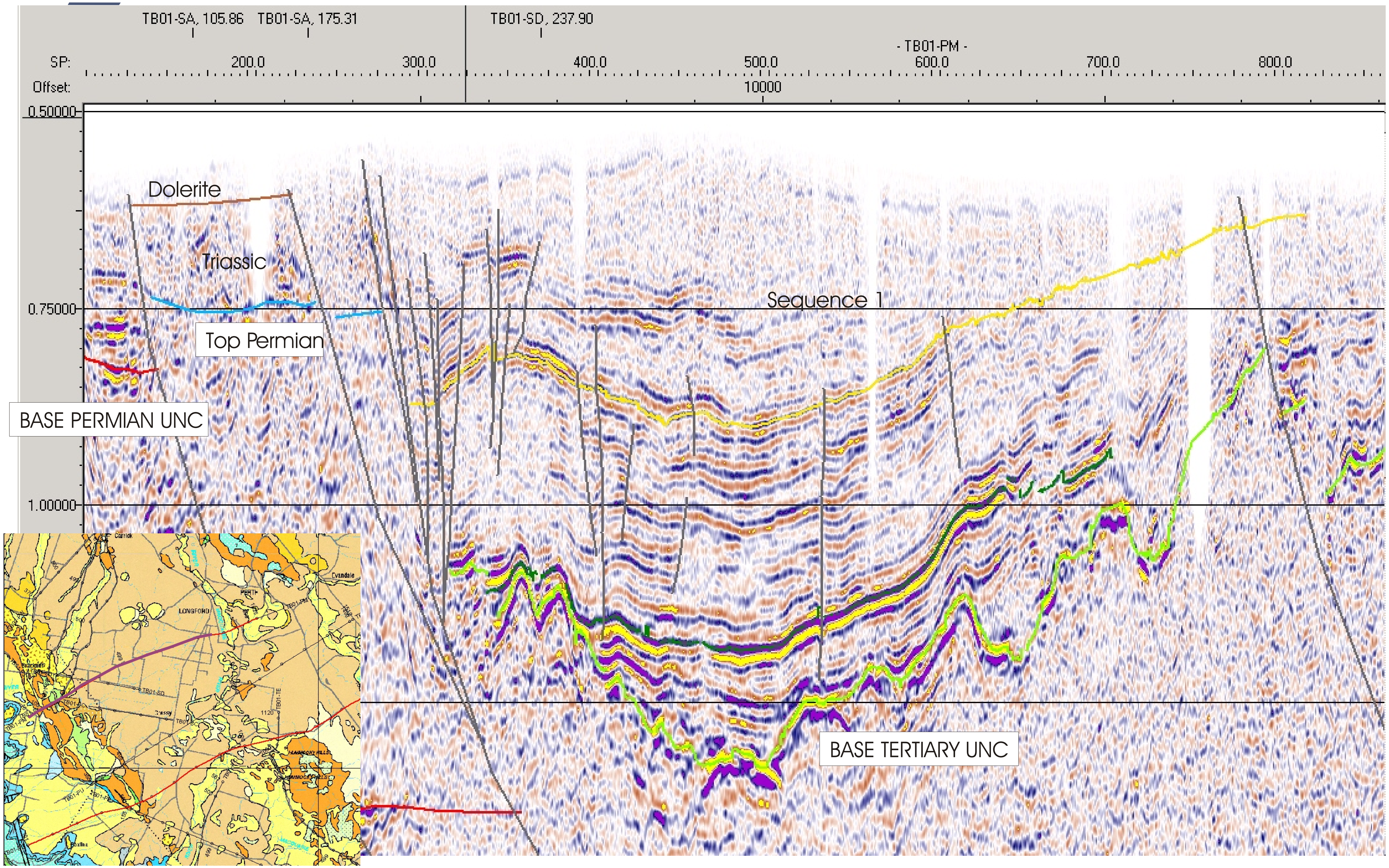
COMPLEX FLOWER STRUCTURE ALONG EASTERN HUMMOCKY HILLS FAULT SYSTEM.
NOTE INVERSION AND FOLDING OF THE TERTIARY SECTION TO THE SURFACE
LONGFORD SUB-BASIN

Figure 6



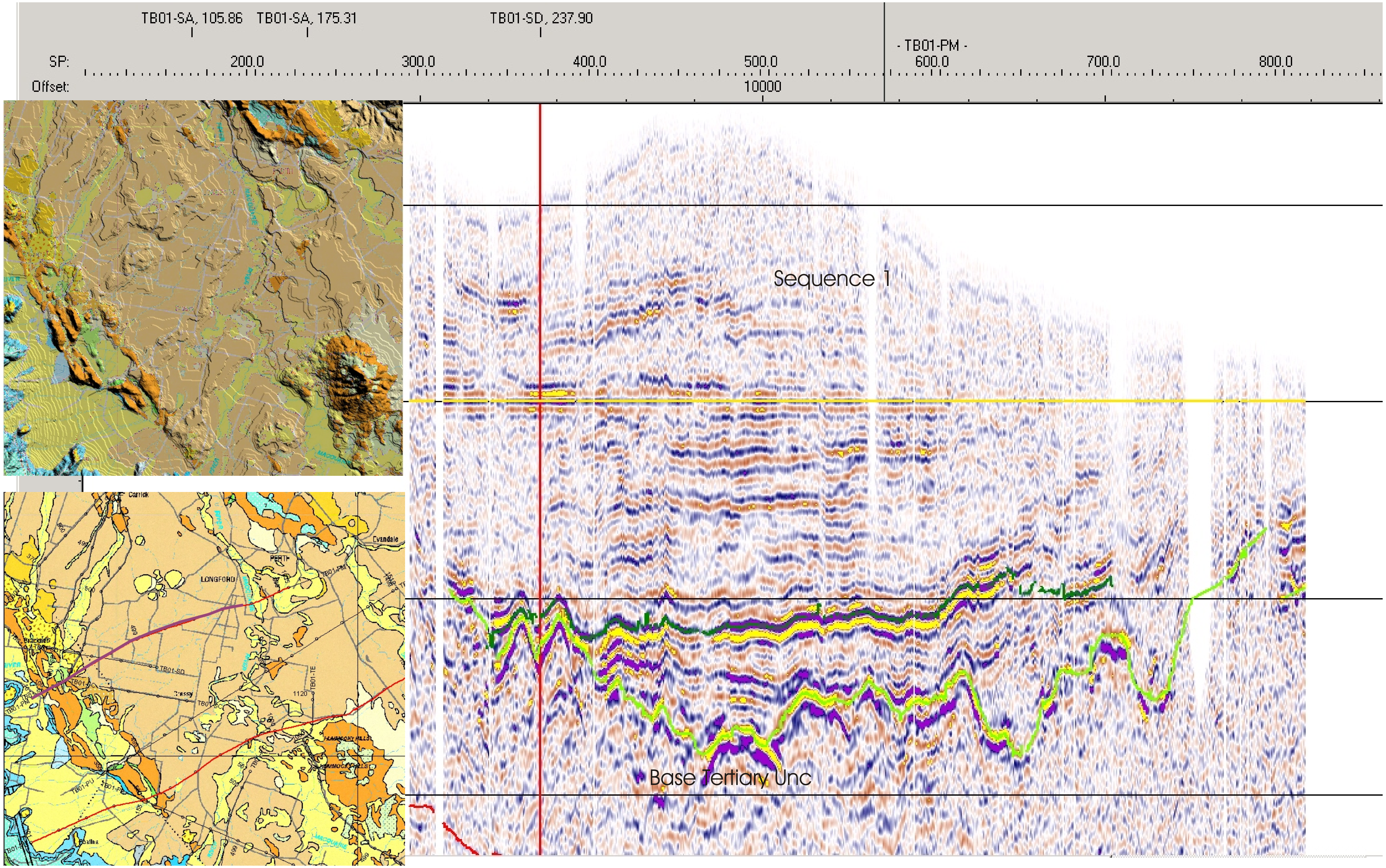
FLATTENED SEISMIC SECTION ON BASE SEQUENCE 1 SHOWING RECONSTRUCTION EASTERN TERTIARY DEPOCENTRE DURING LATE EOCENE
LONGFORD SUB-BASIN

Figure 7



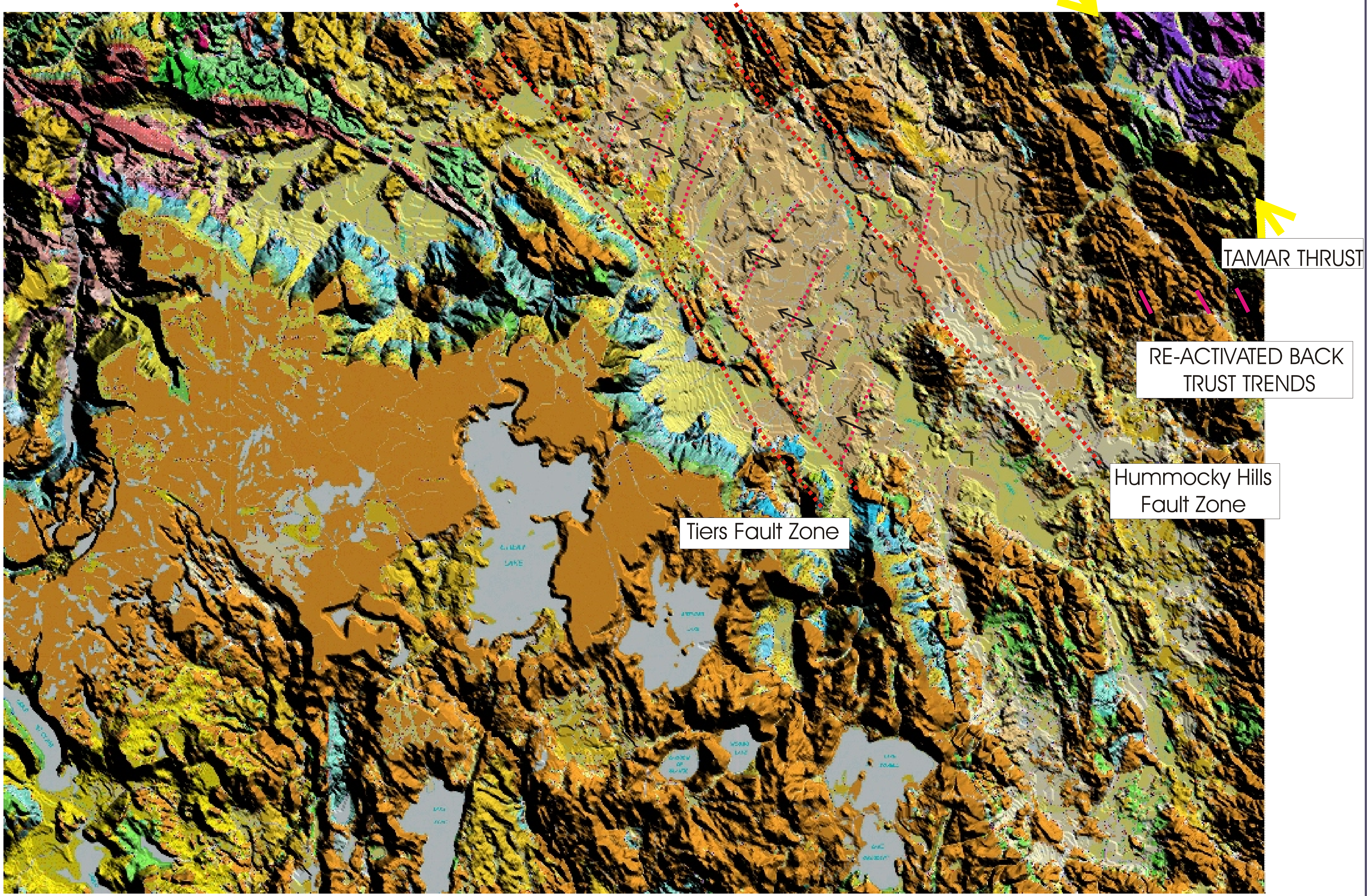
COMPLEX FLOWER STRUCTURE ALONG TIERS FAULT SYSTEM.
NOTE INVERSION AND FOLDING OF THE TERTIARY SECTION TO THE SURFACE
NORTHERN LONGFORD SUB-BASIN

Figure 8



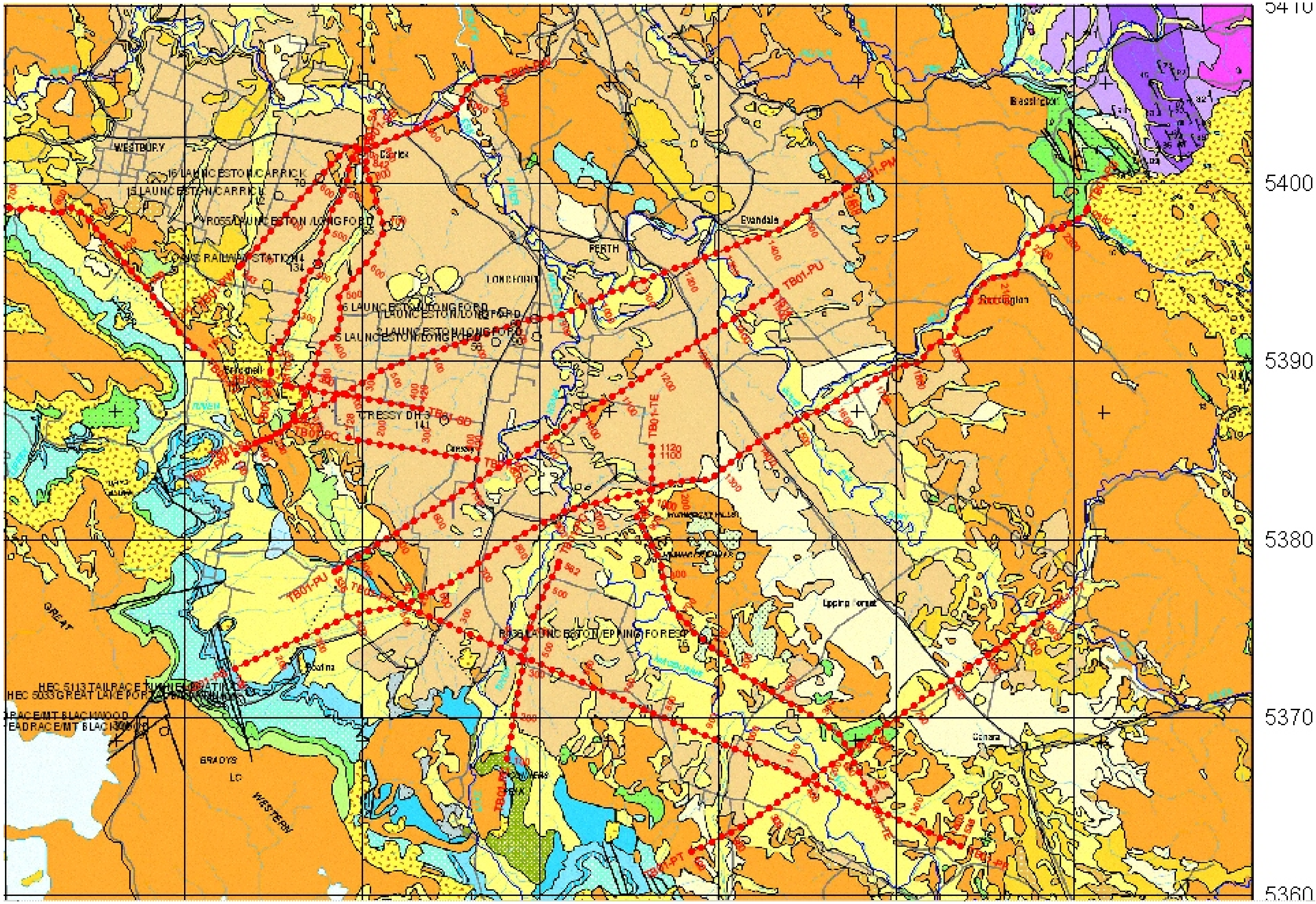
FLATTENED SEISMIC SECTION ON BASE SEQUENCE 1 SHOWING RECONSTRUCTION
TERTIARY DEPOCENTRE DURING LATE EOCENE
NORTHERN LONGFORD SUB-BASIN

Figure 9



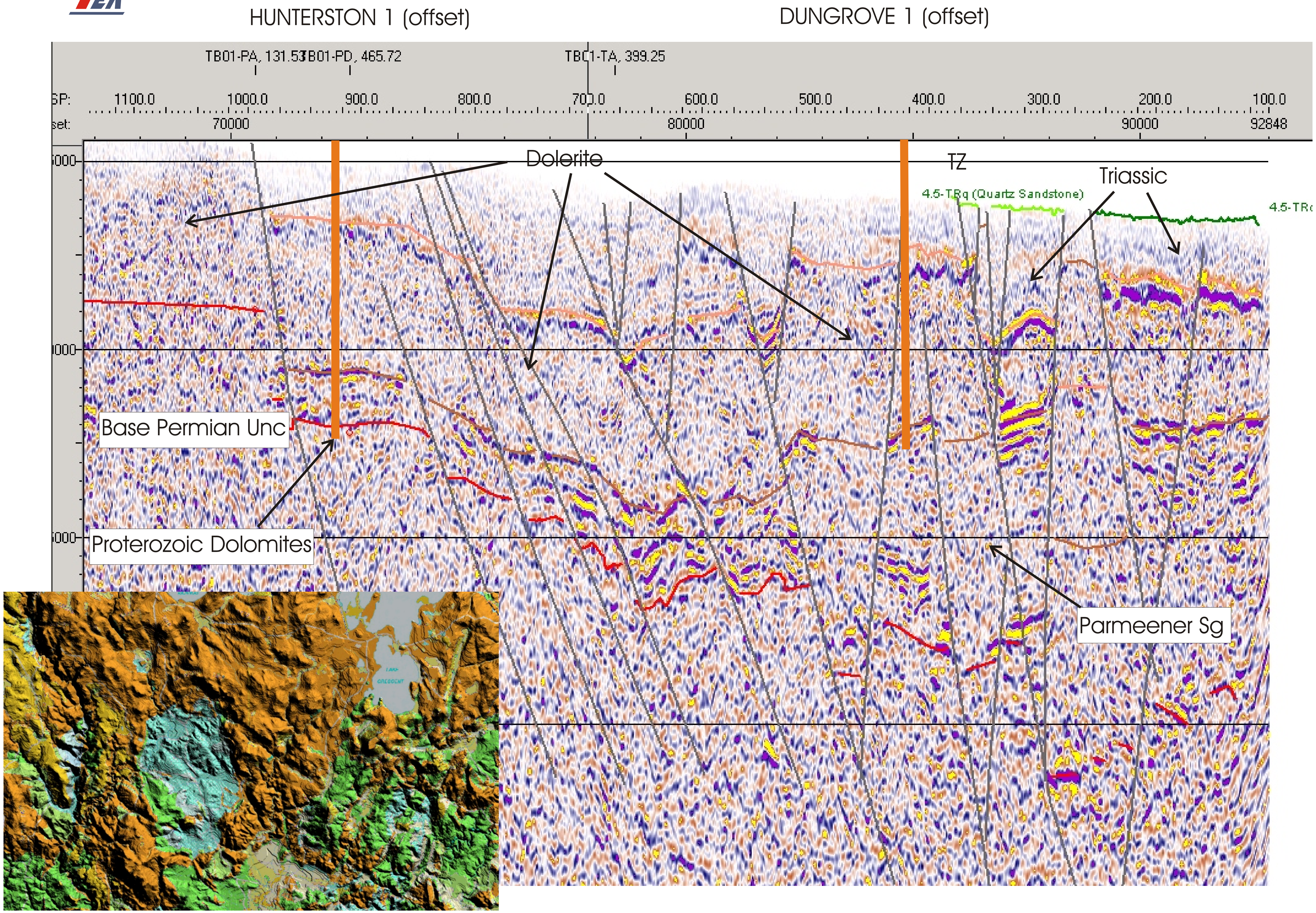
INFERRED STRUCTURAL INTERPRETATION
LONGFORD SUB-BASIN

Figure 10



LONGFORD SUB-BASIN SEISMIC GRID
OVERLAIN ON GEOLOGICAL MAP

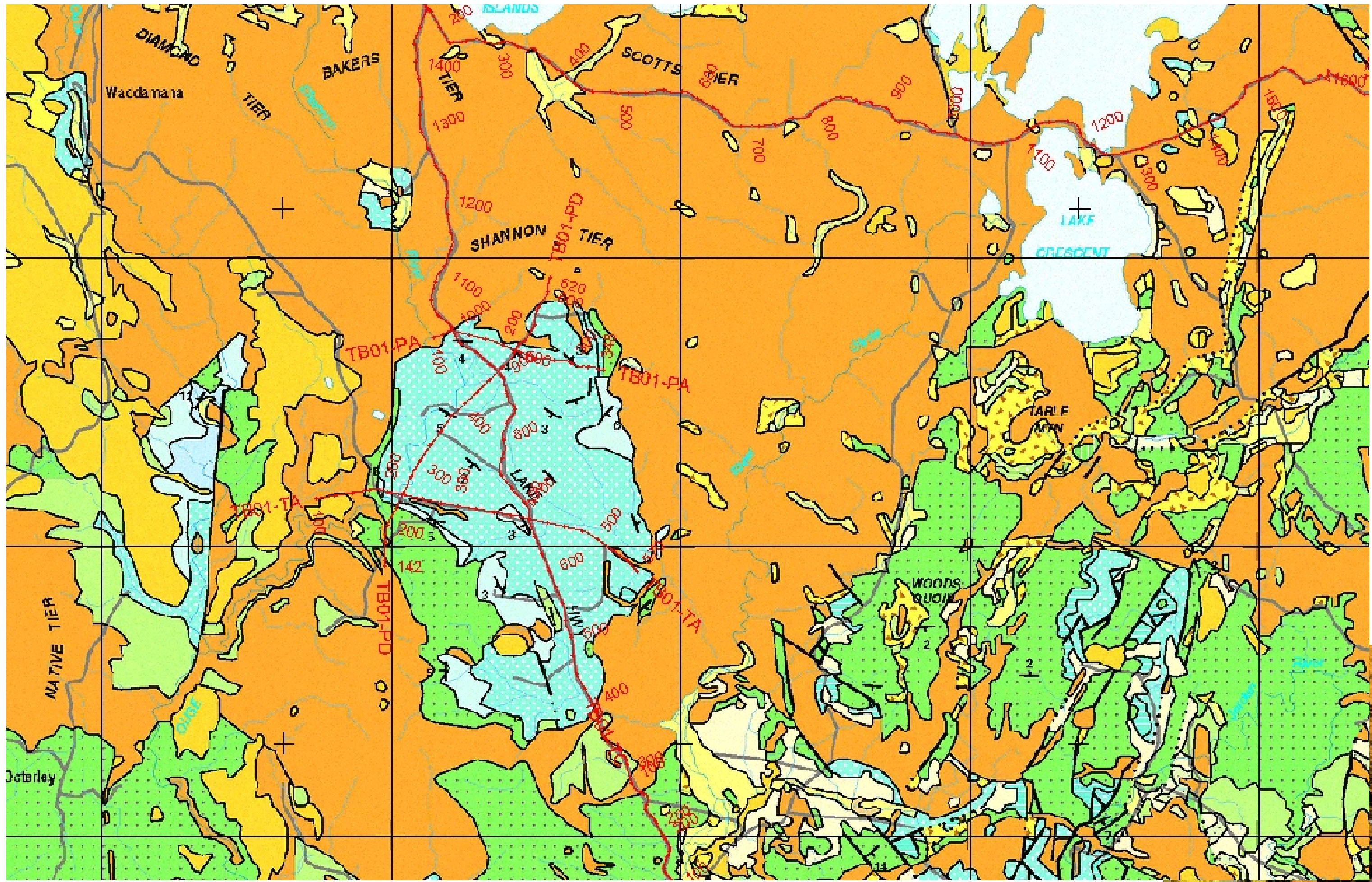
Figure 11

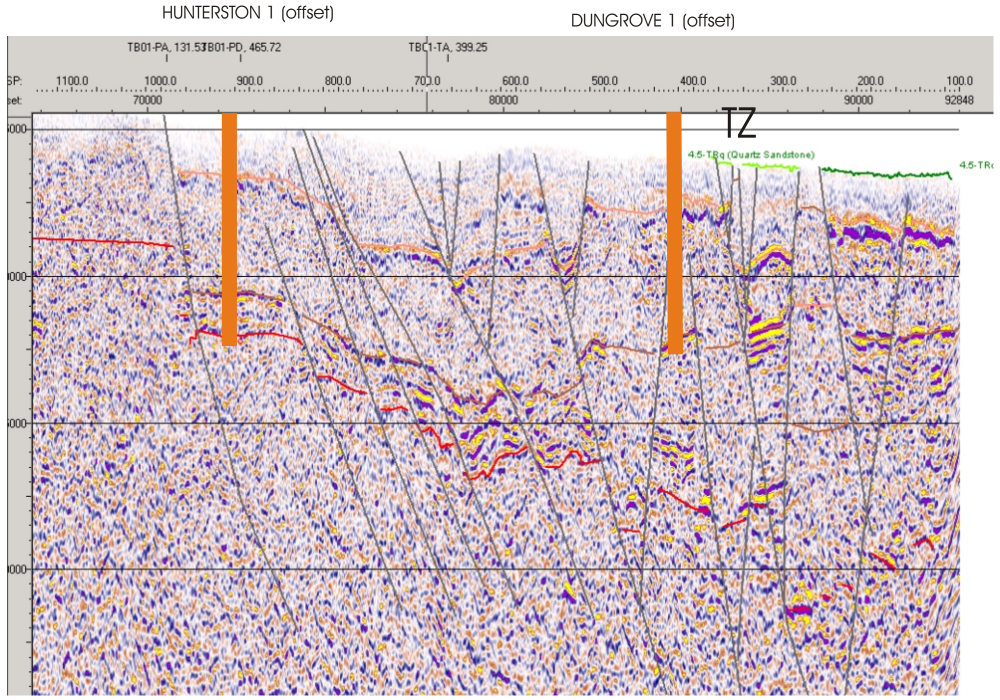


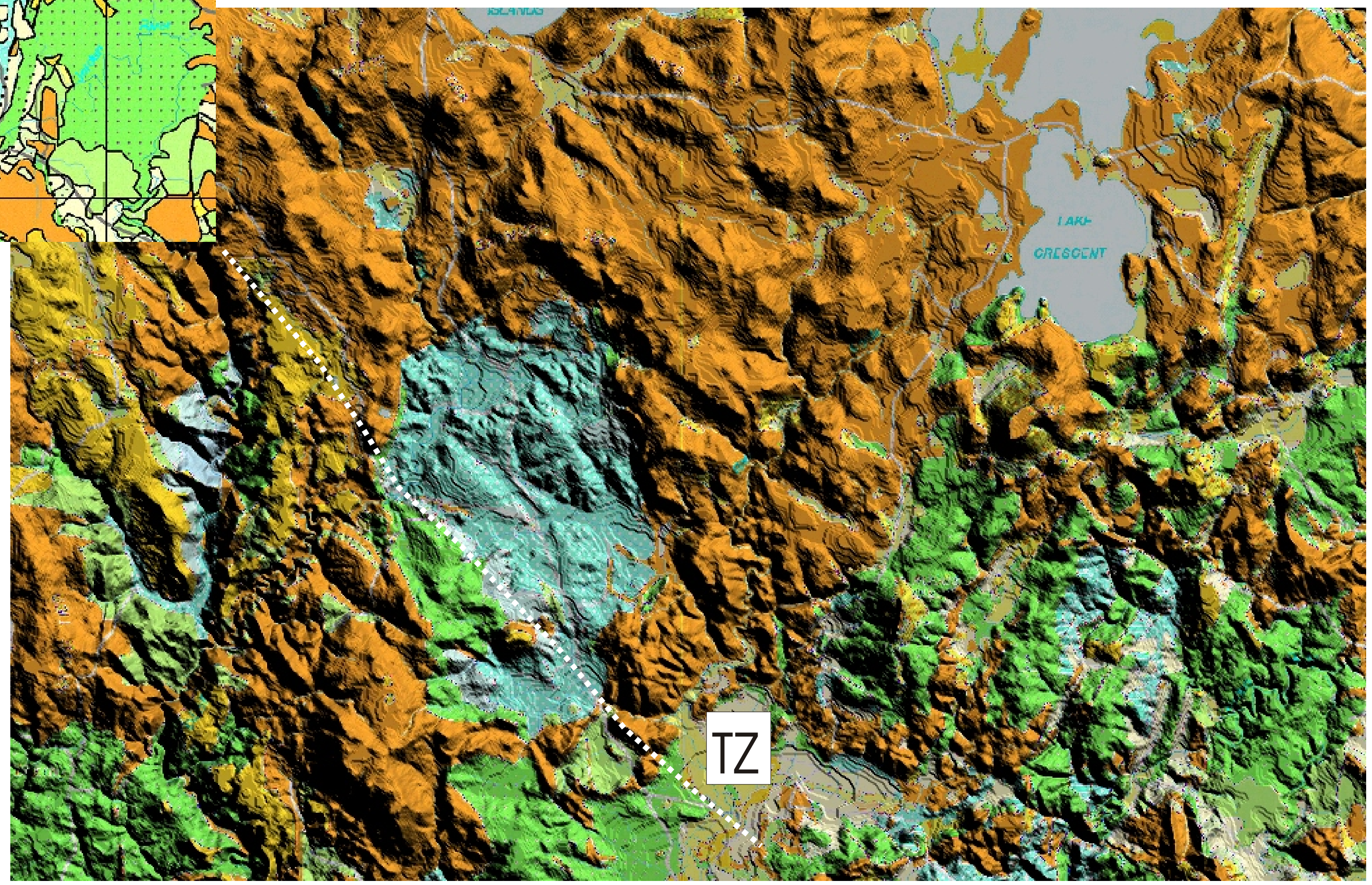
SEISMIC WELL TIES HUNTERSTON 1

NOTE THICKENING OF THE BASAL PERMIAN ACROSS TZ, WHICH HAS BEEN WRENCHED LATER

Figure 12

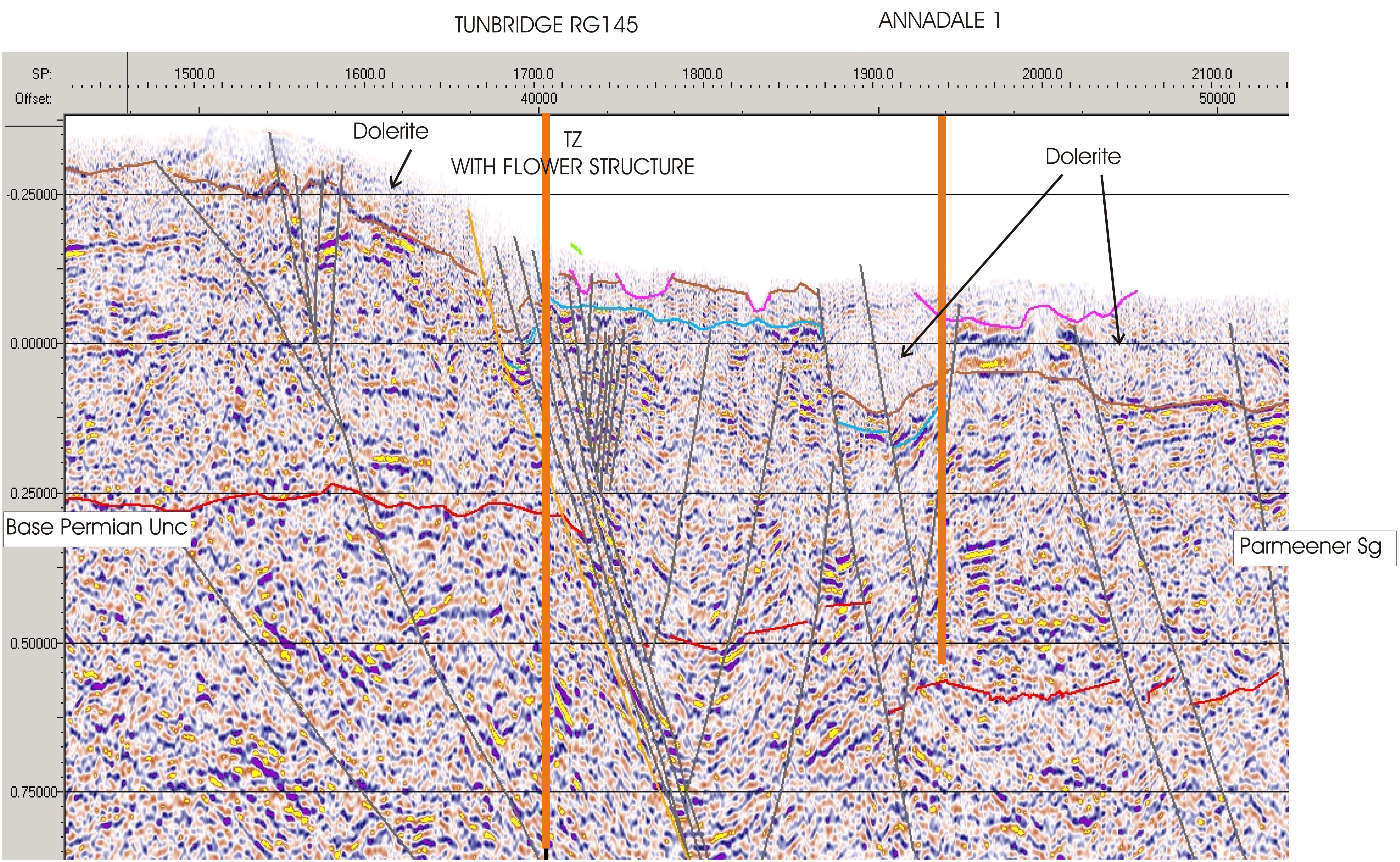






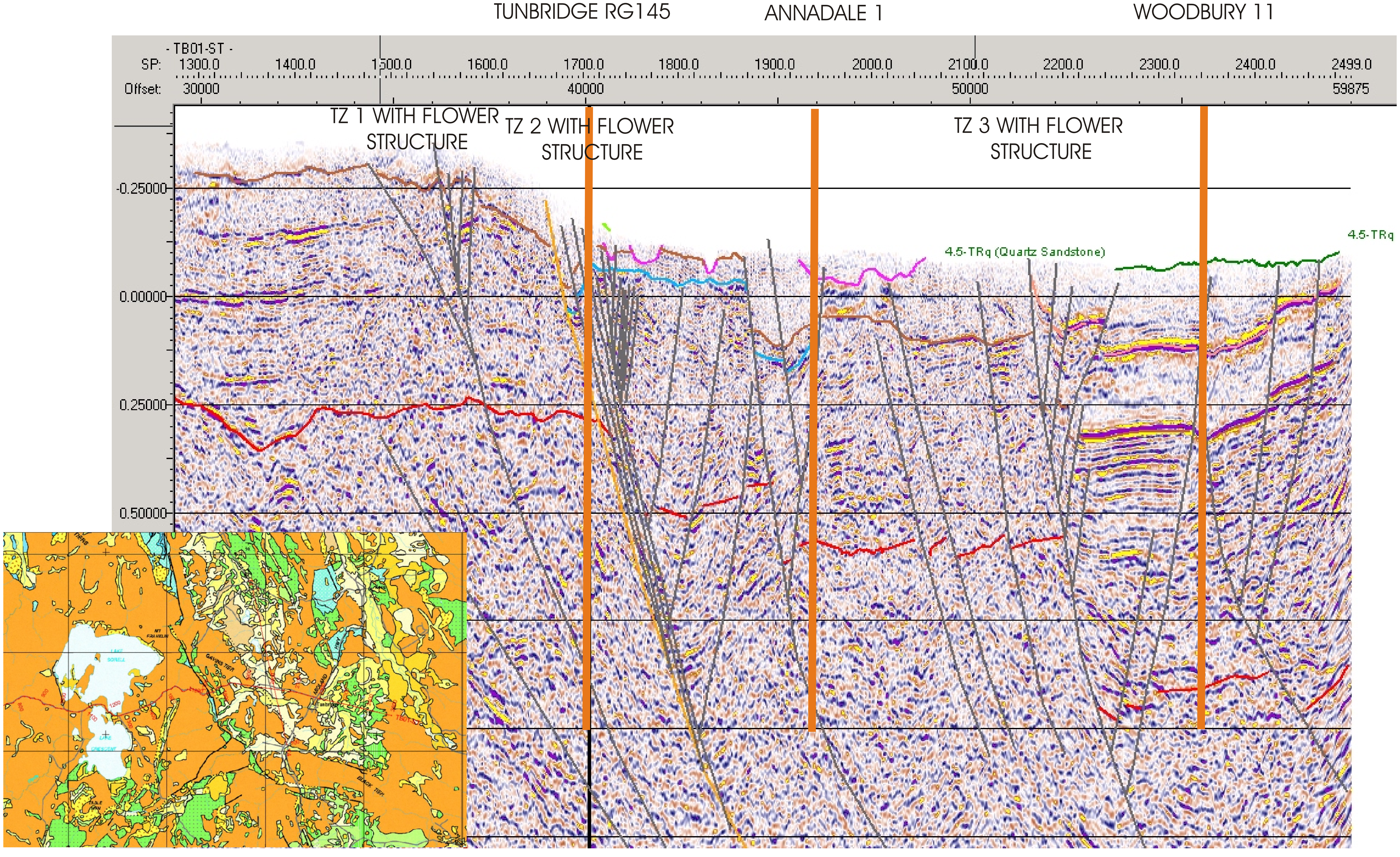
SEISMIC WELL TIES HUNTERSTON 1
NOTE THE PSEUDO DOMAL STRUCTURE AT HUNTERSTON DOES NOT ROLL TO THE NORTH
THE TRIASSIC IS EXPOSED TO THE SW OF TZ

Figure 13



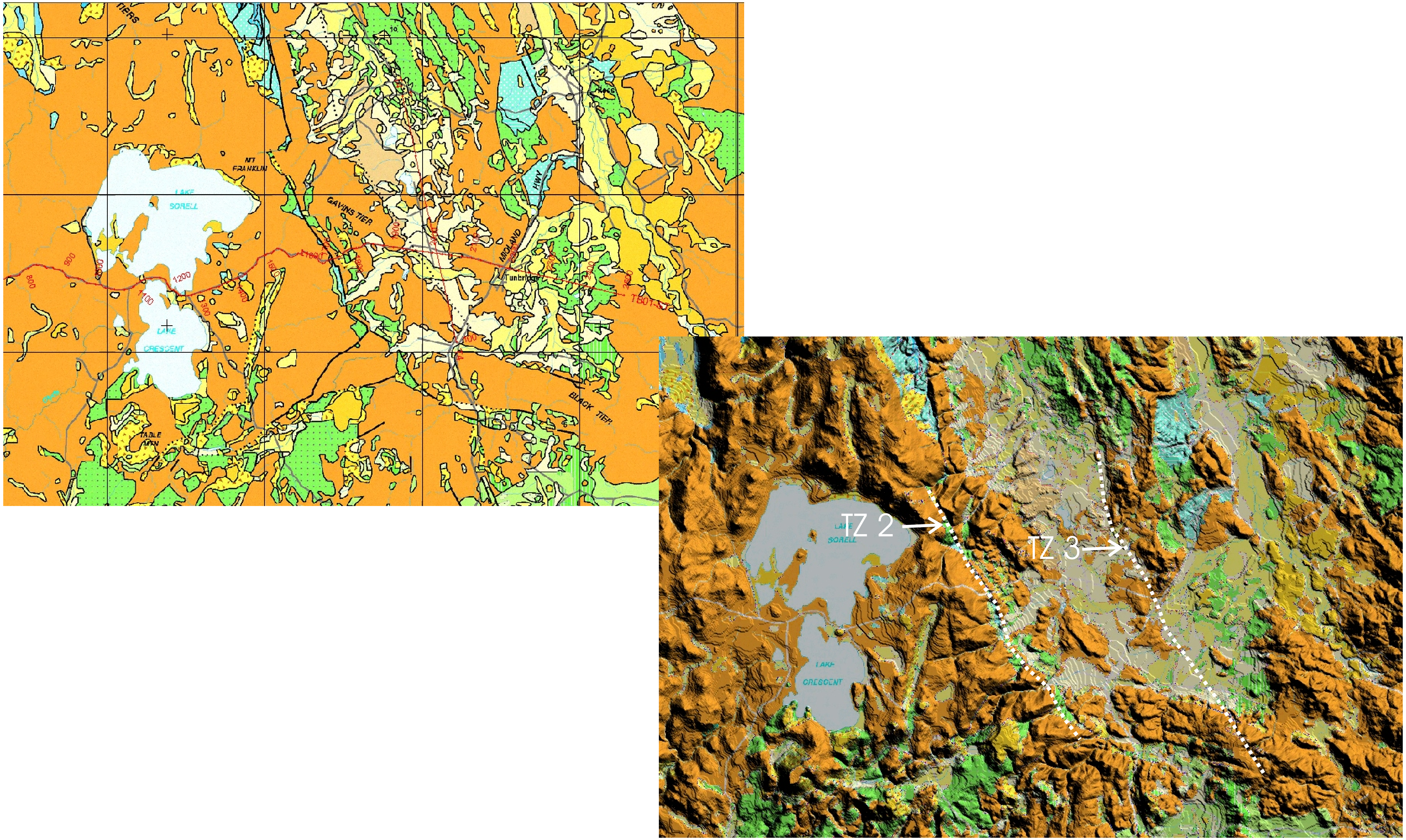
SEISMIC WELL TIES TUNBRIDGE RG145 & ANNADALE 1
NOTE THICKENING OF THE BASAL PERMIAN ACROSS TZ, WHICH HAVE BEEN WRENCHED LATER

Figure 14



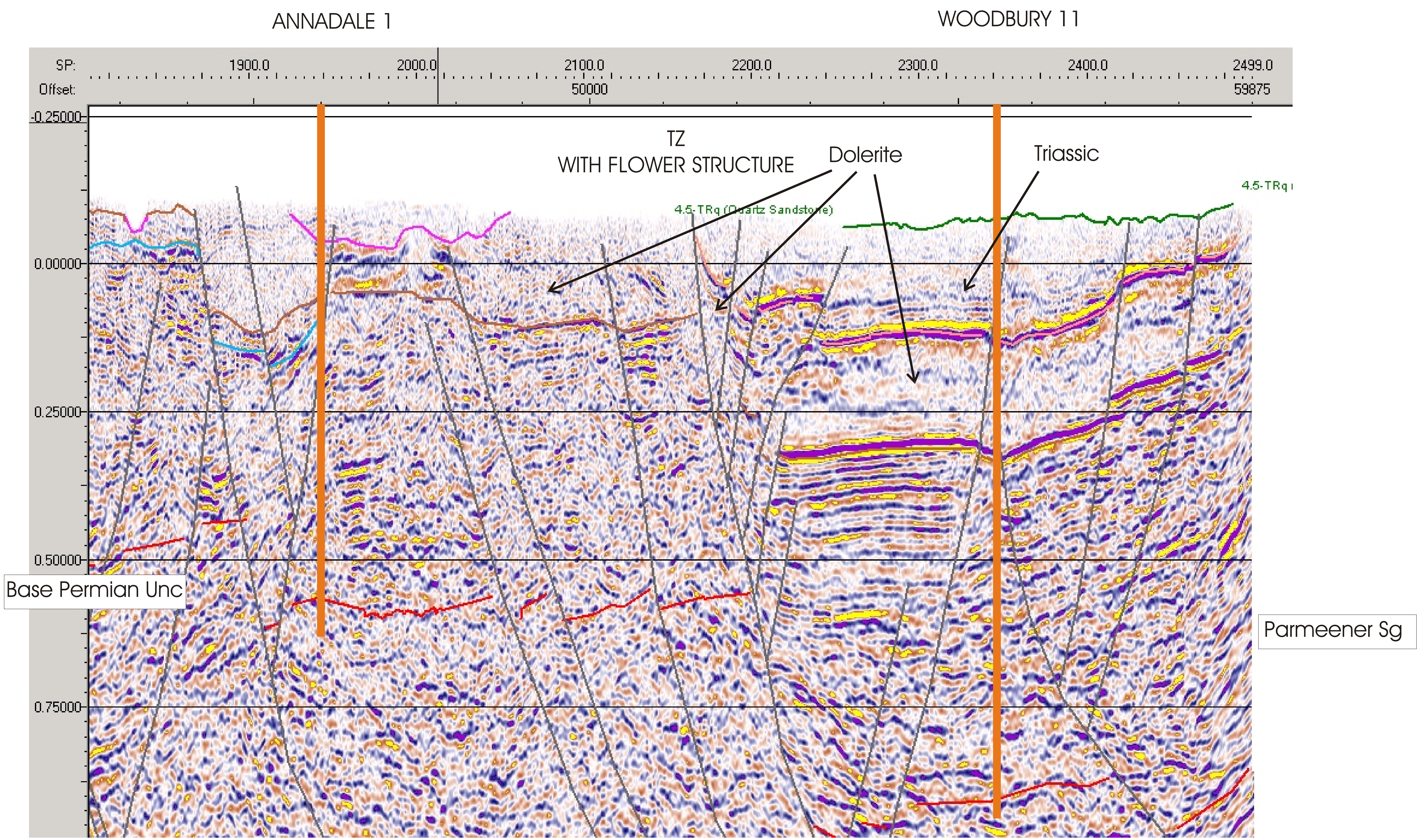
SEISMIC WELL TIES TUNBRIDGE RG145, ANNADALE 1 & WOODBURY 11
NOTE THICKENING OF THE BASAL PERMIAN ACROSS TZ's, WHICH HAS BEEN WRENCHED LATER

Figure 15



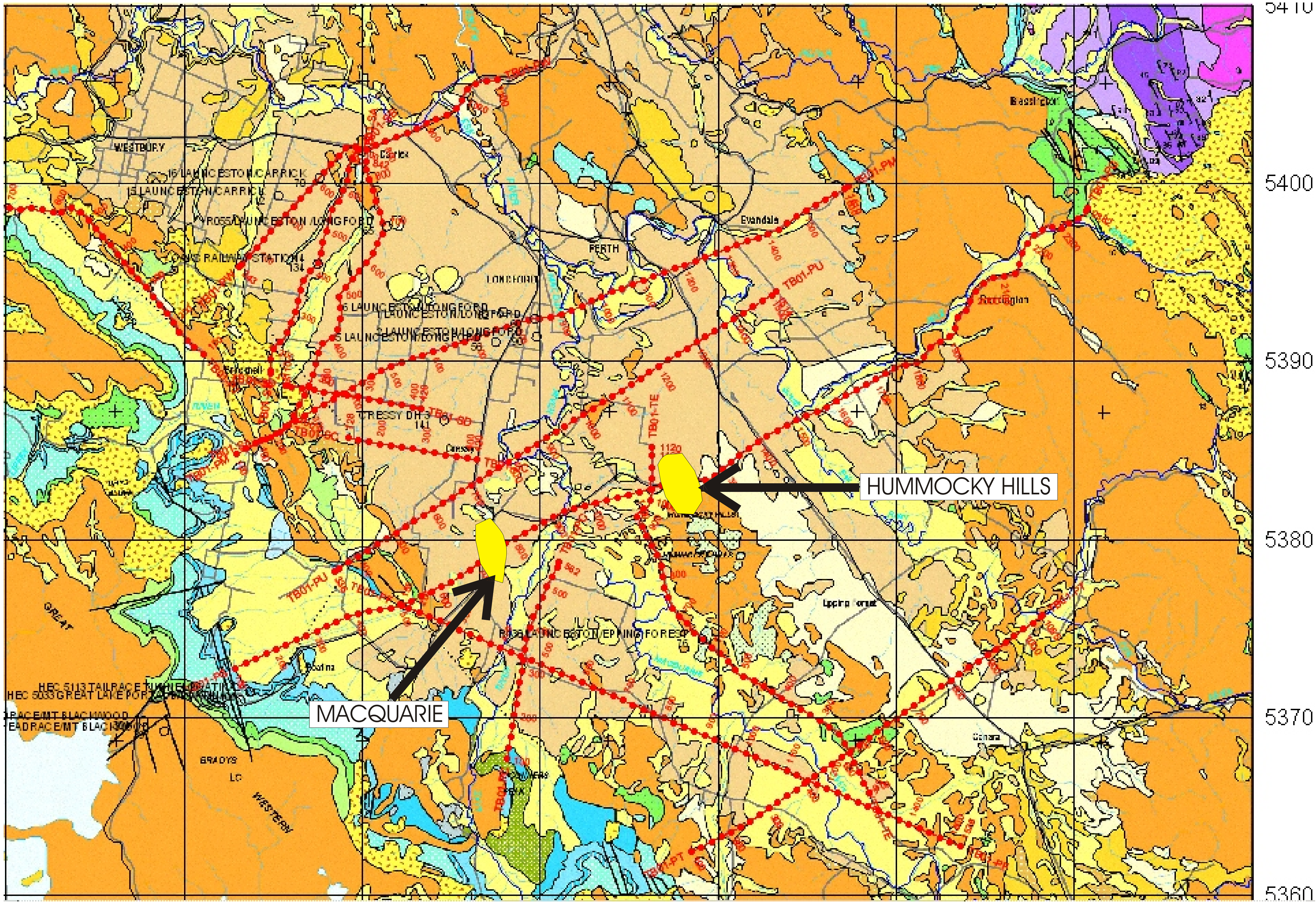
LOCATION THRUST ZONES ON GEOLOGICAL MAPS

Figure 16



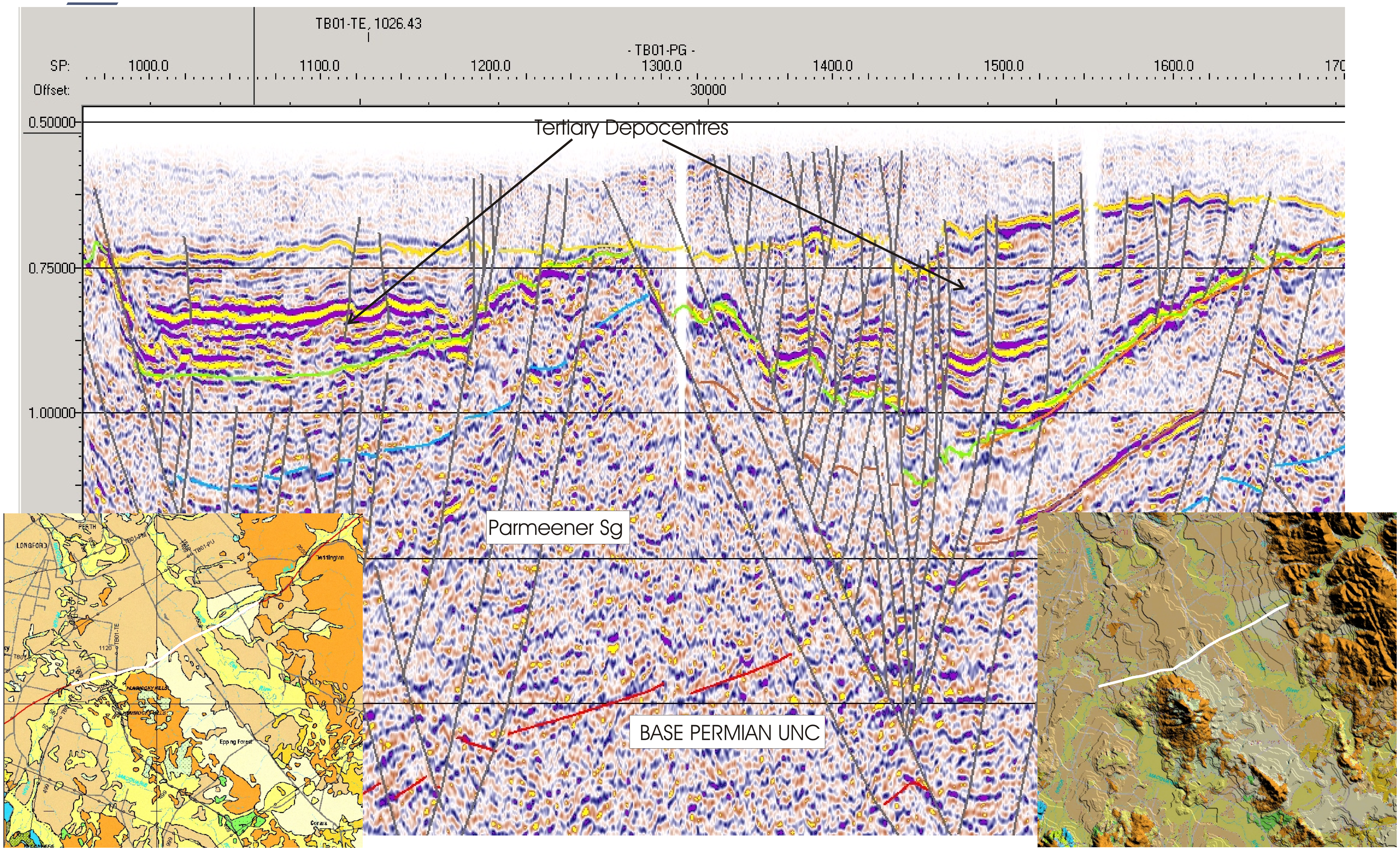
SEISMIC WELL TIES ANNADALE 1 & WOODBURY 11
NOTE THICKENING OF THE BASAL PERMIAN ACROSS TZ, WHICH HAS BEEN WRENCHED LATER

Figure 17



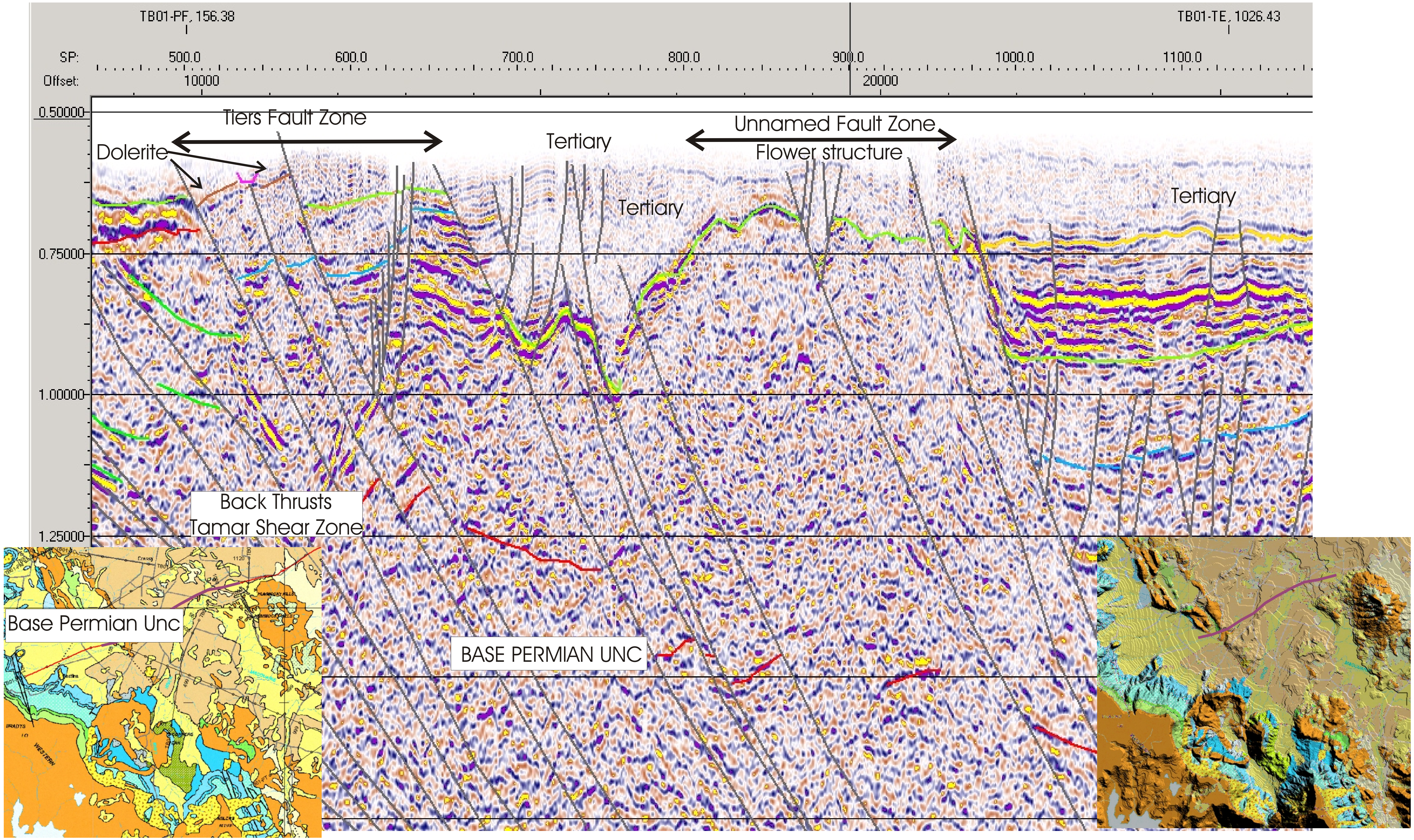
LEADS IN THE LONGFORD SUB-BASIN

Figure 18



HUMMOCKY HILLS LEAD
NOTE LATE FAULT MOVEMENT & RE-ACTIVATION DOWNGRADE THIS LEAD
LONGFORD SUB-BASIN

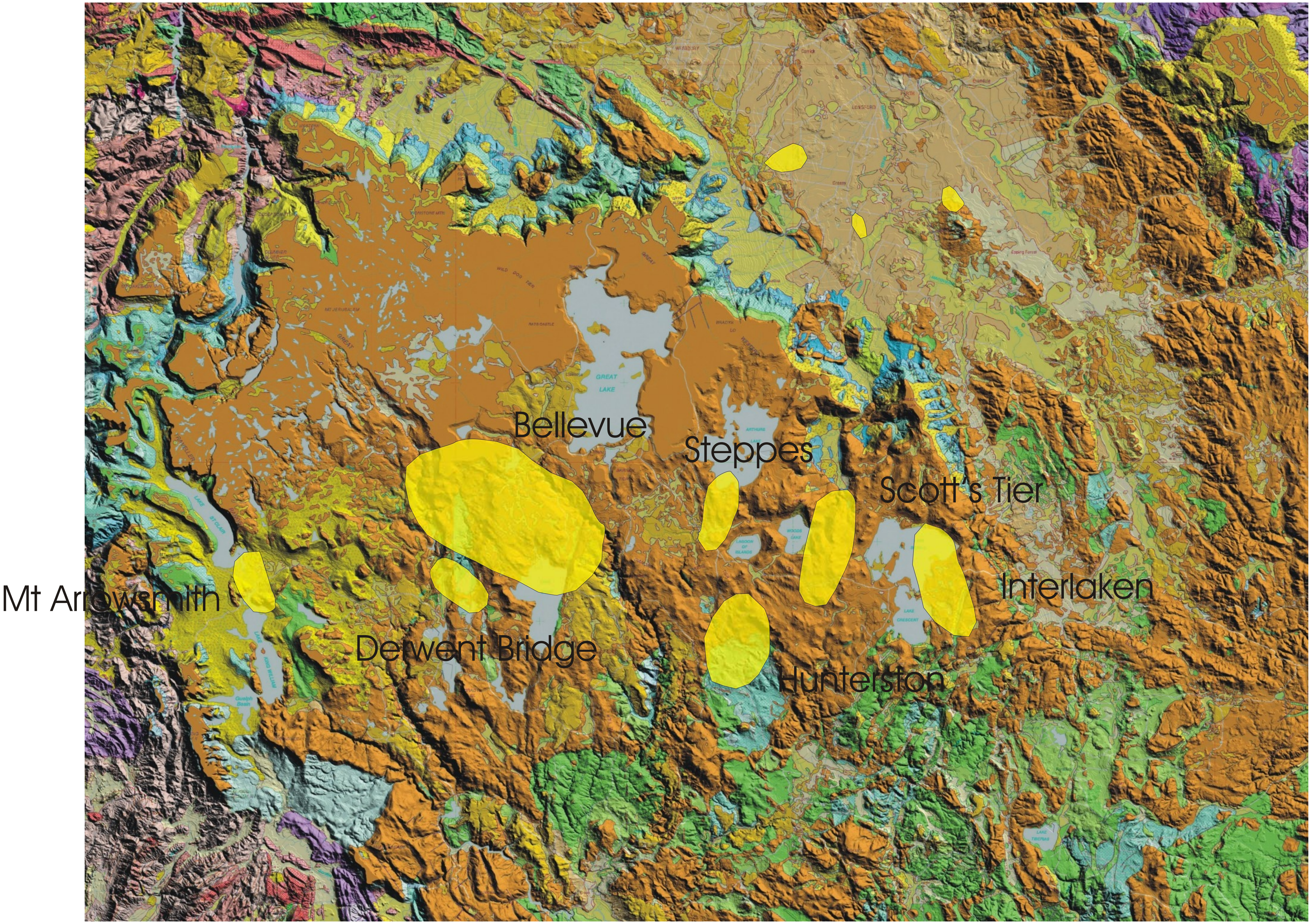
Figure 19



COMPLEX STRUCTURING TIERS FAULT ZONE
ORIGINAL PRE PERMIAN THRUST WAS LATER REACTIVED AND ACTED AS A
NORMAL FAULT FOR PARMEENER & TERTIARY DEPOSITION, THEN SUBSEQUENTLY WRENCHED

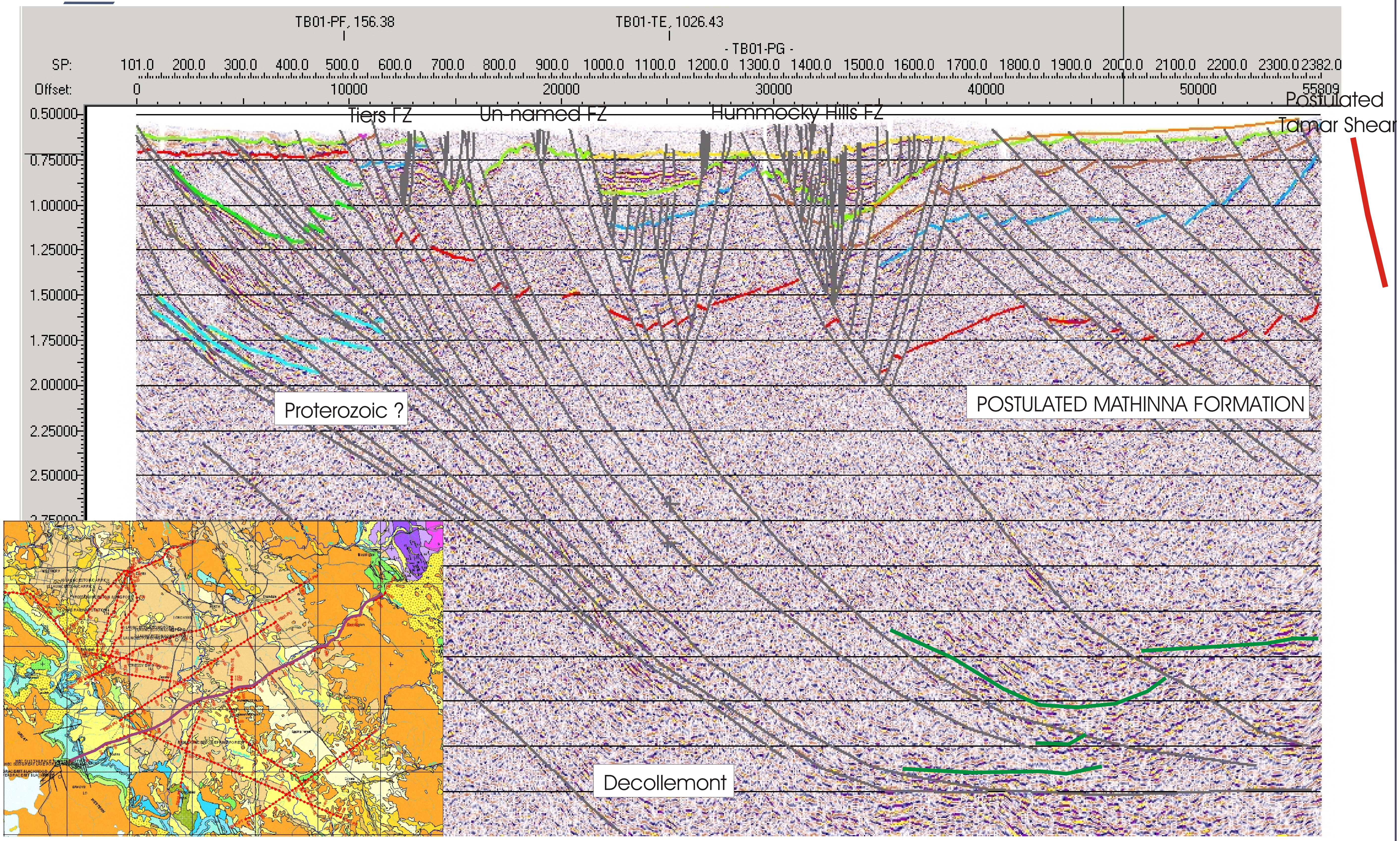
Figure 19A

TerraTek

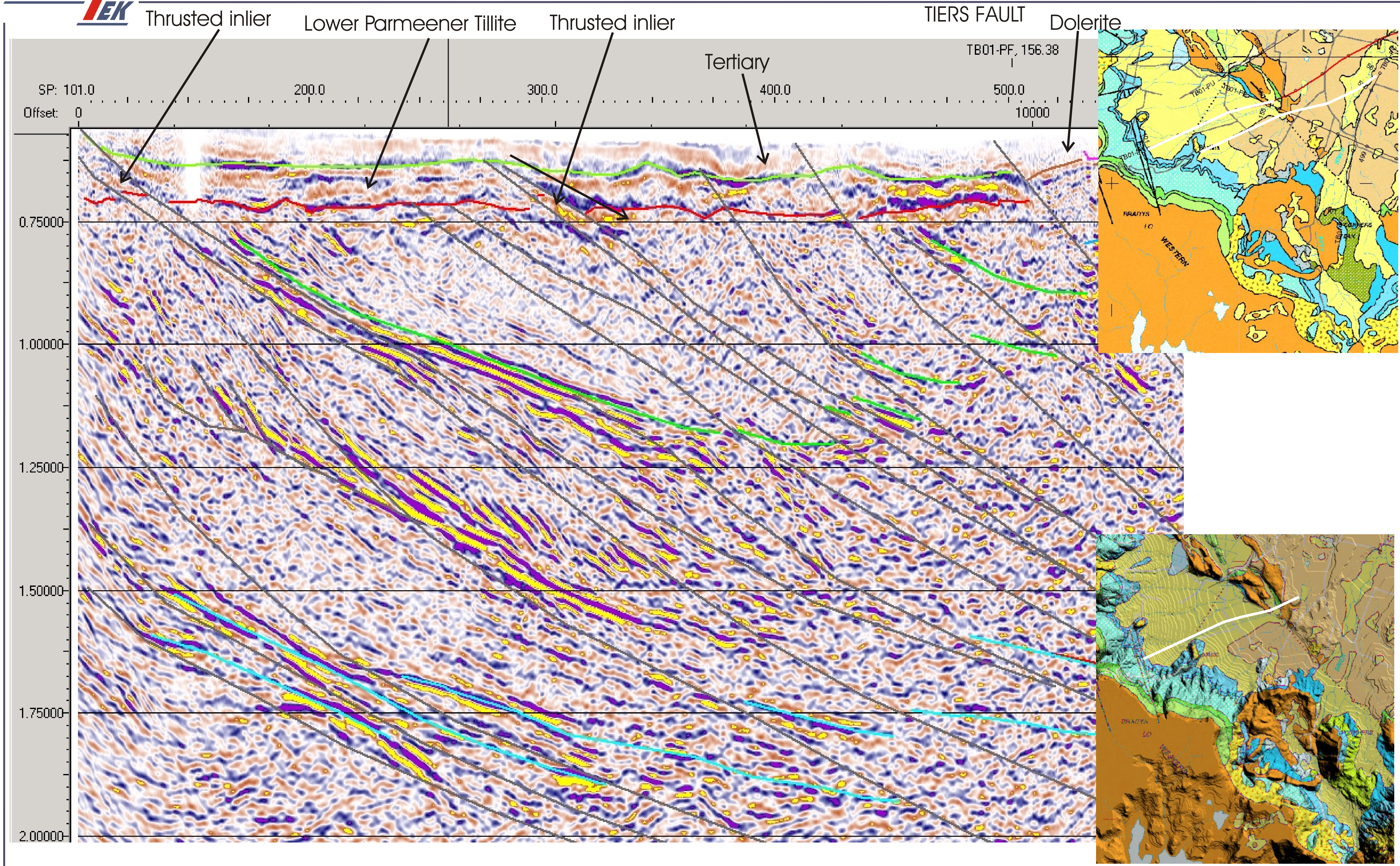


LEADS & PROPECTS OVERLAIN ON GEOLOGICAL MAP

Figure 20

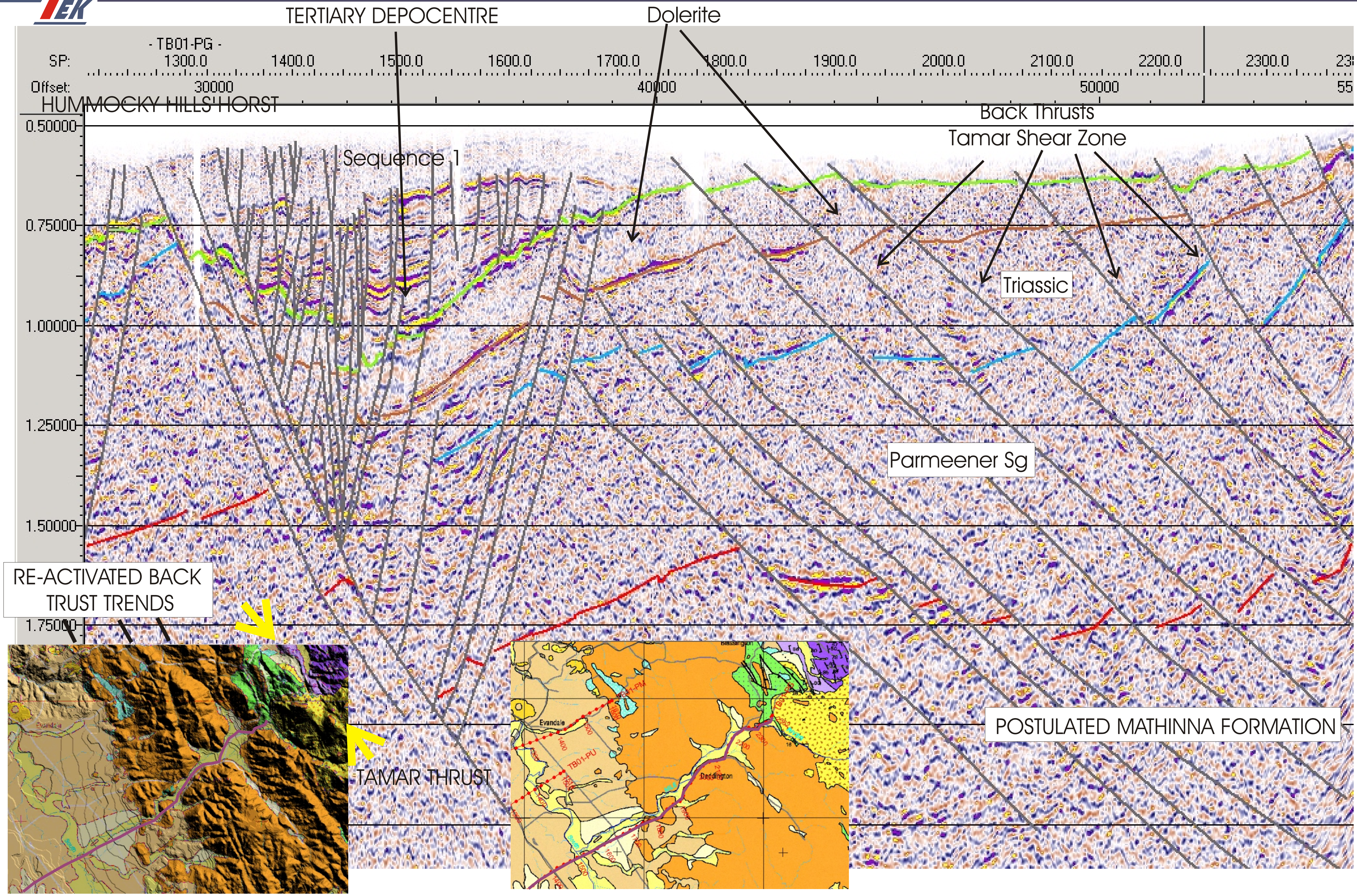


REGIONAL SEISMIC LINE THROUGH LONGFORD SUB-BASIN	Figure 21

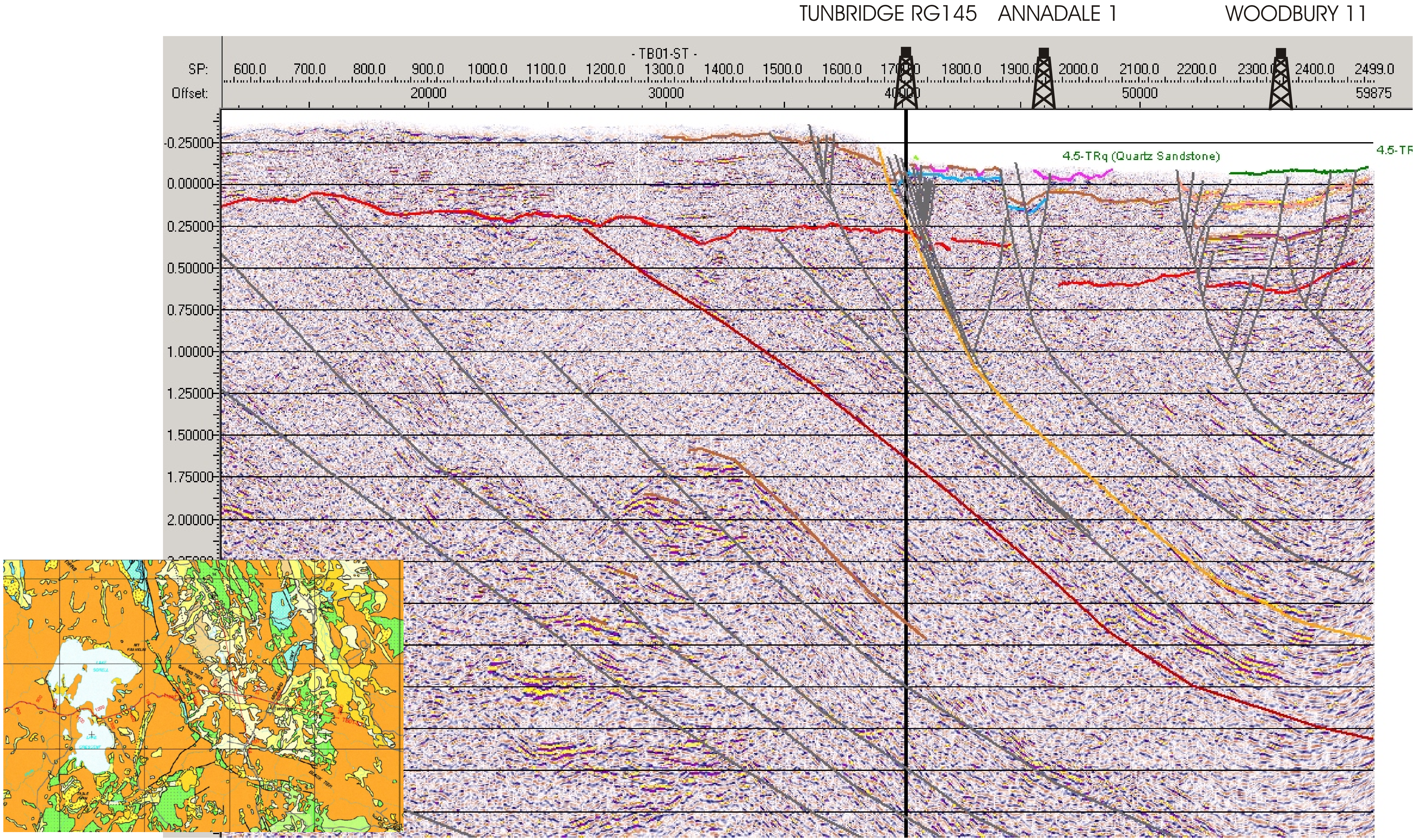


REACTIVATED PRE PERMIAN PREDOMINANTLY BACK TRUSTS THROUGH THE PROTEROZOIC (?) SECTION
THE MAIN THRUST LOCATED ON THE TIERS FAULT SYSTEM
LONGFORD SUB-BASIN

Figure 22

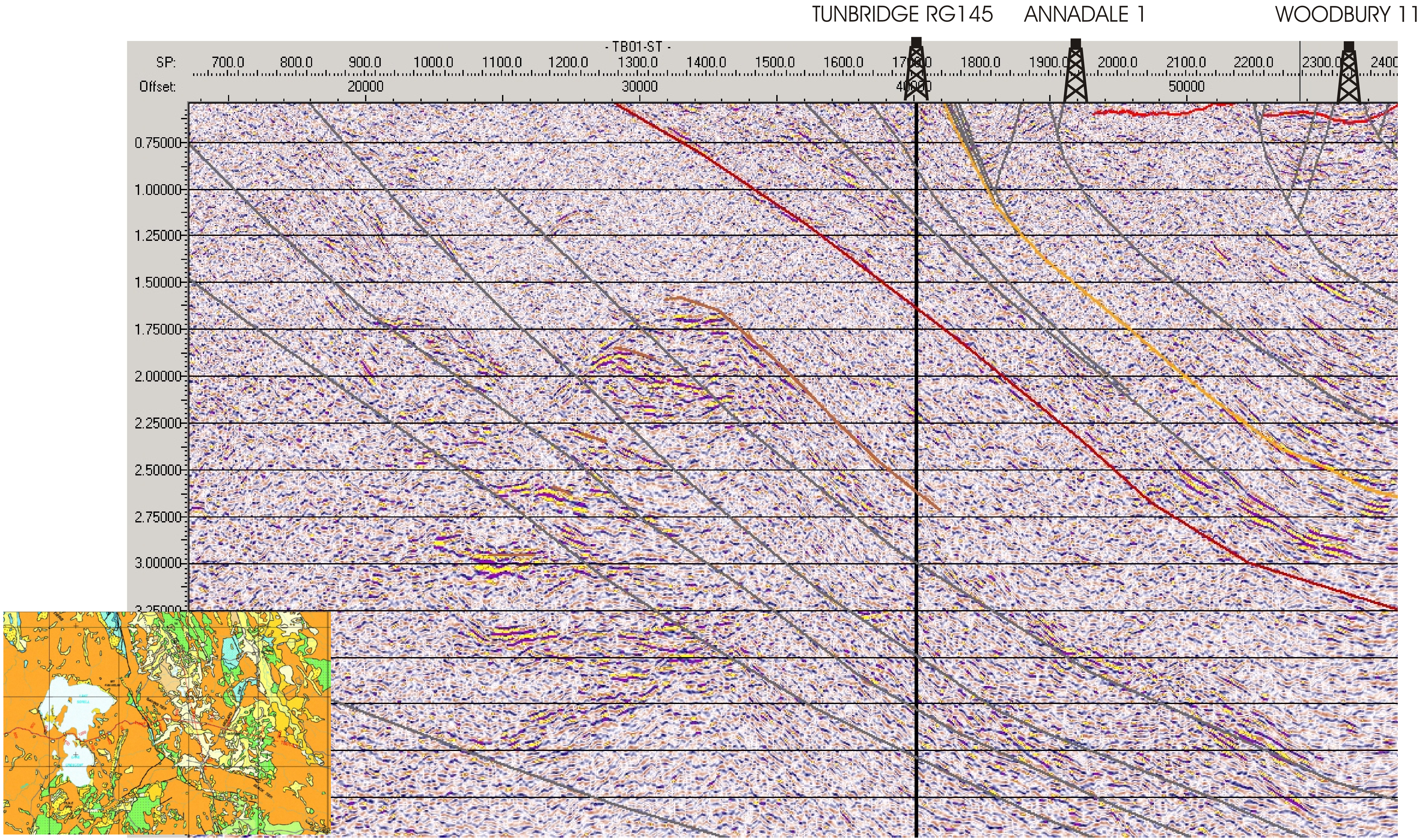


	SEISMIC LINE HUMMOCKY HILLS HORST - NEAR TAMAR LINEAMENT (THRUST) SHOWING THICKENING OF THE PERMIAN TO THE EAST NOTE THE PERMIAN IS THIN AND MISSING THE BASAL UNITS TO THE EAST OF THE TAMAR THRUST	Figure 23



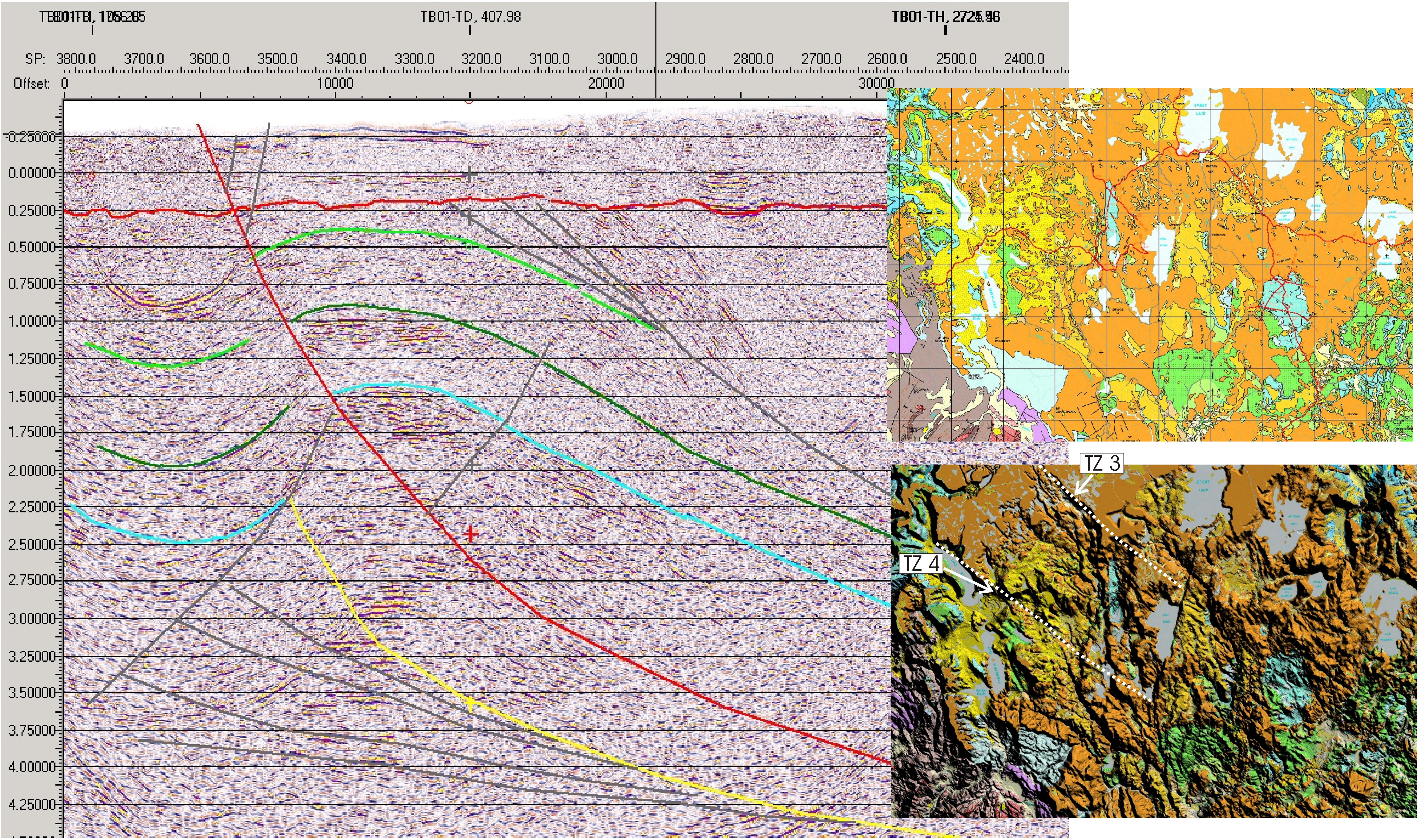
REGIONAL SEISMIC LINE SHOWING DEEP THRUSTING

Figure 24



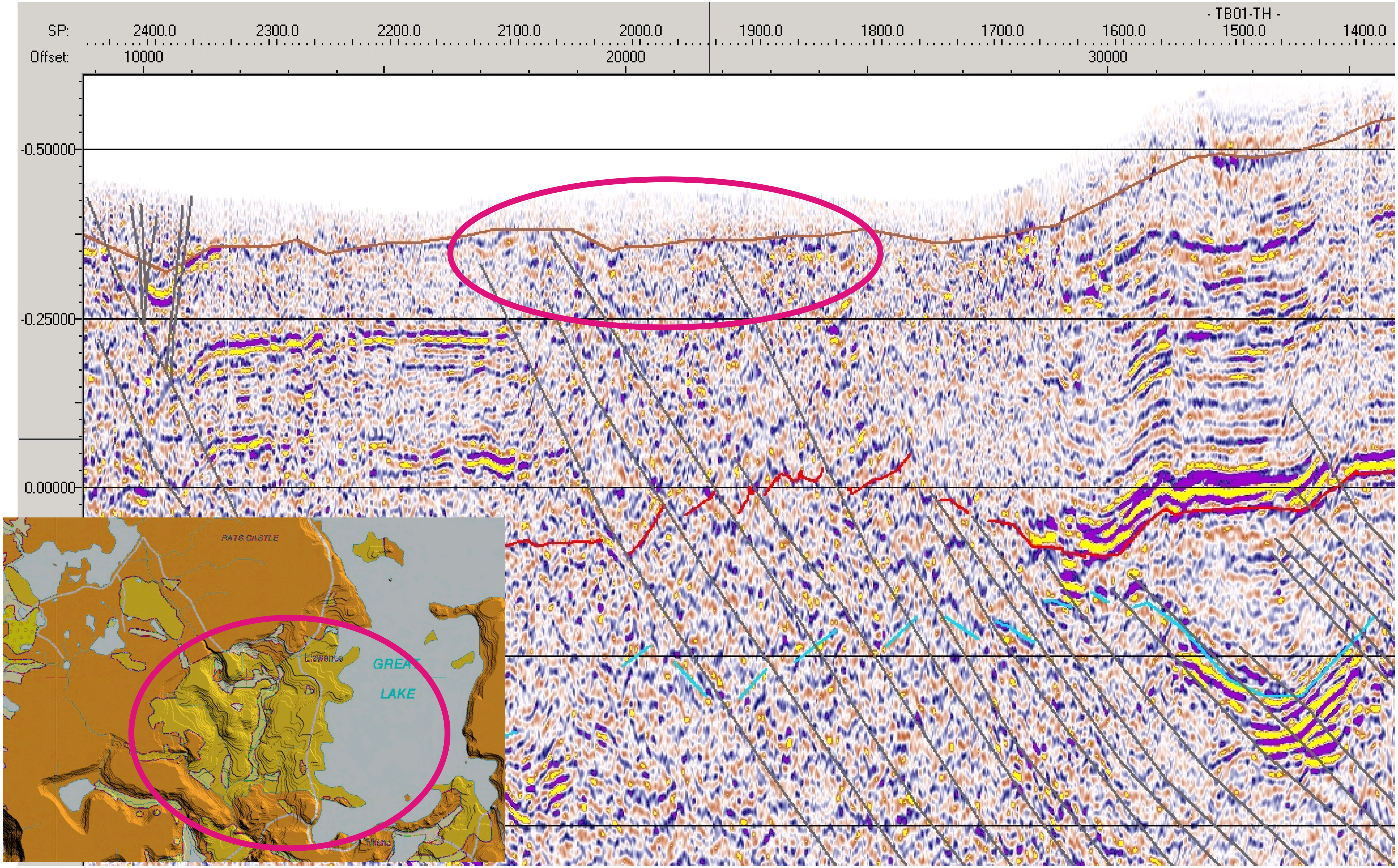
REGIONAL SEISMIC LINE SHOWING DEEP THRUSTING

Figure 25



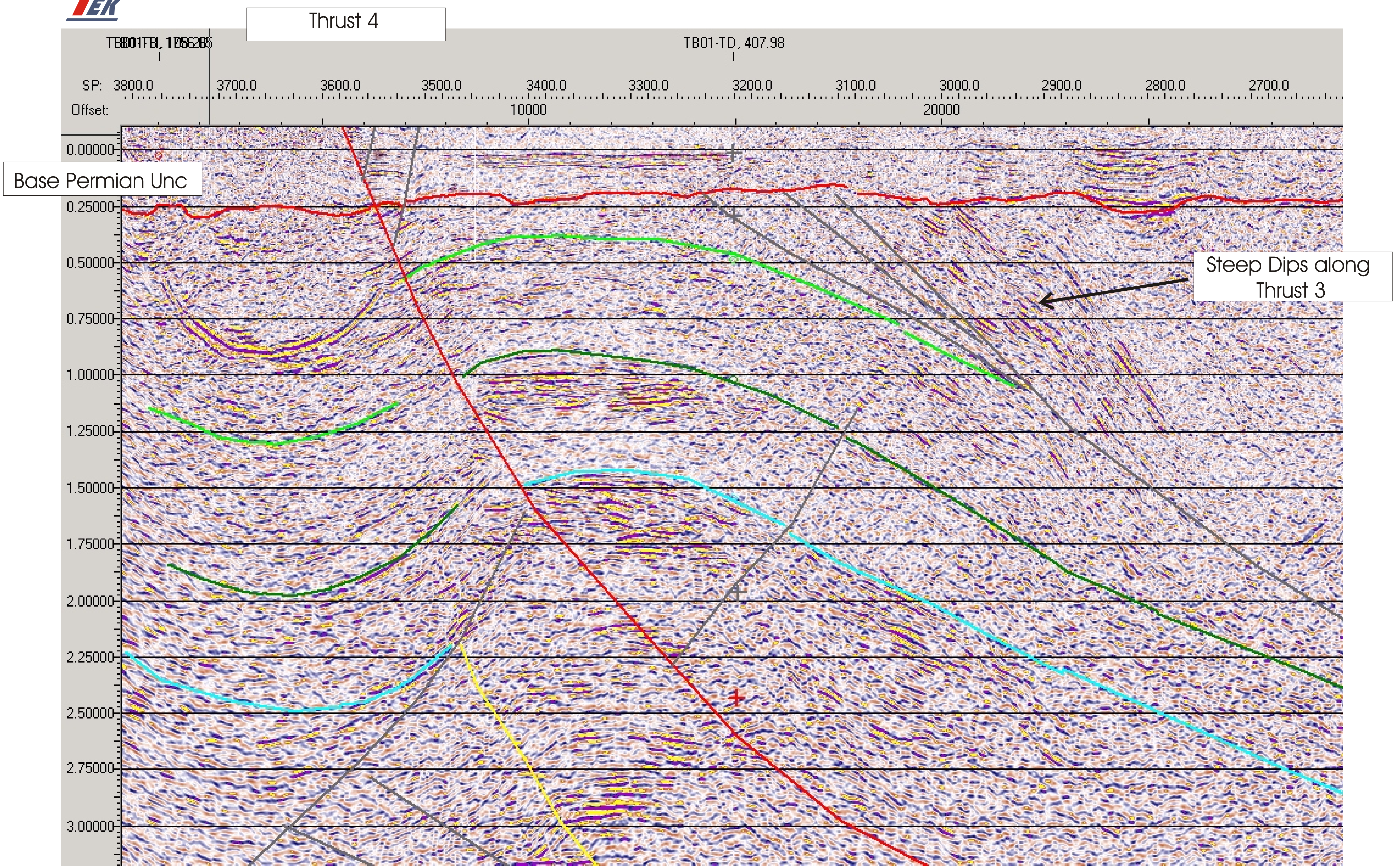
SIMPLE THRUST STRUCTURE
BELLEVUE LEAD
THRUST TRENDS ARE INDICATED ON THE GEOLOGICAL MAPS

Figure 26



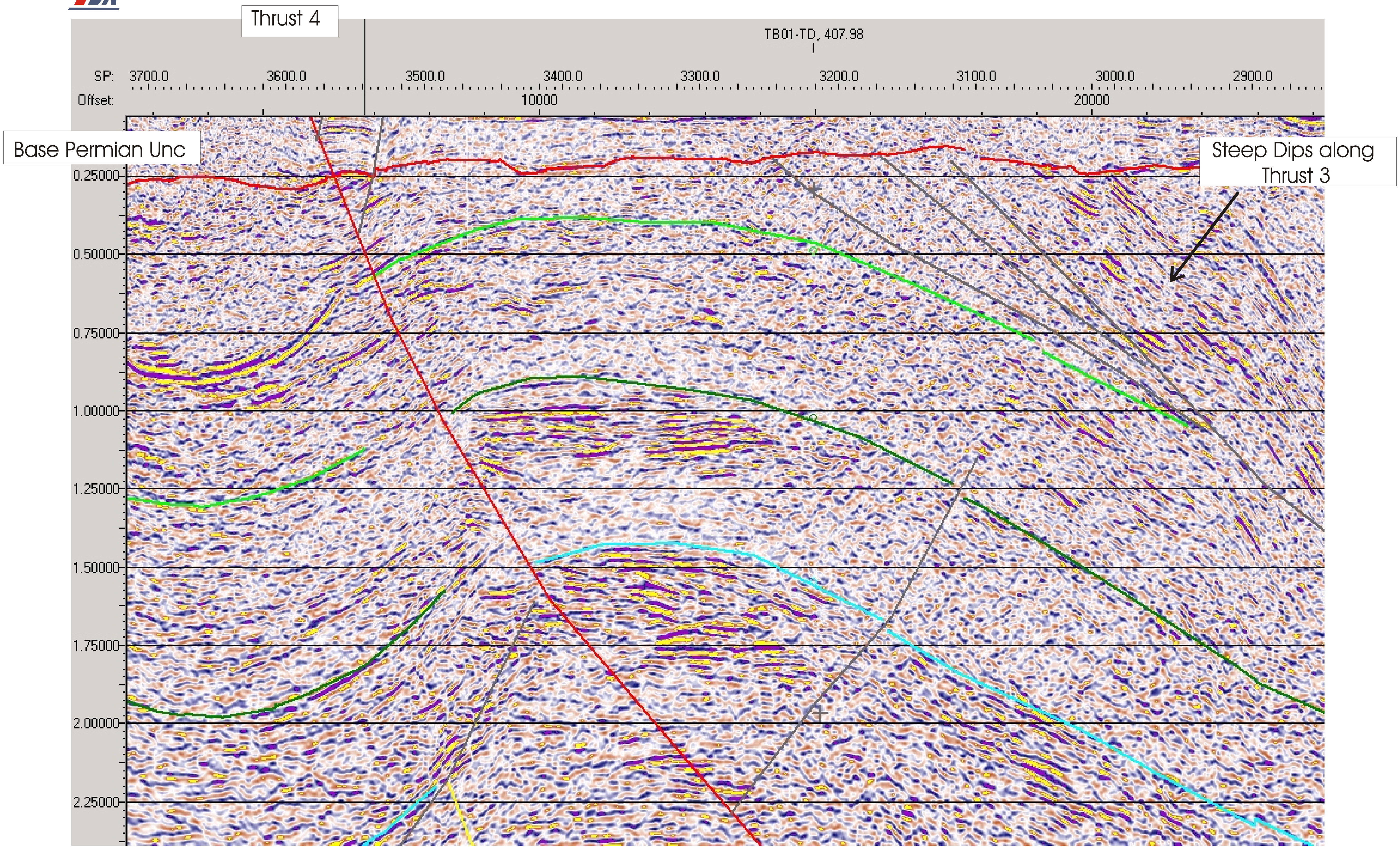
REGIONAL SEISMIC LINE - GOLDEN VALLEY SECTION
RELATIONSHIP THRUST ZONE 2 & TERTIARY BASALT DISTRIBUTION

Figure 27



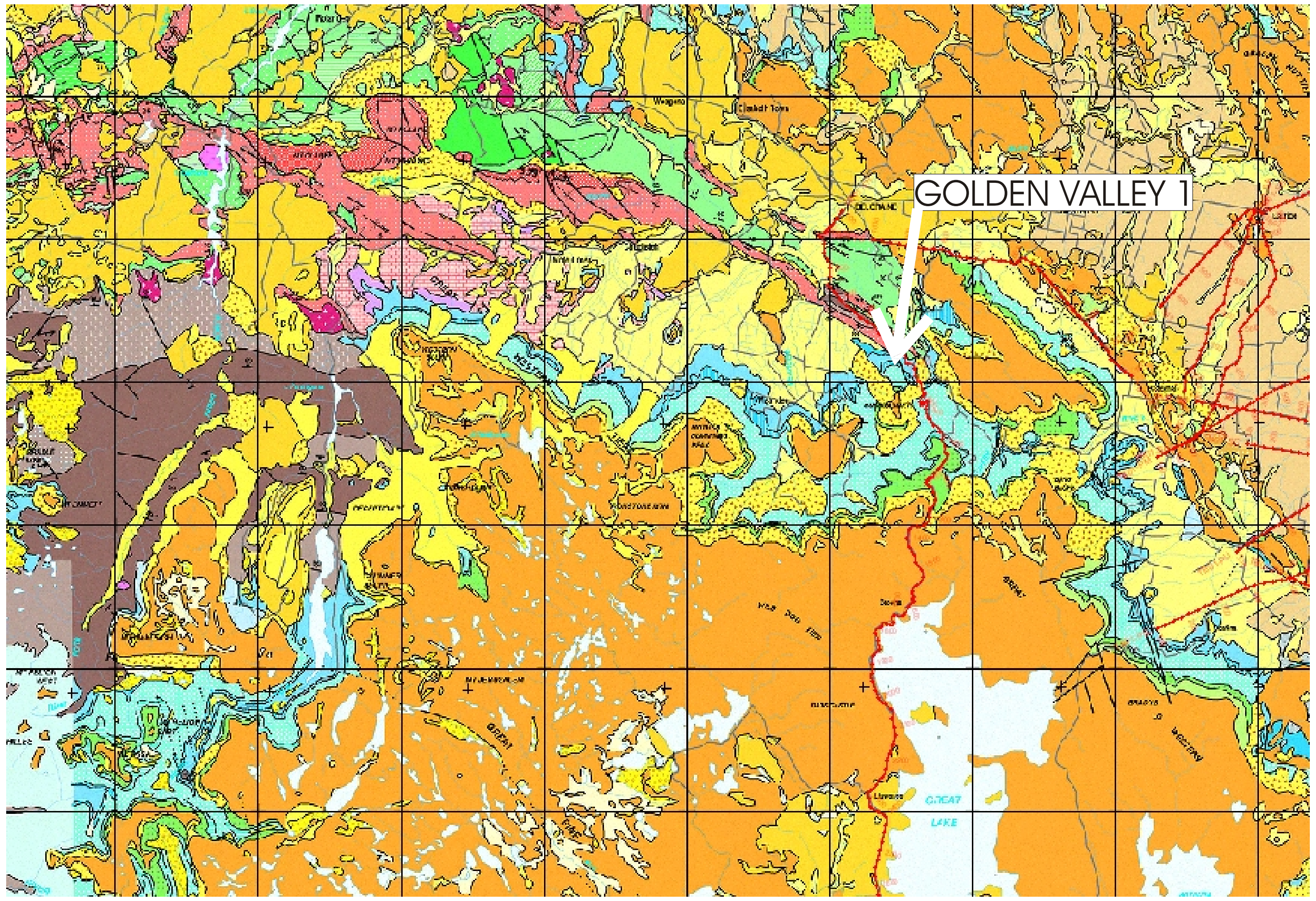
SIMPLE THRUST STRUCTURE
BELLEVUE LEAD
NOTE LACK OF AMPLITUDE NEAR BASE PERMIAN PROBABLY INDICATES NO BASAL SECTION DEPOSITED

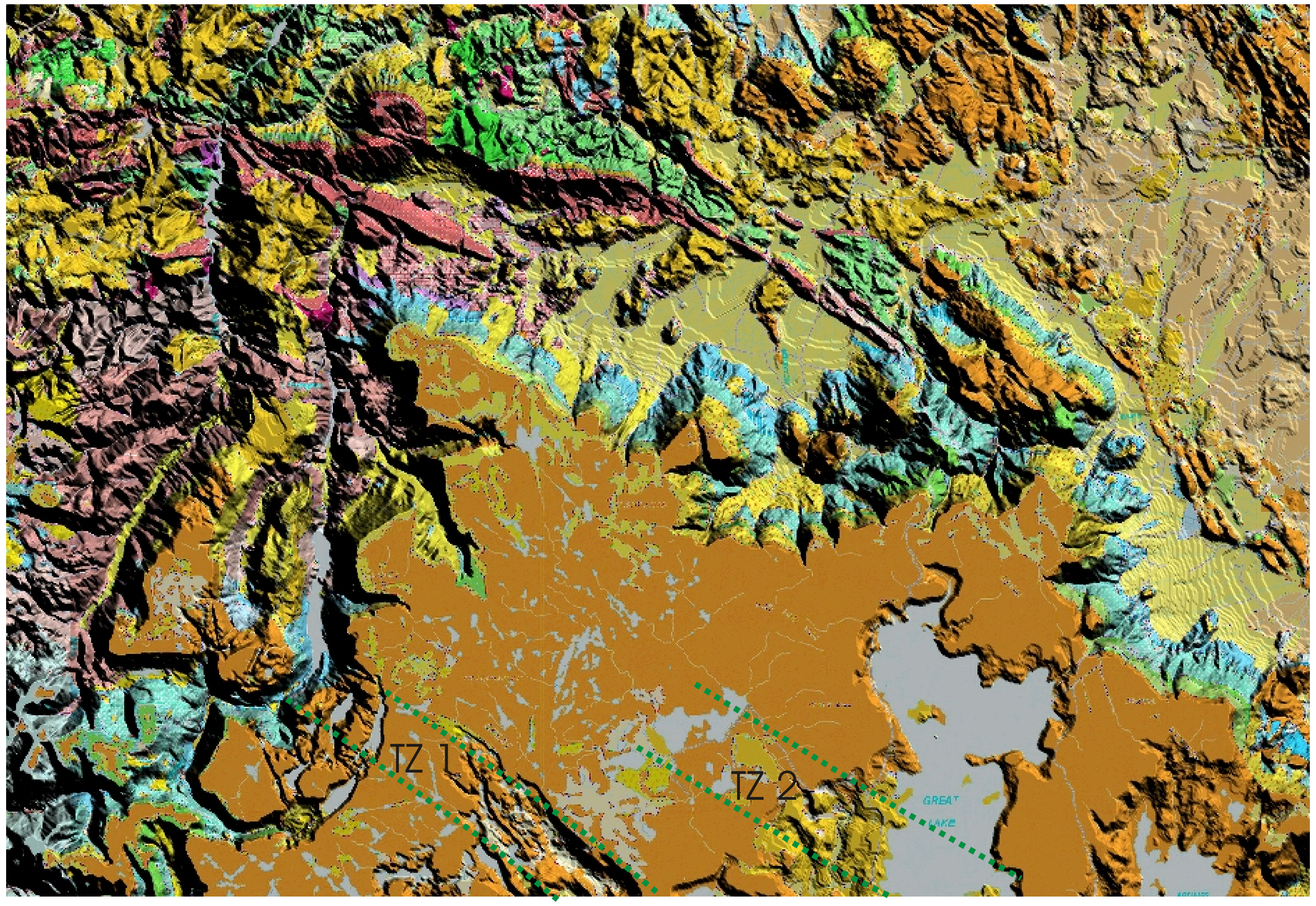
Figure 28

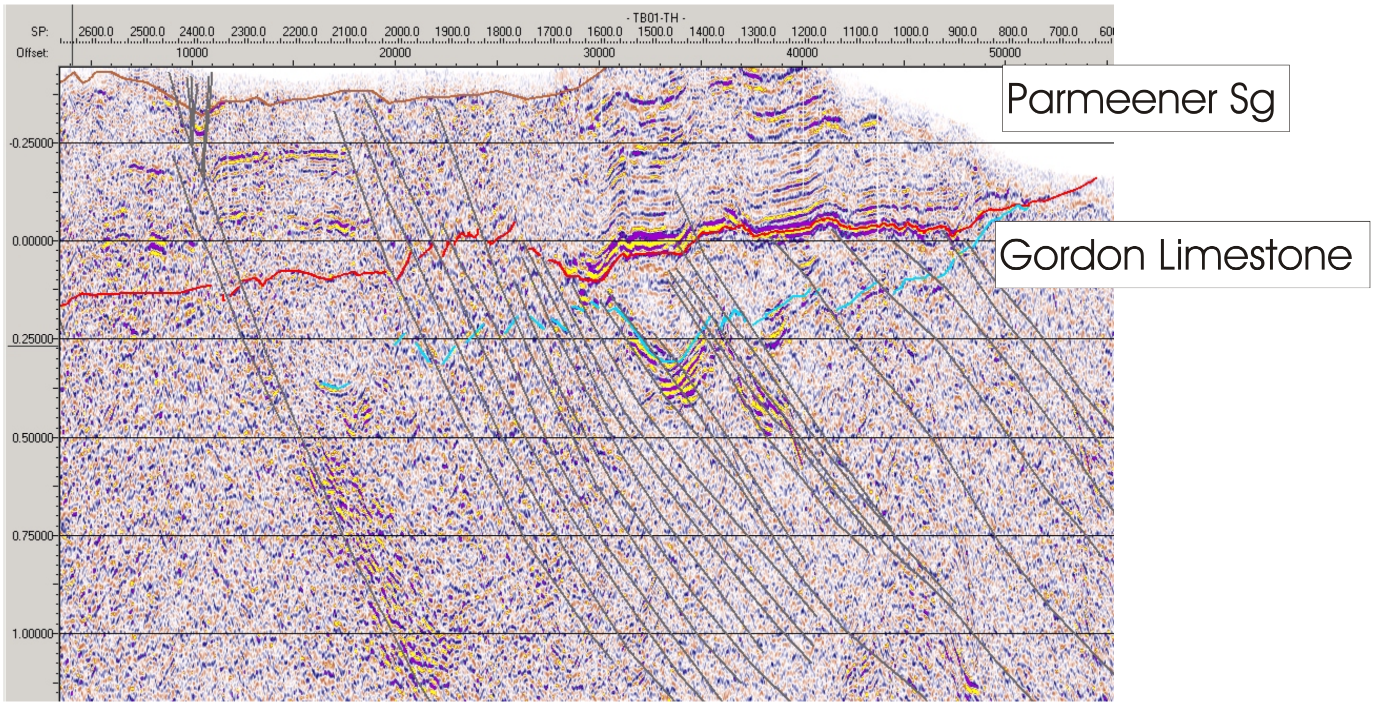


SIMPLE THRUST STRUCTURE
BELLEVUE LEAD
NOTE THE STRONG AMPLTUDE FLAT EVENTS ON THE CREST OF THE STRUCTURE

Figure 29

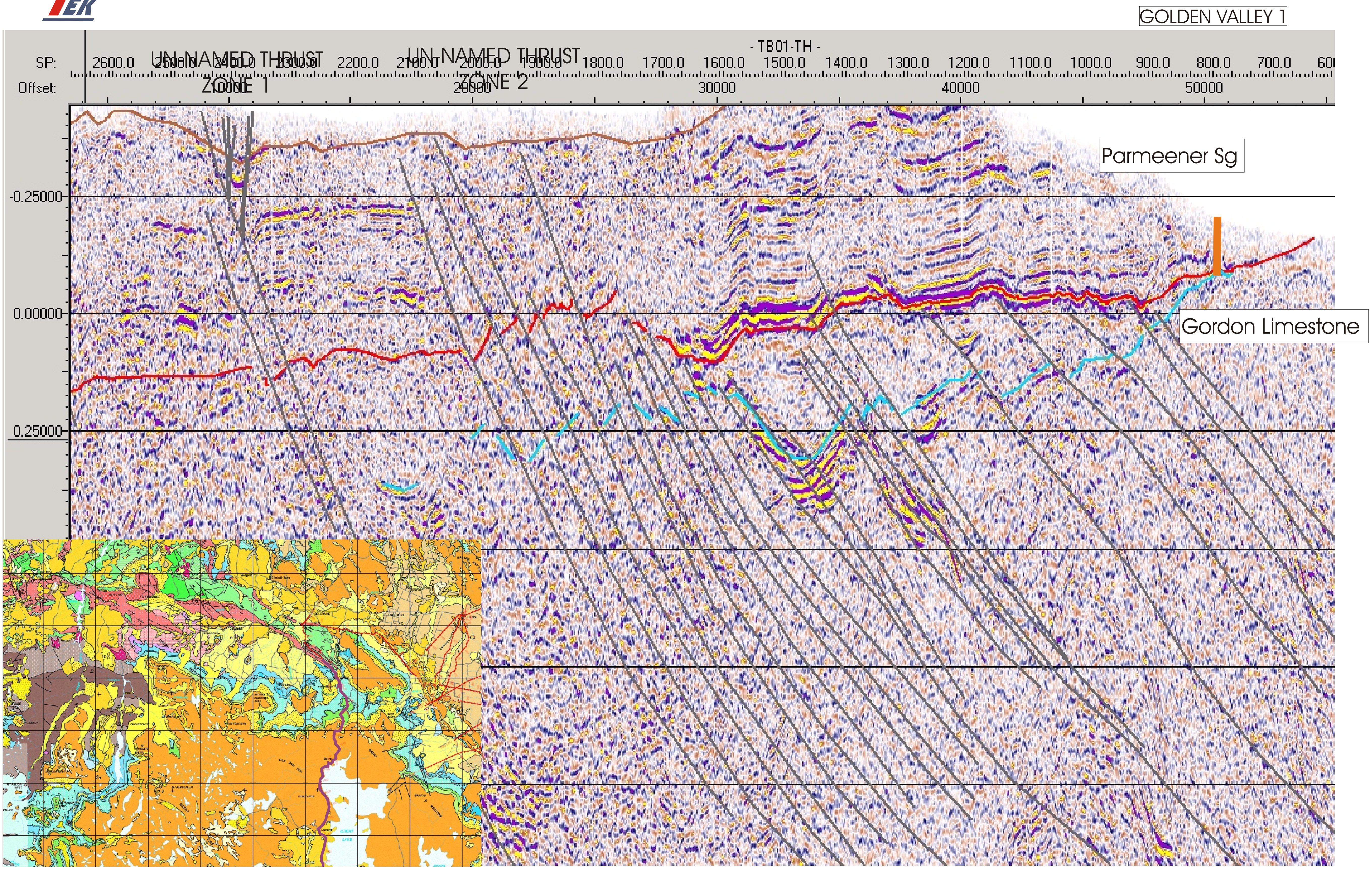






REGIONAL SEISMIC LINE - GOLDEN VALLEY SECTION
GEOLOGICAL MAPS SHOW INFERRED POSITIONS OF THRUST ZONES

Figure 30



	REGIONAL SEISMIC LINE - GOLDEN VALLEY SECTION SHOWING THICKENING OF PERMIAN (BASAL) ACROSS TZ 2. TZ1 HAS ASSOCIATED WRENCHING AND IS ASSOCIATED WITH TERTIARY BASALTS	Figure 31