APPENDIX K

Review of Preliminary Interpretations
Seismic Survey TB01
by
Dr Clive Burrett

Preliminary Seismic Interpretation SEL 13/98

Initial interpretations by Dr Mike Swift and Mr Ian Reid in collaboration with other GSLM geologists were carried out in 2001.

It was immediately apparent that up to 40% of each line was uninterpretable without further sophisticated re-processing. This was due either to the presence of near surface Jurassic dolerite or Tertiary basalt or to acquisition along winding roads. The presence of very high velocity rocks at or near the surface overlying low velocity rocks makes conventional processing difficult. Further details and recommendations for solution of the problems are in Stacey (2002). Recording parameters are listed in Figure 15.

Pending re-processing and the acquisition of reliable seismic velocities from planned down-hole seismic studies on Hunterston #1 in August 2002, it was decided to concentrate initially on the interpretation of obvious potential structural traps in the Parmeener and Wurawina Supergroups. It was further decided that these obvious traps would become the focus of stratigraphic drilling during 2002 concurrently with attempts by Mr Andrew Stacey and his supervisors at the University of Tasmania (Drs Ron Berry and Mike Roach) and GSLM geologists to interpret the seismic lines in detail, draw balanced structural cross sections and identify all potential commercial targets.

Approximate seismic velocities used by GSLM and based on several Tasmanian seismic experiments, are currently:

Tertiary	2,500 m/sec
Jurassic dolerite	6,000 m/sec
Triassic sandstones	3,000 m/sec
Permian siliciclastics	4,000-4,500 m/sec
Lower- Middle Paleozoic siliciclastics and limestones	4,500-6,000 m/sec
Precambrian	4,500-6,000 m/sec

It is expected that these velocities will be substantially refined by downhole seismic planned for Hunterston #1 in the latter part of 2002.

Mr Reid identified two small anticlines within the Parmeener Supergroup in the Longford Basin area (the Macquarie River and Hummocky Hills Anticlines see fig. 16) and these were confirmed by Dr Swift (see fig. 17). Dr Swift subsequently identified one anticline within the Tertiary infill of the Longford Basin at Bracknell (see fig. 1). The Bracknell anticline is not included here as there is no obviously mature source rock within the Longford Basin. Given the disappointing number and size of structures found on the large number of seismic lines within the Longford Basin it was decided that interpretation time would be most efficiently concentrated on the large structures identified in the Central Plateau region. Mr Paul Lane (University of Tasmania) is currently (2002) interpreting the Longford Basin area lines in detail.

Several large anticlinal-domal structures have been identified in the Central Plateau area by Dr Swift and Mr Stacey and these are shown on figures 1-14, 18-20. We have named these structures (from west to east): Mt Arrowsmith, Derwent Bridge, Bronte/Bellevue, Steppes, Hunterston, Scotts Tier and Interlaken (see fig. 1). Of these, Hunterston and Bronte/Bellevue are the most promising commercially.

Anticlines in the generally gently dipping Parmeener Supergroup are found to overlie anticlines with steeper limbs in the Devonian fold-thrust belt beneath the Devonian unconformity. These stacked structures are of obvious economic importance. A surprise, though, is that the Devonian anticlines within the Wurawina Supergroup have generally low limb dips compared to outcrops in the Florentine valley where limb dips of 40 degrees are average. The result is very large structures such as Bellevue and Hunterston, which potentially have long migration fairways.

The Hunterston Dome (20km north of Bothwell) was originally mapped by Rhodes Fairbridge in 1948. The domal structure exhibited by the Ferntree Formation and dolerite, was confirmed by field mapping by GSLM geologists in 1997 (see D. Tanner and C. Burrett GSLM Annual Report December 1997 pages 36-37). Hunterston #1 was drilled to 336m through 160m of Ferntree Formation mudstone and 170m of Jurassic dolerite. Ongoing stratigraphic drilling at Hunterston #1 is expected to reach the Devonian unconformity at 0.7 secs beneath surface (see fig. 11) - about 1,400-2,000m beneath land surface. From the seismic sections (figs 10-12 and 19, 20) it is most probable that Wurawina Supergroup will be intersected beneath the Parmeener Supergroup and very possibly this is Ordovician Gordon Group limestone.

The Bellevue structure (figs 5-8 and 18) consists of large anticlinal and fault structures both within the Wurawina and Parmeener Supergroups. Bronte/Bellevue (fig. 5) is a 6500m long anticline with a closure of 25msec. (see Stacey 2002). The Parmeener Supergroup (including dolerite) extends to 0.5 sec below surface (about 1200m). Swift (fig. 18) identifies the sequence between 1.1secs and 2secs below surface (on fig. 6) 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:

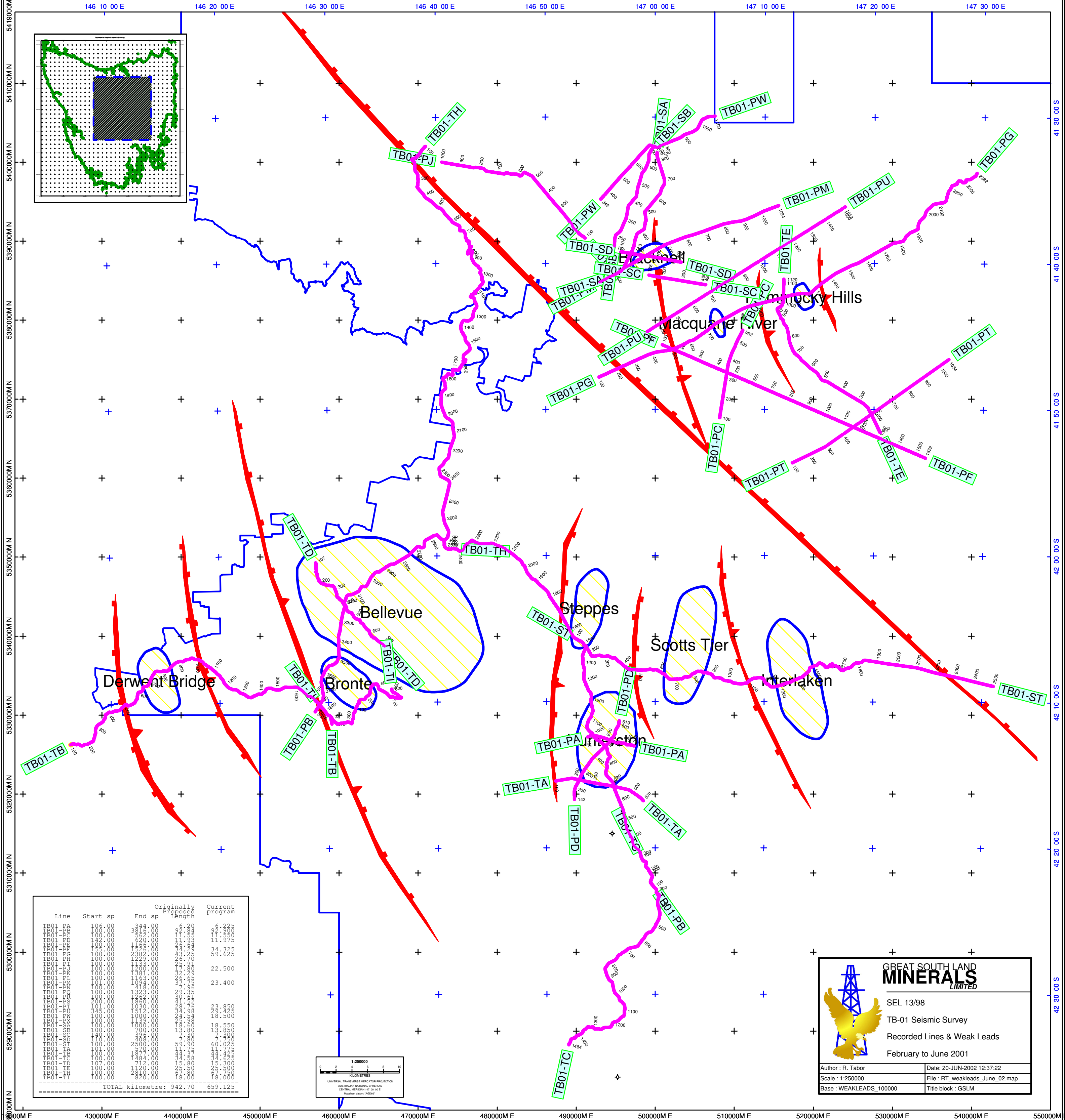
- The 'middle' Permian Liffey Group sandstones (at approx. 1,000m depth) fig. 5 'yellow' horizon
- The sandstone formations of the Eldon/Tiger Range Groups (at approx. 1,550m-1,700m)
- The Upper Ordovician limestones of the Upper Limestone Member of the Benjamin Limestone Fm, particularly vuggy porosity horizons and reef and near reef facies at 2,500+m below surface.

It is recommended that preliminary plans are made to drill a 3,000m hole at Bellevue either before or after further seismic lines being carried out across the structure.

Clive Burrett
May 2002
Based on preliminary studies by Mr Ian Reid, Dr Mike Swift and Mr Andrew Stacey

List of Figures

TASMANIA BASIN SEISMIC SURVEY



Line	Start sp	End sp	Originally Proposed Length	Current program
TB01-PA	106.00	344.00	6.20	6.225
TB01-PB	100.00	3816.00	92.84	92.900
TB01-PC	100.00	562.00	11.55	11.550
TB01-PD	142.00	620.00	11.93	11.975
TB01-PE	100.00	1166.00	26.64	
TB01-PF	155.00	1526.00	34.29	34.325
TB01-PG	100.00	2382.00	43.25	59.625
TB01-PH	100.00	1229.00	26.70	
TB01-PI	100.00	1133.00	25.91	
TB01-PJ	100.00	1200.00	17.80	22.500
TB01-PK	100.00	1381.00	32.29	
TB01-PL	100.00	1163.00	26.65	
TB01-PM	101.00	1094.00	37.75	23.400
TB01-PN	100.00	418.00	7.96	
TB01-PQ	100.00	1323.00	29.35	
TB01-PR	100.00	1262.00	30.61	
TB01-PS	200.00	1860.00	41.52	
TB01-PT	101.00	1030.00	28.76	23.850
TB01-PU	345.00	1512.00	34.98	29.425
TB01-PW	100.00	1000.00	24.54	18.500
TB01-PX	100.00	1139.00	25.98	
TB01-SA	100.00	1000.00	18.60	18.550
TB01-SB	100.00	700.00	13.80	13.850
TB01-SC	140.00	396.00	7.30	7.300
TB01-SD	110.00	408.00	7.80	7.750
TB01-ST	100.00	2500.00	59.90	60.025
TB01-TA	101.00	570.00	11.75	11.775
TB01-TB	100.00	1877.00	44.37	44.425
TB01-TC	100.00	1484.00	34.58	34.625
TB01-TD	107.00	712.00	15.80	15.300
TB01-TE	100.00	1120.00	25.50	25.500
TB01-TH	100.00	2810.00	67.80	67.750
TB01-TI	100.00	820.00	18.00	18.000
		TOTAL kilometre:	942.70	659.125

GREAT SOUTH LAND MINERALS LIMITED

SEL 13/98

TB-01 Seismic Survey

Recorded Lines & Weak Leads

February to June 2001

Author : R. Tabor	Date: 20-JUN-2002 12:37:22
Scale : 1:250000	File : RT_weakleads_June_02.map
Base : WEAKLEADS_100000	Title block : GSLM

FIGURE 1

Mt. Arrowsmith

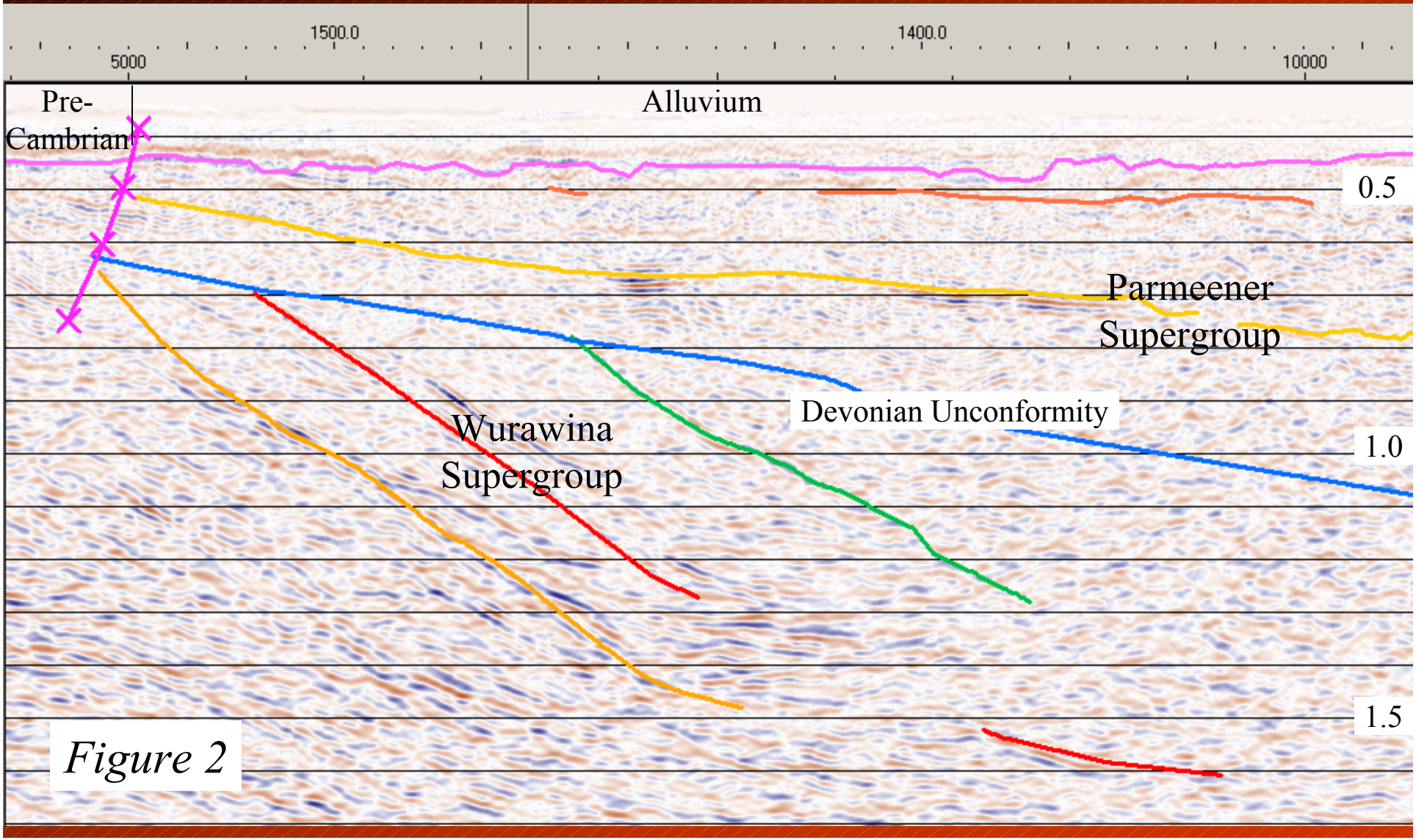


Figure 2

Derwent Bridge

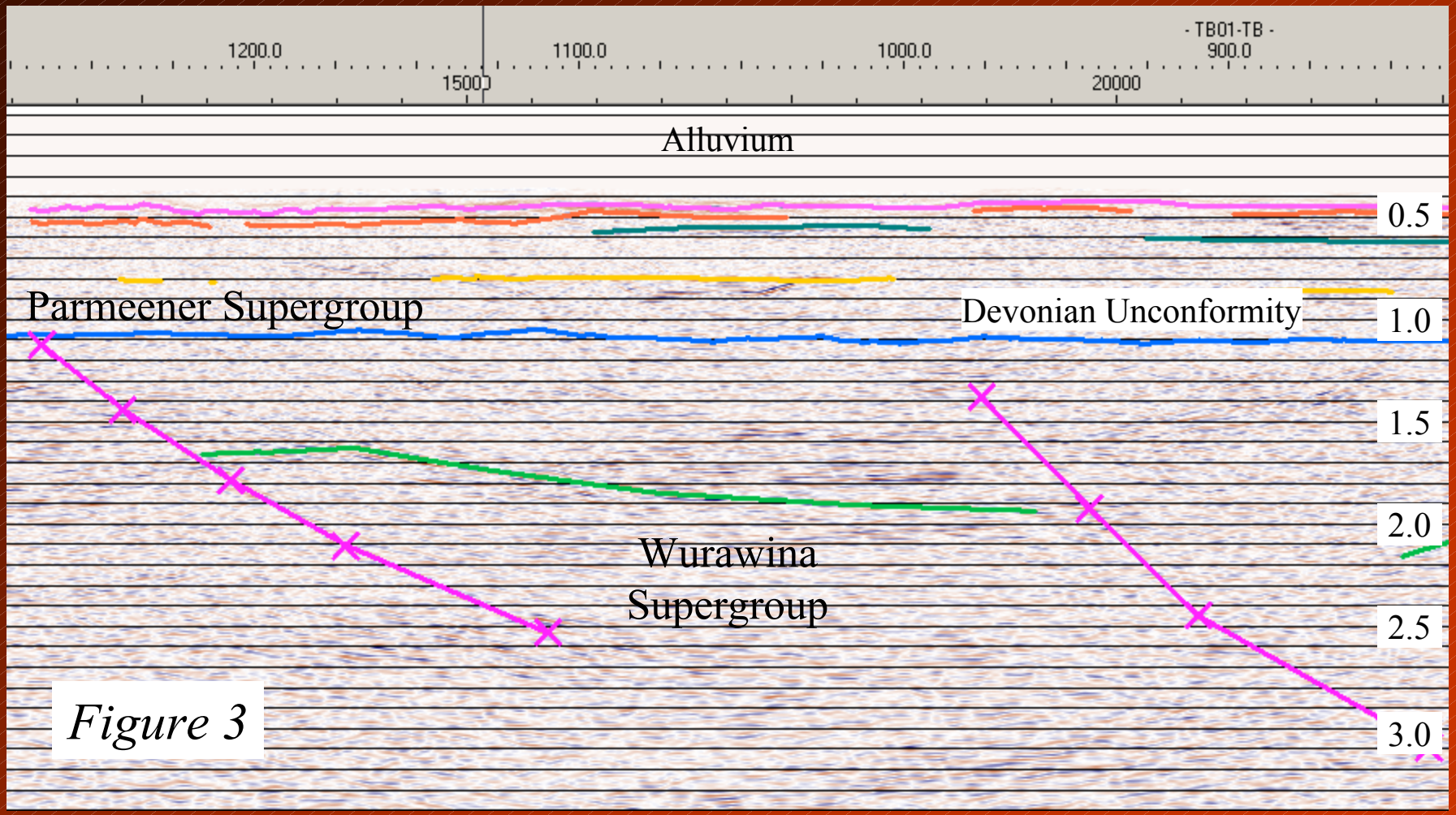


Figure 3

Laughing Jack

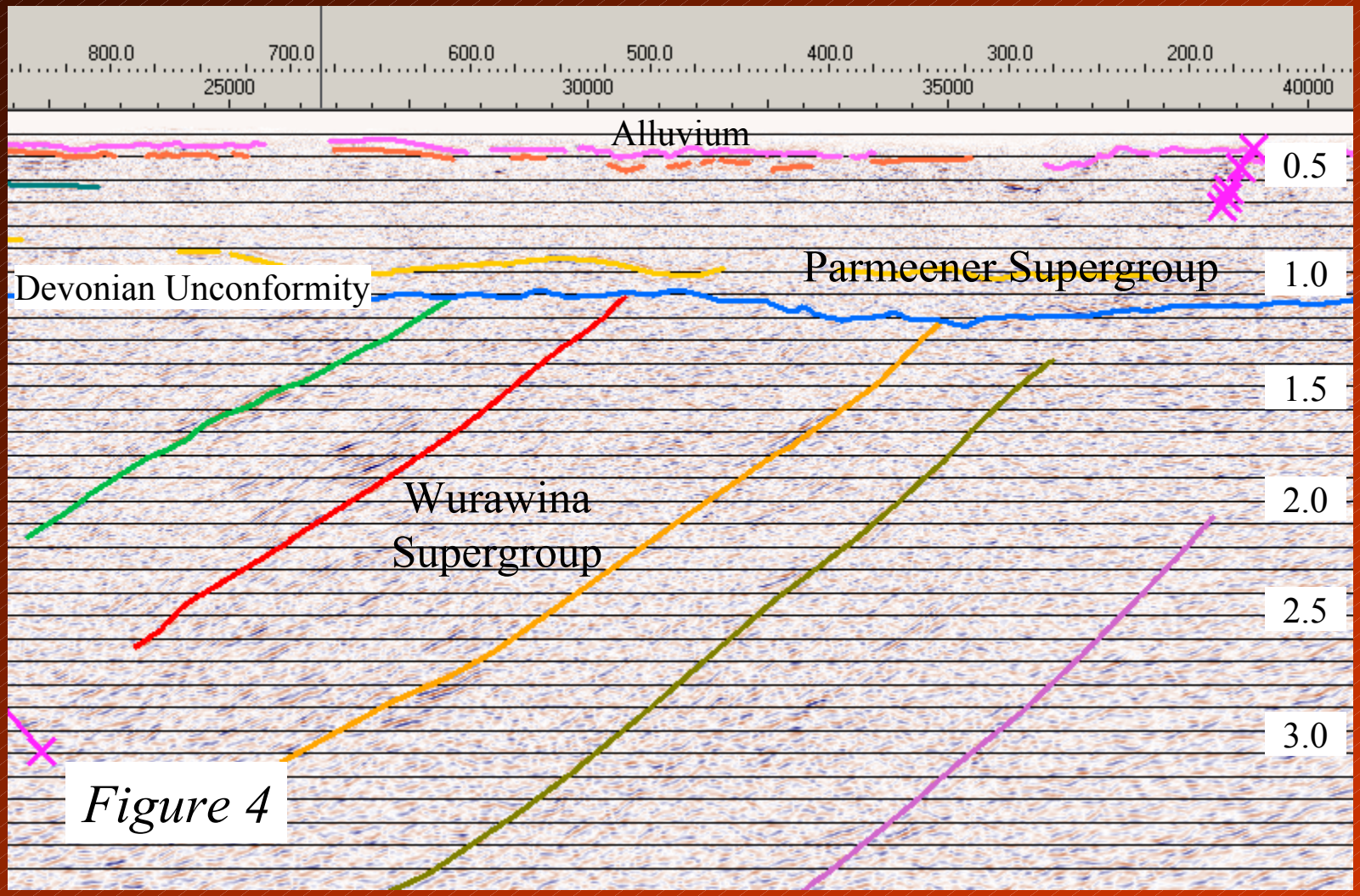


Figure 4

Bronte/Bellevue – TB01-PB

(Parmeener)

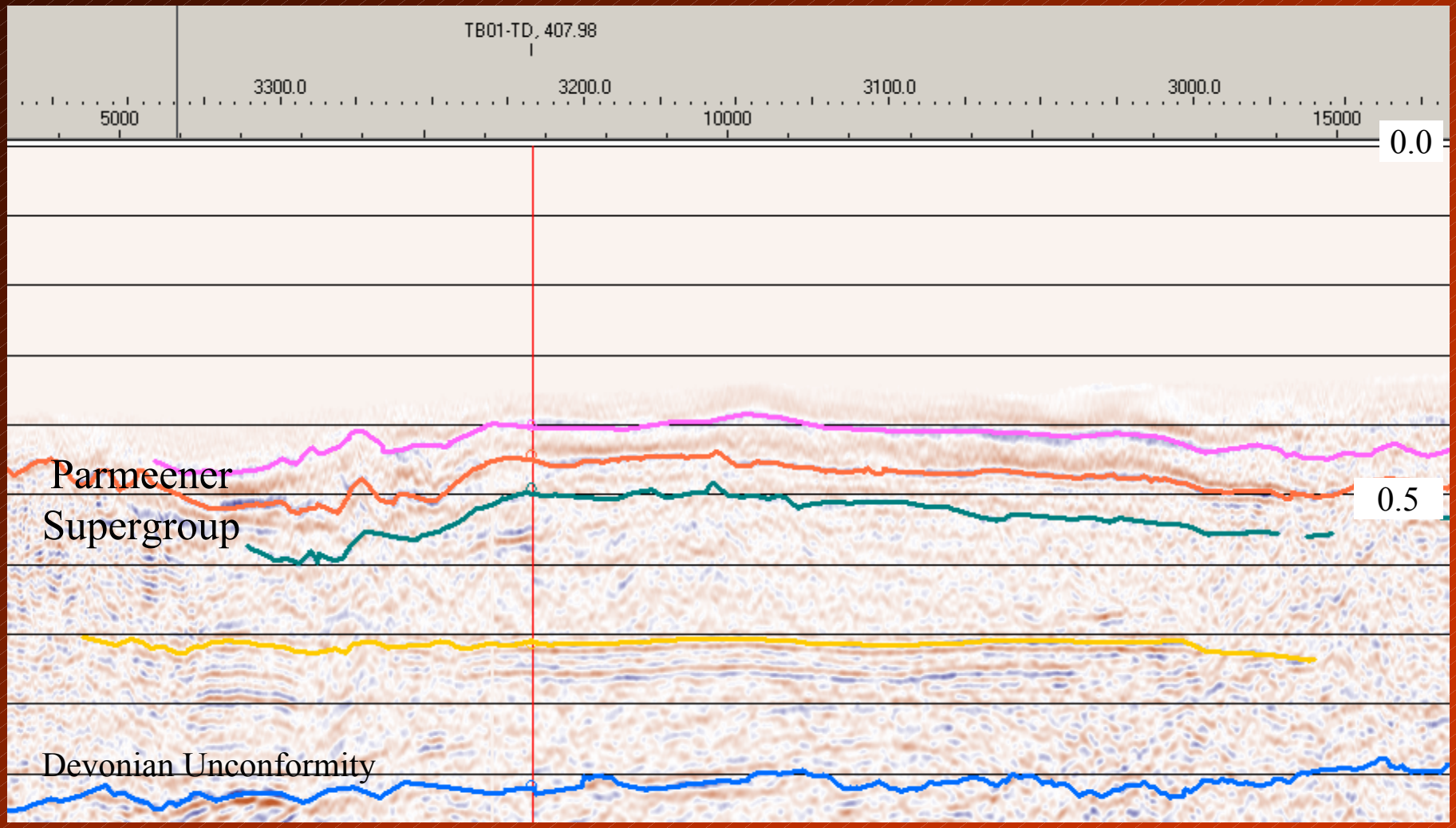


Figure 5

Bronte/Bellevue – TB01-PB

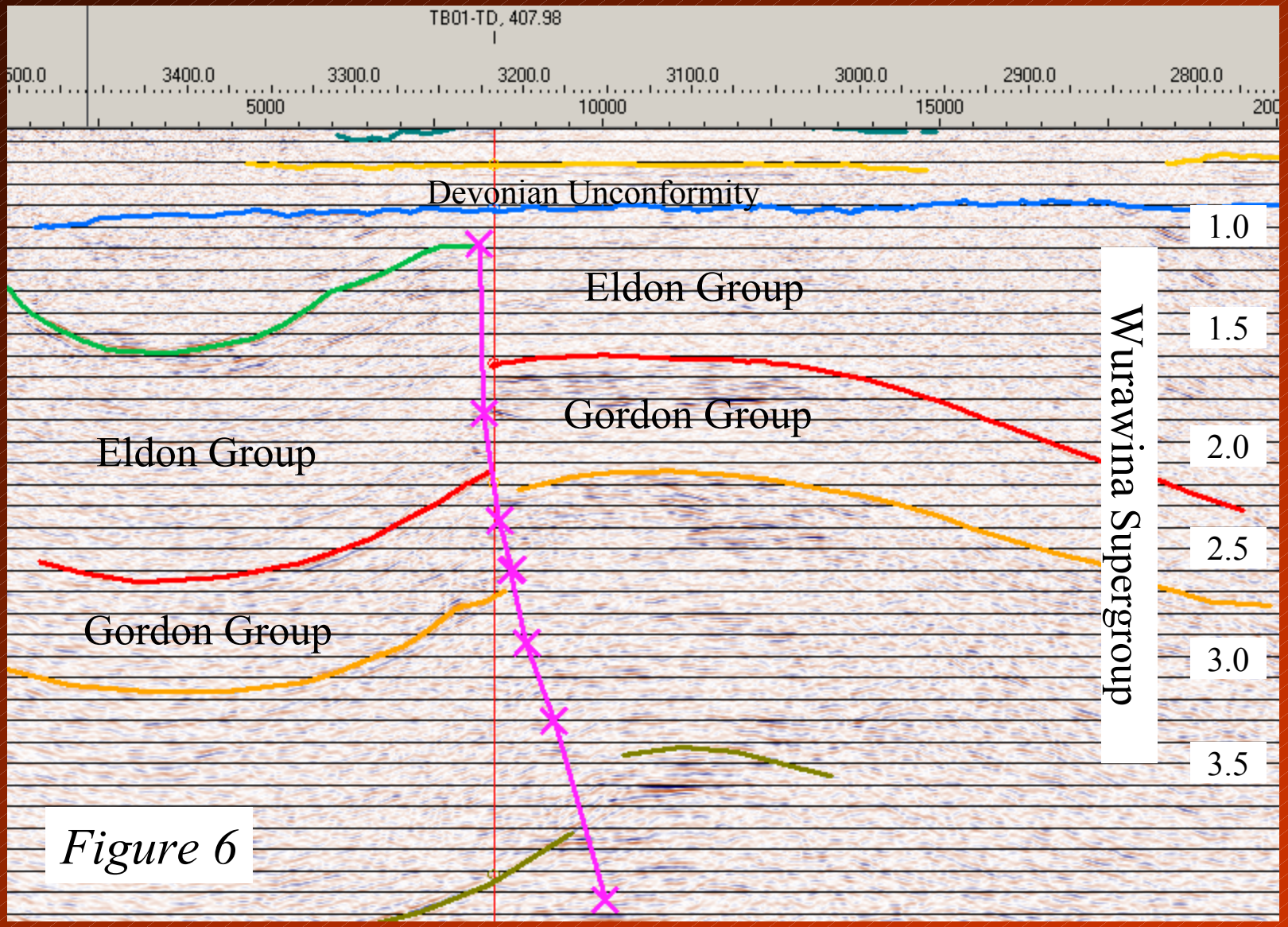


Figure 6

Bronte/Bellevue – TB01-TI

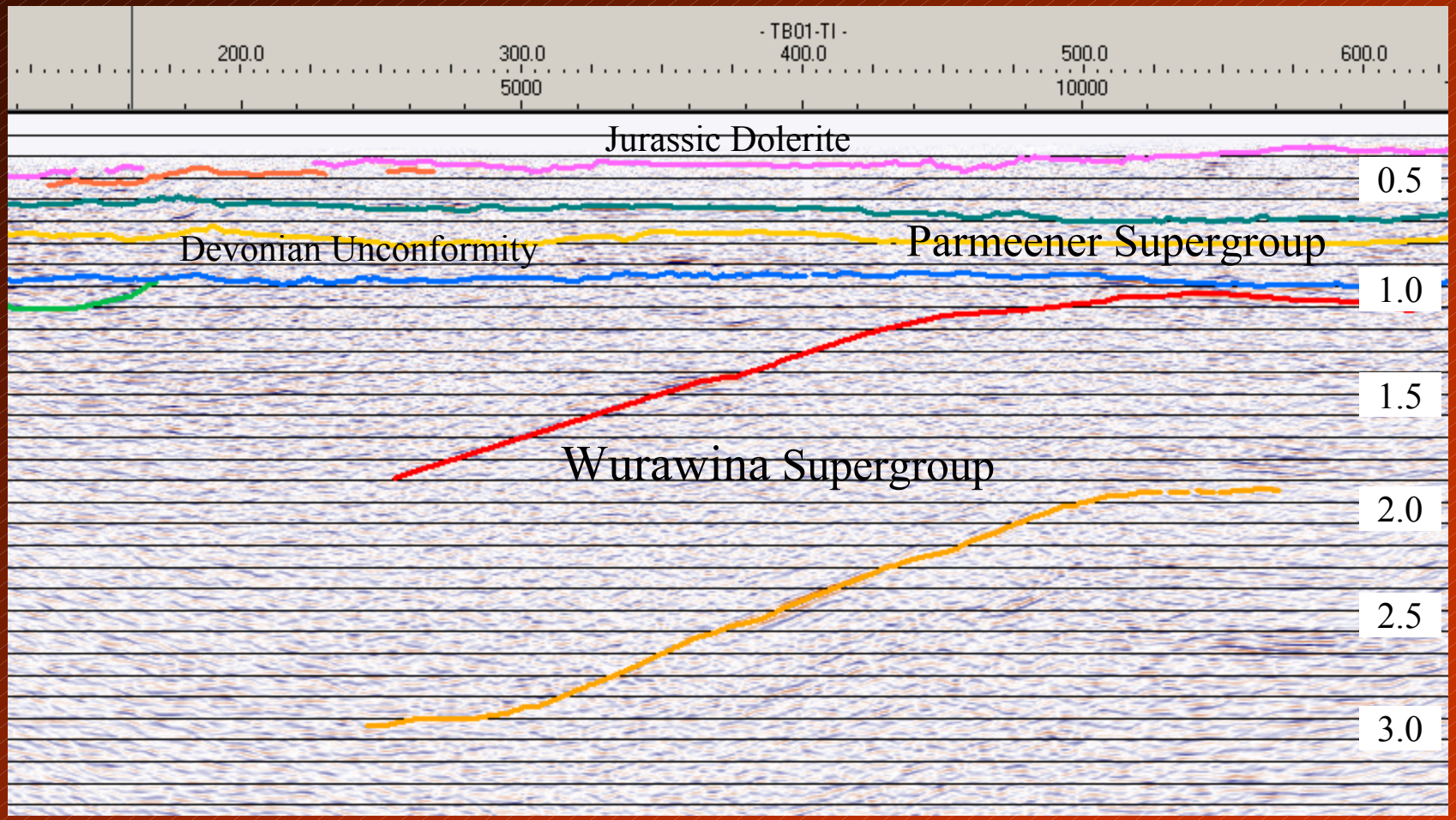


Figure 7

Bronte/Bellevue – TB01-TD

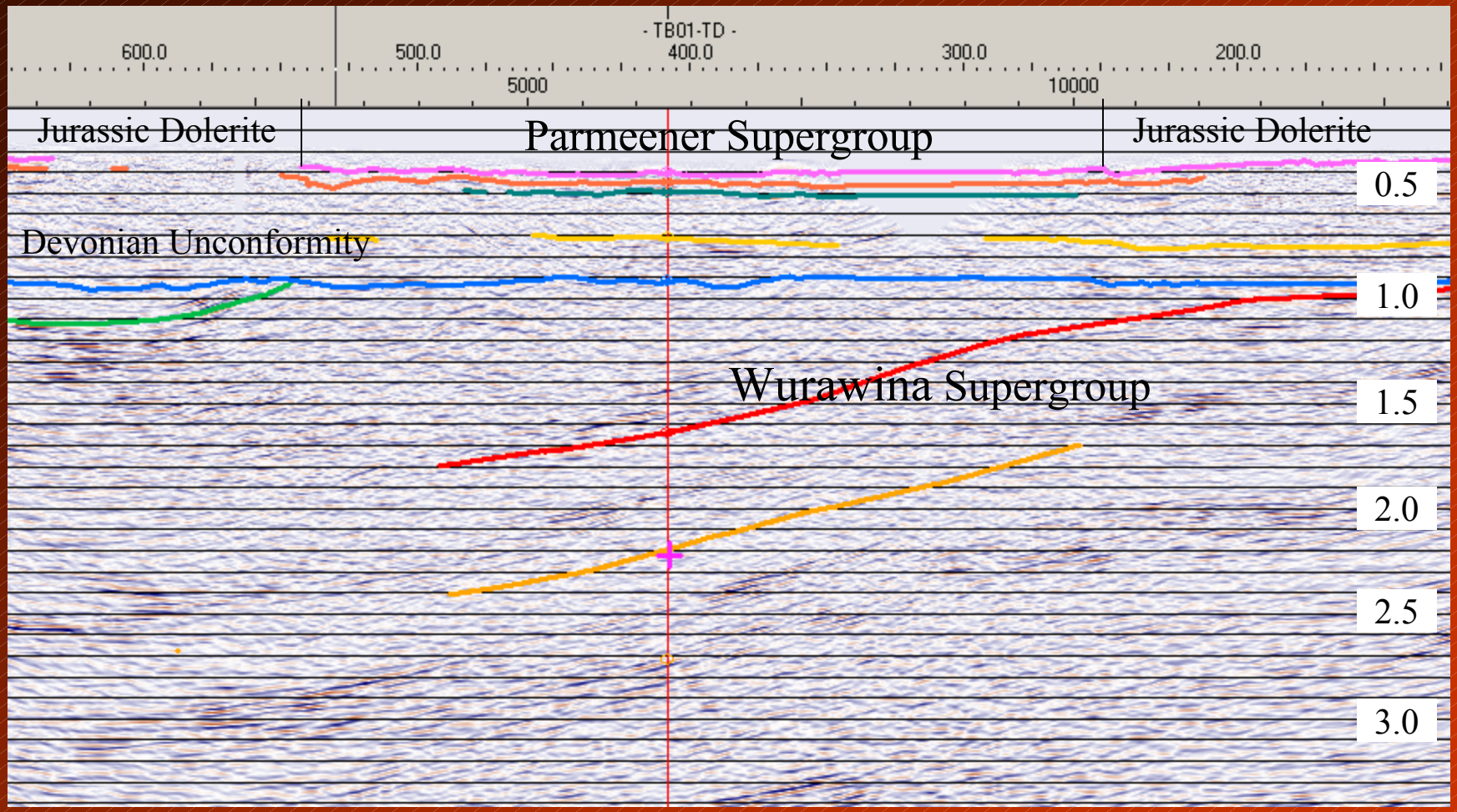


Figure 8

Steppes

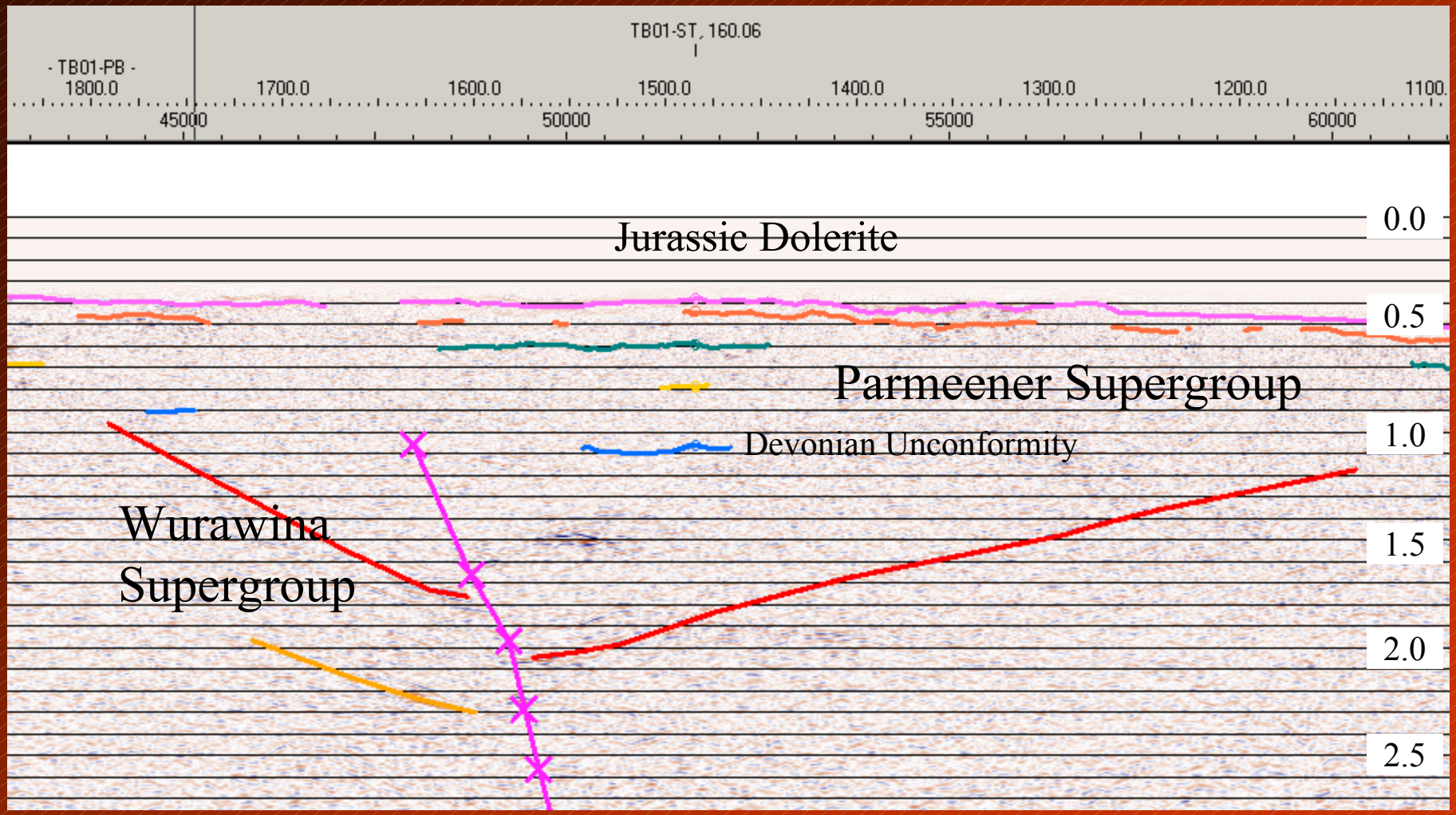


Figure 9

Hunterston – TB01-PB

(Parmeener)

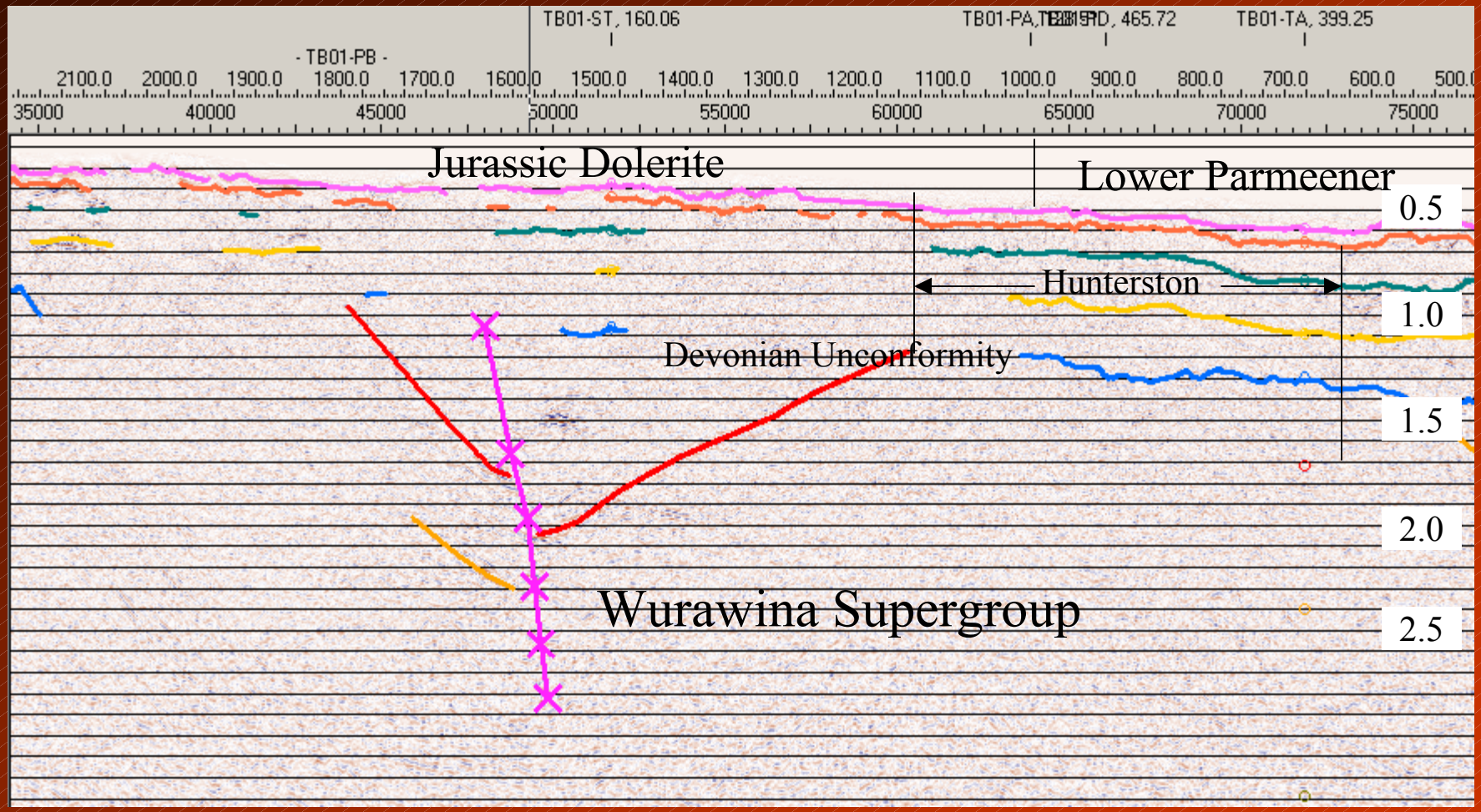


Figure 10

Hunterston – TB01-PB

(Wurawina)

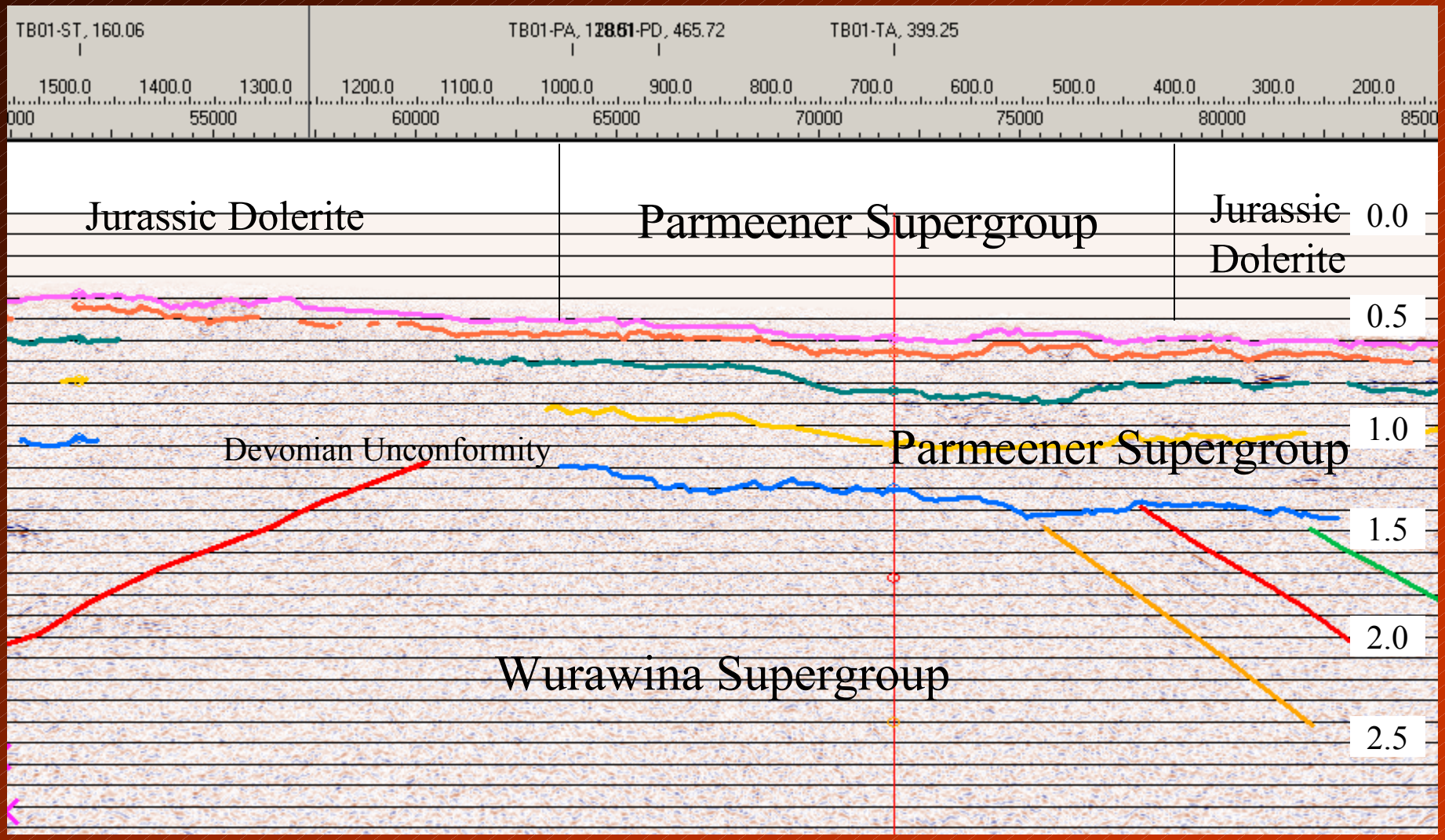


Figure 11

Hunterston – TB01-TA

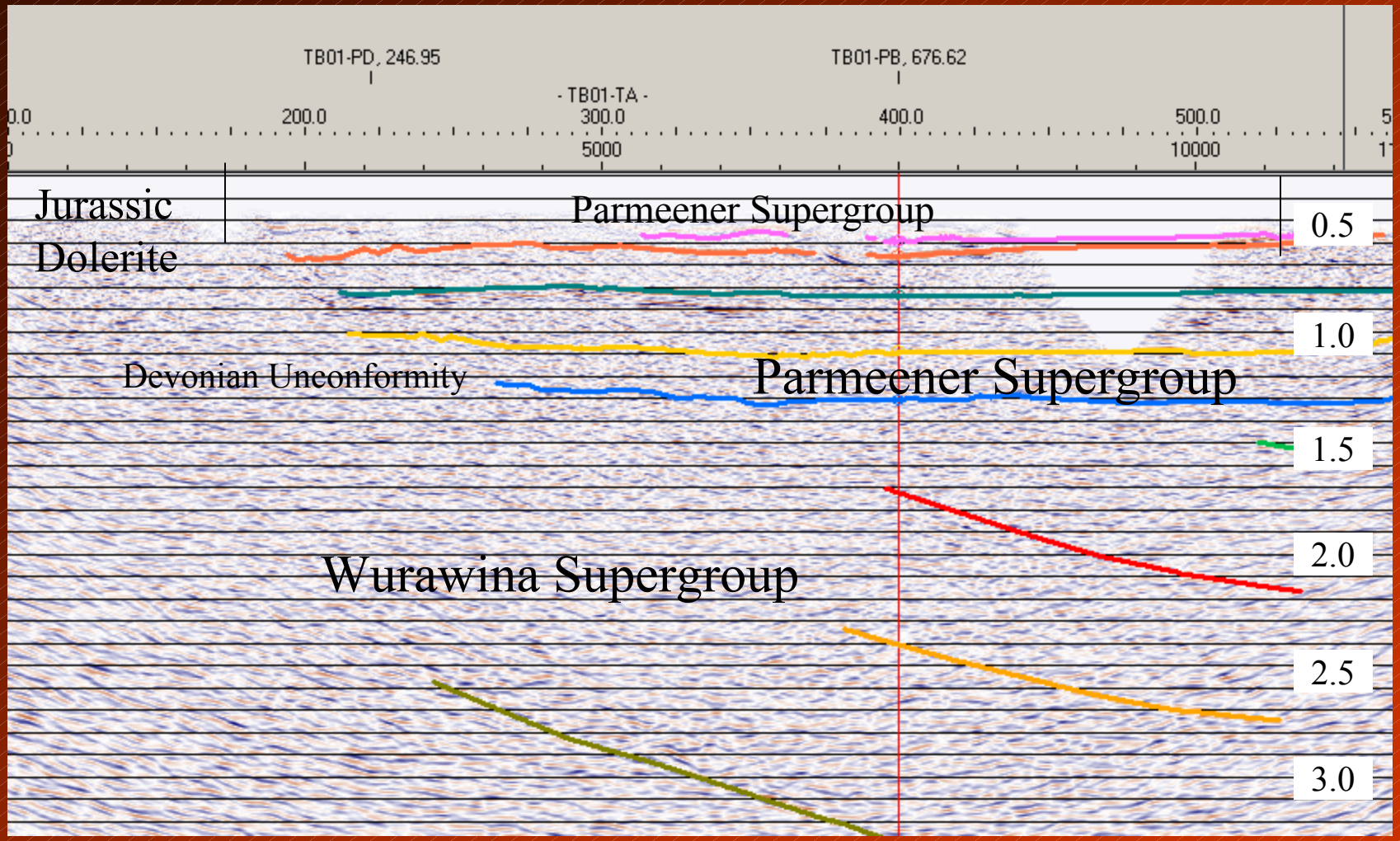


Figure 12

Scotts Tier

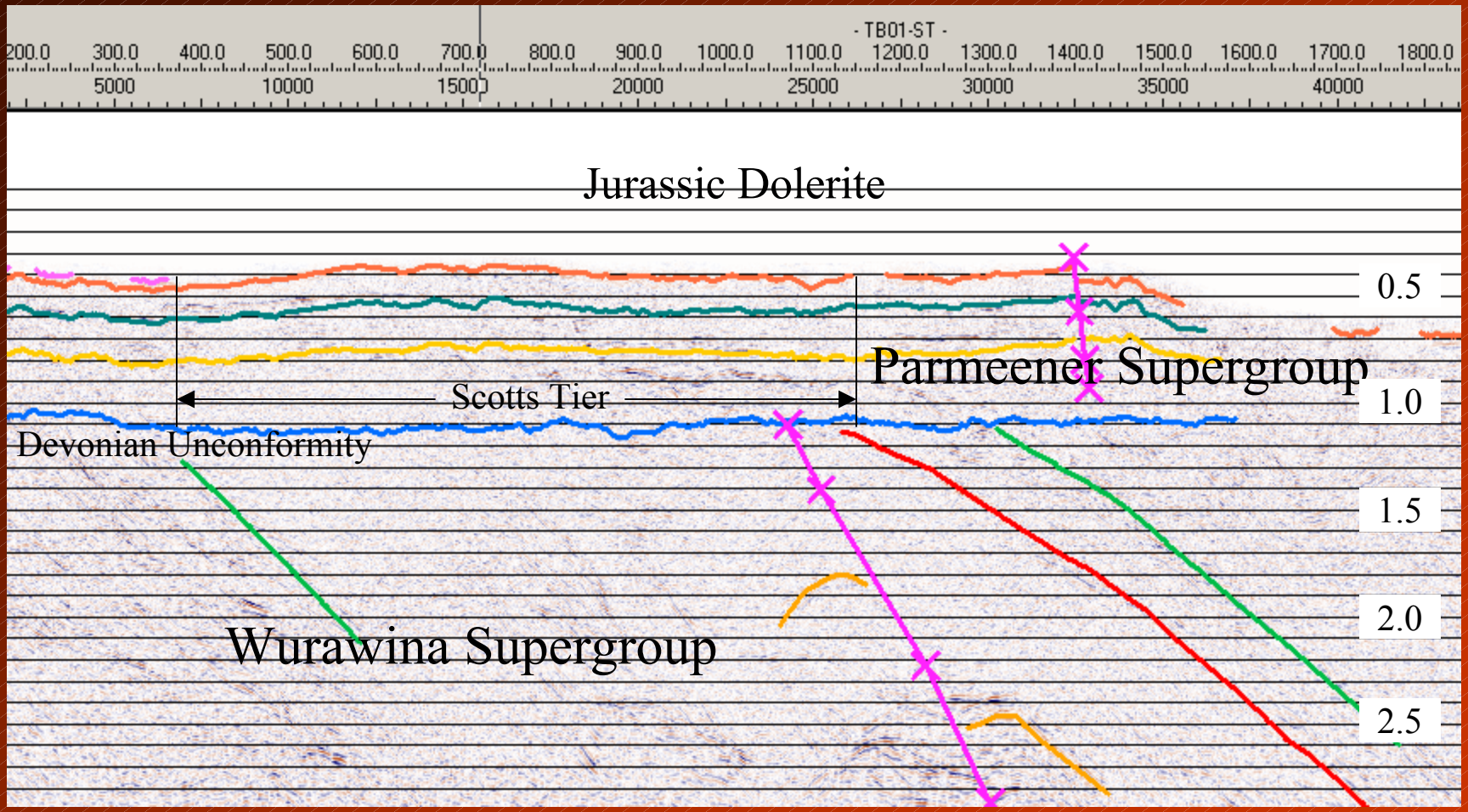


Figure 13

Interlaken

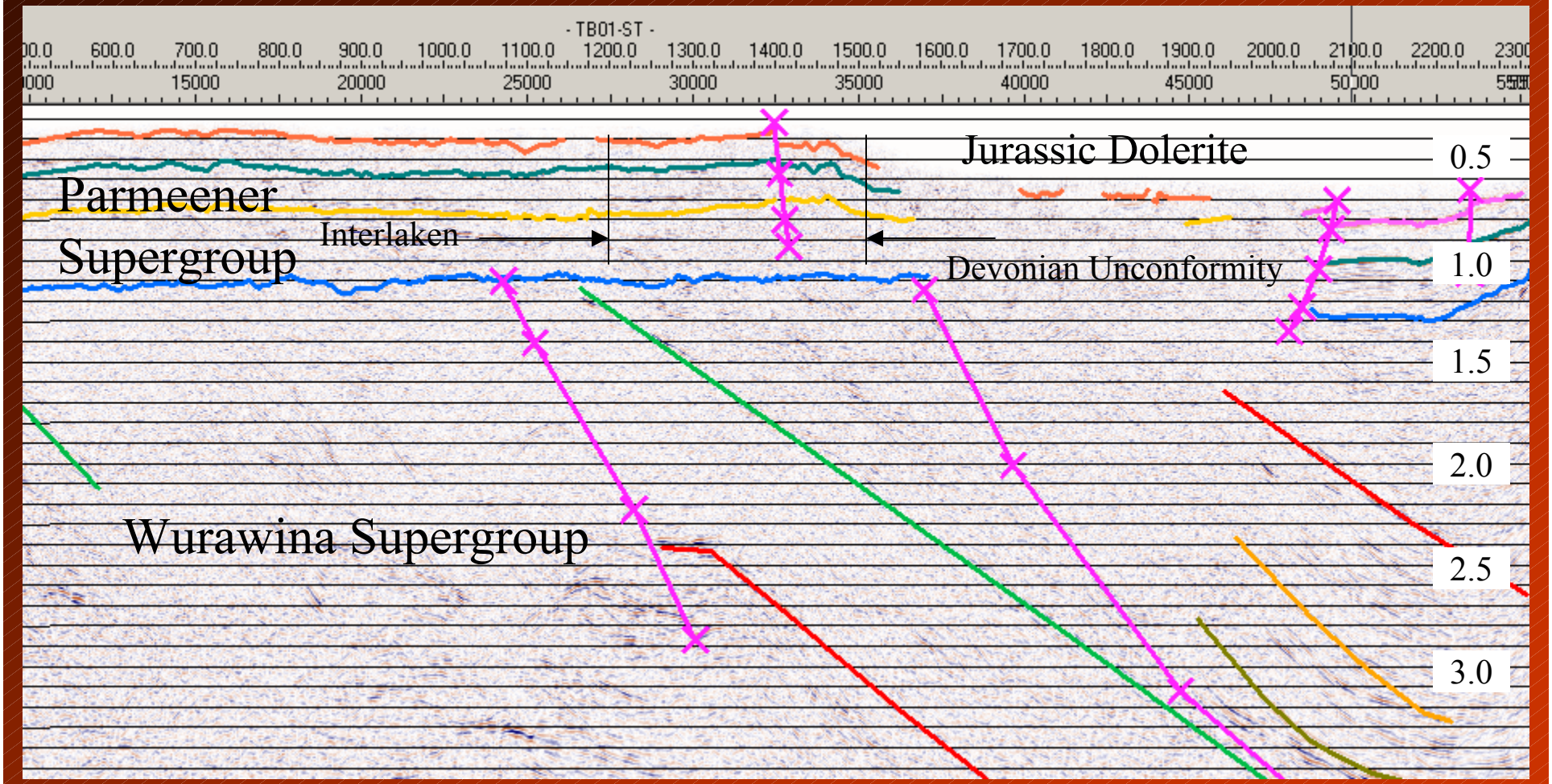


Figure 14

Seismic Survey Recording Parameters

4 vibs centred on station 12.5 m pad to pad
Group Interval 25 m
geophone type SM 4 10Hz
array 12 geophones centred between stations

Sweep Length 8 secs
8 to 96 Hz linear sweep
record length 14 secs
two sweeps each station no move up (standing sweeps)

Crooked Line 4.5 km

180 nominal fold
8975 metres end to end with 360 channels each
25 metres apart

Straight Line 3km

120 nominal fold
5975 metres end to end with 240 channels
each 25 metres apart

Figure 15

Longford Sub Basin

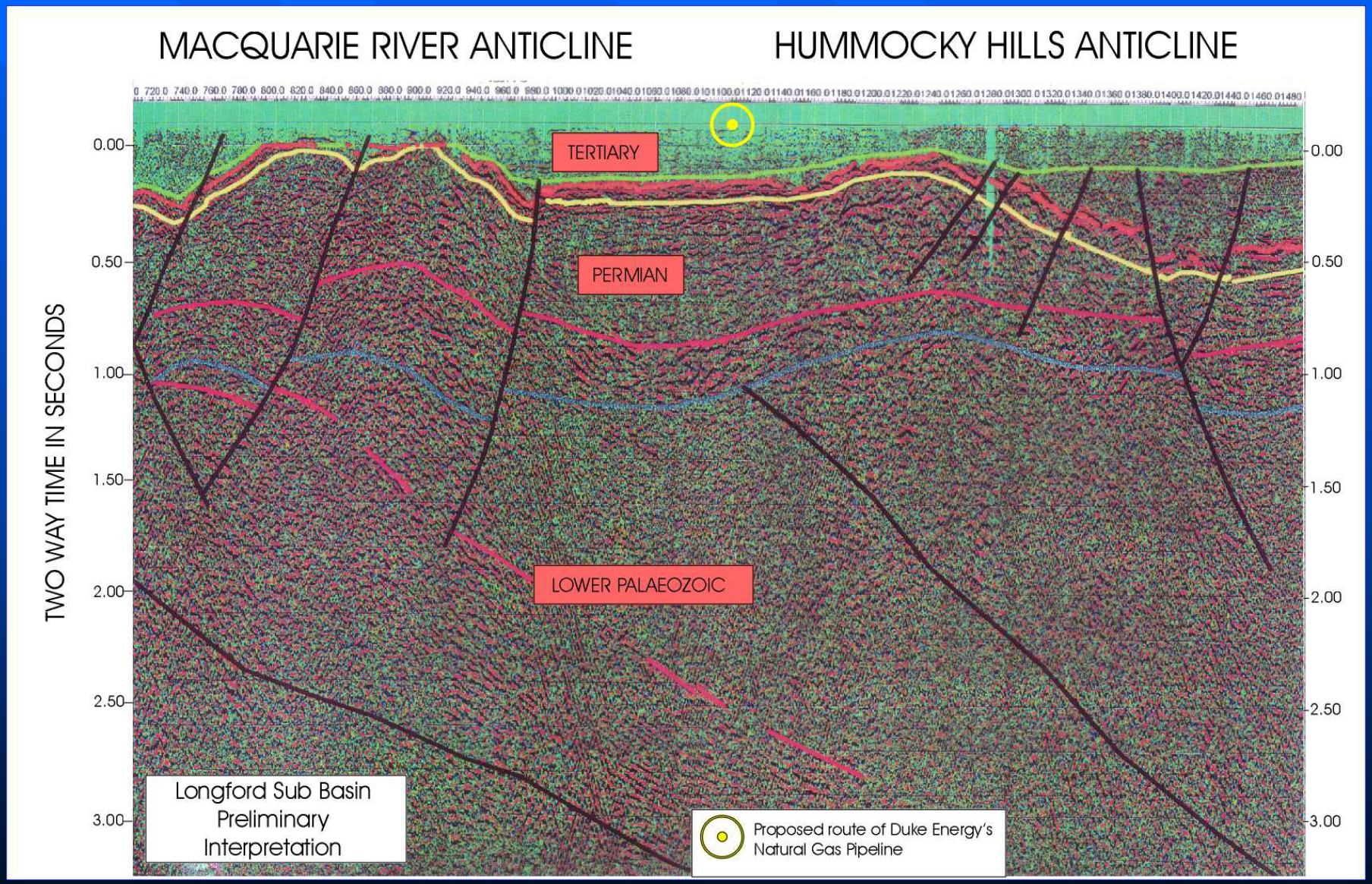


Figure 16

*This geological representation is a preliminary interpretation only and is based on recent seismic or other data.

It may not be representative of the final defined structure

TB01-PG

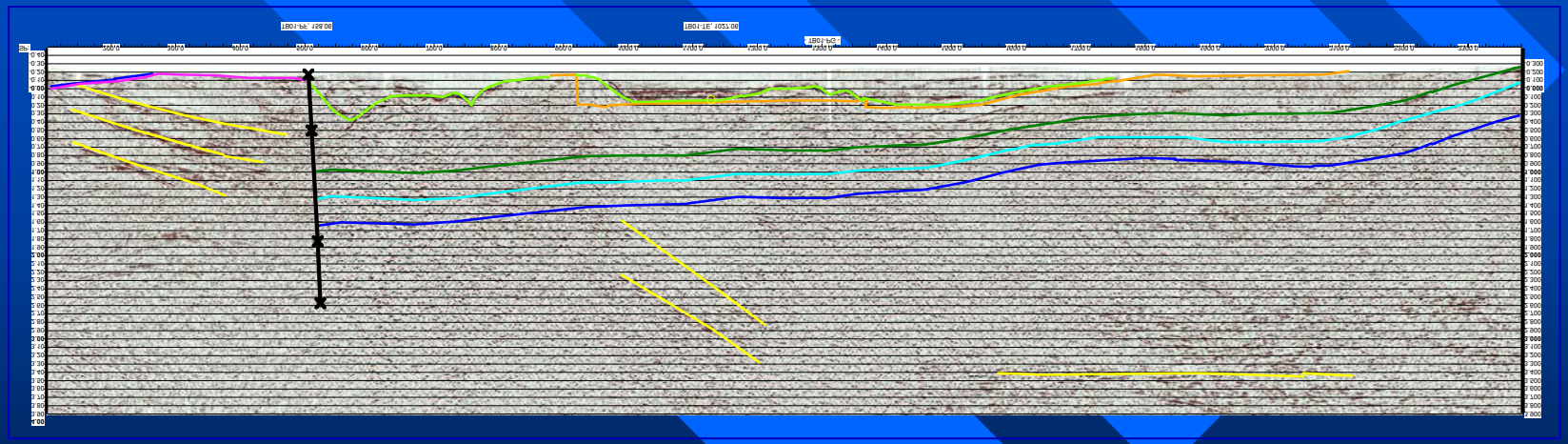


Figure 17

BELLEVUE LEAD

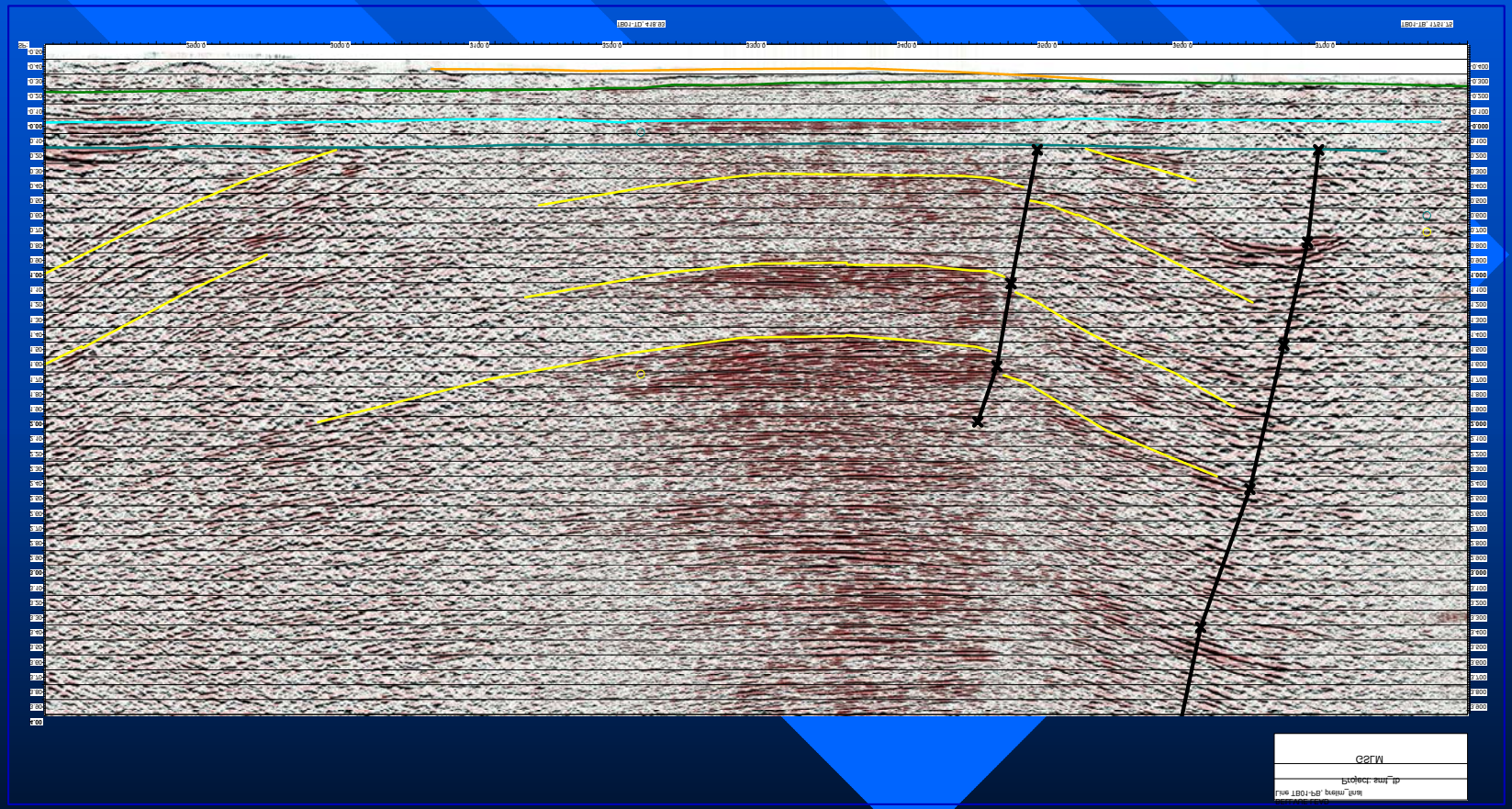


Figure 18

HUNTERSTON PROSPECT

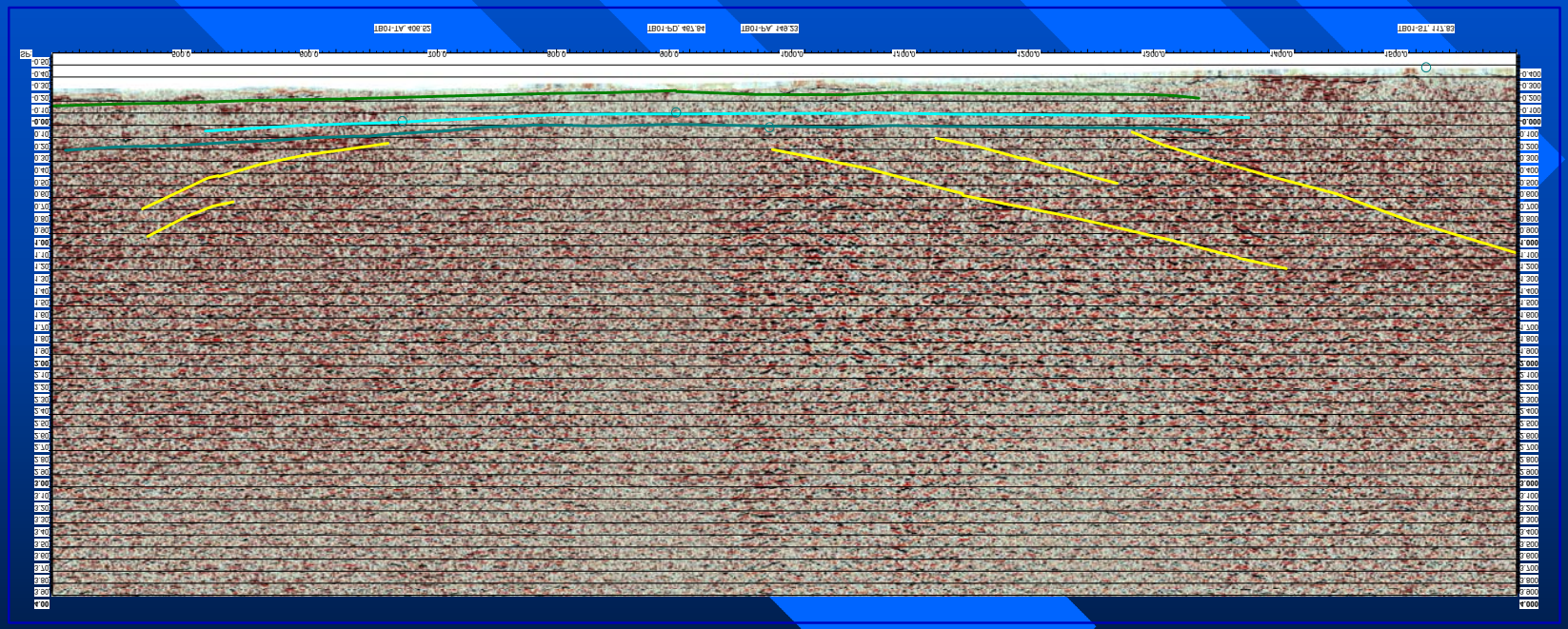


Figure 19

HUNTERSTON MAP

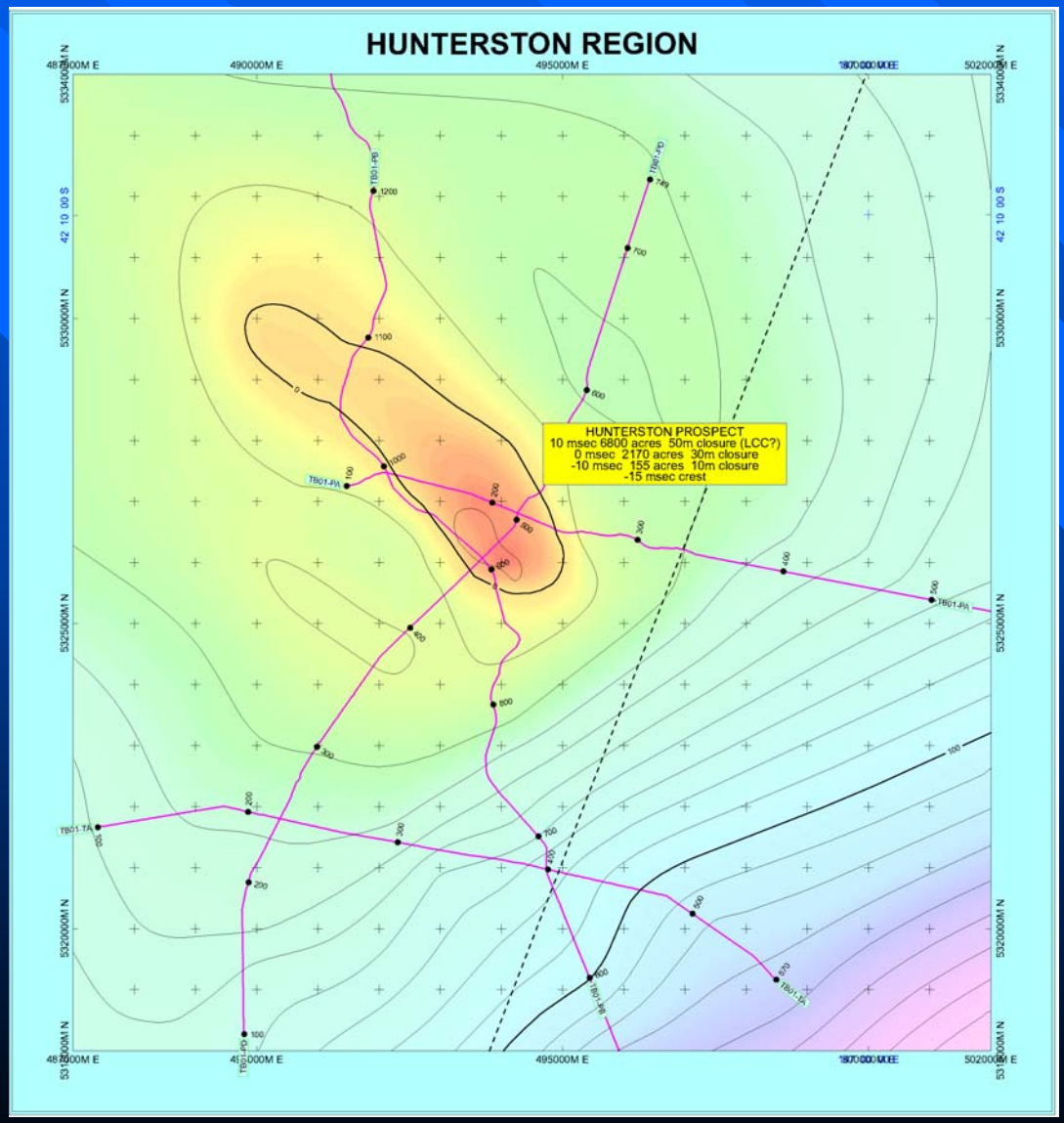


Figure 20