Deep Crustal Seismic Reflection Profiling: Australia 1978-2015

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Foreword

This atlas of reflection profiles penetrating the whole crust, with accompanying geological maps, represents a collaboration between the Research School of Earth Sciences at The Australian National University and Geoscience Australia. The reflection atlas project arose from work on the Australian Seismological Reference Model (AuSREM) sponsored by the National Infrastructure program of AuScope and the Australian National University.

This second edition brings the collection to 2015, with 4,000 km of additional reflection profiles compared with the first version. In all the profiles cover more than 16,000 km of coverage across the Australian continent and provide an insight into the variations in crustal architecture in the varied geological domains. A number of the recent profiles provide coverage in areas that have not been previously studied such as the Nullarbor Plain and the region to the south of Mount Isa.

Each reflection profile is presented at approximately true scale with up to 220 km of profile per page and overlap between pages, with a geological strip map and line configuration. The profiles are organised by region. The material prepared for the first edition for the period 1978-2011 is presented in the same form as before in Part I. The more recent profiles from 2012-2015 are included in Part II with the same mode of display.

In addition in Part III, groups of major reflection profiles have been assembled into continuous transects of 1000 km, or more, that link across major geological provinces and provide an insight into the structure and evolution of the Australian continent.

The set of digital data that is represented in these pages is progressively being made available from the Geoscience Australia website from:

http://www.ga.gov.au/about/projects/minerals/current/seismic

The data are organised by project with the reference numbers as included on the seismic sections (see Appendix B for Geocat reference numbers).

For continuity with the first edition the geological mapping has been derived from the *Surface Geology of Australia data package 2010 edition* prepared by Geoscience Australia.

The reflection results are keyed to relevant reports mostly from Geoscience Australia resources, obtainable from:
http://www.ga.gov.au/products-services/legacy-publications.html

There is also a chronological bibliography for published papers.

The authors would like to thank all the past and present members of the seismic reflection processing group at Geoscience Australia for their efforts in rendering the seismic data into well-balanced sections.

Contents

Introduction

This collection of crustal reflection profiles has been created from the archives maintained by Geoscience Australia and includes all significant profiles for which the recording interval includes reflections from the whole crust. The objective is to provide access to an overview of crustal architecture across the continent, as a contribution to the delineation of the structure and evolution of the Australian continent. The reflection sections are presented as far as possible on the same horizontal and vertical scale and are accompanied by a geological strip map showing the configuration of the profile and its relation to other nearby lines.

The UNCOVER initiative launched by the then Minister for Resources and Energy, the Hon. Martin Ferguson, at the International Geological Congress in Brisbane in August 2012 identifies improved information on the subsurface as a prerequisite for extending exploration in Australia from regions of exposure into those with sedimentary cover. The seismic reflection profiles cover many different environments, and provide an insight into many areas with little surface rock.

The Bureau of Mineral Resources started experimental seismic reflection probing in the late 1950's with short lines, and this work was expanded through the 1960's to 1980's (Moss & Dooley, 1988), with major profiling undertaken in southern Queensland (Finlayson, 1990). Digital recording was introduced in 1976 and we present sections going back to the earliest phase of such recording. Until 1998 the reflection acquisition was undertaken using explosive sources in shotholes, using up to 120 channel acquisition systems yielding typically 6- or 12-fold data. In consequence the suppression of noise was limited, and although some sections have very good results, others are of lower quality.

In 1997 the Australian National Seismic Imaging Resource (ANSIR) was established as a Major National Research Facility, and purchased four 60,000lb vibrator trucks, which have subsequently been used in a wide range of geological environments. Recording spreads were expanded to 240 channels, and the much closer spacing of vibrator points meant that 60-fold cover could be achieved. Recently even more channels have been used, and 75-fold cover has been achieved. Terrex Seismic acted as manager of the reflection facility on behalf of ANSIR up to 2007, and since then as the primary contractor employed for deep crustal work.

The various reflection lines in this compilation have been undertaken by, or on behalf, of Geoscience Australia (and its predecessors) in association with State and Territory partners. A major boost came with the Australian Government's Onshore Energy Security Program in 2006-2011, with additional support in 2007-2011 from the AuScope research infrastructure program, that led to a further 6,500 km. Since 2012 investment from State Governments has enabled more than 4000 km of additional profiling. In all, over 16,000 km of reflection profiles penetrating the full crust have been collected under these programs.

All of the full-crustal reflection lines are included in this compilation, presented on uniform scales with accompanying geological strip map and representation of the geometry of the profile. As will be seen, there are substantial variations in crustal architecture and reflectivity, even along individual profiles. We have chosen to present the reflection sections without superimposed interpretation, so that such variations can be clearly seen and major features can be directly visualised. We provide references to the reports on the acquisition of the individual profiles and to the many papers that have been published on interpretations of particular reflection campaigns.

The crustal reflection sections have proved to be of considerable value in recent compilations of Moho structure in Australia (Kennett et al., 2011; Salmon et al., 2012), when used in combination with data from refraction and receiver function studies. The extensive geographic coverage provides valuable constraints on the thickness of the crust in many regions without other forms of control. The base of the crust is by no means smooth and reflection profiling has revealed a number of localised jumps in the depth to the Moho in different areas and geological environments.

References

Finlayson, D.M., (Compiler and Editor), 1990. The Eromanga. Brisbane Geoscience Transect: a guide to basin development across Phanerozoic Australia in southern Queensland. *Bureau of Mineral Resources, Australia Bulletin* **232**.

Kennett, B.L.N., Salmon, M., Saygin, E. & AusMoho Working Group, 2011. AusMoho: the variation in Moho depth in Australia, *Geophys. J. Int.*, **187**, 946-958.

Moss, F.J. & Dooley J.C., 1988. Deep crustal reflection recordings in Australia 1957-1973 - I Data acquisition and presentation, *Geophys. J.R. Astr. Soc.*, **93**, 229-237

Salmon, M., Kennett, B.L.N., Stern, T. & Aitken, A.R.A. 2012. The Moho in Australia and New Zealand, *Tectonophys*, doi: 10.1016/j.tecto.2012.07.009.

Reflection Displays

The reflection sections have been prepared from SEG-Y digital files from the Geoscience Australia archives. As far as possible we have used migrated record sections so that the positioning of reflectivity is as accurate as the 2-D assumptions inherent in line processing will allow. Much of the older data collected with explosives has not been migrated, and here we use the stacked traces.

The reflection sections have been prepared using the Python script detailed in the Appendix, using the facilities of Seismic Un*x (Center for Wave Propagation, Colorado School of Mines) and Generic Mapping Tools (GMT – Wessel & Smith, 1998).

Each panel of up to 220 km of reflection section is displayed on a uniform horizontal and vertical (time) scale using similar display parameters based on a combination of trace biasing and clipping. The display parameters used for the sections have been chosen to give a representation in which the character of the reflectivity is clear and the sections are not too dark so that detail can be discerned. A very slight time gain has been applied ($t^{0.05}$) to slightly enhance the deeper part of the section. In a few cases, particularly for older data where only a set of stacked traces was available, some significant tuning of the display has proved necessary to achieve a satisfactory result.

Up to 220 km of reflection profile are displayed on a single panel, with a generous overlap between the segments of longer profiles to provide continuity of view. The sections are displayed at approximately V:H 1 to 1 scale, based on an r.m.s. crustal velocity of 6 km/s. The reflection panels are annotated with two-way reflection time on the left (to 20 s) and the approximate depth conversion on the right (to 60 km). Each reflection section is accompanied by a map strip following the profile segment with Common Depth Point (CDP) numbers superimposed on geological information from the national 1:1M digital compilation (Raymond, 2012) displayed at 1:600,000 scale when printed on an A3 sheet. The grid interval is 0.5 degrees in latitude and longitude. The reflection sections are presented without any superimposed interpretation. The approximate position of crossing lines are indicated by markers.

The reflection results are grouped by six geographic regions and then displayed in related groups. Reflection profiles acquired prior to 1998 used explosive sources with limited fold so that noise suppression is uneven, and in many cases only stacked traces are available. Nevertheless these older sections still provide valuable information for many parts of the country. From 1999 (Survey L148) the reflection data were acquired using vibrator sources with much higher fold of cover, so that the signal is enhanced. The extensive reflection work since the establishment of ANSIR means that modern data are available for many parts of the continent.

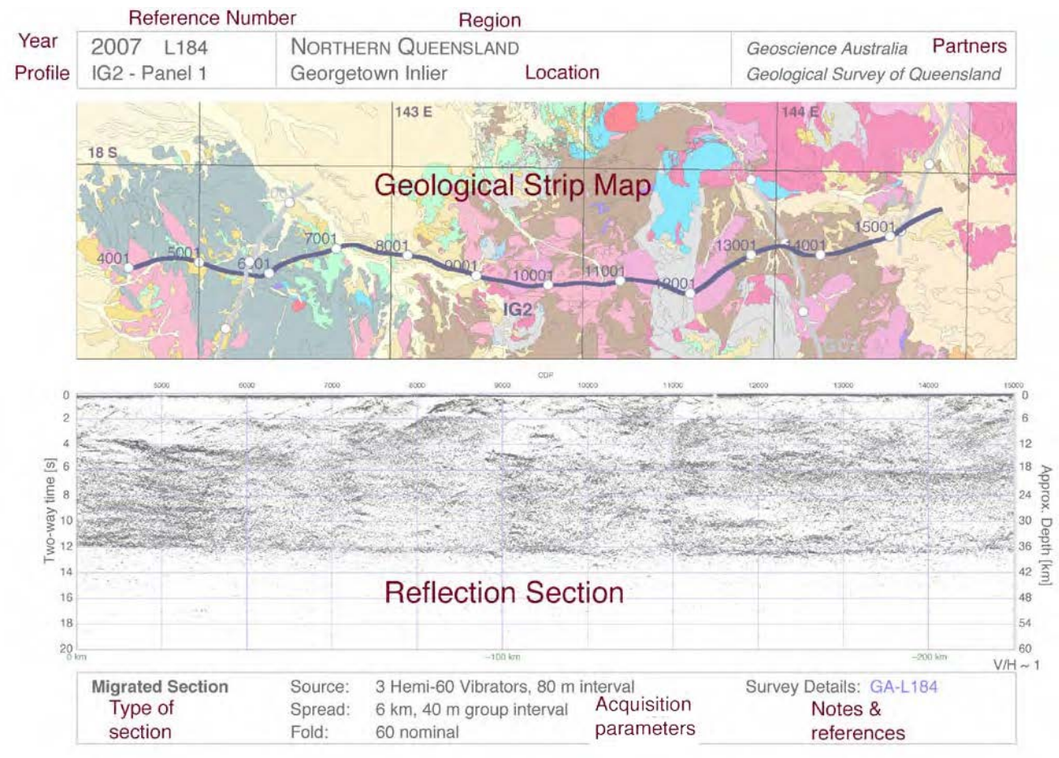
Each reflection panel is accompanied by summary information on the acquisition parameters employed, with a link to more detailed information on the survey and interpretation. The sections are annotated as *Migrated* or *Stacked* in the lower display panel. An example panel with the various elements marked is shown below.

References

Raymond, O.L., 2012. Surface Geology of Australia (1:1M scale dataset) A3 map. Geoscience Australia, Canberra.

Wessel, P. & Smith, W.H.F., 1998. New, improved version of the Generic Mapping Tools Released, *EOS Trans. AGU, 79*, 579.

Example panel

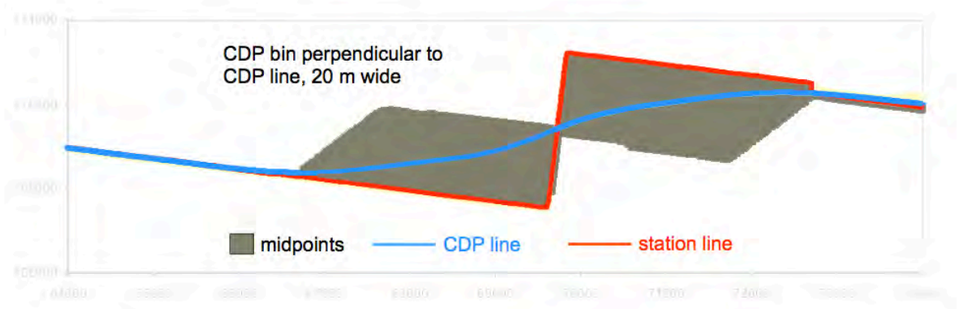


Stacking and Migration

Common Depth Point (CDP) Stacking

Seismic lines follow the available access routes and hence frequently are by no means as straight as desirable. The processing is therefore based on a line of section that smooths out the variations in the line. This CDP line is a curve of best fit through the midpoints between sources and receivers, which optimises the fold of the data while minimising the subsurface area of reflections contributing to each nominal CDP. Each trace (source-receiver pair) is allocated to the nearest CDP bin to its midpoint. Typically the CDP points are at 20 or 40 metre intervals along the line.

The relation of the CDP line to the actual configuration of the original line of stations is indicated in the figure for the case of a sharp bend in the line, as e.g. when following a set of fences.



The effect of the bin size and midpoint scatter within the bin is most critical at shallow depths. Where the line has sharp bends as in the figure, there is likely to be smearing and poor resolution of shallow data. The effect of bends on deeper data can also be significant, depending of the relative directions of the seismic line and the dip of the structures to be imaged. The data in each gather are stacked together with corrections for the vertical variations in velocity, and for more recent sections with corrections for dip at depth. This produces a single stacked trace as a function of two-way time for each CDP point.

The CDP lines are processed as if they were straight, ignoring the effects of changing azimuth along the line. This simplification of the processing to a 2D geometry at the start of the processing sequence is reasonable for large sections of the line that are relatively straight, although, it is not possible to correctly migrate reflections and, therefore, correctly image reflectors at significant bends in the line.

Post stack time migration

Migration is the final processing step and attempts to move dipping reflections to their most likely lateral positions based on an assumed velocity distribution. Reflectors that appear as dipping on a stacked section will be moved up dip, and shortened after migration. Diffraction hyperbolas which result from discontinuities, such as terminations of reflectors at faults, and which are visible on a stacked section, should collapse to a small region after migration.

The migration process is applied to the stacked record section for a line and brings together information from many CDP traces to build up the response at an individual time point. The resulting time-migrated trace is plotted for each CDP point.

Areas of poor signal to noise ratio, and sharp bends in the line, can produce artefacts in the data, which will not migrate successfully. 2-D migration is only fully-effective on a dip-section, and does not move reflections lying along strike. This can cause complications in lines with sharp bends.

The main parameters that need to be selected when performing post-stack time migration are the velocity field and dip ranges to process. The velocity field is normally derived from the stacking velocities, typically 70-80% of these velocities. This choice tends to minimise the complexities associated with interferences due to mild 3-D structure.

Depth conversion

An approximate depth conversion is plotted to the right of each of the display panels based on a conversion for an r.m.s. crustal velocity of 6 km/s. It should be noted that apparent depth will tend to be exaggerated for the shallow sedimentary parts of the section where the seismic velocity is much lower, and might be underestimated for large two-way times.

Legend for 1:1 000 000 and 1:2 500 000 Surface Geology

CENOZOIC UNITS (mainly unconsolidated deposits)

Quaternary

- Q *Quaternary sediments, undivided*
- Qa *Channel and flood plain alluvium; gravel, sand, silt, clay*
- Qb *Volcanic rocks, predominantly mafic*
- Qd *Dunes, sand plain with dunes*
- Qdc *Coastal dunes, beach ridge, barrier beach, foredune and shoreface sands*
- Qe *Estuarine, tidal delta deposits; coastal mud flats*
- Qi *Carbonate sediments*
- Qk *Calcrete*
- Qrc *Colluvium and/or residual deposits: boulder, gravel, sand*
- Qrlb *Black soil plains*
- Qsg *Glacial sediments, moraine*
- Qsm *Anthropogenic deposits; mining waste, salt pans*
- Qt *Lake and swamp deposits; mud, silt, evaporites, limestone, minor sand*
- Qv *Volcanics, undivided*

Cenozoic

- Czu *Cenozoic sediments, undivided*
- Cza *Alluvial deposits; typically incised by current drainage*
- Czb *Volcanic rocks, predominantly mafic*
- Czc *Consolidated siliclastic rocks*
- Cze *Estuarine and delta deposits*
- Czf *Felsic to intermediate volcanic rocks*
- Czg *Felsic intrusive rocks*
- Czi *Carbonate sediments*
- Czk *Calcrete*
- Czl *Laterite, ferruginous duricrust*
- Czq *Spring deposits*
- Czs *Sand plain*
- Czt *Lake and swamp deposits*
- Czu *Ultramafic intrusive rocks*
- Czz *Silcrete*

SEDIMENTARY ROCKS AND LOW-GRADE METAMORPHIC ROCKS

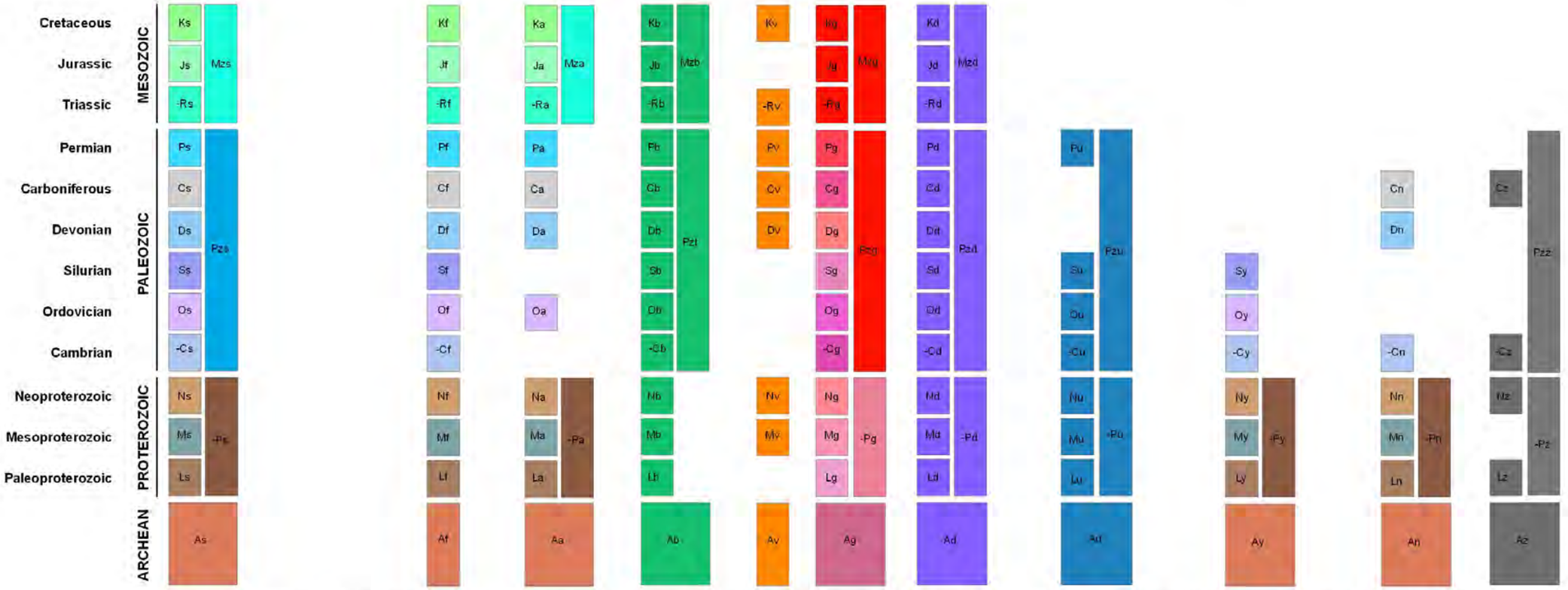
mudstone, siltstone, sandstone, conglomerate (s), limestone (l), coal measures (o), volcanogenic sediments (j), mixed sediments and volcanic rocks (w), chemical sediments (c)

IGNEOUS ROCKS

Volcanic rocks				Intrusive rocks		
Felsic	**Intermediate**	**Mafic to ultramafic**	**Felsic to mafic**	**Felsic**	**Mafic**	**Mafic to ultramafic**
(f), metamorphosed (r)	(a)	metamorphosed (t), mixed intrusives (i)	(v)	(g), quartz vein (q)	(d), metamorphosed (t)	(u), metamorphosed (e), alkaline ultrabasic (k)

METAMORPHIC ROCKS

Low-medium grade	**High-grade**	**Fault/shear rocks**
metacarbonate (m), siliciclastic (y), hornfels (h)	metamorphics (n), complexes (x)	(z)



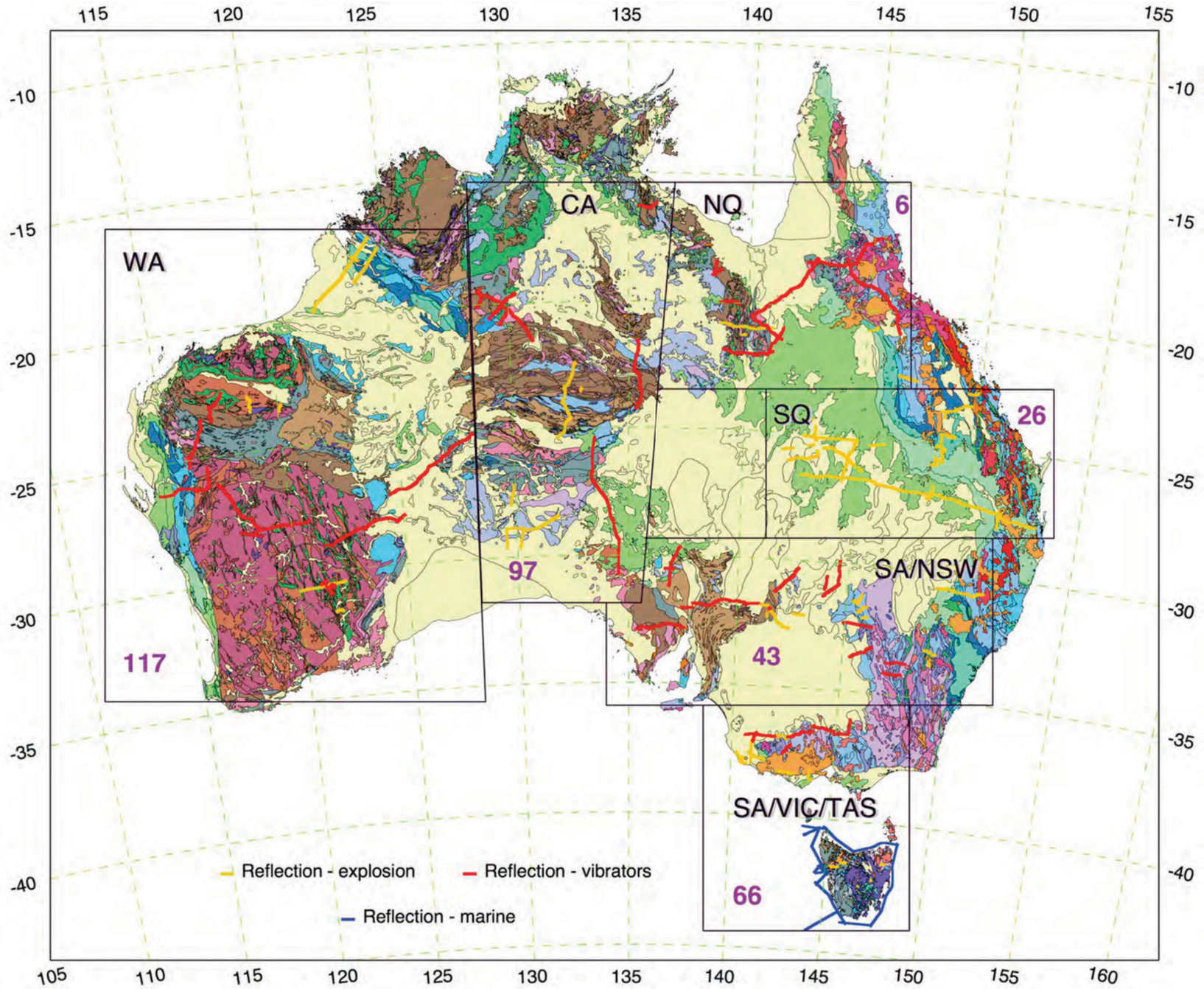
Note: Geological units which span multiple time periods have symbols showing the oldest and youngest time periods. e.g. Cambrian to Ordovician sedimentary rocks = -COs; Paleoproterozoic to Mesoproterozoic high grade metamorphics = LMn

Part I

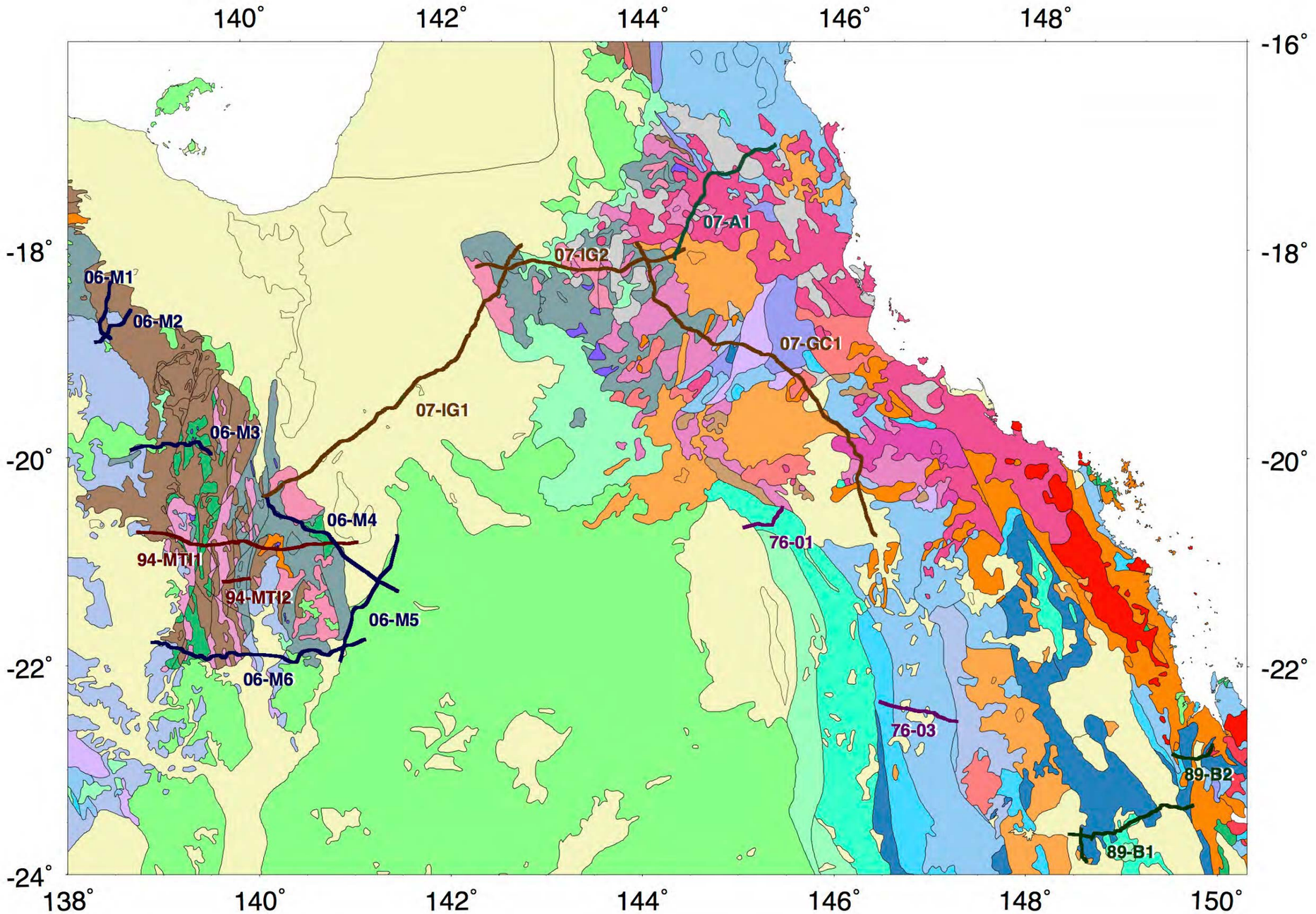
Reflection Profiling 1978-2011

Geographic Regions for Full-crustal Reflection Profiles

The set of six regional groups are outlined with reference to the page for the key diagram for the profiles.



NORTHERN QUEENSLAND REGION 1978-2011



Profiles are identified by 2 digit year and line designator

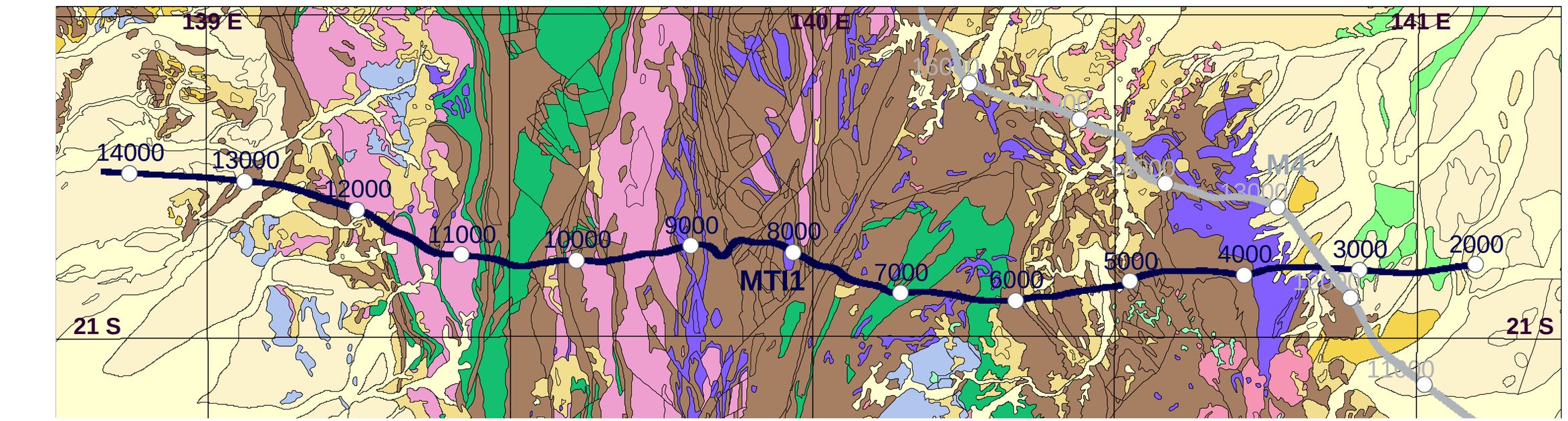
INDEX OF PROFILES: NORTHERN QUEENSLAND 1978-2011

On the display panels the reflection lines are identified by year, project identifier and line designator. The table below presents the full list of the lines and the codes used in Geoscience Australia reports, together with the nature of the display and the bias and clip parameters used to display the sections using the *pssegy* facility.

Year	Project	GA Line Code	Line Designator	Display:	Bias	Clip	Page
1976	L108 *	BMR76-01	01	Stack	1.825	75	149
		BMR76-02	02	Stack	1.825	75	149
1989	L129	BMR89-B1A	B1A	Stack	1.825	75	24
		BMR89-B1B	B1B	Stack	1.825	75	24
		BMR89-B2	B2	Stack	1.825	75	25
		BMR89-B3	B3	Stack	1.825	75	25
1994	L138	94MTI-01	MTI1	Migrated	1.47	85	8-9
		94MTI-02	MTI2	Migrated	1.47	85	9
2006	L180	06GA-M1	M1	Migrated	1.47	85	10
		06GA-M2	M2	Migrated	1.47	85	10
		06GA-M3	M3	Migrated	1.47	85	11
		06GA-M4	M4	Migrated	1.47	85	12
		06GA-M5	M5	Migrated	1.47	85	13
		06GA-M6	M6	Migrated	1.47	85	14-15
2007	L184	07GA-IG1	IG1	Migrated	1.47	85	16-17
		07GA-IG2	IG2	Migrated	1.47	85	18-19
2007	L185	07GA-GC1	GC1	Migrated	1.47	85	20-22
2007	L186	07GA-A1	A1	Migrated	1.47	85	23

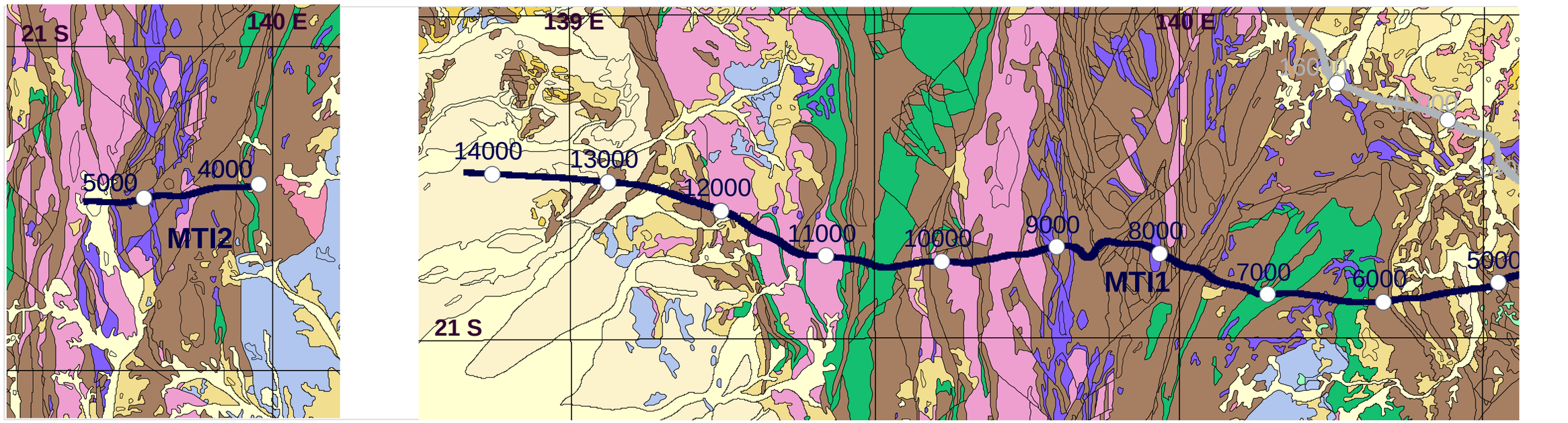
* see Early Experimental Profiles

1994 L138 MTI1 - Panel 1	NORTHERN QUEENSLAND Mt Isa Inlier	*Geoscience Australia* *AGCRC GSQ*



Migrated Section	Source:	Explosives, 240 m interval	Survey Details: GA-L138
	Spread:	120 channel, 40 m group interval	
	Fold:	10 nominal	

1994 L138 MTI2 MTI1-Panel 2	NORTHERN QUEENSLAND Mt Isa Inlier	*Geoscience Australia* *AGCRC GSQ*

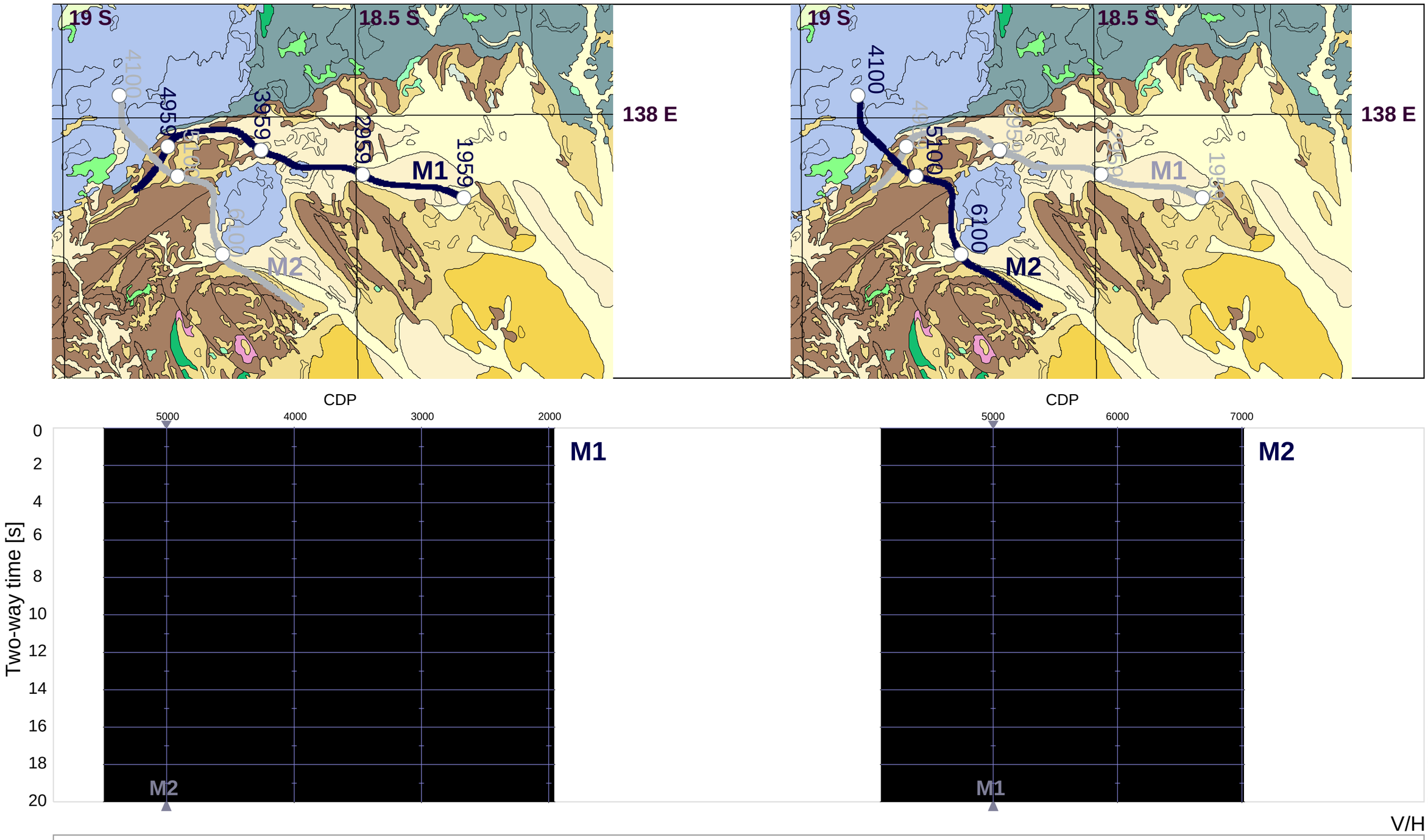


Migrated Section

Source: Explosives, 240 m interval
Spread: 120 channel, 40 m group interval
Fold: 10 nominal

Survey Details: GA-L138

2008 L180 M1 M2	NORTHERN QUEENSLAND Mt Isa Inlier	*Geoscience Australia* *Geological Survey of Queensland*

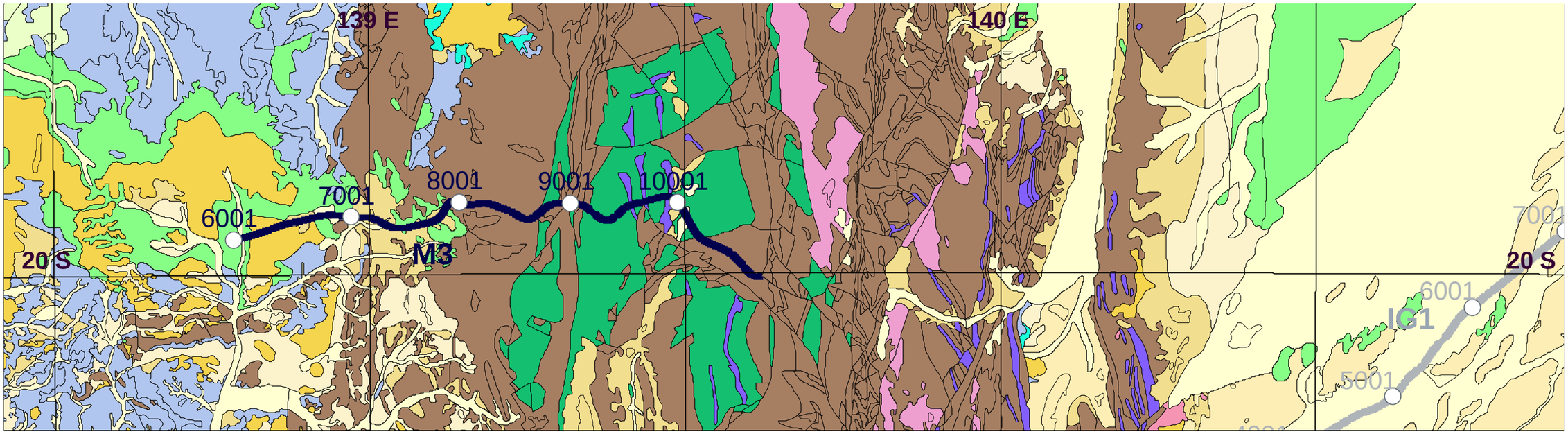


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L180

2006 L180 M3	NORTHERN QUEENSLAND Mt Isa Inlier	*Geoscience Australia* *Geological Survey of Queensland*

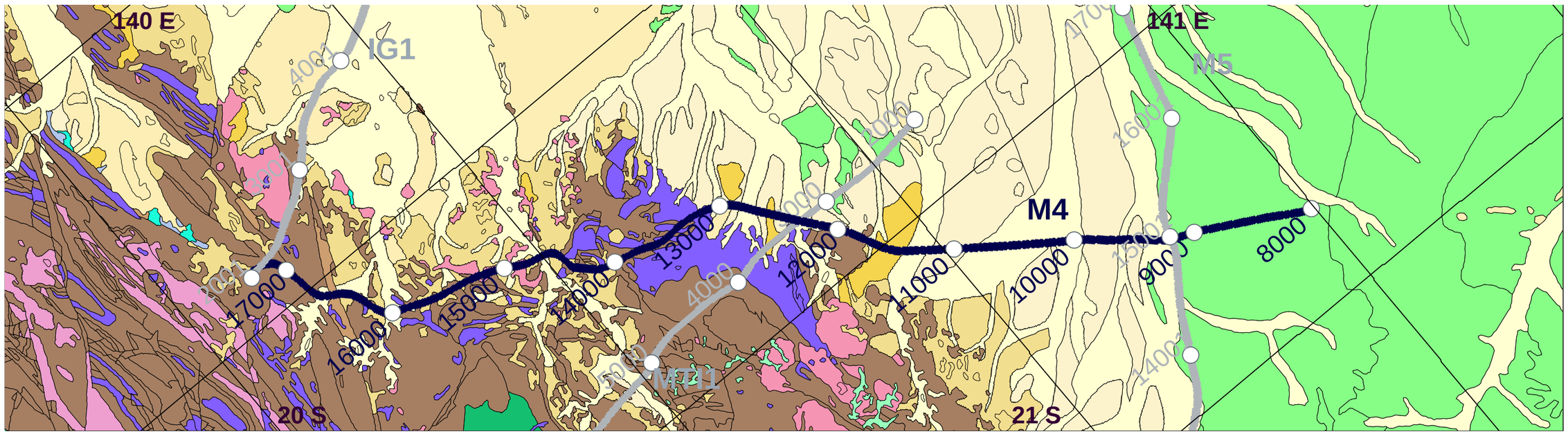


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L180

12	2006 L180 M4	NORTHERN QUEENSLAND Southern Mt Isa Inlier	*Geoscience Australia* *Geological Survey of Queensland*

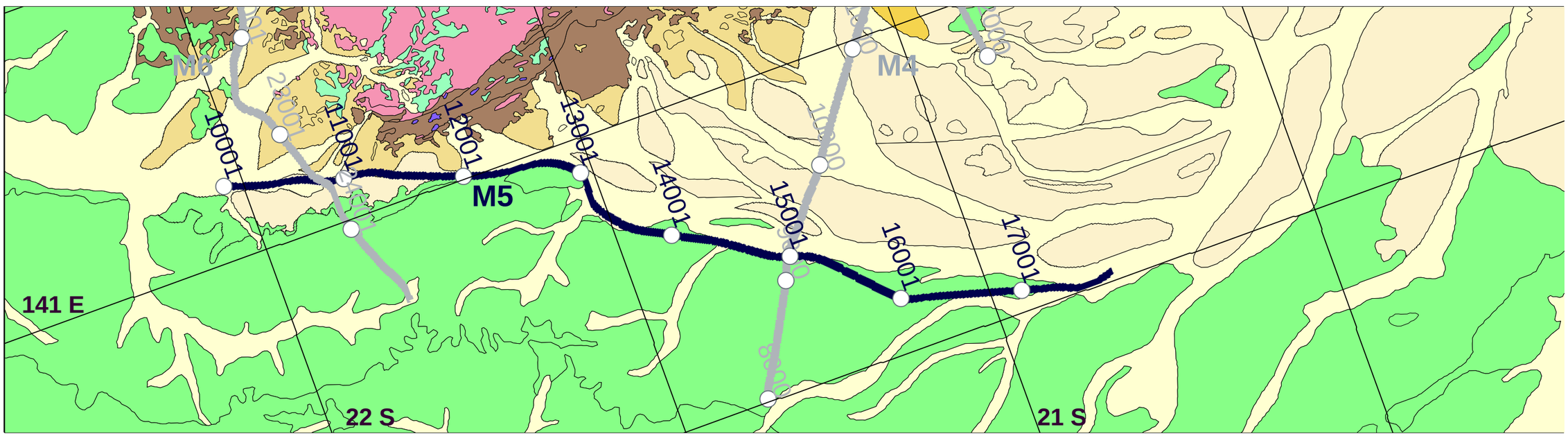


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L180

2006 L180 M5	NORTHERN QUEENSLAND Southern Mt Isa Inlier	*Geoscience Australia* *Geological Survey of Queensland*



Migrated Section

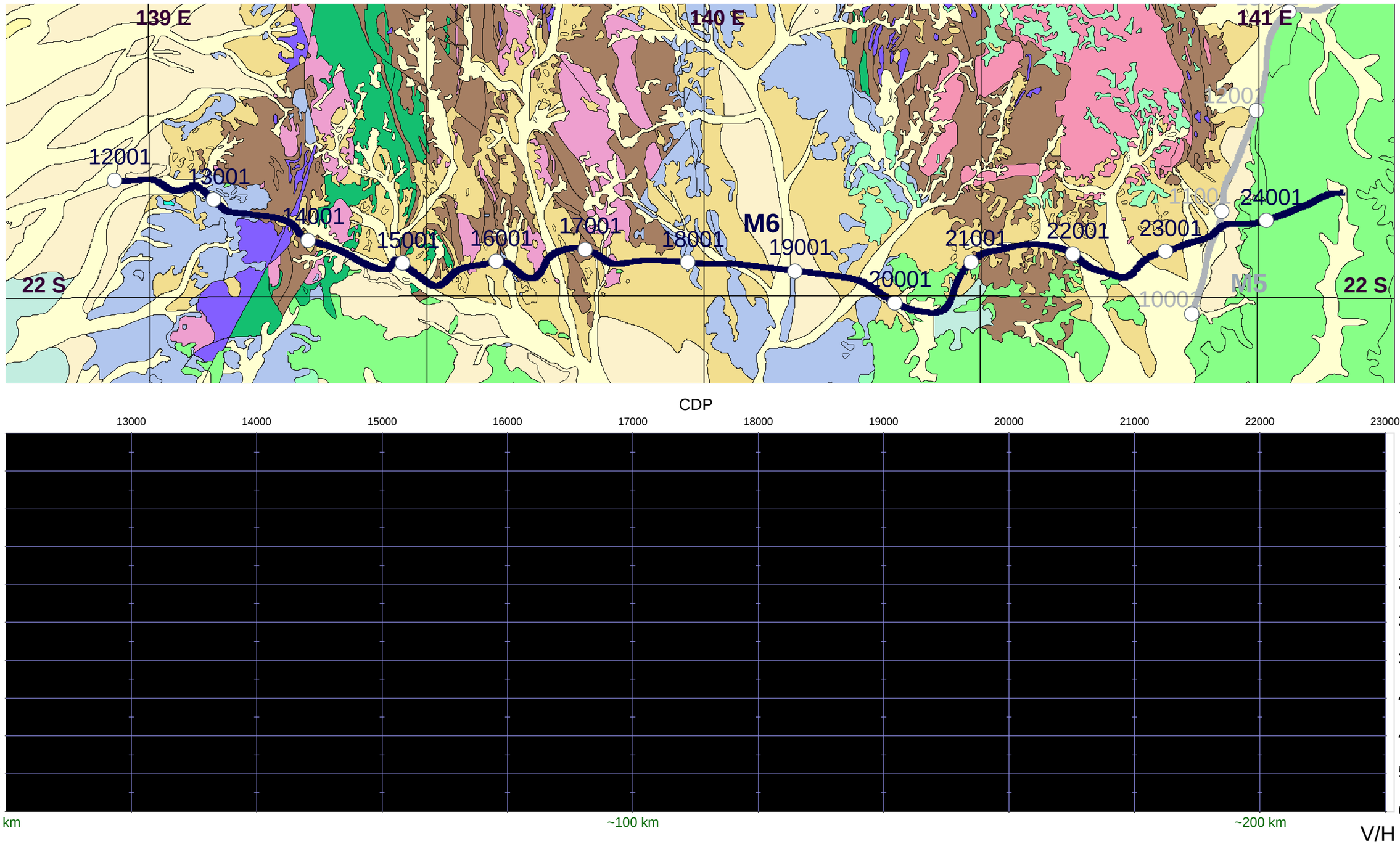
Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L180

2006 L180
M6 - Panel 1

NORTHERN QUEENSLAND
Southern Mt Isa Inlier

Geoscience Australia
Geological Survey of Queensland

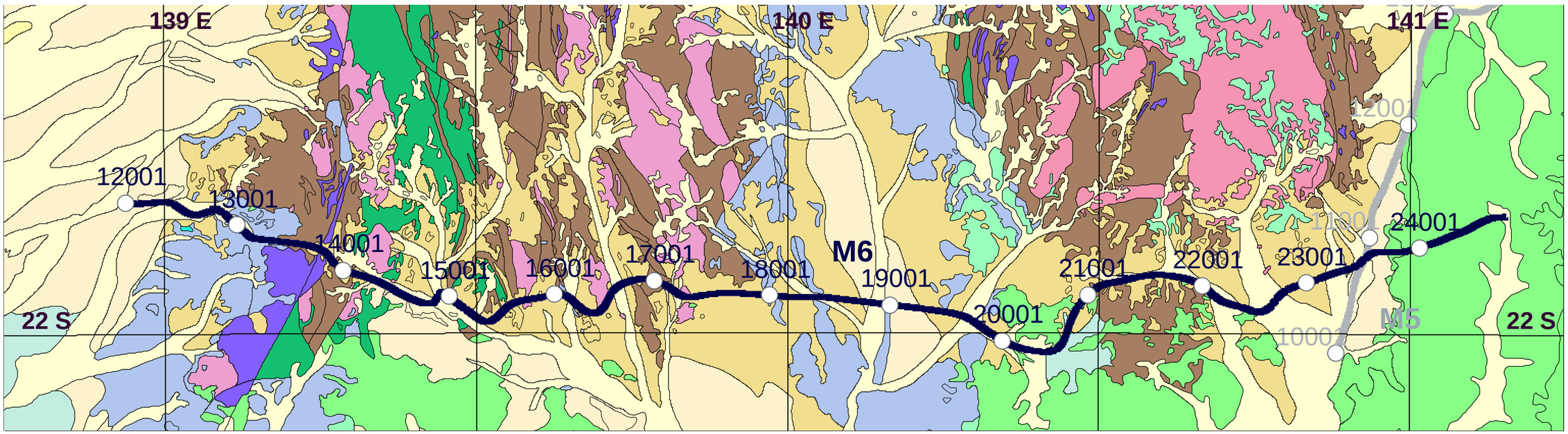


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L180

2006 L180 M6 - Panel 2	NORTHERN QUEENSLAND Southern Mt Isa Inlier	*Geoscience Australia* *Geological Survey of Queensland*

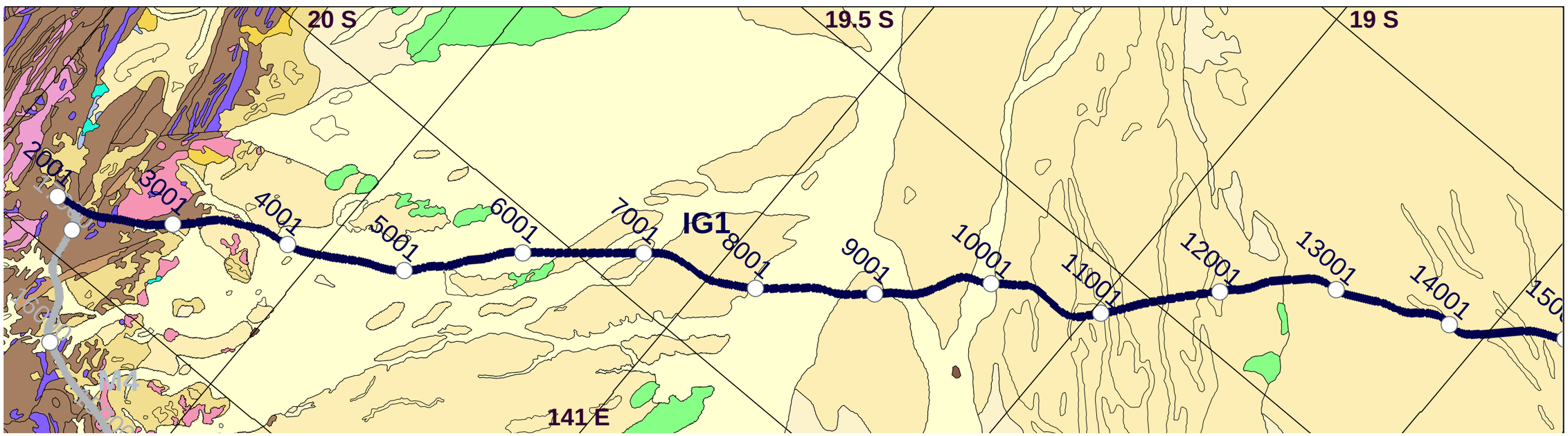


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L180

2007 L184 IG1 - Panel 1	NORTHERN QUEENSLAND Cloncurry to Georgetown Inlier	*Geoscience Australia* *Geological Survey of Queensland*



Migrated Section

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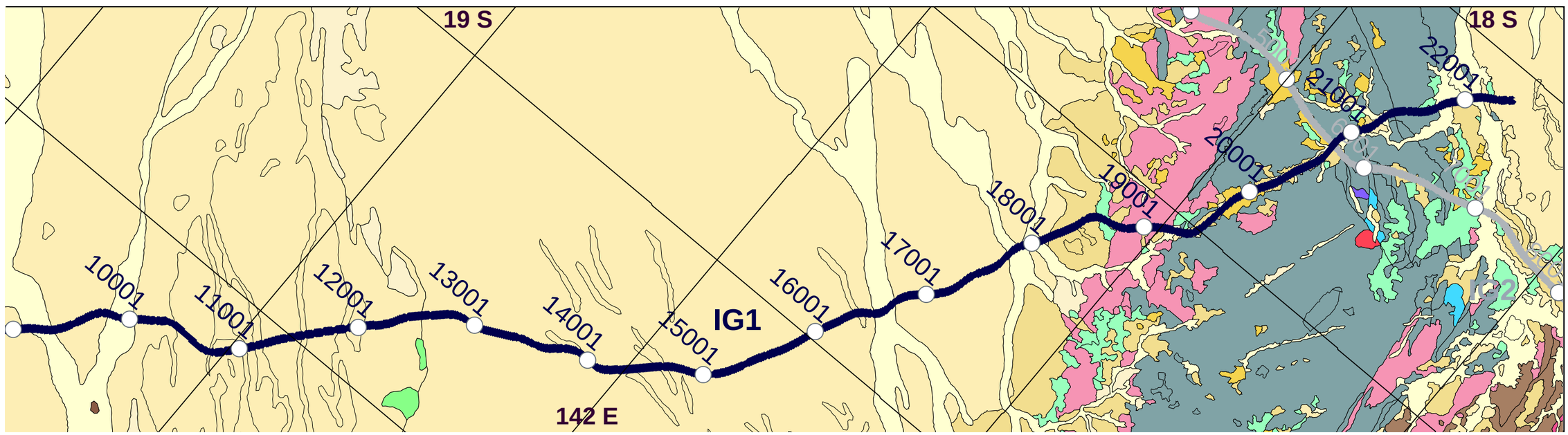
Spread: 240 channels, 40 m group interval
Fold: 60 nominal

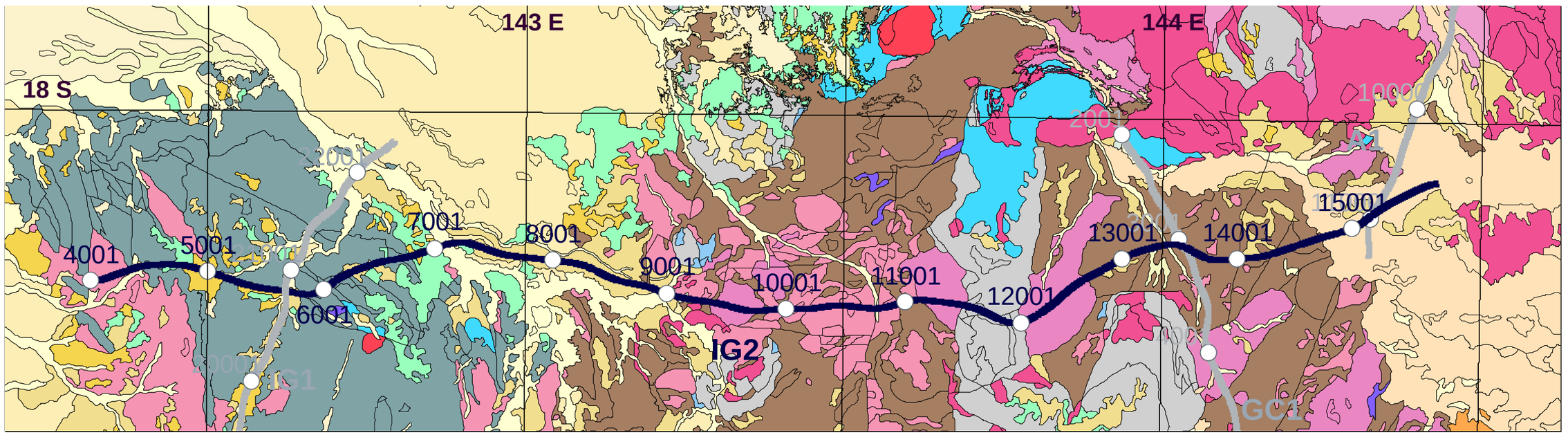
Survey Details: GA-L184

2007 L184 IG1 - Panel 2	NORTHERN QUEENSLAND Cloncurry to Georgetown Inlier	*Geoscience Australia* *Geological Survey of Queensland*



Migrated Section	Source:	3 Hemi-60 Vibrators, 80 m interval	Survey Details: GA-L184
	Spread:	240 channels, 40 m group interval	
	Fold:	60 nominal	

2007 L184 IG2 - Panel 1	NORTHERN QUEENSLAND Georgetown Inlier	*Geoscience Australia* *Geological Survey of Queensland*

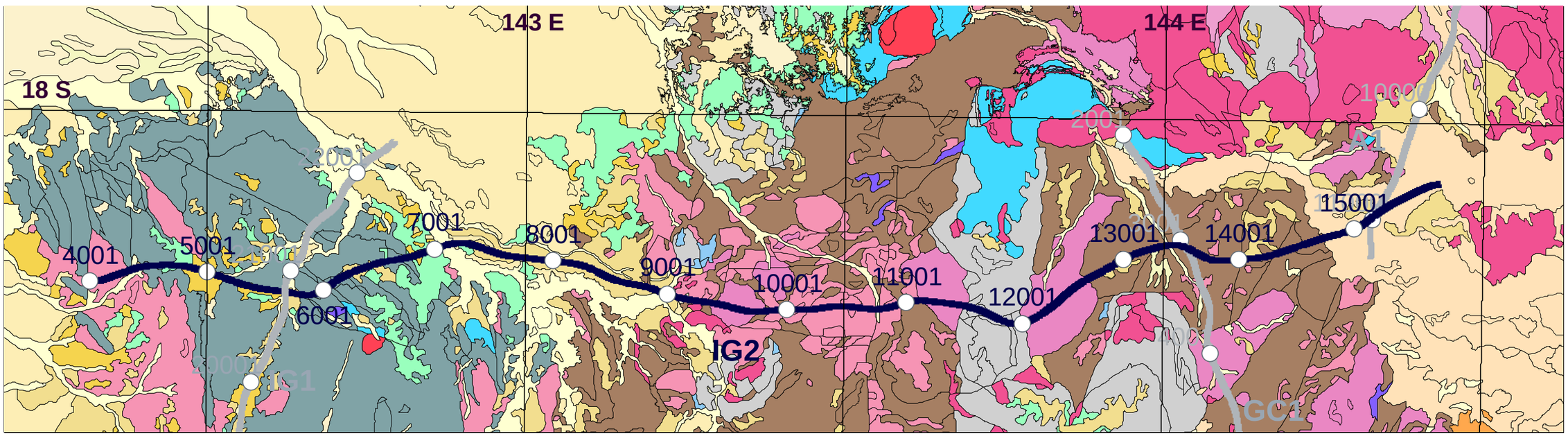


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 300 channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L184

2007 L184 IG2 - Panel 2	NORTHERN QUEENSLAND Georgetown Inlier	*Geoscience Australia* *Geological Survey of Queensland*



Migrated Section

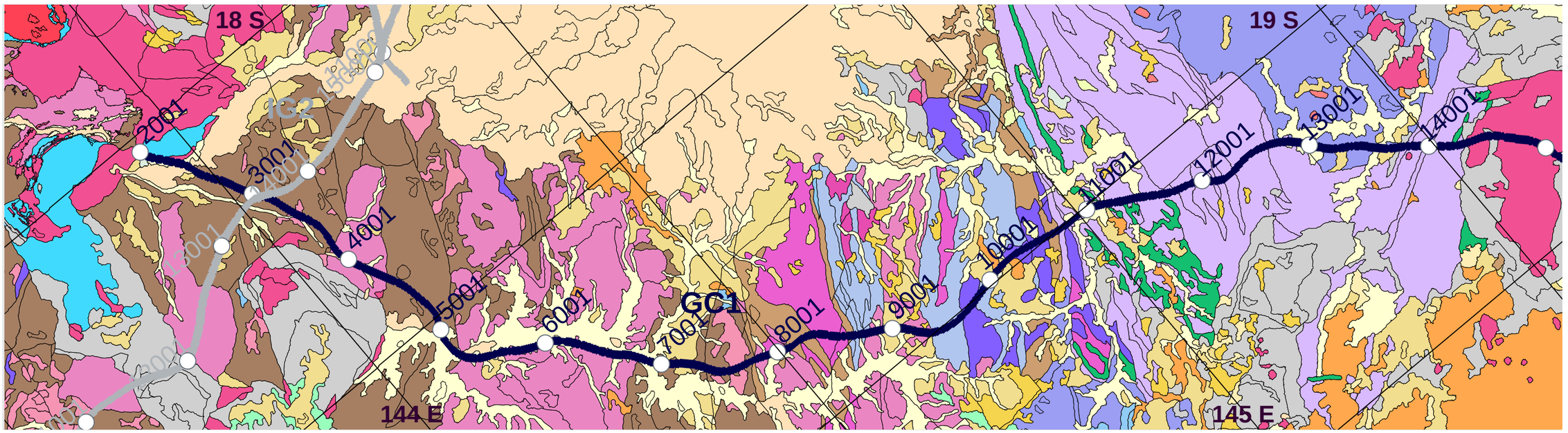
Source: 3 Hemi-60 Vibrators, 80 m interval

Spread: 300 channels, 40 m group interval

Fold: 75 nominal

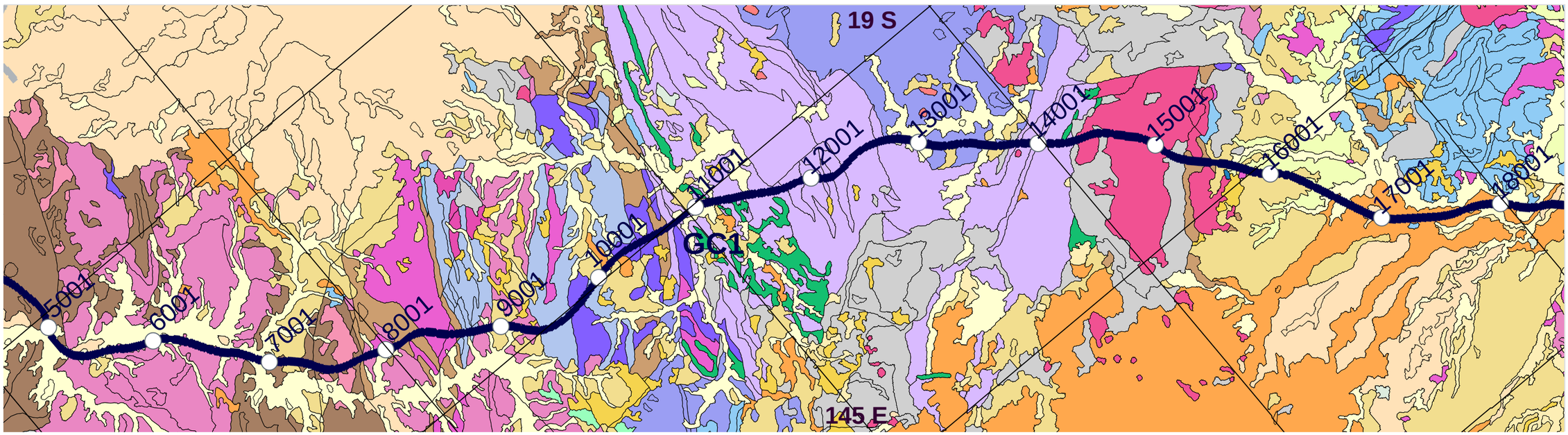
Survey Details: GA-L184

2007 L185 GC1 - Panel 1	NORTHERN QUEENSLAND Georgetown Inlier to Charters Towers	*Geoscience Australia* *Geological Survey of Queensland*



Migrated Section	Source:	3 Hemi-60 Vibrators, 80 m interval	Survey Details: GA-L185
	Spread:	300 channels, 40 m group interval	
	Fold:	75 nominal	

2007 L185 GC1 - Panel 2	NORTHERN QUEENSLAND Georgetown Inlier to Charters Towers	*Geoscience Australia* *Geological Survey of Queensland*

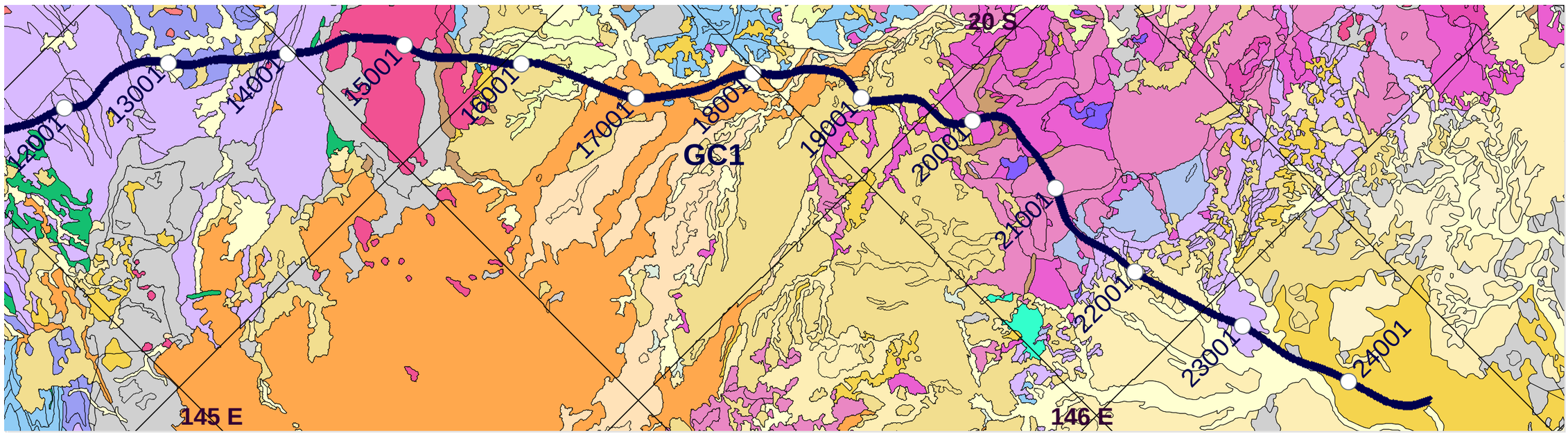


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 300 channels, 40 m group interval
Fold: 75 nominal

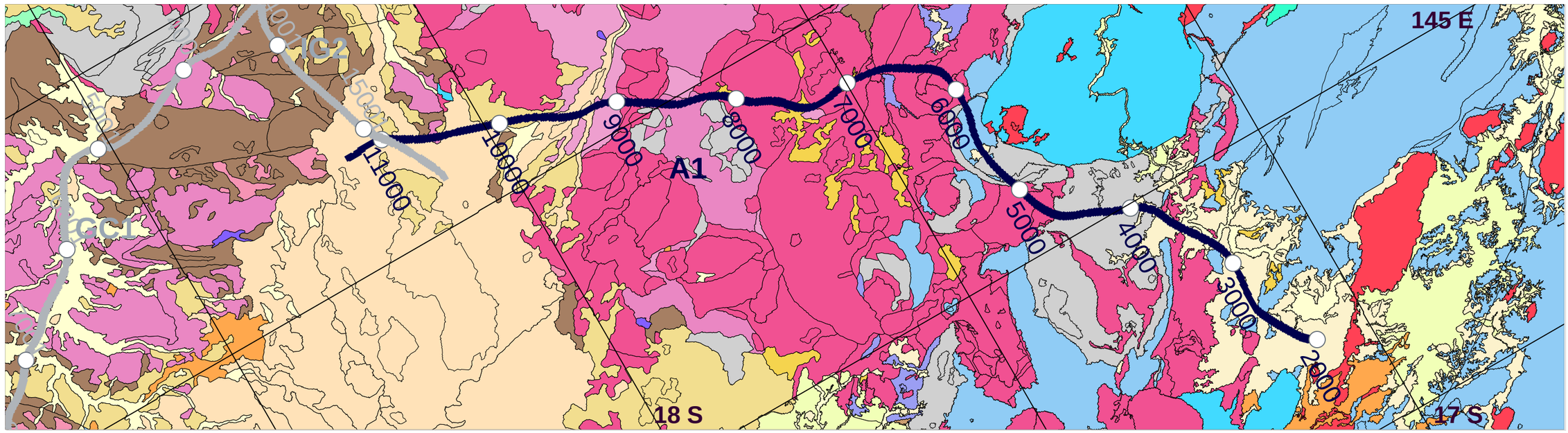
Survey Details: GA-L185

2007 L185 GC1 - Panel 3	NORTHERN QUEENSLAND Georgetown Inlier to Charters Towers	*Geoscience Australia* *Geological Survey of Queensland*



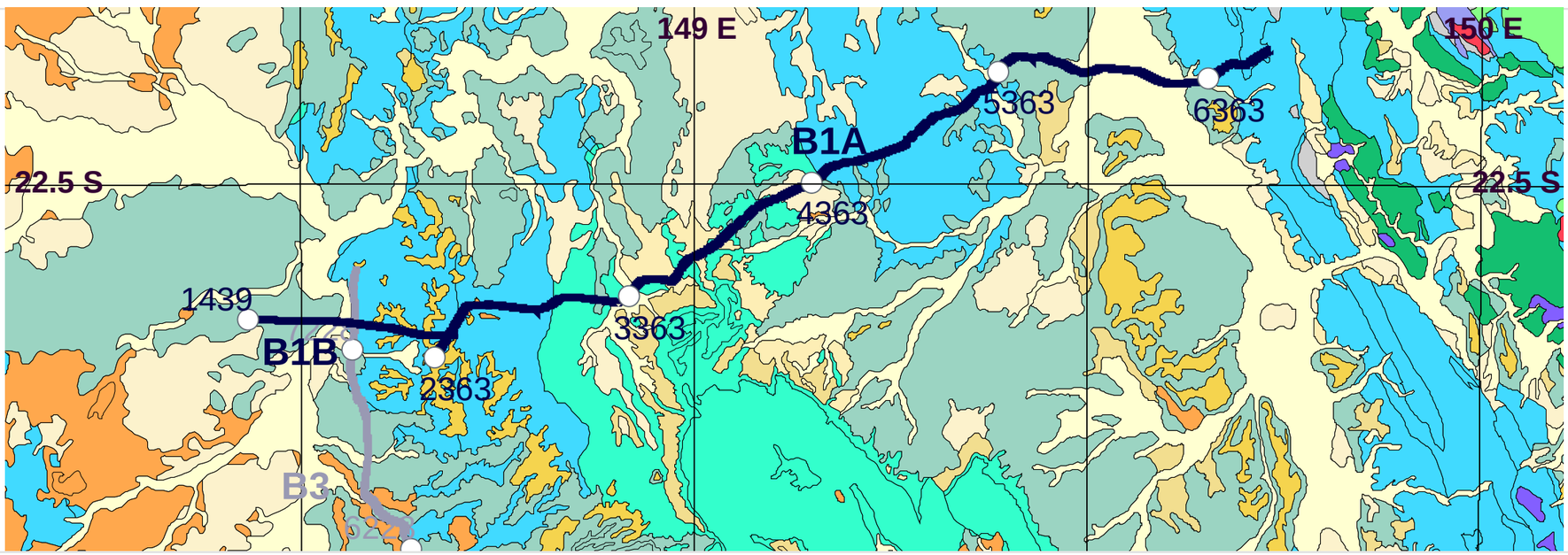
Migrated Section	Source:	3 Hemi-60 Vibrators, 80 m interval	Survey Details: GA-L185
	Spread:	300 channels, 40 m group interval	
	Fold:	75 nominal	

2007 L186 A1	NORTHERN QUEENSLAND Georgetown Inlier to Mareeba	*AuScope* *Geoscience Australia*



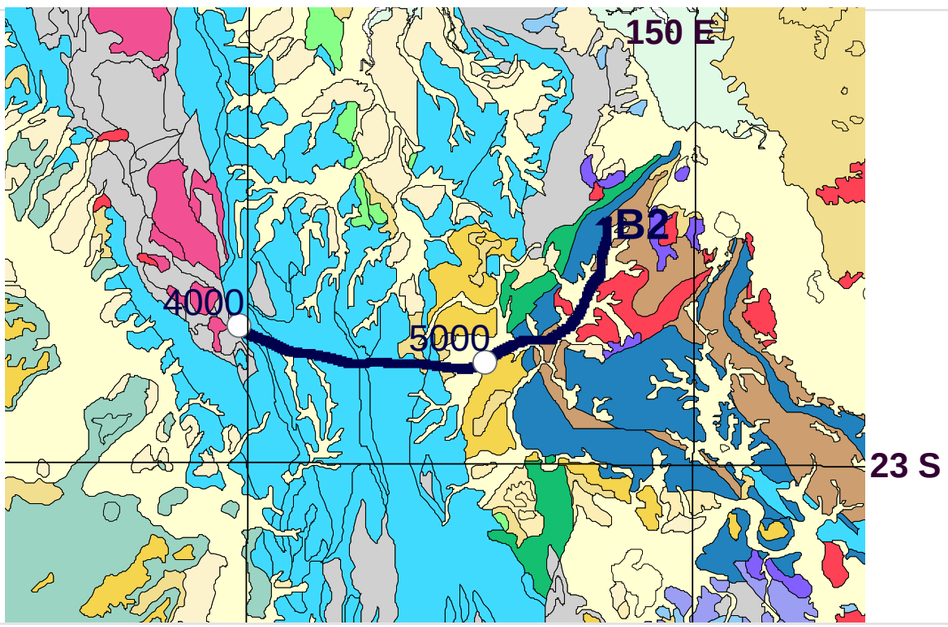
Migrated Section	Source:	3 Hemi-60 Vibrators, 80 m interval	Survey Details: GA-L186
	Spread:	300 channels, 40 m group interval	
	Fold:	75 nominal	

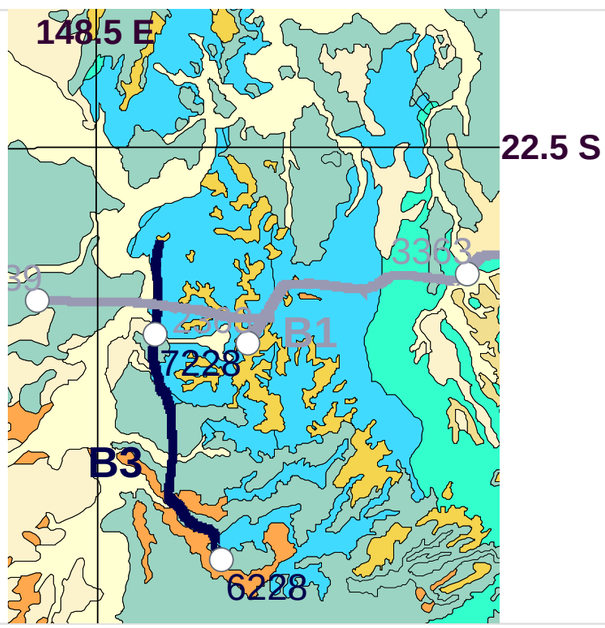
1989 L129 B1A B1B	NORTHERN QUEENSLAND Bowen Basin	*Geoscience Australia*

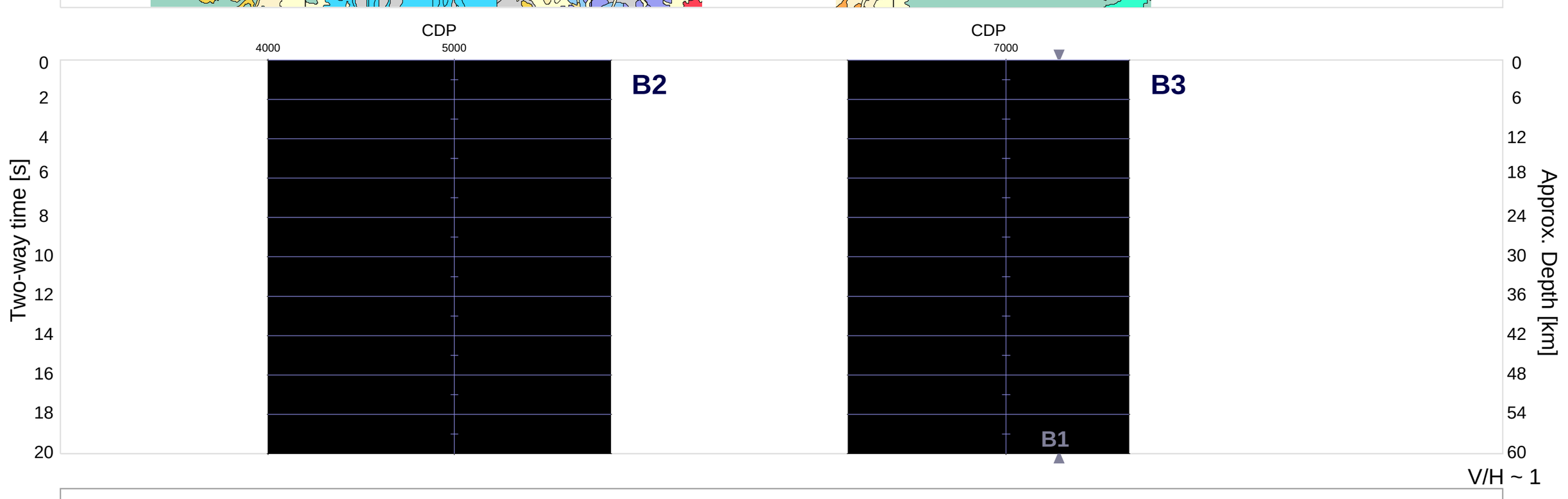


Stacked Section	Source:	Explosion, 360 m interval	Survey Details: GA-L129
	Spread:	96 channels, 60 m group interval	
	Fold:	8 nominal	

1989 L129 B2 B3	NORTHERN QUEENSLAND Bowen Basin	*Geoscience Australia*

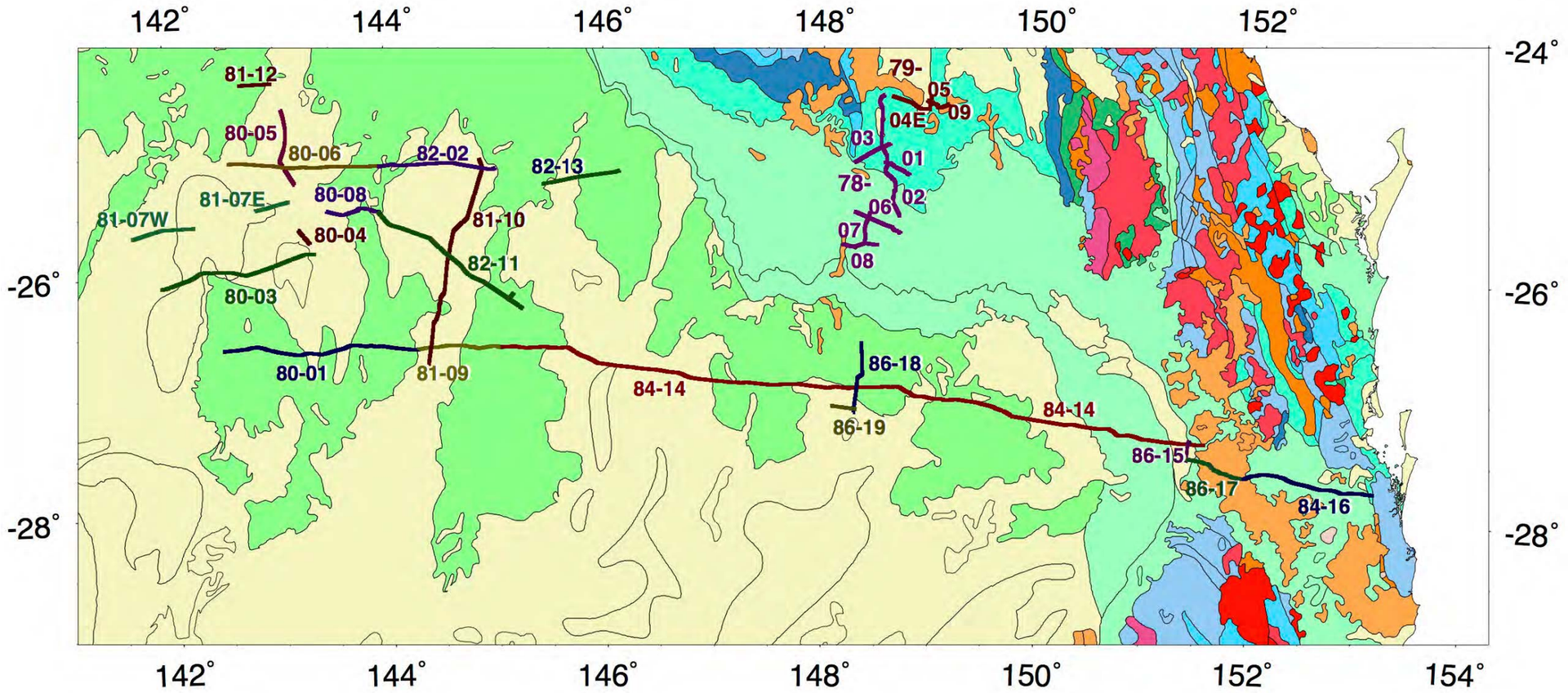






Stacked Section	Source:	Explosion, 360 m interval	Survey Details: GA-L129
	Spread:	96 channels, 60 m group interval	
	Fold:	8 nominal	

SOUTHERN QUEENSLAND REGION 1978-2011



Profiles are identified by 2 digit year and line designator

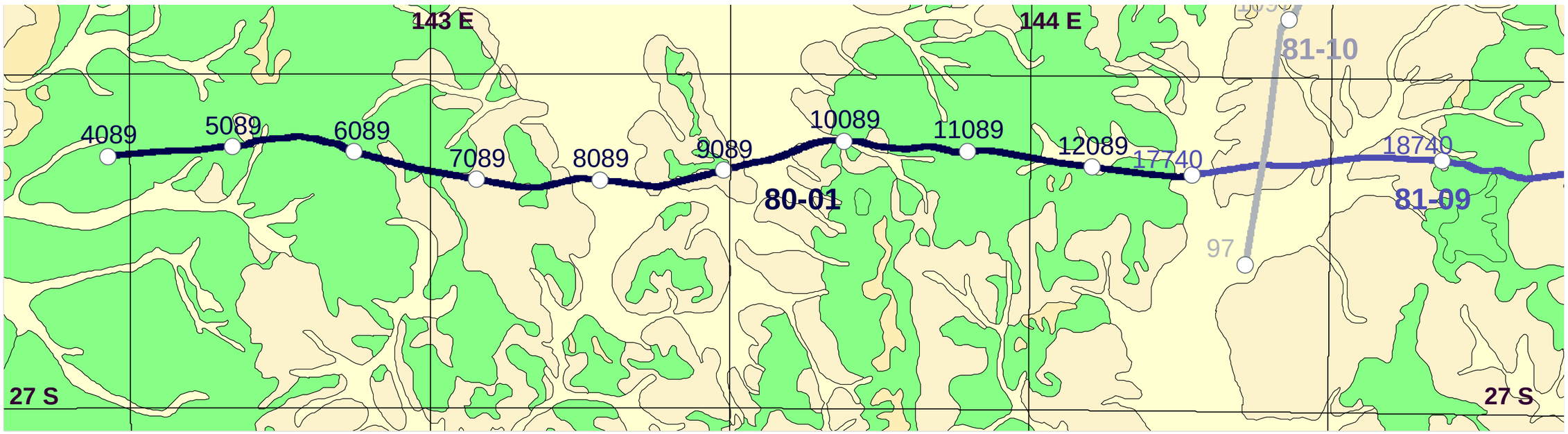
INDEX OF PROFILES: SOUTHERN QUEENSLAND 1978-2011

On the display panels the reflection lines are identified by year, project identifier and line designator. The table below presents the full list of the lines and the codes used in Geoscience Australia reports, together with the nature of the display and the bias and clip parameters used to display the sections using the *pssegy* facility.

Year	Project	GA Line Code	Line Designator	Display:	Bias	Clip	Page
1978	L111*	BMR78-01, 02, 03, 06, 07, 08	78-01, 78-02,78-03, 78-06, 78-07, 78-08	Stack	1.70	80	150,152
1979	L112*	BMR79-04E, 05, 09	79-04E, 79-05, 79-09	Stack	1.70	80	151
1980	L115	BMR80-01	80-01	Stack	1.70	80	28
		BMR80-03	80-03	Stack	1.70	80	35
		BMR80-04	80-04	Stack	1.70	80	35
		BMR80-05	80-05	Stack	1.70	80	39
		BMR80-06	80-06	Stack	1.70	80	36,39
		BMR80-08	80-08	Stack	1.70	80	41
1981	L116	BMR81-7E, 7W	81-07E, 07W	Stack	1.70	80	37
		BMR81-09	81-09	Stack	1.70	80	28,29
		BMR81-10	81-10	Stack	1.70	80	38
		BMR81-12	81-12	Stack	1.70	80	39
1982	L118	BMR82-02	81-02	Stack	1.70	80	36,40
		BMR82-11	82-11	Stack	1.70	80	41
		BMR82-11A	82-11A	Stack	1.70	80	41
		BMR82-13	82-13	Stack	1.70	80	40
1984	L120	BMR84-14	84-14	Stack	1.72	80	29-33
		BMR84-16	84-16	Stack	1.70	80	34
1986	L123	BMR86-15	86-15	Stack	1.70	80	34
		BMR86-17	86-17	Stack	1.70	80	34
		BMR86-18	86-18	Stack	1.70	80	42
		BMR86-19	86-19	Stack	1.70	80	42

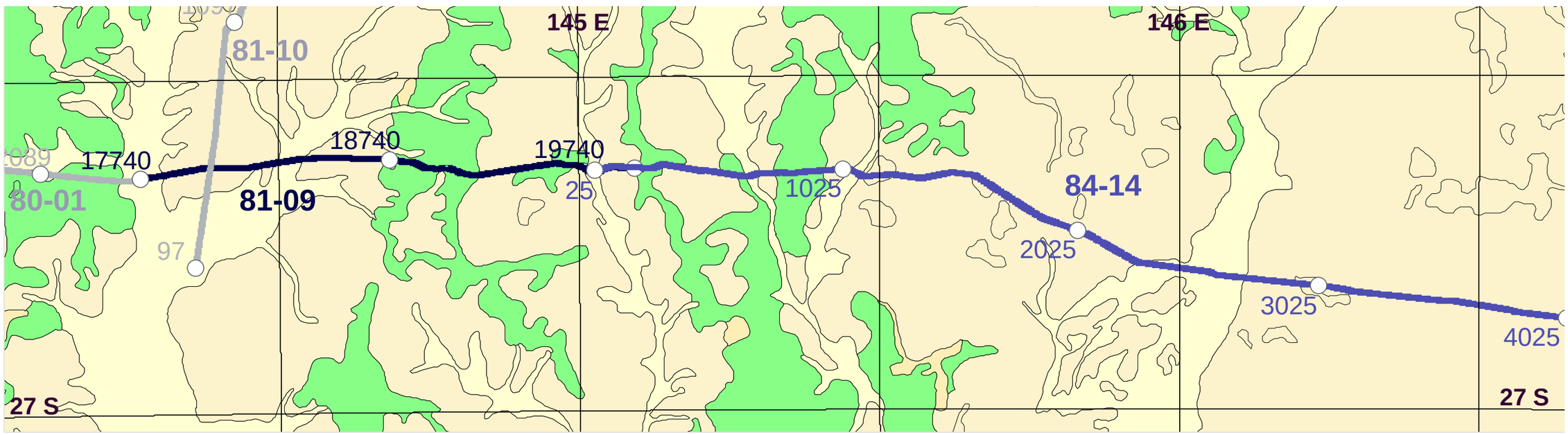
*see Early Experimental Profiles

1980 L115 80-01 1981 L116 81-09	SOUTHERN QUEENSLAND Eromanga-Brisbane Transect	*Geoscience Australia*



Stacked Section	Source:	Explosives, 333 m interval	Survey Details:	GA-L115
	Spread:	48 Channels, 83.33 m group interval		GA-L116
	Fold:	6 nominal		

1981 L116 81-09 1984 L120 84-14	SOUTHERN QUEENSLAND Eromanga-Brisbane Transect	*Geoscience Australia*



Stacked Section

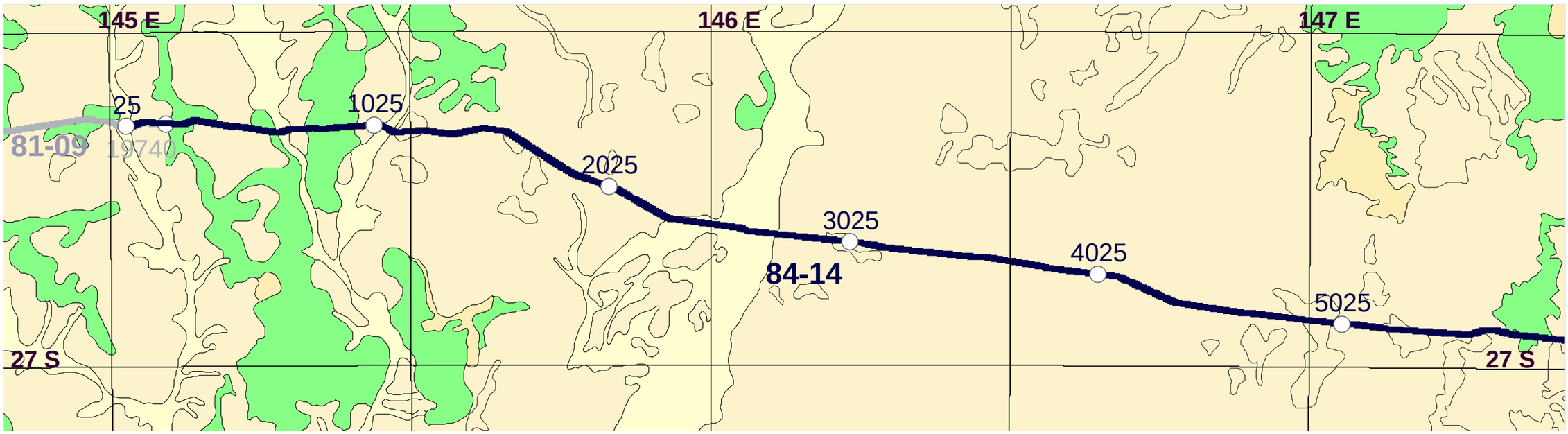
Source: Explosives, 333 m interval

Spread: 48 Channels, 83.33 m group interval

Fold: 6 nominal

Survey Details: GA-L116, GA-L120

1984 L120 84-14 Panel 1	SOUTHERN QUEENSLAND Eromanga-Brisbane Transect	*Geoscience Australia*



Stacked Section

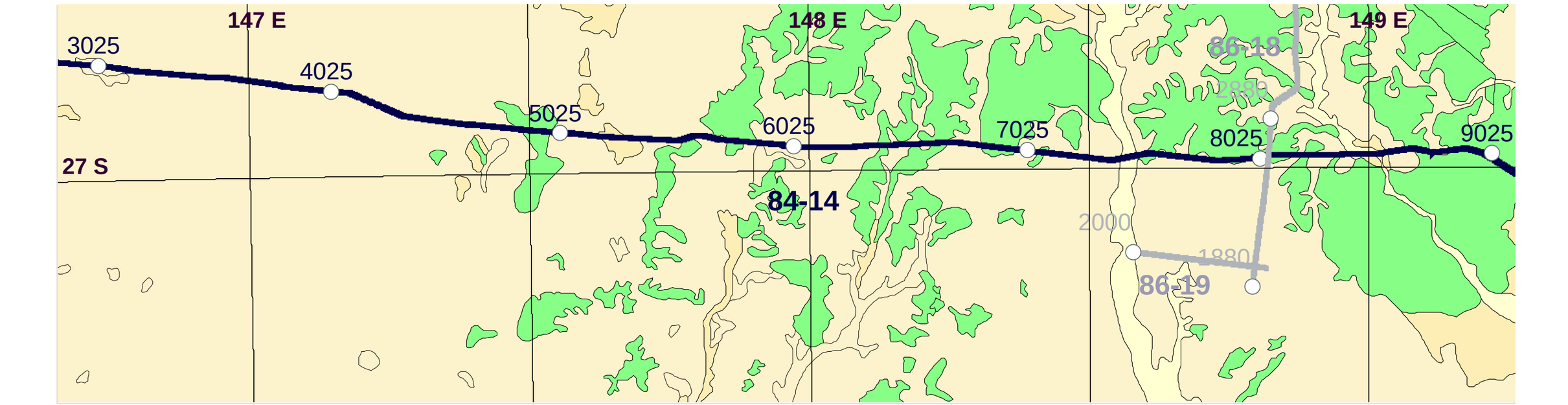
Source: Explosives, 333 m interval

Spread: 48 Channels, 83.33 m group interval

Fold: 6 nominal

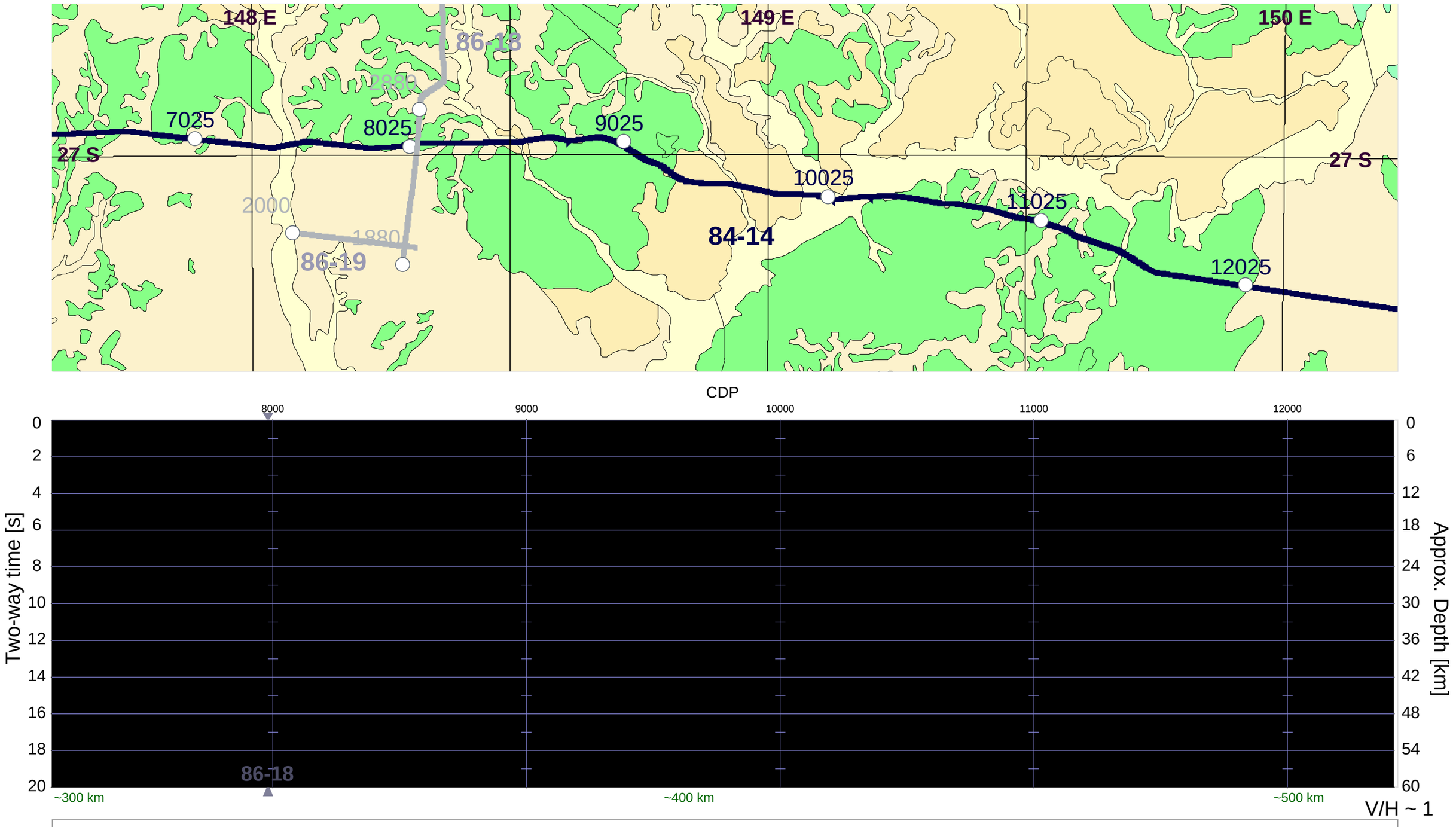
Survey Details: GA-L120

1984 L120 84-14 Panel 2	SOUTHERN QUEENSLAND Eromanga-Brisbane Transect	*Geoscience Australia*



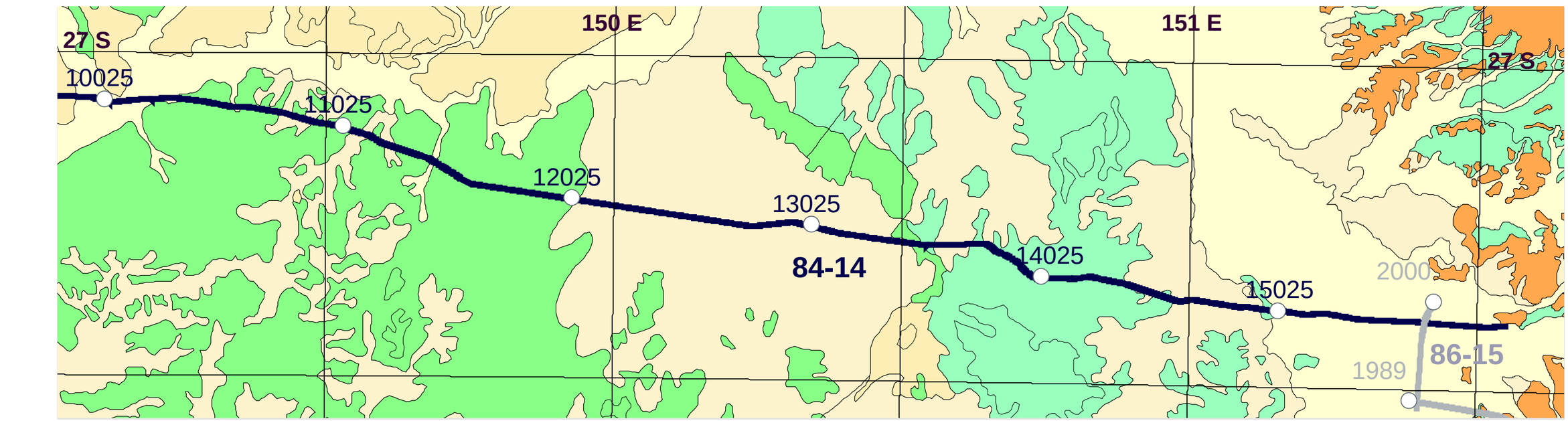
Stacked Section	Source:	Explosives, 333 m interval	Survey Details: GA-L120
	Spread:	48 Channels, 83.33 m group interval	
	Fold:	6 nominal	

1984 L120 84-14 Panel 3	SOUTHERN QUEENSLAND Eromanga-Brisbane Transect	*Geoscience Australia*



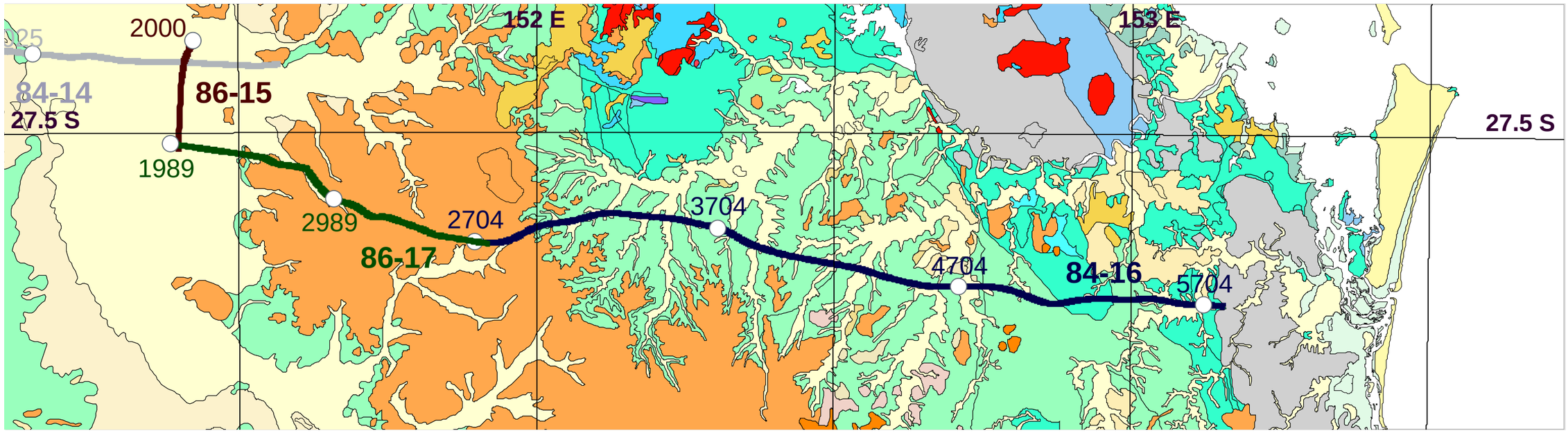
Stacked Section	Source:	Explosives, 333 m interval	Survey Details: GA-L120
	Spread:	48 Channels, 83.33 m group interval	
	Fold:	6 nominal	

1984 L120 84-14 Panel 4	SOUTHERN QUEENSLAND Eromanga-Brisbane Transect	*Geoscience Australia*



Stacked Section	Source:	Explosives, 333 m interval	Survey Details: GA-L120
	Spread:	48 Channels, 83.33 m group interval	
	Fold:	6 nominal	

1984 L120 84-16 1986 L123 86-15,17	SOUTHERN QUEENSLAND Eromanga-Brisbane Transect	*Geoscience Australia*



Stacked Section

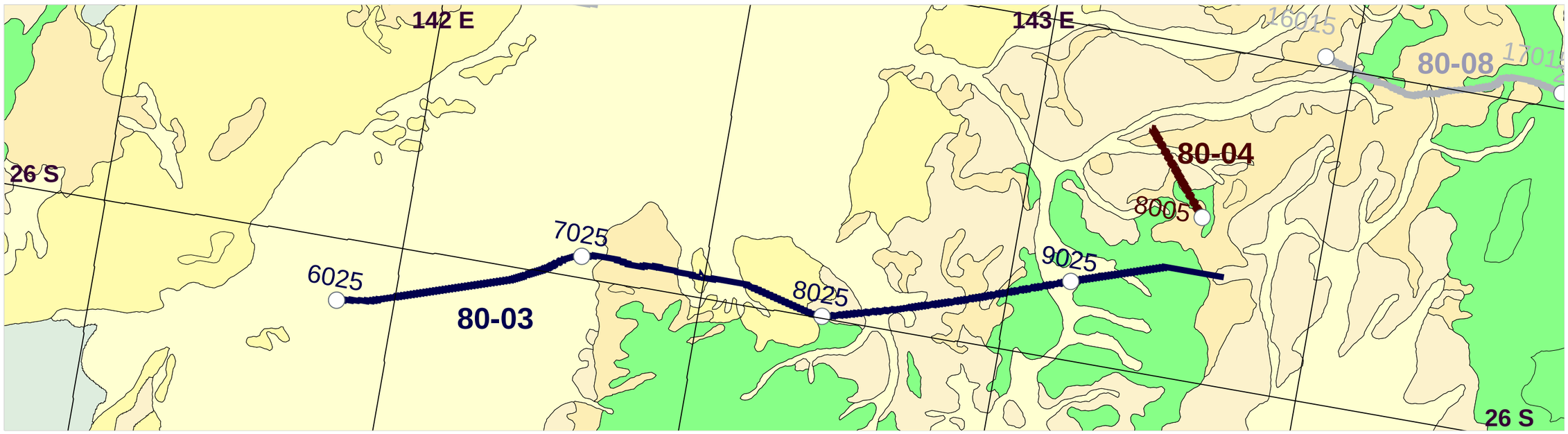
Source: Explosives, interval 333 m - L120, 360 m - L123

Spread: L120 - 48 channels, 83.33 m group interval Fold: 6 nominal

Fold: L123 - 96 channels, 60.00 m group interval Fold: 8 nominal

Survey Details: GA-L120, GA-L123

1980 L115 80-03 80-04	SOUTHERN QUEENSLAND Central Eromanga Basin	*Geoscience Australia*



Stacked Section

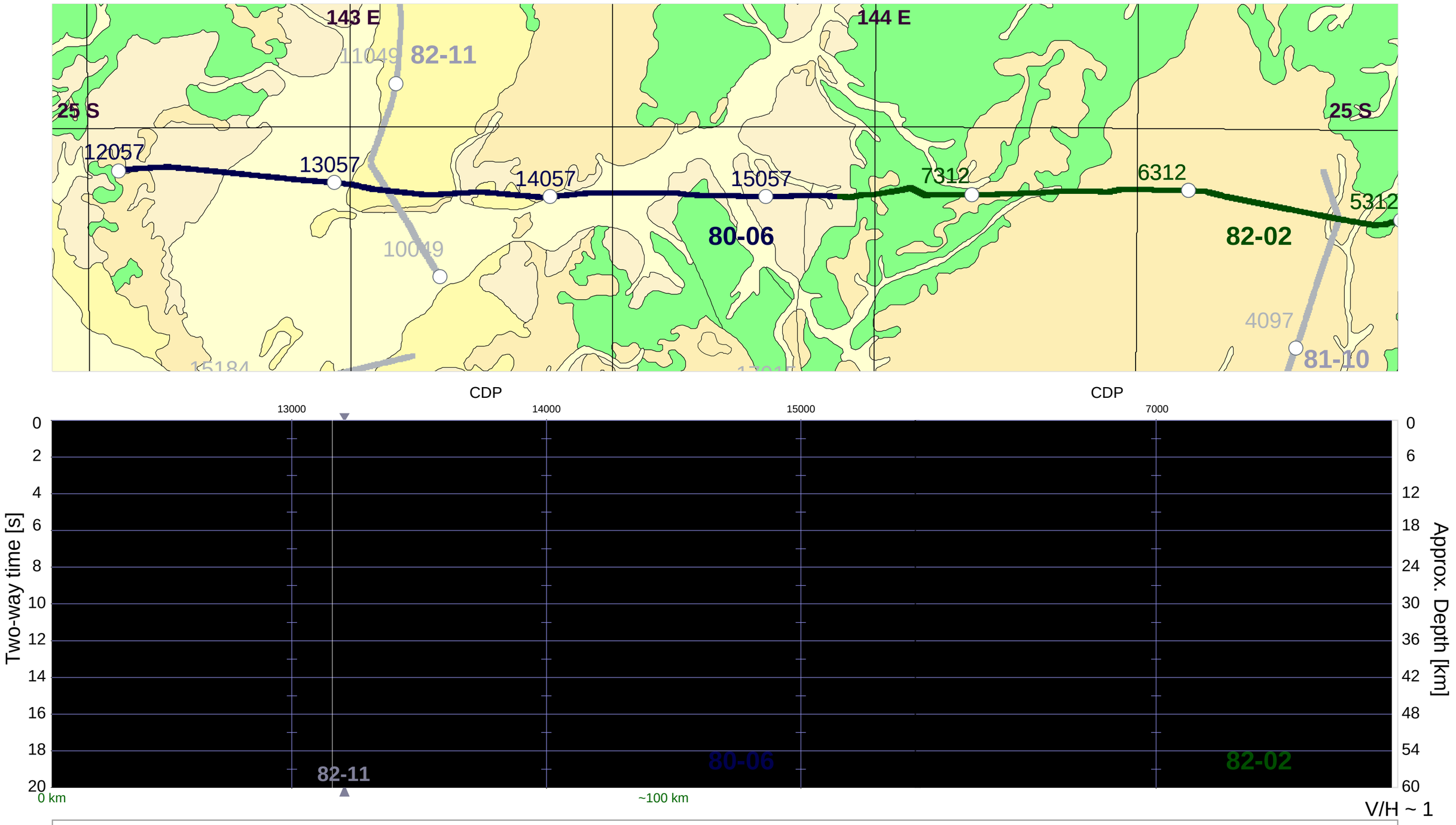
Source: Explosives, 333 m interval

Spread: 48 Channels, 83.33 m group interval

Fold: 6 nominal

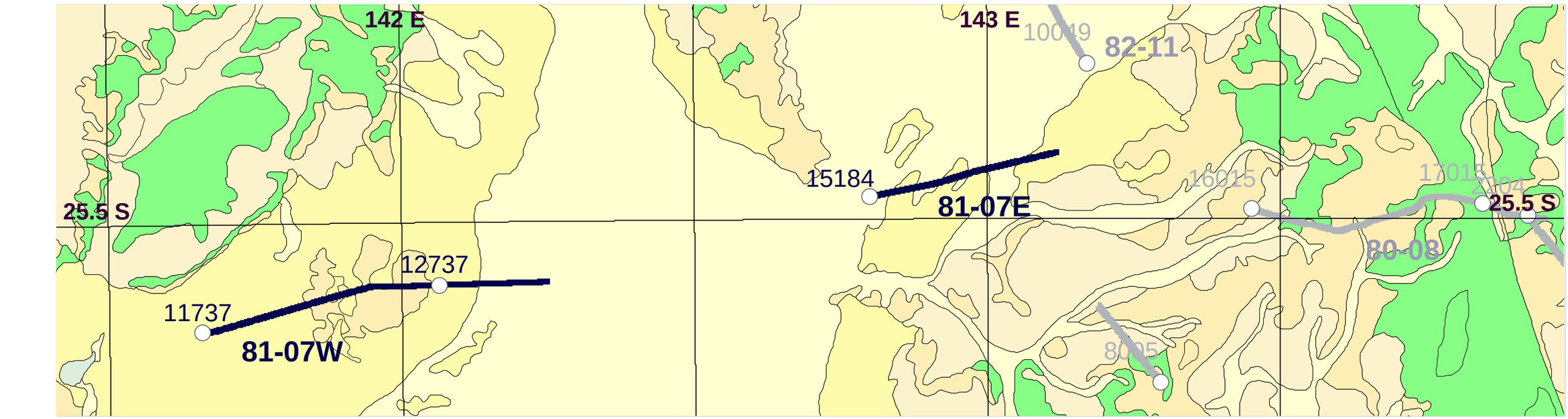
Survey Details: GA-L115

1980 L115 80-06 1982 L118 82-02	SOUTHERN QUEENSLAND Central Eromanga Basin	*Geoscience Australia*



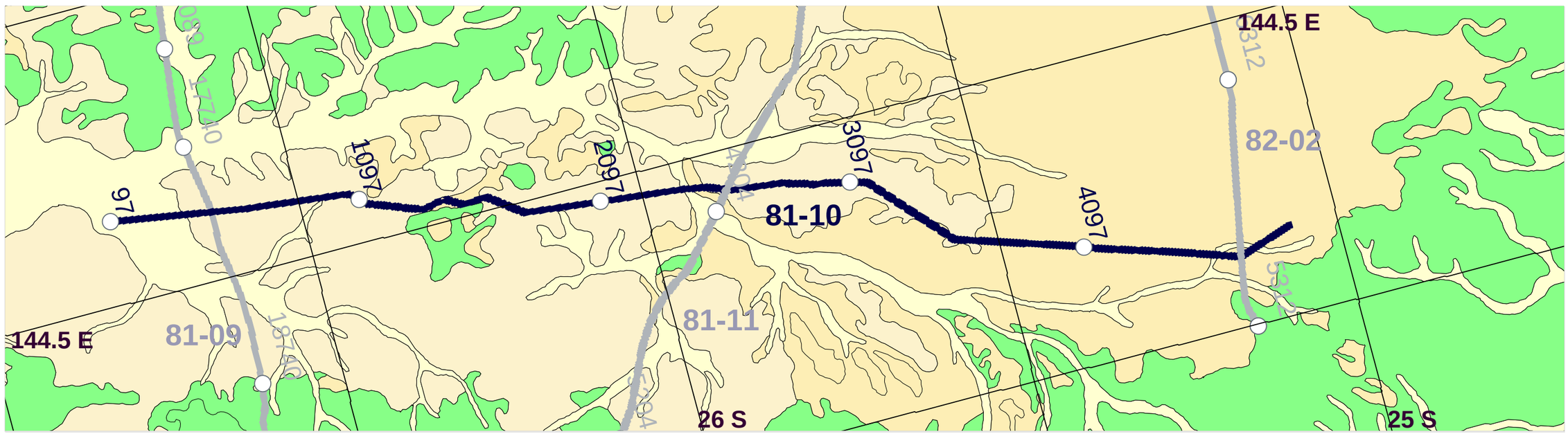
Stacked Section	Source:	Explosives, 333 m interval	Survey Details:	GA-L115
	Spread:	48 Channels, 83.33 m group interval		GA-L118
	Fold:	6 nominal		

1981 L116 81-07W 81-07E	SOUTHERN QUEENSLAND Central Eromanga Basin	*Geoscience Australia*	37



Stacked Section	Source:	Explosives, 333 m interval	Survey Details: GA-L116
	Spread:	48 Channels, 83.33 m group interval	
	Fold:	6 nominal	

1981 L116 81-10	SOUTHERN QUEENSLAND Central Eromanga Basin	*Geoscience Australia*



Stacked Section

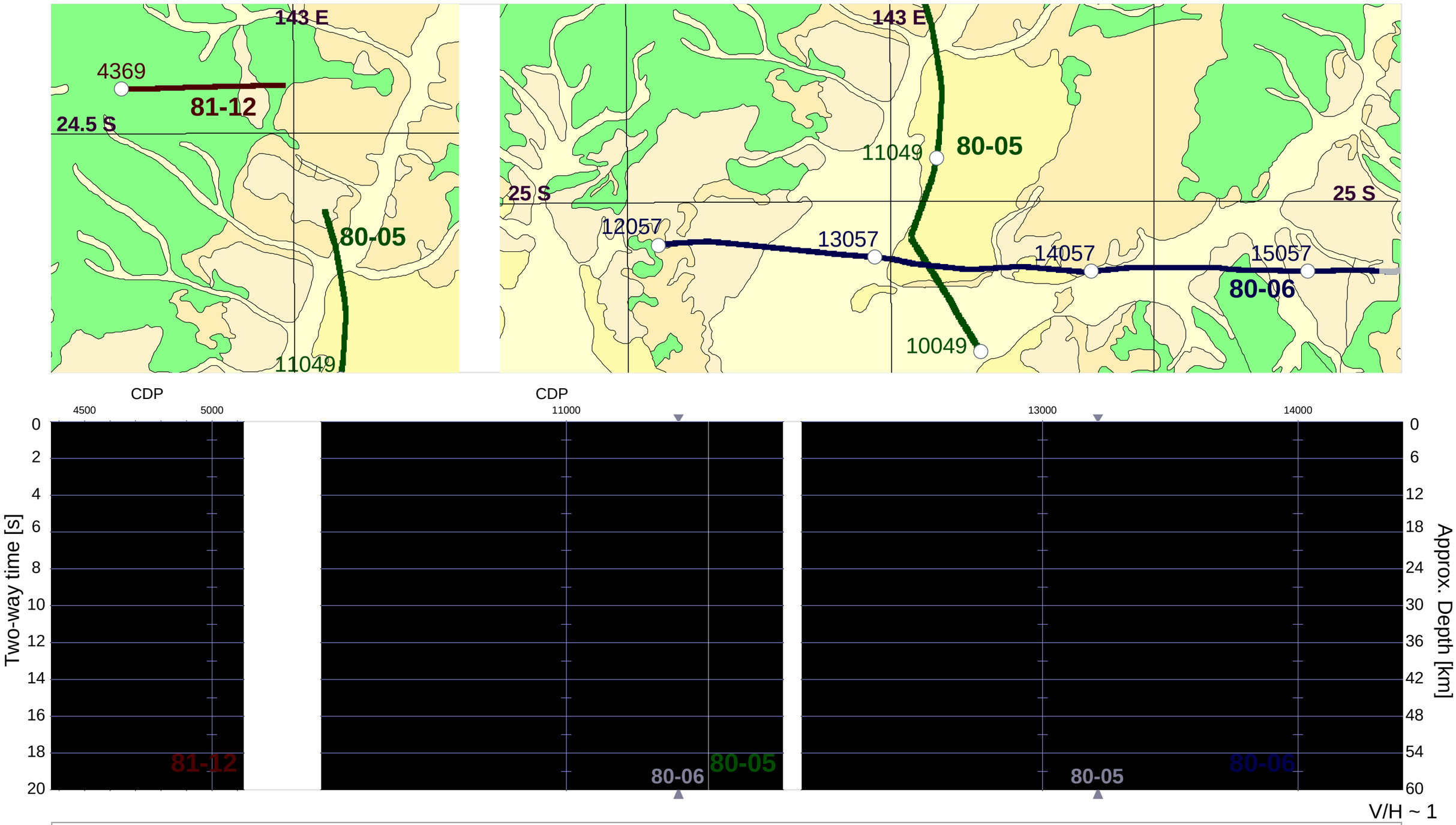
Source: Explosives, 333 m interval

Spread: 48 Channels, 83.33 m group interval

Fold: 6 nominal

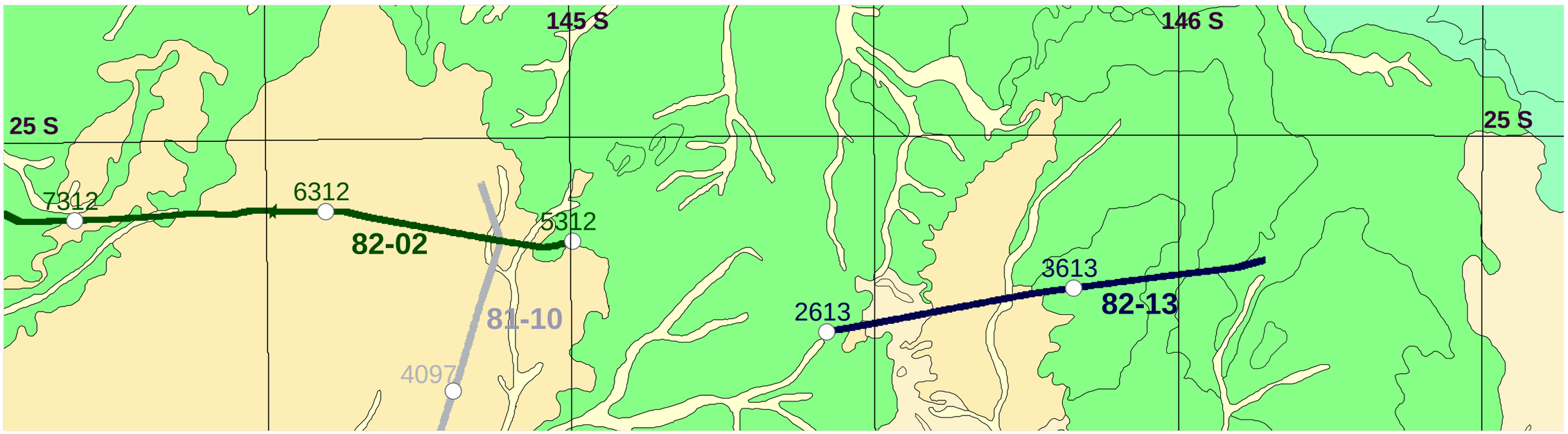
Survey Details: GA-L116

1980 L115 80-05,06 1981 L116 81-12	SOUTHERN QUEENSLAND Central Eromanga Basin	*Geoscience Australia*



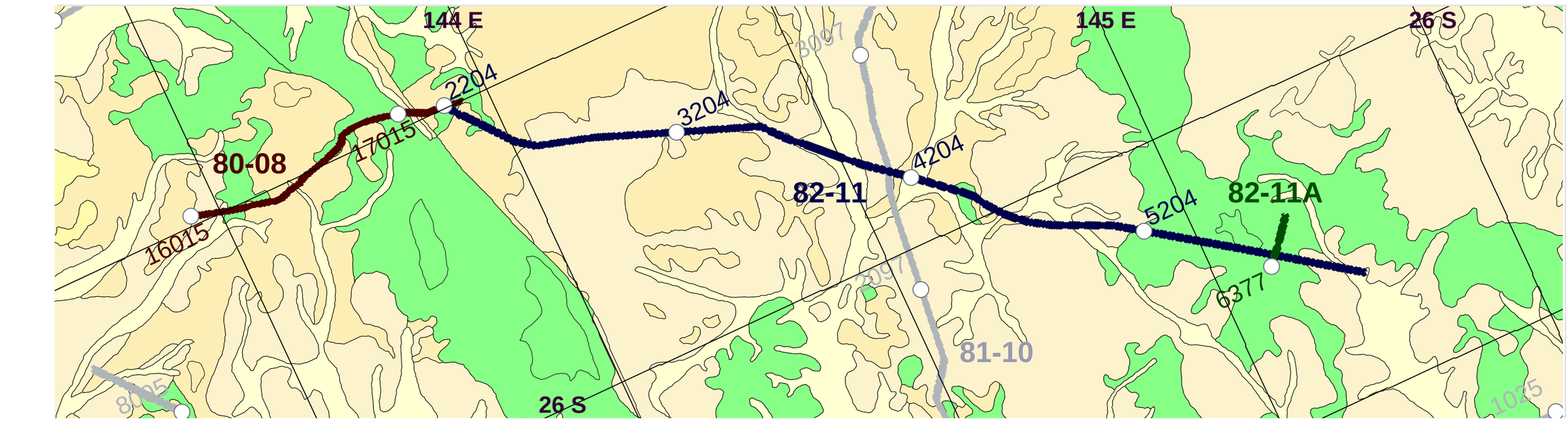
Stacked Section	Source:	Explosives, 333 m interval	Survey Details: GA-L115
	Spread:	48 Channels, 83.33 m group interval	GA-L116
	Fold:	6 nominal	

1982 L118 82-02 82-13	SOUTHERN QUEENSLAND Central Eromanga Basin	*Geoscience Australia*



Stacked Section	Source:	Explosives, 333 m interval	Survey Details: GA-L118
	Spread:	48 Channels, 83.33 m group interval	
	Fold:	6 nominal	

1980 L115 80-08 1982 L118 82-11	SOUTHERN QUEENSLAND Central Eromanga Basin	*Geoscience Australia*



Stacked Section

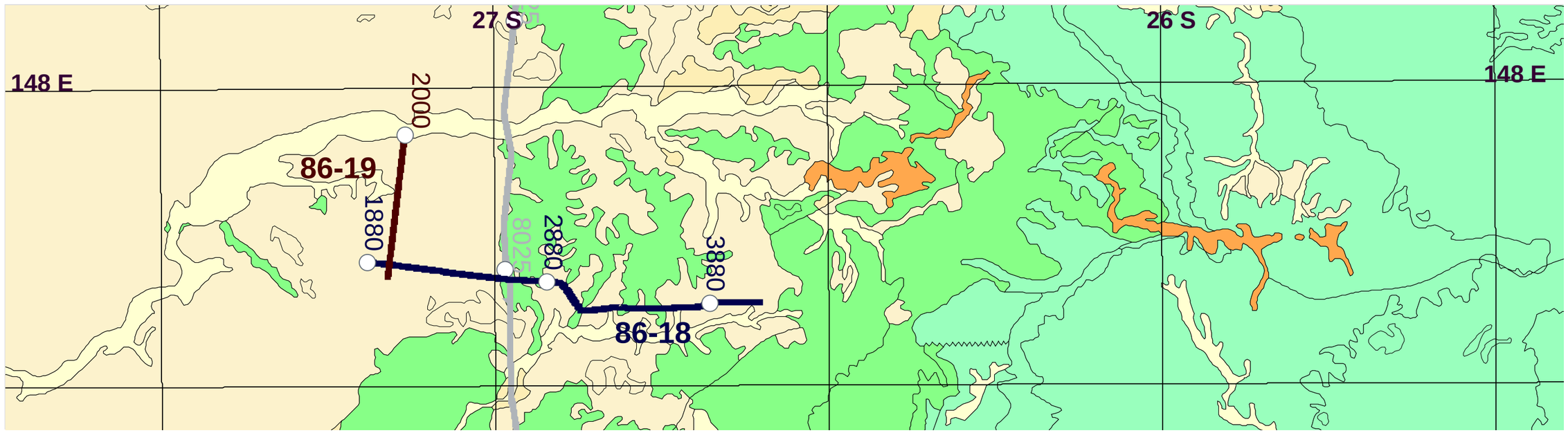
Source: Explosives, 333 m interval

Spread: 48 Channels, 83.33 m group interval

Fold: 6 nominal

Survey Details: GA-L115, GA-L118

1986 L123 86-18 86-19	SOUTHERN QUEENSLAND Eromanga-Brisbane Transect	*Geoscience Australia*

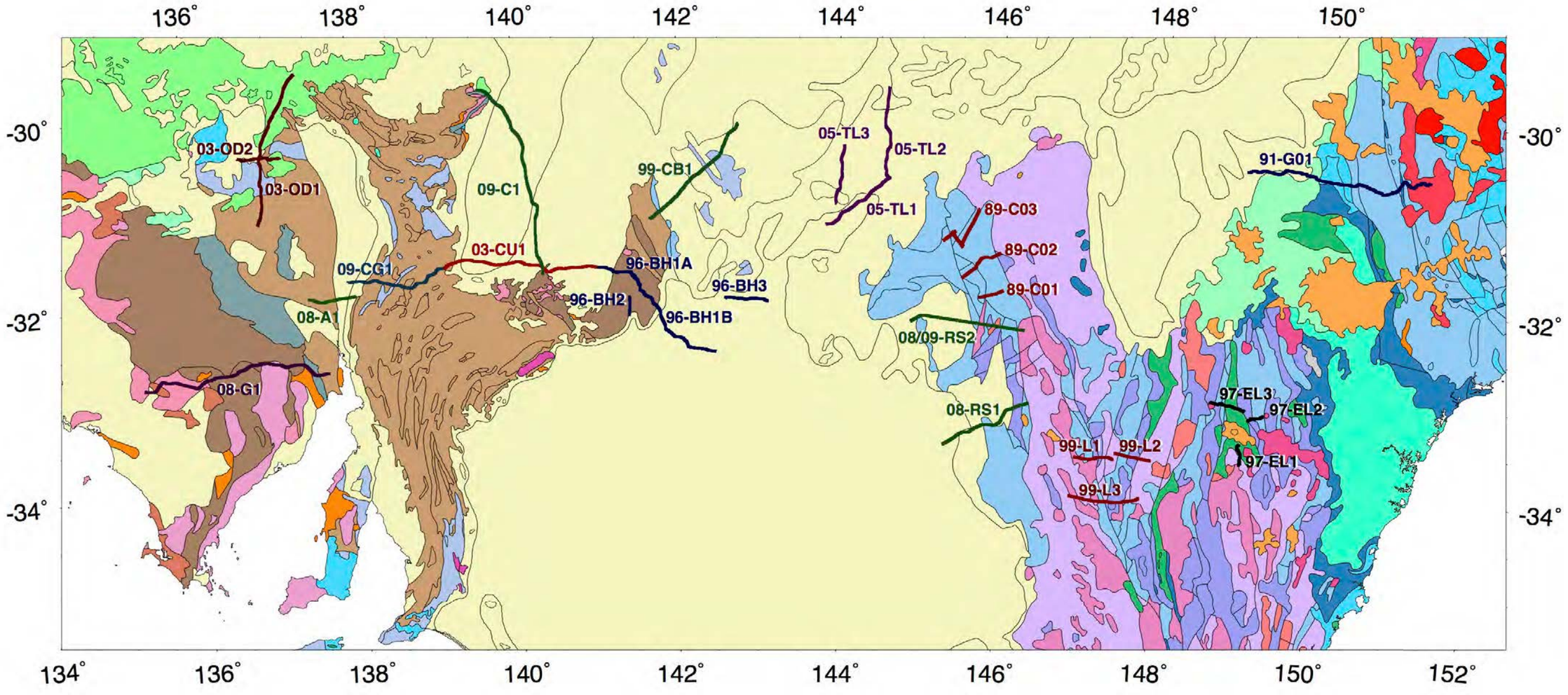


Stacked Section

Source: Explosives, 360 m interval
Spread: 96 Channels, 60 m group interval
Fold: 8 nominal

Survey Details: GA-L123

SOUTH AUSTRALIA AND NEW SOUTH WALES 1978-2011



Profiles are identified by 2 digit year and line designator

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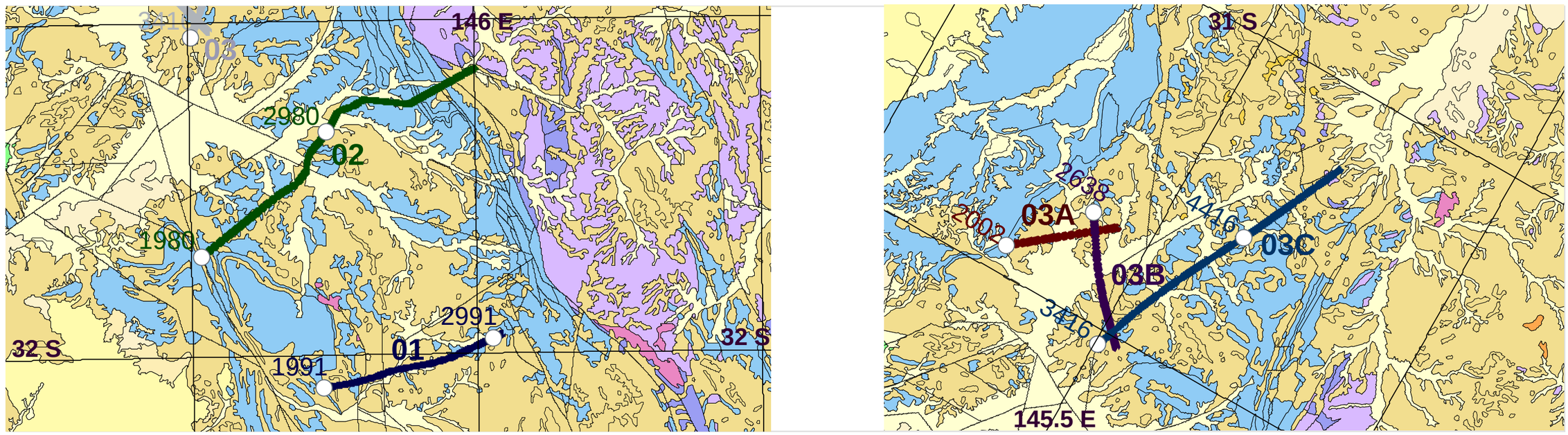
On the display panels the reflection lines are identified by year, project identifier and line designator. The table below presents the full list of the lines and the codes used in Geoscience Australia reports, together with the nature of the display and the bias and clip parameters used to display the sections using the *pssegy* facility.

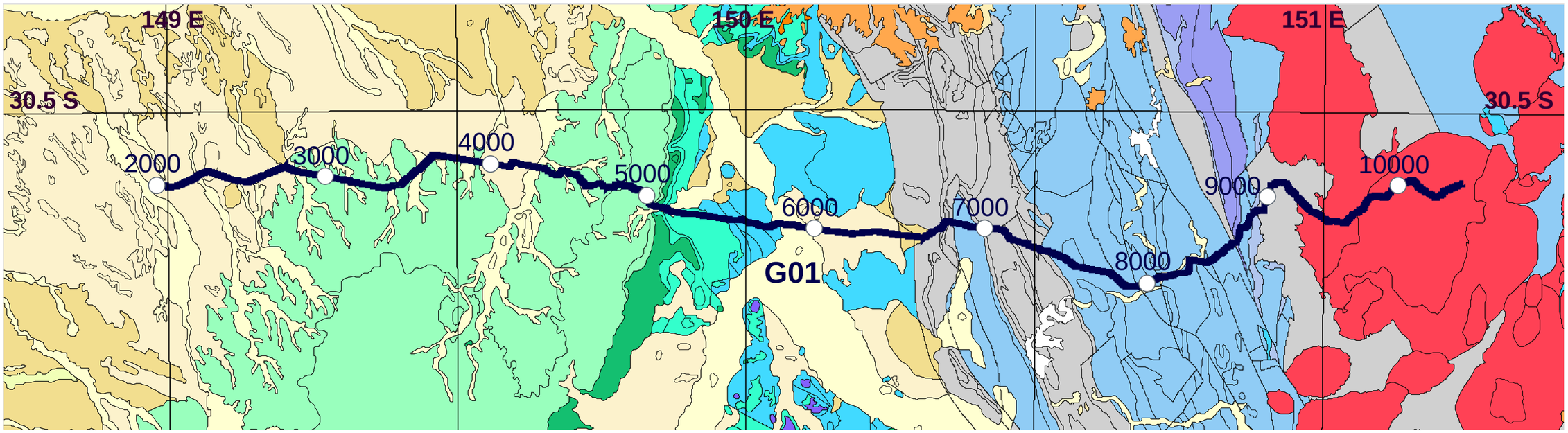
Year	Project	GA Line Code	Line Designator	Display:	Bias	Clip	Page
1989	L130	BMR89-C01	C01	Stack	1.65	80	45
		BMR89-C02	C02	Stack	1.65	80	45
		BMR89-C03A-C	C03A, C03B, C03C	Stack	1.65	80	45
1991	L131	BMR91-G01	G01	Stack	1.65	80	46
1996	L141	96AGS-BH1A	BH1A	Migrated	1.50	80	47
1996-7	L141, L143	96AGS-BH1B	BH1B	Migrated	1.80	80	47
1996	L141	96AGS-BH2	BH2	Migrated	1.50	80	48
1996	L141	96AGS-BH3	BH3	Migrated	1.80	80	48
1997	L146	97AGS-EL1	EL1	Stack	1.65	80	49
		97AGS-EL2	EL2	Stack	1.65	80	49
		97AGS-EL3	EL3	Stack	1.65	80	49
1999	L148	99AGS-C1	CB1	Migrated	1.65	80	50
1999	L151	99AGS-L1	L1	Stack	1.65	80	51
		99AGS-L2	L2	Stack	1.65	80	51
		99AGS-L3	L3	Stack	1.65	80	51
2003-4	L163	03GA-OD1	OD1	Migrated	1.50	80	57
		03GA-OD2	OD2	Migrated	1.50	80	58
2003	L164	03GA-CU1	CU1	Migrated	1.50	80	63
2005	L173	05GA-TL1	TL1	Migrated	1.65	80	52
		05GA-TL2	TL2	Migrated	1.65	80	53
		05GA-TL3	TL3	Migrated	1.65	80	54
2008/9	L188	08GA-RS1	RS1	Migrated	1.50	80	55
		09GA-RS2	RS2	Migrated	1.50	80	56
2008	L189	08GA-G1	G1	Migrated	1.50	80	59-60
		08GA-A1	A1	Migrated	1.50	80	61
		08GA-C1	C1	Migrated	1.50	80	64-65
2009	L191	09GA-CG1	CG1	Migrated	1.50	80	62

1989 L130 C01 C02 C03A,B,C	NEW SOUTH WALES Cobar Trough	*Geoscience Australia* *AGCRC NSW DMR*



Migrated Section	Source:	Explosives, 360 m interval	Survey Details: GA-L130
	Spread:	96 Channels, 60 m group interval	
	Fold:	8 nominal	

1991 L131 G01	NEW SOUTH WALES Gunnedah Basin	*Geoscience Australia*



Stacked Section

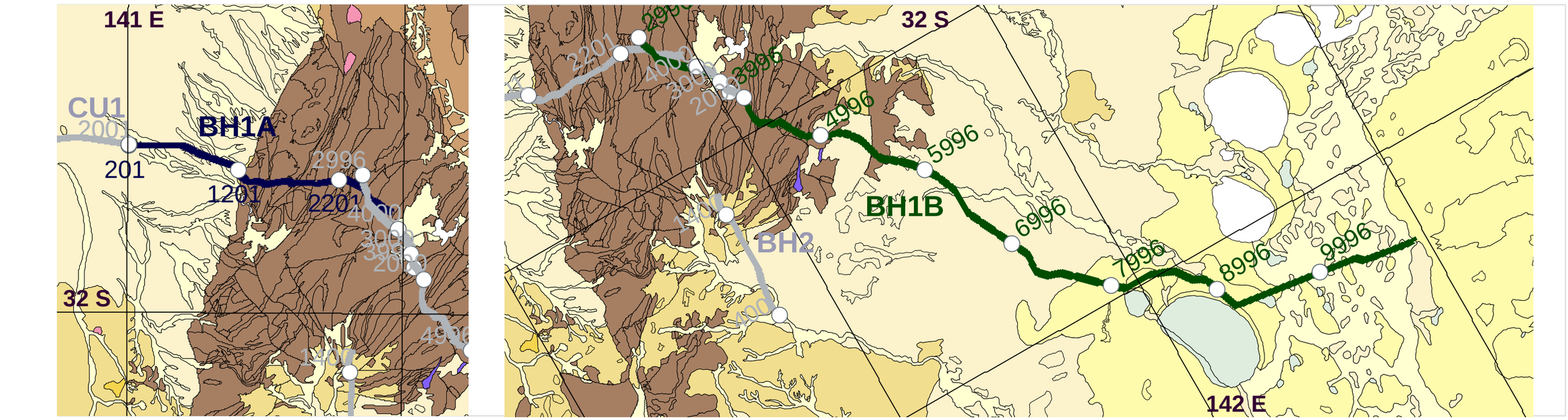
Source: Explosives, 360 m interval

Spread: 96 Channels, 60 m group interval

Fold: 8 nominal

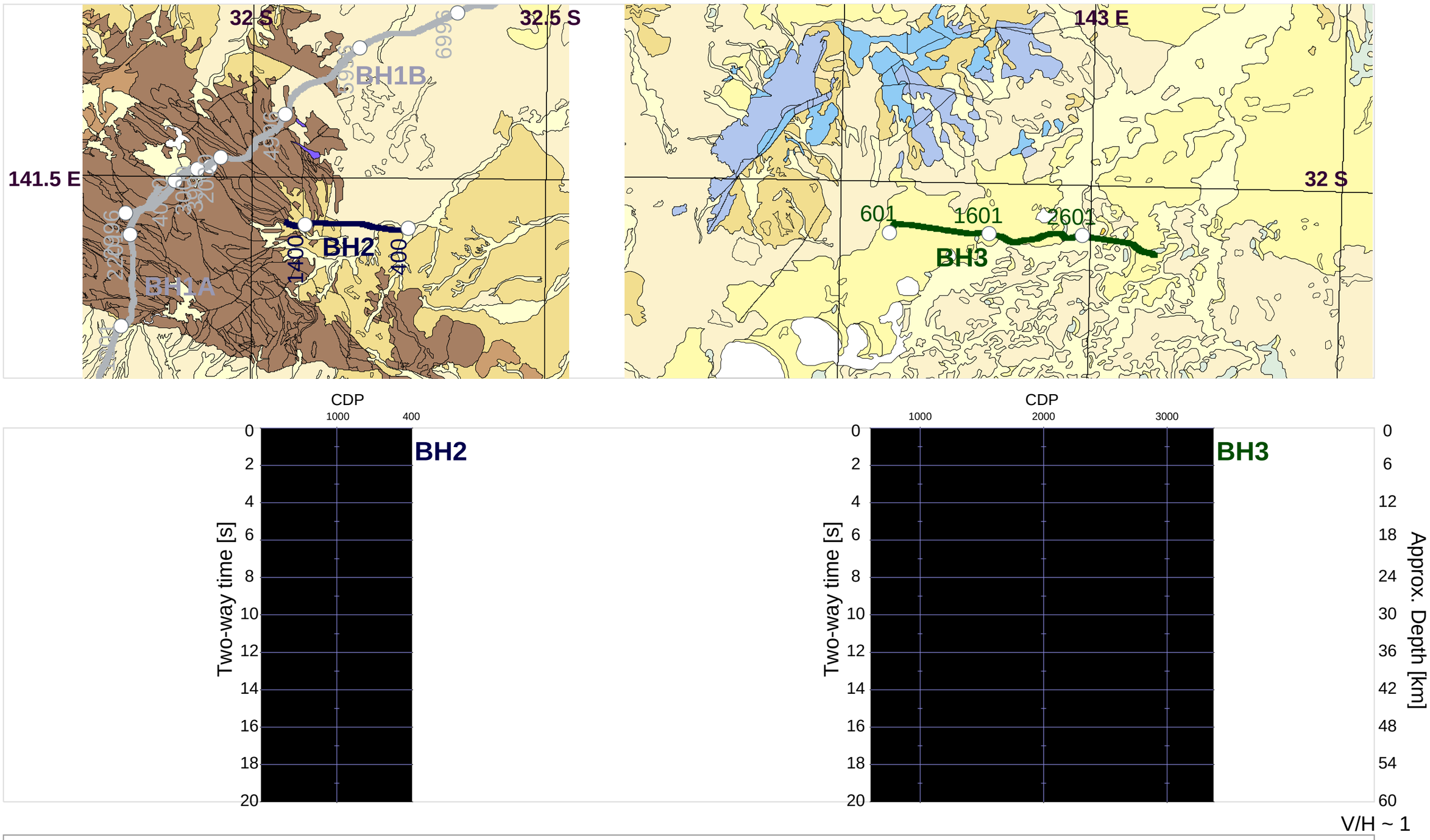
Survey Details: GA-L131

1996-7 L141,L143 BH1A BH1B	New South Wales Broken Hill	*Geoscience Australia* *AGCRC NSW DMR*



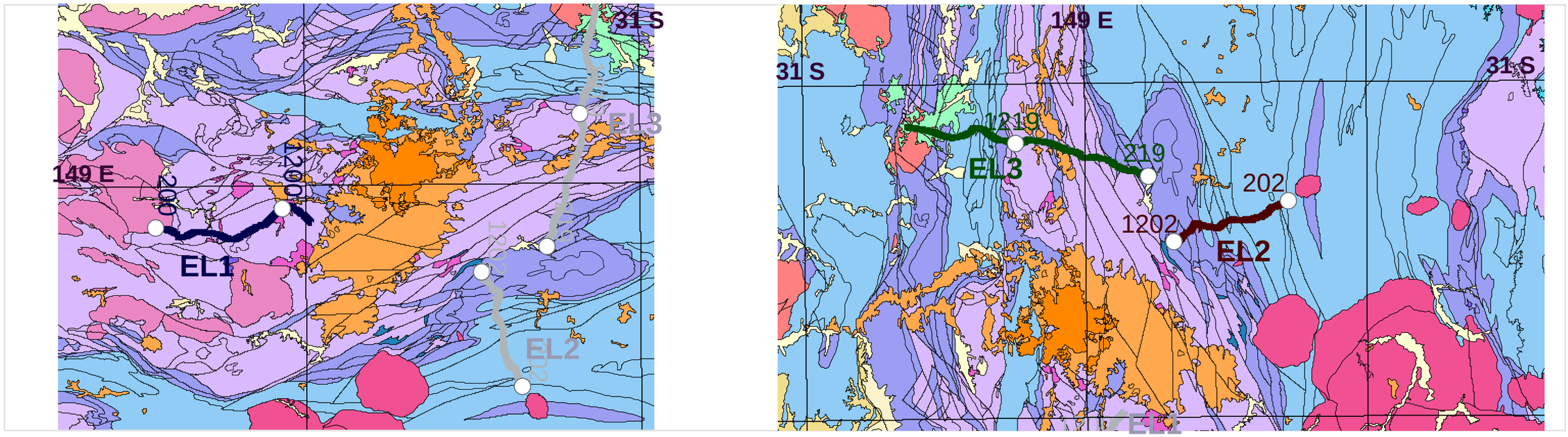
Migrated Section	Source:	Explosives, 240 m interval	Survey Details: GA-L141
	Spread:	120 Channels, 40 m group interval	
	Fold:	10 nominal	

1996 L141 BH2 BH3	NEW SOUTH WALES Broken Hill	*Geoscience Australia* *AGCRC NSW DMR*



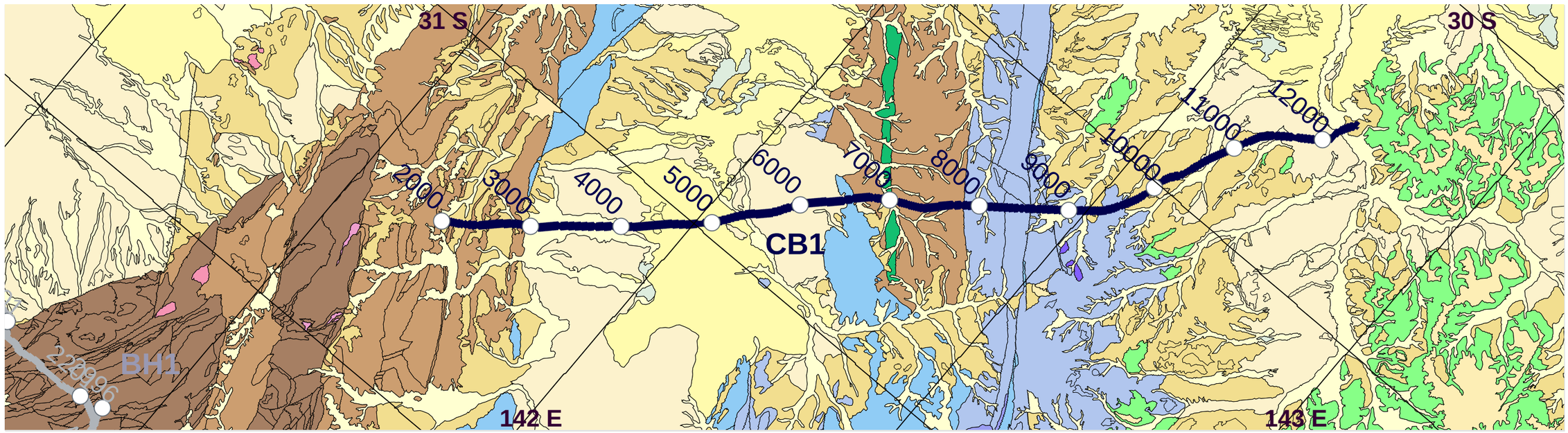
Migrated Section	Source:	Explosives, 240 m interval	Survey Details: GA-L141
	Spread:	120 Channels, 40 m group interval	
	Fold:	10 nominal	

1997 L146 EL1 EL2 EL3	NEW SOUTH WALES Eastern Lachlan	*Geoscience Australia* *AGCRC NSW DMR*



Stacked Section	Source:	Explosives, interval 300 m (EL1), 240 m (EL2,3)	Survey Details: GA-L146
	Spread:	120 Channels, 50 m group interval	
	Fold:	10 nominal	

1999 L148 CB1	NEW SOUTH WALES Broken Hill Margin	*Geoscience Australia* *NSW DMR*



Migrated Section

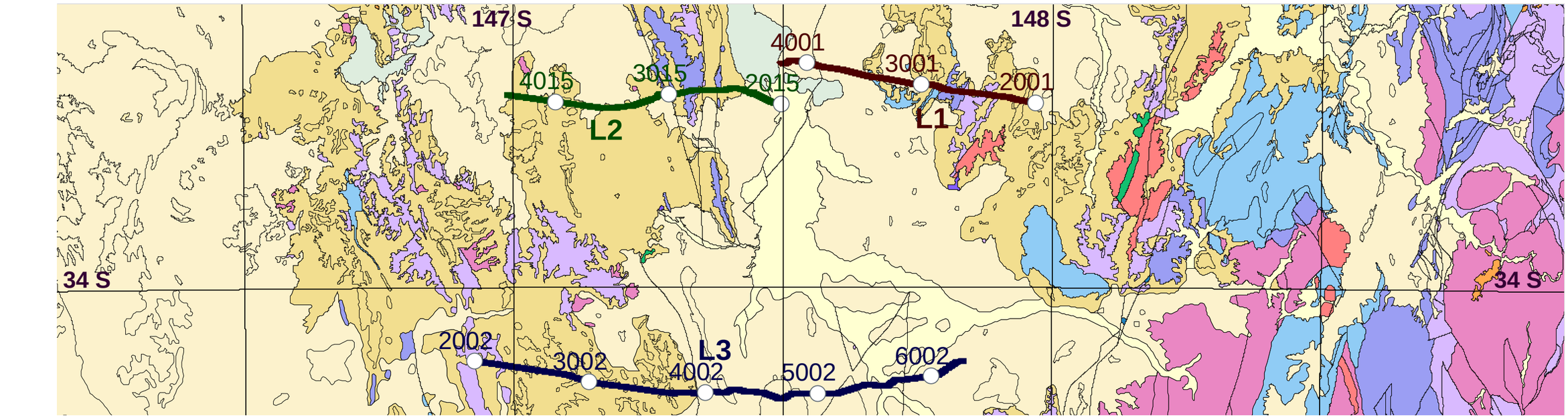
Source: 3 Hemi-60 Vibrators, 30 m interval

Spread: 240 Channels, 30 m group interval

Fold: 120 nominal

Survey Details: GA-L148

1999 L151 L1 L2 L3	NEW SOUTH WALES Lachlan	*Geoscience Australia* *AGCRC NSW DMR*



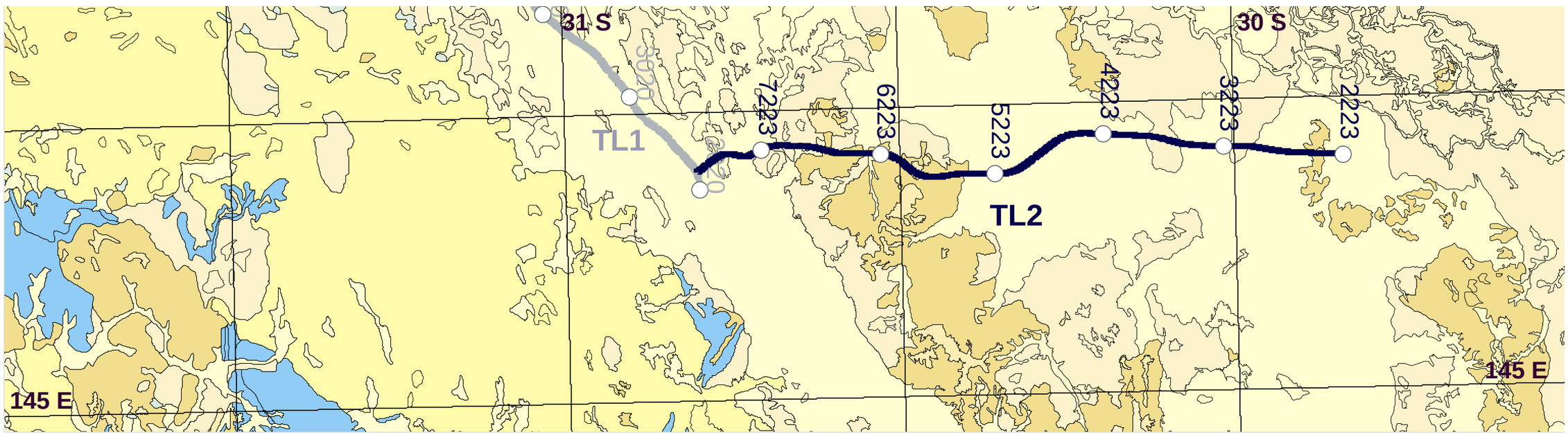
Stacked Section	Source:	3 Hemi-60 Vibrators, 40 m interval	Survey Details: GA-L151
	Spread:	240 Channels, 40 m group interval	
	Fold:	120 nominal	

2005 L173 TL1	NEW SOUTH WALES Thomson-Lachlan	*Geoscience Australia* *NSW DMR pmd*CRC*

Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 Channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L173

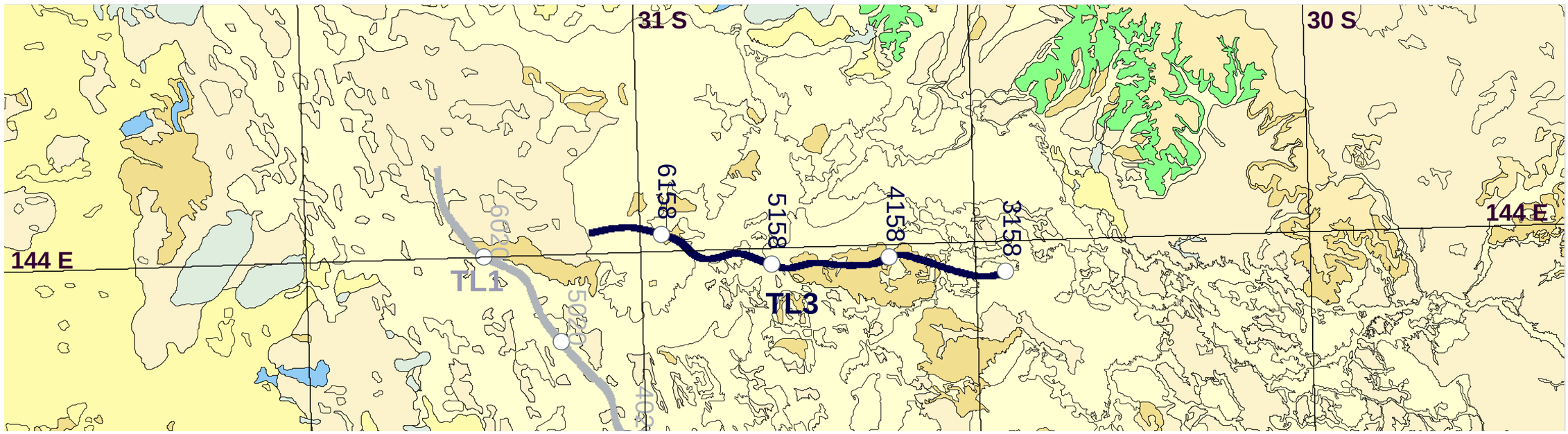


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 Channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L173

2005 L173 TL3	NEW SOUTH WALES Thomson-Lachlan	*Geoscience Australia* *NSW DMR pmd*CRC*

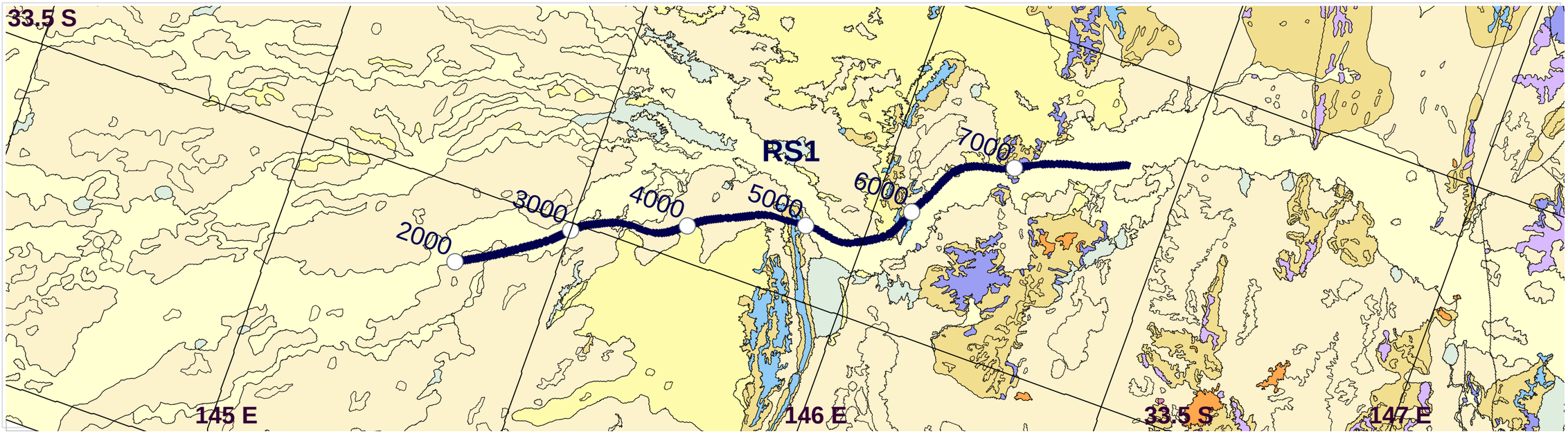


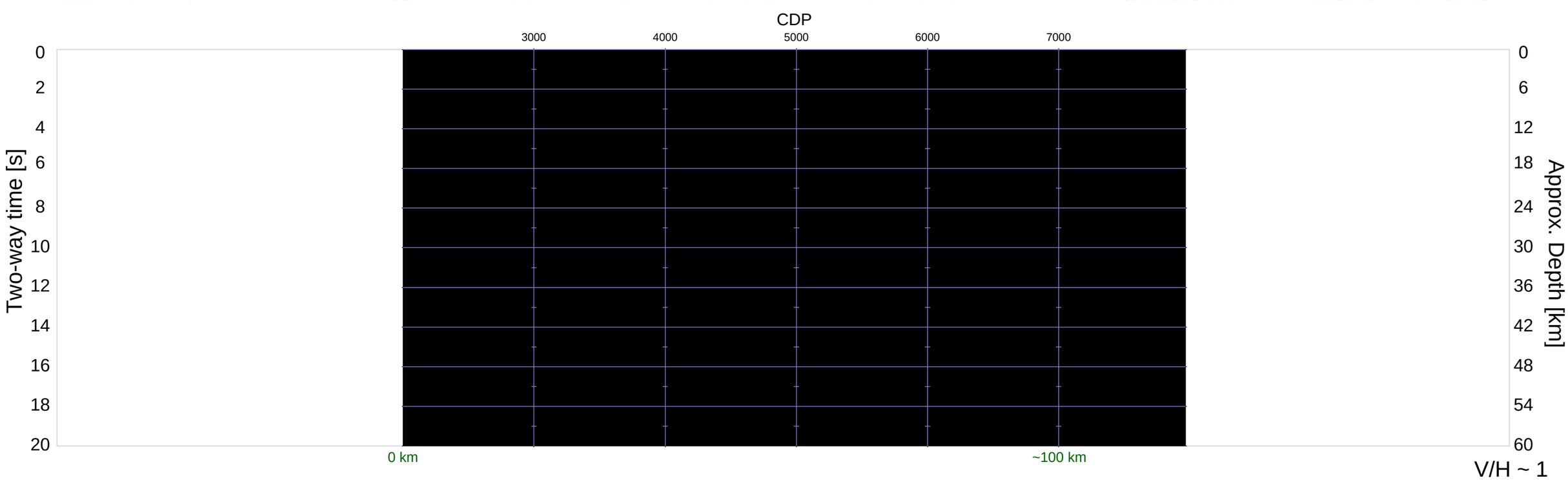
Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 Channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L173

2008 L188 RS1	NEW SOUTH WALES Rankins Springs	*Geoscience Australia* *NSW DPI*



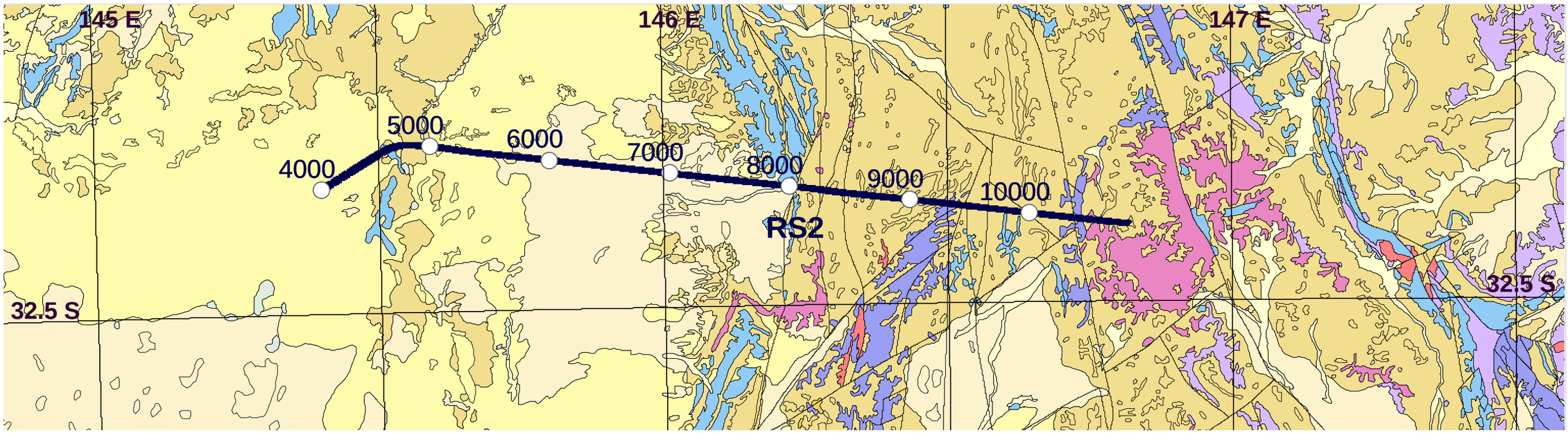


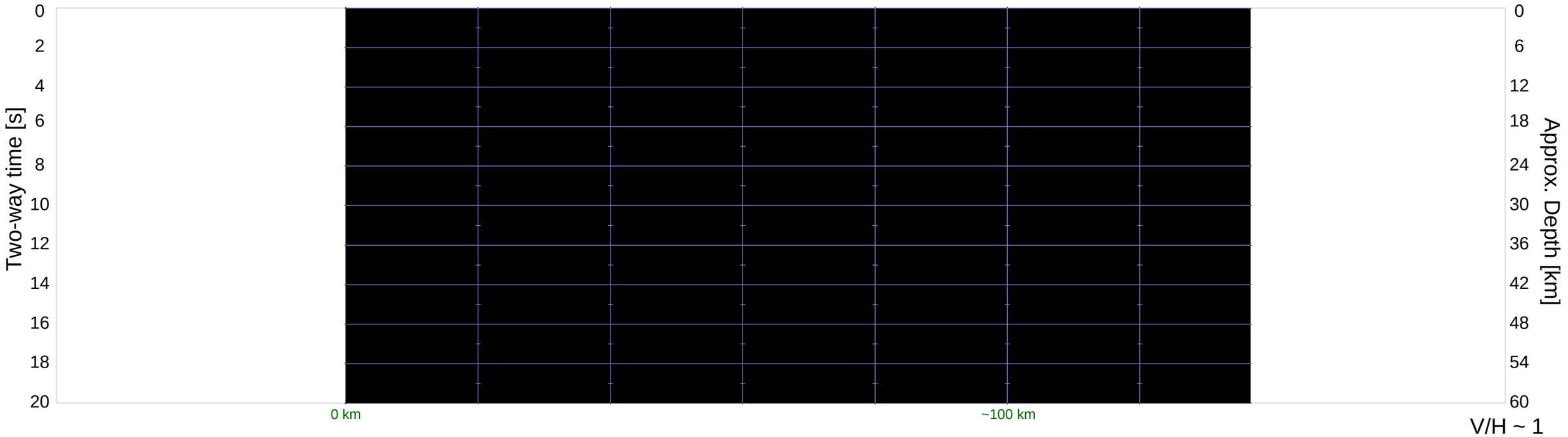
Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L188

2008/9 L188 RS2	NEW SOUTH WALES Rankins Springs	*Geoscience Australia* *NSW DPI*



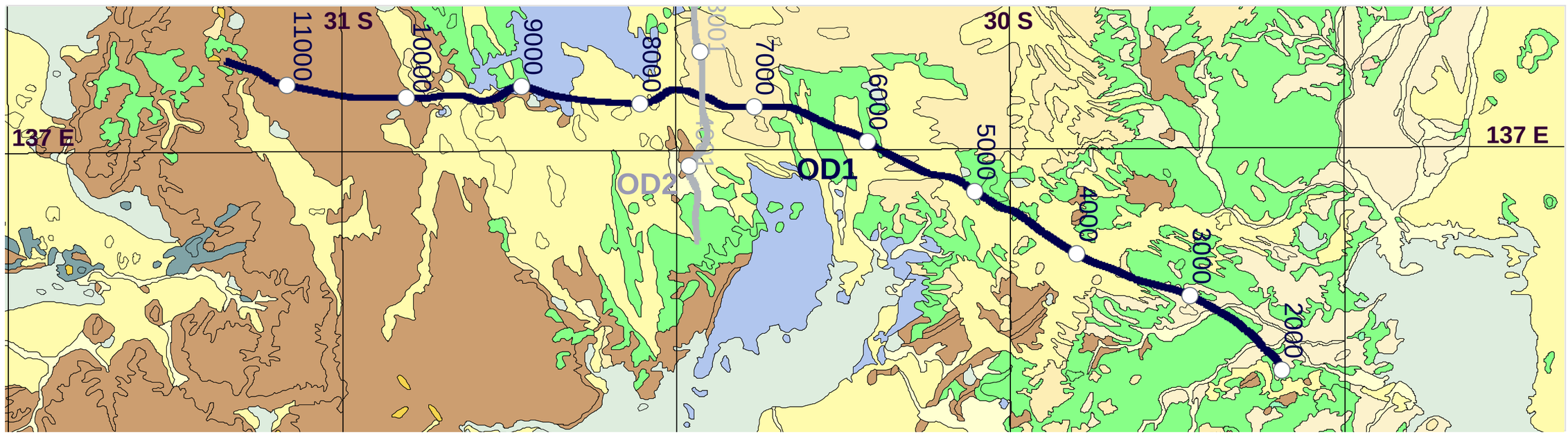


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L188

2003 L163 OD1	SOUTH AUSTRALIA Olympic Dam region	*Geoscience Australia*

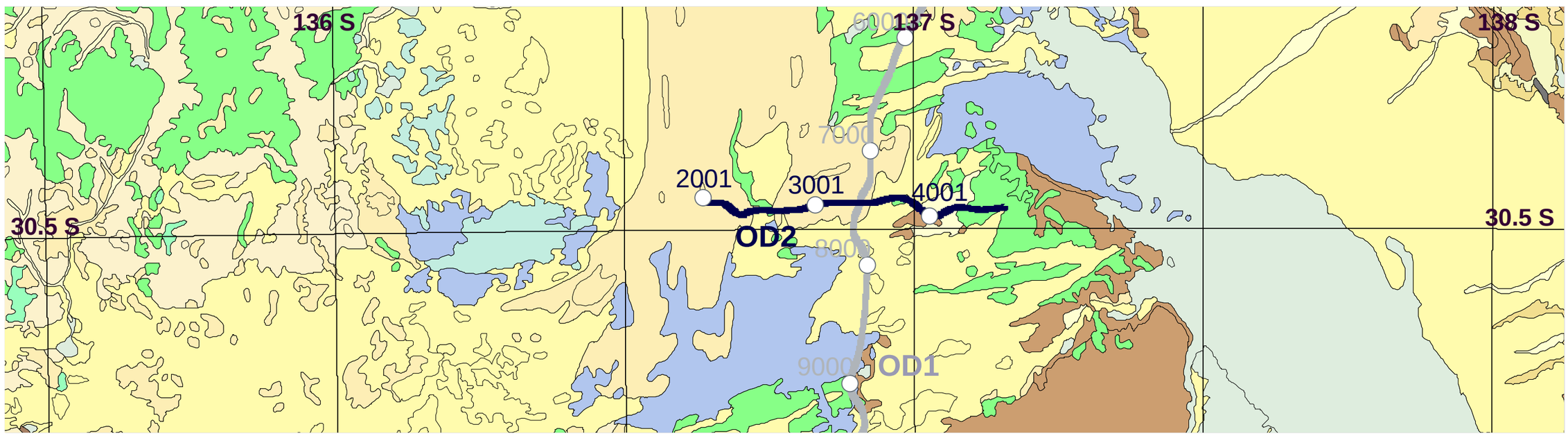


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 Channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L163

2003 L163 OD2	SOUTH AUSTRALIA Olympic Dam region	*Geoscience Australia*

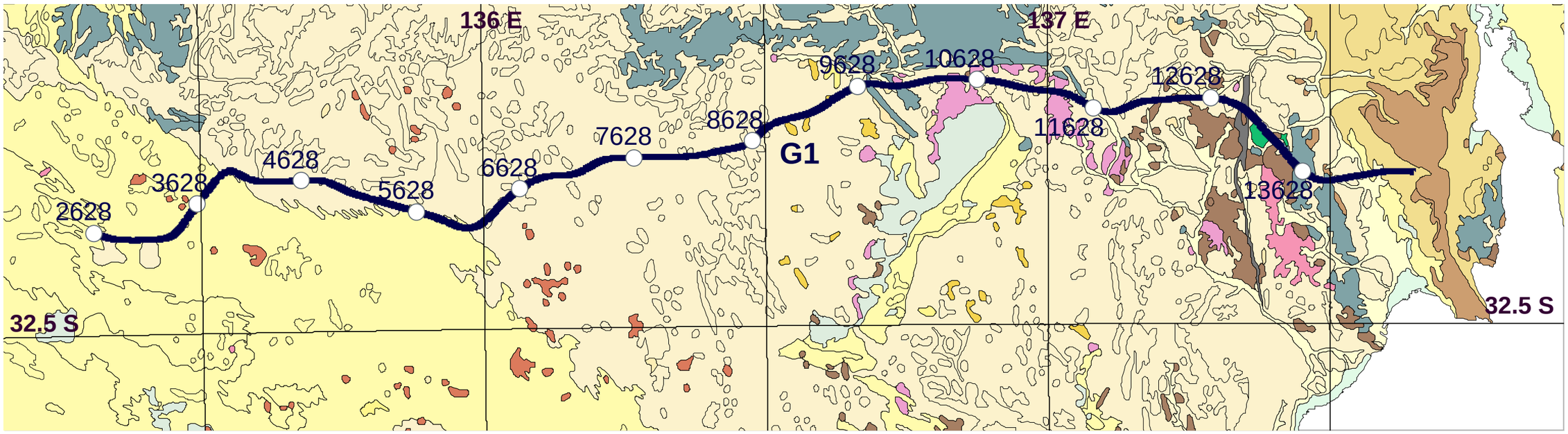


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 Channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L163

2008 L189 G1 - Panel 1	SOUTH AUSTRALIA Gawler Craton	*Geoscience Australia* *PIRSA*	59

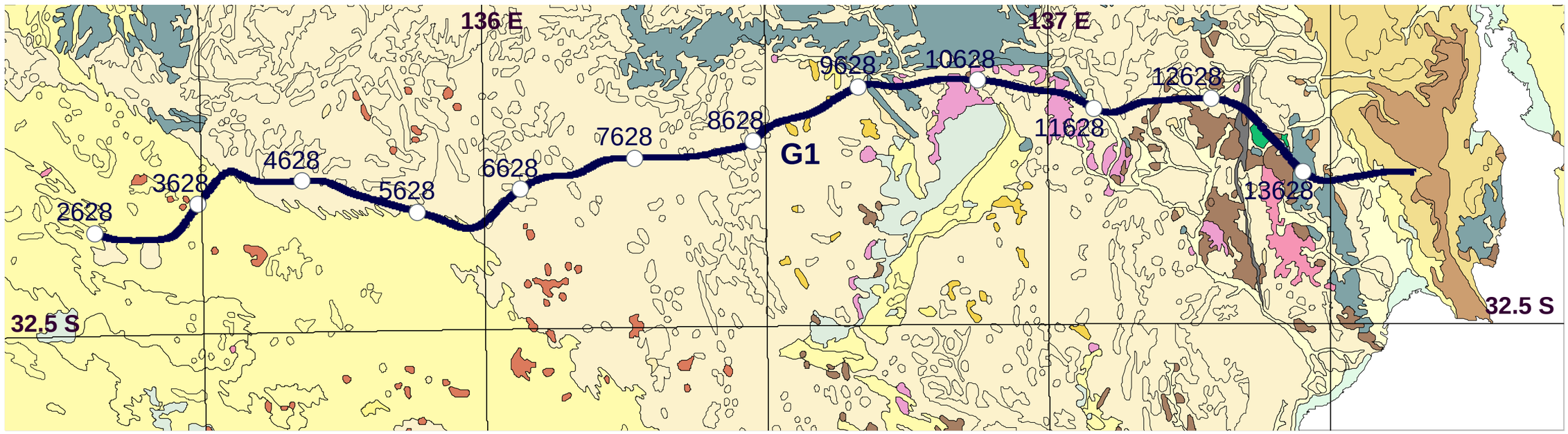


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L189

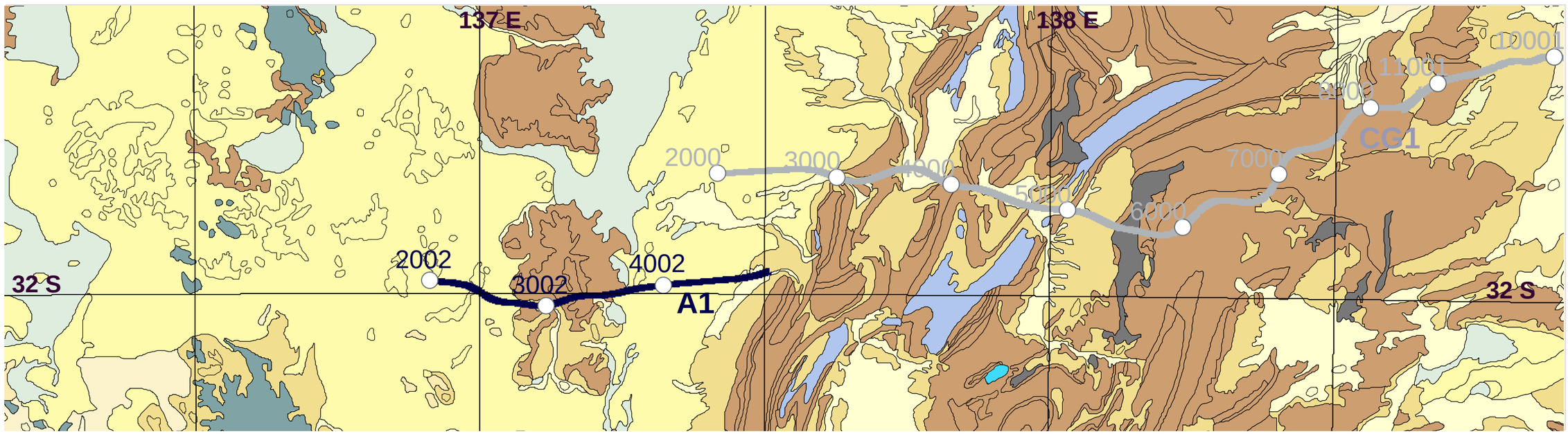
2008 L189 G1 - Panel 2	SOUTH AUSTRALIA Gawler Craton	*Geoscience Australia* *PIRSA*



Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L189



Migrated Section

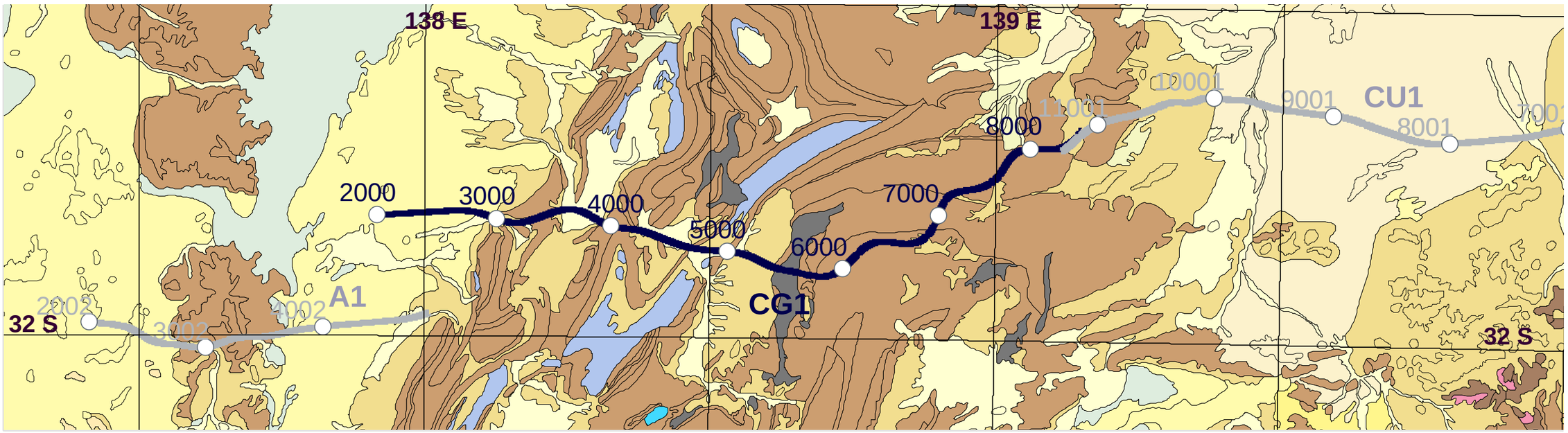
Source: 3 Hemi-60 Vibrators, 80 m interval

Spread: 300 Channels, 40 m group interval

Fold: 75 nominal

Survey Details: GA-L189

2009 L191 CG1	SOUTH AUSTRALIA Flinders-Curnamona	*Geoscience Australia* *PIRSA*



Migrated Section

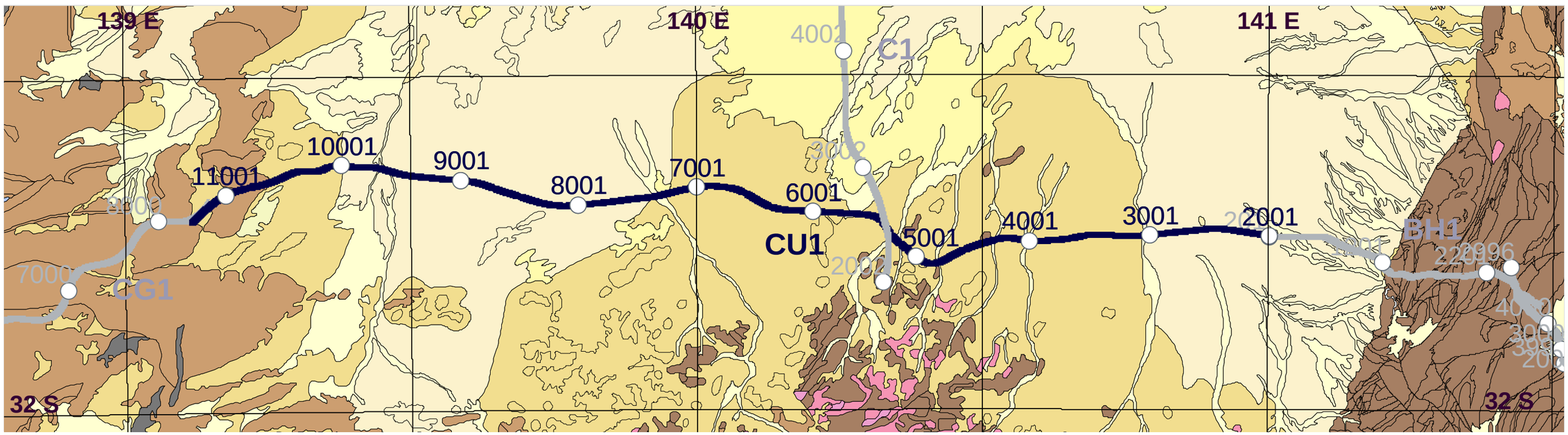
Source: 3 Hemi-60 Vibrators, 80 m interval

Spread: 300 Channels, 40 m group interval

Fold: 75 nominal

Survey Details: GA-L191

2003-2004 L164 CU1	SOUTH AUSTRALIA Curnamona	*Geoscience Australia* *PIRSA pmd*CRC*	63



Migrated Section

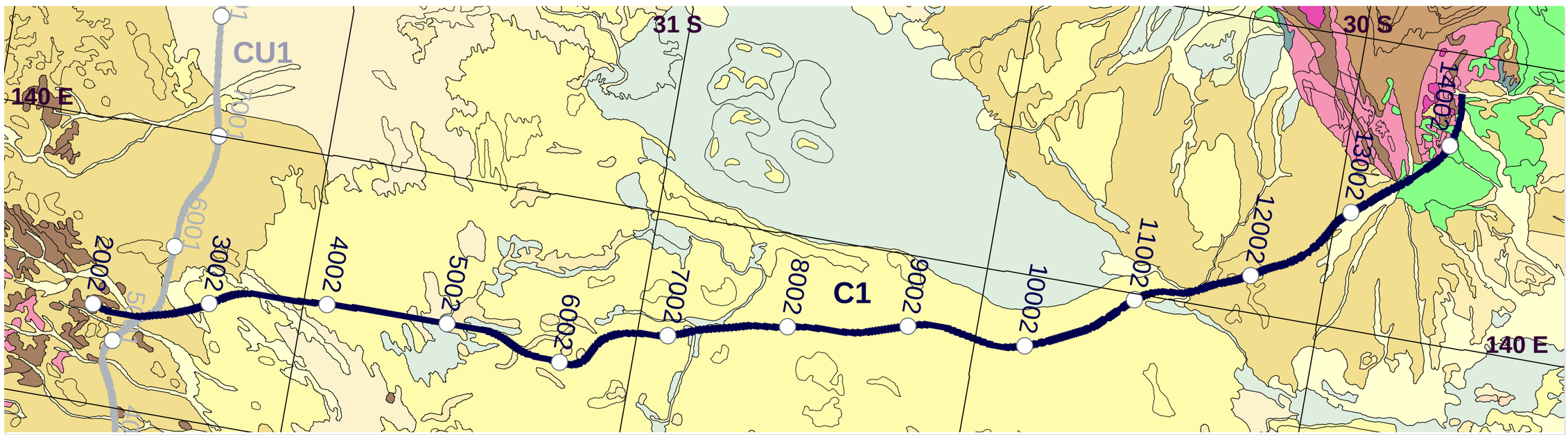
Source: 3 Hemi-60 Vibrators, 80 m interval

Spread: 240 Channels, 40 m group interval

Fold: 60 nominal

Survey Details: GA-L164

2008 L189 C1 - Panel 1	SOUTH AUSTRALIA Curnamona Province	*Geoscience Australia* *PIRSA*

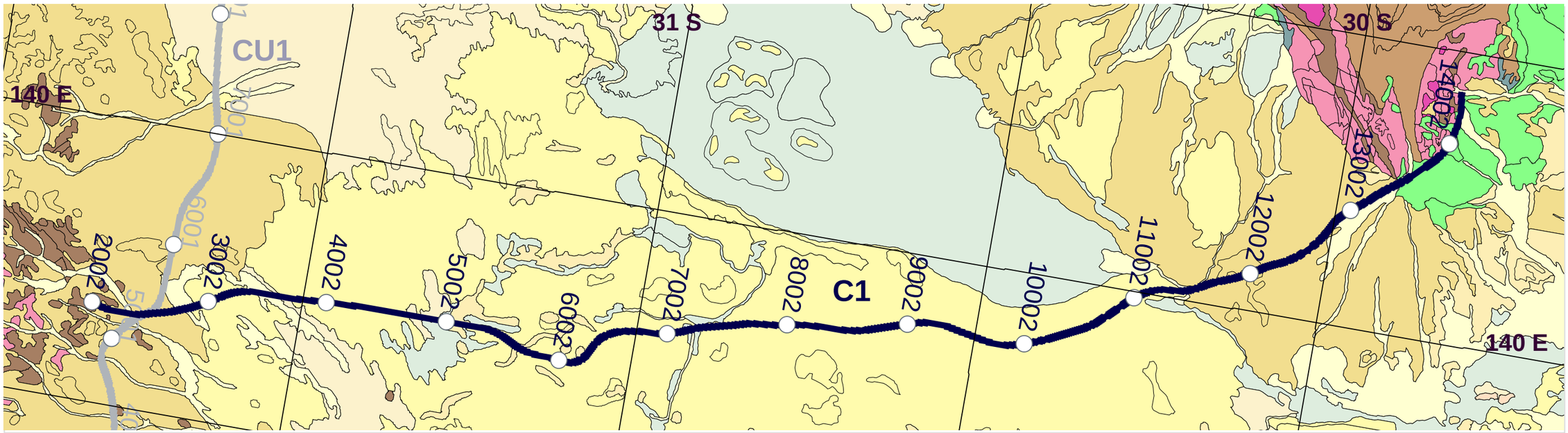


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L189

2008 L189 C1 - Panel 2	SOUTH AUSTRALIA Curnamona Province	*Geoscience Australia* *PIRSA*



Migrated Section

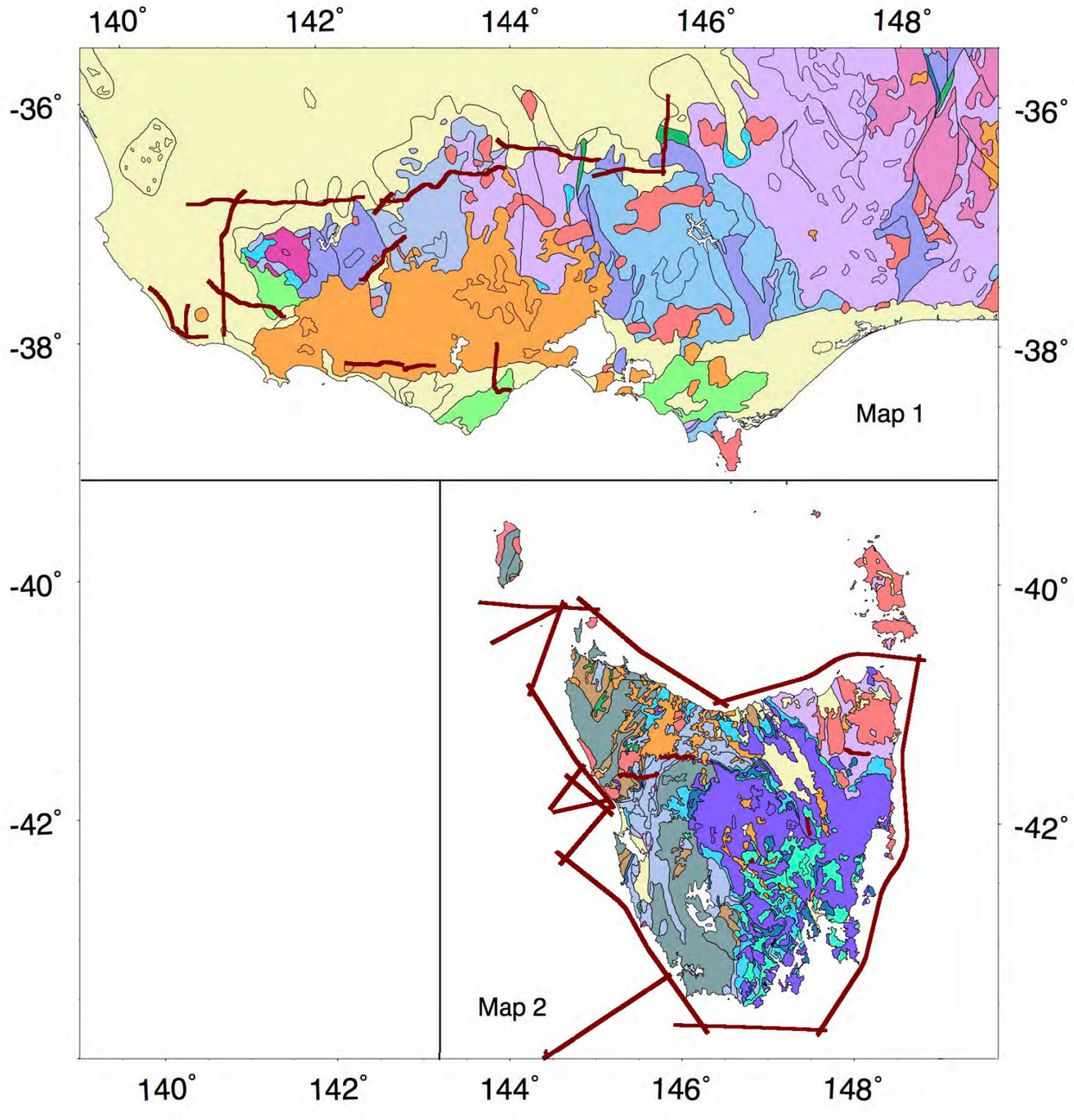
Source: 3 Hemi-60 Vibrators, 80 m interval

Spread: 300 Channels, 40 m group interval

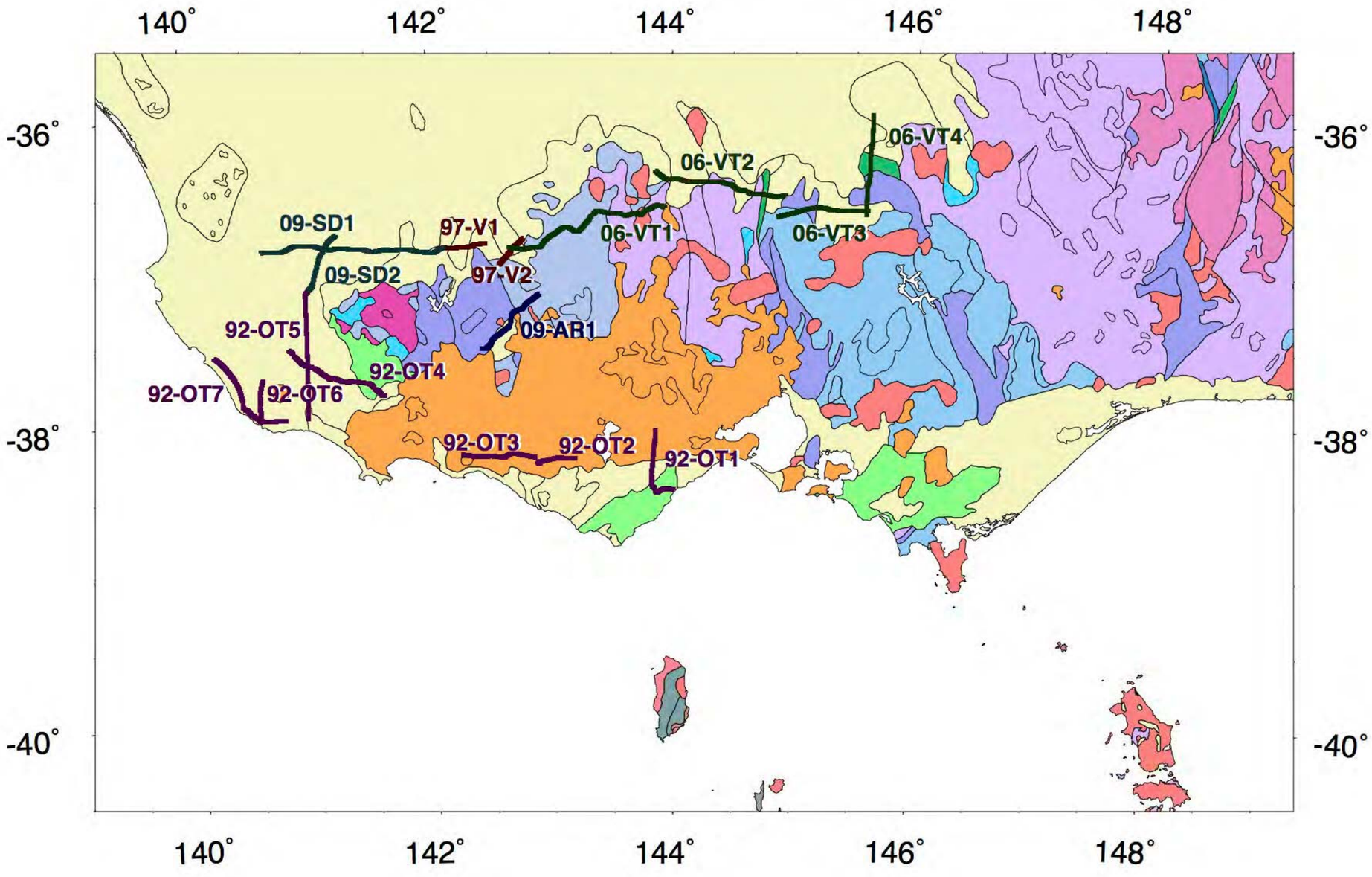
Fold: 75 nominal

Survey Details: GA-L189

SOUTH AUSTRALIA – VICTORIA – TASMANIA 1978-2011

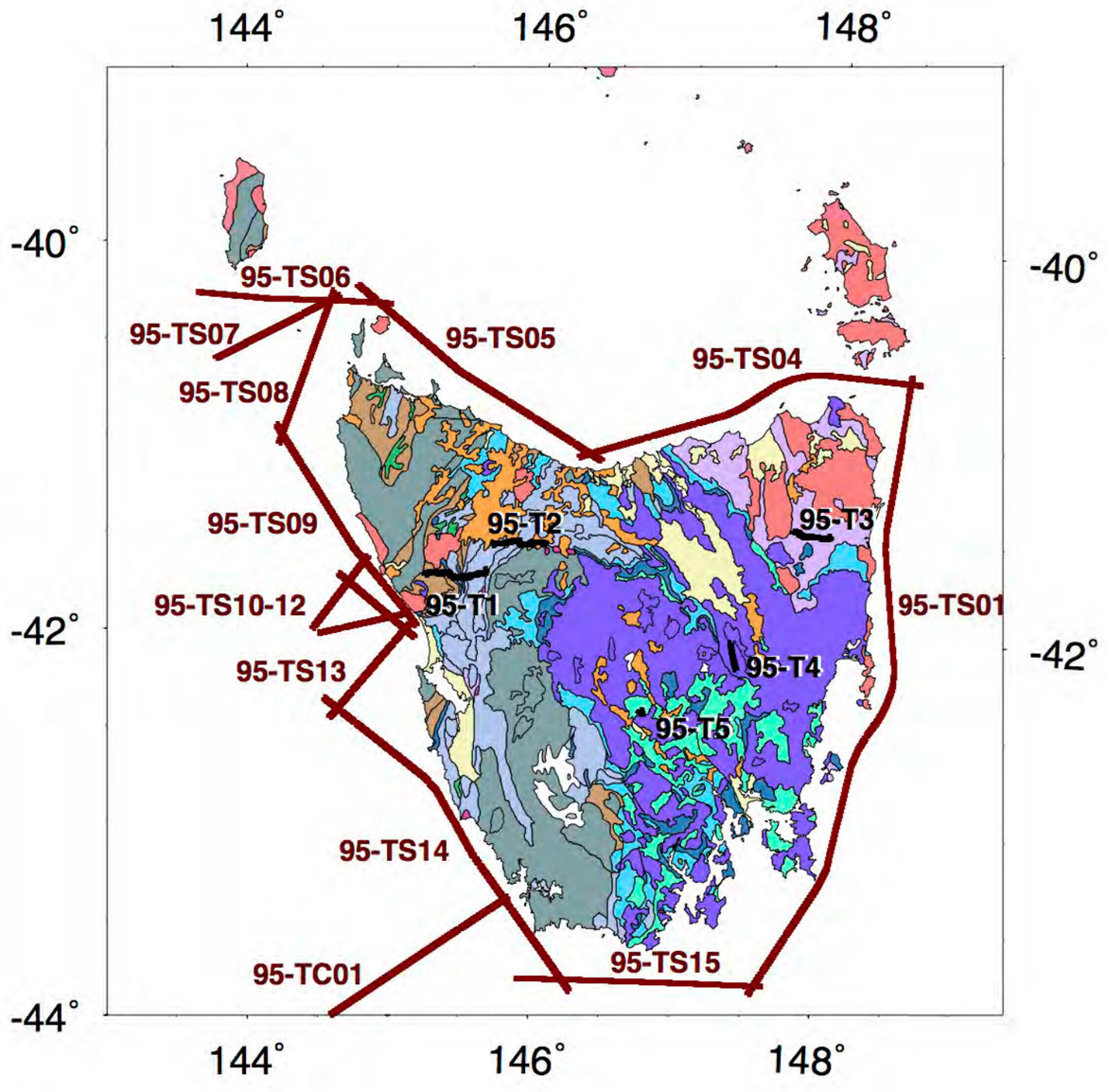


SOUTH AUSTRALIA – VICTORIA 1978-2011



Profiles are identified by 2 digit year and line designator

TASMANIA 1978-2011



Profiles are identified by 2 digit year and line designator

INDEX OF PROFILES: SOUTH AUSTRALIA – VICTORIA - TASMANIA 1978-2011

On the display panels the reflection lines are identified by year, project identifier and line designator. The table below presents the full list of the lines and the codes used in Geoscience Australia reports, together with the nature of the display and the bias and clip parameters used to display the sections using the *pssegy* facility.

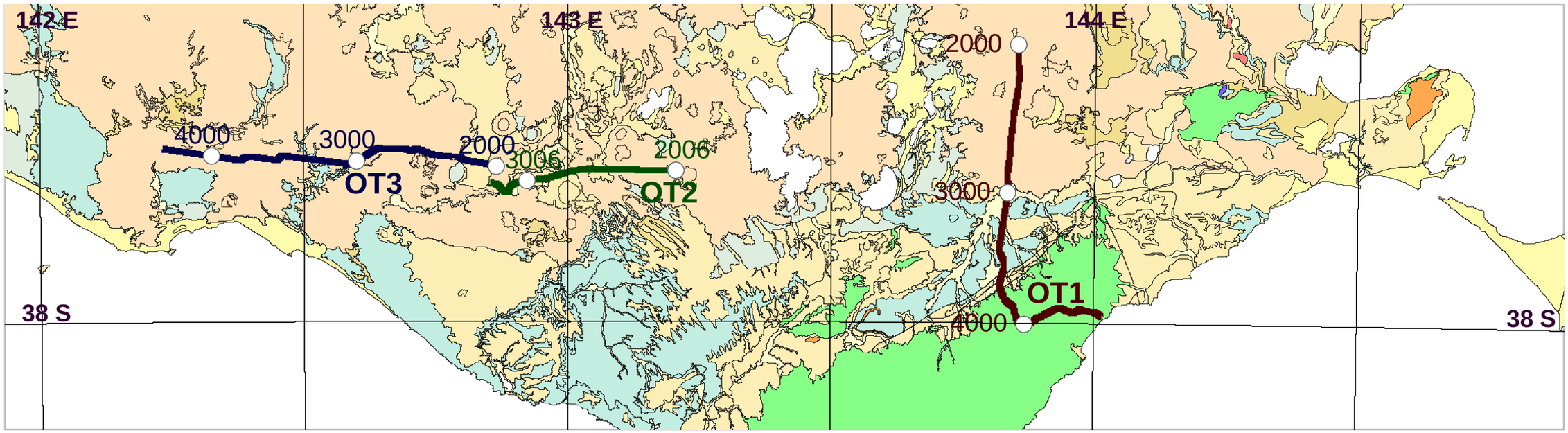
Land profiles:

Year	Project	GA Line Code	Line Designator	Display:	Bias	Clip	Page
1992	L135	BMR92-OT1	OT1	Stack	1.75	77	71
		BMR92-OT2	OT2	Stack	1.75	77	71
		BMR92-OT3	OT3	Stack	1.75	77	71
		BMR92-OT4	OT4	Stack	1.75	77	72
		BMR92-OT5	OT5	Stack	1.75	77	72,75
		BMR92-OT6	OT6	Stack	1.75	77	73
		BMR92-OT7	OT7	Stack	1.75	77	73
1995	L139	95AGS-T1	T1	Stack	1.75	77	81
		95AGS-T2	T2	Stack	1.75	77	81
		95AGS-T3	T3	Stack	1.75	77	82
		95AGS-T4	T4	Stack	1.75	77	82
		95AGS-T5	T5	Stack	1.75	77	82
1997	L142	97AGS-V1	V1	Migrated	1.75	77	77
		97AGS-V2	V2	Migrated	1.75	77	77
2006	L178	06GA-V1	VT1	Migrated	1.47	85	78
		06GA-V2	VT2	Migrated	1.50	80	79
		06GA-V3	VT3	Migrated	1.47	85	80
		06GA-V4	VT4	Migrated	1.60	80	80
2009	L193	09GA-SD1	SD1	Migrated	1.47	85	74
		09GA-SD2	SD2	Migrated	1.47	85	75
2009	L194	09GA-AR1	AR1	Migrated	1.47	85	76

Marine profiles: Offshore Tasmania

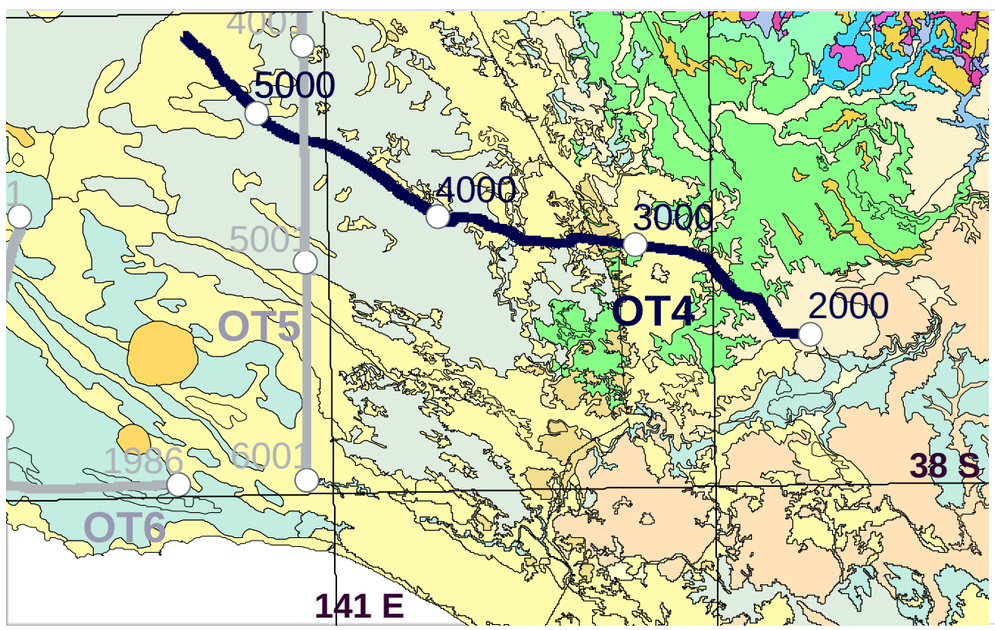
Year	Project	GA Line Code	Line Designator	Display:	Bias	Clip	Page
1995	S148	148-01	TS-01	Migrated	1.47	80	83-85
		148-04	TS-04	Migrated	1.47	80	87-88
		148-05	TS-05	Migrated	1.47	80	86-87
		148-06	TS-06	Migrated	1.47	80	89
		148-07	TS-07	Migrated	1.47	80	89
		148-08	TS-08	Migrated	1.47	80	93
		148-09	TS-09	Migrated	1.47	80	92-93
		148-10	TS-10	Migrated	1.47	80	94
		148-11	TS-11	Migrated	1.47	80	94
		148-12	TS-12	Migrated	1.47	80	94
		148-13	TS-13	Migrated	1.47	80	91-92
		148-14	TS-14	Migrated	1.47	80	90-91
		148-15	TS-15	Migrated	1.47	80	95
	S159	159-01	TC-01	Migrated	1.47	80	96

1992 L135 OT1 OT2 OT3	VICTORIA Otway Basin	*Geoscience Australia*

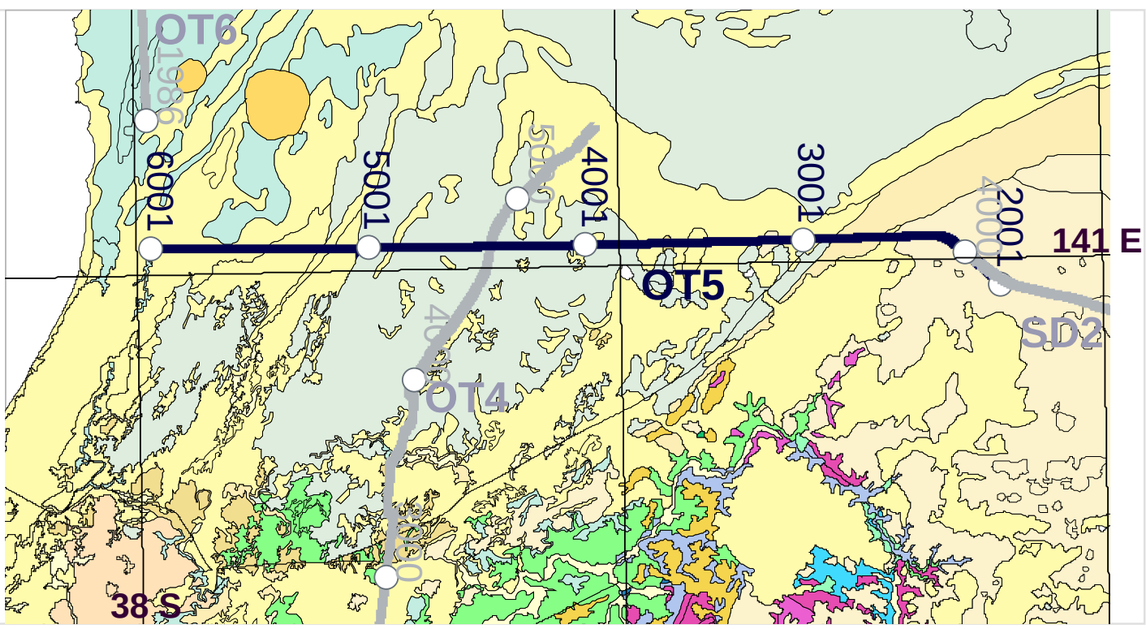


Stacked Section	Source:	Explosives, 300 m interval	Survey Details: GA-L135
	Spread:	120 Channels, 50 m group interval	
	Fold:	10 nominal	

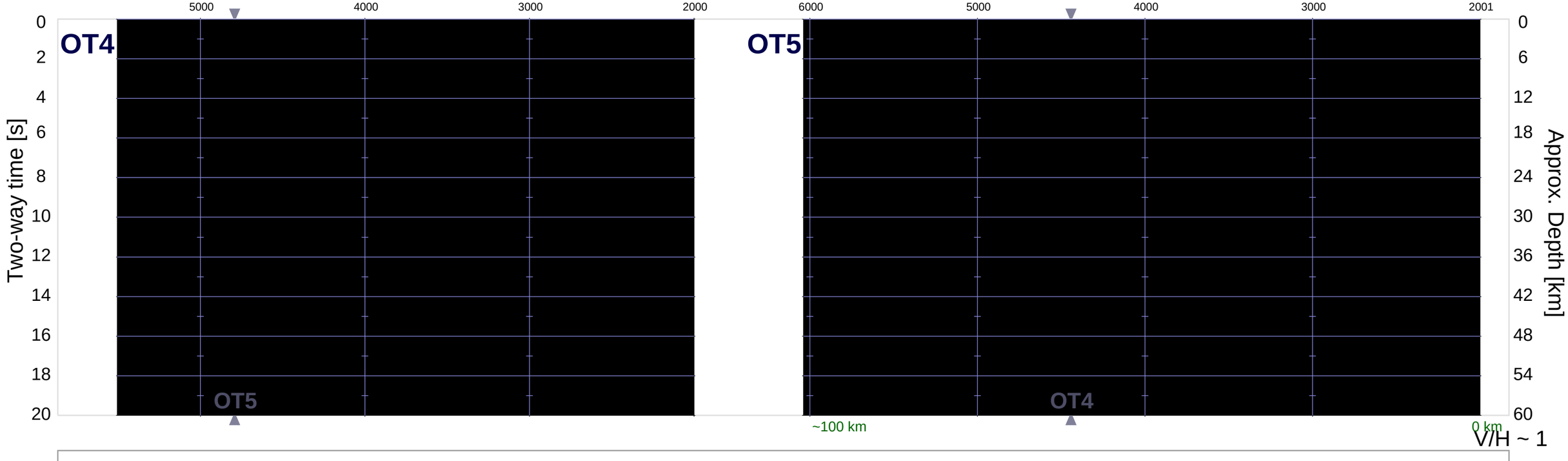
1992 L135 OT4 OT5	VICTORIA - SOUTH AUSTRALIA Otway Basin	*Geoscience Australia*



CDP

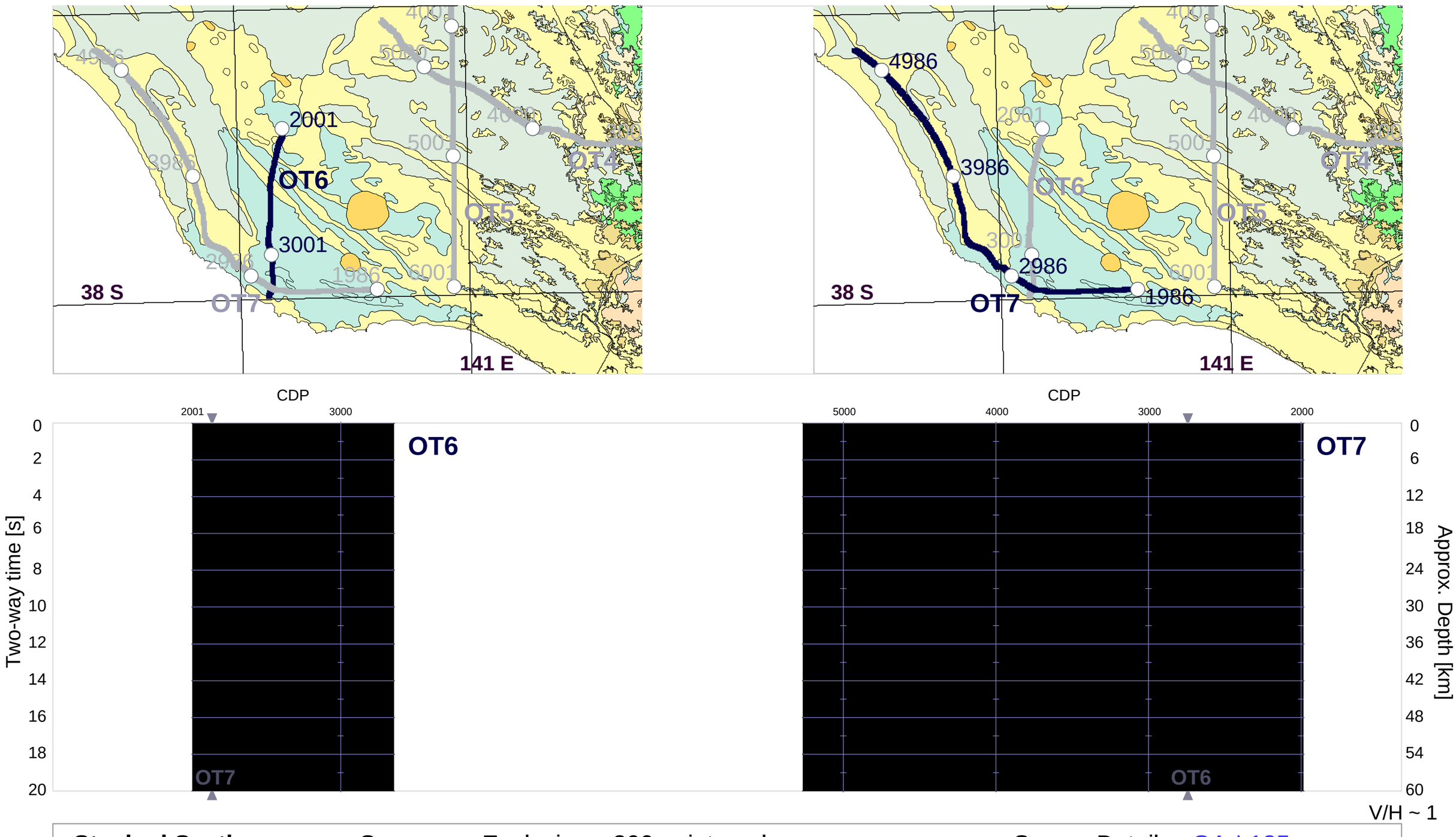


CDP



Stacked Section	Source:	Explosives, 300 m interval	Survey Details: GA-L135
	Spread:	120 Channels, 50 m group interval	
	Fold:	10 nominal	

1992 L135 OT6 OT7	SOUTH AUSTRALIA Otway Basin	*Geoscience Australia*



Stacked Section

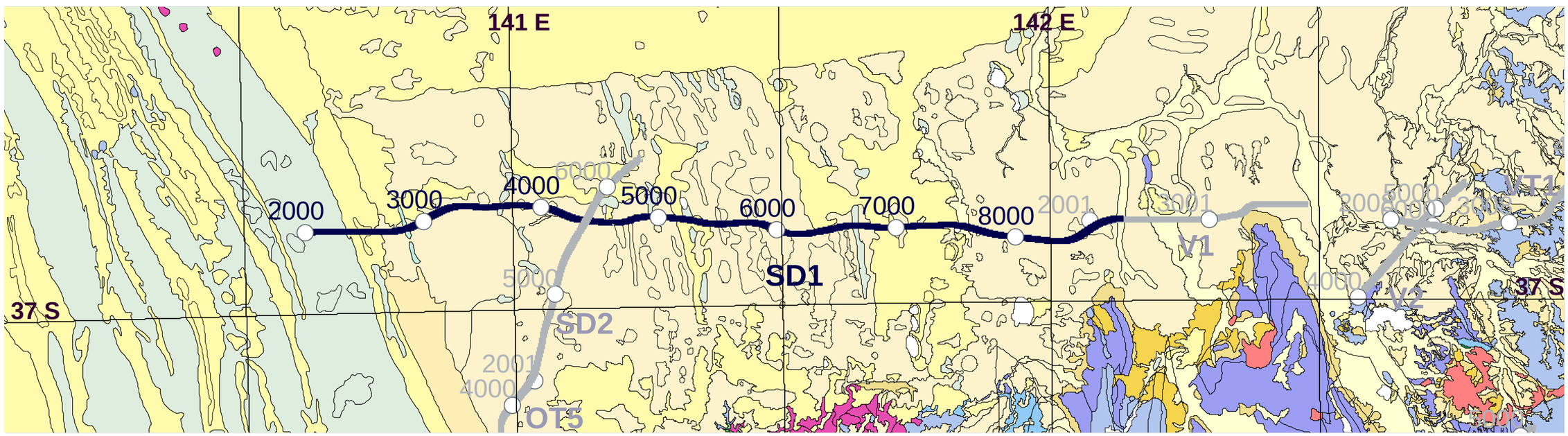
Source: Explosives, 300 m interval

Spread: 120 Channels, 50 m group interval

Fold: 10 nominal

Survey Details: GA-L135

2009 L193 SD1	SOUTH AUSTRALIA - VICTORIA Southern Delamerian	*AuScope Geoscience Victoria* *Geoscience Australia PIRSA*

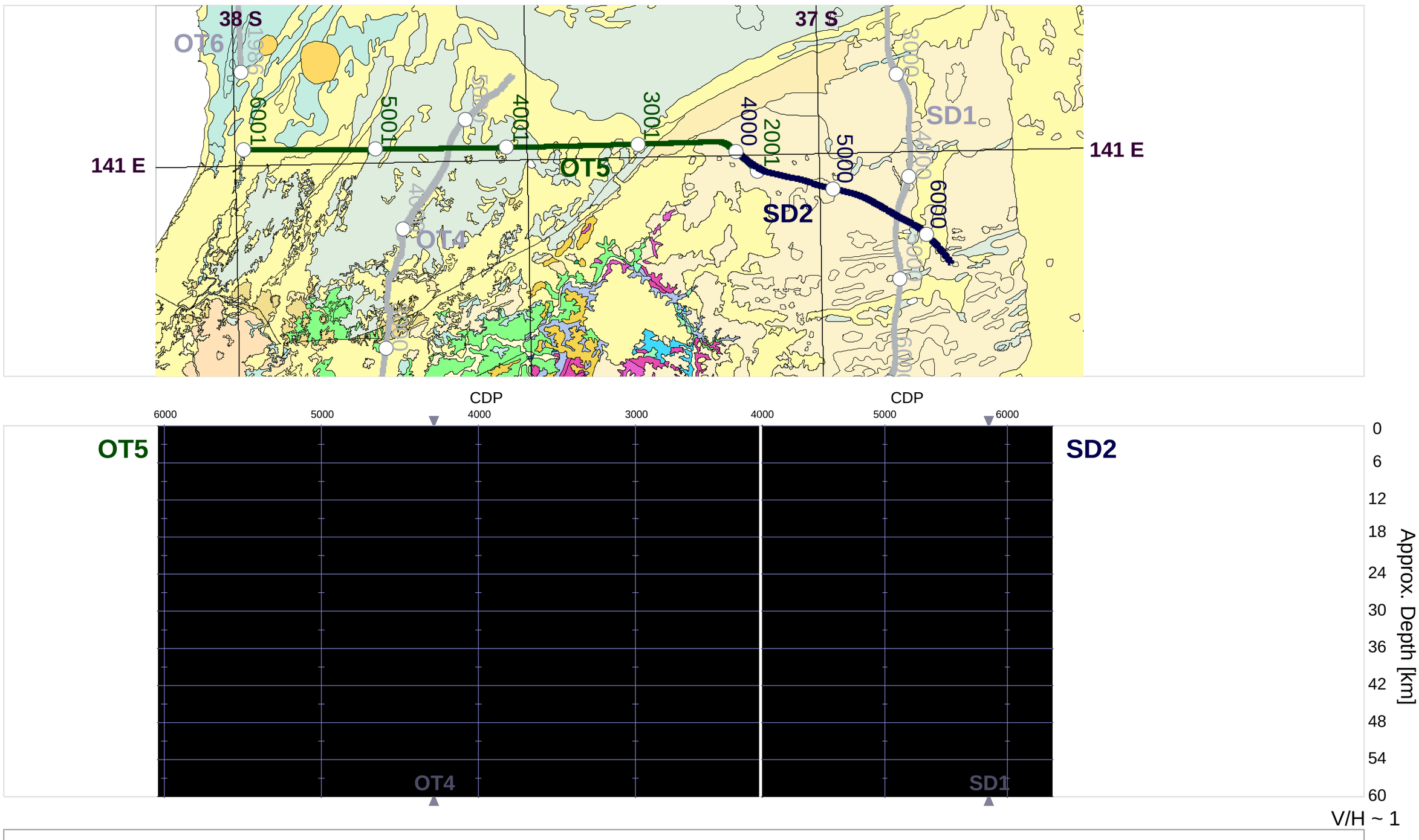


Migrated Section

Source: 3 Hemi-50 Vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

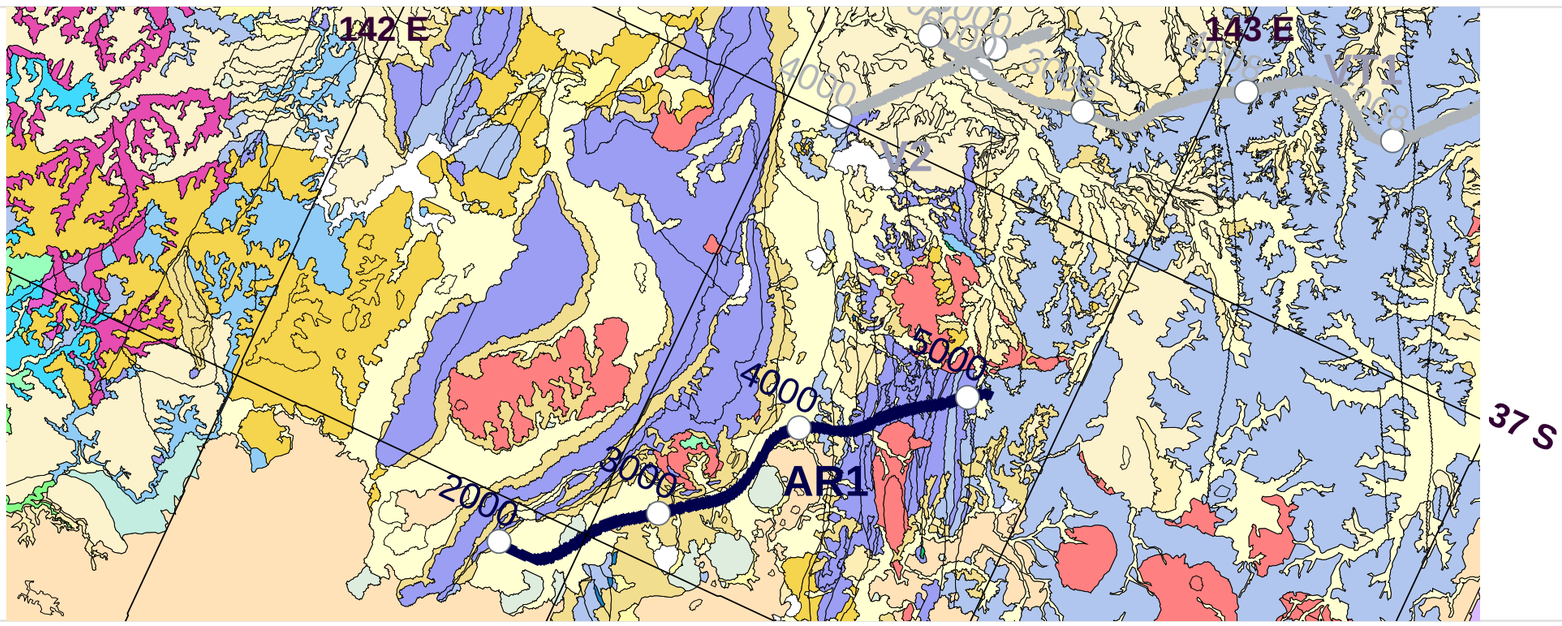
Survey Details: GA-L193

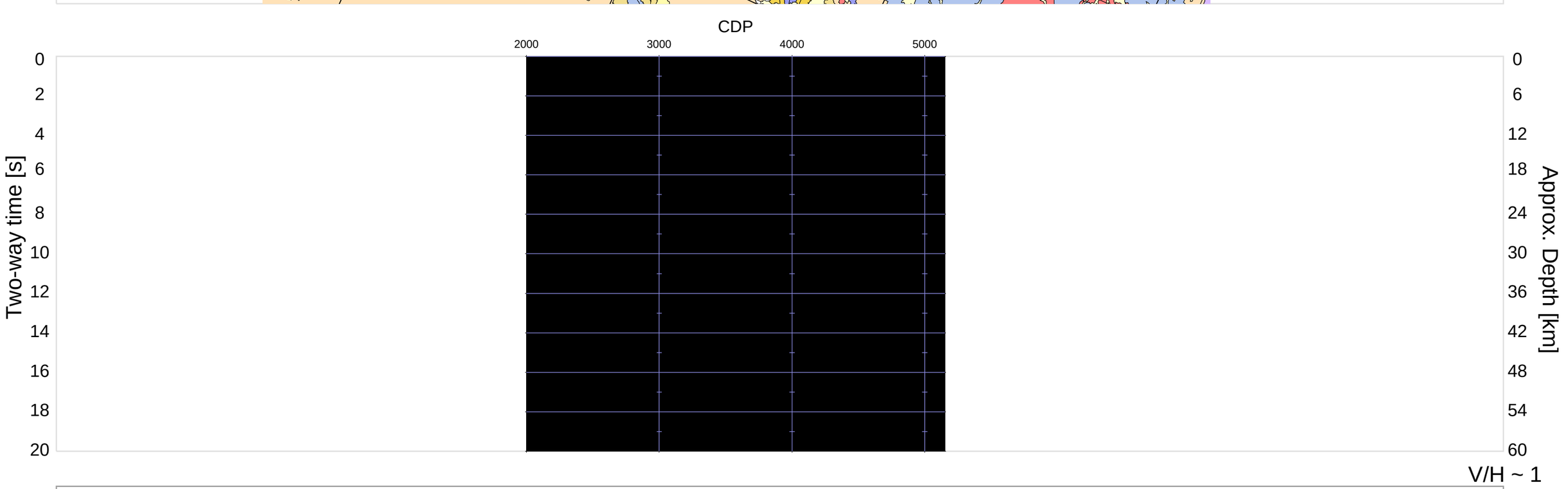
2009 L193 SD2 1992 L135 OT5	SOUTH AUSTRALIA - VICTORIA Southern Delamerian	*AuScope Geoscience Victoria* *Geoscience Australia PIRSA*



Migrated Section SD2	Source: Spread: Fold:	3 Hemi-50 Vibrators, 80 m interval 300 Channels, 40 m group interval 75 nominal	Survey Details: GA-L193 Notes: OT5 - Explosives, 10 fold stacked section

2009 L194 AR1	VICTORIA Ararat	*Geoscience Victoria* *Geoscience Australia*



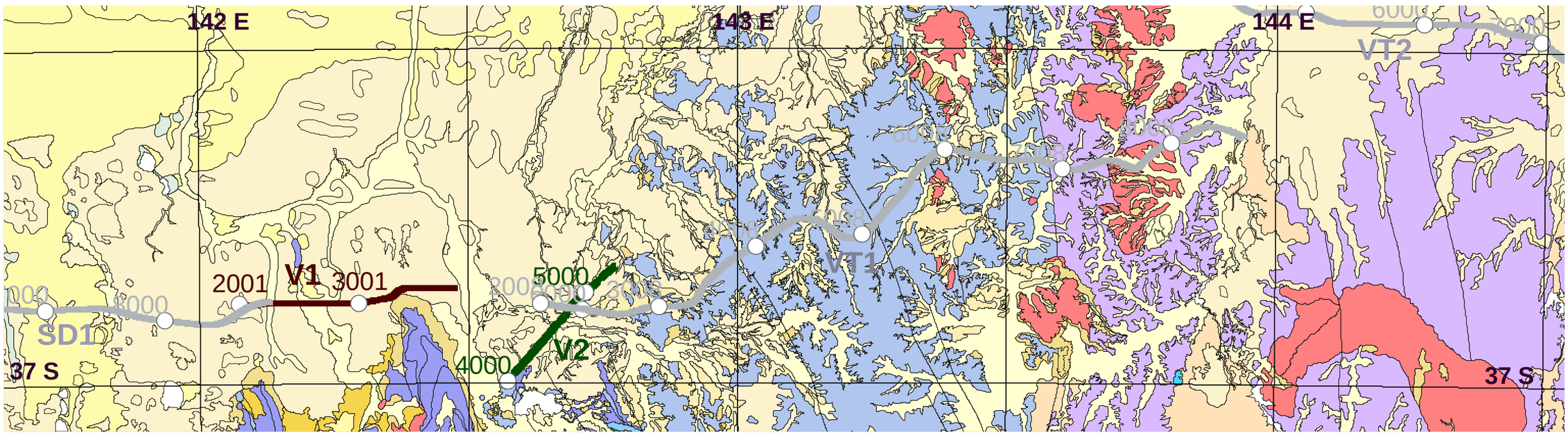


Migrated Section

Source: 3 Hemi-50 Vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L194

1997 L142 V1 V2	VICTORIA Victorian Grampians	*Geoscience Australia* *Australian Geodynamics CRC*



Migrated Section

Source: Explosives, 240 m interval

Spread: 120 Channels, 40 m group interval

Fold: 10 nominal

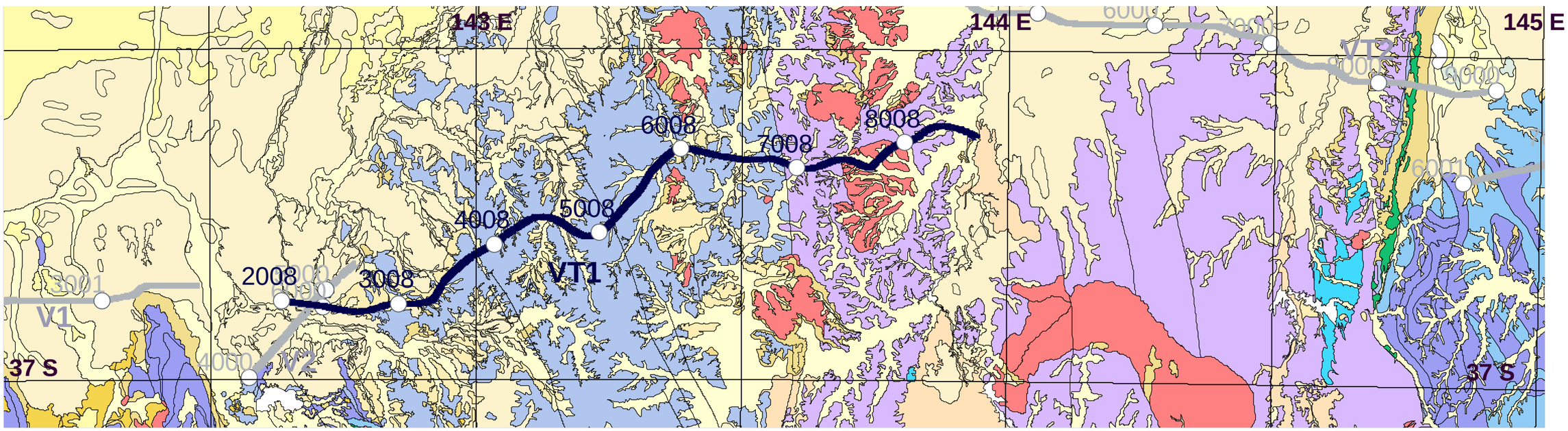
Survey Details: GA-L142

2006 L178 VT1

VICTORIA Central Victoria

Geoscience Australia

*pmd*CRC Geoscience Victoria*



Migrated Section

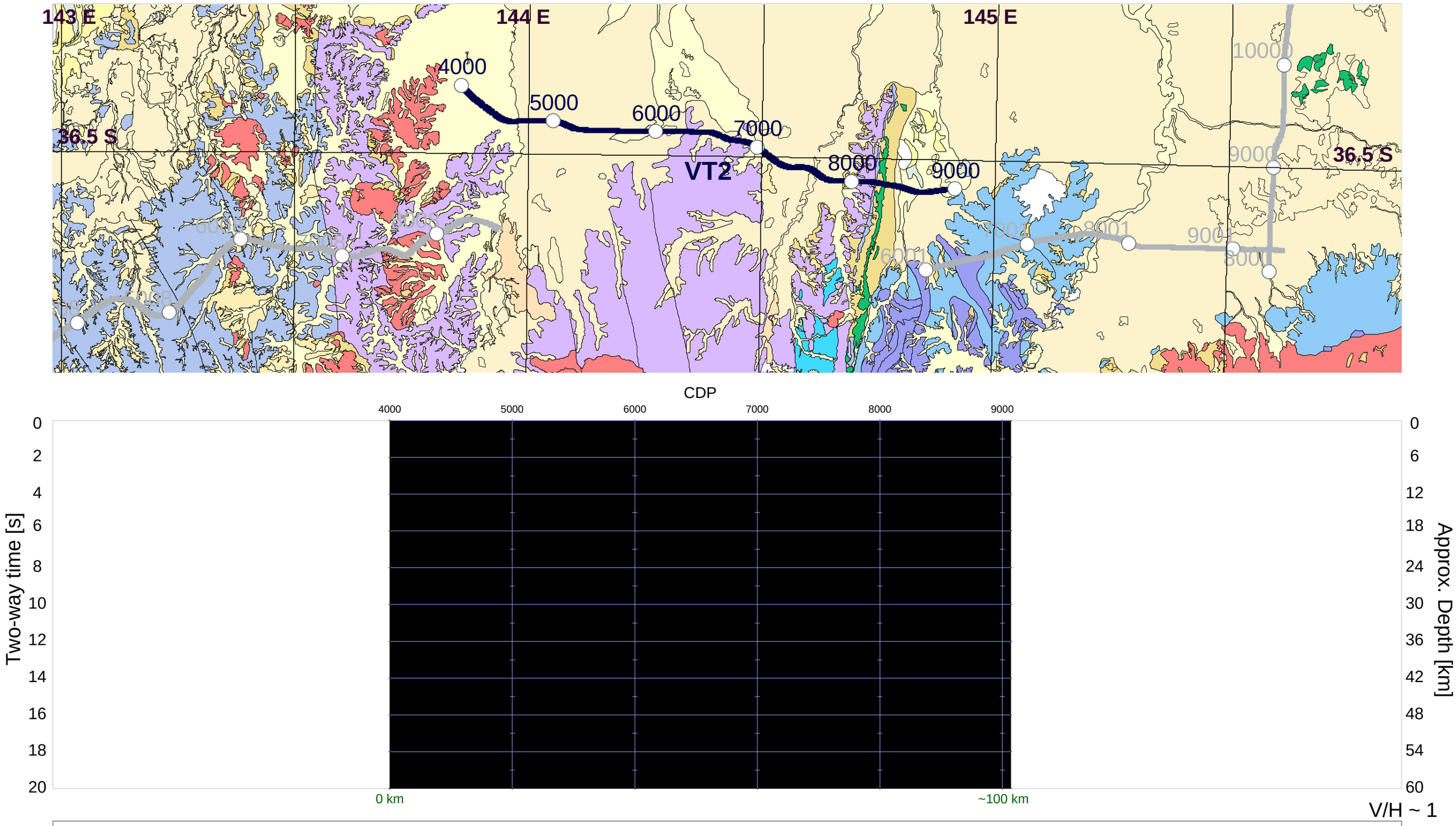
Source: 3 Hemi-60 Vibrators, 80 m interval

Spread: 240 Channels, 40 m group interval

Fold: 60 nominal

Survey Details: GA-L178

2006 L178 VT2	VICTORIA Central Victoria	*Geoscience Australia* *pmd*CRC Geoscience Victoria*



Migrated Section

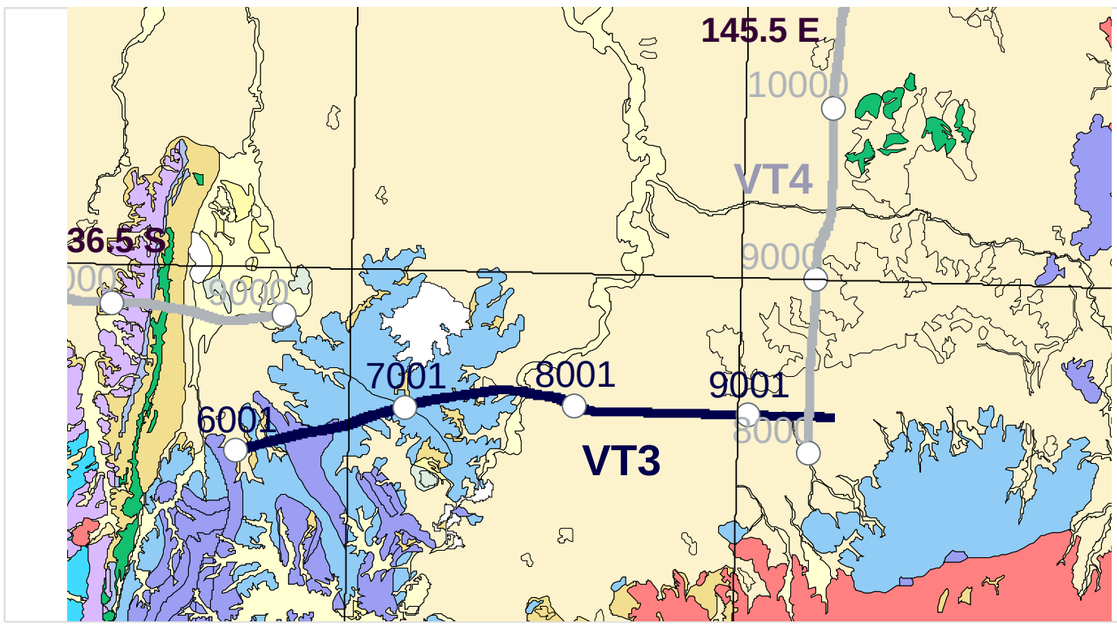
Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 Channels, 40 m group interval
Fold: 60 nominal

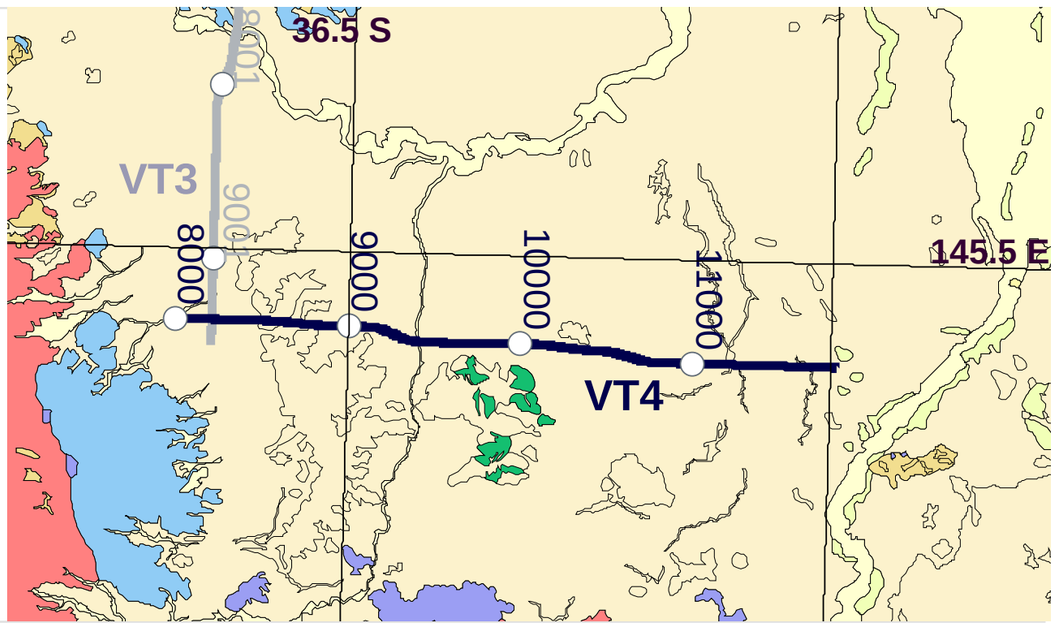
Survey Details: GA-L178

2006 L178
VT3 VT4

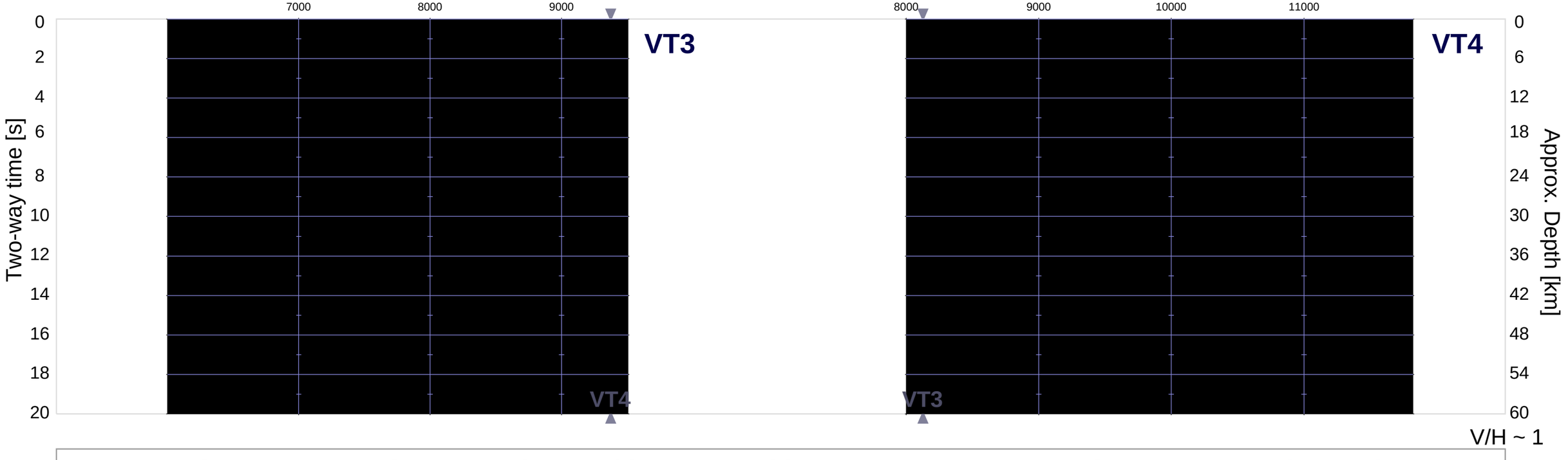
VICTORIA
Central Victoria

Geoscience Australia
*pmd*CRC Geoscience Victoria*





CDP



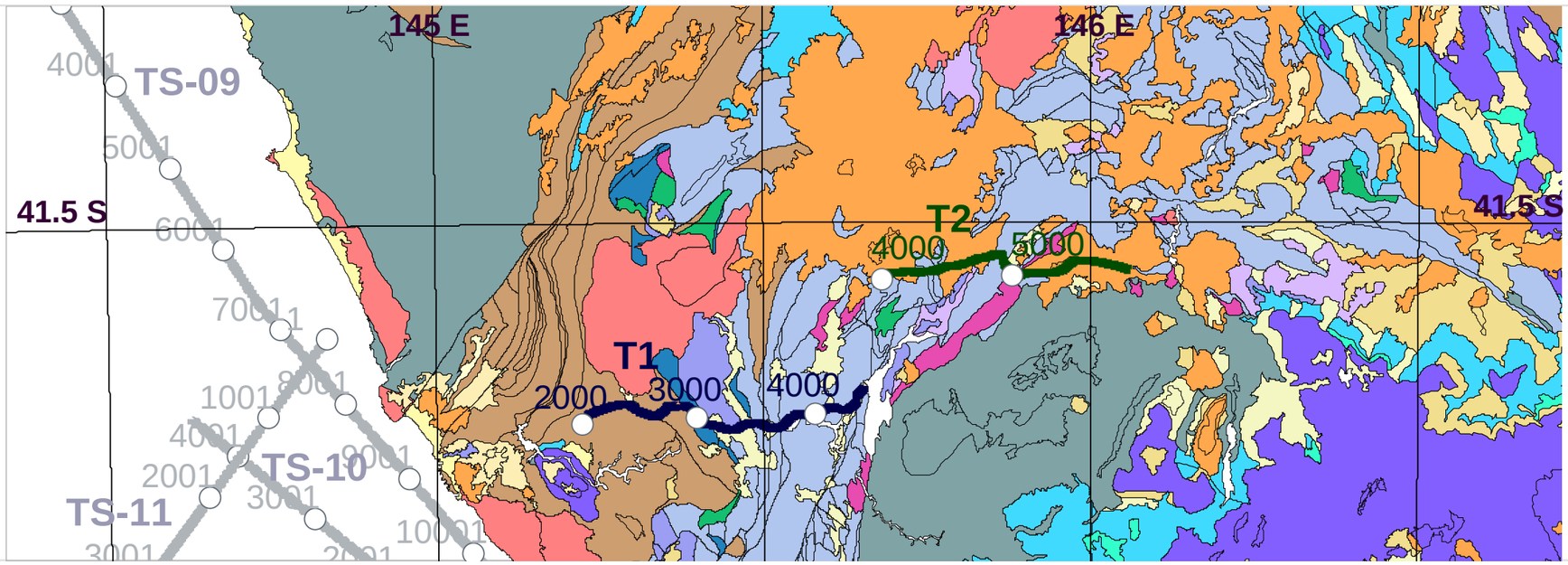
CDP

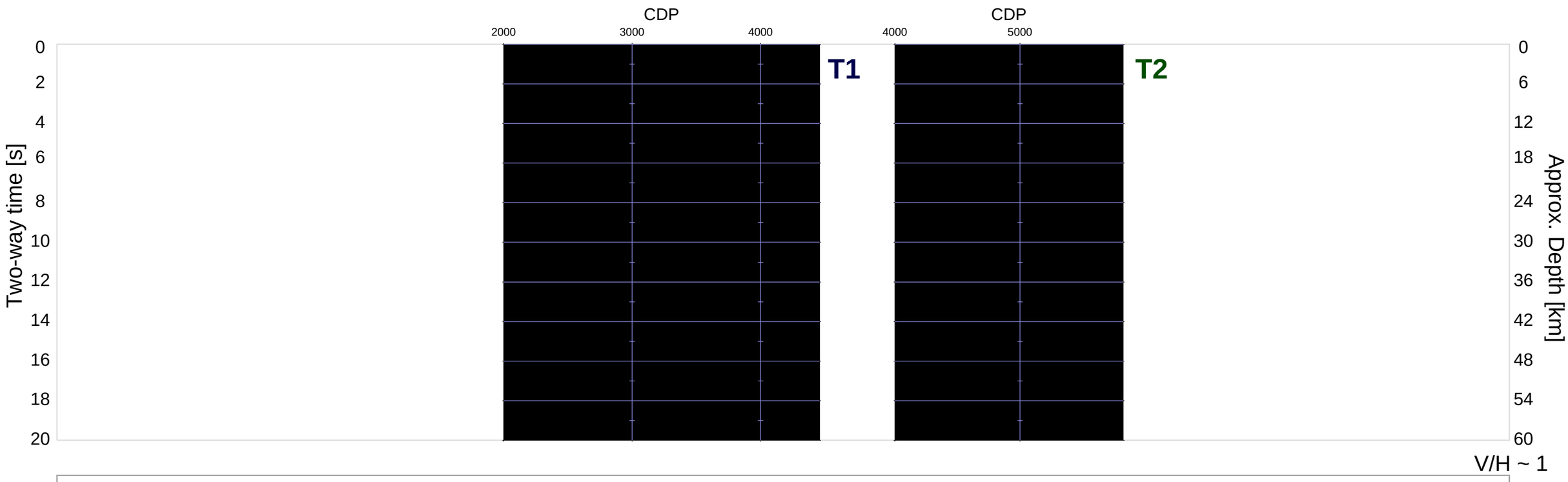
Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 Channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L178

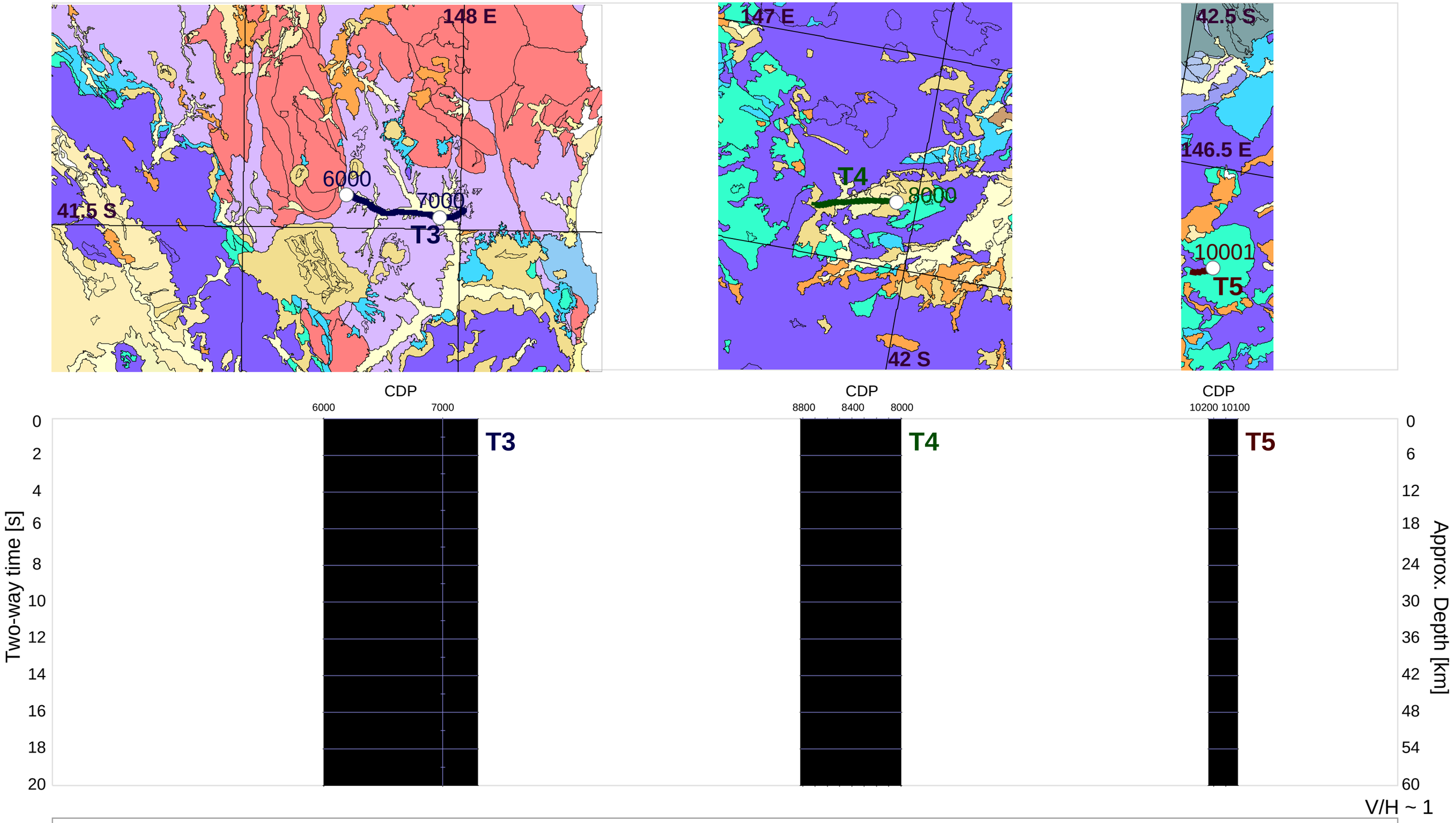
1995 L139 T1 T2	TASMANIA West Tasmania	*Geoscience Australia* *Tasmania Development*	81





Stacked Section	Source:	Explosives, 120 m interval	Survey Details: GA-L139
	Spread:	120 Channels, 40 m group interval	
	Fold:	20 nominal	

1995 L139 T3 T4 T5	TASMANIA East Tasmania	*Geoscience Australia* *Tasmania Development*



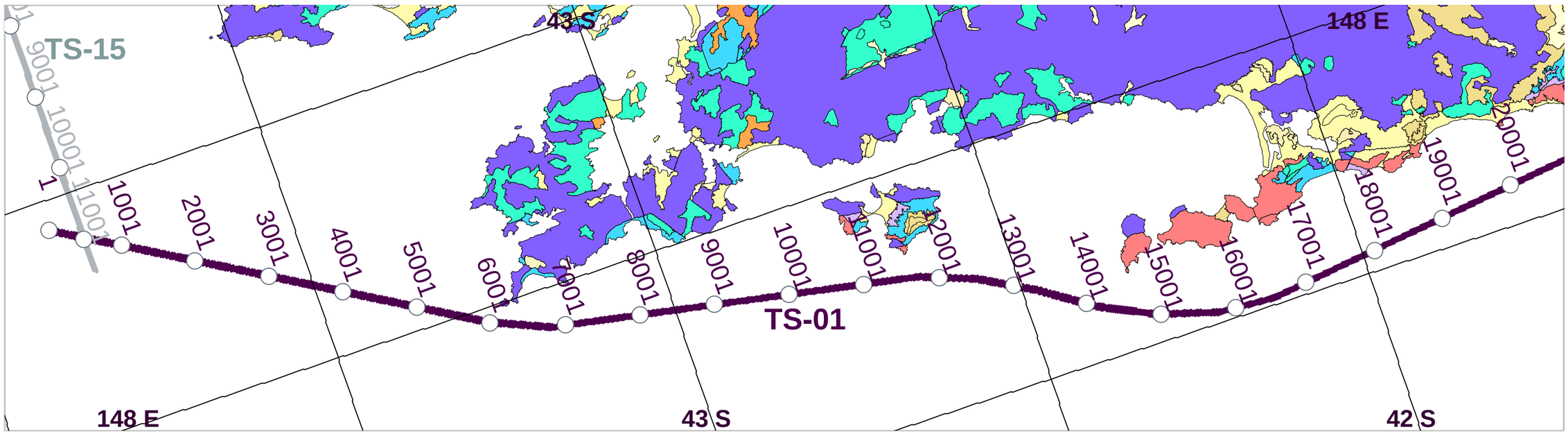
Stacked Section

Source: Explosives, 240 m interval

Spread: 120 Channels, 40 m group interval

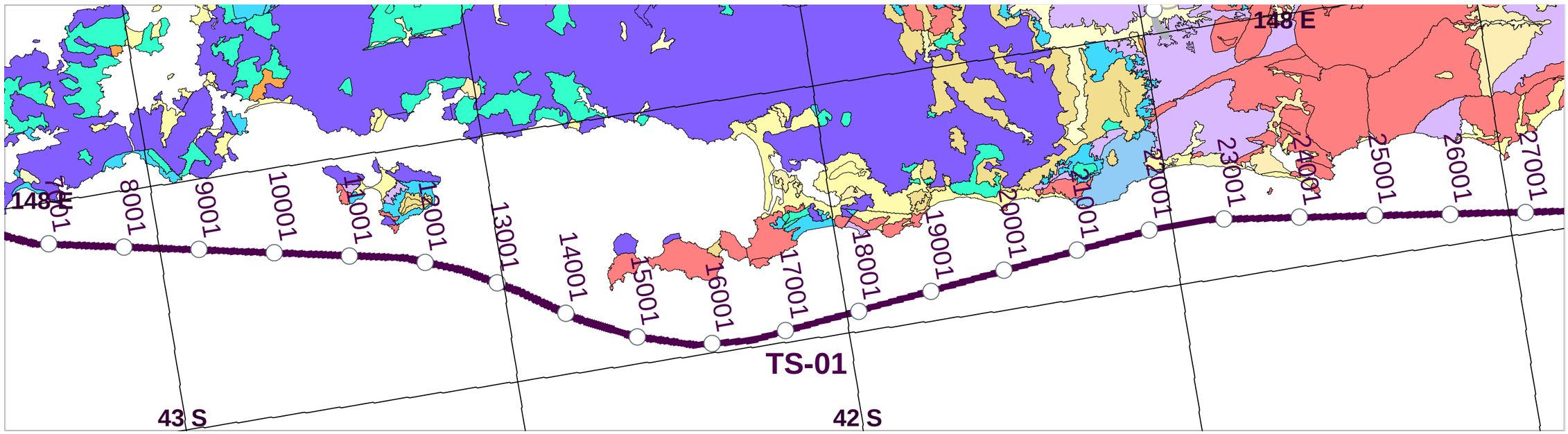
Fold: 10 nominal

Survey Details: GA-L139

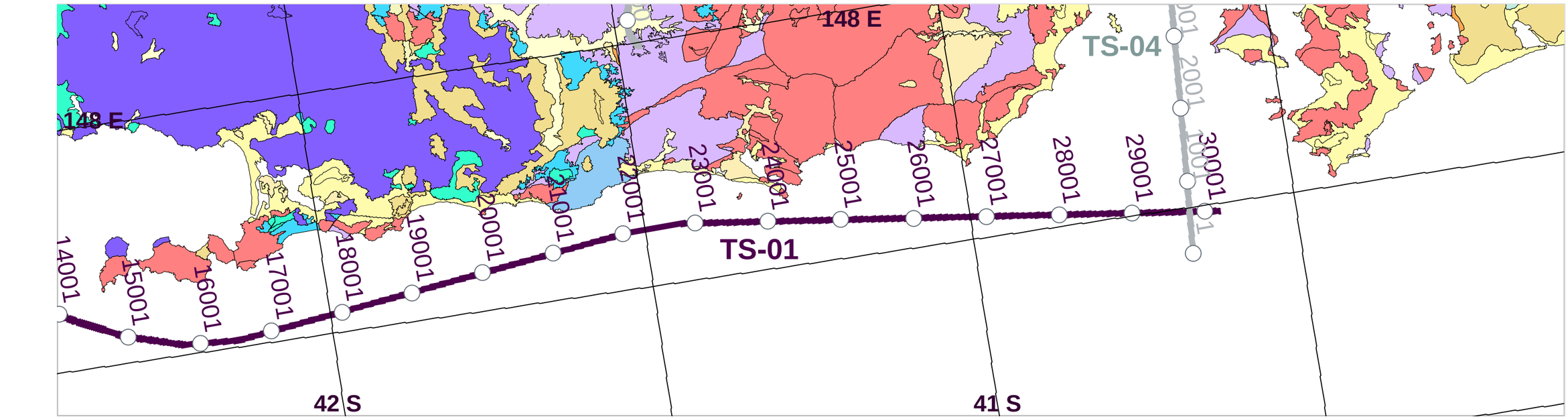


Migrated Section	Source:	Air-guns 3000 cu.in. total, 50 m interval	Survey Details: GA-S148
	Spread:	192 Channels, 25 m group interval	
	Fold:	48 nominal	

1995 S148 TS-01 Panel 2	TASMANIA East Tasmania Offshore	*Geoscience Australia*

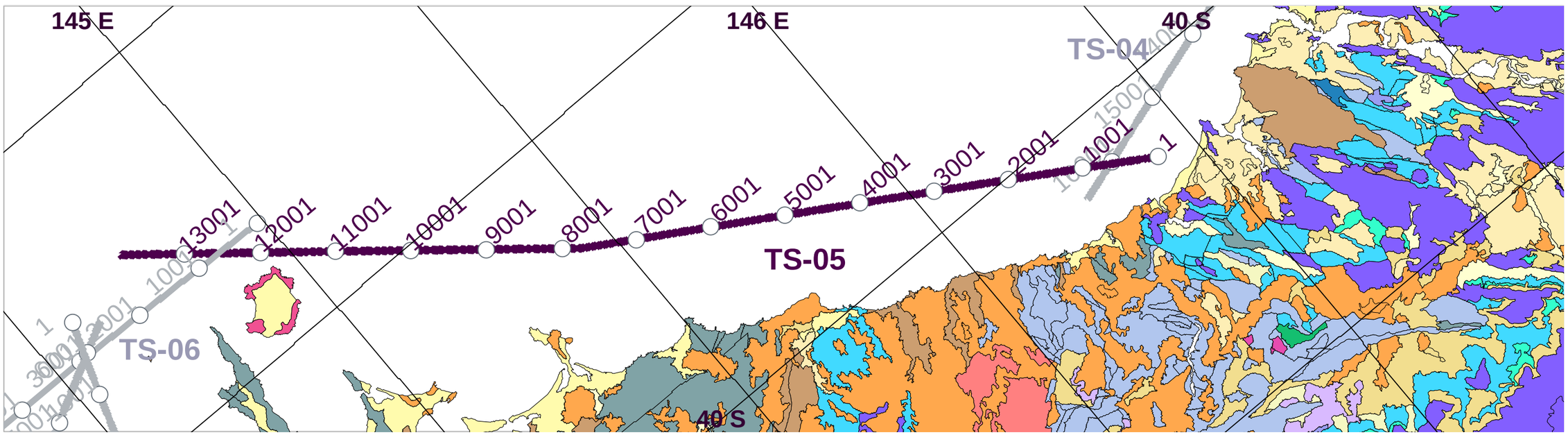


Migrated Section	Source:	Air-guns 3000 cu.in. total, 50 m interval	Survey Details: GA-S148
	Spread:	192 Channels, 25 m group interval	
	Fold:	48 nominal	

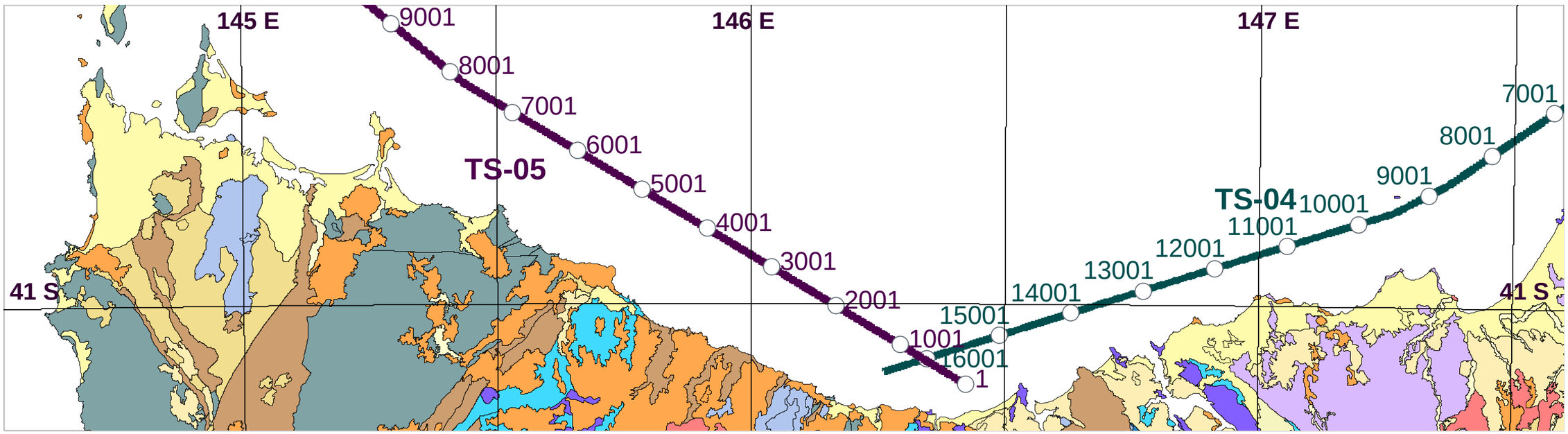


Migrated Section	Source:	Air-guns 3000 cu.in. total, 50 m interval	Survey Details: GA-S148
	Spread:	192 Channels, 25 m group interval	
	Fold:	48 nominal	

1995 S148 TS-05 Panel 1	TASMANIA North Tasmania Offshore	*Geoscience Australia*

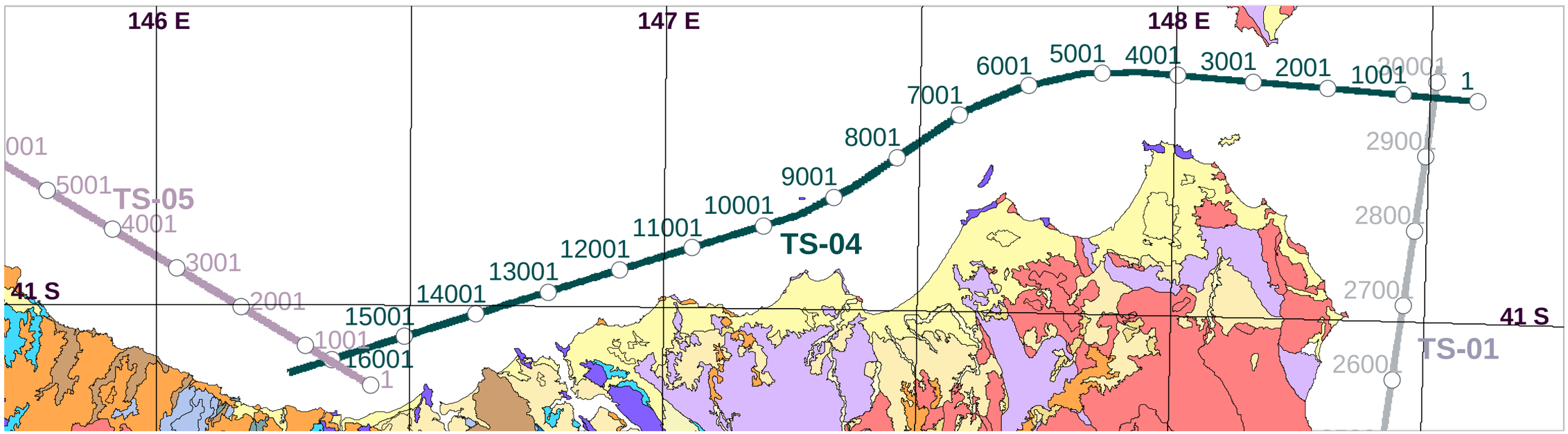


Migrated Section	Source:	Air-guns 3000 cu.in. total, 50 m interval	Survey Details: GA-S148
	Spread:	192 Channels, 25 m group interval	
	Fold:	48 nominal	



Migrated Section	Source:	Air-guns 3000 cu.in. total, 50 m interval	Survey Details: GA-S148
	Spread:	192 Channels, 25 m group interval	
	Fold:	48 nominal	

1995 S148 TS-04 Panel 2	TASMANIA North Tasmania Offshore	*Geoscience Australia*



Migrated Section

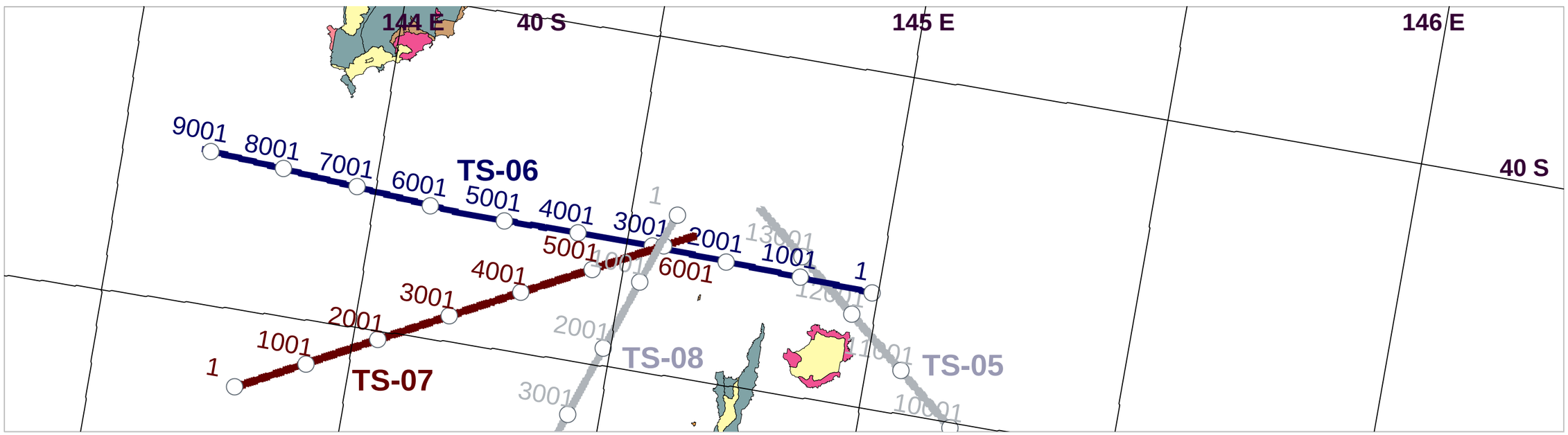
Source: Air-guns 3000 cu.in. total, 50 m interval

Spread: 192 Channels, 25 m group interval

Fold: 48 nominal

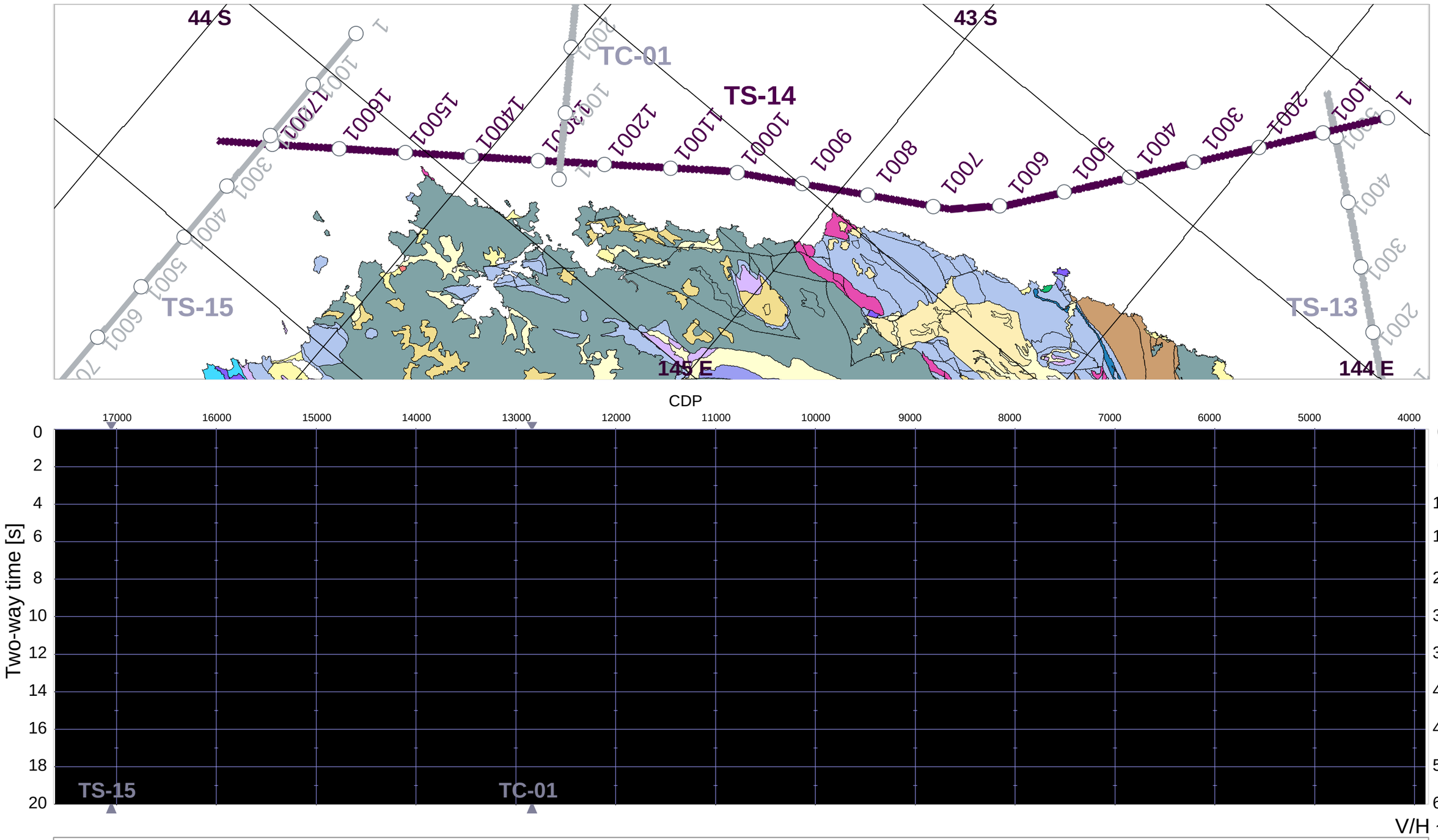
Survey Details: GA-S148

1995 S148 TS-06 TS-07	TASMANIA NW Tasmania Offshore	*Geoscience Australia*



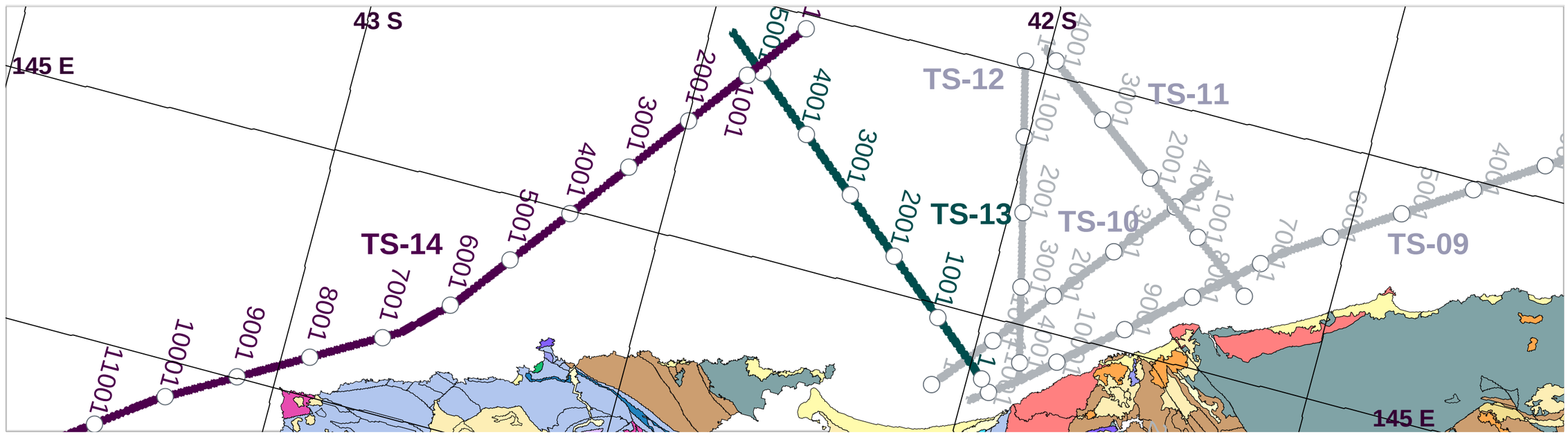
Migrated Section	Source:	Air-guns 3000 cu.in. total, 50 m interval	Survey Details: GA-S148
	Spread:	192 Channels, 25 m group interval	
	Fold:	48 nominal	

1995 S148 TS-14 Panel 1	TASMANIA West Tasmania Offshore	*Geoscience Australia*



Migrated Section	Source:	Air-guns 3000 cu.in. total, 50 m interval	Survey Details: GA-S148
	Spread:	192 Channels, 25 m group interval	
	Fold:	48 nominal	

1995 S148 TS-14 TS-13	TASMANIA West Tasmania Offshore	*Geoscience Australia*



Migrated Section

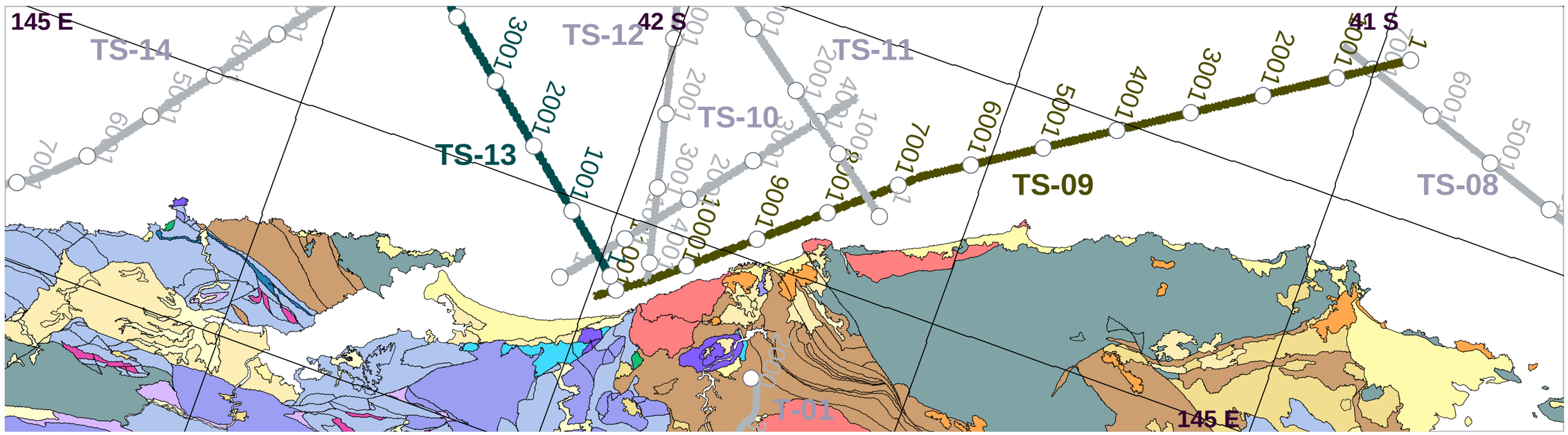
Source: Air-guns 3000 cu.in. total, 50 m interval

Spread: 192 Channels, 25 m group interval

Fold: 48 nominal

Survey Details: GA-S148

1995 S148 TS-13 TS-09	TASMANIA West Tasmania Offshore	*Geoscience Australia*



Migrated Section

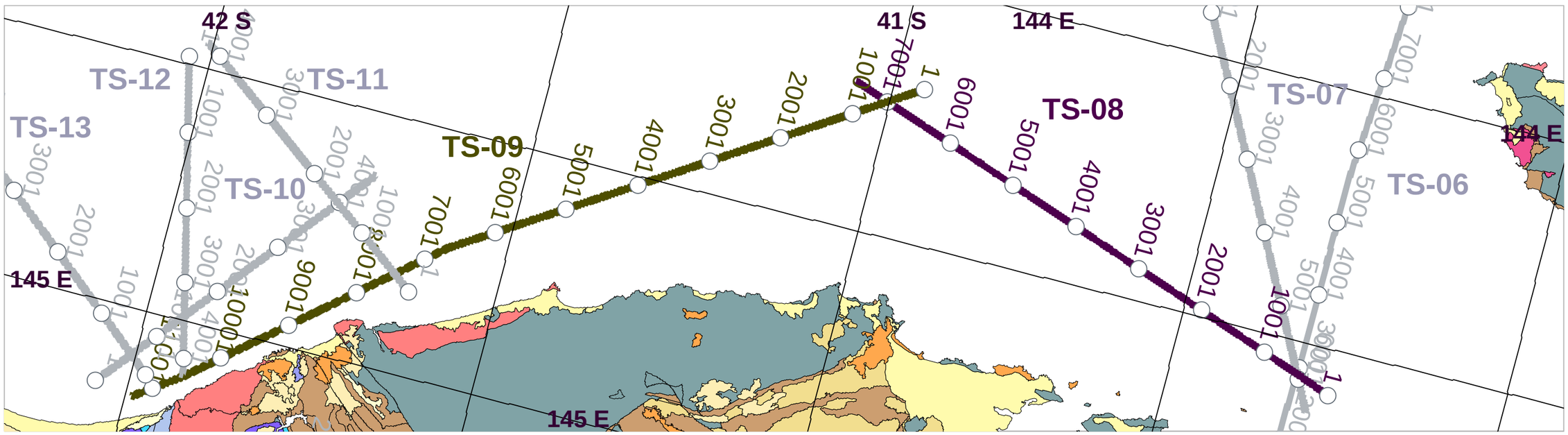
Source: Air-guns 3000 cu.in. total, 50 m interval

Spread: 192 Channels, 25 m group interval

Fold: 48 nominal

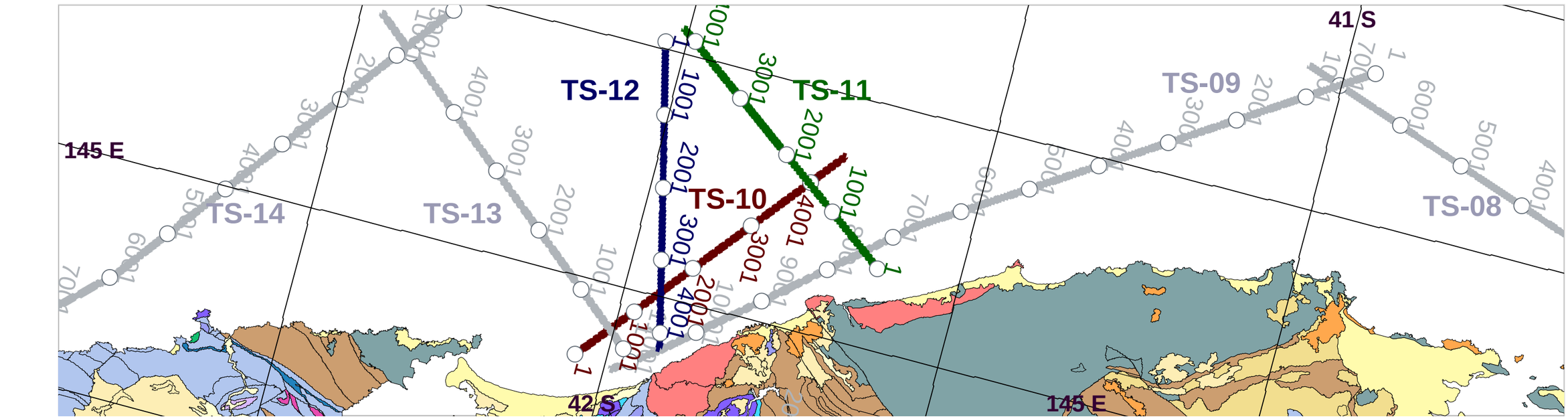
Survey Details: GA-S148

1995 S148 TS-09 TS-08	TASMANIA Tasmania Offshore	*Geoscience Australia*



Migrated Section	Source:	Air-guns 3000 cu.in. total, 50 m interval	Survey Details: GA-S148
	Spread:	192 Channels, 25 m group interval	
	Fold:	48 nominal	

1995 S148 TS-10 TS-11 TS-12	TASMANIA West Tasmania Offshore	*Geoscience Australia*



Migrated Section

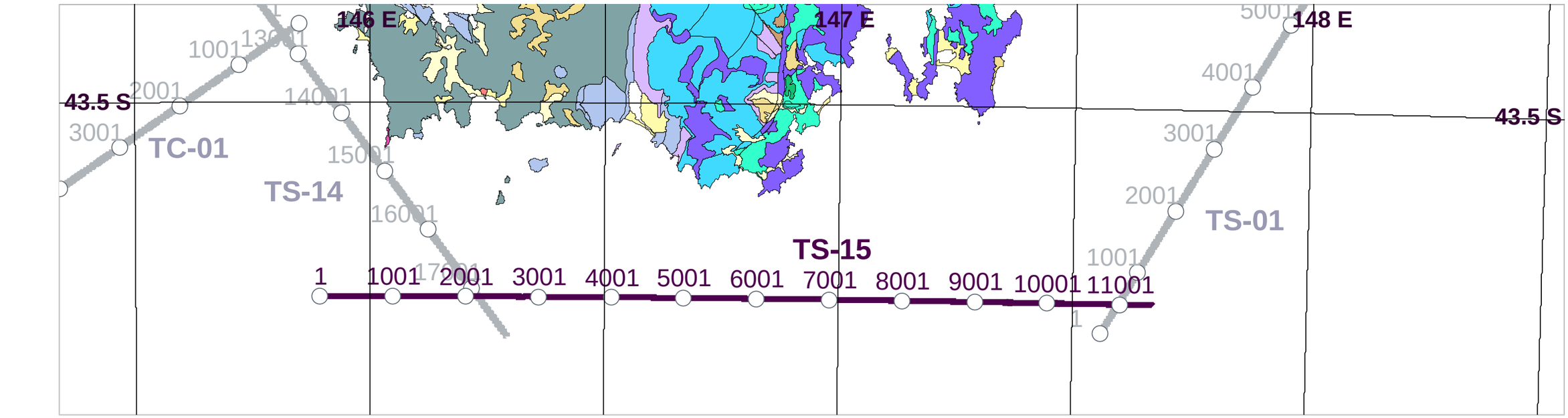
Source: Air-guns 3000 cu.in. total, 50 m interval

Spread: 192 Channels, 25 m group interval

Fold: 48 nominal

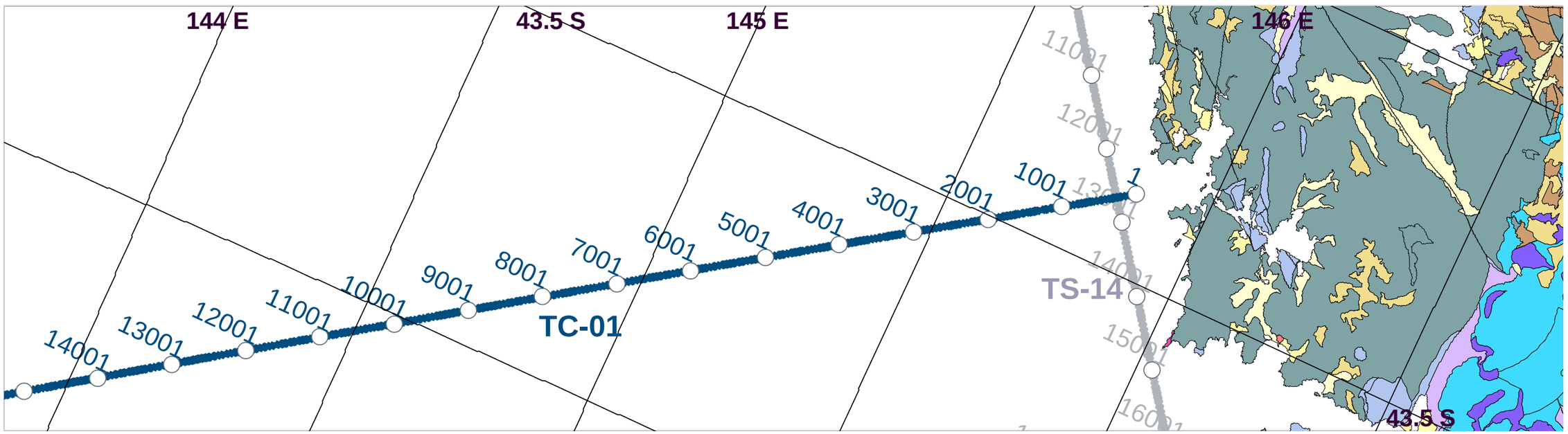
Survey Details: GA-S148

1995 S148 TS-15	TASMANIA South Tasmania Offshore	*Geoscience Australia*



Migrated Section	Source:	Air-guns 3000 cu.in. total, 50 m interval	Survey Details: GA-S148
	Spread:	192 Channels, 25 m group interval	
	Fold:	48 nominal	

1995 S159 TC-01	TASMANIA Tasmania Offshore	*Geoscience Australia*



Migrated Section

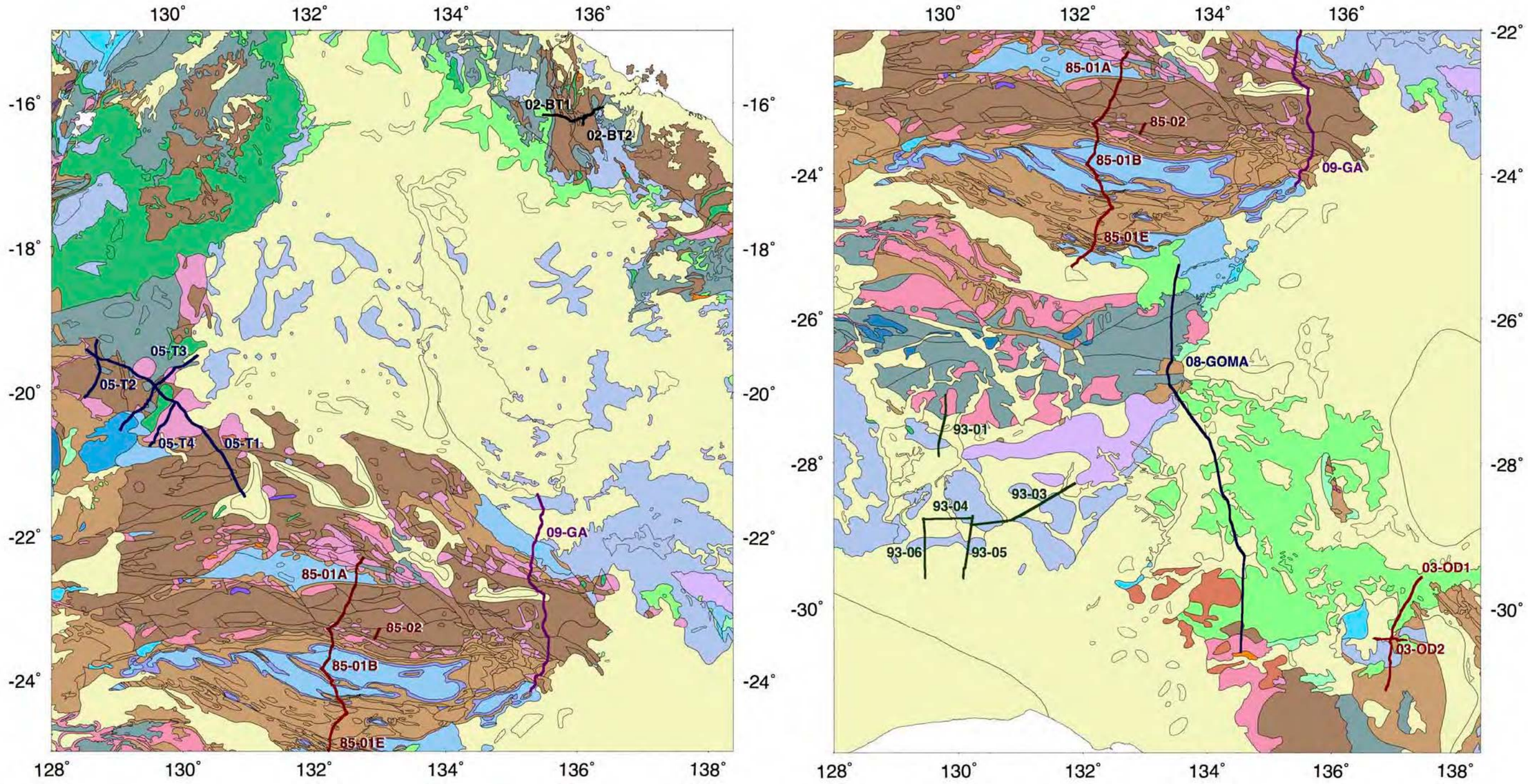
Source: Air-guns 3000 cu.in. total, 50 m interval

Spread: 192 Channels, 25 m group interval

Fold: 48 nominal

Survey Details: GA-S159

CENTRAL AUSTRALIA 1978-2011



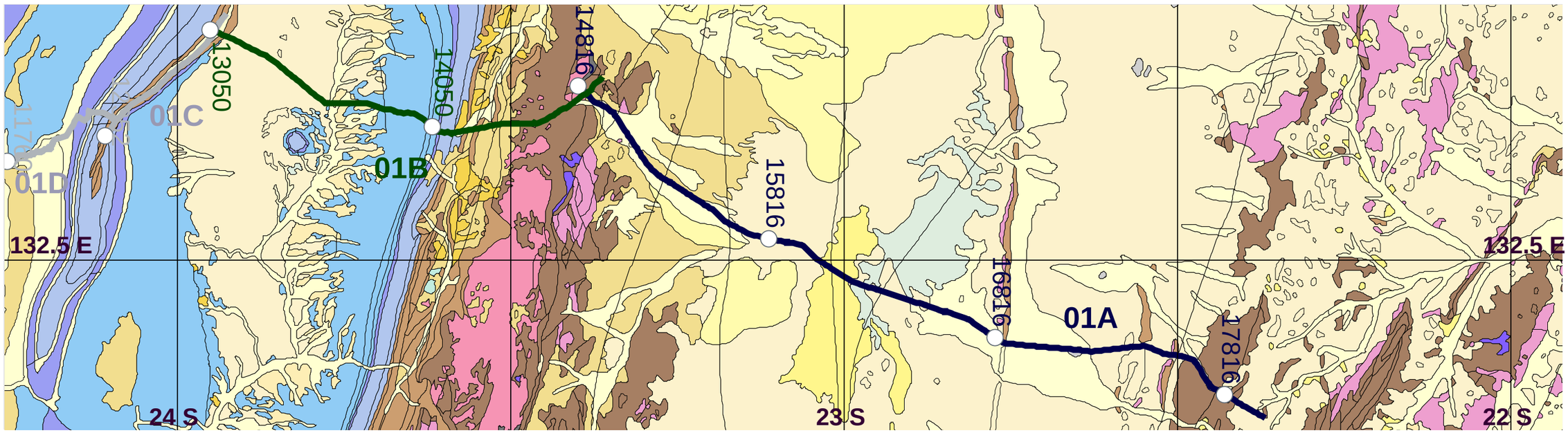
Profiles are identified by 2 digit year and line designator

INDEX OF PROFILES: CENTRAL AUSTRALIA 1978-2011

On the display panels the reflection lines are identified by year, project identifier and line designator. The table below presents the full list of the lines and the codes used in Geoscience Australia reports, together with the nature of the display and the bias and clip parameters used to display the sections using the *pssegy* facility.

Year	Project	GA Line Code	Line Designator	Display:	Bias	Clip	Page
1985	L121	BMR85-01A	01A	Migrated	1.65	80	99
		BMR85-01B	01B	Migrated	1.65	80	99
		BMR85-02	02	Migrated	1.65	80	100
		BMR85-01C	01C	Stack	*	*	101
		BMR85-01D	01D	Stack	*	*	101
		BMR85-01E	01E	Stack	*	*	101
1993	L137	93AGS-01	O1	Stack	1.79	80	102
		93AGS-03	O3	Stack	1.79	80	103
		93AGS-04	O4	Stack	1.79	80	104
		93AGS-05	O5	Stack	1.79	80	105
		93AGS-06	O6	Stack	1.79	80	105
2002	L157	02GA-BT1	BT1	Migrated	1.67	80	106
		02GA-BT2	BT2	Migrated	1.67	80	106
2005	L171	05GA-T1	T1	Migrated	1.60	80	107-108
		05GA-T2	T2	Migrated	1.50	80	109
		05GA-T3	T3	Migrated	1.50	80	110
		05GA-T4	T4	Migrated	1.50	80	111
2008	L190	08GA-OM1	GOMA	Migrated	1.47	80	112-114
2009	L192	09GA-GA1	GA	Migrated	1.47	80	115-116

* Section from archived image, *segy* not available



Migrated Section

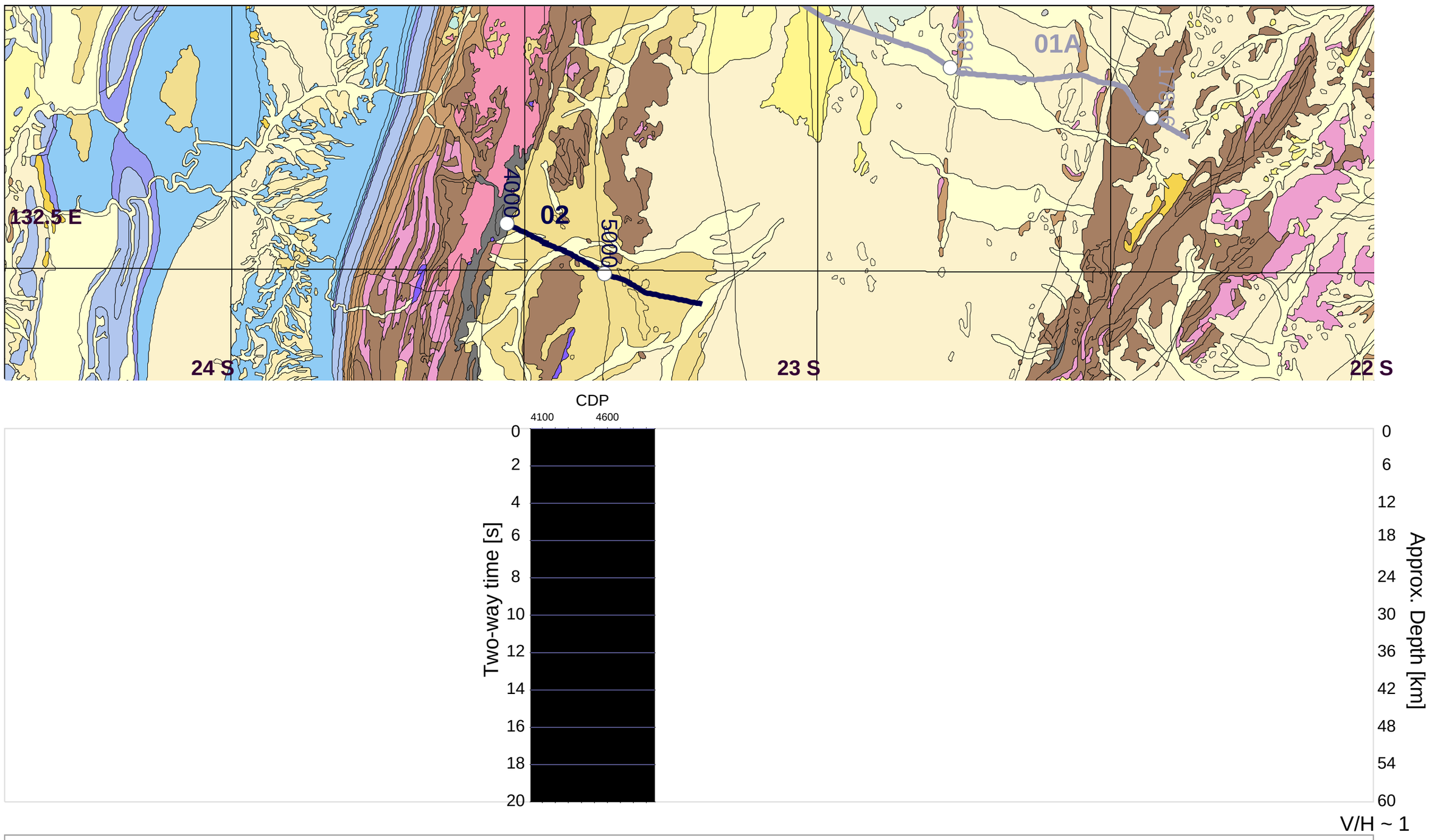
Source: Explosives, 333 m interval

Spread: 48 Channels, 83.3 m group interval

Fold: 6 nominal

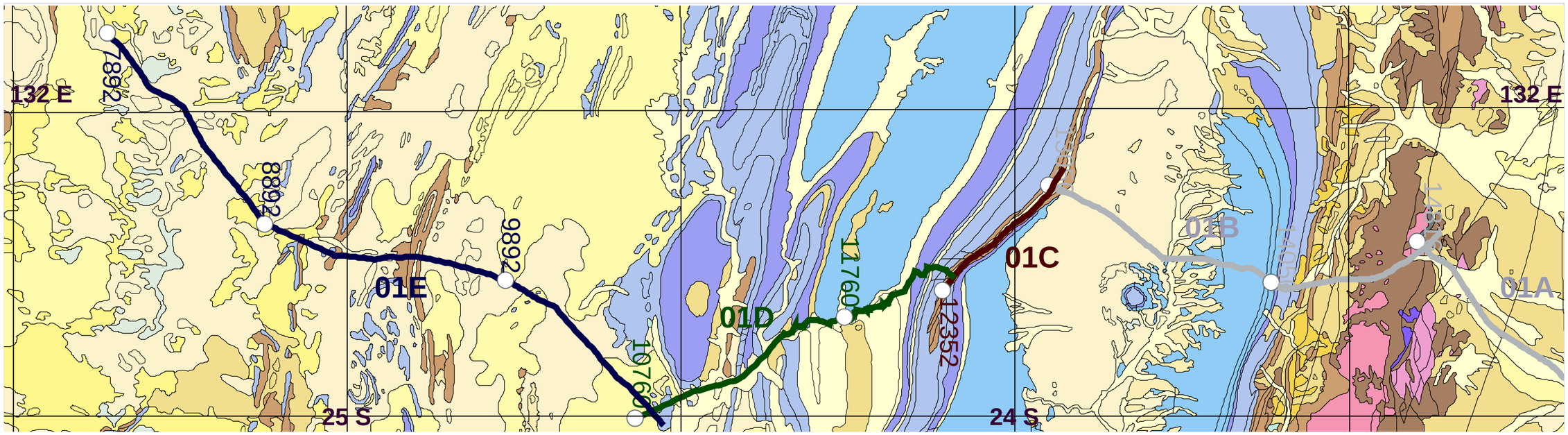
Survey Details: GA-L121

1985 L121 02	NORTHERN TERRITORY Amadeus-Arunta Transect	*Geoscience Australia*



Migrated Section	Source:	Explosives, 333 m interval	Survey Details: GA-L121
	Spread:	48 Channels, 83.3 m group interval	
	Fold:	6 nominal	

1985 L121 01C 01D 01E	NORTHERN TERRITORY Amadeus Basin	*Geoscience Australia*

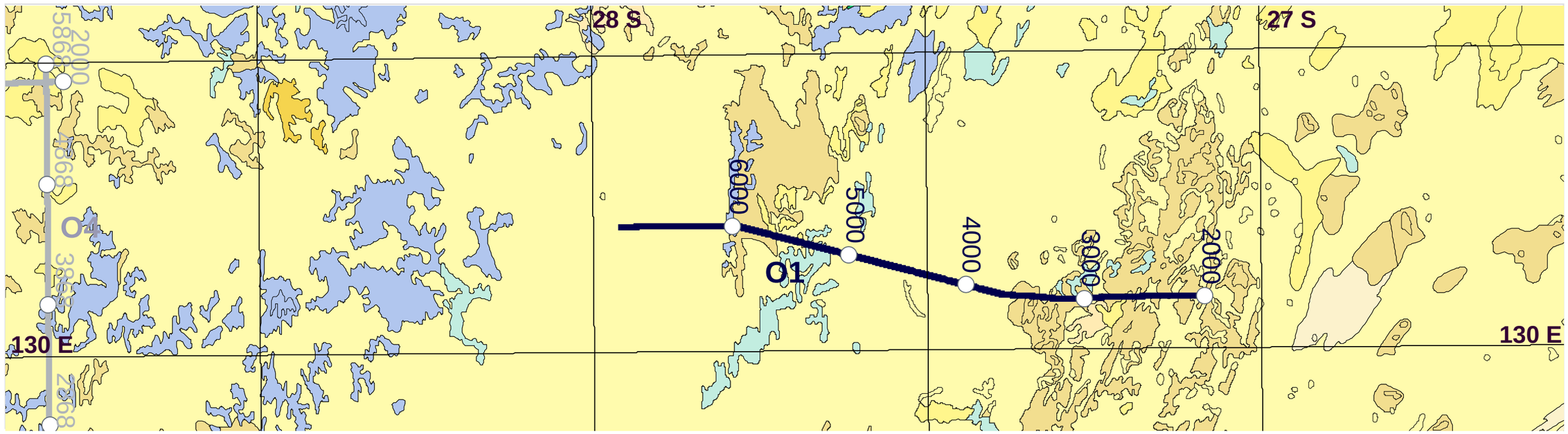


Stacked Section
from Archive Images

Source: Explosives, 333 m interval
Spread: 48 Channels, 83.3 m group interval
Fold: 6 nominal

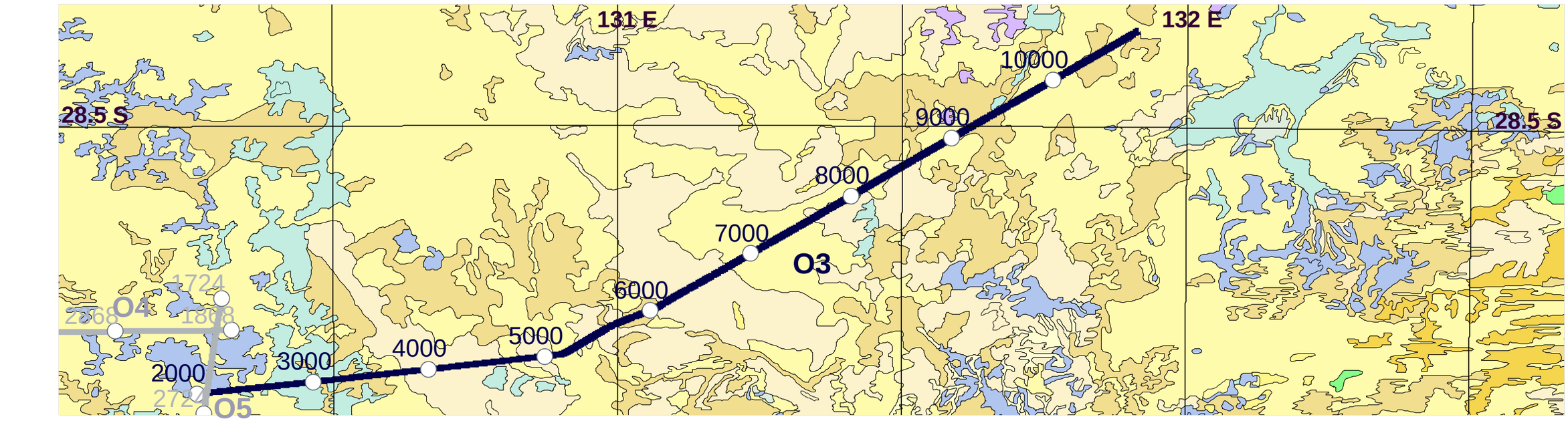
Survey Details: GA-L121

1993 L137 O1	SOUTH AUSTRALIA Officer Basin	*Geoscience Australia*



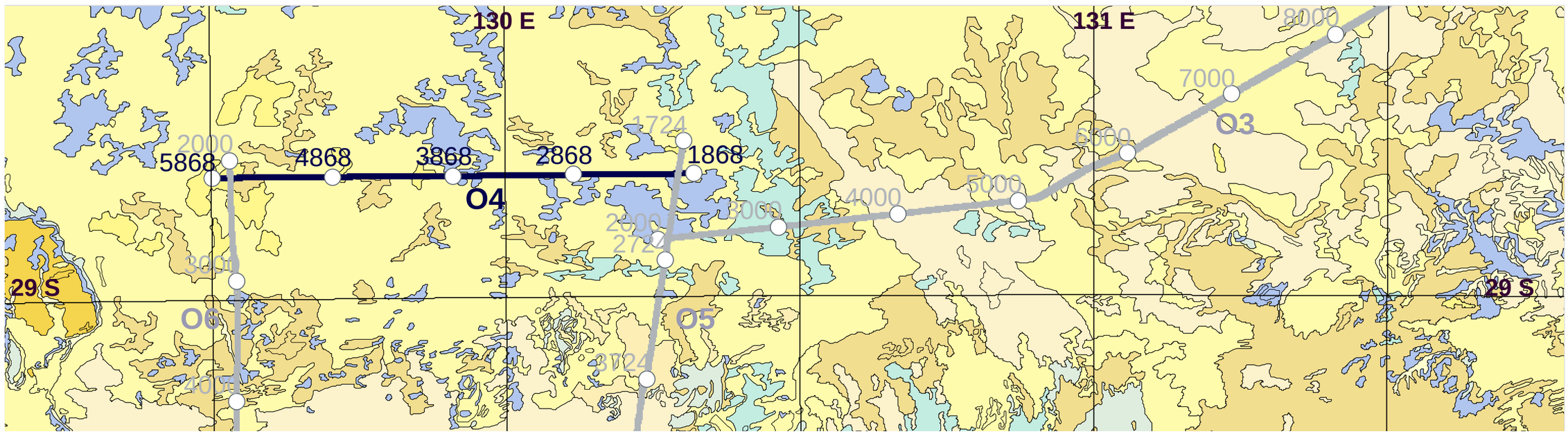
Stacked Section	Source:	Explosives, 240 m interval	Survey Details: GA-L137
	Spread:	120 Channels, 40 m group interval	
	Fold:	10 nominal	Notes: Shallow drill holes in karst

1993 L137 O3	SOUTH AUSTRALIA Officer Basin	*Geoscience Australia*



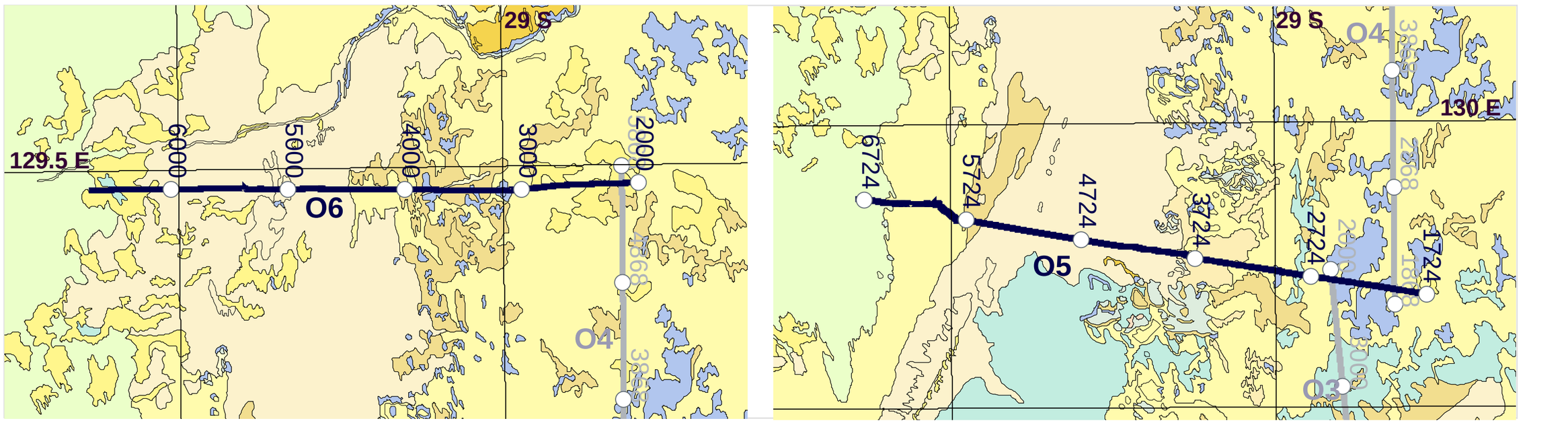
Stacked Section	Source:	Explosives, 240 m interval	Survey Details: GA-L137
	Spread:	120 Channels, 40 m group interval	
	Fold:	10 nominal	Notes: Shallow drill holes in karst

1993 L137 O4	SOUTH AUSTRALIA Officer Basin	*Geoscience Australia*



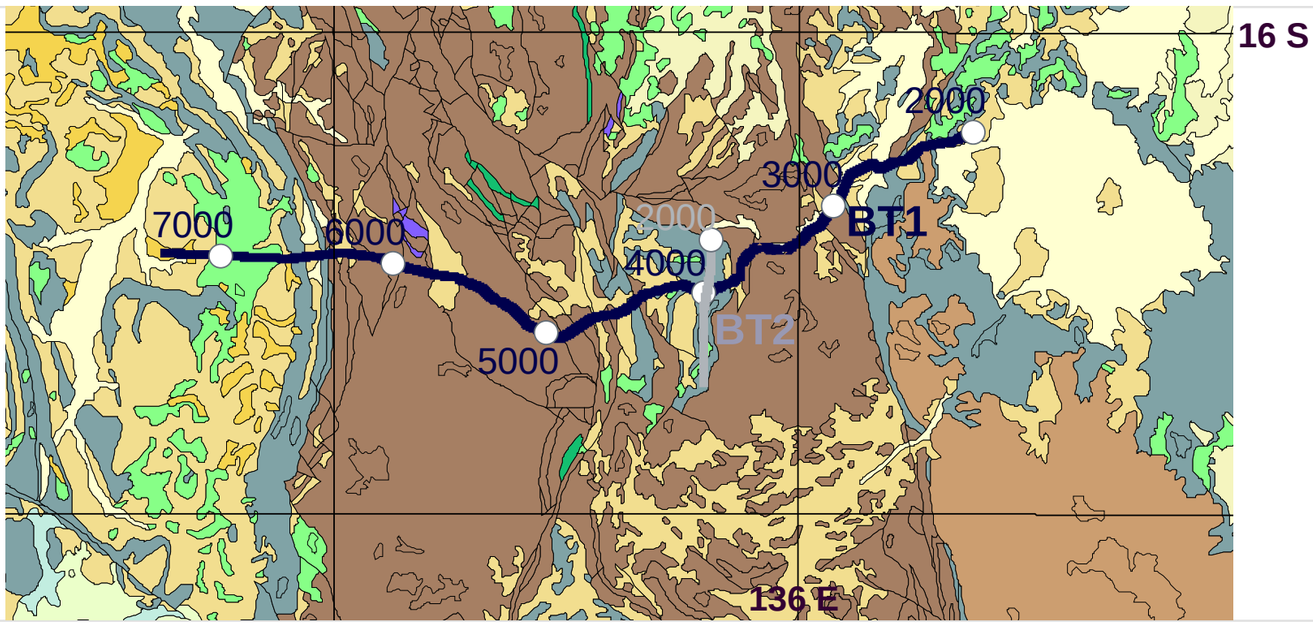
Stacked Section	Source:	Explosives, 240 m interval	Survey Details: GA-L137
	Spread:	120 Channels, 40 m group interval	
	Fold:	10 nominal	Notes: Shallow drill holes in karst

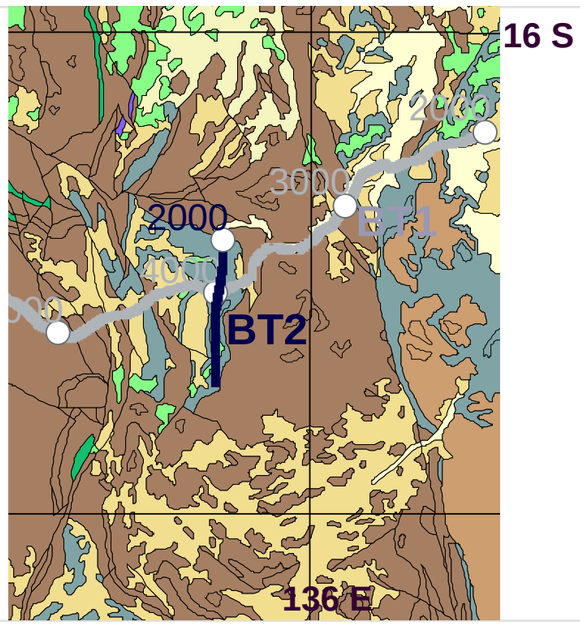
1993 L137 O5 O6	SOUTH AUSTRALIA Officer Basin	*Geoscience Australia*	105

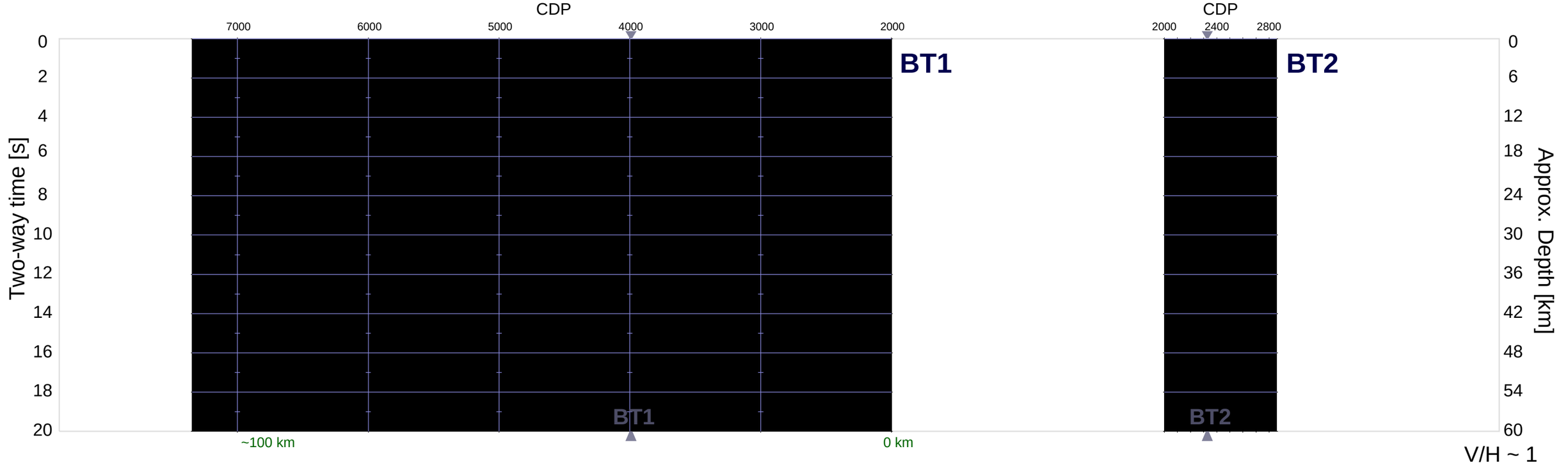


Stacked Section	Source:	Explosives, 240 m interval	Survey Details: GA-L137
	Spread:	120 Channels, 40 m group interval	
	Fold:	10 nominal	Notes: Shallow drill holes in karst

2002 L157 BT1 BT2	NORTHERN TERRITORY Batten Trough	*Geoscience Australia* *NTGS*





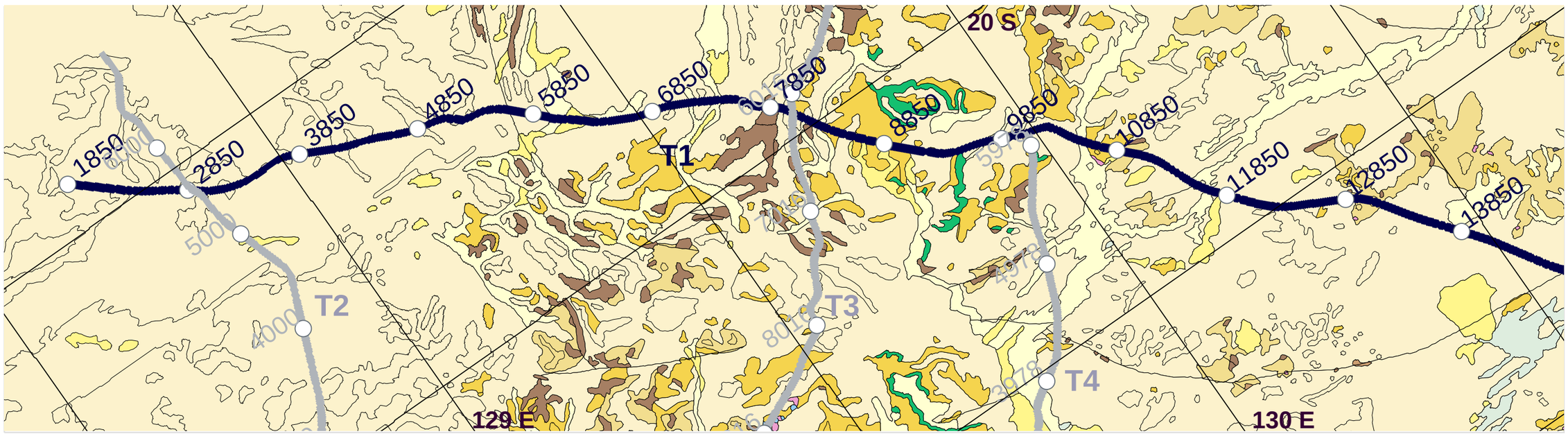


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 Channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L157

2005 L171 T1 - Panel 1	CENTRAL AUSTRALIA Tanami	*Geoscience Australia* *GSWA NTGS*



Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval

Spread: 240 Channels, 40 m group interval

Fold: 60 nominal

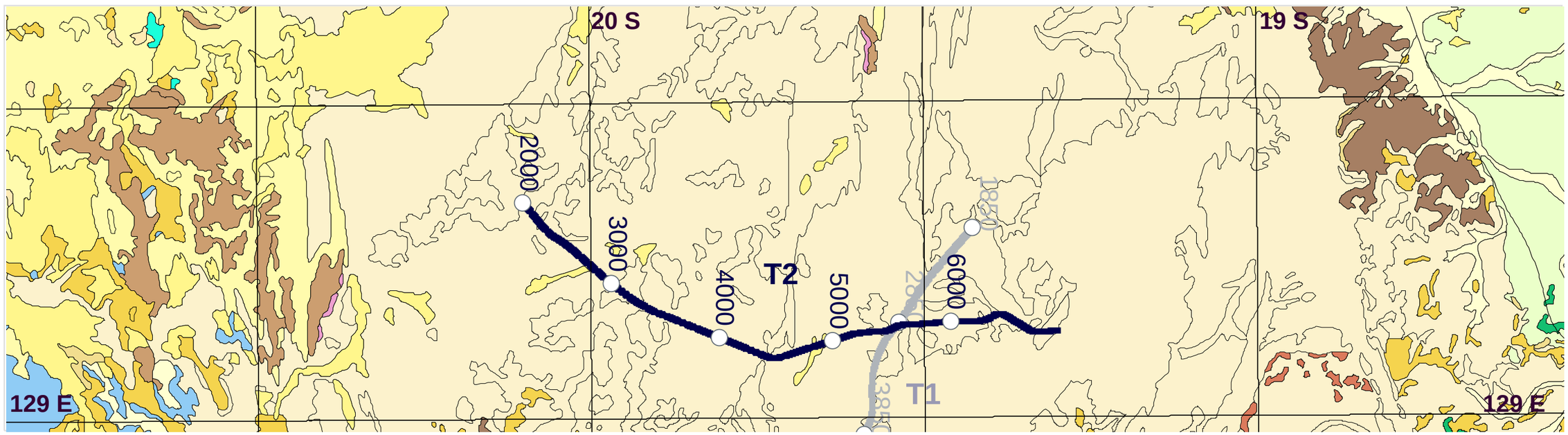
Survey Details: GA-L171

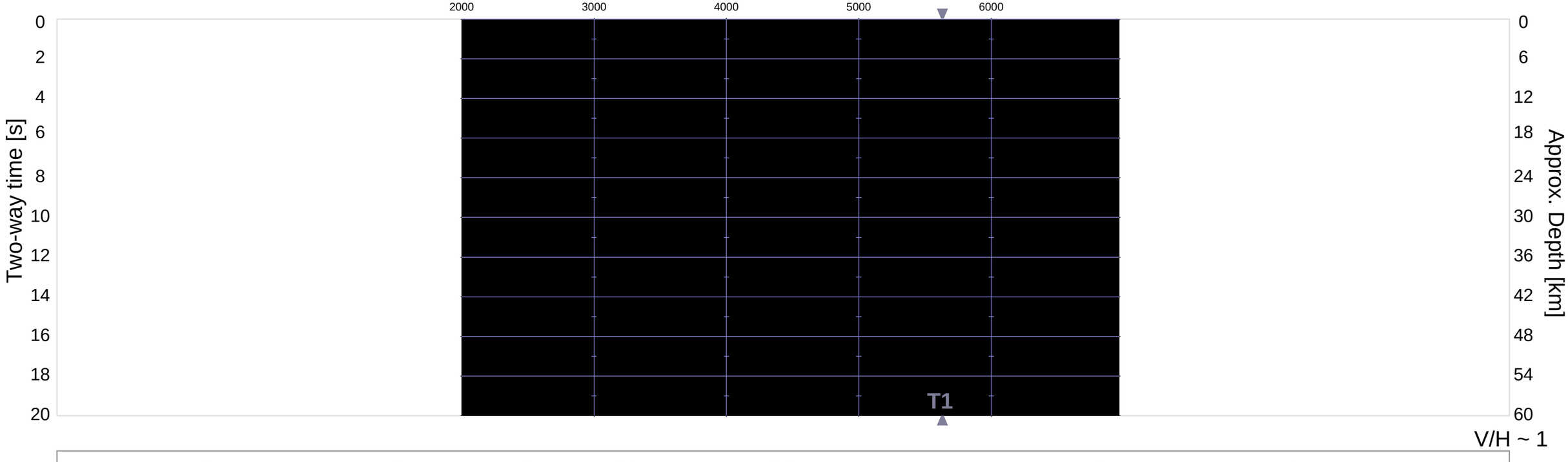
2005 L171 T1 - Panel 2	CENTRAL AUSTRALIA Tanami	*Geoscience Australia* *GSWA NTGS*

Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 Channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L171





Migrated Section

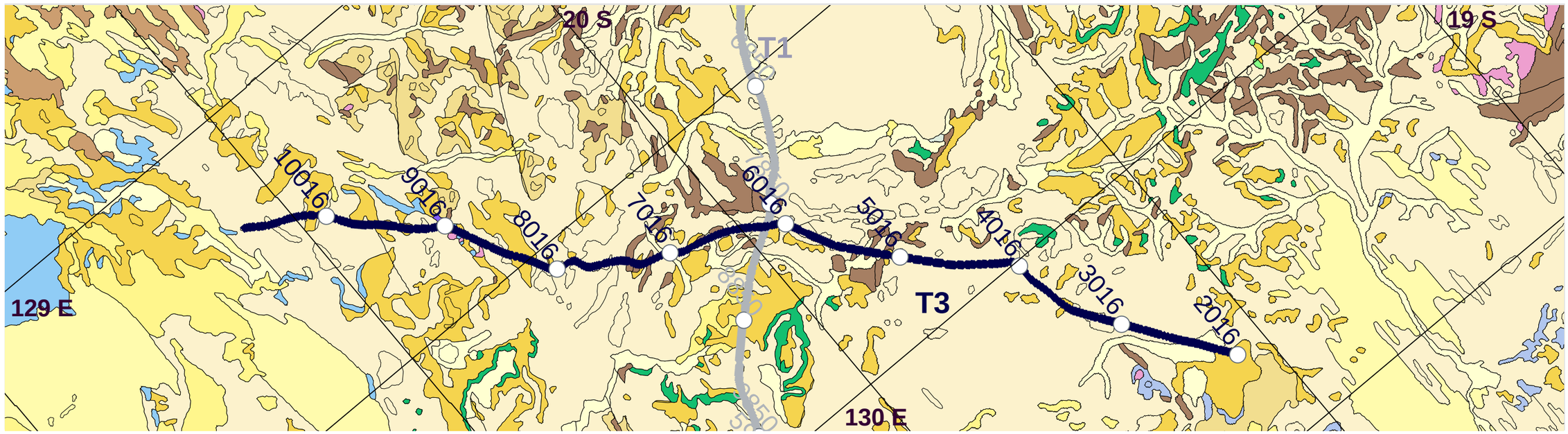
Source: 3 Hemi-60 Vibrators, 80 m interval

Spread: 240 Channels, 40 m group interval

Fold: 60 nominal

Survey Details: GA-L171

2005 L171 T3	CENTRAL AUSTRALIA Tanami	*Geoscience Australia* *GSWA NTGS*

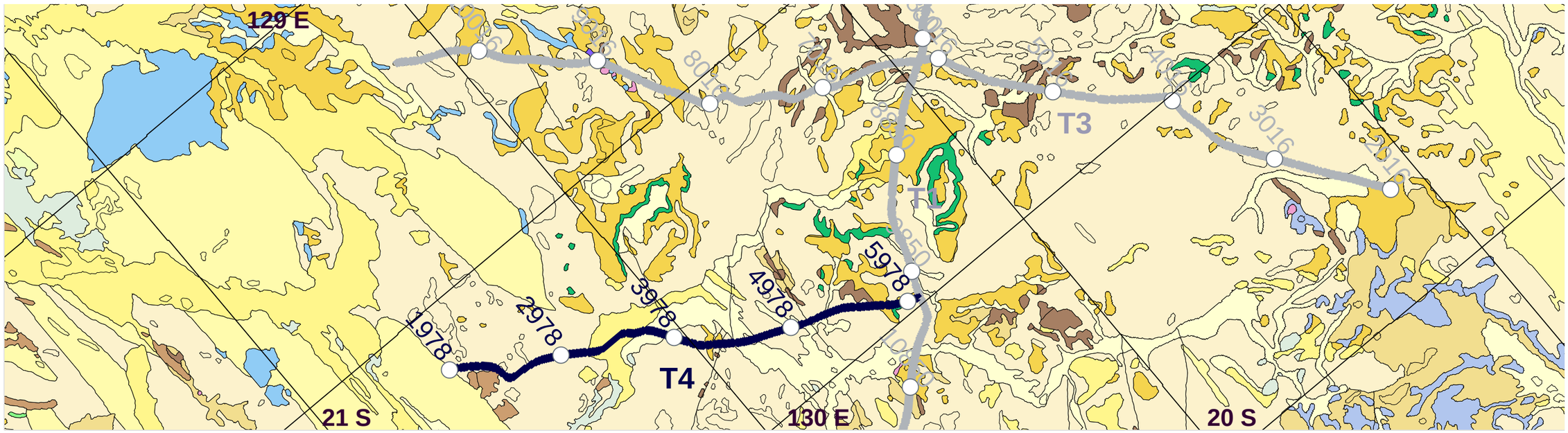


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 Channels, 40 m group interval
Fold: 60 nominal

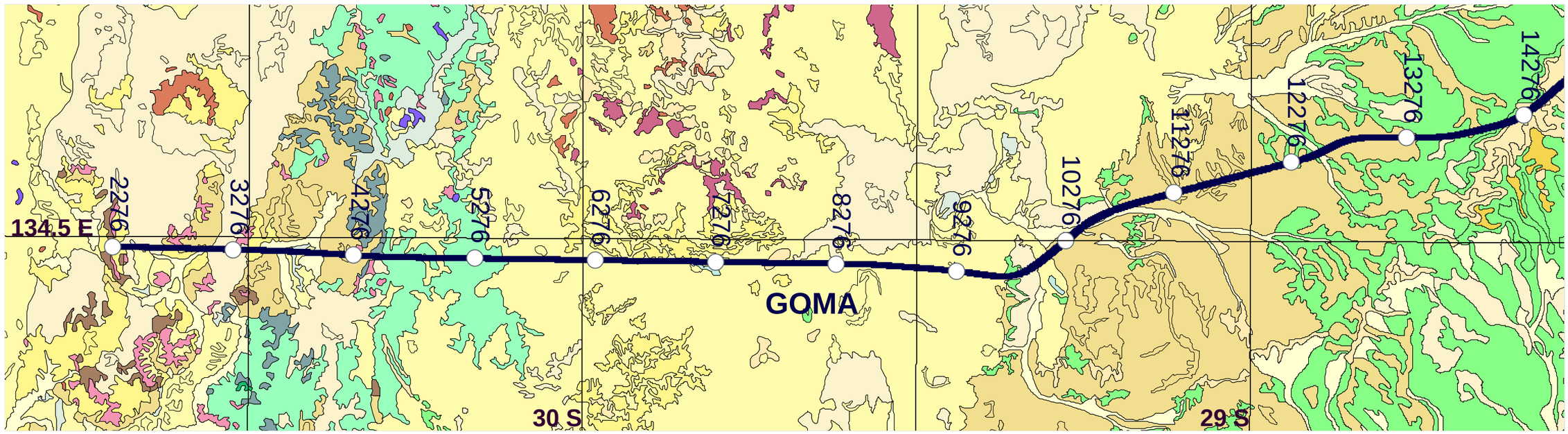
Survey Details: GA-L171

2005 L171 T4	CENTRAL AUSTRALIA Tanami	*Geoscience Australia* *GSWA NTGS*



Migrated Section	Source:	3 Hemi-60 Vibrators, 80 m interval	Survey Details: GA-L171
	Spread:	240 Channels, 40 m group interval	
	Fold:	60 nominal	

2008 L190 GOMA - Panel 1	CENTRAL AUSTRALIA Gawler-Officer-Musgrave-Amadeus	*Geoscience Australia* *AuScope PIRSA*

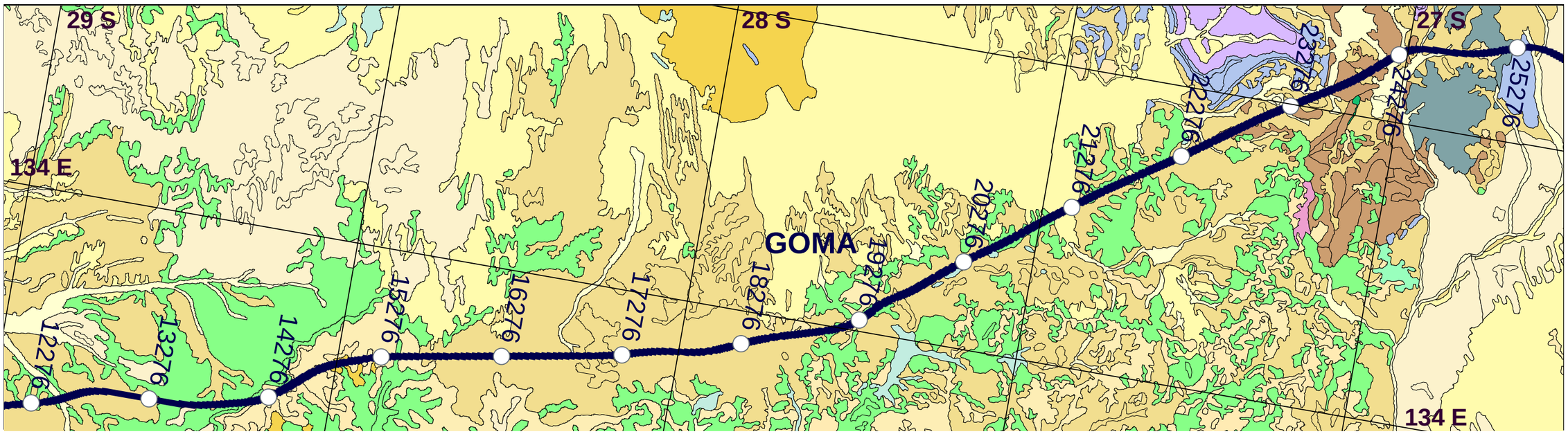


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L190

2008 L190 GOMA - Panel 2	CENTRAL AUSTRALIA Gawler-Officer-Musgrave-Amadeus	*Geoscience Australia* *AuScope PIRSA*

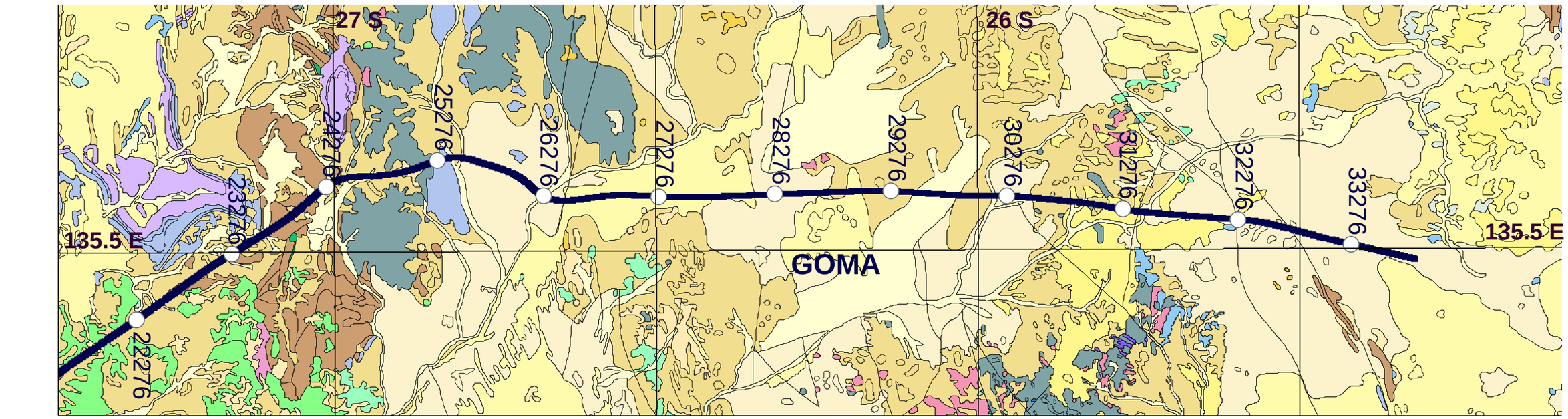


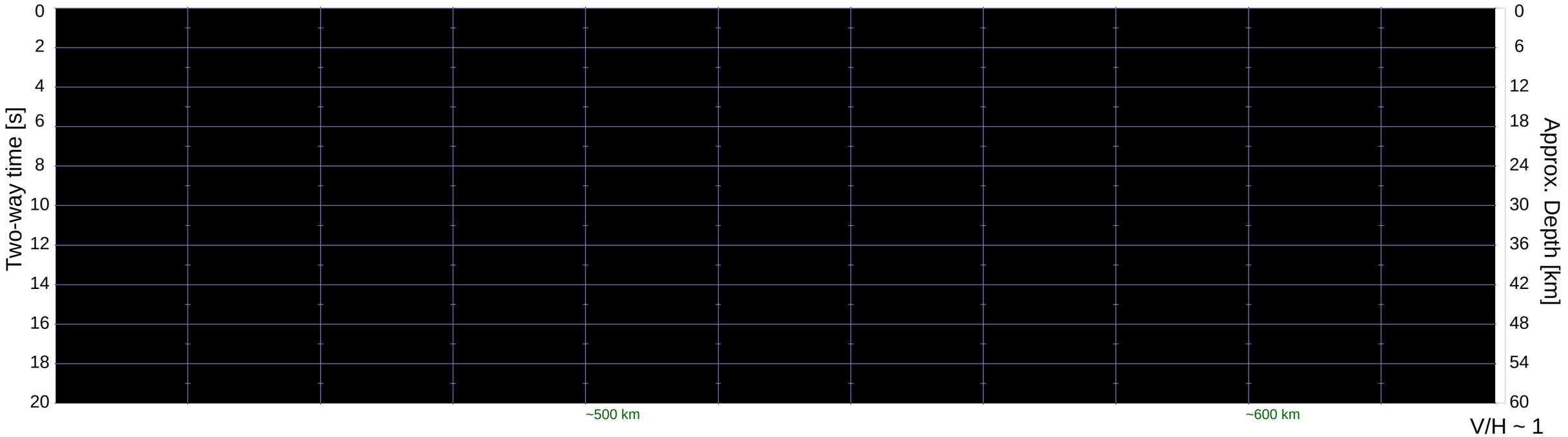
Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L190

2008 L190 GOMA - Panel 3	CENTRAL AUSTRALIA Gawler-Officer-Musgrave-Amadeus	*Geoscience Australia* *AuScope PIRSA NTGS*

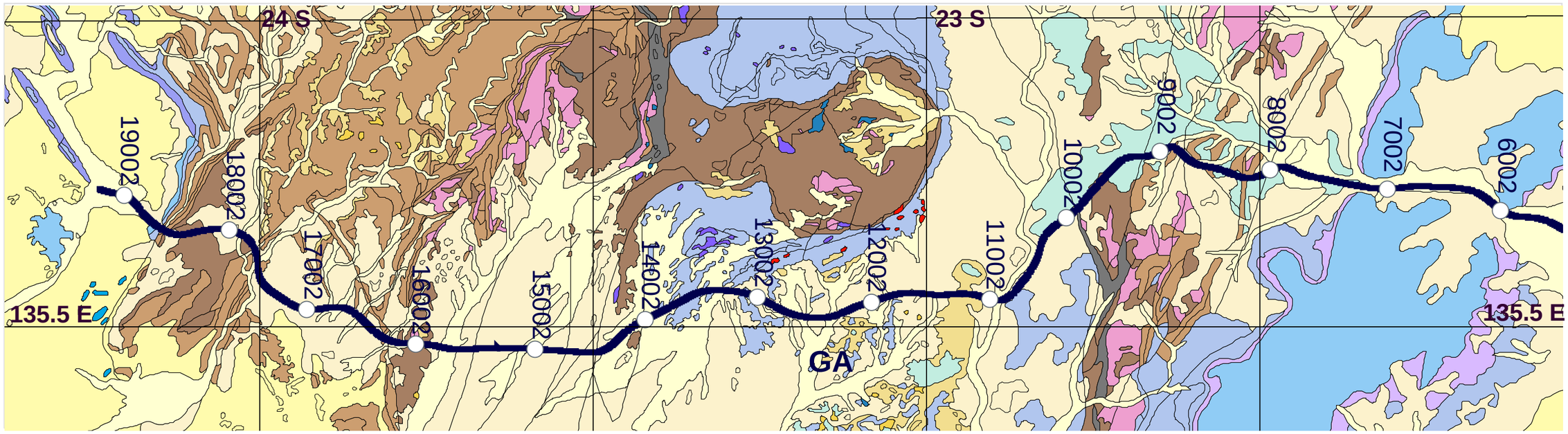




Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L190

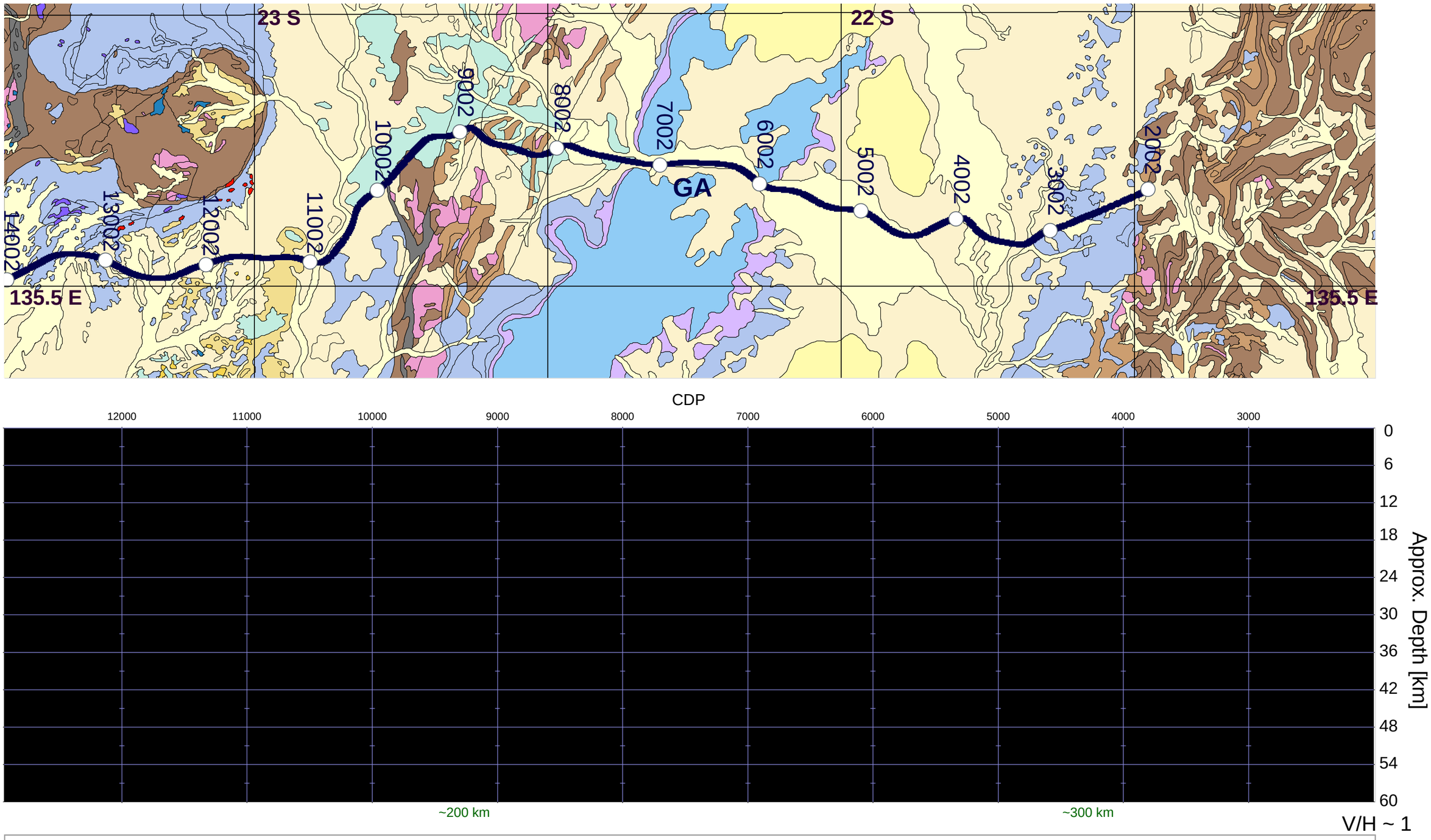


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L192

2009 L192 GA - Panel 2	NORTHERN TERRITORY Georgina-Arunta	*Geoscience Australia* *NTGS*

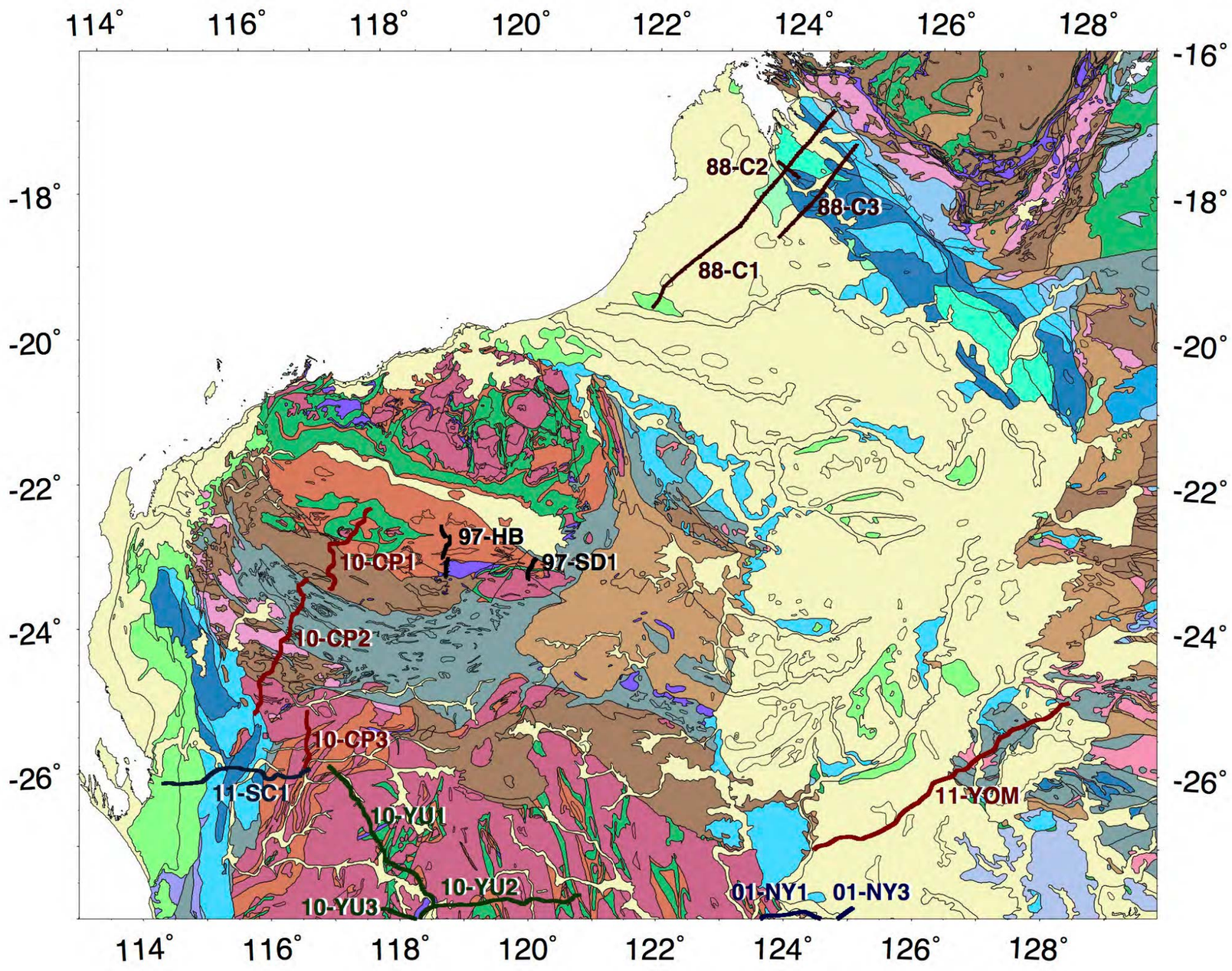


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

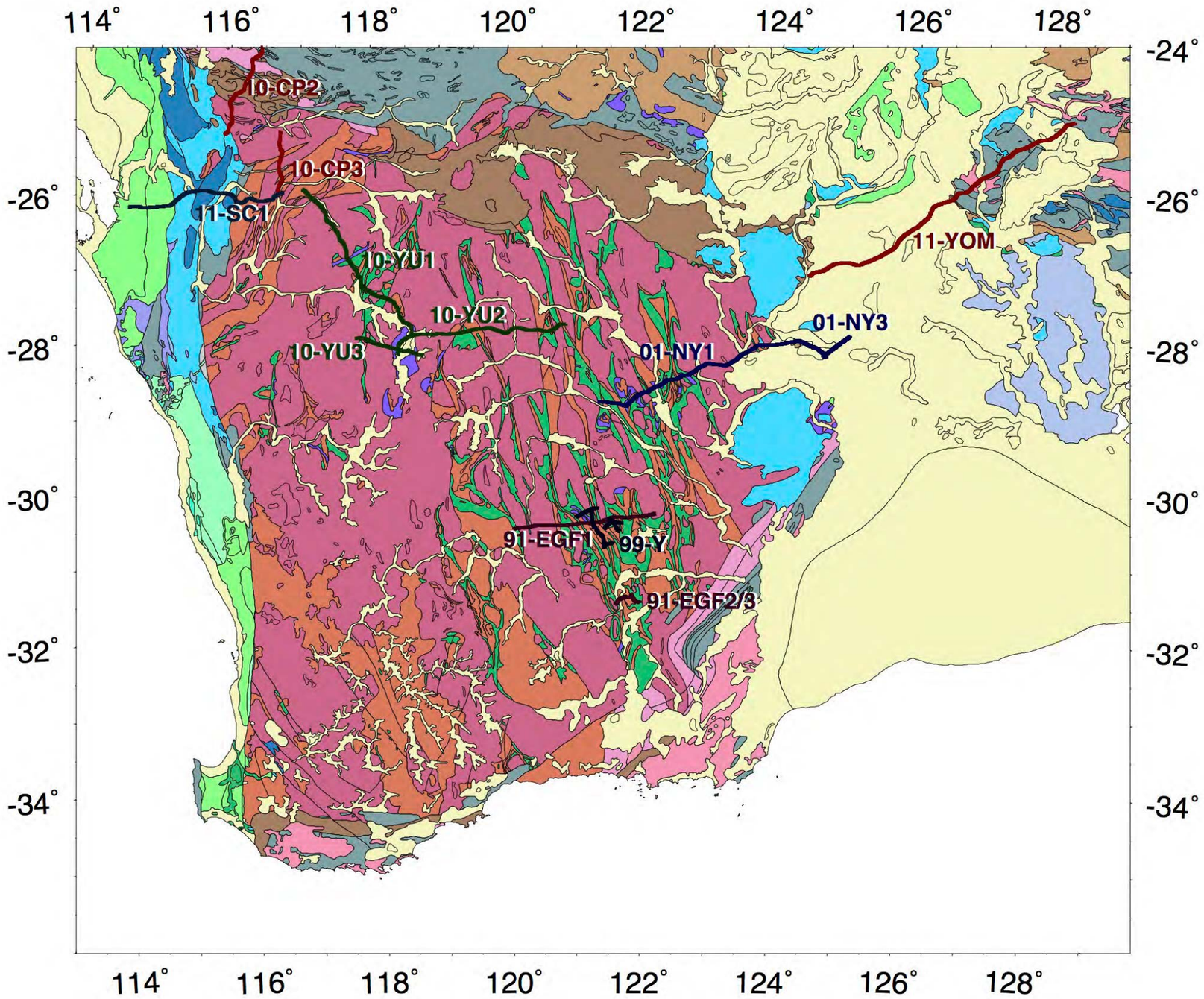
Survey Details: GA-L192

WESTERN AUSTRALIA - NORTH 1978-2011



Profiles are identified by 2 digit year and line designator

WESTERN AUSTRALIA - SOUTH 1978-2011



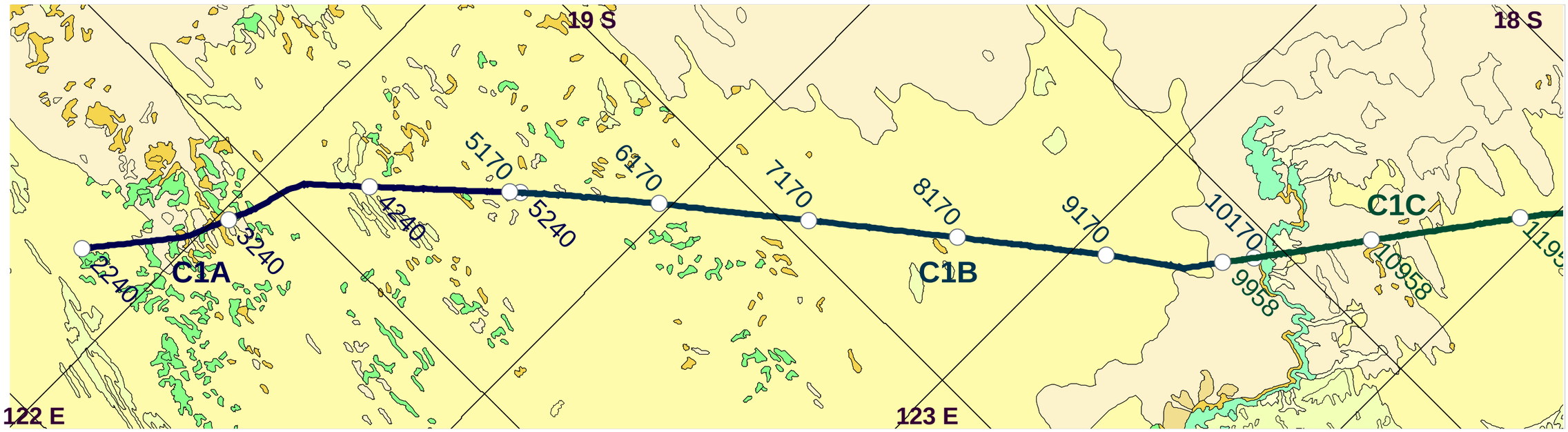
Profiles are identified by 2 digit year and line designator

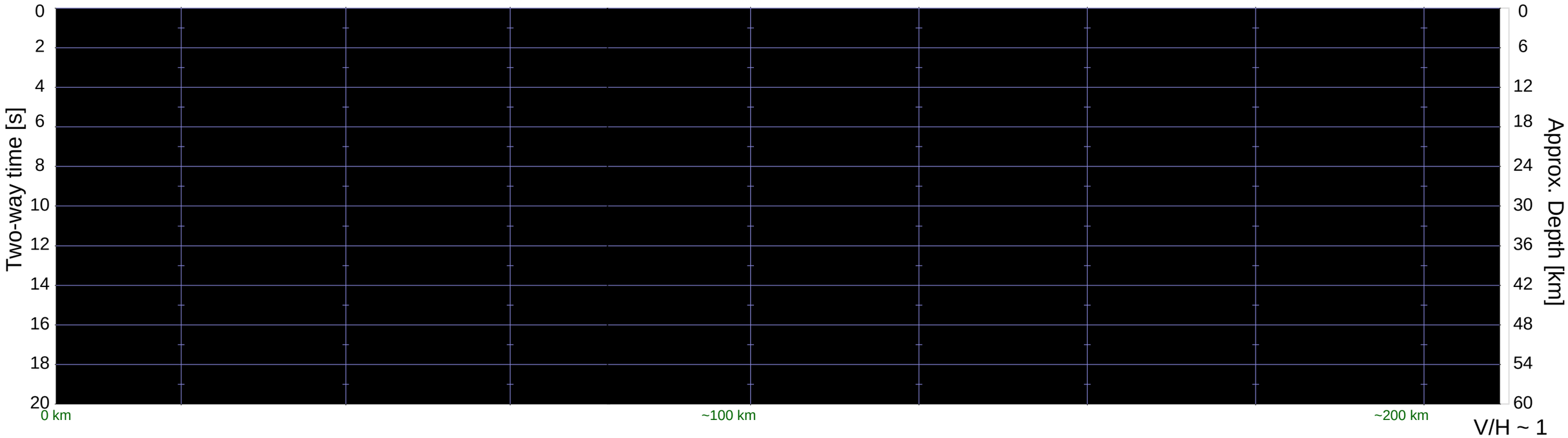
INDEX OF PROFILES: WESTERN AUSTRALIA 1978-2011

On the display panels the reflection lines are identified by year, project identifier and line designator. The table below presents the full list of the lines and the codes used in Geoscience Australia reports, together with the nature of the display and the bias and clip parameters used to display the sections using the *pssegy* facility.

Year	Project	GA Line Code	Line Designator	Display:	Bias	Clip	Page
1988	L126	BMR88-01A	C1A	Stack	1.72	80	120
		BMR88-01B	C1B	Stack	1.72	80	120-121
		BMR88-01C	C1C	Stack	1.72	80	121,122
		BMR88-01D	C1D	Stack	1.72	80	121,122
		BMR88-02	C2	Stack	1.72	80	123
		BMR88-03	C3	Stack	1.72	80	124
1991	L132	BMR91-EGF01	EGF1	Migrated	1.60	80	125
		BMR91-EGF02	EGF2	Stack	1.70	80	126
		BMR91-EGF03	EGF3	Stack	1.70	80	126
1997	L144	97AGS-HB1	HB1	Stack	1.825	75	127
		97AGS-HB2	HB2	Stack	1.825	75	127
		97AGS-HB3	HB3	Stack	1.825	75	127
		97AGS-SD1	SD1	Stack	1.825	75	128
1999	L150	99AGS-Y1 - 99AGS-Y5	Y1-Y5	Migrated	1.60	80	129,130
2001	L154	01AGS-NY1	NY1	Migrated	1.60	80	131-132,133
		01AGS-NY3	NY3	Migrated	1.60	80	133
2010	L195	10GA-CP1	CP1	Migrated	1.65	80	134
		10GA-CP2	CP2	Migrated	1.65	80	135-136
		10GA-CP3	CP3	Migrated	1.65	80	137
2010	L196	10GA-YU1	YU1	Migrated	1.50	80	140-141
		10GA-YU2	YU2	Migrated	1.50	80	142-143
		10GA-YU3	YU3	Migrated	1.50	80	144
2011	L199	11GA-YOM	YOM	Migrated	1.47	80	145-147
2011	L200	11GA-SC1	SC1	Migrated	1.47	80	138-139

1988 L126 C1A C1B	WESTERN AUSTRALIA Canning Basin	*Geoscience Australia*





Stacked Section

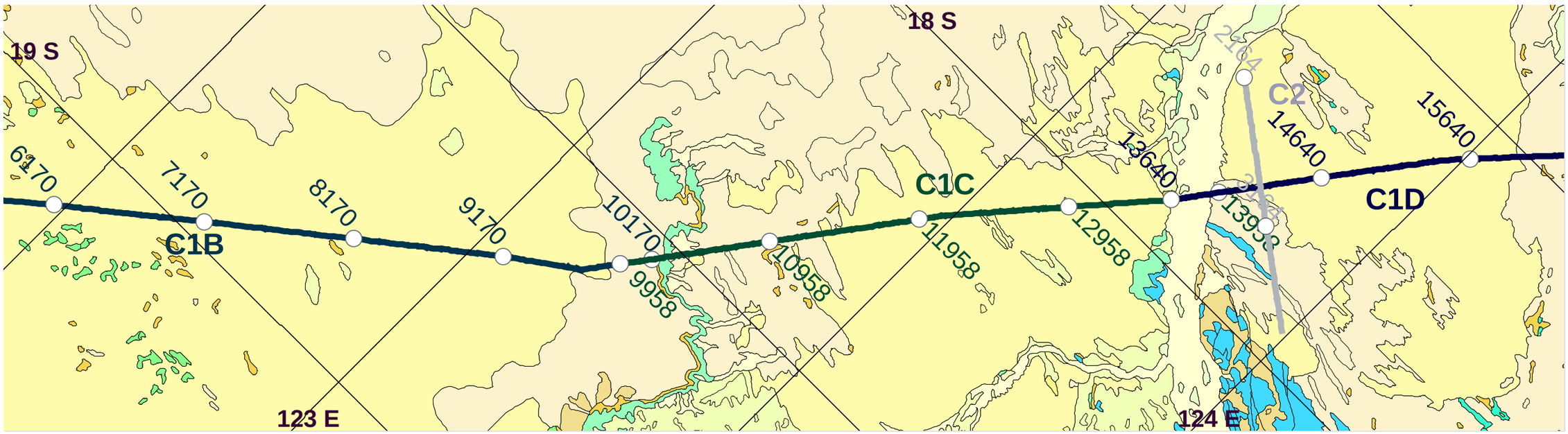
Source: Explosives, 200 m interval

Spread: 96 Channels, 50 m group interval

Fold: 12 nominal

Survey Details: GA-L126

1988 L126 C1B C1C C1D	WESTERN AUSTRALIA Canning Basin	*Geoscience Australia*



Stacked Section

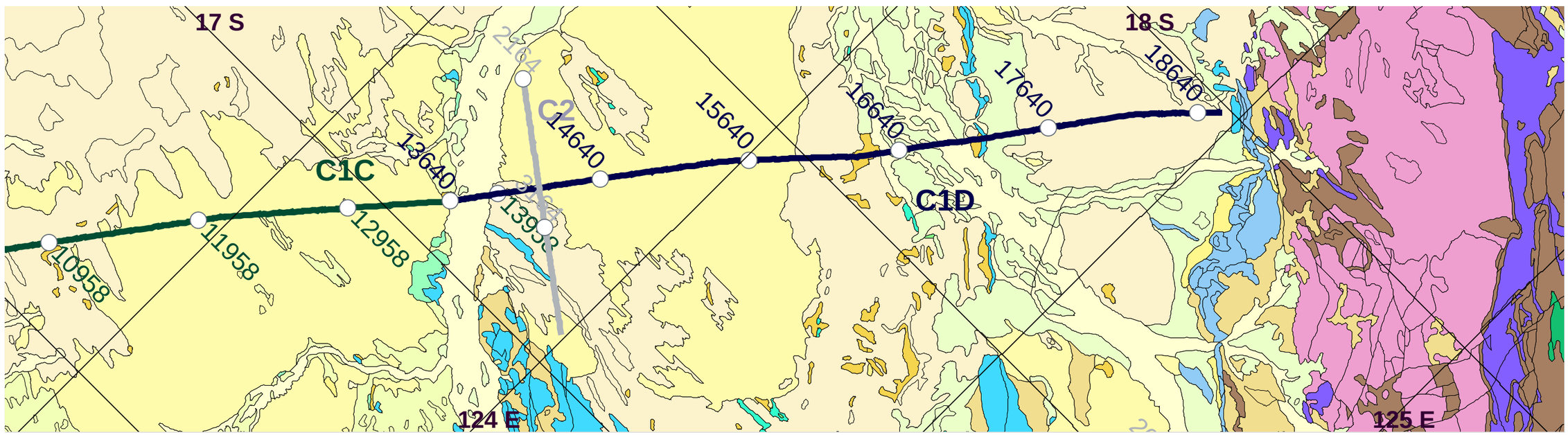
Source: Explosives, 200 m interval

Spread: 96 Channels, 50 m group interval

Fold: 12 nominal

Survey Details: GA-L126

1988 L126 C1C C1D	WESTERN AUSTRALIA Canning Basin	*Geoscience Australia*



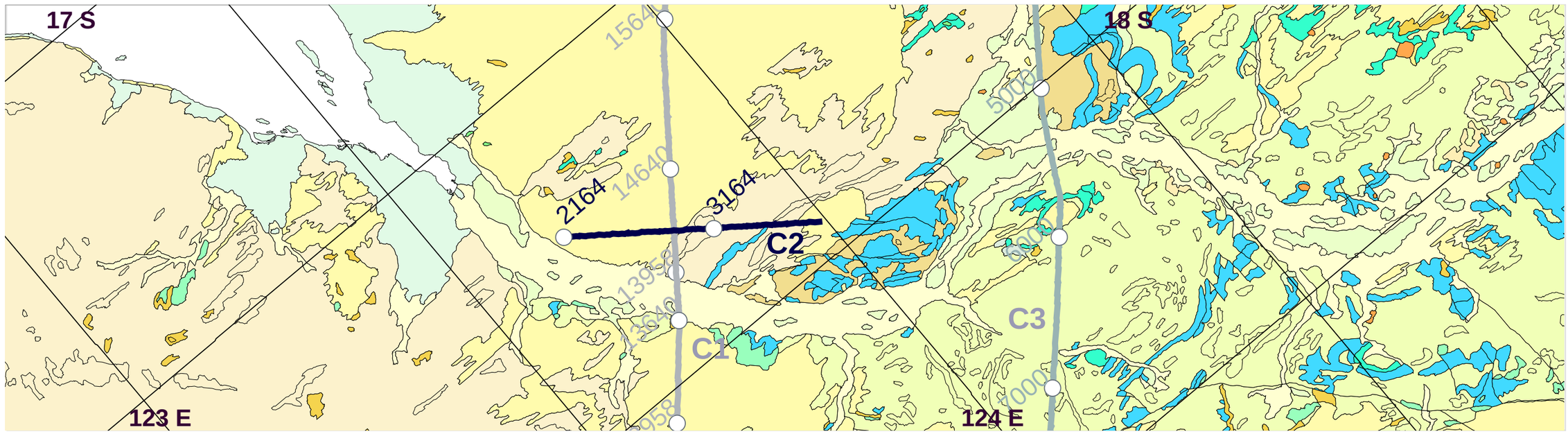
Stacked Section

Source: Explosives, 200 m interval

Spread: 96 Channels, 50 m group interval

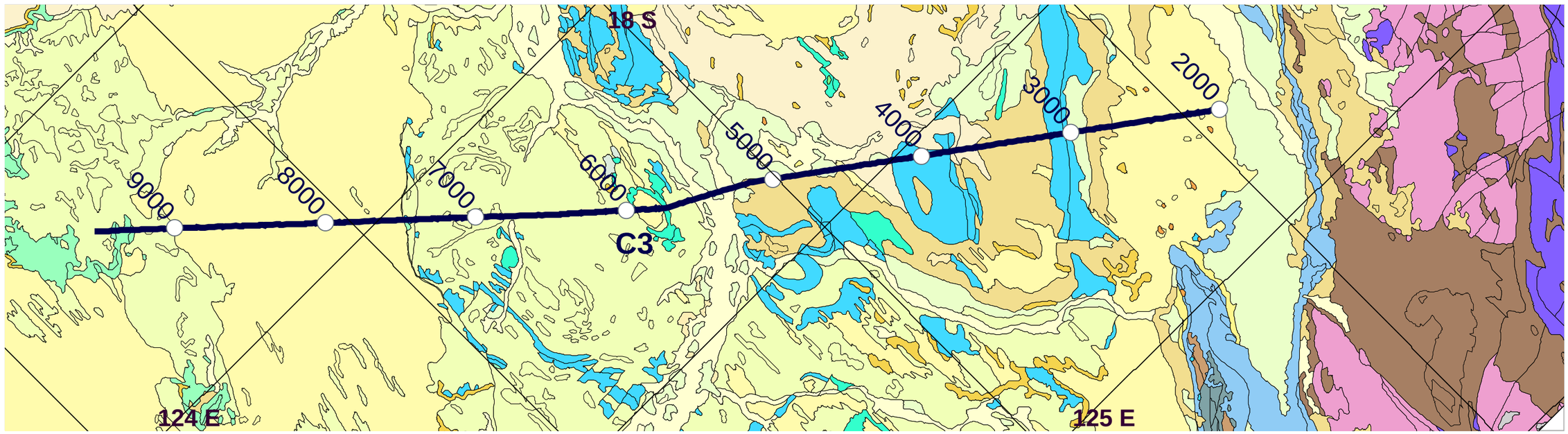
Fold: 12 nominal

Survey Details: GA-L126



Stacked Section	Source:	Explosives, 200 m interval	Survey Details: GA-L126
	Spread:	96 Channels, 50 m group interval	
	Fold:	12 nominal	

1988 L126 C3	WESTERN AUSTRALIA Canning Basin	*Geoscience Australia*

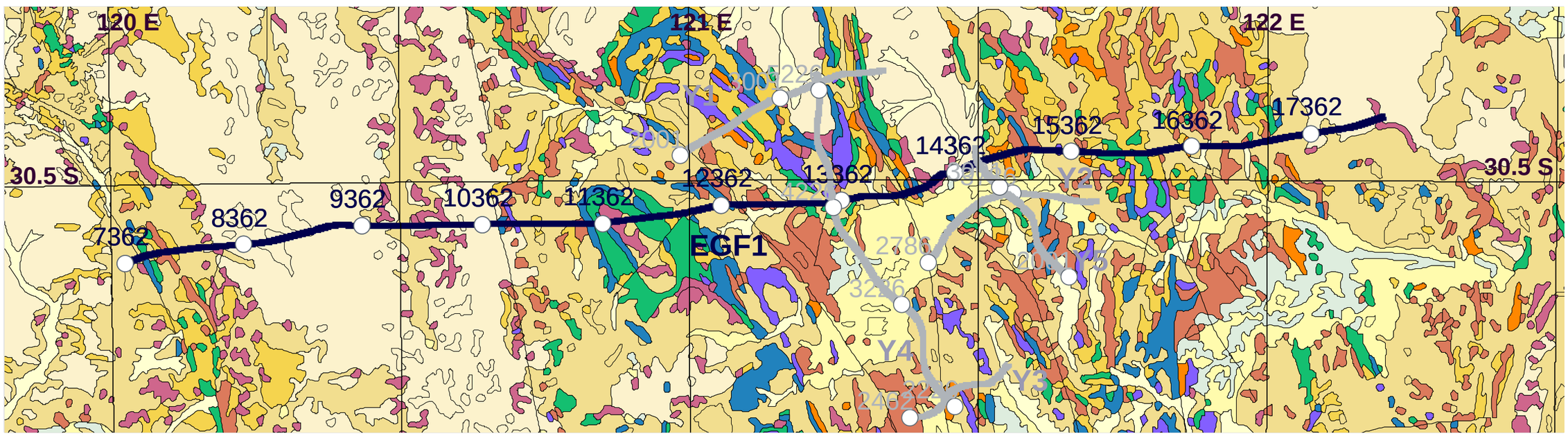


Stacked Section

Source: Explosives, 200 m interval
Spread: 96 Channels, 50 m group interval
Fold: 12 nominal

Survey Details: GA-L126

1991 L132 EGF1	WESTERN AUSTRALIA Yilgarn - Eastern Gold Fields	*Geoscience Australia*



Migrated Section

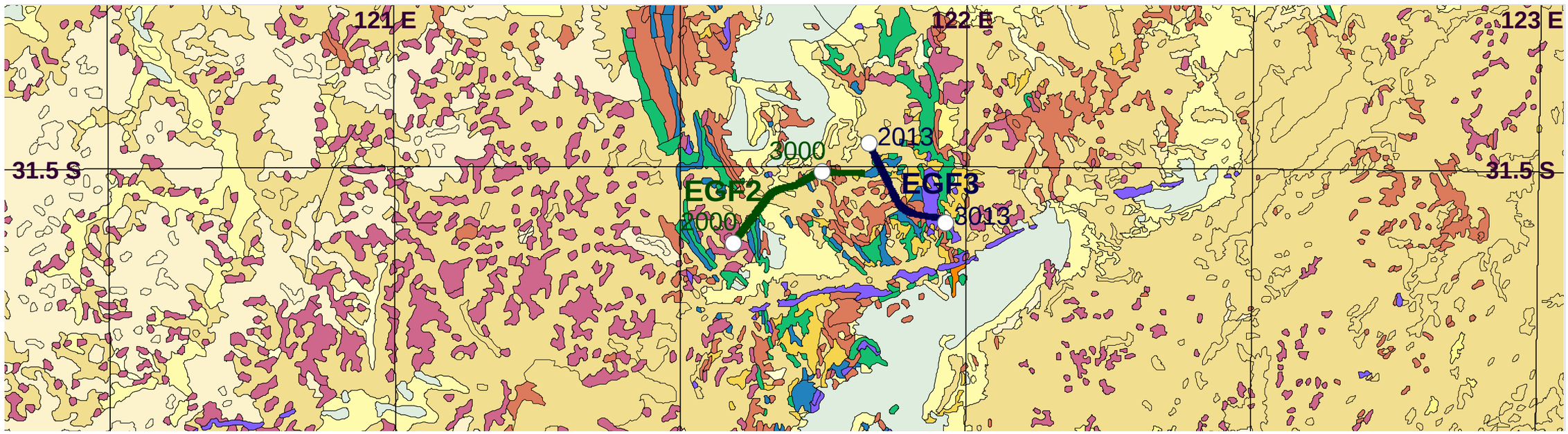
Source: Explosives, 240 m interval

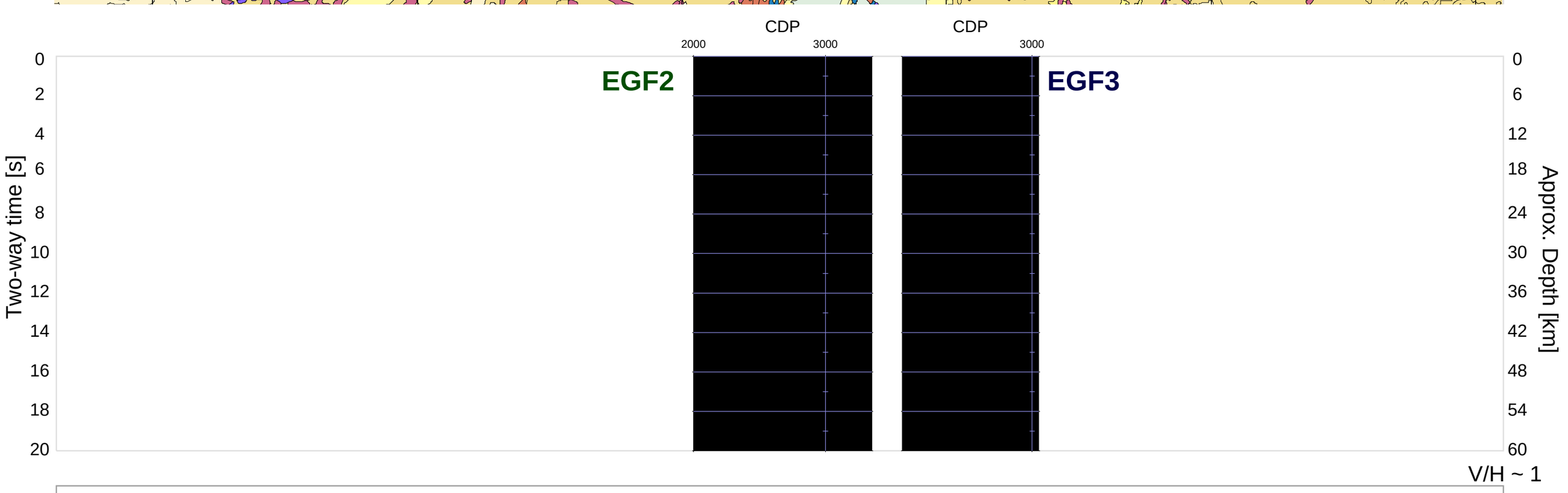
Spread: 96 Channels, 40 m group interval

Fold: 12 nominal

Survey Details: GA-L132

1991 L132 EGF2 EGF3	WESTERN AUSTRALIA Yilgarn - Eastern Gold Fields	*Geoscience Australia*



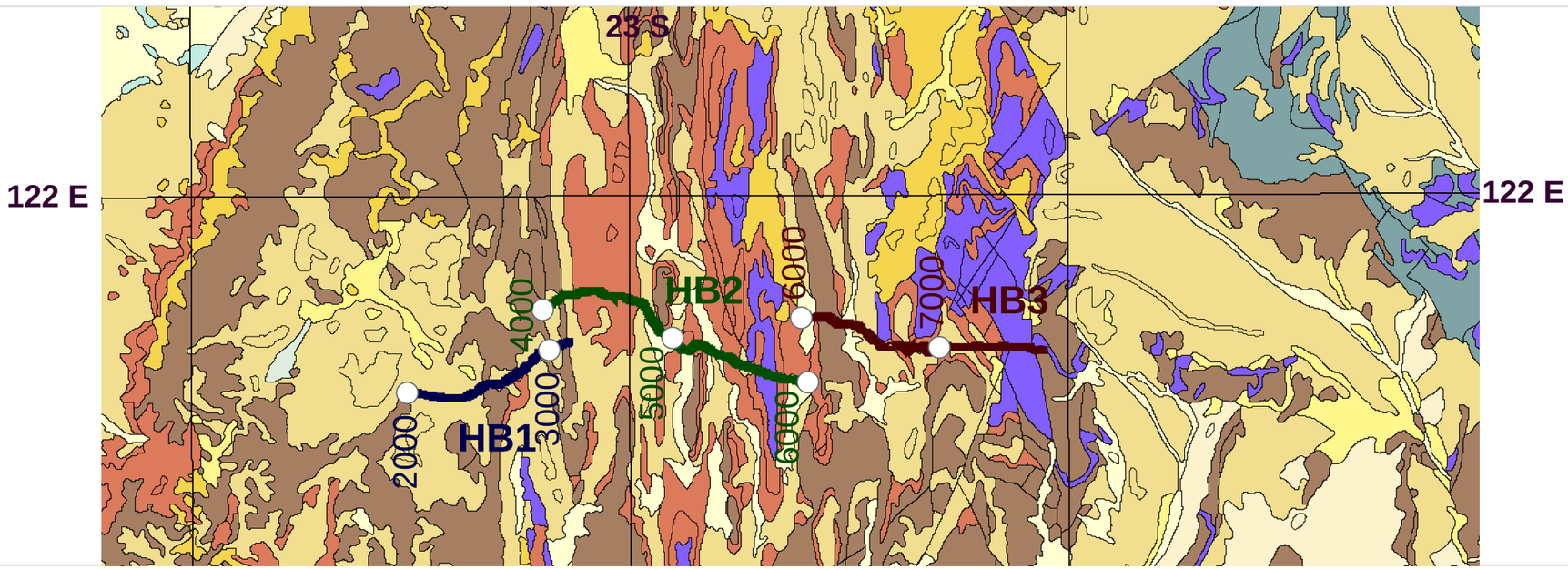


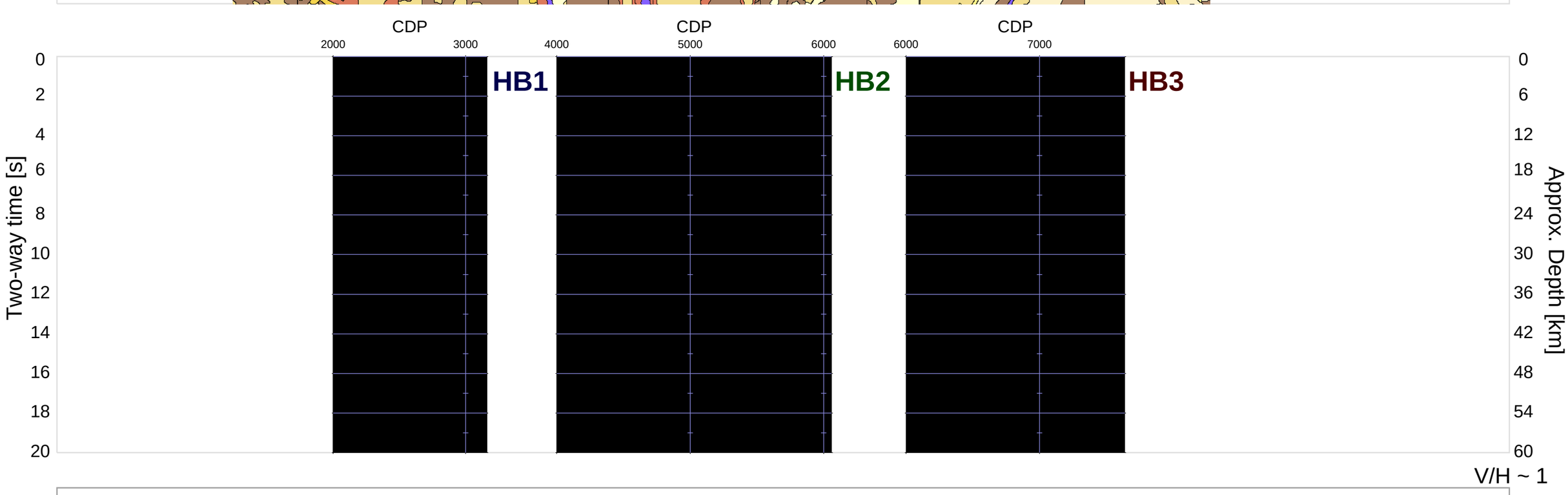
Stacked Section

Source: Explosives, 160 m interval
Spread: 96 Channels, 40 m group interval
Fold: 12 nominal

Survey Details: GA-L132

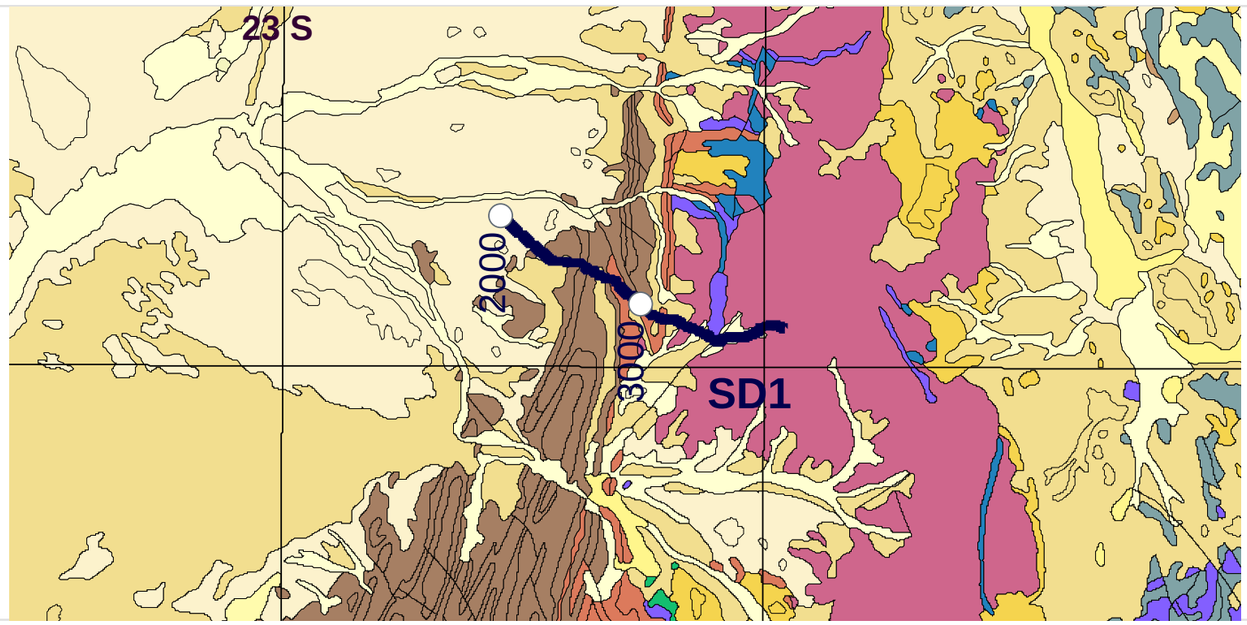
1997 L144 HB1 HB2 HB3	WESTERN AUSTRALIA Hammersley Basin	*Geoscience Australia* *University of Western Australia*	127

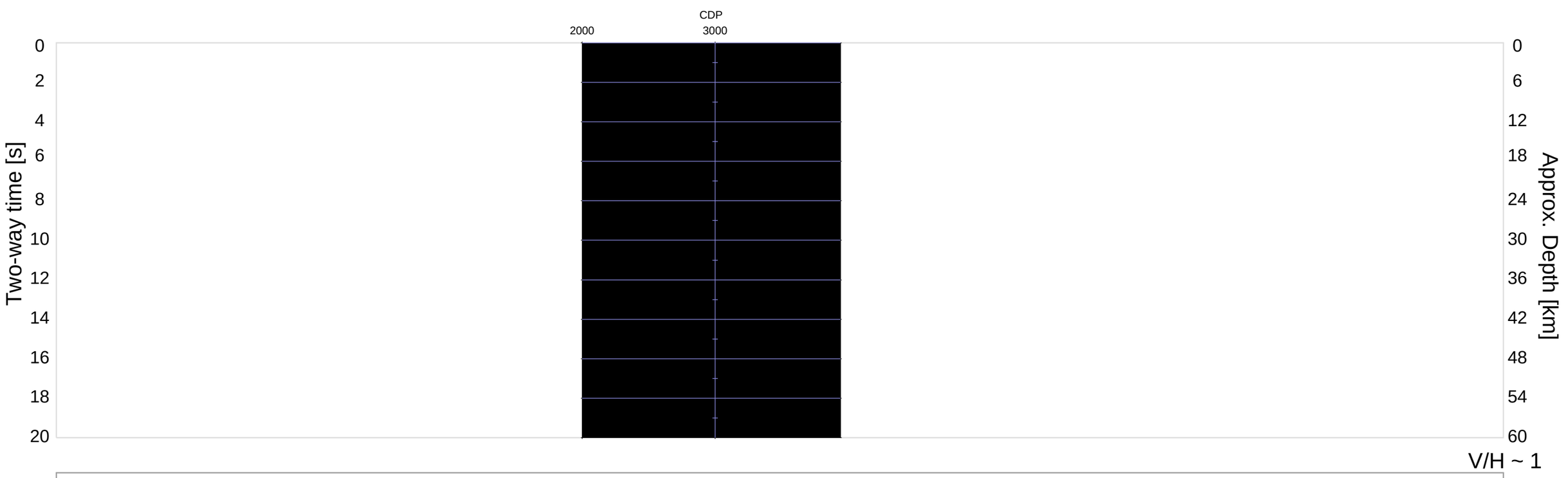




Stacked Section	Source:	Explosives, 240 m interval	Survey Details: GA-L144
	Spread:	120 Channels, 40 m group interval	
	Fold:	8 nominal	

1997 L144 SD1	WESTERN AUSTRALIA Hammersley Basin	*Geoscience Australia* *University of Western Australia*





Stacked Section

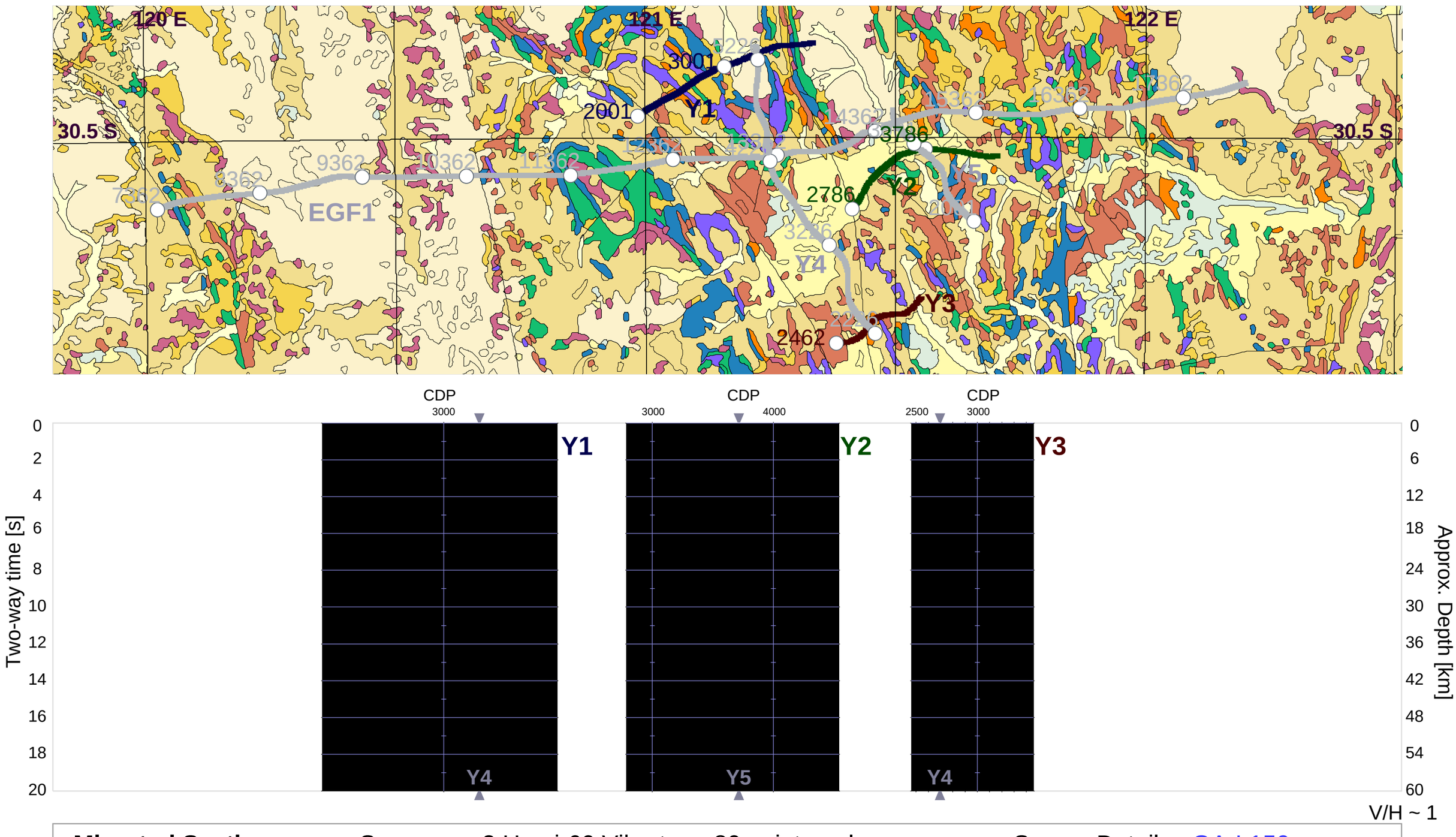
Source: Explosives, 240 m interval

Spread: 120 Channels, 40 m group interval

Fold: 10 nominal

Survey Details: GA-L144

1999 L150 Y1 Y2 Y3	WESTERN AUSTRALIA Yilgarn - Eastern Gold Fields	*Geoscience Australia* *AGCRC*



Migrated Section

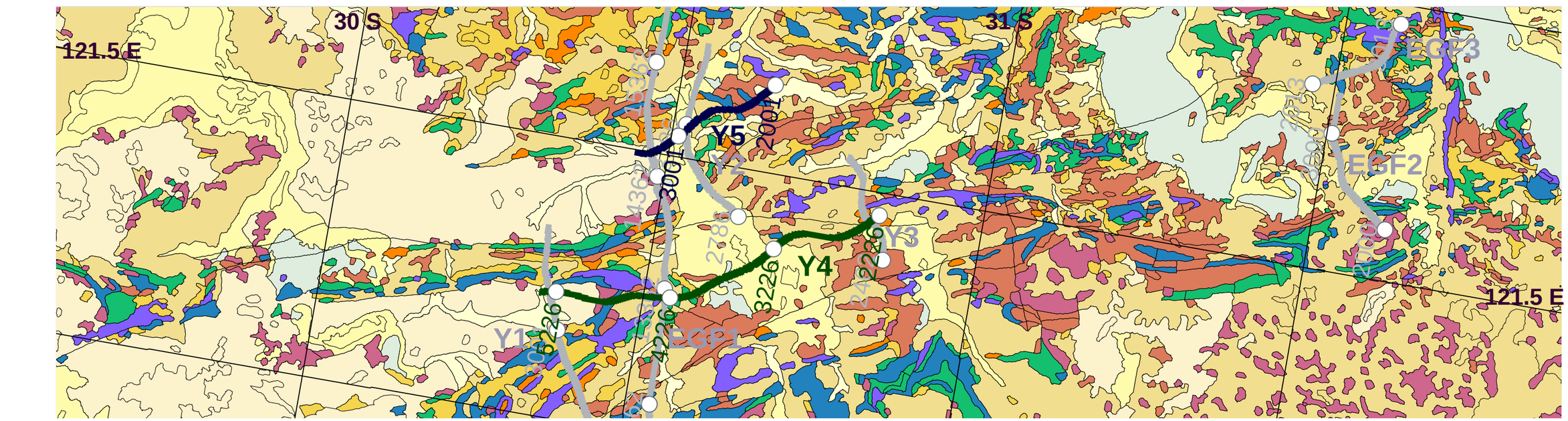
Source: 3 Hemi-60 Vibrators, 80 m interval

Spread: 240 Channels, 40 m group interval

Fold: 60 nominal

Survey Details: GA-L150

1999 L150 Y4 Y5	WESTERN AUSTRALIA Yilgarn - Eastern Gold Fields	*Geoscience Australia* *AGCRC*

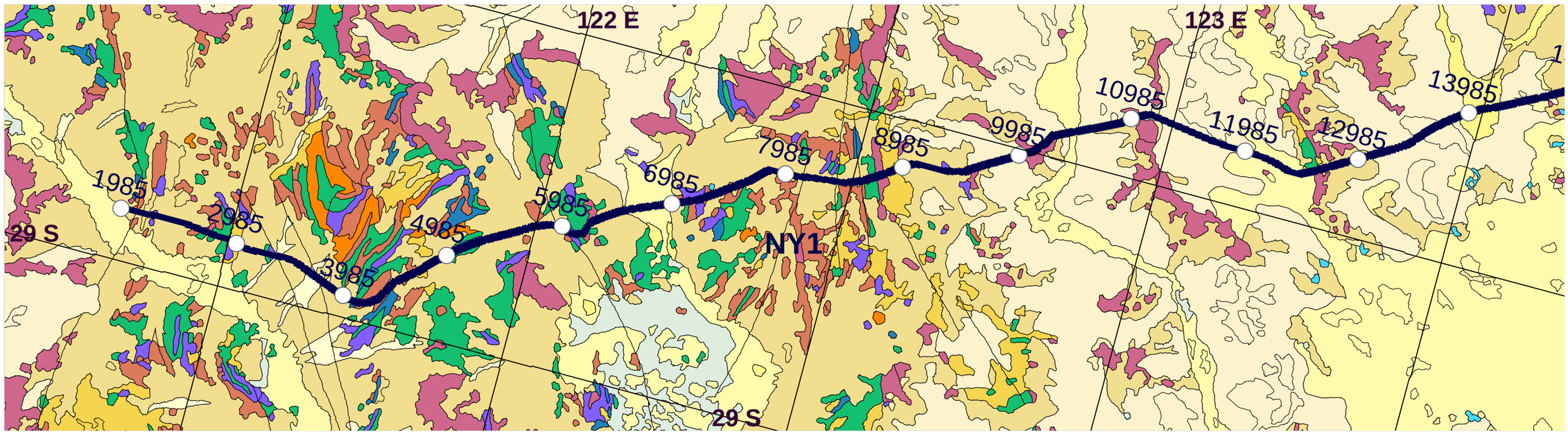


Migrated Section

Source: 3 Hemi-60 Vibrators, 80 m interval
Spread: 240 Channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L150

2001 L154 NY1 - Panel 1	WESTERN AUSTRALIA Leonora - Laverton	*Geoscience Australia* *GSWA pmd*CRC*	131

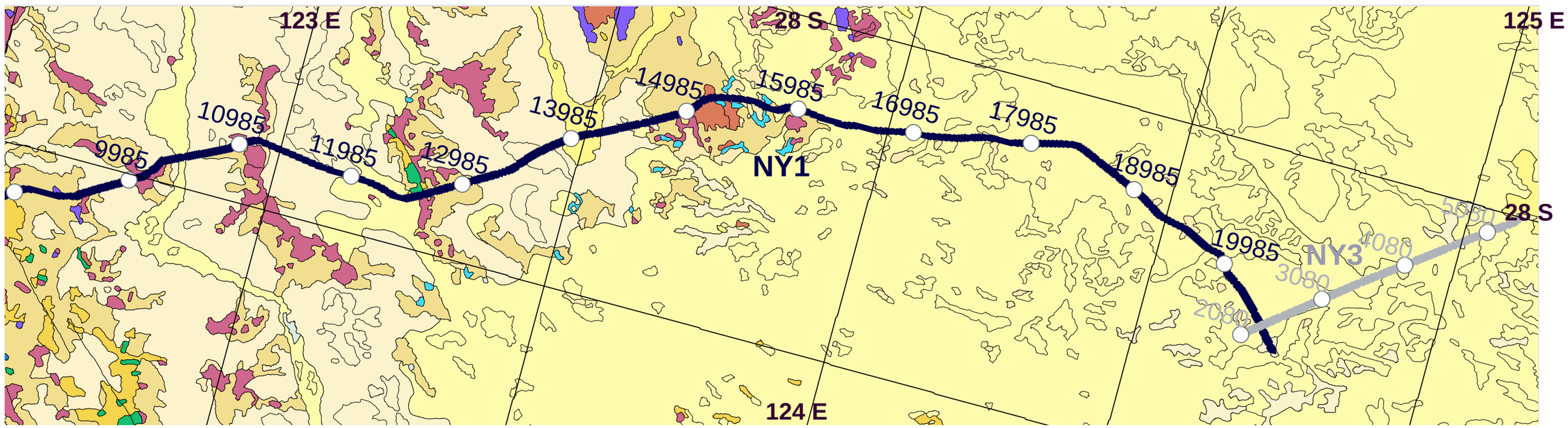


Migrated Section

Source: 3 Hemi-60 vibrators, 80 m interval
Spread: 240 Channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L154

2001 L154 NY1 - Panel 2	WESTERN AUSTRALIA Leonora - Laverton	*Geoscience Australia* *GSWA pmd*CRC*

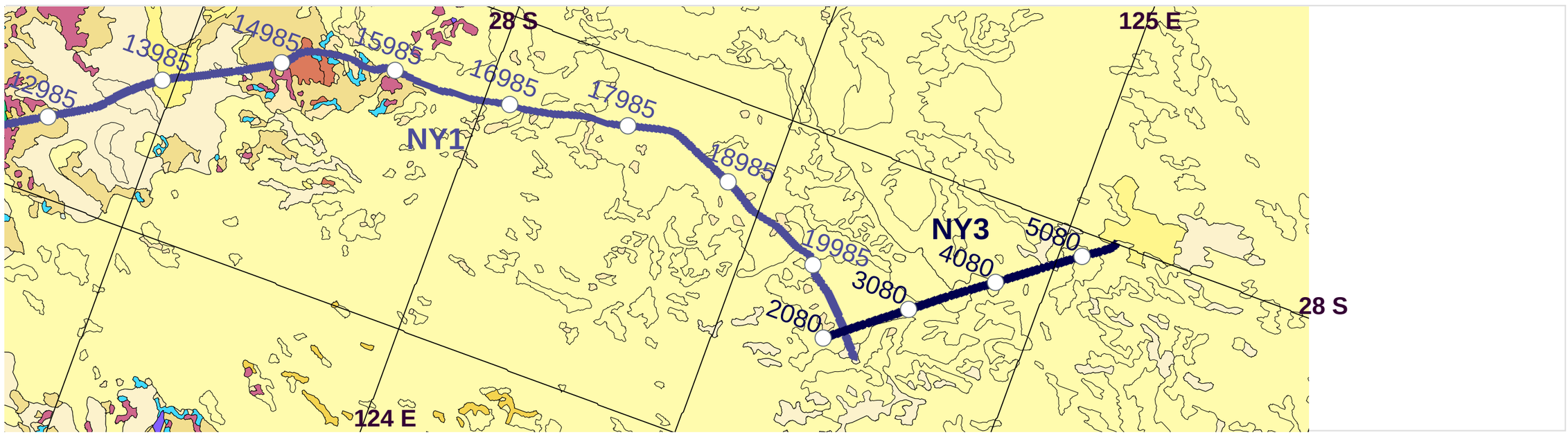


Migrated Section

Source: 3 Hemi-60 vibrators, 80 m interval
Spread: 240 Channels, 40 m group interval
Fold: 60 nominal

Survey Details: GA-L154

2001 L154 NY1 - Panel 3 NY3	WESTERN AUSTRALIA Leonora - Laverton	*Geoscience Australia* *GSWA pmd*CRC*	133

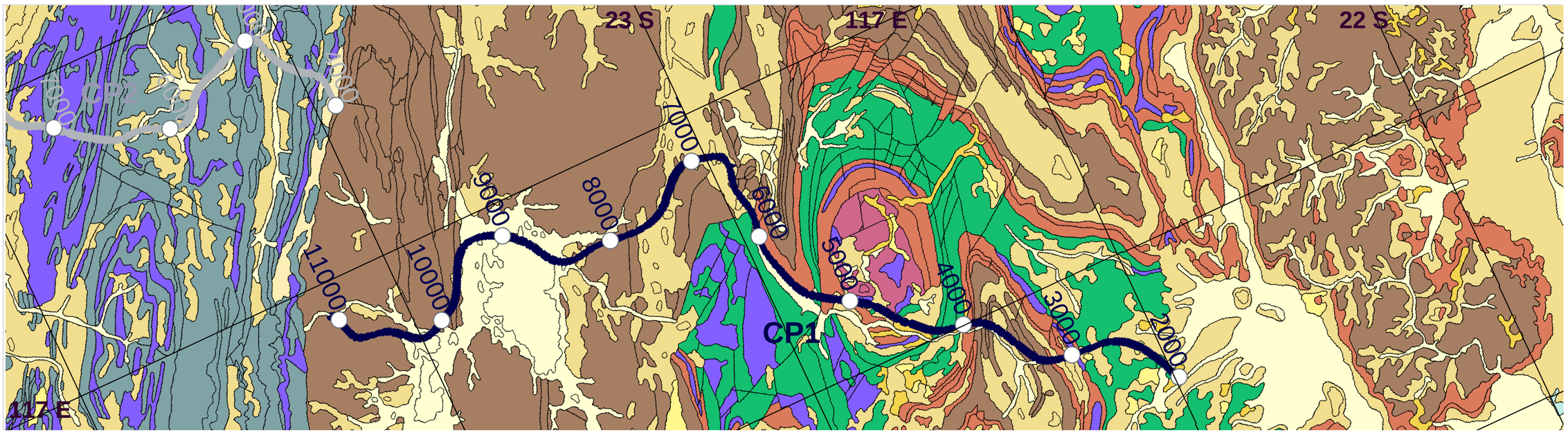


Migrated Section
NY3

Source: 3 Hemi-60 vibrators, 60 m interval
Spread: 240 Channels, 30 m group interval
Fold: 60 nominal

Survey Details: GA-L154

2010 L195 CP1	WESTERN AUSTRALIA Pilbara	*AuScope GSWA* *Geoscience Australia*

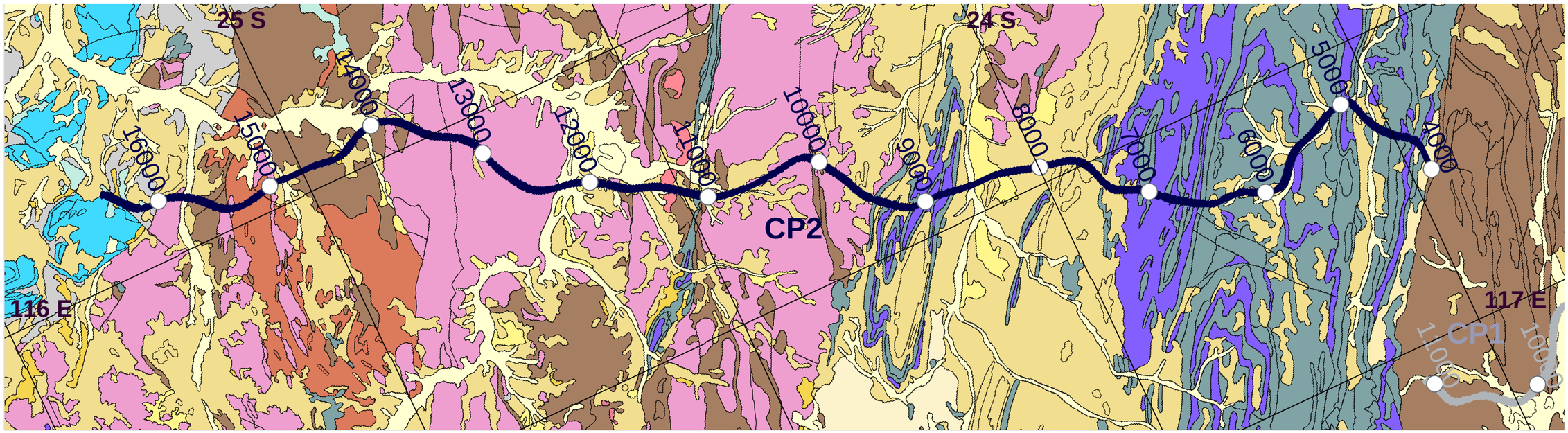


Migrated Section

Source: 3 Hemi-60 vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L195

2010 L195 CP2 - Panel 1	WESTERN AUSTRALIA Capricorn Orogen	*AuScope GSWA* *Geoscience Australia*



Migrated Section

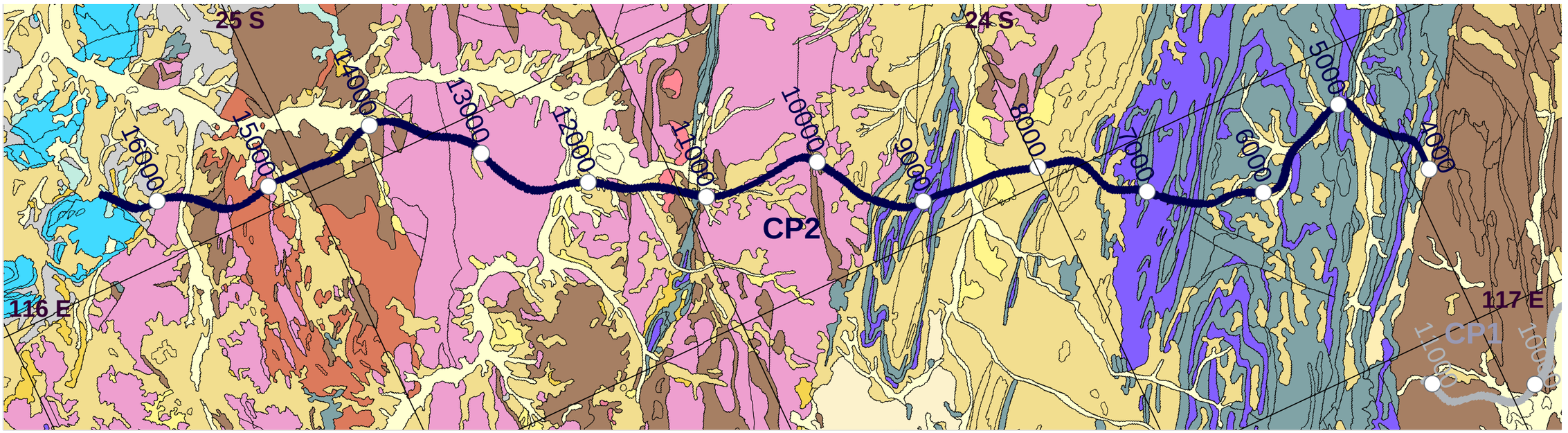
Source: 3 Hemi-60 vibrators, 80 m interval

Spread: 300 Channels, 40 m group interval

Fold: 75 nominal

Survey Details: GA-L195

2010 L195 CP2 - Panel 2	WESTERN AUSTRALIA Capricorn Orogen	*AuScope GSWA* *Geoscience Australia*



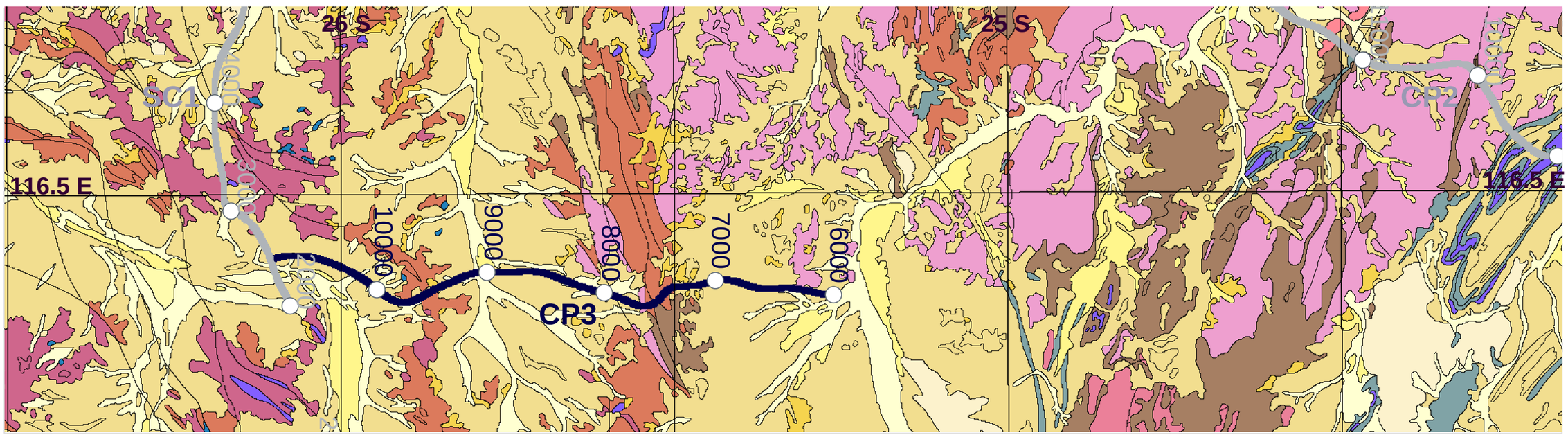
Migrated Section

Source: 3 Hemi-60 vibrators, 80 m interval

Spread: 300 Channels, 40 m group interval

Fold: 75 nominal

Survey Details: GA-L195



Migrated Section

Source: 3 Hemi-60 vibrators, 80 m interval

Spread: 300 Channels, 40 m group interval

Fold: 75 nominal

Survey Details: GA-L195

2011 L200 SC1 - Panel 1	WESTERN AUSTRALIA South Carnarvon	*Geoscience Australia* *GSWA*

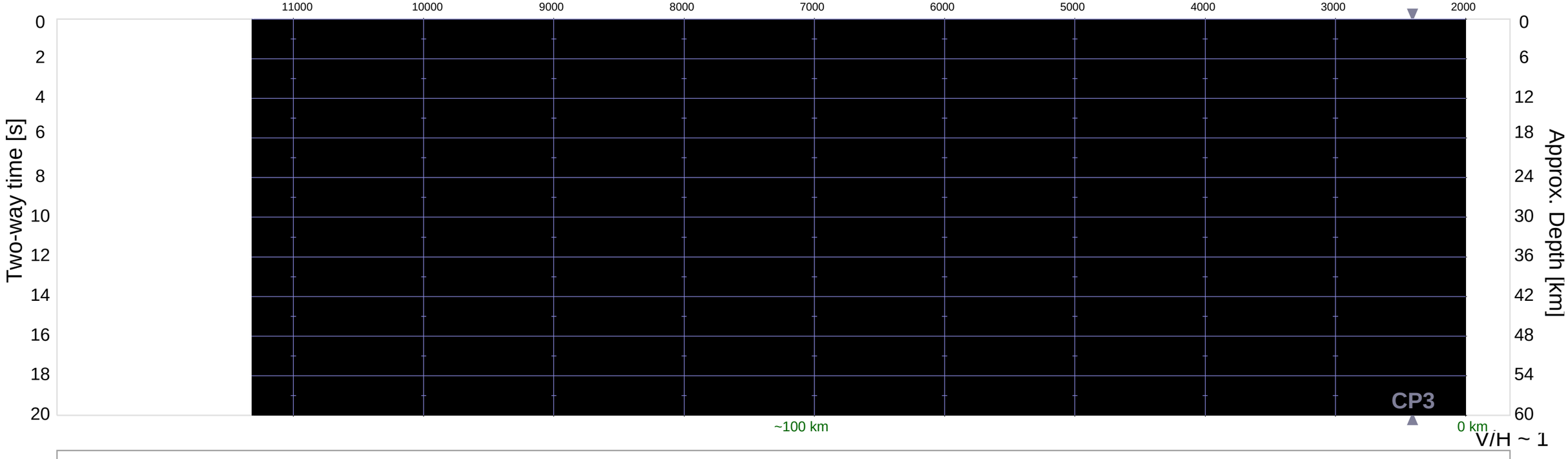
Migrated Section

Source: 3 Hemi-50 vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L200

2011 L200 SC1 - Panel 2	WESTERN AUSTRALIA South Carnarvon	*Geoscience Australia* *GSWA*	139

CDP



Migrated Section

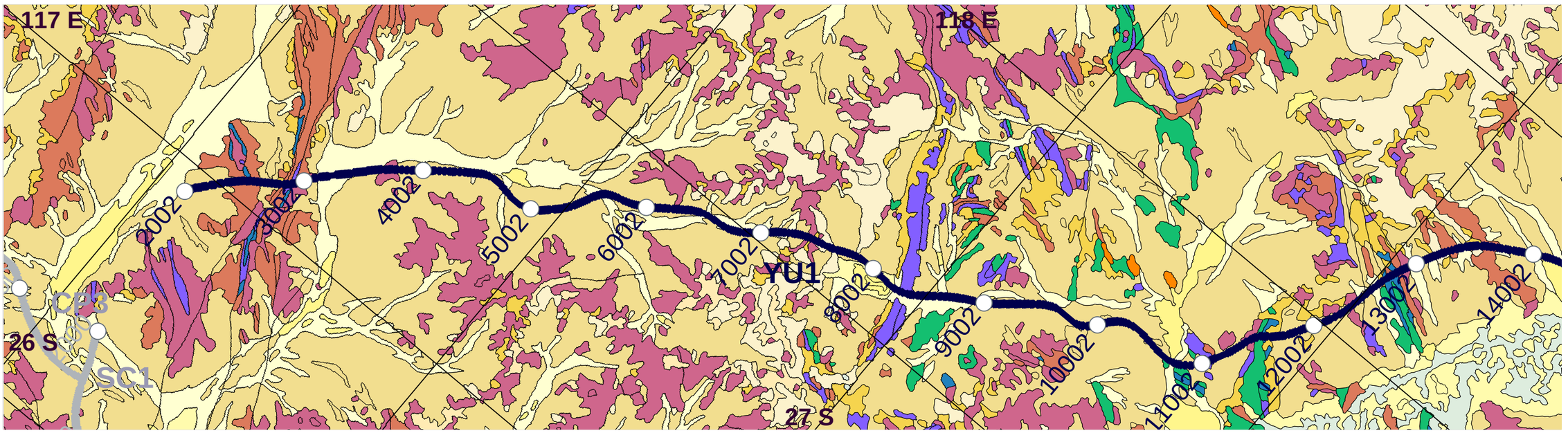
Source: 3 Hemi-50 vibrators, 80 m interval

Spread: 300 Channels, 40 m group interval

Fold: 75 nominal

Survey Details: GA-L200

2010 L196 YU1 - Panel 1	WESTERN AUSTRALIA Youanmi	*GSWA* *Geoscience Australia*

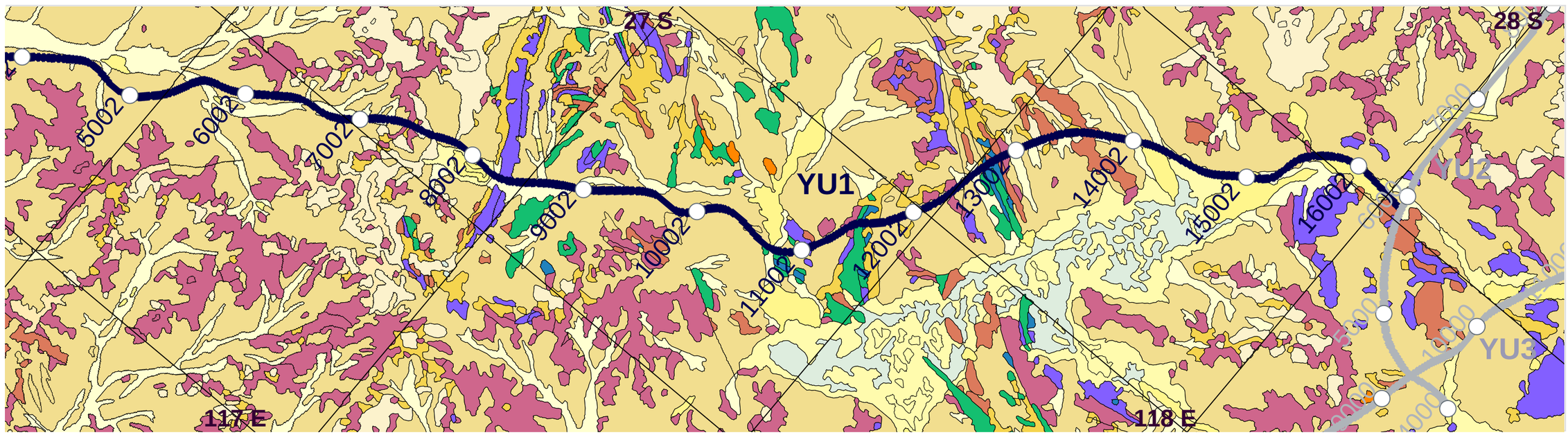


Migrated Section

Source: 3 Hemi-50 vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L196

2010 L196 YU1 - Panel 2	WESTERN AUSTRALIA Youanmi	*GSWA* *Geoscience Australia*



Migrated Section

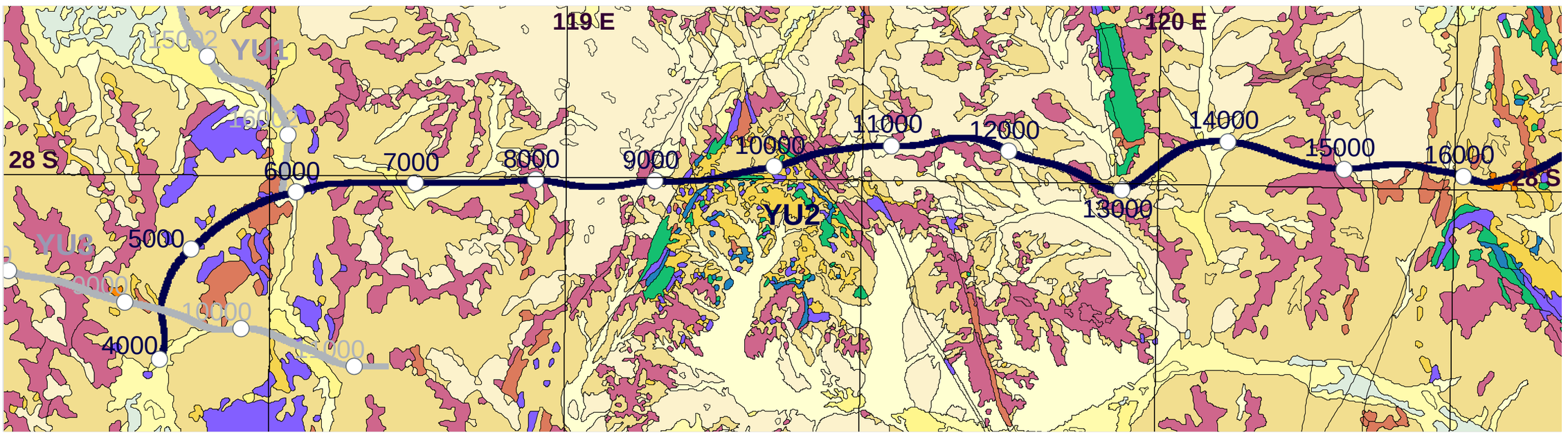
Source: 3 Hemi-50 vibrators, 80 m interval

Spread: 300 Channels, 40 m group interval

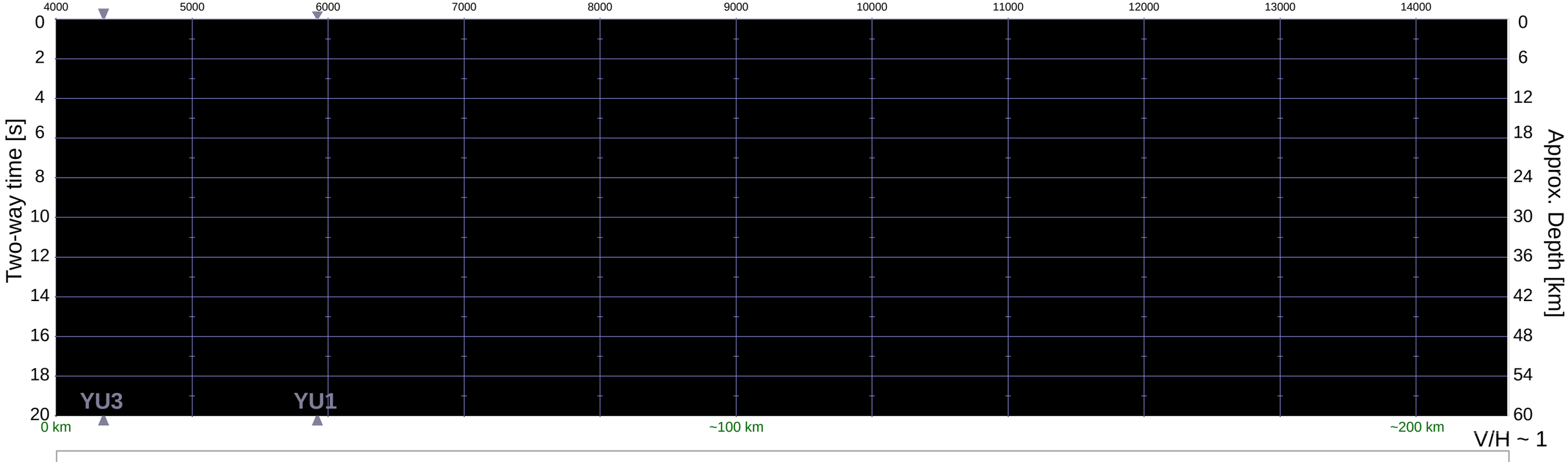
Fold: 75 nominal

Survey Details: GA-L196

2010 L196 YU2 - Panel 1	WESTERN AUSTRALIA Youanmi	*GSWA* *Geoscience Australia*



CDP

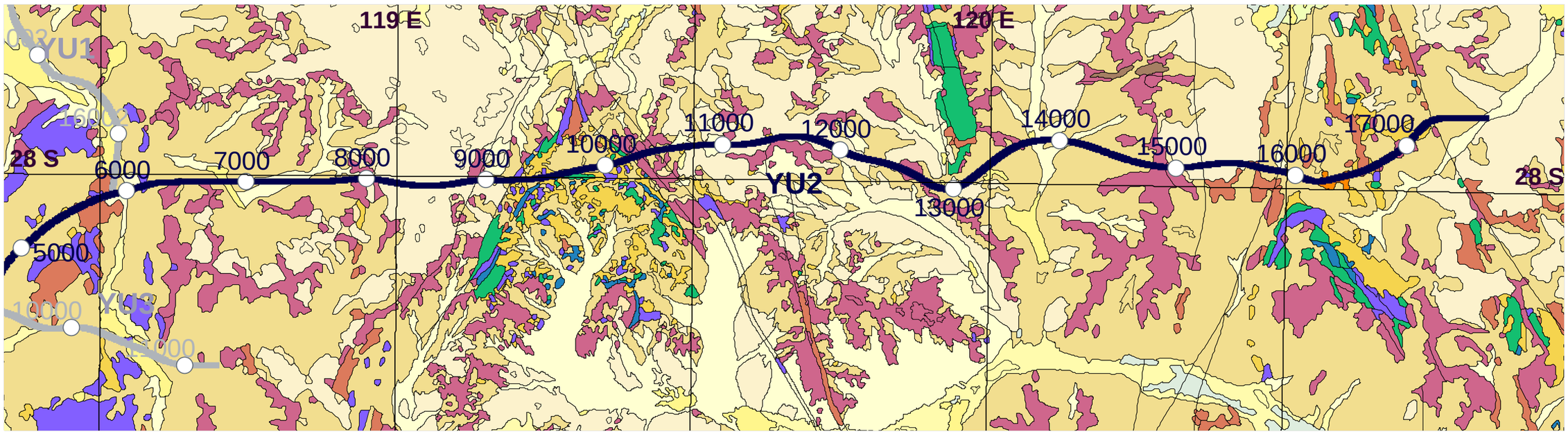


Migrated Section

Source: 3 Hemi-50 vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

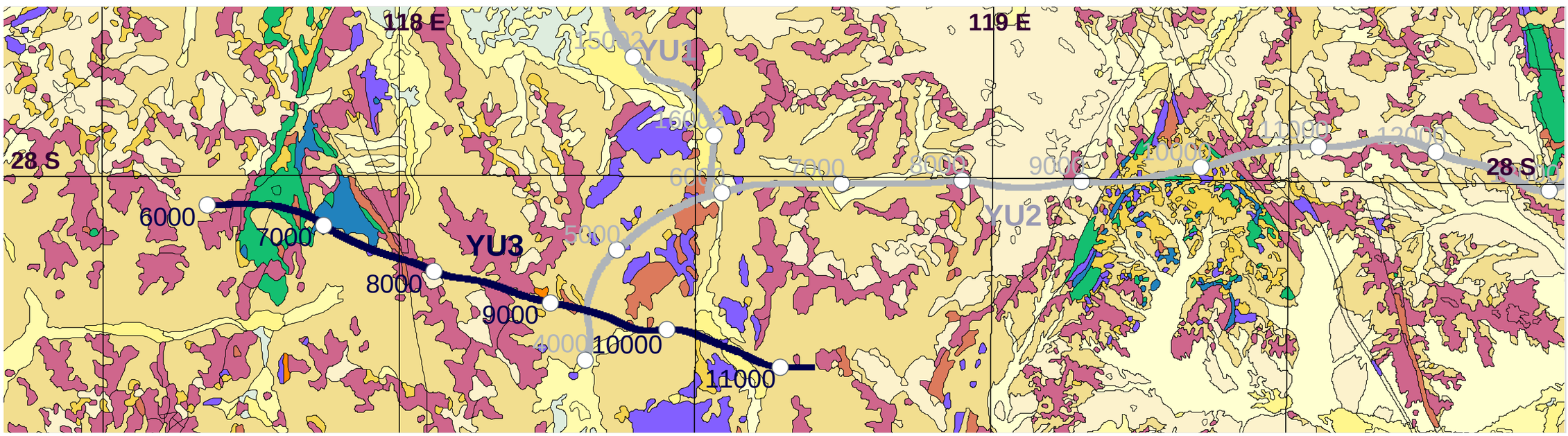
Survey Details: GA-L196

2010 L196 YU2 - Panel 2	WESTERN AUSTRALIA Youanmi	*GSWA* *Geoscience Australia*



Migrated Section	Source:	3 Hemi-50 vibrators, 80 m interval	Survey Details: GA-L196
	Spread:	300 Channels, 40 m group interval	
	Fold:	75 nominal	

2010 L196 YU3	WESTERN AUSTRALIA Youanmi	*GSWA* *Geoscience Australia*

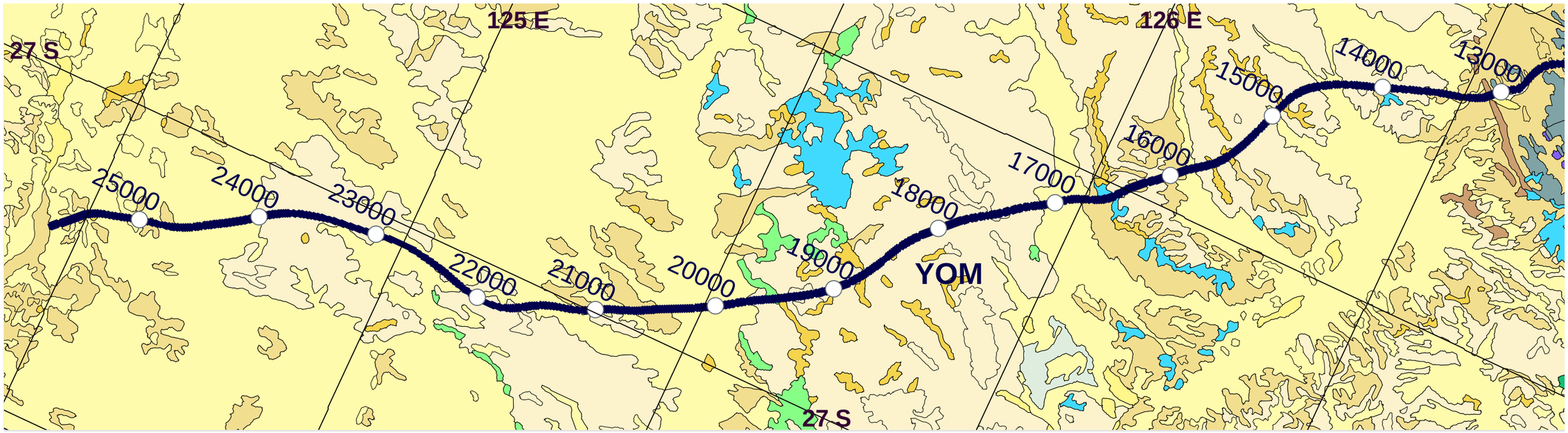


Migrated Section

Source: 3 Hemi-50 vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L196

2011 L199 YOM - Panel 1	WESTERN AUSTRALIA Yilgarn-Officer-Musgrave	*Geoscience Australia* *GSWA*	145

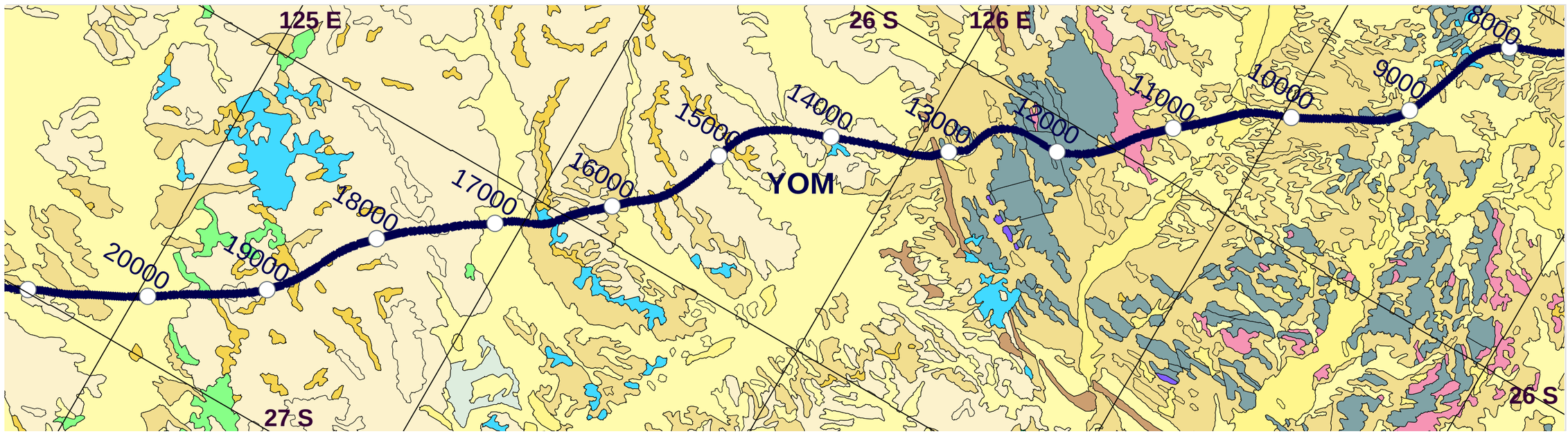


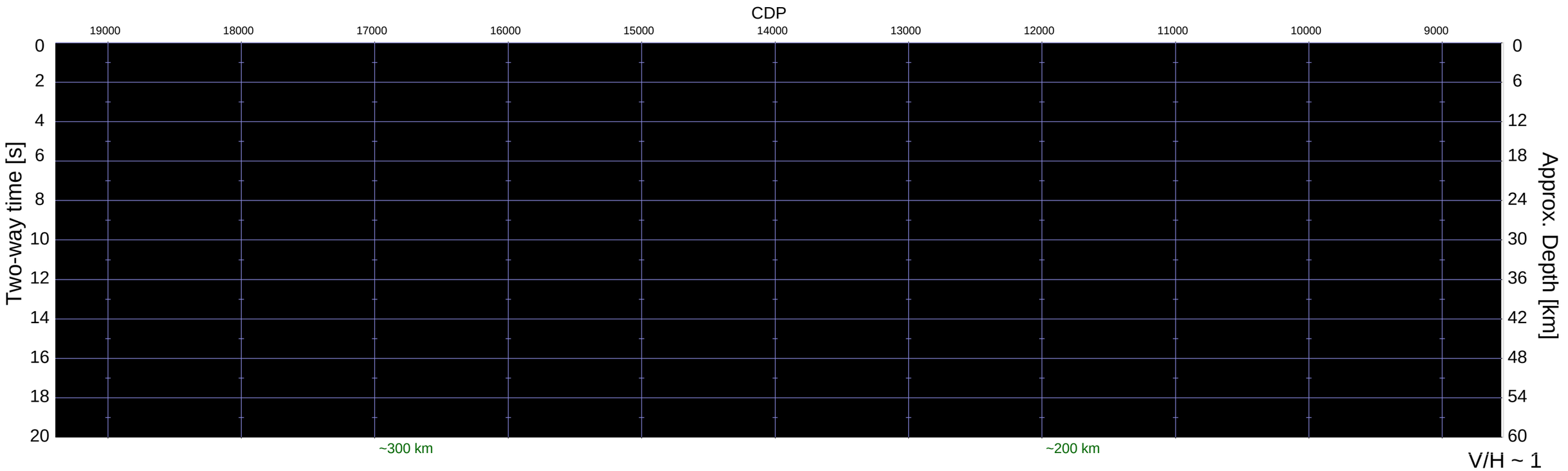
Migrated Section

Source: 3 Hemi-50 vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L199

2011 L199 YOM - Panel 2	WESTERN AUSTRALIA Yilgarn-Officer-Musgrave	*Geoscience Australia* *GSWA*



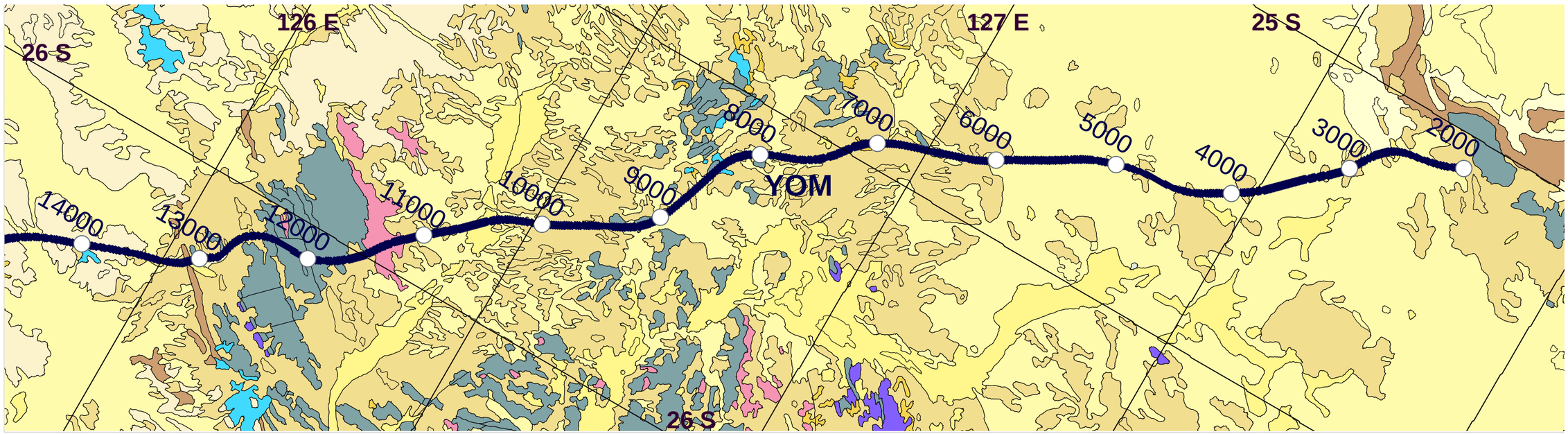


Migrated Section

Source: 3 Hemi-50 vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L199

2011 L199 YOM - Panel 3	WESTERN AUSTRALIA Yilgarn-Officer-Musgrave	*Geoscience Australia* *GSWA*



Migrated Section

Source: 3 Hemi-50 vibrators, 80 m interval

Spread: 300 Channels, 40 m group interval

Fold: 75 nominal

Survey Details: GA-L199

EARLY EXPERIMENTAL PROFILES: 1976-1979

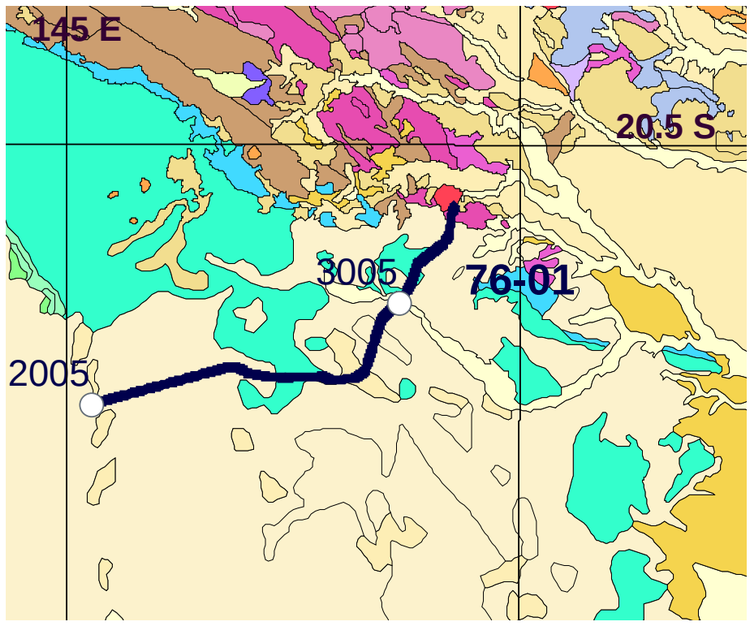
Northern Queensland

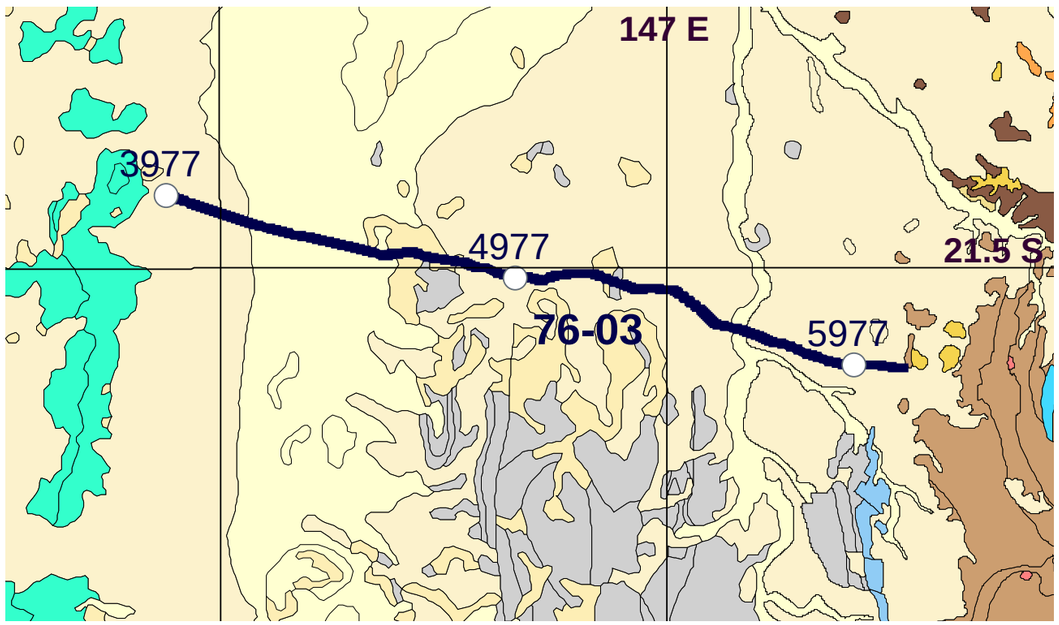
Year	Project	GA Line Code	Line Designator	Display:	Bias	Clip	Page
1976	L108	BMR76-01	76-01	Stack	1.825	75	149
		BMR76-03	76-03	Stack	1.825	75	149

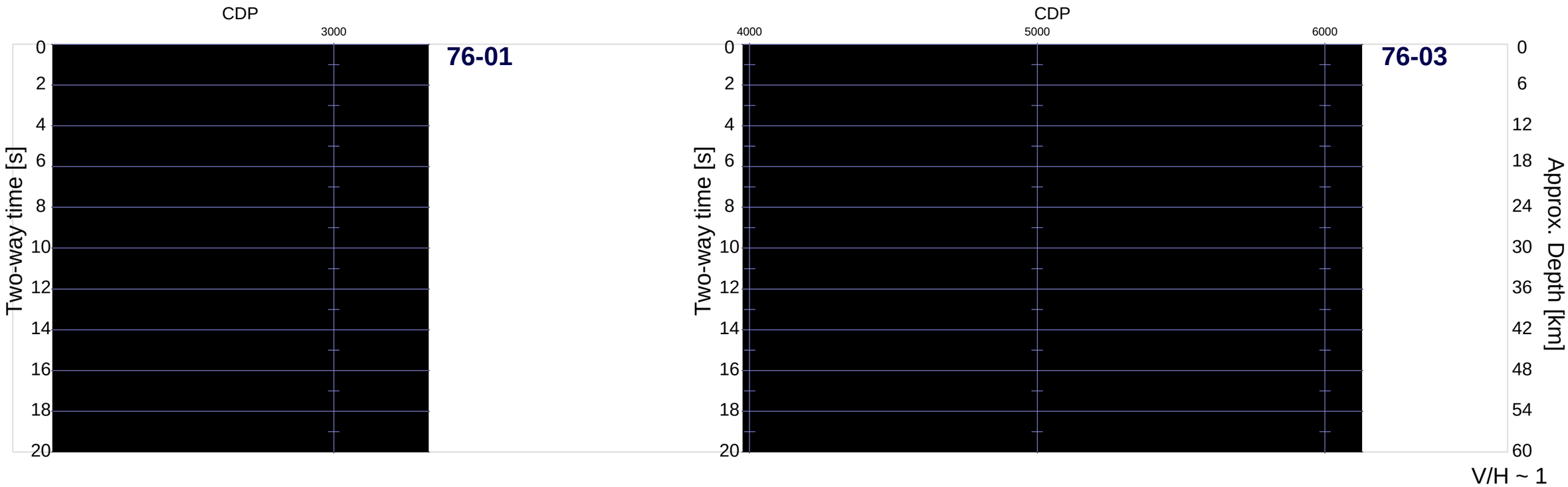
Southern Queensland

Year	Project	GA Line Code	Line Designator	Display:	Bias	Clip	Page
1978	L111	BMR78-01	78-01	Stack	1.70	80	150
		BMR78-02	78-02	Stack	1.70	80	150
		BMR78-03	78-03	Stack	1.70	80	150
		BMR78-06	78-06	Stack	1.70	80	152
		BMR78-07	78-07	Stack	1.70	80	152
		BMR78-08	78-08	Stack	1.70	80	152
1979	L112	BMR79-04E	79-04E	Stack	1.70	80	151
		BMR79-05	79-05	Stack	1.70	80	151
		BMR79-09	79-09	Stack	1.70	80	151

1976 L108 76-01 76-03	NORTHERN QUEENSLAND Galilee Basin	*Geoscience Australia*	149

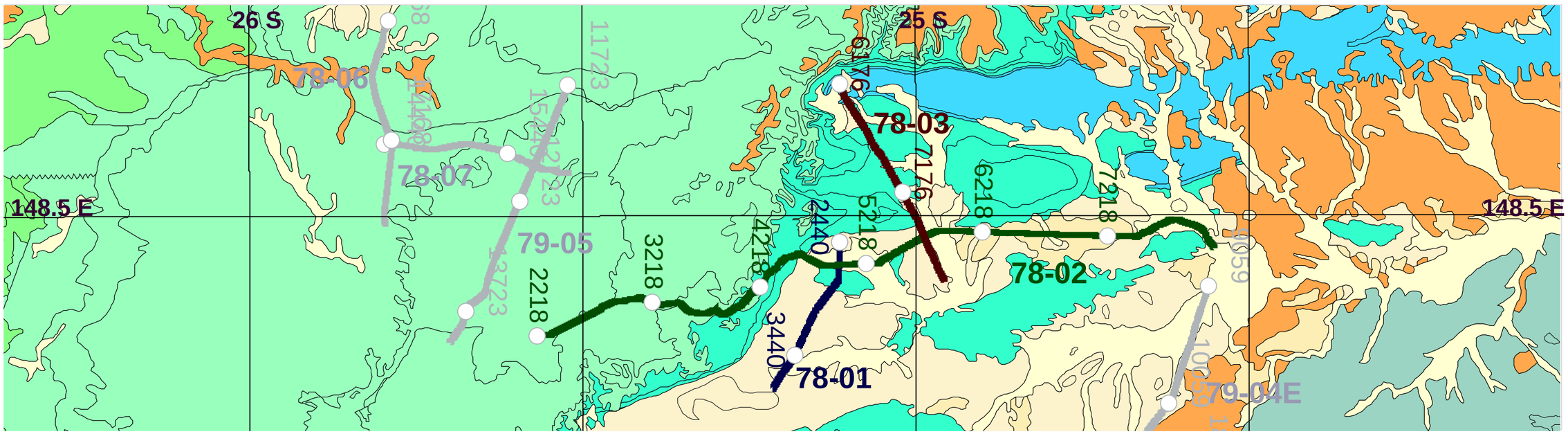


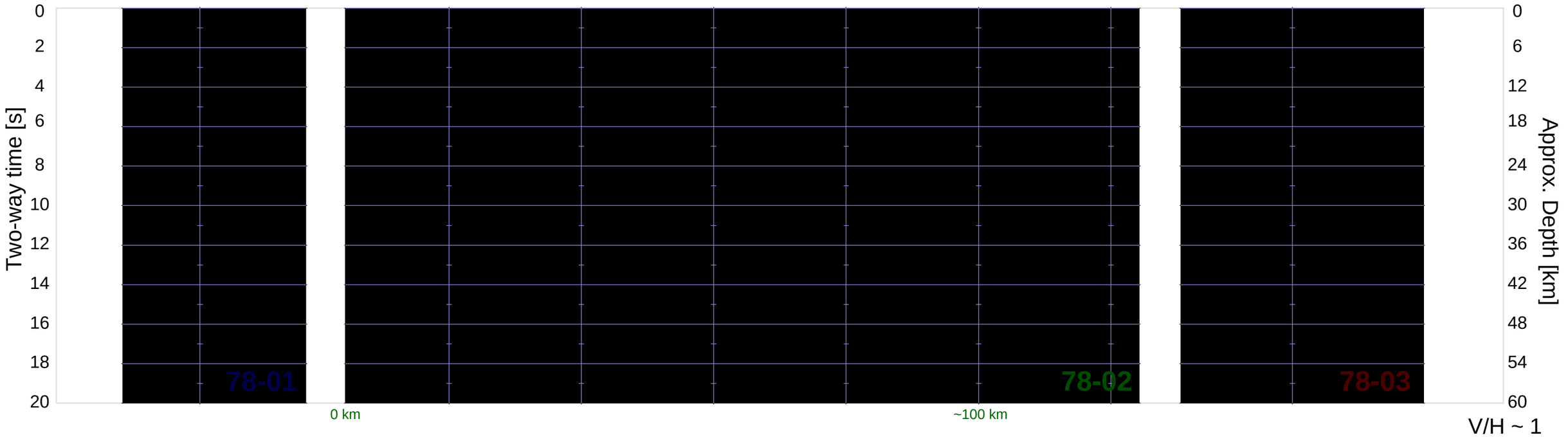




Stacked Section	Source:	Explosions, 166.7 m interval	Survey Details: GA-L108
	Spread:	24 channels, 83.3 m group interval	
	Fold:	6 nominal	Notes: experimental surveys

1978 L111 78-01 78-02 78-03	SOUTHERN QUEENSLAND Denison Trough	*Geoscience Australia*





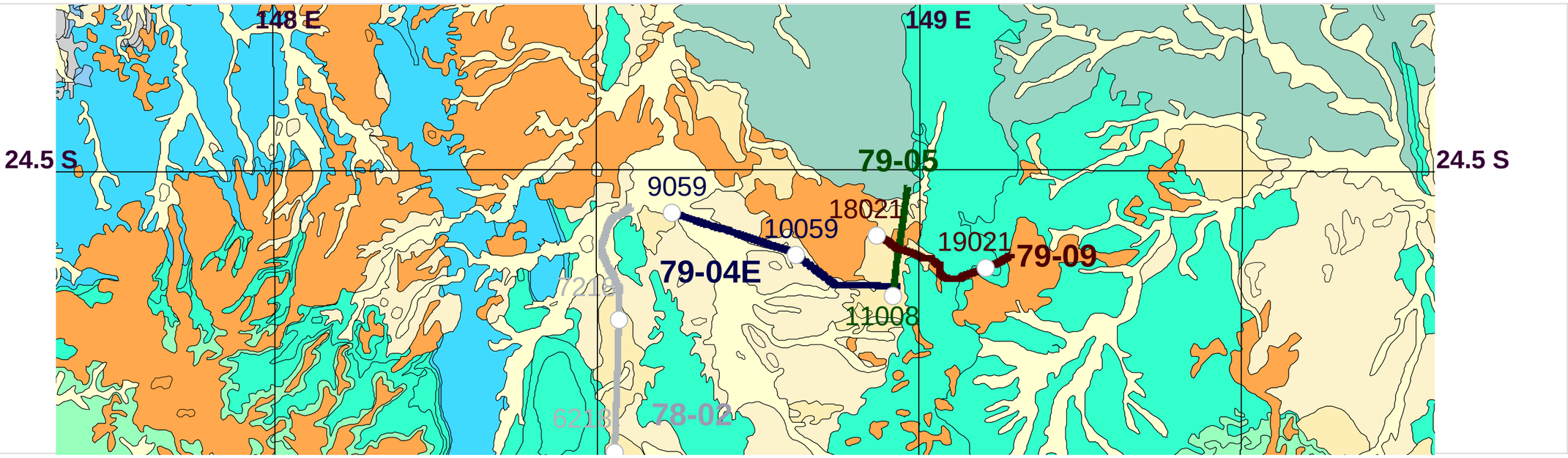
Stacked Section

Source: Explosive, 166.6 m interval

Spread: 48 Channels, 41.66 m group interval

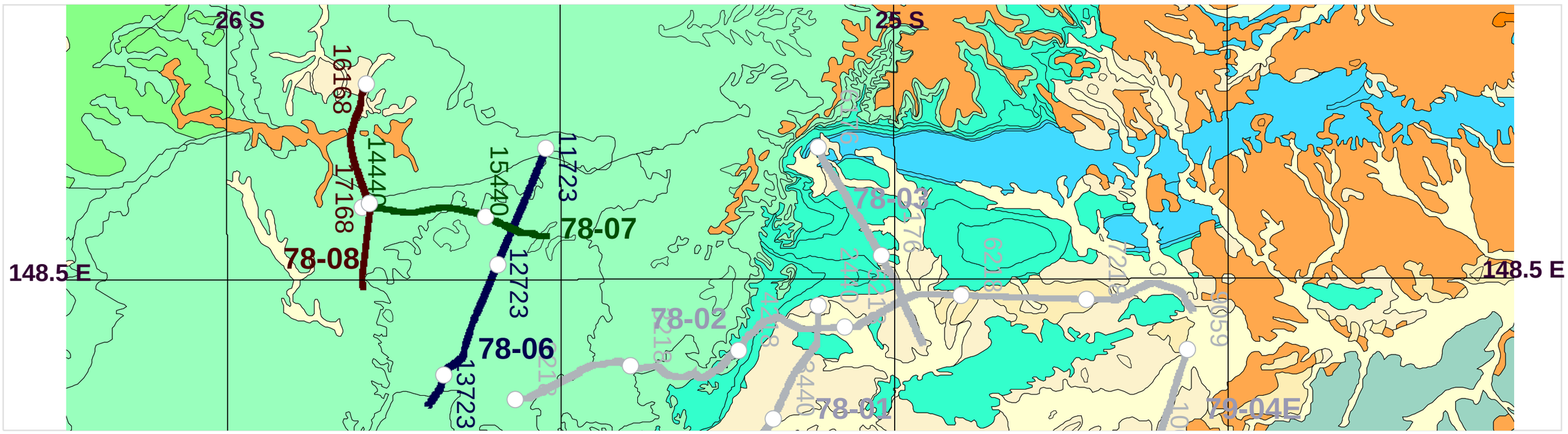
Fold: 6 nominal

Survey Details: GA-L111



Stacked Section	Source:	Explosive, 166.6 m interval	Survey Details: GA-L112
	Spread:	48 Channels, 41.66 m group interval	
	Fold:	6 nominal	

1978 L111 78-06 78-07 78-08	SOUTHERN QUEENSLAND Denison Trough	*Geoscience Australia*



Stacked Section

Source: Explosive, 166.6 m interval

Spread: 48 Channels, 41.66 m group interval

Fold: 6 nominal

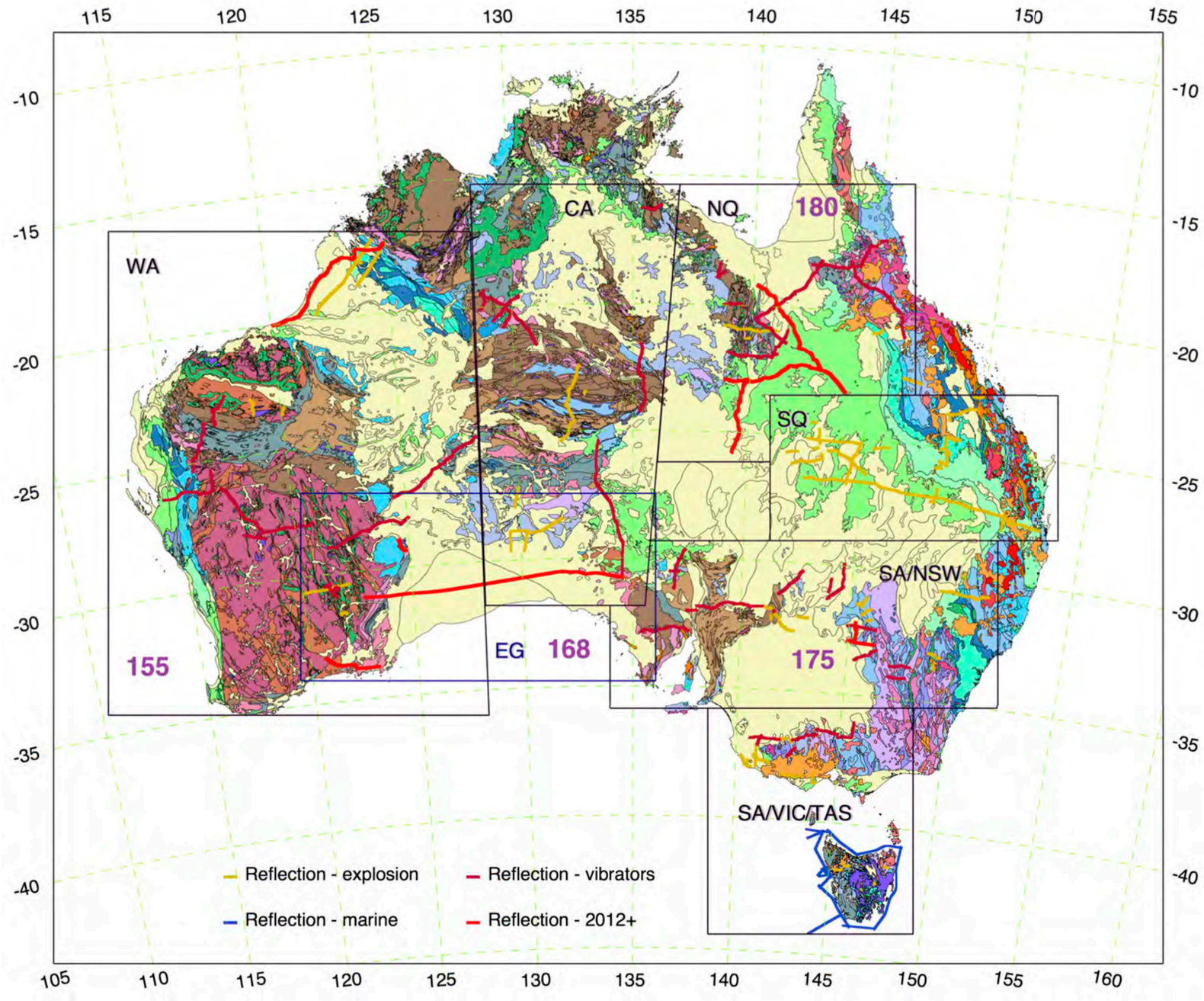
Survey Details: GA-L111

Part II

Reflection Profiling 2012-2015

Geographic Groups for Full-crustal Reflection Profiles 1978-2015

For the period from 2012-2015 we introduce a new region to encompass the Eucla-Gawler Profile, which runs from Western Australia into South Australia. The set of regional groups are outlined with reference to the page for the key diagram for the profiles conducted in 2012-2015.



Legend for 1:1 000 000 and 1:2 500 000 Surface Geology

CENOZOIC UNITS (mainly unconsolidated deposits)

Quaternary

- Q *Quaternary sediments, undivided*
- Qa *Channel and flood plain alluvium; gravel, sand, silt, clay*
- Qb *Volcanic rocks, predominantly mafic*
- Qd *Dunes, sand plain with dunes*
- Qdc *Coastal dunes, beach ridge, barrier beach, foredune and shoreface sands*
- Qe *Estuarine, tidal delta deposits; coastal mud flats*
- Qi *Carbonate sediments*
- Qk *Calcrete*
- Qrc *Colluvium and/or residual deposits; boulder, gravel, sand*
- Qrlb *Black soil plains*
- Qsg *Glacial sediments, moraine*
- Qsm *Anthropogenic deposits; mining waste, salt pans*
- Qt *Lake and swamp deposits; mud, silt, evaporites, limestone, minor sand*
- Qv *Volcanics, undivided*

Cenozoic

- Czu *Cenozoic sediments, undivided*
- Cza *Alluvial deposits; typically incised by current drainage*
- Czb *Volcanic rocks, predominantly mafic*
- Czc *Consolidated siliclastic rocks*
- Cze *Estuarine and delta deposits*
- Czf *Felsic to intermediate volcanic rocks*
- Czg *Felsic intrusive rocks*
- Czi *Carbonate sediments*
- Czk *Calcrete*
- Czl *Laterite, ferruginous duricrust*
- Czq *Spring deposits*
- Czs *Sand plain*
- Czt *Lake and swamp deposits*
- Czu *Ultramafic intrusive rocks*
- Czz *Silcrete*

SEDIMENTARY ROCKS AND LOW-GRADE METAMORPHIC ROCKS

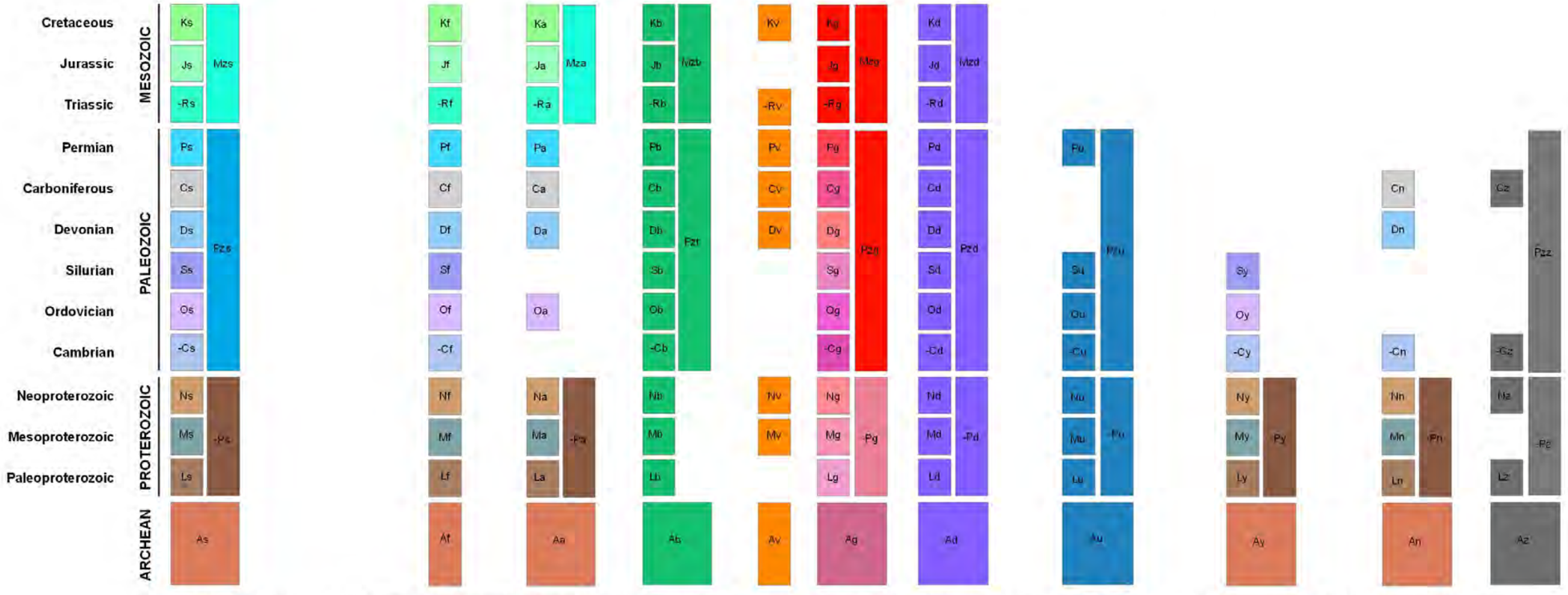
mudstone, siltstone, sandstone, conglomerate (s), limestone (l), coal measures (o), volcanogenic sediments (j), mixed sediments and volcanic rocks (w), chemical sediments (c)

IGNEOUS ROCKS

Volcanic rocks				Intrusive rocks		
Felsic	**Intermediate**	**Mafic to ultramafic**	**Felsic to mafic**	**Felsic**	**Mafic**	**Mafic to ultramafic**
(f), metamorphosed (r)	(a)	metamorphosed (t), mixed intrusives (i)	(v)	(g), quartz vein (q)	(d), metamorphosed (t)	(u), metamorphosed (e), alkaline ultrabasic (k)

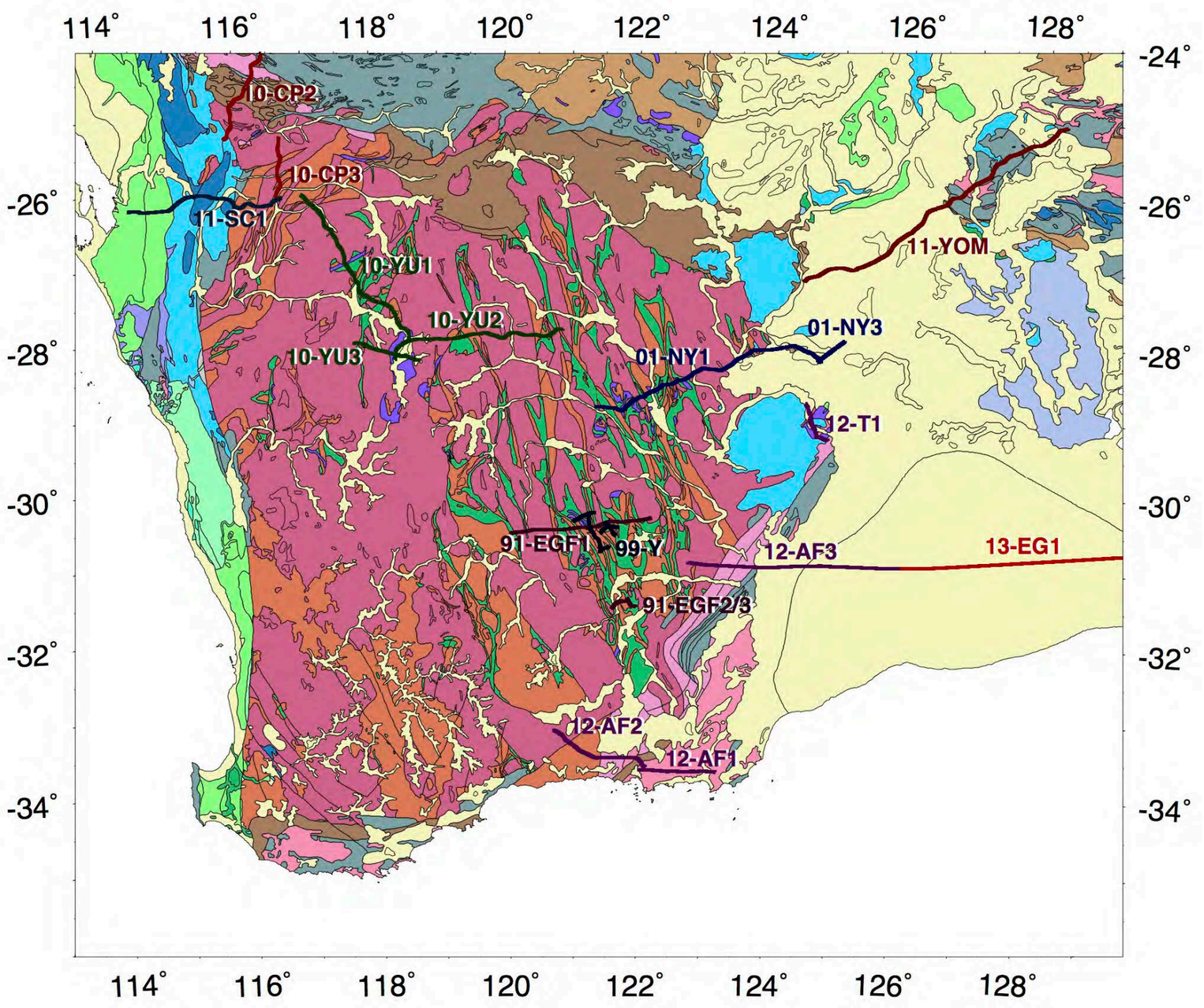
METAMORPHIC ROCKS

Low-medium grade	**High-grade**	**Fault/shear rocks**
metacarbonate (m), siliciclastic (y), hornfels (h)	metamorphics (n), complexes (x)	(z)



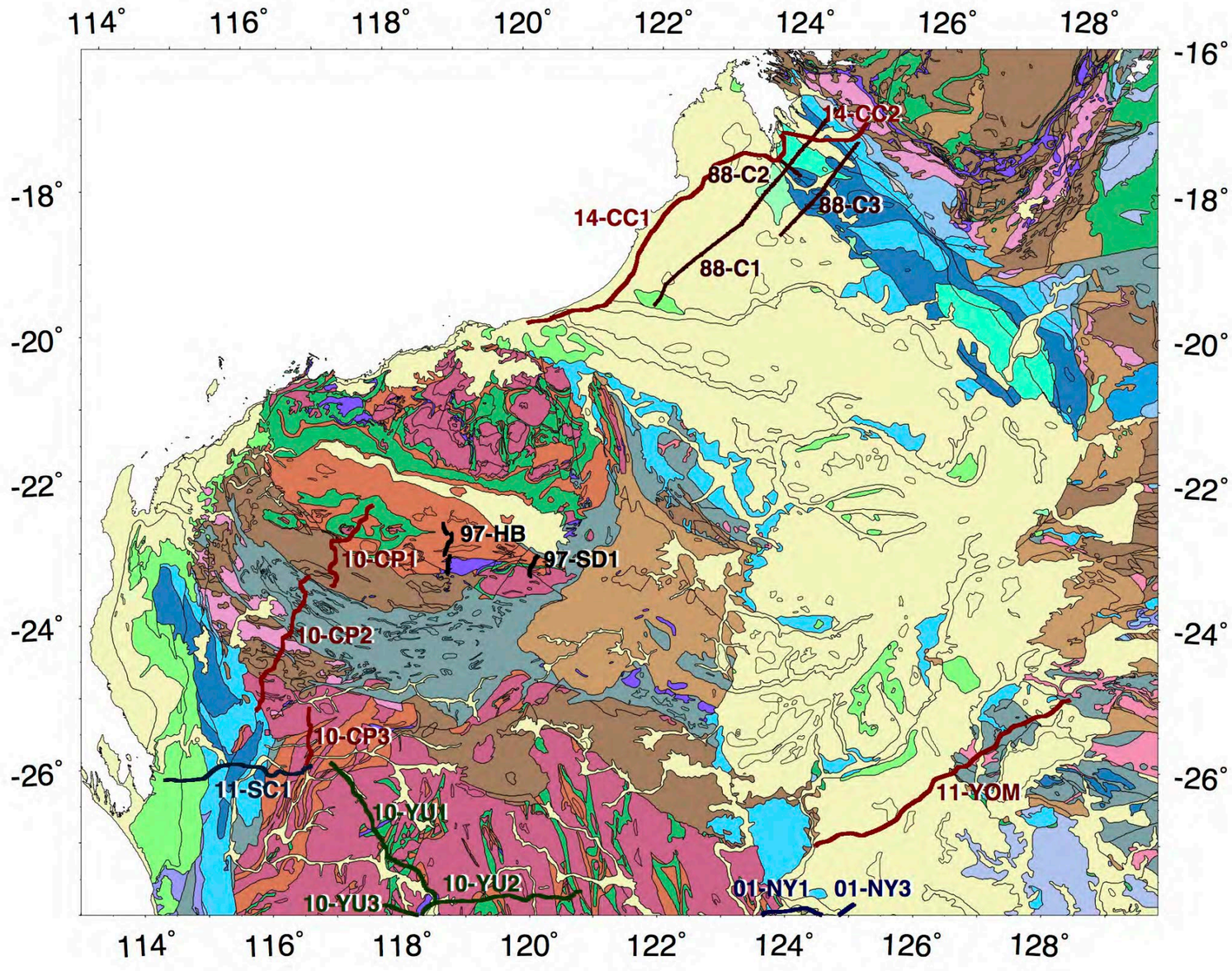
Note: Geological units which span multiple time periods have symbols showing the oldest and youngest time periods. e.g. Cambrian to Ordovician sedimentary rocks = -COs; Paleoproterozoic to Mesoproterozoic high grade metamorphics = LMn

WESTERN AUSTRALIA - SOUTH 1978-2015



Profiles are identified by 2 digit year and line designator

WESTERN AUSTRALIA - NORTH 1978-2015



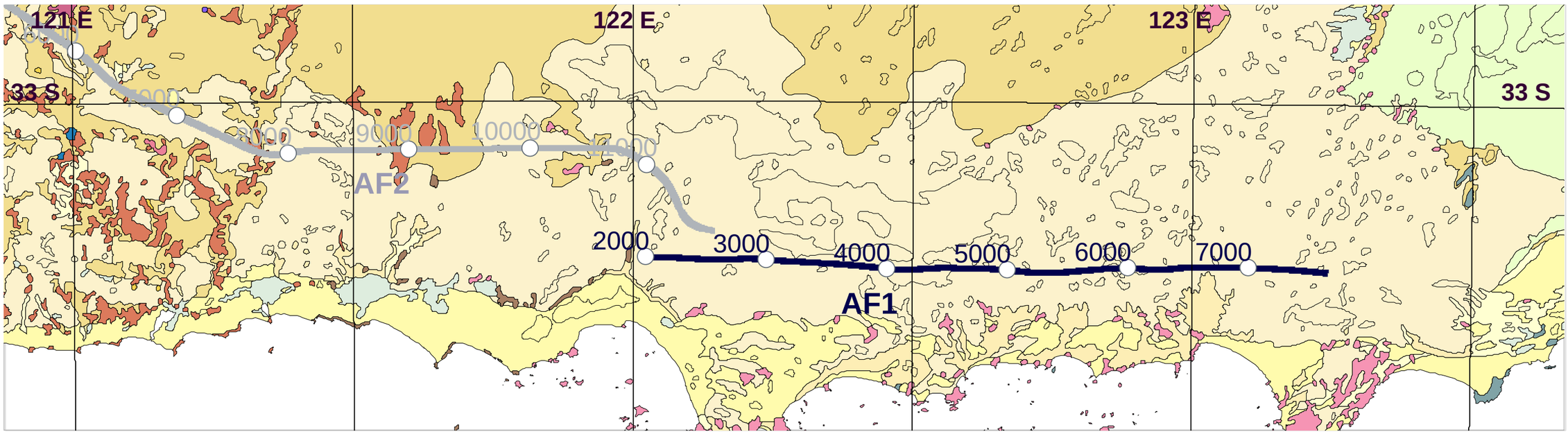
Profiles are identified by 2 digit year and line designator

INDEX OF PROFILES: WESTERN AUSTRALIA 2012-2015

On the display panels the reflection lines are identified by year, project identifier and line designator. The table below presents the full list of the lines and the codes used in Geoscience Australia reports, together with the nature of the display and the bias and clip parameters used to display the sections using the *pssegy* facility.

Year	Project	GA Line Code	Line Designator	Display:	Bias	Clip	Page
2012	L201	12GA-AF1	AF1	Migrated	1.47	85	158,160
		12GA-AF2	AF2	Migrated	1.40	85	159,160
		12GA-AF3	AF3	Migrated	1.47	82	161,162
		12GA-T1	T1	Migrated	1.40	85	163
2013/14	L203	13GA-EG1	EG1	Migrated	1.47	82	169-174
2014	L205	14GA-C1	CC1	Pre-stack Time Migration	1.40	80	164-166,167
		14GA-C2	CC2	Pre-stack Time Migration	1.40	80	167

2012 L201 AF1	WESTERN AUSTRALIA Albany Fraser	*GSWA* *Geoscience Australia*



Migrated Section

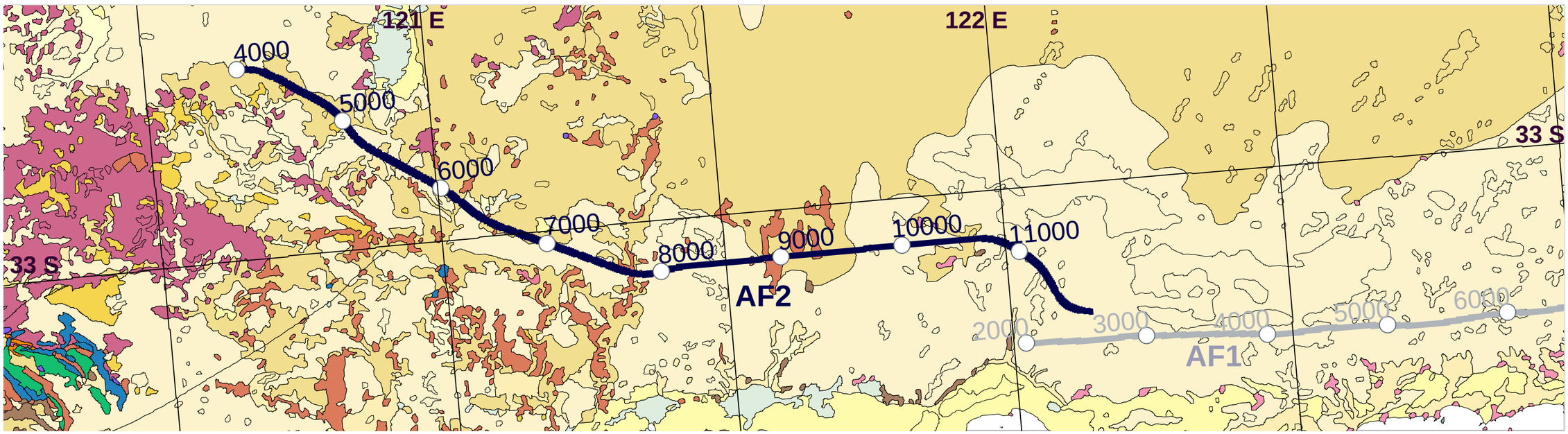
Source: 3 Hemi-50 vibrator, 80 m interval

Spread: 300 Channels, 40 m group interval

Fold: 75 nominal

Survey Details: GA-L201

2012 L201 AF2	WESTERN AUSTRALIA Albany Fraser	*GSWA* *Geoscience Australia*

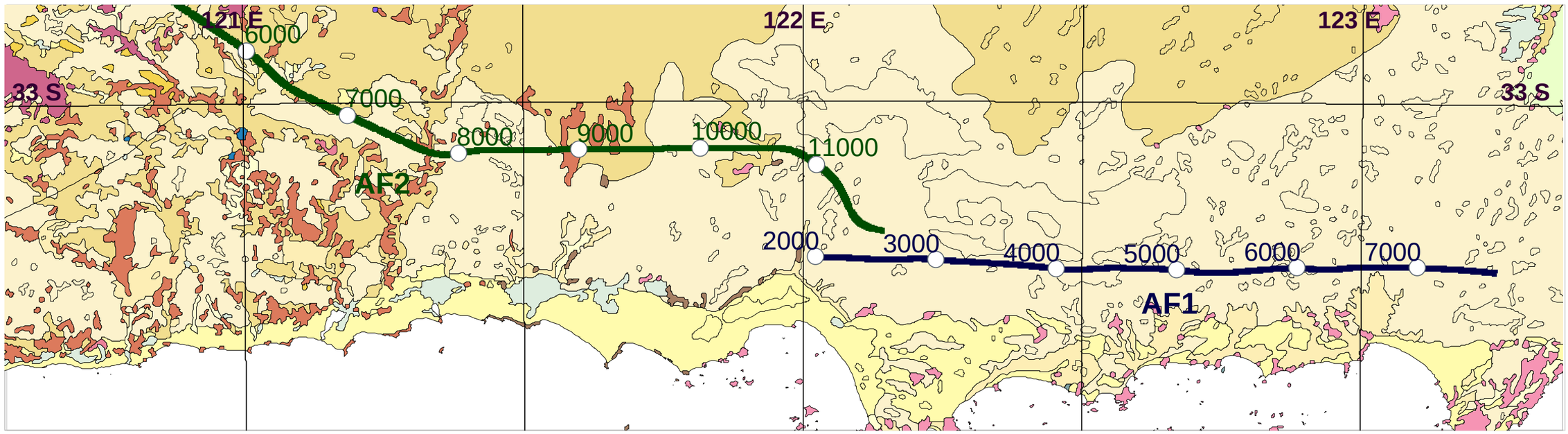


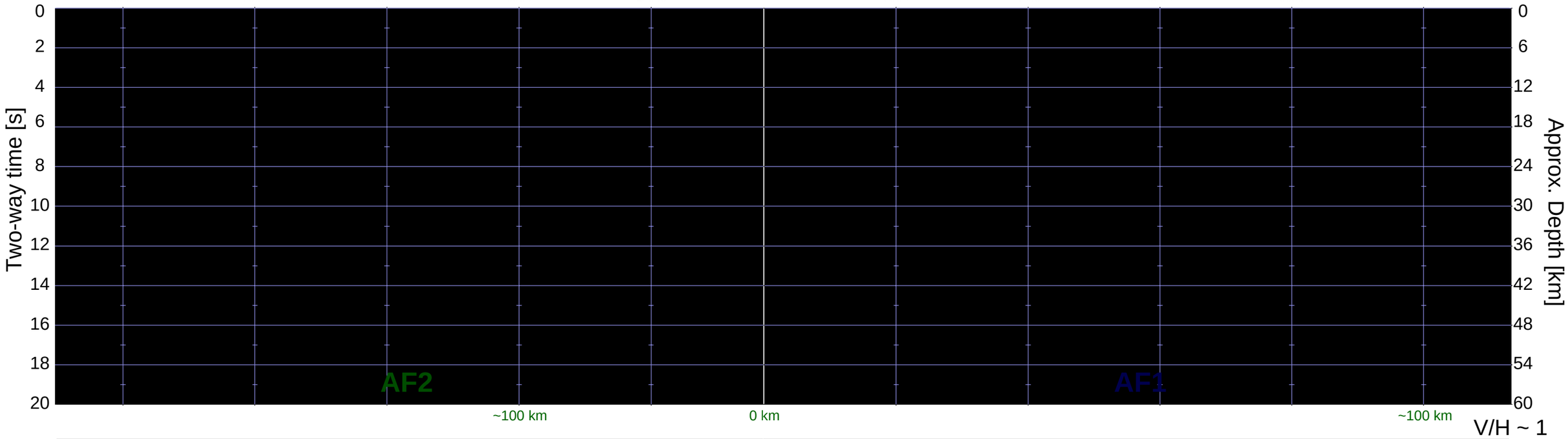
Migrated Section

Source: 3 Hemi-50 vibrators, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L201

2012 L201 AF1 AF2	WESTERN AUSTRALIA Albany Fraser	*GSWA* *Geoscience Australia*





Migrated Section

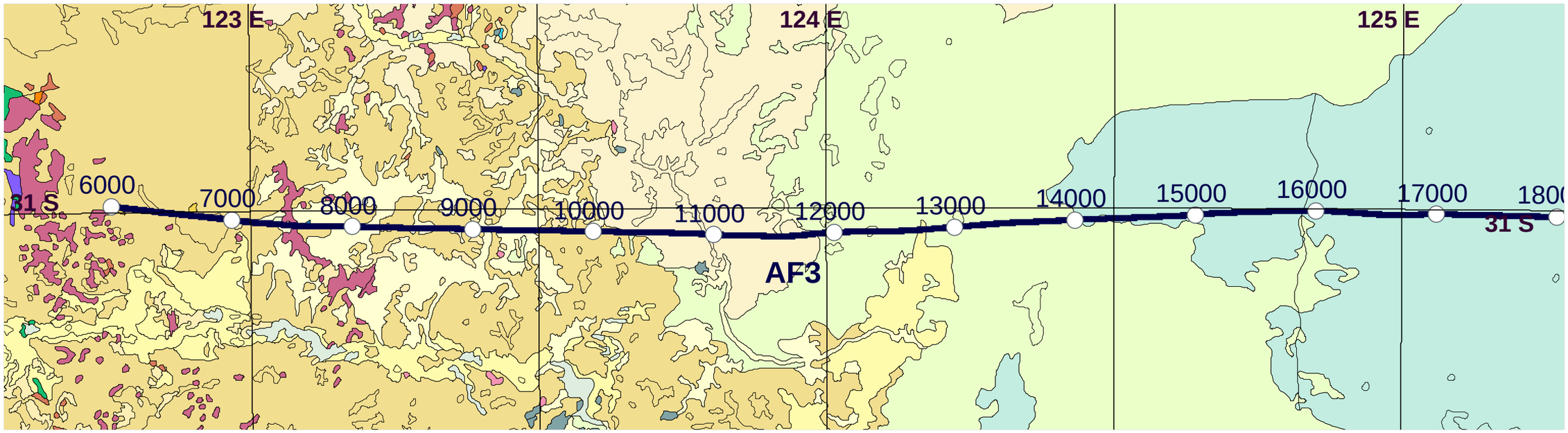
Source: 3 Hemi-50 vibrator, 80 m interval

Spread: 300 Channels, 40 m group interval

Fold: 75 nominal

Survey Details: GA-L201

2012 L201 AF3 - Panel 1	WESTERN AUSTRALIA Albany Fraser	*GSWA* *Geoscience Australia*	161

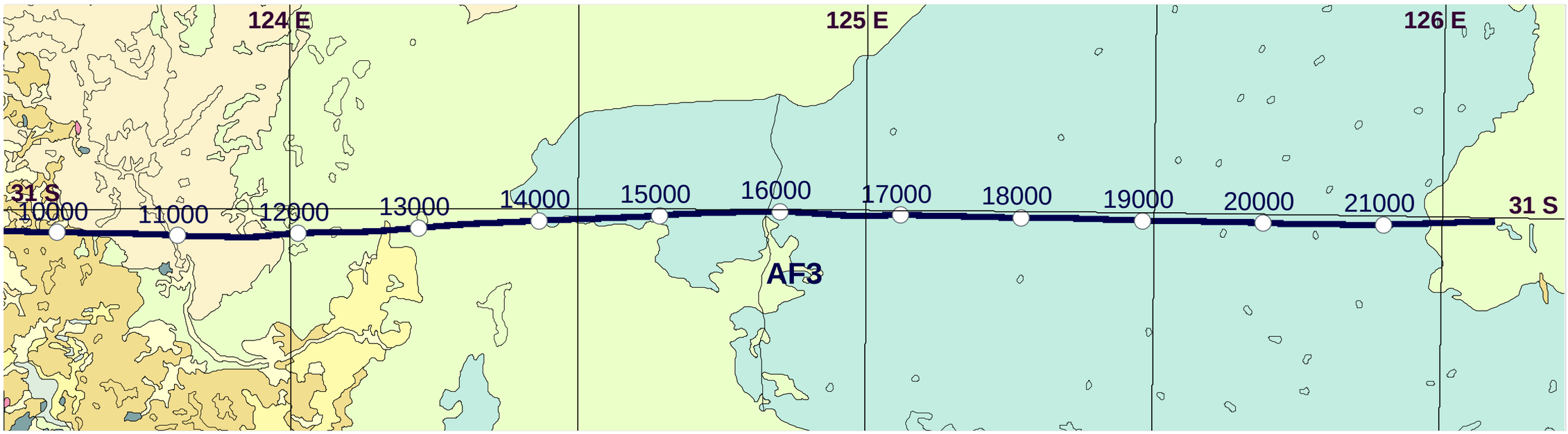


Migrated Section

Source: 3 Hemi-50 vibrator, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

Survey Details: GA-L201

2012 L201 AF3 - Panel 2	WESTERN AUSTRALIA Albany Fraser	*GSWA* *Geoscience Australia*



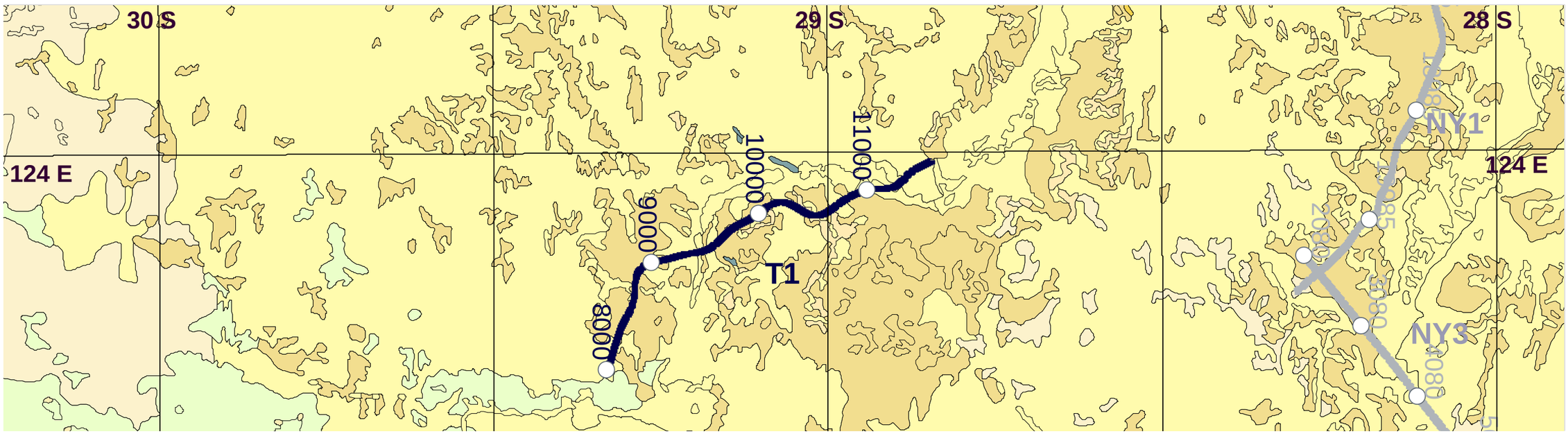
Migrated Section

Source: 3 Hemi-50 vibrator, 80 m interval

Spread: 300 Channels, 40 m group interval

Fold: 75 nominal

Survey Details: GA-L201

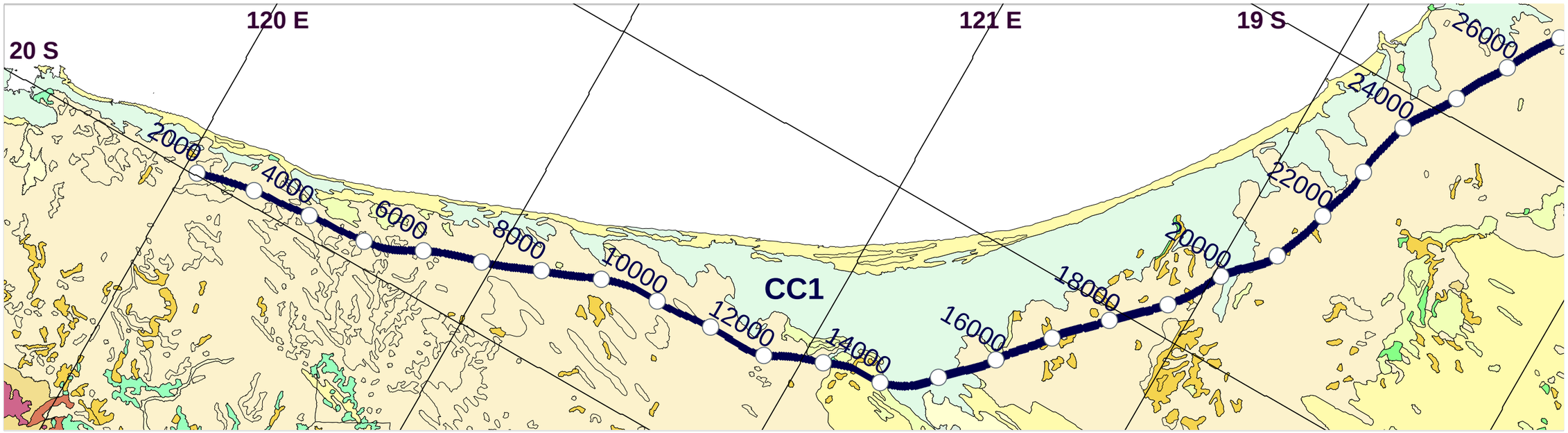


Migrated Section

Source: 3 Hemi-50 vibrator, 80 m interval
Spread: 300 Channels, 40 m group interval
Fold: 75 nominal

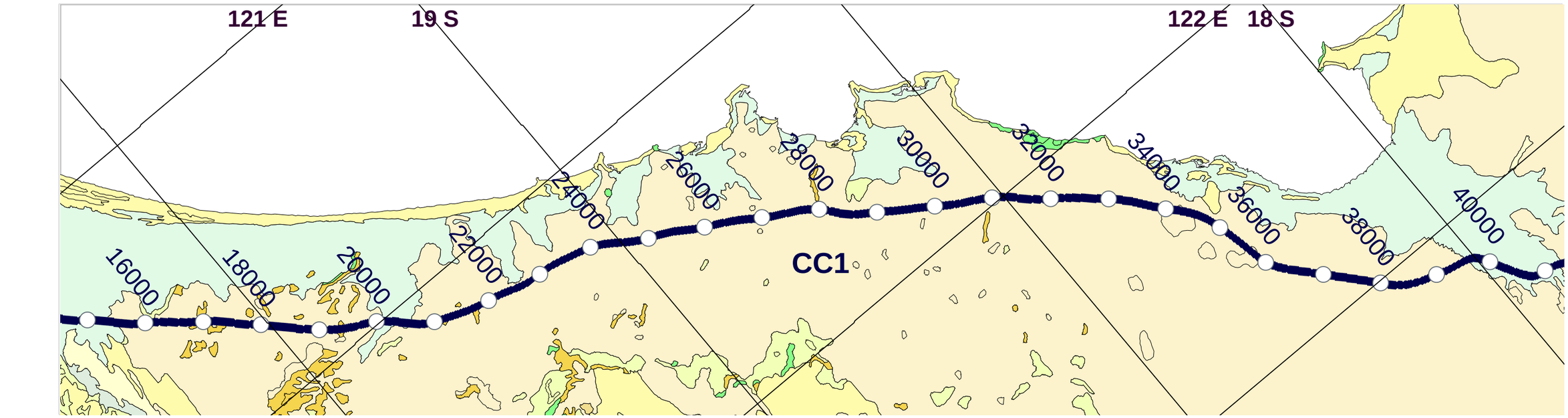
Survey Details: GA-L201

2014 L205 CC1 - Panel 1	WESTERN AUSTRALIA Canning Coastal	*GSWA* *Geoscience Australia*



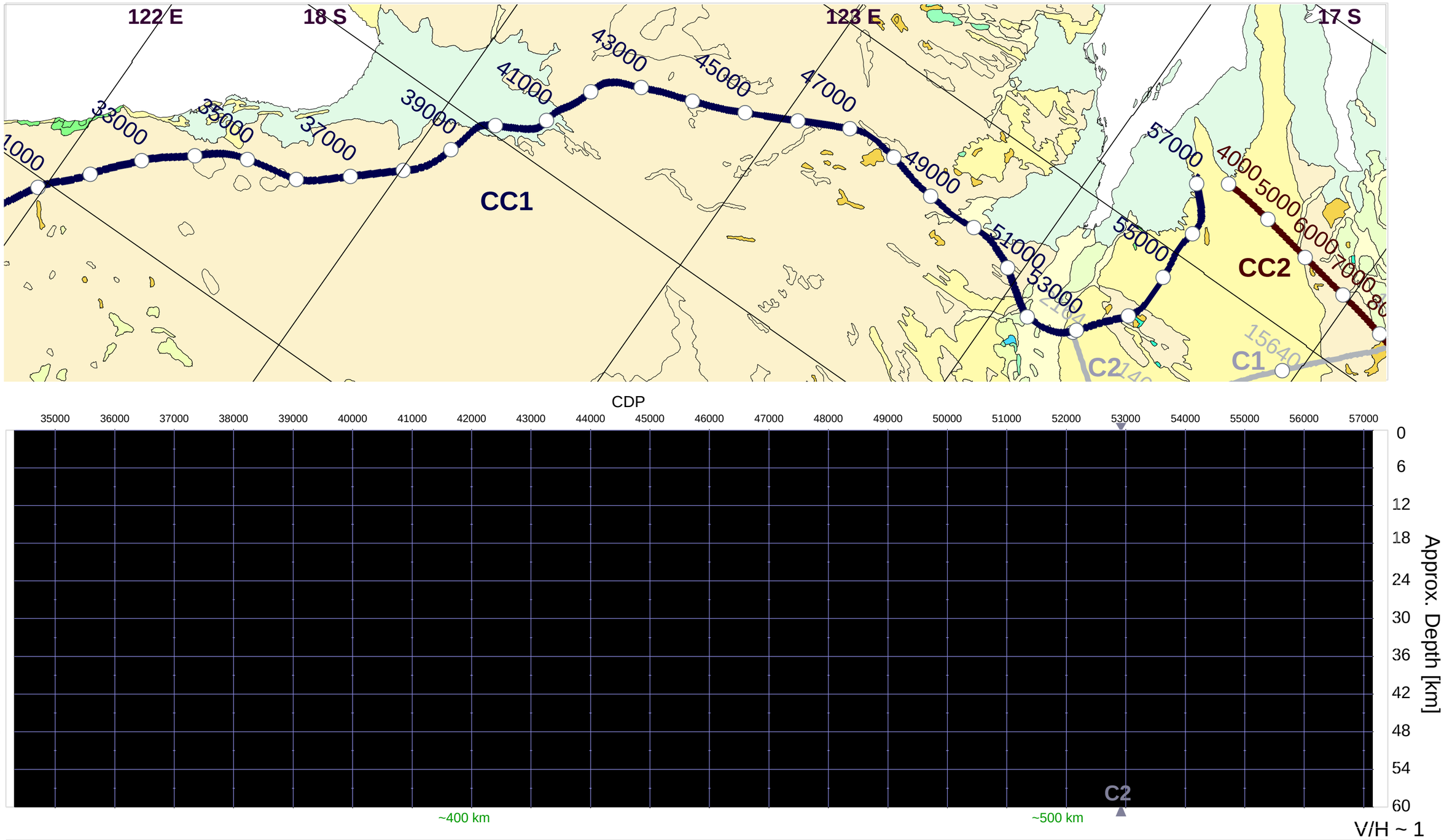
Pre-stack Time	Source:	3 Hemi-50 vibrator, 40 m interval	Survey Details: GA-L205
Migrated Section	Spread:	600 Channels, 20 m group interval	
	Fold:	150 nominal	

2014 L205 CC1 - Panel 2	WESTERN AUSTRALIA Canning Coastal	*GSWA* *Geoscience Australia*

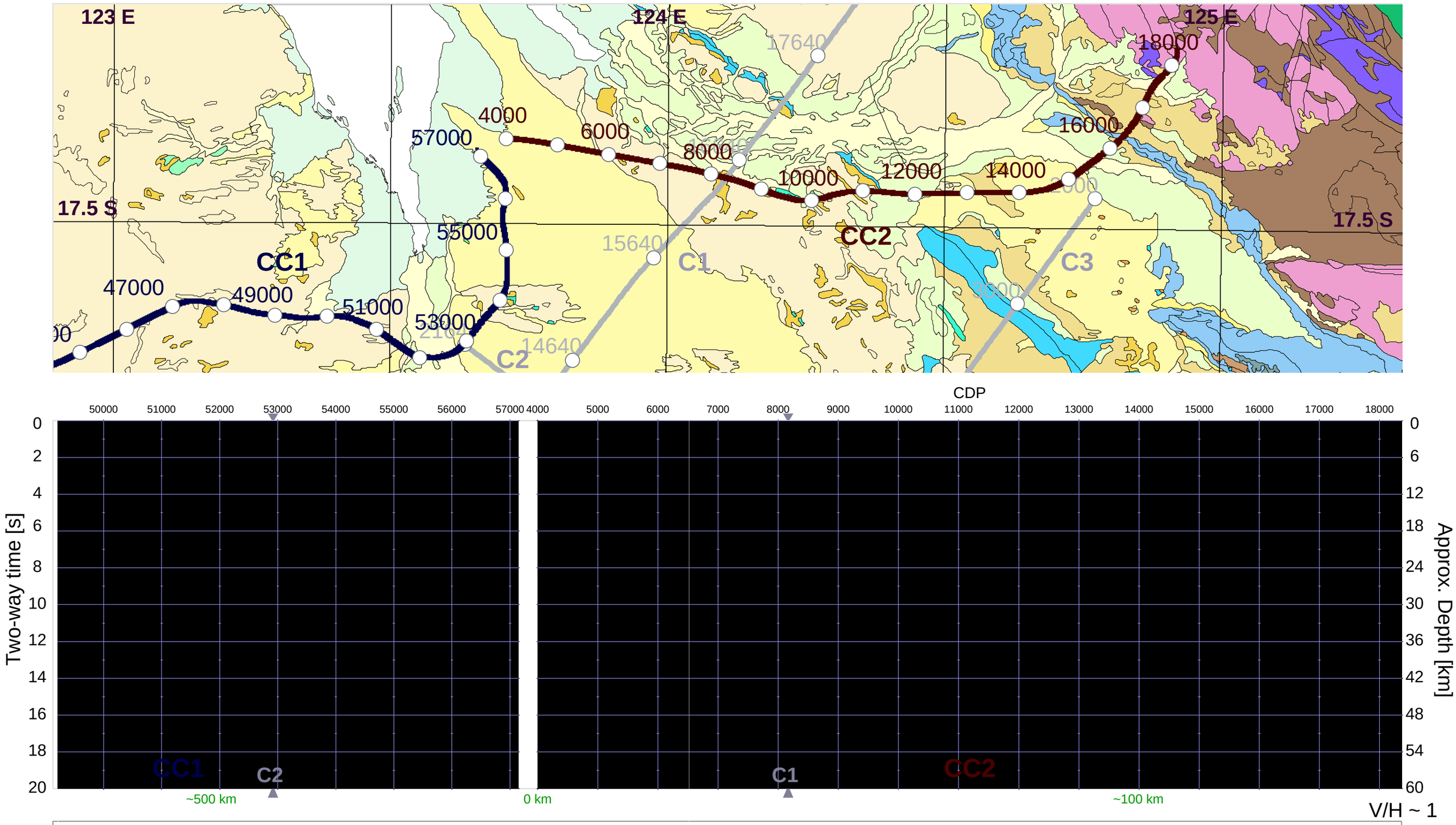


Pre-stack Time	Source:	3 Hemi-50 vibrator, 40 m interval	Survey Details: GA-L205
Migrated Section	Spread:	600 Channels, 20 m group interval	
	Fold:	150 nominal	

2014 L205 CC1 - Panel 3	WESTERN AUSTRALIA Canning Coastal	*GSWA* *Geoscience Australia*

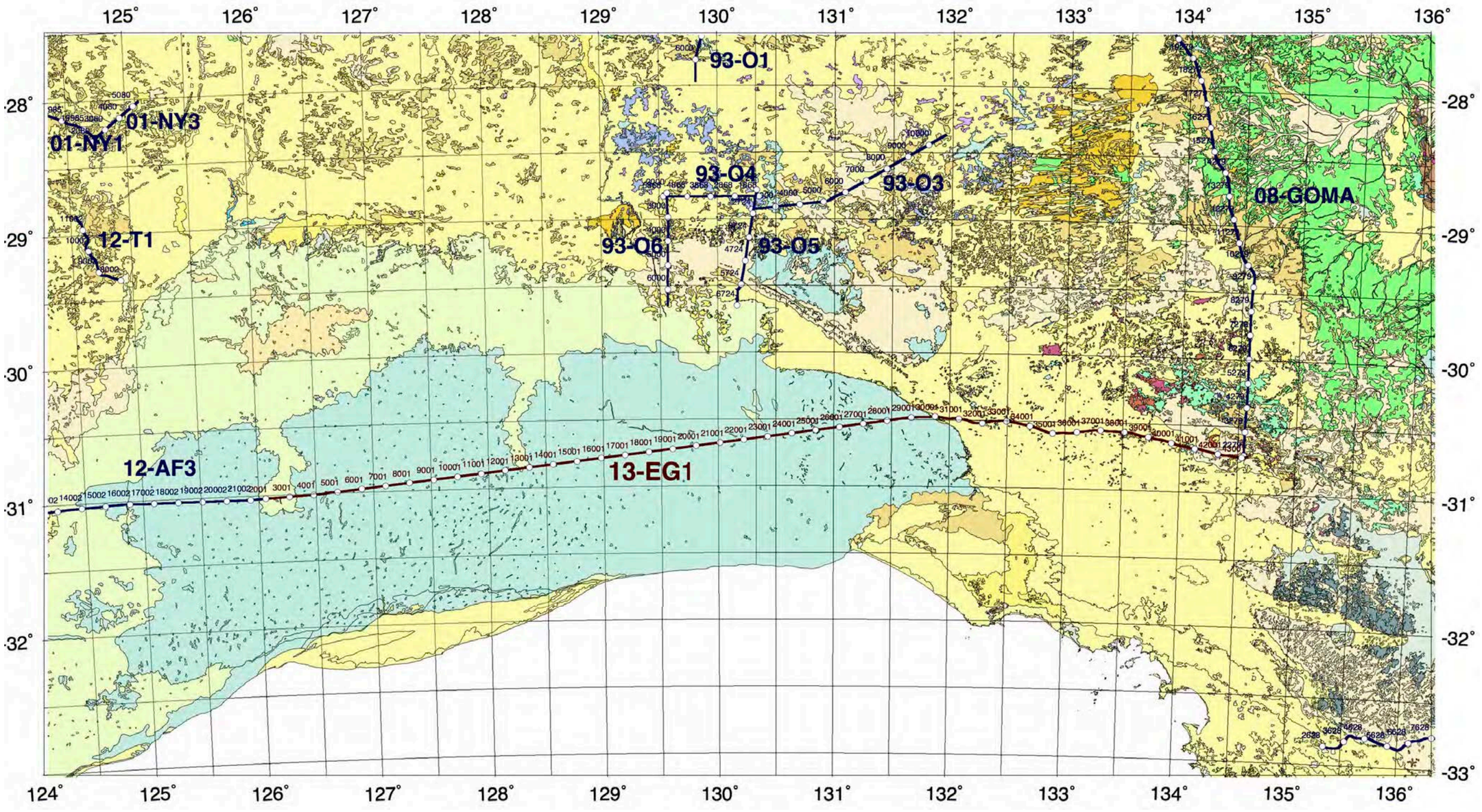


Pre-stack Time	Source:	3 Hemi-50 vibrator, 40 m interval	Survey Details: GA-L205
Migrated Section	Spread:	600 Channels, 20 m group interval	
	Fold:	150 nominal	



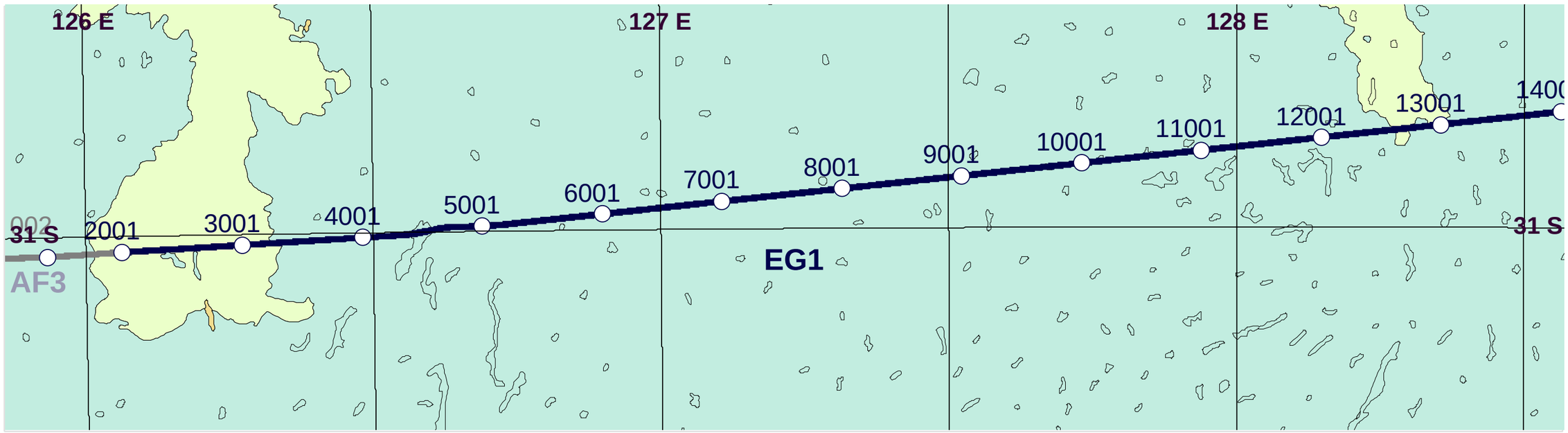
Pre-stack Time **Migrated Section**	Source: Spread: Fold:	3 Hemi-50 vibrator, 40 m interval 600 Channels, 20 m group interval 150 nominal	Survey Details: GA-L205

EUCLA-GAWLER PROFILE



Profiles are identified by 2 digit year and line designator

Year	Project	GA Line Code	Line Designator	Display:	Bias	Clip	Page
2013/4	L203	13GA-EG1	EG1	Migrated	1.47	82	169-174



Migrated Section

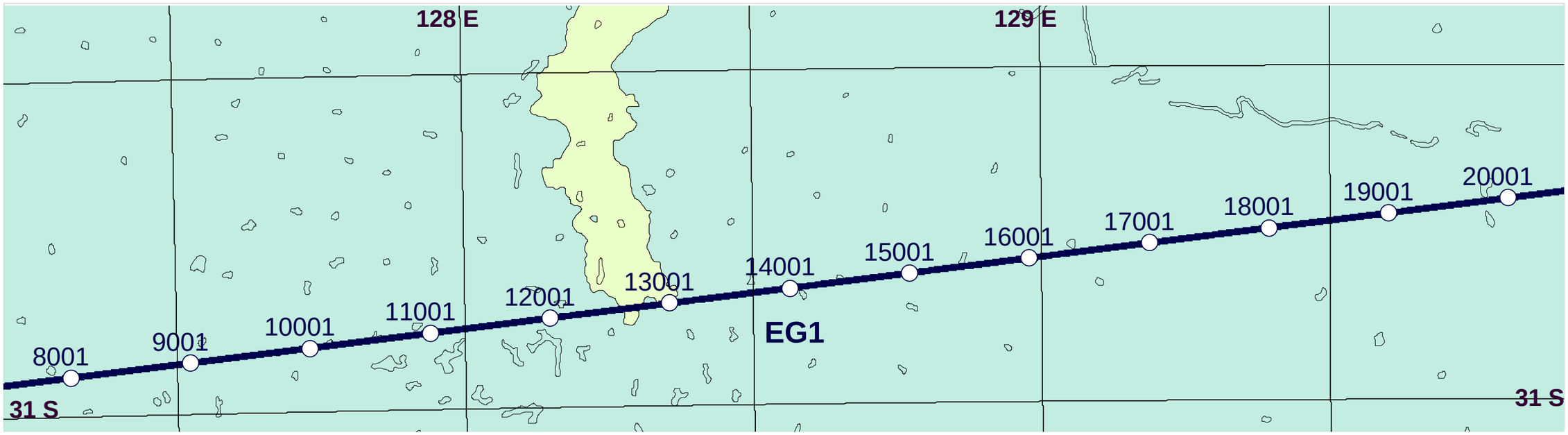
Source: 3/4 Hemi-60 vibrator, 80 m interval

Spread: 600 Channels, 20 m group interval

Fold: 75 nominal

Survey Details: GA-L203

2013-2014 L203 EG1 Panel 2	WEST-CENTRAL AUSTRALIA Eucla-Gawler	*GSWA GSSA* *AuScope Geoscience Australia*



Migrated Section

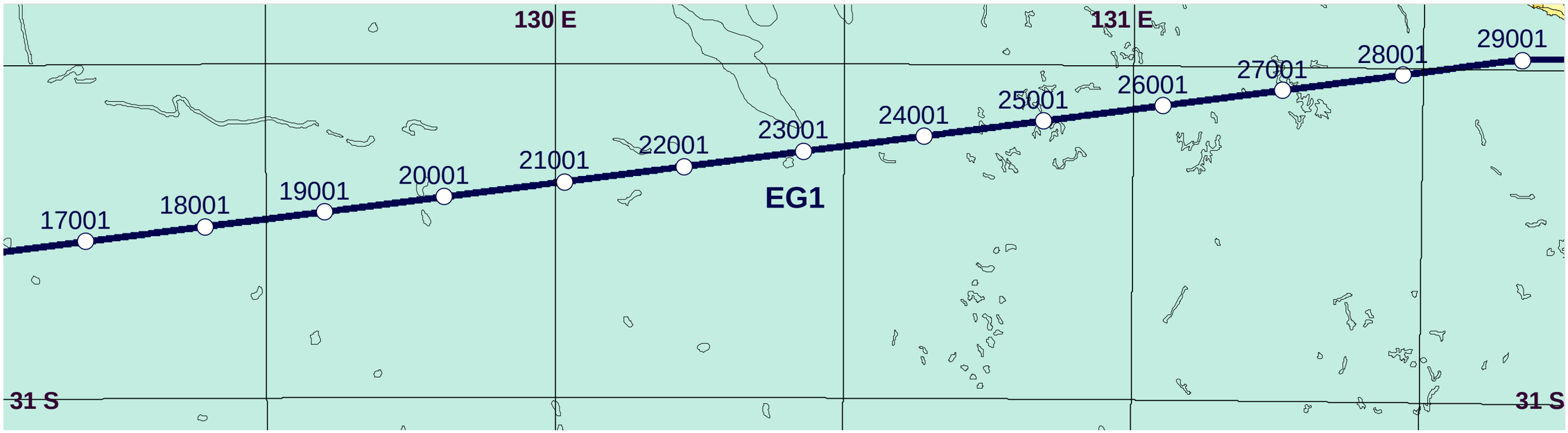
Source: 3/4 Hemi-60 vibrator, 80 m interval

Spread: 600 Channels, 20 m group interval

Fold: 75 nominal

Survey Details: GA-L203

2013-2014 L203 EG1 Panel 3	WEST-CENTRAL AUSTRALIA Eucla-Gawler	*GSWA GSSA* *AuScope Geoscience Australia*	171



Migrated Section

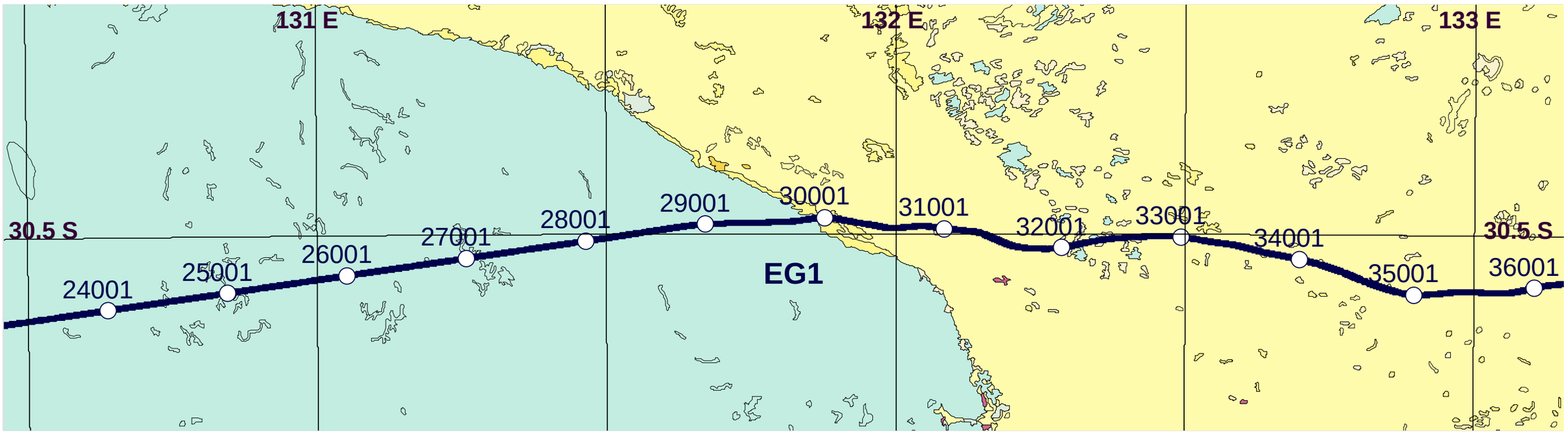
Source: 3/4 Hemi-60 vibrator, 80 m interval

Spread: 600 Channels, 20 m group interval

Fold: 75 nominal

Survey Details: GA-L203

2013 L203 EG1 Panel 4	WEST-CENTRAL AUSTRALIA Eucla-Gawler	*GSWA GSSA* *AuScope Geoscience Australia*



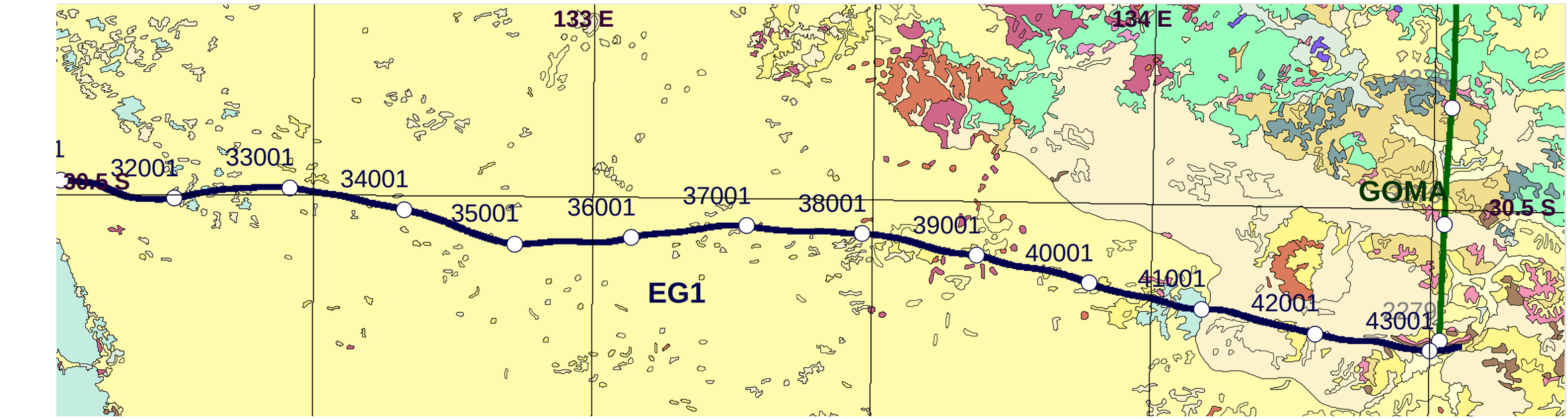
Migrated Section

Source: 3/4 Hemi-60 vibrator, 80 m interval

Spread: 600 Channels, 20 m group interval

Fold: 75 nominal

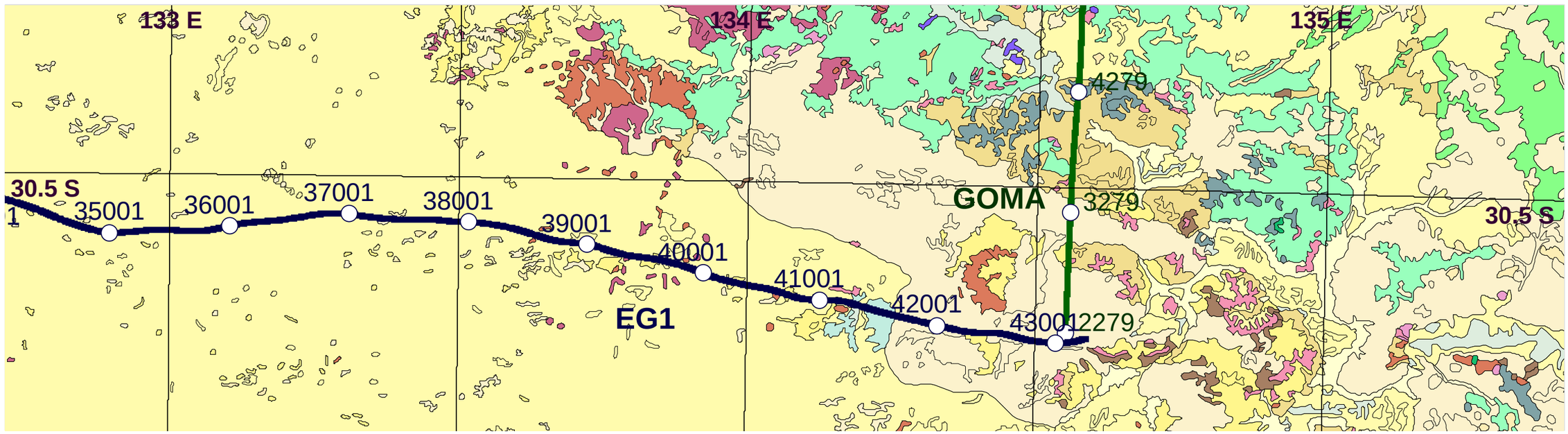
Survey Details: GA-L203



Migrated Section	Source:	3/4 Hemi-60 vibrator, 80 m interval	Survey Details: GA-L203
	Spread:	600 Channels, 20 m group interval	
	Fold:	75 nominal	

2013-2014 L203 West-Central Australia

EG1 Panel 6 | Eucla-Gawler GOMA | *GSWA GSSA* | *AuScope Geoscience Australia*



Migrated Section

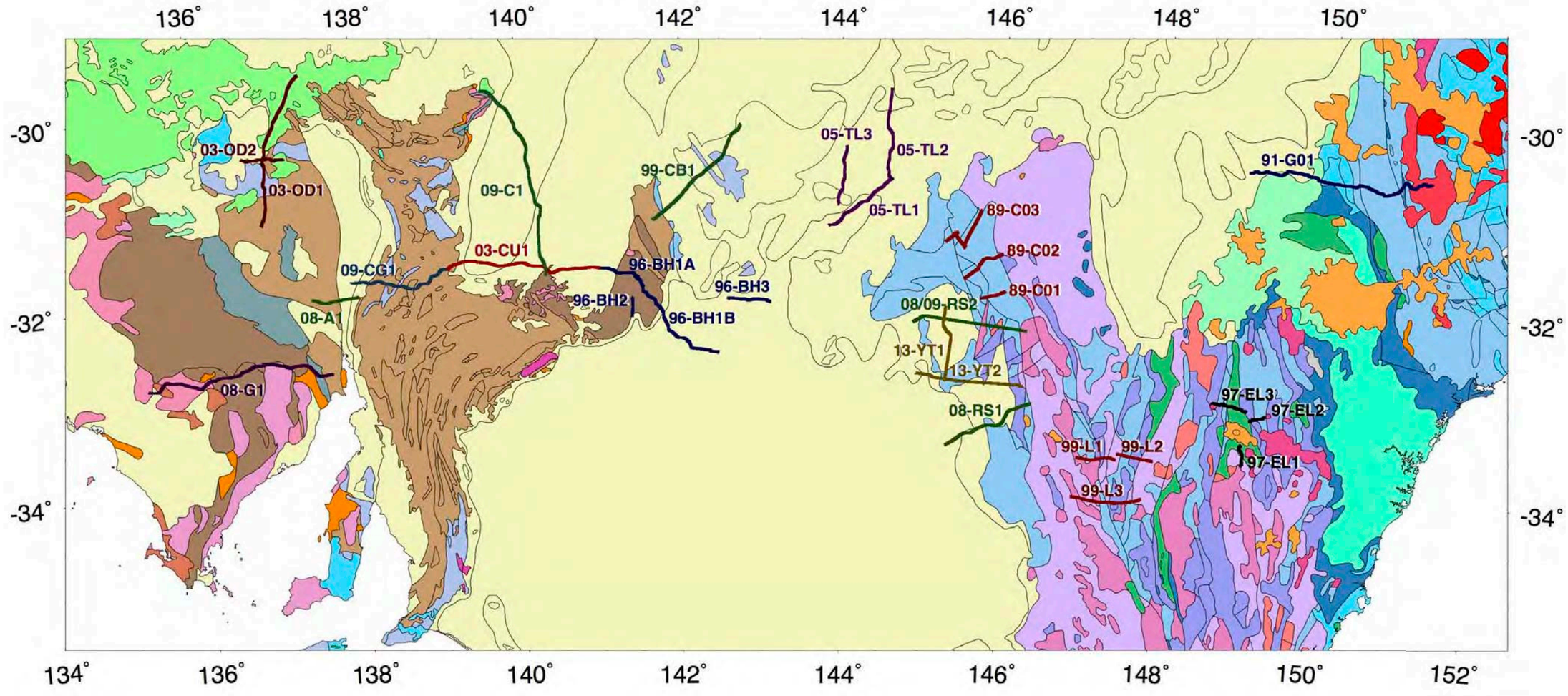
Source: 3/4 Hemi-60 vibrator, 80 m interval

Spread: 600 Channels, 20 m group interval

Fold: 75 nominal

Survey Details: GA-L203

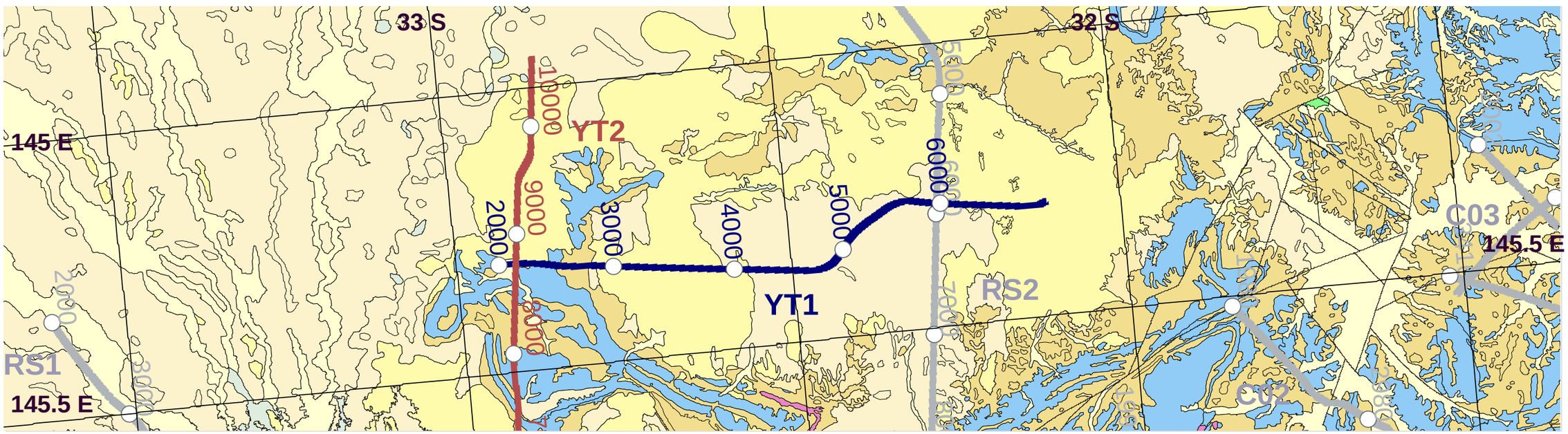
SOUTH AUSTRALIA AND NEW SOUTH WALES 1978-2015



Profiles are identified by 2 digit year and line designator

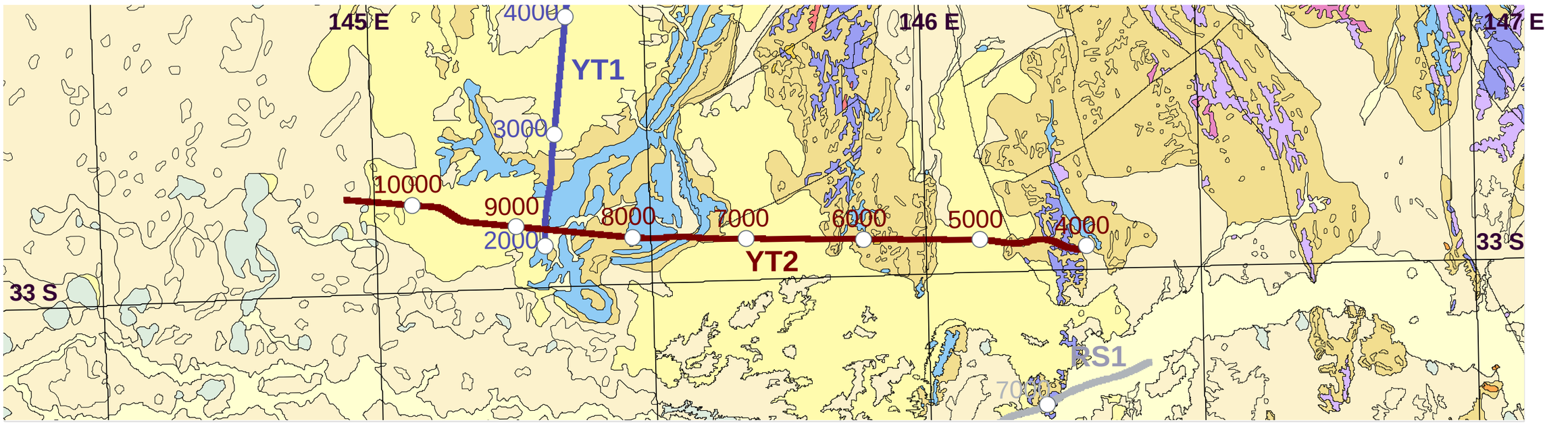
Year	Project	GA Line Code	Line Designator	Display:	Bias	Clip	Page
2013	L202	13GA-YT1	YT1	Migrated	1.40	80	176
		13GA-YT2	YT2	Migrated	1.40	80	177

2013 L202 YT1	NEW SOUTH WALES Yathong Trough	*Geoscience Australia* *GSNSW*



Pre-stack Time Migrated Section	Source:	3 Hemi-50 vibrator, 80 m interval	Survey Details: GA-L202
	Spread:	300 Channels, 40 m group interval	
	Fold:	75 nominal	

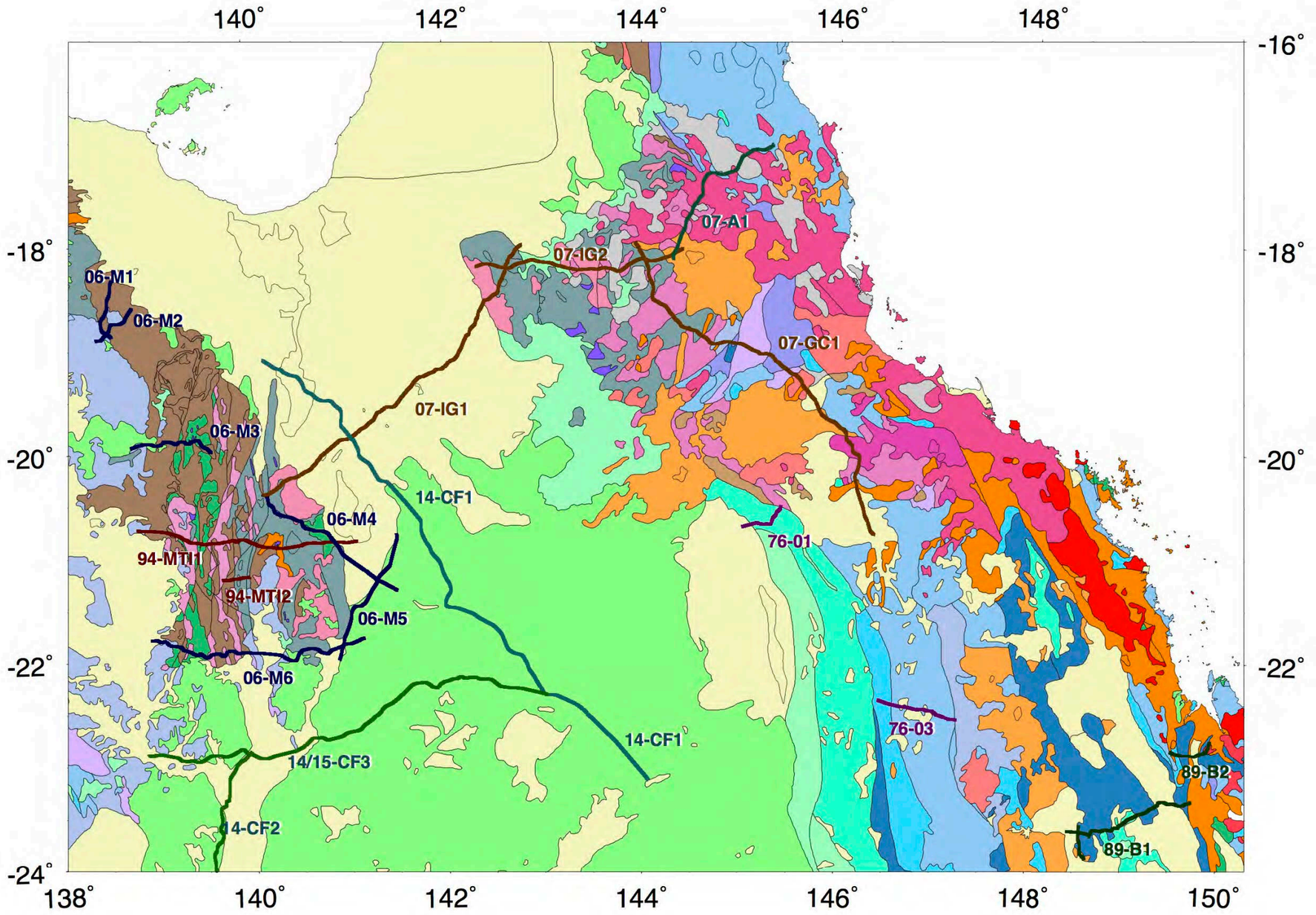
2013 L202 YT2	NEW SOUTH WALES Yathong Trough	*Geoscience Australia* *GSNSW*



Pre-stack Time	Source:	3 Hemi-50 vibrator, 80 m interval	Survey Details: GA-L202
Migrated Section	Spread:	300 Channels, 40 m group interval	
	Fold:	75 nominal	

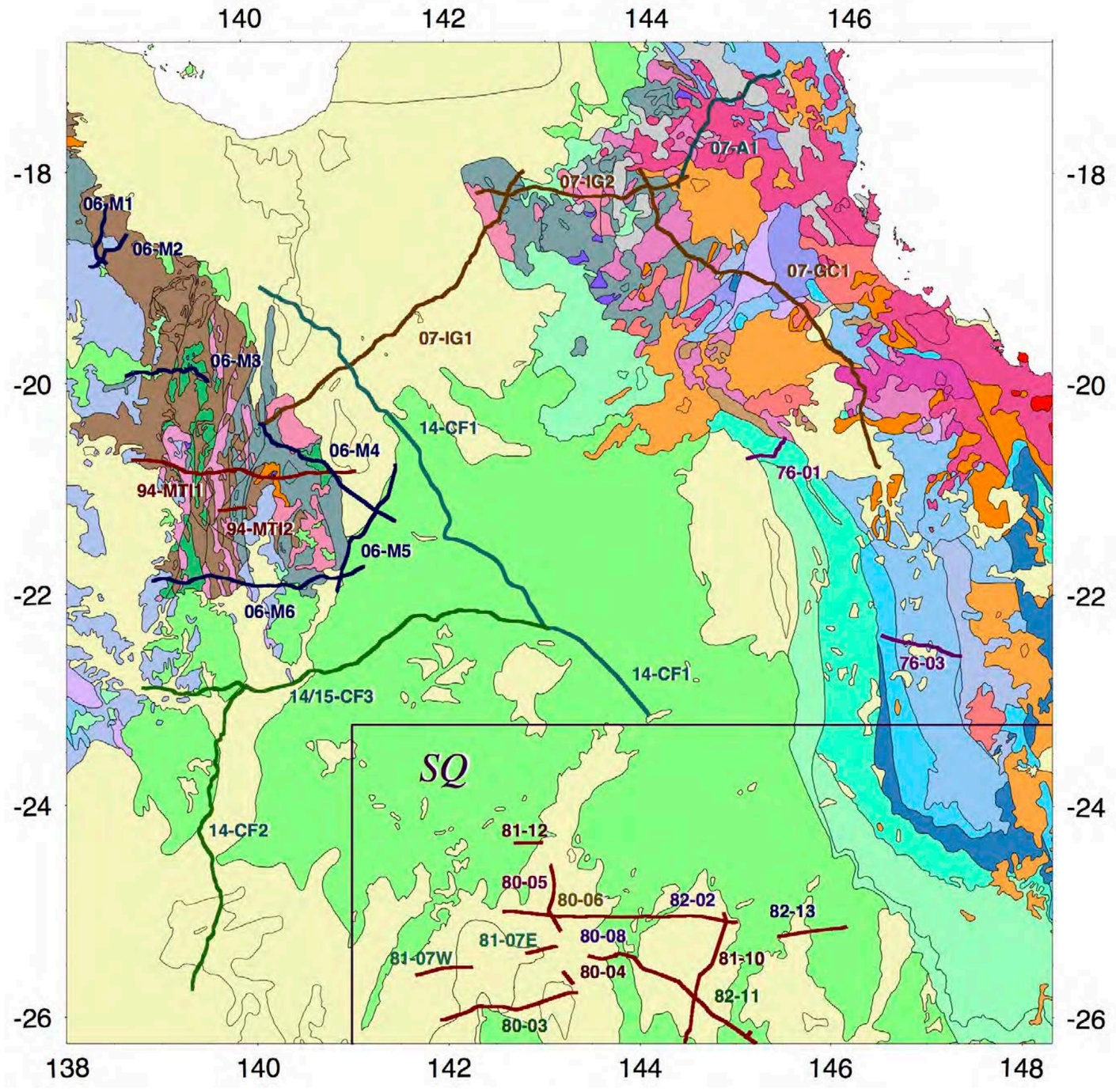
NORTHERN QUEENSLAND 1978-2015

Original Region



Profiles are identified by 2 digit year and line designator

Extended Region: including relation to Southern Queensland profiles



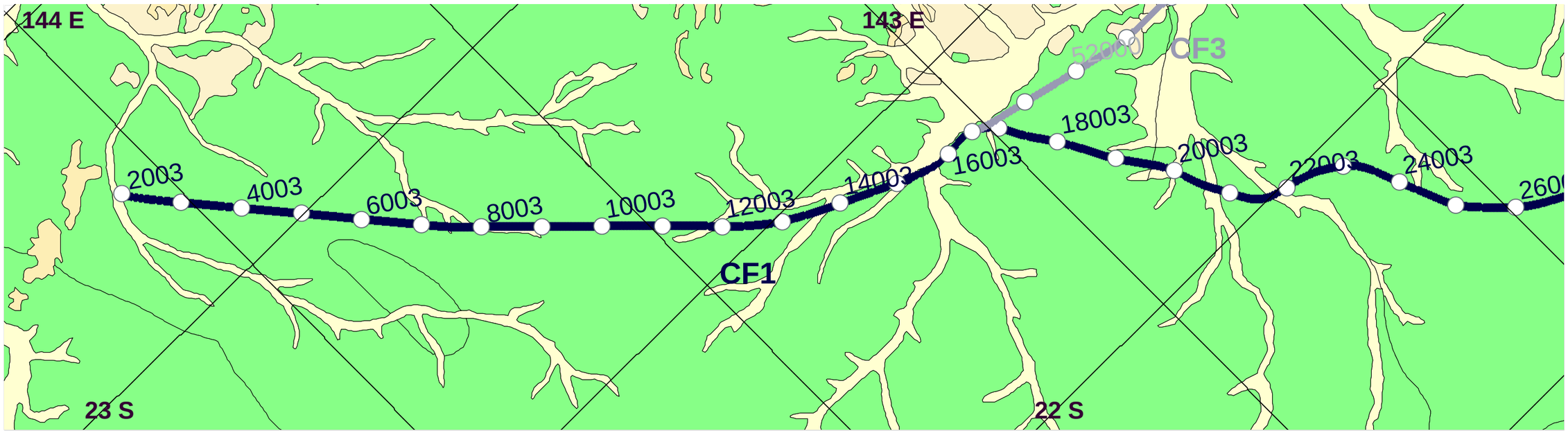
Profiles are identified by 2 digit year and line designator

INDEX OF PROFILES: NORTHERN QUEENSLAND 2014-2015

On the display panels the reflection lines are identified by year, project identifier and line designator. The table below presents the full list of the lines and the codes used in Geoscience Australia reports, together with the nature of the display and the bias and clip parameters used to display the sections using the *pssegy* facility.

Year	Project	GA Line Code	Line Designator	Display:	Bias	Clip	Page
2014	L204	14GA-CF1	CF1	Migrated	1.40	80	181-184
2014	L207	14GA-CF2	CF2	Pre-stack Time Migration	1.40	85	185-186
2014/ 2015	L207	14GA-CF3	CF3	Pre-stack Time Migration	1.40	85	187-189

2014 L204 CF1 Panel 1	NORTHERN QUEENSLAND SE Mount Isa	*GSQ* *Geoscience Australia*

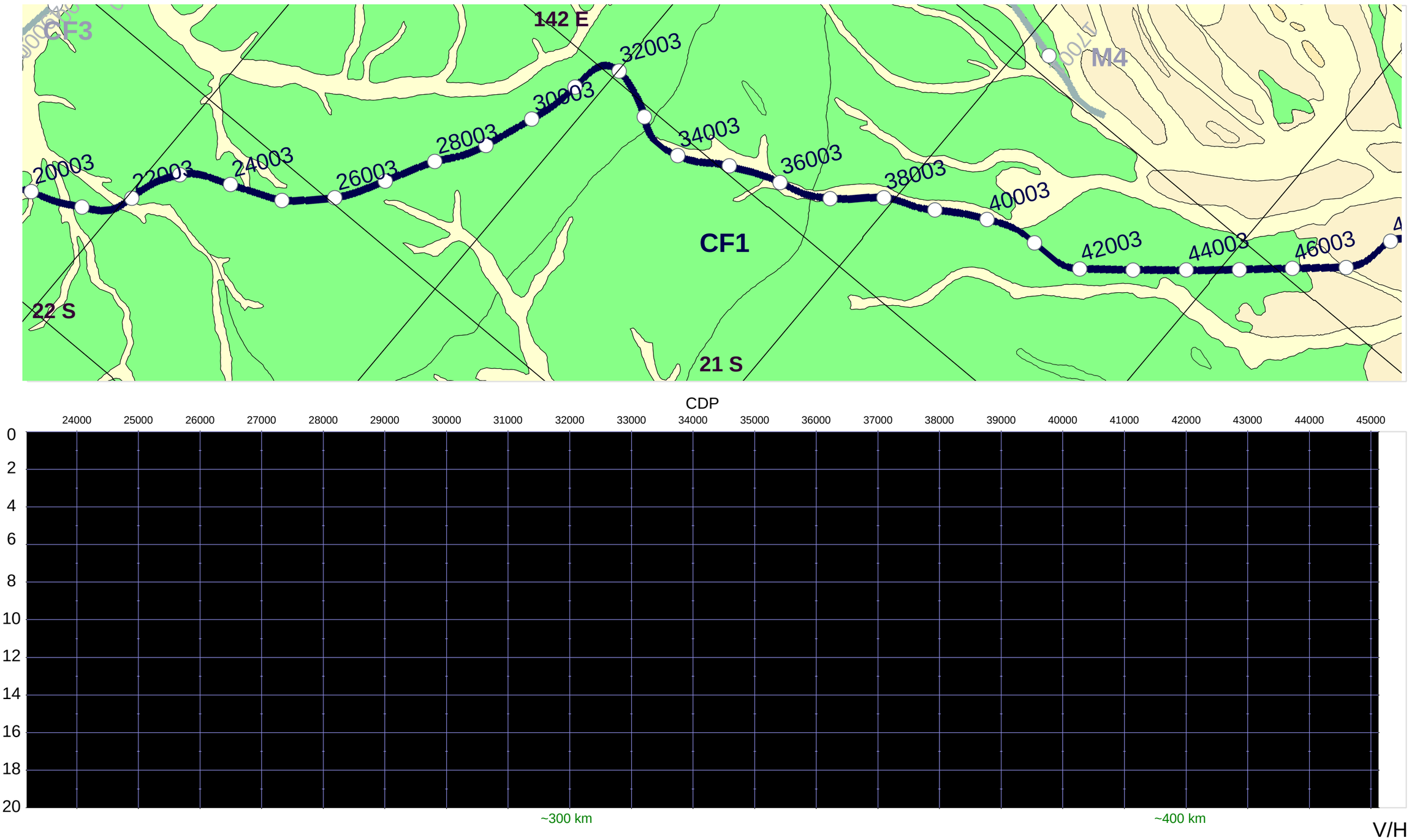


Migrated Section

Source: 3 Hemi-60 vibrator, 80 m interval
Spread: 600 Channels, 20 m group interval
Fold: 75 nominal

Survey Details: GA-L204

2014 L204 CF1 Panel 2	NORTHERN QUEENSLAND SE Mount Isa	*GSQ* *Geoscience Australia*



Migrated Section

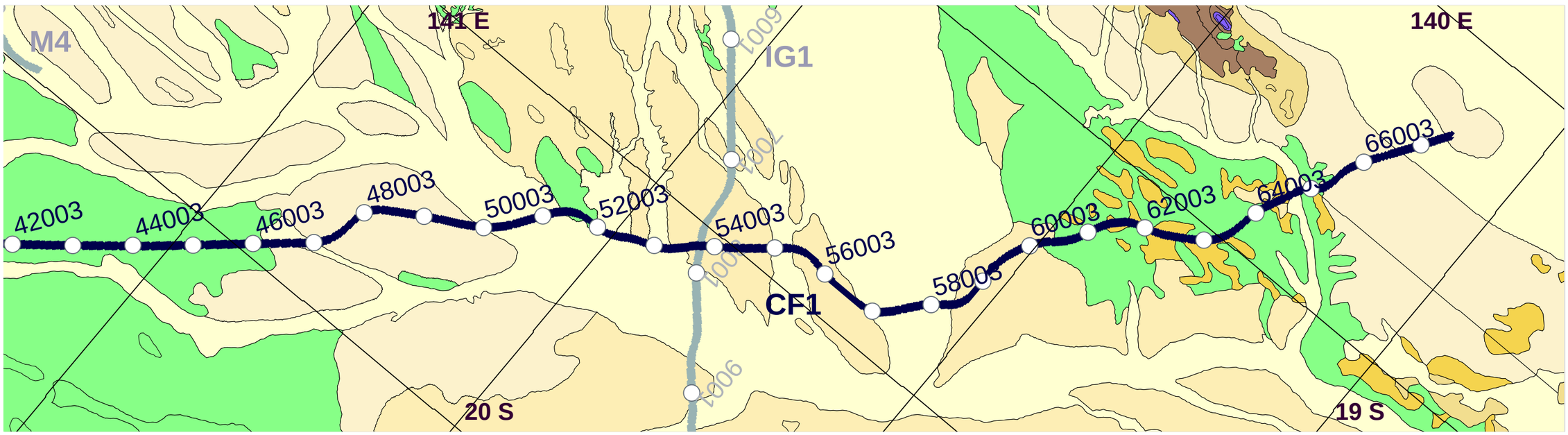
Source: 3 Hemi-60 vibrator, 80 m interval

Spread: 600 Channels, 20 m group interval

Fold: 75 nominal

Survey Details: GA-L204

2014 L204 CF1 Panel 3	NORTHERN QUEENSLAND SE Mount Isa	*GSQ* *Geoscience Australia*



Migrated Section

Source: 3 Hemi-60 vibrator, 80 m interval

Spread: 600 Channels, 20 m group interval

Fold: 75 nominal

Survey Details: GA-L204

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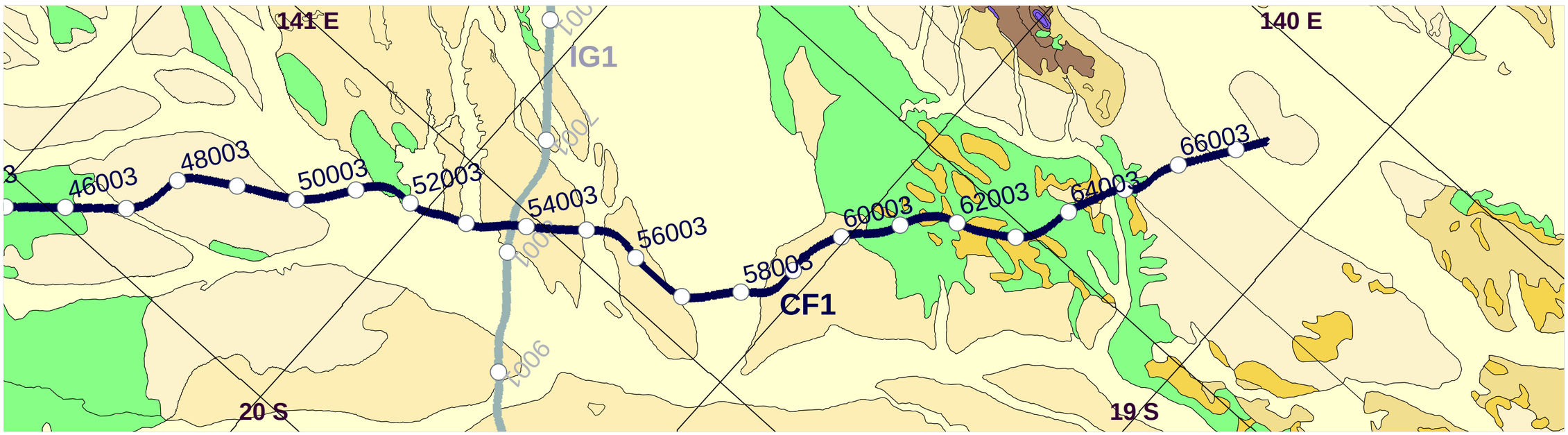


Migrated Section

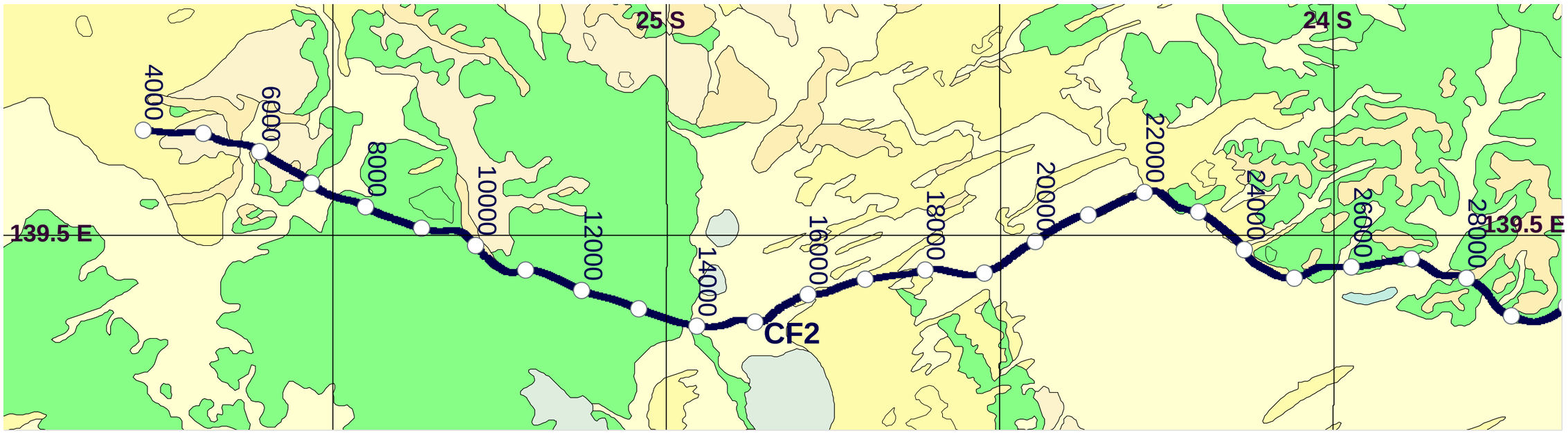
Source: 3 Hemi-60 vibrator, 80 m interval

Spread: 600 Channels, 20 m group interval

Fold: 75 nominal

Survey Details: GA-L204

2014 L207 CF2 Panel 1	NORTHERN QUEENSLAND Birdsville-Boulia	*GSQ* *Geoscience Australia*



Pre-stack Time	Source:	3 Hemi-60 vibrator, 80 m interval	Survey Details: GA-L207
Migrated Section	Spread:	600 Channels, 20 m group interval	
	Fold:	75 nominal	

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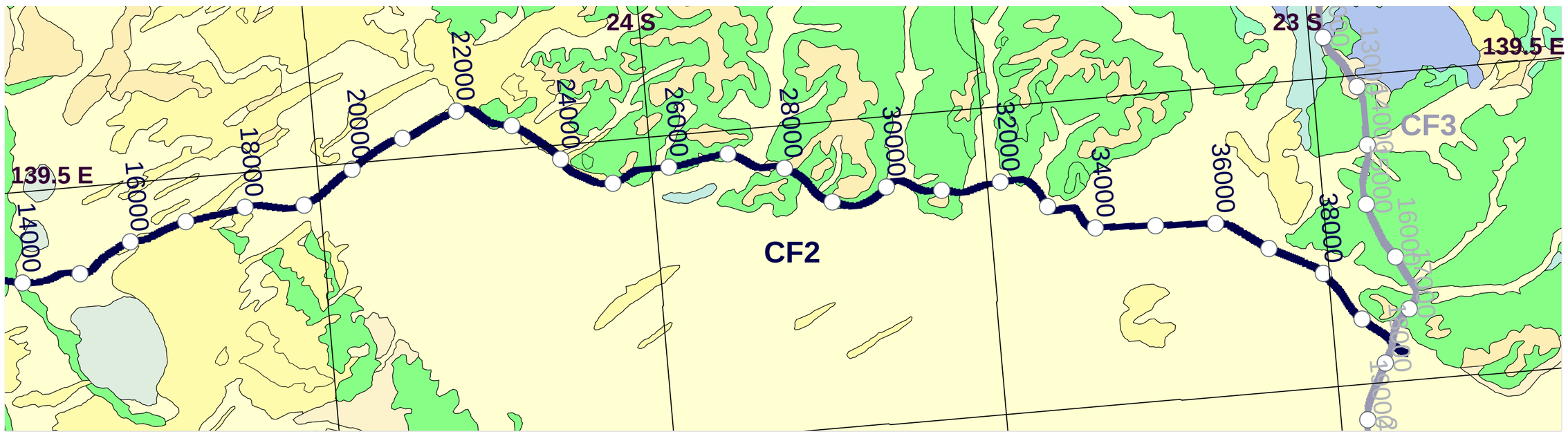
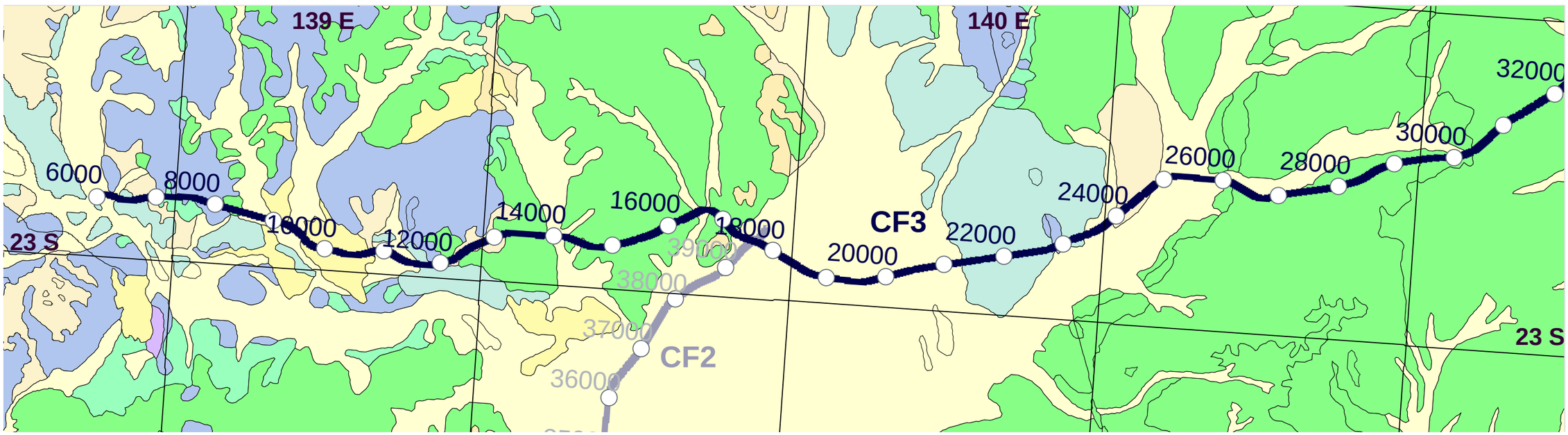


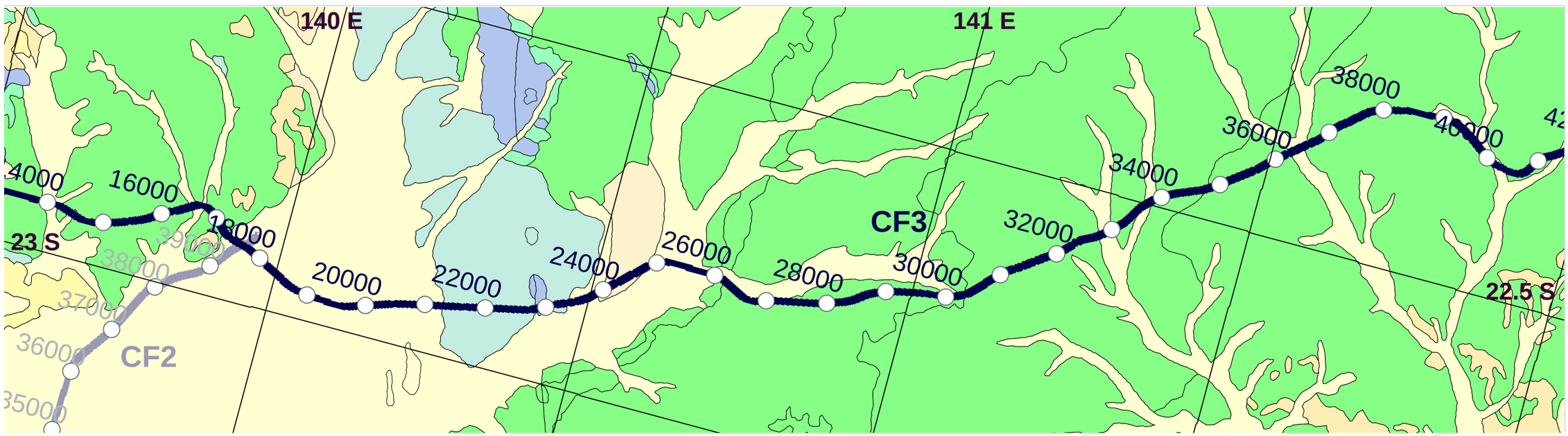
Pre-stack Time	Source:	3 Hemi-60 vibrator, 80 m interval	Survey Details: GA-L207
Migrated Section	Spread:	600 Channels, 20 m group interval	
	Fold:	75 nominal	

2014/15 L207 CF3 Panel 1	NORTHERN QUEENSLAND Boulia	*GSQ* *Geoscience Australia*	187



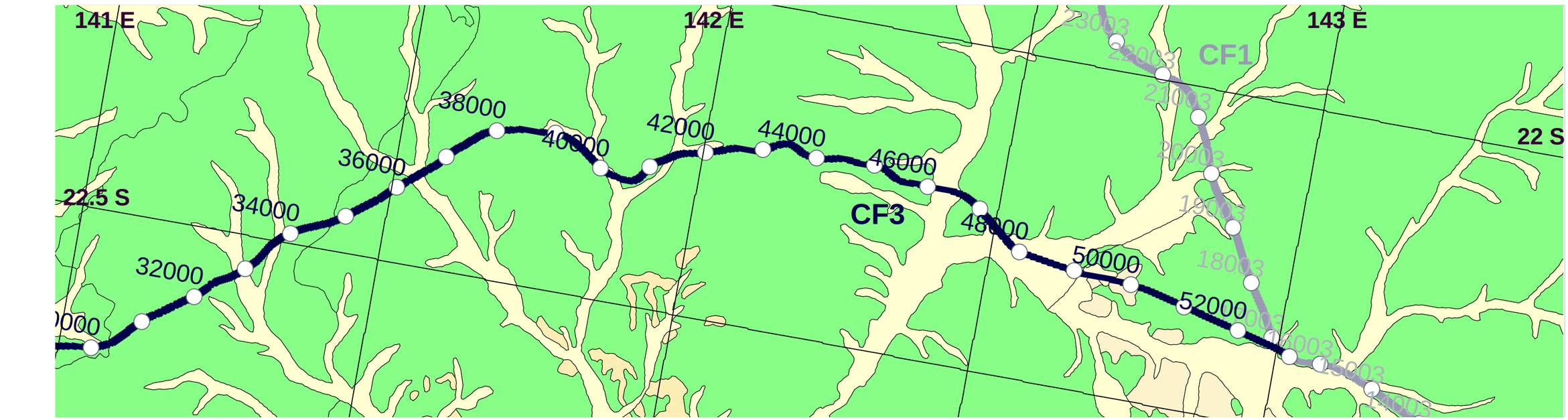
Pre-stack Time	Source:	3 Hemi-60 vibrator, 80 m interval	Survey Details: GA-L207
Migrated Section	Spread:	600 Channels, 20 m group interval	
	Fold:	75 nominal	

2014/15 L207 CF3 Panel 2	NORTHERN QUEENSLAND Boulia	*GSQ* *Geoscience Australia*



Pre-stack Time	Source:	3 Hemi-60 vibrator, 80 m interval	Survey Details: GA-L207
Migrated Section	Spread:	600 Channels, 20 m group interval	
	Fold:	75 nominal	

2014/15 L207 CF3 Panel 3	NORTHERN QUEENSLAND Boulia	*GSQ* *Geoscience Australia*



Pre-stack Time **Migrated Section**	Source: Spread: Fold:	3 Hemi-60 vibrator, 80 m interval 600 Channels, 20 m group interval 75 nominal	Survey Details: GA-L207

Part III

Reflection Transects

REFLECTION TRANSECTS

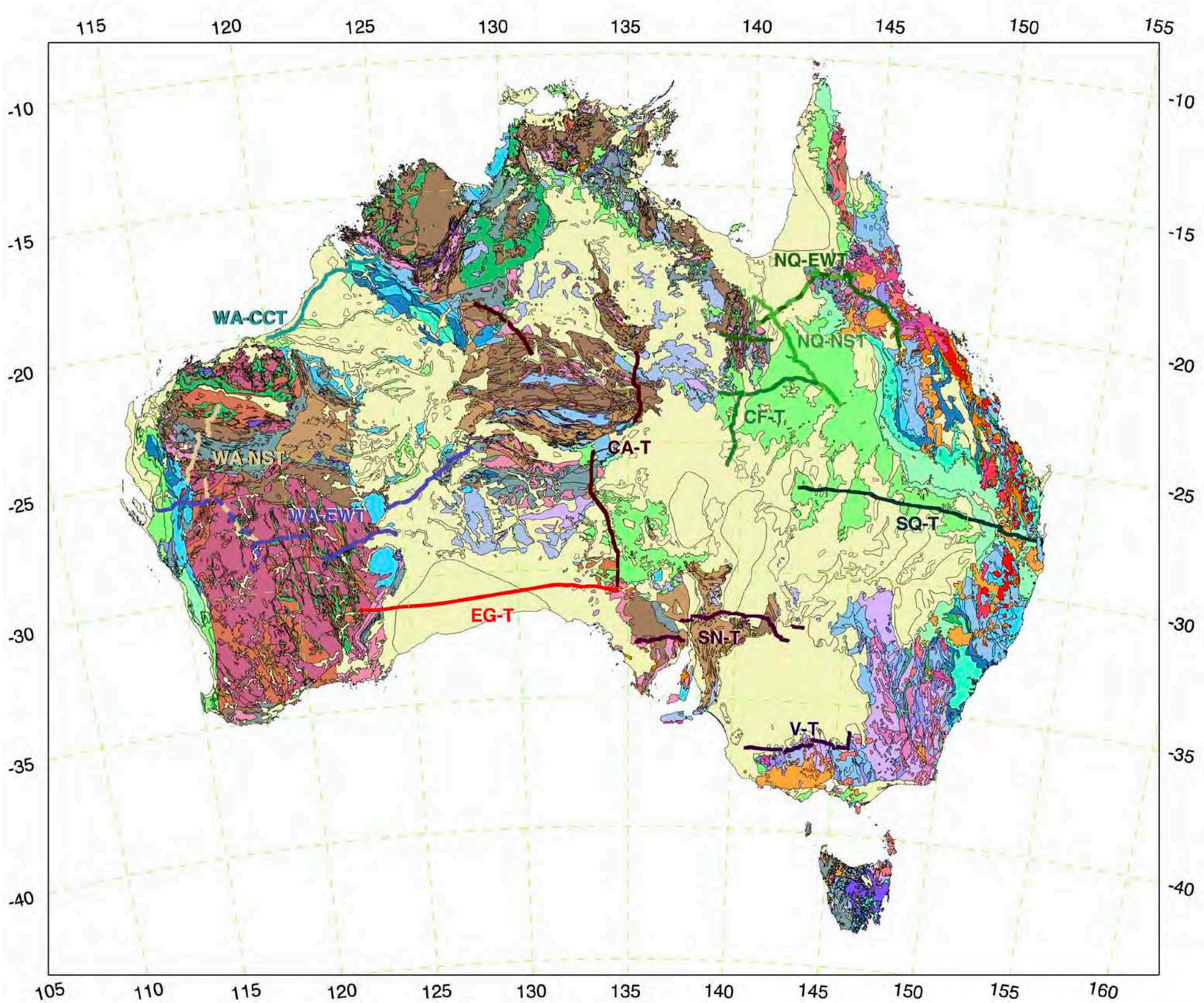
In a number of parts of the continent it is possible to assemble a group of reflection lines that span a broad range of geological structures so that a range of styles of crustal architecture are well displayed. The reflection transect displays have been assembled using the same trace displays that are used for the individual profiles, with joins where appropriate and distinct gaps left where there has been a geographic offset. Segments using explosive sources are indicated in slightly lighter tone. The transect designators refer to the accompanying map on the next page.

To get the large transects onto the same page format, the lines are plotted in approximately 550 km sections with significant overlap between consecutive lines. The distance markers are repeated to make the overlaps clear. The transect plots should be suitable for display at A1 size or larger from the electronic version.

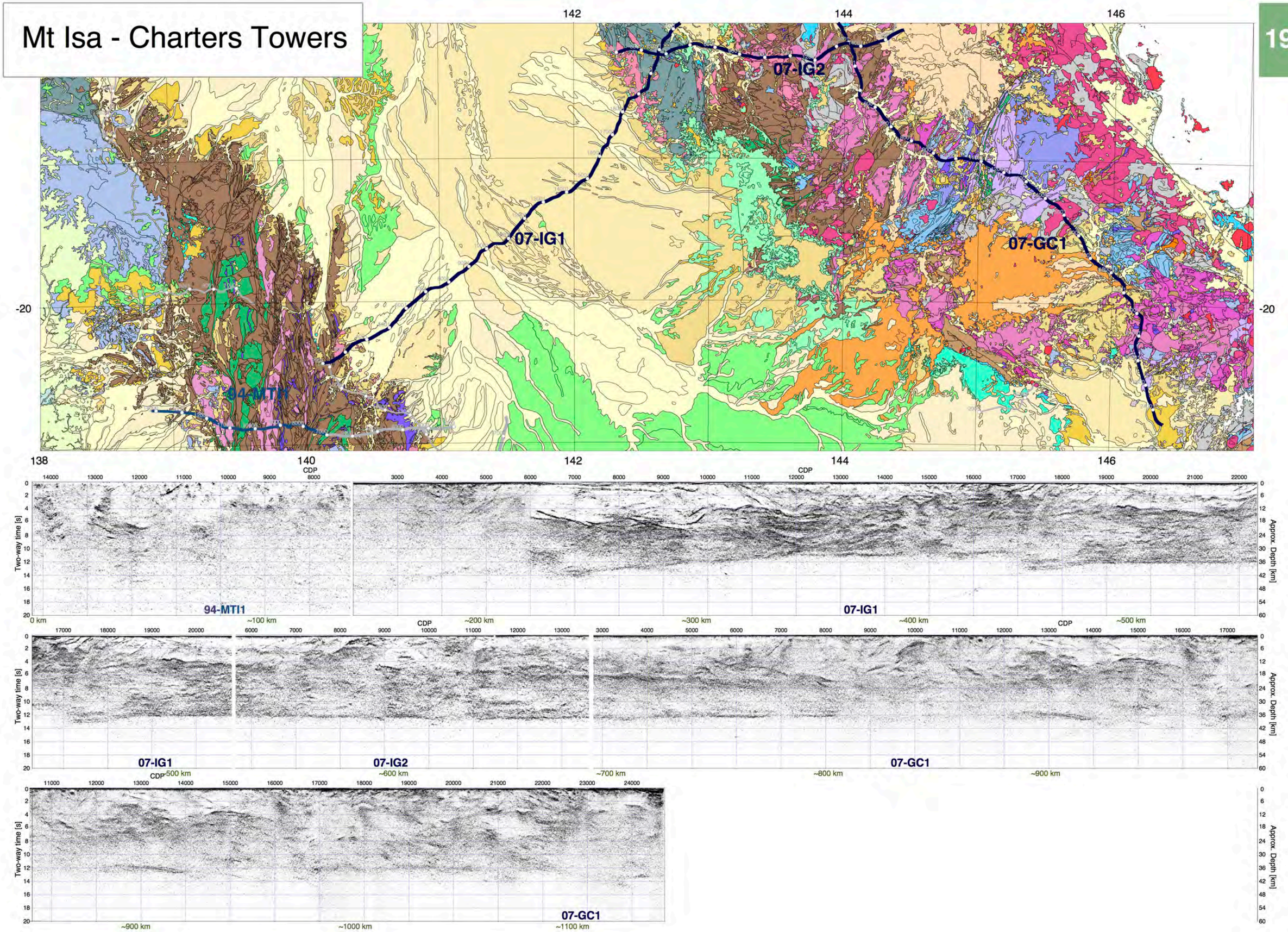
Transects:

Region	Location	Designator	Reflection Lines used	Page
Northern Queensland West-East	Mt. Isa to Charters Towers	NQ-EWT	94-MTI1, 07-IG1, 07-IG2, 07-GC1	193
Northern Queensland South-North	Longreach to Georgetown	NQ-NST	14-CF1, 07-IG1, 07-IG2	194
South of Mt Isa West-East	Birdsville-Boulia-Longreach	CF-T	14-CF2, 15-CF3, 14-CF1	195
Southern Queensland West-East	Eromanga to Brisbane	SQ-T	80-01, 81-09, 84-14, 86-17, 84-16	196
South Australia-New South Wales	Gawler to Broken Hill	SN-T	08-G1, 08-A1, 09-CG1, 03-CU1, 96-BH1A, 96-BH1B, 96-BH3	197
South Australia-Victoria	Naracoorte to Central Victoria	V-T	09-SD1, 97-V1, 97-V2, 06-VT1, 06-VT2, 06-VT3, 06-VT4	198
Central Australia South-North	Gawler-Arunta-Georgina-Tanami	CA-T	08-GOMA, 09-GA, 05-T1	199
Eucla-Gawler	Yilgarn-Gawler	EG-T	12-AF3, 13-EG1	200
Western Australia Canning Coastal	Pilbara-Kimberley	WA-CCT	14-CC1, 14-CC2	201
Western Australia West-East	Carnavon-Yilgarn-Musgrave	WA-EWT	11-SC1, 10-YU1, 10-YU2, 01-NY1, 11-YOM	202
Western Australia South-North	Yilgarn-Capricorn-Pilbara	WA-NST	10-YU1, 10-CP3, 10-CP2, 10-CP1	203

REFLECTION TRANSECTS

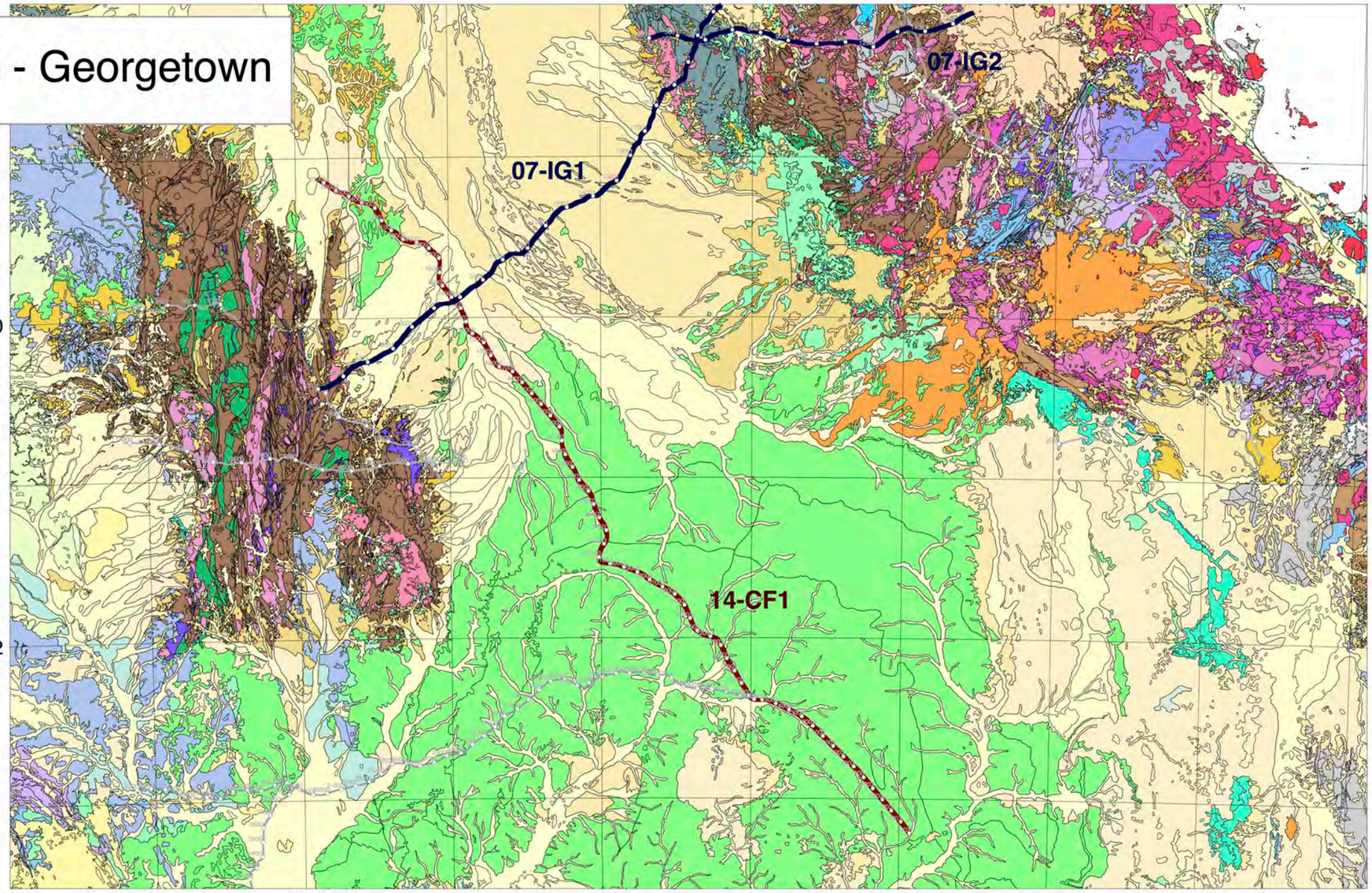


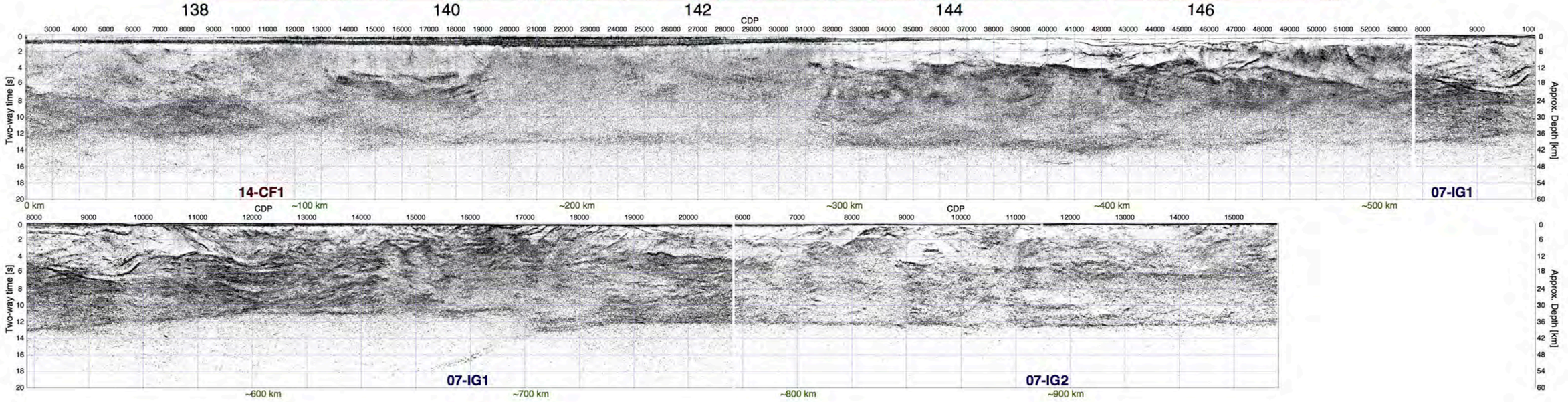
Mt Isa - Charters Towers



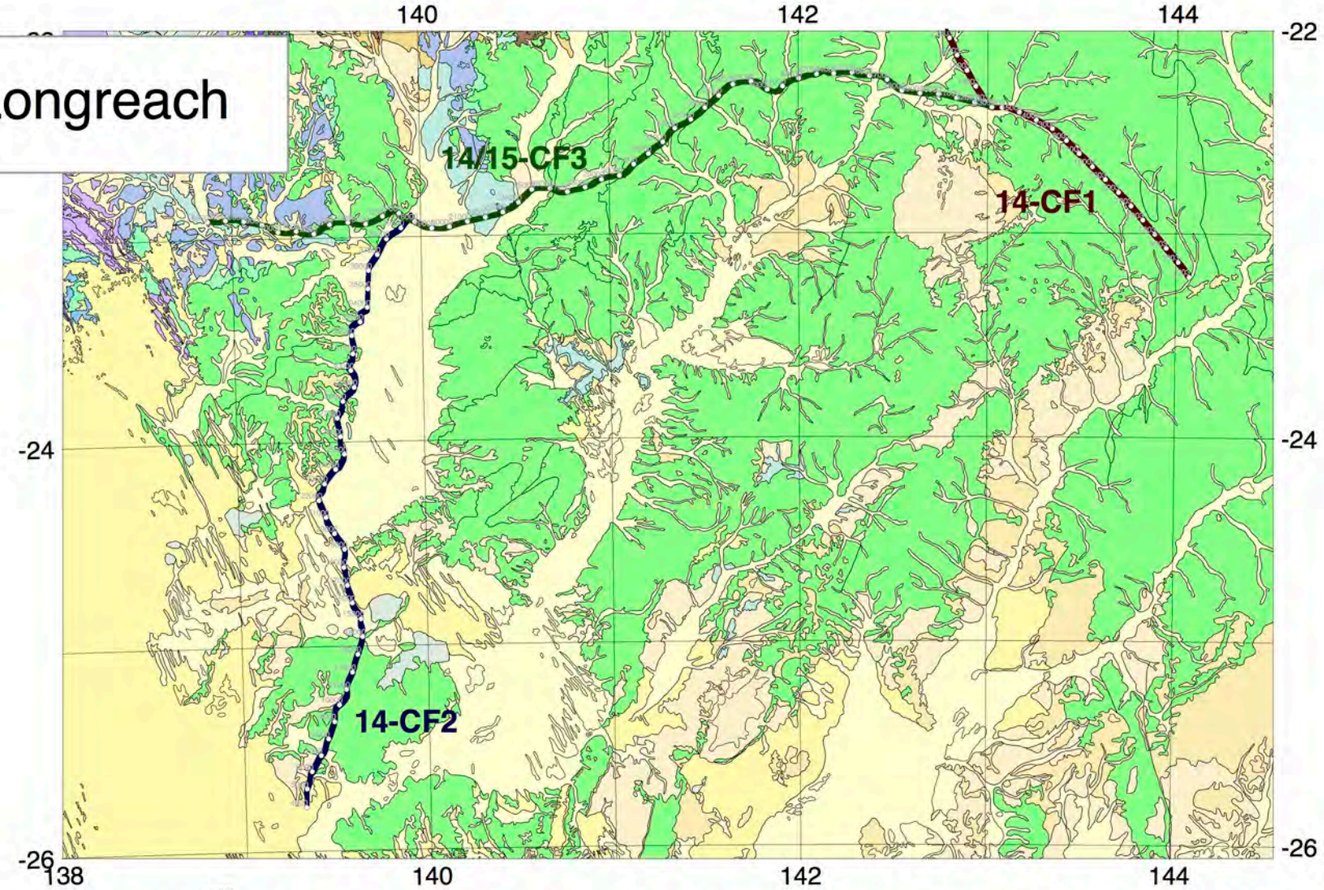
194

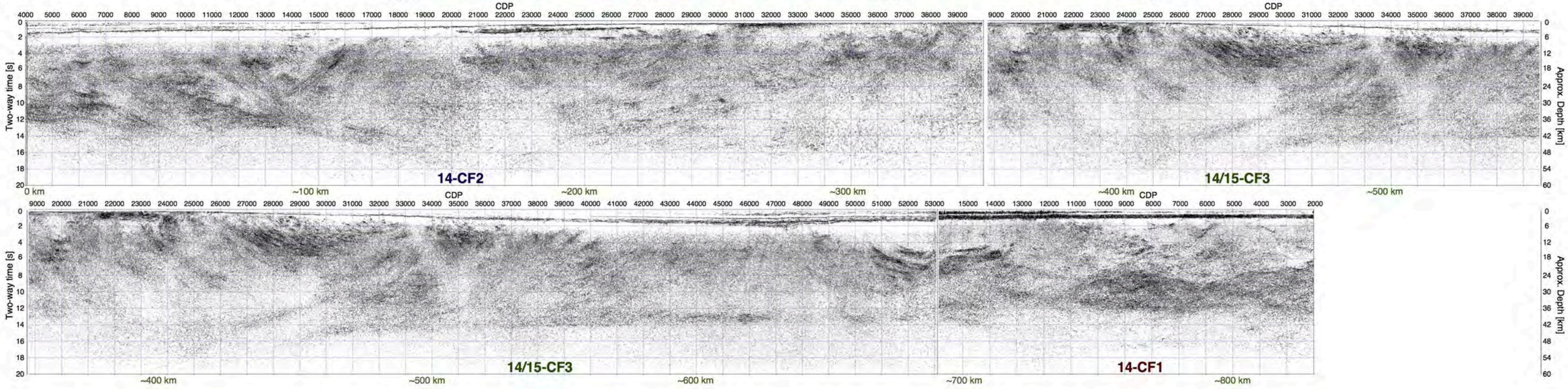
Longreach - Georgetown



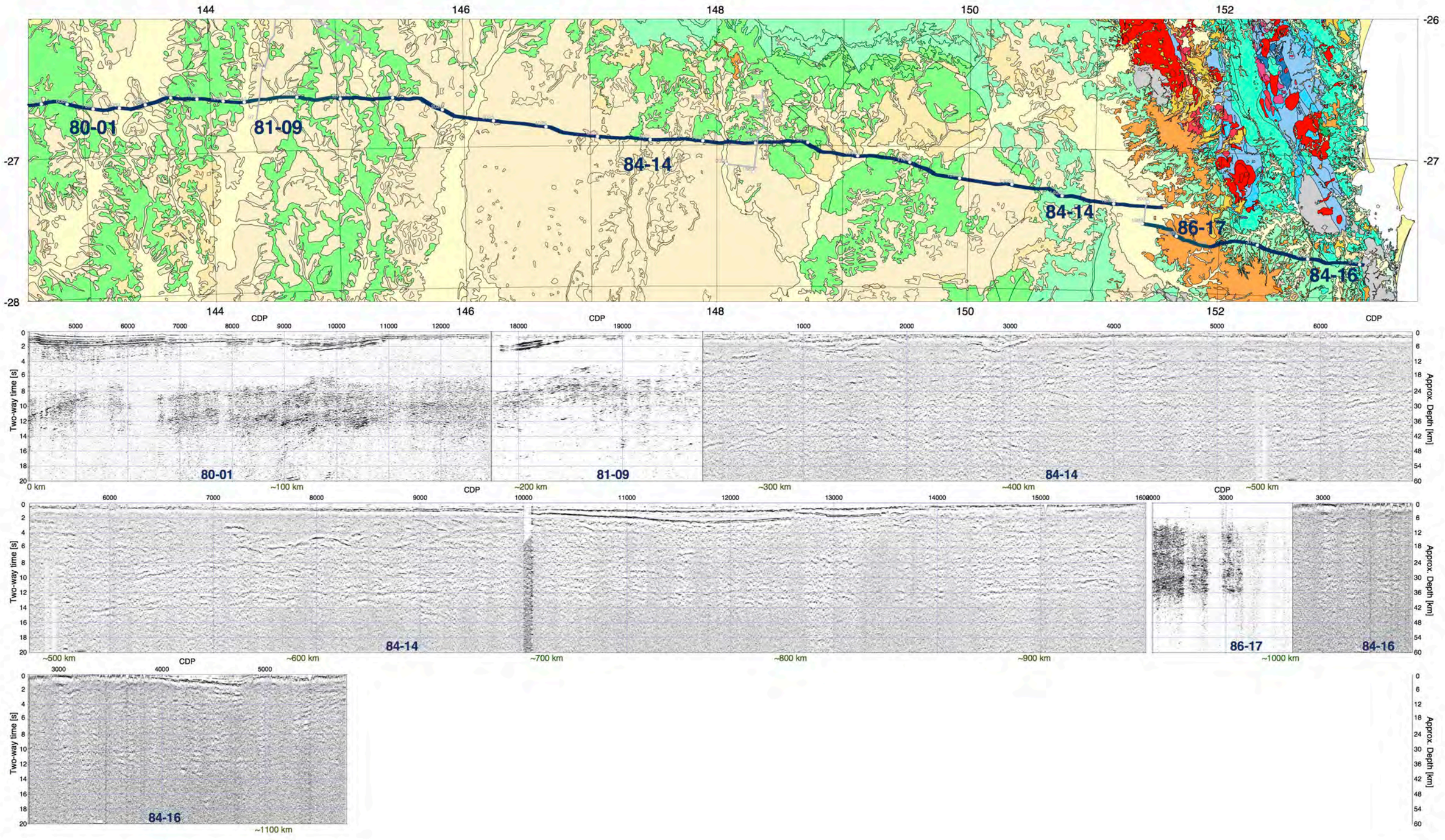


Birdsville - Boulia - Longreach

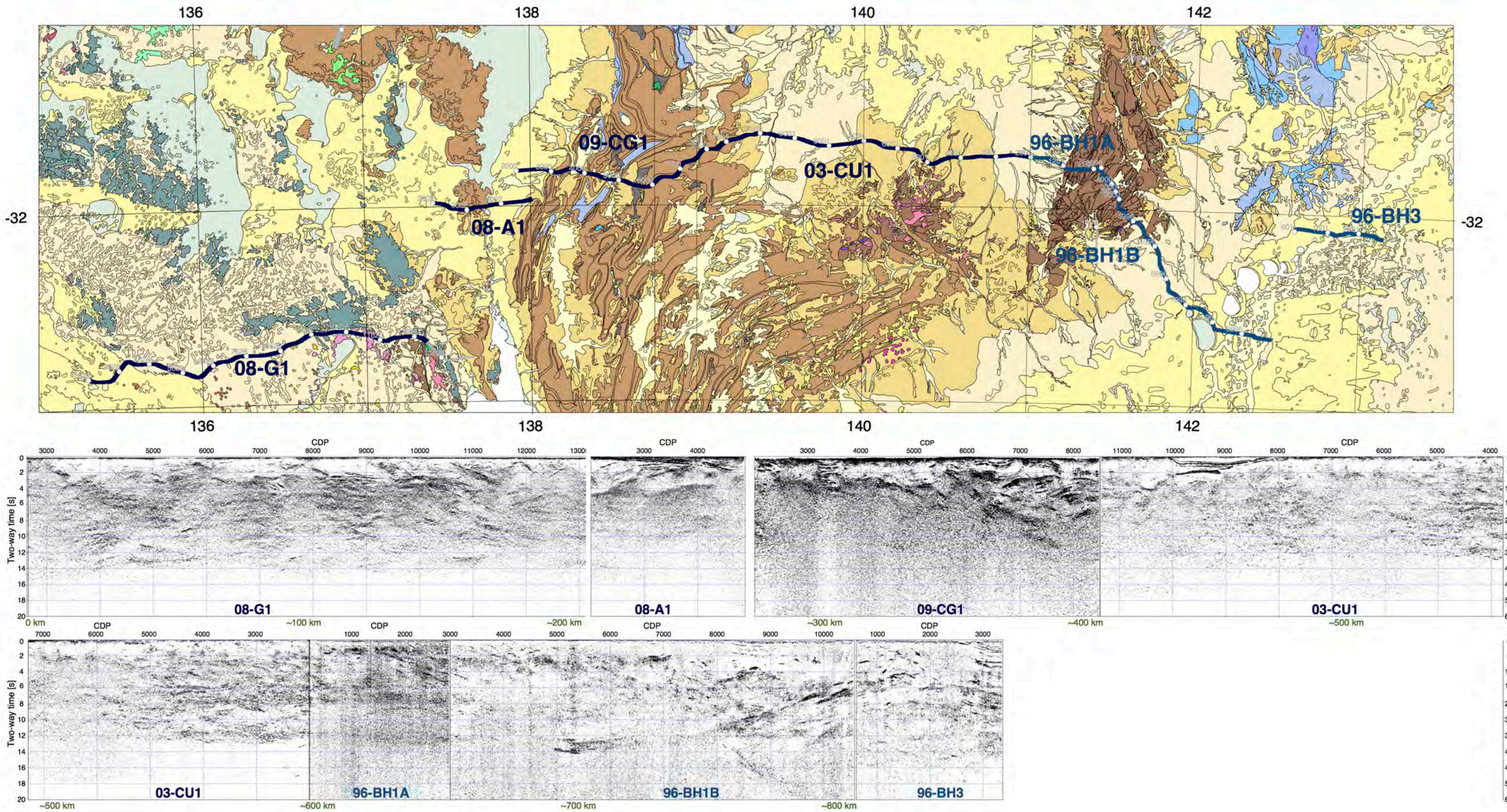




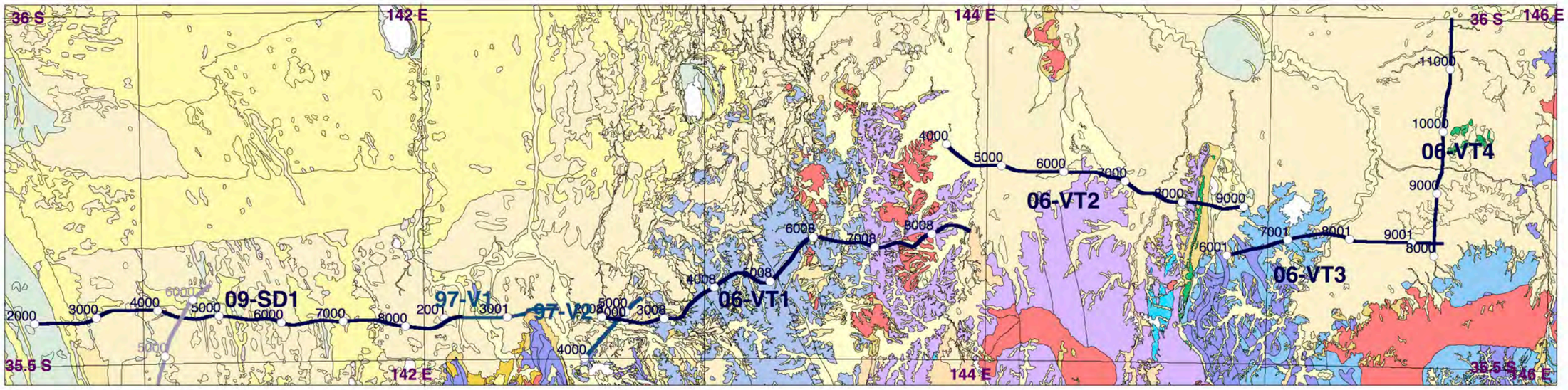
196 Eromanga-Brisbane

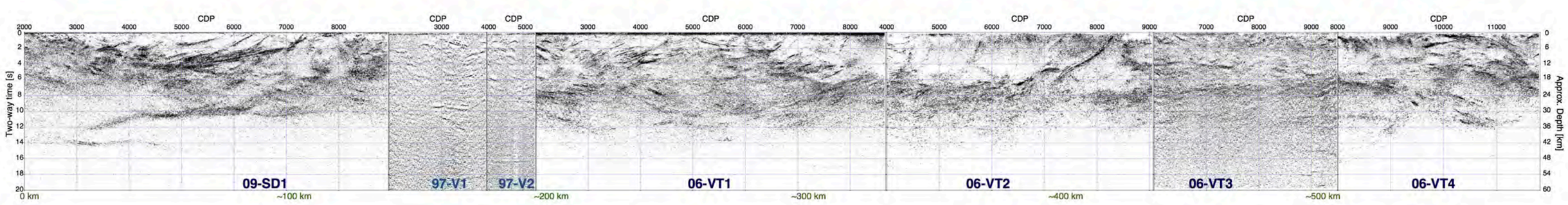


Gawler-Broken Hill

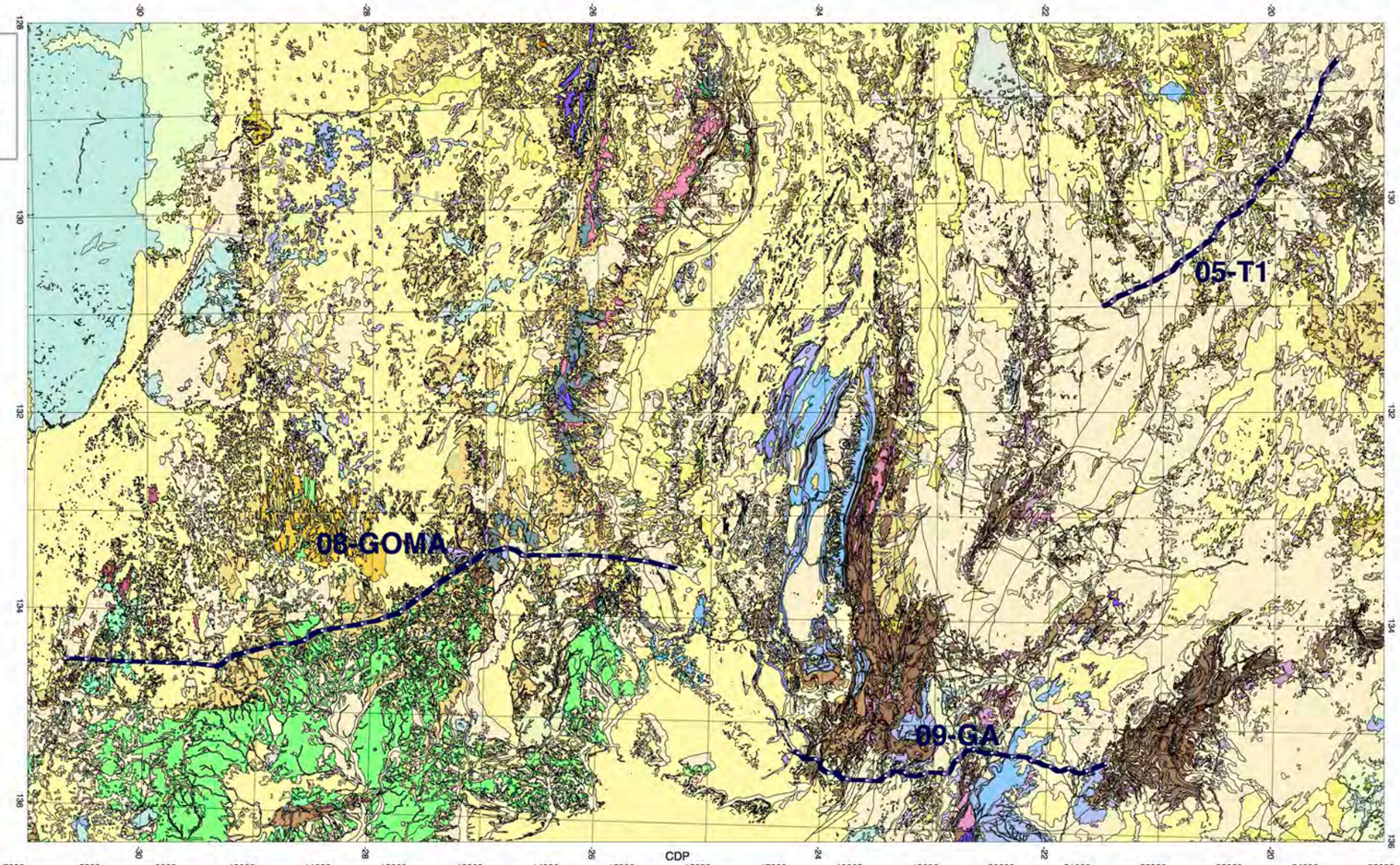


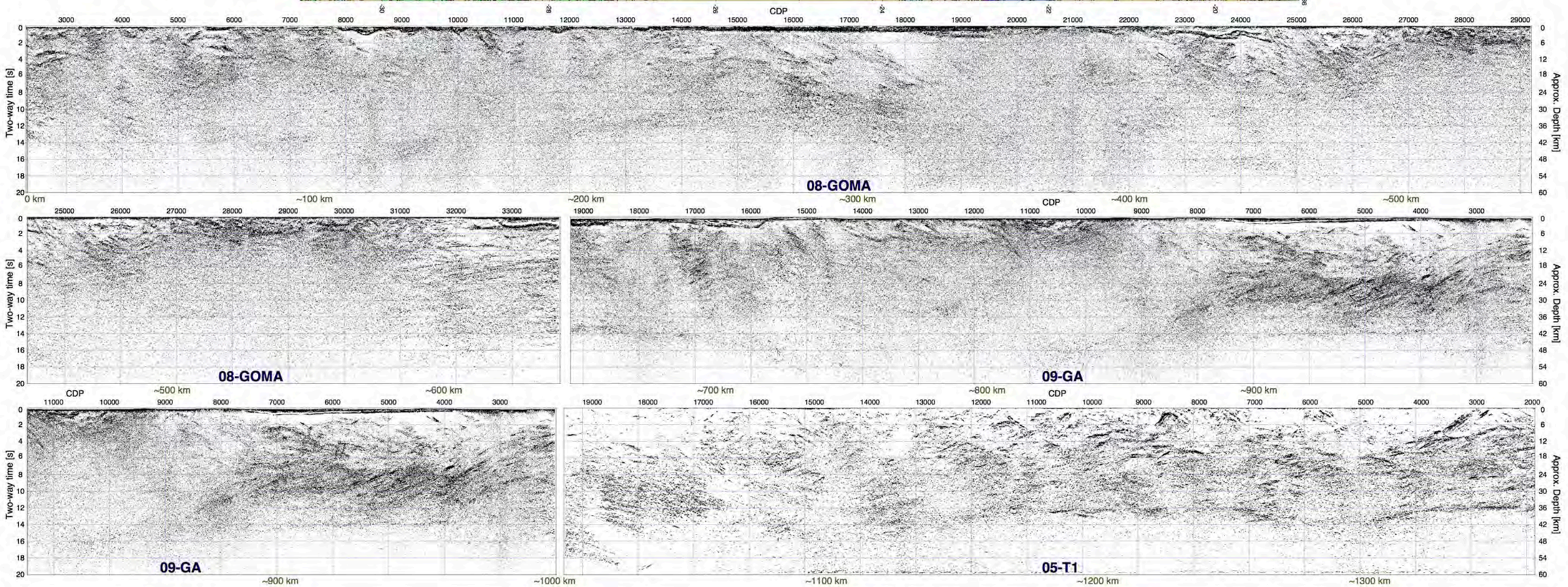
South Australia - Victoria



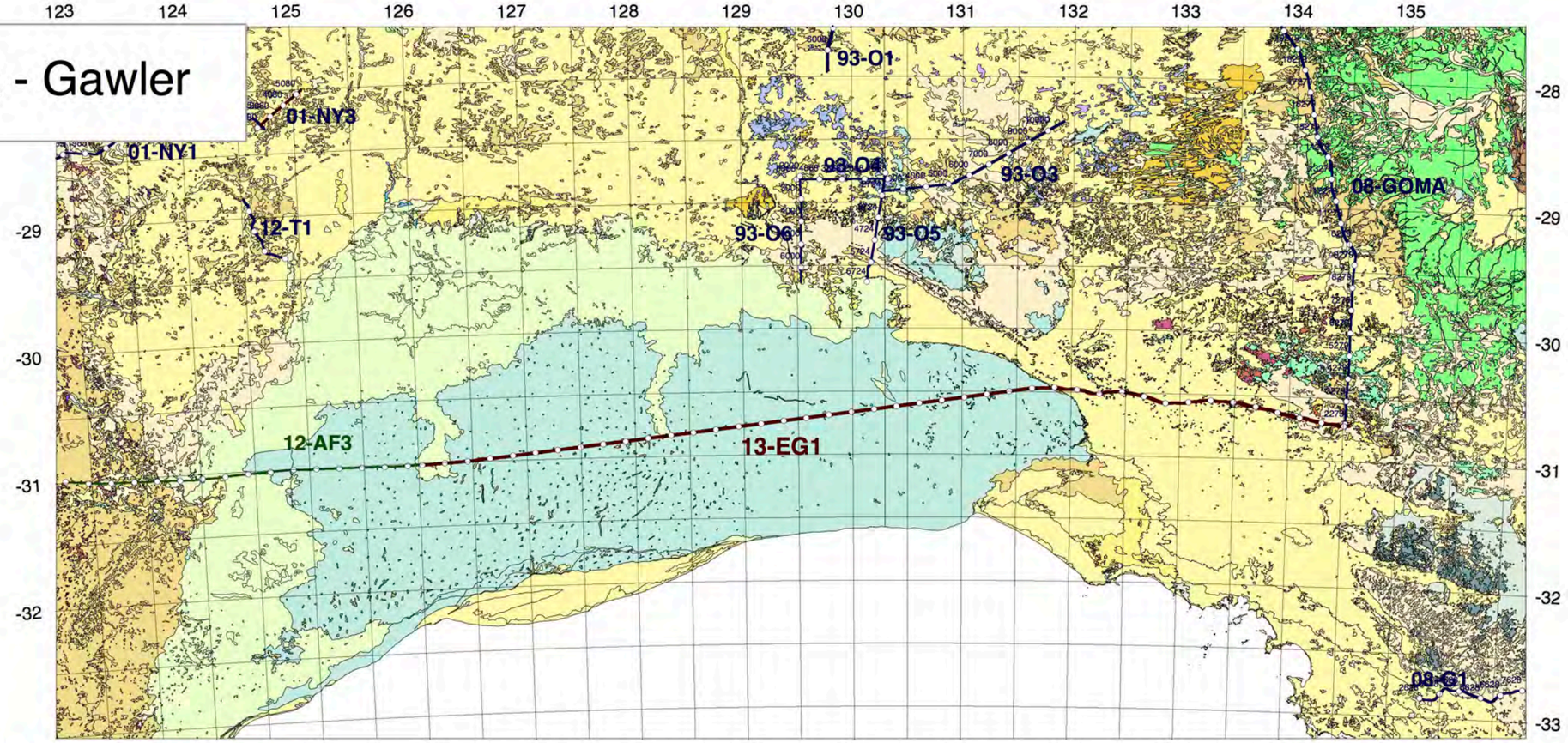


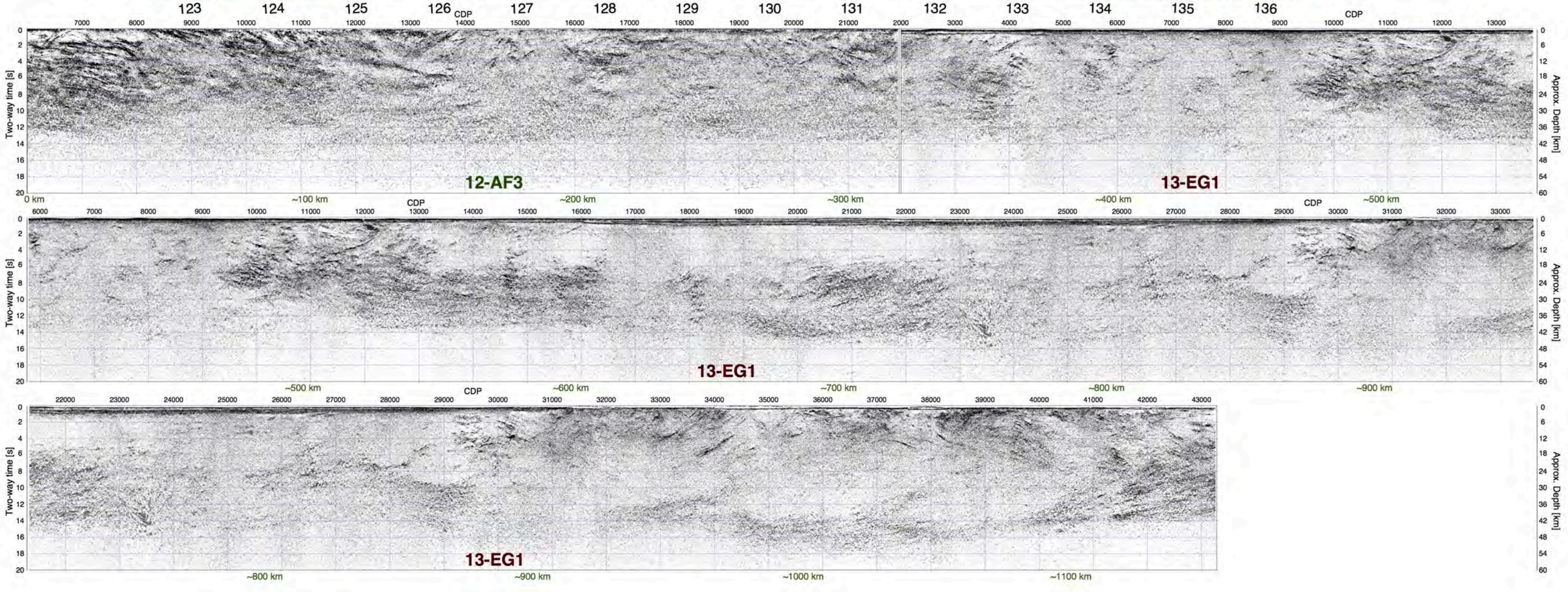
Central Australia



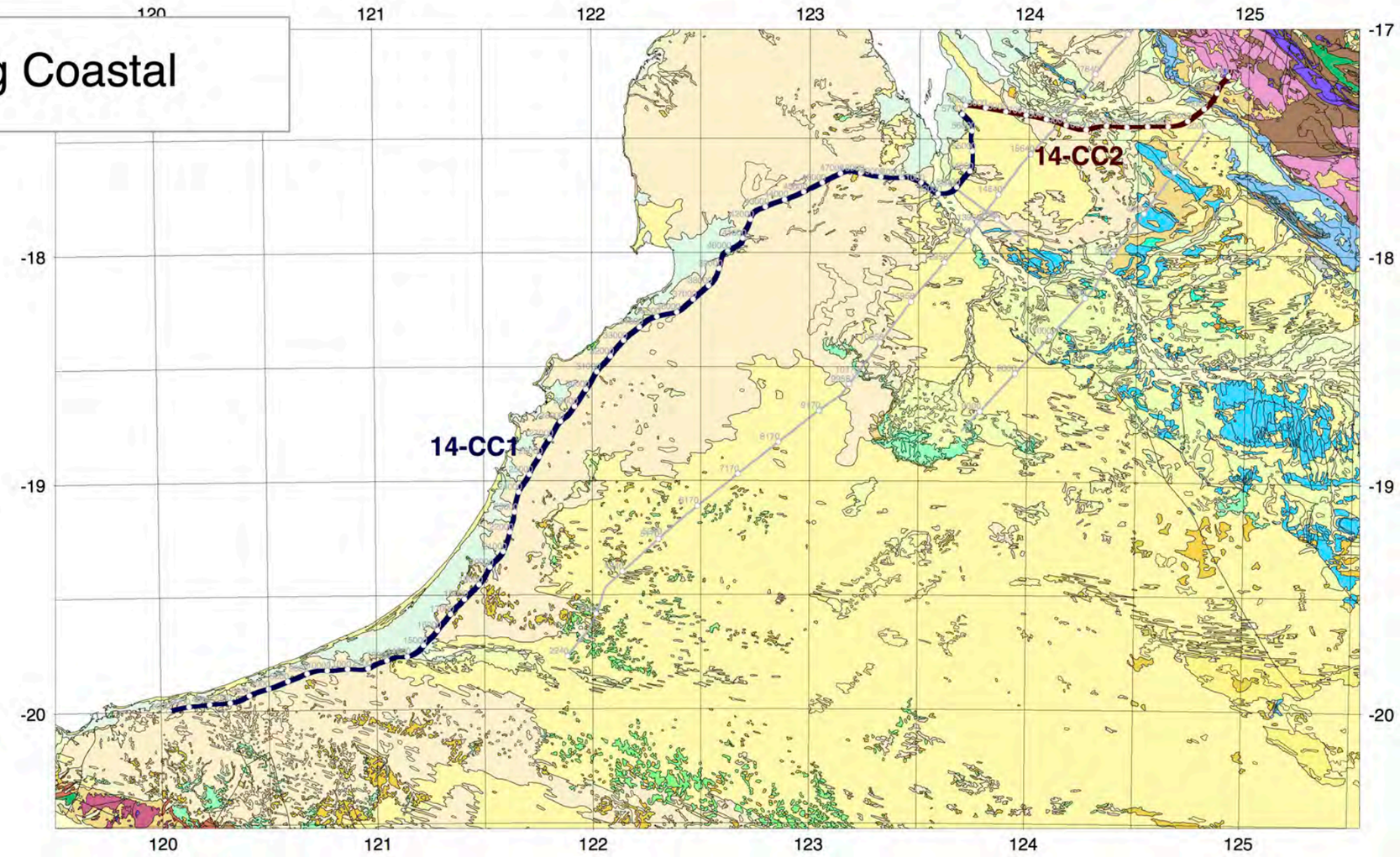


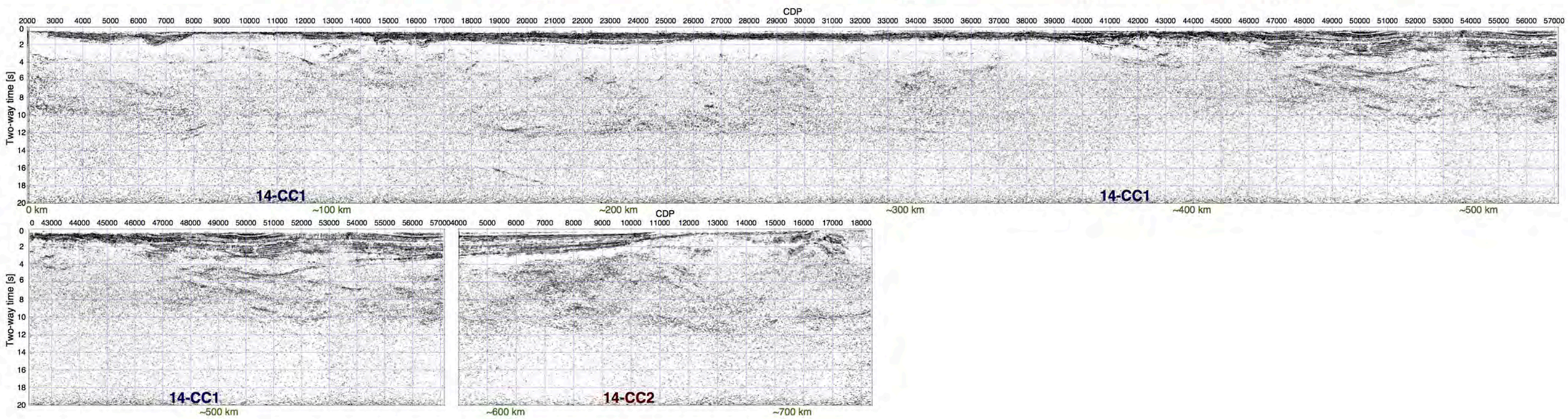
200 Eucla - Gawler



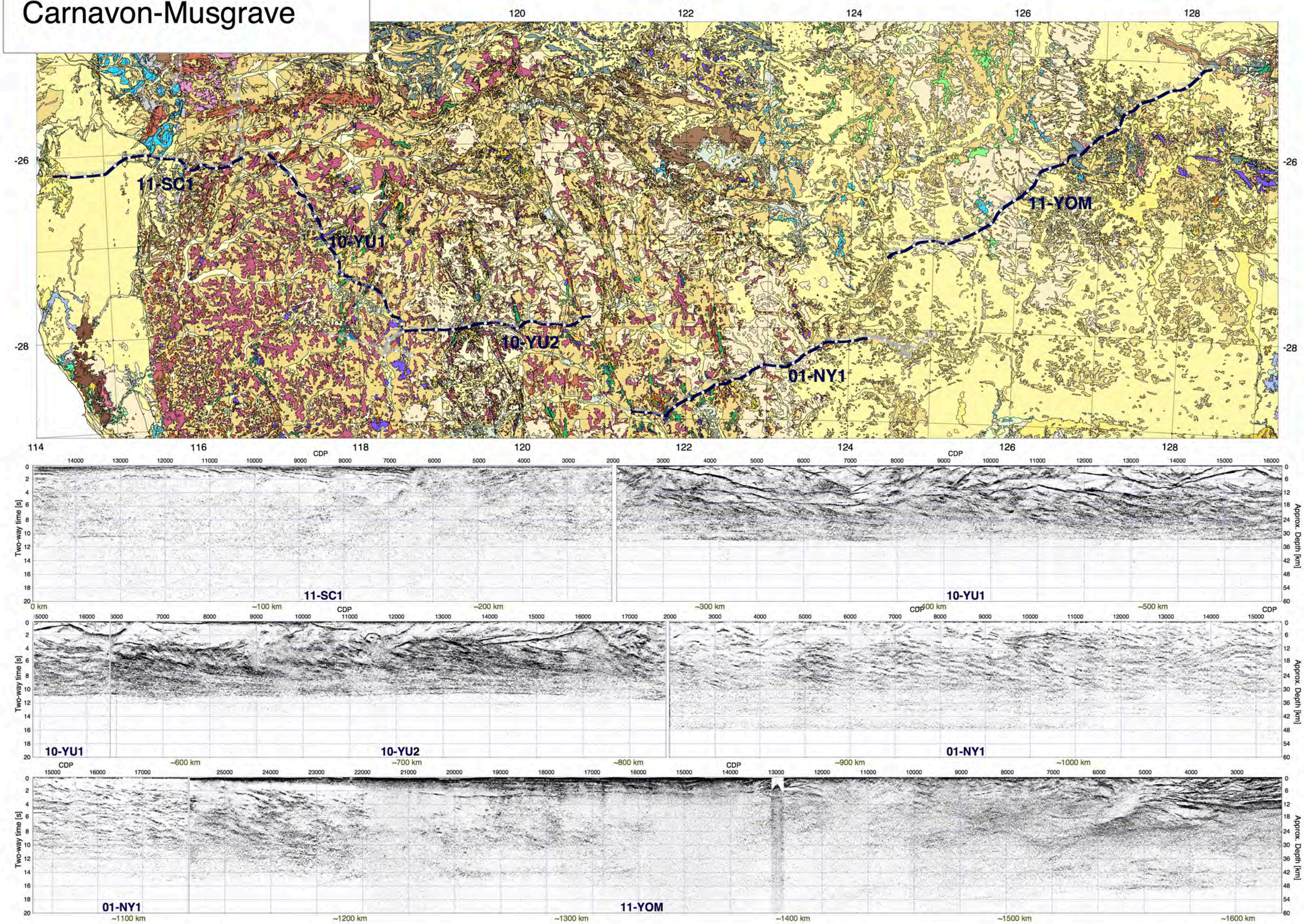


Canning Coastal

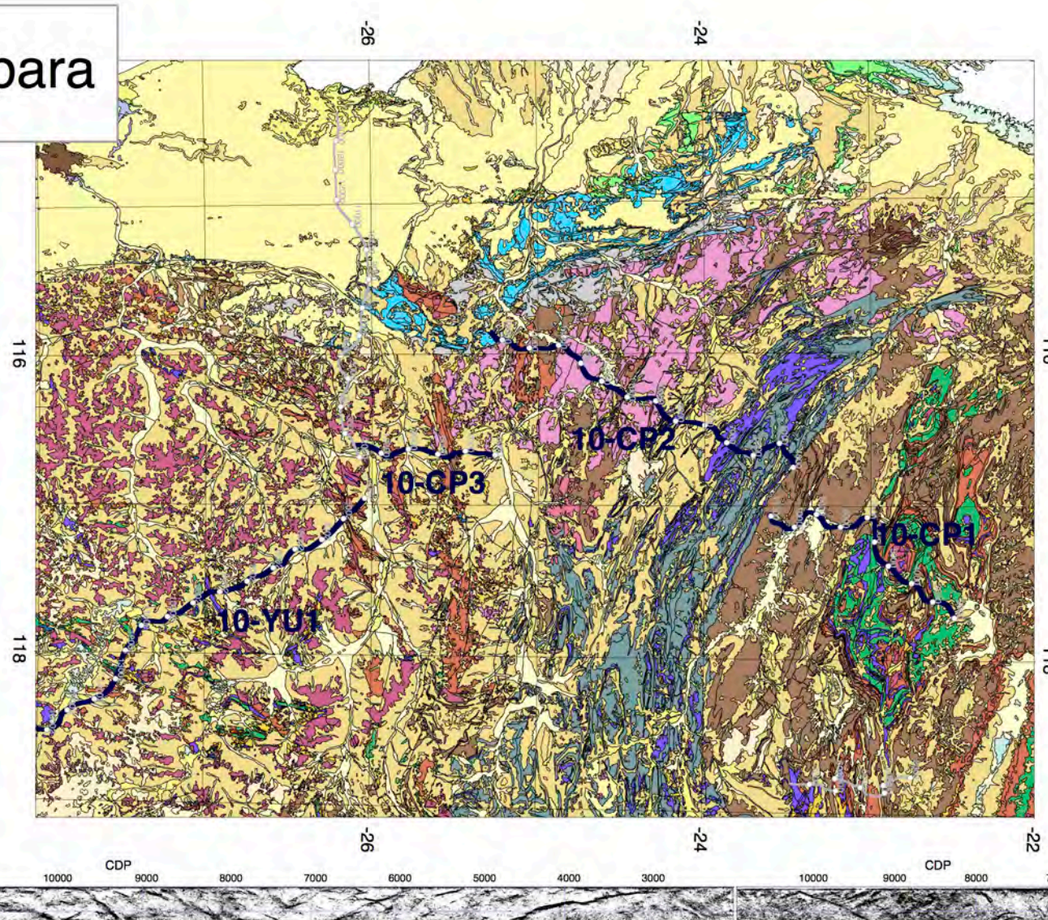


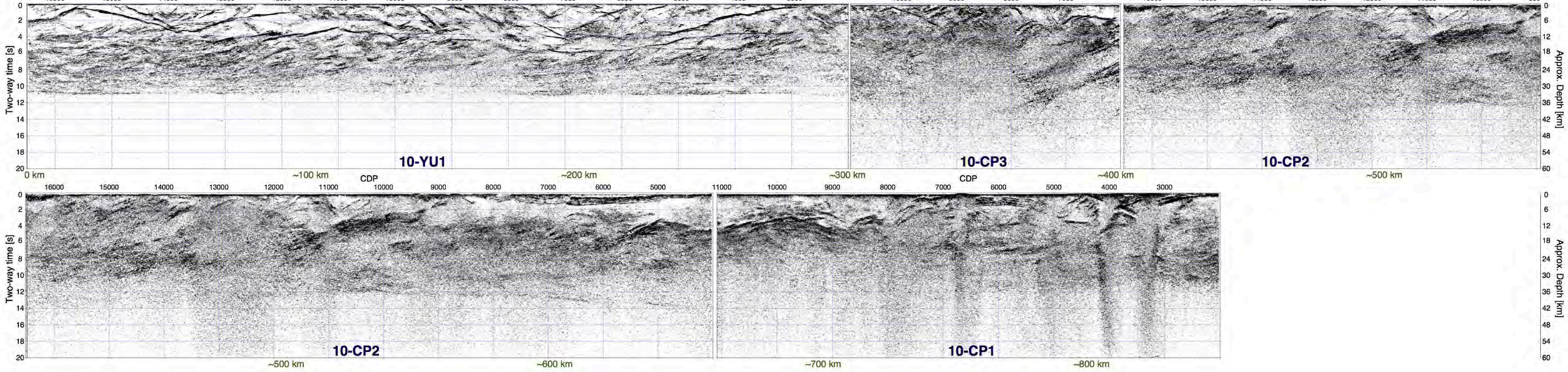


202 Carnavon-Musgrave



Yilgarn-Capricorn-Pilbara





Part IV

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Appendix A: Processing and Display Steps:

Each of the panels in this compilation has been constructed from the archived SEGY files at Geoscience Australia, and the associated coordinates for the reflection lines.

The first step in the process was to convert all coordinates, for the individual CDP points, into latitude and longitude referred to the WGS 1984 datum, rather than grid references. In the process a few UTM zone assignments were corrected. By this means all lines can be handled in the same way.

The same coordinate files are used for the construction of the geological maps with line profiles and for the reflection sections. The data base for the geological maps and associated colour scheme were extracted from the 2010 release of the digital 1:1 million geological map of Australia, and the 1:2.5 million map for regional synthesis (Raymond, 2012). The handling of the shape files for both the reflection lines and the geological maps from the geographic information system was achieved using the open source software *ogr2ogr* [http://www.gdal.org/], linked to the plotting capabilities of Generic Mapping Tools (Wessel & Smith, 1998) to produce Postscript plots. All reflection profiles in a region were plotted onto geological information, so that the configuration of each reflection section relative to other data collection can be seen. The lines are annotated with CDP numbers at 1000 point intervals using the shape files. Some editing has been needed to improve the positioning of the computer-generated text.

The geological maps for the individual panels are plotted at the same scale. A transverse Mercator projection is used for each geological strip with appropriate reference meridian. The grid spacing employed is 0.5 degree in latitude and longitude. For the regional maps differing scales were employed so that they could be reasonably accommodated on a single page. These regional maps use varying Lambert conformal conical projections adapted to the region under consideration.

The archived digital SEGY files for each line, from Geoscience Australia reflection processing (stacked or migrated), were brought into the Seismic Un*x environ- ment (http://www.cwp.mines.edu/cwpcodes/) for modest processing. This was mostly a simple time scaling of amplitudes as described on page 2. The scaled files were then plotted using the python script *plot_surveys_with_shapefile.py* detailed below, which invokes the *pssegy* facility from Generic Mapping Tools to produce a Postscript file for the record section. The bias and clipping applied to the records are adjustable and are specified in the tables for the reflection profiles in each of the areas. These parameters control the appearance of the reflection plot – increased bias produces a lighter plot.

The python script arranges the segmentation of the reflection results into the 220 km segments used in the displays, with annotation of the approximate distance along the profiles derived from the coordinate information. As far as possible the displays of the reflection results are on the same horizontal scale. A constant time scale has been applied to each section with 20s of display plotted in each case, even if the recordings were of lesser or greater duration. The displays are approximately true scale, based on an average r.m.s. velocity of 6 km/s for the crust.

For each profile the reflection section was inserted into a Postscript template, with annotation of line information and acquisition parameters. More work was needed to extract suitable geological strip maps since these needed to follow the reflection line. A standard window was manipulated across a broad area geological plot until the reflection line of interest was suitably bracketed, and this material was added to the Postscript page. Coordinate annotation was then added to the geological strips so that the position of the line can be recognised, even though the orientation might not be standard NS or EW.

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Python script: plot_surveys_with_shapefile.py

```
#This script reads all of the given files, then applies biasing (if selected),
#then computes consecutive cdp points and the distance,
#Then plots the section and a corresponding map.
import glob,string
import os,sys,numpy
from osgeo import ogr

import utils_plot_segy
#sys.path.append('/home/kut/research/noise_python')
#import corr_utils,utilssac

#Give the name of the input text file, which contains the list of files to be processed
segylist='segy_list_bySURVEY'
#Typical format would be like
#'/media/tr_3/GA_reflection/second_phase/L184/AL184/mig_07ga_ig1_20s.sgy'
#'/media/tr_3/GA_reflection/second_phase/L184/AL180/mig_07ga_ig1_20s.sgy'
#---------------------------

#Open and read the contents
segyfile=open(segylist,'r').readlines()
segyfile=[segyfile[i].strip() for i in range(len(segyfile))]
#---------------------------

#Give the name of the shape file, which contains the information of the full paths of the files, and
corresponding coordinate files
#shpfil='/media/local_300/research/australia_crustal_thickness/reflection_processing_scripts/matlab_ba
sed_picking/coordinates/test.shp'
shpfil='test.shp'
#---------------------------

#Output directory for PS files
dirout='TEST_PLOTS'
os.system('mkdir '+dirout)
#---------------------------

#Define the plotting parameters-FOR MORE INFORMATION CONSULT pssegy man pages (GMT
function).
#params='-D3 -F -N -B-1.4 -C95 -M' #ORIGINAL
params='-D3 -F -N -B-1.47 -C85 -M' #Migrated standard
#params='-D3 -Fred -N -B-1.4 -C95 -M' #This one will plot section in red.

cdps='all' #Cdps to choose #if it is all, everything will be plotted, if 5000:6000 is given, only these ones
will be plotted
#cdps='2001:15000' #Cdps to choose #if it is all, everything will be plotted, if 5000:6000 is given, only
these ones will be plotted
#cdps='11000:22000' #Cdps to choose #if it is all, everything will be plotted,
#if 5000:6000 is given, only these ones will be plotted

tmin=0 #Minimum time to plot
tmax=20 #Maximum time to plot
scal=0.1 #Scaling

#---------------------------

#We need to define a max X length, according to this plotting should be divided.

#Define the KM tick marks.
kms=[]
kms.append(0)
#kms.append(50)
kms.append(100)
kms.append(200)
kms.append(300)
kms.append(400)
kms.append(500)
kms.append(600)

 #-----------------------------------------

#Shape File Manipulation for getting the right info
driver = ogr.GetDriverByName('ESRI Shapefile')
map = driver.Open(shpfil)
#Get the first layer
layer = map.GetLayer(0)
nlay = map.GetLayerCount()
layer_list = [map.GetLayer(i) for i in xrange(nlay)]
layer_namelist = [map.GetLayer(i).GetName() for i in xrange(nlay)]

#print segyfile
for i in range(len(segyfile)):
  #Select the file and corresponding attributes from the SHAPEFILE
  srstr="select * from test where SEGY_Loc in ('"+segyfile[i]+"')"
  print srstr,i,' of ',len(segyfile)
  #Start searching the all attributes for the given file name
  reslayer = map.ExecuteSQL(srstr)
  numFeatures = reslayer.GetFeatureCount()
  #--------
  cdp=[]
  lat=[]
  lon=[]
  #Print the results by moving along the feautures
  for j in range(0,numFeatures):
    reslayerfeat=reslayer.GetNextFeature()
    geometry = reslayerfeat.GetGeometryRef()
    cdp.append(float(reslayerfeat.GetField('CDP')))
    lat.append(float(geometry.GetX()))
    lon.append(float(geometry.GetY()))
  reslayer.ResetReading() #Reset the layer.
  #--------------

  #Sort the CDP and corresponding coordinates
  indsrt=numpy.argsort(cdp) #Get the indices of the sorted CDP in ascending order
  #Give the sorted CDPS, lats and lons to the plotting program, plotting will pick the right one
  cdpsorted=[str(int(cdp[indsrt[ii]])) for ii in range(len(indsrt))]
```

```
latsorted=[lat[indsrt[ii]] for ii in range(len(indsrt))]
lonsorted=[lon[indsrt[ii]] for ii in range(len(indsrt))]
#--------------------
splts=segyfile[i].split('/')
#Create the output file name
plotout=dirout+'/'+splts[-1].replace('.sgy','')+"_"+splts[-2]+".ps"
print plotout
seg_len=220.0 #Segment Length
#Plot Chosen Files
utils_plot_segy.plot_segy_plain_segments(segyfile[i],params,plotout,cdpsorted,latsorted,lonsorted,cdps
,tmin,tmax,scal,kms,seg_len)
#-------

#Destroy the opened Shape objects
map.Destroy()
reslayerfeat.Destroy()
```

Appendix B: Line Summary:

Year	Project	Survey Name	GA Line Code	Line Length [km]	No of Channels	Nominal Shot interval [m]	Group interval [m]	Nominal Fold	Record length [sec]	Partners	Processors	Geocat#
1976	L108	Galilee Basin, QLD, 1976	BMR76-01	56.50	24	166.67	83.33	6	6, 10		D.Johnstone	74977
			BMR76-02	35.30	24	166.67	41.66, 83.33	6	6			
			BMR76-03	88.67	24	166.67	83.33	6	6, 20			
			BMR76-04	40.00	24	166.67	83.33	1, 6	6			
1978	L111	Denison Trough, QLD, 1978	BMR78-01	28.66	48	166.67	41.66	6	6, 8, 16		D.Johnstone	74974
			BMR78-02	123.40	48	166.67	41.66	6	6, 8, 16			
			BMR78-03	38.33	48	166.67	41.66	6	6			
			BMR78-06	47.78	48	166.67	41.66	6	6			
			BMR78-07	32.20	48	166.67	41.66	6	6, 16			
			BMR78-08	33.91	48	166.67	41.66	6	6, 8,16			
1979	L112	Denison Trough, QLD, 1979	BMR79-04E	38.79	48	166.67	41.66	6	6		D.Johnstone	74973
			BMR79-05	17.25	48	166.67	41.66	6	6			
			BMR79-09	26.16	48	166.67	41.66	6	6			
1980	L115	Central Eromanga Basin, QLD, 1980	BMR80-01	183.33	48	333.33	41.66, 83.33	6	20		D.Johnstone	74972
			BMR80-03	148.66	48	333.33	83.33	6	20			
			BMR80-04	16.00	48	333.33	83.33	6	20			
			BMR80-05	78.33	48	333.33	83.33	6	20			
			BMR80-06	141.99	48	333.33	83.33	6	20			
			BMR80-08	55.33	48	333.33	83.33	6	20			
1981	L116	Central Eromanga Basin, QLD, 1981	BMR81-7E	31.67	48	333.33	83.33	6	20		D.Johnstone	74971
			BMR81-7W	59.66	48	333.33	83.33	6	20			
			BMR81-09	83.16	48	333.33	83.33	6	20			
			BMR81-10	200.99	48	333.33	83.33	6	20			
			BMR81-12	30.33	48	333.33	83.33	6	20			
1982	L118	Central Eromanga Basin, QLD, 1982	BMR82-02	108.66	48	333.33	83.33	6	20		D.Johnstone	74970
			BMR82-11	172.41	48	333.33	83.33	6	20			
			BMR82-11A	11.50	48	333.33	83.33	6	20			
			BMR82-13	72.33	48	333.33	83.33	6	20			

Year	Project	Survey Name	GA Line Code	Line Length [km]	No of Channels	Nominal Shot interval [m]	Group interval [m]	Nominal Fold	Record length [sec]	Partners	Processors	Geocat#
1984	L120	South East Queensland, QLD, 1984	BMR84-14	667.22	48	333.33	83.33	6	20, 39		D.Johnstone	74969
			BMR84-16A	43.78	48	161	41.66	6	20			
			BMR84-16B	90.66	48	333.33	83.33	6	20			
1985	L121	Central Australia, NT, 1985	BMR85-01A	133	48	333.33	83.33	6	20		B.Goleby	74968
			BMR85-01B	73	48	333.33	83.33	6	24		C.Wright	
			BMR85-01C	29	48	333.33	83.33	6	24			
			BMR85-01D	66	48	333.33	83.33	6	24			
			BMR85-01E	119	48	333.33	83.33	6	24			
			BMR85-02	40	48	333.33	83.33	6	20			
1986	L123	South East Queensland, QLD, 1986	BMR86-15	21.66	96	360	60	8	20		D.Johnstone	74962
			BMR86-17	58.38	96	360	60	8	20			
			BMR86-18	68.88	96	360	60	8	20			
			BMR86-19	24.24	96	360	60	8	20			
1988	L126	Canning Basin, WA, 1988	BMR88-01	414.00	96	200	50	12	20		M.Sexton, T.Barton, D.Johnstone	74956
			BMR88-02	43.00	96	200	50	12	20			
			BMR88-03	188.00	96	200	50	12	20			
1989	L129	Bowen Basin, QLD, 1989	BMR89-B1A	129.96	96	360	60	8	20		K.Wake-Dyster	74954
			BMR89-B1B	27.60	96	360	60	8	20			
			BMR89-B2	55.32	96	360	60	8	20			
			BMR89-B3	41.22	96	360	60	8	20			
1989	L130	Cobar, NSW, 1989	BMR89-C01	31.92	96	360	60	8	20		R.Costelloe	74953
			BMR89-C02	59.64	96	360	60	8	20			
			BMR89-C03A	19.14	96	360	60	8	20			
			BMR89-C03B	23.34	96	360	60	8	20			
			BMR89-C03C	49.98	96	360	60	8	20			
1991	L131	Gunnedah Basin, NSW, 1991	BMR91-G01	253.14	96	360	60	8	20		K.Wake-Dyster, D.Johnstone	74952

Year	Project	Survey Name	GA Line Code	Line Length [km]	No of Channels	Nominal Shot interval [m]	Group interval M]	Nominal Fold	Record length [sec]	Partners	Processors	Geocat#
1991	L132	Eastern Goldfields, WA, 1991	BMR91-EGF01	208.96	96	240	40	12	20		B.Goleby, A.Owen	74951
			BMR91-EGF02	27.64	96	160	40	12	20			
			BMR91-EGF03	21.00	96	160	40	12	20			
1992	L135	Otway Basin, VIC and SA, 1992	BMR92-OT1	65.95	120	300	50	10	20		K.Wake-Dyster	74947
			BMR92-OT2	33.15	120	300	50	10	20			
			BMR92-OT3	58.35	120	300	50	10	20			
			BMR92-OT4	87.70	120	300	50	10	20			
			BMR92-OT5	101.05	120	300	50	10	20			
			BMR92-OT6	34.85	120	300	50	10	20			
			BMR92-OT7	82.00	120	300	50	10	20			
1993	L137	Officer Basin, SA, 1993	93AGS-01	99.16	120	240	40	10	20		J.Leven, A.Owen	74944
			93AGS-03	177.16	120	240	40	10	20			
			93AGS-04	80.20	120	240	40	10	20			
			93AGS-05	100.36	120	240	40	10	20			
			93AGS-06	94.12	120	240	40	10	20			
1994	L138	Mt Isa, QLD, 1994	94MTI-01	255.52	120	240	40	10	20	GSQ, pmd*CRC	L.Jones	74943
			94MTI-02	31.64	120	240	40	10	20	Mimex		
1995	L139	TASGO, TAS, 1995	95AGS-T1	49.20	120	120	40	20	20	TDR	T.Barton	74942
			95AGS-T2	36.48	120	120	40	20	20			
			95AGS-T3	25.84	120	240	40	10	20			
			95AGS-T4	16.32	120	240	40	10	20			
			95AGS-T5	4.80	120	240	40	10	20			
1996 & 1997	L141 & L143	Broken Hill, NSW, 1996 and 1997	96AGS-BH1A	52.96	120	240	40	10	20	NSW DMR AGCRC	T.Fomin	74886
			96AGS-BH1B	134.56	120	240	40	10	20			
			97AGS-BH1B	27.44	120	240	40	10	20			
			96AGS-BH2	24.28	120	240	40	10	20			
			96AGS-BH3	35.08	120	240	40	10	20			
1997	L142	Victoria Grampians, VIC, 1997	97AGS-V1	37.20	120	240	40	10	20	AGCRC	T.Barton	74887
			97AGS-V2	26.80	120	240	40	10	20			

Year	Project	Survey Name	GA Line Code	Line Length [km]	No of Channels	Nominal Shot interval [m]	Group interval [m]	Nominal Fold	Record length [sec]	Partners	Processors	Geocat#
1997	L144	Hamersley Basin, WA, 1997	97AGS-HB1	23.20	120	320	40	8	20	UWA	L.Jones, B.Goleby	74885
			97AGS-HB2	41.16	120	240	40	10	20			
			97AGS-HB3	32.80	120	320	40	8	20			
			97AGS-SD1	38.84	120	240	40	10	20			
1997	L146	Eastern Lachlan, NSW, 1997	97AGS-EL1	32.05	120	300	50	10	20	AGCRC, NSW DMR	L.Jones	74883
			97AGS-EL2	26.90	120	240	50	10	20			
			97AGS-EL3	46.55	120	240	50	10	20			
1999	L148	CABGAS, NSW, 1999	99AGS-C1	160.10	240	30	30	120	16	NSW DMR	J.Leven	74882
1999	L150	Yilgarn, WA, 1999	99AGS-Y1	38.68	240	40, 80	40	60, 120	16	AGCRC	T.Fomin, A.Owen	74880
			99AGS-Y2	37.56	240	80	40	60	16			
			99AGS-Y3	22.28	240	80	40	60	16			
			99AGS-Y4	62.44	240	80	40	60	16			
			99AGS-Y5	28.84	240	80	40	60	16			
1999	L151	Lachlan, NSW, 1999	99AGS-L1	47.32	240	40	40	120	16	AGCRC, NSW DMR	L.Jones, D.Johnstone	74879
			99AGS-L2	50.52	240	40	40	120	16			
			99AGS-L3	89.64	240	40, 80	40	60, 120	16			
2001	L154	Northern Yilgarn, WA, 2001	01AGS-NY1	384.00	240	80	40	60	16, 18	GSWA, pmd*CRC	L.Jones, E.Chudyk, T.Barton,	40495 & 40496
			01AGS-NY3	52.62	240	30, 60	30	60, 120	16			
2002	L157	Batten Trough, NT, 2002	02GA-BT1	127.60	240	40, 80	40	60, 120	20, 22	NTGS, pmd*CRC	D.Johnstone	74876
			02GA-BT2	17.20	240	80	40	60	20	NTGS, pmd*CRC, AngloAmerican		
2003	L163	Gawler, SA, 2003	03GA-OD1	193.36	240	40, 80	40	60, 120	18, 20		L.Jones	74869
			03GA-OD2	57.44	240	80	40	60	18			
2003/4	L164	Curnamona, SA, 2003 and 2004	03GA-CU1	197.50	240	80	40	60	18	PIRSA, pmd*CRC	T.Fomin	74868

Year	Project	Survey Name	GA Line Code	Line Length [km]	No of Channels	Nominal Shot interval [m]	Group interval [m]	Nominal Fold	Record length [sec]	Partners	Processors	Geocat#
2005	L171	Tanami, WA and NT, 2005	05GA-T1	354.24	240	80	40	60	20, 22, 24	NTGS, GSWA, Newmont Australia, Tanami Gold NL	D.Johnstone, B.Goleby, L.Jones	74860
			05GA-T2	101.80	240	80	40	60	20			
			05GA-T3	179.20	240	80	40	60	20			
			05GA-T4	84.40	240	80	40	60	20			
2005	L173	Thomson-Lachlan, NSW, 2005	05GA-TL1	99.20	240	80, 40	40	60, 120	22, 20	NSW DMR, pmd*CRC	R.Costelloe	74857
			05GA-TL2	115.52	240	80, 40	40	60, 120	18, 20, 22			
			05GA-TL3	73.20	240	80, 40	40	60, 120	22			
2006	L178	Central Victoria, VIC, 2006	06GA-V1	140.76	240	80	40	60	20	pmd*CRC, GSV	R.Costelloe, A.Nakamura	74819
			06GA-V2	106.56	240	80	40	60	20			
			06GA-V3	72.08	240	80	40	60	20			
			06GA-V4	78.24	240	80	40	60	20			
2006	L180	Mt Isa, QLD, 2006	06GA-M1	74.84	240	80	40	60	20	GSQ, pmd*CRC, ZINIFEX	H.Tassell, L.Jones, R.Costelloe, J.Holzschuh, E.Saygin	69674
			06GA-M2	62.00	240	80	40	60	20			
			06GA-M3	120.92	240	80	40	60	20			
			06GA-M4	200.00	240	80	40	60	20			
			06GA-M5	159.52	240	80	40	60	20			
			06GA-M6	283.20	240	80	40	60	20			
2007	L184	Mt Isa-Georgetown-Charters Towers, QLD, 2007	07GA-IG1	439.56	240	80	40	60	20	GSQ	A.Nakamura	69254
			07GA-IG2	243.04	300	80	40	75	20			
2007	L185	Georgetown Charters Towers, QLD, 2007	07GA-GC1	492.92	300	80	40	75	20	GSQ	J.Holzschuh, E.Saygin	69255
2007	L186	Far North Queensland, QLD, 2007	07GA-A1	205.40	300	80	40	75	20	AuScope, GSQ	H.Tassell, R.Costelloe	69256

Year	Project	Survey Name	GA Line Code	Line Length [km]	No of Channels	Nominal Shot interval [m]	Group interval [m]	Nominal Fold	Record length [sec]	Partners	Processors	Geocat#
2008 and 2009	L188	Rankins Springs, NSW, 2008 and 2009	08GA-RS1	126.24	300	80	40	75	22	NSW DPI	L.Jones, T.Fomin	68234
			08GA-RS2	106.28	300	80	40	75	22			
			09GA-RS2	43.76	300	80	40	75	22			
2008	L189	Gawler-Curnamona-Arrowie, SA, 2008	08GA-G1	253.48	300	80	40	75	20	PIRSA	J.Holzschuh, E.Saygin, A.Nakamura	69460
			08GA-A1	60.40	300	80	40	75	20			
			08GA-C1	262.16	300	80	40	75	20			
2008	L190	GOMA, NT and SA, 2008	08GA-OM1	634.52	300	80	40	75	20	NTGS, PIRSA, AuScope	R.Costelloe, J.Holzschuh	70579
2009	L191	Curnamona-Gawler Link, SA, 2009	09GA-CG1	144.44	300	80	40	75	20	PIRSA	T.Fomin	70391
2009	L192	Georgina-Arunta, NT, 2009	09GA-GA1	372.92	300	80	40	75	20	NTGS	A.Nakamura	71425
2009	L193	Southern Delamerian, VIC, 2009	09GA-SD1	147.40	300	80	40	75	20	AuScope, GSV, PIRSA	L.Jones	71389
			09GA-SD2	48.60	300	80	40	75	20			
2009	L194	Ararat, VIC, 2009	09GA-AR1	69.64	300	80	40	75	20	GSV	L.Jones	71390
2010	L195	Capricorn, WA, 2010	10GA-CP1	198.00	300	80	40	75	20	GSWA, AuScope	R.Costelloe, J.Holzschuh, T.Fomin	72863
			10GA-CP2	276.80	300	80	40	75	20			
			10GA-CP3	106.40	300	80	40	75	20			
2010	L196	Youanmi, WA, 2010	10GA-YU1	302.16	300	40, 80	40	75, 150	20	GSWA, Royalties for Regions	R.Costelloe, L.Jones	74423
			10GA-YU2	282.80	300	40, 80	40	75, 150	20			
			10GA-YU3	109.84	300	40, 80	40	75, 150	20			
2011	L199	YOM, WA, 2011	11GA-YO1	484.24	300	80	40	75	20 & 22	GSWA, Royalties for Regions	J.Holzschuh	75097
2011	L200	Southern Carnarvon, WA, 2011	11GA-SC1	259.32	300	80	40	75	20	GSWA	Velseis, R.Costelloe	72891

Year	Project	Survey Name	GA Line Code	Line Length [km]	No of Channels	Nominal Shot interval [m]	Group interval [m]	Nominal Fold	Record length [sec]	Partners	Processors	Geocat#
2012	L201	Albany-Fraser Orogen, WA, 2012	12GA-AF1	114.04	300	80	40	75	20	GSWA, WA Royalties for Regions	R.Costelloe, J.Holzschuh, T.Fomin	78966
			12GA-AF2	158.40	300	80	40	75	20			
			12GA-AF3	319.12	300	80	40	75	20			
			12GA-T1	80.32	300	80	40	75	20	AngloGold		
2013	L202	Yathong Trough, NSW, 2013	13GA-YT1	97.80	300	80	40	75	22	GSNSW	Velseis	89798
			13GA-YT2	131.80	300	80	40	75	20			
2013/2014	L203	Eucla Gawler, WA/SA, 2013-2014	13GA-EG1	834.06	600	80	20	75	20	GSWA, WA Royalties for Regions, GSSA, AuScope	J.Holzschuh	89637
2014	L204	Southeastern Mt Isa, Qld, 2014	14GA-CF1	669.3	600	80	20	75	20	GSQ	R.Costelloe	89638
2014	L205	Canning Coastal, WA, 2014	14GA-C1	562.36	600	40	20	150	20	GSWA	DownUnder	89799
			14GA-C2	143.28	600	40	20	150	20			
2014	L207	Boulia, Qld, 2014-2015	14GA-CF2	368.72	600	80	20	75	20	GSQ	DownUnder	
			14GA-CF3	338.88	600	80	20	75	20			
2015			15GA-CF3	139.60	600	80	20	75	20			

Abbreviations: for partner organisations

PIRSA	Primary Industries and Resources South Australia
GSSA	Geological Survey South Australia
GSWA	Geological Survey Western Australia
GSQ	Geological Survey of Queensland
GSV	GeoScience Victoria, Department of Primary Industries
NTGS	Northern Territory Geological Survey
NSW DPI	New South Wales Department of Primary Industries
NSW DMR	New South Wales Department of Mineral Resources
TDR	Tasmania Development and Resources
AuScope	An organisation for a National Earth Science Infrastructure Program
UWA	University of Western Australia
AGCRC	Australian Geodynamics Cooperative Research Centre
pmd*CRC	Predictive Mineral Discovery Cooperative Research Centre
Mimex	Mt Isa Mines Exploration Pty. Ltd.
AngloGold	AngloGold Ashanti Limited