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A new subsurface map of the solid geology
of the Bowen Basin underlying the Surat Basin

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Cover photographs by Owen Dixon, GSQ: From L to R, Early Permian Staircase Sandstone, Staircase Range east of Springsure; Gravel lag at the base of the Precipice Sandstone overlying Clematis Group, Devil's Signpost, Carnarvon Gorge National Park; Expedition Sandstone of the Triassic Clematis Group from Horseshoe lookout, Blackdown Tableland; Coal seam and overlying sandstone of the Bandanna Formation, Moura Mine, Pit 16D

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BACKGROUND

The Permo-Triassic Bowen Basin in Queensland hosts abundant world-class coal resources and significant hydrocarbon wealth. The basin has a complex burial and exhumation history, with tectonism resulting from both compressional and extensional phases of development. Exploitation of coal and hydrocarbons has driven a significant exploration effort, in both the exposed and buried areas of the basin. A substantial portion of the basin in southern Queensland is overlain by the Mesozoic Surat Basin, which is also exploited for water, hydrocarbons and coal.

The western flanks of the Bowen Basin have been targeted for oil and gas exploration for several decades and a significant body of drilling and seismic data is available for interpretation. The eastern margin has received far less attention, with only relatively sparse datasets available. Despite this extensive exploration effort, the subsurface basin margins are poorly constrained and the nature of many of the fault systems is not well understood. This work presents a synthesis of the available open file data and provides a regional interpretation of the distribution of sedimentary units, fault network distributions and basin margin geometry in the subsurface areas of the Bowen Basin. As part of the re-assessment of the Bowen Basin, this data pack and supporting documentation provides a new interpretation for the subsurface Bowen Basin in the form of a GIS dataset.

METHODOLOGY

The seismic horizon data layers that are used in this assessment (Figure 1) are derived from the Sedimentary Basins of Eastern Australia (SBEA) study, which was conducted by Geoscience Australia in cooperation with the relevant state geological surveys. The SBEA seismic horizons were developed from the interpretation of selected regional seismic lines representing approximately a quarter of those available at the time the study was conducted (O. Dixon, personal communication). These data are used only as a guide, as the available well stratigraphy does not necessarily agree with the top seismic horizon for some data points (Figure 1).

Stratigraphic data derived from GSQ projects are plotted as an overlay, as these are considered more reliable than company stratigraphic interpretations. Open file petroleum well completion reports are the primary data sources to determine the stratigraphic formation tops in the Bowen Basin. Where company data is all that is available, delineation of stratigraphic boundaries is based on available company data and the regional overview gained from seismic interpretation and lithological descriptions. Other wells also required reinterpretation as the company determination clearly did not agree with the nearby seismic data. An example of this is ANU Riverview 1 where the company interpretation suggests the Surat Basin overlies basement rocks, however, seismic ties to nearby wells show unequivocally that the underlying stratigraphy consists of Bowen Basin sediments. Wells which have palynology or palaeontology reports are re-assessed in order to determine if the

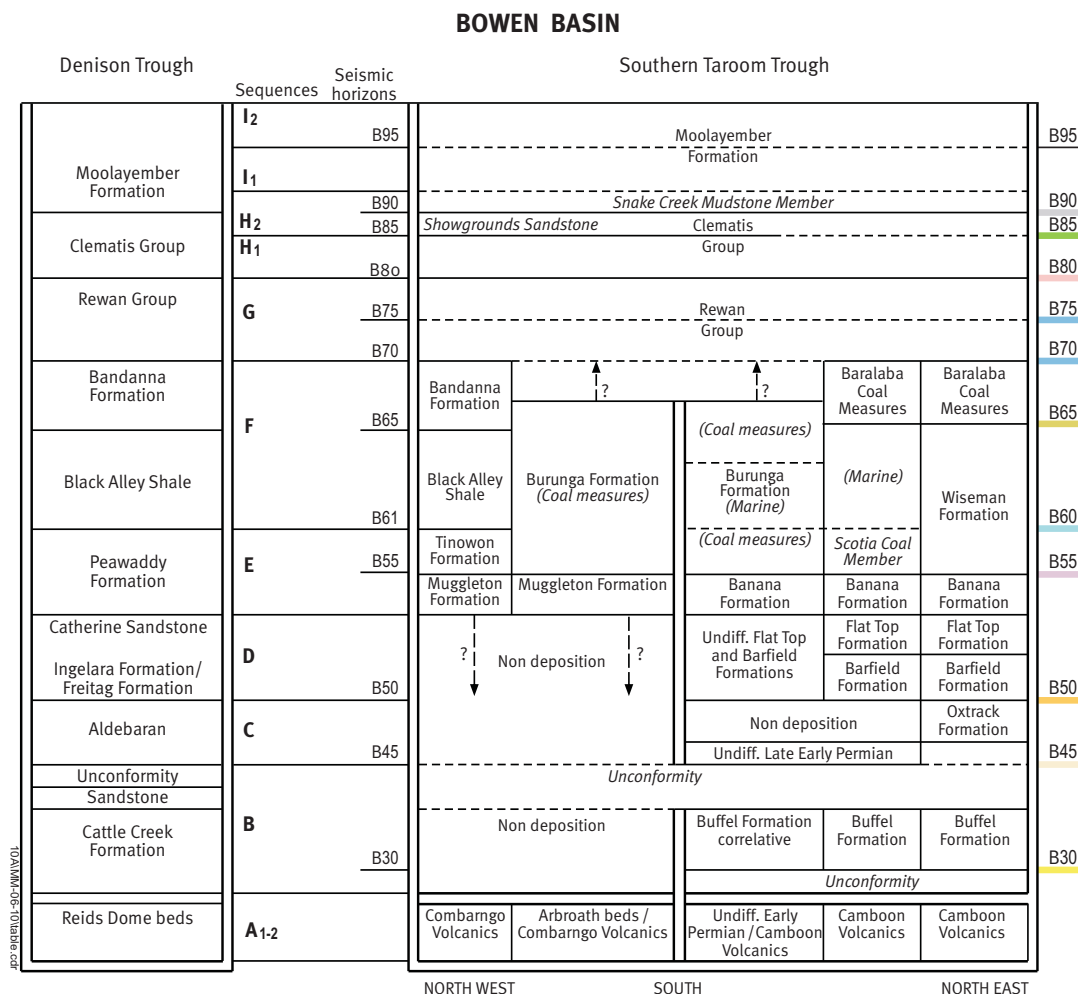


Figure 1. Relationship of the lithostratigraphic and seismic stratigraphic subdivisions for the Bowen Basin, southern Taroom Trough from Green & others (1997)

interpretation is still current (J. McKellar, personal communication). A full listing of reviewed wells and seismic lines used in this assessment is provided in Appendix 1.

The solid geology map of Balfe & others (1988) is used in conjunction with the SBEA seismic horizons to interpret the northern section of the basin. The solid geology Bowen Basin map of Sliwa & others (2008) is used to tie in recent stratigraphic updates, which resulted from the interpretation of newly acquired airborne geophysical data. These maps in conjunction with the seismic horizons are considered complementary where they are in close proximity. Regional magnetic and gravity data are used to assist in determining the eastern basin margin where no other data are available. The structural data layer is also used to assist in inferring formational units in areas where data are sparse.

Earlier stratigraphic nomenclature is not used in this reinterpretation. For example, the older company nomenclature of Cabawin Formation and Wandoan Formation are referred to the Rewan Group and Moolayember Formation respectively. (Green, 1997). This solid geology map also excludes the Early Permian volcanics, which make up the basal unit in parts of the Bowen Basin (Fielding & others, 1990).

RESULTS

The larger part of the mapped Bowen Basin subcrop beneath the Surat Basin consists of the Moolayember Formation. Older formations subcrop beyond the zero edge of the Moolayember Formation on the eastern side of the Bowen Basin and the Denison Trough, and extensions of the Arbroath Trough in the west. Some mapped areas are given multiple attributes or designated a stratigraphic group name, depending on the available data.

Along the eastern margin, the SBEA seismic horizons display down cutting through the basin stratigraphy. There are also areas, which show a degree of structural complexity, reflecting the Late Permian compressional phase (Baker & others, 1993). The Denison Trough subcropping strata also demonstrate major uplift during this time. Data are very sparse in the central regions of the basin, along the axis of the Taroom Trough, which is overlain by the sediments deposited along the Mimosa Syncline of the Surat Basin; however, the regional Surat Basin seismic survey lines show stratigraphic continuity for the Triassic units across the trough. The Arbroath Trough and other graben-like features are present to the west of the main extent of the Bowen Basin (Figure 2, area H); they contain Early Permian strata subcropping below the Surat Basin.

DISCUSSION

A number of wells required reinterpretation, as the company or GSQ data are inconsistent with nearby wells or the SBEA seismic horizons. These wells are generally near the edge of interpreted formation boundaries. An example can be seen in the well GWH Pineview 1, in which the original palynological study suggests the presence of Middle Triassic, and the subcropping unit is ascribed to the Moolayember Formation. In this study this sample is reassessed and determined to be of Early Triassic age (J. McKellar, personal communication) and ascribed to the Rewan Group. This reinterpretation is then extended by wireline log correlation to the nearby well UOD Conloi 1 where the subcropping unit is also attributed to the Rewan Group.

The sedimentary fill within the Denison Trough was uplifted during the Middle Triassic (Baker & others, 1993). As a result, units older than the Moolayember Formation are exposed. Some subcropping units in the Denison Trough are not able to be differentiated due to insufficient data and therefore, polygons in this region have attributes of more than one formation.

A small enclave of Peawaddy Formation in the west of the Denison Trough (Figures 2 and 3, area A) is indicated by the interpreted B60 seismic horizon (base Black Alley Shale) and the presence of Back Creek Group rocks from the well AAO Killoran 1. The rock chip cuttings contain marine fossils and a palynological description suggests the presence of the upper stage 5 palynological zonation of Price (1997) (J. McKellar, personal communication), which encompasses the late Middle Permian to the Late

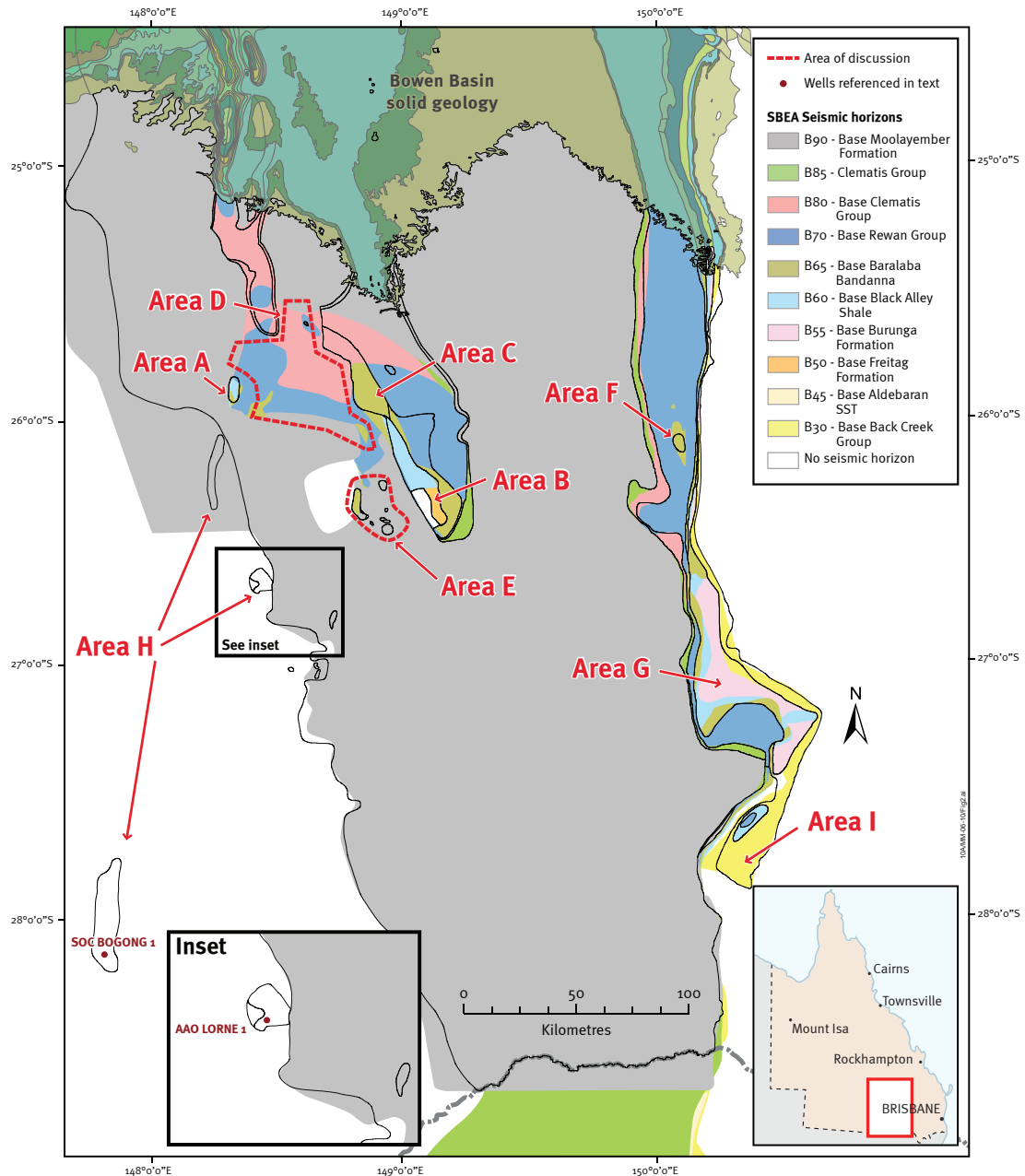


Figure 2. Seismic horizon overlay with areas discussed in this report

Permian. These marine fossils are more indicative of the Peawaddy Formation than that of the Black Alley Shale. Seismic lines 85-K501 (Killoran Survey) and 83-E323 & 83-E325 (South Denison Survey) display uplift and block faulting in this area next to the thrust fault. This is relatively localised, as nearby wells such as AGL Mount Hutton 1 intersect the Moolayember Formation, which had detailed palynological work conducted, confirming the Triassic age of the strata.

Based on five wells available for stratigraphic interpretation, a Denison Trough inlier (Figures 2 and 3, area B) is delineated as subcropping Peawaddy Formation or Black Alley Shale. The well AAO Koorunga 1 contains marine rocks, which have an abundance of hystrichosheres (acritarchs) and, combined with a Permian

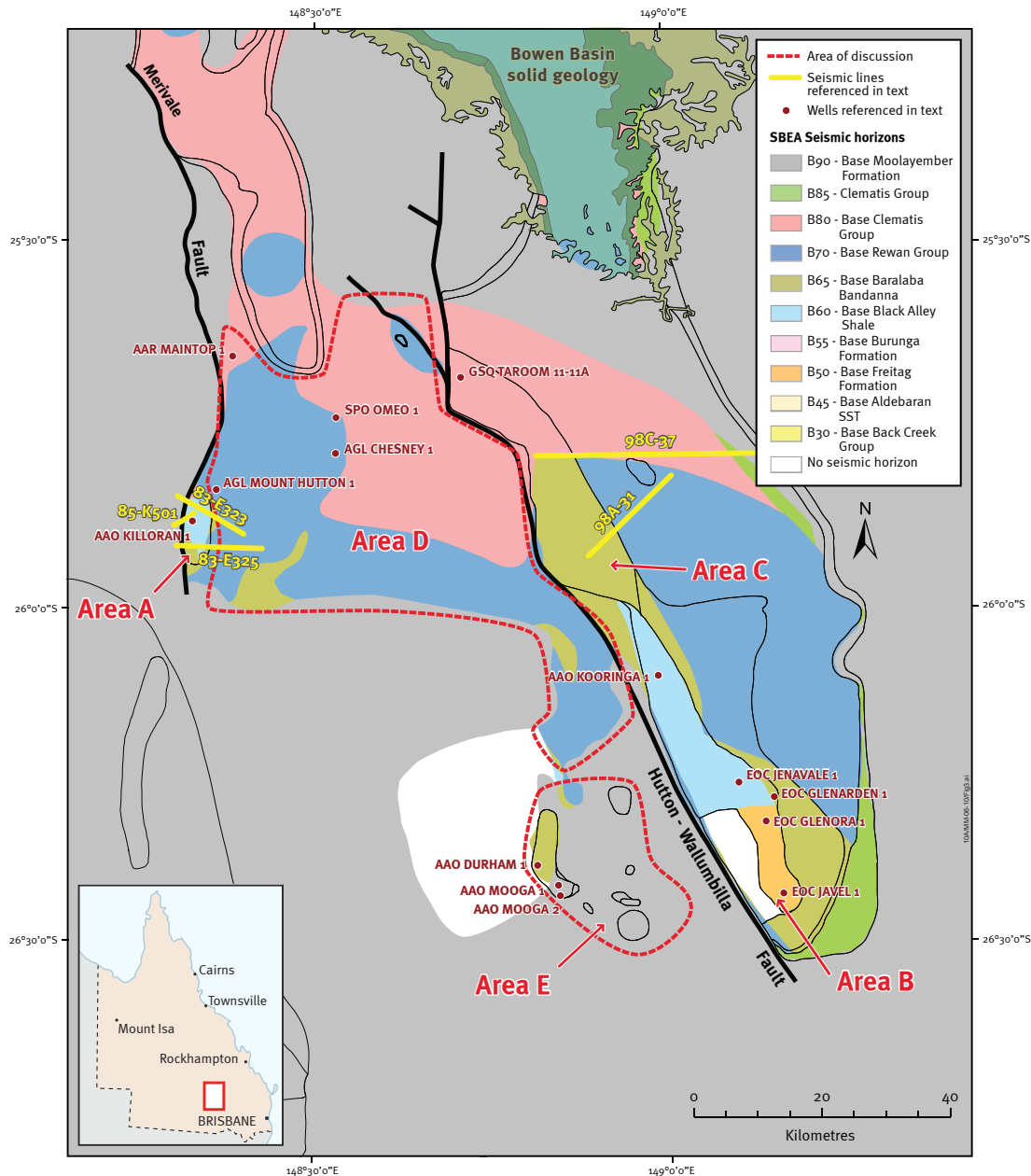


Figure 3. Interpretation for the western Bowen Basin, showing location of major faults, seismic lines and wells referred to in the text

palynological age, is suggested to be the Black Alley Shale. The well EOC Jenavale 1 intersects the B60 (base Black Alley Shale), however, the company suggests the Peawaddy Formation as the subcropping unit. The lithological descriptions for this well however are ambiguous as to whether it is the Black Alley Shale or the Peawaddy Formation. The B60 horizon is absent at EOC Glenora 1 and EOC Javel 1 however the lithological descriptions suggest Black Alley Shale is present. In addition the cuttings descriptions of EOC Glenarden 1 are of poor quality, but are assigned to the Black Alley Shale.

A region within the Denison Trough shows generalised attributes of the Peawaddy Formation, Black Alley Shale and Bandanna Formation (Figures 2 and 3, area C).

There are six seismic lines in this area and one well, which was drilled on the hanging wall east of the Hutton-Wallumbilla fault. The seismic lines 98A-31 and 98C-37 (Comet Ridge Survey 1998A and 1998C, respectively) situated on the eastern side of the region indicate that the strata in this area have been truncated down section. The well GSQ Taroom-11-11A further north intersects the Peawaddy Formation below the Surat Basin. This well confirms the presence of this formation as the subcropping unit in the north of the trough. It also demonstrates that the seismic horizon data are not precise, as they indicate the presence of the Clematis Group in this area.

The SBEA seismic horizons in the western Denison Trough suggest areas of Clematis Group, Rewan Group and the Bandanna Formation as the subcropping units between the Merivale Fault and the Hutton-Wallumbilla Fault (Figures 2 and 3, area D). Well coverage over these areas, however, shows the Moolayember Formation to be the main stratigraphic unit intersected. Seismic data to the east of the Merivale Fault show a thinning of the Triassic strata in this region. A number of wells in this area do not intersect the Rewan Group and Clematis Group from the Triassic sequence. Further north also, over the Denison Trough, the full Triassic sequence is present, as can be seen in the well AAR Maintop 1. Palynology results are employed in this area using the classification of Price (1997) from three wells as follows: SPO Omeo 1 contains APT32, AGL Chesney 1–APT331 and AGL Mount Hutton 1 -APT22-APT31. These results indicate the Moolayember Formation; however, the result from the well AGL Mount Hutton 1 suggests an age range from the top most Rewan Group through to the bottom of the Moolayember Formation.

There are small inliers on the northern Roma Shelf, where the Moolayember Formation is not preserved (Figures 2 and 3, area E). Interpretation of thin Bowen Basin cover in this region excludes seismic interpretation, due to poor seismic resolution; hence, well data are the primary source of information in this region. The B90 seismic horizon partly overlies the B65 surface in this area, which represents the Moolayember Formation in contact with the Blackwater Group. The Blackwater Group inlier is interpreted based on three wells (AAO Durham 1, AAO Mooga 1 and AAO Mooga 2) and the absence of the B90 horizon overlying the B65 horizon. The delineation of other inliers in this region is based only on well intersections.

A small area of Baralaba Coal Measures within a Rewan Group inlier in the east is interpreted by a combination of data from the UOD South Burunga 1 well and the relevant seismic horizons (Figures 2 and 4, area F). The area of this inlier, however, is much less than that suggested by the seismic horizons; in addition, there are nine Peat wells that intersect the Rewan Group within the area suggested by the seismic horizons.

In the southern Bowen Basin, there are coal measures considered to be part of the Burunga Formation (Figure 1). This formation also consists of marine strata, which are stratigraphically younger than the Scotia Coal Member of the Burunga Formation. These marine strata are equivalent to coal bearing strata further west and also underlie coal measures of the same unit (Green, 1997). Wells in the Burunga Formation inlier on the eastern side of the Bowen Basin contain subcropping marine strata with other

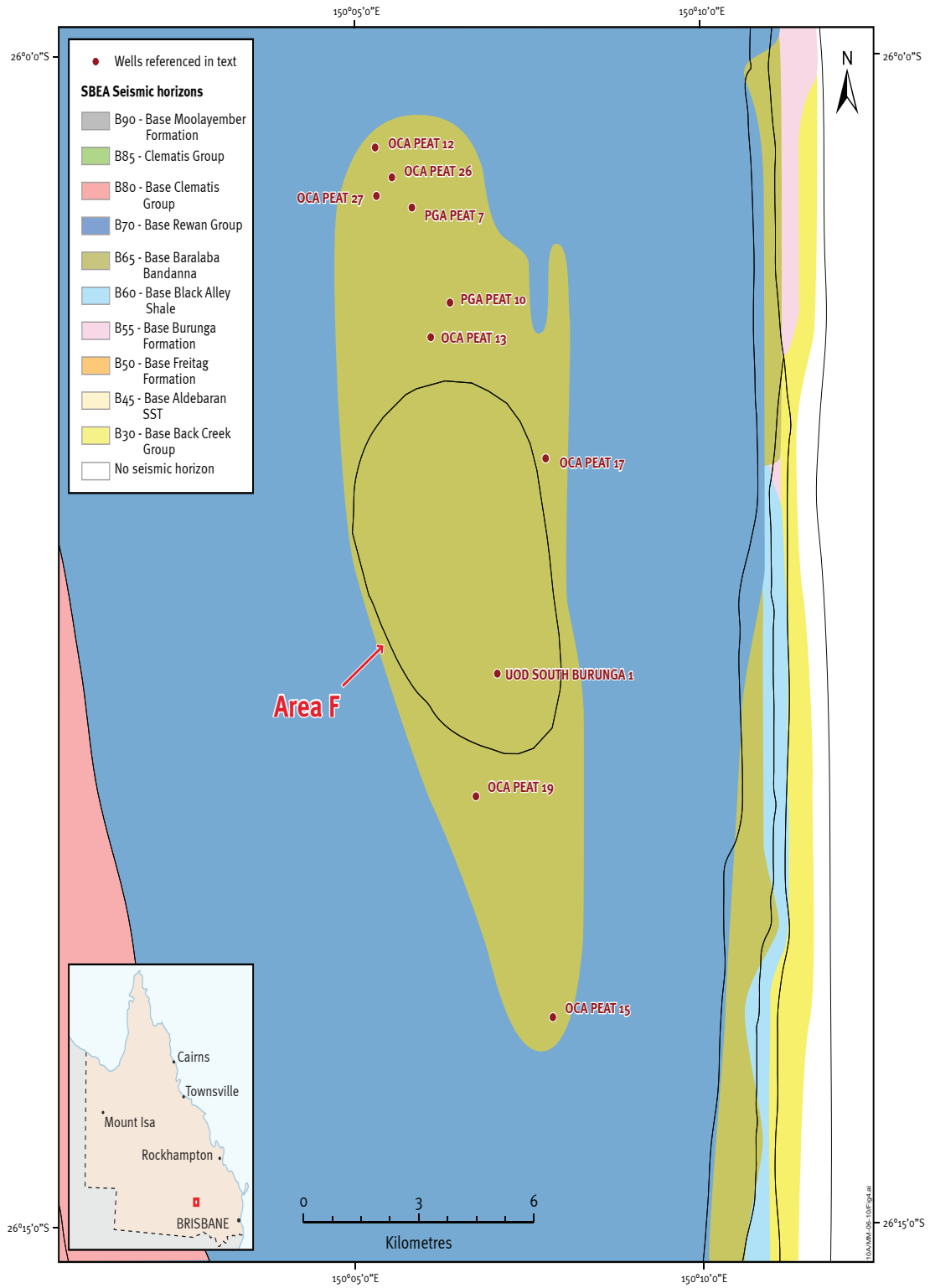


Figure 4. An area in the north-east of the Bowen Basin where the subcropping unit has been interpreted as the Baralaba Coal Measures.

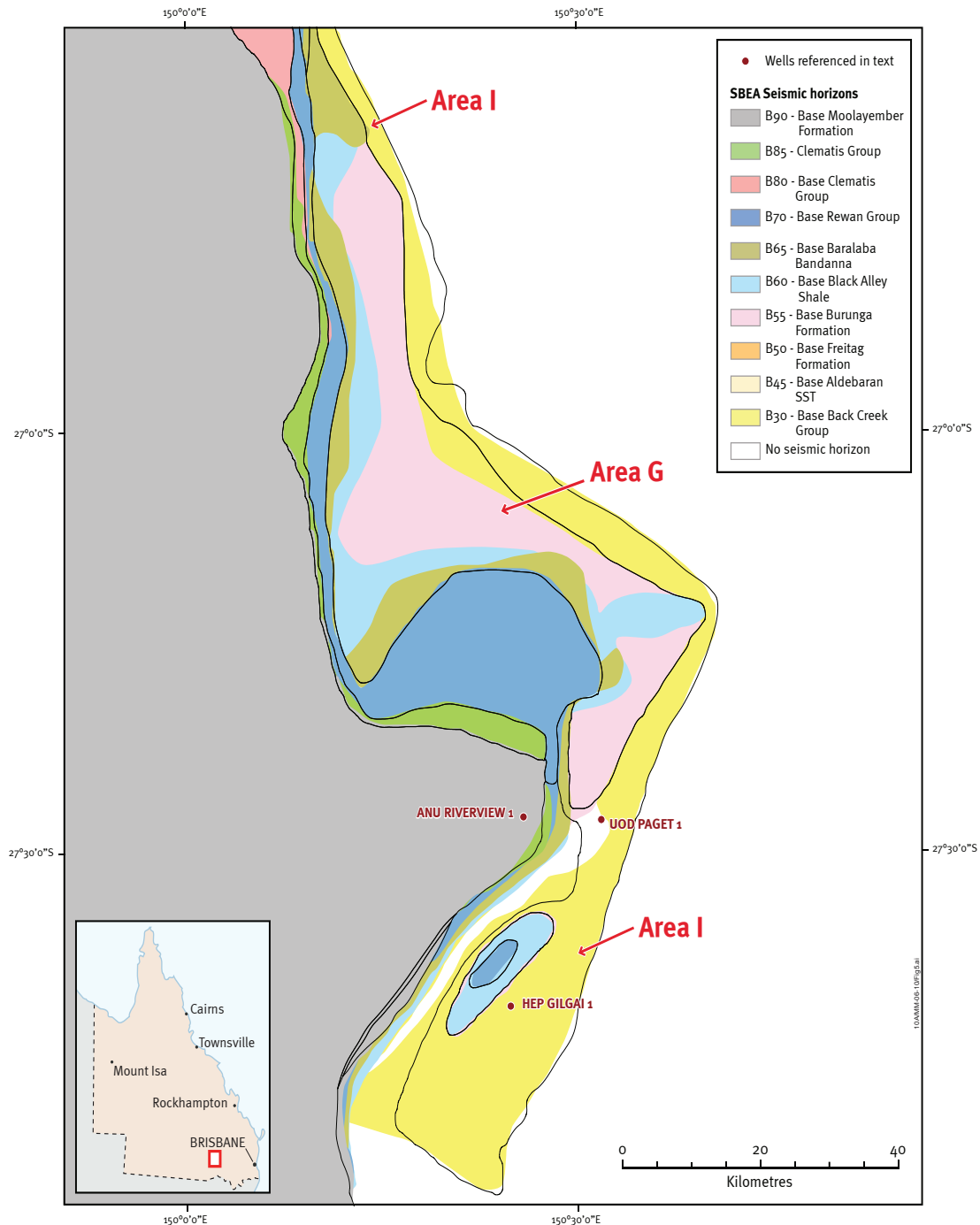


Figure 5. Interpretation of the south-east Bowen Basin with areas G and I highlighted

wells intersecting coal bearing strata further down section (Figures 2 and 5, area G). The lithological descriptions for this area also fit that of the Burunga Formation.

Early Permian outliers on the western flanks of the Bowen Basin are determined from the seismic interpretation of half-graben structures and the presence of the Early Permian Reids Dome beds in the wells AAO Lorne 1 and SOC Bogong 1 (Figure 2, area H). The half-graben structures consist of a series of troughs, including the Arbroath, Bogong and Katanga troughs (Korsch & others, 2009). Similar structures may occur in this area, but are undetected due to the lack of data. Poor seismic quality precludes accurate placement of the trough boundaries.

Area I (Figures 2 and 5) in the south-eastern Bowen Basin is attributed by the SBEA mapping to Back Creek Group (B30) overlying the Early Permian volcanics. Two wells, HEP Gilgai 1 and UOD Paget 1 that intersect this horizon contain palynological dates suggesting Middle Permian and late Early Permian, respectively. Seismic line data also show the strata being truncated down section to the east of these wells on the edge of the basin. This stratal group has been interpreted along the eastern flanks adjoining the basin margin, where it merges with two sections of grouped strata containing the Buffel, Otrack and Barfield formations and the Flat Top and Gylanda formations.

Delineation of the eastern basin margin is based primarily on the extremity of the SBEA B30 seismic horizon (base Back Creek Group). The western margin is relatively undeformed in comparison with the eastern margin. The western boundary is primarily based on the SBEA margin; however, well intersections and seismic interpretation have been used to refine this boundary.

CONCLUSIONS

This new interpretation of the subcropping units of the southern Bowen Basin underlying the Mesozoic Surat Basin provides revised basin margin delineations and stratigraphic interpretations. The approach used in this study demonstrates the value of an interdisciplinary methodology applied to regional geological interpretations. The SBEA seismic horizons provide a valuable starting point, but lack adequate resolution in some areas. Integrating well data and 2D seismic profile interpretation puts tighter constraints on original modelled boundaries and surface geometrical interpretations. Where dense well data are present more precise boundaries can be determined than those indicated by seismic data. These new constraints assist in reducing the potential exploration risk associated with the significant mineral and hydrocarbon resources hosted in the Bowen Basin. The GIS dataset provides a foundation for exploration companies and also assists in establishing new targets for future exploration efforts.

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Appendix 1: Reviewed wells and seismic lines

Reviewed Wells by Company	Reviewed Wells by Name	Viewed Seismic Lines	Seismic Survey Name
AAO Durham 1	MOL (Boyanda) 1	78-2	Surat Basin Regional Survey
AAO Durham1	HOM Alick Creek 1	78-3	Surat Basin Regional Survey
AAO Glentulloch 1	UOD Auburn 1	78-6	Surat Basin Regional Survey
AAO Grafton Range 19	UOD Bennett 1	79-C1	Spring Creek
AAO Grafton Range 9	UOD Bennett 2	79-C2	Spring Creek
AAO Kia Ora 1	UOD Bennett 3	79-C3	Spring Creek
AAO Kooringa 1	UOD Bennett 4	79-C4	Spring Creek
AAO Meeleebee 1	UOD Bennett North 1	79-C5	Spring Creek
AAO Mooga 1	TAI Bentley 1	79-C6	Spring Creek
AAO Mooga 1	UOD Booroondoo 1	79-E16	Eddystone & Detail
AAO Mooga 2	UOD Cherwondah 1	79-E2	Eddystone & Detail
AAO Mooga 2	GWH Cherwondah 2	79-K11	Kildare
AAO Mooga 3	AGL Chesney 1	79-K14	Kildare
AAO Mooga 4	UOD Cobbareena 1	79-K8	Kildare
AAO Mount Beagle 1	UOD Columboola 1	79-K9	Kildare
AAO Sawpit Creek 1	UOD Condamine 1	80-E104	Eddystone 80
AAO Tabers 1	UOD Conloi 1	80-H07	Piebald-Marmadua
AAO Westgrove 1	UOD Cooloomala 1	80-H20	Piebald-Marmadua
AAO Westgrove 2	TMR Devon Park 1	80-H32	Tara North
AAO Westgrove 3	UOD Dockerill 1	80-H34	Tara North
AAO Westgrove 4	AAO Durham 1	80-H39	Tara North
AAO Westland 1	AAO Durham1	80-H44	Mundagai-Weir
AAO Westland 2	TOG Euroa East 1	80-H45	Mundagai-Weir

Reviewed Wells by Company	Reviewed Wells by Name	Viewed Seismic Lines	Seismic Survey Name
AAO Westland 3	HPP Gilgai 1	80-H48	Mundagai-Weir
AAO Westland 4	UOD Giligulgul 1	80-H49	Mundagai-Weir
AAO Wyena 1	SEQ Giligulgul North 1	80-H50	Mundagai-Weir
AAR Maintop 1	EOC Glenarden 1	80-P1	Pring
AAR Myrtleville 1	EOC Glenavon 1	80-P2	Pring
AAR Myrtleville 2	EOC Glenora 1	80-P3	Pring
AAR Springvale 1	AAO Glentulloch 1	80-P4	Pring
AAR Springvale 2	AAO Grafton Range 19	80-P5	Pring
AAR Westgrove 5	AAO Grafton Range 9	80-P6	Pring
AAR Yellowbank 1	ANU Green Swamp 1	80-P7	Pring
AAR Yellowbank 2	LEA Gums 1	81-107	Kooroon
AAR Yellowbank 3	ARO Gunnewin 9	81-109	Kooroon
AAR Yellowbank 4	UOD Humbug Creek 1	81-H11	Huttonvale & Extension
AGA Reben Downs 1	UOD Humbug Creek 2	81-H15	Huttonvale & Extension
AGL Chesney 1	EOC Javel 1	81-H19	AD91
AGL Mount Hutton 1	EOC Jenavale 1	81-H39	Huttonvale & Extension
AGL Yellowbank 5	OCA Kattanga 1	81-H40	Huttonvale & Extension
AGL Yoothappinna 1	AAO Kia Ora 1	81-H41	Huttonvale & Extension
ANU Green Swamp 1	SPO Kia Ora West 1	81-H53	Huttonvale & Extension
ANU Miles 1	AAO Kooringa 1	81-H54	Huttonvale & Extension
ANU Riverview 1	UOD Leichhardt 1	81-T10	Tullagrie
ANU Riverview 1	UOD Leichhardt 2	81T-9	Tarilla
AOL Upson 1	TMA Lorraine	82-505	Bonanza

Reviewed Wells by Company	Reviewed Wells by Name	Viewed Seismic Lines	Seismic Survey Name
APN Snake Creek wells	AAR Maintop 1	83-E20	Mooga Gas Field
ARO Gunnewin 9	OCA Maintop 2	83-E24	Mooga Gas Field
CQN Yellowbank 6	AAO Meeleebee 1	83-E323	South Denison
CQN Yellowbank 7	ANU Miles 1	83-E324	AD91
EOC Glenarden 1	UOD Miles Creek 1	83-E325	AD91
EOC Glenavon 1	AAO Mooga 1	83-E336	South Denison
EOC Glenora 1	AAO Mooga 1	84-E413	South Denison
EOC Javel 1	AAO Mooga 2	84-E414	South Denison
EOC Jenavale 1	AAO Mooga 2	84-E416	South Denison
GSQ Taroom 11-11A	AAO Mooga 3	84-E419	South Denison
GSQ Taroom 12-12A	AAO Mooga 4	84-E420	South Denison
GSQ Taroom 15	AAO Mount Beagle 1	84-L12	Lyndon Caves & Extension
GSQ Taroom 17	AGL Mount Hutton 1	84-L17	Lyndon Caves & Extension
GWH Cherwondah 2	AAR Myrtleville 1	84-L19	Lyndon Caves & Extension
GWH Pineview 1	AAR Myrtleville 2	84-L24	Lyndon Caves & Extension
HEP Royston 1	RPN North Cherwondah 1	84-L56	Lyndon Caves & Extension
HEP Royston 3	SPO Omeo 1	84-L58	Lyndon Caves & Extension
HEP Royston 4	UOD Paddy Creek 1	84-L60	Lyndon Caves & Extension
HOM Alick Creek 1	UOD Paget 1	84VR-1	Vickery
HPP Gilgai 1	OCA Peat 16	84VR-2	Vickery
LEA Gums 1	GWH Pineview 1	84VR-3	Vickery
MOL (Boyanda) 1	AGA Reben Downs 1	84VR-4	Vickery
MON Southeast Moonie 1	UOD Retreat 1	84VR-6	Vickery

Reviewed Wells by Company	Reviewed Wells by Name	Viewed Seismic Lines	Seismic Survey Name
NIL Xenolith 1	ANU Riverview 1	84-W21A	Wallabella & Extension
OCA Kattanga 1	ANU Riverview 1	84-W21B	Wallabella & Extension
OCA Maintop 2	UOD Rogers 1	84-W32	Wallabella & Extension
OCA Peat 16	TOG Round Mountain 1	85-H23	Hospital Hill
OCA Toryboy 1	HEP Royston 1	85-H7	Hospital Hill
OCA Toryboy 2	OEC Royston 2	85-K501	Killoran
OEC Royston 2	HEP Royston 3	85-K502	Killoran
RPN North Cherwondah 1	HEP Royston 4	85MU-9	Muya
SEQ Giligulgul North 1	AAO Sawpit Creek 1	85-N16	Niella & Extension
SPO Kia Ora West 1	APN Snake Creek wells	85-N19	Niella & Extension
SPO Omeo 1	UOD South Burunga 1	85-N2	Niella & Extension
TAI Bentley 1	MON Southeast Moonie 1	85-N20	Niella & Extension
TMA Lorraine	UOD Southwood 1	85-N24	Niella & Extension
TMR Devon Park 1	AAR Springvale 1	85-N4	Niella & Extension
TOG Euroa East 1	AAR Springvale 2	86-D10	Dilginbilly
TOG Round Mountain 1	AAO Tabers 1	86-D10a	Dilginbilly
TOG Taringa 1	UOD Tara 1	86-D16	Dilginbilly
UOD Auburn 1	UOD Tara South 1	86-D20	Dilginbilly
UOD Bennett 1	TOG Taringa 1	86-D22	Dilginbilly
UOD Bennett 2	GSQ Taroom 11-11A	86-D7a	Dilginbilly
UOD Bennett 3	GSQ Taroom 12-12A	86-D9	Dilginbilly
UOD Bennett 4	GSQ Taroom 15	86-D9a	Dilginbilly
UOD Bennett North 1	GSQ Taroom 17	86-P2	Pamaroo

Reviewed Wells by Company	Reviewed Wells by Name	Viewed Seismic Lines	Seismic Survey Name
UOD Booroondoo 1	UOD Tey 1	86-P20	Pamaroo
UOD Cherwondah 1	UOD Tinhut 1	86-P4	Pamaroo
UOD Cobbareena 1	OCA Toryboy 1	86-P5	Pamaroo
UOD Columboola 1	OCA Toryboy 2	86-P6	Pamaroo
UOD Condamine 1	UOD Undulla 1	86-P6a	Pamaroo
UOD Conloi 1	AOL Upson 1	87-WD12	Woodduck
UOD Cooloomala 1	AAO Westgrove 1	87-WD14	Woodduck
UOD Dockerill 1	AAO Westgrove 2	87-WD38	Woodduck
UOD Giligulgul 1	AAO Westgrove 3	87-WD8	Woodduck
UOD Humbug Creek 1	AAO Westgrove 4	87-WD8a	Woodduck
UOD Humbug Creek 2	AAR Westgrove 5	88-C1	Coot
UOD Leichhardt 1	AAO Westland 1	88-C12	Coot
UOD Leichhardt 2	AAO Westland 2	88-C33	Coot
UOD Miles Creek 1	AAO Westland 3	88-M20	Marengo
UOD Paddy Creek 1	AAO Westland 4	88-M21	Marengo
UOD Paget 1	UOD Wieambilla 1	88-M22	Marengo
UOD Retreat 1	AAO Wyena 1	98A-31	Durham (Comet Ridge Seismic Survey 98A)
UOD Rogers 1	NIL Xenolith 1	98A-32	Durham (Comet Ridge Seismic Survey 98A)
UOD South Burunga 1	XLX Xyl-I 1	98C-37	Comet Ridge 1998C
UOD Southwood 1	XLX Xyloid 1	98C-38	Comet Ridge 1998C
UOD Tara 1	AAR Yellowbank 1	A82LT-13	Lentara
UOD Tara South 1	AAR Yellowbank 2	A82LT-14	Lentara

Reviewed Wells by Company	Reviewed Wells by Name	Viewed Seismic Lines	Seismic Survey Name
UOD Tey 1	AAR Yellowbank 3	A82LT-15	Lentara
UOD Tinhut 1	AAR Yellowbank 4	A82LT-15a	Lentara
UOD Undulla 1	AGL Yellowbank 5	A82LT-16	Lentara
UOD Wieambilla 1	CQN Yellowbank 6	A82LT-17	Lentara
XLX Xyl-I 1	CQN Yellowbank 7	A82LT-18	Lentara
XLX Xyloid 1	AGL Yoothappinna 1	A82LT-19	Lentara
		A82LT-20	Lentara
		A82LT-20	Lentara
		A82LT-20a	Lentara
		A82LT-21	Lentara
		A82LT-23	Lentara
		A82LT-24	Lentara
		A82LT-25	Lentara
		A82LT-26	Lentara
		A82LT-27	Lentara
		A82LT-28	Lentara
		A82LT-3	Lentara
		A82LT-30	Lentara
		A82LT-8	Lentara
		A82LT-8a	Lentara
		AD90-18	AD90
		AD90-20	AD90
		AD90-23	AD90

		Viewed Seismic Lines	Seismic Survey Name
		AD90-23a	AD90
		AD91-25	AD91
		AD91-26	AD91
		AD91-27	AD91
		AD91-29	AD91
		AD91-32	AD91
		AD91-32a	AD91
		AD91-33	AD91
		AD91-34	AD91
		AD91-39	AD91
		AD91-43	AD91
		AD91-43b	AD91
		AD92B-33	AD92B
		AD94-01	AD94
		AD94-05	AD94
		AD94-09	AD94
		AD94-10	AD94
		AD94-11	AD94
		AD94-13	AD94
		AR91-28	AR91
		AT92-1	AT92
		AT92-12	AT92
		AT92-13	AT92

		Viewed Seismic Lines	Seismic Survey Name
		AT92-14	AT92
		AT92-15	AT92
		AT92-16	AT92
		AT92-2	AT92
		BBC87-13	Billa Billa Creek
		BG86-39	Bungunya-Goondiwindi
		BMR78-6	Denison Trough 78
		BUR81-10	Burunga
		BUR81-12a	Burunga
		BUR81-12b	Burunga
		BUR81-14	Burunga
		BUR81-18	Burunga
		BW85-108	Brentwood
		BW85-249	Brentwood
		BW85-251	Brentwood
		BW85-257	Brentwood
		BW85-259	Brentwood
		BW85-261	Brentwood
		BW85-263	Brentwood
		CR95A-04	Comet Ridge (Fairview) Phase 1
		CR95A-05	Comet Ridge (Fairview) Phase 1
		CR95A-06	Comet Ridge (Fairview) Phase 1
		CR95A-12	Comet Ridge (Fairview) Phase 1

		Viewed Seismic Lines	Seismic Survey Name
		CR95A-13	Comet Ridge (Fairview) Phase 1
		CR95B-22	Comet Ridge (Fairview) Phase 2
		CR95B-23	Comet Ridge (Fairview) Phase 2
		CTC96-4	Cabbagetree Creek
		DC85-290	Downfall Creek
		G81-45	Goondiwindi
		G81-47	Goondiwindi
		G81-53	Goondiwindi
		G81-55	Goondiwindi
		G81-61	Goondiwindi
		G81-63	Goondiwindi
		GWH81-13	Wandoan81
		GWH81-13EX	Wandoan81
		GWH81-14	Wandoan81
		GWH81-15	Wandoan81
		GWH81-16	Wandoan81
		GWH81-30	Wandoan81
		GWH84-21	Wandoan
		GWH84-21	Wandoan
		GWH84-32	Wandoan
		GWH84-36	Wandoan
		GWH85-29	Conloi
		GWH87-1	South Moonie

		Viewed Seismic Lines	Seismic Survey Name
		GWH87-3	South Moonie
		GWH87-4	South Moonie
		H79-4	Tara West
		H79-6	Tara West
		H79-7	Tara West
		H79-8	Tara West
		H81BN-06	Bennett & Detail
		H81BN-27	Bennett & Detail
		H81BN-35	Bennett & Detail
		H81BN-37	Bennett & Detail
		H81ER-12	Eurombah
		H81ER-14	Eurombah
		H81ER-4	Eurombah
		H81ER-6	Eurombah
		H81ER-8	Eurombah
		H82-101	Talinga
		H82-101a	Talinga
		H82-102	Talinga
		H82-103	Talinga
		H82-104	Talinga
		H82-105	Talinga
		H82-106	Talinga
		H82-107	Talinga

		Viewed Seismic Lines	Seismic Survey Name
		H82-108	Talinga
		H82-109	Talinga
		H82-110	Talinga
		H82-111	Talinga
		H82-112	Talinga
		H82BN-102	Bennett & Detail
		H82BN-103	Bennett & Detail
		LDC87-1	Deep Crossing
		LDC87-2	Deep Crossing
		LDC87-3	Deep Crossing
		LDC87-4	Deep Crossing
		LDC87-5	Deep Crossing
		MM88-1	Moonie North
		MM88-11	Moonie North
		MM88-17	Moonie North
		MM88-1a	Moonie North
		MM88-2	Moonie North
		MM88-3	Moonie North
		MM88-5	Moonie North
		MM88-6	Moonie North
		MM88-7	Moonie North
		MS87-16	Trackers Lagoon
		P81-104	Goodar

		Viewed Seismic Lines	Seismic Survey Name
		P81-104a	Goodar
		P81-106	Goodar
		P81-107	Goodar
		P81-108	Goodar
		P81-109	Goodar
		P81-110	Goodar
		P81-111	Goodar
		P81-112	Goodar
		PR81-1	Rockwood & Extension
		PR81-10	Rockwood & Extension
		PR81-11	Rockwood & Extension
		PR81-12a	Rockwood & Extension
		PR81-12b	Rockwood & Extension
		PR81-19	Rockwood & Extension
		PR81-1a	Rockwood & Extension
		PR81-2a	Rockwood & Extension
		PR81-4	Rockwood & Extension
		PR81-7	Rockwood & Extension
		PR81-8	Rockwood & Extension
		PR81-9	Rockwood & Extension
		PR81-9a	Rockwood & Extension
		Q85-G1	Girraween
		Q85-G10	Girraween

		Viewed Seismic Lines	Seismic Survey Name
		Q85-G12	Girraween
		Q85-G2	Girraween
		Q85-G3	Girraween
		Q85-G4	Girraween
		Q85-G5	Girraween
		Q85-G6	Girraween
		Q85-G7	Girraween
		Q85-G8	Girraween
		R80-15	R80
		R80-17	R80
		R83-71	R83
		R83-75	R83
		R85-127	R85
		R85-130	R85
		R85-143	R85
		R85-153	R85
		R86-201	R86
		R86-221	R86
		R86-223	R86
		R86-225	R86
		R86-227	R86
		R86-229	R86
		S79-850	Surat Basin 79

		Viewed Seismic Lines	Seismic Survey Name
		S79-854	Surat Basin 79
		S79-854a	Surat Basin 79
		SB86-13	Sunny Corner-Bendidee
		SB86-19	Sunny Corner-Bendidee
		SB86-5	Sunny Corner-Bendidee
		T82L-3	Leichhardt & Infill
		T82WR-15	Weranga
		T82WR-15	Weranga
		T82WR-21	Weranga
		T82WR-22	Weranga
		T82WR-23	Weranga
		T82WR-24	Weranga
		T82WR-25	Weranga
		T82WR-26	Weranga
		T82WR-27N	Weranga
		T82WR-27S	Weranga
		T82WR-28	Weranga
		T83PR-4	Perth
		TH85-273	Tinhut
		TH85-279	Tinhut
		TH85-282	Tinhut
		TH85-287	Tinhut
		TMR80-24	Bennett

		Viewed Seismic Lines	Seismic Survey Name
		TRM05-03	TRM05 Round Mountain 2D
		TRM05-04	TRM05 Round Mountain 2D
		TRM05-05	TRM05 Round Mountain 2D
		WEP84-10	Dockerill
		WEP84-11	Dockerill
		WEP84-15	Dockerill
		WEP84-2	Dockerill
		WEP84-3	Dockerill
		WEP84-4	Dockerill
		WEP84-5	Dockerill
		WEP84-6	Dockerill
		WEP84-7	Dockerill
		WEP84-8	Dockerill
		XX85-11	Xylex & Extension
		XX85-17	Xylex & Extension
		XX85-21	Xylex & Extension
		XX85-9	Xylex & Extension

