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PROGRESS IN MAPPING THE PRECAMBRIAN OF THE CURDIMURKA AREA

GEOLOGICAL SURVEY

by

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DEPARTMENT OF MINES AND ENERGY
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ABSTRACT

Adelaidean (late Proterozoic) sedimentary rocks of the Willouran Ranges, southeast CURDIMURKA map area, have been mapped in varying detail by a large number of geologists over the years. This report notes work done since early 1981. Recently released map data by the Utah Development Company will provide additional valuable information for the CURDIMURKA geological map. Survey mapping has been plotted for about 30% of the Precambrian and covers fault-bounded structural complexes in the Callanna Group and sections measured through upper Burra Group and overlying glacial beds tentatively correlated with the Bolla Bollana Tillite and Wilyerpa Formation (Umberatana Group). Near Chintapanna Dam the post-glacial Amberoona Formation cuts down through the lower glacial beds into the upper Burra Group and overlies part of the structural complex associated with the Bungarider Fault.

INTRODUCTION

This report summarises information gathered during geological mapping of Adelaidean rocks on CURDIMURKA since the last progress report (Forbes and Callen, 1981). Related reports, currently in preparation, describe the stratigraphy of the Skillogalee Dolomite (Belperio, in preparation) and Phanerozoic rocks (mainly Mesozoic and Cainozoic - Krieg, 1984 and Callen, 1984).

As outlined in Forbes and Callen, 1981, the CURDIMURKA map area lies in the southwest Eromanga Basin west of Marree and contains, mainly in its southeastern quadrant, folded and fractured Adelaidean (upper Precambrian) sedimentary rocks of the Willouran Ranges and adjacent inliers (Fig. 1).

PREVIOUS INVESTIGATIONS

Earlier work is covered in the last progress report. Prior to relinquishing in 1983 their Exploration Licence 850 Willouran

Ranges, Utah Development Company continued to carry out some drilling and geochemical sampling in the region. Results are described in open file envelope No. 3507. This and envelope 2915, covering the successive EL's 227, 461 and 850 provide geological maps and other useful and detailed background data on the Willouran Ranges. The region is now covered by EL 1196, CRA Exploration Pty Ltd.

A formalised subdivision of the Callanna Group and part of the Burra Group was presented by Forbes, Murrell and Preiss (1981). This was based on Murrell's original informal names and further section measurement and mapping by Forbes and Preiss.

In 1983 Parker made a structural study of the Rischbeith megabreccia zone and Coats and Dalgarno commented on large-scale slumping in the Umberatana Group.

Petrological work has been carried out by McColl (1983), Farrand (1984), Brown (1984) and McColl and Brown (1984).

Systematic regional mapping did not resume until 1983, when A.P. Belperio and B.G. Forbes each completed about eight weeks' section measurement and mapping between April and September. Photo interpretation of field data is currently in progress and about 30% completed.

Members of the Regional Geology Branch are grateful to Utah geologists for hospitality and use of facilities at their camp and to managers at Witchelina, Callanna, Muloorina and Mundowdna stations for friendly assistance.

CALLANNA GROUP

Mapping and photo-interpretation of the megabreccia zone extending between the southeast corner of the map area and "Callanna" has resulted in identification of most of the major blocks comprising the megabreccia (Fig. 2). One point to be checked in this zone is the possibility of sandstone in sequence above the Boorloo Siltstone southwest of the Rook workings, east-southeast of Mirra Bore. This could be an additional sandstone unit in the Curdimurka Subgroup or basal Burra Group. From Parker's work (1983) in the Rischbieth inlier, similar relationships may exist there between sandstone and possible Boorloo Siltstone. On the CURDIMURKA preliminary map some Witchelina Quartzite is shown here (based on Ruker, 1966). However, Rowlands and Blight do not recognise any typically basal

Burra Group in this area (Utah Development Co., 1979, envelope 3506, volume 6).

The narrow breccia zone west of Tarlton Knob contains a block of probable Cooranna Formation.

Blocks of folded Black Knob Marble have been examined at Black Knob, but the relationship with enclosing brecciated sandstones is not evident.

BURRA GROUP

Basal Burra Group is well exposed northeast of Black Knob. The Witchelina Quartzite as identified here by Murrell (1977) contains much more carbonate than it does in the eastern Willouran Range. It is difficult to make correlations between western and eastern areas within the Emeroo Subgroup (Top Mount Sandstone Beds, Willawalpa Formation and Witchelina Quartzite). Contact with the underlying Callanna Group is a fault.

Upper and lower contacts of the overlying Skillogalee Dolomite have been difficult to fix in some areas, but this is under study by A.P. Belperio and will be reported separately.

The type section of the Myrtle Springs Formation has been examined near Copley. The characteristic lithology is greenish siltstone, and is accompanied by quartzite and carbonate weathering yellow-brownish. It is thus considered likely that the generally thick siltstone-quartzite-carbonate sequence on CURDIMURKA between Skillogalee Dolomite and glacial beds is entirely Myrtle Springs Formation. Greenish siltstone is generally present at intervals throughout this sequence and it is not thought appropriate to restrict the name Myrtle Springs to a basal unit, as has been proposed by Murrell (1977).

Myrtle Springs Formation forms the lowest part of a stratigraphic section measured north of Mount Norwest (Appendix A and Figs, 1, 3, 4, 6 and 7). The base of the formation here was chosen as the incoming of prominently-outcropping carbonate-poor sands and greenish silts in contrast with an underlying greyish and reddish carbonate-rich sequence.

Greenish siltstones do not appear in the uppermost part of the formation in this section but do occur immediately below the glacial beds along strike to the northwest. Total thickness here is 358 m.

North of North Bungarider Dam the basal units of the Myrtle Springs Formation (total thickness 700 m) are quartzitic and lacking in carbonates, overlying a carbonate-quartzite-siltstone sequence assigned to the Skillogalee Dolomite. North of Mirra Bore basal units are silty sandstone. In the South Bungarider region total thickness is 4 600 m and north of Chintapanna Dam 2 500 m.

UMBERATANA GROUP

The Sturtian glaciation is represented by two sequences, a lower, relatively massive diamictite, ?Bolla Bollanna Tillite (Figs 8-10), and an upper flaggy quartzite-siltstone-diamictite sequence, probably Wilyerpa Formation (Figs. 10,11). These are exemplified in the stratigraphic section (Figs 3, 4 and Appendix A) north of Mount Norwest, where they would appear to be conformable. South of Chintapanna Dam and northeast of Willouran Hill the lower diamictite appears to have suffered erosion in places prior to deposition of the overlying Wilyerpa Formation.

As described by earlier investigators (Murrell, 1977, Coats and Dalgarno, 1983) the Amberoona Formation displays large-scale slumping. Near Chintapanna Dam it cuts across the underlying Tapley Hill, Wilyerpa and Myrtle Springs Formations and in places contains a bouldery basal diamictite.

Upper units of the Umberatana Group including the Elatina Formation, occur west of Mount Norwest, but have yet to be completely mapped.

WILPENA GROUP

The Wilpena Group is exposed in scattered outcrops in southern Wangianna and Bopeechee. It has been mapped by Murrell (1977) and examined subsequently by Coats and Forbes, but further checking will be required.

STRUCTURAL GEOLOGY

Parker (1983) has demonstrated in the megabreccia zone (Rischbieth Structural Complex) between Tarlton Knob and Rischbieth Well the presence of an older generation of fold hinges, trending northerly. These lie within fault and breccia-bound blocks, some of which appear to contain rocks of latest Willouran age. This area was mapped in detail in 1979 by N.J.

Rowlands and P.G. Blight who identified units ranging from Dome Sandstone to Boorloo Siltstone (Utah Development Co., 1979, envelope 3507, vol. 6).

The folding is thought by Parker to be pre-Torrensian in age, but as yet it is not confirmed that there is a break in deposition between the Callanna and Burra Groups. However, tectonism beginning in Willouran time would serve to explain significant variations in stratigraphic thickness shown by units in the Callanna and Burra Groups.

Southeast of Tarlton Knob, much of what was shown on earlier maps as diapiric breccia now appears to be Amberoona Formation rather than Callanna Group. This has already been shown on maps by Utah Development Company.

Some megabreccia zones are bounded by regular sedimentary carbonate beds which may have acted as slip surfaces. South of Tarlton Knob carbonate forms the base of the younger sequence (Skillogalee Dolomite, Myrtle Springs Formation). Northeast of Kingston Dam (Figs 2 and 5) a carbonate at the base of the Top Mount Sandstone Beds adjoins faulted Callanna Group for a great distance. Southwest of Douglas Gully a carbonate bed at the base of the Boorloo Siltstone forms a remarkably straight feature faulted against Amberoona Formation.

Attitudes of faults shown in the geological sketch section, Figure 5, are by no means certain. All faults appear to have steep attitudes, but some, since they partly follow stratigraphic units at the surface, are given attitudes subparallel to bedding in depth. Nature and attitude of contents of structural complexes at depth are also uncertain. The isolated structure west of the Bungarider Fault is informally labelled Tarlton west diapir, since it appears to be composed largely of a tectonic breccia intruding the Skillogalee Dolomite. It contains basic plugs or blocks and has been mapped in detail by Peter Blight (Utah, envelope 2915, vol. 13).

CONCLUSIONS

Further work on structurally complex parts of the Callanna Group has enabled identification of component blocks, some of which record fold hinges which may have originated in Willouran time. Although Utah geologists have made considerable contributions in these areas, further work may be necessary to adequately explain relationships.

There is also still much scope for studying thickness and facies variations of other Adelaidean sedimentary units and possible tectonic and other causes for these. The current phase of mapping has covered most of the Adelaidean outcrop and photo-interpretation of this suggests that not a great deal of further checking will be needed to complete the first stage of the 1:250 000 geological map.

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TABLE 1 PRECAMBRIAN STRATIGRAPHY

Age	Stratigraphic unit and symbol	Lithology	Thickness (m)	Remarks
Adelaidean	Wilpena Group Pw		(total 450+)	(Total Adelaidean 20 700 +)
	Wonoka Formation Pww	Yellow and reddish flaggy limestone, green calcareous shale, siltstone, limestone breccia.	600	South of Coward Cliff, Bopeechee; shallow marine.
	Bunyeroo Formation Pwb	Reddish and greenish siltstone.	300	Southwest of Coward Cliff, Bopeechee; contains Wearing Dolomite Member.
	ABC Range Quartzite Pwa	Grey and reddish flaggy quartzite with shale clasts.	600	Southwest of Coward Cliff; ?deltaic. Cross bedding.
	Brachina Formation Pwr	Grey, greenish, reddish siltstone sandstone.	450	Southwest to southeast of "Stuart Creek"; Trecompana and Bopeechee. Flute casts, mud cracks, current lineation.
	Nuccaleena Formation Pwn	Pale yellowish, reddish laminated dolomite.	4	Southern and eastern Wangianna.
	Umberatana Group		(total 7 880)	
	Elatina Formation Phl	Reddish and white sandstone, siltstone.	70	Southern Wangianna; Willochra Subgroup.
	Yerelina Subgroup Pe	Diamictite, slate, quartzite.	1 100	Eastern Wangianna; upper glacial sequence, equivalent to Elatina Formation.
	Enorama Shale Pfe	Grey-green silty and dolomitic shale.	50	Southern Wangianna; Farina Subgroup.
	Etina Formation Phe	Sandy limestone and dolomite.	25	Southern Wangianna.
	Angepena Formation Pha	Reddish and green siltstone, shale and carbonate.	140	Southern Wangianna.
	Amberoona Formation Pfa	Greenish and grey siltstone, shale and slump breccias.	3 000	Southern Wangianna. Slumps have replaced the Tapley Hill Formation in places.
	Tapley Hill Formation Pft	Grey laminated siltstone; dark, finely laminated basal dolomite and siltstone (Tindelpina Shale Member).	1 600	Southern Wangianna: marine.
	Wilyerpa Formation Puw	Pebbly sandstone, quartzite, diamictite green siltstone.	200	Possible Sturt Tillite equivalent. Pyl unit on COPLEY. Widespread lower glacial.

Age	Stratigraphic unit and symbol	Lithology	Thickness (m)	Remarks
		U N C O N F O R M I T Y		
	Burra Group Pb		(total 7 240)	
	Myrtle Springs Formation Pbm *BT1-4, BR1-3, W4-5	Green siltstones, sandstone and grey dolomite.	1 500	Large areas in southern Wangianna.
	Skillogalee Dolomite Pbk TW1-7, TN1, W3, F2-F8, W1-3, ER4-6, E12	Dark dolomite, magnesite, sandstone, siltstone.	2 000-3 700	Large areas in southern Wangianna. ?Lagoonal to shallow marine. Mud cracks, edgewise breccia.
	Emeroo Subgroup Po			
	Witchelina Quartzite Pow F1, N1-2, T1-3, ER1-3, WW1-3, T1-2, E5-9.	Flaggy to medium-bedded feldspathic quartzite, siltstone.	800	Prominent ridges in Willouran Range. Cross bedding, ripple marks. ?Deltaic.
	Willawalpa Formation Pol	Flaggy to platy quartzite, siltstone minor dolomite.	2 200	Ripple marks, mudcracks, lenticular bedding. Pre-Witchelina beds named after Murrell. Possibly equivalents of River Wakefield Subgroup. ?Tidal environment.
	Top Mount Sandstone Beds Pot	Medium-bedded to platy quartzite, siltstone, minor dolomite overlying	215	Ripple marks, mud cracks, halite and ?gypsum casts.
		dolomite, shale, sandstone.	530	Ripple marks, mud cracks, wavy bedding.
	Callanna Group Pc		(total 5 200+)	Wangianna.
	Curdimurka Subgroup Pk			
	Boorloo Siltstone Pkb TN4-6, WU3-5, BS3-5, WR3-5, K5.	Grey siltstone, dolomite, limestone, minor sandstone.	520	?Shallow marine.
	Cooranna Formation Pkc TN3, RS1-2, WR1-2, WU1-2, K4	Grey, greenish flaggy siltstone, sandstone, minor dolomite.	2 200	Halite, gypsum casts, mud cracks. ?Lacustrine.
	Hogan Dolomite Pkh R5, K3	Light brownish and grey flaggy to medium-bedded dolomite, partly sandy; chert.	640	Stromatolites, gypsum pseudomorphs cauliflower chert, ripple marks. ?Sabhka environment.
	Recovery Formation Pkr R4, K2	Grey, greenish flaggy siltstone, sandstone, minor dolomite.	2 200	Halite and gypsum casts, mud cracks, ripple marks. Lacustrine or tidal environment.

* equivalent unit, Utah Development Co.

Age	Stratigraphic unit and symbol	Lithology	Thickness (m)	Remarks
	Dunns Mine Limestone Ɛku R3.2-4	Grey medium-bedded to flaggy limestone partly sandy, sandstone, chert.	330	Wavy bedding, load casts, lenticular bedding. ?Marginal marine, sabkha.
	Rook Tuff Ɛkk R3.1, EC3	Dark, slaty rock, in places silty, sandy; minor carbonate.	40	Dacite flow south of Dunns
	Dome Sandstone Ɛkd EC3 (lower) R2, K1	Thin to medium-bedded quartzite, greenish siltstone, limestone; partly hematitic, pebbly.	1 480	Rippel marks, cross bedding, mud cracks. ?Fluviatile to deltaic. Mainly west and southeast of "Callanna".
	Ɛcd	Breccia		Diapiric or tectonically disturbed zones; various ages.
	Arkaroola Subgroup Ɛa Noranda Volcanics Ɛan	Altered basic lava		Probably in sequence below Dome Formation Sandstone. Equivalent to Wooltana Volcanics.
	Black Knob Marble	Laminated grey to white calcitic marble.		Distorted blocks in diapirs.

APPENDIX A

Stratigraphic Section measured approximately 0.5 km north of Mount Norwest. See Figures 1,3,4.

6438 RS359 refers to rock specimen; 2450 is number of photograph taken.

Unit No.	Notes	Thickness (metres)
	Umberatana Group Wilyerpa Formation (Underlies grey flaggy siltstone with fragmental carbonate, probable Amberoona Formation).	
73	Siltstone, greenish-grey; siltstone, sandy, brown-grey, weathering brown and greenish, pebble layers, beds 0.5-1 m; sandstone, pebbly, grey.	15
72	Diamictite, more massive, medium-grey, weathering brown, sparse pebbles of ?basaltic rock, carbonate, quartzite, chert, gneiss, pale granite, amphibolite, ?diorite 6438RS359.	52
71	Quartzite, brown and greenish, pebble layers; minor grey siltstone, ?dolomitic; siltstone, greenish.	25
70	Diamictite, crowded small clasts of quartzite and siltstone, 50 cm rounded pale granitic clast.	9
69	Quartzite, grey, medium to coarse-grained, medium- to thick-bedded, some dropstones.	16
68	Dolomite, yellow-brown.	0.3
67	Siltstone, greenish; quartzite, pebbly; quartzite, medium-grey, medium to coarse-grained, medium- to thick-bedded. 24251	33
66	Diamictite, silty, greenish.	4
65	Quartzite, grey, medium-to coarse-grained, rare small pebbles.	2
64	Diamictite, massive quartzitic matrix, laminated; fragments of siltstone, quartzite up to 40 cm, gneissic rock up to 50 cm, generally subrounded; matrix becomes greenish, silty, above.	15

63	Siltstone, greenish, pebbly, bouldery and more massive; quartzite, medium and pale grey, medium and coarse-grained; siltstone, greenish-grey, flaggy.	31
62	Quartzite, pale grey, weathering light brown, medium-grained, beds 20-60 cm, laminated.	4
61	Interbedded siltstone and quartzite with rare quartzite dropstones; siltstone, greenish, fissile; quartzite, light grey, dark greenish grey, fine and medium- to coarse-grained.	71
60	Quartzite, light grey, medium- to coarse-grained beds 0.5 to 1 m; ridge-forming.	13
59	Siltstone, greenish, poorly outcropping, with quartzite and carbonate dropstones.	17
58	Dolomite, light brownish, weathering yellow-brown, some 5-10 mm pebbles.	1
57	Siltstone, poorly-outcropping, with quartzite clasts.	13
56	Quartzite, very light grey, weathering pale brown, medium-grained, laminated, medium-bedded.	2
55	Siltstone, light brown-grey, greenish grey, some fine pebbles in places.	25
54	Quartzite, white, weathering light brown, fine- to medium-grained, faint lamination, beds up to 1 m.	5
53	Diamictite and siltstone, poorly outcropping, some carbonate fragments.	44
52	Quartzite.	1
51	Diamictite, silty and sandy matrix, light greenish grey, clasts of carbonate, amphibolite, quartzite up to 60 cm.	8
50	Quartzite, very light grey, weathering brown, medium-grained, small-scale cross-lamination.	4
49	Siltstone, pebbly, greenish and quartzite, fine-grained.	10.5
48	Carbonate, partly calcitic, fragmental.	0.5

47	Siltstone, light grey, dark greenish-grey, flaggy, lenticular bedding (?large ripples); interbedded quartzite, weathering brownish, medium-grained, cross-laminated (current apparently to southerly direction), beds 10-30 cm. 24250	16
46	Quartzite, partly pebbly, weathering brown and cream, medium- to coarse-grained, medium- to thick-bedded; quartzite light grey, very fine-grained, flaggy to medium-bedded.	9
45	Diamictite, dolomitic, light brownish, massive appearance, clasts up to about 10 cm.	10
44	Sandstone, ?dolomitic, partly pebbly, light brownish, medium- to coarse-grained, concentric weathering, beds about 1 m.	13
43	Diamictite, dolomitic, light brownish, massive, fragments up to 10 cm of carbonate, quartz, quartzite, ?gneiss and very pale grey granitic rock.	4
42	Quartzite, light brownish, medium-grained, small-scale trough cross-lamination, beds 20-100 cm; prominent outcrop.	4
41	Siltstone and fine sandstone partly calcitic, occasional sparsely pebbly layers, light grey or brownish, laminated, medium-bedded, climbing ripples. 24248,9	22
40	Diamictite, calcitic, sandy, brown-grey, weathering brown, small pebbles quartz, carbonate, chert. 24247	38
39	Quartzite, pebbly, ?dolomitic, pale grey, brownish.	2
38	Quartzite, pale, weathering dark reddish, fine-grained, medium-bedded. 24246	9
37	Quartzite, pale and brownish, medium-grained, medium-bedded and flaggy; siltstone, light brownish, flaggy.	10.4
36	Quartzite, pale brown, coarse-grained, laminated, 50 cm cross-bed unit.	10
35	Quartzite, ?dolomitic, light brownish, weathering dark reddish, faint lamination. 6438RS358	0.6

34	Siltstone, partly calcitic pale olive grey, brownish, weathering yellow-brown, laminated.	14.9
33	Sandstone, pebbly, brownish.	0.1
	(Total thickness, Wilyerpa Formation	584)
	?Bolla Bollana Tillite	
32	Diamictite, calcitic, greyish, poorly exposed, but similar to unit below.	47
31	Diamictite, calcitic, sandy, medium-grey, weathering reddish; carbonate and quartz clasts up to 10 cm, many light grey granitic fragments up to 20 cm. 24245 6438RS357	140
30	Siltstone, dolomitic, brownish, coarse-grained, flaggy, lenses of diamictite with clasts of grey carbonate up to 30 cm, chert, quartzite; coarsening downward.	15
29	Quartzite, pebbly, light grey, weathering, reddish, coarse-grained; small-scale trough cross-bedding. 24243	2
	(Total thickness, ?Bolla Bollata Tillite	204)
	Burra Group Myrtle Springs Formation	
28	Dolomite, siltstone, medium grey, weathering light brown, laminated flaggy.	8
27	Quartzite, pale, fine- to medium-grained wavy lamination, ripples, flaggy to medium-bedded, 10 cm cross-bed unit, current directed ?south-easterly.	2
26	Siltstone, sandy, pale (?bleached), wavy lamination, flaggy.	10
25	Siltstone, partly sandy, partly calcitic, coarse, light greenish grey, some sandy carbonate-rich layers with 1 cm carbonate clasts, minor 5-20 cm dolomite and sandy calcitic carbonate layers.	24
24	Dolomite, medium grey, weathering light brownish, laminated, slumped, some dolomite arenite with 8 cm dolomite clasts, minor finely sandy laminated siltstone, mud cracks.	3
23	Interbedded dolomite, grey, laminated; siltstone, greenish, laminated; siltstone, partly calcitic, grey, laminated, flaggy to medium-bedded, mud cracks, dolomite with algal structure; quartzite, minor 5-10 cm beds. 6438RS356	57

22	Dolomite, medium-grey; weathering light brown-grey, algal structure.	1
21	Siltstone, partly calcitic, medium and light grey, weathering brownish, flaggy.	14
20	Dolomite, calcitic, light grey, laminated, some algal structure near base; prominent outcrop.	1.5
19	Siltstone, calcitic, greenish and grey; dolomite, silty, laminated, flaggy; limestone, sandy, with carbonate breccia, mud cracks.	19
18	Limestone, dark grey, stromatolitic. 24242	1.5
16	Siltstone, calcitic, partly sandy, grey, flaggy, wavy lamination, and mud cracks. 24239-40-41. 6438RS355	26
15	Siltstone, calcitic, in part sandy, light grey, mud cracks; minor carbonate interbeds.	35
14	Carbonate, at least in part calcitic, grey-weathering and cherty below, weathering pale brown and grey above, well laminated.	2
13	Siltstone, silty sandstone, calcitic, greenish grey, laminated, flaggy; carbonate, calcitic, grey-weathering, laminated and fragmental. 24236, 24238	9
12	Dolomite, pale brown weathering.	3.5
11	Siltstone, partly calcitic, partly sandy, medium and light grey, medium greenish grey, wavy lamination, ?slump structure (24237), cross-lamination; limestone lens, 30 cm, grey, weathering brown.	54
10	Siltstone, medium grey, more massive; minor lenticular quartzite and greenish laminated siltstone near base.	29
9	Quartzite, light grey, weathering light brownish, medium-grained, mainly massive appearance.	0.3
8	Siltstone, sandy, greenish and grey, laminated; minor brown ?dolomite layers and lenses; sandstone lenses, medium to coarse-grained, cross-laminated.	5

7	Quartzite, light grey, fine and medium-grained, more massive, 5 to 10 cm low-angle cross-lamination units.	2
6	Siltstone, light greenish grey, weathering brownish and greenish, minor 5 cm, fine- to medium-grained sandstone layers and lenses, laminae 1-10 mm, slightly wavy lamination, ripple cross-lamination.	7
5	Quartzite, very pale grey, fine- to medium-grained, laminated, trough cross-lamination.	1.5
4	Siltstone, calcitic, greenish, laminated, flaggy to medium-bedded; minor sandstone, calcitic, medium to coarse, with carbonate layers.	17
3	Carbonate, calcitic, weathering yellow-brown and siltstone; minor medium to coarse sandy lenses; some small-scale trough cross-lamination. 6438RS354	2
2	Siltstone, calcitic, partly sandy, greenish; minor sandstone, calcitic, pale cream-grey, medium to coarse, with carbonate plates up to 7 cm long.	14
1	Quartzite, calcitic, light greenish grey or pale pink-grey, weathering brownish, mottled, fine- to coarse-grained, laminated, 20 cm cross-bed unit (current flowing to south-east, approximately), medium to thick-bedded, prominent outcrop; minor interbedded siltstone, sandy in part, greenish or dark reddish grey. 24002, 24235, 24244. 6438RS353	6
	(Total thickness, Myrtle Springs Formation	358)

(Underlain by less prominent reddish and grey siltstone, dolomite and quartzite of the Skillogalee Dolomite).

APPENDIX B

Contents of some reports containing map information by Utah Development Company, Willouran Ranges.

Open File envelope 2915 E.L. 277.
Report 301 December 1977.
Volume 6

Plate

1. Progress summary map 1:100 000
2. Carte previsionelle
3. Metallotect inventory
4. 1:5 000 Euraminna
5. Geology 1:5 000 Euraminna
6. 1:5 000 Dunns Mine
7. Geology " "
8. Carte prev. Dunns Mine
9. Drill holes " "
10. " " " "
11. Profiles " "
12. 1:5 000 Rooks
13. Geology "
14. Carte prev. Rooks
15. Drill holes "
16. Placefix 1:10 000 Warra Warra
17. Geology " " "
18. Carte prev. " "
19. Geochemistry " "

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Plate

20. Profiles Warra Warra
21. Diagrams " "
22. Sections " "
23. Drill sections Warra Warra
24. " " " "
25. Placefix West Willourans
26. Geology 1:5 000 West Willourans (Douglas Gully)
27. " Central Mine 1:1 000
28. Carte prev. West Willourans
29. Stratigraphic columns West Willourans
30. Placefix Boorloo-Breaden Hill
31. Geology 1:10 000 Boorloo-Breaden Hill
32. Carte prev. " " "
33. Sections " " "
34. " " " "
35. " Breaden Hill
36. " Boorloo
37. " " - Breaden Hill

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Volume 12

Plate

1. Progress summary map 1:100 000
2. Metalotect
3. Placefix Euraminna
4. Geology 1:10 000 Euraminna
5. Carte prev. "
6. Sections "
7. Track etch "

Plate
8. Placefix Callanna
9. Geology 1:10 000 Callanna
10. Carte prev "
11. Sections "
12. Placefix Black Shale (west of Boorloo-Breaden Hill)
13. Geology 1:10 000 Black Shale
14. Carte prev. " "
15. Sections " "
16. Placefix West Willourans

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Plate
17. Geology 1:10 000 West Willourans
18. Carte prev. " "
19. Sections " "
20. " " "
21. Placefix Horse Shoe (SW of Callanna)
22. Geology " "
23. Section Warra Warra
24. Placefix Rischbieth
25. Geology 1:10 000 Rischbieth
26. Placefix Tarlton West
27. Geology 1:10 000 Tarlton West
28. Placefix Breaden Hill S.
29. Geology 1:10 000 Breaden Hill S.
30. Section " " " & Boorloo
31. Track etch " " " "

Open File envelope 3507 E.L. 461.
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Volume 5.
Selected figures in text.
Figure
3. Callanna subproject (Dome Hill & SE)
8. Tarlton North
9. Kingston
13. Camp area
17. North of Douglas Gully
18. Kingston & NW
23. East Rooks
26. Mt. Norwest
30. Chintapanna - Nth Bungarider
33. Mt. Norwest

Volume 6
Plate
1. Progress summary map
2. Drilling outcomes, west Willourans
3. Interpretative drill hole sections, Black Shale area.
4. Geochemistry - some detailed geology, Callanna area (SW of Dome Hill)
5. Drill hole sections
6. " " "
7. Geochemistry, Rook's, Dunn's area.
8. Placefix, Tarlton North
9. Geology, Tarlton North 1:10 000

Plate
10. Search target, Tarlton North
11. Placefix, Kersantite area (NW of Willouran Hill)
12. Geology, " " 1:10 000
13. Placefix, Kingston " 1:10 000
14. Geology, " " "
15. Cross section, Kingston area 1:2 500

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Plate
16. Placefix, camp
17. Geology, camp 1:10 000
18. Geology, Dorothy 1:20 000 (Chintapanna & north)
19. Placefix, Twenty Mile Hill (geochemistry)
20. Carte Previsionelle, Twenty Mile Hill
21. Placefix, East Rooks
22. Geology, " "
23. Placefix, Mt. Norwest, Burra Gp.
24. Geology, " " " " 1:10 000
25. Palaeogeography, Burra Gp.
26. Placefix, Bungarider
27. Geology, " 1:10 000
28. Placefix, Mt. Norwest, Umberatana Gp.
29. Geology, " " " " 1:10 000
30. Bouguer anomaly, Tarlton North

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Selcted text figures.
Figure
3. Simplified geology, 1:250 000
5. Drill hole section, Euraminna 1:2 500
6. " " " Callanna area 1:15 000
7. Simplified geology, Top Mount area 1:250 000
9. " " Mirra Bore area.

Volume 9.
Plate
1. Progress summary 1:10 000 road map showing project areas.
2. Regional geology 1:50 000 geology, roads, drainage.
3. Palaeogeographic cameos, sub-project areas
4. Location of gravity survey areas 1:100 000
5. Drill hole location plan 1:50 000
6. Landsat theme mapping
7. Structural interpretation 1:100 000 Landsat-based.
8. Bouguer gravity contour plan 1:10 000 (NW of Willouran Hill)
9. " " " " (SW of " ")
10. " " " " (Dome Hill)
11. " " " " (SW of Callanna)
12. " " " " (Bungarider)

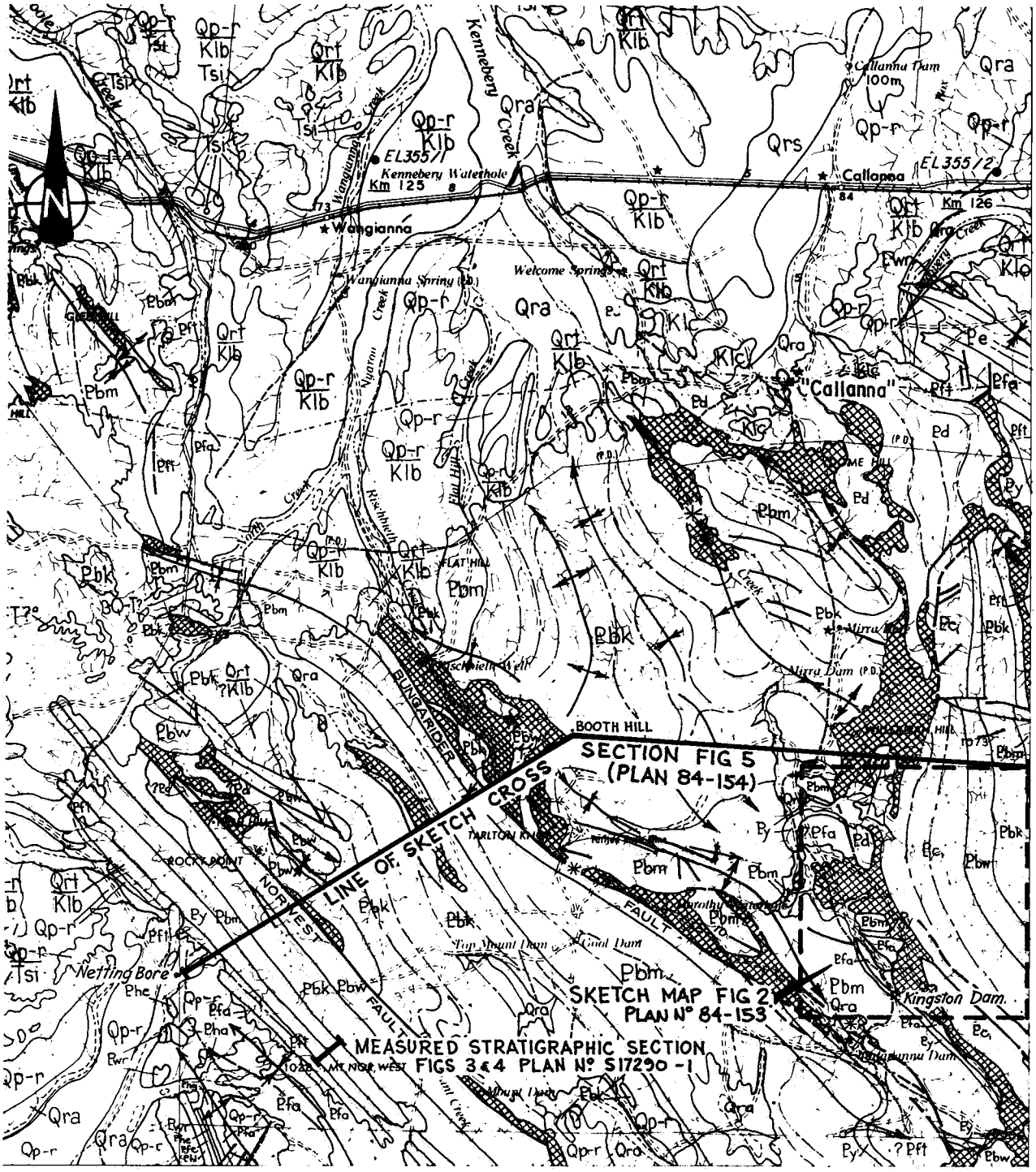
Volume 10
Plate
13. Bouguer gravity, Wangianna 1:10 000
14. " " Tarlton North 1:10 000
15. Placefix, Mirra Bore 1:10 000 road map
16. Geology, " "
17. Lateral lithofacies correlation, central Burra basin 1:10 000
18. Geological cross sections Mirra Bore 1:10 000

Plate

19. Placefix, Wangianna
20. Geology, Wangianna 1:10 000 (mainly Pleistocene)
21. Placefix, Top Mount 1:10 000
22. Geology, Top Mount 1:10 000
23. Carte previsionelle, Top Mount 1:25 000
24. Longitudinal section, Warra Warra

Locality Index to some reports by Utah Development Company

Locality Envelope / Volume / Plate or Figure

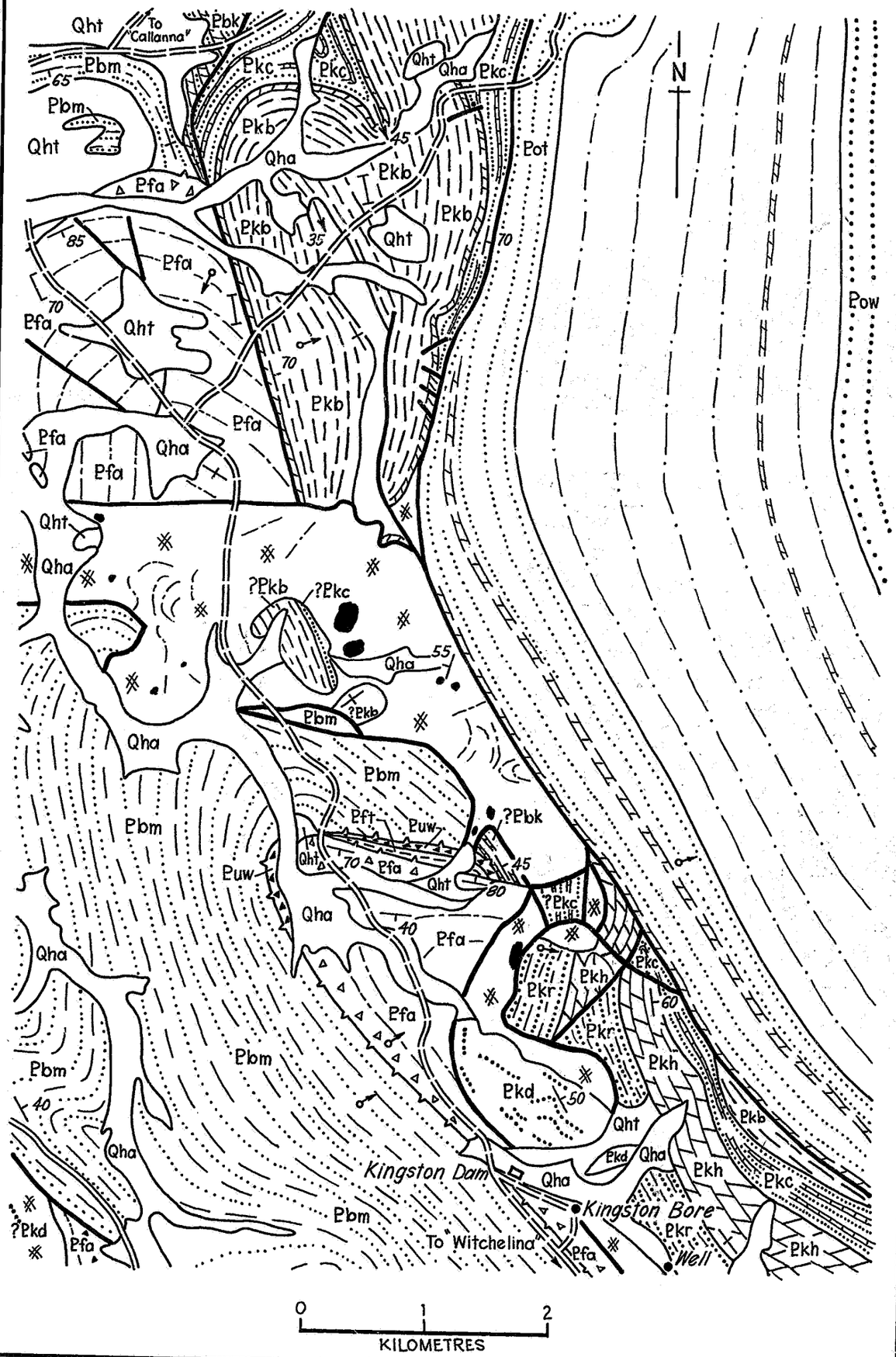


Based on Curdimurka preliminary geological map, plan no. 80-372

FIG. 1

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	B.G.F.	11·4·84
CURDIMURKA 1:250 000 SHEET PRECAMBRIAN GEOLOGY	A.F.	1:250 000
LOCALITY PLAN SHOWING MAPPED AREA AND LOCATION OF SECTIONS	10-4-84	S 17290

3475



Alluvium Qha *
Slope deposits Qht *
Megabreccia
Dolerite, gabbro, basic lava
Amberoona Formation Pfa

UNCONFORMITY

Tapley Hill Formation Pft
Wilyerpa Formation Puw

UNCONFORMITY

Myrtle Springs Formation Pbm
Skillogalee Dolomite Pbk
Witchelina Quartzite Pow
Willawalpa Formation Pol
Top Mount Sandstone Beds Pot

FAULT

Boorloo Siltstone Pkb
Cooranna Formation Pkc
Hogan Dolomite Pkh
Recovery Formation Pkr

FAULT

Dome Sandstone Pkd

FAULT

* Unconformities below these units not shown.

Strike and dip of bedding
Inclined 60
Vertical

Strike and dip of cleavage
Inclined 70
Vertical

Trend lines

Sedimentary facing

Based on geology by Forbes, Preiss, Utah Development Co., and Murrell.

For location of area see Fig. 1, Plan S17290

FIG. 2.

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

CURDIMURKA 1:250 000 SHEET
PRECAMBRIAN GEOLOGY

GEOLOGICAL SKETCH NORTH OF
KINGSTON DAM

COMPILED	B.G.F.
DRAWN	A.F.
DATE	10-4-84
CHECKED	
CDO DATE	11-4-84
SCALE	1:40 000
PLAN NUMBER	84-153

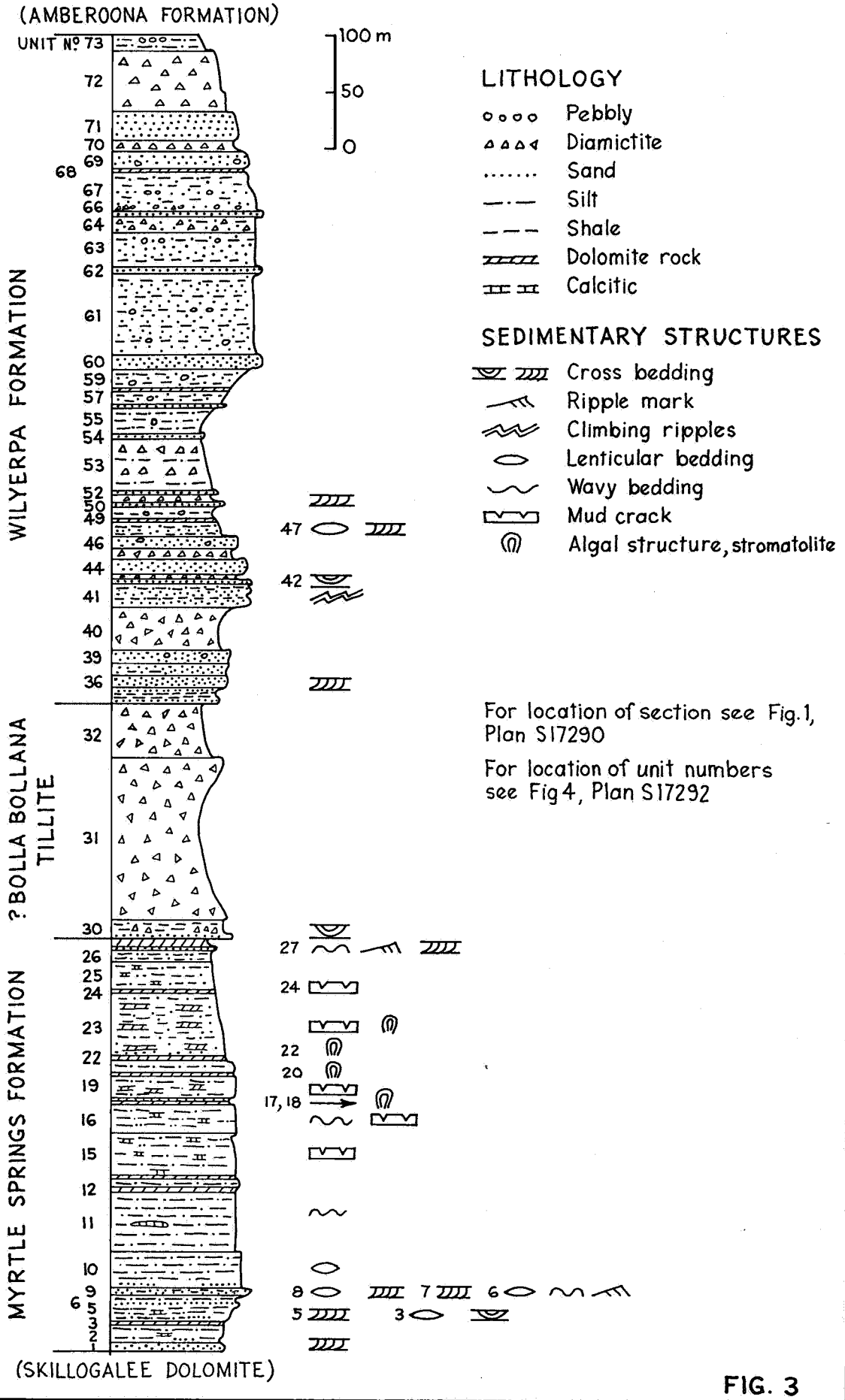
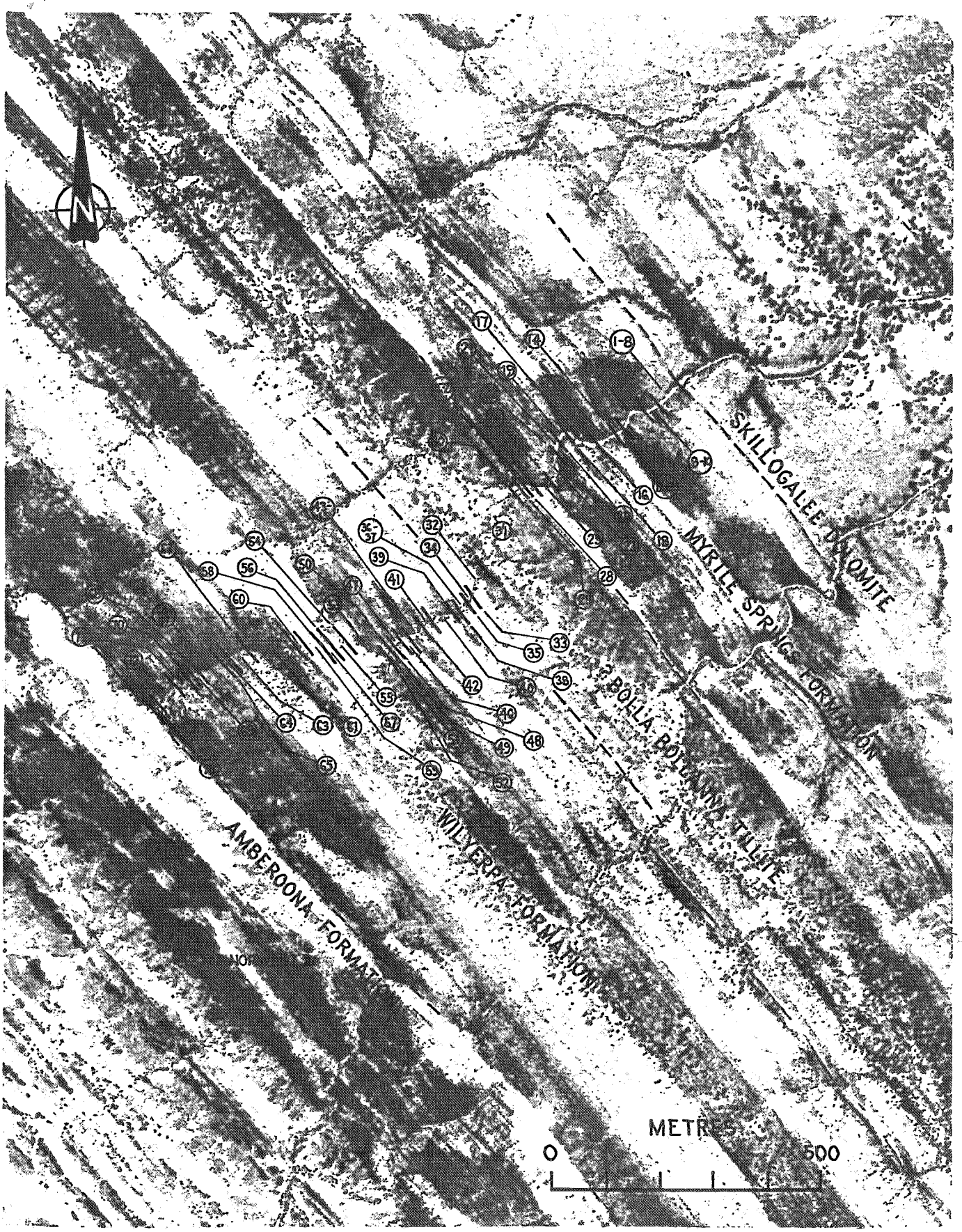


FIG. 3

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED B.G.Forbes	DATE 11·4·84
CURDIMURKA 1:250 000 SHEET PRECAMBRIAN GEOLOGY	DRAWN A.F.	SCALE 1:5000
STRATIGRAPHIC SECTION NORTH OF MT NORWEST	DATE 27-3-84	PLAN NUMBER S17291

3475

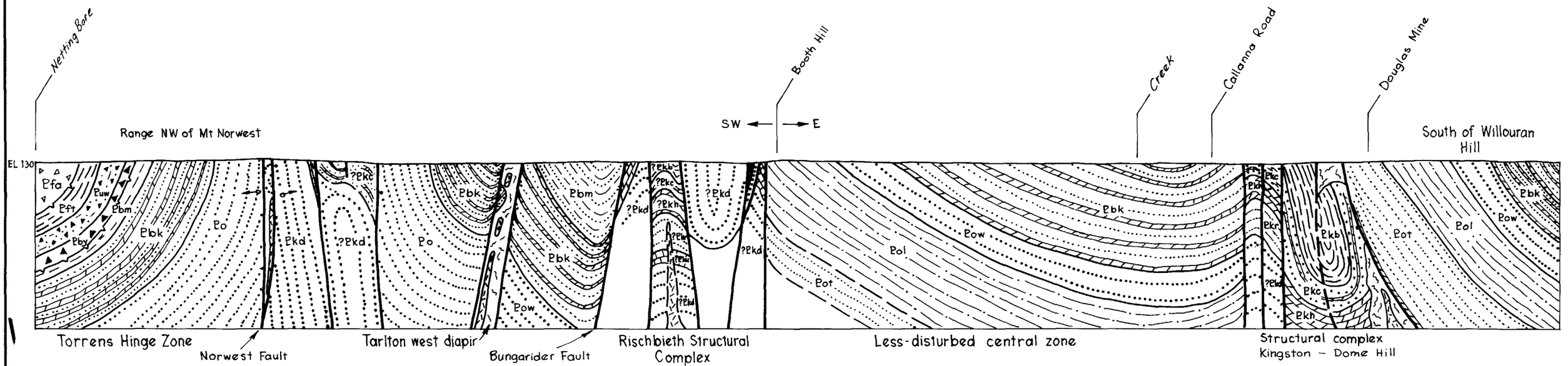


21 Unit number (see stratigraphic column, fig. 3, plan no. S17291)

FIG. 4

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED B. Forbes	C.D.O 11·4·84 DATE
CURDIMURKA 1:250 000 SHEET PRECAMBRIAN GEOLOGY	DRAWN A.F.	SCALE 1:10000
STRATIGRAPHIC SECTION NORTH OF MT NORWEST	DATE 3-4-84	PLAN NUMBER S17292
LOCATION OF UNIT NUMBERS	CHECKED	

3475



UMBERATANA GROUP

- Pfa Amberoona Formation : siltstone, limestone.
- Unconformity
- Pft Tapley Hill Formation : siltstone.
- Puw Wilyerpa Formation : quartzite, siltstone, diamictite.
- Pyb ? Bolla Bollana Tillite : diamictite, quartzite.
- Unconformity

BURRA GROUP

- Pbm Myrtle Springs Formation : siltstone, quartzite, carbonate.
- Pbk Skillogalee Dolomite : dolomite, magnesite, quartzite, siltstone.
- Po Emeroo Subgroup : quartzite, siltstone, carbonate.
- Pow Witchelina Quartzite
- Pol Willawalpa Formation
- Pot Top Mount Sandstone Beds

CALLANNA GROUP

- Pkb Boorloo Siltstone
- Pkc Cooranna Formation : quartzite, dolomite, siltstone.
- Pkh Hogan Dolomite
- Pkr Recovery Formation : siltstone, quartzite.
- Pku Dunns Mine Limestone
- Pkd Dome Sandstone
- Dolerite, gabbro, metabasalt
- Tectonic breccia
- Fault (attitudes uncertain but steep)
- Sedimentary facing

SCALE V = H

0 1000 m

Note : Elevation derived from contours provided by Department of Lands. Datum - A.H.D.

For location of section see Fig 1, Plan S17290

Based on geology by Forbes, Parker, Preiss, Murrell, Utah Development Co. and Coats.

FIG. 5

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED B. Forbes	CDO 11·4·84 DATE
CURDIMURKA 1:250 000 SHEET PRECAMBRIAN GEOLOGY	DRAWN A.F	SCALE
GEOLOGICAL SKETCH SECTION SOUTH OF CALLANNA	DATE 2-4-84	PLAN NUMBER 84-154
	CHECKED	

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FIGURE 6. Basal Myrtle Springs Formation: quartzite and siltstone at locality of measured section, NE of Mount Norwest (slide 24244)

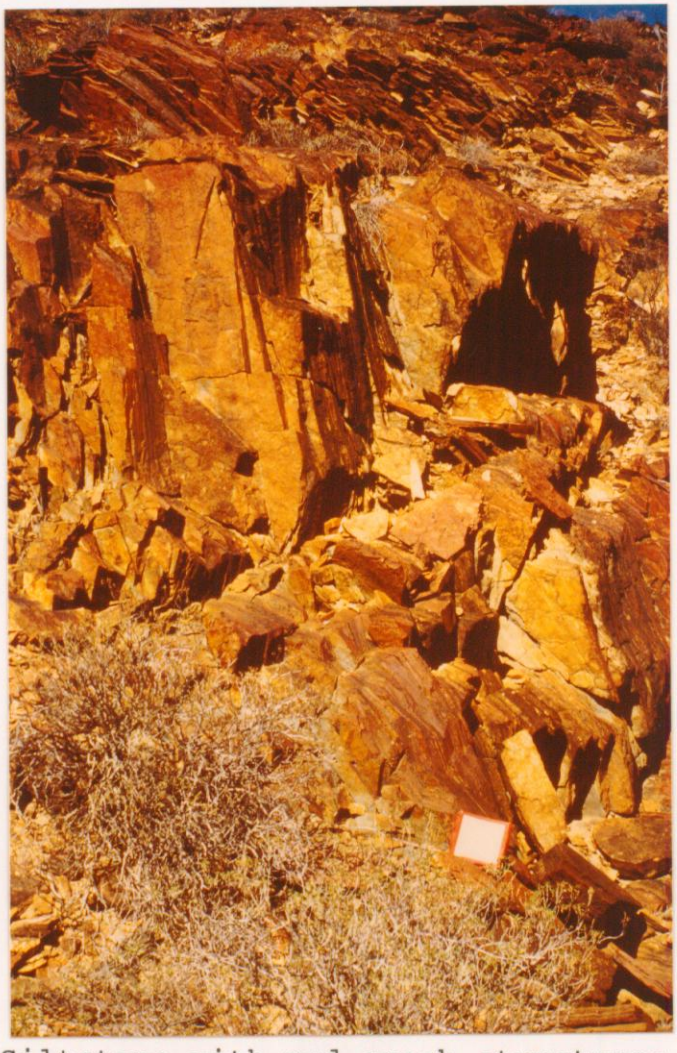

FIGURE 7. Siltstone with mud crack structures, Myrtle Springs Formation, NE of Mount Norwest (slide 24239)

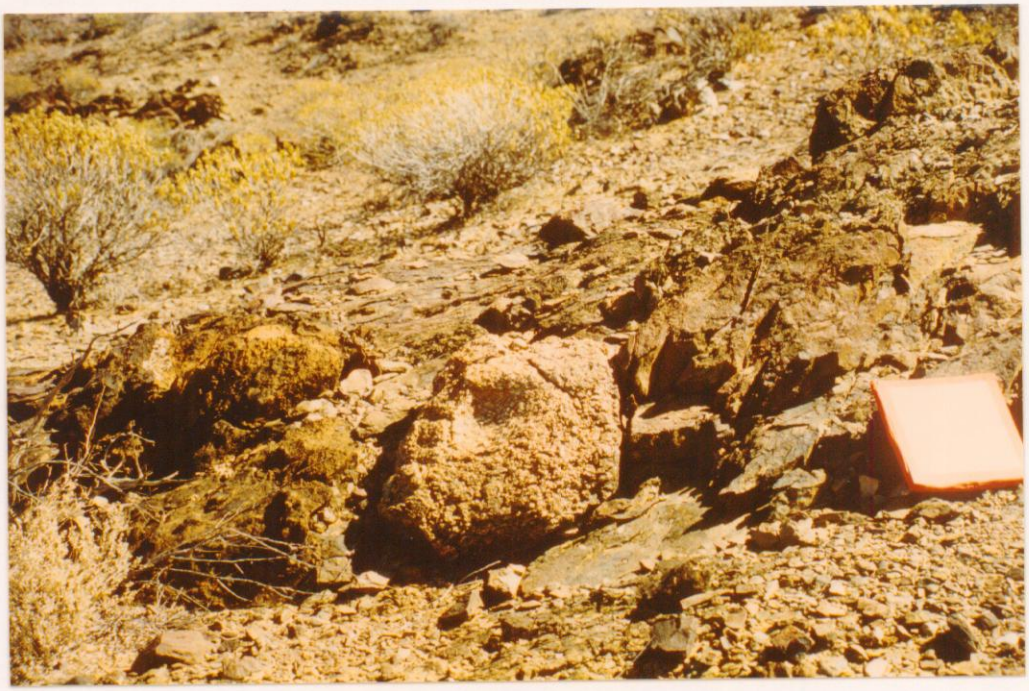

FIGURE 8. Granitic erratic in ?Bolla Bollana Tillite, NW of Willouran Hill (slide 23962).

FIGURE 9. Diamictite, ?Bolla Bollana Tillite, containing carbonate and quartz clasts: measured section N of Mount Norwest (slide 24245)

FIGURE 10. Pebbly quartzite of basal Wilyerpa Formation on more massive diamictite of ?Bolla Bollana Tillite 9 km NW of Mount Norwest (slide 24267). Wilyerpa dips steeply left of hammer (lower left).

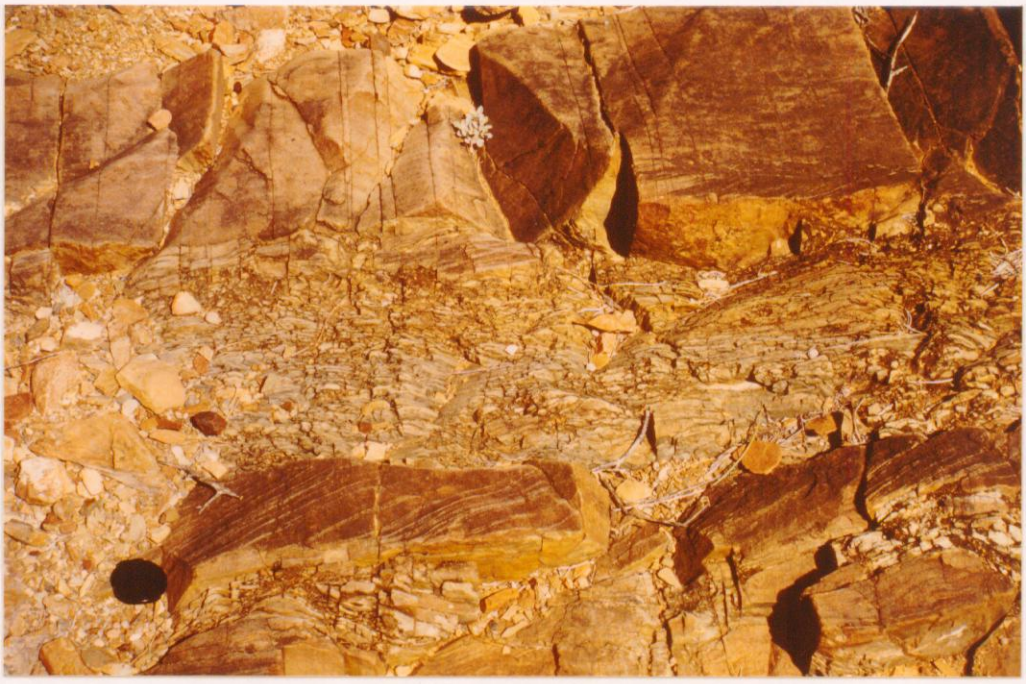

FIGURE 11. Quartzite and siltstone of Wilyerpa Formation, measured section N of Mount Norwest (slide 24250).