BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

RECORD

RECORD 1986/24

YEURALBA REGION, NORTHERN TERRITORY; DATA RECORD OF 1:100 000 SCALE MAPPING

R.S. NEEDHAM, P.G. STUART-SMITH & L. BAGAS

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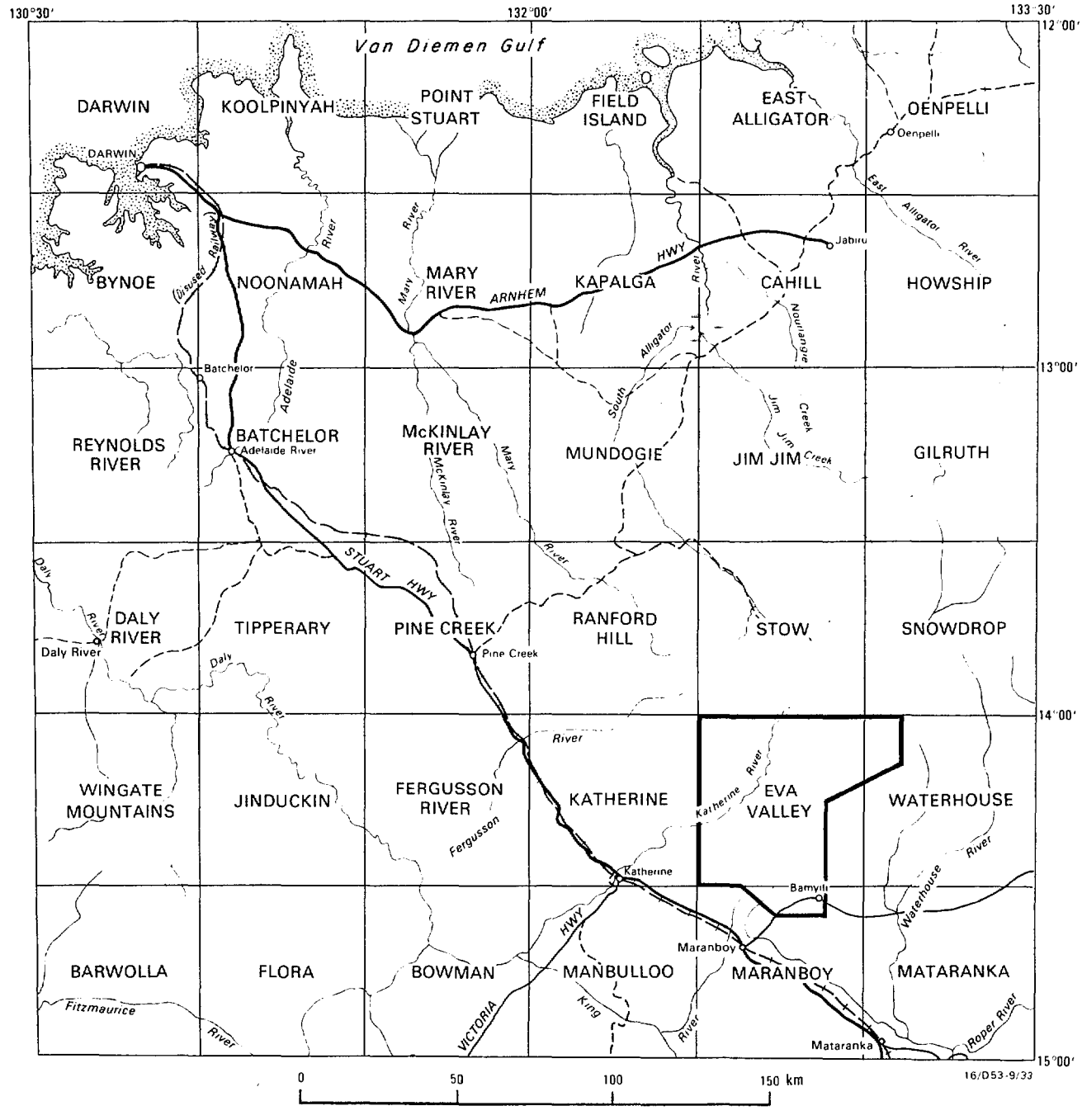
*NORTHERN TERRITORY GEOLOGICAL SURVEY

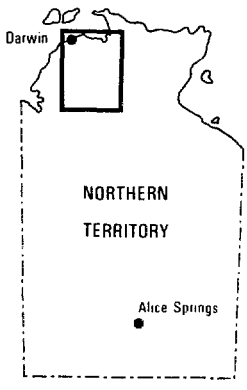
CONTENTS

ABSTRACT

This record summarises the results of 1982-3 fieldwork by the Pine Creek Geological Party (BMR and NTGS) in the Eva Valley, Maranboy and Waterhouse 1:100 000 Sheet areas. Reductions to 1:100 000 - scale of the 1:25 000 - scale compilation sheets, petrographic descriptions of selected samples, and a list of age determination sampling sites, are enclosed.

The area contains mostly Early Proterozoic rocks. Moderately folded Tollis Formation (El Sherana Group) is intruded by Maud Dolerite and Maranboy Porphyry. These units are unconformably overlain by Hindrance Creek Sandstone and Plum Tree Creek Volcanics of the Edith River Group in which a large subvolcanic intrusion, the Grace Creek Granite, is developed. The El Sherana Group is intruded by the Eva Valley and Yeuralba Granites, and these granites may also post-date the Edith River Group. Middle Proterozoic rocks of the Kombolgie Formation rest unconformably on older rocks and form dissected sandstone plateaux in the west and east. Gently dipping sandstone and basalt in the south mark the edge of the Paleozoic Daly River Basin, and thin horizontal Mesozoic sediments form tablelands over much of the south and southeast.





KATHERINE *1:100 000 Sheet area*

Area covered in Figure 2

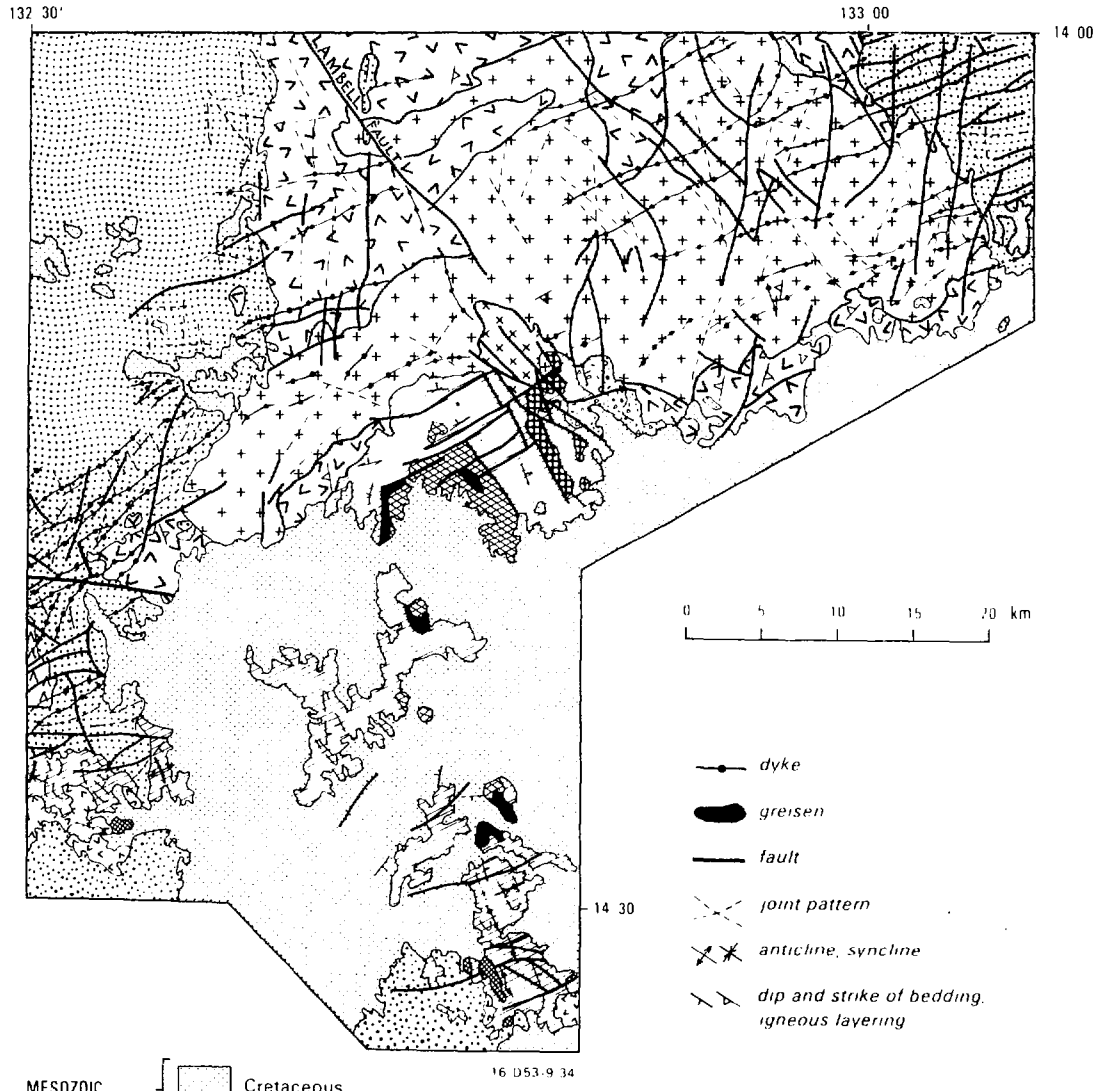
Figure 1. Locality map of the Yeuralba region

INTRODUCTION

This record summarises the major results of the 1982-3 field work of the Pine Creek Geosyncline Geological Party of the Bureau of Mineral Resources (BMR) and the Northern Territory Geological Survey (NTGS) in the Eva Valley, Maranboy and Waterhouse 1:100 000 Sheet areas. The work was a continuation of geological fieldwork in the Pine Creek Geosyncline, as part of the Pine Creek Project, whose overall objective is to study the geology, geophysics, and mineralisation of the geosyncline; an important subsidiary objective is to produce 1:100 000 - scale geological maps of the region. A detailed account of the geology of the area mapped (the "Yeuralba Region") is in preparation and will be published in the BMR Map Commentary series.

This record presents 1:100 000 scale reductions (Figs 4-19) of the 1:25 000 scale compilation sheets, and an outline of the stratigraphy. Age determination sample sites and petrographic descriptions are appended.

The location of the area is shown in Figure 1. Colour airphotos at 1:25 000 - scale were used, in conjunction with 1:89 000 - scale panchromatic airphotos. Figure 3 contains the geological reference and an index to the compilation sheets. Copies of the compilation sheets at 1:25 000 original photoscale can be obtained from the Copy Service, Australian Government Printer (Production), P.O. Box 84, Canberra, ACT 2601 - price on application.



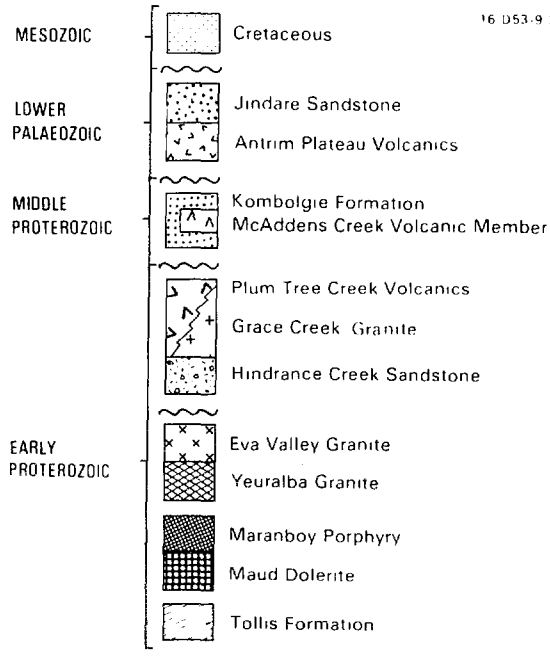


Figure 2. Solid geology of the Yeuralba region

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The field positions of specimens described petrographically are shown on topographic bases accompanying each compilation sheet, as 8-digit BMR sample submission numbers.

About 700 field observations points were occupied over the 2700 km< area, representing an average density of about 1 per 4 km<; the density is about 1 per 1.7 km< in areas of Early Proterozoic rocks.

GEOLOGY

Generalised geology is shown in Figure 2, and the stratigraphy is summarised in Table 1. Changes from previous stratigraphic nomenclature are listed in Table 2.

The region is dominated by extensive tablelands of Mesozoic sediments which cover much of the southern half, and by plateaux of subhorizontal Middle Proterozoic Kombolgie Formation sandstone in the west and northeast (Fig. 2). The lower lands are mainly gently undulating plains and hills with local rugged areas which form parts of the upper Katherine River, King River and Maranboy Creek catchments. Mesozoic sediments lie over warped to moderately folded sediments (Tollis Formation and Hindrance Creek Sandstone), volcanics (Plum Tree Creek Volcanics), and intrusive rocks (Maud Dolerite, Maranboy Porphyry, Yeuralba Granite, Eva Valley Granite, Grace Creek Granite) of Early Proterozoic age.

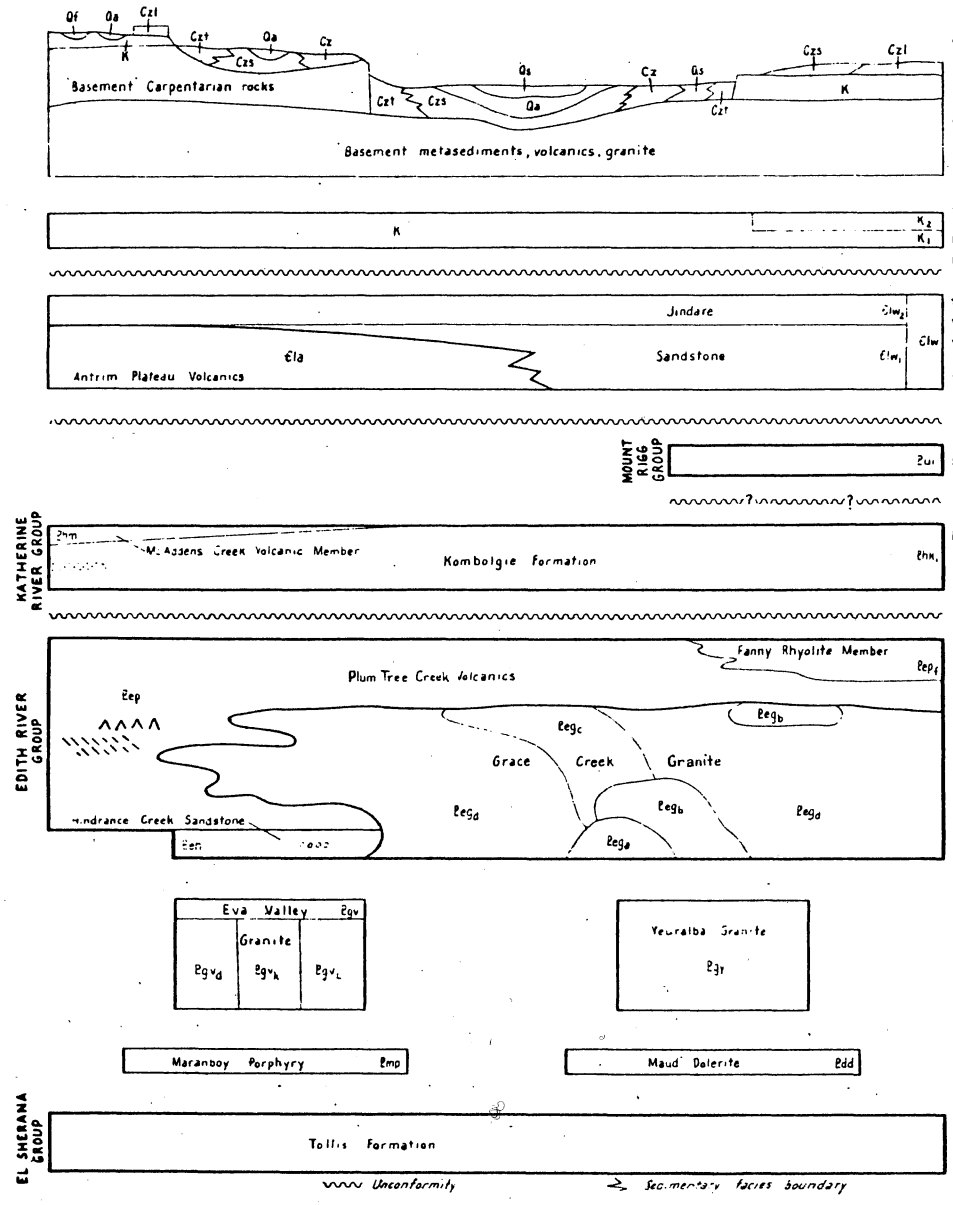
Sandy and black soil plains in the extreme south overlie subhorizontal sandstone and basalt (Jindare Sandstone and Antrim Plateau Volcanics) of Lower Palaeozoic age.

The Palaeozoic rocks lie at the edge of the Daly River Basin which extends south and west of the region, and the Middle Proterozoic rocks lie at the base of the McArthur Basin sequence, developed mainly to the east. The Early Proterozoic rocks form part of a dominantly felsic volcanic suite which is intermediate in age between the older and unconformably separated Early Proterozoic Pine Creek Geosyncline sequence, and the Middle Proterozoic McArthur Basin sequence.

Walpole and others (1968) briefly described the geology of the area as part of a reconnaissance survey of the Katherine-Darwin region. Significant changes to their stratigraphy include:

1. The outer parts of the Walpole and others' Grace Creek Granite consist of ignimbrite, continuous with ignimbrite of the Plum Tree Creek Volcanics of the Stow region further north. (Needham & Stuart-Smith, 1985).

2. The Grace Creek Granite is less extensive than mapped previously, and consists of a zoned mass of microgranite and granite. It is lithologically very similar to the surrounding ignimbrite, the distinction being made on differences in groundmass grain size, and the presence of feldspar xenocrysts in the intrusive rocks.



Qa	Silt, sand, clay Creek and river alluvium	QUATERNARY, CAINOZOIC
Qs	Unconsolidated sand: outwash and colluvium	
Qf	Black and brown humic soils and clays	
Cz	Soil, rubble, sand: regolith obscuring bedrock	
Czs	Ferruginous and clayey sand	TERTIARY
Czt	Sandstone and weathered volcanic rubble: talus and scree	
Czl	Nodular, concretionary and pisolitic laterite	
K	Undivided fine white sandstone, yellow and brown ferruginous fine to medium-grained friable sandstone, kaolinitic white to purple sandstone, minor red-brown siltstone; fossiliferous in places	CRETACEOUS, MESOZOIC
K_2	Friable brown ferruginous medium-grained sandstone	
K_1	White medium-coarse kaolinitic quartz sandstone	
ϵlw	Undivided fine to coarse, white-purple-brown sandstone, brecciated chert, and arkose	LOWER CAMBRIAN, PALAEOZOIC
ϵlw_2	Fine to coarse, well-sorted white friable sandstone	
ϵlw_1	Pink to purple ferruginous poorly sorted sandstone, pebbly friable arkose, laminated chert commonly brecciated and limonitic	
ϵla	Purple to black, commonly weathered, fine basalt, vesicular in places. Minor red ferruginous medium-grained to coarse sandstone interbeds near base in places	
Pur	Pink and white flaggy quartz sandstone	MIDDLE PROTEROZOIC
Phm	Dark grey massive andesite-basalt, vesicular in places	
Ph_{K_1}	Coarse, commonly poorly sorted pebbly and clayey, white to buff sandstone, brown ferruginous siltstone interbeds, cross-bedded and ripple-marked; denotes siltstone lenses	
Pep	Massive to poorly layered red to reddish-brown xenolithic and xenocrystic ignimbrite, minor red-pink and purple rhyolite, rare sandstone. Rare interbedded greywacke, tuff, chert, tuff denoted by ΛΛΛΛ. Flow-banded glassy pink rhyolite and porphyry denoted by	PROTEROZOIC
Pep_f	Massive to layered white to purple-brown massive rhyolite	
Peg_c	Fine to medium grained equigranular light grey pink biotite granite	
Peg_b	Slightly porphyritic grey-green medium-grained granite	
Peg_c	Porphyritic pink-grey medium grained granite	
Peg_d	Porphyritic grey pink microgranite, layered in places	
Pen	Fine to coarse pink-grey moderately sorted feldspathic quartz sandstone and arkose, rare rounded quartz pebbles, oooo denotes conglomerate; recrystallised to quartzite near Grace Creek Complex contact	
Pgv	Undivided Eva Valley Granite	EARLY PROTEROZOIC
Pgv_d	Fine white, buff, pink and salmon leucogranite	
Pgv_k	Coarse porphyritic pink and green leucogranite	
Pgv_L	Fine to medium-grained light grey to pale pink porphyritic leucogranite	
Pgy	Medium-grained to coarse pink equigranular tourmaline biotite leucogranite, extensive greisen alteration	
Pmp	Pinkish green-grey medium grained feldspar porphyry	
Pdd	Medium-grained grey-green quartz dolerite	
Pst	Interbedded greywacke siltstone, pale green argillite, minor cherty tuff	

Record 1986/24 Figure 3(a). Reference to accompany 1:25 000 compilation sheets of Yeuralba region, NT

Geological boundary

Anticline

Syncline

Fault

85 Normal fault, tick on downthrown side indicates direction of dip

Fault showing relative horizontal displacement

U / D Fault (U,D indicates relative movement; up, down)

ΔΔΔ Fault containing breccia

dl / q Fault; dl - dolerite, e - epidote, g - greisen, q - quartz, qb - quartz breccia, tqb - tourmaline quartz breccia

Where location of boundaries, folds and faults is approximate line is broken; where inferred, queried; where concealed, boundaries and folds are dotted, faults are shown by short dashes

Minor syncline

Drag fold

FA Fold axis

Arrow indicates trend and value indicates plunge of fold axis

Shear zone

Brachyanticline

72 Strike and dip of strata

Horizontal dip

Strike and dip of strata } Showing proved direction of facing based on sedimentary structures

Strike and dip of overturned strata }

Strike and dip of strata, dip 5°-15°

Strike and dip of strata, dip greater than 45°

Vertical strata

Horizontal strata

8 Dip-slope

Trend-line

Lineament

Joint

12 Trend-line showing dip

} airphoto interpretation

25 Strike and dip of joint

Vertical joint

Horizontal joint

50 Strike and dip of foliation

72 Strike and dip of cleavage

Vertical cleavage

k / 85 Strike and dip of kink cleavage

35 Strike and dip of flow banding or igneous lamination

Vertical flow banding or igneous lamination

q Dyke or vein; a - aplite, dl - dolerite, f - felsite, g - greisen, m - mylonite, q - quartz, t - tourmaline, tg - tourmaline greisen, tq - tourmaline quartz

60 Dyke, tick on downthrown side indicates direction of dip

Macrofossil locality

Drillhole, DD - Diamond-drillhole, PD - Percussion-drillhole
GCDDH1 - Grace Creek Diamond-drillhole No.1

·Cu Minor mineral occurrence

Abandoned prospect

Open cut, quarry; minor

Abandoned mine

Alluvial workings; not being worked

Abandoned battery

Costean

Cu - copper, Gg - aggregate other than crushed rock, Mo - molybdenum, Sn - Tin, W - tungsten

Waterhole

Swamp

Escarpment

Minor road

Vehicle track

Foot track

LG Landing ground

Fence

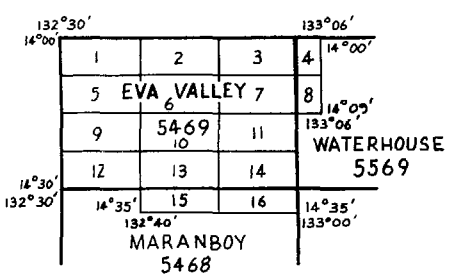
Eva Valley Homestead

Building

Yard

Trigonometrical station

·277 Elevation in metres



INDEX TO COMPILATION SHEETS

Figure 3(b). Reference to accompany 1:25 000 compilation sheets for Yeuralba region, NT

16/D53-9/36

3. Rocks mapped previously as 'Edith River Volcanics' between the Kombolgie Formation and Grace Creek Granite are crumbly purple weathering products of the Plum Tree Creek Volcanics and Grace Creek Granite, and do not represent a distinct extrusive or in places intrusive felsic unit as suggested by Walpole and others (1968, p.148).

4. The Kombolgie Formation rests unconformably on the Grace Creek Granite indicating an age for this intrusion roughly equivalent to the }1800 m.y. granites of the Pine Creek Geosyncline (Needham and others, 1980).

5. The folded greywacke-siltstone assemblage is part of the Tollis Formation, which unconformably rests on Burrell Creek Formation of the Pine Creek Geosyncline sequence west of the region (Needham and others, 1986).

6. The northern part of the Yeuralba Granite as defined by Walpole and others is distinct from the main body and is renamed the Eva Valley Granite. Additional exposures of the Yeuralba Granite up to 14 km south of the main body indicate the thinly-roofed and flat-topped character of the pluton and link it with massive greisen bodies further south in the Maranboy area (mapped previously as undifferentiated granite). Other bodies of 'undifferentiated granite' in the Maranboy area are distinctive grey-green feldspar porphyry and are redesignated Maranboy Porphyry.

7. A swarm of long, subvertical east-northeasterly dolerite and minor felsite dykes cross the region and cut all the Proterozoic units. They commonly fill faults.

8. Sandstone, arkose and chert of the Jindare Formation are the earliest Cambrian sediments, and appears to intertongue in places with the Antrim Plateau Volcanics.

The Tollis Formation of the El Sherana Group is moderately folded about NNW-axes; individual greywacke beds are prominent and may be traced in places for hundreds of metres. Internal variations related to higher proportions of argillite and tuff which have enabled subdivision of the formation in some areas (Needham and others, 1986), are not present here. In the north of the region an area of interbedded greywacke, tuff, rhyolite and porphyry (Ebi; compilation sheet 2, fig. 5) forms a folded belt about 2x1 km within microgranite, or may represent an unusual, sediment-bearing portion of the Plum Tree Creek Volcanics, with which it is in faulted contact. In the centre of the region the Tollis Formation is intruded by Maud Dolerite (compilation sheets 6, 7, 10, 11; figs 9, 10, 13, 14), a dyke-like body about 1 km wide and 10 km long with small subparallel bodies to the east. The dolerite is extensively faulted and in several places its otherwise clearly intrusive contacts are faulted, quartz-veined, and sheared. The main body contains discontinuous bodies of banded iron formation and Tollis Formation metasediments. One easterly small body appears to be conformably overlain by poorly exposed Plum Tree Creek Volcanics.

The Tollis Formation is also intruded by several scattered bodies of Maranboy Porphyry (compiliation sheets 12, 15; figs 15 and 18), mainly within 5 km of Maranboy. They form disconnected dykes or plug-like structures. The largest is about 3x1 km and is very poorly exposed. Contacts with the Tollis Formation are not exposed and no contact effects are evident.

Two leucocratic granite plutons invade the Tollis Formation in the centre of the region. The Yeuralba Granite (compilation sheets 6, 10, 13; figures 9, 13 and 16) measures about 24x10 km, but much of the southern half is roofed by country rock and the central part is concealed by Cretaceous sediments. The granite forms low-lying sandy plains surrounded by ridges of hornfelsed Tollis Formation. The contact is discordant and commonly faulted. The margins are extensively greisenised and a large greisen body about 4x2 km in size extends from the southern-most exposure of the granite towards the northern end of the Maranboy tinfield. The Eva Valley Granite (compilation sheet 6, figure 9) contains three iregularly distributed phases of leucogranite. In the south it is faulted against the Tollis Formation and Maud Dolerite, and the metasediments are hornfelsed. In the north the contact between the pluton and the Grace Creek Granite is not exposed, and no contact effects are apparent.

The Hindrance Creek Sandstone of the Edith River Group (compiliation sheets 6, 7; figures 9 and 20) is less extensive than mapped previously. It is about 400 m thick and apparently lies unconformably on Tollis Formation. It is truncated and hornfelsed by the Grace Creek Granite, and overlain by Plum Tree

Creek Volcanics. Evidence of the intrusive nature of the Grace Creek Granite which is extensive throughout the northern half of the region is restricted to the hornfelsed character of adjacent Hindrance Creek Sandstone on compilation Sheet 7 (figure 10), as contact effects with other adjacent units are not exposed. Zoning in the Grace Creek Granite is roughly concentric from equigranular medium-grained light grey to pink biotite granite in the centre (around the common junction of compilation sheets 2, 3, 6, 7; figures 5, 6, 9 and 10) around the Grace Creek tin prospect, to increasingly finer-grained and more porphyritic types outwards. The gradation to finer phases is accompanied by a broad colour change from grey-green to pink and red, so that the outer microcrystalline type is in many ways identical in hand specimen (red to red-brown, aphanitic, massive, porphyritic) to the surrounding ignimbrite with a microcrystalline to cryptocrystalline groundmass of the Plum Tree Creek Volcanics of the Edith River Group. Owing to this lithological similarity, the contact cannot be precisely located in the field, but the common presence of corroded feldspar xenocrysts in the granite enables establishment of an approximate boundary in many places.

The Plum Tree Creek Volcanics presumably overlie and are intruded by the Grace Creek Granite, but the nature of the contact cannot be determined in the field. Rare sandy sediments occur in the volcanics in the west below the Kombolgie Formation escarpment. Similar interbeds of less resistant sediments may underlie parts of the extensive sandy plains between the isolated tors and rocky ridges of ignimbrite.

Unnamed interbedded greywacke, tuff, rhyolite and porphyry exposed in the actively eroding banks of Ironbark Creek (Compilation Sheet 2, figure 5) may represent a similar, partly sedimentary interval in the Plum Tree Creek Volcanics. In the east (compilation sheet 8, figure 11) an extensive body of rhyolite, the Fanny Rhyolite Member, either overlies or passes laterally into the Plum Tree Creek Volcanics.

The Plum Tree Creek Volcanics and Grace Creek Granite are overlain by a weathering profile of crumbly purple material which is overlain by the Kombolgie Formation and thus represents a period of weathering at least as old as the early Middle Proterozoic. This profile was mapped by Walpole and others (1968) as feeder dykes or flows of 'Edith River Volcanics' which they believed were intruded by the Grace Creek Granite.

The Kombolgie Formation rests non-conformably on the weathered profile, and with marked angular unconformity on the Tollis Formation. About 500-600 m of jointed and dissected sandstone section is preserved; in the west it is unconformably overlain by andesite and basalt of the McAddens Creek Volcanic Member, and in places a discontinuous siltstone layer about 30 m thick is developed in the sandstone about 100 m stratigraphically below the volcanics.

The Proterozoic rocks of the region are extensively faulted by mainly ENE and N to NNE, and lesser NW and E faults which, except for wrench movement on at least one of the east-trending faults, represent subvertical normal displacements. Many of the

ENE-faults are filled with dolerite, which is therefore post-Kombolgie Formation. Numerous straight to sinuous and occasionally bifurcating dolerite dykes up to 20 m across which trend in the same direction are most probably comagmatic with the dolerite in the faults.

The Antrim Plateau Volcanics is probably of early Cambrian age. It is a valley-fill basalt flow up to 40 m thick resting unconformably on older rocks, and in places contains sandstone interbeds near the base which are laterally equivalent to the Jindare Sandstone, about 50 m thick, which commonly overlaps the basalt to rest on Proterozoic rocks.

The tableland of Cretaceous sandstone is made up of about 15-20 m of white kaolinitic to red-brown ferruginous sandstone and white to pale purple siltstone and claystone, and in places a 1-2 m basal conglomerate is present. The sequence thickens to about 35 m in the northern part of the King River headwaters (compilation Sheet 10, figure 13), where it fills a palaeo-depression over Yeuralba Granite. Generally no subdivision is possible owing to the thickness (`5 m) of lithologically distinctive intervals and steep and rubbly exposures, but locally in the west, where the sequence is levelled off by erosion, two subunits have been distinguished (compilation sheet 5, figure 8).

Tin and tungsten occur in association with the Yeuralba Granite. Tungsten has been mined from greisen within or at the margin of the granite; tin occurs in the same situation and also in quartz-tourmaline veins within the granite and in Tollis

Formation country rock up to 12 km from exposed granite, mainly south of the pluton. Low-grade tin occurs in quartz-tourmaline veins cutting the centre of the Grace Creek Granite. The veins are probably related to the central equigranular medium-grained biotite granite phase (Bega, compilation sheets 2, 3 6, 7; figures 5, 6 9, and 10). Minor copper accompanied tungsten in places within the greisen bodies at the margin of the Yeuralba Granite, and copper staining was noted at one locality in the Fanny Rhyolite Member (compilation sheet 8, figure 11).

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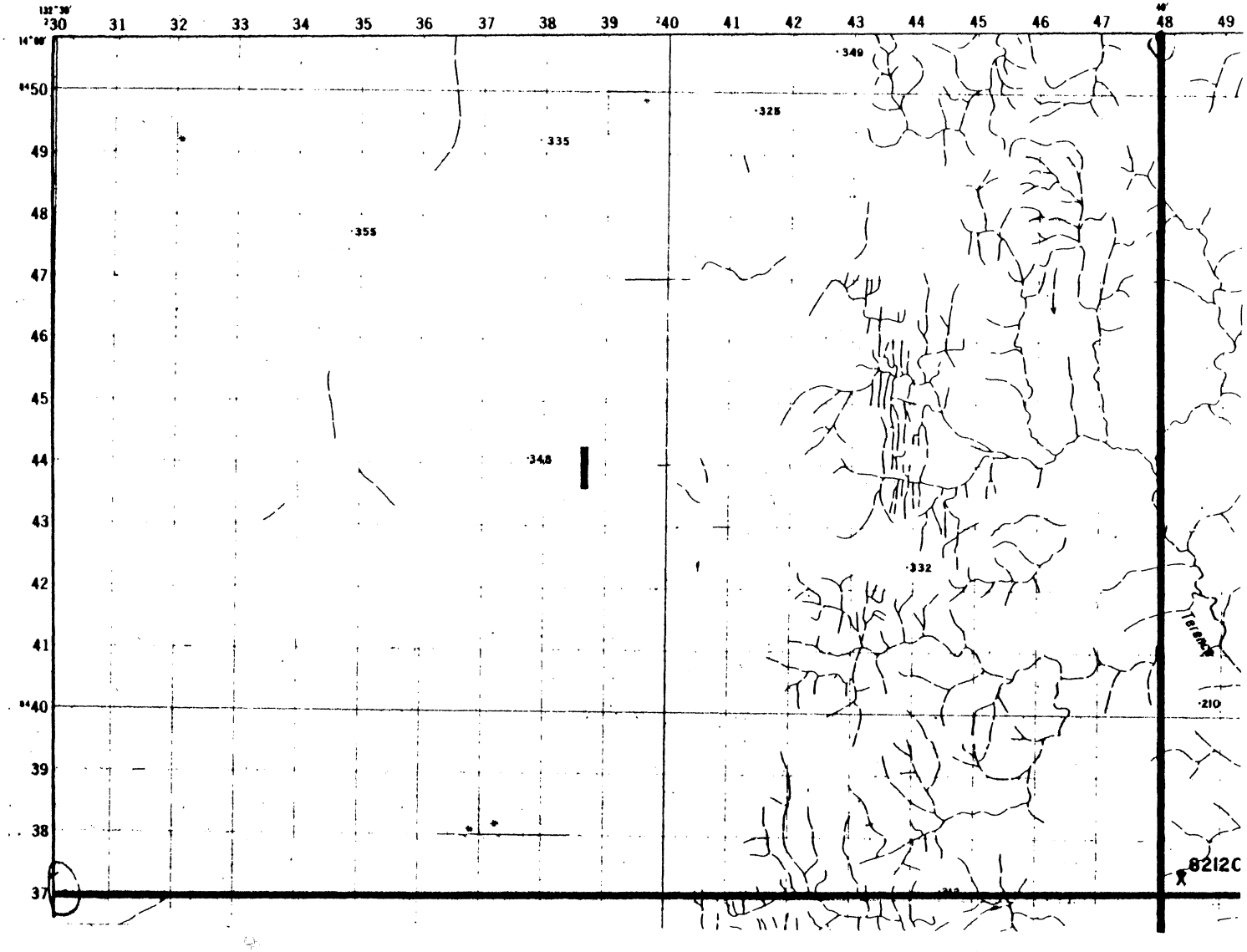

X 82120145 *Thin section locality with BMR registered number*

EVA VALLEY, NT

0 2 4 6 km

Record 1986/24

16/D 53-9/37

Figure 4(a). Yeuralba region thin section localities

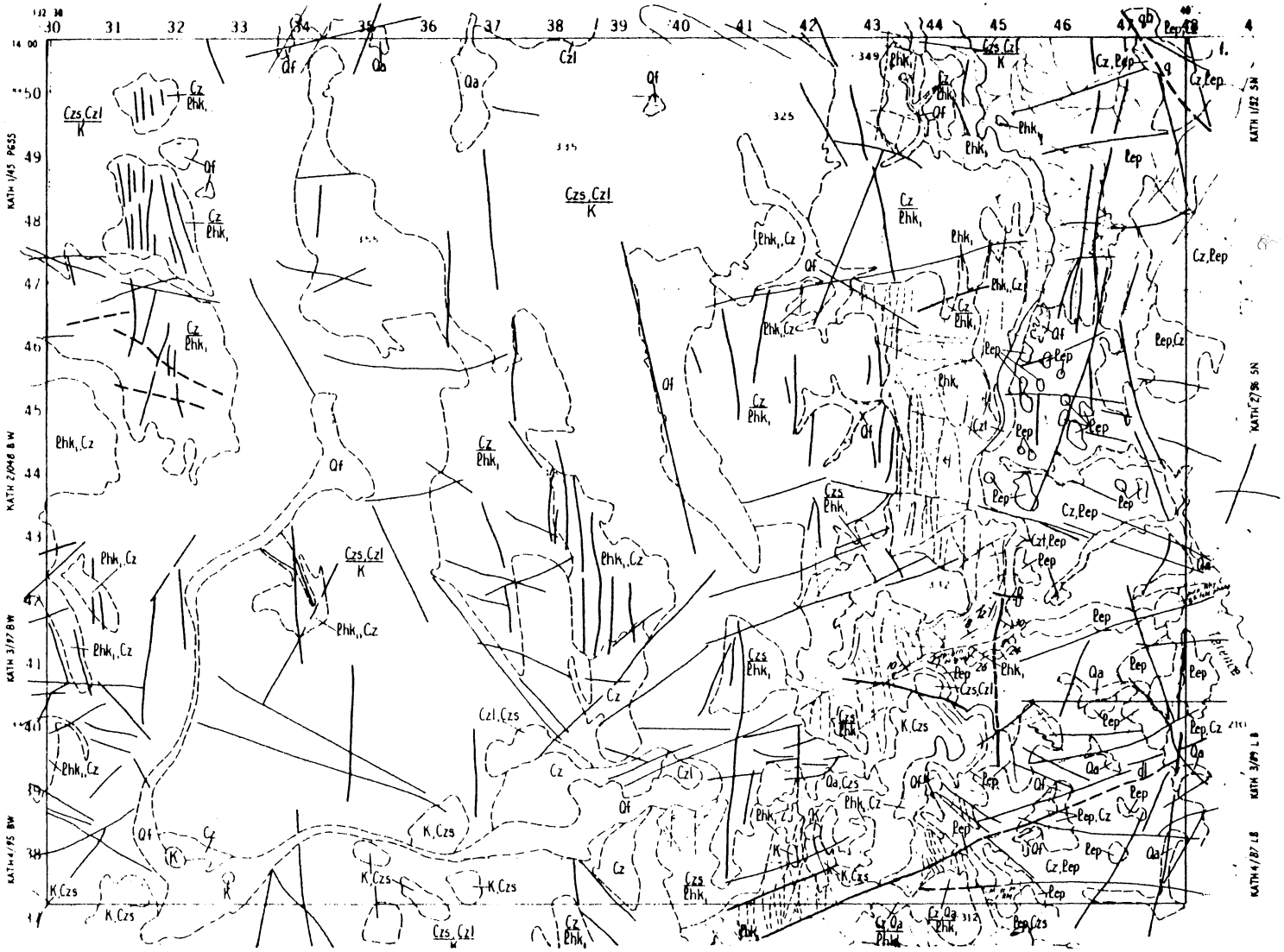

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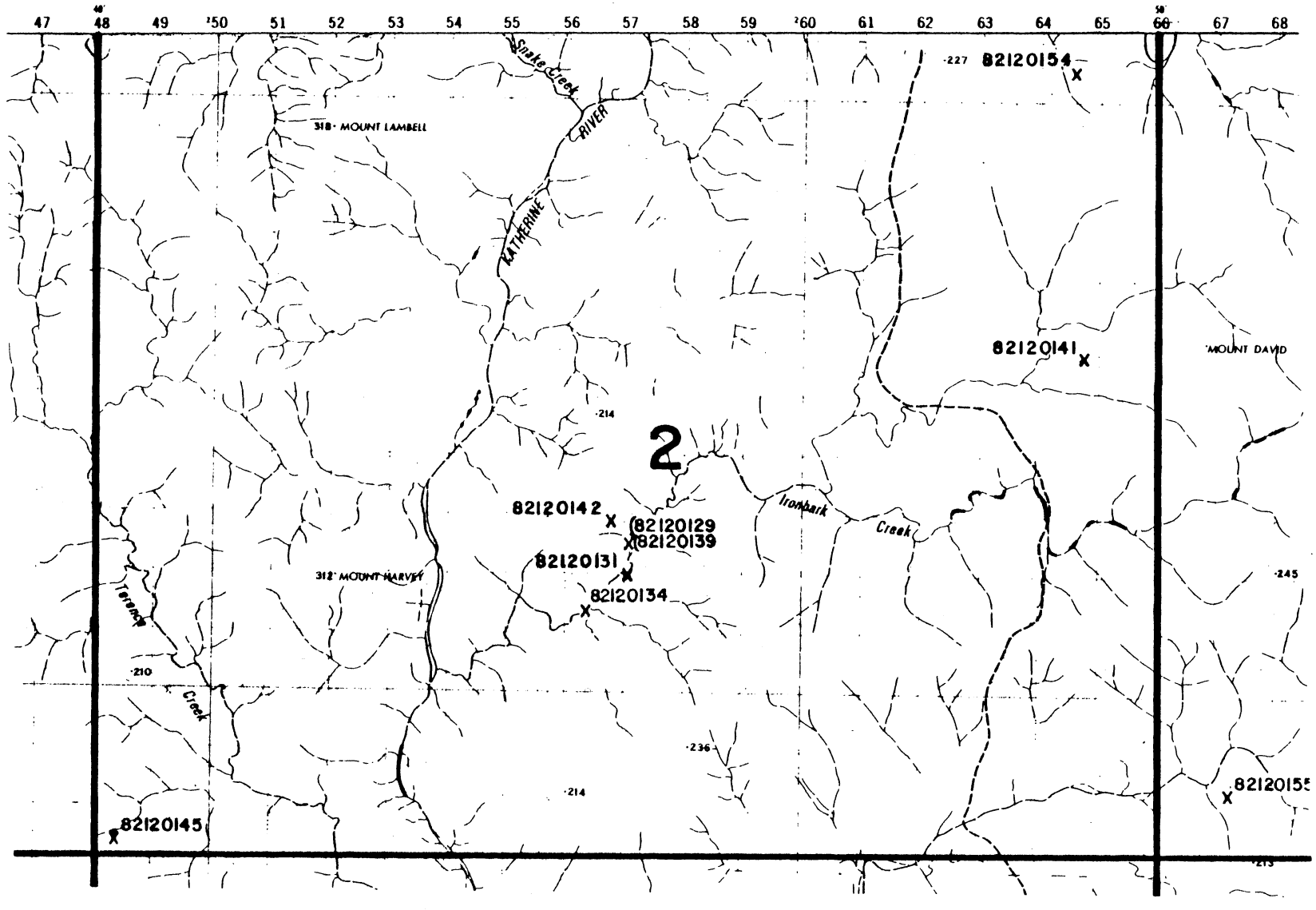
Figure 4(b). Yeuralba Region 1:100 000 reduction of 1:25 000 compilation sheet. 16/D53-9/38



X 82120145 *Thin section locality with BMR registered number*

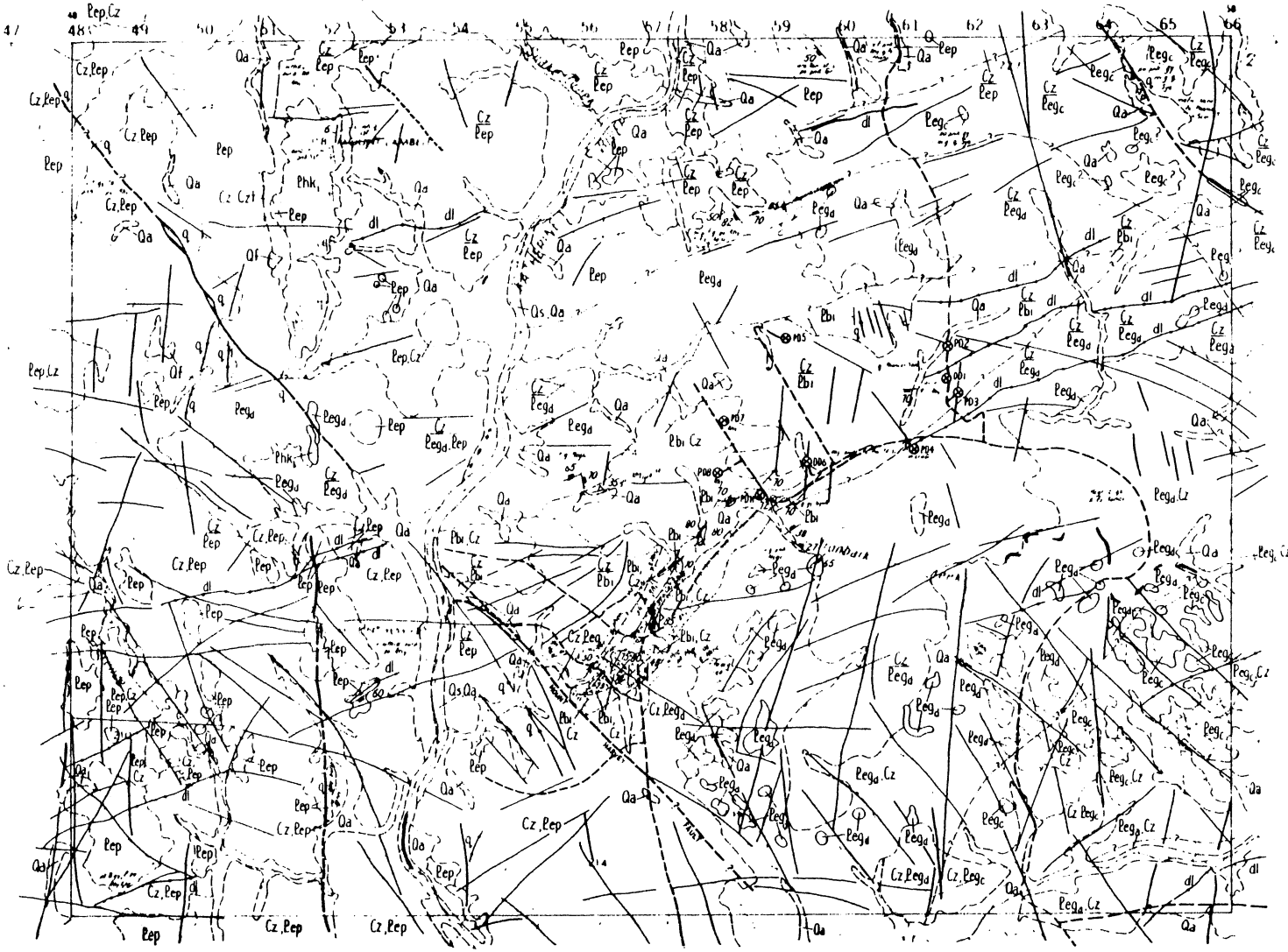
EVA VALLEY, NT

0 2 4 6 km

Record 1986/24

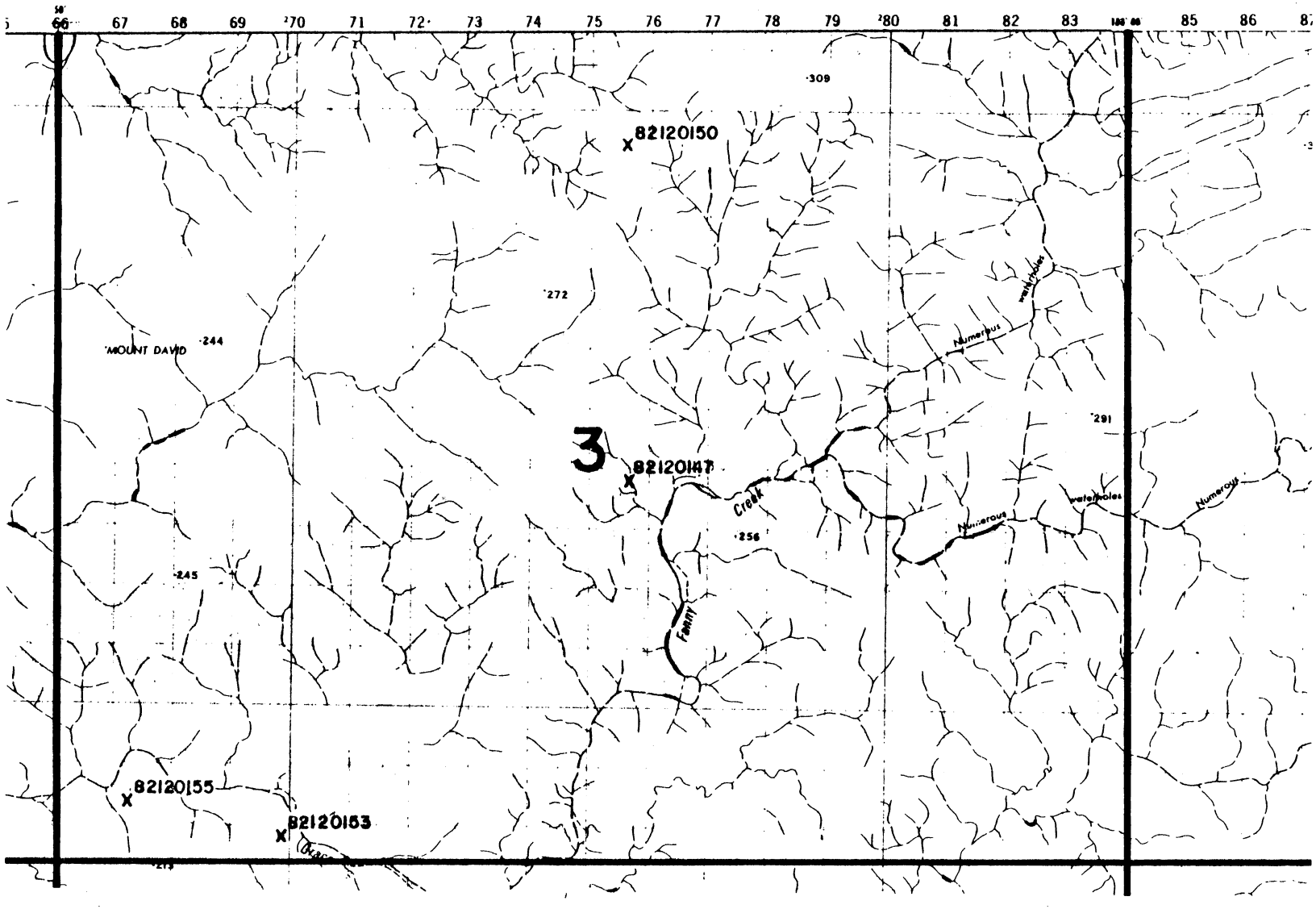
16/D 53-9/39

Figure 5(a). Yeuralba region thin section localities



Record 1986/24

Figure 5(b). Yeuralba Region 1:100 000 reduction of 1:25 000 compilation sheet. 16/D53-9/40



X 82120145 *Thin section locality with BMR registered number*

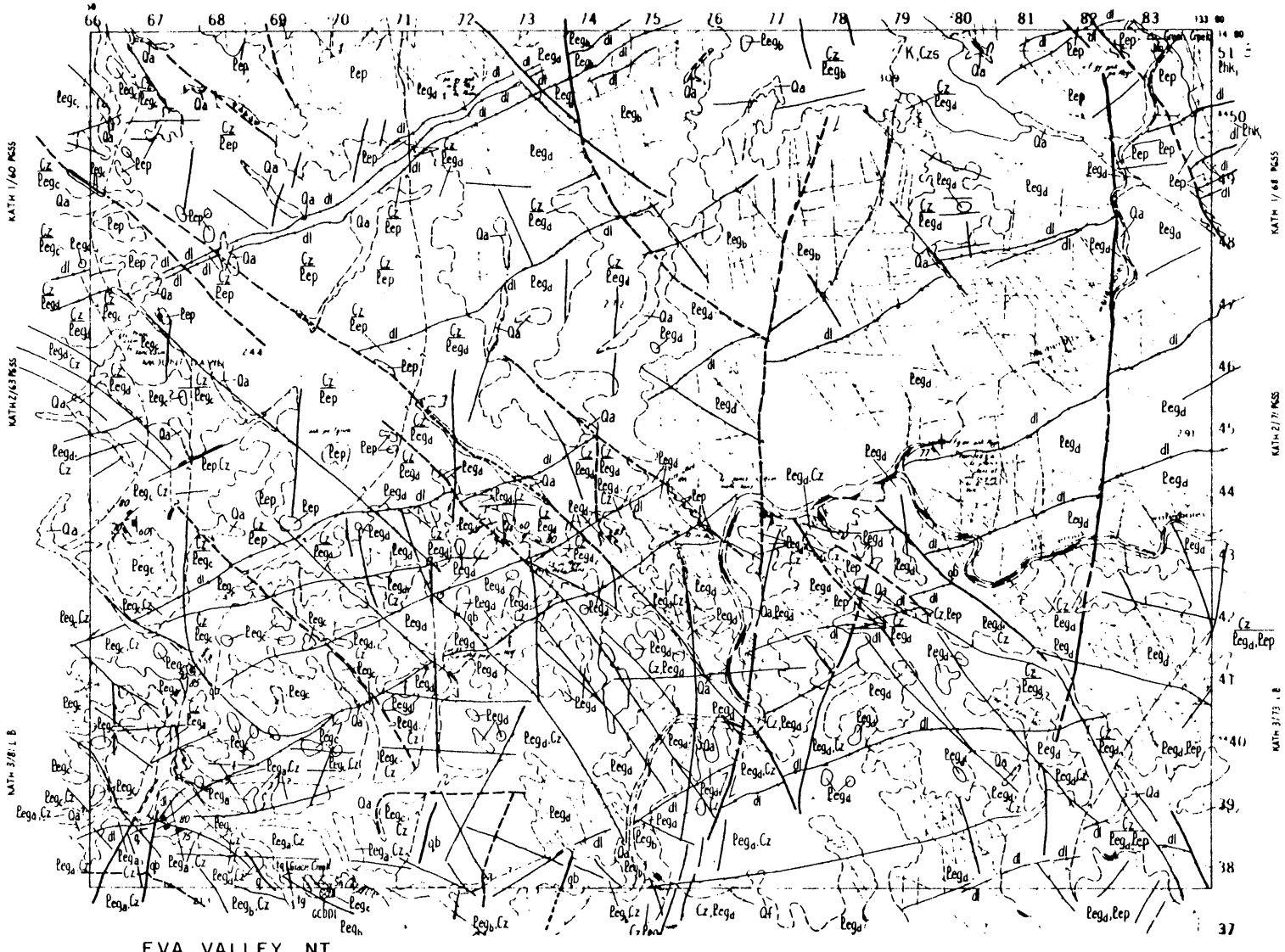
EVA VALLEY, NT

0 2 4 6 km

Record 1986/24

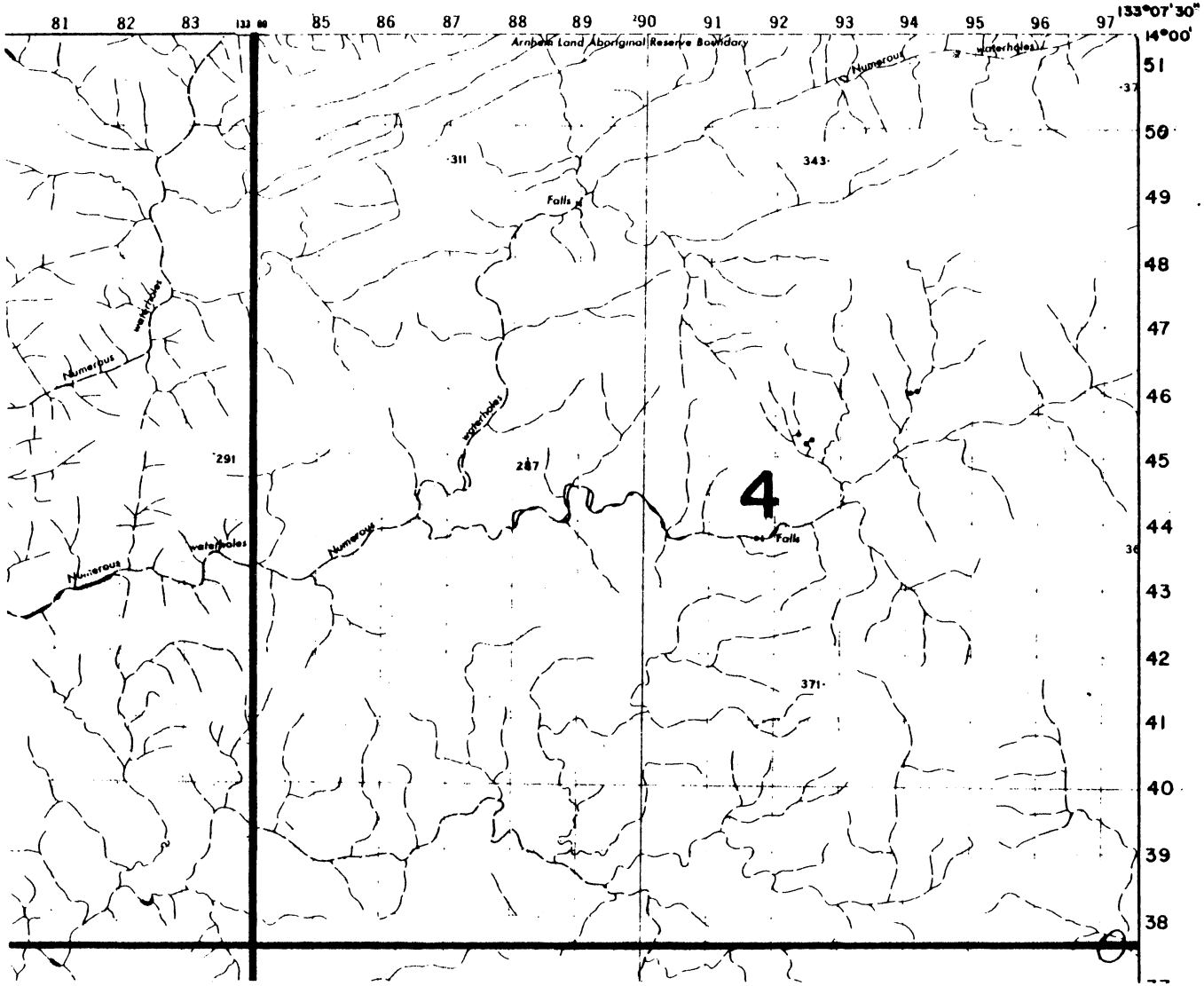
16/D 53-9/41

Figure 6(a). Yeuralba region thin section localities



Record 1986/24

Figure 6(b). Yeuralba Region 1:100 000 reduction of 1:25 000 compilation sheet, 16/D53-9/42



X 82120145 *Thin section locality with BMR registered number*

WATERHOUSE, NT

Record 1986/24

16/D 53-9/43

Figure 7(a). Yeuralba region thin section localities

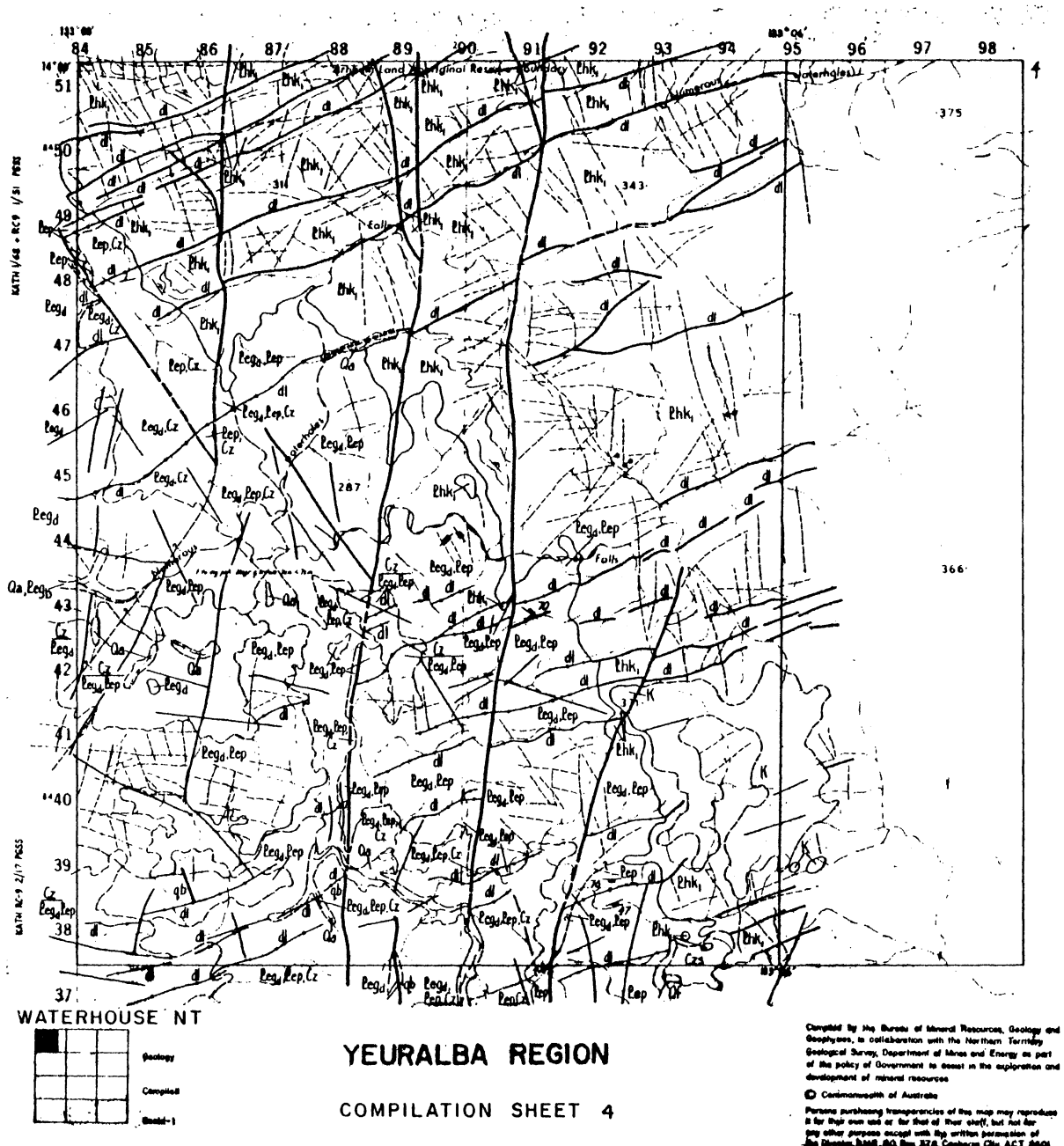
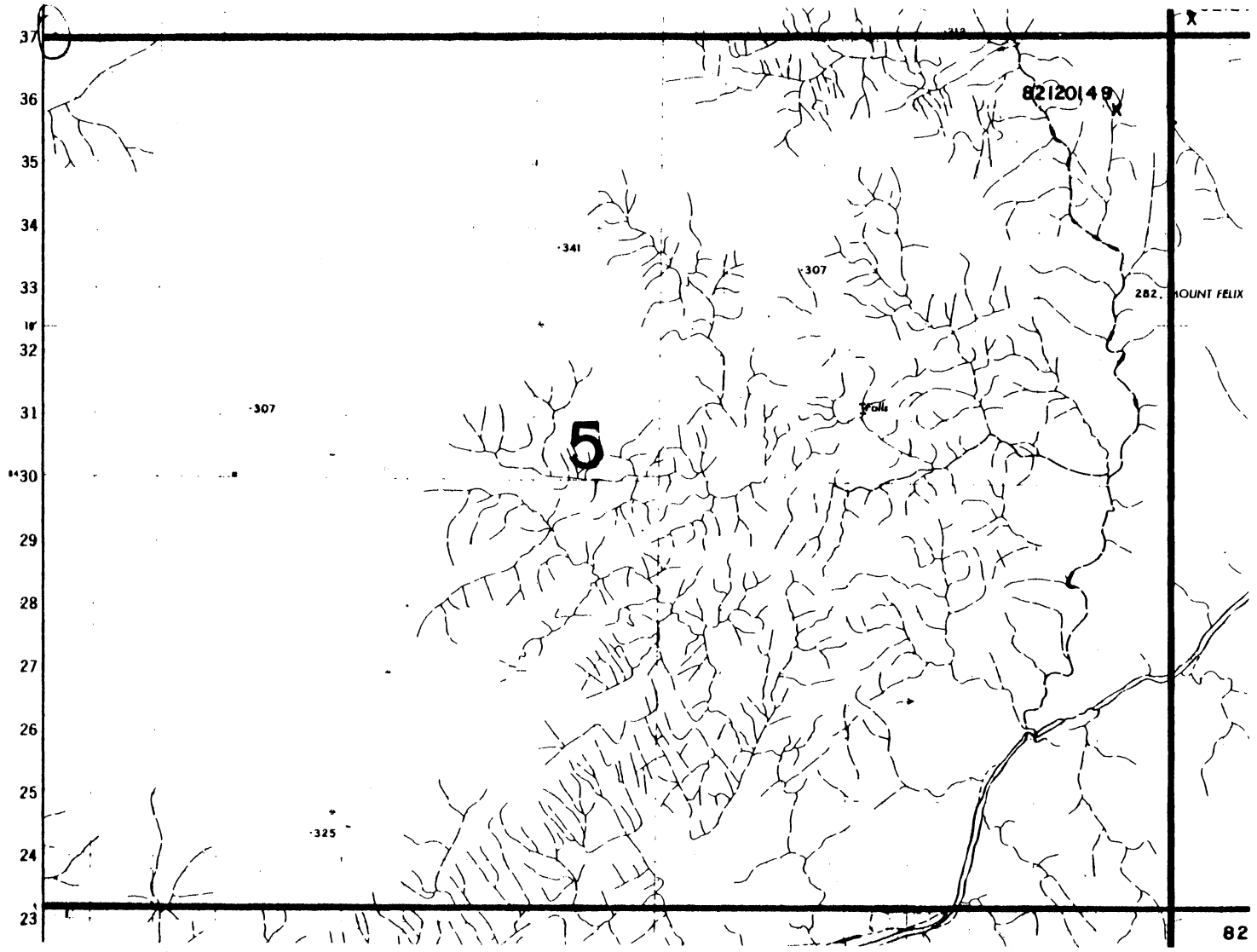


Figure 7(b). Yeuralba Region 1:100 000 reduction of 1:25 000 compilation sheet. 16/D53-9/44



X 82120145 *Thin section locality with BMR registered number*

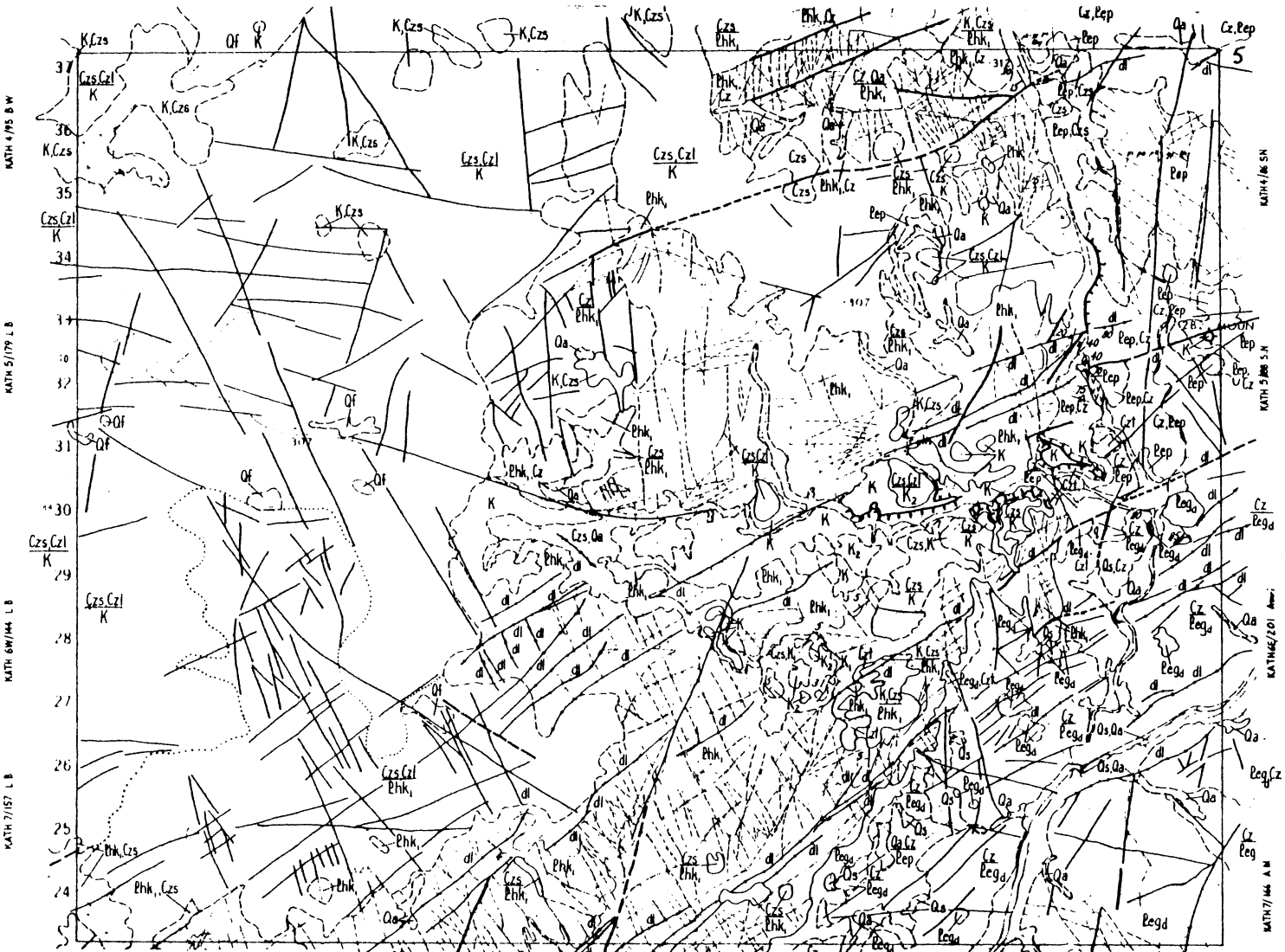
EVA VALLEY, NT

0 2 4 6 km

Record 1986/24

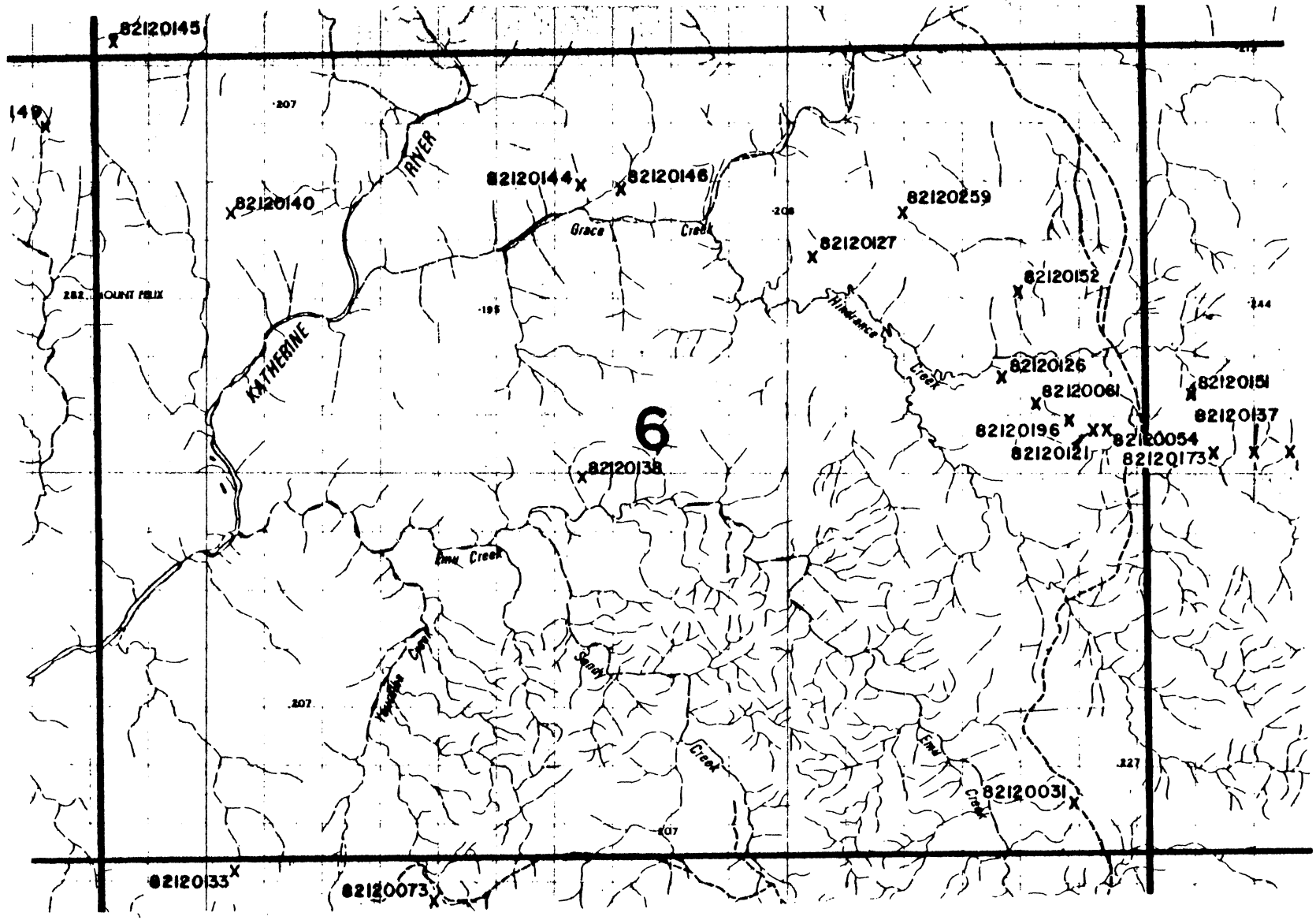
16/D 53-9/45

Figure 8(a). Yeuralba region thin section localities



Record 1986/24

Figure 8(b). Yeuralba Region 1:100 000 reduction of 1:25 000 compilation sheet. 16/D53-9/46



X 82120145 *Thin section locality with BMR registered number*

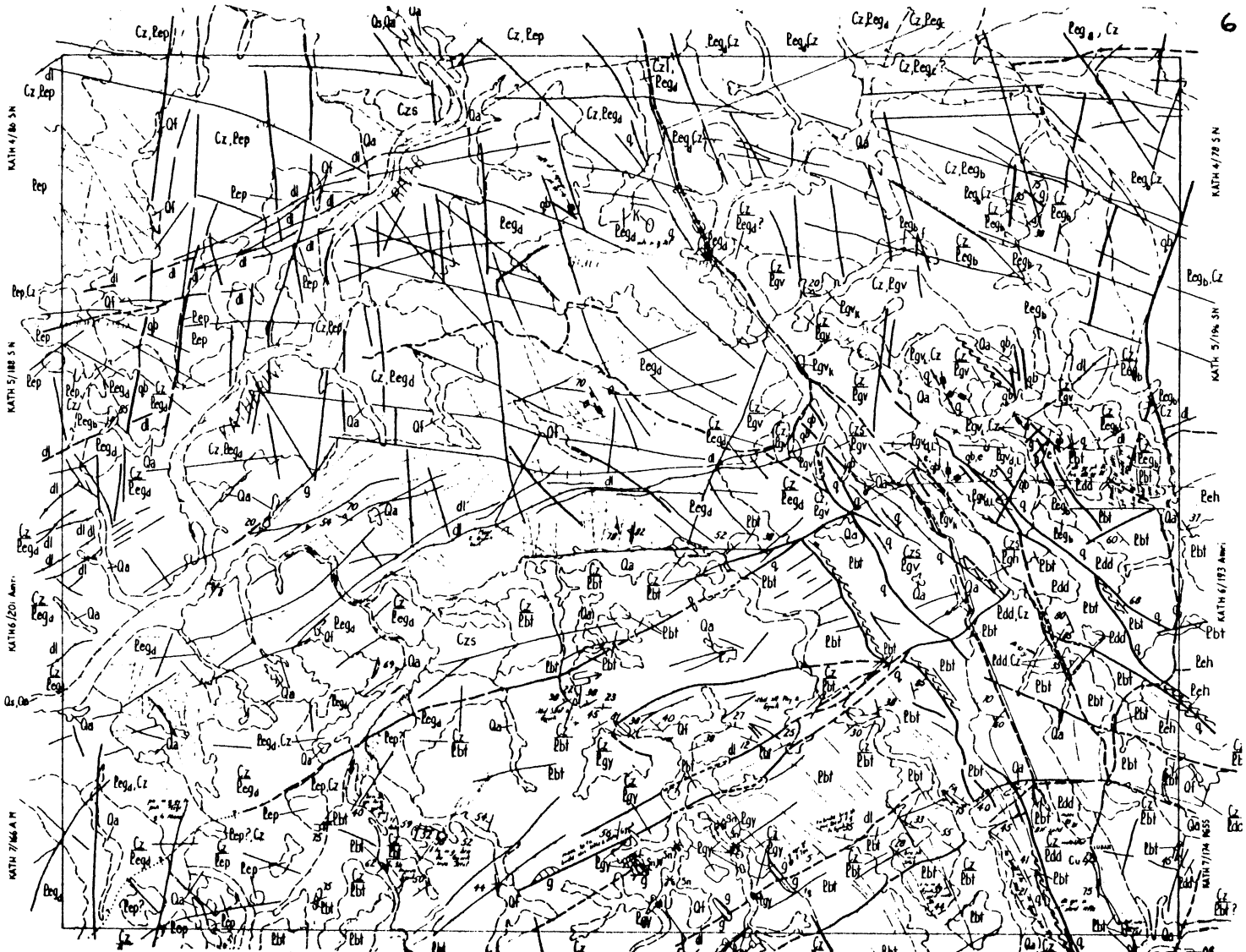
EVA VALLEY, NT

0 2 4 6 km

Record 1986/24

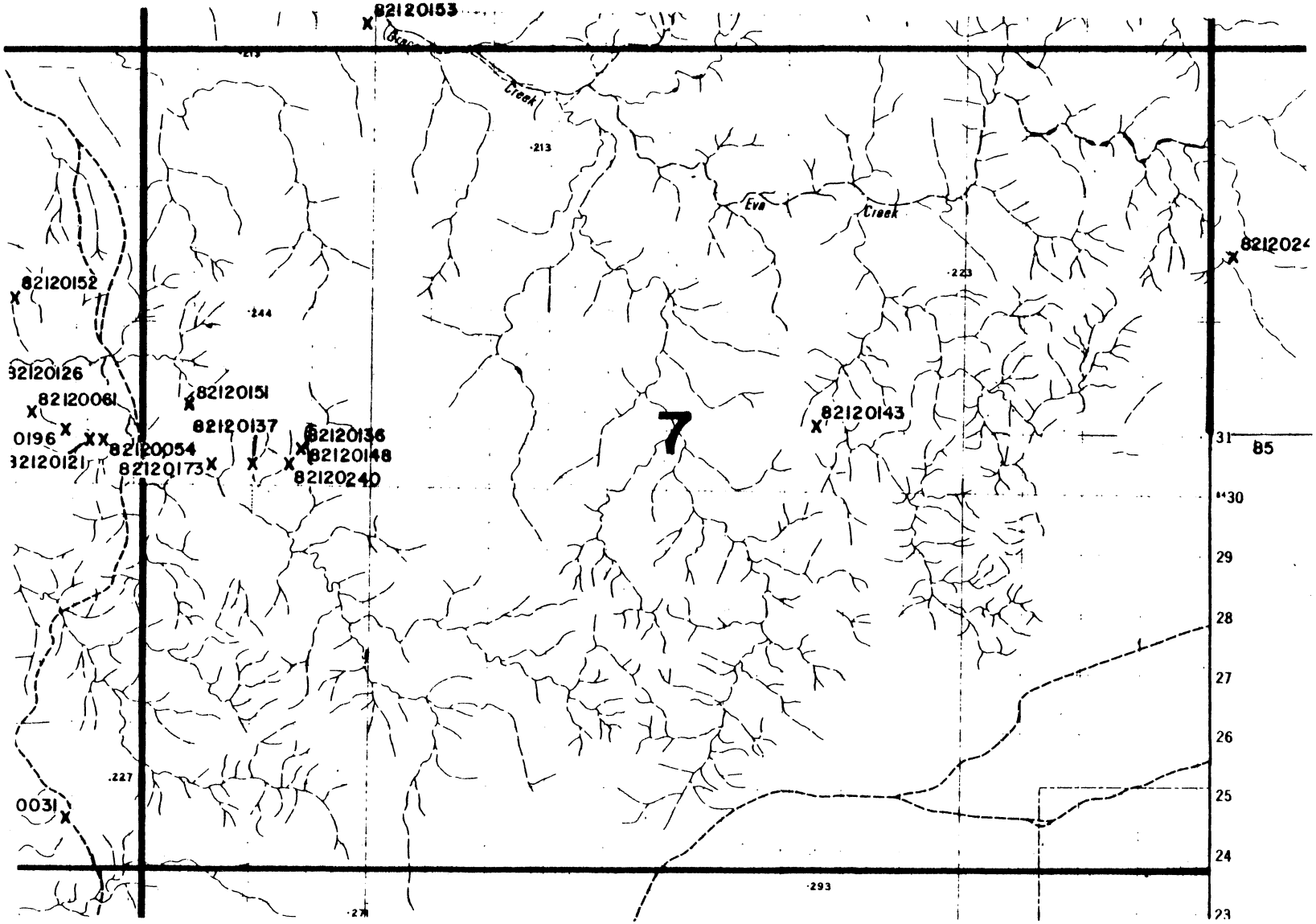
16/D 53-9/47

Figure 9(a). Yeuralba region thin section localities



Record 1986/24

Figure 9(b). Yeuralba Region 1:100 000 reduction of 1:25 000 compilation sheet. 16/D53-9/48



X 82120145 *Thin section locality with BMR registered number*

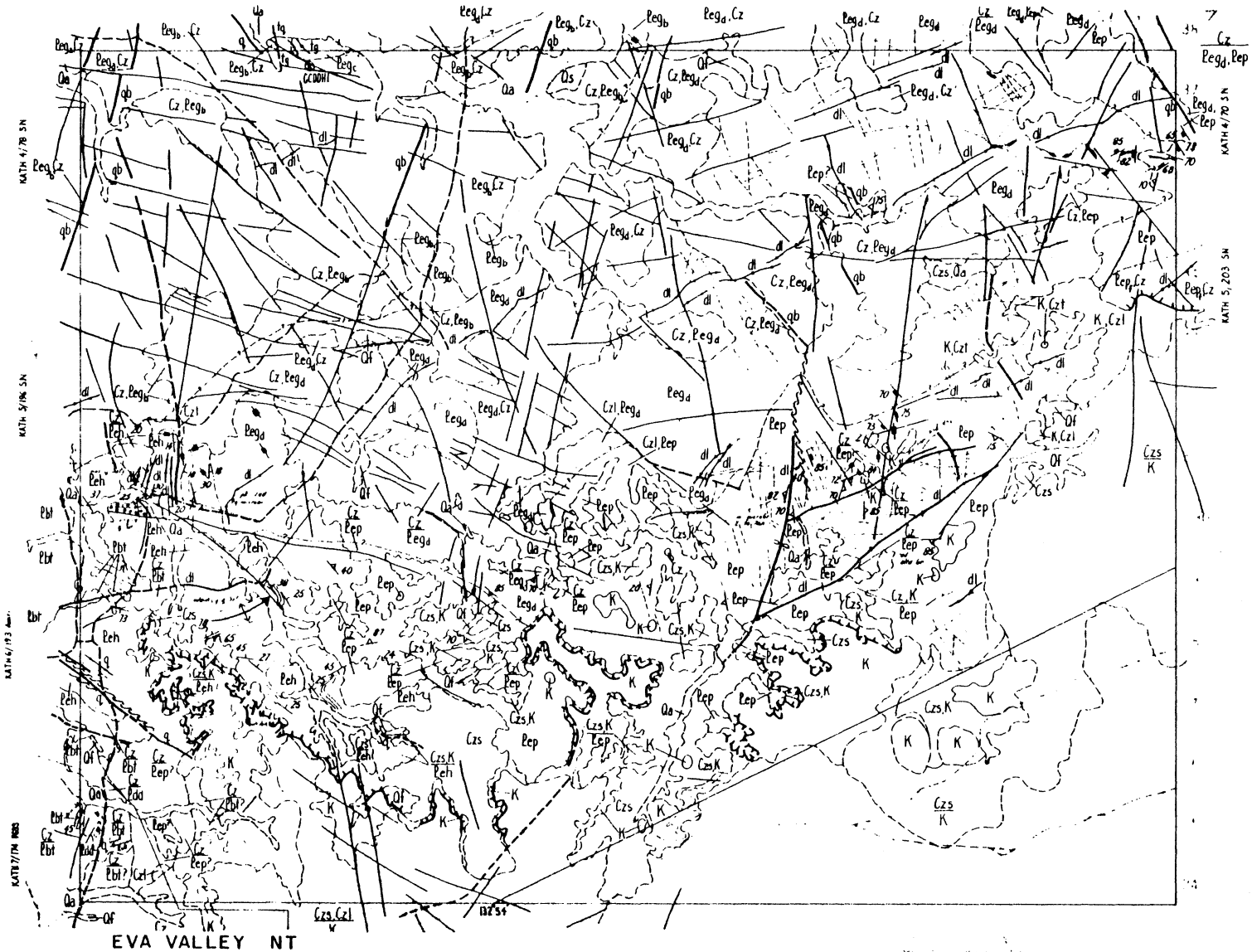
Record 1986/24

EVA VALLEY, NT

0 2 4 6 km

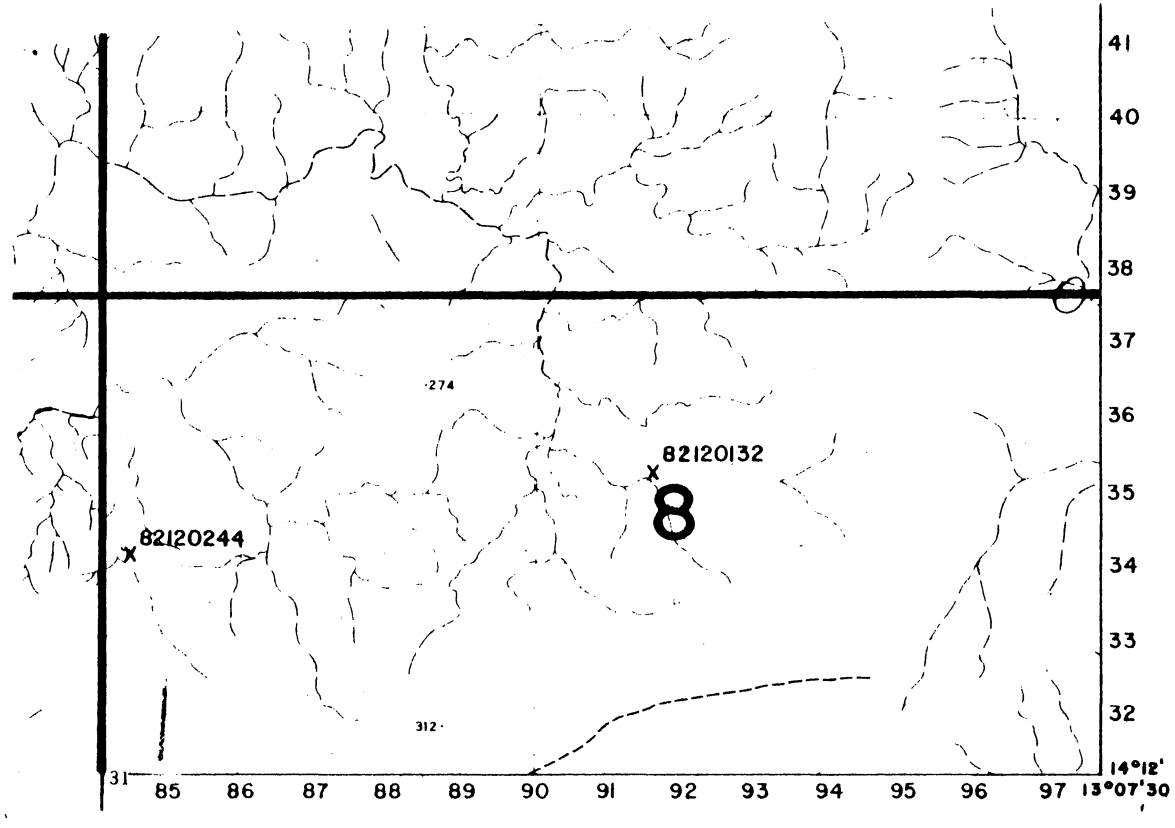
16/D 53-9/49

Figure 10(a). Yeuralba region thin section localities



Record 1986/24

Figure 10 (b). Yeuralba Region 1:100 000 reduction of 1:25 000 compilation sheet, 16/D53-9/50



X 82120145 *Thin section locality with BMR registered number*

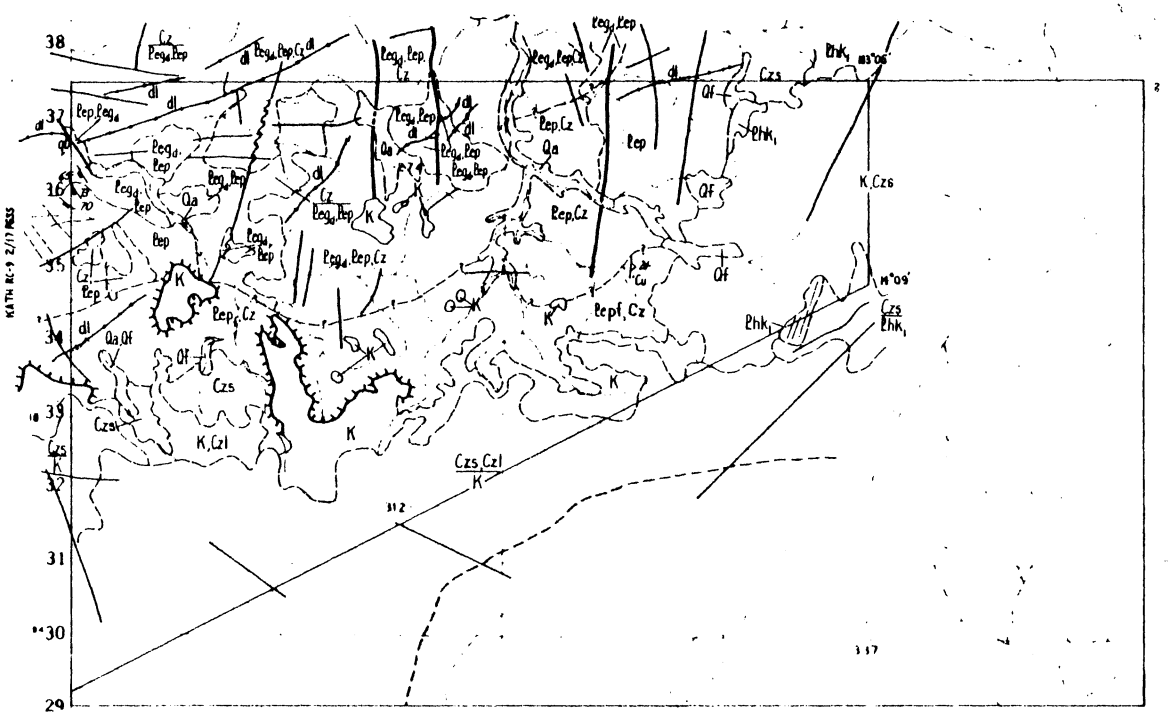
WATERHOUSE, NT

0 2 4 6 km

Record 1986/24

16/D 53-9/51

Figure 11 (a). Yeuralba region thin section localities



WATERHOUSE NT

Geology

Compiled

Scale-1:100 000

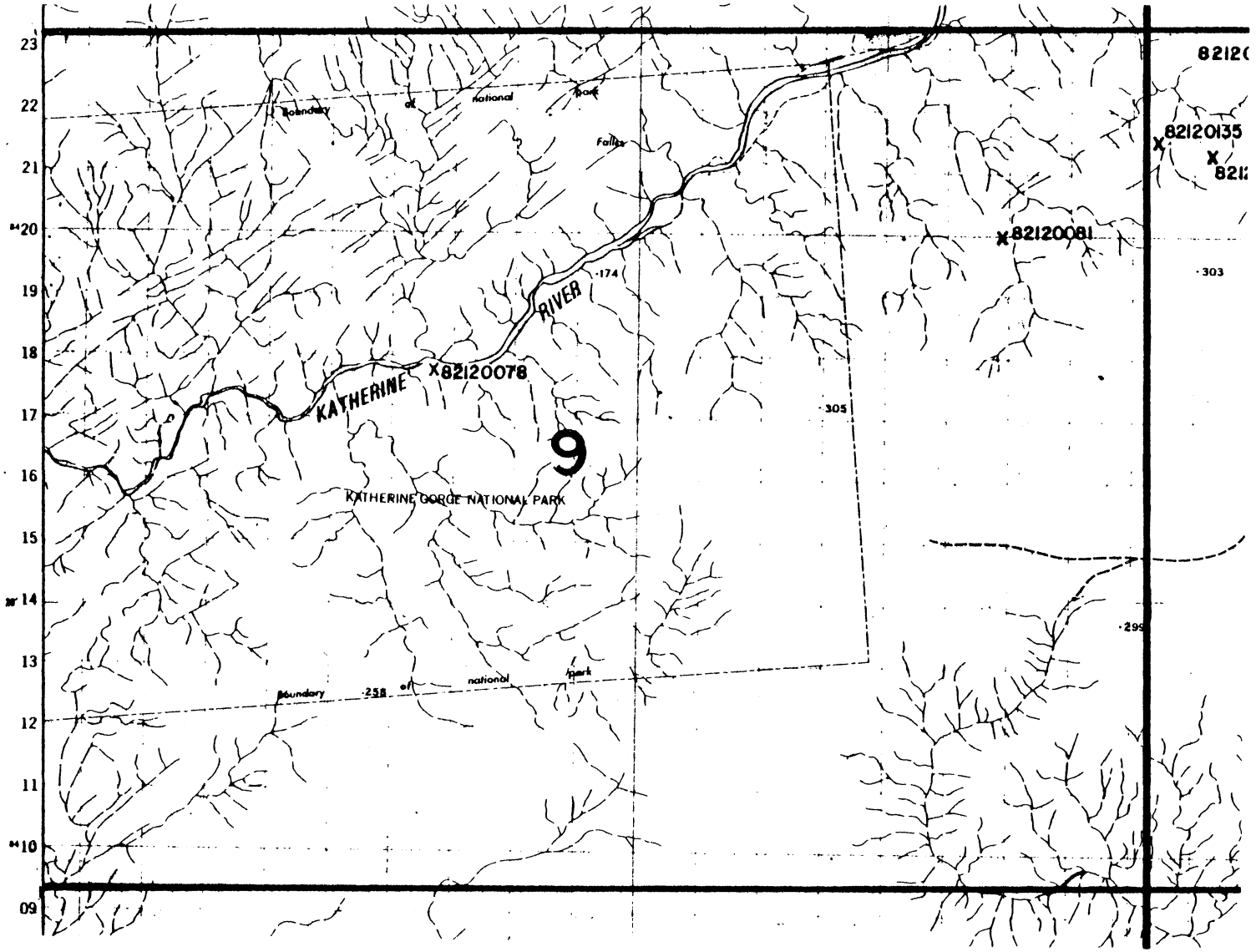
YEURALBA REGION

COMPILATION SHEET 8

Compiled by the Bureau of Mineral Resources, Geology and Geophysics, in collaboration with the Northern Territory Geological Survey, Department of Mines and Energy as part of the policy of Government to assist in the exploration and development of mineral resources

Record 1986/24

Figure 11(b). Yeuralba Region 1:100 000 reduction of 1:25 000 compilation sheet. 16/D53-9/52



X 82120145 *Thin section locality with BMR registered number*

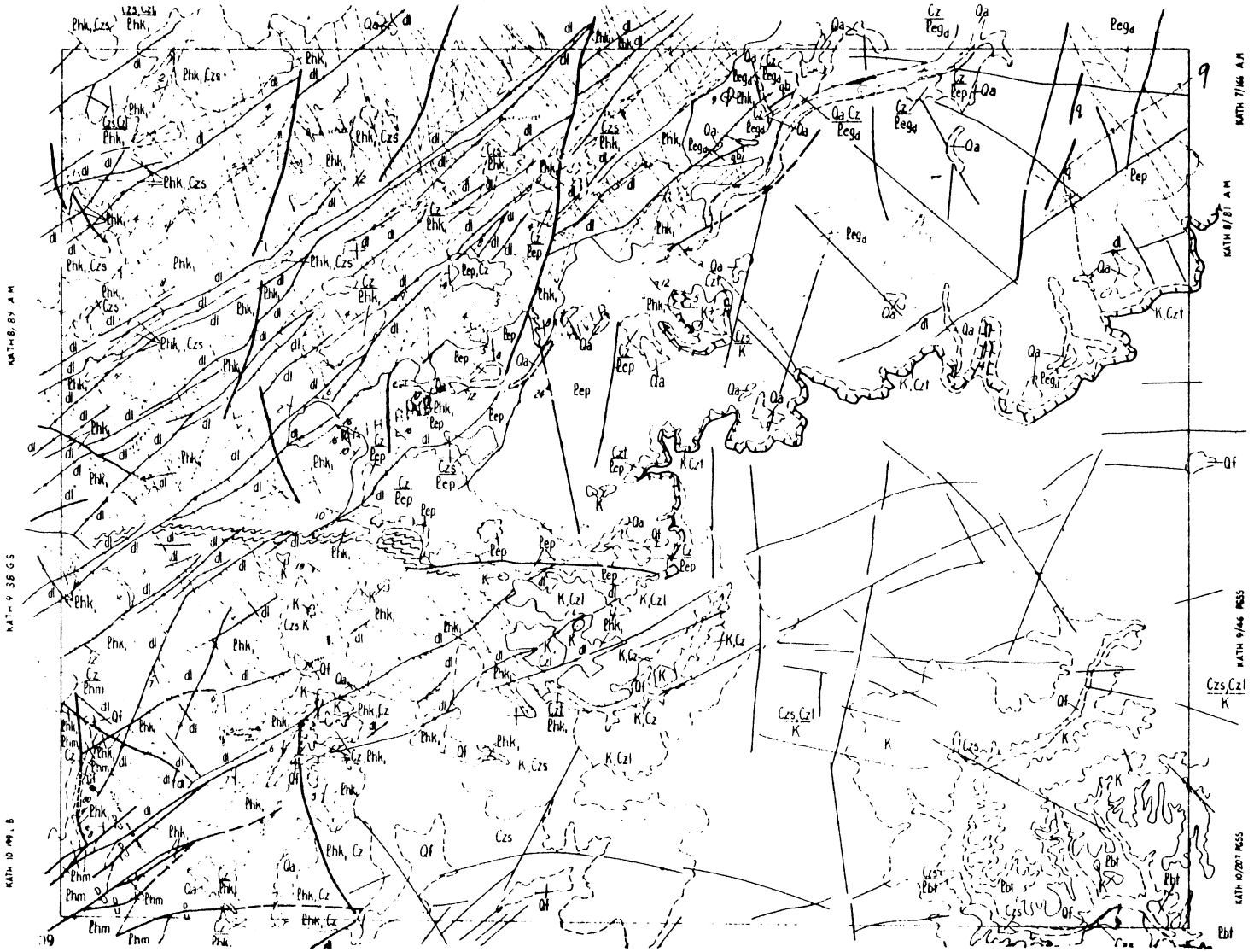
EVA VALLEY, NT

0 2 4 6 km

Record 1986/24

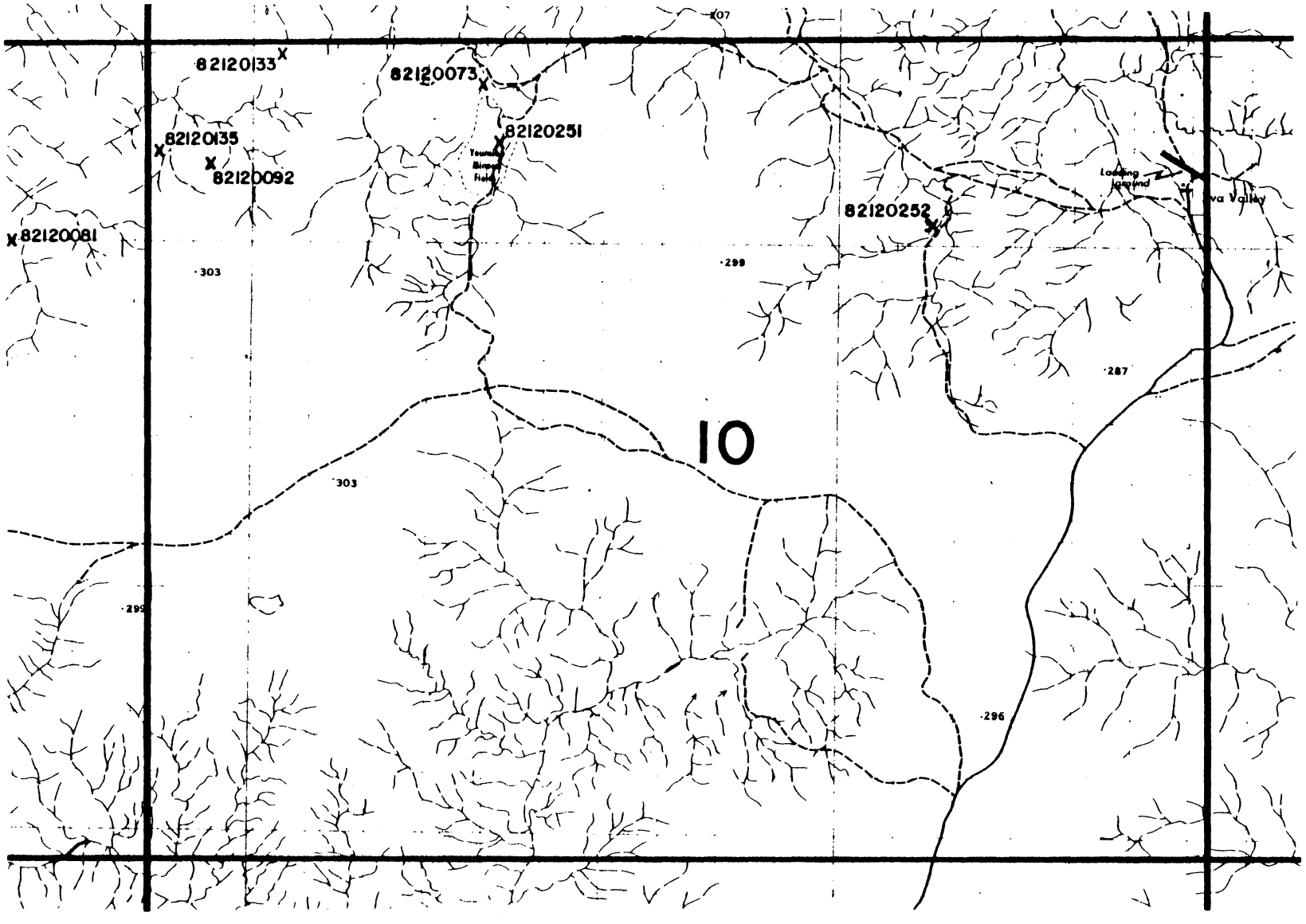
16/D 53-9/53

Figure 12 (a). Yeuralba region thin section localities



Record 1986/24

Figure 12(b). Yeuralba Region 1:100 000 reduction of 1:25 000 compilation sheet. 16/D53-9/54



X 82120145 *Thin section locality with BMR registered number*

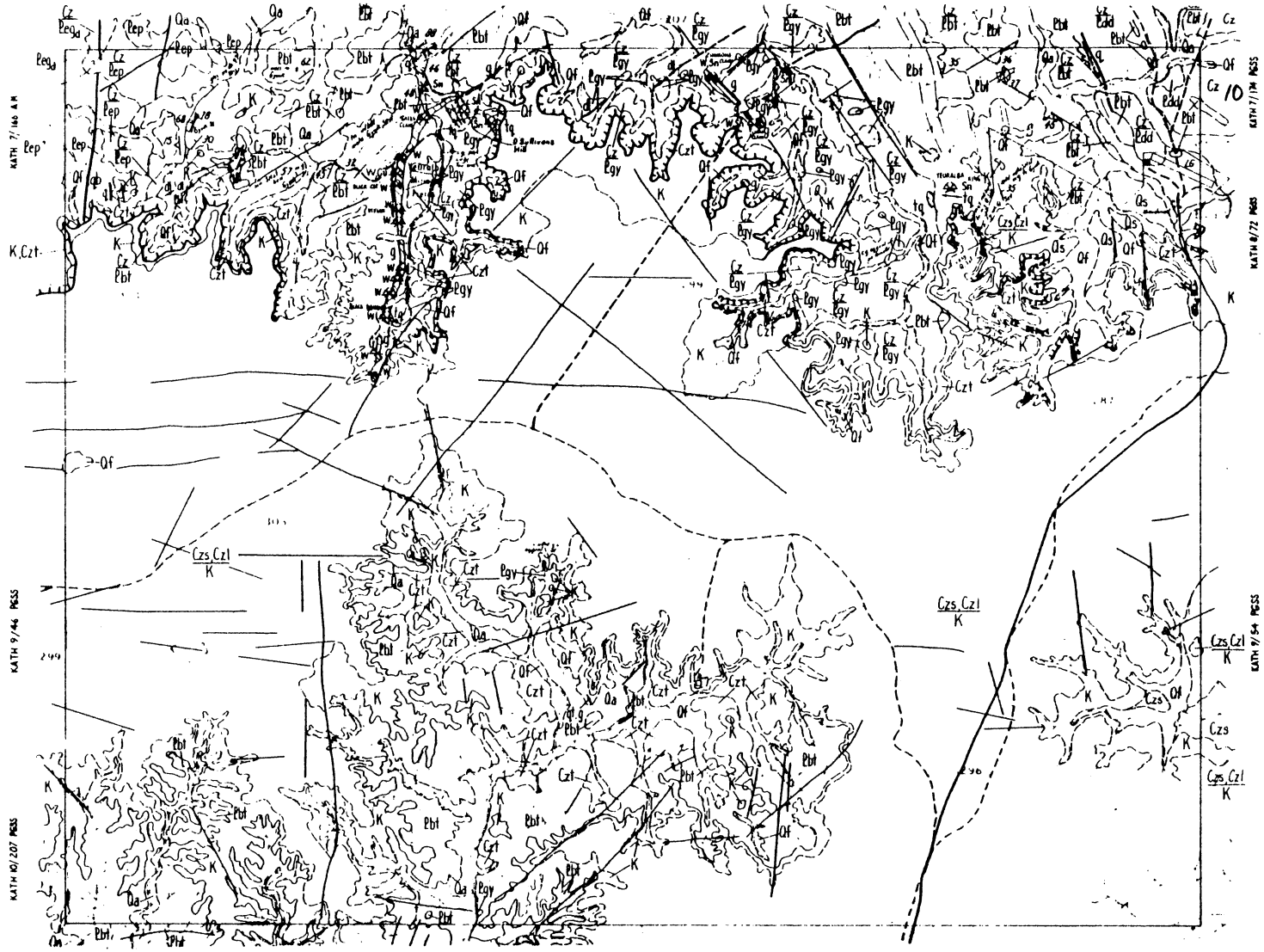
EVA VALLEY, NT

0 2 4 6 km

Record 1986/24

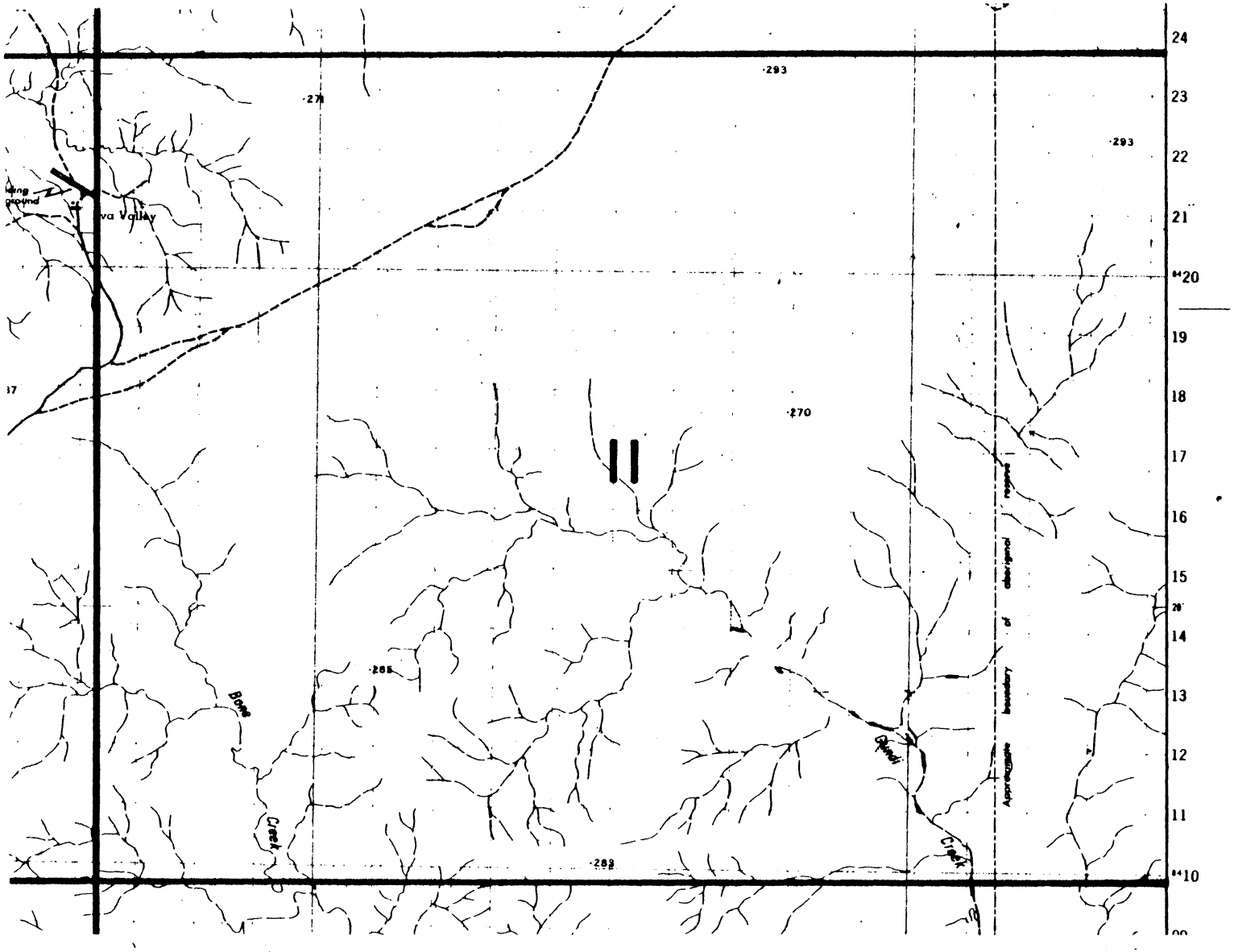
16/D 53-9/55

Figure 13 (a). Yeuralba region thin section localities



Record 1986/24

Figure 13 (b). Yeuralba Region 1:100 000 reduction of 1:25 000 compilation sheet. 16/D53-9/56



X 82120145 *Thin section locality with BMR registered number*

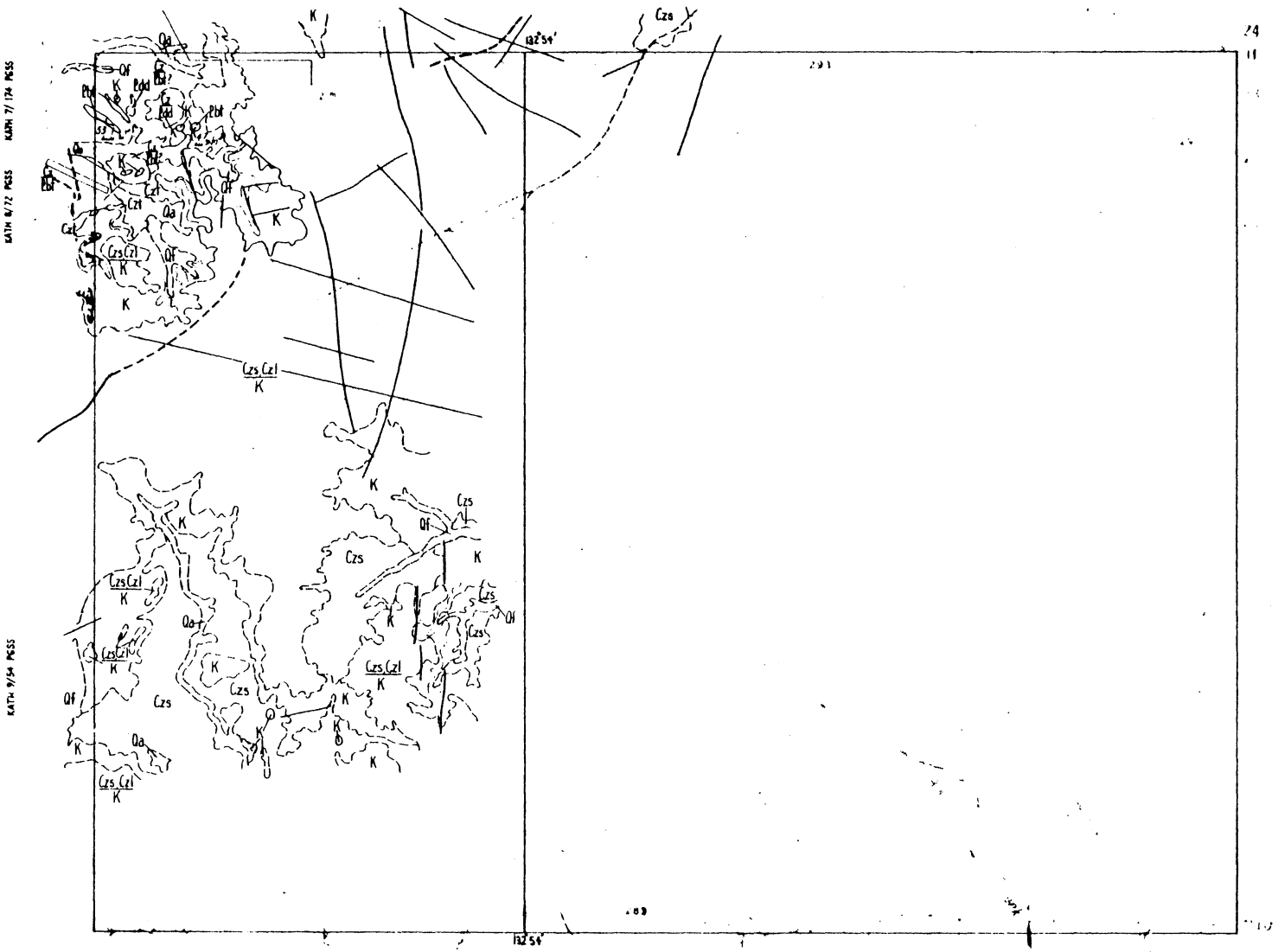
EVA VALLEY, NT

0 2 4 6 km

Record 1986/24

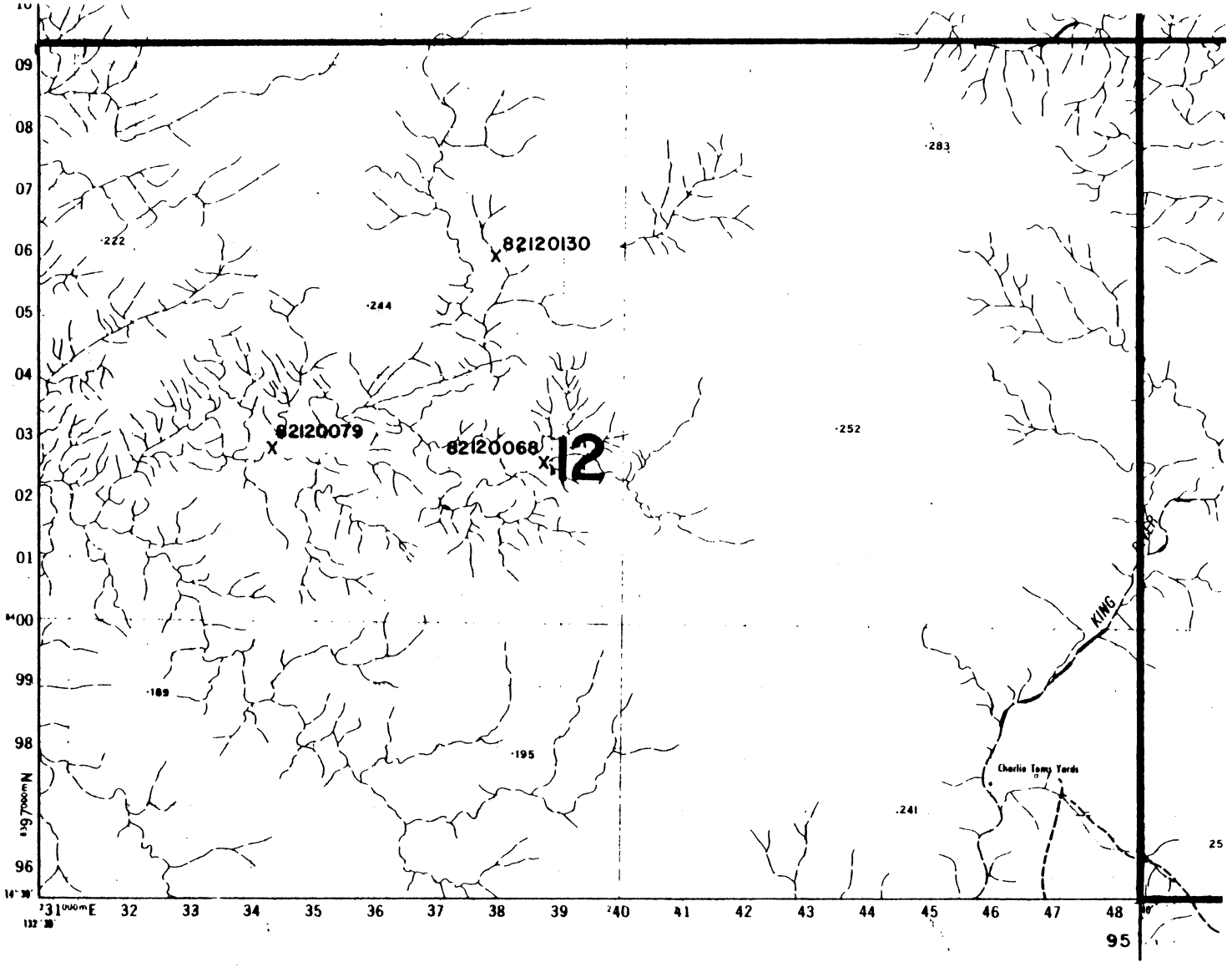
16/D 53-9/57

Figure 14 (a). Yeuralba region thin section localities



Record 1986/24

Figure 14 (b). Yeuralba Region 1:100 000 reduction of 1:25 000 compilation sheet. 16/D53-9/58



X 82120145 *Thin section locality with BMR registered number*

EVA VALLEY, NT

0 2 4 6 km

Record 1986/24

16/D 53-9/59

Figure 15 (a). Yeuralba region thin section localities

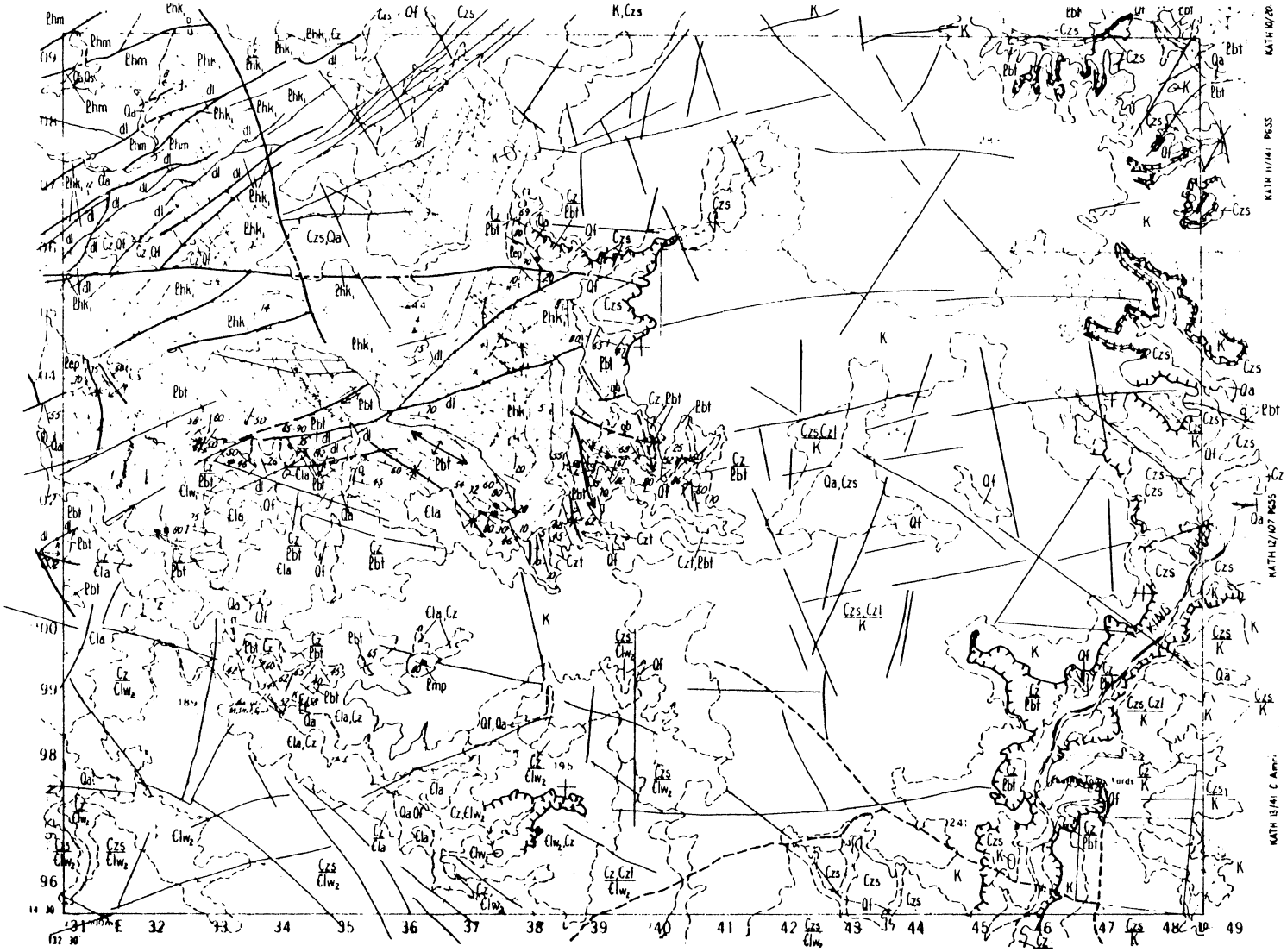
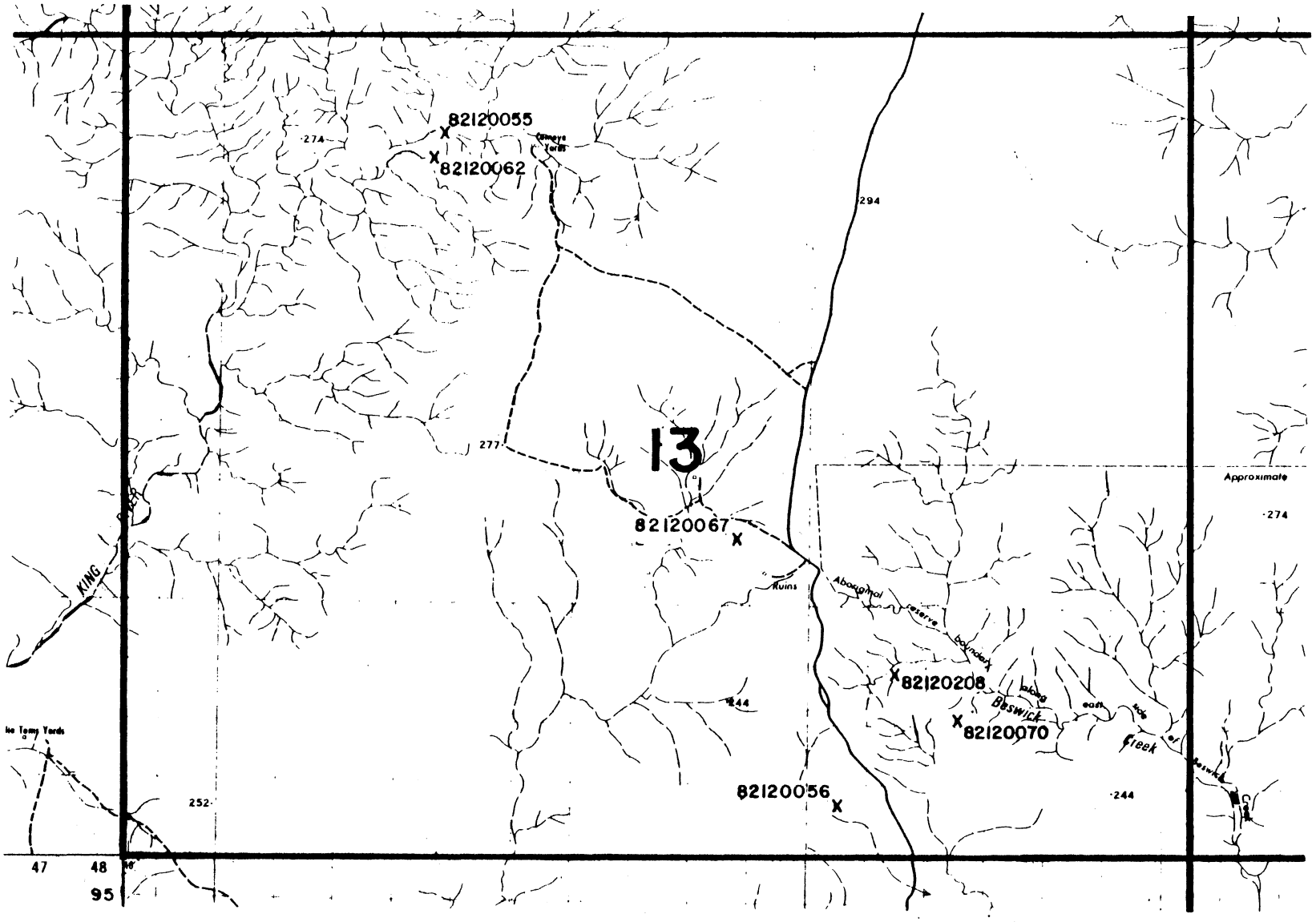


Figure 15(b). Yeuralba Region 1:100 000 reduction of 1:25 000 compilation sheet. 16/D53-9/60



X 82120145 *Thin section locality with BMR registered number*

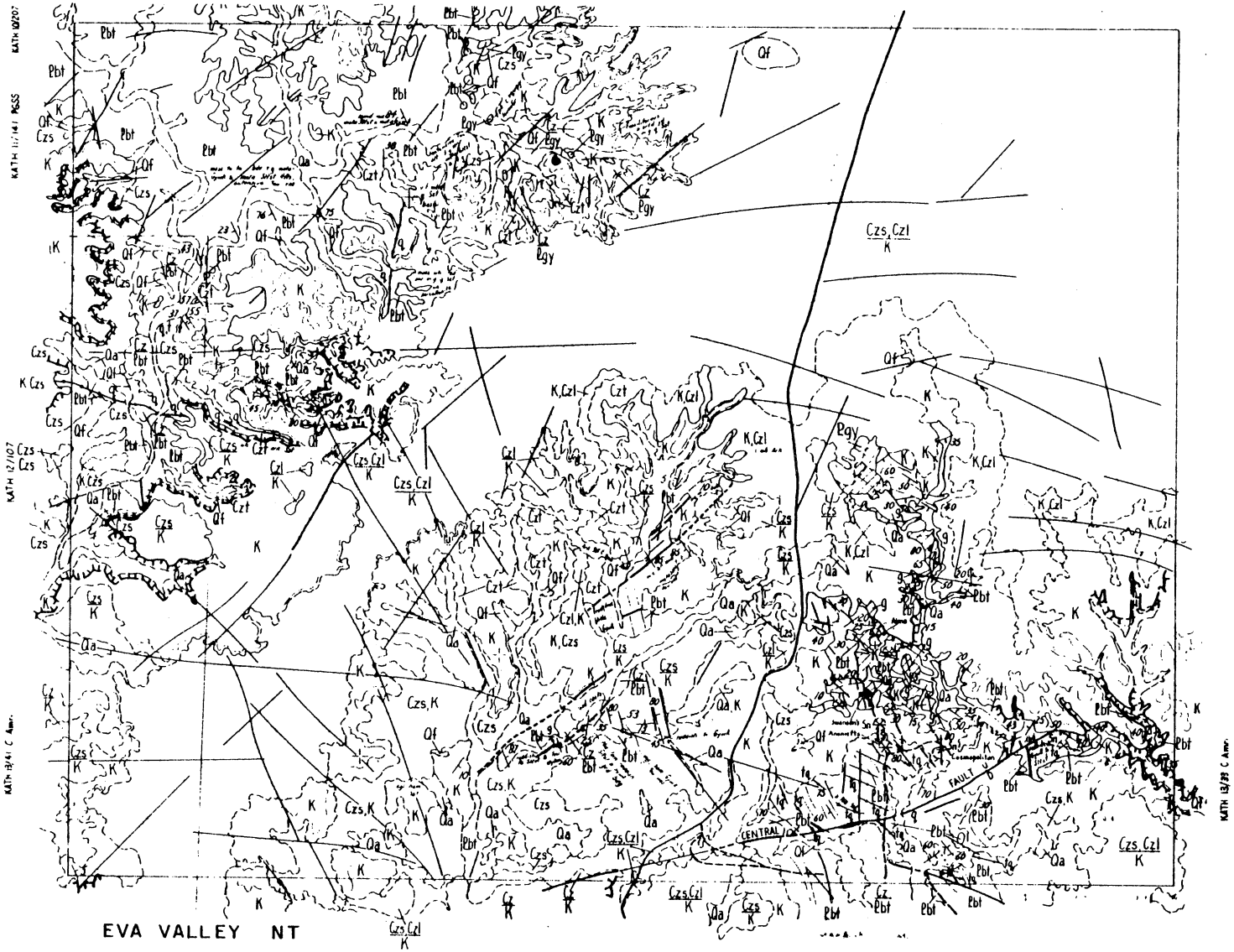
EVA VALLEY, NT

0 2 4 6 km

Record 1986/24

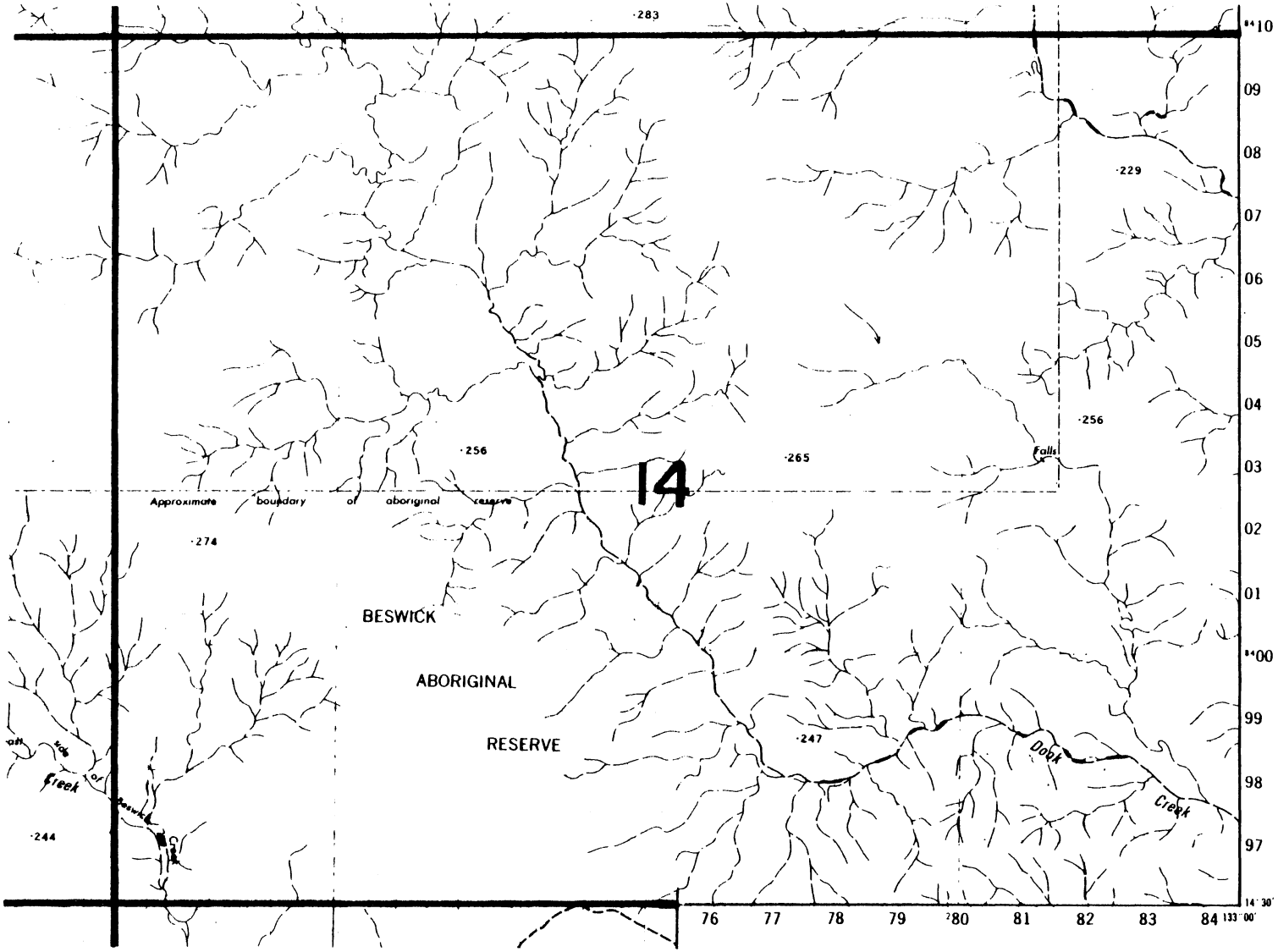
16/D 53-9/61

Figure 16(a). Yeuralba region thin section localities



Record 1986/24

Figure 16(b). Yeuralba Region 1:100 000 reduction of 1:25 000 compilation sheet. 16/D53-9/62



X 82120145 *Thin section locality with BMR registered number*

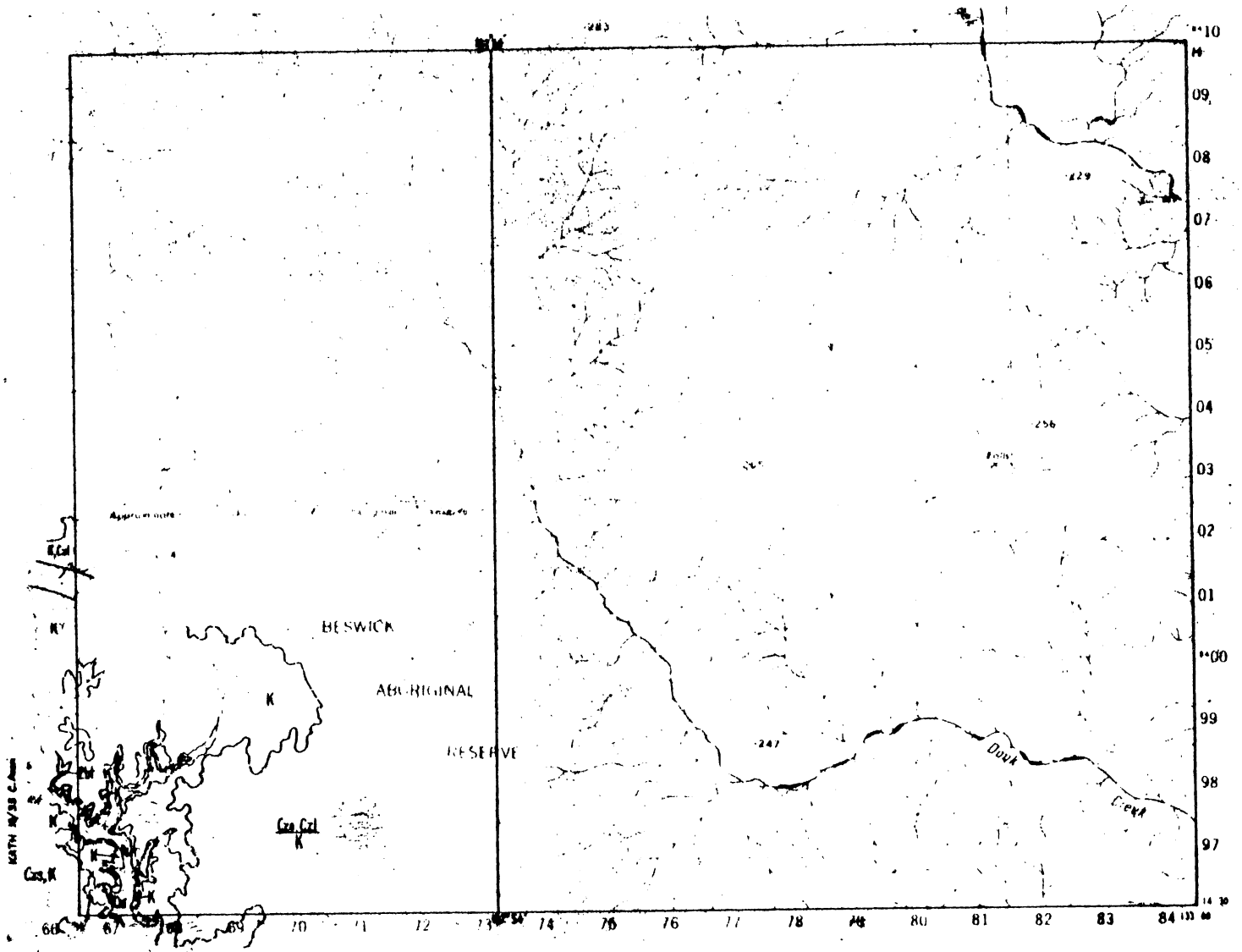
EVA VALLEY, NT

0 2 4 6 km

Record 1986/24

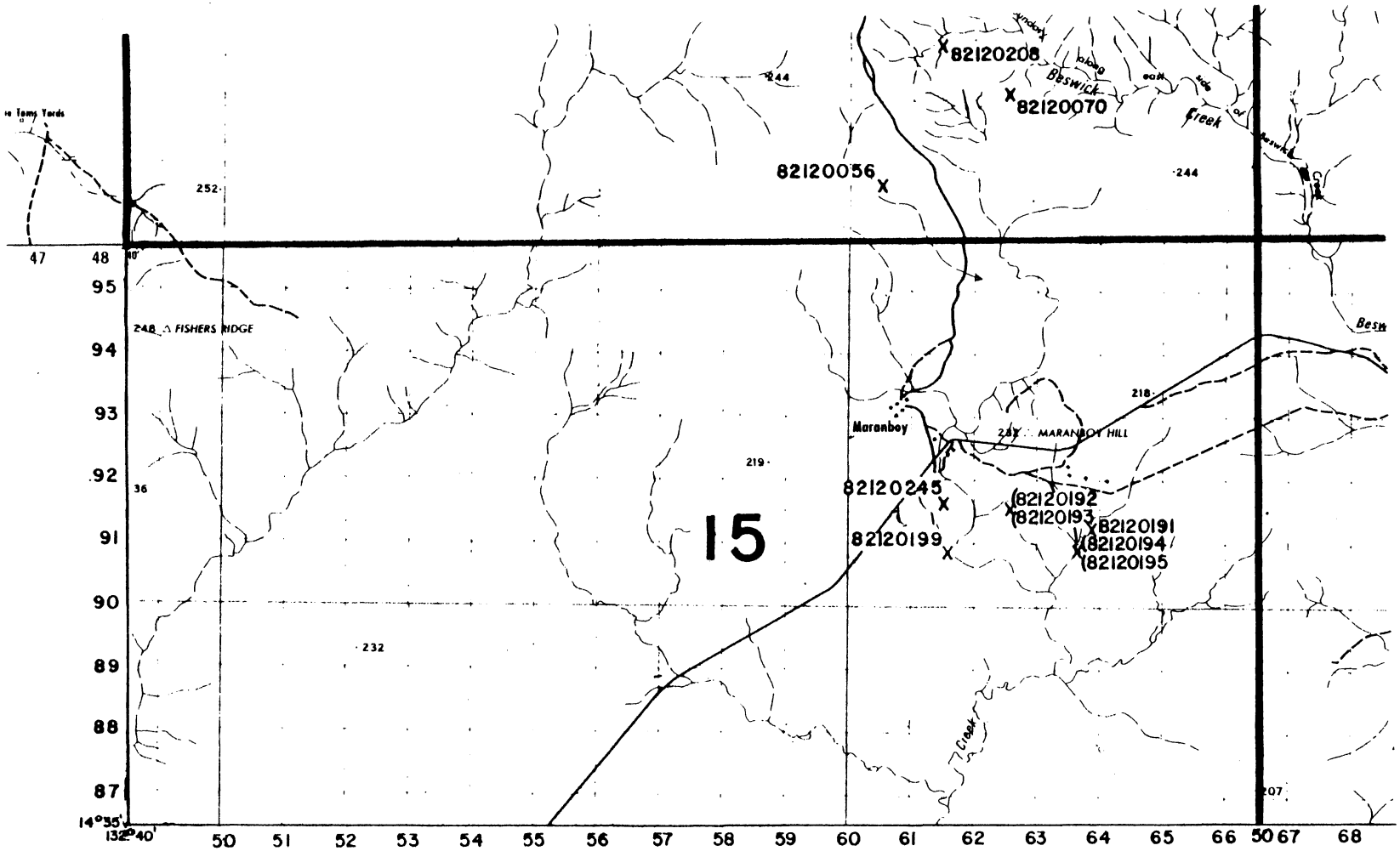
16/D 53-9/63

Figure 17(a). Yeuralba region thin section localities



Record 1986/24

Figure 17(b). Yeuralba Region 1:100 000 reduction of 1:25 000 compilation sheet. 16/D53-9/64



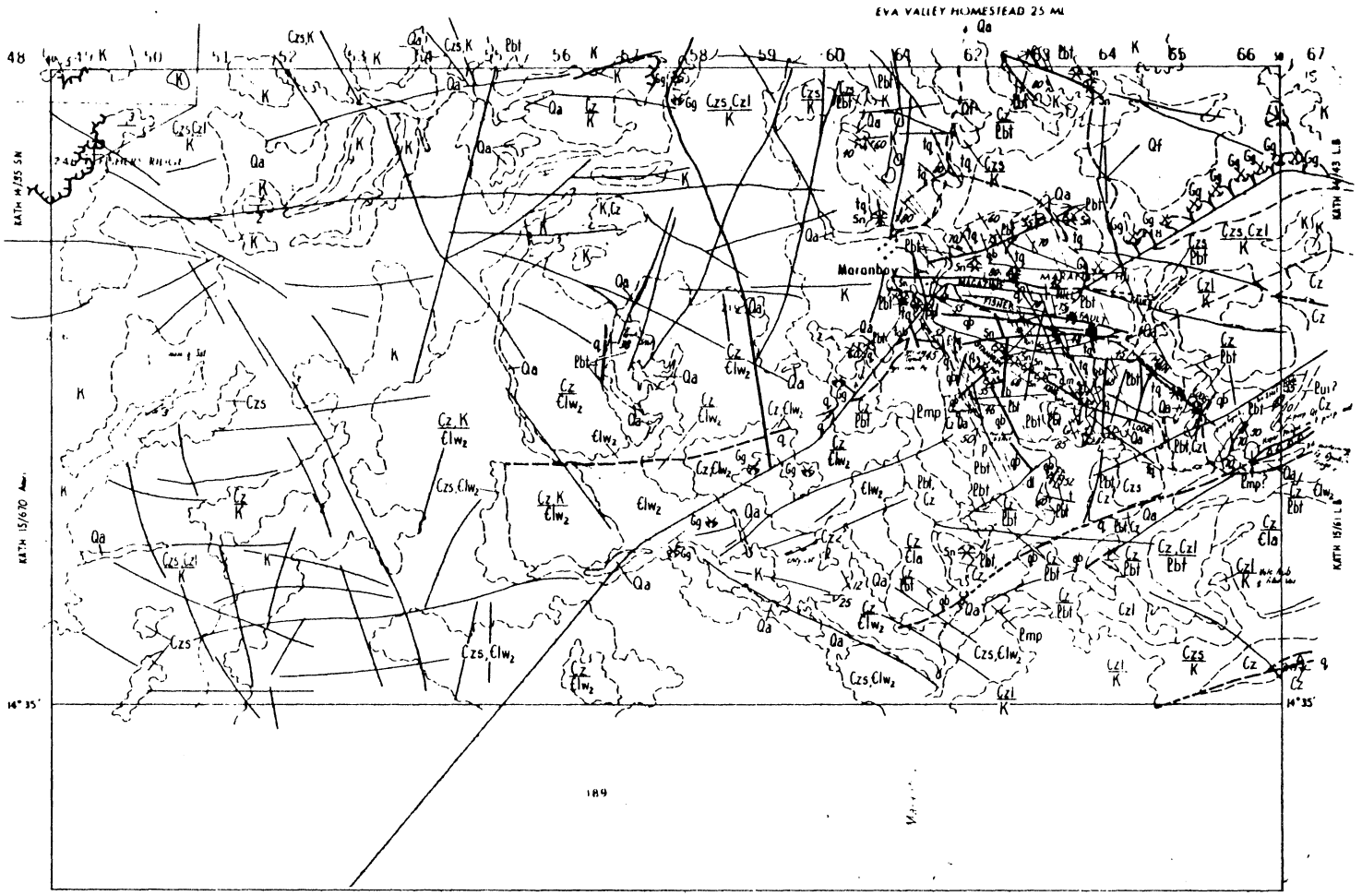
X 82120145 *Thin section locality with BMR registered number*

MARANBOY, NT

Record 1986/24

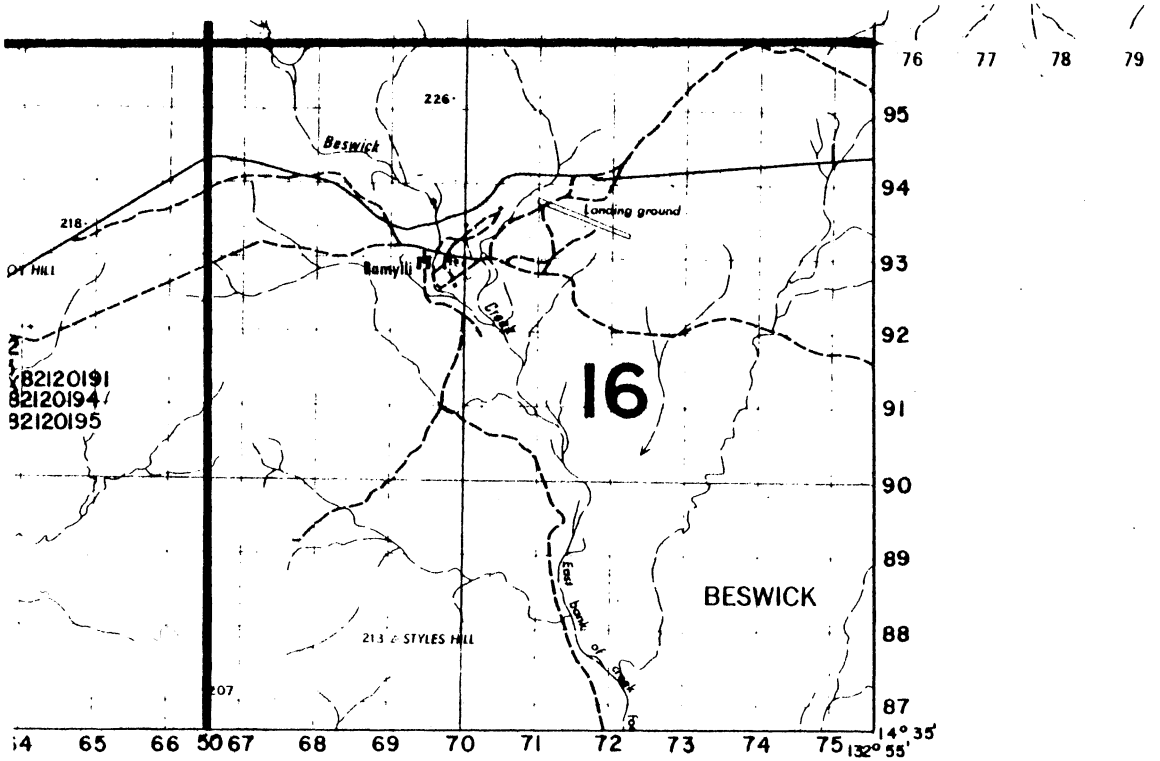
16/D53-9/65

Figure 18(a). Yeuralba region thin section localities



Record 1986/24

Figure 18(b). Yeuralba Region 1:100 000 reduction of 1:25 000 compilation sheet. 16/D53-9/66



X 82120145 *Thin section locality with BMR registered number*

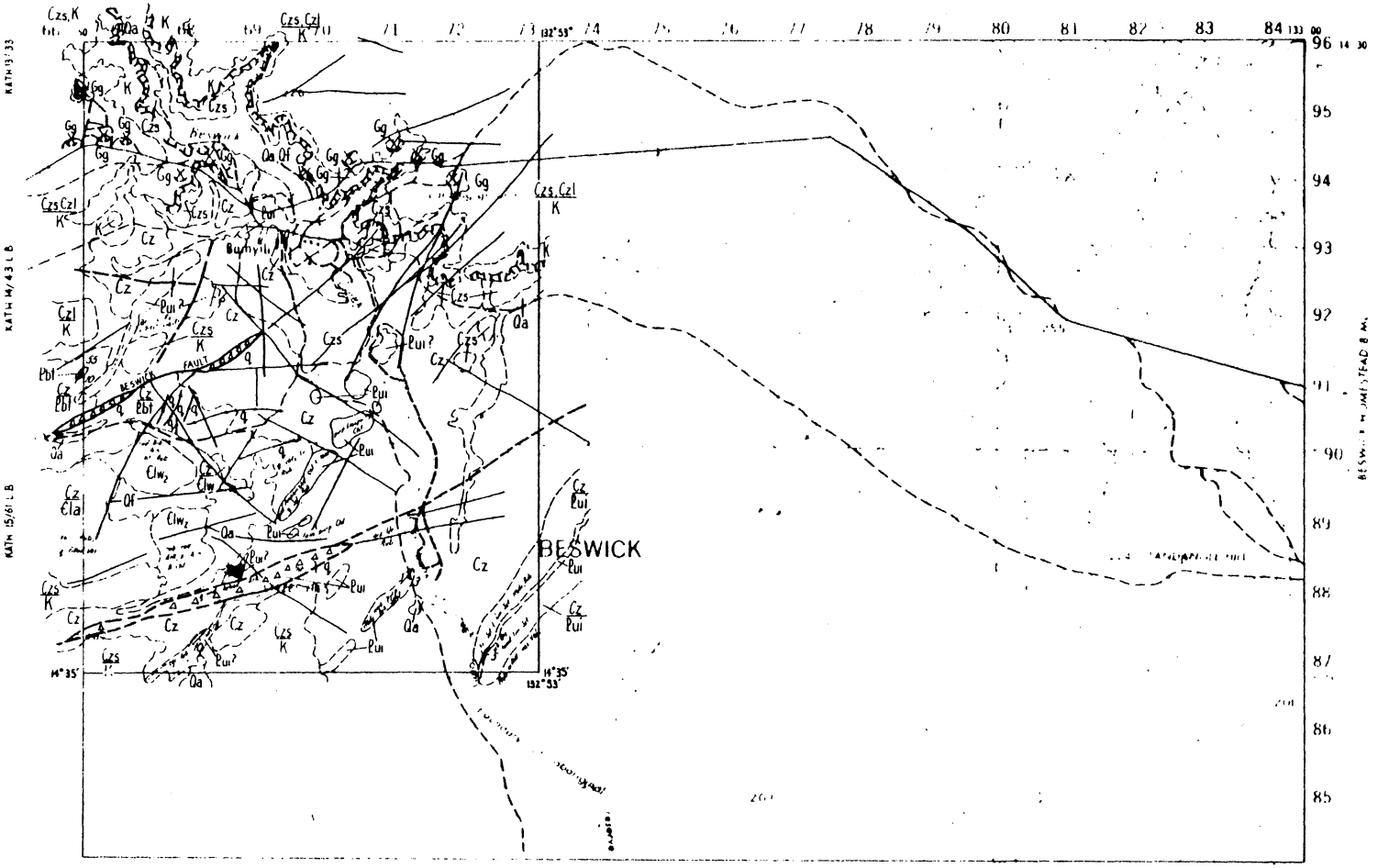
MARANBOY, NT

0 2 4 6 km

16/D 53-9/67

Record 1986/24

Figure 19 (a). Yeuralba region thin section localities



YEURALBA REGION

MARANBOY NT

Geology

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Scale–1:100 000

COMPILATION SHEET 16

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Figure 19(b). Yeuralba Region 1:100 000 reduction of 1:25 000 compilation sheet. 16/D53-9/68

TABLE 1: SUMMARY OF STRATIGRAPHY OF THE YEURALBA REGION, N.T.

		Unit	description	field relationships
MESOZOIC		CRETACEOUS K	Fine white sandstone, yellow-brown ferruginuous friable sandstone kaolinitic in places, minor siltstone	Unconformable on older units; forms extensive tablelands with sandy aprons
		UNCONFORMITY		
PALAEOZOIC (CAMBRIAN)		JINDARE SANDSTONE Ꞓlw	Fine-coarse commonly ferruginous sandstone, arkose, laminated and brecciated chert	Appears to unconformably overlie Antrim Plateau Volcanics
		ANTRIM PLATEAU Ꞓla	Fine basalt, vesicular in places, minor sandstone intervals near base	Unconformable on older units; sandstone interbeds may be equivalent to part of Jindare Sandstone
		UNCONFORMITY		
MIDDLE PROTEROZOIC	MT RIGG GROUP	Bui	Flaggy quartz sandstone	No relationships apparent in region
		?UNCONFORMITY		
	KATHERINE RIVER GROUP	KOMBOLGIE FORMATION Bhk$_1$	Coarse buff-white sandstone, commonly poorly sorted pebbly and clayey, minor siltstone	A conformable sequence, resting with slight angular unconformity on Plum Tree Creek Volcanics and highly angular unconformity on Tollis Formation
		McADDENS CREEK VOLCANIC MEMBER Bhm	Dark grey andesite-basalt, vesicular in places	
		UNCONFORMITY		

	Unit	description	field relationships
EARLY PROTEROZOIC — EDITH RIVER GROUP	PLUM TREE CREEK VOLCANICS Bep	Red-brown glassy to fine ignimbrite commonly with xenoliths; minor red-pink or purple rhyolite, banded, spotted or agglomeratic, rare sandstone	Probably conformable on Hindrance Creek Sandstone
	FANNY RHYOLITE MEMBER Bepf	White to purple-brown rhyolite	Contact not seen
	GRACE CREEK GRANITE $Beg_{a,b,c,d}$	fine to medium-grained equigranular to porphyritic, grey-pink microgranite	Contacts obscure owing to similarity between outer, microgranitic, part and surrounding ignimbrite of Bep
	HINDRANCE CREEK SANDSTONE Beh	feldspathic sandstone, arkose, minor conglomerate	Hornfelsed by Grace Creek Granite
		UNCONFORMITY	
	EVA VALLEY GRANITE Bgv	Fine equigranular and fine to coarse porphyritic leucogranite	Intrudes and hornfelses Tollis Formation; no contact effects visible near contact with Grace Creek Granite.
	YEURALBA GRANITE Bgy	Medium to coarse equigranular tourmaline-biotite leucogranite, extensive greisen alteration	Intrudes and hornfelses Tollis Formation, unconformably overlain by Cretaceous
	MARANBOY PORPHYRY Bmp	Medium-grained feldspar porphry	Intrudes Tollis Formation, unconformably overlain by Cretaceous
	MAUD DOLERITE Bdd	Medium-grained dolerite	Intrudes Tollis Formation, faulted against Eva Valley Granite, apparently overlain by Plum Tree Creek Volcanics

		Unit	description	field relationships
EARLY PROTEROZOIC	?EL SHERANA GROUP	Bbi	Greywacke, tuff rhyolite and porphyry	Forms apparent syncline within Grace Creek Granite faulted against PLum Tree Creek Volcanics
	EL SHERANA GROUP	TOLLIS FORMATION Bbt	Greywacke, siltstone, argillite, minor tuff	Oldest unit in the Yeuralba region, intruded by Maranboy Porphyry, Maud Dolerite, and Eva Valley and Yeuralba Granites and related hydrothermal veins

TABLE 2. CHANGES IN STRATIGRAPHIC NOMENCLATURE IN THE YEURALBA REGION NEW NAMES, VARIATIONS OF NAMES, AND RELEVANT DEFINITIONS, HAVE BEEN APPROVED BY THE STRATIGRAPHIC NOMENCLATURE COMMITTEE.

Walpole & others 1968	This Record	Comments
not recognised	Jindare Sandstone	new name
not recognised	Fanny Rhyolite Member	new name
part of Grace Creek Granite	Plum Tree Creek Volcanics	new name; extends into Stow region to N where it has been redefined (previously Plum Tree Creek Volcanic Member of Kombolgie Formation) by Needham & Stuart-Smith (1985)
Edith River Volcanics		name discontinued
Grace Creek Granite	Grace Creek Granite	new definition
Hindrance Creek Sandstone Member (of Edith River Volcanics)	Hindrance Creek Sandstone	elevation to formation status
Yeuralba Granite (northern mass)	Eva Valley Granite	new name
un-named granite	Maranboy Porphyry	new name
un-named dolerite	Maud Dolerite	new name
Burrell Creek Formation	Tollis Formation	new name

APPENDIX 1

SAMPLES COLLECTED FOR AGE DETERMINATION

Sample No.	grid ref.	rock type	stratigraphic unit	technique
83126007	KE602337	granite	Eva Valley Granite	
83126008	KE563353	microgranite	Grace Creek Granite	
83126009	KE572421	ignimbrite	Plum Tree Creek Volcanics	U-Pb Zircon
83126010	KE630446	microgranite	Grace Creek Granite	Rb-Sr
83126011	KE637446	microgranite	Grace Creek Granite	total
83126012	KE646432	microgranite	Grace Creek Granite	U-Pb Zircon rock
83126013	KE629414	microgranite	Grace Creek Granite	
83126014	KE626392	microgranite	Grace Creek Granite	
83126015	KE661376	microgranite	Grace Creek Granite	
83126016	KE644375	microgranite	Grace Creek Granite	
83126017	KE650355	microgranite	Grace Creek Granite	

APPENDIX 2. THIN SECTION DESCRIPTIONS

The first line of each entry records BMR sample number, rock type, AMG grid reference, and compilation sheet number

TOLLIS FORMATION

82120031 BANDED IRON FORMATION KE649243 6

Laminated microcrystalline quartz mosaic and granular magnetite, with coarser grained secondary hematite and cross-cutting quartz-hematite veinlets

82120054 VOLCANOLITHIC PEBBLE CONGLOMERATE KE655307 6

Rounded pebbles, <1 cm, of Fe-oxide - stained and altered pitchstone, minor vein quartz, chert and mafic volcanics, in a coarse poorly sorted matrix of quartz, and metamorphic chlorite, epidote, Fe-oxides and white mica

82120055 MUSCOVITE HORNFELS KE538080 13

Fine mosaic of muscovite and hematite veined by quartz, with coarse poikilitic muscovite along altered margins. Meta-shale

82120056 TOURMALINISED SILTSTONE HORNFELS KD605967 13

Graded laminae of very fine subidioblastic tourmaline, quartz, muscovite and minor hematite. Laminae vary from quartz-rich to tourmaline-rich and represent replaced pelitic bands. Hornfels texture

82120061 PELITIC HORNFELS KE643312 6

82120062 TOURMALINISED GREYWACKE HORNFELS KE536075 13
Poorly sorted subrounded fine quartz and chert in a recrystallised matrix of quartz and tourmaline

82120067 FERRUGINISED PELITIC HORNFELS KE587012 13
Fine white mica and blades of hematite with minor patches of coarse poikilitic muscovite (showing Fe-oxide penetration along cleavage planes), and very minor quartz

82120068 DEVITRIFIED VITRIC TUFF KE387026 12
Microcrystalline quartz, sericite, chlorite, secondary Fe-oxides, minor scattered angular to rounded very fine quartz crystal fragments. Relict eutaxitic texture

82120070 TOURMALINISED SILTSTONE HORNFELS KD625982 13
Recrystallised fine muscovite, in places poikilitic, quartz, and scattered rounded quartz grains <0.2 mm, and fine secondary hematite. Quartz veinlets surrounded by disseminated tourmaline haloes

82120073 PELITIC CORDIERITE HORNFELS KE539226 10
Very fine poikilitic muscovite, biotite, minor quartz, ?cordierite, and secondary Fe-oxides, with rare prismatic tourmaline. Spotted appearance from cordierite-muscovite intergrowths

82120121 COARSE LITHIC METATUFF KE654307 6

Poorly sorted subrounded clasts <3 mm of altered devitrified pitchstone, heavily impregnated with Fe-oxides; minor altered (white mica) plagioclase crystals and chert. Fine metamorphic biotite and minor muscovite throughout

82120191 TOURMALINISED GREYWACKE KD638912 15

Very poorly sorted coarse subangular quartz, chert, minor felsic volcanic rock fragments, and fine white mica aggregates after feldspar, in a subidiomorphic tourmaline and fine white mica matrix. Rare rounded detrital zircon. Tourmaline concentrations close to open fractures

82120193 QUARTZ-TOURMALINE ROCK KD626916 15

Fine mosaic of subprismatic tourmaline and quartz. Recrystallised breccia texture with relic cherty clasts and patches of mosaic quartz-tourmaline in a more tourmaline-rich matrix. Late tourmaline veinlets

82120194 VOLCANOLITHIC GREYWACKE KD637909 15

Coarse, very poorly sorted angular clasts of felsic volcanics, quartz grains and minor plagioclase, Kspar and phyllite, with fine metamorphic chlorite, white mica, rare tourmaline, and minor detrital zircon

82120195 METAMUDSTONE KD637909 15

Weakly foliated microcrystalline sericite and minor chlorite impregnated by secondary hematite granules

adjacent to fractures

MAUD DOLERITE

82120196 METADOLERITE KE648308 6

Medium-grained ophitic colourless clinopyroxene marginally replaced by pale green to colourless fibrous amphibole, moulds euhedral plagioclase. Rare anhedral quartz, minor opaques

MARANBOY PORPHYRY

82120192 QUARTZ METAPORPHYRY KD626916 15

Scattered embayed quartz phenocrysts <3 mm and lesser altered (white mica and Fe-oxides) feldspar, in a fine quartz-muscovite base, with secondary Fe-oxides. Minor aggregates of tourmaline and coarser patches of muscovite indicate later alteration (contact metamorphism?)

82120199 PORPHYRITIC HORNBLENDE GRANITE KD616908 15

As 82120245; rare relict colourless clinopyroxene cores within amphibole grains

82120245 PORPHYRITIC HORNBLENDE GRANITE KD615916 15

Strongly porphyritic; rounded subhedral phenocrysts of altered plagioclase <5 mm, subprismatic hornblende and minor chloritised biotite in a fine groundmass of anhedral quartz, Kspar, hornblende, apatite and zircon

YEURALBA GRANITE

82120251 EQUIGRANULAR BIOTITE-MUSCOVITE LEUCOGRANITE KE543216 10

Medium-grained subhedral microperthite 50% and oligoclase 5%, anhedral quartz 40%, muscovite 2%, biotite (with zircon inclusions) 1%

82120252 EQUIGRANULAR MUSCOVITE-BIOTITE LEUCOGRANITE KE615204 10

Coarse subhedral microperthite 50% and oligoclase 5%, anhedral quartz 40%, biotite 2%, muscovite 1%

EVA VALLEY GRANITE

82120126 PORPHYRITIC BIOTITE GRANITE KE637316 6

Minor megacrysts of subhedral plagioclase and quartz to 1 cm in a medium-grained (1 mm) groundmass of anhedral quartz, Kspar, euhedral plagioclase, biotite, minor hornblende, muscovite, fluorite, zircon and opaques. Biotite altering to chlorite and plagioclase to white mica and fluorite

82120127 PORPHYRITIC BIOTITE GRANITE KE604337 6

Megacrysts of plagioclase, perthitic Kspar and anhedral quartz to 1 cm, in a coarse groundmass of anhedral quartz, Kspar, biotite, minor subhedral plagioclase, trace muscovite, apatite, zircon and opaques

HINDRANCE CREEK SANDSTONE

82120173 VOLCANOLITHIC QUARTZ SANDSTONE KE673303 7

Coarse, poorly sorted angular quartz, chert, altered (hematised and kaolinised) volcanics, kaolinised ?feldspar and rare phyllite/sericite schist, in a clayey matrix. Rare detrital zircon

GRACE CREEK GRANITE

82120133 PORPHYRITIC MICROGRANITE KE505233 10

Eroded and embayed phenocrysts (?xenocrysts) to 5 mm of quartz, plagioclase, and aggregates of biotite, magnetite, apatite and zircon in a microcrystalline base of anhedral quartz, Kspar (dusted by hematite), minor biotite, trace apatite and zircon. Secondary chlorite and epidote. The mafic aggregates may be original euhedral biotite crystals altered to opaques and surrounded by poikilitic greenish brown biotite crystals.

82120135 XENOCRYSTIC FINE BIOTITE GRANITE KE483216 10

As 82120151; xenocrysts <5 mm, hornblende mostly altered to chlorite

82120136 PORPHYRITIC COARSE SYENITE KE688306 7

Xenolith. Anhedral Kspar phenocrysts to 1 cm in coarse Kspar, quartz, minor plagioclase and clinopyroxene. Most grain boundaries are sutured and recrystallised to fine polygonal aggregates containing metamorphic

biotite. Clinopyroxene is rimmed by metamorphic biotite. Trace zircon and opaques. About 10% quartz; plagioclase is <10% of total feldspar

82120138 PORPHYRITIC COARSE GRANITE KE565300 6

Felsic xenolith. Coarse subhedral microperthite phenocrysts to 1 cm rimmed by, and in a medium to coarse groundmass of, sericitised plagioclase, anhedral alkali feldspar and quartz (commonly graphically intergrown), chloritised biotite, and opaques, with trace zircon and carbonate. The groundmass and rims are dusted by very fine hematite. Quartz 20%, plagioclase 10%, chlorite/biotite 5%

82120140 XENOCRYSTIC FINE GRANITE KE504345 6

As 82120147; minor secondary epidote

82120141 XENOCRYSTIC FINE GRANITE KE648457 2

As 82120147; feldspar xenocrysts to 1 cm

82120142 PORPHYRITIC MICROGRANITE KE568428 2

Similar to 82120133; eroded and embayed phenocrysts (xenocrysts?) to 1 cm of plagioclase (with clay alteration), quartz and minor Kspar and chlorite aggregates (after biotite), in a microcrystalline base of anhedral quartz, stubby Kspar crystals, and chlorite (after biotite), opaques, apatite and sphene. Feldspars cloudy and reddish from very fine hematite alteration

82120143 PORPHYRITIC MICROGRANITE KE775310 7

Similar to 82120142; xenocrysts to 5 mm, minor carbonate alteration, and some micrographic intergrowths of quartz and Kspar in the groundmass

82120144 PORPHYRITIC MICRO-LEUCOGRANITE KE565349 6

Phenocrysts of alkali feldspar, sericitised plagioclase, and minor rounded quartz, in a groundmass of anhedral quartz and Kspar which are commonly micrographically intergrown. Minor secondary chlorite, opaques, and <1% primary biotite

82120145 PORPHYRITIC MICROGRANITE KE484375 2

Subhedral phenocrysts to 4 mm of plagioclase crystals or aggregates, in a very fine groundmass of quartz-Kspar micrographic intergrowths, chloritised biotite, and secondary carbonate and sphene. Accessory zircon, apatite, and rare garnet showing chlorite alteration

82120146 PORPHYRITIC FINE BIOTITE GRANITE KE571349 6

Euhedral plagioclase phenocrysts to 3 mm in a fine base of graphically intergrown quartz and Kspar, euhedral plagioclase crystals, biotite, and secondary chlorite and carbonate. Accessory apatite and opaques

82120147 XENOCRYSTIC FINE GRANITE KE757438 3

Eroded xenocrysts to 5 mm of Kspar and quartz, and euhedral plagioclase (hematite dusted), in a fine base of graphically intergrown quartz and Kspar (commonly surrounding minor euhedral plagioclase or Kspar

crystals), chloritised biotite, and accessory apatite and opaques

82120148 PORPHYRITIC GRANITE KE688306 7

Scattered eroded xenocrysts to 5 mm of quartz, Kspar, plagioclase and minor clinopyroxene, in a fine base of anhedral quartz, Kspar crystals, minor biotite, subhedral plagioclase, hornblende, opaques, apatite, zircon, and secondary carbonate. Clinopyroxene xenocrysts rimmed by biotite and hornblende

82120149 PORPHYRITIC MICROGRANITE KE472360 5

Subhedral phenocrysts and aggregates to 5 mm of sericitised oligoclase and rare Kspar in a microcrystalline groundmass of anhedral Kspar and quartz, mostly forming graphic intergrowths, with patches of chlorite, sphene, apatite, opaques and epidote after mafic minerals, forming 5% of the rock

82120150 XENOCRYSTIC FINE GRANITE KE756494 3

As 82120147

82120151 XENOCRYSTIC FINE BIOTITE- KE669314 7
HORNBLENDE GRANITE

Eroded xenocrysts to 5 mm of Kspar and plagioclase, hornblende-biotite aggregates, and minor quartz, in a fine base of anhedral quartz, Kspar and minor subhedral plagioclase, biotite and hornblende. Accessory opaques, apatite and zircon. Hornblende rims some biotite crystals

82120152 XENOCRYSTIC FINE BIOTITE-HORNBLENDE GRANITE KE639331 6

Xenocrysts/phenocrysts to 5 mm of Kspar, plagioclase, minor quartz, and hornblende-biotite aggregates, in a fine base of anhedral quartz, Kspar, biotite, hornblende, plagioclase, opaques, apatite and rare epidote

82120153 EQUIGRANULAR FINE-MEDIUM GRAINED HORNBLENDE-BIOTITE GRANITE KE699378 3

Fine to medium grained equigranular anhedral quartz, Kspar, minor subhedral plagioclase, biotite, hornblende. Trace apatite, zircon, opaques (magnetitic). Minor chlorite alteration of mafic minerals

82120154 XENOCRYSTIC FINE HORNBLENDE-BIOTITE GRANITE KE646505 2

Similar to 82120151; extensive chlorite-epidote alteration of mafic minerals; xenocrysts to 1 cm

82120155 EQUIGRANULAR FINE TO MEDIUM GRAINED BIOTITE GRANITE KE672383 3

Fine to medium grained anhedral quartz, Kspar and lesser subhedral (kaolinised) plagioclase, with minor partly chloritised biotite. Accessory opaques, apatite and zircon. The altered plagioclase forms rare xenocrysts to 5 mm

PLUM TREE CREEK VOLCANICS

82120078 IGNIMBRITE? KE367177 9

Euhedral phenocrysts of Kspar, sericititsed plagioclase, and minor chlorite clots after mafic mineral (mostly altered to Fe oxides), in a mosaic quartz-Kspar groudmass. Secondary Fe oxides, white mica

82120079 DEVITRIFIED VITRIC CRYSTAL TUFF KE343027 12

Angular crystal fragments and splinters of quartz, Kspar and plagioclase to 0.2 mm, in a devitrified chloritic base. Fe oxide granules. Eutaxitic fabric preserved in places

82120081 RHYOLITE? KE458200 9

Phenocrysts to 1 cm of embayed quartz, rounded Kspar and euhedral sericitised plagioclase, in a microcrystalline mosaic groundmass of quartz, Kspar and opaques (Fe oxides). Very minor oxidised biotite

82120092 ALTERED RHYOLITE KE492213 10

Scattered embayed and eroded phenocrysts of quartz and kaolinised? feldspar to 3 mm, in a microcrystalline base of quartz, white mica, minor altered (white mica and Fe oxides) biotite, and radiating Fe oxide microlites

82120129 BANDED IRON FORMATION KE570425 2

Laminated microcrystalline quartz and hematite (minor magnetite). Laminae disrupted and brecciated. Scattered

angular quartz grains may be disrupted veins

82120130 ALTERED RHYOLITE KE379060 12

Euhedral and rounded phenocrysts of quartz to 4 mm, and minor euhedral feldspar (completely replaced by a prismatic colourless high relief mineral - probably diaspore?), and sericite, in a groundmass of alkali feldspar, quartz and sericite

82120131 VOLCANOLITHIC GREYWACKE KE570419 2

Coarse, angular, and very poorly sorted quartz, felsic volcanic rock fragments, plagioclase, and Kspar, with very minor detrital muscovite, in a Fe oxide-stained recrystallised biotite-muscovite matrix

82120132 WELDED FELSIC TUFF - IGNIMBRITE? KE916352 8

Rounded to angular fragments of fine-grained felsic volcanics, kaolinised feldspar, and quartz crystals, in a devitrified siliceous base which is extensively fractured, quartz veined, impregnated with Fe oxides, and altered to clay

82120134 FINE GREYWACKE KE563413 2

Fine, poorly sorted, angular quartz, chert, and rare ?felsic volcanic rock fragments, in a weakly foliated matrix of fine white mica, chlorite/biotite, and opaques. Quartz vein

82120137 ALTERED RHYOLITE KE680303 7

Scattered subhedral rounded phenocrysts of altered feldspar (clay, Fe oxides and quartz), and minor quartz, in a devitrified brown glassy base with a weak ?spherulitic fabric. About 20% of the feldspar phenocrysts are now fine hematite dust and quartz (i.e. no clay), and were probably Kspar

82120139 ?RHYOLITE KE570425 2

Eroded phenocrysts to 3 mm of quartz, Kspar, plagioclase, a mafic mineral (now chlorite), and smaller opaque grains and apatite crystals, in a devitrified hematised base containing radiating microlites, and minor patches of microcrystalline anhedral quartz and stubby Kspar crystals

ALTERATION ZONES AND DYKE ROCKS

82120208 GREISEN KD615988 13

Fine anhedral quartz and muscovite, very minor opaques and rare tourmaline veinlets

82120240 LAMPROPHYRE KE686304 7

Strongly porphyritic; phenocrysts of eroded plagioclase, colourless pyroxene (marginally altered to biotite), and very minor quartz, in a microcrystalline quartz-feldspar base with biotite and trace zircon, apatite, epidote, chlorite, and opaques

82120244 OLIVINE DOLERITE KE845340 8

Medium grained ophitic colourless clinopyroxene moulds altered (white mica) plagioclase laths, rounded fractured and altered (green-brown ?chlorite, Fe oxides) olivine, and chloritised biotite. Accessory opaques and rare interstitial quartz

82120259 SYENITE KE620345 6

Fine anhedral equigranular cloudy (hematite dust) Kspar with crystal faces growing into cavities filled by quartz. Rare subhedral altered plagioclase. Accessory zircon. Quartz veins replace feldspar in places. Quartz <10%