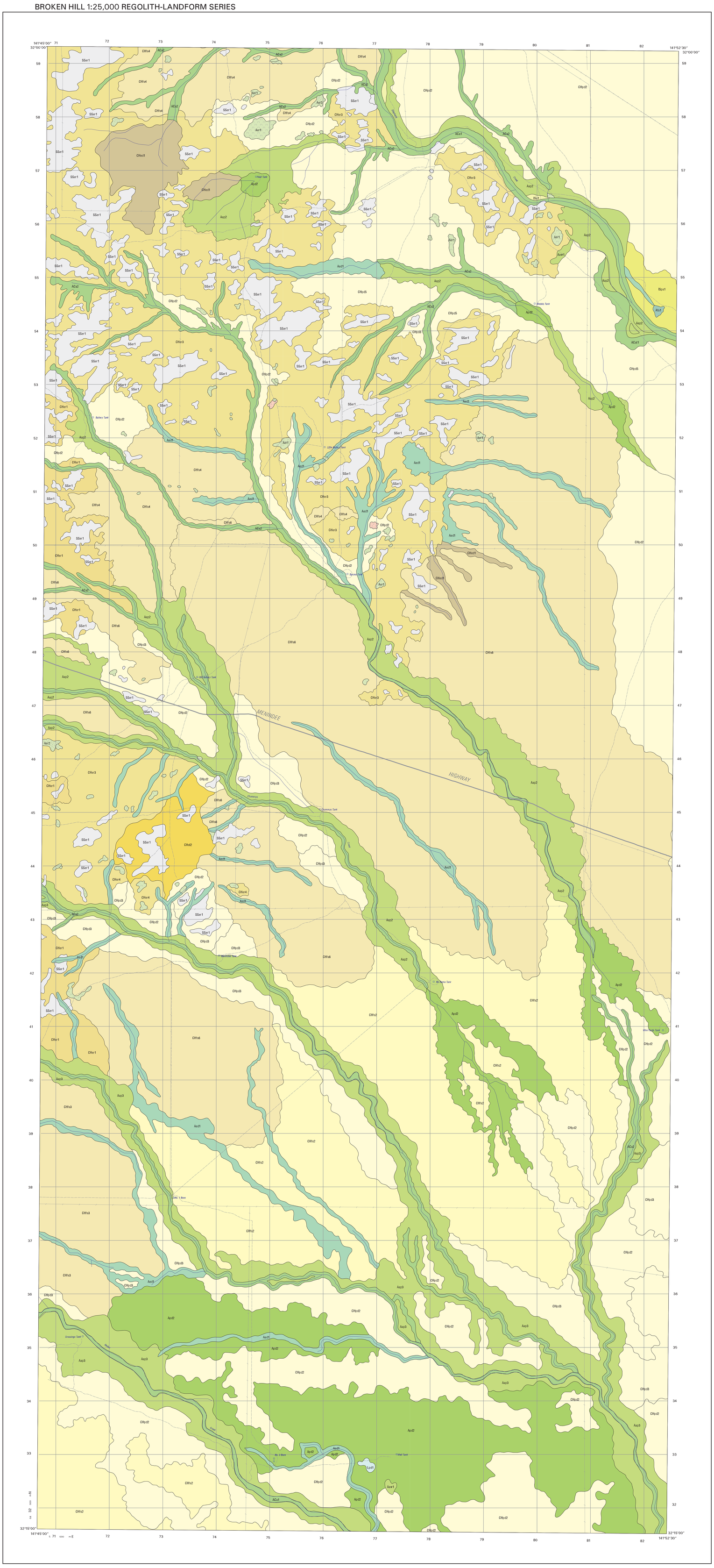
KINALUNG WEST-QUONDONG WEST

NEW SOUTH WALES

BROKEN HILL 1:25,000 REGOLITH-LANDFORM SERIES



TRANSPORTED REGOLITH

Alluvial sediments

Alluvial sediments

Aap1 — *Sub-rounded to sub-angular sands, silts and minor gravels, composed of quartz and lithic fragments, in low relief areas with minor shallow channels. Surface materials consist of coarse quartz sands and minor quartzose and lithic gravel lag. Minor powdery and rhizomorphic regolith carbonates. Colonised by chenopod shrublands dominated by Atriplex vesicaria and minor Maireana spp.*

Aap2 — *Sub-rounded to sub-angular sands, silts and minor gravels, composed of quartz and lithic fragments, in low relief areas with minor deeply (> 1m) incised channels. Surface materials consist of coarse quartz sands and minor quartzose and lithic gravel lag. Minor powdery and rhizomorphic regolith carbonates. Colonised by chenopod shrublands dominated by Atriplex vesicaria and minor Maireana spp.*

Aap3 — *Sub-rounded to sub-angular sands, silts and minor gravels, composed of quartz and lithic fragments, in low relief areas with minor shallow channels and sand dunes. Surface materials consist of quartzose sands and minor gravel lag in depressions. Colonised by mixed chenopod shrublands and grasslands dominated by Atriplex vesicaria and minor Maireana spp.*

Aaw1 — *Silts and clays with minor sub-rounded quartzose sands within swampy depressions. Surface materials consist of clayey silt and minor sand, with organic material. Minor ephemeral standing water. Colonised by grasses and forbs dominated by Muehlenbeckia cunninghamii and Astrebla spp., with occasional Acacia victoriae shrubs.*

Aed1 — *Sub-rounded to sub-angular quartzose and lithic sands with occasional gravels within depressions containing minor channels. Surface materials consist of quartzose sands and gravels. Minor powdery and hardpan regolith carbonates with fine red-brown sands. Colonised by chenopod shrublands dominated by Atriplex vesicaria and minor Maireana spp.*

Aer1 — *Rounded to angular quartzose sands with minor gravels and clayey silts mostly indurated by secondary silica in areas of slight relief. Surface materials consist of angular to sub-rounded silicified material and quartzose gravels. Minor powdery and hardpan regolith carbonates along with fine red-brown sands. Colonised by chenopod shrublands dominated by Atriplex vesicaria and minor Maireana spp.*

Aer2 — *Rounded to angular quartzose sands with minor gravels and clayey silts with mostly ferruginous induration in areas of slight relief. Surface materials consist of angular ferruginous and minor quartzose gravel lag. Minor fine red-brown sands. Colonised by chenopod shrublands dominated by Atriplex vesicaria and minor Maireana spp.*

Afa1 — *Sub-rounded to angular lithic and quartzose sands, silts and gravels within outwash fans with braided distributary channels. Surface materials consist of lithic gravel lag in proximal settings and quartzose sands in distal settings. Minor fine red-brown sands. Colonised by chenopod shrublands dominated by Maireana pyramidata and minor Codonocarpus cotinifolius and Xanthium spp.*

Apd2 — *Sub-rounded to angular quartzose and lithic sands, silts and minor gravels within low relief areas. Surface materials consist of quartzose sands and silts. Minor fine red-brown sands colonised by open grasslands.*

Channel deposits

ACa1 — *Sub-rounded to sub-angular sands, silts and gravels, composed of quartz and lithic fragments and minor heavy minerals within ephemeral meandering and minor braided channels. Surface materials consist of imbricated gravel lag and minor sandy braid bars and channels. Minor exposures of slightly weathered bedrock. Colonised by open woodlands dominated by Eucalyptus camaldulensis.*

ACa2 — *Sub-rounded to sub-angular sands, silts and gravels, composed of quartz and lithic fragments and minor heavy minerals within ephemeral meandering and minor braided channels. Surface materials consist of imbricated gravel lag and minor sandy braid bars and channels. Minor exposures of slightly weathered bedrock. Colonised by shrublands dominated by Acacia victoriae and minor western boobialla.*

ACat1 — *Sub-rounded to sub-angular sands, silts and gravels composed of quartz and lithic fragments on a low relief slope between an elevated plain and an entrenched channel system. Surface materials consist of imbricated gravel lag and minor sandy braid bars. Minor aeolian sands and sheetwash surficial modifications. Colonised by Eucalyptus camaldulensis and rare Callitrus columellaris.*

Aeolian sediments

Aeolian sand

ISps1 — *Clayey silt to fine rounded quartzose sands within low relief areas with low (< 1m) hummocky dunes. Surface materials consist of fine, rounded, red-brown, quartzose sands with occasional coarser sands. Minor powdery regolith carbonate accumulations. Colonised by chenopod shrublands dominated by Atriplex vesicaria and Maireana spp. + or - open woodland typically dominated by Casuarina cristata.*

ISu1 — *Sub-rounded to rounded fine quartzose sands within sounce bordering transverse dunes. Surface materials consist of fine, rounded, red-brown quartzose sands with occasional coarser sands. Minor lithic, quartzose and occasional indurated gravels within depressions. Colonised by grasses (Stipa spp. & Astrebla spp.) and thickets of Myriocephalus stuartii with occasional chenopods and scattered Casuarina pauper, Acacia spp. and Alectryon oleifolius.*

Colluvial sediments

Sheet flow deposit

CHed1 — *Sub-rounded to sub-angular quartzose and lithic sands with occasional gravels within depressions containing minor channels. Surface materials consist of quartzose sands and gravels conforming to a contour banding pattern. Minor powdery and hardpan regolith carbonates with fine red-brown sands. Colonised by chenopod shrublands dominated by Atriplex vesicaria and minor Maireana spp.*

CHel2 — *Angular to sub-rounded lithic and indurated gravels mantling and flanking areas with moderate relief. Surface materials consist of quartz sand lag with occasional maghemite and red-brown sands. Minor powdery, hardpan and nodular regolith carbonates. Colonised by chenopod shrubland dominated by Atriplex vesicaria + or - open woodland with Casuarina pauper and Acacia brachystachya.*

CHer1 — *Angular to sub-rounded lithic and quartzose sands and gravels mantling and flanking areas with slight relief. Surface materials consist of coarse lithic and quartz sand and gravel lag with occasional maghemite and red-brown sands. Minor powdery, nodular and hardpan regolith carbonates. Colonised by chenopod shrublands dominated by Sclerolaena spp., Maireana spp. and Atriplex vesicaria.*

CHer3 — *Angular to sub-rounded lithic and indurated gravels mantling and flanking areas with slight relief. Surface lag consist of coarse lithic and indurated sands and gravels with occasional maghemite and red-brown sands conforming to a contour banding pattern. Colonised by chenopod shrublands dominated by Atriplex vesicaria.*

CHer4 — *Angular to rounded gravels of indurated material mantling and flanking areas with slight topographic relief. Surface materials consist of coarse quartz sand lag with occasional maghemite and red-brown sands conforming to a contour banding pattern. Colonised by chenopod shrublands dominated by Maireana spp. with sparse Atriplex vesicaria.*

CHfs2 — *Fine sub-angular quartz sand with occasional maghemite and other ferruginous sands within low relief, low gradient fans. Surface materials conform to a patchy contour banding pattern. Colonised by grasslands dominated by Astrebla pectinata, Hardeum ceparinum and minor Maireana spp.*

CHfs3 — *Angular to sub-angular quartz gravels with occasional maghemite within slight relief, low gradient fans. Surface materials conform to a discrete contour banding pattern. Colonised by grasslands dominated by Astrebla pectinata, Hardeum ceparinum and minor Maireana spp.*

CHfs4 — *Sub-angular to sub-rounded lithic and quartz gravels with occasional maghemite within slight relief, low gradient fans. Surface materials conform to a discrete contour banding pattern. Vegetation assemblage consists of chenopod shrublands dominated by Atriplex vesicaria and Maireana spp.*

CHfs6 — *Sub-angular to sub-rounded gravels composed of lithic, quartz and indurated regolith with occasional maghemite within slight relief, low gradient fans. Surface materials conform to discrete contour banding pattern with soil piping and soil slumping common. Colonised by grasslands dominated by Astrebla pectinata, Hardeum ceparinum and minor Maireana spp.*

CHpd2 — *Sub-angular to sub-rounded lithic and quartz sands and gravels within low relief areas. Surface lag consists of fine lithic and quartz sand and gravel with occasional maghemite and red-brown material. Minor nodular and hardpan regolith carbonates. Colonised by chenopod shrublands dominated Atriplex vesicaria and Maireana spp.*

CHpd3 — *Sub-angular to sub-rounded lithic and quartz sands and gravels within low relief areas. Surface lag consists of fine lithic and quartz sand and gravel with occasional maghemite and red-brown material conforming to a contour banding pattern. Minor nodular and hardpan regolith carbonates. Colonised by chenopod shrublands dominated by Atriplex vesicaria and Maireana spp.*

CHpd5 — *Angular to sub-rounded lithic and indurated sands and gravels in low relief areas. Surface materials?consist of coarse lithic, quartz and indurated sands and gravel lag with occasional maghemite, and red-brown sands conforming to a contour banding pattern. Minor nodular and hardpan regolith carbonates.?Colonised by chenopod shrublands dominated by Atriplex vesicaria and Maireana spp.*

Lacustrine sediments

Lacustrine sediments

Lpd1 — *Silts and clays in local depressions within low relief landforms. Surface materials consist of clayey silt and minor quartzose sands. Minor ephemeral standing water. Vegetation is typically absent.*

IN-SITU REGOLITH

Saprolith

Highly weathered bedrock

SHer1 — *Kaolinitic saprolite with locally extensive ferruginous induration, and occasional quartz veins, in areas of slight topographic relief. Surface materials are dominated by coarse quartz and ferruginised saprolith sands and gravel surface lag (with occasional ferruginised sediments) with red-brown sands. Colonised by open chenopod shrublands dominated by Mairena spp. and Atriplex vesicaria with occasional Acacia aneura trees.*

Saprock

SSer1 — *Bedrock exposure with thin surficial weathering, slight ferruginous staining and prominent fractures, in areas of slight topographic relief. Surface materials consist of coarse quartz and lithic sands and gravel lag with discontinuous red-brown sands. Colonised by open chenopod shrublands dominated by Maireana spp., Atriplex vesicaria with occasional Acacia aneura trees.*

INDURATION MODIFIER

Ferruginous induration

Siliceous induration

LANDFORMS

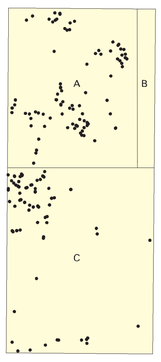
DEPOSITIONAL LANDFORMS

- a Alluvial landforms
- ap Alluvial plain
- at Alluvial terrace
- aw Alluvial swamp
- ed Drainage depression
- fa Alluvial fan
- fs Sheet-flow fan
- u Dunefield
- ps Sand plain
- pd Depositional plain

EROSIONAL LANDFORMS

- er Rises
- el Low hills

Regolith-landform unit boundary
Highway
Vehicle track
Fence
Railway
Watercourse
Earth dam or tank



SAMPLE SITE LOCATIONS AND DATASETS USED

A Aerial photograph and airborne gamma ray spectrometric imagery interpretation, with detailed field mapping and characterisation

B Aerial photograph and airborne gamma ray spectrometric imagery interpretation, with no field mapping and characterisation

Areas A and B were initially mapped by Jaclyn Brachmanis as part of a University of Canberra Honours thesis, during 2000.

Reference: Brachmanis, J., 2000. Regolith-Landforms and Geochemistry of Silicified Palaeovalley Systems, Kinalung West, Broken Hill, NSW. Honours thesis, University of Canberra, Canberra.

C Aerial photograph and airborne gamma ray spectrometric imagery interpretation, with detailed field mapping and characterisation

Area C was initially mapped by Benjamin E.R. Maly as part of a University of Canberra Honours thesis, during 2000.

Reference: Maly, B. E. R., 2000. Regolith-Landforms and Landscape Evolution of Quondong West, Broken Hill, NSW: Sediment Characteristics and Architecture of the Northern Murray Basin. Honours thesis, University of Canberra, Canberra.

Areas A, B and C have also been mapped and characterised as part of a wider regional study by S.M. Hill

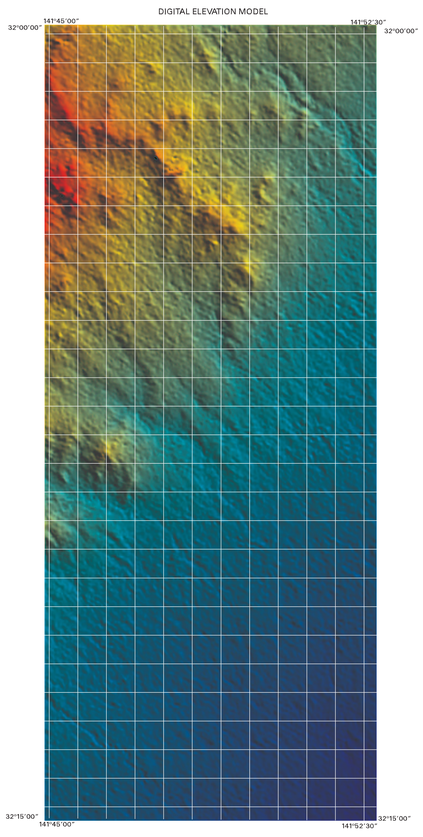
Reference: Hill, S.M., 2000. Regolith and Landscape Evolution of the Broken Hill Block and adjoining area. PhD thesis, Australian National University, Canberra.

SCALE 1:25 000

0.5 0 0.5 1.0 1.5 2.0 2.5 Kilometres

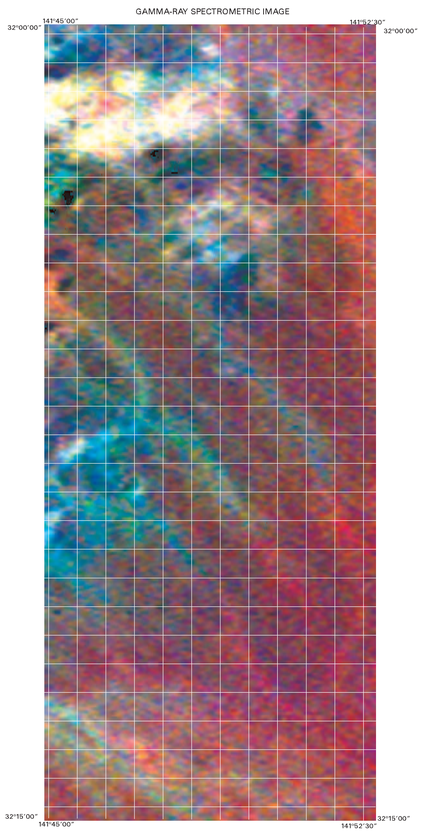
UNIVERSAL TRANSVERSE MERCATOR PROJECTION
LATITUDE OF ORIGIN: 0° LONGITUDE OF ORIGIN: 141°
HORIZONTAL DATUM: GDA94, UTM ZONE 54

DIGITAL ELEVATION MODEL



False colour Digital Elevation Model of the Kinalung West-Quondong West sheet area. Maximum elevations exceed 195 m (red areas) and lowest areas are less than 125 m (blue).

GAMMA-RAY SPECTROMETRIC IMAGE



Three-band gamma-ray spectrometric image (potassium is red, thorium is green, uranium is blue) of the Kinalung West-Quondong West 1:25,000 sheet area.

Compiled by J. Brachmanis (CRC LEME/AGSO), B. E. R. Maly (CRC LEME/AGSO) and S. M. Hill (CRC LEME/UC), 2000-1

Cartography and GIS by J. Brachmanis (CRC LEME/AGSO), L.M. Highet (AGSO), K.A. Foster (AGSO) and P. Uroem (AGSO). Acknowledgment to the IMB division at AGSO

It is recommended that this map be referred to as:

Brachmanis, J., Maly, B. E. R. & Hill, S. M., 2001. Kinalung West-Quondong West Regolith-Landform Map (1:25,000 scale). Cooperative Research Centre for Landscape Evolution and Mineral Exploration (CRC LEME), Canberra/Perth

The regolith-landform polygons on this map are based on interpretation of 1:82,000 and 1:12,500 panchromatic aerial photographs, airborne gamma-ray spectrometric imagery and extensive field mapping. It is the intention of this map to identify and characterise surface materials and processes in a prospective area relatively void of exposed bedrock

Copies of this map may be obtained from:

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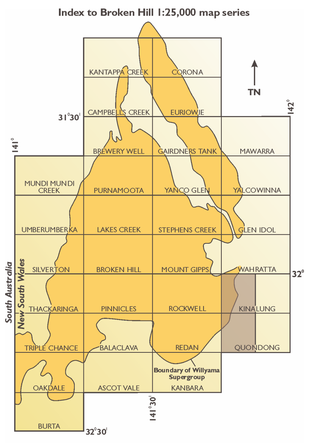
Cultural features and drainage information reproduced from; Willis, I.L. 1988. Kinalung 1:25,000 Geological Sheet, 7233-I-N. New South Wales Geological Survey, Sydney.

Digital Elevation Model (DEM) information has been derived from GEODATA DEM-9S Commonwealth of Australia 1996 by permission of the Australian Land Information Group (AUSLIG), Department of Industry, Science and Resources, Canberra.

CRC LEME acknowledges the collaboration of the Australian Geological Survey Organisation (BHEI Project) and the support of the New South Wales Department of Mineral Resources (Discovery 2000) in the production of this map.

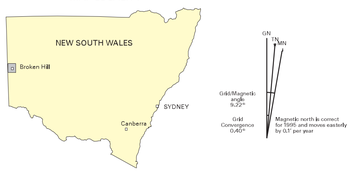
CRC LEME is an unincorporated joint venture between the Australian National University, University of Canberra, Australian Geological Survey Organisation and CSIRO Exploration and Mining, established and supported under the Australian Government's Cooperative Research Centres Program

Index to Broken Hill 1:25,000 map series



The Kinalung West and Quondong West 1:25,000 Regolith-Landform map is highlighted in grey. The orange areas are dominated by outcropping and subcropping Willyama Supergroup rocks, while the yellow shaded areas are dominated by regolith.

MAP LOCALITY



Cooperative Research Centre for Landscape Evolution & Mineral Exploration

MINERAL RESOURCES
Geological Survey of New South Wales

Horizontal coordinates on this map are based on the new earth-centered GEOCENTRIC DATUM OF AUSTRALIA (GDA)
To convert GDA to AGD (around 10 metre accuracy):
Geographicals (from GDA94 to AGD66/84) - Add 5.58" to latitude (S); Subtract 4.38" from longitude (E)
UTM grid coordinates (from MGA94 to AMG66/84) - subtract 184m from Northing; subtract 113m from Easting

KINALUNG WEST-QUONDONG WEST

REGOLITH-LANDFORMS

SHEETS 7233-I-N & 7233-I-S

FIRST EDITION 2001

SUBJECT TO REVISION

WARNING: Colour may deteriorate with prolonged exposure to light and moisture