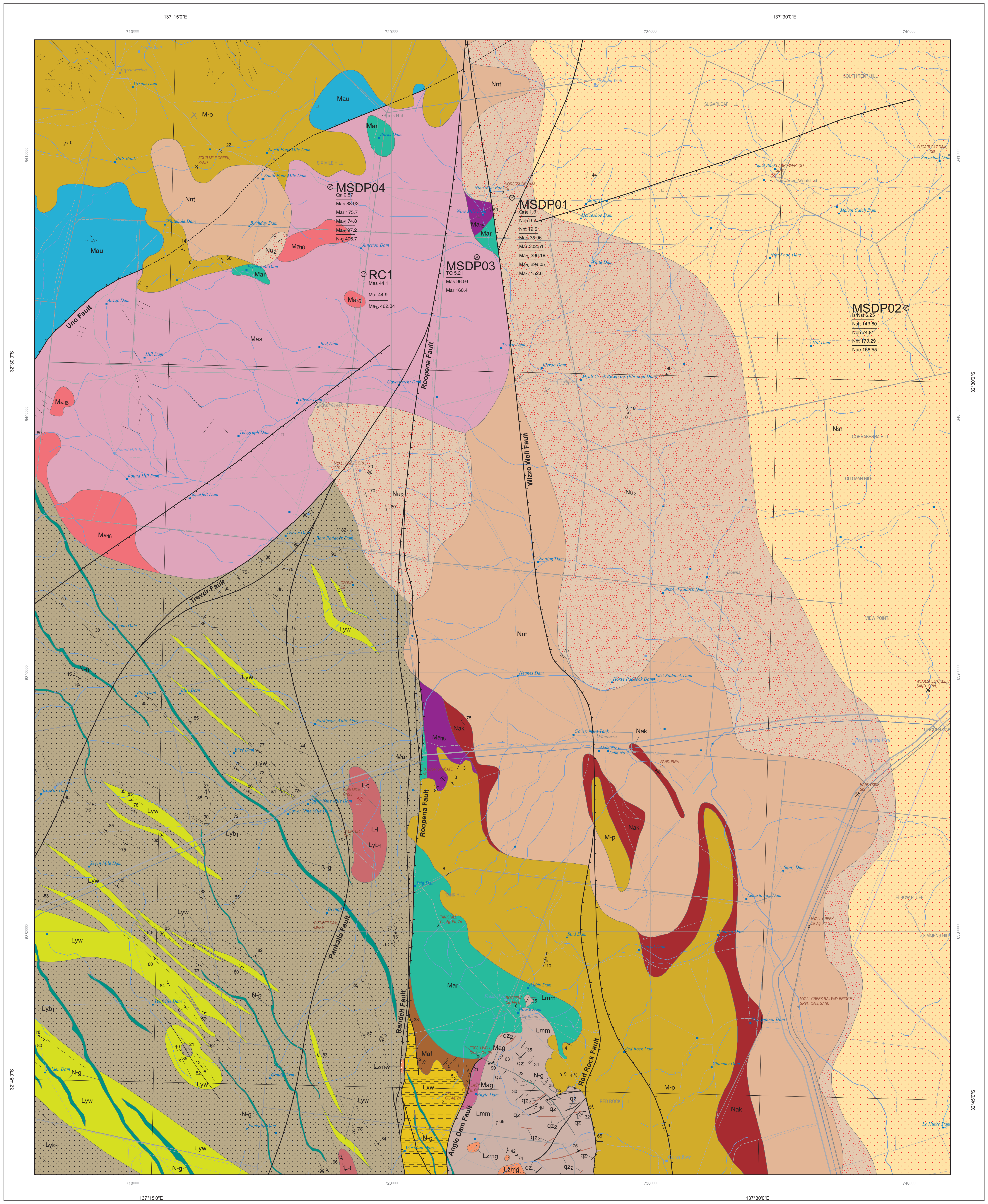
INTERPRETED PROTEROZOIC SOLID GEOLOGY OF SIX MILE HILL - MINERAL SYSTEMS DRILLING PROGRAM SPECIAL MAP SERIES

GEOLOGICAL SURVEY OF SOUTH AUSTRALIA
DEPARTMENT OF STATE DEVELOPMENT



Grey numbered lines indicate 10 000 metre intervals of the Map Grid of Australia, Zone 53
Universal Transverse Mercator projection, Geocentric Datum of Australia, 1994.

REFERENCE

			Code	Description
NEOPROTEROZOIC	MARINOAN	WILPENA GROUP	Nst	TENT HILL FORMATION: White, red and purple shale, sandstone and quartzite; laminated; slumped.
			Nstt	TREGOLANA SHALE MEMBER: Reddish brown laminated shale and siltstone, minor ripple cross-laminated sandstone; flute casts. Intersected in MSDP02.
		UMBERATANA GROUP	Neh	WHYALLA SANDSTONE: Fine- to coarse-grained sandstone, minor siltstone and conglomerate. Intersected in MSDP01 and MSDP02.
			Nu_2	Sandstone, siltstone and conglomerate of inferred UPALINNA and YERELINA SUBGROUPS.
	STURTIAN		Nnt	TAPLEY HILL FORMATION: Grey to black, laminated siltstone, dolomitic and pyritic; intra-formational conglomerate.
	WILLOURAN		Nak	BACKY POINT FORMATION: Medium- to coarse-grained arkosic sandstone with minor basaltic lavas of BEDA BASALT (Nae).
			N-g	GAIRDNER DOLERITE: Dolerite dykes. SHRIMP U-Pb baddelyite age 827±6 Ma (Wingate et al., 1998).
MESOPROTEROZOIC			M-p	PANDURRA FORMATION: reddish-brown cross-bedded sandstone, minor shale, siltstone, conglomerate. Maximum depositional age of 1575±5 Ma (Fraser and Neumann, 2010).
		UPPER GRV	Mau	EUCARRO RHYOLITE: Rhyolite, massive, red to pink, columnar-jointed, euhedral phenocrysts of plagioclase, pyroxene and hornblende, rare free quartz.
		LOWER GAWLER RANGE VOLCANICS (GRV)	Mas	SPEARFELT RHYODACITE: Rhyodacite, red-brown, porphyritic, phenocrysts of feldspar, pyroxene, hornblende and lesser quartz in a fine-grained groundmass.
			Ma_{16}	Rhyolitic ignimbrite, orange to pink, rounded quartz phenocrysts and tabular feldspar phenocrysts in a fine-grained vitric groundmass.
			Mar	ROOPENA BASALT: Basalt, altered amygdale-rich or brecciated flow tops, altered and brecciated bases, local peperite and hyaloclastite.
			Maf	FRESH WELL FORMATION: Fine- to medium-grained arkosic and lithic sandstone, massive to laminated siltstone, laminated dolomitic mudstone, pebble conglomerate and felsic tuff. U-Pb SHRIMP maximum depositional age 1587±15 Ma (Johnson, 1993).
			Mag	ANGLE DAM VOLCANICS: Rhyolite to dacite, porphyritic, tabular feldspar phenocrysts, lesser quartz and biotite phenocrysts, dark red to purple-red fine-grained groundmass. Peperitic contact with FRESH WELL FORMATION.
			Ma_{15}	Rhyolite to dacitic, lava and ignimbrite, minor tuff, lapillistone and tuffaceous mudstone.
			Ma_{18}	Undifferentiated intermediate to mafic volcanics, lower Gawler Range Volcanics. Intersected in MSDP01 and MSDP04.
			Ma_{17}	Undifferentiated felsic volcanics, lower Gawler Range Volcanics. Intersected in MSDP01.
PALAEOPROTEROZOIC			Lzmg	GLUEPOT GRANITE: Porphyritic granite composed of large pink K-feldspar phenocrysts in a medium-grained plagioclase-K-feldspar-quartz-biotite-tourmaline matrix. Contains phases of equigranular, medium-grained granite, late stage, microgranite, pegmatite, aplite, quartz porphyry dykes and plugs. $^{207}Pb/^{206}Pb$ TIMS age c. 1740 Ma.
			Lzmw	WORTHAM GRANITE: Granite, medium-grained, equigranular, pink, K-feldspar, quartz, minor plagioclase, biotite, trace tourmaline, opaques, zircon, weakly foliated. U-Pb SHRIMP age 1747±13 Ma (Jagodzinski and McAvaney, 2016).
			Lxw	WANDEARAH FORMATION: Massive to laminated dolomitic micaceous siltstone and fine-grained micaceous sandstone with lesser dolomite and greywacke.
			Lmm	MOONABIE FORMATION: Grey to purplish massive to well-bedded sandstone, locally pebbly with heavy mineral laminae. U-Pb SHRIMP maximum depositional age 1755±5 Ma – 1750±5 Ma (Fraser and Neumann, 2010).
			L-t	TIP TOP GRANITE: Granite, gneissic, coarse-grained to pegmatitic, quartz-feldspar-muscovite±garnet±tourmaline. U-Pb SHRIMP age 1773±6 Ma (McAvaney et al., 2016).
			Lyw	WIRE DAM DOLERITE: Dolerite, thinner units finer grained and thicker units with gabbroic cores and doleritic chilled margins. Increasingly metamorphosed to amphibolite and foliated metabasalt to the south. Intrudes Broadview Schist metasediments as sills. Age c. 1790–1775 Ma.
			Lyb_1	BROADVIEW SCHIST: Quartzite, laminated and fine-grained with interbedded shale. Deformed with a variably developed solid-state foliation. Maximum depositional age c. 1790 Ma (Szpunar and Fraser, 2010).

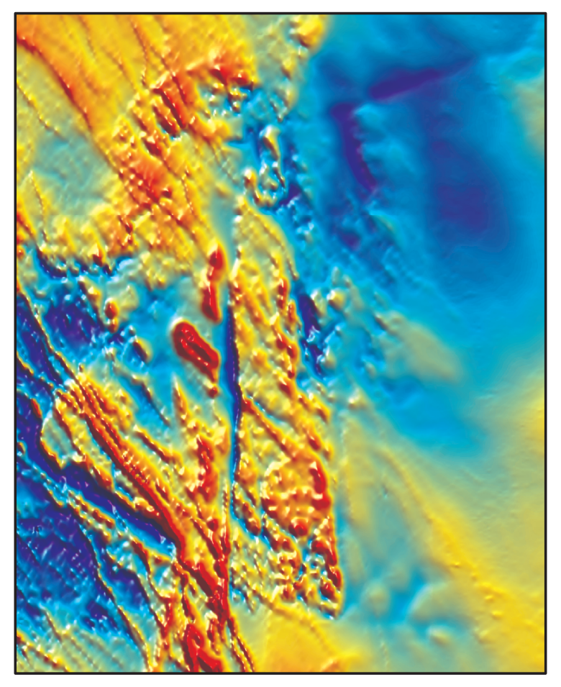
PROTEROZOIC

MISCELLANEOUS

Code	Description
qz	Quartz veins/bodies, undifferentiated.
qz_2	Quartz-tourmaline veins.

GEOPHYSICAL DATA

TOTAL MAGNETIC INTENSITY IMAGE



SCALE 1:500 000

The Total Magnetic Intensity Image has been compiled using aeromagnetic data from the Department of State Development, South Australia.

Aeromagnetic data has been merged, gridded and image processed by the Geological Survey of South Australia, DSD Resources and Energy Group.

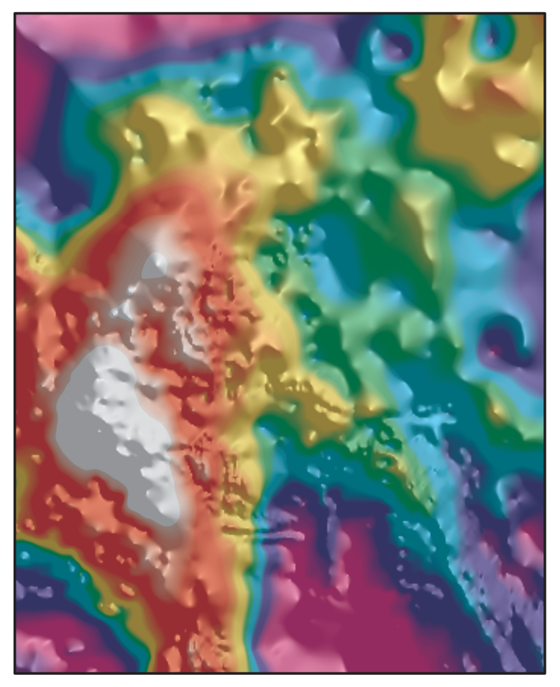
n Tesla

-682.792 – 1361.098

-312.86 45.949 404.758

A two standard deviation contrast stretch has been applied to the raster image above.

BOUGUER GRAVITY ANOMALY MAP



SCALE 1:500 000

The Bouguer Gravity Anomaly Map has been compiled using gravity data from the Department of State Development, South Australia.

Gravity data has been merged, gridded and image processed by the Geological Survey of South Australia, DSD Resources and Energy Group.

Milligals

-22.113117 – 0.649621

-21.544876 -13.899466 -6.254056

A two standard deviation contrast stretch has been applied to the raster image above.

SOLID GEOLOGY - LINEAR STRUCTURE

FAULT
FAULT NORMAL RELATIVE DISPLACEMENT
TREND-LINE
FOLD AXIAL LINES POSITION ACCURATE
FOLIATION TREND METAMORPHIC
JOINT PATTERN AIRPHOTO INTERPRETED

CULTURAL FEATURES

PRINCIPAL ROAD
SECONDARY ROAD
MINOR ROADS
VEHICULAR TRACKS
OPERATIONAL RAILWAY
FENCE
GAS, OIL PIPELINE
WATER PIPELINE
LANDING GROUND
YARDS
BUILDING
RUIN

STRUCTURAL FEATURES

HORIZONTAL SEDIMENTARY BEDDING
CURRENT DIRECTION
FORESET BEDDING
PLANAR VOLCANIC AUTOCLAST ALIGNMENT
VOLCANIC FLOW BANDING
IGNEOUS INTRUSIVE DYKE
VEIN
JOINT
Z-STYLE CRENULATION AXIS
SCHISTOSITY
MYLONITIC FOLIATION
LINEAR STRUCTURAL ELEMENT
TECTONIC FOLIATION

GEOMORPHIC FEATURES

BORE ●
WATER TANK ■

RELIEF FEATURES

IDENTIFIED POINT •

MINING

OCCURRENCE ●
PROSPECT
MINE - METALS AND INDUSTRIAL MINERALS
QUARRY - CONSTRUCTION MATERIALS (HARD ROCK)
PIT/CUT - CONSTRUCTION MATERIALS (SAND AND/OR CLAY)
DIGGINGS - ALLUVIAL GOLD/GEMS

DRILLHOLE REFERENCE

SELECTED DRILLHOLE ⊗
STRATIGRAPHY (THICKNESS IN METRES) Nstt 130.33 / Nsn 10.31

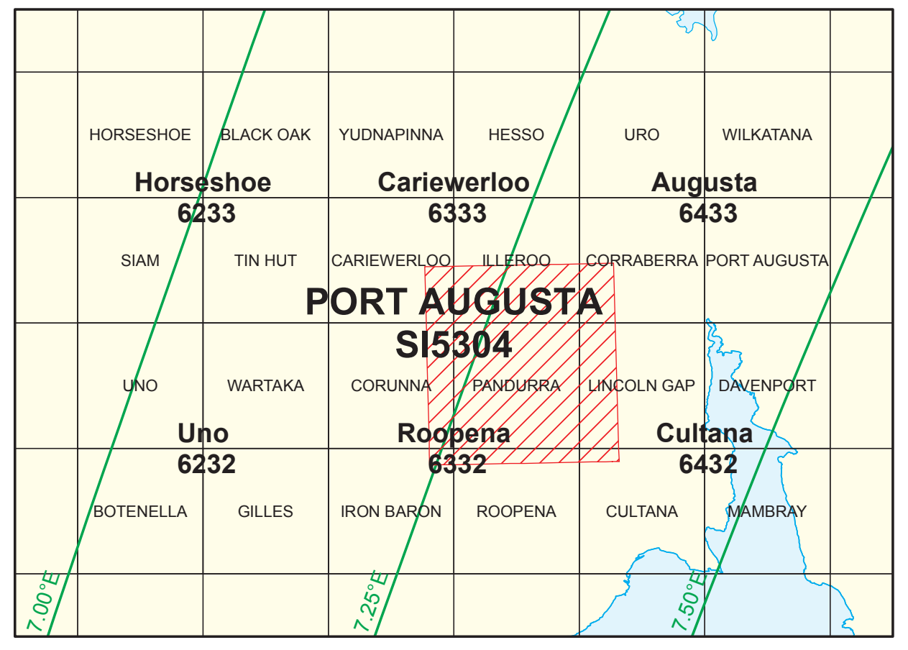
COMMODITIES

Ag	Silver
AGA	Agate
Au	Gold
Co	Cobalt
Cu	Copper
DIA	Diamond
FELD	Feldspar
GNSS	Gneiss
GRVL	Gravel
MHEM	Micaceous Hematite
OPAL	Opal
Pb	Lead
QTZE	Quartzite
SAND	Sand
SDST	Sandstone
SIS	Silica sand
Zn	Zinc

LOCALITY

INDEX TO ADJOINING SHEETS

Magnetic Declination 2000



Geological mapping and compilation:
Compiled by M.J. Pawley, M. Werner, C.B.E. Krapf and S.O. McAvaney.

Drafting and cartography by J.A. Irvine B.Sc.

S.M. Hill, Ph.D., Director, Geological Survey of South Australia.

Topographic detail based on TOPO-250K GEODATA (source scale 1:250 000)
supplied by Geoscience Australia - National Mapping Division, ACT.
The relationship between this data and PIRSA data is not guaranteed.

Computer generated from SA_GEOLOGY database
(Digital data available upon request)
Current version 2016.1

Product of DSD Geological Survey of South Australia.
Published by, and with the authority of, the
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December 2016

SCALE 1 : 75 000

0 1 2 3 4 5

KILOMETRES

Bibliographic reference: M.J. Pawley, M. Werner, C.B.E. Krapf and
S.O. McAvaney. (compilers). 2016. Interpreted Proterozoic solid
geology of Six Mile Hill – Mineral Systems Drilling Program
Special Map Series, 1:75 000 scale.
Geological Survey of South Australia, Adelaide.

This map is produced on the Geocentric Datum of Australia (GDA94)

The sheetedge of this map will not coincide with adjoining maps
based on the superseded datum (AGD84)

For the surface geology of Six Mile Hill, please refer to Krapf, C.B.E., Werner, M., Pawley, M.J. and McAvaney, S.O. (compilers). 2016. Surface Geology of Six Mile Hill – Mineral Systems Drilling Program Special Map Series, 1:75 000 scale. Geological Survey of South Australia, Adelaide.

For detailed descriptions of stratigraphy, structural geology and geological history of the Six Mile Hill Map Sheet please refer to: McAvaney, S.O., Werner, M., Pawley, M.J., Krapf, C.B.E. and Nicolson, B.E. Geology of the Six Mile Hill 1:75 000 Map Sheet, Mineral Systems Drilling Program Special Map Series. Department of State Development, Report Book 2016/00014.

Government of South Australia
Department of State Development