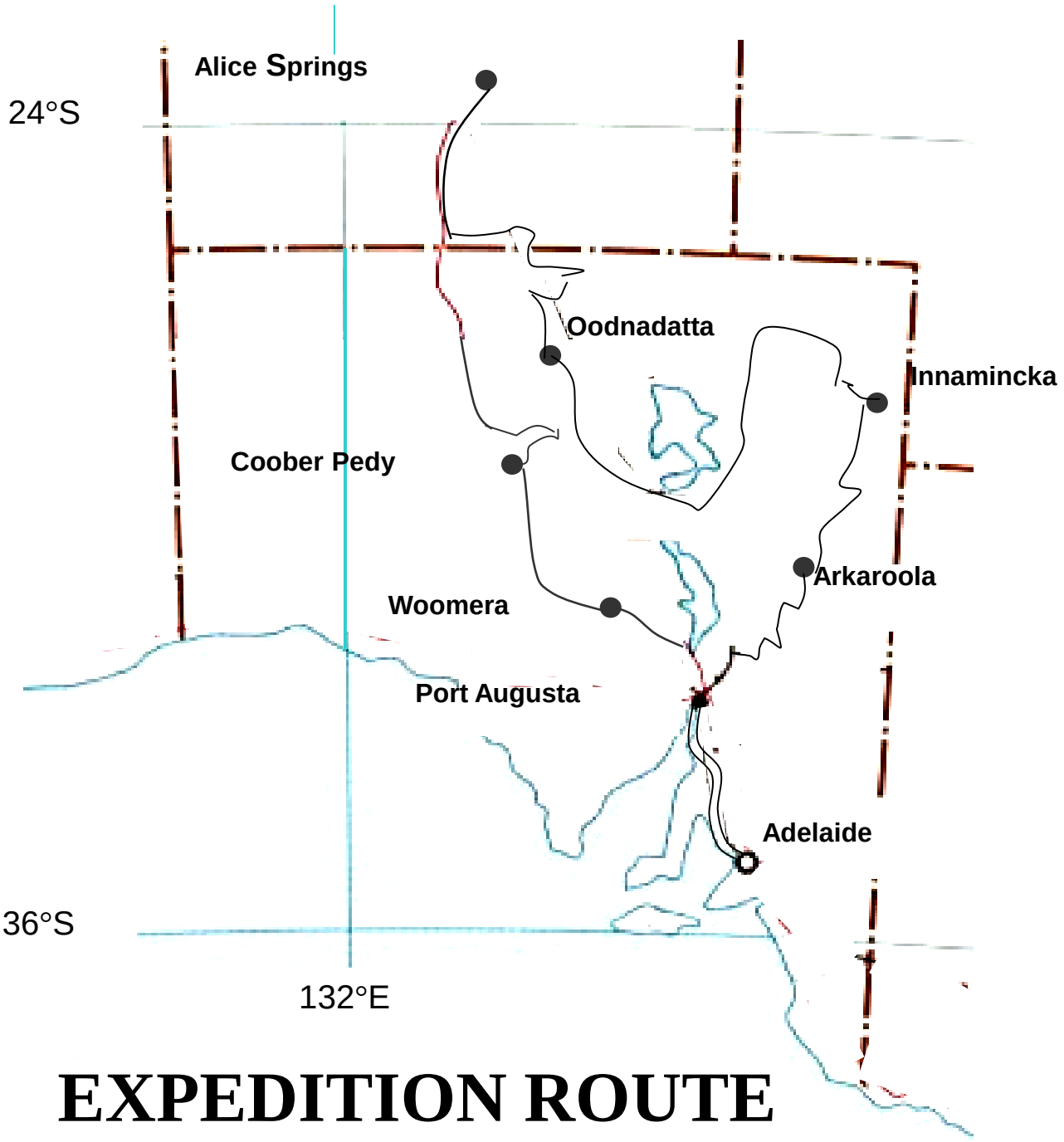
WHY ARKAROOLA?

Jonathan Clarke
Mars Society Australia

SITE SELECTION
Jarntimarra-1 Expedition
(October-November 2001)

OBJECTIVES

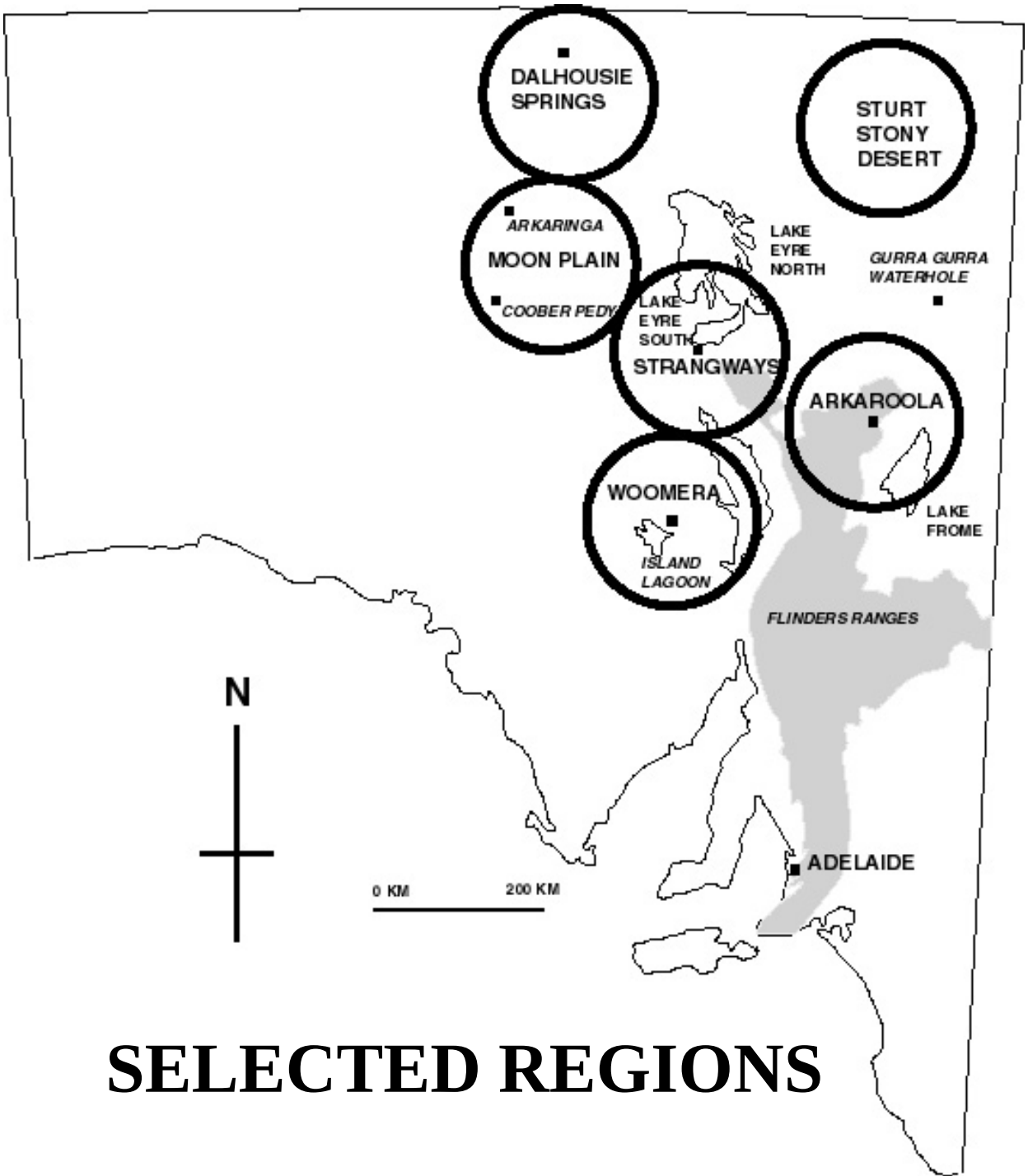
- To evaluate Mars analogue potential in central Australia
- To select a suitable site for MARS-OZ
- To define next stage of Australian Mars Analogue Research



EXPEDITION ROUTE

SITE ASSESSMENT CRITERIA

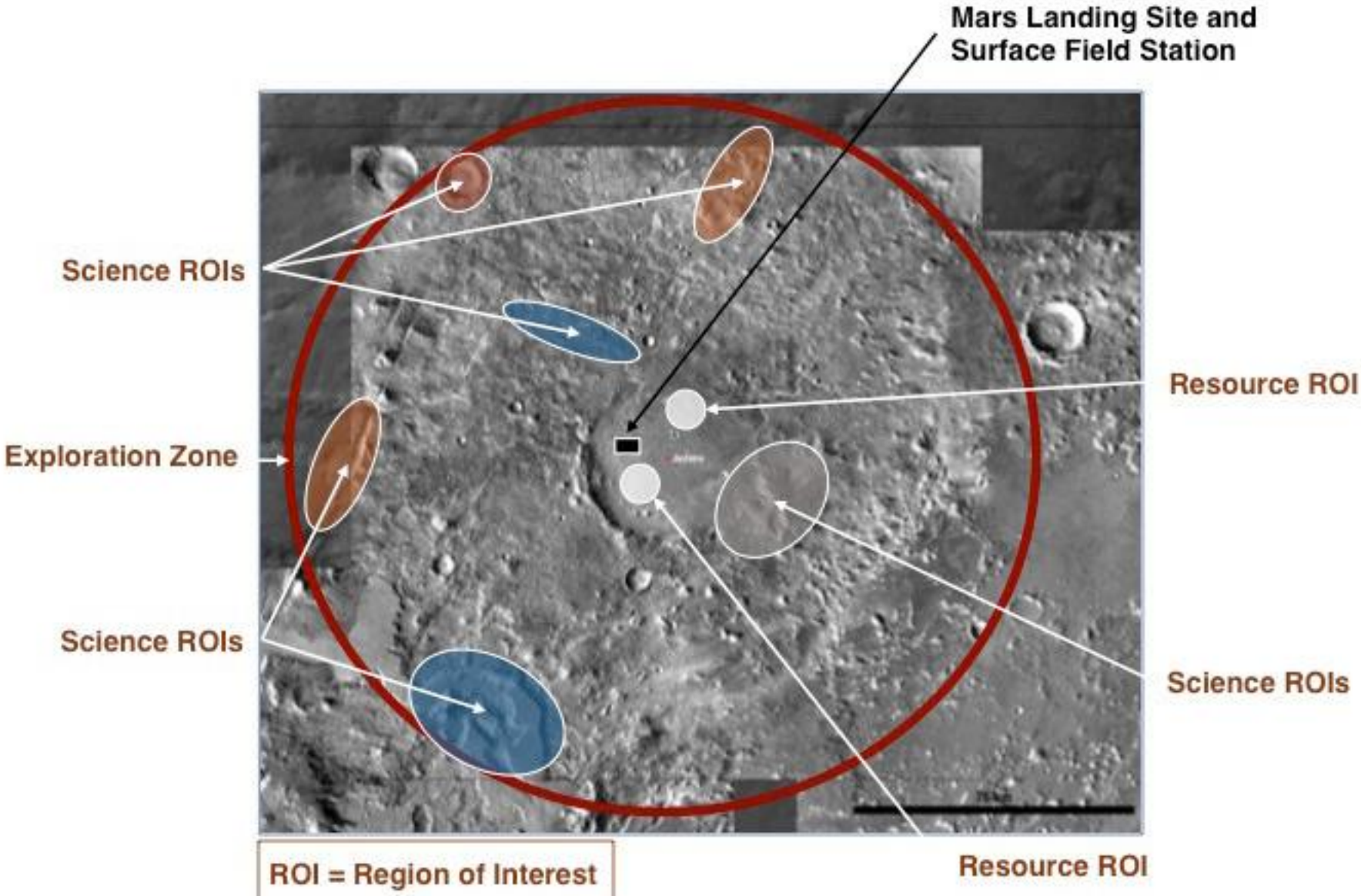
SCIENTIFIC CRITERIA	*ENGINEERING CRITERIA*	*LOGISTIC CRITERIA*	*VISUAL CRITERIA*
Bedrock geology	Rocky	Security	Climate
Geomorphology	Boulders	Accessibility	Surface water
Surficial deposits	Sandy	Infrastructure	Colour
Groundwater	Dusty	Land tenure	Vegetation
Weathering	Firm	Liabilities	Physiography
Palaeontology	Chemical Activity	Safety	Landscape process
Microbiology	Wind	Outreach potential	Cultural association
Extremophiles	Temperature variation		Cultural disturbance



SELECTED REGIONS


Strzelecki Desert
Lake Frome
Lake Torrens
© 2018 Google
Image Landsat / Copernicus
100 km
Google Earth

Exploration Zone Layout Considerations



REASONS FOR SELECTING ARKAROOLA

- **Accessible from Adelaide**
- **Hospitable owners**
- **Suitable infrastructure**
- **Reasonable access over much of region**
- **Medical evacuation possible by RFDS**
- **“Mars-like” landscape (especially on plains to east)**
- **Diverse geology**
- **Wide range of terrain types**
- **Biologically and palaeontologically interesting**
- **History of past Mars analogue research**
- **Mars Oz could be isolated from public**
- **History of analogue research**

REGION 6: ARKAROOLA
The Mars Oz prime site

Airstrip location

Arkaroola spring location

SUPPORT FACILITIES
Workshops

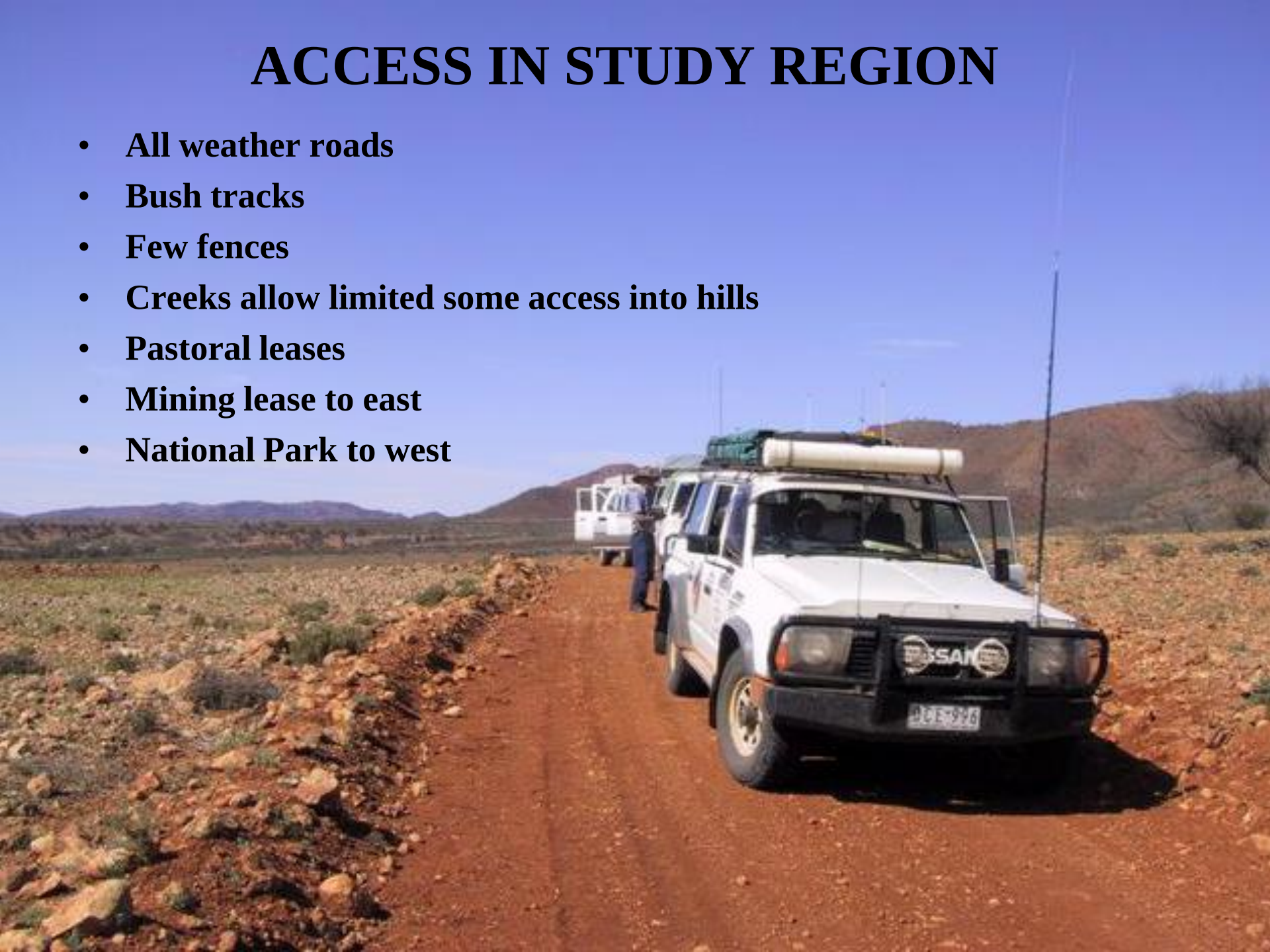
SUPPORT FACILITIES
Other work areas

LOGISTICS

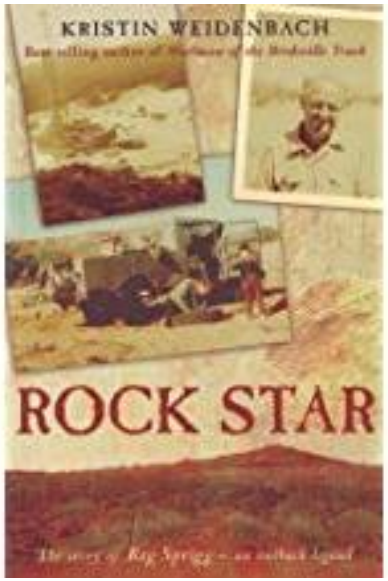
- **Logistic support available from Arkaroola village**
- **Graded roads from both east (through Arkaroola and Leigh Creek) and west of Flinders (via both Martins well and Barrier Highway)**
- **Other graded roads to north and west**
- **8 hours by road from Adelaide**
- **Airstrips at Arkaroola (Wooltana), and Balcanoona homestead (RFDS), and Beverley (mine site)**

ACCESS IN STUDY REGION

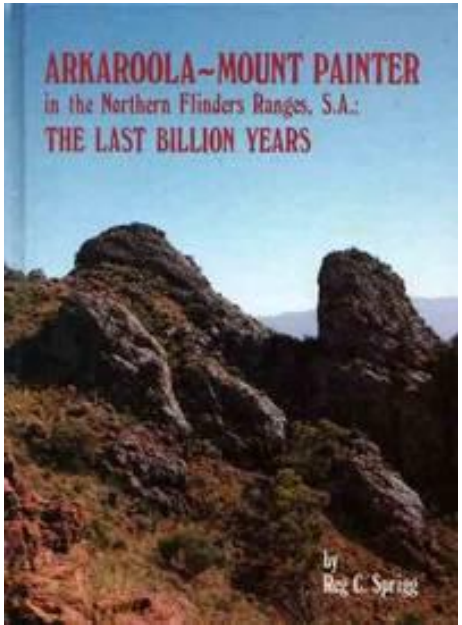
- All weather roads
- Bush tracks
- Few fences
- Creeks allow limited some access into hills
- Pastoral leases
- Mining lease to east
- National Park to west



TENURE


KRISTIN WEIDENBACH
ROCK STAR


DUNE
is a four-letter word
Griselda Sprigg
with Rod Maclean
I came to realise that Griselda Sprigg is a great Australian. Now, in the pages of this book, readers the world over can make the same discovery.
Dick Smith


ARKAROOLA~MOUNT PAINTER
in the Northern Flinders Ranges, S.A.:
THE LAST BILLION YEARS
by
Reg C. Sprigg

Landscape

- **Rocky hills and gorges**
- **Outwash plains and fans**
- **Residual and exhumed surfaces**
- **Playa lakes**
- **Active and relict sand dunes**
- **Dust**
- **Mostly limited vegetation (by Australian standards)**



GEOLOGY

- **Neoproterozoic to Cambrian sediments, intrusives and volcanics of the Adelaide fold belt**
- **Fossil hydrothermal systems of Mt. Painter igneous complex**
- **Modern geothermal springs**
- **Record of important and controversial events in earth history (snowball earth, Acaraman impact, Cambrian explosion)**
- **Complex weathering history and resulting regolith**
- **Wide range of desert landforms and processes**



BIOLOGY AND PALAEONTOLOGY

- **Neoproterozoic stromatolites**
- **Possible fossil extremophiles in Mt Painter complex**
- **Extremophiles in the radioactive Paralana hot spring**
- **Possible deep hot biosphere microfossils**
- **Wide of desert ecosystems including endolithic, cryptogamic and playa lake organisms**

HUMAN-CENTRED RESEARCH

- **Space suit fields of view (2004)**
- **Cognitive state (2004)**
- **Social interaction (2004)**
- **Physiological load during EVA (2014)**
- **Observer effectiveness while suited (2014, 2016)**

History of MSA activities at Arkaroola

- **Jarntimarra - 2001**
- **Expedition 2 - 2004**
- **Spaceward Bound – 2007 (education)**
- **Spaceward Bound – 2009 (education)**
- **Arkaroola Mars robot challenge - 2014**
- **MSA Arkaroola – 2016**

DISCUSSION