



## **ASKAP Project Update**

### **Data Transmission Link to the Murchison Radio-astronomy Observatory**

The Square Kilometre Array (SKA) is an international mega-science project now under consideration: a telescope that will answer fundamental questions in physics and cosmology. The Australian SKA Pathfinder (ASKAP) is a new radio telescope, to be designed and built by CSIRO, in collaboration with leading overseas astronomers and engineers, that will provide an important test-bed for SKA technology as well as being a world-leading telescope in its own right.

This is an outline of the requirements for a CSIRO-owned data transmission link that is required to support ASKAP and SKA. This is not an invitation to tender a solution, nor will an apparently compliant design solution imply any established relationship with CSIRO. As part of an ongoing R&D project, any aspect of the fibre link specification may be refined.

#### **Context of requirement**

The ASKAP project requires a new fibre optic network connection from the Murchison Radio-astronomy Observatory (MRO), situated at Boolardy Station, to a site in Geraldton. As the MRO is Australia's candidate site for the SKA, the intention is to install sufficient fibre to support the estimated capacity for the SKA – so that the MRO can be 'SKA ready'.

There are two radio telescopes currently in development at the MRO: the CSIRO-led ASKAP and the US-Australian-Indian Murchison Widefield Array (MWA). These telescopes will share infrastructure, in particular the broadband fibre link. More information on ASKAP can be found at [www.ska.gov.au](http://www.ska.gov.au) More information on the MWA can be found at [www.haystack.mit.edu/ast/arrays/mwa](http://www.haystack.mit.edu/ast/arrays/mwa)

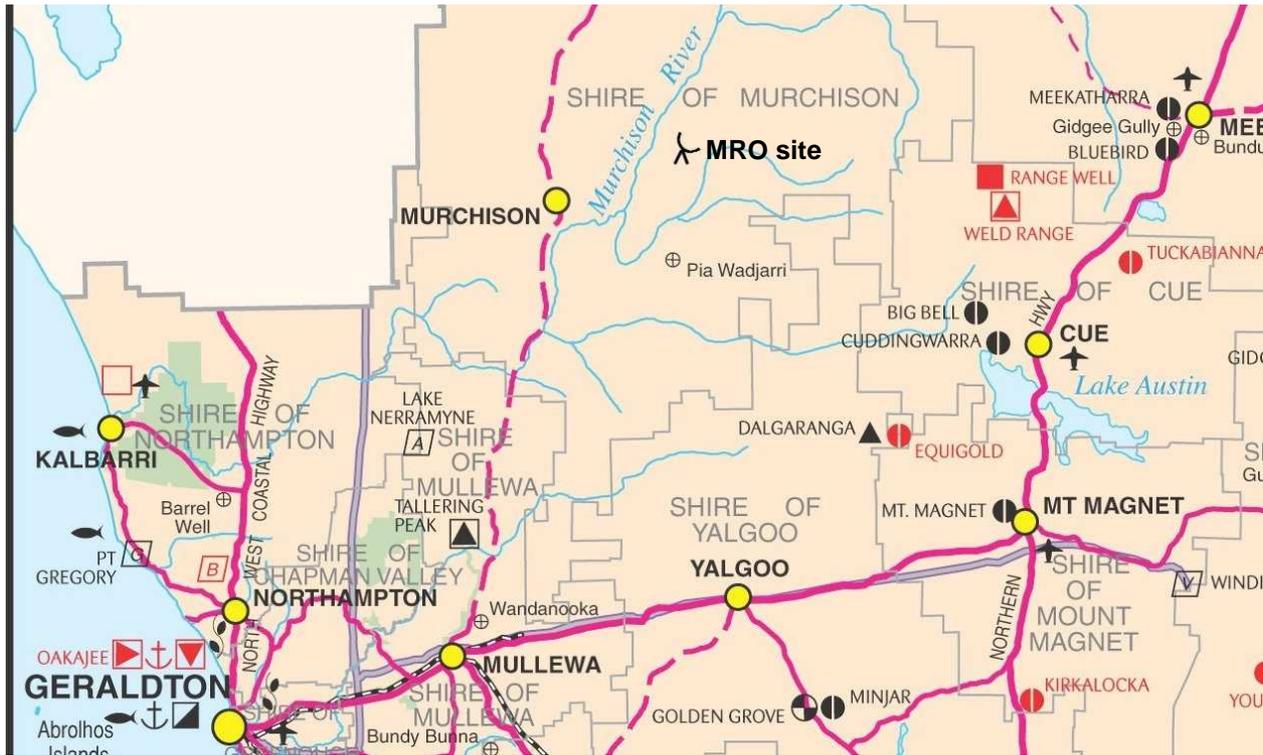
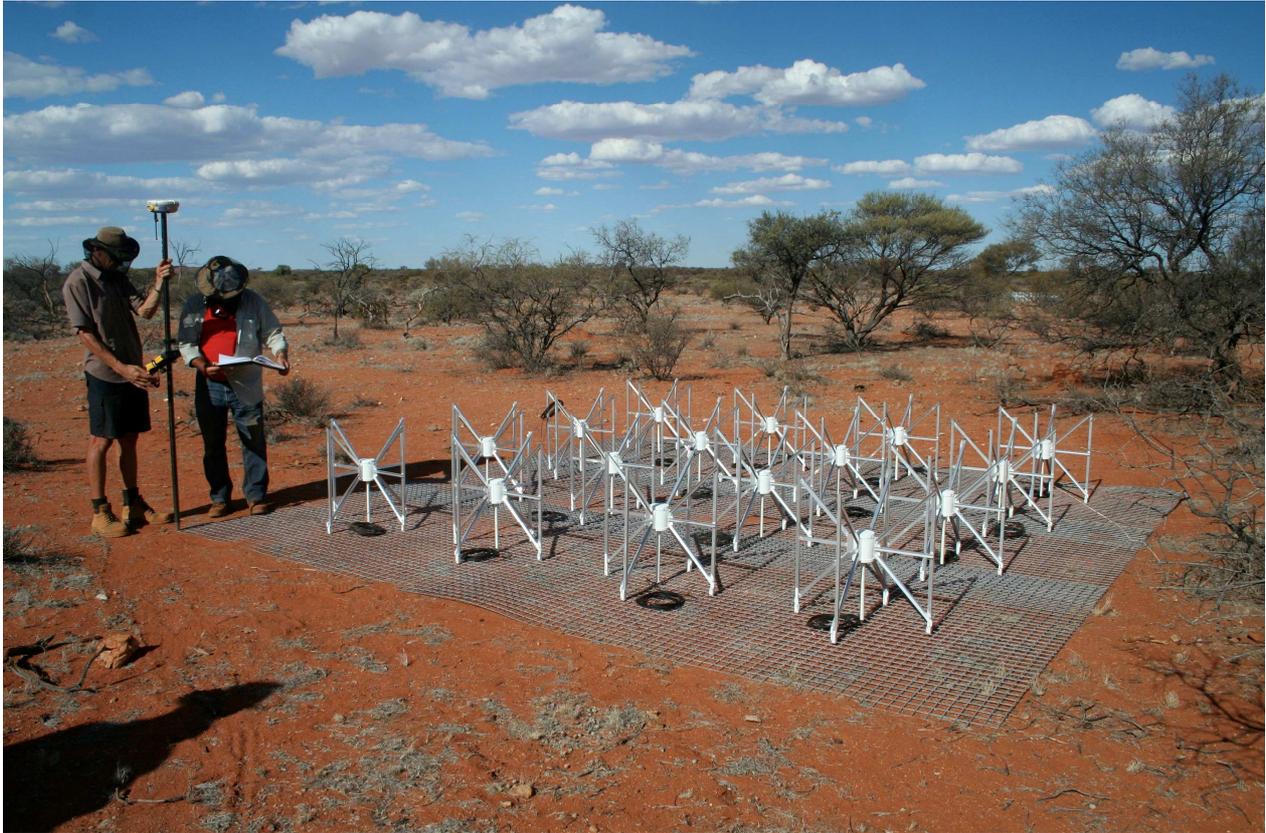


Figure 1 – Map of region showing approx. location of Murchison Radio-astronomy Observatory



Figure 2 – Artist's impression of CSIRO's ASKAP radio telescope (Credit Chris Fluke, Swinburne University of Technology)



**Figure 3– Photo of an MWA ‘tile’ (Credit CSIRO)**

**Location: The Murchison Radio-astronomy Observatory, Boolardy Station, WA**

The MRO is located in remote WA, approximately 230 km North of Pindar, on the Pindar-Berringarra Road.

The ASKAP site is a level area of land currently leased for pastoral activity at 381m elevation above mean sea level. Normal access rules apply. The terrain is weathered granite. The specific locations of the ASKAP antennas will be identified and surveyed during the Antenna design contract.

**Route of fibre-optic data transmission link**

At the present time, the preferred route for the fibre-optic link is East from Geraldton alongside the main Geraldton-Mullewa-Mt Magnet highway to Pindar then North from Pindar up the Pindar - Berringarra Road to the MRO, using normal “right of ways”.

CSIRO is working closely with the Government of Western Australia and the Commonwealth Government, through the Department of Innovation, Industry, Science and Research, on Australia’s SKA project. CSIRO has agreed to consult with the Australian SKA Coordination Committee on matters that impact on Australia’s positioning with regard to SKA. Any proposed change to the defined route above will be discussed with the ASCC before proceeding.

## Data transmission link requirements

The projected capacity requirements for the fibre link are:

Year of operation	Capacity – Option A	Capacity – Option B <sup>1</sup>
2009 (Q3)	10 Gb/s	120 Gb/s
2011	20 Gb/s	160 Gb/s
2013	30 Gb/s	160 Gb/s
2016 (SKA Phase I) <sup>2</sup>	Indicative only: 4Tb/s	Indicative only: 16Tb/s
2020 (SKA) <sup>2</sup>	Indicative only: 400Tb/s	Indicative only: 1,600Tb/s

The data transmission link should have an expected operational lifetime of 25+ years.

## Work update

CSIRO has contracted AARNet to conduct a design study that covers the following Scope of Work:

1. Define technical options;
2. Analyse technical growth path options;
3. Conduct cost/benefit analysis of various technical approaches;
4. Define and analyse project implementation options;
5. Detail cost estimates for the complete project, including:
  - Capital costs and payment/finance models,
  - Operational/maintenance costs
  - Carrier costs (if applicable)
6. Design fibre route and manage land access activities for the duration of the design and planning consultancy;
7. Analyse project risks.

The study will be completed in June 2008.

Prior to the completion of the study we intend to invite expressions of interest for the implementation phase of the data transmission link. The Commonwealth Procurement Guidelines will be strictly followed throughout the entire procurement process.

## Data transmission link contact

Comments, feedback and general questions on this brief should be addressed to:

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<sup>1</sup> Option A is the operational-level requirement, Option B would provide for enhanced data operations. At this stage we have not decided which level to adopt.

<sup>2</sup> Only if Australia will be selected as the SKA site.