

# *Extension of Warrumbungle Dark Sky Park to include Siding Spring Observatory*

Annex to original submission: 2015

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## Introduction



Siding Spring Observatory from the air, with the dome of the 3.9-m Anglo-Australian Telescope in the centre, the Trig Point and western telescopes on the extreme left, and the 1.2-m UK Schmidt Telescope and LCOGT telescopes on the right. (ANU)

Siding Spring Observatory contains 148 hectares of land, owned and maintained by the Australian National University. This land is adjacent, and near to, the existing boundary of the Dark Sky Park. In the successful application to the International Dark Sky Association in 2015, the National Parks and Wildlife Service, noted that the Warrumbungle Dark Sky should encompass the area of Siding Spring Observatory (SSO) as Phase II of this project. Given the strong association SSO has with dark sky protection, the inclusion of this land is integral to the future of the DSP, and equally extends the potential for outreach opportunities.

With the exception of the Schmidt Telescope, Water Treatment facility and the Lodge and Visitor's centre, the site is virtually light free outdoors. Those areas with outdoor lighting, comply with the original Light Management Plan for the park, and are outlined in the inventory.

SQM readings are frequently taken from the Australian Astronomical Telescope (serial 3122) and demonstrate a consistent reading below 21.75, under moonless conditions maintaining the Dark Sky Park status of Gold Tier.

The following pages present:

- the lighting inventory of Siding Spring,
- a cross section of SQM readings,
- the proposed new Dark Sky Park boundary, and
- letter of support for the extension.

Warrumbungle Dark Sky Working Group are committed to enhancing the public experience of the dark sky movement in Australia.

# Letter of Support



**Professor Matthew Colless FAA FRAS**  
**Director**  
**Research School of Astronomy and Astrophysics**  
**The Australian National University**

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19 December 2017

**Prof. Fred Watson**  
**Chair, Siding Spring Dark Skies Committee**  
**Australian Astronomical Observatory**  
**PO Box 915, North Ryde, NSW 1670**

Dear Fred,

As Director of the Research School of Astronomy and Astrophysics at the Australian National University, I write now to support the extension of the Warrumbungle Dark Sky Park to include Siding Spring Observatory.

Siding Spring Observatory (SSO) has an area of 148 hectares and thirty buildings, most owned and operated by the Australian National University. The site is home to a wide range of facilities, including Australia's largest in-country optical telescope, the Anglo-Australian Telescope, and a range of international and domestic research telescopes, plus some commercial and outreach facilities. Extending the Dark Sky Park to include SSO will incorporate Australia's best site for optical and infrared astronomy, and one of the key hubs of astronomical research in Australia.

The Siding Spring Dark Skies Committee works alongside local councils and the NSW State government to communicate the long-term strategies associated with preserving the night sky.

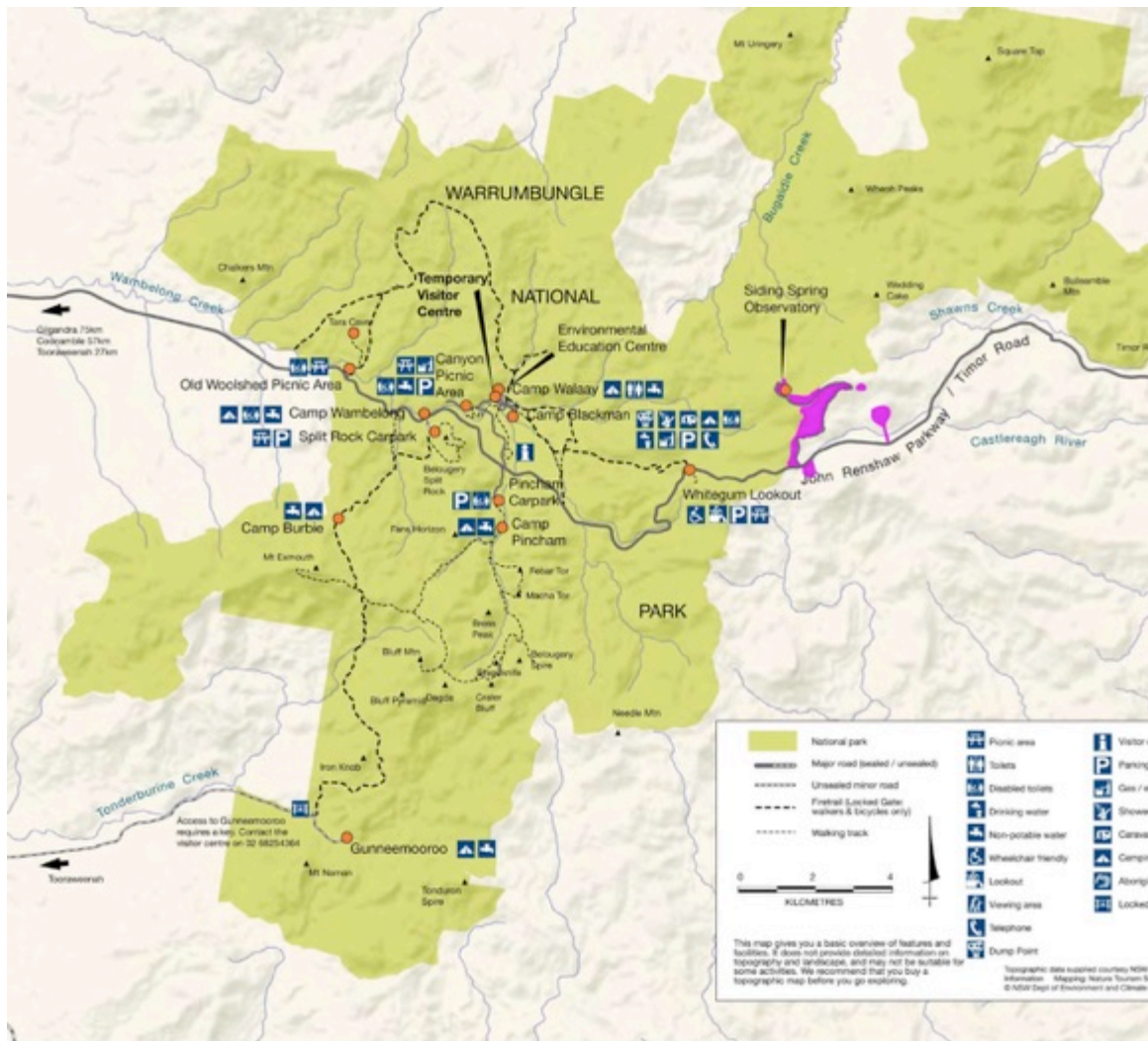
We are therefore proud to be associated with the Dark Sky Park and keen to support measures to extend its size and status.

Yours sincerely,

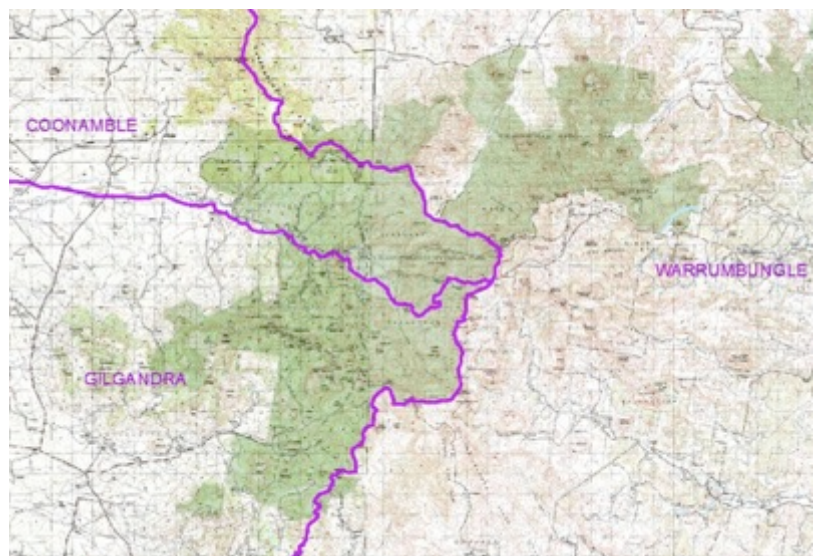
A handwritten signature in black ink that reads "Matthew Colless".

**Professor Matthew Colless**  
**Director, Research School of Astronomy and Astrophysics**  
**The Australian National University**

## Map – including extension






Area shaded pink is extended boundary area



## Lighting Inventory



### Lodge

	<p>LEDs in walkways. Connected to timer switch.</p>
	<p>Fluoro light in plant room. Undercover. Only used when urgent maintenance on hot water systems is required.</p>
	<p>Lights in stairways. On a timer switch.</p>

## Visitor Centre

	<p>Shielded light, undercover. On timer. Only used for lodge guests arriving after dark to access key safe.</p>
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## Schmidt Telescope

	<p>2 x Shielded light, undercover above garbage bins and near fuse box.</p>
	<p>Shielded light, undercover. On timer. Only used for astronomers to open door with complicated lock.</p>

## Water Treatment Plant



Fluoro light on press button timer. Only used in emergency chemical spill



Emergency light



Area images



*Trig Point Telescopes*



*i Telescope*



*LCOGT*



*Western  
Telescopes*

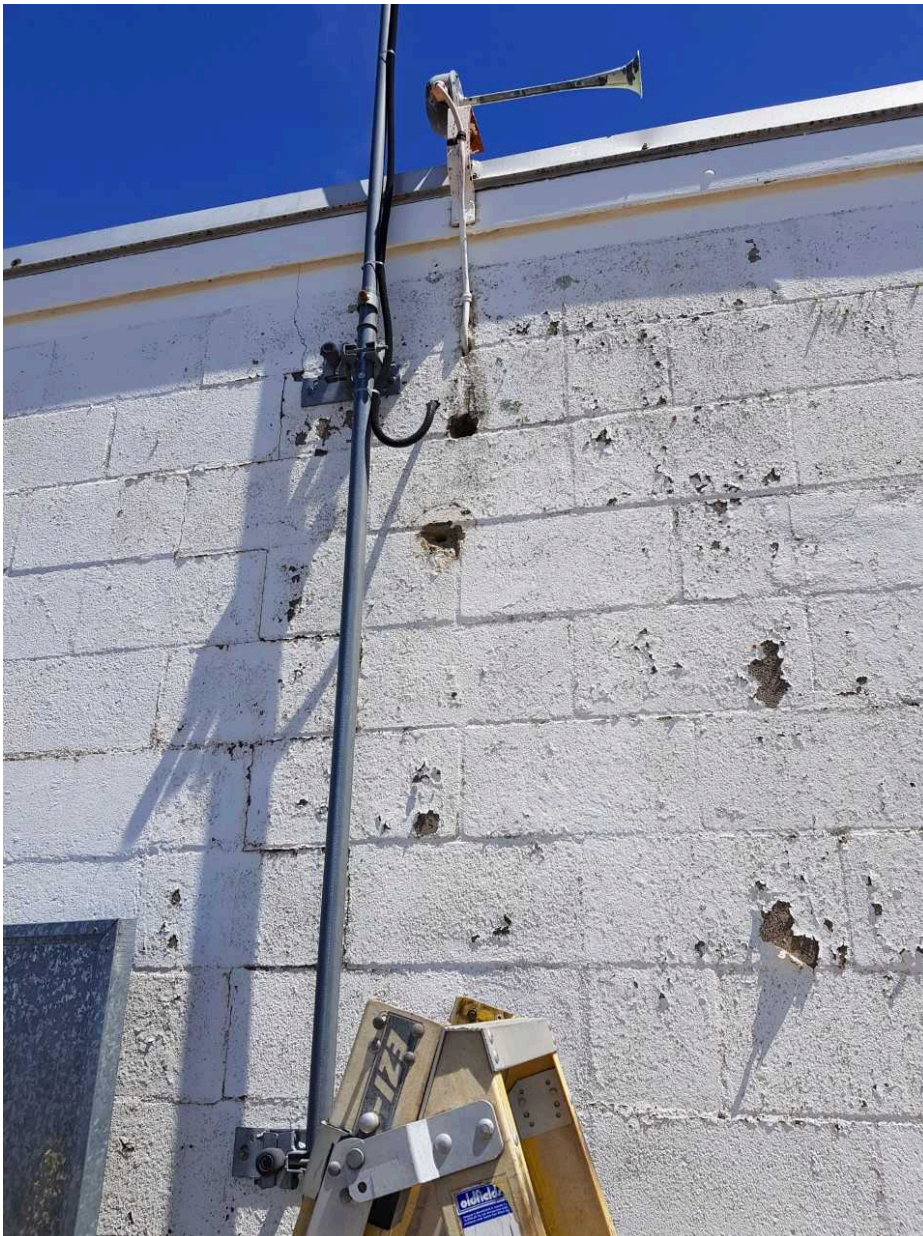


BEFORE REMOVAL

*Water Treatment Plant*



AFTER REMOVAL





*AAT Workshop  
& Dome base*



*Schmidt Telescope*



*Visitor  
Centre*



*Residential  
Cottages*

## SQM readings

The table below gives a sample of SQM readings taken from Siding Spring Observatory, at the Australian Astronomical Telescope during 2016 and 2017. The SQM points slightly south of the zenith.

The readings are taken through a glass weatherproof housing during the night, once per minute. Because of reflection at the glass surfaces, 0.11 mag should be removed from data.

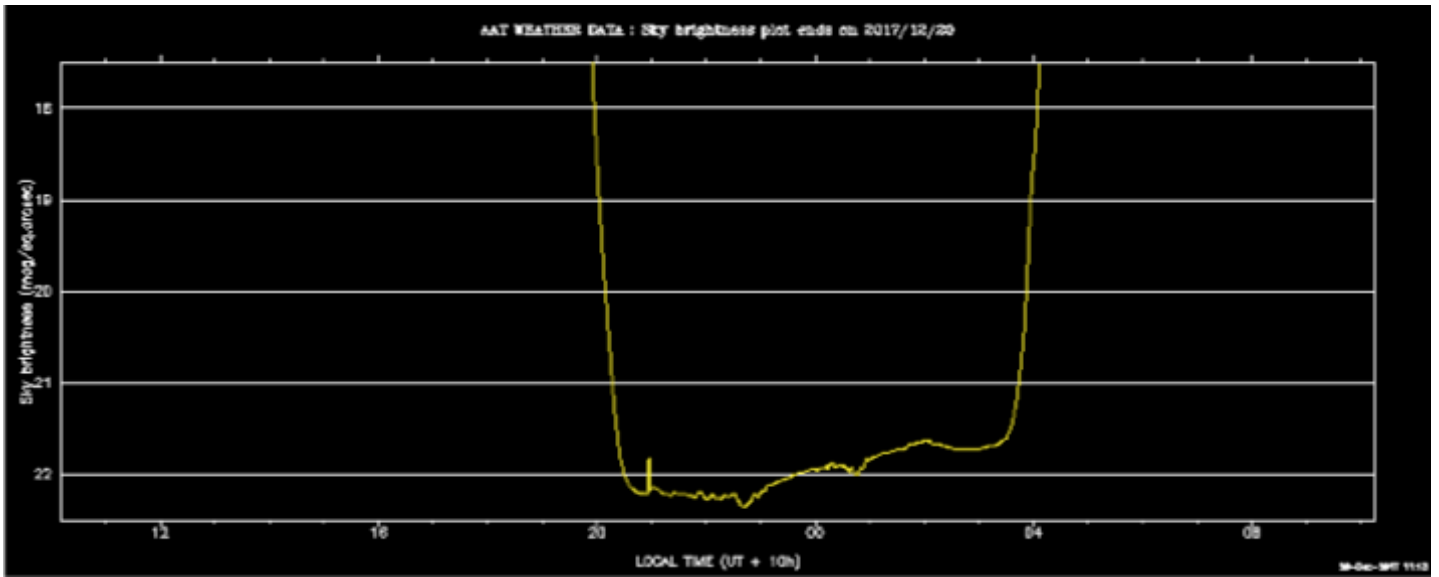
Date	UTC	Sky Brightness (Mag/sq arcsec)	Ambient Temp (C)	Moon / Sky conditions
23/9/16	13:16:40	21.97	9.6	3rd q, clear
26/9/16	14:00:18	21.86	8.3	crescent, clear
31/10/16	13:00:52	21.95	8.7	new, clear
1/11/16	10:07:19	21.79	12.8	new, clear
3/11/16	13:04:18	21.86	15.7	crescent, clear
19/11/16	13:00:53	22.06	21.9	3rd quarter, clear
28/11/16	13:00:49	21.95	21.2	new, clear
29/11/16	13:00:23	22.00	21.2	new, clear
28/12/16	13:00:53	21.91	23.2	new, clear
27/2/17	14:21:57	21.82	16.1	new, clear
26/3/17	13:10:24	21.84	19.9	new, clear
2/6/17	19:31:03	21.96	7.0	1st quarter, clear
25/6/17	16:20:24	22.10	10.9	new, clear
26/6/17	16:06:47	22.01	9.6	new, clear
22/7/17	14:36:12	22.02	7.7	new, clear
20/8/17	14:19:51	22.09	6.7	new, clear
19/9/17	14:30:45	21.94	7.4	new, clear

Real-time sky-brightness plots from the SQM are presented on the AAO weather data web page at:

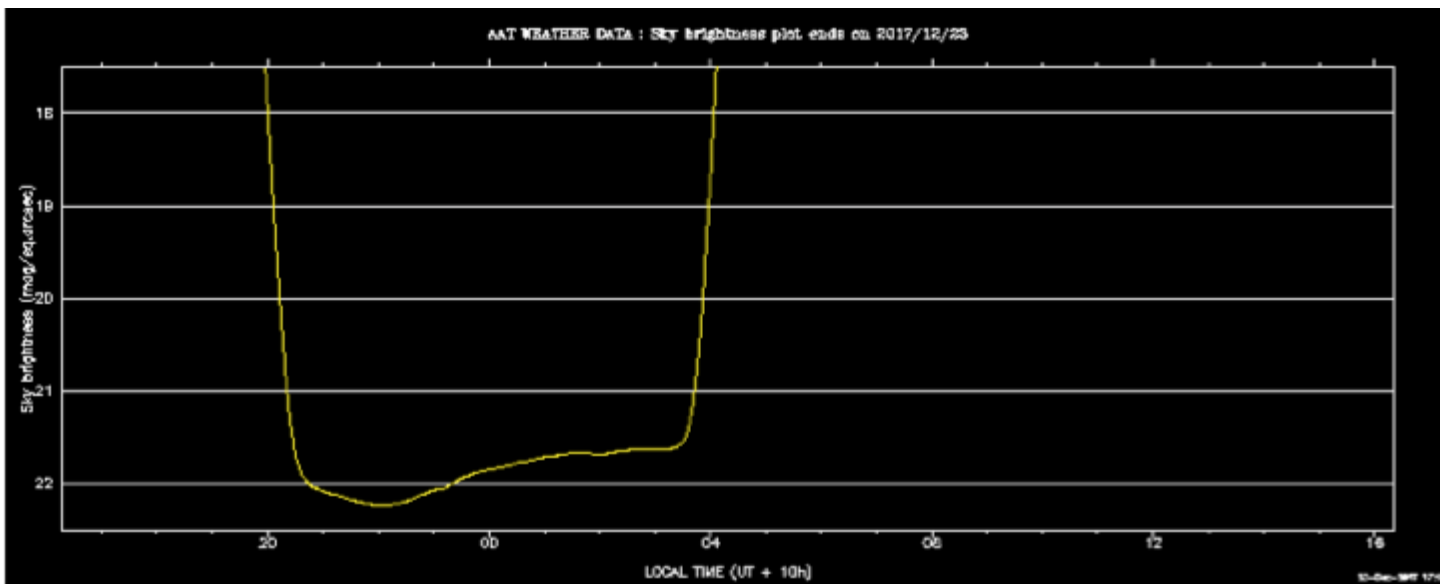
<http://site.aao.gov.au/AATdatabase/met.html>

Below are two examples, obtained shortly after New Moon. Small amounts of cloud were present on 19/20 December, while the Milky Way brightened the second half of both nights.





19/20 December 2017



22/23 December 2017