HERITAGE ASSESSMENT REPORT

NAME:	Mount Wudinna and Environs	**PLACE:**	17060
ADDRESS:	Barngarla Country Mount Wudinna Access, Wudinna SA 5652		

This heritage assessment considers that the place meets criterion (c). Refer to Summary of State Heritage Place for final approved wording, including criteria statement.

The slope of Mount Wudinna from the Mount Wudinna Recreation Reserve

Source: DEW Files 5June 2025

ASSESSMENT OF HERITAGE SIGNIFICANCE

Statement of Heritage Significance:

Mount Wudinna and Environs is an exceptional example of granite inselbergs. Located on the northern Eyre Peninsula, Mount Wudinna and Environs is comprised of four major granite outcrops, each displaying well-preserved and sometimes unusual geological features formed in the granite due to compressive stresses and weathering. The granite outcrops provide excellent opportunity for research on the

effect of these natural processes in the South Australian landscape and trace the evolution of the topography of the State through several geological features. These features associated with granite are highly likely to contribute to an understanding of the development of granite inselbergs over geological time and into the future as they continue to develop.

Statement of Designation (Geological)

Mount Wudinna and Environs including Mount Wudinna, Turtle Rock, Polda Rock and Little Wudinna contains many minor geological features formed in Hiltaba Suite granite. Extruded granites formed the inselbergs and the varying surrounding granite outcrops which were weathered and shaped over millions of years by erosion and compressive stresses. This has formed minor geological features including rillen, domal sheet jointing, flared slopes, tafoni and spectacular examples of A-tents. The site contains excellent granite outcrops and is highly likely to contribute to an understanding of the geomorphology of granite inselbergs throughout the State.

The significant geological features contained within Mount Wudinna and Environs are:

- Mount Wudinna,
- Little Wudinna,
- Polda Rock,
- Turtle Rock,
- Erosional and compressive minor geological features associated with the above outcrops.
- Erosional and compressive minor geological features that may not be attached directly to the above outcrops such as boulders or blocks, sheets and A-tents.

Relevant South Australian Historical Themes

1. Natural Environment

1.1 Tracing climatic and topographical change

1.5 Appreciating South Australia's natural environment

1.6 Recognising human impacts on the natural environment

Comparative Analysis:

Mount Wudinna and Environs is an example of a granite inselberg located in the northern Eyre Peninsula, which exhibits a variety of geological features created through weathering and compressive stresses. The following comparative analysis considers these three primary defining elements, namely: inselbergs, granite outcrops located in the northern Eyre Peninsula, and minor geological features, each is considered in turn below.

Inselbergs

Mount Wudinna and Environs is an inselberg standing approximately 60m tall and 261m above sea level (asl). Although it is often described as Australia's second largest granite inselberg,[1] surpassed only by Uluru, there are several taller inselbergs including in South Australia Carappee Hill (353m, ~495m asl), Caralue Bluff (291m, ~489m asl) and Mount Sturt (242m, ~414m asl).[2] Each is composed of a different geological formation to Mount Wudinna's Hiltaba Suite granites, except for Mount Sturt which may have Hiltaba Suite inclusions.[3]Mount Monster, 61m tall (93m asl), in the southeast and Ilpinga/Mount Kintore (1066m asl), in the State's north-west are two other large and notable inselbergs, although little in-depth research has been undertaken on either of them. Other notable granites are the unusual green granites found in several inselbergs near Padthaway in the southeast.[4]

Some of the most notable inselbergs in the State for both research and tourism purposes are found on the Eyre Peninsula. The best known of these are: Pildappa Rock (SHP 17058), Murphy's Haystacks (SHP 14230), and Yarwondutta Rock and Quarry (SHP 17059).

Granite outcrops in the northern Eyre Peninsula

The Eyre Peninsula has many granite outcrops that are large enough to be defined as inselbergs, and many more that are too small to be defined as such. Those listed as State Heritage Places include:

- Pildappa Rock, Pildappa Road, Minnipa (SHP 17058); confirmed 16 March 2000; designated as a place of geological significance; stands at 22m tall (~130m asl). Pildappa Rock is composed of Hiltaba Suite granite and is best known for the large gnammas that are found on the surface of the inselberg, one of which is 70cm deep and 2.7x2.3m wide;[5] it also displays evidence of rillen (natural gutters), tafoni (hollowed-out boulders) and subsurface erosion within its heavily eroded and wave-like flared slopes.
- Yarwondutta Rock and Quarry, Yardea Road, Minnipa (SHP 17059); confirmed 5 July 2000; designated as a place of geological significance; is a 15m tall (~190m asl) inselberg composed of Hiltaba Suite granite. Yarwondutta Rock and Quarry is best known for its flared slopes and for the well-developed minor geological features, including excellent rillen. The quarry clearly demonstrates excellent examples of weathering profiles and was instrumental in developing an understanding of subsurface erosion on inselbergs throughout the Eyre Peninsula.
- Ucontitchie Hill, Wudinna (SHP 17061); confirmed 16 March 2000; designated as a place of geological significance; is a 35m tall (~148m asl) inselberg composed of Hiltaba Suite granite. The site has been studied most extensively for the presence of its tafoni, triangular wedges and corestones, the latter two are uncommon among the Eyre Peninsula granite inselbergs.
- Coralbignie (Houlderoo) Rocks, via Iron Knob (SHP 17062); confirmed 5 July 2000; designated as a place of geological significance and composed

predominantly of rhyolitic Peter Pan Supersuite. Rather than inselbergs, this site displays several small outcrops of oddly shaped rhyolite as a result of erosion.

- Murphy's Haystacks, Benbarber Road off Flinders Highway, Mortana (SHP 14230); confirmed 4 March 1993. The site is made up of two large groups of rocks and boulders that can be up to 10m tall. The unusual shapes and heavily flared slopes of certain outcrops are striking against the flat surrounding plains. These outcrops are composed of Calca Granite rather than the usual Hiltaba Suite granite.

These inselbergs along with Mount Wudinna and Environs are the most well-known outcrops within the State but there are many more that are both named and unnamed that are not State Heritage listed.

Unlisted Granite outcrops in the Northern Eyre Peninsula

Several granite outcrops on the Eyre Peninsula are unlisted but named and widely known throughout the community. Many of these sites contain limited minor geological features and have been altered by human activity. Several are associated with historic water catchments such as Minnipa Hill, Tcharkuldu Rock, Poldinna Rock, Podinna Rock, Pildappa Rock (SHP 17058), Pygery Rocks, Ucontitchie Hill (SHP 17061) and Yarwondutta Rock and Quarry (SHP 17059), and Yarwondutta Rock Tank (SHP 14225) among others.[6] Most large outcrops at Mount Wudinna and Environs have dams or water tanks associated with them, the most extensive is the Polda Rock Reservoir sited just outside of Mt Wudinna and Environs.

Many other granite outcrops have been quarried, predominantly for their granite and are variably affected by this activity. Despite one modern mineral exploration and two historical mines present in the immediate area, the inselbergs at Mount Wudinna and Environs are not affected and are in excellent condition. Other intact sites include:

- Wattle Grove Rock, located immediately north of Mount Wudinna and Environs. It is approximately 20m tall. It demonstrates eroded platforms[7] much like Turtle Rock at Mount Wudinna. It is a part of the same Geological Monument as Mount Wudinna, Turtle Rock, Polda Rock, Little Wudinna and several small granite outcrops in the area (Mount Wudinna and Environs Geological Monument).[8] It has 'one of the best examples of tafoni observed' likely referring to tafoni found in the Eyre Peninsula. It also displays flared slopes, rillen and gnammas.[9]
- Mount Sturt is comprised of Gawler Range Volcanics, which are partially granitic but mostly silicic.[10] Mount Sturt has a prominence of 242m and a peak at 414m asl. Very little research has been conducted on Mount Sturt.
- Minnipa Hill is an unusual outcrop of Hiltaba Suite granite that stands approximately 30m tall and 201m asl. The place has been subject of neotectonic activity and developed A-tents between 2000 and 2001.[11]
- Carappee Hill, an inselberg composed of Carappee Granite, is thought to be the highest exposed granite rock on the Eyre Peninsula.[12] It rises 495m asl with

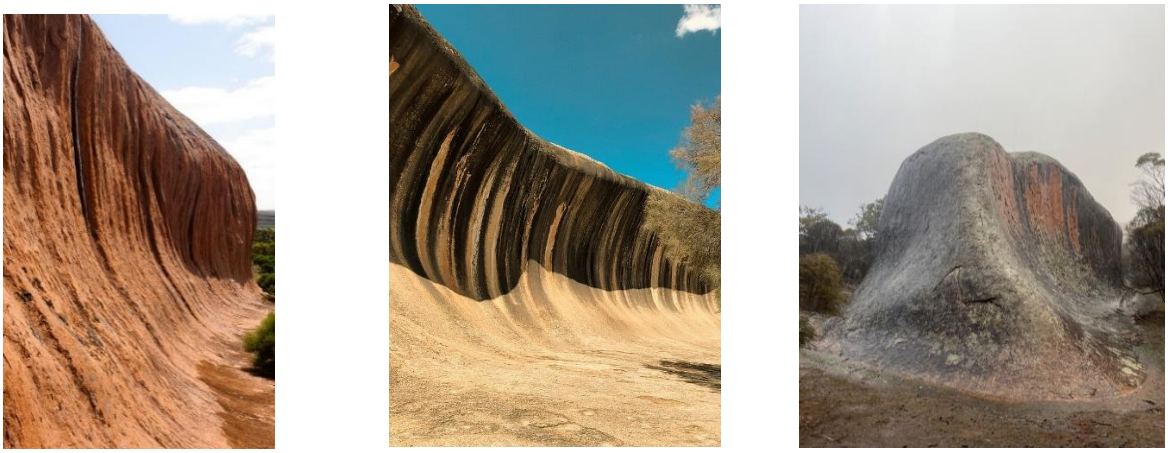
a prominence of 353m. Carappee Hill is gneissic and contains A-tents but these are smaller than those present on the western slopes of Mount Wudinna.[13] Very few other inselbergs display A-tents, particularly in South Australia and it has been a site of study into gnammas of which many are present.[14]

- Cooyerdoo Granite is little known as it was only identified in 2008, although it is believed to be the oldest outcrop in South Australia at approximately 3150 million years old.
- Waddikee Rocks is a small, exposed inselberg and features a monument to explorer and surveyor John Charles Darke at its base.[15] It is composed of Sleaford Complex rocks (Granitic gneiss) and stands 203m asl.
- Caralue Bluff is one of the largest outcrops on the Eyre Peninsula and is known for gneiss exposures and for boulders and platforms present at the site. The outcrop itself is a mix of granite and quartz, Warrow Quartzite and the Peter Pan Supersuite.[16] Caralue Bluff is approximately 291m tall and 489m asl.
- Dumonte Rock, found south-west of Mount Wudinna is a low relief Hiltaba Suite granite outcrop with flared slopes[17] and asymmetrical hollows.[18] Notably, it has extensive rillen running along the entire surface of the rock, giving it a heavily pockmarked appearance. It was partially cleared before 1997 when a water reservoir was created.[19]
- Waulkinna Hill is found within the Gawler Ranges National Park, it is a Hiltaba Suite granite inselberg with a prominence of 162m and an elevation of 362m asl with notable flared slopes.[20] The area is best known for fields of associated blocks and boulders.[21]
- Calca Hill is made up of undescribed Gawler Range Volcanics. Calca Hill is approximately 118m asl and with a 51m prominence and like Mount Wudinna displays flared slopes[22] including shallow concavities.[23]

Minor geological Features

Minor geological features found commonly at granite inselbergs include flared slopes, stepped slopes, rillen, gnammas, tafoni, boulders, triangular wedges, A-tents, corestones and polygonal cracking.

Flared slopes are common occurrences at inselbergs due to subsurface weathering. Thirteen outcrop sites in Australia display particularly notable examples of flared slopes[24]. Ten of these are within South Australia. Some of the best examples are present at Mount Wudinna, Turtle Rock (both subject of this reassessment), Pildappa Rock (SHP 17058), Yarwondutta Rock and Quarry (SHP 17059), Chilpuddie Hill, and Dumonte Rock.[25] Turtle Rock shows flared slopes meeting on a spur of the rock, which is an unusual feature.[26]



Flared Slopes from Pildappa Rock (left) (SHP 17058), Wave Rock, WA (centre) and two flared slopes meeting at Turtle Rock (right)

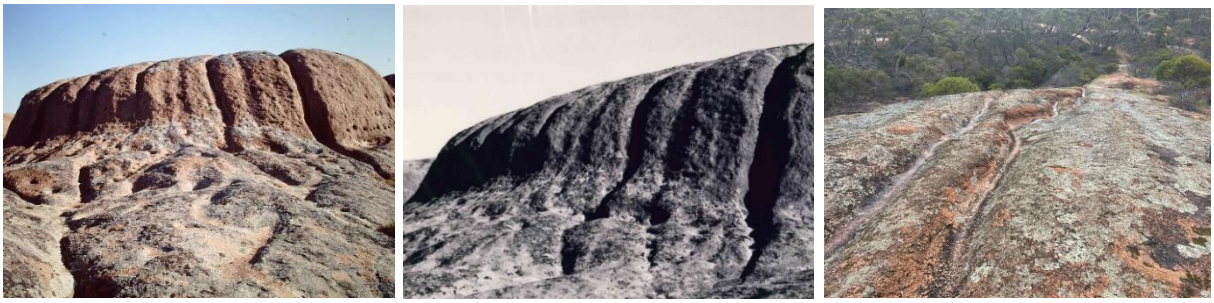
Source: Stephen Edmonds (2011), User: Jhazerey, DEW Files 6June 2025

Stepped slopes have been eroded in a way that produces a stepped appearance. Such geological features provide evidence of multiple periods of weathering or episodic exposures of the rock.[27] Quarrying works and construction at localities such as Yarwondutta Rock and Quarry (SHP 17059), Mount Wudinna (subject of this reassessment) and Calca Hill have displayed flared slopes underneath the surface of the surrounding plains, demonstrating that subsurface erosion by water was the most likely contributor to the shapes of the rocks. Stepped slopes above ground are present at Mount Wudinna, Yarwondutta Rock and Quarry (SHP 17059), Poondanna Rock, and Ucontitchie Hill (SHP 17061), among others.[28]

Stepped Slopes at Ucontitchie Hill (SHP 17061) (left), at Yarwondutta Rock and Quarry (SHP 17059) (centre) and at Mt Wudinna (right).

Source: DEW Files c. 2009, c. 2016, 5June 2025

Rillen, karren or erosional gutters, are shallow channels that are produced by the erosion of the rock surface and are created when water runs through the gutters, eventually making them increasingly deeper. Rillen are present at nearly all inselbergs on the Eyre Peninsula. Twidale identified particularly notable examples of rillen at Yarwondutta Rock and Quarry (SHP 17059), Pildappa Rock (SHP 17058), Dumonte Rock[29] and Uncontitchie Hill (SHP 17061).[30] Rillen at Yarwondutta Rock and Quarry (SHP 17059) and Little Wudinna (subject of this reassessment) are also regarded as excellent examples.[31] These gutters can demonstrate where there is, or perhaps was, a gently sloping surface that allowed water to flow downhill.[32] This can be particularly useful on remnant slabs of rock which may have been moved by erosional or compressive forces.



Rillen at Ucontitchie Hill (SHP 17061) (left), Yarwondutta Rock and Quarry (SHP 17059) (centre) and at Mt Wudinna (right)

Source: DEW Files c. 2009, c. 2016, 5June 2025

One area of Turtle Rock (subject of this reassessment) displays 'inverted rilllen' on a flared sidewall. Similar minor geological features can also be seen on Pildappa Rock (SHP 17058), Yarwondutta Rock and Quarry (SHP 17059)[33] and Murphy's Haystacks (SHP 14230)[34] and are a result of differential drying and wetting periods on either side of a rillen, eventually eroding surrounding sidewalls and leaving a raised rib.[35]

Inverted Rillen on the flared slope of Turtle Rock

Source: DEW Files 6 June 2025

Gnammas. Gnammas are also known as water basins, pits or pans and are common among inselbergs. Some excellent examples can be found at Pildappa Rock (SHP 17058), Minnipa Rock, Pygery Rocks and Turtle Rock (subject of this reassessment). Gnamma are often shaped by collected standing water, however, can also be the result of flowing water such as 'water eyes' at Peella Rock and Polda Rock (subject of this reassessment) and armchair hollows at Dumonte Rock and Coralbignie (Houlderoo) Rocks (SHP 17062). Polda Rock, has excellent examples of deep gnamma that display laminations due to weathering, expansion and rupture of the surface of the granite.[36]

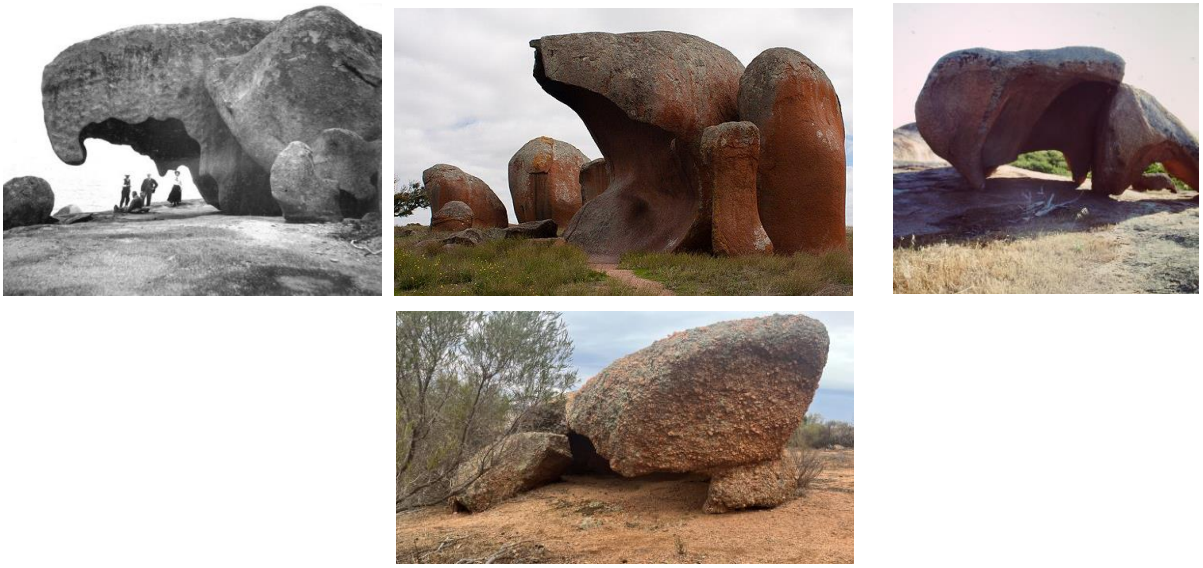
Water eyes on Polda Rock

Source: DEW Files 6June 2025

Gnammas at Pildappa Rock (SHP 17058) (left) and Mt Wudinna (right).

Source: User: Denisbin, DEW Files 5June 2025

Tafoni are cavities that typically form underneath boulders. They are formed by weathering and can be honeycomb-like or resemble large cavities that can hollow out most of the rock. Tafoni are found at several inselbergs on the Eyre Peninsula including Mount Wudinna and Little Wudinna (subject of this reassessment), Ucontitchie Hill (SHP 17061), Murphy Haystacks (SHP 14230) Tcharkuldu Rock, Pildappa Rock (SHP 17058), Chilpuddie Rock, Wattle Grove Rock[37] and Yarwondutta Rock and Quarry (SHP 17059).[38] Other excellent examples of tafoni are found in the Remarkable Granite at Remarkable Rocks, Flinders Chase National Park, Kangaroo Island.



Tafoni at Remarkable Rocks (left), Murphy Haystacks (SHP 14230) (centre), Yarwondutta Rock and Quarry (SHP 17059) (right) and Mt Wudinna (below)

Source: SLSA [PRG 280/1/1/297] (1906), Stephen Edmonds (2011), c. 2009, DEW Files 5June 2025

Layers of rock that have been detached by weathering may also occur as boulders and often form due to erosion along horizontal joints. Boulders are common at many inselbergs. Displaced slabs also occur at Mount Wudinna and Little Wudinna (subject of this reassessment),[39] likely as a result of minor tectonic events[40] such as faulting[41] or perhaps heating and/or erosion.[42] The displaced slabs at Little Wudinna are regarded as the most spectacular examples, having slipped down one of the inselbergs' flared slopes and lodging there.[43] Some remnants of sheets on midslopes are also present on Mount Wudinna and Little Wudinna but are heavily broken up.[44]

Slabs at Ucontitchie Hill (SHP 17061) (left), Coralbignie (Houlderoo) Rocks (SHP 17062) (centre), Residual Sheets at Pildappa Rock (SHP 17058) (right) and sheets/slabs at Mt Wudinna (below).

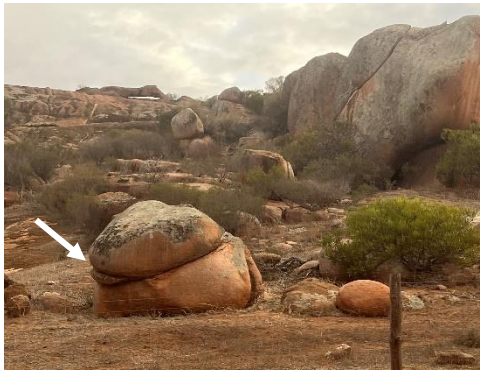
Source: DEW Files c. 2000, c. 1999, c. 2016, 5June 2025

Some slabs can overlap, which is likely the result of the same forces that created the slabs, including those at Mount Wudinna. Other examples of displaced slabs, such as those at Quarry Hill, Mount Wudinna, and likely Desert Rose Quarry South of Mount Wudinna, are not formed from natural processes but instead from past blasting with explosives.[45] At Mount Wudinna sheets have also resulted in suspended exfoliation layers.

Suspended Exfoliation layer at Mt Wudinna seen in 1987 (left) and the same sheet in 2025 (right)

Source: DEW Files 1987. 5June 2025

Triangular Wedges, also known as cornerstones,[46] are a type of dislocated slab[47] and are related to sheet fractures, likely formed by compressive or tectonic stress.[48] They can be vertical or lateral wedges and often appear triangular in cross section. Prominent examples can be seen at Mount Wudinna, Little Wudinna[49] (subject of this reassessment), Murphy's Haystacks (SHP 14230), [50] Ucontitchie Hill (SHP 17061),[51] and Hyden Rock, WA.[52]



Triangular wedges from Mt Wudinna

Source: DEW Files 5June 2025

A-Tents are another type of dislocated slab.[53] Present at Mount Wudinna, Little Wudinna[54] (subject of this reassessment), Carappee Hill, and Minnipa Hill, these minor geological features are uncommon among the Eyre Peninsula inselbergs. The A-Tents at Mount Wudinna are noted as being larger than those at Carappee Hill[55] and thicker than those at Minnipa Hill.[56] A large A-tent, the largest known to researchers worldwide, can be found on the north face of Mount Wudinna.[57] Some A-tents are recent, having formed between February and May in 1985 due to tectonic events.[58] Others are older and unusually thick.[59]

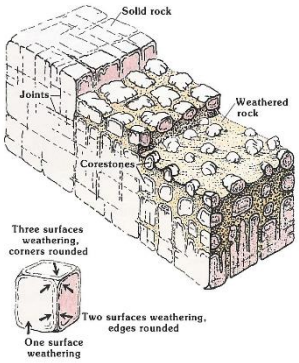
Also present at Mount Wudinna is what has been described as a 'triangular granite beam', the predecessor to what is believed to become an A-tent, a rock that is being bent but has not yet split to form the 'A' of the A-tent.[60]

These A-tents and granite beams demonstrate that inselbergs, such as Mount Wudinna and Uluru, are still likely under compressive forces or that residual compressive forces are still acting on them from previous weathering and erosion.[61] However, the formation of A-tents is not entirely understood. For example, if A-tents are a result of compressive stresses, J.A. Peterson argued that such A-tents would be more common on granite inselbergs of similar prominence. With few outcrops matching Mount Wudinna's prominence, it is difficult to make a meaningful conclusion on the formation of the A-tents.[62]

A-tents from Mt Wudinna

Source: DEW Files 5June 2025

'Corestones' or 'kernels' are a result of 'spheroidal weathering' a process whereby water has infiltrated fractures in the rock and weathered it selectively. The cubic blocks of the granite then become gradually rounded. The size of the corestones at Mount Wudinna demonstrates the original joints in the rock and are the first stage in the creation of boulders.[63] Excellent examples are known predominantly from Ucontitchie Hill (SHP 17061) and Mount Wudinna (subject of this reassessment).



The formation of corestones (left), boulders formed from spheroidal weathering at Mount Wudinna (right)

Source: Hubner, NK (1987), DEW Files 5June 2025

Polygonal cracking or tessellated pavements are the unusual splitting of the rock, typically granite, in a polygonal pattern, not dissimilar to how mud can crack when dried in the sun. Wudinna lacks polygonal cracking due to the porphyritic nature of the granite. However, these are present on the weathering front at Tcharkuldu Hill.

Granite inselbergs have fewer fractures than the surrounding plains, allowing them to erode at a slower rate. Still, many fractures are visible on most of the outcrops. Fractures have been mapped on some inselbergs including Mount Wudinna and Pildappa Rock (SHP 17058). However, Polda Rock and Little Wudinna do not have many visible fractures.[64]

Assessment against Criteria under Section 16 of the *Heritage Places Act 1993*. All Criteria have been assessed using the 2020 Guidelines.

(a) it demonstrates important aspects of the evolution or pattern of the State's history.

Criterion arguments have considered the *Guidelines for State Heritage Places*:

> *The place should be closely associated with events, developments or cultural phases which have played a significant part in South Australian history. Ideally it should demonstrate those associations in its fabric.*
>
> *Places will not normally be considered under this criterion if they are of a class of things that are commonplace, or frequently replicated across the State, places associated with events of interest only to a small number of people, places associated with developments of little significance, or places only reputed to have been the scene of an event which has left no trace or which lacks substantial evidence.*

Mount Wudinna and Environs is associated with the historic theme Natural Environment and its subthemes Tracing climatic and topographical change; Appreciating South Australia's natural environment; and Recognising human impacts on the natural environment.

While some aspects of the State's natural history with regard to weathering and compressive forces are understood through the study of granite inselbergs the significance of Mount Wudinna and Environs lies in its ability to yield further information about these aspects of South Australia's natural history. Consequently, criterion (a) is not considered to be met, whereas criterion (c) is (see below).

Mount Wudinna and Environs also demonstrates human impacts on the natural environment through the use of Mount Wudinna and Polder Rock to collect water. While an important aspect of South Australia's history it is places such as Yarwondutta Rock and Quarry (SHP 17059)/ Yarwondutta Rock Tank (SHP 14225) and Kolballa Rock (see Comparative Analysis) both of which informed the development of water collection systems in association with inselbergs on the Eyre Peninsula that better demonstrate this aspect of the State's history.

It is recommended that the nominated place **does not fulfil** criterion (a).

(b) it has rare, uncommon or endangered qualities that are of cultural significance.

Criterion arguments have considered the *Guidelines for State Heritage Places*:

> *The place should demonstrate a way of life, social custom, industrial process or land use which is no longer practised, is in danger of being lost, or is of exceptional interest. This encompasses both places which were always rare, and places which have become scarce through subsequent loss or destruction.*
>
> *Places will not normally be considered under this criterion if their rarity is merely local, or if they appear rare only because research has not been done elsewhere, or if their distinguishing*

characteristics have been degraded or compromised, or if they are at present common and simply believed to be in danger of becoming rare in the future.

Granite inselbergs are particularly abundant on the Eyre Peninsula with at least 157 recorded in the northern part of the peninsula alone. Inselbergs also occur elsewhere in South Australia. While Mount Wudinna and Environs may be culturally significant, it is not considered to be rare, uncommon or endangered.

It is recommended that the nominated place **does not fulfil** criterion (b).

(c) it may yield information that will contribute to an understanding of the State's history, including its natural history.

Criterion arguments have considered the *Guidelines for State Heritage Places*:

The place should provide, or demonstrate a likelihood of providing, information that will contribute significantly to our knowledge of the past. The information should be inherent in the fabric of the place. The place may be a standing structure, an archaeological deposit or a geological site.

Places will not normally be considered under this criterion simply because they are believed to contain archaeological or palaeontological deposits. There must be good reasons to suppose the site is of value for research, and that useful information will emerge. A place that will yield the same information as many other places, or information that could be obtained as readily from documentary sources, may not be eligible.

Mount Wudinna and Environs has the potential to yield information, that will contribute to an understanding of South Australia's history through its geology. The area, has four major inselbergs; Mount Wudinna, Little Wudinna, Polda Rock and Turtle Rock, which display varied minor geological features. While many of these features are found at other sites across the State, including rillen (some displaying small scale relief inversion), domal sheet jointing, flared slopes (indicating cycles of weathering and erosion of both the outcrops and the surrounding landscape) and tafoni, Mount Wudinna and Environs displays many with a high level of integrity and intactness.

These minor geological features can assist in tracing the evolution of South Australia's geological development through evidence of erosion and compressive stresses. For example, while leading theories exist, the emplacement mechanisms for the Hiltaba Suite granites, which makes up Mount Wudinna and Environs, are still not fully understood. Mount Wudinna and Environs provides the opportunity to further research the emplacement of both it and other granite outcrops in the State. Additionally, the inselberg, particularly stepped slopes at Mount Wudinna, can trace the evolution of South Australia through evidence of several distinct weathering events over millions of years.

Several geological features at the site, such as A-Tents, vertical wedges and displaced slabs, demonstrate releases of compressive stresses, likely caused by minor tectonic events. The A-Tents at Mount Wudinna are particularly notable, being larger and thicker than comparable A-Tents at other granite outcrops. The presence of these

features demonstrates that the place may be under continued or residual stresses and could provide insight into the formation of minor geological features, and the effect of such stresses on the inselbergs at Mount Wudinna and Environs and others in the State.

Mount Wudinna and Environs is highly intact as it has not been impacted by quarrying or agricultural practices. Though it will be affected by continuing weathering and tectonic events, such alterations further facilitates research on granite inselbergs.

It is recommended that the nominated place **fulfils** criterion (c).

(d) it is an outstanding representative of a particular class of places of cultural significance.

Criterion arguments have considered the *Guidelines for State Heritage Places*:

> *The place should be capable of providing understanding of the category of places which it represents. It should be typical of a wider range of such places, and in a good state of integrity, that is, still faithfully presenting its historical message.*
>
> *Places will not be considered simply because they are members of a class, they must be both notable examples and well-preserved. Places will be excluded if their characteristics do not clearly typify the class, or if they were very like many other places, or if their representative qualities had been degraded or lost. However, places will not be excluded from the Register merely because other similar places are included.*

Mount Wudinna and Environs belongs to the class of place known as inselbergs. Inselbergs are a broad and varied category and while a majority of South Australia's inselbergs are formed of volcanic granites, they can be composed of many differing rock types.

The cultural significance of inselbergs lies in their ability to provide insight into the geological formation and evolution of the State over millions of years and demonstrate how erosional and compressive forces continue to change the landscape.

Inselbergs are abundant in the South Australia with 157 present in the northern Eyre Peninsula alone. Despite the abundance of inselbergs in South Australia it remains a relatively understudied part of the State's geology and at present there is insufficient information to be able to assess if Mount Wudinna and Environs can be considered to be an outstanding example of the class. Future research may provide additional insight and reconsideration of creation (d) at that time.

It is recommended that the nominated place **does not fulfil** criterion (d).

(e) it demonstrates a high degree of creative, aesthetic or technical accomplishment or is an outstanding representative of particular construction techniques or design characteristics.

Criterion arguments have considered the *Guidelines for State Heritage Places*:

The place should show qualities of innovation or departure, beauty or formal design, or represent a new achievement of its times. Breakthroughs in technology or new developments in design would qualify, if the place clearly shows them. A high standard of design skill and originality is expected.

Places would not normally be considered under this criterion if their degree of achievement could not be demonstrated, or where their integrity was diminished so that the achievement, while documented, was no longer apparent in the place, or simply because they were the work of a designer who demonstrated innovation elsewhere.

As Mount Wudinna is not a built item, it cannot meet this criterion.

It is recommended that the nominated place **does not fulfil** criterion (e).

(f) it has strong cultural or spiritual association for the community or a group within it.

Criterion arguments have considered the *Guidelines for State Heritage Places*:

The place should be one which the community or a significant cultural group have held in high regard for an extended period. This must be much stronger than people's normal attachment to their surroundings. The association may in some instances be in folklore rather than in reality.

Places will not be considered if their associations are commonplace by nature, or of recent origin, or recognised by a small number of people, or not held very strongly, or held by a group not widely recognised, or cannot be demonstrated satisfactorily to others.

Mount Wudinna and Environs has been important to Wudinna's economy and community. The water reservoirs and tanks constructed at the place have allowed Wudinna to thrive by providing a water source. However, while past and present residents of Wudinna and the surrounding area might have strong cultural or spiritual associations with Mount Wudinna and Environs this does not resonate across the broader South Australian community. More influential examples may be Yarwondutta Rock and Quarry (SHP 17059)/ Yarwondutta Rock Tank (SHP 14225) and Kolballa Rock which informed water collection systems at places like Mount Wudinna, Polda Rock Peella and Cocata among others (see Comparative Analysis).

It is recommended that the nominated place **does not fulfil** criterion (f).

(g) it has a special association with the life or work of a person or organisation or an event of historical importance.

Criterion arguments have considered the *Guidelines for State Heritage Places*:

The place must have a close association with a person or group which played a significant part in past events, and that association should be demonstrated in the fabric of the place. The product of a creative person, or the workplace of a person whose contribution was in industry, would be more closely associated with the person's work than would his or her home. Most people are associated with many places in their lifetime, and it must be demonstrated why one place is more significant than others.

Places will not generally be considered under this criterion if they have only brief, incidental or distant association, or if they are associated with persons or groups of little significance, or if they are associated with an event which has left no trace, or if a similar association could be claimed for many places, or if the association cannot be demonstrated. Generally the home or the grave of a notable person will not be entered in the Register unless it has some distinctive attribute, or there is no other physical evidence of the person's life or career in existence.

Mount Wudinna and Environs does not have a close association with any one person or organisation or event of historical importance to South Australia. While surveyor and explorer John Charles Darke is often discussed in association with Mount Wudinna, as he is believed to be the first European to have spotted the outcrop, this is an incidental association. John Charles Darke may be better associated with Wadikee Rocks where he was killed and later buried and to Darke Peak which is named after him and where there is a monument to him.

It is recommended that the nominated place **does not fulfil** criterion (g).

PHYSICAL DESCRIPTION

Mount Wudinna and Environs contains several inselbergs including Mount Wudinna (Sometimes referred to as Mount Weedina or Wudinna Hill), Little Wudinna, Polda Rock and Turtle Rock. It also includes a small granite exposure between Polda Rock and Little Wudinna and another to the northwest of Mount Wudinna. Each of the outcrops demonstrate weathering of the rocks that contrast with the surrounding plains.

The outcrops of Mount Wudinna and Environs are composed of the coarse-grained pink-red Hiltaba Suite granites that are of Mesoproterozoic age (1600-1575 Ma). The outcrops are the exposed tips of a deep, homogeneous intrusion of granite[65] that have become exposed due to weathering processes. The outcrops present at Mount Wudinna and Environs display minor and major weathering patterns in the form of tafoni, rillen, domal sheet jointing, flared slopes and less commonly A-tents.[66] Mount Wudinna is surrounded by a pitted platform which extends to the other nearby outcrops like Turtle Rock. It is highly likely that these outcrops are interconnected.

Mount Wudinna

Mount Wudinna rises approximately 60m above the surrounding landscape. It is the largest of the granites in the area of Minnipa and Kyancutta. Mount Wudinna is an inselberg known as a bornhardt, simply meaning an inselberg that is considered large. It is domal in shape with steep sides and is surrounded by several other minor geological features including platforms, smaller domes, rock knobs and 'whalebacks'[67] that are also exposed above the surrounding plains.[68]

Mount Wudinna is an example of a 'stepped inselberg' and has flared slopes that demonstrate subsurface weathering.[69] Other notable minor geological features at Mount Wudinna include but are not limited to:

- Sheets and suspended exfoliation layers,
- boulders,
- tafoni,
- large A-tents,[70]
- rillens,
- gnammas,
- vertical wedges,

- and flared slopes.

A-tent (Left), Suspended exfoliation layer (Centre), Sheets and boulders (Right) at Mount Wudinna

Source: DEW Files N.D., 1987, 1996

A 'trig point' (not significant fabric) denotes the highest point of Mount Wudinna.[71] Low human-made walls (not significant fabric) on the west side of the hill, a water drain and an underground tank (not significant fabric) to the north were built by the South Australian Government in 1922 to collect water from the rock.[72]

Little Wudinna

Little Wudinna, also known as Little Weedinna Rocks, Little Wudinna Hill or Little Mount Wudinna, is a large domal inselberg.

Its most notable minor geological features include but are not limited to:

- Flared slopes,
- gnamma,
- rillen,[73]
- inverted rillen,
- vertical wedges,
- slabs, including displaced slabs,[74]
- boulders,
- and sheets[75]

The rillen present on Little Wudinna are better than those at Mount Wudinna.[76]

Little Wudinna from a distance

Source: DEW Files 6June 2025

Polda Rock

Polda Rock is a domal inselberg with low slopes, allowing for easy observation of the minor geological features of the granite. Notable features at Polda Rock include but are not limited to:

- Rillen,
- gnammas,[77]
- water eyes,
- a small A-tent,
- and flared slopes.

The outcrop is predominantly free of joints.[78] Though, notably, when walking in some areas, a hollow sound is produced which indicates that erosional processes have formed slabs on the surface of the rock due to fractures called 'exfoliation joints'.[79]

A channel on the northwest end of the rock and a water catchment wall (not significant fabric) is built around the base of the rock and collects water. The channel feeds into three water tanks (not significant fabric) to the southeast of the rock, while the wall feeds into a dam (Polda Dam or Polda Rock Reservoir) (not significant fabric) and then into the three water tanks (not significant fabric). The system was built by the

South Australian Government in 1919-22.[80] The dam is said to be used by the landowner to potentially farm yabbies and marron.[81]

A slope of Polda Rock with the retaining wall that encircles the entire granite outcrop

Source: DEW Files 6June 2025

Polda Rock was used as a water supply for Wudinna town and built structures were restored in 2002.[82]

Turtle Rock

Also known as the Dinosaur or Lizard Rock[83] is a heavily pitted outcrop with overhanging flared slopes.[84] It is a moderately sized and dome-shaped whaleback inselberg.

Notable minor geological features at Polda Rock include but are not limited to:

- Flared slopes, particularly notable for meeting on a spur,
- gnammas,
- rillen[85]

Turtle Rock from Mount Wudinna

Source: DEW Files 5June 2025

- and inverted rillen.

Granite exposures

Several granite exposures exist within and nearby to the State Heritage Place. Inside the State Heritage Place are outcrops described as the West, Central West, Central and South outcrops. These are small, low-rising, scattered outcrops. They did not demonstrate any minor geological features better than those at the other larger outcrops within the State Heritage Place.

Parsons Rock (also known as Cottage Loaf Rock) is located between Turtle Rock and Little Wudinna. It does not display any minor geological features not already represented better by the other larger inselbergs.

Elements of Significance:

Elements of heritage significance include (but are not necessarily limited to):

- Mount Wudinna,
- Little Wudinna,
- Polda Rock,
- Turtle Rock,
- Erosional and compressive minor geological features associated with the above features.
- Erosional and compressive minor geological features that may not be attached directly to the above features such as boulders or blocks, sheets and A-tents.
- Granite exposures as identified on site plan.

Elements not considered to contribute to significance of place include (but are not necessarily limited to):

- Human-made objects, trails and roads (excluding portion of road identified in CT 5958/646 D69310 (Road) A13), vegetation, fencing and signage.
- Granite exposures not identified in site plan.

HISTORY

Geological History

Mount Wudinna and Environs is composed of Hiltaba Suite granite, which is Mesoproterozoic in age, approximately 1600-1575 million years old (Ma) and is a part of the Hiltaba Suite. It is likely that the Hiltaba Suite granite was formed in the last

Informative sign at Mount Wudinna demonstrating the size of the Gawler Craton and location of Gawler Ranges Volcanics and Hiltaba Suite granites

Source: DEW Files 6June 2025

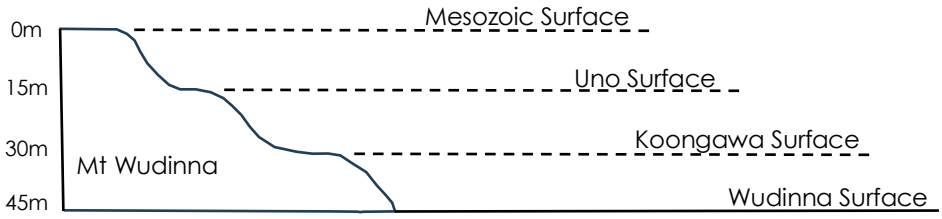
volcanic event to have affected the Eyre Peninsula. The Hiltaba Suite granites often have a red or pink colour from abundant iron oxide inclusions. Areas of this geological formation can be found throughout the west and central sections of South Australia. The Hiltaba Suite intrudes into the larger Gawler Craton,[86] the underlying basement rock covering much of the centre of the State,[87] though the mechanisms relating to this emplacement are still not well understood.[88]

Once emplaced, the Hiltaba Suite was then covered by sediment. Eventually, Mount Wudinna and Environs was exposed to the surface as the surrounding plains eroded faster than the granite rock. This was due to the few fractures that are present in the granite when compared to the surrounding rocks. Polda Rock and Little Wudinna, for example, have minimal fractures.[89] With fewer fractures, there was less opportunity for erosion to occur and the more fractured surrounding sediment eroded, leaving inselbergs exposed above the plains.

Over the millions of years since the granites were exposed, they have continued to be weathered, quite considerably in some places. The erosion of the inselbergs of Mount Wudinna remains unusual, with the few fractures and characteristics of the granite creating minor geological features such as gnammas, rillen and others. These features are often reflected in many other granite outcrops throughout the world.

Stepped slopes on the surface of Mount Wudinna demonstrate numerous potential exposures and periods of erosion on the rock surface. Mount Wudinna has a flat summit, showing heavy weathering through the presence of tafoni, corestones and gnammas.[90] It is believed that weathering at this level is from the Mesozoic (sometime between 261 and 66 Ma), and is the time when the mountain was first exposed.[91] Bands of weathering on the western piedmont approximately 30-35m above the plain and approximately 15m beneath the flat summit[92] are thought to be related to the early Cenozoic-aged (sometime between 66 Ma and the present) Uno Surface,[93] another weathering period. This was then followed by the even younger Koongawa Surface hypothesised to potentially be late Pliocene or early Pleistocene in age, where further weathering occurred, though this date is speculative.[94] Altogether, it is currently understood that Mount Wudinna underwent at least three erosion events since its Mesozoic-aged exposure.

Similar weathering events are reflected in other inselbergs at Mount Wudinna and Environs such as at Polda Rock.



Simplified diagram of potential erosion surfaces based on Twidale and Bourne (1975)

Source: Twidale and Bourne (1975)

Mount Wudinna and Environs have also been affected by compressive stresses that have formed A-tents, displaced slabs and formed fractures in sheets on the rock surface. A-tents preserved at Mount Wudinna are varied in age: some are very old, and some have formed as recently as 1985, demonstrating continued development of the rock.

Human History

Mount Wudinna and Environs is located on Barngarla Land. The Barngarla People lived on the eastern side of the Eyre Peninsula prior to colonisation. Extending over a distance of 1100km or more, the Barngarla nation is believed to be the largest in South Australia.[95] The Barngarla People had and continue to have a strong connection to the land.

The Barngarla People strongly resisted colonisation, though their numbers were greatly reduced due to introduced disease, deaths during acts of resistance by Barngarla People and retribution by colonisers, and loss of access to traditional foods.[96] In the 1840s, the Barngarla people and the neighbouring Nauo People who lived on the south-western portion of the Eyre Peninsula, began attacking outlying sheep runs around the Port Lincoln district resulting in the temporary abandonment of many of these runs.[97]

In 1844, surveyor and explorer John Charles Darke passed through the Wudinna area[98] and is recognised as the first European to sight Mount Wudinna which was then referred to as 'Granite Mount'.[99]

In the first 20 years of colonisation at least a dozen European settlers and an unrecorded number of First Nations People were killed.[100] Many were disposed from their Country and would not return until many years later. By the 1930s, it was estimated that very few Barngarla or Nauo People lived in the southern Eyre Peninsula instead being found at Franklin Harbour, Streaky Bay, Gawler Ranges and Iron Knob, Whyalla, Port Augusta or Port Pearce. Often, they worked on farms or sheep stations or lived in fringe camps. In the 1940's, some Barngarla People were employed for extensive pipeline construction from Whyallla to the River Murray.[101] A Native Title determination for the Barngarla People was registered in 2016.

The name 'Wudinna' derives from 'Weedna' (alternatively Weedinna or Weedina[102]), a First Nations word that means 'granite hill'.[103] The word is included in *Barngarlidhi Manoo – Speaking Barngarla Together*, a book written in part by the Barngarla people of Port Lincoln.[104] It was once also believed the word derived from 'Woodna', meaning 'boomerang', but this has since been disproven.

Wudinna was settled by Europeans in 1861. Robert George Stanley laid claim to 10 square miles of land surrounding what was then known as Weedina Hill (Now Mount Wudinna).[105] In 1896, W.A. Barns (also written as Barnes) and A.J. Inkster leased some of the surrounding area. Prior to the 1900s, pastoralists struggled to make a living in the northern Eyre Peninsula due to a lack of reliable water. Many survived around granite outcrops such as Mount Wudinna, Tcharkulda, and Cocata and Kolballa further

South.[106] The leases were transferred solely to W.A. Barns in 1905 and were subdivided in 1912 for agricultural use.

Around 1912 Wudinna Well, a small well south of Mount Wudinna, was constructed and several sites identified as possible locations for masonry tanks including a rock to the South of Wudinna (Likely referring to Polda Rock).[107] 1913 marked the beginning of major water collecting schemes in the region, first at Minnipa Hill, followed by Tcharkulda Rock and Yarwondutta Rock and Quarry (SHP 17059)/Yarwondutta Rock Tank (SHP 14225). Some of the water collecting devices were created by digging into the rock, such as at Yarwondutta Rock.

In 1914, rock quarrying was suggested as a means to provide materials for construction.[108] The following year, Wudinna township was surveyed and then in 1916 gazetted.[109]

Elsewhere in the Eyre Peninsula, Yarwondutta Dam was constructed in 1915.[110] This government-funded water collection at Yarwondutta Rock and Quarry (SHP 17059)/ Yarwondutta Rock Tank (SHP 14225) (and also at Kolballa) informed decisions for further collections at other granite outcrops within the State. At Yarwondutta Rock, the water tank was close to the granite outcrop which was found to be less suitable than having a tank that was sited further away, even wholly or partly above ground. Thereafter water collection tanks at places such as Mount Wudinna, Peella, Cocata and Polda, among others were designed in a more efficient manner.

Many water tanks in the Eyre Peninsula were built to aid in development of agricultural areas.[111] Government-implemented water conservation projects were completed at Polda Rock between 1919-1922 including walls, drains and three tanks.[112] Water channels were hand constructed and a reservoir was made to provide the Wudinna township with water,[113] still extant. The large reservoir to the southeast of Polda Rock was constructed in 1922. The reservoir provided water to the Wudinna township and to nearby farmers.

Also in 1919, an early version of the Polda Well Water Scheme, eventually shortened to Polda Scheme, was initiated to establish a permanent water source for the township. The scheme involved pumping water from wells in the area.[114] Discussions about the efficacy of the scheme continued into 1923. Water catchment systems in association with the inselbergs would continue to be built throughout the 1920s.[115]

Implementing the lessons learnt at Yarwondutta Rock and Quarry (SHP 17059)/ Yarwondutta Rock Tank (SHP 14225), water tanks were constructed at Mount Wudinna in 1922. A retaining wall and silt trap were also constructed as a part of the tank.

In 1929, along with previous plans to expand the Polda Rock water catchment area, plans were also made to construct channels to connect the Polda water catchments and those at Little Wudinna.[116] The Polda Scheme would later be recommissioned in 1998.[117]

In 1980, Mt Wudinna and Environs was recognised as a Geological Monument by the South Australian Division of the Geological Society of Australia. Areas outside of the State Heritage Place were quarried between 1992 and 2006 (Desert Rose Quarry) and during 1998 (Kopi Kop 6).

Researchers Ferris, Gray and Pain in their 1998 publication *Reconnaissance Granite Sampling of the Mesoproterozoic Hiltaba Suite granite on Northern Eyre Peninsula, South Australia for Dimension Stone* for Primary Industries and Resources SA noted significant minor geological features at Mount Wudinna, Polda Rock and Little Wuddina. Mount Wudinna's significant minor geological features were noted as: A-tents, flared slopes, rillen, gnammas and tafoni. Mount Wudinna was described as 'one of the most impressive granite landforms on [the] Eyre Peninsula' and was noted as one of the best geomorphological sites with granite inselbergs and was too significant to be quarried. Significant minor geological features at Polda Rock were determined as: A flared western slope, a small A-tent, numerous rillen and gnammas.[118] Finally, significant minor geological features at Little Wuddina were determined as: flared slopes, gnamma and rillen and it was 'deemed too significant for quarrying'.[119] Turtle Rock was not assessed by Ferris *et al*.

Chronology

Year	Event
~1600-1575	Mesoproterozoic. Hiltaba Suite formed.
Unknown	Covering of the Hiltaba Suite by sediment.
Unknown	Erosion of the surrounding sediment and exposure of Mount Wudinna and Environs.
~261 - 66 Ma	Mesozoic. Weathering of the first surrounding sediment layer, Mesozoic Surface.
~66 Ma - Present	Cenozoic. Weathering of the second surrounding sediment layer, the Uno Surface.
~3.6 - 1.9 Ma	Late Pliocene or early Pleistocene, weathering of the third surrounding sediment layer, the Koongawa Surface. Eventually exposing the current Wudinna Surface.
~65 – 50 ka	First Nations People arrive in Australia. Gnamma on rock surfaces likely used as water sources.
1839-1860	Period of concerted First Nations resistance to colonisation, resulting in temporary abandonment of some pastoral leases on the Eyre Peninsula.
1844	Surveyor and Explorer John Charles Darke passes through the area. Mount Wudinna sometimes referred to as 'Granite Mount'.
1861	Wudinna settled by Europeans. Mount Wudinna sometimes referred to as 'Weedina Hill'.

1896	WA Barnes and AJ Inkster lease some of the area surrounding Mount Wudinna.
Prior to 1900s	Pastoralists use granite outcrops as water sources throughout the Eyre Peninsula.
1905	Leases transferred solely to WA Barns.
1912	Leases subdivided for agricultural use. Several sites identified as masonry tank locations likely at Polda Rock.
1913	Water collection at Minnipa Hill, followed by Tcharkulda Rock and Yarwondutta Rock.
1914	Mount Wudinna considered for use as a quarry for building materials.
1915	Yarwondutta Dam constructed, funded by the government, inspired design for many other water catchments at other inselbergs on the Eyre Peninsula. Wudinna Township surveyed.
1916	Wudinna Township gazetted.
1919-1920	Walls, drains and water tanks built at Polda Rock.
1922	Large reservoir constructed at Polda Rock.
1922	Water Tanks built at Mount Wudinna including retaining wall and silt trap.
c.1920s	Hand constructed water channel and reservoir provided Wudinna township with water.
1980	Recognised as a Geological Monument by the SA Division of the Geological Society of Australia.
1992-2006	Desert Rose Quarry (Kop 4) South of Mount Wudinna quarried.
1998	Kopi Kop 6, West of Mount Wudinna quarrying begins.
1999	Sections of Mount Wudinna and Environs are entered in the SA Heritage Register and designated as a place of geological significance.
2007	Granite most likely from Desert Rose Quarry used in the 'Australian Farmer' sculpture at Wudinna by artist Marijan Bekic.
2016	Barngala Native Title Claim determined over the area of Mount Wudinna and Environs.

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SITE RECORD

NAME:	Mount Wudinna and Environs	**PLACE NO.:**	17060

FORMER NAME:	Weedinna Hill, Weedina, Granite Mount.	
DESCRIPTION OF PLACE:	Complex of several granite inselbergs including Mount Wudinna, Little Wudinna, Polda Rock and Turtle Rock and two areas of granite exposures.	
DATE OF CONSTRUCTION:	Mesoproterozoic – Approximately 1600-1575 million years old.	
REGISTER STATUS	Provisionally entered and Designated as a Place of Geological Significance 11 November 1999. Confirmed 16 March 2000. Error in listing noted 10 April 2025 and reassessment requested by the South Australian Heritage Council.	
CURRENT USE:	Agriculture 1861- Present Tourism 1900s-Present Water collection 1919-Present	
LOCAL GOVERNMENT AREA:	Wudinna District Council	
	Street Name:	Mount Wudinna Access
	Town/Suburb:	Wudinna
	Post Code:	5652
LAND DESCRIPTION:	**Title Reference:**	CR 6199/369 H641600 S53; CR/6196/869 F31595 A10; CR/5763/286 H641600 S51; CT/5897/848 D59272 A102; CT/5958/645 D69310 Q11, CR/5897/847 D59272 A101 and a public road (CT 5958/646 D69310 (Road) A13)
	Hundred:	Hundred of Wudinna
	Encumbrance:	Barngarla Native Title Claim (Determination) Mining encumbrances: EL 6742 and EL 6726 (Tri-Star Minerals Pty Ltd)

PHOTOS

NAME:	Mount Wudinna and Environs	**PLACE NO.:**	17060

A slope of Mount Wudinna, showing boulders and slabs.

Source: DEW Files 5June 2025

PHOTOS

NAME:	Mount Wudinna and Environs	**PLACE NO.:**	17060

A slope of Mount Wudinna, showing boulders, slabs and rillen.

Source: DEW Files 5June 2025

PHOTOS

NAME:	Mount Wudinna and Environs	**PLACE NO.:**	17060

A slope of Turtle Rock, showing rillen and a portion of the flared slope (left).

Source: DEW Files 6June 2025

PHOTOS

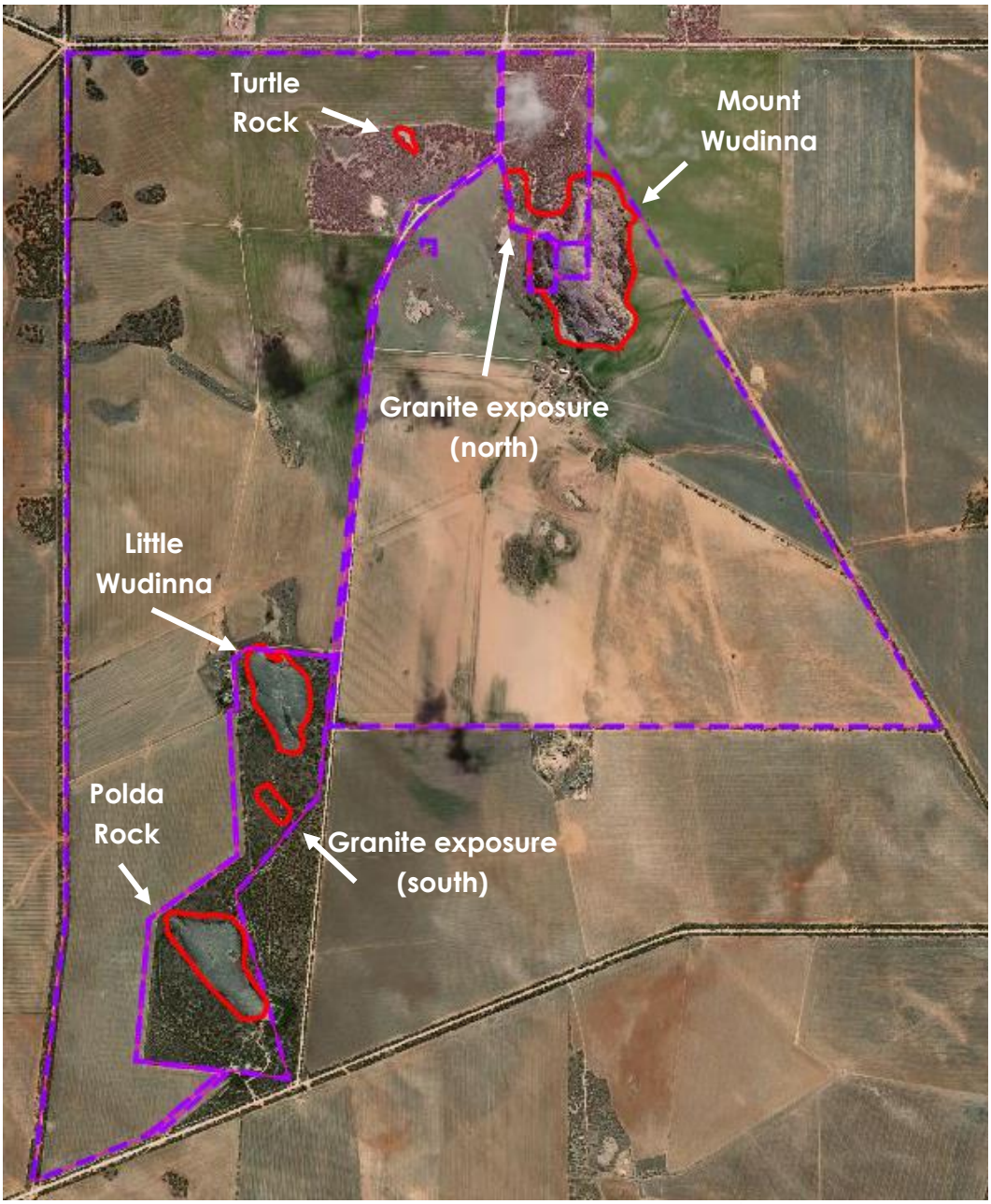
NAME:	Mount Wudinna and Environs	**PLACE NO.:**	17060

A slope of Polda Rock, showing gnammas.

Source: DEW Files 6June 2025

SITE PLAN

NAME: Mount Wudinna and Environs **PLACE NO.:** 17060



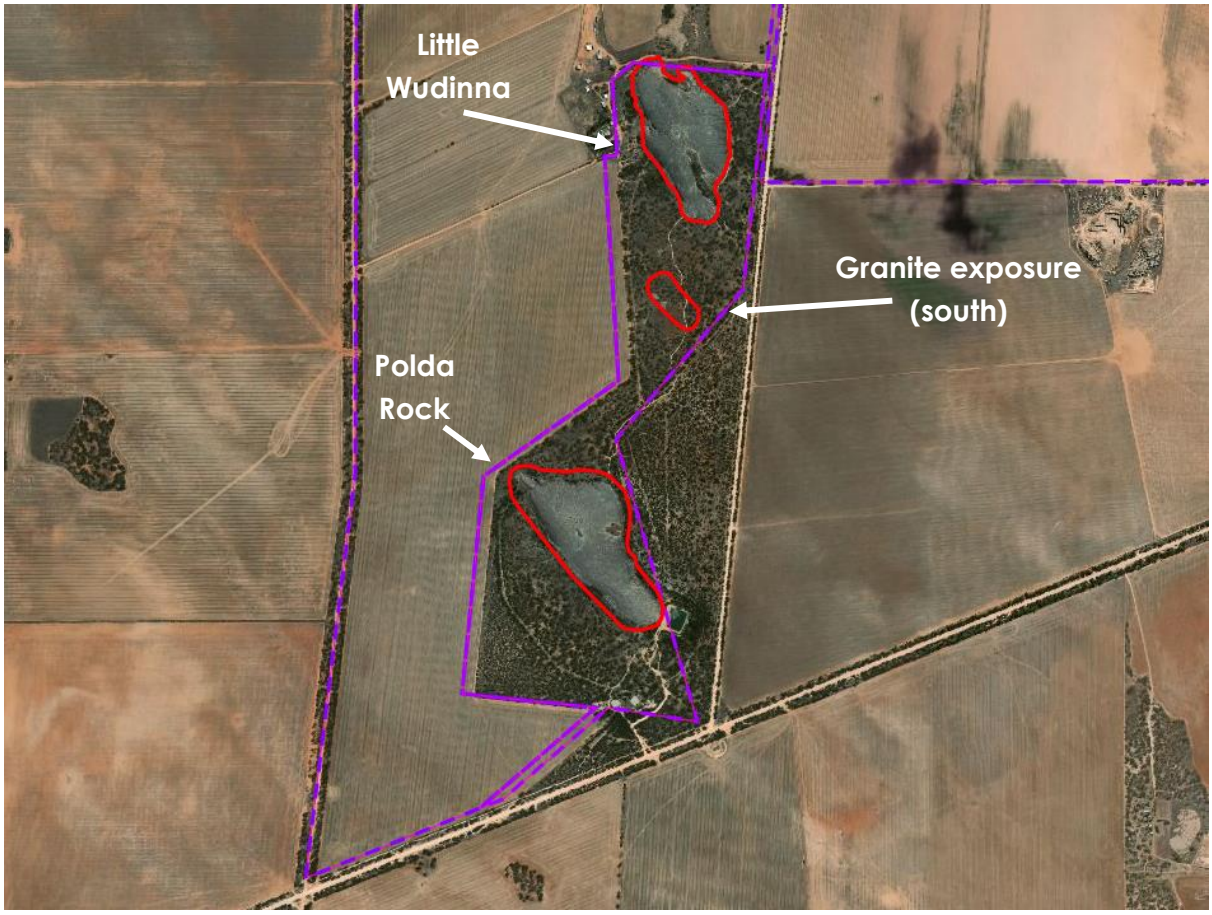
LEGEND

Parcel boundaries (Indicates extent of Listing)

Outline of Elements of Significance for State Heritage Place

SITE PLAN - DETAIL

NAME: Mount Wudinna and Environs **PLACE NO.:** 17060



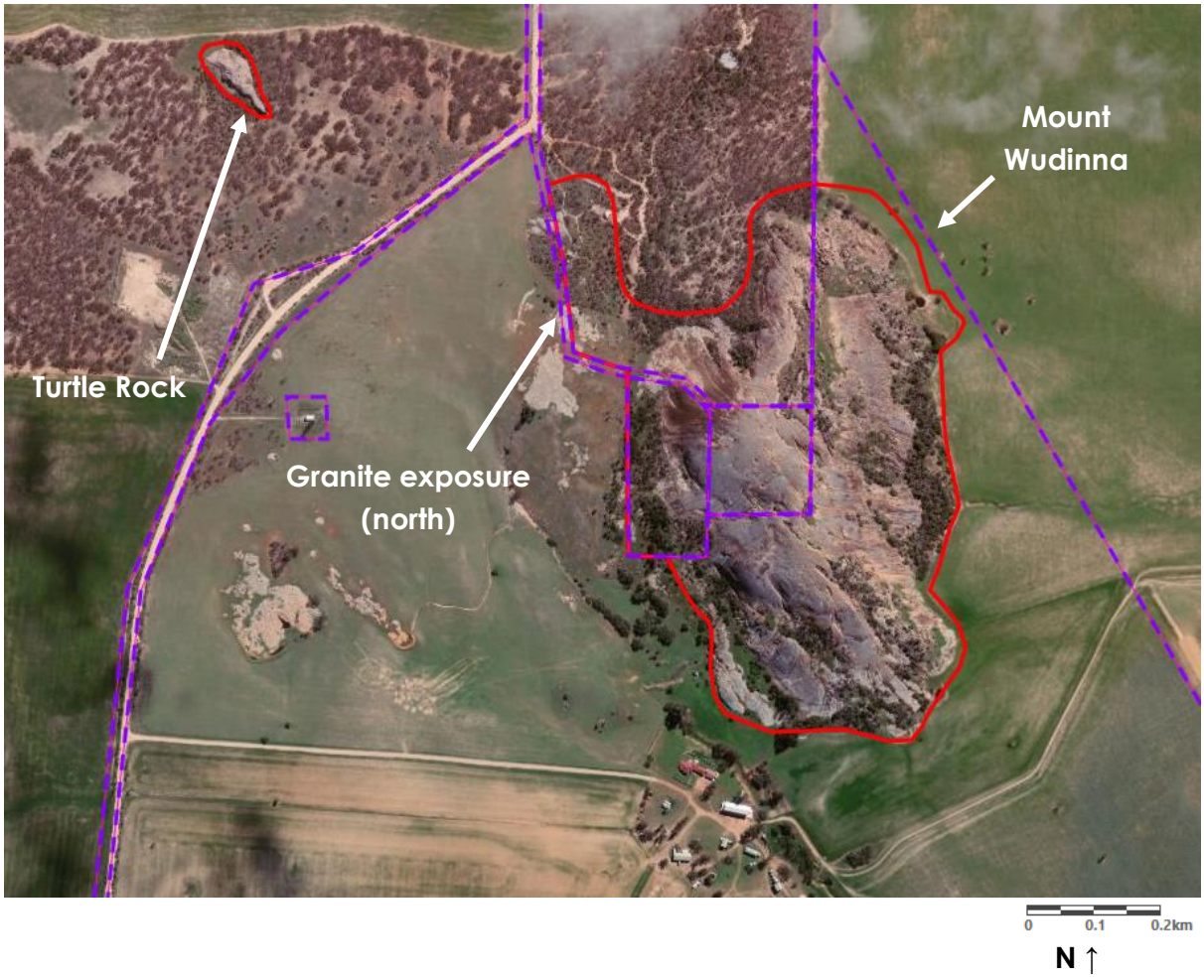
LEGEND

Parcel boundaries (Indicates extent of Listing)

Outline of Elements of Significance for State Heritage Place

SITE PLAN - DETAIL

NAME: Mount Wudinna and Environs **PLACE NO.:** 17060



LEGEND

Parcel boundaries (Indicates extent of Listing)

Outline of Elements of Significance for State Heritage Place

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