

VHM Limited
Goschen Rare Earths and Mineral
Sands Project

Chapter 08 Cultural Heritage

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8. Cultural Heritage

This chapter assesses the Aboriginal and non-Aboriginal cultural heritage aspects of the construction, operation and decommissioning / closure of the Goschen Rare Earths and Mineral Sands Project (the Project). This chapter summarises the outcomes of EES Technical Report C: Cultural Heritage prepared in support of the Environment Effects Statement (EES).

Overview

The site is in the southern Murray Basin at the boundary of the Riverine plain and Mallee Regions of Victoria. The landscape materials are the Loxton Sands deposited as nearshore, shoreline and backshore ridges during a staged marine regression with episodes of stillstand from Late Miocene through Pliocene and into the upper Pleistocene. The deposits are of fine to medium quartz and sand with abundant shelly fossils. Overlying the sands are clays and silts of Lake Bungunna. Several sand bodies of different origin and composition were emplaced across the Victorian Mallee region – Woorineen Formation and Molineaux Sand (formerly Lowan Sand) in the late Pleistocene. The location of the study area is partially located on the Cannie Ridge, a low but prominent north – south ridge uplifted in late Pliocene to early Pleistocene times and capped by ridges of Loxton Sand.

The *Aboriginal Heritage Act 2006* forms the framework within which Aboriginal heritage assessment is undertaken in Victoria and provides for the protection and management of Victoria's Aboriginal heritage. The Wemba Wamba Aboriginal Corporation are recognised as Traditional Owners for the study area and were consulted during the process of the Aboriginal cultural heritage impact assessment.

The *Heritage Act 2017* enables the identification and protection of heritage places and objects that are of significance to the state of Victoria, the protection of known and unknown archaeological sites, and establishes the Victorian Heritage Register, the Victorian Heritage Inventory and the Heritage Council of Victoria, the expert statutory body for determining matters relating to historic cultural heritage.

The desktop assessment undertaken for the Project did not identify any Aboriginal cultural heritage places located within the study area. The subsequent archaeological survey undertaken for the Project also identified there is a very low likelihood of subsurface Aboriginal cultural heritage. The entirety of the study area has undergone continuous ploughing activities, including the removal of the lower calcareous layer which has revealed the limestone/ironstone nodules to the surface. It is therefore likely the archaeological deposits have been disrupted and would have been visible on the surface especially in consideration of the excellent visibility. During construction and operation, there is the potential that ground disturbance works would result in partial or complete disturbance of previously unidentified and unregistered Aboriginal cultural heritage, resulting in loss of heritage values. Mitigation measures including the preparation of an Aboriginal Cultural Heritage Management Plan (CHMP) would reduce potential impacts to Cultural Heritage.

The desktop assessment and subsequent survey also identified that there is a very low likelihood of historical cultural heritage in the Project area. A single historical site H7626-0004 (Beauchamp State School No. 3560 and Memorial Hall) is located 150 m north of the study area. The Victorian Heritage Inventory (VHI) site is located within a privately owned paddock and could not be accessed. No works or disturbance is proposed within this privately owned paddock where the VHI site is located. A review of the ground surface immediately adjacent to the VHI site did not identify any artefacts, or structure. No other historical artefacts or structures were identified during field surveys undertaken for the Project. Historical cultural heritage values are therefore unlikely to be impacted by the Project. Contingency measures would be implemented to reduce harm to unknown historical cultural heritage values that may be present within the study area.

EES evaluation objective

The scoping requirements provided by the Minister for Planning for the Project set out the specific environmental matters to be investigated and documented in the Project's EES. The scoping requirements inform the extent and scope of the EES technical studies. The following EES evaluation objective is relevant to the cultural heritage assessment:

To avoid or minimise adverse effects on Aboriginal and historic cultural heritage values.

EES Technical Report C: Cultural Heritage was prepared in support of the Project EES. The technical report provides more detailed information on the investigations and impact assessments conducted in response to the EES scoping requirements.

8.1 Methodology

The following approach was adopted for the cultural heritage impact assessment:

- Completion of desktop assessment including:
 - Review of the Victorian Aboriginal Heritage Register (VAHR), the VHI and the Victorian Heritage Register.
 - Documentation review (e.g. background literature, geological and environmental conditions).
 - Consultation with stakeholders (First Peoples State Relations and the Traditional Owners (Wemba Wamba)).
- Completion of a standard assessment, including:
 - Archaeological survey of the study area, including examination of ground surfaces, mature trees and any rock shelters or cave entrances, and historical structures or features in the study area.
 - Field survey including identification of landforms and areas of Aboriginal cultural heritage sensitivity to inform the site predictive model.
 - Observations of developments and disturbance that may have impacted cultural heritage deposits.
- Assessment of impacts to cultural and European heritage during construction, operation and decommissioning / closure of the Project.
- Development of mitigation measures in response to identified impacts.
- Evaluating the residual environmental impacts once mitigation has been implemented.

8.2 Study area

The study area (also referred to as the activity area) for the cultural heritage impact assessment is located between Ultima, Lalbert and Meatian and covered a total area of 1,557.79 hectares. The majority of the study area is situated approximately 35 kilometres south of Swan Hill and is within both the Gannawarra Shire Council and Swan Hill Rural City Council. It comprised roadway, road reserve and ground surfaces within 14 private properties (large paddocks) along Thompson Road, Bennett Road, Mystic Park-Meatian Road and Pola Road. Residential property and agricultural land are present within the study area. The study area also included several roadways (Shepherd Road, Jobling Road, Bish Road, Mystic Park – Beauchamp Road, Mystic Park East Road, Lookout Road, Mystic Park-Meatian Road, Bennett Road, Donald-Swan Hill Road, Lake Boga-Ultima Road and David Street). The study area is shown in Figure 8-1.

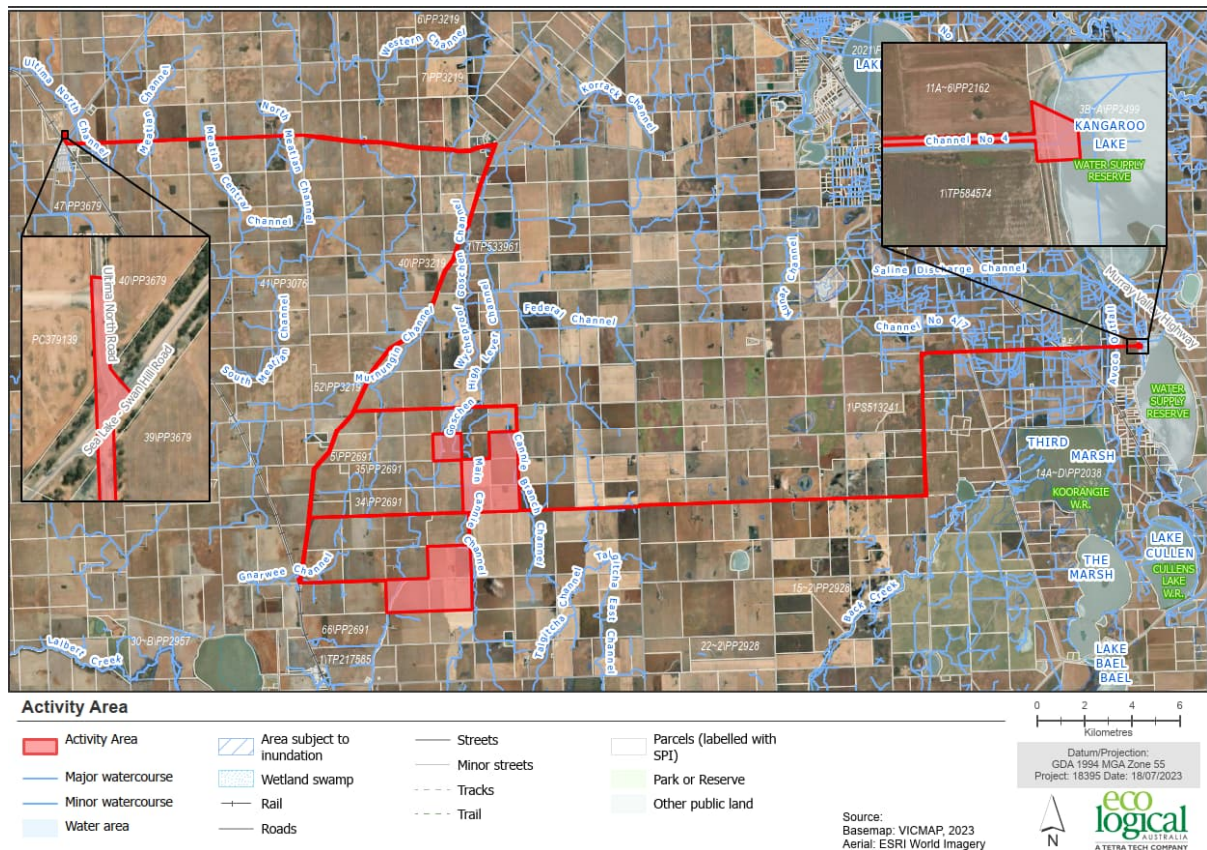


Figure 8-1 Study area

8.3 Existing environment

A comprehensive assessment was undertaken to understand the existing environment of the study area in order to inform the cultural heritage impact assessment. Further information including land use history, historical accounts and landforms and geology is provided in Section 7.1 of EES Technical Report C: Cultural Heritage.

8.3.1 Aboriginal cultural heritage

Landforms, geomorphology and geology

The site is in the southern Murray Basin at the boundary of the Riverine plain and Mallee Regions of Victoria. The landscape materials are the Loxton Sands deposited as nearshore, shoreline and backshore ridges during a staged marine regression with episodes of stillstand from Late Miocene through Pliocene and into the upper Pleistocene. The deposits are of fine to medium quartz and sand with abundant shelly fossils. Overlying the sands are clays and silts of Lake Bungunnia. Several sand bodies of different origin and composition were emplaced across the Victorian Mallee region – Woorineen Formation and Molineaux Sand (formerly Lowan Sand) in the late Pleistocene. The location of the study area is partially located on the Cannie Ridge, a low but prominent north – south ridge uplifted in late Pliocene to early Pleistocene times and capped by ridges of Loxton Sand.

Environment

The study area falls within the Murray Mallee bioregion. The Murray Mallee, located in the north-west of the state, is typified by calcium carbonate material in the form of broad undulating sandy plains that are often associated with linear, east-west aligned, low sand dunes with intervening heavier textured swales developed from Cainozoic (aka Cenozoic Era) deposits of alluvial, aeolian and swampy deposits. The vegetation is dominated by East/West-Dune Mallee with some Chenopod Mallee and Shallow-Sand Mallee. The plains, drainage lines and groundwater discharge landscapes are dispersed with salt lakes and gypsum flats with lunettes developed on the eastern margins of the lakes. The Cainozoic deposits give rise to earths containing calcium carbonate (Calcarosols), cracking clays (Vertosols), and red sands (Rudosols). The vegetation is dominated by Gypseous Plains Shrubland, Saline Shrubland (Raak), Plains Grassland and Drainage-line Grassy Woodland. The bioregion

has few surface waterbodies due to highly permeable soils and climatic conditions. The Murray River forms the northern edge for the bioregion and the Avoca River roughly defines the eastern edge. The bioregion has few surface waterbodies due to highly permeable soils and climatic conditions. Little remains of the native vegetation that would have covered the study area, with most ground surfaces having been cleared for agricultural purposes in the mid-19th century.

Aboriginal Heritage Registers

A search of the Victorian Aboriginal Heritage Register (VAHR) covering the full extent of the study area and the wider geographic region was initially conducted on 06 April 2021, and subsequently updated on 14 February 2022. The VAHR was searched using the online Aboriginal Cultural Heritage Research and Information System (ACHRIS) maintained by First Peoples – State Relations.

The desktop assessment did not identify any registered Aboriginal cultural heritage places located within the study area.

The closest registered Aboriginal cultural heritage places to the study area are situated around Kangaroo Lake to the east of the proposed pumping station (VAHR 7526-0530 and VAHR 7523-0571/72). All of the places within the geographic region were identified in proximity to Lalbert Creek, Lake Lalbert and Kangaroo Lake.

The registered Aboriginal cultural heritage places located within the geographic region include:

- 11 (27%) scarred trees.
- Two (4.8%) low density artefact distributions (LDADs).
- Nine (22%) artefact scatters.
- 15 (36.5%) earth features (Mounds/Hearths).
- Three (7.3%) artefact scatters and earth feature (multi-component).
- One (2.4%) ancestral remains (burial).

The following key points emerge from a review of the registered Aboriginal cultural heritage places identified within the geographic region:

- The majority of registered places are located in close proximity to water sources including Lake Lalbert and Kangaroo Lake (both of which include a significant number of registered places) and Lalbert Creek.
- Places containing stone artefacts (artefact scatters and LDADs) within the geographic region were all identified on the surface.
- More than half of these sites were discovered during archaeological surveys (and one during a CHMP standard assessment).
- The Aboriginal cultural heritage places containing less than four artefacts, consisting of raw materials comprising of silcrete, hornfels, quartz or of an unknown material.
- Scarred trees identified (n=11) within the geographic region were mainly identified surrounding Lake Lalbert and Kangaroo Lake.

Review of historical and ethnohistorical accounts

The Murray Valley was home to many large Aboriginal communities who lived on the rich resources associated with the Murray River and its tributaries. Tindale (1974) identified the Watiwati (Wadi Wadi) and Wembawemba (Wemba Wamba) language groups as clans occupying the area south and west of Swan Hill.

The basic economic unit of Aboriginal society was the 'band'. 'Band' is the term traditionally applied to the group of people who came together to live or hunt and gather food. In Aboriginal society, the group did not necessarily belong to the same clan but consisted of one or more families from several clans. Larger groupings, composed of different bands or even whole tribes and numbering up to between 400 and 1,000 individuals, came together at times of seasonal resource abundance. In the Murray region, these included eeling seasons in autumn and winter, and large-scale hunting drives, trading and ceremonial exchanges, which principally took place in summer (Lourandos 1976: 180). A local meeting place for groups from this part of the Murray is believed to be on Wemba Wamba land in proximity to the Swan Hill Bridge (Feltdtmann 1973: 9).

The Murray River was central to local Aboriginal lifeways, especially as a source of food. In countryside that was often dry and arid outside the river corridors, the Murray River supported a variety of aquatic and terrestrial life, which in turn sustained large Aboriginal communities. The river created diverse landscapes such as swamps and billabongs, many of which can no longer be seen in the area. Each spring these flooded with the melting of winter snows in the Snowy Mountains.

The subsistence strategies of the Wemba Wamba are difficult to reconstruct in detail from the limited documentary evidence provided by early European explorers and settlers. However, some information is available

from these ethnographic accounts. Such records indicate that Aboriginal people led a semi-sedentary way of life focused on rivers. Their economic way of life involved the exploitation of riverine resources for most of the year, only retreating to more favourable areas during the colder months of June, July and August. Their settlement patterns were likely in tune to the seasonal rhythm of the rivers. This would suggest that during non-flood periods Aboriginal people occupied areas of floodplain. In the Murray region, instances have been recorded of Aboriginal people moving away from the river to exploit seasonally available resources in dry areas, including the Mallee (Hughes 1984: 21).

The material culture of the Aboriginal people of the Murray region was diverse, utilising materials derived from a variety of plants, birds and animals, as well as stone. Aboriginal people living near Swan Hill had access to a wide variety of both aquatic and terrestrial food resources. Climatic and environmental conditions in the study area and in the Murray Valley generally meant food was particularly plentiful from spring to early autumn; during late autumn and winter, however, food was scarce. Archaeological and ethnographical evidence indicates that Aboriginal people concentrated along the river during the warmer months, consuming fish, shellfish, game (including mammals, reptiles and birds) and some varieties of vegetable. During the winter months, minor shifts away from the river system may have occurred as food supplies dwindled and communities searched further afield for game.

Initial contact between Aboriginal people and Europeans in the Murray Valley was the result of European explorer's attempts to map Australia's waterways. After numerous expeditions between 1817 and 1836, the intensity of contact increased as the observations made by early explorers filtered back to the Colony and encouraged graziers into the region. The result was the arrival of people overlanding stock to Victoria from NSW. As graziers arrived on the Victorian side of the Murray in the 1830s a period of escalating conflict and settlement occurred within the region. After the mid-1840s Aboriginal people and Europeans were in active competition for land. Aboriginal people began to lose their land despite attempts to resist the overwhelming wave of European settlement. Eventually, Aboriginal people from the Murray region were left with few options beyond finding a means of keeping their customs alive on their own lands. In many cases this resulted in local Aboriginal people working for the white settlers that now occupied their lands or camping elsewhere on the lands of friendly settlers. The loss of traditional lands had a great impact upon Aboriginal society in the Murray region. As their lands were swallowed by European settlers, Aboriginal people forced from their lands came into conflict with not only Europeans, but groups from other tribal areas.

During the 1850s white settlement continued in the district, with the European population expanding rapidly with a corresponding decrease in the Aboriginal population. This was a trend that continued throughout the remainder of the century. A government Gazette of 1865 noted that there were now 550 Europeans in the Swan Hill district, 150 of them in Swan Hill. By this time the Aboriginal population of the entire state of Victoria had been reduced to less than 2,000.

Further detail is contained in EES Technical Report C: Aboriginal cultural heritage.

Land use history

Swan Hill and the surrounding region were among the earliest settled areas in Victoria. The occupation of the broader region was influenced by environmental conditions that confronted selectors in the region in the later 19th century.

Initial European exploration of the study area occurred in the 1830s by Thomas Mitchell; by the late 1840s the area was fully occupied by squatters. The area remained sparsely settled and was grazed initially by sheep, and later by cattle, up until the late 1870s. Occupation of the landscape by pastoralists resulted in the clearance of native vegetation, the sinking of dams and the diversion/alteration of watercourses to provide for livestock. Further vegetation clearance, including grubbing out and burning of tree stumps, construction of water storages and fencing took place during this time, and continued ploughing and rabbit infestation led to widespread erosion. Dust storms were common by the early 1900s. Further settlement of the region was driven by closer settlement acts and the spread of irrigation schemes in the early twentieth century. Due to the region's highly saline ground water, which was too deep to extract and distribute, surface water was heavily relied on. Water has since dropped with the continuing drought, with the communities facing ongoing issues due to the dry conditions exacerbated by hydrology patterns fundamentally altered by 163 years of white settlement, and the trading of water rights away from the region. The current low water quality in local streams and rivers is evidence of the impacts of historical land and water management practices.

Previous studies and archaeological reports

A number of previous regional and localised archaeological investigations and studies have been undertaken within the geographic region surrounding the activity area. The studies were undertaken in relation to various

infrastructure developments. The results of the background research including the archaeological investigations previously undertaken within the geographic region were compared and the following conclusions were drawn:

- No archaeological places have previously been identified within the study area.
- The study area is located on linear dunes.
- A total of 41 registered Aboriginal cultural heritage places are located within the geographic region, which is defined as a radius buffered on the study area spanning six kilometres capturing creeks and rivers.
- A review of these Aboriginal places indicated specific clustering around Lake Lalbert and Kangaroo Lake.
- Registered Aboriginal places have also been identified on the plains, floodplains and depressions, although these tend to be low density scatters or isolated artefacts.
- Artefact scatters within the geographic region mostly comprise sparse surface stone artefacts identified in ploughed paddocks on plain landforms. Artefact scatters, scarred trees and earth features also exist along the margins of nearby watercourses and waterbodies including Lalbert Creek, Kangaroo Lake and Lake Lalbert.
- There has been a limited number of archaeological investigations within the geographic region.
- The study area is located on a landscape that was historically utilised for stock grazing and for agricultural practices.

Further details of previously studies that have taken place within the activity area can be found in Section 7.1.6 and Section 7.1.7 of EES Technical Report C: Cultural Heritage.

Aboriginal archaeological survey

The desktop assessment and subsequent survey identified that there is a very low likelihood of subsurface Aboriginal cultural heritage.

An Aboriginal archaeological ground survey of the study area was conducted in line with the requirements of a CHMP standard assessment, pursuant to regulation 63 of the *Aboriginal Heritage Regulations 2018* (Vic) (the Regulations) and in accordance with proper archaeological practice as outlined in Burke, Morrison and Smith (2017: 93-94). The archaeological field inspection included:

- The identification and recording of existing surface evidence of past Aboriginal activity.
- Identification of areas with the potential for subsurface archaeology.
- Investigation and development of strategies for avoiding and/or mitigating potential impacts to Aboriginal cultural heritage.

The archaeological survey was carried out over five days from 19-23 April 2021, a further three days on the 10-11 November 2021 and 21 July 2022 were included to survey the proposed water supply pipeline route and road upgrades. The survey was undertaken by a team comprising three archaeologists and three representatives of the Wemba Wemba Traditional Owner group. Pedestrian spacing varied from 2 to 30 metres, with good survey coverage across the study area given its size. Areas with trees were targeted, with a pedestrian inspection also conducted along the access and pipeline route (including the alternative water supply pipeline route and the proposed pumping station location). Key results of the archaeological ground survey are summarised as follows:

- The majority of the ground surface within the study area was not obscured by ground cover and was deemed as having excellent visibility. The effective ground surface visibility of the total study area was calculated as 80%
- The study area was divided into 11 Investigation Areas (IAs) based on landform, location and disturbance. These included:
 - IA-1 - located along the southern boundary of Thompson Road within a large agricultural field on a gently inclined landform.
 - IA-2 - situated on the eastern boundary of Shepard Road on the upper slope of a ridge, within a large agricultural field.
 - IA-3 – situated on the western boundary of Shepherd Road, within a large agricultural field on a ridge landform.
 - IA-4 - located along the eastern boundary of Bush Road within a large agricultural field on a flat/level landform.
 - IA-5 – located along a small rise within a large agricultural field.
 - IA-6 - located along the eastern boundary of Shepherd Road within a large agricultural field on a flat to gently inclined landform.
 - IA-7 – encompasses a ridge landform within a large agricultural field. A large quarry was identified within the centre of the field along with multiple rabbit and snake burrows.

- IA-8 – located within a large agricultural field on a flat to gently inclined landform along the western boundary of Pola Road, with Bennet Road to the north.
- IA-9 - located within a large agricultural field on a mid-slope inclined to the west.
- IA-10 - encompassed all the access tracks between the paddocks and leading out onto Donald-Swan Hill Road.
- IA-11 – encompasses all the access tracks between Willis Road, Mystic Park towards the east of the study area (Kangaroo Lake) and leading out onto Donald-Swan Hill Road.

Photos of each IA are shown in Plate 8-1 to Plate 8-11.



Plate 8-1: IA-1 facing north (photo credit: Eco Logical Australia, 2022)



Plate 8-2: IA-2 facing east (photo credit: Eco Logical Australia, 2022)



Plate 8-3: IA-3 facing north (photo credit: Eco Logical Australia, 2022)



Plate 8-4: IA-4 facing northwest (photo credit: Eco Logical Australia, 2022)



Plate 8-5: IA-5 facing east (photo credit: Eco Logical Australia, 2022)



Plate 8-6: IA-6 facing west (photo credit: Eco Logical Australia, 2022)



Plate 8-7: IA-7 Overlooking a quarry (photo credit: Eco Logical Australia, 2022)



Plate 8-8: IA-8 facing north (photo credit: Eco Logical Australia, 2022)



Plate 8-9: IA-9 facing west (photo credit: Eco Logical Australia, 2022)



Plate 8-10: IA-10 facing south (photo credit: Eco Logical Australia, 2022)



Plate 8-11: IA-11 View of Kangaroo Lake, including subsurface utilities (photo credit: Eco Logical Australia, 2022)

The results of the archaeological ground survey are presented in Section 7.1.8 of EES Technical Report C: Cultural Heritage and are summarised as follows:

- Observed impacts to the study area include road construction, drainage channel works utility installations including above ground electricity, landscaping and agricultural practices including ploughing.
- A moderate disturbance rating was established for each IA with the exception of IA-7, IA-10 and IA-11. Disturbance ratings were based on taphonomic processes factors such as the extent of accidental and deliberate human activity (ploughing, road construction, soil removal) to the activities of animals (grazing, trampling, burrowing, digging), insects (nesting, burrowing, eating) and plants (tree roots, vegetation, overgrowth). The disturbance rating reflects the compounded impact of past and present land uses. The disturbance ratings for IA-7, IA-10 and IA-11 were as follows:
 - IA-7 was assessed as having a moderate to high level of ground disturbance through the impact of farming practices such as land clearance, drainage, dam excavations, quarrying activities and ongoing ploughing.
 - IA-10 was assessed as having a moderate to high level of ground disturbance through the impact of farming practices such as land clearance for an access track for heavy machinery and the construction of all-weather road.
 - IA-11 was assessed as having undergone a high level of ground disturbance through the impact of road construction and installation, such as land clearance for an access track for heavy machinery and the construction of sealed bitumen roads. Land clearance and modification has also occurred within the location of the pumping station for a water supply station.
- Archaeological sensitivity ratings were mostly low for each of the IAs with the exception of IA-3, IA-5, IA-10 and IA-11. Archaeological sensitivity ratings were based on a variety of factors including elevation, distance to water, land use history, Traditional Owner viewpoints, the presence or absence of previously identified cultural heritage and the presence or absence of newly identified cultural heritage. The archaeological sensitivity for IA-3, IA-5, IA-7, IA-10 and IA-11 were as follows:
 - IA-3 was assessed as being of low to moderate archaeological sensitivity due to it being situated on a stranded ridge landform.
 - IA-5 was assessed as being of low to moderate archaeological sensitivity due to it being a slightly raised hillcrest.
 - IA-7 was assessed as being of low to moderate archaeological sensitivity due to it being situated on a stranded ridge landform.
 - IA-10 was assessed as being of low to moderate archaeological sensitivity due to the landform comprising flat to gently inclined plain with nearby resources, and also due to the absence of cultural heritage within an area of good to excellent visibility.
 - IA-11 was assessed as being of moderate archaeological sensitivity due to the landform comprising flat to gently inclined plain with nearby water resources, with a high level of disturbance comprising of subsurface utilities and sealed roads.
- The disturbance and archaeological sensitivity rating were combined to determine an overall Archaeological Potential Rating (APR) for each landform. IAs 1, IA-2, IA-4 and IAs 6 to IA-11 were all rated as having low archaeological potential, while IA-3 and IA-5 (small rise) was rated as having a low to moderate archaeological potential.

The results concluded that any Aboriginal cultural heritage, if present, is most likely to be diffuse, low density stone artefact scatters in disturbed surface and shallow subsurface deposits. The comparative analysis of the landforms and cultural heritage identified within the geographic region have indicated that there is a low likelihood for subsurface cultural heritage to be present, and that undertaking a subsurface excavation program was unlikely to yield any additional information. The full archaeological ground survey is presented in Section 7.1.8 of EES Technical Report C: Cultural Heritage.

8.3.2 Historical heritage

Historical heritage registers

The following historical heritage registers covering the study area were searched for the Project:

- World Heritage list – no places included on the World Heritage List were identified within or adjacent to the study area.

- National and Commonwealth Heritage Lists – no places included on the National Heritage List and the Commonwealth Heritage list were identified within or adjacent to the study area.
- National Trust of Australia (Victoria) – no places included on the National Trust of Australia were identified within or adjacent to the study area.
- Victorian Heritage Register and Victorian Heritage Inventory – no places included on the Victorian Heritage Register were identified within or adjacent to the study area. A single VHI site: H7626-0004 (Beauchamp State School No. 3560 and Memorial Hall) was identified to be within 150 metres of the study area.
- Gannawarra Shire Council – no places included on the Gannawarra Shire Councils local heritage register were identified within or adjacent to the study area.
- Swan Hill Rural City Council - No heritage places are located within the study area. There are three heritage places located adjacent to the proposed transport routes.
 - HO209 is located north and adjacent to Lake Boga – Ultima Road and consists of a single Eucalyptus tree and is of local and state significance.
 - HO185 consists of a nominal boundary around the commercial centre of Ultima, and includes 5 streets (Breen, Dillion, Ailsa, Vernon and David Street) and the Ultima rail station and railway line. HO185 is adjacent to the western end of the study area and is of local significance.
 - HO175 is located adjacent to HO185 and the study area, at the western end along David Street, Ultima. The site consists of a single dwelling and is of local significance.

Previous studies relevant to the Project

An archaeological survey was prepared for the Cannie Ridge Pipelines Project, the aim of which was to undertake an investigation of the cultural heritage values on or near the proposed Cannie Ridge pipelines routes. The study also assessed historical archaeological features within the study area. The survey recorded four historic archaeological sites (three former school sites and one house and farm site), three of which were within the proposed pipeline route. These sites were concluded to be common archaeological sites in the sparsely settled Mallee area of north-west Victoria and were reflective of the settlement by a wave of selectors and their families who arrived in the Cannie Ridge area from the 1880s onwards. These sites were:

- H76262-0005: Kunat State School No.3294.
- H7626-0004: Beauchamp State School No. 3560 and Beauchamp Memorial Hall.
- H7526-0002: Mud-Brick house ruins, Cannie.
- H7526-0001: Budgerum Cemetery.

Historical archaeological survey

A historical archaeological ground survey of the study area was conducted in line with the requirements of the 'Guideline for conducting historical archaeological survey' (Heritage Victoria 2020), and in accordance with archaeological practice as outlined in Burke, Morrison and Smith (2017: 93-94). The aims of the archaeological survey were to:

- Inspect areas with ground surface visibility for any features or structures of archaeological sites within the study area.
- Undertake a general assessment of the overall archaeological potential of the study area.

The survey was undertaken over seven days (19-23 April 2021, 10-11 November 2021 and 21 July 2022) by a team comprising between four and six participants. The pedestrian inspection was also conducted along the access and pipeline route (including the proposed pumping station location). The landscape was entirely characterised by a generally flat plains to low sloping ridges within ploughed fields with clayey or sandy soils exposed by ploughing. Multiple instances of ironstone, sandstone, small snail shells, modern ceramics, glass and slag were identified exposed throughout the paddocks within the ridges and furrows. Disturbances identified within the study area were generally homogenous (moderate), owing to widespread ploughing, vegetation clearance, rabbit and snake burrows scattered throughout the fields.

No historical artefacts, historical archaeological deposits or standing structures of historical significance were identified during the survey. A single VHI site: H7626-0004 (Beauchamp State School No. 3560 and Memorial Hall) was identified to be approximately 150 metres from the study area. The VHI site, however, is located within a privately owned paddock and could not be accessed. No works or disturbance is proposed within this privately owned paddock where the VHI site is located. The ground surface immediately adjacent to the VHI site did not identify any artefacts, or structure.

The site has been heavily cleared of vegetation in order to facilitate pastoral agricultural practices. A couple of disused and collapsing fences run through the site. Other disturbances to the study area include the installation of both underground and overhead services, and vehicle tracks.

8.4 Construction impact assessment

8.4.1 Aboriginal Cultural Heritage

The study as presented in EES Technical Report C: Cultural Heritage has not identified any known cultural heritage values that have the potential to be impacted by the Project. During construction, there is the potential that ground disturbance works would result in partial or complete disturbance of previously unidentified and unregistered Aboriginal cultural heritage, resulting in loss of heritage values. Mitigation measures such as the preparation of an Aboriginal Cultural Heritage Management Plan (CHMP) would reduce potential impacts to Cultural Heritage.

8.4.2 Historical Cultural Heritage

The study has not identified any known historical cultural heritage values that have the potential to be impacted by the Project. Section 8.7 outlines appropriate mitigation measures that would be followed if construction works would encounter unknown historical cultural heritage.

The full assessment is shown in EES Technical Report C: Cultural Heritage. Contingency measures prior to construction would also be implemented to reduce harm to unknown historical cultural heritage values that may be present within the study area. These are presented in Section 8.7.

8.5 Operation impact assessment

8.5.1 Aboriginal Cultural Heritage

The study as presented in EES Technical Report C: Cultural Heritage has not identified any known cultural heritage values that have the potential to be impacted by the Project. During operation, there is the potential for exploration works to result in partial or complete disturbance of previously unidentified and unregistered Aboriginal cultural heritage, resulting in loss of heritage values. The CHMP would include contingency measures in the event that Aboriginal cultural heritage places or materials are discovered.

8.5.2 Historical Heritage

As discussed in Section 8.4.2, the study has not identified any known historical cultural heritage values that have the potential to be impacted by the Project. Mitigation measures including the requirement for an appropriate contractor induction to communicate the protections, requirements and the Unexpected Finds Protocol would be implemented prior to construction commencing. Contingency measures would also be implemented to reduce harm to unknown historical cultural heritage values that may be present within the study area. These are presented in Section 8.7.

8.6 Residual impacts

Residual impacts refer to those impacts that remain once mitigation measures have been implemented. The study has not identified any known cultural heritage values that have the potential to be impacted by the Project and no residual impacts remain.

The study has not identified any known cultural heritage values that have the potential to be impacted by the Project and no residual impacts remain. As a result, no site-specific reduction measures have been recommended as no cultural heritage places were identified during the course of the CHMP. Similarly, the study has not identified any known historical cultural heritage values that have the potential to be impacted by the Project.

8.7 Summary of mitigation measures

8.7.1 Mitigation measures

The management measures that are proposed to assess Cultural heritage impacts associated with the Project are presented in Table 8-1.

Table 8-1 Cultural Heritage mitigation measures

Mitigation measure ID	Mitigation measure	Project phase
Aboriginal Heritage		
MM-CH01	<p>The Project to be delivered in accordance with the approved CHMP which will include (but not limited to):</p> <ul style="list-style-type: none"> • The requirement for all personnel involved in ground disturbing activities to participate in a cultural heritage induction. • The need for the proponent to regularly review their compliance with the management conditions contained in the CHMP. • Strategies to be implemented if any suspected human remains are found within the Project's disturbance footprint. • Process to follow if unexpected Aboriginal places or objects other than human remains are found during the activity. • Custody and management of Aboriginal cultural heritage recovered. • Reviewing compliance with the management plan. • Dispute resolution. • Delays and other obstacles. • Authorised Project Delegates and the handling of sensitive information. 	All phases
Historic Heritage		
MM-HH01	<p>An Unexpected Finds Protocol will be prepared to reduce harm to unknown historical cultural heritage values that may be present within the Project area. If historical heritage sites are discovered during the construction, operation or decommissioning / closure of the Project, the following steps will be applied:</p> <ol style="list-style-type: none"> a) The person who identified the find will immediately notify the person in charge of the activity. b) The person in charge of the activity will then suspend any relevant works at this location of the discovery and to a distance within 50 metres of the relevant site extent and isolate the find via the installation of safety webbing, or other suitable barrier and the material to remain in situ. c) Works for the activity may continue outside of the exclusion zone, although if additional heritage is identified this must also be protected following the steps outlined above. d) The person in charge of works will notify a suitably qualified archaeologist of the find within 24 hours of discovery. e) Relevant management actions will be determined by the suitably qualified archaeologist in relation to the <i>Heritage Act 2017</i> (Vic) and in consultation with Heritage Victoria. f) Site cards for identified historic archaeological sites required to be submitted to Heritage Victoria (HV) within 30 days of discovery. g) Approvals must be granted by HV for works to continue. All historical archaeological sites are protected under the <i>Heritage Act 2017</i> and cannot be harmed without approval. 	All phases

8.7.2 Contingency measures

Management principles for the construction and operation phases of the Project cycle can help manage potential impacts on cultural heritage. As discussed in Section 8.4 and Section 8.5, no known Aboriginal or non-Aboriginal cultural heritage would be impacted as a result of the construction, operational and decommissioning / closure phases of the Project. Contingency measures would be implemented to ensure the management measures as presented in Table 8-1 are understood and implemented correctly. These contingency measures would be applied to all phases of the Project and include:

- Aboriginal Heritage:
 - Preparation and delivery of a CHMP induction, including a cultural awareness induction.
 - Use of a compliance checklist throughout the construction phase.
 - The requirement for appropriate contractor induction to communicate the protections, requirements, and the Unexpected Finds Protocol
- Non-Aboriginal Heritage:
 - The requirement for appropriate contractor induction to communicate the protections, requirements and the Unexpected Finds Protocol.

8.8 Conclusion

An assessment was undertaken to evaluate potential impacts associated with the Project, considering the existing environment within the study area and associated construction, operational and decommissioning / closure activities. No known Aboriginal or non-Aboriginal cultural heritage would be impacted as a result of the construction, operational and decommissioning / closure phases.

The study has not identified any known cultural heritage values that have the potential to be impacted by the Project and no residual impacts remain. As a result, no site-specific reduction measures have been recommended as no cultural heritage places were identified during the course of the CHMP. Similarly, the study has not identified any known historical cultural heritage values that have the potential to be impacted by the Project.

In response to the EES evaluation objective described at the beginning of this chapter, impacts of the Project on Aboriginal and historic cultural heritage values have been assessed and mitigation measures have been identified to avoid and minimise adverse effects.