



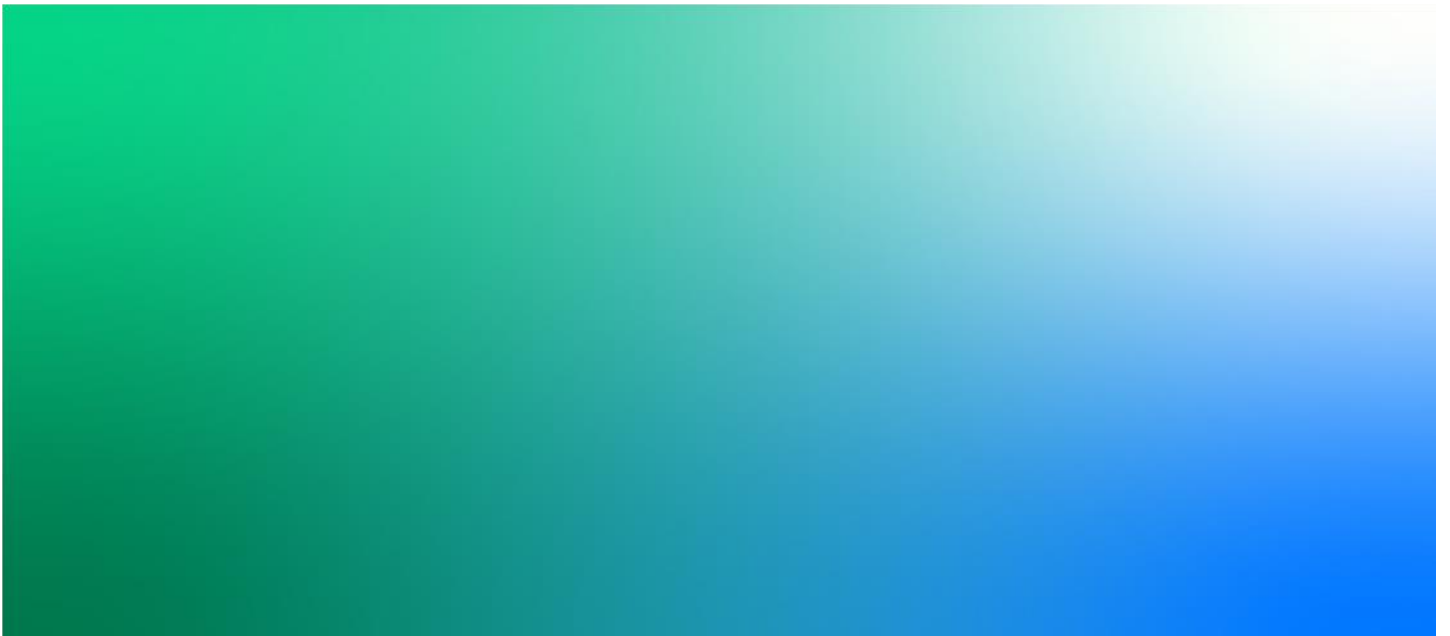
# **Victorian Murray Floodplain Restoration Project**

## **Desktop Historical Heritage Assessment - Burra Creek**

IS297752-CH-CH-RP-0001 | Rev 0

15 May 2020

**Lower Murray Urban and Rural Water Corporation**



## Victorian Murray Floodplain Restoration Project

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## Abbreviations

CHL	Commonwealth Heritage List
EMP	Environmental Management Plan
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
HHA	Historical Heritage Assessment
HIA	Heritage Impact Assessment
HO	Heritage Overlay
HV	Heritage Victoria
LEP	Wakool Local Environmental Plan 2013
LGA	Local Government Area
mAHD	metres above Australian Height Datum
NHL	National Heritage List
NSW	New South Wales
NT	National Trust of Australia (Victoria)
the project	Burra Creek Floodplain Restoration Project
R8	R8 joint venture
RNE	Register of the National Estate
SHI	NSW State Heritage Inventory
SHR	NSW State Heritage Register
VHI	Victorian Heritage Inventory
VHR	Victorian Heritage Register
VMFRP	Victorian Murray Floodplain Restoration Project
WHL	World Heritage List

## Executive Summary

### Project overview

This desktop historical heritage assessment has been prepared for the Burra Creek Floodplain Restoration Project (the project), to support the preparation of referrals under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Victorian *Environment Effects Act 1978*. The project is one of nine discrete environmental works projects being undertaken as part of the Victorian Murray Floodplain Restoration Project (VMFRP), which is being implemented as part of Victoria's obligations under the Murray Darling Basin Plan. Lower Murray Urban and Rural Water Corporation (LMW) has been nominated by the partnership established to deliver VMFRP, as the project proponent for the purpose of submitting referrals and approval applications.

The project aims to restore a more natural inundation regime and improve ecological condition across approximately 330 ha of high ecological value Murray River floodplain at Burra North and a further 73 ha of creek habitats at Burra South, through the construction of new infrastructure, the modification of existing infrastructure and removal of some existing barriers to flow within Burra Creek. The project is designed to enable managed inundation up to a design water level of 58.7 mAHD at Burra North and up to the top of bank of Burra Creek at Burra South using water from both natural flood events and pumping from the Murray River.

The project involves the construction of three new regulators (B1, B2 and B4), two temporary pump hardstands, a drop structure to control erosion, and a series of containment banks incorporating spillways. The project also involves the removal of some existing obstructions to flow in Burra Creek, including removal of Banks 1, 2, 3 and 4, and modification of Bank 5. Maintenance works may also be required along access tracks to enable use by construction and operational vehicles. Temporary construction laydown areas will also be established near the main work sites (i.e. near Regulator B1, Regulator B2 and Bank 5).

The project is located within the Victorian localities of Kenley, Natya, and Piangil, within the Swan Hill Local Government Area (LGA). The project is located almost entirely in the State of Victoria. A small portion of the proposed works associated with a drop structure, extends down the western bank of the Murray River into New South Wales (NSW) within the locality of Goodnight and the Murray River Council LGA. The project is mostly located on Crown land (natural features reserve) managed by Parks Victoria, with some access tracks, a temporary laydown area and part of the inundation area on private land.

Construction activities would occur within the construction footprint identified in Figure 1.1-Figure 1.3. Construction activities would include:

- Establishment of construction sites, including removal of vegetation, stripping and stockpiling of topsoil, establishing temporary parking and truck turnaround areas, laydown and stockpiling areas
- Removal of existing structures / block banks where required
- Construction / installation of new structures.

Construction would involve use of vehicles and machinery such as trucks, excavators, and access equipment.

### Desktop review

There are no listed historical heritage places that intersect with the area of investigation or the inundation area. Examination of the *Rural City of Swan Hill Heritage Study Stage II* in combination with a review of the parish maps and aerial imagery review has not identified any potential historical heritage places or archaeological sites within the area of investigation or inundation area.

There is moderate potential for previously unidentified historical heritage to be present within the area of investigation and the inundation area, from the background history of the area. Site types most likely to be

identified in the area of investigation and the inundation area would be places associated with early agricultural or pastoral activities, logging, and water management practices.

### **Impact assessment**

There are no listed historical heritage places that intersect with the area of investigation or the inundation area. As such, neither the proposed works (Section 3.1) nor the proposed inundation area (Section 3.1.1) will impact upon any known historical heritage values.

There is moderate potential for previously unidentified historical heritage items or archaeological sites to be present within the area of investigation and the inundation area, based on the background history of the area. Site types most likely to be identified would be heritage places or archaeological sites associated with early agricultural or pastoral activities, logging, and water management practices.

### **Approvals, mitigation measures and recommendations**

If the scope of works changes to include other features of the heritage places detailed in Table 1, further heritage assessment would be required, and this assessment will need to be updated.

Table 1: Statutory requirements, mitigation measures and recommendations for heritage places within the area of investigation

Place	Statutory requirements	Recommendations	Mitigation measures
Entire area of investigation	<p>Discovery of archaeological sites - under Section 127 of the Victorian <i>Heritage Act 2017</i>, If an archaeological site is discovered in Victoria during construction or excavation on any land, the person in charge of the construction or excavation must as soon as practicable report the discovery to Heritage Victoria (HV).</p> <p>Under the NSW <i>Heritage Act 1977</i>, should any unexpected historical materials, features or deposits be discovered in NSW at any time prior to, or during, the project, the person in charge must stop work, protect item and inform Murray River Council and the Heritage Division of the Office of Environment and Heritage as soon as practicable. The relic provisions in the <i>Heritage Act 1977</i> also require that an excavation permit be obtained from the Heritage Council of NSW prior to commencement of works if disturbance to a site with known or potential archaeological relics is proposed.</p>	<p>Due to the possibility for historic archaeology to be impacted, as identified in this desktop assessment (Section 2.4), it is recommended that a Historical Heritage Assessment (HHA) be undertaken for the project.</p> <p>This should include a field survey to identify further historical archaeological sites and any unidentified historical heritage places, and a significance assessment of these potential historical places.</p> <p>If any historical heritage items or archaeological sites are identified as part of the HHA, a Heritage Impact Assessment (HIA) would be required which would include the:</p> <ul style="list-style-type: none"> <li>Assessment of impacts on all historical heritage sites</li> <li>Detailed identification of mitigation measures and approval requirements</li> <li>Heritage Impact Statement(s).</li> </ul> <p>All historical archaeological places in Victoria are protected under the <i>Heritage Act 2017</i>, whether they are registered or not. In NSW, the <i>Heritage Act 1977</i> protects relics which are defined as: 'Any deposit, artefact, object or material evidence that relates to the settlement of the area that comprises NSW, not being Aboriginal settlement; and is of State or local heritage significance'.</p>	<p>General mitigation measures to be implemented across the area of investigation:</p> <ul style="list-style-type: none"> <li>Historical heritage awareness training should be completed as part of the site induction for all personnel and/or contractors prior to the commencement of construction works to ensure: <ul style="list-style-type: none"> <li>an understanding of where all heritage places are located within the area of investigation</li> <li>an understanding of the potential heritage places that may be impacted during the project</li> <li>the procedures required to be undertaken in the event of discovery of historical heritage material, features or deposits, or the discovery of human remains</li> </ul> </li> <li>If an archaeological site is discovered in Victoria during construction or excavation, the person in charge of the construction or excavation must as soon as practicable report the discovery to HV</li> <li>If an archaeological site is discovered in NSW during construction or excavation, the person in charge of the construction or excavation must as soon as practicable report the discovery to Murray River Council and the Heritage Council of NSW. A copy of this report should be kept onsite and on file with the project records. All contractors and/or project staff should be made aware of the heritage status of the heritage places in the area of investigation prior to works taking place.</li> </ul>



## Important note about your report

The purpose of R8's engagement under the Victorian Murray Floodplain Rehabilitation Project (VMFRP) is to design infrastructure for VMFRP including regulators, levees, roads, access tracks and culverts. The designs are required to be suitable for construction pricing to inform business case prioritisation. The purpose of this infrastructure is to allow floodplains to be watered at the hydraulic design levels nominated by VMFRP. R8 is also engaged to provide Regulatory Approvals and Cultural Heritage Services. The purpose of these services is for VMFRP to lodge the necessary approvals documents for the project with the relevant approvals authorities.

The sole purpose of this report and the associated services performed by R8 is to complete a Desktop Historical Heritage Assessment for VMFRP in accordance with the scope of services agreed between R8 and VMFRP.

R8 has prepared this report in accordance with the usual care and skill expected of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. However, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

In preparing this report, R8 has relied on the information provided by VMFRP. In particular R8 is reliant on VMFRP's prior flood modelling work to define inundation levels and extents. R8 is not responsible for achievement of the project's desired operational ecological outcomes.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by R8 for use of any part of this report in any other context. This report has been prepared on behalf of, and for the exclusive use of VMFRP, and is subject to, and issued in accordance with, the provisions of the agreement between R8 and VMFRP. R8 accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

# 1. Introduction

The Burra Creek Floodplain Restoration Project (the project) is one of nine discrete environmental works projects being undertaken as part of the Victorian Murray Floodplain Restoration Project (VMFRP), which is being implemented as part of Victoria's obligations under the Murray Darling Basin Plan. The VMFRP aims to restore a more natural inundation regime across more than 14,000 ha of high ecological value Murray River floodplain in Victoria through the construction of new infrastructure and modification of existing infrastructure.

The VMFRP is being implemented in partnership between Lower Murray Urban and Rural Water Corporation (LMW), Goulburn Murray Rural Water Corporation (GMW), Mallee Catchment Management Authority (Mallee CMA), North Central Catchment Management Authority (North Central CMA), Parks Victoria and the Department of Environment, Land, Water and Planning (DELWP), and is funded by the Commonwealth Department of Agriculture, Water and Environment (DAWE). LMW has been nominated by the partnership as the project proponent for the purpose of submitting referrals and approval applications.

R8 is a joint venture formed between Jacobs and GHD, which has engaged by LMW to deliver design, cultural heritage and approvals services for the VMFRP. This desktop historical heritage assessment has been prepared for the project to support the preparation of referrals under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Victorian *Environment Effects Act 1978*.

## 1.1 Project description

The Burra Creek floodplain is divided into two areas by the privately owned Piambie Channel, these being referred to as:

- Burra North – floodplain north of Piambie Channel through to the northern / downstream end of Burra Creek
- Burra South - floodplain south of Piambie Channel through to the southern / upstream end of Burra Creek.

The project aims to restore a more natural inundation regime and improve ecological condition across approximately 330 ha of high ecological value Murray River floodplain at Burra North and a further 73 ha of creek habitats at Burra South, through the construction of new infrastructure, the modification of existing infrastructure and removal of some existing barriers to flow within Burra Creek. The project is designed to enable managed inundation up to a design water level of 58.7 mAHD at Burra North and up to the top of bank of Burra Creek at Burra South using water from both natural flood events and pumping from the Murray River.

The project involves the construction of three new regulators (B1, B2 and B4), two temporary pump hardstands, a drop structure to control erosion, and a series of containment banks incorporating spillways. The project also involves the removal of some existing obstructions to flow in Burra Creek, including removal of Banks 1, 2, 3 and 4, and modification of Bank 5. Maintenance works may also be required along access tracks to enable use by construction and operational vehicles. Temporary construction laydown areas will also be established near the main work sites (i.e. near Regulator B1, Regulator B2 and Bank 5).

This report has been prepared based on the Issue for Review (IFR) Design dated March 2020.

## 1.2 Project location

The project is located in the Victorian rural localities of Kenley, Natya, and Piangil, on the western side of the Murray River approximately 25 km north of the township of Nyah, 50 km northwest of Swan Hill and 60 km southeast of Robinvale in northwest Victoria. The drop structure crosses into NSW within the rural locality of Goodnight (see Figure 1.1-Figure 1.5).

The project is located along Burra Creek and its associated floodplain. Burra Creek is a 54 km long anabranch of the Murray River that diverges from the River near Piangil, Victoria (opposite the township of Tooleybuc in New South Wales (NSW)) and re-joins the Murray River approximately 10 km upstream of its junction with the Wakool

River. The area enclosed between Burra Creek and the Murray River is known as Macredie Island. The northern part of Macredie Island is known as Burra Forest.

The Burra Creek floodplain is divided into two areas by the Piambie (formerly Timbercorp) Irrigation Channel, these being referred to throughout this report as:

- Burra North – floodplain north of Piambie Channel through to the northern / downstream end of Burra Creek
- Burra South - floodplain south of Piambie Channel through to the southern / upstream end of Burra Creek.

The majority of proposed project infrastructure and the majority of the proposed inundation area (approx. 330 ha) are located in the area referred to as Burra North. A minor component of the proposed inundation area (approx. 73 ha) associated with the Burra Creek channel and one of the proposed regulating structures (Regulator B4) are located in the area referred to as Burra South.

The project is located almost entirely in the State of Victoria, within the Rural City of Swan Hill Local Government Area (LGA). A small portion of the proposed works associated with the drop structure, extends down the western bank of the Murray River into NSW and the Murray River Council LGA.

The majority of the proposed inundation area and area of investigation at Burra North, including the development footprint of all proposed infrastructure, is located within the River Murray Reserve, a natural features reserve which is managed by Parks Victoria. The majority of the proposed inundation area and area of investigation at Burra South, including the development footprint of all proposed infrastructure, is also contained within natural features reserve managed by Parks Victoria. Parts of the proposed inundation area, some sections of access track and one proposed construction laydown area are located on private land.

This desktop assessment considers potential historical heritage impacts in relation to the area of investigation (Figure 1.1-Figure 1.3), which comprises the development footprint, as well as a substantial buffer around the development footprint, laydown areas and access tracks, and the proposed inundation area (Figure 1.1-Figure 1.3).

### 1.3 Purpose of assessment

The purpose of this desktop historical heritage assessment is to:

- Identify registered historic heritage places potentially impacted by construction works or managed inundation
- Identify likelihood of unregistered historic heritage being encountered in construction areas
- Describe likely approval requirements
- Describe further investigations and/or recommended management measures.

### 1.4 Desktop assessment

This desktop assessment involved the following activities:

- Register searches
- Review of previous heritage reports and local heritage studies, site cards and other site information (including a review and update of the existing historical archaeology due diligence assessment previously prepared for the project by Jo Bell Heritage Services (Bell 2013))
- Background historical research including historical maps and plans
- Synthesis of background information to identify known heritage places both in the area of investigation and within the inundation area, and areas with potential for previously unidentified heritage places
- Summary of potential impacts and mitigation measures

- Identifying further heritage investigation required to meet legislative requirements and to minimise project risk
- Identifying approvals requirements under the *Heritage Act 2017* (Victoria), *Heritage Act 1977* (NSW), local planning schemes, and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The drop structure works proposed within NSW are minor, and do not extent to land beyond the Murray River. As such, a detailed assessment of history of the Goodnight area and impacts under NSW heritage legislation have not been included.

### 1.5 Authorship

This report was prepared by Caroline Seawright (Project Archaeologist, R8). Mapping was prepared by Nicole Kiely (Senior Consultant – Spatial and Information Services, R8). A technical review was undertaken by Rose Overberg (Principal Heritage Consultant, R8).

### 1.6 Assumptions and limitations

The constraints are as follows:

- The assessment was undertaken using the assessment area provided on 27 March 2020 by Milos Pelikan (Principal Spatial Analyst, R8)
- No field investigation was undertaken
- The register searches were undertaken on 27 February 2020 and any findings within this report are based on those search results. As such, this report is accurate as to the date of that generation.



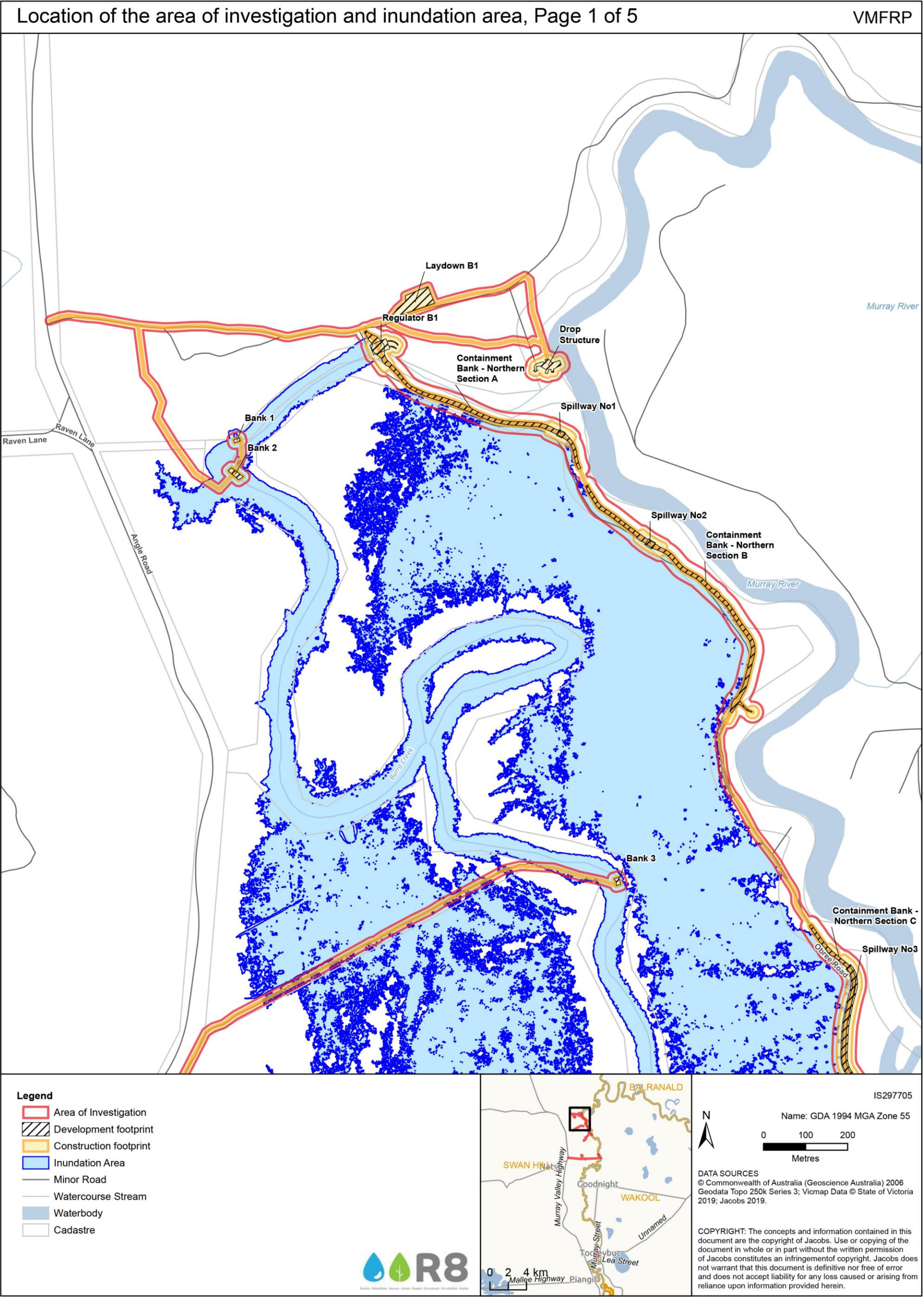


Figure 1.1: Location of the area of investigation and inundation area (1 of 5)



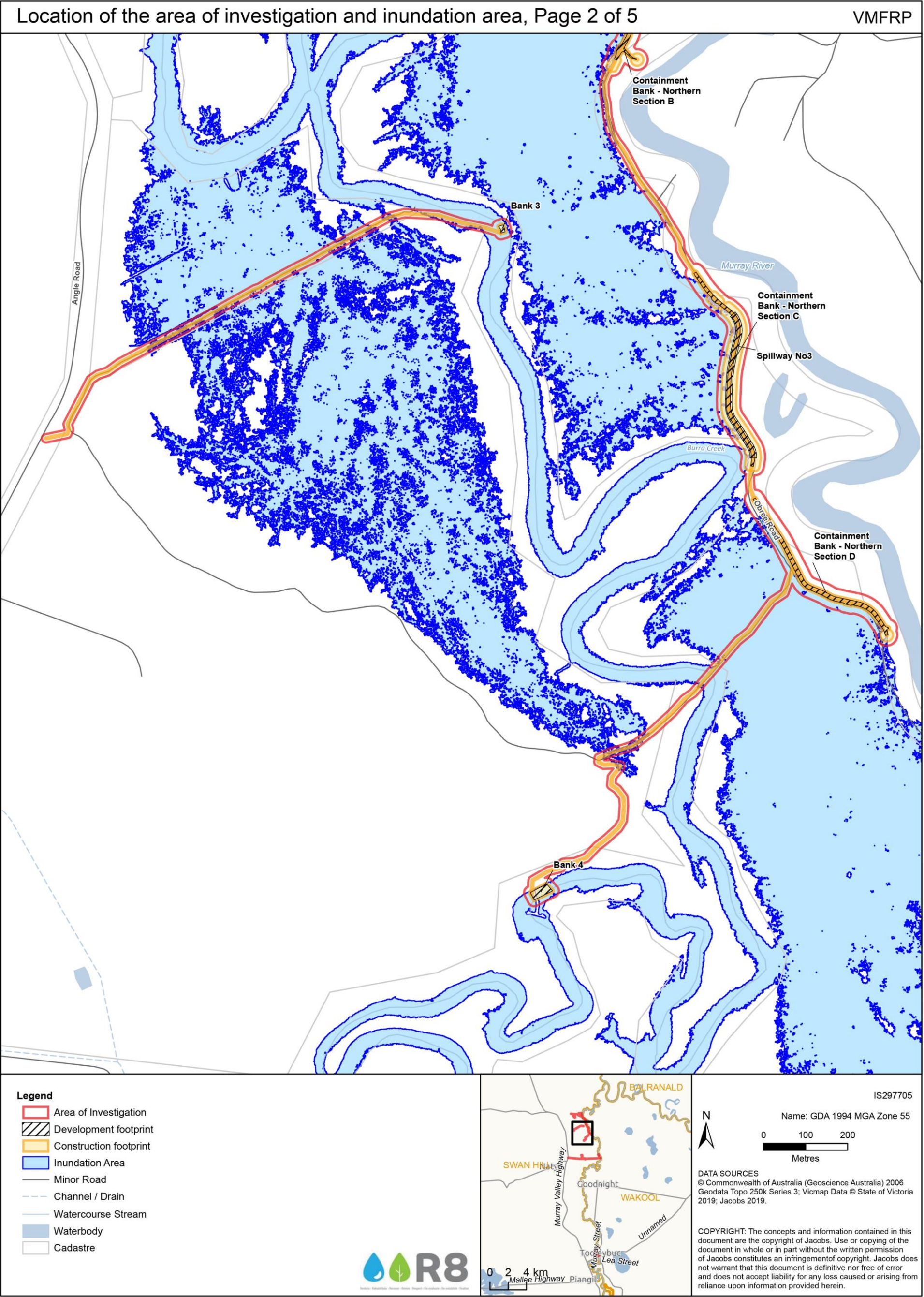


Figure 1.2: Location of the area of investigation and inundation area (2 of 5)



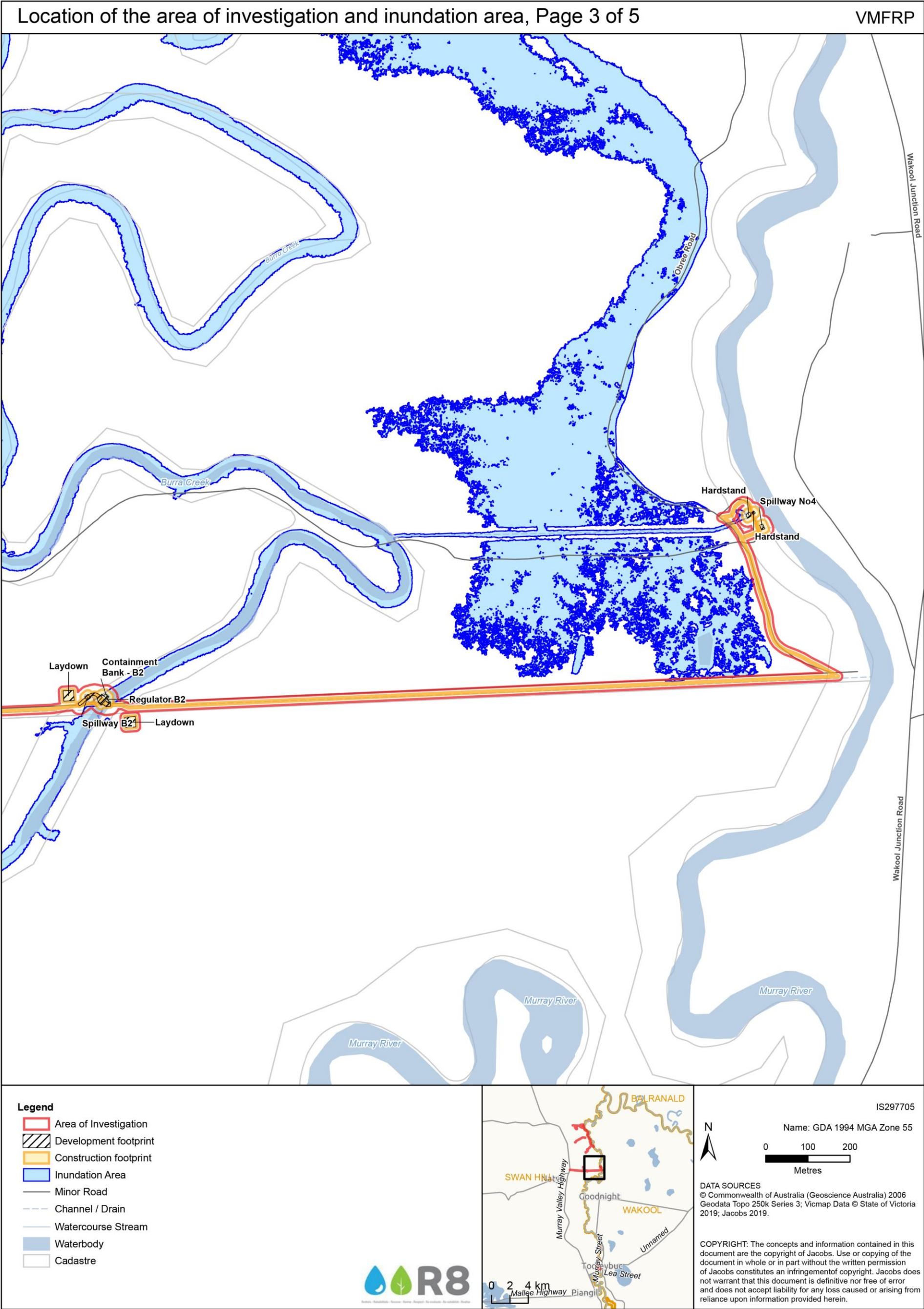


Figure 1.3: Location of the area of investigation and inundation area (3 of 5)



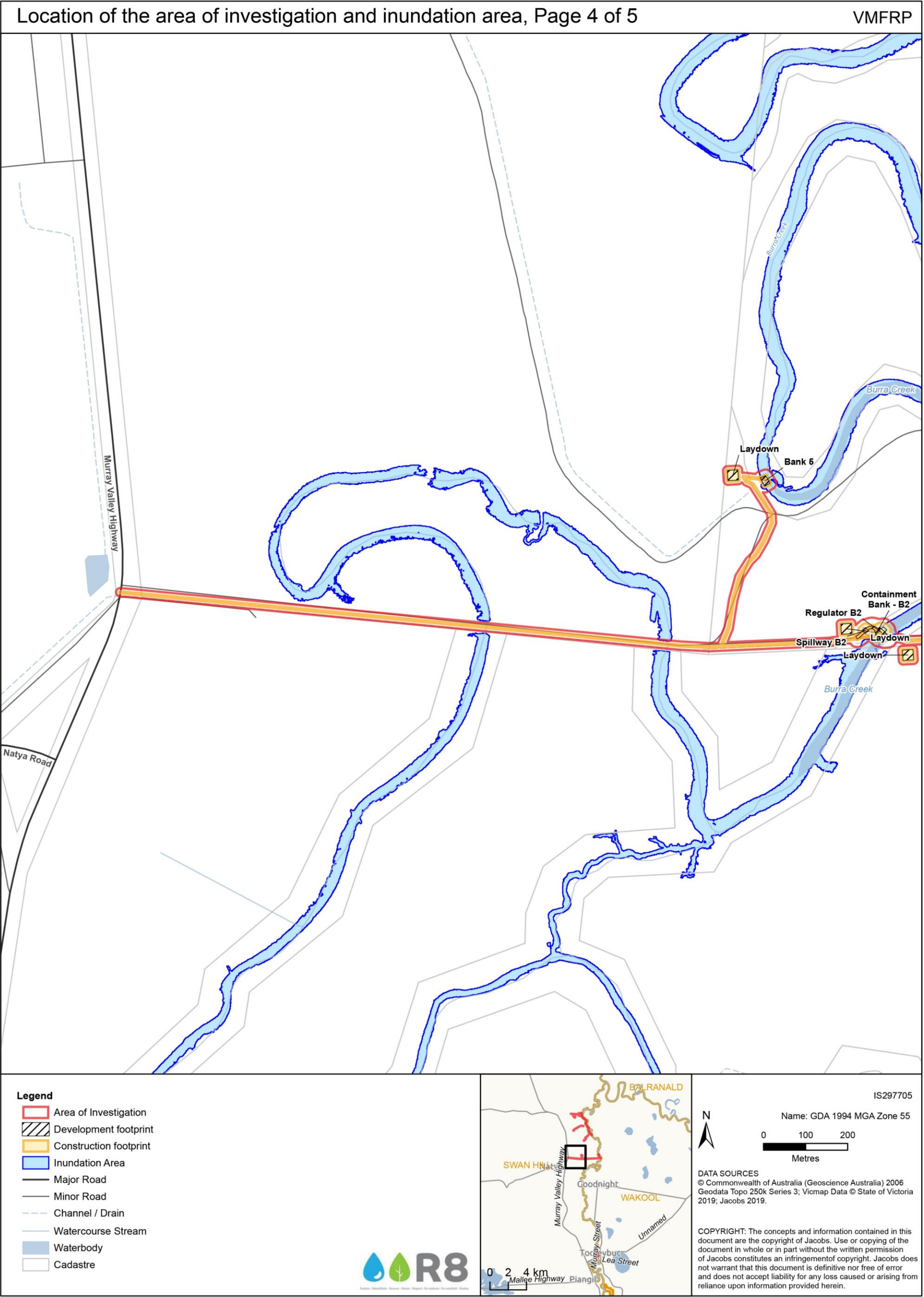


Figure 1.4: Location of the area of investigation and inundation area (4 of 5)





Figure 1.5: Location of the area of investigation and inundation area (5 of 5)

## 2. Desktop review

### 2.1 Heritage context

#### 2.1.1 Register searches

The following heritage registers were searched on 27 February 2020 by Caroline Seawright (Project Archaeologist, R8) to determine whether any known historical heritage places were present within or in proximity to the area of investigation and to the inundation area:

- Victorian Heritage Register (VHR)
- Victorian Heritage Inventory (VHI)
- Swan Hill Planning Scheme Heritage Overlay (HO)
- NSW State Heritage Inventory (SHI)
- NSW State Heritage Register (SHR)
- Wakool Local Environmental Plan 2013 (LEP)
- Commonwealth Heritage List (CHL)
- National Heritage List (NHL)
- World Heritage List (WHL)
- Register of the National Estate (RNE)
- National Trust of Australia (Victoria) (NT).

There are no historical heritage places within proximity to the area of investigation or inundation area (Figure 2.10).

The closest historical heritage places to the area of investigation and inundation area in the north comprises Menegezzo's 2 (VHI D7528-0002), which is an archaeological site of local significance categorised under 'farming and grazing', at approximately 60 m to the north of the area of investigation. The closest heritage item is the Tooleybuc Bridge (VHI H7527-0001, VHR H0765/HO215, and LEP I13), located approximately 100 m to the southeast. Each of the heritage registers propose a slightly different heritage curtilage (Figure 2.10). The bridge itself is physically located approximately 40 m to the east of the area of investigation.

#### 2.1.2 Previous historical heritage assessments

There have been four historical heritage investigations undertaken in proximity to the area of investigation (Table 2.1).

Table 2.1: Summary of the existing historical archaeology due diligence assessments

Author	Summary
Bell (2013)	<p>Jo Bell Heritage Services undertook an historic due diligence assessment on behalf of the Mallee Catchment Management Authority (CMA) as part of proposed water management options on the Burra Creek floodplain. The report was prepared for the proposed regulator sites, track raising and embankments situated on the Burra Creek floodplain, between Kenley and Coonimur, east of Natya. Since then, the area of investigation has changed, and the areas assessed in the report only intersect with small sections of the current area of investigation. As such, the entire current area of investigation has not been assessed.</p> <p>During the desktop assessment, the report noted that no previous heritage assessments of the Burra Creek floodplain had taken place. As such, the assessment area has not previously been systematically assessed for historic heritage or historic archaeological sites. A register search identified no historical heritage places located within 2 km of the assessment area. No predictive model for archaeological potential was included in the report.</p>

Author	Summary
	<p>The site inspection comprised an investigation of 100 m radius around each of the proposed structures, which comprised the assessment area. The site inspection indicated that logging was evident throughout the area. No historic archaeological sites or areas of archaeological potential were identified during the site inspection. The report noted that this may be due to the narrow scope of the investigation, which did not include access tracks to the structures except where they coincided with proposed track raising. As no historic features or areas of archaeological potential were identified, no significance assessments or detailed management recommendations were made.</p>
Allom Lovell and Associates (2001a; 2001b; 2001c; 2001d)	<p>Allom Lovell and Associates completed a Stage II heritage study for the Rural City of Swan Hill in 2001, based on Stage I project which commenced in 1998, which included the identification of sites of potential heritage significance, with 204 places identified across the entire municipality. For each of these sites, the Stage II heritage study undertook further investigation, including a reassessment of each site to identify its cultural significance. After further research, Stage II compiled a list of 223 heritage places: six were recommended for inclusion on the VHR, the RNE, and the Swan Hill HO; 73 were recommended for the RNE, and the Swan Hill HO; 128 were recommended for the Swan Hill HO; and 16 places were ungraded due to demolition or insufficient levels of significance.</p> <p>One heritage place was identified at Kenley. This comprised the <i>Geijera parviflora</i> (Wilga Tree) (HO26), which was already listed on the HO. This site is approximately 6.4 km north of the area of investigation.</p> <p>There were six historical heritage places identified in Natya. These comprised Public Hall (HO57), Tennis Courts (HO58), Station Ground (HO59), Hastings Tank (HO60), Freeland's Tank (HO61), and Ruins. All of these places, except the Ruins, were recommended for listing on the HO; Freeland's Tank was also recommended for the RNE. As the Ruins had been demolished since they were first identified, this site was not recommended for listing on the HO. The closest of these places to the area of investigation is Station Ground (HO59), at approximately 7.3 km to the southwest.</p> <p>A total of four heritage places were identified at Piangil, comprising Public Hall (HO87), Piangil Primary School (HO88), RSL Building (HO89), and House (HO90). All of these places were recommended for the HO, with RSL Building also being recommended for the RNE.</p> <p>The Tooleybuc Bridge, situated over the Murray River at Tooleybuc, was also identified. This was recommended for adding on the NSW planning scheme. Although the bridge was not recommended for the Swan Hill HO, as it is technically situated in NSW, the bridge was subsequently listed on both the VHR (HO765) and the HO (HO215). It is approximately 91 m to the southeast of the area of investigation.</p> <p>None of these historical heritage places intersect with the current area of investigation or inundation area.</p>
Edmonds (2006)	<p>SKM undertook a cultural heritage assessment for Menegazzo's Almond Project, on behalf of Timbercorp Limited, at Piambie. The study area comprised land between Heywood Lake and Haysdale, along the Murray Valley Highway. The study area is adjacent to the current area of investigation near Raven Lane, Kenley.</p> <p>The background history of the study area showed that no prior archaeological assessments had been undertaken in the study area. The closest assessment comprised a study within road reserve along the Murray Valley Highway between Boundary Bend and Natya, and no historical sites were recorded; this assessment does not intersect with the current area of investigation. Additionally, no listed historical heritage was identified within the study area.</p> <p>Two historical archaeological sites, Menegazzo's 1 (D7528-0001) and Menegazzo's 2 (D7528-0002) which were both dated to the 1920s solid settlement period, were recorded during the site survey. Of these two sites, D7528-0002 is the closest to the area of investigation, being approximately 65 m to the north. It comprises a rural rubbish dump (with modern usage). No evidence of any fencing dating to the 1880s was noted in the study area. The report noted that the lack of historical sites suggests that historical activity in the area was centred on a homestead on the Murray River, 'Narroween' (approximately 10 km northwest of the area of investigation), or on the Murray River floodplain.</p>
Ecological Associates Pty Ltd (2007)	<p>Ecological Associates Pty Ltd was engaged by the Mallee CMA to undertake Stage II investigations of water management options for the Murray River from Nyah to Robinvale. One section of the assessment area intersected with the current area of investigation along Burra Creek, between the River Murray Reserve and Piangil North.</p> <p>Burra Creek is described as an anabranch of the Murray River, which departs from the Murray River near Tooleybuc then meanders in a northerly direction for 54 km before re-joining the Murray River near Major Mitchell Lagoon. The land between the Murray River and Burra Creek is known as Macredie Island.</p> <p>The background history of the assessment area stated that no historical archaeological investigations have been undertaken in the study region.</p> <p>A site inspection was undertaken across the assessment area to identify historical heritage places, focussing on the priority options sites, including Burra Creek. The site inspection aimed to inspect obtrusive historical structures, surface sites, and potential subsurface archaeological sites. No historical heritage places or areas of historical archaeological potential were identified during the site inspection, likely due to ground surface visibility being limited to 10-15 per cent across the works locations. The site inspection was limited to works areas, which mapping indicates was to be located in the northwest</p>

Author	Summary
	portion of the forest near the current area of investigation. While the mapping is not clear enough to determine the exact locations investigated, it is clear that the fieldwork did not cover the entire current area of investigation.

## 2.2 Historical context

### 2.2.1 Historical background

The area of investigation is located on what was previously the Burra Burra and Piangil squatters runs. The boundary of the Burra Burra run extended to the north of Haysdale, east of Natya and north of Piangil. The eastern boundary was the Murray River. Both the Burra Burra and Piangil runs were established by William Coghill in 1846, and were gazetted in 1848. Coghill held both runs until 1860, when they were taken up by the Beveridge brothers. The Burra Burra run was then taken up by Hastings Cunningham in April 1866, followed by John Macredie in May 1866. It was eventually forfeited in 1880; The Piangil run by William Kaye, George Butchart and John George Dougherty in 1866, then by James McCulloch and Robert Sellar in 1870, by Edwin Brett and John Russell Ross in 1873, then by Macredie in 1873 (Spreadborough and Anderson 1983, pp. 209, 236). The island that is formed by the Murray River and Burra Creek (Macredie Island) was named after the John Macredie, who lived at Piangil station with his family (Friends of the La Trobe Library 1982).

The two present-day townships of Kooloonong and Piangil are located in the vicinity of the area of investigation. Kooloonong is located 13 km northwest of the area of investigation, and Piangil is located 13 km south of the area of investigation. The Kooloonong area was subdivided into blocks for soldier settlement in the early 1920s. The Piangil to Kooloonong railway line opened in 1920, and schools opened in the area in 1922 and 1929. Kooloonong contained two stores, a boarding house and a hall. Water was supplied via stock water channels from the Waranga and Grampians systems. A combination of drought, the Depression, over-cultivation, low farm incomes and sand-clogged water channels resulted in a decline in the Kooloonong district around 1941-1945, as sheep were no longer able to be farmed. In 2002 the Northern Mallee Pipeline was completed allowing water into the area again (Victorian Places 2015a; 2015b).

The Piangil area originally formed the Piangil pastoral run, located immediately south of the Burra Burra run. Farming in this area failed due to clearing and wind erosion after initially being reserved for a village settlement in 1894. Irrigation blocks were released in 1900-1910 when some irrigation of the lower river flats occurred. However, many of the blocks were relinquished by 1924, despite the Swan Hill to Piangil railway line opening in 1915. Areas along the river flats were cultivated for grape growing and away from the river flats, wheat farming was undertaken. In 1923 a school opened in Piangil, with a hall, churches and general store built at later dates (Victorian Places 2015a; 2015b).

During the early- to mid-1900s, as townships were established in the rural areas of the municipality of Swan Hill, intensive irrigation development took place to bring water to these townships; much of Macredie Island became state forest (Burra Forest) by 1929. However, the most significant population growth occurred in these areas after World War II. While the population continued to slowly increase from the 1950s into the 1970s, it remained relatively stable since the 1980s. In the mid-1990s, approximately 80 per cent of land in the municipality was utilised for agricultural and pastoral purposes. Sheep, meat and dairy cattle, orcharding, viticulture, and growing barley, wheat and potatoes (Bell 2013, p. 14; Sunraysia Environmental 2015, p. 37; Swan Hill Rural City Council 2011; Victorian Places 2015c).

The area of investigation on the Burra Creek floodplain is likely to have been impacted by pastoralism, logging activities, drainage construction, and tourism (Cusak 2000).

### 2.2.2 Historical maps and aerial imagery review

In 1851, the assistant surveyor's map of the Murray River between Swan Hill and the Darling River shows the present-day area of investigation and inundation area as comprising box forest, open gum forest, polygonum, 'bruron', and some flooded ground. When referring to Macredie Island, the land situated to the east of Winkles



Creek (Burra Creek), the map also states that the 'greater portion of this island is flooded during the winter months'.

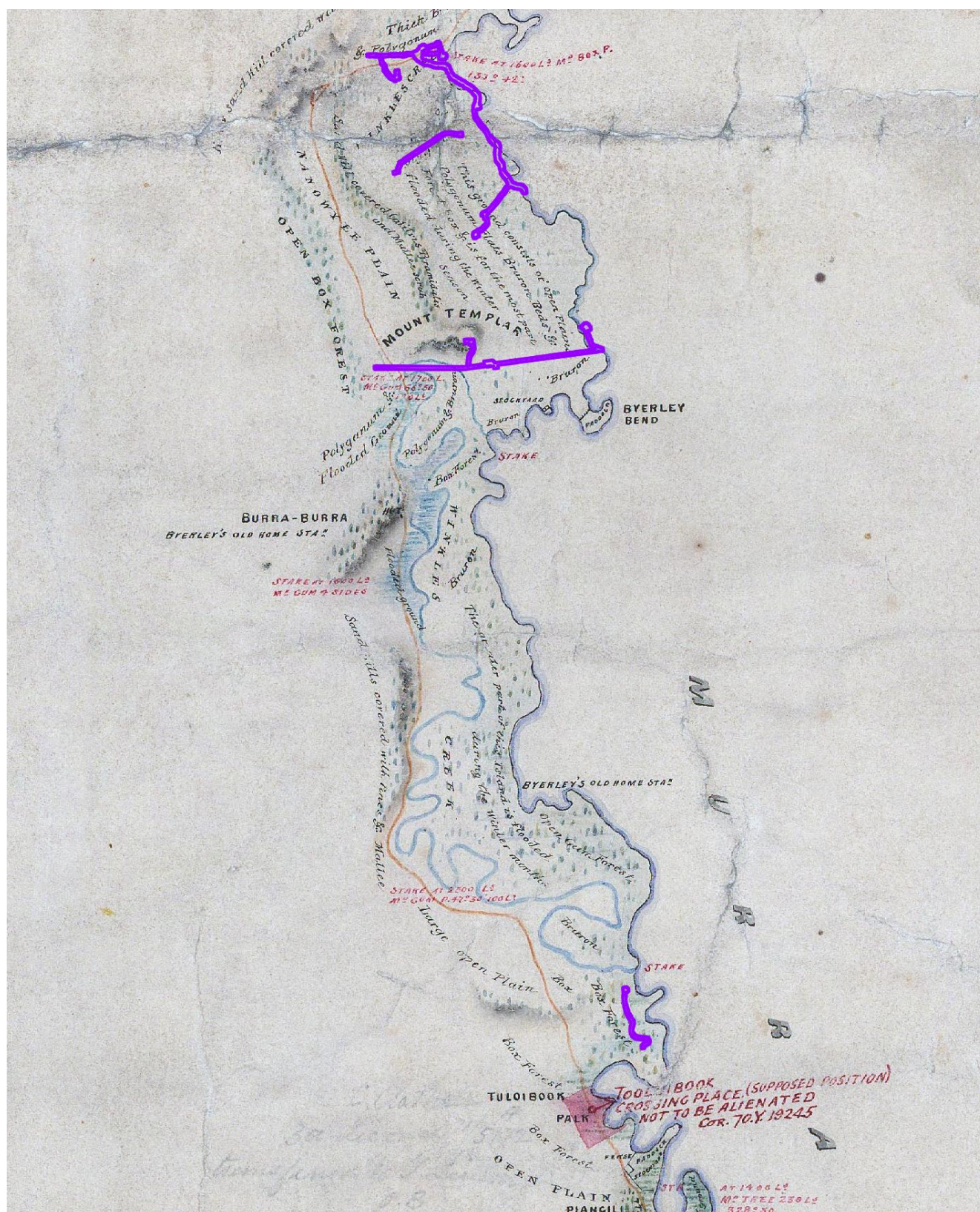


Figure 2.1: Surveyor's map from Billoo to Piangil, with approximate area of investigation location in purple (Prichard 1851)



The map also marks Mount Templar and the Nanowye Plain, to the west of Byerley Bend, along with a stockyard adjacent to the Murray River immediately west of Byerley Bend, while Byerley Bend itself comprised a fenced paddock. A roadway leads from Piangil in the south then northeastwards past a place marked as 'Biloo' to the north of the area of investigation (Figure 2.1). The presence of the stockyard and nearby fenced-off paddock suggests that at least part of the Murray River frontage was used for grazing at the time, likely related to the Burra Burra run.

The County of Tatchera map from 1884 shows that there were townships extant along the Murray River, including Piangil, on the road to Tooleybuc in NSW, and a smaller roadway to the west of Winkles Creek (Burra Creek) leading to Burra Burra, which was situated to the south of Mount Templar and the Nanowye Plain. Biloo is noted on the map in the north, adjacent to the roadway which generally follows the alignment noted in 1851 (Figure 2.2). Both the Murray River and Burra Creek appear to have changed courses somewhat since this map was produced.

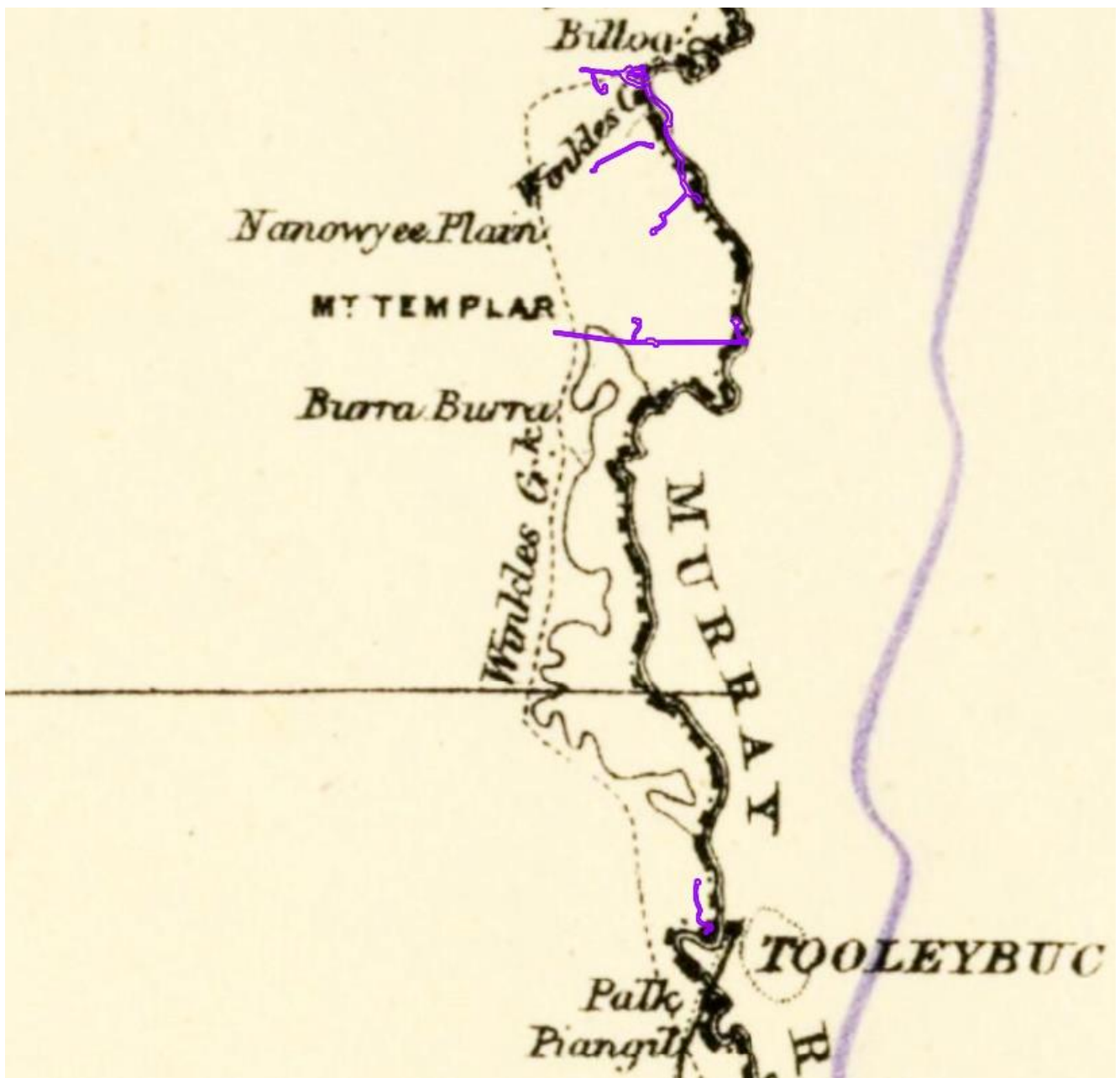


Figure 2.2: 1884 Tatchera county map, with the area of investigation outlined in purple; the Murray River appears to have changed course since this map was created (Department of Lands and Survey 1884)

A 1912 map of Murray River frontage grazing blocks shows that the area of investigation intersected with two large allotments used for grazing: allotments 30 and 31. The Burra pre-emptive rights land is excluded from grazing block allotment 30. While several buildings are included in the map near Piangil, there are no structures mapped within proximity to the area of investigation (Figure 2.3).

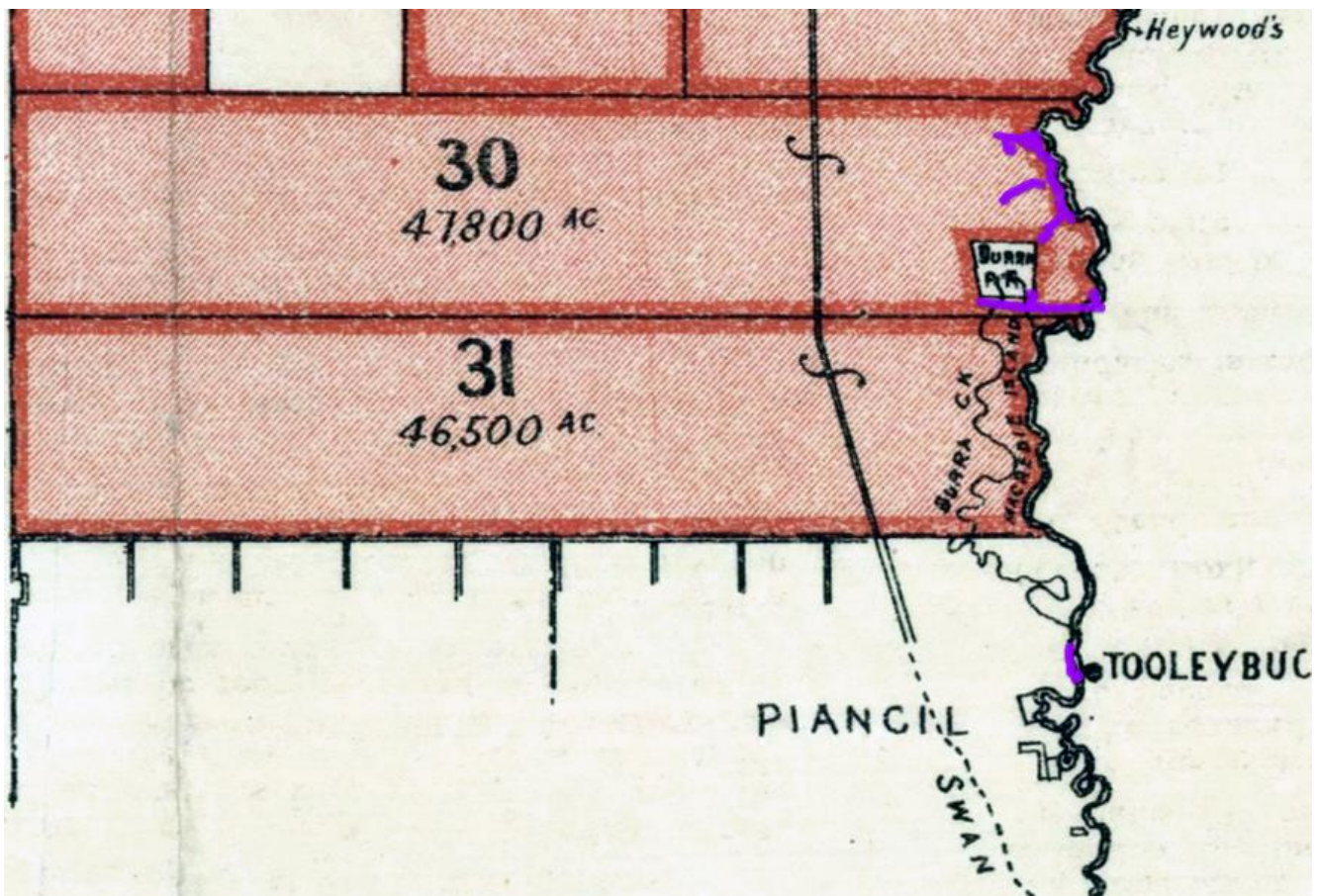


Figure 2.3: 1912 Grazing Blocks Murray River Frontages tender map, with the area of investigation outlined in purple (Butson 1912)

Surveyed allotments were included on the 1920 Tatchera county map, which shows that the old roadway was still extant, and marked as a track, and that Winkles Creek was then officially known as Burra Creek. 'Burra P.R.' (which refers to land purchased under pre-emptive right), Macredie Island, and Byerleys Bend were also all marked on the map. While the majority of allotments were surveyed to the west of what is now the Murray Valley Highway, only three allotments, 20, 20A and 21, and the Burra pre-emptive right allotment, intersect with the area of investigation to the west of Burra Creek. There are no allotments marked on Macredie Island. However, in the south where a majority of small allotments are marked between Coonimur and Piangil, the area of investigation intersects with allotments 126A and 135A (Figure 2.4).



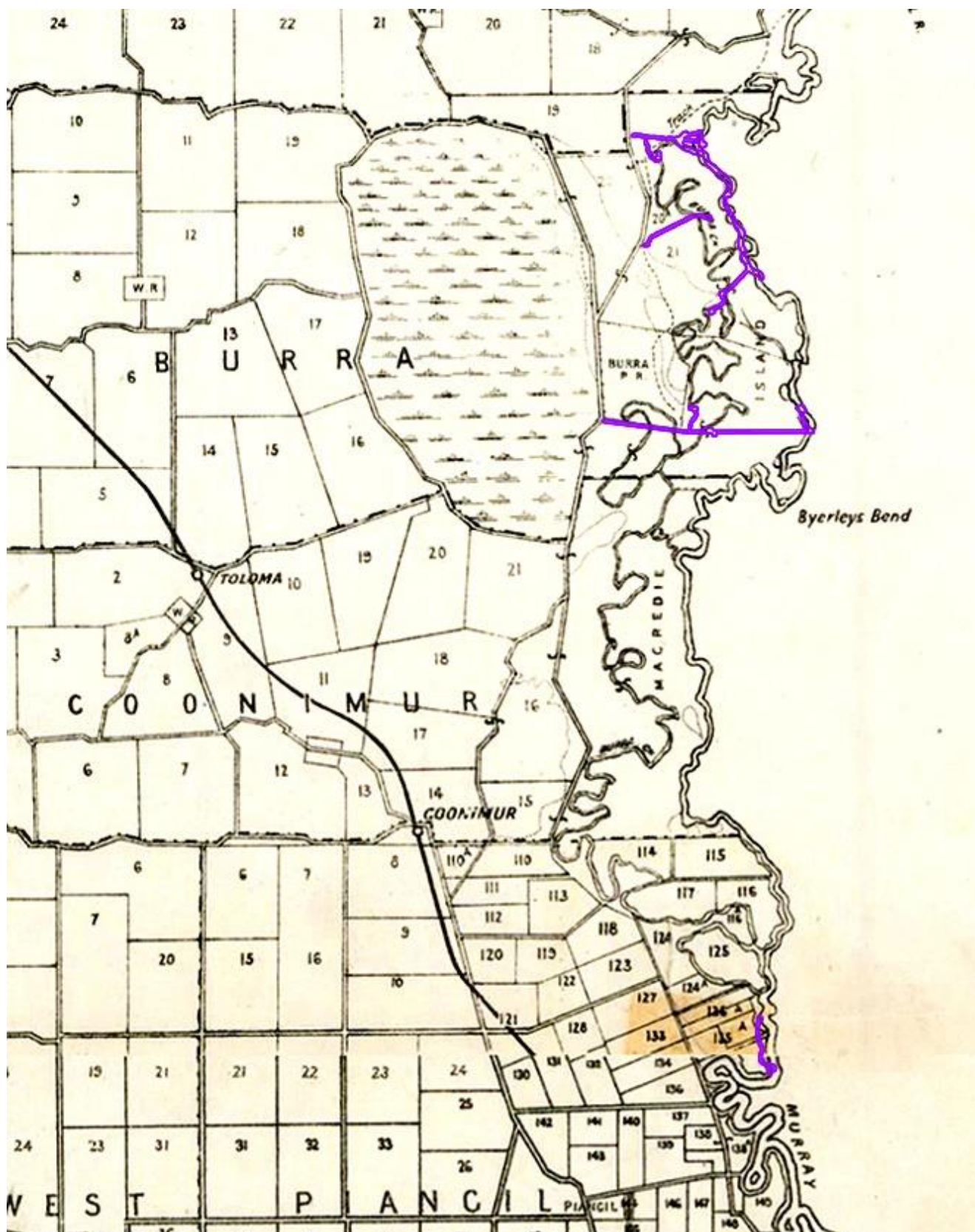


Figure 2.4: 1920 Tatchera county map, with the area of investigation outlined in purple (Department of Lands and Survey 1920)



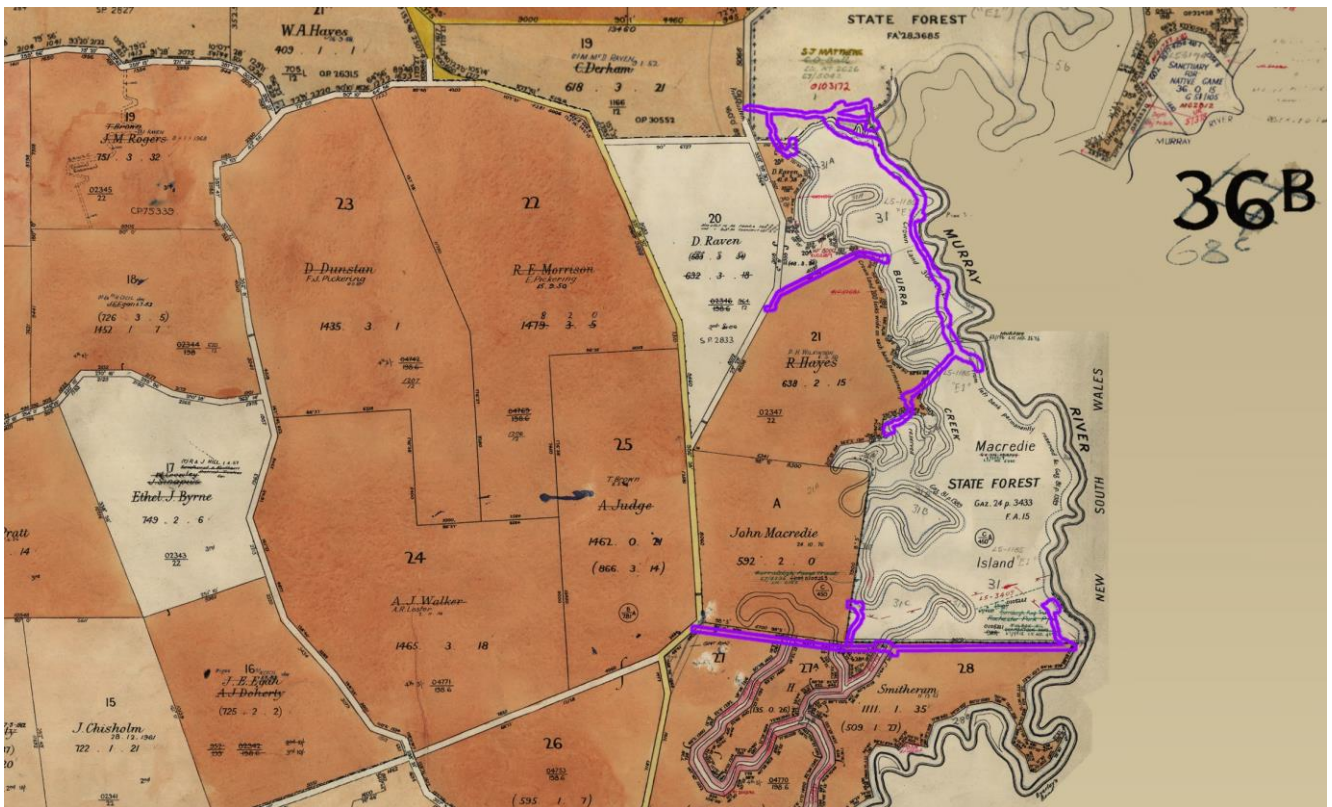


Figure 2.5: A combined map of the Parishes of Piambie (1945) and Burra (1925), showing allotments near the northern section of the area of investigation (after Butson 1925; Department of Lands and Survey 1946)

The Burra Parish map of 1925 shows that the area of investigation intersects with the roadway north of allotments 20, 20A and 20B (owned by David Raven, purchased under the World War I Soldier Settlement scheme (Public Record Office Victoria n.d.-a)), allotment 21 (owned originally by Roderick Hayes, which is annotated later as being owned by Peter Hargreaves Wilkinson (Public Record Office Victoria 2016a)), allotment A (previously noted as the Burra pre-emptive right allotment, with John Macredie being the owner), allotments 27, 27A and 28 (owned originally by soldier-settler Horatio Smitheram (Public Record Office Victoria n.d.-b)), and State Forest on Macredie Island.

The 1945 Piambie Parish map, at the northern end of the area of investigation, shows that the area of investigation follows the roadway adjacent to allotment 19 (originally owned by Catherine Derham, then later annotated as Melville McDonald Raven being the owner (Public Record Office Victoria 2016b)) in the west, and into State Forest in the east (Figure 2.5).

However, by 1953, the Tatchera map shows that the land between Burra Creek and the Murray River comprises State Forest in the north; this still includes the northern part of Macredie Island. From Byerlay's Bend southwards, the land has now been divided into rural allotments; the smaller allotments to the northeast of Piangil predominantly remain along the same alignments, although some of the allotment numbering has changed. The area of investigation takes up part of the State Forest, along with sections of allotments 20, 20A, 20B, 21, and 21A (the Burra pre-emptive right allotment) in the north, and allotments 126, 126A, 135A and 135B in the south (Figure 2.6).

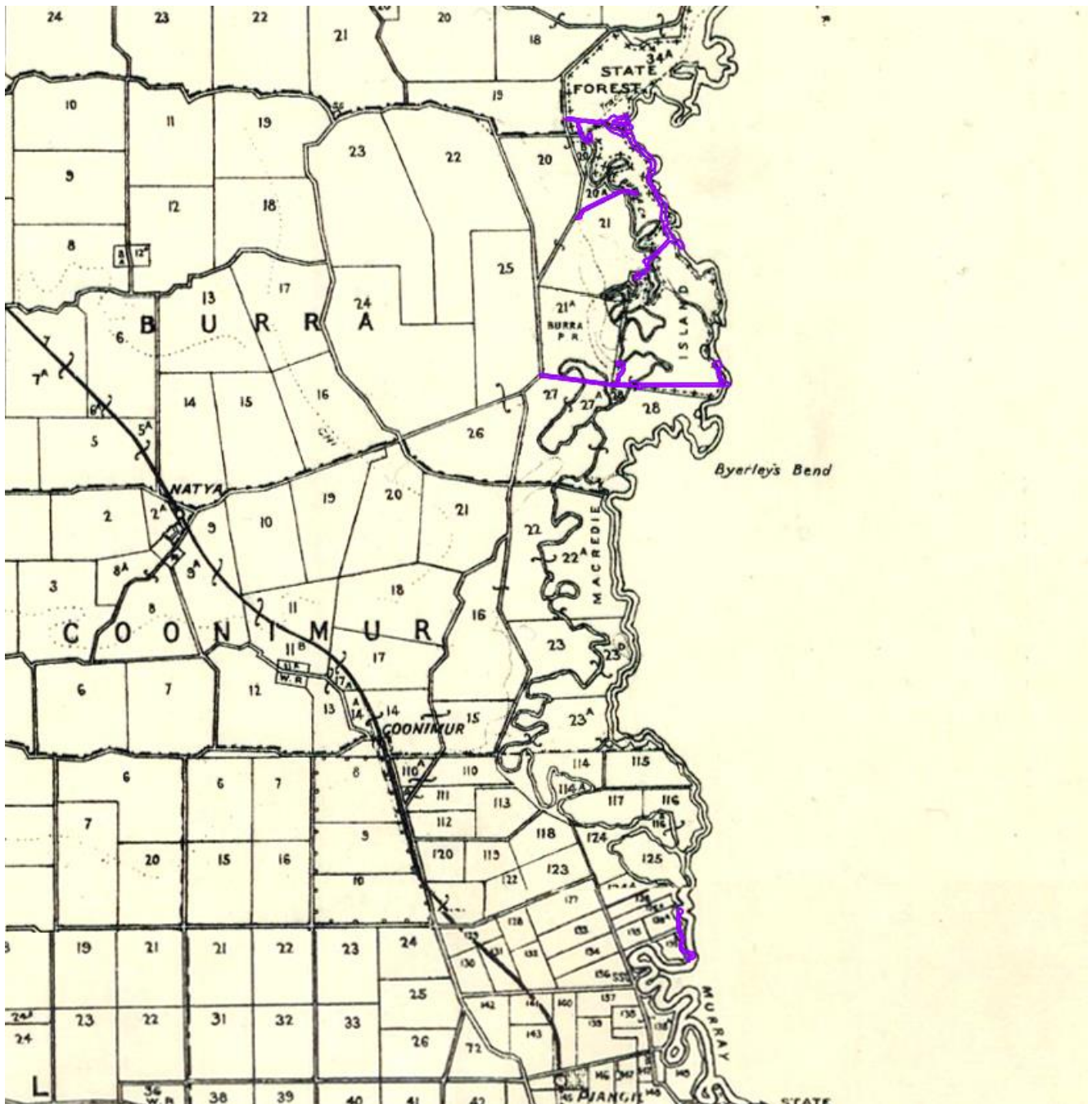


Figure 2.6: 1953 Tatchera county map, with the area of investigation outlined in purple (Department of Lands and Survey 1953)

The Piangil Parish map of 1961 shows that the area of investigation intersects with allotments 126 (originally owned by J.J. Figg), 126A (F. Smith), and 135A (F. Wolf). It runs between Burra Creek where it meets the Murray River in the north to the road to Tooleybuc at the Murray in the south (Figure 2.7).



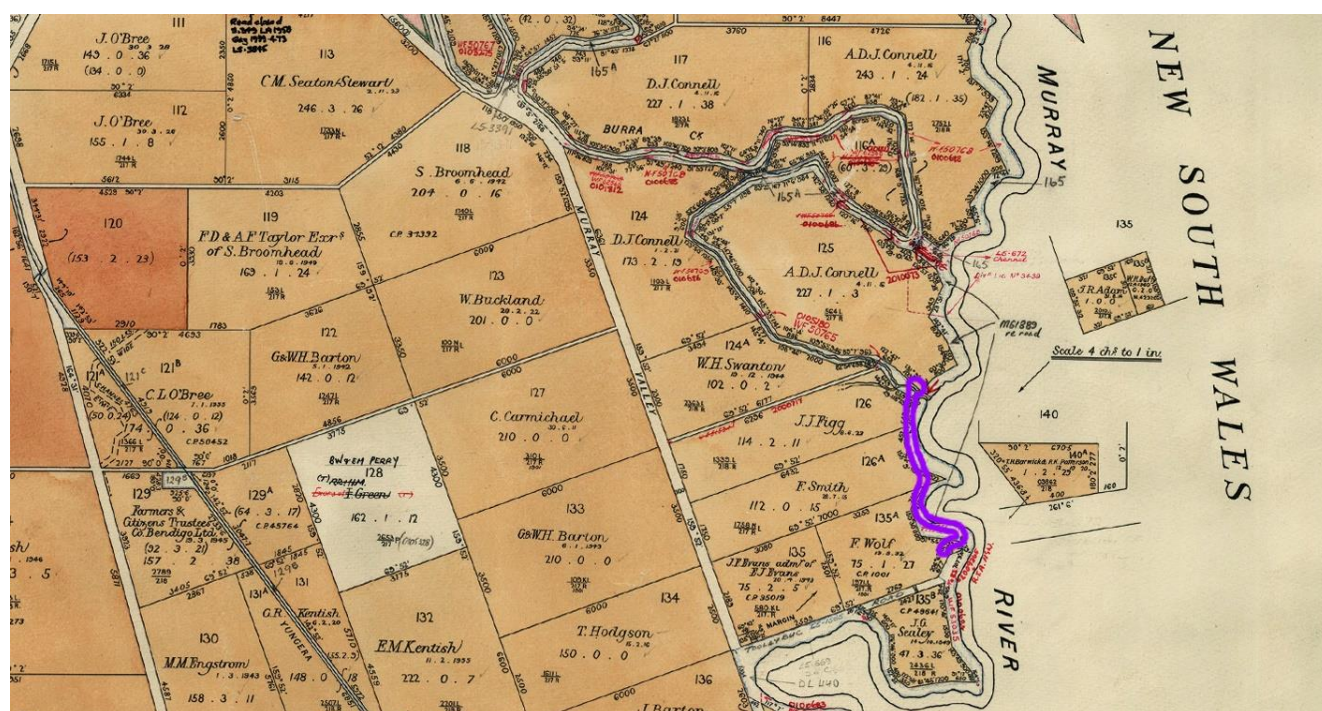


Figure 2.7: Parish of Piangil (1961), showing allotments within the vicinity of the southern section of the area of investigation (Department of Lands and Survey 1961)



Figure 2.8: 1946 aerial imagery, northern part of area of investigation outlined in purple (Aerial Survey of Victoria 1946)

Aerial imagery from 1946 shows that the northern section of the area of investigation follows an unnamed road leading to what is now the southern end of the State Forest (in the south). It also appears to follow access tracks



through parts of the State Forest, where the tracks are not obscured by tree cover. There are no obvious structures within the area of investigation, although bridges are likely to have been present where tracks cross Burra Creek (Figure 2.8).



Figure 2.9: 1947 aerial imagery, area of investigation near Tooleybuc outlined in purple (Victoria State Rivers and Water Supply Commission 1947)

Aerial imagery dating to 1947 shows that the southern part of the area of investigation crosses a predominantly tree-covered area between Burra Creek and the Murray River. The road to Tooleybuc is on the same alignment as that used today, at the south end of the area of investigation. There is little open space, and no evidence of cultivated land within the area of investigation, although farmland is visible to the west of Burra Creek. However, there appears to be a roadway adjacent to the Murray River in alignment with the area of investigation, heading northwards from Tooleybuc Road. There are no obvious structures within the area of investigation (Figure 2.9).

Today, modern aerial imagery shows that there is a definite divide between the State Forest identified on the historic maps (River Murray Reserve), and the farmland to its west. The roadways and access tracks that the area of investigation aligns with can also be clearly seen, as can Burra Creek. There appears to be a small area of land that is free of trees along the northernmost access track in the Reserve, with several groups of trees in a row, but there do not appear to be any structures within this area; while there are some structures visible to the west of Burra Creek, no buildings are observable within the area of investigation itself. There is a jetty on the Murray River to the east of the southeastern corner of the area of investigation, but its age is unknown. The roadway running between the Murray Valley Highway and the jetty is immediately adjacent to an irrigation channel, which intersects with part of the area of investigation along this alignment. To the south, near Tooleybuc, the area of investigation also follows an access track through tree-covered area. No structures appear to be present amongst the medium-to-dense tree cover found across the area of investigation.

## 2.3 Predictive statement

Following a search of the above registers, review of the previous literature and analysis of relevant reports, the following predictive statements can be made in relation to the area of investigation and the inundation area:

- The most likely site type in the area of investigation would be places associated with early agricultural or pastoral activities, logging, and water management practices
- There is moderate potential for previously unidentified historical heritage to be present within the area of investigation, due to the possibility of remnant fences at the eastern end of the large section of area of investigation as per the 1851 survey map, and possible pastoral or rural heritage places associated with the rural allotments that intersect with the area of investigation.

## 2.4 Summary of desktop findings

There are no listed historical heritage places that intersect with the area of investigation or the inundation area. Examination of the *Rural City of Swan Hill Heritage Study Stage II* in combination with a review of the parish maps and aerial imagery review has not identified any potential historical heritage places or archaeological sites within the area of investigation or inundation area.

There is moderate potential for previously unidentified historical heritage items to be present within the area of investigation and the inundation area, from the background history of the area. Site types most likely to be identified in the area of investigation and the inundation area would be heritage places or archaeological sites associated with early agricultural or pastoral activities, logging, and water management practices.



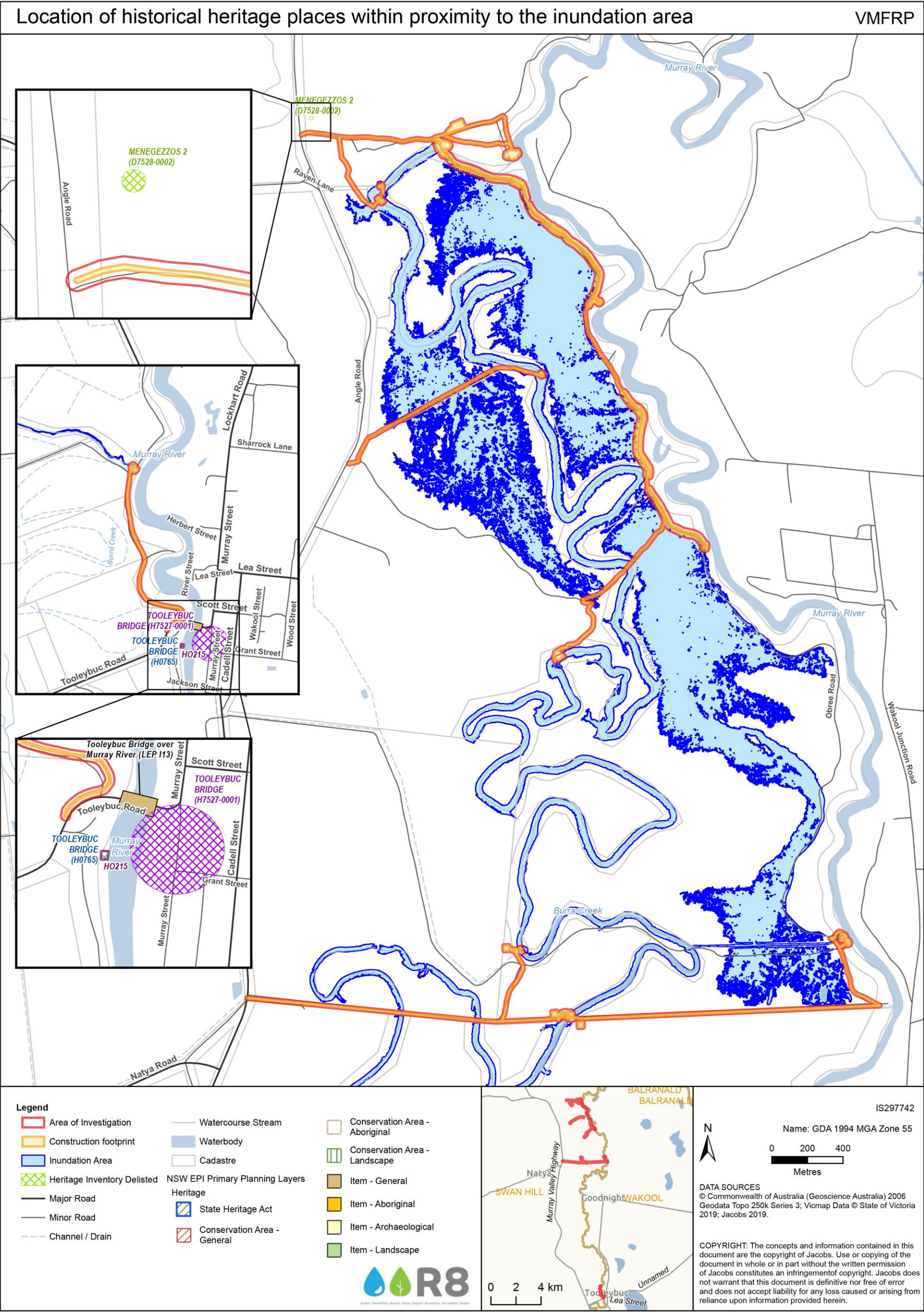


Figure 2.10: Location of historical heritage places within proximity to the area of investigation and inundation area



### 3. Impact assessment

#### 3.1 Proposed works

##### 3.1.1 Main works

The project aims to restore a more natural inundation regime and improve ecological condition across approximately 330 ha of high ecological value Murray River floodplain at Burra North and a further 73 ha of creek habitats at Burra South, through the construction of new infrastructure, the modification of existing infrastructure and removal of some existing barriers to flow within Burra Creek. The project is designed to enable managed inundation up to a design water level of 58.7 mAHD at Burra North and up to the top of bank of Burra Creek at Burra South using water from both natural flood events and pumping from the Murray River.

Specifically, the project involves the following main components:

- Regulator B1 – A large regulator will be installed in Burra Creek at the northern / downstream end of the Burra North managed inundation area, and is designed to enable inflows (backflow) from the Murray River into the creek, the retention of water in the managed inundation area and the return of managed floodwaters to the Murray River on completion of a managed event.
- Regulator B2 – A small regulator will be installed in Burra Creek at the southern / upstream end of the Burra North managed inundation area, and is designed to enable the retention of water in Burra North and to prevent flows into private land at Burra South during a managed event.
- Regulator B4 – A small regulator will be installed within an existing containment bank in Burra Creek at the southern / upstream end of the creek near its junction with the Murray River near Tooleybuc, and is designed to allow flow into Burra Creek for supply of water during a natural event and to enable pumping through the regulator when required.
- Drop structure - A drop structure will be installed at the northern / downstream confluence of Burra Creek and the Murray River, to control erosion during managed releases from Burra Creek to the river, including some modification of the western bank of the Murray River and placement of 0.3 m thick reno mattress down the river bank to approximately 50 mAHD.
- Containment banks - Approximately 2.48 km of containment bank (four sections, Section A, B, C and D) will be constructed by raising existing access tracks at Burra North to a constant level of 59.12 mAHD to facilitate a managed water level of 58.7 mAHD with 300 mm freeboard and 120 mm wearing course. Access tracks will be reinstated on top of the proposed containment banks and surfaced with gravel, with passing bays at necessary locations.
- Spillways – Four spillways (approx. 400 m total combined length) at an upstream level of 58.8 mAHD will be incorporated into the containment banks to enable controlled release of larger flows prior to overtopping of the containment banks.
- Temporary pump hardstands – A 6 m x 6 m hardstand area will be constructed at Regulator B4 to support temporary pump infrastructure, and an existing private pump station site at Spillway 4 will be modified to make it suitable for temporary pumping by installing a 6 m x 6 m hardstand and rock-lining in the existing pump discharge pool for erosion control. Temporary pump infrastructure will include a trailer-mounted rig with a suction pipe extending into the Murray River, which would be brought onto site as required.
- Blockage removal - Four existing blockages (Banks 1, 2, 3 and 4) within Burra Creek at Burra North will be removed and one existing block bank (Bank 5) within Burra Creek at Burra North will be modified. Removal of blockages is proposed where there is considered to be no adverse impact on existing water licence holders, while modification rather than removal of Bank 5 is proposed to enable an existing water licence holder to continue to pump suction water from pooled water in the creek.

A summary of the design specifications for each of the regulators is presented in Table 3.1.

Table 3.1: Summary of regulator design specifications

Regulator	Open/Close or regulate flow	Proposed design	Proposed gates
B1	Regulate	6 No. 1800W x 3600H to deck	Split leaf gates
B2	Open/close	2 No. 1800W x 1800H box culverts	Penstock with manual actuator
B4	Open/close	1 No. DN1500 RC pipe	Penstock with manual actuator

The following design philosophy has been applied:

- The regulating structures are designed to allow natural flows to pass unhindered, to and from the floodplain when the structures are not in use (fully open).
- The arrangement of regulating structures, containment banks and overflow spillways have been developed to minimise the potential for erosion over the whole range of flow conditions.
- The regulating structures are designed to provide fish passage when not in use (fully open).

#### 3.1.1.1 Construction laydown areas

Temporary construction work sites will include laydown areas at Regulator B1 (approx. 50 m north east of the regulator work site), Regulator B2 (two alternative locations: approx. 15 m northwest of the regulator work site on public land and 40 m southeast of the regulator work site on private land) and Bank 5 (approx. 50 m west of the work site).

#### 3.1.1.2 Access tracks maintenance

The proposed access arrangements for construction and operation of the project will involve use of existing access tracks. Maintenance will need to be undertaken to the existing access tracks to ensure they are suitable for use during construction and operation. Track maintenance will involve grading and applying additional road base to the surface. The construction footprint provides for a 5 m wide corridor along existing access tracks to carry out maintenance works.

#### 3.1.2 Key construction activities

Construction activities would occur within the construction footprint identified in Figure 1.1–Figure 1.3. Construction activities would include:

- Establishment of construction sites, including removal of vegetation, stripping and stockpiling of topsoil, establishing temporary parking and truck turnaround areas, laydown and stockpiling areas
- Removal of existing structures / block banks where required
- Construction / installation of new structures.

Construction will involve use of vehicles and machinery such as trucks, excavators, and access equipment.

Importation of construction materials, including regulators and imported soils, will comply with Parks Victoria consent under Section 27 of the *National Parks Act 1975* and the future *Environment Protection Act 2017* (due to commence on 1 July 2020).

A Construction Environmental Management Plan (CEMP) will be prepared for the works and will detail the measures to avoid and minimise impacts during construction. Once construction of regulators, containment banks and associated works are complete, all waste and spoil will be removed from the sites and disposed of as required by the proposed CEMP.



## **3.2 Potential impacts**

### **3.2.1 Proposed works**

There are no listed historical heritage places that intersect with the area of investigation. As such, the proposed works (Section 3.1) will not impact upon any known historical heritage places.

### **3.2.2 Inundation area**

There are no listed historical heritage places that intersect with the inundation area. As such, the proposed inundation area (Section 3.1.1) will not impact upon any known historical heritage places.

There is moderate potential for previously unidentified historical heritage items or archaeological sites to be present within the area of investigation and the inundation area, based on the background history of the area. Site types most likely to be identified would be heritage places or archaeological sites associated with early agricultural or pastoral activities, logging, and water management practices.

## 4. Approval requirements

The approvals requirements for potential archaeological sites within the area of investigation is provided in Table 4.1.

If the scope of works changes, this heritage assessment will need to be updated.

Table 4.1: Statutory requirements for heritage within the area of investigation

Project element	Statutory requirements
Entire area of investigation	<p>Discovery of archaeological sites - under Section 127 of the <i>Heritage Act 2017</i>, If an archaeological site is discovered in Victoria during construction or excavation on any land, the person in charge of the construction or excavation must as soon as practicable report the discovery to HV.</p> <p>Under the <i>Heritage Act 1977</i>, should any unexpected historical materials, features or deposits be discovered in NSW at any time prior to, or during, the project, the person in charge must stop work, protect item and inform Murray River Council and the Heritage Division of the Office of Environment and Heritage as soon as practicable. The relic provisions in the Act also require that an excavation permit be obtained from the Heritage Council of NSW prior to commencement of works if disturbance to a site with known or potential archaeological relics is proposed.</p>

## 5. Historical heritage recommendations

### 5.1 Recommendations and project risk

Due to the possibility for historic archaeology to be impacted, it is recommended that a Historical Heritage Assessment (HHA) be undertaken for the project.

This should include a field survey to identify further historical archaeological sites and any unidentified historical heritage places, and a significance assessment of these potential historical places.

If any historical heritage items or archaeological sites are identified as part of the HHA, a Heritage Impact Assessment (HIA) would be required which would include the:

- Assessment of impacts on all historical heritage sites
- Detailed identification of mitigation measures and approval requirements
- Heritage Impact Statement(s).

All historical archaeological places in Victoria are protected under the *Heritage Act 2017*, whether they are registered or not. In NSW, the *Heritage Act 1977* protects relics which are defined as: 'Any deposit, artefact, object or material evidence that relates to the settlement of the area that comprises NSW, not being Aboriginal settlement; and is of State or local heritage significance'.

## 6. Mitigation measures

High level mitigation measures may apply to the project, and are outlined in Table 6.1. These can be confirmed after the HHA.

Table 6.1: Proposed project activities and specific management measures for the heritage places within the area of investigation

Proposed activities	Project element	Mitigation measures
General activities	Entire area of investigation	<p>General mitigation measures to be implemented across the area of investigation:</p> <ul style="list-style-type: none"> <li>Historical heritage awareness training should be completed as part of the site induction for all personnel and/or contractors prior to the commencement of construction works to ensure:               <ul style="list-style-type: none"> <li>an understanding of where all heritage places are located within the area of investigation</li> <li>an understanding of the potential heritage places that may be impacted during the project</li> <li>the procedures required to be undertaken in the event of discovery of historical heritage material, features or deposits, or the discovery of human remains</li> </ul> </li> <li>If an archaeological site is discovered in Victoria during construction or excavation, the person in charge of the construction or excavation must as soon as practicable report the discovery to HV</li> <li>If an archaeological site is discovered in NSW during construction or excavation, the person in charge of the construction or excavation must as soon as practicable report the discovery to Murray River Council and the Heritage Council of NSW</li> <li>A copy of this report should be kept onsite and on file with the project records. All contractors and/or project staff should be made aware of the heritage status of the heritage places in the area of investigation prior to works taking place.</li> </ul>

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