APPENDIX L

Aboriginal Heritage Due Diligence Assessment

Historical Heritage Assessment (niche Environment and Heritage)

niche
Environment and Heritage

Six Mile Creek Dam Safety Upgrade Project

Aboriginal Cultural Heritage Due Diligence Assessment

Prepared for SMEC and Seqwater

November 2018

Aboriginal Cultural Heritage Risk Assessment

This Aboriginal Cultural Heritage Risk Assessment presents an assessment of the risk a proposed activity may have to cause harm to Aboriginal cultural heritage as defined in the *Aboriginal Cultural Heritage Act 2003*, *Section 8*. It addresses "the matters a court may consider to decide whether a person has complied with the cultural heritage duty of care" *(Aboriginal Cultural Heritage Act 2003, Section 23 [2])*. This is achieved through review of the nature of the proposed activity, past land use, a consideration of known Aboriginal cultural heritage and archaeological and historical evidence located within and in proximity to the proposed activity area, and presentation of recommendations for consultation with relevant Aboriginal parties to ensure your activity is delivered "in compliance with cultural heritage duty of care guidelines" *(Aboriginal Cultural Heritage Act 2003, Section 23 (3)(iv)).*

This assessment is not intended to replace the need for a detailed Aboriginal cultural heritage assessment, Cultural Heritage Management Plan, or other agreement, or consultation with Aboriginal parties or bodies about your activity, as may be required under the *Aboriginal Cultural Heritage Act 2003*.

What is the nature of the activity?	SMEC is undertaking an IAR on behalf of Seqwater for the Six Mile Creek Dam Upgrade Project (the Project). This upgrade will require: • The construction of a temporary coffer dam. • Lowering of the lake level. • Removal of the existing spillway. • The spillway foundations will be improved and the spillway rebuilt. • The left and right embankments will also be removed and rebuilt from natural foundations. • The footprint of the upgrade will be generally the same as the existing dam.
Are there any previously recorded Aboriginal cultural heritage sites or registered Aboriginal places within or within proximity (e.g. 500 m) of the boundary of the Project activity area?	**Yes.** DATSIP search (#40006) dated 23 July 2018 (Annex 2) included the Project activity area and a 500 m buffer. The search returned one record of a previously recorded Aboriginal heritage site present within the Project activity area. The site is entered in the Aboriginal Cultural Heritage Database as KC:G17. KC:G17 is recorded as a cultural site/earthen arrangement. No additional descriptive information on the nature of the site was available. The accuracy of the site's location is given as "estimated" meaning the original recording did not include any accurate information as to the physical location of the site. The estimated site coordinates included in the database entry place the site within the area currently designated as a possible coffer dam during the Project activities. Enquiries made to DATSIP indicated the KC:G17 site information was obtained from a report or publication by Robin A. Wells. Well's (2003) publication *In the Tracks of the Rainbow* was investigated though no

	specific reference to this ceremonial ground was identified, nor was a ceremonial ground indicated on the publication's map of the region showing important cultural sites. Further information on KC:G17 may be held elsewhere, including in a report or within other information held by the Aboriginal Party. This information was not available for this assessment. Despite the lack of publically available information about the KC:G17 site, based on the site type, a number of observations can be made. Cultural sites/earthen arrangements are generally considered to be highly significant to Aboriginal people due to their role in ceremony. Section 6.1 of the Duty of Care Guidelines provide this description: "Ceremonial places: The material remains of past Aboriginal ceremonial activities come in the form of **earthen arrangements** or bora grounds and their associated connecting pathways, and stone circles, arrangements and mounds. Indigenous people used these places for ceremonies, including initiation and inter-group gatherings." Therefore the site is likely to be significant for its physical presence (i.e. the physical location and form of the site) as well as the intangible values associated with the place, which may extend from the physical location shown to nearby areas. **Note**: The Aboriginal Cultural Heritage Database and Register was established under Part 5 of the ACHA. It is searchable via the DATSIP online portal. Since the ACHA commenced in 2004, it has not been mandatory to record known Aboriginal cultural heritage in the Database or Register. On this basis, such searches are limited in their accuracy to adequately inform any assessment for significant Aboriginal objects or areas, or for previously recorded sites of archaeological or historic significance.
Who is the Aboriginal party for the Project activity area?	The proposed activities will be undertaken within the area of the: **Kabi Kabi First Nation people** Queensland South Native Title Services Limited PO Box 10832, Adelaide Street BRISBANE QLD 4000 Phone: (07) 3224 1200 Freecall: 1800 663 693 Fax: (07) 3229 9880 Email: reception@qsnts.com.au **Note**: The Aboriginal Party is a recognised term under the ACHA that broadly means Aboriginal parties who should be involved in the assessment and management of cultural heritage. Refer to https://www.datsip.qld.gov.au/people-communities/aboriginal-torres-strait-islander-cultural-heritage/aboriginal-torres-strait-islander-statutory-parties for more information.

Is there a Cultural Heritage Body for the Project area?	**No.** **Note**: The role of the Cultural Heritage Body is to identify the Aboriginal parties for an area and to serve as the first point of contact for cultural heritage matters. Refer to https://www.datsip.qld.gov.au/people-communities/aboriginal-torres-strait-islander-cultural-heritage/cultural-heritage-bodies for more information.
Has the Project activity area been subject to Surface Disturbance or Significant Ground Disturbance?	**Yes**. The majority of the Project activity area has been subject to Significant Ground Disturbance and Surface Disturbance. The extent of past ground and surface disturbance across the Project activity areas was determined through analysis of historic aerial imagery from the 1950s until the present day. Analysis demonstrates that vegetation clearance and earthworks occurred prior to and during the construction of the original dam wall and subsequent expansion of the water treatment plant. These past activities have caused Significant Ground and Surface Disturbance. NB: Areas of potential remnant vegetation are located along Six Mile Creek (north of the spillway), south of the left embankment, and north of Collwood Road in an area designated as 'Area Available for Construction (if required)' (refer to Annex 5).
Results of historical aerial photo analysis	An analysis of historic aerials from 1953, 1967, 1974, 1984, 1993, 2002, 2007 and 2017 was undertaken to identify the extent of Surface Disturbance and Significant Ground Disturbance that has occurred (refer to Annex 3). Identifying the extent of disturbance is important because where an activity is proposed in an area where the ground has previously been disturbed, it is generally unlikely that any evidence of Aboriginal cultural heritage will remain. The earliest aerial photograph of the Project activity area dates to 1953.
Will the proposed Project activities disturb the ground surface?	**Yes**. The construction of permanent works for the spillway and embankment upgrades (removal and reinstallation) will cause ground disturbance in the Project activity area. As will the establishment of temporary works for the Project, such as a coffer dam and associated pump station, stock piles, laydown areas, and access roads.

Are the proposed Project activities consistent with previous ground disturbance?	**Yes.** The installation of the original dam wall and associated infrastructure caused Significant Ground Disturbance in the past. Activities proposed for these areas are mostly consistent with previous ground disturbance. **No.** The proposed activities do however vary in their scope and scale and therefore may cause additional Ground Surface Disturbance. The area north of Collwood Road designated 'Area Available for Construction (if required)' (see Annex 5) is an area of potential remnant vegetation. Any activities in this area will not be consistent with previous ground disturbance. The cleared area at Camp Cooroora will be used as a 'borrow pit' (see Annex 5). Between 30,000 and 40,000 cubic metres of clay materials will be removed from this site to be used in construction activities. This proposed activity is inconsistent with the previous ground disturbance at this location. It appears limited disturbance occurred during the construction of a now disused bridge/culvert at the entrance to the Noosa Water Treatment Plant. The level of disturbance is limited to the former road alignment and culvert installation within the drainage line. While this would constitute previous Significant Ground Disturbance the full area of disturbance cannot be accurately confirmed by review of historic aerial imagery. Especially considering that the now dislodged culvert is no longer located where it was originally installed.
Are there any high risk Landscape Features within the Project activity area?	**Yes.** There are 'Landscape Features', as described in Section 6.2 of the Duty of Care Guidelines, present in the Project activity areas. Such features are commonly identified as places of importance to Aboriginal people. Remnant vegetation occurs, along Six Mile Creek, immediately adjacent to the Project activity area. However, the proposed activities should not impact this remnant vegetation. Remnant vegetation also occurs north of Collwood Road and south of the left embankment. This vegetation could be impacted by the proposed activities.

<table>
<tr><td></td><td colspan="2">Six Mile Creek (waterway) is a Landscape Feature as described in Section 6.2 and may have intangible cultural heritage value to Aboriginal people.</td></tr>
<tr><td></td><td><u>Landscape Feature</u></td><td><u>Yes / No</u></td></tr>
<tr><td></td><td>Rock outcrops</td><td>No</td></tr>
<tr><td></td><td>Caves</td><td>No</td></tr>
<tr><td></td><td>Foreshore and coastal dunes</td><td>No</td></tr>
<tr><td></td><td>Sand hills</td><td>No</td></tr>
<tr><td></td><td>Areas of biogeographical significance, such as natural wetlands</td><td>No</td></tr>
<tr><td></td><td>Permanent and semi-permanent waterholes, natural springs</td><td>Yes – Six Mile Creek</td></tr>
<tr><td></td><td>Particular types of native vegetation</td><td>Yes –remnant vegetation is present north of Collwood Road, south of the left embankment, and north of the spillway on Six Mile Creek</td></tr>
<tr><td>Are there any political or community issues or concerns in relation to the Project activity area?</td><td colspan="2">No.</td></tr>
<tr><td>Does the site visit confirm the findings of the due diligence desktop assessment?</td><td colspan="2">Yes.

Visual inspection of the Project area on 18 July 2018, confirmed that large areas of the Project activity area have been subject to Significant Ground and Surface Disturbance owing to vegetation</td></tr>
</table>

	clearance and the construction of the dam, associated infrastructure and buildings, and roadways (Annex 4). The desktop assessment was confirmed by the site inspection, by an appropriately qualified archaeologist. In some areas however there remains a high risk that the proposed activities will disturb Aboriginal cultural heritage objects/sites (see Annex 4). These are the three areas containing remnant vegetation. In addition, the removal of 30-40,000 cubic metres of sediment from Camp Cooroora will be inconsistent with previous land use. There exists a risk that the proposed activity will disturb Aboriginal cultural heritage objects/sites at this location (see Annex 1). The visual inspection focused on validating the results of the desktop assessment, especially the effects of past land use disturbance at the proposed activity areas. No formal archaeological survey was undertaken, although the visible presence of any archaeological evidence or environmental indicators for surface and subsurface archaeological potential were considered during the visual inspection. Evidence of past ground and surface disturbance was evident. Clearance of vegetation and the installation of infrastructure visible in the aerial photography were confirmed by on site observations. No archaeological evidence was noted in the proposed activity areas.
What is the likelihood that the activity will harm Aboriginal cultural heritage?	**Potentially.** The proposed activities have the potential to damage or destroy Aboriginal cultural heritage, if it exists, in a number of areas: - The proposed activities have the potential to impact the values associated with KC:G17 – the previously recorded location of the Six Mile Creek Ceremonial Ground. Based on information available, the estimated location of site is now underwater and within the current dam area. If the site was located within the current dam footprint, it is probable there is no physical evidence left of the site. However, as a ceremonial ground, the former location of the ceremonial ground may still be considered of importance to Aboriginal people. - The proposed 'Area Available for Construction (if required)' north of Collwood Road is within an area of remnant vegetation. The presence of remnant vegetation within the Project activity area may indicate a higher risk for Aboriginal

	cultural heritage. Remnant vegetation was noted north of the dam spillway in a previous ecological review of the Lake MacDonald Dam site area (URS 2014). The ecological assessment conducted for this IAR was not however available for consideration in this Aboriginal cultural heritage due diligence assessment. - There exists potential for subsurface archaeological evidence of Aboriginal occupation and use of the area within the Project activity area at Camp Cooroora. While the area has been previous subject to past surface disturbance due to some tree clearing, the location of Camp Coorora in an elevated position in close proximity to a possible ceremonial ground located along the former major creek line (Six Mile Creek) suggests a higher risk for physical evidence of Aboriginal occupation, such as camp sites, to still exist in the general area. The proposed activity at Camp Coorora is the removal of 30-40,000 cubic metres of clay materials from within the currently cleared area directly above Lake MacDonald and positioned above what would have been the gradual slope down to the recorded ceremonial ground. This removal of soils will result in substantial changes to ground surface levels at this location. This activity therefore has a high risk of harm to any subsurface archaeological evidence that may still exist at this location. The proposed activities are also inconsistent with the level of previous disturbance caused by tree clearing which would likely have only impacted on upper soil profiles and not deeper deposits. Subsurface evidence of Aboriginal occupation and use of the area may therefore remain at this location in an undisturbed context. The proximity to significant 'Landscape Features' (remnant vegetation and a waterway), is another indicator of higher potential for Aboriginal cultural heritage and that some residual intangible cultural heritage may also still exist in the Project area.
What is the DoC Category?	**Category 2 - Activities causing No Additional Surface Disturbance.** Where an activity causes No Additional Surface Disturbance of an area it is generally unlikely that the activity will harm Aboriginal cultural heritage or could cause additional harm to Aboriginal cultural heritage to that which has already occurred. ***This DoC Category applies to the majority of the Project area (see Annex 1).***

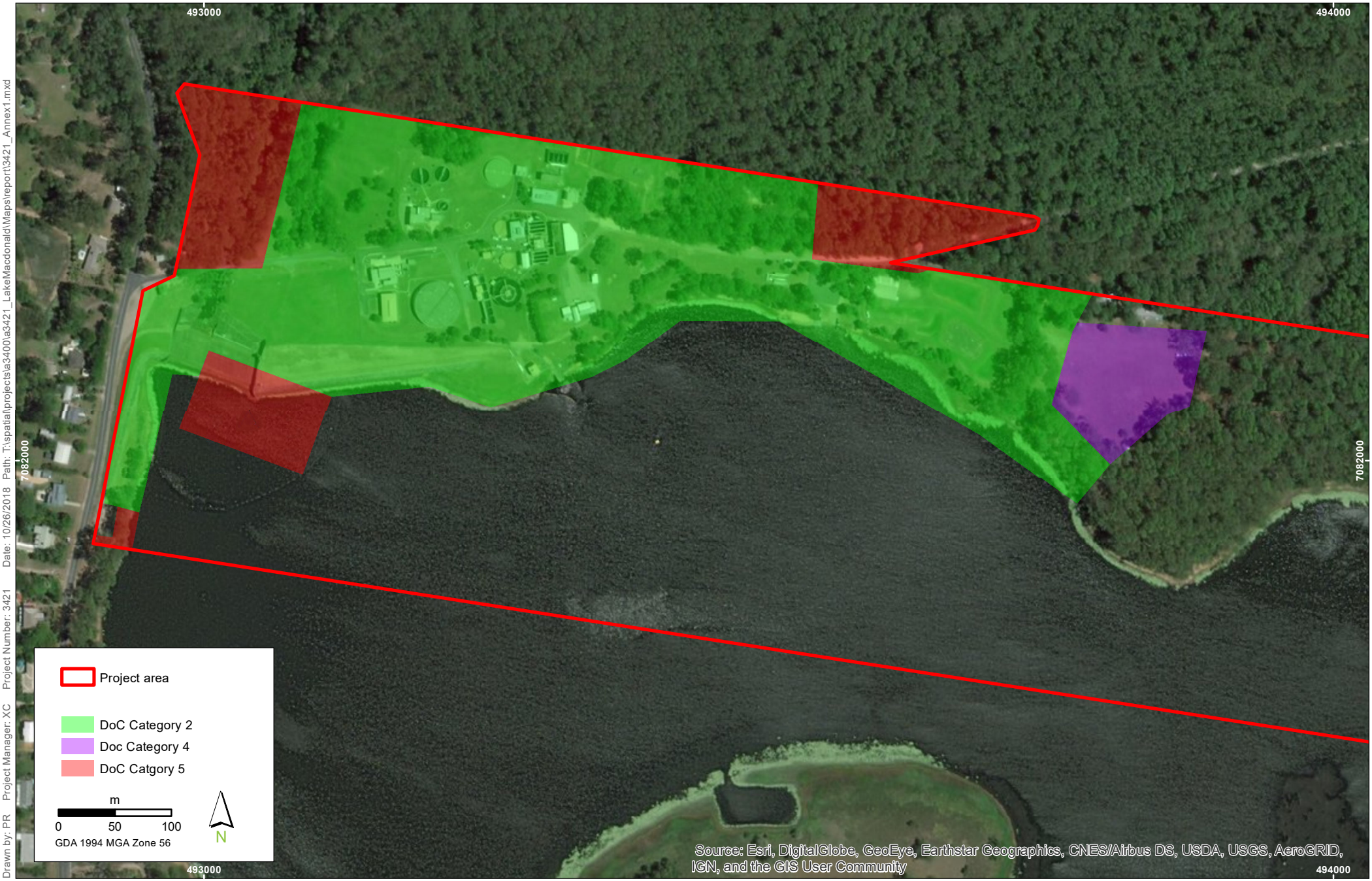
	Category 4 - Areas previously subject to Significant Ground Disturbance. Where an activity is proposed in an area, which has previously been subject to Significant Ground Disturbance it is generally unlikely that the activity will harm Aboriginal cultural heritage. In some cases, despite an area having been previously subject to Significant Ground Disturbance, certain features of the area may have residual cultural heritage significance. ***This DoC Category applies to area designated as a 'borrow pit' at Camp Cooroora.*** **Category 5 - Activities causing additional surface disturbance.** A category 5 activity is any activity, or activity in an area, that does not fall within category 1, 2, 3 or 4. Where an activity is proposed under category 5 there is generally a high risk that it could harm Aboriginal cultural heritage. In these circumstances, the activity should not proceed without cultural heritage assessment. ***This DoC Category applies to the area south of the existing spillway, in the vicinity of registered site KC: G17; and the area of remnant vegetation north of Collwood Road, south of the left embankment, and along Six Mile Creek (north of the spillway) (see Annex 1).***
Is consultation with the Aboriginal party required under the ACHA?	**Yes.** Consultation with Aboriginal Party is required owing to the Category 5 classification areas.
Recommendations	The proposed activities and areas meet the definition of DoC Category 2, Category 4, and Category 5. Therefore, it is recommended: **All areas** All Project staff should be provided with a Cultural Heritage Induction prior to the commencement of Project works. This induction should include the procedure to be followed if unexpected cultural heritage objects are identified during the Project. **Category 2 areas** All project activities can proceed as planned. **Category 4 areas** This Category relates to the area of land at Camp Cooroora that has been designated as a 'borrow pit'. This area has previously been

	Significantly Disturbed through vegetation clearance. However the proposed activity is inconsistent with this previous land use practices. Therefore it is recommended that consultation with the registered Aboriginal Party for the area be undertaken. **Category 5 areas** Activities undertaken within or immediately adjacent to KC: G17 will require consultation with the Aboriginal Party for the Project activity area - the Kabi Kabi First Nation people. The areas of remnant vegetation north of Collwood Road, south of the left embankment, and along Six Mile Creek (north of the spillway) should be avoided if possible. Consultation with the Kabi Kabi First Nation people will be required to identify the presence of any significant Aboriginal cultural heritage areas or objects within Category 5 areas will be required.

References

URS (2014) *Lake MacDonald Ecology Review*, unpublished report prepared for SEQWater, 14 February 2014.

Wells, Robin A. (2003) *In the Tracks of the Rainbow: Indigenous Culture and Legends of the Sunshine Coast*, Gullirae Books, Queensland.



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Project area

Lake Macdonald IAR

Annex 1

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Project area

Lake Macdonald IAR

Annex 2

Annex 3: Historical aerial photographs

Year	Observation	Disturbance (as defined by the DoC Guidelines)
1953	 **Plate 1. Aerial photograph of the Project area in 1953. Project activity area marked in red.** The earliest aerial photograph of the Project activity area dates to 1953. At this time the Project area had been subject to Significant Ground Disturbance and Surface Disturbance in the form of vegetation clearance, ploughing, and road/track construction.	• Significant Ground Disturbance has occurred in the Project area in the form of vegetation removal and ploughing. • Surface Disturbance has occurred in the Project area in the form of roads/track ways.
1967	 **Plate 2. Aerial photograph of the Project area in 1967. Project activity area marked in red.** In the 1967 aerial photograph of the Project area the dam wall has been construction (c. 1965). The Project area would have	• Significant Ground Disturbance has occurred in the Project area owing to the construction of the dam wall. • There has been no additional Surface Disturbance in the Project area.

	been subject to Significant Ground Disturbance through the establishment of the dam wall.	
1974	 **Plate 3. Aerial photograph of the Project area in 1974. Approximate Project activity area marked in red.** The 1974 aerial highlights additional Significant Ground Disturbance through the establishment of the spillway. Surface Disturbance is evident through the establishment of additional tracks through the Project area.	• Additional Significant Ground Disturbance has occurred in the Project area through the construction of the spillway on Six Mile Creek. • Additional Surface Disturbance has occurred through the establishment of a track across the area.
1984	 **Plate 4. Aerial photograph of the Project area in 1984. Project activity area marked in red.**	• Additional Surface and Significant Ground Disturbance has occurred through the construction of associated water treatment infrastructure.

	The 1972 aerial shows additional Significant Ground Disturbance in the Project area through the construction of water treatment infrastructure associated with the dam. No additional Surface Disturbance has occurred.	
1993	 **Plate 5. Aerial photograph of the Project area in 1993. Project activity area marked in red.** The 1993 aerial shows no additional Significant Ground Disturbance in the Project area. No additional Surface Disturbance has occurred.	• No additional Significant Ground Disturbance has occurred. • No additional Surface Disturbance has occurred.
2002	 **Plate 6. Aerial photograph of the Project area in 2002. Project activity area marked in red.** The 2002 aerial shows additional Significant Ground and Surface Disturbance in the Project area. Since 1993 photograph, large areas along the northern property boundary have been cleared of vegetation. New buildings and associated infrastructure have been built in this location. In addition partial vegetation clearance has occurred north of Collwood Road at its western end.	• Additional Significant Ground Disturbance has occurred through the clearing of vegetation. • Surface Disturbance has occurred through the construction of buildings and roadways.

2007	 **Plate 7. Aerial photography of the Project area in 2007. Project activity area marked in red.** The 2007 aerial shows additional Significant Ground Disturbance in the Project area through the clearance of vegetation south of Collwood Road at its western end. No additional Surface Disturbance has occurred.	• Additional Significant Ground Disturbance has occurred through vegetation clearance. • No additional Surface Disturbance has occurred.
2017	 **Plate 8. Aerial photography of the Project area in 2017. Project activity area marked in red.** The 2017 aerial shows no additional Significant Ground Disturbance in the Project. No additional Surface Disturbance has occurred.	• No additional Significant Ground Disturbance has occurred. • No additional Surface Disturbance has occurred.

Annex 4: Results of Site Inspection

On 19 July 2018, Xavier Carah and Cameron Harvey (Niche) and Steven Cox (Seqwater) undertook a visual inspection of the Project activity areas. All impact areas were inspected. Plate 9-22 show the environment and level of previous disturbance within the Project area.

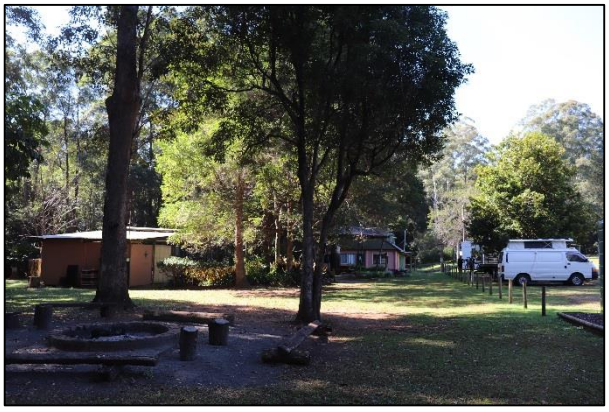

Plate 9. Camp Cooroora – existing buildings and established trees will not be impacted by the proposed activities.

Plate 10. Camp Cooroora – this area will be used as a 'borrow site' during construction. 30-40,000 cubic metres of sediment will be removed from this location.

Plate 11. Camp Cooroora – an access track will be established along the Lake shore. Vegetation in this area is regrowth and will be cleared.

Plate 12. Fish hatchery located on northern shore of Lake Macdonald is an area available for construction, if required.

Plate 13. Access will be along an established roadway.

Plate 14. The spillway and right embankment will be removed and reconstructed during the Project works.

Plate 15. Sludge drying bed - this area will be used as a stock pile area during construction.

Plate 16. Spillway - this area will be the main site of construction during the Project works.

Plate 17. An area of regrowth vegetation just north of Collwood Road, near the site gate.

Plate 18. An existing clearing, north of Collwood Road, currently used as a stockpile area.

Plate 19. Remnant vegetation north of Collwood Road at the western edge of the Project area. This site is designated as an 'Area Available for Construction (if required)'.

Plate 20. Remnant vegetation north of Collwood Road.

Plate 21. Remnant vegetation north of Collwood Road.

Plate 22. A dislodged culvert, in Six Mile Creek, north of the spillway will be removed with a crane.

Annex 5: Lake Macdonald Dam Upgrade – Proposed Project Construction Boundaries

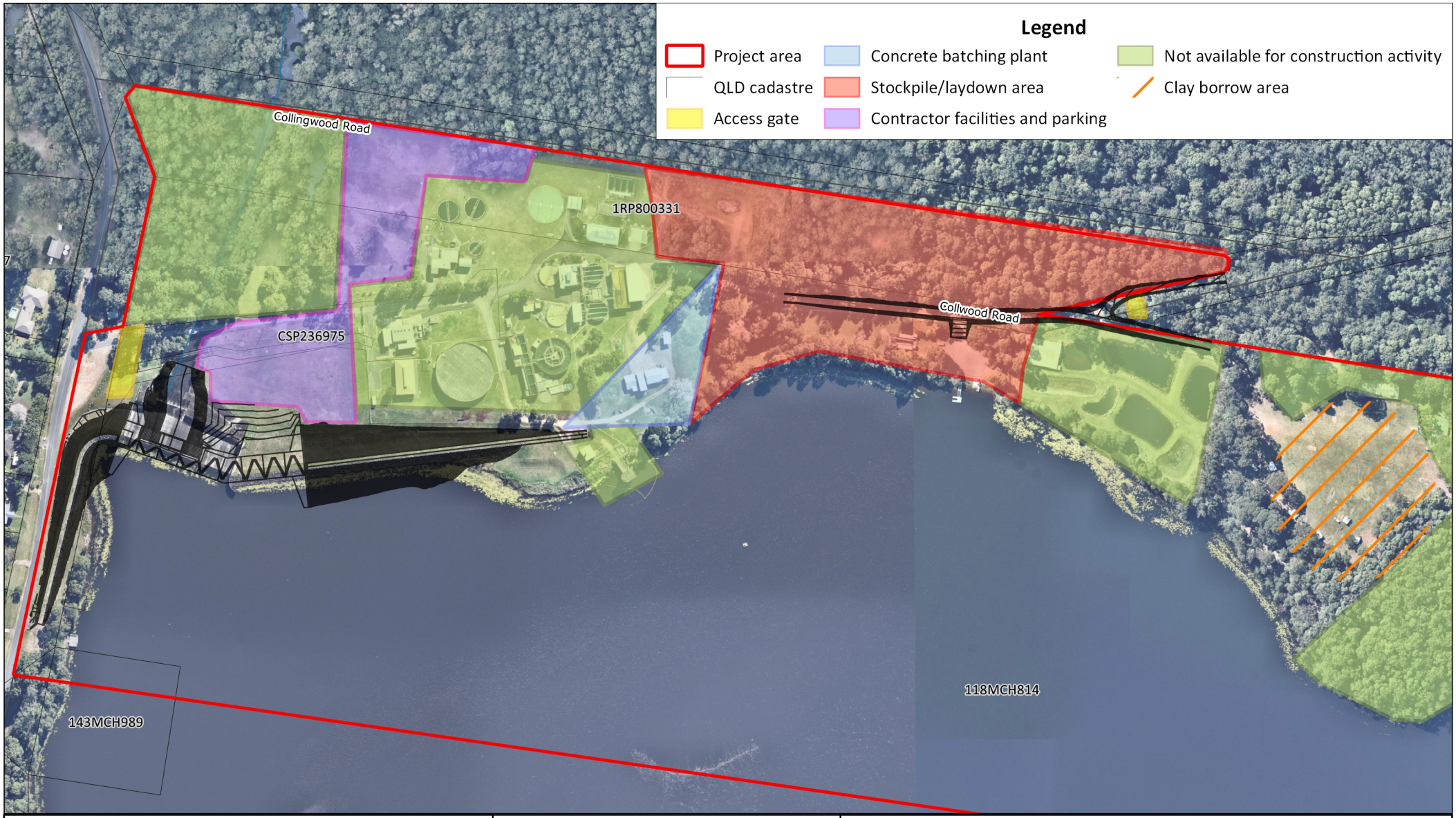

FIGURE TITLE	Six Mile Creek Dam Safety Upgrade
PROJECT NO.	30031970
DATE	08-10-2018
CREATED BY	Holly ROBERTS-SIMMONDS
SOURCES	Roadnet

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Annex 6: Definitions

Aboriginal Cultural Heritage Act 2003	
Aboriginal cultural heritage	Is anything that is— • a significant Aboriginal area in Queensland; or • a significant Aboriginal object; or • evidence, of archaeological or historic significance, of Aboriginal occupation of an area of Queensland.
Harm	harm, to Aboriginal cultural heritage, means damage or injury to, or desecration or destruction of, the cultural heritage.
Project	project includes— • a development or proposed development; and • an action or proposed action; and • a use or proposed use of land.
Project area	project area, in relation to a project, means the area the subject of the project, whether in construction or operational phases.
Duty of Care Guidelines (2004)	
Surface Disturbance	means "any disturbance of an area which causes a lasting impact to the land or waters during the activity or after the activity has ceased". An example of such prior activities includes: • Cultivation. • Cattle grazing. • Construction of roads, tracks, power lines, other infrastructure footprints, existing services or utilities.
Significant Ground Disturbance	means: • Disturbance by machinery of the topsoil or surface rock layer of the ground by ploughing, drilling, dredging, and or; • Removal of native vegetation by disturbing root systems and exposing underlying soil.

Annex 7: Aboriginal Cultural Heritage DoC Category Definitions

Category	Description
1	Activities involving No Surface Disturbance. Where an activity involves no Surface Disturbance of an area it is generally unlikely that the activity will harm Aboriginal cultural heritage
2	Activities causing No Additional Surface Disturbance. Where an activity causes No Additional Surface Disturbance of an area it is generally unlikely that the activity will harm Aboriginal cultural heritage or could cause additional harm to Aboriginal cultural heritage to that which has already occurred.
3	Developed areas. Where an activity is proposed in a Developed Area it is generally unlikely that the activity will harm Aboriginal cultural heritage.
4	Areas previously subject to Significant Ground Disturbance. Where an activity is proposed in an area, which has previously been subject to Significant Ground Disturbance it is generally unlikely that the activity will harm Aboriginal cultural heritage. In some cases, despite an area having been previously subject to Significant Ground Disturbance, certain features of the area may have residual cultural heritage significance.
5	Activities causing additional surface disturbance. A category 5 activity is any activity, or activity in an area, that does not fall within category 1, 2, 3 or 4. Where an activity is proposed under category 5 there is generally a high risk that it could harm Aboriginal cultural heritage. In these circumstances, the activity should not proceed without cultural heritage assessment.

Niche Environment and Heritage

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niche
Environment and Heritage

Six Mile Creek Dam Safety Upgrade Project

Historical Heritage Assessment

Final

Prepared for SMEC and Seqwater

November 2018

Executive summary

Niche Environment and Heritage Pty Ltd (Niche) was commissioned by SMEC (on behalf of Seqwater) to prepare a Historical Heritage Assessment (HHA) for the proposed Six Mile Creek Dam Safety Upgrade Project located at Lake Macdonald, on the Sunshine Coast, Queensland (the Project). The Project area included the Noosa Water Treatment Plant (WTP) precinct, the shoreline areas of Lake Macdonald, and the adjacent Seqwater land leased and occupied by Scouts Australia at 'Camp Cooroora' and the Gerry Cook fish hatchery operated by Mary River Catchment Coordinating Committee (MRCCC).

Project works

The aim of the Six Mile Creek Dam Upgrade Project is to upgrade the dam to meet modern safety standards. Key features of the works will include:

- Staged and temporary lowering of the dam's water level to allow for construction works.
- Construction of a temporary coffer dam/working platform.
- Demolition of the existing spillway and embankments.
- Construction of a replacement spillway and embankments; and
- Potential construction of a new saddle dam.

Assessment requirements

SMEC commissioned Niche to prepare a HHA to assess the potential impacts of the Six Mile Creek Dam Upgrade Project on any known or potential historical heritage values within the Project area. This assessment therefore sought to achieve the following:

- An understanding of the full lifecycle of the existing assets at the dam from the original construction to the present day use (historical context).
- Considerations of heritage values and the effects of the works on any values identified (significance assessment).
- Provision of information as to what stages of the current assets were built during each era, in what order and which areas are deemed of significant heritage interest (chronology).
- Report to identify any items of significant heritage value or local interest (reporting).
- Assess the likely impacts of the works on any values identified and provide recommendations for mitigation.

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Methods

The methodology for this assessment included desktop historical research, visual inspection, significance and impact assessment. The tasks undertaken included:

- Background literature review to develop an understanding of the history of the WTP and broader precinct. The review included secondary and primary source research (where required) and the preparation of a basic chronology of the precinct.
- Physical inspection of the Noosa WTP, Lake Macdonald, and Camp Cooroora to document heritage features and conduct a visual assessment. Recording was largely photographic, with notes taken in the field regarding potential significant features, issues and the condition of fabric.
- A significance assessment of the precinct and the preparation of a Statement of Significance for the precinct.
- Presentation of recommendations for the ongoing management of the significance of the precinct and the likely impacts of the proposed Project activities.

Listing of features of the precinct that may require immediate attention or essential maintenance, possible conservation works, and additional assessments that could be considered.

Recommendations

Mitigating direct impacts

Two features with local heritage significance (unregistered) - the Lake Macdonald brick structure and dedication plaque, and Dam Wall and Spillway - will be directly impacted by the proposed Project works.

The Lake Macdonald brick structure with dedication plaque will be directly impacted by the construction of a 6 m wide access track. This track exits Lake Macdonald Drive and runs north along the western side of Lake Macdonald. Its current alignment would directly impact the structure. Redesigning the track alignment to avoid the structure would mitigate against any direct impacts to the structure. If this is not possible a photographic archival recording of the structure, prior to impactful works, should be conducted. The dedication plaque should be salvaged and repositioned on a suitable structural feature or other location nearby.

The demolition and replacement of the Dam Wall and Spillway is the core objective of the Project. Therefore, it is not practicable to avoid impact to these structures. It is recommended that these structures are subject to photographic archival recording, prior to impacting works.

Mitigating indirect impacts

All of the significant features identified at Camp Cooroora will be indirectly or possibly inadvertently impacted by the proposed Project owing to their proximity to a work area. The excavation of a large 'borrow pit' in the cleared area at Camp Cooroora will be undertaken in close proximity to these structures. This will significantly alter the setting in which these structures are located. Structures could also be damaged unintentionally through interactions with heavy machinery on site. Owing to the high level of Project activity at this site it is recommended that each of these structures be temporarily barricaded to protect them from harm.

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Niche Environment and Heritage Pty Ltd (Niche) was commissioned by SMEC (on behalf of Seqwater) to prepare a Historical Heritage Assessment (HHA) for the proposed Six Mile Creek Dam Safety Upgrade Project located at Lake Macdonald, on the Sunshine Coast, Queensland (the Project, Figure 1). The Project area included the Noosa Water Treatment Plant (WTP) precinct, the shoreline areas of Lake Macdonald, and the adjacent Seqwater land leased and occupied by Scouts Australia at 'Camp Cooroora' and the Gerry Cook fish hatchery operated by Mary River Catchment Coordinating Committee (MRCCC) (Figure 2).

1.1 Project works

The aim of the Six Mile Creek Dam Upgrade Project is to upgrade the dam to meet modern safety standards. Key features of the works will include:

- Staged and temporary lowering of the dam's water level to allow for construction works.
- Construction of a temporary coffer dam/working platform.
- Demolition of the existing spillway and embankments.
- Construction of a replacement spillway and embankments; and
- Potential construction of a new saddle dam.

1.2 Approval pathway

In December 2017 the Commonwealth declared the project a controlled action requiring assessment and approval under the *Environment and Biodiversity Conservation Act 1999* (EPBC Act) due to the presence of listed threatened species and communities. Under the bilateral agreement that exists between the Commonwealth and the Queensland Government on such matters, on 22 December 2017 the Queensland Coordinator-General declared by gazette notice that the upgrade project was to be a coordinated project under the *State Development and Public Works Organisation Act* 1971. The approval pathway chosen for the works was preparation of an Impact Assessment Report (IAR).

An IAR is to be prepared so the Coordinator-General is satisfied that the environmental effects of the project do not, having regard to their scale and extent, require assessment through the detailed Environmental Impact Statement (EIS) process. It is used for well-defined, low-medium risk projects and unlike an EIS has no formal terms of reference.

1.3 Assessment requirements

SMEC commissioned Niche to prepare a HHA to assess the potential impacts of the Six Mile Creek Dam Upgrade Project on any known or potential historical heritage values within the Project area. This assessment therefore sought to achieve the following:

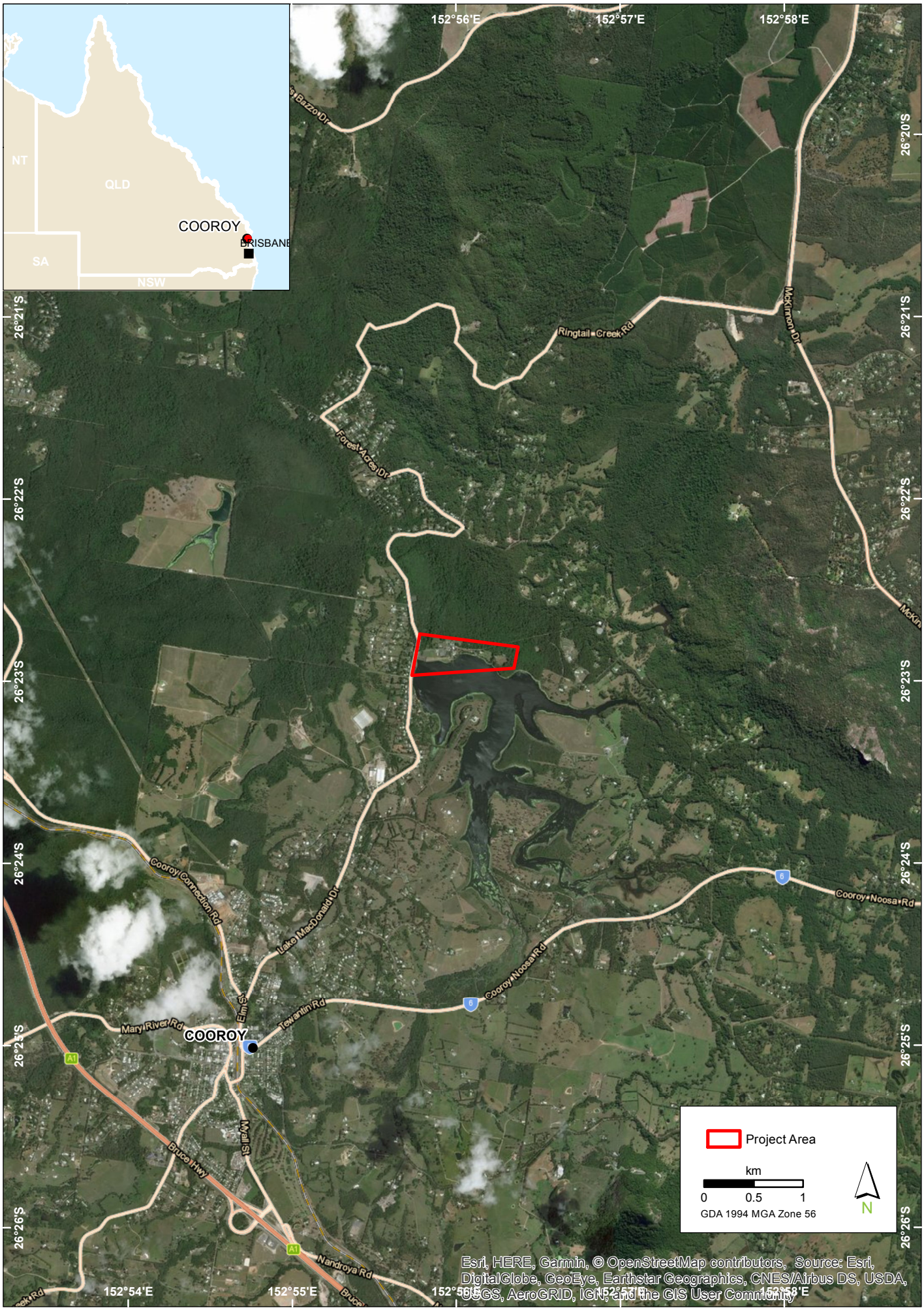
- An understanding of the full lifecycle of the existing assets at the dam from the original construction to the present day use (historical context).
- Considerations of heritage values and the effects of the works on any values identified (significance assessment).
- Provision of information as to what stages of the current assets were built during each era, in what order and which areas are deemed of significant heritage interest (chronology).
- Report to identify any items of significant heritage value or local interest (reporting).
- Assess the likely impacts of the works on any values identified and provide recommendations for mitigation.

This assessment has been prepared by Dr Xavier Carah (Heritage Consultant, Niche) and Cameron Harvey (Regional Manager, Niche). It was reviewed by Clair Davey (Senior Heritage Consultant, Niche) for consistency and quality.

1.4 Methods

The methodology for this assessment included desktop historical research, visual inspection, significance and impact assessment. The tasks undertaken included:

- Background literature review to develop an understanding of the history of the WTP and broader precinct. The review included secondary and primary source research (where required) and the preparation of a basic chronology of the precinct.
- Physical inspection of the Noosa WTP, Lake Macdonald, and Camp Cooroora to document heritage features and conduct a visual assessment. Recording was largely photographic, with notes taken in the field regarding potential significant features, issues and the condition of fabric.
- A significance assessment of the precinct and the preparation of a Statement of Significance for the precinct.
- Presentation of recommendations for the ongoing management of the significance of the precinct and the likely impacts of the proposed Project activities.
- Listing of features of the precinct that may require immediate attention or essential maintenance, possible conservation works, and additional assessments that could be considered.



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niche Environment and Heritage

Regional Location

Lake Macdonald IAR

FIGURE 1

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Specific Location

Lake Macdonald IAR

FIGURE 2

Imagery: (c) DigitalGlobe 2017-01-18

2. Contextual history

Historical research was undertaken using reliable primary and secondary publications, including Kerr et al. (2002) and TROVE newspaper searches. The following sections are the results of that research.

2.1 Regional History

After a number of forays into the region by earlier European explorers and escaped convicts, non-Indigenous settlement began in earnest from the 1860s. There was a considerable increase in population in the late 1860s following the discovery of gold at Gympie and the establishment of Tewantin as a port to service the gold field (Kerr et al. 2002:15). The township of Cooran began in 1869 as a coach stop on the road between Tewantin and Gympie. Finally, Cooroy was established in the 1890s supported by timber getting, dairying, and the arrival of the railway (Kerr et al. 2002:4).

The first roadway system in the region was initiated in 1869 connecting Tewantin, Tuchekoi, and Skyring Creek with areas around the Mary River. Walter Hay established a route between Gympie and Tewantin in 1873 which followed the eastern watershed of Six Mile Creek as far as possible and then cut across the escarpment immediately north of Tinbeerwah Bluff (Kerr et al. 2002:12). A road to Brisbane was established in the 1880s, which ran to the east of Cooroy but west of Tinbeerwah Bluff and opened the area along the route to selectors (Kerr et al. 2002:3). Settlement of the area was directed mainly from Gympie before a railway was established to Brisbane in 1891. The railway opened the region to migration from the south and facilitated the transport of timber and dairy products to Brisbane. The establishment of this vital artery ensured the economic viability of the region.

Early immigrants to the region often selected land and cleared the timber for profit before initiating dairying activities. In 1885 the Queensland government resumed much of the land around Cooroy that had earlier been selected and freeholded. They allocated 5507 acres of land around Cooroy to saw millers Dath Henderson Bartholomew & Co. who systematically felled the softwood in the area (Kerr et al. 2002:4). The land was reopened to selection following the abolition of the timber concession in 1907. By 1911-12 Cooroy was an established centre of administration, commerce, and culture (Kerr et al. 2002:4).

With the establishment of the railway and abundant land for selection, the economic focus of the region shifted towards dairying, while maintaining strong links to the timber industry. From the 1890s cream depots and travelling dairies operated effectively in the region. The railway allowed selectors to effectively transport their product to local creameries, improving the economic viability of the endeavour. The Cooroy Butter Factory was built in 1915 (a replacement was built in 1930, which still exists today) to service the burgeoning regional dairy industry. This booming local economy supported increases in population during the 1920s with the population doubling between 1921 and 1927 (Kerr et al. 2002:15).

The experimental planting of banana crops in 1911-12 was followed by an escalation in production during the 1920s. In 1925, 14,924 cases of bananas were railed through Pomona. Banana production peaked in 1928 with 1.5 million bunches grown in the Gympie district, contributing 50.4% of Queensland's banana crop for the year (Kerr et al. 2002:15). The experiment with bananas, however, was short lived. A resurgence of the Tweed district in the banana market, following its recovery from an outbreak of 'bunchy top disease', flooded the market with supply. By 1935 the Gympie district only contributed 10.3% of Queensland banana production.

The downturn in the banana market in the 1930s coincided with depressed economic conditions globally. Many of the banana farmers returned to dairying, while some were forced to participate in Depression-era

work schemes, or turn to growing pineapples, beans, and peas (Kerr et al. 2002:15). The establishment of an Empire Agreement in 1932 (the Ottawa Agreement 1932) provided the local dairy industry with some certainty. The Agreement between Australia and other Commonwealth countries guaranteed access for Australian butter especially into the British market. These preferential economic conditions supported the viability of the local dairying industry during the turmoil of The Great Depression.

In the 1950s an engineering and feasibility study explored a plan to secure a water supply for Divisions 3 and 4 of the Shire (which includes Cooroy) by damming Six Mile Creek. The Shire Council ultimately found the plan to be too costly and it did not proceed any further (Nambour Chronicle and North Coast Advertiser 1954). By the 1960s most of the original pioneers of the region had died and many of their children had left the district. The farmers who remained often sold their properties to inland graziers for agistment of cattle or to real estate companies who subdivided the land for residential developments (Kerr et al. 2002:18). The rate of development across the district accelerated through the 1970s and 80s with many beach side holiday properties demolished and subdivided to clear way for large scale tourist developments. This change in land use moved the focus of the Shire away from dairying and timber towards residential developments and tourism along the coast.

2.2 The Project area

Lake Macdonald was formed in 1965 as a result of the damming of Six Mile Creek, north east of Cooroy. Between 1965 and 2012 the Project area went through five phases of construction and expansion.

2.2.1 Phase 1 – 1965-1971

Initially the water treatment plant consisted of the dam wall/spillway, a raw water pump station, main residence, and what is now known as the lime building. Between 1967 and 1971 backwash tank no. 1 and clarifier no. 1 were built. The backwash tank no. 1 was built to the west of the lime building and the clarifier no. 1 to its east.

2.2.2 Phase 2 – 1974-1984

During this period the clear water storage tank, administration building, backwash tank no. 2 and clarifier no. 2 were built at the water treatment plant. At this time the hatchery building to the east of the site was also constructed alongside the first hatching ponds. Between 1975 and 1977 an open air bush chapel and shower/toilet block were built at Camp Cooroora – only the chapel still remains. In 1979 the dam wall was raised to its current height.

2.2.3 Phase 3 – 1984-1993

The first of two major phases of construction occurred between 1984 and 1993. During this time the clear water pump station, oxidation tank, bulk chemicals building, clarifier no. 3, filter block 4, potassium permanganate building were all constructed at the water treatment plant. Across this period Camp Cooroora expanded considerably – a bush-style kitchen was built in 1984, followed by the scout activity centre which was completed in 1988, a rotunda in 1989-90, and the Moonga flagpole in 1990. All of these structures remain standing today, although the original Moonga flagpole had to be replaced after a severe storm in 2006.

2.2.4 Phase 4 – 1993-2002

The second major phase of construction at the site occurred between 1993 and 2002, and included the expansion of the overall site footprint. During this period the centrifuge building, sludge equalisation tank, and thickener tank were built for waste water treatment at the site. The ozone generator building, ozone contact column and BAC filters, as well as an office and workshops (for dam operations) were added during

this phase of expansion at the water treatment plant. During this time a caretaker's residence was established at Camp Cooroora where it remains today.

2.2.5 Phase 5 – 2002-2012

During the final phase of construction the backwash recovery tank 1, backwash recovery tank 2, intermediate storage tank, and intermediate pump station were all built between 2002 and 2007. In 2011, the fluoride building was built and then in 2012 the water quality management facility and bulk chemicals building, associated with the Northern Pipeline Interconnector – SEQ Water Grid Infrastructure, were constructed. In 2015 the original main residence, which had been present on the site since 1965, was demolished because it contained asbestos. After a long history of exclusive use by the Scouting movement Camp Cooroora was opened up during this period as a commercial camp ground.

2.3 Chronology

Table 1. Basic chronology of the Project area.

Year	Event
1965	Completion of the constuction of Six Mile Creek Dam (Lake Macdonald)
1965-1967	Lime Building and Lake Macdonald Raw Water Pump Station, Lake Macdonald brick structure with dedication plaque built
1967-1971	Backwash Tank No.1 and Clarifier No. 1 built
1979	Dam raised to its current height being RL 95.32 mAHD
1974-1984	Clear Water Storage Tank, Hatchery Building, Administration Building, and Clarifier No. 2, Backwash Tank No. 2 built
1984-1993	Clear Water Pump Station, Oxidation Tank, Bulk Chemicals, Clarifier No. 3, Filter Block 4, Potassium Permanganate Building, Main Scout Building – Scout activity centre (Camp Cooroora) built
1993-2002	Centrifuge Building, Sludge Equalisation Tank, Thickener, Ozone Generator Building, Ozone Contact Column, BAC Filters, Open Kitchen and Dining Shed (Camp Cooroora), Caretaker's Residence (Camp Cooroora) built
1993-2010	Seqwater Offices and Workshop built
2002-2007	Backwash Recovery Tank 1, Backwash Recovery Tank 2, Intermediate Storage Tank, Intermediate Pump Station built
2011	Fluoride Building built
2012	Water Quality Management Facility and Bulk Chemicals built

3. Desktop review

3.1 Databases, registers and inventories

Searches of Commonwealth and State databases, registers and inventories were conducted, including:

- The Australian Heritage Database (AHD) – which includes places entered in the statutory World Heritage List (WHL), National Heritage List (NHL) and Commonwealth Heritage List (CHL), and the non-statutory archive the Register of the National Estate (RNE).
- The Queensland Heritage Register (QHR) – which lists all places entered for their State heritage significance under the QHA.
- *The Noosa Plan* – which is the Noose Shire Council's Planning Scheme.

3.1.1 National lists and databases

The EPBC Act is the Commonwealth's central piece of environmental legislation. One of its core objectives is to enhance the protection and management of important cultural places. A National Heritage List (NHL) and Commonwealth Heritage List (CHL) are established under the EPBC Act.

The NHL identifies places of cultural significance to the nation of Australia. The CHL identifies natural, Aboriginal and historic heritage places owned and controlled by the Commonwealth (i.e. on Commonwealth land or in Commonwealth waters).

- There are no NHL or CHL places within or in proximity to the Project area.

The Commonwealth also maintains the Register of the National Estate (RNE). The RNE was established under the *Australian Heritage Commission Act 1975* (AHC Act). The AHC Act has been repealed and the RNE is now kept as a non-statutory archive of over 13,000 places around Australia that have been identified as having heritage value. It is important to note that following the repeal of the AHC Act there are no statutory management or development constraints associated with a listing on the RNE unless that listed place is owned by a Commonwealth agency.

- There are no RNE places within or in proximity to the Project area.

3.1.2 State lists and databases

The *Queensland Heritage Act 1992* (QHA) provides for the conservation of Queensland's cultural heritage for the benefit of the community and future generations. Administered by the Department of Environment and Heritage Protection (DEHP), the QHA sets out a framework for identifying and protecting heritage places by establishing the Queensland Heritage Council (QHC), the Queensland Heritage Register (QHR), local heritage registers, regulating development, and enabling the management of heritage places through heritage agreements.

- There are no QHR places located within or in proximity to the Project area.

3.1.3 Local planning scheme

Six Mile Creek Dam is located with the suburb of Lake Macdonald, part of Noosa Shire Council. Council's planning scheme, known as the *Noosa Plan*, identifies the Lake Macdonald area to be within the *Cooroy and Lake Macdonald* locality plan which includes a Heritage Overlay mapping 'Heritage Sites' covered by the development provisions of the planning scheme.

- No Heritage Sites are located within or in proximity to the Project area.

3.2 Previous heritage assessments

Few historical heritage assessments have been previously undertaken in the vicinity of the Six Mile Creek Dam and Lake Macdonald.

Kerr et al. (2002) prepared a historical cultural heritage study of Noosa Shire which includes consideration of the history of the region, associated cultural sites, features and precincts. The Lake Macdonald area was included in assessments of *Cooroy Mountain, Lake Macdonald and Tinbeerwah*. No sites, features or precincts associated with the Project area are identified in the study.

The University of Queensland's Centre for Queensland Government (2018) *Queensland Places* identify the following potential features around Lake Macdonald:

- On the northern and western shorelines of Lake Macdonald, the Cooroora Scout Camp and the Noosa Botanic Gardens, both dating from the 1980s.
- Fish hatchery between the water-treatment plant and Camp Cooroora on the lake's northern shoreline.
- South of Lake Macdonald on the Cooroy-Noosa Road there are the Figtree and Frogmouth Bushland Reserves.

3.3 Discussion

Searches of heritage registers, inventories and the local planning scheme do not identify any places, landscape or precincts of historical heritage value within the Project area. The only relevant heritage study by Kerr et al. (2002) also did not identify any significant places.

Cooroora Scout Camp, also known as 'Camp Cooroora', and the fish hatchery, are both located within the Project area. While not a heritage study, the *Queensland Places* study does identify these as places of note in the Lake Macdonald area and require further consideration.

4. Physical inspection

The Project area was inspected by Cameron Harvey and Xavier Carah (Niche) and Steven Cox (Seqwater) on the 19 July 2018. The precinct is comprised of the following structures and features:

Noosa Water Treatment Plant

- Spillway and embankments
- Lime Building
- Lake Macdonald Raw Water Pump Station
- Potassium Permanganate Building
- Clarifier No. 1, 2 and 3
- Backwash Tank No. 1 and 2
- Seqwater Offices and Workshops
- Administration Building
- Oxidation Tank
- Bulk Chemicals Storage x 2
- Clear Water Storage Tank
- Clear Water Pump Station
- Filter Block 4
- Water Quality Management Facility
- Fluoride Building
- Ozone Generator Building
- Ozone Contact Column
- BAC Filters
- Intermediate Pump Station
- Intermediate Storage Tank
- Centrifuge Building
- Sludge Equalisation Tank
- Thickener Tank
- Backwash Recovery Tank 1 and 2

Camp Cooroora

- Scout Activity Centre
- Bush-style Kitchen
- Rotunda
- Open air chapel
- Flag pole
- Caretaker's Residence
- Horse corral
- Stone wall with 'Australian flag' gate
- Fireplace x 2

Other places

- Lake Macdonald brick structure and dedication plaque
- Gerry Cook Fish hatchery

4.1 Noosa Water Treatment Plant

The Noosa Water Treatment Plant has four distinct areas – the early works area, the treatment area, the clear water area, and the recovery area (Figure 3). The Noosa WTP covers 7.5 hectares east of Lake Macdonald spillway and embankments.

4.1.1 Early works

The early works area contains the original buildings constructed in 1965 when the WTP was established. Initially the water treatment plant consisted of the dam wall/spillway, a raw water pump station, main residence, and what is now known as the lime building. Between 1967 and 1971 backwash tank no. 1 and clarifier no. 1 were built. The backwash tank no. 1 was built to the west of the lime building and the clarifier no. 1 to its east.

- The lime building (Plate 1, Plate 2) has a single gabled roof with eaves. The structure has two above ground storeys and one subterranean level. The subterranean level is built of concrete and brick and is accessible via an internal vertical metal ladder. The ground level is also made of concrete and brick. It has a sliding aluminium framed window in its southern wall. Two sets of wooden framed horizontally-pivoting windows are positioned either side of a door way on the western side. The north side contains one set of wooden framed horizontally-pivoting windows. Internally, the ground level contains pipework and pumps which are connected to Clarifier No. 1 through the eastern wall. The upper level of the structure is composed of narrow weatherboards with a bank of four horizontally-pivoting windows on the southern side and two banks on the western side. The northern side contains a large metal loading door replete with an exposed steel girder used to lift heavy materials into the building. The girder is situated at the top of the door and protrudes out from the building about 1 m. The eastern side of the upper level contains four banks of wooden framed horizontally-pivoting windows and a doorway onto a gangway over Clarifier No. 1. A small weatherboard shed with a concrete foundation and skillion roof is situated to the south of the lime building. It has a door on its southern side and a set of wooden framed horizontally-pivoting windows on its western side.
- Clarifier No. 1 (Plate 3) is situated to the east of the Lime Building. It is a large concrete tank, approximately 15m in diameter and 10 m in depth. Situated at the top of the tank are four metal pipes and other water treatment infrastructure.
- Backwater tank No. 1 (Plate 4) is situated to the west of the Lime Building. It is a large concrete tank, approximately 15 m in diameter, the tank is capped by a butterfly pitched roof of corrugated metal sheeting. The structure is mostly subterranean.
- The dam wall is a large earthen embankment with inward facing riprap, the wall contains an ungated spillway at its western end (Plate 5). The spillway is made of concrete and discharges into Six Mile Creek.
- The raw water pump station (Plate 6) is a concrete and metal structure with a flat roof situated on the northern bank of Lake Macdonald.
- The main residence is no longer present on the site. This building initially served as a residence for operating staff but was demolished in 2015.

Table 2. Noosa Water Treatment Plant - early works area significance assessment

Structure	Condition	Significance criteria	Significance rating
Lime Building	Fair-good	a) Demonstrates a distinct phase in the 1960s when dams and their associated infrastructure were constructed by the Queensland Government.	Local significance

Structure	Condition	Significance criteria	Significance rating
Clarifier No. 1	Fair-good	a) Demonstrates a distinct phase in the 1960s when dams and their associated infrastructure were constructed by the Queensland Government.	Local significance
Backwash tank No. 1	Fair-good	a) Demonstrates a distinct phase in the 1960s when dams and their associated infrastructure were constructed by the Queensland Government.	Local significance
Dam wall and spillway	Fair-good	a) Demonstrates a distinct phase in the 1960s when dams and their associated infrastructure were constructed by the Queensland Government.	Local significance
Raw water pump station	Fair-good	Modern construction	Not of heritage significance
Main residence (former)	No longer present	NA	NA

Plate 1: The lime building facing north east

Plate 2: The lime building facing east

Plate 3: Clarifier No. 1

Plate 4: Backwasher Tank No. 1

Plate 5: Dam wall and spillway

Plate 6: Raw water pump station

4.1.2 Treatment area

This area contains buildings that were constructed from the 1970s to the 2000s. Most of these buildings are related to the water treatment process.

- The Potassium Permanganate Building (Plate 7) is a two storey, partially subterranean building with a single gabled roof with eaves. The concrete lower storey has a large door (double door) and a strip of large louvres on its eastern side. The upper storey is of red brick and contains a large ventilation grate on its northern and southern walls, and a smaller grate on its western wall. There is also a double-door width opening on the western side of the building. This is accessible via a set of concrete stairs and landing. The building contains operating machinery.
- The Seqwater offices and workshops are comprised of three modern sheds made of colour bond metal sheeting. Each shed has a gabled roof with eaves.
- Clarifier No. 3 (Plate 8) is a concrete tank 25 m in diameter with metal and concrete gangways across its expanse. Clarifier No. 3 is connected to filter block 4, to the west, by a raised concrete walkway.
- The administration building was originally built between 1974 and 1984 but has undergone significant alterations. Currently it is a modern three-storey structure, including a subterranean level. It has a hipped roofline which is capped by a ridge monitor. The ridge monitor has a flat roof line and windows on all four side with horizontal wooden slats on the eastern and western sides. The original building is still preserved, in part, at the core of the current building. It appears to have been constructed from rendered brick.
- The oxidation tank (Plate 12) is a large (10 x 30 m) rectangular concrete tank with associated pipe work. Pipe work and metal gangways connect the oxidation tank to clarifier no. 1 and 2 which are located to the west of the structure.
- The bulk chemicals storage building (Plate 11) is one of two structures by this name on site. The bulk chemical storage building in the treatment area is a large modern shed (25 x 10 m) made of corrugated metal sheets (walls and roof). The roof is a low gable and overhangs the walls of the structure by 1 m on the north side and 3 – 4 m on the eastern and southern sides. The western side of the building directly abuts the oxidation tank.
- Filter block 4 (Plate 9) is a rectangular concrete tank (5 x 45 m) connected to clarifier 3, to the east, by a concrete raised walkway. A red brick building (5 x 45 m) runs parallel to the concrete structure along its western side. The red brick building is flat roofed and has two banks of four horizontally pivoted wooden framed windows, and two banks of eight horizontally pivoted wooden framed windows on its western side. There are two large doors on the northern end of the building, at the top of which runs an exposed steel girder used to lift heavy materials into the building. On the roof of the building there is a small roughly square (5 x 5 m) weathered board structure with a flat roof and eaves. This structure has a door on its northern side.
- The fluoride building (Plate 10) is a rectangular painted besser block structure with a flat roof. The western two thirds of the building is two stories high with the remaining third only one storey. There are three doorways on the southern side. Two large double doors in the two storey section and one single door in the single storey section.
- The ozone generator building (Plate 10) is a modern gable-roofed corrugated metal shed. Along the southern and northern side the eaves are supported by metal bracing. On the eastern and western ends the eaves are unbraced. The middle section of the roof is capped by a rectangular flat roofed ridge monitor which contains windows on the northern and southern side. There are wooden horizontal slats associated with these windows.
- The ozone contact column is a rectangular concrete structure around 6 x 17 m in dimensions.
- The BAC filters are rectangular concrete structures around 10 x 20 m in dimensions.
- The intermediate pump station is a modern corrugate metal shed with a gabled roof.
- The intermediate storage tank is a large concrete tank with a butterfly pitched corrugate metal roof.

Table 3. Noosa Water Treatment Plant - treatment area significance assessment

Structure	Condition	Significance criteria	Significance rating
Potassium Permanganate Building	Fair-good	Modern construction	Not of heritage significance
Clarifier No. 3	Good	Modern construction	Not of heritage significance
Seqwater Offices and Workshops	Good	Modern construction	Not of heritage significance
Administration Building	Good	Modern construction	Not of heritage significance
Oxidation Tank	Fair-good	Modern construction	Not of heritage significance
Bulk Chemicals Storage	Good	Modern construction	Not of heritage significance
Filter Block 4	Fair-good	Modern construction	Not of heritage significance
Fluoride Building	Fair-good	Modern construction	Not of heritage significance
Ozone Generator Building	Fair-good	Modern construction	Not of heritage significance
Ozone Contact Column	Fair-good	Modern construction	Not of heritage significance
BAC Filters	Fair-good	Modern construction	Not of heritage significance
Intermediate Pump Station	Good	Modern construction	Not of heritage significance
Intermediate Storage Tank	Good	Modern construction	Not of heritage significance

Plate 7: The potassium permanganate building

Plate 8: Clarifier No. 3

Plate 9: Filter Block 4

Plate 10: Fluoride building (foreground) and Ozone Generator building (background)

Plate 11: Bulk Chemical Storage building

Plate 12: Oxidation Tank

4.1.3 Clear water area

In this area clear water (potable drinking water) is stored and pumped out to the community.

- The clear water storage tank is a large (40 m diameter) concrete structure with an asbestos butterfly pitched roof.
- The clear water pump station (Plate 13; Plate 14) is a building composed of red brick with exposed concrete pillars. The building has a hipped roof line with ridge monitor and eaves. The ridge monitor is a simple gable and contains ventilation grates on all sides. This building contains the machinery employed to pump clean water to the community. Therefore, on the eastern and western sides of the building there are large metal pipes which protrude through the building's walls. There are also ventilation screens along both the eastern and western walls of the building.
- Water quality management facility and bulk chemical is a modern building built of concrete and metal.

Table 4. Noosa Water Treatment Plant - clear water area significance assessment

Structure	Condition	Significance criteria	Significance rating
Clear water storage tank	Fair-good	Modern construction	Not of heritage significance
Clear water pump station	Good	Modern construction	Not of heritage significance
Water quality management facility and bulk chemical	Good	Modern construction	Not of heritage significance

Plate 13: Clear water pump station

Plate 14: Clear water pump station (interior)

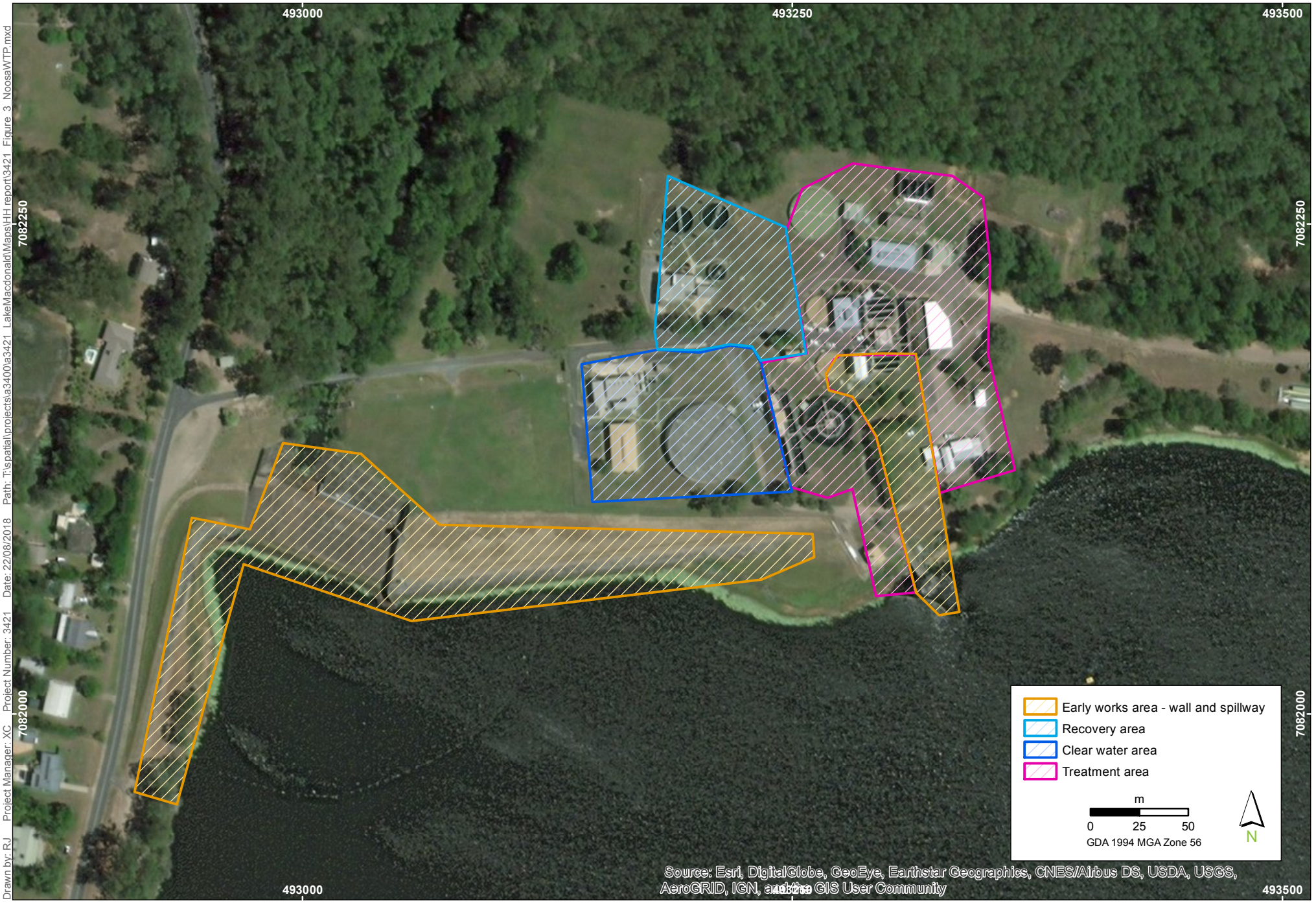
4.1.4 Recovery area

The recovery area of the water treatment plant processes waste water and returns recovered water to the system for use.

- The centrifuge building is a modern building built of concrete and metal.
- The sludge equalisation tank, thickener tank, and backwash recovery tanks 1 and 2, are all circular concrete tanks. Each is partially subterranean and has a metal gangway which extends over the tank.

Table 5. Noosa Water Treatment Plant - recovery area significance assessment

Structure	Condition	Significance criteria	Significance rating
Centrifuge building	Good	Modern construction	Not of heritage significance
Sludge equalisation tank	Good	Modern construction	Not of heritage significance
Thickener	Good	Modern construction	Not of heritage significance
Backwash recovery tank 1	Good	Modern construction	Not of heritage significance
Backwash recovery tank 2	Good	Modern construction	Not of heritage significance



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Noosa Water Treatment Plant areas

Lake Macdonald IAR

FIGURE 3

Imagery: (c) DigitalGlobe 2017-01-18

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4.2 Camp Cooroora

The structures at Camp Cooroora were constructed during the 1980s and 1990s. These structures mainly relate to the use of the site by the Scout Association of Australia.

- The scout activity centre (Plate 16; Plate 20) is a log framed double-storey structure with a single gable roof with eaves. The structure measures 28 x 12 m in dimensions and is roofed with corrugated metal sheeting. The roof contains three dormer windows on either side of the roof line which provide light into the upper storey. The upper storey is divided into three separate spaces by fibro sheeting. There are aluminium framed windows at either end. The lower (ground-level) storey has a bunk house at the western end and bathrooms at the eastern end. The middle of the lower storey is an open breezeway.
- The bush-style kitchen (Plate 17) is an open air structure with a low pitched single gable roof of corrugated sheet metal. The roof is supported by square metal posts set into a concrete foundation.
- The rotunda (Plate 18) is an octagonal shaped structure roofed with corrugated sheet metal, with rectangular metal posts set into a concrete foundation.
- The caretaker's residence is a conglomeration of a modern sheds and other informal structures.
- The open air chapel comprises of eight wooden benches arranged either side of an aisle in front of a wooden altar and metal crucifix.
- There are two flag poles at Camp Cooroora. The first is a flag pole with yard arm mounted in a pyramidal dressed stone base. The base includes a plaque which reads 'Moonga Place – Dedicated to the memory of district venture leader Ray 'Moonga' Anderson 22-8-47 – 30-8-89 A Good Scout'. The second is main flagpole for the site. This pole has a yard arm and gaff and is mounted in a pyramidal concrete base.
- Horse corrals made out rough cut bush timber supplemented with some milled timber cross members.
- The entrance gate to Camp Cooroora is in the design of the Australia flag (Plate 19). This gate is positioned between two 2 m high wet laid rock columns. To either side of the columns runs a half metre high wet laid rock wall.
- The camp has two open air fire places (Plate 15). The main fire place is a circular structure with a concrete base, it is surrounded by low log seating. The second, located behind the open air chapel, is a smaller fire place with two low log seats. To the north of the fire place is a low stone retaining wall.

Table 6. Camp Cooroora - significance assessment

Structure	Condition	Significance criteria	Significance rating
Scout activity centre	Fair	g) The Scouting movement has a strong and special association with this important meeting/gathering place h) This place has a special association with an organisation (Scouts) which has made a valuable contribution to the development of our society	Local significance
Bush-style kitchen	Good-fair	g) The Scouting movement has a strong and special association with this important meeting/gathering place	Local significance

Structure	Condition	Significance criteria	Significance rating
		h) This place has a special association with an organisation (Scouts) which has made a valuable contribution to the development of our society	
Rotunda	Good-fair	g) The Scouting movement has a strong and special association with this important meeting/gathering place h) This place has a special association with an organisation (Scouts) which has made a valuable contribution to the development of our society	Local significance
Caretaker's residence	Fair	This is a modern construction and reuse	Not of heritage significance
Open air chapel	Good-fair	g) The Scouting movement has a strong and special association with this important meeting/gathering place h) This place has a special association with an organisation (Scouts) which has made a valuable contribution to the development of our society	Local significance
Flagpoles	Good-fair	g) The Scouting movement has a strong and special association with this important meeting/gathering place h) This place has a special association with an organisation (Scouts) which has made a valuable contribution to the development of our society	Local significance
Horse corrals	Fair-poor	These were a later addition to the site for horse riding campers	Not of heritage significance
Entrance gate and wall	Good	g) The Scouting movement has a strong and special association with this important meeting/gathering place h) This place has a special association with an organisation (Scouts) which has made a valuable contribution to the development of our society	Local significance
Fireplaces	Good	g) The Scouting movement has a strong and special association with this important meeting/gathering place h) This place has a special association with an organisation (Scouts) which has made a valuable contribution to the development of our society	Local significance

Plate 15: Central fireplace

Plate 16: Scout activity centre (interior, 2nd storey)

Plate 17: 'Bush-style' kitchen

Plate 18: Rotunda

Plate 19: Camp Cooroora gateway

Plate 20: Scout activity centre

4.3 Other places

There are two other places located in the Project area which are outside of the water treatment plant and Camp Cooroora.

The Lake Macdonald brick structure (Plate 22) was originally constructed to commemorate the opening of the dam in 1965. It appears later additions were added to the original structure subsequently. The structure is made of red brick, with a concrete foundation laid after its original construction. The structure consists of two curved walls with a single straight wall running through them and extending to the north and south. The dissected curved wall produce four enclaves which each contain a wooden slat and metal framed picnic table. The structure has a flat sheet metal roof, with guttering, supported by a wooden frame.

The fish hatchery (Plate 21) located between the Noosa Water Treatment Plant and Camp Cooroora has been present since the 1970s. The site consists of 6 earthen ponds and a single modern metal shed.

Table 7. Other places - significance assessment

Structure	Condition	Significance criteria	Significance rating
Lake Macdonald brick structure with dedication plaque	Fair-good (steel roof is a later addition)	a) An example of the phase of dam and associated infrastructure construction in the 1960s	Local significance
Fish hatchery	Good	Modern construction	Not of heritage significance

Plate 21: Fish hatchery

Plate 22: Lake Macdonald brick structure with dedication plaque

5. Impact assessment

While no heritage registered places, landscapes or other features are located within the Project area, several features have been identified in this assessment as having local heritage significance. Most of these features will not be directly impacted by the Project. Based on a review of the Project works, an assessment of impacts to significant features identified at the WTP, Camp Cooroora and other areas is provided in the tables below.

Only the existing dam wall and spillway (which will be removed) and the Lake Macdonald brick structure with dedication plaque, located along the western shore of the lake, will be directly impacted.

Indirect impacts may occur to other features of local heritage significance particularly at Camp Cooroora.

Table 8. Noosa Water Treatment Plant – impact and management

Feature	Significance	Impact	Management
Lime Building	Local significance	No impact	General maintenance and upkeep.
Clarifier No. 1	Local significance	No impact	General maintenance and upkeep.
Backwash tank No. 1	Local significance	No impact	General maintenance and upkeep.
Dam wall and spillway	Local significance	Direct impact – demolished as part of Project	Photographic recording should be undertaken prior to demolition.
Clear water pump station	Local significance	No impact	General maintenance and upkeep.

Table 9. Camp Cooroora – impact and management

Feature	Significance	Impact	Management
Scout activity centre	Local significance	Indirect impact - possible indirect impact due to proximity to works site.	Construct a temporary barricade to protect this structure. Provide general maintenance and upkeep.
Bush-style kitchen	Local significance	Indirect impact - possible indirect impact due to proximity to works site.	Construct a temporary barricade to protect this structure. Provide general maintenance and upkeep.
Rotunda	Local significance	Indirect impact - possible indirect impact due to proximity to works site.	Construct a temporary barricade to protect this structure. Provide general maintenance and upkeep.

Feature	Significance	Impact	Management
Open air chapel	Local significance	Indirect impact - possible indirect impact due to proximity to works site.	Construct a temporary barricade to protect this structure. Provide general maintenance and upkeep.
Flagpoles	Local significance	Indirect impact - possible indirect impact due to proximity to works site.	Construct a temporary barricade to protect this structure. Provide general maintenance and upkeep.
Entrance gate and wall	Local significance	Indirect impact - possible indirect impact due to proximity to works site.	Construct a temporary barricade to protect this structure. Provide general maintenance and upkeep.
Fireplaces	Local significance	Indirect impact - possible indirect impact due to proximity to works site.	Construct a temporary barricade to protect this structure. Provide general maintenance and upkeep.

Table 10. Other places – impact and management

Feature	Significance	Impact	Management
Lake Macdonald brick structure with dedication plaque	Local significance	Direct	Consider redesigning access road to avoid impact. If not possible, photographic recording should be undertaken prior to demolish.

6. Recommendations

6.1 Mitigating direct impacts

Two features with local heritage significance (unregistered) - the Lake Macdonald brick structure and dedication plaque, and Dam Wall and Spillway - will be directly impacted by the proposed Project works.

The Lake Macdonald brick structure with dedication plaque will be directly impacted by the construction of a 6 m wide access track. This track exits Lake Macdonald Drive and runs north along the western side of Lake Macdonald. Its current alignment would directly impact the structure. Redesigning the track alignment to avoid the structure would mitigate against any direct impacts to the structure. If this is not possible a photographic archival recording of the structure, prior to impactful works, should be conducted. The dedication plaque should be salvaged and repositioned on a suitable structural feature or other location nearby.

The demolition and replacement of the Dam Wall and Spillway is the core objective of the Project. Therefore, it is not practicable to avoid impact to these structures. It is recommended that these structures are subject to photographic archival recording, prior to impacting works.

6.2 Mitigating indirect impacts

All of the significant features identified at Camp Cooroora will be indirectly or possibly inadvertently impacted by the proposed Project owing to their proximity to a work area. The excavation of a large 'borrow pit' in the cleared area at Camp Cooroora will be undertaken in close proximity to these structures. This will significantly alter the setting in which these structures are located. Structures could also be damaged unintentionally through interactions with heavy machinery on site. Owing to the high level of Project activity at this site it is recommended that each of these structures be temporarily barricaded to protect them from harm.

7. Summary and conclusions

The objective of this assessment was to identify and assess the potential impacts of the Six Mile Creek Dam Upgrade Project on any known or potential historical heritage values within the Project area. The Project area was focused on the Six Mile Creek Dam site, Lake Macdonald, Camp Cooroora, a small fish hatchery on the northern shores of Lake Macdonald.

A review of the land use history of the Project area indicated that prior to dam construction in 1965, use included timber getting and agricultural activities in the Lake Macdonald area. However, most activity including within the Project area was associated with the dairy industry. No historical heritage places or landscapes have been registered or listed in local, State or other registers. No historical heritage places or landscapes in Lake Macdonald were identified in a previous heritage study of the Noosa Shire area.

The physical inspection of the Project area did identify several features which, while not heritage registered, do have local heritage significance. These include several early structures associated with the first water treatment plant erected at this site (1960s). Several features within Camp Cooroora also have significance for their associations with the scouting movement and operations at the site. A brick structure with dedication plaque to the construction of the dam and lake (1960s) located on the western shores of Lake Macdonald, also has significance.

The Project works will require impacts to two features identified in this assessment as having local heritage significance. These features and possible mitigation options are:

- The original dam wall and spillway (1965) adjacent to the water treatment plant complex. These impacts cannot be avoided as removal of these features is the primary reason for the Project works.
- The brick structure with dedication plaque located on the western shoreline of Lake Macdonald. While there are no statutory obligations associated with this structure, if possible it is recommended that the brick structure and plaque be retained in situ through realignment of the proposed new access track to the dam. Essential maintenance and repairs to the brick structure (e.g. repairs to damaged brickwork sections) should be undertaken. The later steel shelter roof should be removed. If retention of this feature is not considered feasible, it is recommended the dedication plaque be relocated to another suitable locations nearby and the entire structure be adequately recorded photographically prior to removal.

8. References

Secondary Sources

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