

**Mamre Road Data Centre Campus (SSD-92743706)**

# Aquatic & Riparian Impact Assessment

Final Report

Prepared for Plan Project Management

14 November 2025

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- Jessica Chapman (Project manager)
- Jenny Beckius (GIS mapping)

*Biosis acknowledges the Aboriginal and Torres Strait Islander peoples as Traditional Custodians of the land on which we live and work.*

*We pay our respects to the Traditional Custodians and Elders past and present and honour their connection to Country and ongoing contribution to society.*

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## Definitions

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BC Act	<i>Biodiversity Conservation Act 2016</i>
Biosecurity Act	<i>Biosecurity Act 2015</i>
CBD	Central Business District
CEEC	Critically Endangered Ecological Community
Cth DCCEEW	Australian Commonwealth Department of Climate Change, Energy, the Environment and Water
DCP	Development Control Plan
DPI	Department of Primary Industries
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
FM Act	<i>Fisheries Management Act 1994</i>
GIS	Geographic Information System
LEP	Local Environmental Plan
LGA	Local Government Area
LLS	Local Land Services
NPW Act	<i>National Parks and Wildlife Act 1974</i>
NSW	New South Wales
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
SEPP	NSW State Environmental Planning Policy
study area	Lot 10 DP1280592, 706-752 Mamre Road in Kemps Creek, NSW
subject site	The area of impact for the proposed works
TEC	Threatened Ecological Community
VEC	Vulnerable Ecological Community
VMP	Vegetation Management Plan
VRZ	Vegetated Riparian Zone
WM Act	<i>Water Management Act 2000</i>

# 1 Introduction

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Biosis was commissioned by Project Plan Management (PPM) to undertake an Aquatic and Riparian Impact Assessment for the proposed Mamre Road Data Centre Campus (the Project) at Lot 10 DP1280592, 706-752 Mamre Road in Kemps Creek, NSW (the development site).

The development footprint is largely contained within 706-752 Mamre Road, Kemps Creek (Lot 10 DP 1280592). The development site also includes areas across the shared boundaries to the east and south, utilised to facilitate roadworks and bulk earthworks. These areas include:

- Gibb Group site to the East known as 1-22 Bakers Lane, Kemps Creek (Lot 40 in DP 709347).
- GPT Group site to the South known as 754 Mamre Road, Kemps Creek (Lot 180 in DP 1290397).

Additionally, power supply lead-in from Sydney-West Substation is proposed as part of the development, which traverses through multiple landholdings.

PPM, acting as the proponent on behalf of the developer, is securing approvals for site preparation works for the construction of the Project at the development site (Figure 1), involving the demolition of an existing structure, the infill of man-made dams, and removal of vegetation to allow for the Project's associated infrastructure.

It is important to note that the subject land as assessed in this Aquatic and Riparian Report, is subject to an existing SSDA which is close to approval and proposes works across the entire site, which is consistent in terms of proposed earthworks and impacts to this report.

The Project is considered a State Significant Development (SSD), registered as SSD-92743706, and will be assessed under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). As the Project is an SSD, Planning Secretary's Environmental Assessment Requirements (SEARs) have been released for the project which require that an Environmental Impact Statement (EIS) be prepared for the Project, supported by various environmental studies. For biodiversity, the SEARs requires that an assessment of the proposal's biodiversity impacts be undertaken in accordance with the NSW *Biodiversity Conservation Act 2016*, which requires the preparation of a Biodiversity Development Assessment Report (BDAR). This aquatic ecological report is to support the BDAR.

The Project is located within the area covered by the Cumberland Plain Conservation Plan (CPCP) and includes land that is categorised as 'Certified – Urban Capable Land' and 'Excluded Land'. Land categorised as 'Excluded Land' is not certified under the BC Act or Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and requires full assessment. The remaining land categorised as 'Certified - Urban Capable Land' is biodiversity certified. Assessment of the certified land in the development site is required under the NSW *Fisheries Management Act 1994* (FM Act) and the NSW *Water Management Act 2000* (WM Act).

This Aquatic and Riparian Impact Assessment aims to outline and assess the aquatic features present within the study area and provide legislative and ecological advice on managing these features during the proposed works.

## 1.1 Project description

The site is proposed for development under a State Significant Development Application (SSDA) as a data centre campus comprising:

- Approximately 26 shells across four-storeys data centre buildings (4x four shells and 2x five shells), including six technical office buildings, plus a campus office.
- Incoming and internal electrical substations and associated infrastructure
- Site preparation, including earthworks, stormwater, sewer, roads, and associated infrastructure.

## 1.2 Scope of assessment

The objectives of this investigation are to:

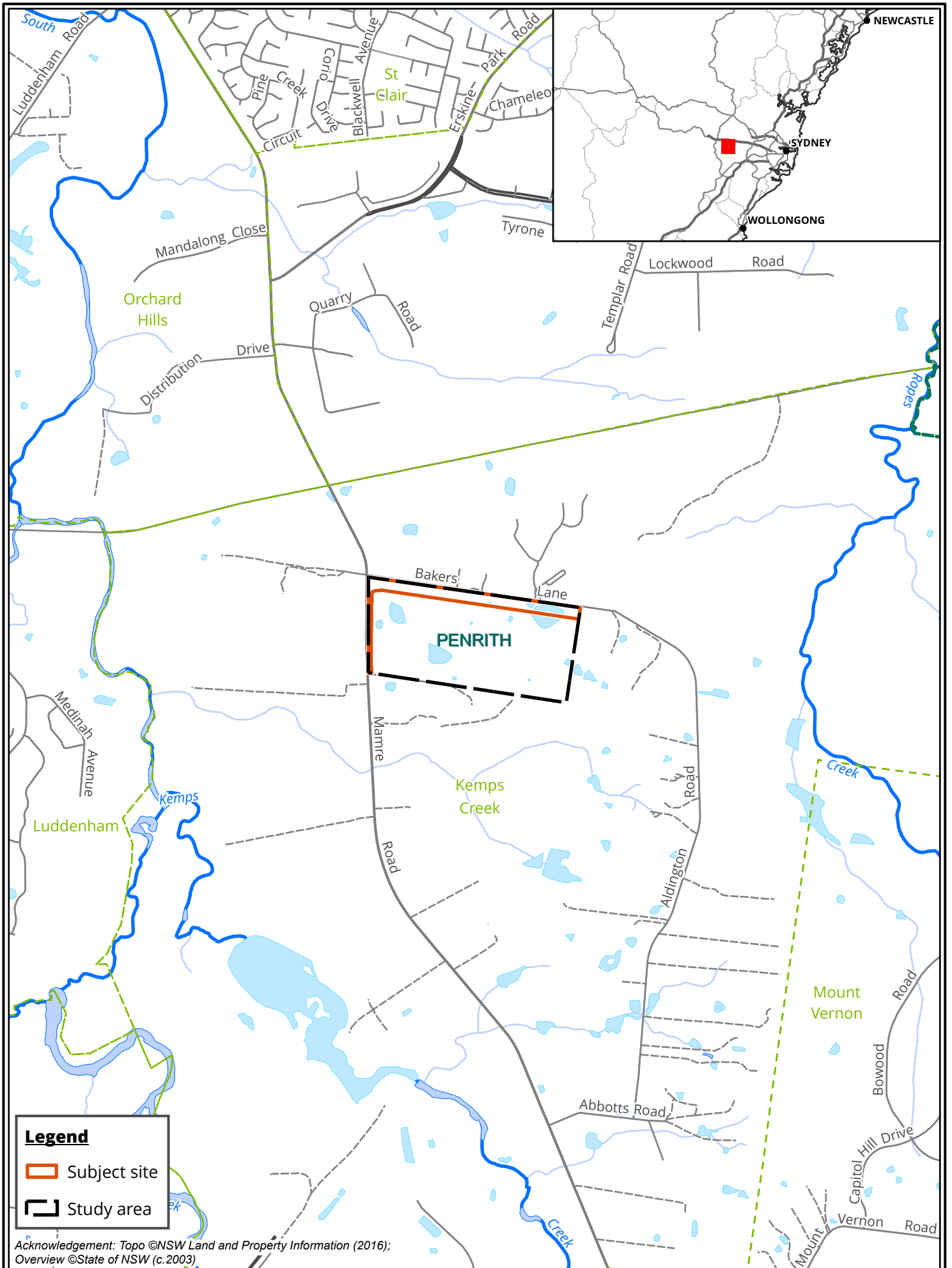
- Identify and define watercourse, farm dams and other aquatic habitats within the study area.
- Describe the vascular flora (ferns, conifers, and flowering plants), vertebrate fauna (birds, mammals, reptiles, frogs, and fish) and decapod crustacea (e.g., crayfish).
- Map native vegetation and other habitat features.
- Review the implications of relevant biodiversity legislation and policy.
- Identify potential implications of the proposed development and provide recommendations to assist with development design.

## 1.3 Location of the study area

The terms subject land, and study area, are used throughout this assessment and are defined below:

- The study area is the area of land that is subject to the proposed development and is defined as Lot 10 DP1280592. It covers an area of approximately 52.8 ha and is defined as follows.
  - The study area is bounded in the north by Bakers Lane, by Mamre Road to the west, and private property to the south and east. The study area is approximately 12.5 km southwest of Blacktown Central Business District (CBD).
  - The study area is in the Penrith City Local Government Area (LGA), the Deerubbin Local Aboriginal Land Council area, and the Greater Sydney Local Land Services (LLS) region.
  - The study area is zoned as General Industrial IN1 and Infrastructure SP2 under the State Environmental Planning Policy (Industry and Employment) 2021.
  - The study area occurs in the CPCP area and includes certified 'Urban Capable Land' land and non-certified 'Excluded Land'.
- The subject land is restricted to the area of non-certified 'Excluded land' within the study area which includes the northern and western edges of the development site. The subject land includes the areas of the study area subject to direct, indirect and prescribed impacts which are not certified under the CPCP. The subject land covers an area of approximately 7.18 ha.

The location of the study area and subject land are shown in Figure 1.



**Legend**

- Subject site
- Study area

Acknowledgement: Topo ©NSW Land and Property Information (2016);  
 Overview ©State of NSW (c.2003)



**Figure 1 Location of the study area**

Matter: 43542, Date: 15 October 2025,  
 Prepared for: JN, Prepared by: JB, Last edited by: jbeckius  
 Location: P:\43500s\43542\mapping\43542\_MamreRd\_KempsCrk\_AquaticAssessment  
 Layout: 43542\_FT\_Locality

0 200 400 600 800 1,000  
 Metres  
 Scale 1:25,000@A4, GDA2020 MGA Zone 56

## 2 Methods

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### 2.1 Database and literature review

Prior to completing the field investigation, information provided by Plan Project Management as well as other key information was reviewed, including:

- The NSW Department of Primary Industries (DPI) Spatial Data Portal for FM Act listed threatened species, populations and communities.
- NSW DPI *Biosecurity Act 2015* for priority listed weeds for the Greater Sydney Local Land Services (LLS) area.
- NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) Vegetation Information System (VIS) mapping, including.
  - NSW State Vegetation Type Mapping (SVTM\_NSW\_Extant\_PCT) (NSW DCCEEW 2025).
- *Guidelines for riparian corridors on waterfront land* (Department of Climate Change, Energy, the Environment and Water 2025).
- Topographic mapping for the location of waterways and similar features.

The implications for the project were assessed in relation to key biodiversity legislation and policy including:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- *Environmental Planning and Assessment Act 1979* (EP&A Act).
- *Local Land Services Act 2013* (LLS Act).
- *Water Management Act 2000* (WM Act).
- *Fisheries Management Act 1994* (FM Act).
- *Biosecurity Act 2015* (Biosecurity Act).
- *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (Biodiversity and Conservation SEPP).
- *Penrith Local Environmental Plan 2010*.
- *Penrith Development Control Plan 2014*.

### 2.2 Field investigation

A field investigation of the study area was undertaken on 17 September 2025 by Joel Nicholson (Senior Zoologist) and Todd Horton (Botanist). Aquatic features and surrounding habitats within the study area were visually assessed over eight person hours.

General classification of native vegetation in NSW used in this report is based on the classification system in Keith (2004) which uses three groupings of vegetation: vegetation formation, vegetation class and vegetation type, with vegetation type the finest grouping. The grouping referred to in this report is Plant Community Type (PCT) as defined by the Biodiversity Assessment Method (BAM) (DPIE 2020) and has been the standard used across NSW since 2016.

The vegetation types, within the study area, were stratified into PCTs broadly based on previous vegetation mapping, and the vegetation boundaries marked with a hand-held GPS in the field. Appropriate PCTs were selected on the basis of species composition and structure, known geographical distribution, landscape position, underlying geology, soil type, and any other diagnostic features.

### **2.2.1 Permits and licences**

This aquatic and riparian impact assessment was conducted under the terms of Biosis' Scientific Licence issued by NSW DCCEE under the BC Act (SL100758, expiry date 30 June 2026).

## 3 Results

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### 3.1 Desktop assessment

A desktop assessment of the study area identified one non-perennial, first-order watercourse located in the eastern section, flowing in a north-westerly direction from the eastern boundary. Historical imagery shows the first-order watercourse to be predominantly absent and has been altered over the years with changing agricultural landscapes (NSW Spatial Services 2025).

Hydrological mapping also delineates eleven hydro areas within the study area, which are as associated with farm dams based on aerial imagery. There are no mapped Key Fish Habitat, as mapped on the *Fisheries Spatial Data Portal* (DPI 2025a), or important wetlands, as recorded on the *Directory of Important Wetlands* (Cth DCCEEW 2019), present within the study area boundaries. Additionally, no threatened aquatic species were identified in the study area according to the available threatened species spatial data layer.

### 3.2 Riparian assessment results

#### 3.2.1 Mapped watercourse assessments

##### Unnamed watercourse 1

Field investigation confirmed the presence of one unnamed non-perennial watercourse (identified as unnamed watercourse 1) within the study area. As seen on the historical imagery, the watercourse has been altered over the years due to changes in agriculture and landscape and is now predominantly absent. The mapped hydroline layer was ground-truthed and accurately mapped by Biosis with a handheld DGPS to reflect the current watercourse pathway (Figure 2). This watercourse has been separated into two distinct reaches due to definable changes in watercourse, as shown on Figure 2. The reaches are defined as:

- Unnamed watercourse 1.1 (UWC 1.1) in which comprises the eastern reach of the watercourse, flowing northwest from Dam 9 into Dam 8.
- Unnamed watercourse 1.2 (UWC 1.2) in which comprises the northern reach of the watercourse flowing from Dam 8 into Dam 7 and offsite through a culvert on the northern boundary of the study area.

The reach of UWC 1.1 originates offsite to the east of Dam 9 (Photo 1), flows into the study area near Dam 9 and continues in a north-westerly direction for approximately 207 metres into Dam 8 (Photo 2). No active flow was observed during the site assessment. Additionally, the reach lacked definable features such as a bed or banks, and there were no visible changes in vegetation type or presence of aquatic vegetation (Photo 3). No aquatic or semi-aquatic fauna species were recorded during the survey. A small pooling area was observed approximately 20 metres upstream of Dam 8, however this is likely attributable to overflow from the dam rather than natural flow (Photo 4). Based on site evidence, it is likely that UWC 1.1 was historically an active watercourse, but the construction and operation of upstream dams have likely altered the local hydrology, resulting in a reduction or loss of definable stream features along this reach.

The section of the watercourse reach flowing from the western wall of Dam 8 northwards into Dam 7 and continuing offsite via a culvert under Bakers Lane is referred to as Unnamed Watercourse 1.2 (Photo 5). This reach extends approximately 110 metres from the outlet of Dam 8 to the culvert. At the time of the survey, active surface water flow was observed between Dam 8 and Dam 7. An eroded edge along the back wall of Dam 8 had formed a defined bank, indicating hydrological activity (Photo 6). While no aquatic vegetation was

observed within the stream, the watercourse was shaded by a Grey Box *Eucalyptus moluccana* and contained clumps of *Juncus usitatus* along sections of the bank. Water discharges from Dam 7 via an overflow point on the dam's northern side, ultimately flowing into a culvert beneath Bakers Lane. The entrance to the culvert was found to be densely vegetated with Bulrush *Typha orientalis*, which may restrict the movement of aquatic fauna and impede hydrological connectivity.

UWC 1.1 and UWC 1.2 have been assessed using the Waterfront land tool in Table 1 and Table 2 respectively.

**Table 1 Waterland Tool for UWC 1.1**

Waterland Tool (2020) task	Assessment	Evidence or comments
<b>Desktop assessment</b>		
<b>Is your property located on a watercourse, lake or estuary within the shaded area in any of the NRAR waterfront land maps? (Appendix 1; NRAR Guidelines, 2020)</b>	No	The study area is not contained within any of the maps listed in Appendix 1 of the NRAR Guidelines (2025).
<b>Using the Hydro Line spatial data map, identify if there is a blue line on your property or within 40 metres of the proposed work?</b>	Yes	The Hydro Line spatial data map identifies a watercourse within the eastern section of the study area.
<b>Is your property within the shaded area on the NRAR Map—Western land map local government area? (Appendix 2; NRAR Guidelines, 2020)</b>	No	The LGA of the study area is Penrith, which is excluded from the Western Land map.
<b>Is there a watercourse visible on your property?</b>	Yes	The desktop assessment indicates that there is a mapped hydro line.
<b>Is there a lake or wetland on your property or within 40 metres of the proposed work?</b>	No	There are no lakes or wetlands within the study area or within 40 metres of the proposed works.
<b>Using the Determining stream order fact sheet at Appendix 4 and the Hydro Line spatial data map, what is the stream order of your watercourse?</b>	1 <sup>st</sup> order watercourse	Using the Strahler order stream classification and the Hydro Line spatial data, the watercourse within the study area is considered to be a first order watercourse.
<b>Site assessment</b>		
<b>Does the watercourse have a defined bed or bank?</b>	No	UWC 1.1 does not contain any of these features.
<b>Using Appendix 5 – Watercourse types (NRAR Guidelines, 2020), choose the watercourse type that best matches the watercourse on your property</b>	Not applicable	
<b>Using Appendix 6 – Watercourse features (NRAR Guidelines, 2020), are there any watercourse features present?</b>	None	
<b>Using Appendix 3 – Lakes and wetlands (NRAR Guidelines, 2020), identify if the feature is a lake or wetland</b>	None	
<b>Referring to Appendix 7 – Wetland change in vegetation (NRAR Guidelines, 2020), is there a</b>	None	

Waterland Tool (2020) task	Assessment	Evidence or comments
change in vegetation on the property that indicates a wetland?		
Using <i>Appendix 8 – Determining the high bank of a watercourse</i> (NRAR Guidelines, 2020), locate the high bank of the watercourse, lake or wetland on your property	None	
Are the proposed works located within 40 metres of the high bank?	No	
<b>Survey Results</b>		
Controlled Activity approval required?	Exempt	Exempt – Not required under Section 4.41(1)(g) of the EP&A Act.
Vegetated Riparian Zone required (m)	Not applicable	No bank defined
Comments	The reach of UWC 1.1 is historically mapped as a first order watercourse. However, as there is no defined bed, bank or water within the stream area, it likely no longer functioning as a watercourse and is a remnant watercourse overland flow.	

Table 2 Waterfront land tool for UWC 1.2

Waterfront land tool criteria	Assessment	Evidence or comments
<b>Desktop assessment</b>		
Is your property located on a watercourse, lake or estuary within the shaded area in any of the NRAR waterfront land maps? (Appendix 1; NRAR Guidelines, 2020)	No	The study area is not contained within any of the maps listed in Appendix 1 of the NRAR Guidelines (2025).
Using the Hydro Line spatial data map, identify if there is a blue line on your property or within 40 metres of the proposed work?	Yes	The Hydro Line spatial data map identifies a watercourse within the eastern section of the study area.
Is your property within the shaded area on the NRAR Map—Western land map local government area? (Appendix 2; NRAR Guidelines, 2020)	No	The LGA of the study area is Penrith, which is excluded from the Western Land map.
Is there a watercourse visible on your property?	Yes	The desktop assessment indicate that there is a mapped hydro line. Aerial Imagery does not reveal any watercourses.
Is there a lake or wetland on your property or within 40 metres of the proposed work?	No	There are no lakes or wetlands within the study area or within 40 metres of the proposed works.
Using the Determining stream order fact sheet at Appendix 4 and the Hydro Line spatial data map, what is the stream order of your watercourse?	1 <sup>st</sup> order watercourse	Using the Strahler order stream classification and the Hydro Line spatial data, the watercourse within the study area is considered to be a first order watercourse.
<b>Site assessment</b>		
Does the watercourse have a defined bed or bank?	Yes	The northern section of the watercourse that flows from Dam 8 to Dam 7 and offsite through a

Waterfront land tool criteria	Assessment	Evidence or comments
		culvert on the northern boundary does have a defined bed and bank. The southern section of the watercourse that flows from Dam 9 to Dam 8 does not have a defined bed or bank. The southern section is not applicable in this assessment any further.
<b>Using Appendix 5 – Watercourse types (NRAR Guidelines, 2020), choose the watercourse type that best matches the watercourse on your property</b>	Type 4 – Laterally Unconfined Discontinuous	The northern section is considered to be Type 4 as the watercourse contains unconfined banks and is discontinuous in its bed and bank quality.
<b>Using Appendix 6 – Watercourse features (NRAR Guidelines, 2020), are there any watercourse features present?</b>	Pooling and Erosion	The northern section has pooling and erosion features on the back of Dam 8 flowing into Dam 7.
<b>Using Appendix 3 – Lakes and wetlands (NRAR Guidelines, 2020), identify if the feature is a lake or wetland</b>	No	-
<b>Referring to Appendix 7 – Wetland change in vegetation (NRAR Guidelines, 2020), is there a change in vegetation on the property that indicates a wetland?</b>	No	-
<b>Using Appendix 8 – Determining the high bank of a watercourse (NRAR Guidelines, 2020), locate the high bank of the watercourse, lake or wetland on your property</b>	-	-
<b>Are the proposed works located within 40 metres of the high bank?</b>	Yes	-
<b>Survey Results</b>		
<b>Controlled Activity approval required?</b>	No	Exempt – Not required under Section 4.41(1)(g) of the EP&A Act
<b>Vegetated Riparian Zone required (m)</b>	10 metres	To be confirmed.
<b>Comments</b>	UWC 1.2 flows from Dam 8 northwest down to Dam 7 and then northeast to a culvert offsite to the north. The overflow from Dam 8 has active water in the channel with sediment and definable banks.	

### 3.2.2 Overland flows

Overland flow water refers to water that flows across the land surface, typically as a result of rainfall or stormwater runoff, and does not form part of a defined watercourse, lake, or estuary. Under Section 4A of the *NSW Water Management Act 2000*, overland flow water is defined as *water, including rainfall runoff, that flows over the land otherwise than in a watercourse, lake or estuary*. This includes water that may collect in depressions or move across the landscape before entering a defined drainage line.

Overland flow paths may represent the remnants of historical watercourses that have lost defining aquatic features, such as a defined bed and banks, due to alterations in upstream hydrology. These changes, often resulting from dam construction, land clearing, or modified drainage patterns, can reduce or eliminate regular flow, leading to the degradation or disappearance of typical watercourse characteristics.

Field investigations confirmed the presence of four overland flow paths within the study area, as mapped in Figure 2. The length and key characteristics of each overland flow path are summarised in Table 3 below

**Table 3 Overland flows within the study area**

Overland Flows	Length of stream (m)	Comments
<b>Overland flow 1 (OLF 1)</b>	321	OLF 1 originates from both Dam 3 and Dam 1, following a constructed earthworks channel designed to direct surface runoff downslope (Photo 7). Pooling of water was observed in the lower sections of the channel, suggesting that during periods of excessive rainfall, water likely dissipates into the surrounding grassland vegetation rather than continuing as a defined flow path. The water within this channel does not directly flow offsite and remains contained within the study area.
<b>Overland flow 2 (OLF 2)</b>	418	OLF 2 extends from Dam 2 to Dam 3, following a constructed earthworks channel that appears to have been designed to manage surface runoff and minimise erosion within the landscape (Photo 8). During the field investigation, no flowing water was observed within the channel, however, significant pooling was recorded at Dam 3, which was observed to be at full capacity (Photo 9). Historical overflow from Dam 2 has likely contributed to the pooling observed on the upstream side of Dam 3. The water within the channel does not directly flow offsite, and the overland flow is contained within the study area.
<b>Overland flow 3 (OLF 3)</b>	160	OLF 3 originates from Dam 10 and flows northward until a discernible change in vegetation is no longer visible (Photo 10), indicating the likely extent of surface water movement. Historical flow patterns suggest that this overland flow path may have once connected to either Dam 8 or the mapped first-order watercourse within the study area. However, the construction and presence of Dam 10 have altered the local hydrology, effectively capturing surface runoff during rainfall events and preventing any downstream connectivity to Dam 8 or adjacent drainage features.
<b>Overland flow 4 (OLF 4)</b>	75	OLF 4 occurs in the northeastern corner of the study area, entering from offsite and flowing towards Dam 8 (Photo 11). During the field investigation, pooling water was observed within the flow path as a result of recent rainfall. Aquatic vegetation, including exotic Sharp Rush <i>Juncus acutus</i> subsp. <i>acutus</i> , was recorded near the entry point to Dam 8, likely associated with overflow pooling (Photo 12). No defined watercourse was identified to the east of this area, which may be attributed to historical changes in surface hydrology caused by the construction of upstream farm dams. The water within this overland flow path does not flow offsite but rather contributes to the inflow of Dam 8.

### 3.2.3 Farm Dams

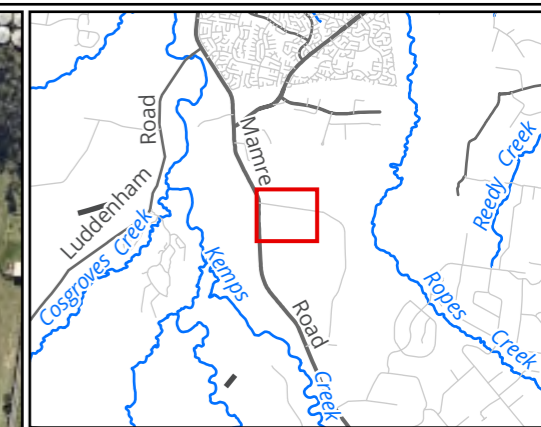
The study area encompassed a total of eleven farm dams, which were distributed across the landscape and likely served as key water resources within the agricultural setting. These dams varied in size, depth, and usage, reflecting a range of management practices and environmental conditions. The location and extent of each dam is shown on Figure 2 and the size and description in Table 4 below.

**Table 4 Farm dams within the study area**

Dams	Size (Hectares)	Habitat description
<b>Dam 1</b>	0.17	Dam 1 is slightly turbid with a large patch of <i>Eleocharis sphacelata</i> in the centre and small sparse patches of Water Ribbons <i>Cyanogeton procerum</i> (Photo 13). The water contained aquatic vegetation such as Ribbonweed <i>Vallisneria australis</i> . The border of

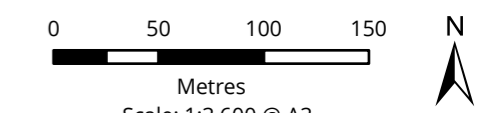
Dams	Size (Hectares)	Habitat description
		<p>the dam was lined with <i>Juncus usitatus</i>, with the southeastern section showing signs of livestock impacts. A Forest Red Gum <i>Eucalyptus tereticornis</i> was present providing minimal shade on the southern section of the dam.</p> <p>The water contained Mosquito Fish <i>Gambusia affinis</i>, and sparse clouds of algae. Fauna species such as Purple Swamp Hen <i>Porphyrio porphyrio</i> and Common Eastern Froglet <i>Crinia signifera</i> were observed utilising the dam.</p>
<b>Dam 2</b>	0.58	<p>Dam 2 is slightly turbid with small patches of <i>Juncus usitatus</i> scattered along the banks and a small patch of <i>Eleocharis sphacelata</i> in the northern section (Photo 14). The water contained aquatic vegetation such as Ribbonweed.</p> <p>The water contained Mosquito Fish, and large clouds of algae. Fauna species such as Australian Wood Duck <i>Chenonetta jubata</i>, Eurasian Coot <i>Fulica atra</i> and Common eastern froglets were observed with the dam.</p>
<b>Dam 3</b>	0.84	<p>Dam 3 is slightly turbid with emergent vegetation including <i>Eleocharis sphacelata</i> and Water Ribbons, with sparse sections of <i>Juncus usitatus</i> along the banks (Photo 15). The dam had a small surface covering of Nardoo <i>Marsilea mutica</i> and aquatic vegetation of Ribbonweed. The northern side of dam contained an overflow of water due to the dams capacity, labelled as OFL 2.</p> <p>The water contained Mosquito Fish, and large clouds of algae. Fauna species such as Short-finned Eel <i>Anguilla australis</i> Australian Wood Duck, and Eurasian coot were observed with the dam.</p>
<b>Dam 4</b>	0.02	<p>Dam 4 is small and turbid with the banks consists of <i>Juncus usitatus</i> with a small surface covering of Nardoo and <i>Azolla pinnata</i> (Photo 16). The southern section of the dam wall is built from a loose brick pile.</p> <p>Due to the turbidity, no submerged vegetation could be observed, however Mosquito Fish were observed near the banks. No fauna species were observed in the dam.</p>
<b>Dam 5</b>	0.02	<p>Dam 5 is small and turbid with <i>Eleocharis sphacelata</i> and sparse sections of <i>Juncus usitatus</i> along the banks (Photo 17).</p> <p>Due to the turbidity, no submerged vegetation or aquatic fauna could be observed. Fauna species such as Australian Wood Duck, and Common Eastern Froglet were observed within the dam.</p>
<b>Dam 6</b>	0.05	<p>Dam 6 is turbid with emergent <i>Eleocharis sphacelata</i>, sparse sections of <i>Juncus usitatus</i> along the banks and a small surface covering of Nardoo (Photo 18). The banks show signs of erosion from livestock access.</p> <p>Due to the turbidity, no submerged vegetation could be observed, however Mosquito Fish were observed near the banks. No fauna species were observed in the dam.</p>
<b>Dam 7</b>	0.07	<p>Dam 7 is turbid with an active overflow occurring from Dam 8 (Photo 19). Emergent vegetation of Bulrush <i>Typha orientalis</i> and <i>Eleocharis sphacelata</i>, sparse sections of <i>Juncus usitatus</i> along the banks and a small surface covering of Nardoo. The water contained aquatic vegetation such as Ribbonweed.</p> <p>The water contained Mosquito Fish, and large clouds of algae. Fauna species such as Australian Wood Duck, Eurasian coot and Common Eastern Froglet were observed with the dam.</p>
<b>Dam 8</b>	1.49	<p>Dam 8 is large, clear, and contains a variety of habitats and vegetation (Photo 20). Emergent and aquatic vegetation such as Bulrush, <i>Eleocharis sphacelata</i>, <i>Bacopa monnieri</i>, <i>Juncus usitatus</i>, Sharp Rush <i>Juncus acutus</i> subsp. <i>acutus</i>, Hyssop Loosestrife <i>Lythrum hyssopifolia</i>, Ribbonweed and Nardoo are observed throughout the dam. The northern side contains a large patch of <i>Eleocharis sphacelata</i>, with the centre containing a Bulrush patch. The southern and eastern banks have dense patches of <i>Juncus usitatus</i> and Sharp rush offering good breeding habitat for frogs. The eastern</p>

Dams	Size (Hectares)	Habitat description
		<p>corner of the dam offers moderate shorebird habitat with two species; Black-fronted Dotterel <i>Charadrius melanops</i> and an unidentified sandpiper (observed flying from the dam on approach), observed using the habitat during the field investigation.</p> <p>The water contained Mosquito Fish, and sparse clouds of algae. Fauna species such as Short-finned Eel, Australian Wood Duck, Eurasian coot, Australasian Grebe <i>Tachybaptus novaehollandiae</i>, and Common Eastern Froglet were observed with the dam.</p>
<b>Dam 9</b>	0.07	<p>Dam 9 is turbid with emergent <i>Eleocharis sphacelata</i> and sparse sections of <i>Juncus usitatus</i> (Photo 21). Active overflow is occurring from the dams offsite to the east.</p> <p>Due to the turbidity, no submerged vegetation could be observed, however Mosquito Fish were observed near the banks. No fauna species were observed in the dam.</p>
<b>Dam 10</b>	0.01	<p>Dam 10 is small and turbid with emergent <i>Eleocharis sphacelata</i>, sparse sections of <i>Juncus usitatus</i> along the banks and a small surface covering of Nardoo (Photo 22). The banks show signs of erosion from livestock access.</p> <p>Due to the turbidity, no submerged vegetation could be observed, however Mosquito Fish were observed near the banks. No fauna species were observed in the dam.</p>
<b>Dam 11</b>	0.01	<p>Dam 11 is small and turbid with emergent <i>Eleocharis sphacelata</i>, sparse sections of <i>Juncus usitatus</i> along the banks and a small surface covering of Nardoo (Photo 23). The banks show signs of erosion from livestock access.</p> <p>The water contained Mosquito Fish, and large clouds of algae. No fauna species were observed in the dam.</p>



- Legend**
- Subject site
  - Study area
  - Dam (Biosis, 2025)
  - Watercourse (Biosis, 2025)
  - Overland flow
  - Culvert
- Strahler stream order**
- 1

**Figure 2 Riparian ecological features**



Scale: 1:3,600 @ A3  
 Coordinate System: GDA2020 MGA Zone 56



Matter: 43542, Date: 15 October 2025,  
 Prepared for: JC, Prepared by: JB, Last edited by: jbeckius  
 Location: P:  
 V43500s43542\Mapping43542\_MamreRd\_KempsCrk\_AquaticAssessment.aprx  
 Layout: 43542\_F2\_RiparianEcoFeat

Acknowledgements: Basemap © Land and Property Information 2016, Imagery © NearMap 2025

## 4 Impact assessment and legislative requirements

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### 4.1 Impact summary

The proposed works will impact the following aquatic features within the study area:

- Eleven farm dams
- Four overland flow channels
- One first order watercourse stream

The subject site of non-certified 'Excluded land' contains Unnamed watercourse 1, overland flow 4 and Dams 5, 7, and 8.

### 4.2 *Environmental Planning and Assessment Act 1979*

Under Division 4.7, Section 4.41(1)(b) and (g) of the *Environmental Planning and Assessment Act 1979* (NSW), developments that are classified as State Significant Development (SSD) are not subject to separate approvals under other legislation. Specifically, subsection (1)(b) removes the requirement to obtain approval under section 201, 205, or 219 of the *Fisheries Management Act 1994*, while subsection (1)(g) removes the need for a water use approval, water management work approval, or activity approval under the *Water Management Act 2000*. As the project is declared SSD, these approvals are not required.

### 4.3 *Water Management Act 2000*

The *Water Management Act 2000* governs the sustainable and integrated management of NSW's water for the benefit of both present and future generations. In the context of aquatic ecology, the *Water Management Act 2000* provides a physical definition of a waterway and other relevant waterbodies applicable to this assessment. Specifically, the Act defines a watercourse as "*a river, creek or other natural stream of water (whether modified or not) flowing in a defined channel, or between banks, notwithstanding that the flow may be intermittent or seasonal or the banks not clearly or sharply defined.*" This definition underpins the classification and assessment of aquatic habitats within the study area, including both perennial and ephemeral systems.

The *Water Management Act 2000* also provides guidance on controlled actions undertaken within the riparian zone of a watercourse, with assessments of the potential impact of any controlled activity to be undertaken to ensure that minimal impacts will occur to "waterfront land". However, as the Project has been declared as SSD, approvals under Sections 89, 90 and 91 the WM Act are not required (section 4.41 of the EP&A Act).

### 4.4 *Fisheries Management Act 1994*

The FM Act, administered by the Department of Primary Industries (DPI), provides for the sustainable management of fish and their habitats in New South Wales. It establishes approval processes for activities that may impact threatened fish species and habitats, and contains provisions for the conservation of fish stocks, key fish habitat, aquatic biodiversity, and threatened species, populations, and ecological communities. The Act regulates the conservation of fish, aquatic vegetation, and certain aquatic macroinvertebrates, through promoting the ecologically sustainable development. The FM Act lists threatened aquatic species, populations, and ecological communities, as well as key threatening processes

and declared critical habitats. Guidelines for assessing whether an activity is likely to result in a significant impact are set out in sections 220ZZ and 220ZZA of the FM Act.

A key objective of the FM Act is the conservation of key fish habitat—aquatic environments essential to the sustainability of recreational and commercial fishing industries, the maintenance of fish populations, and the survival and recovery of threatened aquatic species. Key fish habitat is defined in Sections 3.2.1 and 3.2.2 of the *Policy and Guidelines for Fish Habitat Conservation and Management* (DPI 2013), and is classified based on a combination of habitat sensitivity (i.e., waterway type) and waterway class. These habitats include rivers, creeks, lakes, lagoons, billabongs, weir pools, and impoundments up to the top of the bank, but explicitly exclude small ephemeral headwater creeks and gullies—namely 1st and 2nd order streams as defined by the Strahler method (1952)—and farm dams constructed on these systems. Generally, 3rd order tributaries and above are considered key fish habitat requiring conservation and management. However, it is recognised that threatened species may still utilise 1st or 2nd order streams when temporarily inundated. In line with the FM Act's objective to conserve key fish habitats, all permanent and semi-permanent freshwater habitats intersecting a project's area of impact must be identified and assessed for their ecological value and potential risk of disturbance.

As the Project has been declared as SSD, permits under the following sections of the FM Act are not required (s 4.41 of the EP&A Act), however, where applicable, consideration has been given to these issues within this report:

- Section 201 Circumstances in which a person (other than a public or local government authority) may carry out dredging or reclamation.
- Section 219 Passage of fish not to be blocked.

There is no Key Fish Habitat mapped within the study area (DPI 2025b).

## 5 Conclusion and recommendations

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### 5.1 Conclusion

This report is an assessment of the impacts to the aquatic and riparian features of the study area as a result of the proposed Project, in accordance with the EP&A Act, FM Act, and WM Act. The proposed activities that will result in impacts to aquatic ecological values include:

- Removal of eleven farm dams.
- Removal of four overland flows.
- Removal of one first order watercourse.

As the project is listed as an SSD approvals section 201, or 219 of the *Fisheries Management Act 1994*, and the *Water Management Act 2000* are not required, however they are recommended to be considered where reasonably applicable.

### 5.2 Recommendations

Given there are requirements for removal of aquatic habitat and features for the project, the focus of the recommendations is to minimise disturbance to aquatic species and surrounding water habitats. These recommendations are:

- Prior to construction, a suitably experienced and qualified Project Ecologist should be appointed to oversee ecological works to mitigate construction impacts on native biota welfare.
- A dam dewatering plan is to be required for the removal of the farm dams within the study area.
- In the unlikely event that unexpected threatened species are identified within the riparian areas during the project, works should cease, and an ecologist contacted.
- Appropriate erosion and sediment control measures should be installed at all sites to avoid sedimentation of receiving water bodies or other indirect impacts to surrounding biodiversity values.
- A Vegetation Management Plan (VMP) is recommended post-construction for landscaping areas.
- Appropriate control measures should be installed to avoid the translocation of *Gambusia* into other watercourse or waterbodies.

## References

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Cth DCCEEW 2019. Directory of Important Wetlands in Australia, Australian Commonwealth Department of Climate Change, Energy, the Environment and Water, accessed 26 February 2024, <https://www.dcceew.gov.au/water/wetlands/australian-wetlands-database/directory-important-wetlands>.

Department of Climate Change, Energy, the Environment and Water 2025. 'Controlled activities - Guidelines for riparian corridors on waterfront land',.

DPI 2013. Policy and Guidelines for Fish Habitat Conservation and Management (2013 Update), NSW Department of Primary Industries, [https://www.dpi.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0005/634694/Policy-and-guidelines-for-fish-habitat.pdf](https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/634694/Policy-and-guidelines-for-fish-habitat.pdf).

DPI 2025a. 'Fisheries NSW Spatial Data Portal', [https://webmap.industry.nsw.gov.au/Html5Viewer/index.html?viewer=Fisheries\\_Data\\_Portal](https://webmap.industry.nsw.gov.au/Html5Viewer/index.html?viewer=Fisheries_Data_Portal).

DPI 2025b. 'Key Fish Habitat', accessed 27 November 2020, <https://www.dpi.nsw.gov.au/fishing/habitat/publications/pubs/key-fish-habitat-maps>.

DPIE 2020. Biodiversity Assessment Method (BAM), NSW Department of Planning, Industry and the Environment, <https://www.environment.nsw.gov.au/research-and-publications/publications-search/biodiversity-assessment-method-2020>.

Keith D 2004. Ocean Shores to Desert Dunes: the native vegetation of New South Wales and the ACT, Department of Environment and Conservation, Hurstville, NSW.

NSW DCCEEW 2025. 'NSW State Vegetation Type Map (SVTM C2.0M2.1)', <https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet/state-vegetation-type-map>.

NSW Spatial Services 2025. Historical Imagery, NSW Government, <https://portal.spatial.nsw.gov.au/portal/apps/webappviewer/index.html?id=f7c215b873864d44bccdda8075238cb>.

# Appendices

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## Appendix 1 Photos

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**Photo 1** Start of Unnamed Watercourse reach 1.1 to the east of Dam 9 on the eastern boarder of the study area



**Photo 2** Unnamed Watercourse reach 1.1 hydroline to Dam 8



**Photo 3** Unnamed Watercourse reach 1.1 with no bed or bank or visible vegetation changes.



**Photo 4** Small area of pooling on Unnamed Watercourse reach 1.1



**Photo 5** Unnamed Watercourse reach 1.2 flowing over Dam 7 and into the culvert on the northern border of the study area



**Photo 6** Water flowing from Dam 8 into Dam 7 with an eroded back edge of Dam 8 creating a bank



**Photo 7** Overland Flow 1 originating from Dam 3 and Dam 1



**Photo 8** Overland flow 2 originating from Dam 2 to Dam 3



**Photo 9** Significant pooling at Dam 3 from Overland flow 2



**Photo 10** Overland flow 3 originating from Dam 10



**Photo 11** Overland flow 4 originating from offsite to the northeast of the study area



**Photo 12** Pooling near Dam 8 along Overland flow 4



**Photo 13 Farm Dam 1**



**Photo 14 Farm Dam 2**



**Photo 15 Farm Dam 3**



**Photo 16 Farm Dam 4**



**Photo 17 Farm Dam 5**



**Photo 18 Farm Dam 6**



**Photo 19 Farm Dam 7**



**Photo 20 Farm Dam 8**



**Photo 21 Farm Dam 9**



**Photo 22 Farm Dam 10**



**Photo 23 Farm Dam 11**

